SAFETY MANAGEMENT: PROBLEMS ENCOUNTERED AND RECOMMENDED SOLUTIONS

By Joe M. Wilson Jr.[1] and Enno "Ed" Koehn,[2] Fellow, ASCE

ABSTRACT: The philosophy of safety management is a relatively new method of controlling safety policies, procedures, and practices within a company. This philosophy is currently being implemented by many construction companies to limit their liabilities and costs, thereby making them more competitive in the construction marketplace. While the principles behind safety management are fairly simple in concept, it is during the implementation of such a program that construction companies may encounter their most difficult obstacles. In fact, it is often the workers who present the greatest opposition—the same individuals who benefit the most by improved safety conditions on the site. Safety management is a dynamic process operating in a constant state of change. Therefore, the process must be constantly monitored and adjusted to achieve the desired goals. This paper presents a discussion of the methods of safety management employed on a small-to medium-sized project in the northwestern United States. The discussion will highlight several of the problems encountered and the solutions utilized to overcome these problems.

INTRODUCTION

The interest in safety awareness among construction companies has greatly increased in the past decade. This increased awareness in safety can be attributed to many factors. As an example, the construction industry has come to recognize the relationship between risk management and return on investment (Davis 1998). The ever-increasing cost of medical treatment, convalescent care, and the potential for lawsuits all add up to higher insurance premiums, which in turn tend to have a negative impact on a company's profit (Hinze 1998). In addition, companies with high experience modification ratings are often prohibited from bidding on a certain type of work. It is, therefore, in the company's best interest to take whatever means necessary to manage safety on the work site.

RESPONSIBILITY FOR SAFETY

The Occupational Safety and Health Administration (OSHA) specifically requires that employers such as contractors are responsible for providing workers a place of employment free from recognized hazards. This may be interpreted as a safe place at which to work (Koehn 1996). Accordingly, the manner in which a construction firm manages safety depends on the type of work in which the company is engaged. A general contracting firm may employ hundreds of workers as employees, and many more as subcontractors. The general contractor thus may have the responsibility of managing the safety of its own employees as well as the employees of the various subcontractors utilized for the project. This often places the general contractor in an awkward position, since the firm may not be competent in managing the safety of all subcontractors on the job site. This is not meant to imply that the general contractor should assume the burden of implementing a safety program for every subcontractor, but the general contractor should have a good working knowledge of safety procedures for every subcontractor on the site. This is often the most difficult aspect of implementing a safety program, because a thorough knowledge of safety practices is often learned on the job and usually requires considerable experience. As a result, the general contractor often leaves the responsibility of safety to the individual subcontractors and may never take an active part in ensuring that the subcontractor is actually exercising all measures necessary to provide a safe working environment.

Subcontractors are faced with similar problems in that, like general contractors, they may employ large groups of workers, or as few as one. The primary problem faced by subcontractors involves implementing a safety program that will satisfy the requirements of the general contractor as well as the standards outlined by OSHA. This may seem as an easy task; however, often the subcontractors' emphasis on safety is proportionate to the size of the company. As an example, smaller companies may not place as high a priority on safety as larger companies. This, of course, is a generalization. While there are smaller firms with excellent safety programs and records, and while there is no doubt that smaller firms would benefit from a more comprehensive safety program, it is nonetheless a difficult process for them because of the expense incurred in implementing such a program. Safety training is often left to an on-the-job learning exercise or taught by the employees' union or trade organization. While most union and trade organizations have excellent training programs, they should be considered only as a base upon which to build (Unions 1998). The best training is often acquired through experience, on-the-job training, and continuing education.

According to J. Hinze of the University of Florida, the owner of the project and the project designers can also have an impact on the safety practices encountered on the job site (Moral 1997; Safety 1997). In addition, engineers have a professional and moral obligation to take safety, health, and welfare under consideration. In fact, today there is a trend in the construction industry to enhance safety by design. The theory behind this concept, according to Hinze, is that designers clearly can and do influence construction worker safety through their design decisions ("Some More" 1997). Therefore, if the design process takes the safety of the workers into consideration, the overall safety of the project can be impacted in a positive manner. Implementation of this type of program requires the cooperation of both architects and engineers. It is important to note, however, that the owner is responsible for ensuring the implementation of this design criteria from project initiation, and for making safety a priority for the duration of the project. It is believed that safety by design generally does not involve extra expenses incurred in the design and in the construction process. In fact, there may be a decrease in cost due to reduced insurance rates, which in turn

[1]Engr., Arceneaux and Gates Consulting Engineers, Inc., 3501 Turtle Creek Dr., Ste. 102, Port Arthur, TX 77642. E-mail: AGENG7888@AOL.com

[2]Prof. and Chair, Dept. of Civ. Engrg., Lamar Univ., P.O. Box 10024, Beaumont, TX 77710. E-mail: koehneu@hal.lamar.edu

Note. Discussion open until July 1, 2000. To extend the closing date one month, a written request must be filed with the ASCE Manager of Journals. The manuscript for this paper was submitted for review and possible publication on June 26, 1999. This paper is part of the ***Journal of Construction Engineering and Management***, Vol. 126, No. 1, January/February, 2000. ©ASCE, ISSN 0733-9634/00/0001-0077–0079/ $8.00 + $.50 per page. Paper No. 19728.

will lower the contractors' expenses. As this method of design gains acceptance, it is almost certain to improve overall construction safety along with the safety records of construction companies.

SAFETY PRACTICES

The safety practices encountered on construction sites are as varied as the sites themselves. All construction sites have their own unique aspects of safety, which must be considered. Larger construction projects generally are better organized from a safety standpoint. These type of projects are often high profile. The companies involved in such visible construction projects have reputations to uphold as well as safety records to maintain; they are generally better prepared to manage the safety aspects of a project. Almost all of the larger construction firms have a full-time safety director or at least one person who is responsible for the company's safety program. Having full-time safety personnel relieves the pressure, somewhat, on the onsite construction project team. This may be accomplished by keeping the team members informed of possible safety problems, by making sure that subcontractors are implementing their safety programs adequately, and by assisting in the routine day-to-day aspects of safety management. This allows the project personnel to focus their efforts on the project itself.

Small to medium projects such as that described in this paper probably hold the greatest potential for improvement in safety management. Projects of this type usually involve smaller firms that, as stated earlier, may not have an adequate safety program or the personnel to oversee safety criteria. Implementation of their safety management programs is usually left up to the foreman or the project superintendent. Because of their normal work load, neither of these have time to put the best effort toward the program. As a result, the method employed is often a ''just get by'' approach, satisfying only the minimum requirements. It is on these types of projects that good safety management practices, implemented properly, can have a very positive impact on overall project safety, as well as improving the company's profits by keeping injuries and claims to a minimum.

SAFETY PLAN IMPLEMENTATION

One method of safety management with which the first writer has personal experience was used on a small-to medium-sized project that experienced many of the problems characteristic of the smaller projects mentioned earlier. The project was a large timber frame medical facility located in a suburb of Seattle, Wash. While the project wasn't difficult to construct, it did have a tight schedule, which resulted in those involved placing the majority of their efforts into attempting to meet construction deadlines. As a result, the safety management on the project did not obtain, at times, the attention that it should have received.

The first writer was employed as the project superintendent by the general contractor on the project. At the peak time, this firm had approximately twenty employees working on the project. The company required daily ''tool box'' safety talks each morning for their employees. These talks lasted about 10 minutes and included a description of the work to be accomplished that day. In addition, appropriate safety information for the task(s) to be undertaken was discussed by the foreman or job superintendent. The information presented was generally obtained from the company safety manual. This approach worked well at the onset of the project, since the small number of subcontractor employees on the job generally attended the contractors' morning safety sessions. However, as construction progressed it became increasingly more difficult to maintain control of the onsite safety practices. The company had a full-time safety department but, being a branch office of a Canadian construction firm, the site was not often visited by the safety officer. Therefore, little assistance was given to the superintendent.

The difficulty encountered was that subcontractors on the project did not, at times, place the proper emphasis on safety. In fact, they sometimes overlooked safety violations in order to maintain the project schedule. As the total number of workers on the site increased to approximately fifty, and subcontractors began holding their own safety talks, it became clear that changes needed to be made. In addition to the ''tool box'' meetings, a weekly safety conference of foremen was also held by the general contractor. Here appropriate safety information and project scheduling was reviewed. In addition, possible conflicts between various trades was discussed in order to decrease potential problems and increase the safety level at the job site.

It was at this weekly safety/project meeting that it was first suggested to assign the different trades the task to conduct the safety inspections. Therefore, instead of the general contractor being solely responsible, the enforcement of safety was to be shared. The weekly safety inspections would be conducted on a rotating basis by the various onsite subcontractors. This proved to be an effective approach, involving the workers on the site with the safety issues of the job. Another benefit this method provided was to educate employees on the various safety concerns of the different trades and how they may affect the project. Acceptance was slow at first, but the idea gradually took hold as the workers realized they could actually voice their concerns and be taken seriously.

The overall results achieved by this method of safety management were excellent. In particular, the safety inspections were generally conducted the day before or the morning of the weekly meeting with foremen. The report was first submitted to the superintendent who reviewed the results with the inspection team and later with the foremen. Using this approach, corrective action, if necessary, could be quickly undertaken. In addition, the foremen and superintendent were exposed to the concerns of various trades which increased their knowledge of a variety of different safety practices. It should be noted that the subcontractors did not request payment for the time spent making the inspections. In addition, they were not concerned with possible liability problems.

As with any new concept, there was, nevertheless, some difficulty in implementing the process. One problem encountered involved the older workers on the site. Many believed they were being watched by the other trades and simply were not willing to listen to any input from a fellow worker from another trade. Some perceived that they were being criticized for their actions which led to the initial rejection of the plan by some older workers. Another difficulty encountered was a ''get even'' attitude between some of the trades. While this was not a widespread problem, the solution was simply to take this under consideration during the review of the safety reports with the inspection team prior to the weekly safety/project meeting. This action tended to reduce any possible negative conflict that might arise. Another approach was to comprise the team of different trades. This provided a buffer and put an end to most of the disputes before they arose.

As the project progressed, the various trades actually looked forward to their week to conduct the safety inspections and, surprisingly, most of the subcontractors welcomed the feedback on their safety practices. Another positive benefit of this approach, was that it required the involvement of the workers, not just the foremen and superintendents. This meant the apprentices' comments and observations were just as important as those of the journeyman or the foreman on the project.

J. Constr. Eng. Manage., 2000, 126(1): 77-79

CONCLUSIONS

The overall safety record for the project was quite good with no lost time accidents being experienced during construction. The project, therefore, could be deemed to be a success from a safety management aspect. In fact, the first author received the Company Safety Award for his efforts. Duration of the work was a little over one and one-half years with the safety management plan being implemented during the last year of the project. The insight gained by listening to the safety concerns of workers and utilizing their input on the construction site was invaluable. In fact, this proved to be the key element in the safety management plan. The success of this approach was also due, in part, to the willingness of the workers to try something new and to their flexibility in adapting to change. No doubt similar measures could be taken on other projects and positive results achieved. It is recommended that this method of safety management be considered by other contractors interested in safe construction operations.

APPENDIX. REFERENCES

Davis, S. G. (1998). ''Reducing insurance costs in today's marketplace.'' *Roads and Bridges*, 36(1), 54–75.

Hinze, J. (1998). ''Identifying root causes of construction injuries.'' *J. Constr. Engrg. and Mgmt*., ASCE, 124(1), 67–71.

Koehn, E., and Surabhi, M. R. (1996). ''Involving employees with construction safety and health practices.'' *Implementation of Safety and Health on Construction Sites*, L. M. Alves Dias and R. J. Coble, eds., *Proc., 1st Int. CIB Safety Conf., W99*, Balkema, Rotterdam, The Netherlands, 385–392.

''Moral, ethical obligations an issue for safety design.'' (1997). *Engineering Times*. NSPE, Washington, D.C., 19(8), 16, 23.

''Safety roles expanding in design.'' (1997). *Engineering Times*. NSPE, Washington, D.C., 19(7), 16.

''Some more proven ways to design for safety.'' (1997). *Engineering Times*. NSPE, Washington, D.C., 19(10), 15, 17.

''Unions boost training programs.'' (1998). *ENR*, 240(3), 13.