

Blueprints

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Subcontractor Safety Orientation

A jobsite safety orientation is an opportunity to communicate the rules and regulations and to influence a tradesperson to make good decisions.

BY NEIL WEBSTER, CSP, OHST

In the construction management industry, much, if not all, of the construction work is subcontracted. Various specialized contractors are contracted to perform the work and the construction manager performs the overall management function. It is not uncommon for the construction manager on a project to provide a safety orientation for subcontractors who will work on the project. The purpose of the safety orientation is to

Whether it is having a toolbox talk with subcontractor foremen, conducting a safety orientation or stopping a work operation due to its unsafe nature, it is all about passion for safety.

provide general safety and logistical information to the subcontractor community. Some construction managers only orient the foreman of each specialty subcontractor and others require each person who works on the project to attend.

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Hot Issues

Let's look at four hot items in our industry. First is federal legislative action. Witness the proposed Protecting America's Workers Act for more information. Second is OSHA's apparent gravitation toward firm but fair enforcement and increased rule promulgation along with additional national emphasis programs such as recordkeeping. Third is ASSE's consideration of a bold venture into the development of its body of knowledge and increasing its global expansion. Fourth is the continued development of the profession, the practice and our personal careers. Put the first three items on your radar screen and note that ASSE has the resources and information on each.



MICHAEL W. HAYSLIP,
P.E., CSP

The Construction Practice Specialty (CPS) has been charged with fostering a new Utilities Branch. That effort is progressing nicely and we trust it will later become an independent practice specialty. Many thanks to those who have volunteered to help.

Finally, in the name of being a trusted resource and to promote the efforts of those who wish to move into a management position, I offer the following suggestions to prepare for your future:

- 1) **Make all the contacts and connections you can.** No manager, no matter how gifted, flourishes autonomously. Take a real interest in people. People do not care how much you know until they know how much you care. ASSE is wonderful for networking.
- 2) **Get to know the core of your company's business.** Gather a comprehensive knowledge of the business's heart and soul plus that of the industry.
- 3) **Hook up with a mentor.** Find someone to help you understand what you need to do to move up into management. Find someone with the experience to acquaint you with the specifics and quirks of management within your particular organization. It has been said, "Do not ask somebody who earns \$25,000 a year for advice on how to make a million." Find the right person.
- 4) **Work above your station.** Go beyond what you normally do. Volunteer for projects that move you into other areas of the company or the Society that expose you to different and perhaps greater challenges.
- 5) **Increase your level of training.** Enough said.
- 6) **Stay abreast of news about your company, your industry and those people and organizations that affect it.** Never be outdated with stale information or job skills. Learn more about what is new and upcoming, both within your business and your industry as a whole. Read trade journals, join groups, attend new conferences and constantly watch for information and insight on new trends and patterns.
- 7) **Read about other great managers.** Pick up a book about a particularly skilled or effective leader and come to understand what s/he did and why it worked. Do not limit yourself just to business. Politics, science and the arts are teeming with leaders of skill and vision.
- 8) **Be careful of what you ask for or you might just get it.** Be sure (as best you can) that you will genuinely enjoy and prosper in the role as a manager. You must be passionate. Ask yourself honestly whether you will be comfortable directing others, making important decisions and, if need be, facing the music if something goes poorly.

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By Armar Mann

BLS data show that construction industry fatalities were down 19% in 2008.

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Looking for Cultural Differences in Your Own Backyard

This article discusses safety culture in the Danish construction industry and aims to demonstrate the value of this understanding in relation to preventive activities in the everyday working environment.

The article discusses how safety culture is defined and understood. A short presentation of the Danish construction industry highlights well-known safety risks and three cases addressing different aspects of the working environment are presented. One case addresses accident prevention, one addresses musculoskeletal disease prevention and the last demonstrates how changed aspects in using modern management's theories can improve everyday safety on site.

Safety culture is defined as the shared and learned meanings, experiences and interpretations of work and safety.

SAFETY CULTURE

The approach to discussing safety culture is based on the assumption of an underlying understanding of beliefs and values in relation to risk and safety in a group of people. However, few agree on the definition of safety culture, how to measure it or how to improve it (Glendon, 2006).

Culture studies in an organizational understanding have been dominated by two main paradigms: functionalism and interpretivism, including symbolism (Alvesson, 2001; Richter & Koch, 2004). The approach adopted in our studies represents a modified version of symbolism. The focus is on symbols, which can be expressed. Culture studies must be related to the specific setting, production tasks and organizational contexts (Alvesson, 2001).

Safety culture is viewed as a focused aspect of an organizational culture, in this case, within construction industry firms. Safety culture is defined as the shared and learned meanings, experiences and interpretations of work and safety. This is expressed symbolically, verbally and physically. Safety culture is shaped by people in the structures and social relations within and outside the organization (Richter, 2004).

The development of organizational culture theory continues to be controversial to conceptualize and analyze, but basically it must include differentiation, integration and ambiguity. Alvesson (2001) adds to this what he calls synthesizing the perspectives into the concept of multiple configurations. This allows the researcher to handle a complex cultural pattern.

Integration

Within the integration perspective, culture is the shared and common understandings in a given organization. A consistency exists across cultural manifestations where culture is seen as an integrative mechanism "labeled as the social glue between its members" (Alvesson, 2001). Some authors understand integration as common basic assumptions in the consistent shared element (Richter, 2004). It is rarely recognized that several cultures are at play and if it is, then it is often interpreted as a sign of weakness. The dominant sets of values are often set by top management.

Differentiation

This perspective focuses on the lack of consensus between interpretations, experiences and assignments of meaning in organizations. Researchers within this perspective often put considerable attention toward non-leader-centered sources of culture (Richter, 2004). Others see culture as a product of social structures, such as countries, enterprises, departments, professions and groups (Glendon, 2008).

Different groups and cultures often coexist in an organization. Alvesson (2001) stresses that everyday work practice produces local cultures, which can cut across social structures. Pidgeon (1998) finds that differentiation is related to social structure and to power relations, which may influence processes of sense-making and construct different versions of reality. He emphasizes the need for being sensitive to existing subcultures.

Ambiguity

Cultural manifestations may seem ambiguous, with only little clarity. Potentially, there is a continual process of differences in meanings and interpretations of symbols etc., which are incommensurable and irreconcilable (Richter, 2004). Ambiguity may originate from social structures or social practices calling for carefulness in assigning cultural phenomena to ambiguity too easily (Alvesson, 1993). Social practices or fields can represent professional groups with a distinct field of activity and qualifications, with its own rules for success and recognition and its own structure of positions and economic and symbolic rewards.

There are three types of governing rationales: producers' perspective, wage workers' perspective and safety perspective. The producers' perspective points at the possibility of a member of the organization being able to produce a product of quality that resonates with the per-

son's own values. Some degree of autonomy in the mobilization of one's skills is a central element in this perspective. The wage workers' perspective relates foremost to decent pay, codetermination and job security. The safety perspective relates to the lifelong preservation of one's own ability to work and to cope with emotional aspects of risk taking in a short-term, and long-term perspective. Tensions between these three rationales create ambiguity of intentions (Richter, 2004).

Alvesson (2001) also discusses bounded ambiguity. Even if culture does not produce clarity and consensus throughout an organization, it can offer guidelines for coping with ambiguous meanings and give clues how to deal with difficult issues. Bounded ambiguity may also be seen in quick switches between different social circumstances, legitimizing various sets of ideas and meanings.

MULTIPLE CONFIGURATION

Alvesson's central argument for introducing multiple configurations is to combine insights of approaches to integration, differentiation and ambiguity. He also recognizes the role of macro cultures, local cultures and possible integration and unity. However, the mixture and overlapping character are a central observation. Alvesson observed that different people and organizations are only able to hold a partial, often different and changing, interpretation of a situation. Orders may be ambiguous and responsibilities only vaguely defined. Goals may shift and subsequently draw attention away from existing risks. Furthermore, he claims that processes of defining risks or reporting errors can be undermined if the possibility of differentiated understandings is not recognized. These meaning-giving processes are socially negotiated (Richter, 2004).

FERRET OUT SAFETY CULTURE

When approaching safety culture in terms of assessing and developing safety culture within an organization, two major assumptions must be clarified: whether safety culture is understood as something an organization has or whether safety culture is something that is in the organization (Glendon, 2008). Two approaches are thus to be considered; an interpretive approach and a functionalistic approach. Whereas the interpretive approach assumes that organizational culture is an emergent, complex phenomenon of social groupings that serves as the prime medium for organizational members to interpret their collective identity, beliefs and behaviors, a functionalistic viewpoint favors the regulators' approach in that organizations can change their existing safety culture to one that can result in improved safety performance. An interpretive view indicates that such a change will be difficult to achieve and cannot be imposed by senior management. In practice, many organizations contain elements of both approaches.

Gherardi and Nicolini (Glendon, 2006) observed that safety culture emerges from operational practices within

a community. These interpretive standpoints assume that culture is a complex outcome of all people in the organization, that strategy supports culture (not the other way around), that culture cannot be trained or "sloganized" into people and that culture changes cannot be carried out quickly but must be related to what they call slow learning.

Richter (2004) adopts a modified form of symbolism and defines within the frame of an interpretive approach that this allows people to construct events, which are reproduced by networks and symbols that enable shared meanings and actions. Whether changes of success are possible depends on whether the introduced changes are meaningful to the local players.

HOW TO ASSESS SAFETY CULTURE

Focus areas for mapping a safety culture are the interplay between environment, including equipment, tools, machines, housekeeping, physical layout and temperature; persons, including knowledge, skills, abilities, intelligence, motives, personality, attitudes and beliefs; and behavior, including safe and unsafe practices, compliance, coaching, recognition, communication and actively caring toward colleagues.

A range of methods both quantitative and qualitative are available to measure safety culture. Self reports have been widely used as creating a baseline for further actions. Observations cover techniques from structured observations using standard schedules to record and observe the performance of a sample of workers and less structured approaches. Shadowing is a technique that pairs an observer with a person who executes a specific job. Observations and dialogue on the ongoing performance is its key element. Work diaries involve key performers in the organization to complete daily diaries on, for example, critical incidents, issues or events that are of particular interest for safety. Action research is based on participation by all who are involved in the production in question. Data are collected and executed over a period of time, thus providing high-quality data (Glendon, 2008).

An ethnographic approach is characterized by an open set of concepts. It includes listening and looking to primarily verbal symbols, such as metaphors, myths and narratives. It also includes expressions of meaning and interpretations in relation to central aspects of safety and observations of actions expressed in a ritual form, for example, at safety meetings. The key is to exercise empathy with the field, while creating a sufficient distance from it (Alvesson, 1993). One must seek, capture and question elements of everyday understandings and practices that have been normalized or have become routine. The study of the organization encompasses organizational structures, history, occupations, safety procedures, skills and other aspects of the organization. The action research encompasses meetings with project groups and supporting change processes in the Scandinavian tradition of industrial action research.

DANISH CONSTRUCTION INDUSTRY

More than 165,000 people currently work in the Danish construction industry. The majority are highly trained and organized, in either employers' organizations or trade unions. Work on site is usually accredited and paid as piecework, allowing the workers freedom to plan and organize the daily work on their own. The trades work with strong professional barriers between them, which are often related to specific use of materials each trade has. Each trade also has its own cabin with wardrobe, bathing and cooking facilities on site. Execution of the working environment is supposed to follow working environment laws, extensions to these being negotiated in Nordic tradition between the labor market partners and the government. At the workplace or site, the center for the working environment is organized as a safety organization, which is obligatory (Pedersen, 2008).

RISKS & ACCIDENTS

The fatality rate for the Danish construction industry has ranged from 4 to 10 per 100,000 employees, with an average of 6 throughout the last 20 years, compared with the national average for all industries of close to 2 per 100,000 employees. The rate for serious injuries, defined as loss of part of the body and broken bones, for the construction industry is close to 4 per 1,000 employees, compared to the national average for all industries, which is less than 2 per 1,000 employees. An underrated problem exists for nearly 50% to 100% of the fatalities reported, which is verified by numbers from the Danish hospital system on first-aid treatment. The total amount of incidents does not differ much from construction industries in other European countries.

Construction consists of different activities and occupations, each with different risks even on the same site. At first glance, accident causes can appear simple, but they often have a complex background. That is why many accidents still occur though few are of a new kind. Normally, most employees are able to take care of the risks at work and prevent accidents from occurring. On the other hand, "a drift toward danger" seems to play an important role. This occurs when employers must maximize performance through effectiveness or strive for individual benefit, pushing behavior and activities to be more risky. This is a process, which often occurs without regard to what is happening, at least not until an accident occurs. Behavior will thus likely migrate toward the boundary of acceptable performance (Jørgensen, 2008).

Generally, construction workers and carpenters have the most dangerous jobs. Construction workers have the highest injury risks, whereas carpenters have a higher fatality rate. Bricklayers, electricians and plumbers also have many accidents but not with fatal consequences at the same level.

Fatalities are usually caused by falls and use of transport equipment either in transit or on the construction site. Serious injuries and all other injuries are caused by differ-

ent activities. Falls at the same level primarily happen on roads and open spaces on the construction site. Falls to a lower level primarily occur from ladders, from scaffolding or from roofs and parts of the construction. Manual handling is primarily handling of construction materials, other materials and components or hand tools. Circular saws cause the most accidents. Transport equipment, such as cranes, other lifting equipment or use of trucks, vans or pickups also cause accidents (Jørgensen, 2008).

RISKS & HEALTH PROBLEMS

Based on the 2002 Labor Force Survey, an ad-hoc sample of all 16- to 64-year-olds in the EU member states show that about 0.9% had a longstanding health problem or disability, that they attributed to an accident at work. Such health problems caused by work were most prevalent in construction (1.6 % of workers) (Jørgensen, 2008).

The overall incidence rate for registered disabilities related to the Danish construction industry is 50 per 10,000 employed (2005). From this, musculoskeletal diseases account for 31.6, hearing reduction for 6.3, psychiatric disorders for 1 and cancer related to work for 1.1 per 10,000 employed. Hearing reduction is the only disability that has changed dramatically over the last 10 years. In 1996, the incidence rate was 19.4 (Jørgensen, 2009).

A vast underrated problem, plus two other factors, shadows the correct picture. One is that many construction workers change profession when they are close to 50 years old and seek service or caretaker work. These groups are thus known to statistically overrate fatalities, that cannot be explained by work demands. Also, many diagnoses are not registered as work-related when a person enters the health system for diagnosis and treatment.

Well-known risks and exposures are chemicals, dust, pollution, insulation fibers, repetitive unilateral movements, heavy lifting, noise and vibrations, microorganisms, etc. Diseases following these exposures are brain damage, cancer, airway diseases, skin problems, allergies, wear and tear of muscles, joints, tendons and other parts of the musculoskeletal system, hearing damage and more.

SYMBOLIC SAFETY CULTURE UNDERSTANDING

The three projects presented represent three different approaches to using safety culture as a guideline in an assessment and analysis of the working environment and to introducing changes toward improvement.

The first case assesses the safety culture in three carpentry firms in Copenhagen and at a technical college. Five different cultures were found and presented metaphorically. The overall aim was to prevent accidents. Activities following the assessment were participatory defined.

The second case is an ongoing project also in a carpentry firm in Copenhagen. This is entirely participatory and addresses prevention of long-term musculoskeletal

diseases. The starting point in this project was an acceptance of differences in the working environment.

The third case is a project aimed toward more effective building production using new management tools, such as partnering and lean construction in combination with a range of learning activities on site. This project was initiated on site by top management. Activities were carried out by the tradespersons supervised by external consultants. The meeting between top-down perspectives and bottom-up perspectives on site resulted in a high-profiled improvement of the safety culture.

Case 1: Accident Prevention in the Construction Industry

This project was carried out between 2002 and 2004 (Richter, 2004). It was aimed to develop workable tools and procedures, which would improve accident prevention in the construction industry.

The project was carried out in cooperation with three carpentry firms of varying size and a technical college that trains carpentry apprentices.

The carpentry industry was chosen because of its above-average accident rate compared to the Danish construction industry in general. This trade is characterized by many small firms and thus is a typical example of the structure of companies in Denmark's construction industry.

Historically, the general conditions and forms of production contribute to development of specific safety cultures. Safety culture within the trade is first formed during training. The project's focus was to understand how people understand safety and work practices and how learning takes place in communities of practice (Lave, 1991). The project aimed to introduce processes and tools to develop safer cultures, organizational conditions of importance to accidents and prevention in the firms and in the training system.

Evaluation of basic conditions on a general level in the participating firms and the college and the participants' general understanding of problems in terms of reasons to errors in critical situations, problems with quality, etc., proved comparable to other smaller firms in the industry.

The frame of reference was symbolic and interpretive. In this effort, ethnographic interviews and participant observations on the worksite and at the technical college were carried out. It was based on the analysis of safety cultures and using participative methods, with a perspective of training the three firms and the technical college in developing tools to improve safety in their own setting. This process involved both young and older carpenters, trainees/apprentices and managers in the firms, and students and teachers at the college. In the firms, for example, this was development of better work assessments; at the college, it was development of teaching materials with a focus on preventive actions (Pedersen, 2004).

Differentiated and ambiguous safety cultures were found. Within and between the safety cultures are barriers as well as options of prevention. It was presumed that

a dialogue on barriers would trigger learning, thus finding new ways to identify risks and to improve prevention.

Five different safety cultures were found, each metaphorically named according to its dominating character trait. The five safety cultures are master, conditions and rules, drawing board and plan, shared learning and tight bands.

For all five safety cultures, the following values and understandings applied:

- Risks are a part of the work situation.

- Qualities in work, such as independence in relation to work performances, comprehensiveness and community spirit, are highly valued.

Master. Safety is closely connected to being professionally skillful and reasonably cautious toward risks. Risks can thus be handled by a competent tradesperson; accidents are related to human factors by taking unnecessary risks and lack of thoughtfulness. Prevention is to look after each other and to be continually conscientious. Formal safety work is of lesser importance. One looks after oneself.

Conditions and rules. Safety is always closely related to good working conditions and observance of the law. Risks are unacceptable but can be reduced if the conditions are in order. Accidents occur because of insufficient actions on inexpedient or illegal conditions. Prevention is to cry out and demand improvements. Formal safety work is both an individual and collective effort, which must be used.

Drawing board and plan. Safety is basically determined by conditions in relation to the organization and the planning of a building project. Risks are unacceptable but difficult to avoid in pressing situations. Prevention follows good planning, cooperation and coordination in work situations. Formal safety work is to be used as a leading edge, systematically and everyone must contribute.

Shared learning. Safety is subordinated and to be understood as specific conditions in the college or work setting. Risks are unacceptable but difficult to avoid. Accidents occur if the responsible individual has not established the necessary safety precautions. Prevention implies systematic and visible planning. Formal safety work must be in place but often lacks drive.

Tight bands. Safety has little use. Rules and safety precautions restrict workflow. Risks are atypical and other conditions are more important. Accidents may happen. Prevention is of little use. Rules are impractical in real work situations. Formal safety work is a waste of time.

Most players were found to be in the first two groups; master and conditions and rules. Only a few belonged to



Safety is basically determined by conditions in relation to the organization and the planning of a building project.

the last group. Whereas many players can be related to one safety culture only, others will enter other cultures according to the specific setting.

Ambiguity was found in all five safety cultures. Ambiguity as defined by strong and weak issues in relation to being active in terms of preventing accidents. For example, in the drawing board and plan safety group, the strength is that actions are taken to handle difficult situations or conditions that do not live up to the working environmental laws. The common denominator is that action is going on. Strategies may vary: 1) they may construct better equipment; 2) they do not complete an assignment in a situation they do not trust; 3) they refer to rules and perform first when the conditions are in order; 4) they involve a safety steward or a site manager in a given problem; and 5) if this does not help, they stop.

The weakness of this safety culture is that not all are equally oriented regarding the working environmental rules and that the rules might be set aside. Likewise social relations, power or other work demands can place a barrier to being active.

This knowledge about local conceptions and actions on risks and accidents adds up to, in relation to the overall structure of the industry, the technology and range of jobs in the varied phases of the construction process to form an industrial risk profile.

Almost none of the players in this project spoke spontaneously about sudden musculoskeletal pains as an accident risk. That is noticeable as many of the carpenters perform much heavy lifting and hold many difficult positions while executing their work. Heavy work and lifting are considered a risk for long-term wear and tear. One carpenter told about an incident, which could have been named a lifting injury. He experienced sudden back pains in relation to putting in a window and was on sick leave for a week but did not report it to the working environment authority. He was required to do this after one day away from work on account of the accident. He took painkillers and thought they would carry him through, which they did in the short term.

Within the groups of workers, there are often different understandings of whether certain conditions or situations might represent a risk or not and what in any situation might be the thing to do. Decisions about if and how to act often happen in a split second or through short or scarce communication during work. Many things might intervene and disturb. If no room is available for exchange of ideas or opinions, this is a barrier to developing a higher understanding of preventive issues, including getting the safety steward involved. The same restrictions are present in not being able to discuss rules and laws.

Information and new knowledge seem mainly to arise from reading the trade union's magazine and from when the working environment authority visits the site. For the professional/manager, the situation is somewhat similar.

They read the employer organization's magazine, which presents facts on new rules and laws and in general has more information on the working environment.

Creating a platform to better understand safety culture through discussions and learning in an everyday setting with a focus on preventing long-term musculoskeletal diseases is what the next project aims to do.

Case 2: Knowledge That Works

An ongoing project in a mid-sized (40 tradespersons) carpentry firm in Copenhagen addresses the long-term problem of high exposure to many poor work postures and many heavy lifts in the daily performance of work. The funding comes from the Danish working authority and the initiator and coordinator for the project's execution is the firm's safety manager.

Daily work performed includes various jobs in relation to renovation of apartments, replacement of windows and doors, replacement of roofs, customized renovation and new build. The firm has existed for 40 years and is renowned for its quality and craftsmanship. It is also known for a high-profiled training program for apprentices, many of whom stay on in the firm.

The project aims to minimize exposure to musculoskeletal diseases among the core group of carpenters by using participative and learning methods. Most of the carpenters are between age 25 and 55.

Initially, two carpenters met with their colleagues on various sites to introduce the idea and to determine what their colleagues would like to see promoted. The tour was also done to check on the willingness to participate on an agreed hourly pay, which is set to be equal to the average hourly pay, which the union reports on each week. The two carpenters came back with a long list of interest areas, many related to ergonomic issues.

The next step was the organization and execution of a future workshop for everyone in the firm (Jungk, 1984). This was to bring forth more new ideas and to detail and prioritize them. The 1-day workshop took place in a historic wooden cottage outside Copenhagen and was organized between group discussions and physical competitions and games. Coaches were assigned to each group to ensure that rules were adhered to and that ideas were written down. The workshop proved to be a great success and a guide for the following activities. Three major activities have been conducted so far:

- 1) assessment of a personal work profile;
- 2) dust reduction;
- 3) project and process investigation.

The personal work profile includes a personal discussion and analysis by an ergonomic instructor. Photographs were taken and personal advice to improve work posture was given. Afterwards each receives an ergonomic driving license to keep. Once everyone had an ergonomic driving license, a meeting with a fitness trainer was held for all to learn stretching exercises to do after long periods of bending positions or floor work. He also advised that carpenters exercise at a fitness center.

Dust on sites was the highest priority to address. The safety steward and another colleague were sent to various health institutions and other carpentry firms to pick up ideas. First, all tradespersons were shocked by the effects of dust on health; second, they found the ideal vacuum cleaner; and third, they communicated their findings to their colleagues.

Project and process investigation has been carried out on a large roof renovation. One carpenter in charge of the workers, along with the tender responsible at the office, examined the material from the project engineering firm. They intended to develop a list of 10 working environmental demands to be sent to the project engineer in the future as a guideline for their fulfillment of what the law demands on site. The general knowledge is that the engineers know too little about the execution of their ideas and when the project is about to start, it is too late to change, for example, the width of scaffolding. The first project carried through proved to be cost-effective on the same level as with other projects. However, the working environment was rated much higher among the carpenters involved.

Safety culture is changing in this firm. Its focus is on prevention of long-term wear and tear. The key to success is worker participation and shared learning. Other key factors are management support and adequate money to pay for the participants' involvement.

The next project presents how participation and learning is important in changing safety culture. This project was initiated by management and aimed at promoting better efficiency in the building process using new management tools. This resulted in an improved working environment.

Case 3: Cooperation & Learning in the Construction Industry"

A key issue in changes of safety culture is cooperation and learning. This also applies to changes in the working environment. A large EU-funded project, "Cooperation and Learning in the Construction Industry," abbreviated in Danish as BygSol, was carried out in Denmark between 2004 and 2007 on more than 23 working sites at all stages of production. This included 650 people, both building professionals and building workers of all trades. The project was based in The Technical Institute, with partners in a range of trade colleges all over Denmark and in three universities, including the Technical University of Denmark. A range of qualitative and quantitative assessments were conducted during and after completion.

The overall model of change and goal setting in the project was directed toward a new and more effective building process, a new and changed work organization, a new process with new forms for cooperation and learning and new leadership. Tools to be used were partnering, lean construction and workplace-based methods of adult learning.

After the introduction and activity clarification with management, a kick-off meeting with tradespersons and managers was held. It was called a 12-12 seminar because it lasted from noon one day until noon the next. An external coach conducted the seminar, which took place in a rented facility. The activities in the seminar centered on a future workshop and related to cooperation in the forthcoming site production (Jungk, 1984). They were conducted on an interdisciplinary basis and also included a range of psychical games and activities. The end results included a list of values and improvement activities to be carried out in the daily work to come.

The 12-12 seminars proved to be popular, especially among many of the tradespersons who enjoyed getting to know other tradespersons (Dam, Pedersen & Elsborg, 2007). These reactions correspond with cultural and anthropological studies on workers in the concreting trade, who define a good work colleague as a person who has practical sense, judgment and social intuition (Baarts, 2004).

Following this interdisciplinary opening, the site's organization was changed from the traditional setup so that all workers used the same cabin and lunchroom. Weekly meetings were introduced where all team members present on site needed to appear. This meeting had a fixed agenda of topics related to the ongoing production process, the list of values from the 12-12 meeting and safety and health issues. On some sites, the working environment authority gave special permission to conduct the obligatory safety meeting at the weekly site meeting. If an external teacher or coach gave special instructions, the time allocated for this was classified as "school on site." This could include solutions to a specific problem, which had arisen from a new design submitted by the architect, or it could be an overall introduction to, for example, the lean construction concept.

TEACHING & LEARNING NEW MANAGEMENT CONCEPTS

Workers received a more in-depth introduction to lean construction. From the lean construction package, the last planner system proved to be a success. The gangs met weekly with the objective of planning production in a rolling planning process running over 5 to 6 weeks. The success was based on the interdisciplinary considerations, which needed to be taken and would arise in the dialogue, for example, between two groups of workers trying to integrate two trades' use of scaffolding in a specific location, for example, or other logistic problems.

Partnering was another top-down management tool introduced as part of BygSol activities. Partnering has been introduced successively over the last 10 years in Denmark, but is not widely implemented full-scale, especially in relation to economic openness. Over the years, many firms have in practice operated with a kind of a strategic management organization, often based on informal or personal relationships. In BygSol, the more formal concept of partnering was stressed, which could

be carried through with a high degree of involvement from the beginning of the planning process to the end of the building process. Tradespersons' involvement was formulated as increased responsibility, autonomy and engagement.

WORKING ENVIRONMENT

Working environment was from the beginning of the project defined mostly by two units of measurement, i.e. reduction in work accidents and stress defined in broad terms, such as "well being" or "job satisfaction," relating to participation. Participants were in fact taken by surprise as the working environment proved to be the most successful result of the whole implementation of BygSol's ideas and visions. This was evident with respect to the interest growing out of the weekly meetings, from seeing how a focus on visions and learning was actually followed up in the daily running of the production and how increased awareness of other tradespersons' work organization could interplay in a positive manner. The rate of success was conveyed by verbal praise to the manager and/or tradespersons for their mutual willingness to improve work processes. This sometimes also found a more tangible form when the manager threw a spontaneous party on site or just said thank you for a special effort at the weekly meeting. It would show in the choice of topics at the school onsite arrangements, where topics, such as stress and balanced diet, would be part of the chosen agenda.

In terms of a reduction in the accident rate, there was no direct statistical success. However, no serious accidents occurred throughout the time period and a general awareness to report and discuss the issue, including near accidents, was evident. In addition to these observations, statements were made, such as, "Safety is a mutual responsibility. Rule breakers have not understood the social play (game) among colleagues" (Dam, et al., 2007).

CONCLUSION

Studies of safety cultures offer a range of options to understand the complexity of work situations. This is not the least important if changes are to be introduced. It cannot be concluded that only one safety culture is present in any given situation. Here assessments show that usually a range of safety cultures can be found in a group of players. Different safety cultures might supplement each other or contradict each other. However, it is important to understand the setting in which safety cultures are present.

In the process of changing a given set of safety cultures toward a higher level of safety or a higher level of participant awareness, the cases presented point to a range of important considerations that must be included.

Participatory intervention actions are important. This creates interest, gives priority to activities and creates a platform for learning. Learning, from an everyday perspective and a lifelong understanding, is a basic require-

ment for change. The learning process must be broad and varied. Some learn by doing (tradespersons), others by reading (professionals). When they meet in the learning process, there must be room for discussion and reflection. Reflection creates room for new ideas and innovation. The process requires time. Time is precious in a production process. Loss of time reduces earning and income, but, well-used time will promote the production process and bring quality to both process and product. When introducing changes to workers, their participation is too often on their own time, i.e., paid by themselves, thus reducing the participation considerably. Sufficient money for allowing change is a must when seeking success. ☺

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Fixed Ladders Can Be Hazardous

JIM SMITH IS MANAGING DIRECTOR, SOUTHEAST REGION RISK CONTROL SERVICES, FOR ARTHUR J. GALLAGHER RISK MANAGEMENT SERVICES FLORIDA.

James D. Smith, CSP, is chair of the American National Standards A14.3 Subcommittee. In this interview, Smith provides an overview of fixed ladders and explains how the latest version of the A14.3 standard addresses the unique safety hazards fixed ladders can present.



Blueprints: Please provide a brief description of your professional background and of your position as managing director, Southeast Region Risk Control Services, for Arthur J. Gallagher Risk Management Services.

Jim Smith: To summarize my position, I provide risk management, safety and loss control consultative services to various clients in a variety of different industries. Additionally, I provide technical support and am a professional resource to our clients.

Blueprints: You are chair of the ANSI A14.3 Subcommittee, which oversees the “American National Standard for Ladders—Fixed—Safety Requirements” (ANSI A14.3). Why did you decide to get involved in this group?

JS: In 1982, my previous employer had more than 200 fixed ladder installations, plus microwave tower installations in excess of 100 feet in height. Safety concerns, a few ladder injuries plus the fact that the

organization was installing new towers to replace existing ones led me to get more involved as the organization’s Safety and claims manager.

I worked with project engineers to add my professional review and input into the engineering plans and specifications. Climbing devices were added to the microwave tower design and during this period, research on fall protection equipment efficacy was not what it is today. Therefore, as part of the team for fixed ladder design, training and education, I felt this was important enough for me to become involved in the standard development process.

In 1990, I was accepted to the A14.3 Subcommittee because of my experience with fixed ladder installation.

Blueprints: How does ANSI define a fixed ladder and what unique safety hazards do fixed ladders present?

JS: In Section 2 of the A14.3 standard, a fixed ladder is defined as a ladder that is permanently attached to a structure. Section 1.5 of the standard provides exceptions and explains how fixed ladders are used but does not cover all fixed ladders. Anything connected to a building or structure will typically be covered by the A14.3 standard, while the authority having jurisdiction may approve the installation of use. As a subcommittee, we define what a fixed ladder is, then look at the application and intent.

Some unique safety hazards that fixed ladders present include the ability to climb a ladder with a three-

point contact and for outdoor fixed ladder installation, exposure to environmental elements while maintaining good slip resistance on the user’s footwear and ladder rungs can be challenging. Many fixed ladders have an inclination of 90° to horizontal, so it is important to keep rungs and footwear clean while a climbing fixed ladder, especially when factoring into account the gravitational forces placed on a person climbing at a 90° to horizontal ladder. Therefore, protective features like the cage and ladder safety climbing device can be important when designing and installing a fixed ladder.

Blueprints: How has the A14.3 standard changed or improved in the years you have served on the subcommittee?

JS: We have enhanced the ladder safety system, which now includes performance testing criteria, such as uniformity, materials used and dimensions. A power grip definition and the ability to change the height of the first rung to allow consistency of rung spacing throughout the length of

Some unique safety hazards that fixed ladders present include the ability to climb a ladder with a three-point contact and for outdoor fixed ladder installation, exposure to environmental elements while maintaining good slip resistance.

climb have been improved. We have also included provisions for hand grasps when exiting through a roof hatch, which were never addressed in previous editions of the standard. The standard is always a work in progress but it is a good standard.

Blueprints: *How did the A14.3 subcommittee ensure that the latest version of the standard best reflects the needs of ladder manufacturers and component suppliers? In turn, how can these two groups, as well as ladder users, best comply with the standard?*

JS: Many fixed ladders are field-built using designs by engineers and installed on location. This is different

Common concerns in fixed ladder accidents are ladder designs of side rails and rungs, clearances of the ladder and consistent rung spacing, to name a few.

from other types of ladders made in manufacturing facilities. The A14.3 standard gives sound criteria to build a fixed ladder using performance criteria that engineers can use to create field drawings and component specifications. Engineers can

design fixed ladders according to these specifications that will have sufficient safety factors to ensure the user's safety.

The standard offers figures to visually display the standard text allowing the users of the document to better understand the standard.

Blueprints: *Who conducts annual inspections of fixed ladders and ladder safety systems and what do they look for?*

JS: First, the owner is responsible for inspection and maintenance of the fixed ladder. Section 9 of the standard addresses the inspection process and places the responsibility on the owner to inspect the fixed ladder.

Furthermore, Section 7 discusses ladder safety systems, which require the ladder safety system device man-

ufacturer to provide sufficient information on what the owner should inspect. For fixed ladder inspection, the standard describes identifiable performance criteria for various components, such as rung designs, side rails, ladder anchor spacing and clearances for the side and back side of the ladder. Platform and hatch designs and protecting openings are clearly identified for inspectors to assess. In my view, the standard is user-friendly when it comes to an effective inspection process.

Blueprints: *Are fall protection systems commonly used in conjunction with fixed ladders? If so, what safeguards are the systems required to have?*

JS: Fall protection requirements are set forth in the standard. The standard has height criteria, that trigger when ladder safety devices or cage requirements exceed a certain height. For example, when a fixed ladder exceeds 24 ft above floor or ground-height level, a fall protection system is required in the form of a cage or ladder safety device. Where the ladder exceeds 50 ft in height, only a ladder safety device can be used.

The A14.3 standard is different from OSHA's standard where fall protection systems are required. OSHA has 20-ft height criteria whereas ANSI A14.3 has 24-ft height criteria. The A14.3 fixed ladder standard has more progressive fall protection safeguards than OSHA.

What is interesting about the ladder safety system used for fall protection is the connection length between the carrier and the safety sleeve—it is at 9 in. maximum with the maximum length of movement of the safety sleeve at 6 in. This is much more stringent and different than traditional fall protection systems standards.

Blueprints: *What is the primary cause of fixed ladder injuries and accidents and how does the A14.3 standard address this?*

JS: Fortunately, fixed ladder falls



A high-exposure area for an accident to occur is getting off an elevated platform to the fixed ladder.

and accidents are not common. Various reasons may exist for this, but the use of these ladders is generally different from other types of ladders where people often work off the ladder compared to a fixed ladder used to transition from one working surface to another elevated location.

Common concerns in fixed ladder accidents are ladder designs of side rails and rungs, clearances of the ladder and consistent rung spacing, to name a few. In my view, a high-exposure area for an accident to occur is getting off an elevated platform to the fixed ladder.

Blueprints: *What was the most challenging part of the A14.3 Standard's recent revision process?*

JS: Challenges faced during the revision process included means/methods to achieve slip resistance of rungs and how to measure it and ladder safety climbing devices (application of fall protection to ladder). Additionally, a fixed ladder in a manhole has it challenges for clearance of the back side of the ladder, which allows proper foot placement for optimal support while climbing. Today, a conflict exists between the ANSI standard and ASTM's manhole ladder installation standard. The same holds true for tower designs with fixed ladders. OSHA's transmission communication tower standard has different spacing requirements when compared

to the A14.3 standard. In my view, 18-in. spacing between rungs or allowing varying spacing between different ladder designs for towers is not a good means to allow for standardization for the user. Consistency in design is important, but that is just my view of the situation.

Blueprints: What revisions are planned for the next version of the Standard?

JS: It is too soon to tell what revisions will be needed, but the A14.3 Subcommittee welcomes any suggestions with supporting documentation/research for improving the current version of the standard.

Blueprints: Do you have any closing comments?

JS: Yes, I have been fortunate to work with great subcommittee members in the past, some of whom have served the committee for 30 years, such as Ron Bennett, Tom Bresnahan and Nigel Ellis. In addition, subcommittee members such as Sharon Morales and Tom Wolner, have made significant contributions to the standard over the years. We continue to refresh the committee with new talent, such as the recent addition of Thomas Heebner, to bring different experience levels and viewpoints.

In closing, I cannot forget the late Bernie Enfield, past chair and member since the 1960s, whose influence in this standard set the bar high with user safety always in mind, which continues today by our subcommittee members. ☺

James D. Smith, CSP, was safety and claims (liability) manager for 18 years with South Florida Water Management. He currently serves on ASSE's Board of Directors as Vice President of Finance. Smith is chair of the American National Standards A14.3 Subcommittee and served on several other ANSI national standards committees, including ANSI Z590, Z10, A10.33, A1264.1 and A1264.2. Smith holds B.S. and M.S. degrees in Industrial Safety from the University of Central Missouri. He is a recipient of ASSE's Edgar Monsanto Queeny Safety Professional of the Year Award, President's Award and Charles V. Culbertson Award for Outstanding Volunteer Service.

CCHEST to Launch New Construction Examination

The Council on Certification of Health, Environmental and Safety Technologists (CCHEST) will phase-out the current edition of the Safety Trained Supervisor (STS) construction examination. The updated examination will better reflect what construction safety supervisors need to know and the skills required for the tasks and functions in today's practice.

The new STS construction examination features ethics as a new task area. Candidates must demonstrate their knowledge of the STS Code of Ethics and how to apply it. Additionally, new emphasis will be placed on ensuring that supervisors demonstrate an understanding of how to coach employees to perform their work safely, how to model safe work and how to hold employees accountable for safe work. Another new emphasis is ensuring that supervisors demonstrate an understanding of emergency action planning.

No areas on the new examination are associated with demonstrating knowledge of the content of specific regulations, codes and standards. The board has determined that STS candidates must already have an acceptable knowledge of the relevant regulations, codes and standards associated with the specific areas where the candidate practices. U.S. federal regulations may not apply in lieu

of stricter state or local regulations, etc. Therefore, BCSP expects all STS candidates to possess the necessary regulatory knowledge when they apply for the STS credential.

The examination will continue to be multiple-choice and computer-based. Details about the blueprints, which identify



STS PROGRAM

what will be covered on the examination and how the content should be distributed in the respective domains, topics, tasks, knowledge areas, skill areas, frequently asked questions and examination cross tables are available at <http://www.cchest.org>.

Those interested in pursuing the STS certification in construction will take the new examination when submitting an application on or after Sept. 15, 2010. Those individuals who purchase an examination on or after Oct. 1, 2010 will receive the new examination. ☺

Diversity, Risk & Your Operations: What Is at Stake?

In my personal and professional life, I have always lived by the motto “expand your horizons.” That saying is appropriate today as we face and live in a world that is dramatically shifting due to our changing demographics. To that end, we must pay close attention to what is happening in our society as it relates to diversity and the associated risks of a failure to respond to the changing tide of its crystalline message.

It is my intent to share a holistic point of view pertaining to diversity. I want to extend that conversation to encompass the challenges and opportunities that are present within the diversity dialogue and finally I want to conclude by sharing my thoughts on what is at stake for adherents to diversity and those who would suggest that diversity is just a fad. This submission is designed to be a more practical and accessible analysis versus purely theoretical.

As it relates to risk, each of us must understand that, as is the case with change, it is never a question of what will I do if risk presents itself. Rather, it is a question of what will I do when risk presents itself.

of compliance, and compliance carries with it that in some manner you will be punished for your failure to comply. Today, various speakers talk about diversity in more glowing terms, such as celebrating and embracing diversity. These are much more appropriate and show the commitment required from each of us that comes from allowing ourselves to extend ourselves for others.

Diversity differs from affirmative action in many ways, but for me, it is most apparent in the fact that affirmative action was designed to rectify past injustices and instantiated by law. However, as Martin Luther King, Jr. once opined, a law cannot make you love a man. Diversity is not manmade—it is naturally occurring, and as a result, we do not have a choice as to whether or not we will participate or adhere to its tenants. Our only choice is how we will adhere to its tenants. In this regard, we can either understand that the changes for which we are now involved mean that the ways of the past are forever gone and we can get on board with the new reality, or we can cling to the stubborn ways of the past and be

washed away like sand being carried out to sea by a swift-moving tide.

DEMOGRAPHICS

Current demographics indicate the following:

- More women than men are in the workforce.
- There is more minority participation in the workforce.
- Texas, California, Arizona and Florida have a majority of minorities who make up their workforce, and Hawaii is not far behind.
- A growing percentage of people are getting older and are eligible for retirement.
- The birth rate is slowing except among Hispanic, Asians and African-Americans.

Often, when we think about risk, we associate it with a cost-benefit analysis. My decision to invest in any item in large part will depend on my risk tolerance. Risk tolerance can be defined as the amount of pressure one can withstand before reaching a conclusion that the likelihood of any further upside is not as great as the likelihood of an impending downturn. Therefore, when we think about risk, we can see that it has a historical, current and future orientation.

Based on the above, we may define risk as the capacity to look at the historical-, current- and future-oriented aspects of a planned course of action to determine one's willingness to pursue or proceed in a desired manner.

ASSESSING RISK

As it relates to risk, each of us must understand that, as is the case with change, it is never a question of what will I do if risk presents itself. Rather, it is a question of what will I do when risk presents itself. We must develop a simple (e.g., practical) system(s) to address strategies and tactics to be employed to mitigate risk or to maximize its positive outcomes. In addition, we must examine the threats, real and perceived, to our strategies and tactics.

One methodology to assess risk is a three-part assessment that asks the following questions:

- What am I trying to protect?
- Why am I trying to protect this?
- What would happen in the event of a failure (time and duration)?

If you cannot answer these questions with specific short statements, then operations are in trouble.

When it comes to risk, as is the case with many issues, people suffer because of what they do not know

(or more appropriately what they choose not to know) and/or what they know and choose not to use.

If we are to answer the question of what is at stake with regard to our business operations, then we must assess our risk profile from the three-part perspective of historical, current and future orientation. Additionally, we must provide opportunities to correct misconceptions we may have about our business.

The biggest barrier to future success is current success or the belief that because we are successful today we will be successful tomorrow. Nothing could be further from the truth.

CONDUCTING A RISK ASSESSMENT

When conducting an assessment, you should begin by identifying what in your environment creates the most risk? These may include people, customers, technology, financing for future growth, etc. One common mistake people make is trying to include every possible risk situation in their assessment, and as a result, nothing gets done. Be aware that a no decision is a decision, and more times than not, it a recipe for absolute failure. No single approach will guarantee a complete resolution of the issues under consideration. Therefore, when conducting a risk assessment, consider both qualitative and quantitative measures.

Conducting a risk assessment allows you to look at key result areas on a common scale. It will also allow you to know what to protect, why you should protect it and what course of action to follow in the event of failure.

CONCLUSION

The course of action I have described is probably something that many of you know and perhaps are willing to do. However, in the words of Goethe:

Knowing is not enough
We must apply.
Willing is not enough
We must do.

When we consider what is at stake, it is a lot more than just operations. While our individual operations may take a hit if we do not understand our risk, the larger issue that each of us should be concerned with is our profession. As we continue to build the public's awareness of what we contribute on a daily basis it is imperative that we take a more global focus on how we, as a profession, are connected. A focus on the success of our collective assembly will mean good things for all of us individually. ☺

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Ask an Authority

A SSE members regularly submit technical questions through the "Ask ASSE" feature on the Society's website. Construction Practice Specialty member Barry A. Cole answers a question about the hazard of falling banana wedges.

Question: Our piping systems are separated (connected) by flanges, and to isolate equipment, the flanges are spread and a blind or blank is inserted between them. To spread the flanges wide enough, banana wedges are used. The wedges have sprung out of the flanges and have either injured the employee who is installing them or they have fallen from heights, creating a hazard to workers and to equipment below. Do you know of any safety measures that are effective in preventing banana wedges from springing out of a pipe flange and becoming airborne?

Answer: I have seen this happen and, in fact, we have fitted wedges (and blanks/blinds too) with lanyards that are strong enough to catch it when it falls. Note I said "when" it falls, not "if" it falls because even with a decent crew of pipefitters, it will sooner or later get away from someone. There are not enough hands to hold all of the parts, get the bolts started, keep the flanges apart and get the blinds to fit.

In the case of the wedges, it is not something I have heard before (the name "banana wedges"), but I have seen various wedges used to get a blank or blind started, and when the pressure is taken off of one when another is inserted or the blank or blind is maneuvered around or hammered into place, the wedges (regardless of size or shape) can get loose and fall.

Many blanks or blinds have a handle or two on the outside (most I have seen are plate steel), and the tab of steel that sticks out is for handling it and positioning it, as it gets mostly buried in the joint/flange as it is bolted up. A hole through the handle and a conventional tool lanyard, or a small nylon lanyard that is large enough to restrain a falling object of the particular weight that your blank or blind happens to be, should help.

The other end must be tied (or choked) tightly around the pipe behind a flange or a structural member above or nearby. [When working at heights, we often use tool lanyards to secure tools (wrenches, etc.) to our workers' wrists or to the scaffold or ladder.] In this case, I am not sure it makes sense to have the part falling out and then being brought toward a person, so look for a tie-off that will restrain its fall and keep it away or above the workers in the immediate area. The same concept can apply with a wedge—I assume a banana wedge is no exception. Build it or fit it with a tab



Options for Safety of Falling Wedges



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Making the Right Calls After a Jobsite Accident

Every good company, whether in the construction industry or elsewhere, tries to maintain a safe, injury-free environment for its employees and the public. However, even on the safest jobsite, serious accidents can happen and when they do, the jobsite becomes chaotic. A skilled opposing counsel will count on that chaos to result in actions by a company's employees that are not conducted with eventual litigation in mind. Every company should, as with any other serious incident,

If at all possible, it is best to clear and secure the jobsite after a serious accident to allow a proper investigation and to prevent spoiling evidence of the accident.

after a serious accident emergency personnel will be on their way.

CALL THE HOME OFFICE

After the emergency response is initiated, jobsite personnel should inform the home office of the accident and the call should immediately be routed to a designated person. That person can be a risk manager, a safety person, an engineer or some other person who is competent and sophisticated enough to know how to handle these calls and to implement a plan of action. The designated person should obtain the facts necessary to ascertain that the conditions at the accident scene do not pose any additional danger or whether steps must be taken to alleviate any danger. That person will also have access to the injured party's emergency contact information.

CALL YOUR INSURER

Ensure that the person(s) designated to implement the action plan also has the contact information for the insurance companies that have issued policies for the jobsite. Insurance policies usually provide for the payment of legal defense costs and leaving the insurer out of the loop until after significant post-accident activity has occurred can

have procedures in place that its employees are educated to follow in the event of a serious jobsite accident, both to ensure a prompt and safe accident response and to protect the company in the event that a lawsuit follows.

CALL 9-1-1

The safety of the people on the jobsite and the care of an injured person comes first. Make it the responsibility of a job foreman or other senior person (with alternates in case the first choice is the person who is hurt) to make certain that



give rise to an argument by the insurer that its ability to defend the insured has been impaired. Also, most policies usually require prompt notice to the insurance company that an insurable event may have occurred.

CALL YOUR ATTORNEY

Jobsite insurers are likely to have relationships with law firms and provisions in their policies that allow them to select which firms will defend a personal injury action. That should not prevent an employer or contractor from calling its own attorney. An attorney should be contacted for advice (not simply as part of a checklist) before any accident investigation occurs. An experienced attorney, if litigation appears likely to follow, will direct the investigation and instruct the client to communicate with the attorney about the progress and results. By doing so, the accident investigation can be protected from disclosure to an opposing attorney by attorney-client privilege, attorney work product doctrine or both. Counsel can also be involved in communications with OSHA or other government entities that may need to be informed of the accident.

CALL OFF THE JOB CREW

If at all possible, it is best to clear and secure the jobsite after a serious accident to allow a proper investigation and to prevent spoiling evidence of the accident. Steps should be taken to ensure that work in progress is safe and secure, but the longer workers are left at the site of a serious accident, the more likely that the scene will

be disturbed. Also, your workers are likely to be distressed, or at least distracted, by the incident, which could potentially lead to unsafe conduct and perhaps another mishap. Employees should be instructed not to discuss the accident with anyone and to refer any requests for information to the home office or, better yet, to a home office designated contact person.

CONCLUSION

By making the right calls, companies can respond to an accident in a way that protects everyone. The injured person is protected from a slow emergency response, other employees are protected from distracted co-workers, the scene is protected from any disturbances, and the company is protected from careless actions or statements that could be used against it in a later lawsuit. ☺

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Ask an Authority

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or eye or weld a tab or eye on it where it will not be a hindrance to the use of the device, and attach a simple tool lanyard. It is still necessary to tether the other end to something sound, like the pipe end behind the flange, the structural beams or floor grating above (with an overhead hanging choker) or an adjacent pipe or machine.

My research shows that a common banana wedge is a semicircular plate or bar with a ground leading edge, shaped to a wedge, that is married to another like it and when hammered together, they ride up on each other and expand the gap in between the flanges. Another type might be simple flat or plates (often rectangular) with the one edge, or if semicircular, the inside of the curl ground to a point or narrow width, and the outer or opposite side left full thickness. This allows the wedge to work a section of the flange, while hopefully remaining outside the circumference of the flange bolt holes, so it is holding open the pipe flange but allows the blank to be inserted.

Whether I have described your pipefitters version by size or shape of a banana wedge, the object must have a place where you handle it, place it (including hammering on it) and retrieve it, so that is where you hook a lanyard. (If it does not have a handle or other safe way to hold it and place it, you have pinch point hazards too, so it makes sense to add these tabs or handles, which then gives the place for a lanyard or other tie-off method too.)

Most safety supplies have tool lanyards or conventional tie-off straps or other restraints that might be convenient to get commercially, or you could make wire loops and/or wire rope restraints on site that might serve safely too. Even a good-quality rope could be used, as long as it is maintained. Anything would be adequate for retaining a dropped wedge, or a blank or blind plate, assuming that these things do not weigh more than 10 or 15 lb. It might take two or more looped together to choke onto the eye or handle of a wedge and then wrapped around the pipe, or if very heavy, something stronger than a conventional commercially available tool lanyard.

I have seen more pipefitters using come-alongs and chain falls to pull larger pipes apart for the purposes of blanking and usually leaving the chains and come-alongs in place during the operation since they will be needed again to get the blank out if it is a tight fit. There is still a potential of dropping nuts, bolts and the blank/blind flange, but not the wedges with this method. It seems the prying apart is a little more controlled and less likely to slam shut on a hand or fingers trying to place a blind/blank as might happen if a wedge is bumped out of position.

Either can be done safely but consider talking over the best methods with your pipefitters and their supervision through a thorough job safety analysis and see whether different tools, resources and methods might help avoid your exposures. Also, for facilities or lines that have common maintenance and frequent blinding operations must be conducted, consider the cost and safety benefit of inserting a lockout valve in the line, rather than break the line and the fitting every time. Over the course of a few shutdowns, the valve may be cost-effective and safer for all concerned. ☺

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Construction Workers to Wear Hi-Vis Warning Garments

High-visibility warning garments are required safety attire for highway and road construction workers according to a new [OSHA letter of interpretation](#).

“Highway construction workers should not suffer serious or fatal injuries simply because they could not be seen,” says acting assistant secretary of labor for OSHA Jordan Barab. “Requiring the use of reflective vests is essential to help prevent workers from being injured or killed.”

In 2004, OSHA issued a letter of interpretation about the use of high-visibility apparel in highway construction. The letter emphasized that section 5(a)(1) of the OSH Act requires workers in highway work zones to wear high-visibility apparel.

However, the Occupational Safety and Health Review Commission (OSHRC) ruled that OSHA’s letter indicated a more limited position: high-visibility garments are only

required where the Federal Highway Administration’s (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) mandates their use.

In response, OSHA issued a new letter (Letter #20080829-8611) stating that all highway and road construction workers must wear high-visibility apparel regardless of whether MUTCD requires them. OSHA considers road and construction traffic a well-recognized hazard to highway/road construction workers. Bureau of Labor Statistics reinforced the need for using safety apparel when data from 2003 to 2007 showed 425 road construction work zone fatalities occurred. The OSHA letter follows.

Re: Whether use of high-visibility warning garments by construction workers in highway work zones is required.

We previously wrote to you on May 11, 2004, in response to your question about the use of high-visibility apparel in highway construction work. We stated:

“It is well recognized in the construction industry that construction workers in highway/road construction work zones need to be protected from traffic. MUTCD reflects industry practice with respect to identifying the types of situations where these workers need high-visibility warning garments. In such cases, section 5(a)(1) requires the use of such garments.”



Subsequently, OSHRC in *Ruhlin Co.* (OSHRC No. 04-2049, Nov. 20, 2006) determined that the letter did not provide construction employers with fair notice of a requirement for employees in highway construction work zones to wear high-visibility garments. The commission interpreted the letter as indicating an agency view that high-visibility garments are only required in those instances identified by MUTCD with mandatory language (i.e., where MUTCD states that such garments “must” or “shall” be used).

Since that was not OSHA’s view, we are withdrawing our earlier answer to that question, restating the question below and providing a more comprehensive answer to clarify and expand on OSHA’s reasons for concluding that section 5(a)(1) of the OSH Act requires construction workers in highway/road construction work zones to be protected from road and construction traffic by wearing high-visibility garments.

Question: Construction employees working on highway/road construction work zones often risk being struck by traffic. Do OSHA standards require high-visibility apparel for these construction workers?

Answer: Road and construction traffic poses an obvious and well-recognized hazard to highway/road construc-

High visibility is one of the most prominent needs for workers who must perform tasks near moving vehicles or equipment.

tion work zone employees. OSHA standards require such employees to wear high-visibility garments in two specific circumstances: when they work as flaggers and when they are exposed to public vehicular traffic in the vicinity of excavations. However, other construction workers in highway/road construction work zones are also exposed to the danger of being struck by the vehicles operating near them. For such workers, section 5(a)(1) of the OSH Act, 29 U.S.C. §654(a)(1), also known as the general duty clause, requires similar protection.

FHWA's recent issuance of a final rule (Worker Visibility, 23 CFR Part 634) demonstrates the need for all workers who are exposed either to public traffic or to construction vehicles and equipment to wear high-visibility apparel. Section 634.3 of the worker visibility rule states:

"All workers within the right-of-way of a federal-aid highway who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel."

The purpose of this requirement, as stated in section 634.1, is "to decrease the likelihood of worker fatalities or injuries caused by motor vehicles and construction vehicles and equipment. . . ." In the preamble to the Worker Visibility rule (Volume 71 of the *Federal Register*, page 67792), FHWA stated:

"High visibility is one of the most prominent needs for workers who must perform tasks near moving vehicles or equipment. The need to be seen by those who drive or operate vehicles or equipment is recognized as a critical issue for worker safety. The sooner a worker in or near the path of travel is seen, the more time the operator has to avoid an accident. FHWA recognized this fact and included language in the 2000 edition of MUTCD to address this issue."

FHWA's rationale underlying the rule well illustrates that the industry recognizes that construction workers in highway/road construction work zones need protection against the hazard posed by moving traffic. FHWA's recent mandatory standard for workers on federal-aid highways shows that struck-by hazards in highway/road construction work zones are well recognized by the construction industry. Furthermore, the standard indicates that a feasible means of addressing that hazard is the wearing of high-visibility apparel. Accordingly, high-visibility apparel is required under the general duty clause to protect employees exposed to the danger of being struck by public and construction traffic while working in highway/road construction work zones. Typically, workers in a highway/road work zone are exposed to that hazard most of the time. ☛

Richard E. Fairfax
Acting Director,
Directorate of Construction

Jordan Barab Addresses ACCSH

Jordan Barab, Deputy Assistant Secretary of Labor for Occupational Safety and Health, addressed the Advisory Committee on Construction Safety and Health (ACCSH) on Dec. 10, 2009, in Washington, DC. His speech is excerpted here.

ENFORCEMENT FOCUS

In October 2009, we issued \$87.4 million in proposed penalties to BP—the largest in OSHA's history. We took this action when we determined that BP failed to correct potential hazards at its Texas City refinery. BP is just one of several recent enforcement cases where OSHA has cited companies for egregious violations of workplace safety and health standards. In fact, OSHA has addressed more egregious cases and issued higher fines than in the previous fiscal year. This reflects our commitment to refocus OSHA's priorities on writing and enforcing standards to protect workers.

OSHA will enforce its standards uniformly on all construction sites and will bring the full force of its citations and penalties to any contractor who violates the law.

HISPANIC SUMMIT

On the national level, more fatalities occur in construction than in any other industry and each year, one-third of all Hispanic workers killed on the job work in construction. To address this, OSHA, along with NIOSH and other agencies, will sponsor a Hispanic workers summit in Texas in April 2010.

STATE PLAN OVERSIGHT

OSHA values state plans. Many have shown that they can address workplace hazards that are sometimes not addressed by OSHA, and this agency strongly supports their initiative and dedication.

ACCURATE RECORDS, GOOD INCENTIVES

OSHA is also concerned about accuracy in reporting workplace injuries and illnesses. The November 2009 GAO report on injury and illness recordkeeping included evidence that OSHA's current audit process needs improvement. The report also found that certain incentive and discipline programs can discourage workers from

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Executive Keys to Propelling Safety Performance & Culture

The maritime industry can be tossed by rolling waves of injuries, both shipboard and shoreside. Mariner accidents can directly drain profits and insidiously erode productivity, teamwork and morale. In addition to high Jones Act payouts, missteps and mishandling can result in costly equipment damage, raise operating costs and put future contracts at risk.

Unfortunately, many executives are seemingly adrift, attempting strategies for encouraging higher-level safety

performance, cost control and culture. Interventions to cut pervasive injuries often work only to a certain plateau; even well-intended actions can run aground, wasting limited resources and time or even backfire.

The good news is that safety at its highest level—joining higher-level performance with efficient cost control—has been achieved in the maritime industry by Alaska Tanker Co. (ATC). If the company can do this, so can you.

BACKGROUND

Shipping oil between Alaska and the lower 48, ATC is the safest tanker company in the world as well as recipient of the Benkert “Golden Osprey,” the U.S. Coast Guard’s highest environmental award. In the past 7.5 years, ATC has gone more than 13.5 million hours without a lost-time injury and has excellent systems for loss control and safety.

However, it was not always that way. When Anil Mathur took over as

CEO in 2001, ATC’s record was average at best over a range of indicators. How did ATC climb to its current level of safety success? It began with executive-driven leadership. According to Mathur, “We initially developed a series of management-led interventions that were highly scripted. As our culture improved and evolved, the need for these kinds of strong interventions went away. We have now reached a stage in our culture where people do not do stupid things. I truly believe all accidents are preventable.”

This same approach has had paybacks beyond safety. ATC has operated smoothly and profitably in many dimensions.

NAVIGATING THE COURSE:

WHAT KINDS OF INJURIES & APPROACHES?

Common maritime injuries include slips, trips and falls, strains/sprains and damage to the hands, wrists, fingers or arms. Contributors to these injuries include:

- exposure to the environment (temperature extremes, high winds, rain, ice) that lowers body temperature, heightens discomfort, fogs glasses, creates slippery decks, etc.;

- turning valves or changing them out;
- traversing vertical stairs;
- consistent motion of the vessel (listing and rolling, vibration, etc.);
- crossing slippery decks;
- using heavy tools;
- operating or maintaining/greasing winches;
- entering and leaving the dock (tying/untying lines, hooking up to terminals, etc.);
- oil and grease on surfaces;
- changing elevation;
- working long hours, often with interrupted sleep patterns.

AVOIDING THE SHOALS: WHAT NOT TO DO

Many companies have barely dented the hard problems of soft-tissue injuries or slips, trips and falls. Approaches to loss control typically include signs or verbal reminders (“Pay attention when you lift something heavy”), PPE, such as lifting aids or footwear, training that does not focus on specific maritime applications or disciplining workers for getting injured. While these strategies may help to a point, they have not engendered breakthrough results in most companies.

Mathur contends that the right mindset, skill set and toolsets are critical to high-level safety performance. Here are five shoals that are shipwrecks-in-waiting, along with strategies for steering around them.

Shoal 1: Treating soft-tissue injuries (strains/sprains, back injuries) as acute, single-source problems when instead they are predominantly wear-down issues that build over time. Think of soft-tissue injuries as “the straw that broke the camel’s back” problems. In reality, many get hurt from relatively low-risk tasks they have done thousands of times before (e.g., stepping down, bending to tie a shoe). While trying to close a heavy valve might seem to have precipitated the back pain and can certainly be a contributor, it is often the smaller tensions over time that lead to a breakdown.

Be wise. Think beyond strenuous lifting or slippery

Do not go down the safety journey unless you truly believe in it yourself. Having only a superficial level of commitment produces deep cynicism in the workforce. Safety pays many dividends, but the irony is that if you only focus on the quick payback, it will fail.



decks. Focus on small changes that leverage into significant improvements in soft-tissue strength and control and better moving balance. Develop strategies that address seemingly minor exposures—lifting light loads, climbing low heights, traversing dry as well as wet surfaces—before they mount into an injury.

Shoal 2: Assuming engineering fixes will save the day. Even in land-based sites, it is almost impossible to control all exposures. People still manage to trip crossing dry decks in calm seas (or clear parking lots) as well as injure their shoulders/back/knees when lifting relatively light loads. It is impossible to control maritime exposures through design-only interventions. Ergonomics (literally “the study of work”) is defined as improving the fit between crew and their work. This can be accomplished in three ways:

1) Bring tasks closer to workers by cost-effectively adapting the ship environment through designing, redesigning, best purchasing of tools and working conditions.

2) Inculcate the appropriate set of mariner skills for making small physical and judgment adaptations that reduce forces concentrating in potentially vulnerable parts of their body.

3) Combine 1 and 2 above.

Be improvement-focused. Experience has shown that best safety results come from combining both work/tool modifications with crew behavioral improvements.

Shoal 3: Believing changes in awareness or motivation alone will somehow fix these problems.

Without question, motivation affects safety, but this is not enough. Actions are at least as important as will and wishes. Specific mental and physical skills are needed for preventing strains/sprains, slips, trips and falls and hand injuries.

Be strategic. Transfer needed skills, not just awareness. Skill transfer must be personally motivating so people want to use these wherever they can, at work and at home. However, skills must also quickly show improvements, be easily transferred to a range of people, readily duplicated and practiceable and foster continuous improvement in performance with relatively little effort.

Experience in the maritime industry worldwide has shown the following are critical for injury prevention.

Mental skills

•Identifying personal level of accepted risk (i.e., seeing potential injury exposures at an earlier level, those that are currently accepted as inevitable or unchangeable).

•Adjusting to changing surfaces.

•Personal stress control (not allowing excess physical or emotional attention to “wag the dog”). Overtension can lead to the soft-tissue danger zone, just as a taut cord is easier to cut than one that is slacked. Further, unmanaged stress can upset physical balance.

•Team connection or doing tasks seamlessly with others. For example, safer two-person lifting can be coordinated by employing small eye confirmations and verbal gestures.

•Thinking forward, cumulatively and 24/7. As in, “What can go wrong here?” as well as realizing that small levels of tension can build into nagging soft-tissue problems.

•Ability to better direct attention. Crew can readily upgrade attention skills, such as scanning for best options (e.g., safest path, changes in environment that might affect safety), selecting where they wish to focus, sustaining attention on priorities among other attentional pulls, switching back to an important task when distracted, sequencing parts of tasks for greatest efficiency and safety (e.g., securing load against the body, seeing condition of steps, sighting handrails, situating feet for best balance, spying where stairs end).



•Eye-hand coordination for better response time and setting strong autopilot programs.

•Self-monitoring is a precursor to effective self-regulation. With a mobile, rarely moment-to-moment-inspected workforce, inner cue scanning enables noting current areas of body weakness or injury, where force is building, to then allow small on-the-go adjustments.

Physical skills

•Ability to maximize personal leverage and strength through best alignment, position and connected movement.

•Significantly improved balance and coordination.

•Transfer of forces away from vulnerable areas.

•Improving flexibility and range of motion.

•Strategies for fatigue reduction.

•Synchronizing breathing with tasks (e.g., when bend-

With the right leadership, personal injuries in the maritime industry can be overcome, and safety performance can exceed highest expectations and can generate higher engagement, morale and efficiency.

ing to pick up/lift, most people hold their breath, increasing pressure in the lower back while significantly weakening balance; the right training can reduce this at-risk habit and can enable greater lifting strength).

•Methods for practical recovery, employed as early as possible, to steer away from potential major problems. For example, should you begin to fall, how to reflexively regain vertical balance without straining muscles.

All of these are tangible, easily transferable skills, proven to significantly reduce soft-tissue injuries and slips, trips and falls.

Shoal 4: Thinking inside the box, that strains/sprains, hand injuries and slips, trips and falls are unrelated problems requiring never-the-twain-shall-meet solutions. Losing balance while carrying directly results in diminished strength; because of this, one company attributes all tool drops onto feet as caused by an incipient slip or trip. In reality, all personal injuries have a base of common causes that include attention breakdowns, balance disturbances, failure to think through approaches and bailouts in advance, suboptimal position and alignment, lack of synchronized breath control and more.

Be efficient. Simultaneously address root causes of strains/sprains, slips, trips and falls and hand injuries.

Shoal 5: Becoming a lone ranger. It is easy for some executives who have sighted the shore of high-level safety to become frustrated or to give up. Mathur reveals, “I did not believe for many years anyone had the same commitment to safety as I did because of the lapses I saw between their words and actions.”

Be flexible. Mathur reflects, “I learned the power of persuading people into another mindset. This kind of advocacy convinced people to change much more effectively than disparagement.” According to Mathur, what is most important is to be true to yourself as a leader. “Do not go down the safety journey unless you truly believe in it yourself. Having only a superficial level of commitment produces deep cynicism in the workforce. Safety pays many dividends, but the irony is that if you only focus on the quick payback, it will fail.”

With the right leadership, personal injuries in the maritime industry can be overcome, and safety performance can exceed highest expectations and can generate higher engagement, morale and efficiency. ☺

Robert Pater is managing director of Strategic Safety Associates in Portland, OR, and creator of the MoveSMART® injury-prevention system for preventing strains/sprains, slips, trips and falls and hand injuries.

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Jordan Barab Addresses ACCSH

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reporting injuries and illnesses and that a high percentage of healthcare providers have been pressured to adjust treatment or to take other steps to avoid reporting injuries and illnesses.

Most of this information had been reported in studies and Congressional hearings, which prompted OSHA to initiate a major recordkeeping national emphasis program to ensure that injuries and illnesses are accurately reported.

STANDARDS & GUIDANCE

OSHA has accelerated its standards development efforts. We have revised our enforcement policies for fall protection during steel erection, posted a letter of interpretation requiring the use of high-visibility warning garments to protect construction workers in highway work zones and issued a direct final rule to protect workers from acetylene hazards.

OSHA will also continue working on a final rule for confined spaces in construction and will rescind OSHA's compliance directive on residential construction.

We are preparing the final rule in the new cranes and derricks rulemaking. We plan to issue this new standard in July 2010.

We also welcome your comments on the MSD column regulation, the silica standard and the standards improvement project.

ACCSH WORK GROUPS

I request that ACCSH consider making some changes to its work groups:

•Change the regulatory compliance work group to a group that can focus on green jobs in construction. This group could give the agency much-needed assistance by defining green jobs in construction and by helping OSHA develop training materials, research and information for a new green construction page on our website.

•Consider broadening the silica work group to address other health hazards in construction. It would be helpful if this work group also addressed health hazards, such as the consistency of permissible exposure limits, isocyanates, lead and ergonomics.

•Broaden the rollover protection work group to include prevention though design issues. We need help in developing products that will make design industries more aware of the value of design decisions that can help reduce hazards to construction workers. ☺

How Material Layout Affects Safety & Efficiency

Did you know: It takes 0.6 seconds to bend down? Wasted movements add to employee fatigue, injury exposure and task completion time? Material placement impacts the bottom line in terms of injury prevention and productivity?

WASTE

Every builder's goal is to provide the highest quality and the lowest cost in the shortest time by continually eliminating waste. This is exactly the same goal as lean manufacturing. Waste is a major impediment to achieving this goal.

Waste can be described as anything beyond the minimum amount of equipment, tools, materials, parts, space and worker's time, which are absolutely essential to add value to the product. For example, unnecessary human motion, unnecessary material movement or unreasonable mental or physical burden is waste.

Extended reaches and forward bends take ~1.2 seconds roundtrip. An unnecessary lift takes ~2 seconds if it is straight up and more if a bend or extended reach is needed or if the item must be carried. Unnecessary trips can take 10 seconds, 30 seconds or 2 minutes.

Excessive bending, twisting, lifting, reaching and walking not only take extra time and add no value to the final product produced (e.g., a building), they also cause fatigue and often become safety and health issues. Eliminating these excessive motions will result in reduced injury risk as well as in increased efficiencies and reduced waste.

WASTED MOTION COSTS

If a laborer performs 200 bends per day, that is 4 minutes per day (20 minutes/week) of wasted time. At \$20/hour, that is \$6.67 given away every week for every single laborer just for bending over and standing back up again. If 10 employees do that, that is 200 minutes and \$66.70 given away every week. What else could those laborers accomplish in 200 minutes?

Furthermore, frequent bending can contribute to back pain and frequent extended reaches can contribute to shoulder and neck pain. By positioning materials more wisely, a double payout of increased efficiency and reduced injury risk is possible.

WASTE-VALUE CONNECTION

Your customer does not want to pay for nonskilled work, such as lifting, carrying or pushing. The value they pay for is the workers' skill. Your customer does not

want to pay for the extra time it takes for employees to complete tasks because of fatigue or because not working at their full capacity because of pain or an injury. Your customer also does not want to pay for reduced quality or rework due to employee fatigue.

Lifting equipment is like the business practice of outsourcing. Workers do their skill and the equipment does the grunt work.

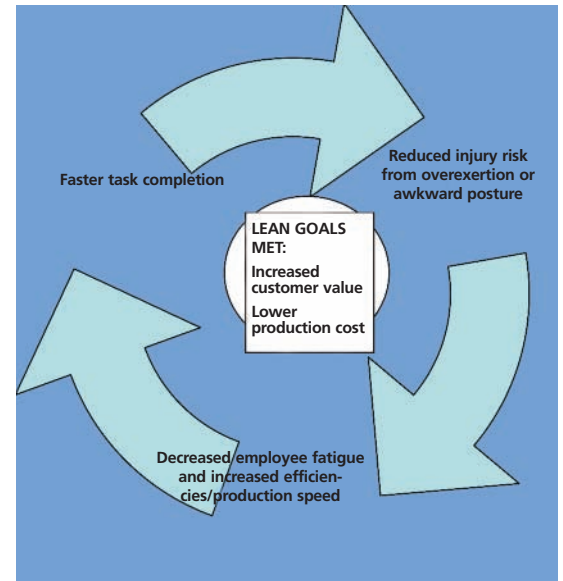
COST REDUCTIONS

Cost reductions include less money spent on poor-quality products; on fixing a mistake; on rework; tied up in inventory; on workers' compensation; and on labor per task.

WORKING TOWARD LEANER

CONSTRUCTION PROCESSES & WORKSITES

- Think "just in time" and "point of work."
- Look at upstream and downstream effects.
- Eliminate awkward postures to prevent bottlenecks and wasted time and energy.
- Have the right tool/part at the right place at the right time and at the right ergonomic position or location.
- Avoid lifting materials more than once. Plan the workflow to eliminate lifts.
- Reduce the vertical distance of lifting and lowering.
- Plan the workflow and have the right equipment to reduce carry distances.
- Plan the workflow to bring work between knee and shoulder height.
- Reduce amounts lifted to less than 50 lb whenever possible for manual lifts or make the lift so heavy (more than 130 lb) that a lift-assist device must be used. ☺



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Construction Fatalities Fell Sharply in 2008

The number of fatalities in the construction industry fell by 19% last year, from 1,239 in 2007 to 1,005 in 2008, according to U.S. Bureau of Labor

While part of the drop in construction deaths may be attributed to lower construction activity last year, the rate at which construction fatalities occurred was also lower.

Statistics (BLS) data. While part of the drop in construction deaths may be attributed to lower construction activity last year, the rate at which construction fatalities occurred was also lower. For every 100,000 full-time construction workers, 10.8 died in 2007, but that number fell to 9.6 in 2008, (Figure 1).

Fatality rates for different construction occupations varied greatly (Table 1). Carpenters, pipelayers, plumbers, pipefitters and steamfitters had the lowest fatality rates. On the

other hand, structural iron and steel workers and roofers had fatality rates that were four to five times the construction industry average. Fatality rates were lower or flat in most construction jobs in 2008, with the exception of painters and operating engineers and construction equipment operators.

BLS also publishes data on construction fatalities for select metro areas (Table 2). On-the-job construction deaths fell or were unchanged in 10 of the 12 areas for which data were available for 2008. Detroit and Los Angeles were the only two metro areas where construction fatalities rose last year, and New York City had the largest number of construction fatalities with 56.

For more information on fatalities and injuries in construction or in other industries and occupations, visit <http://www.bls.gov/iif>.

Amar Mann is a regional economist for BLS in San Francisco.

Figure 1
Construction Fatalities in the U.S.

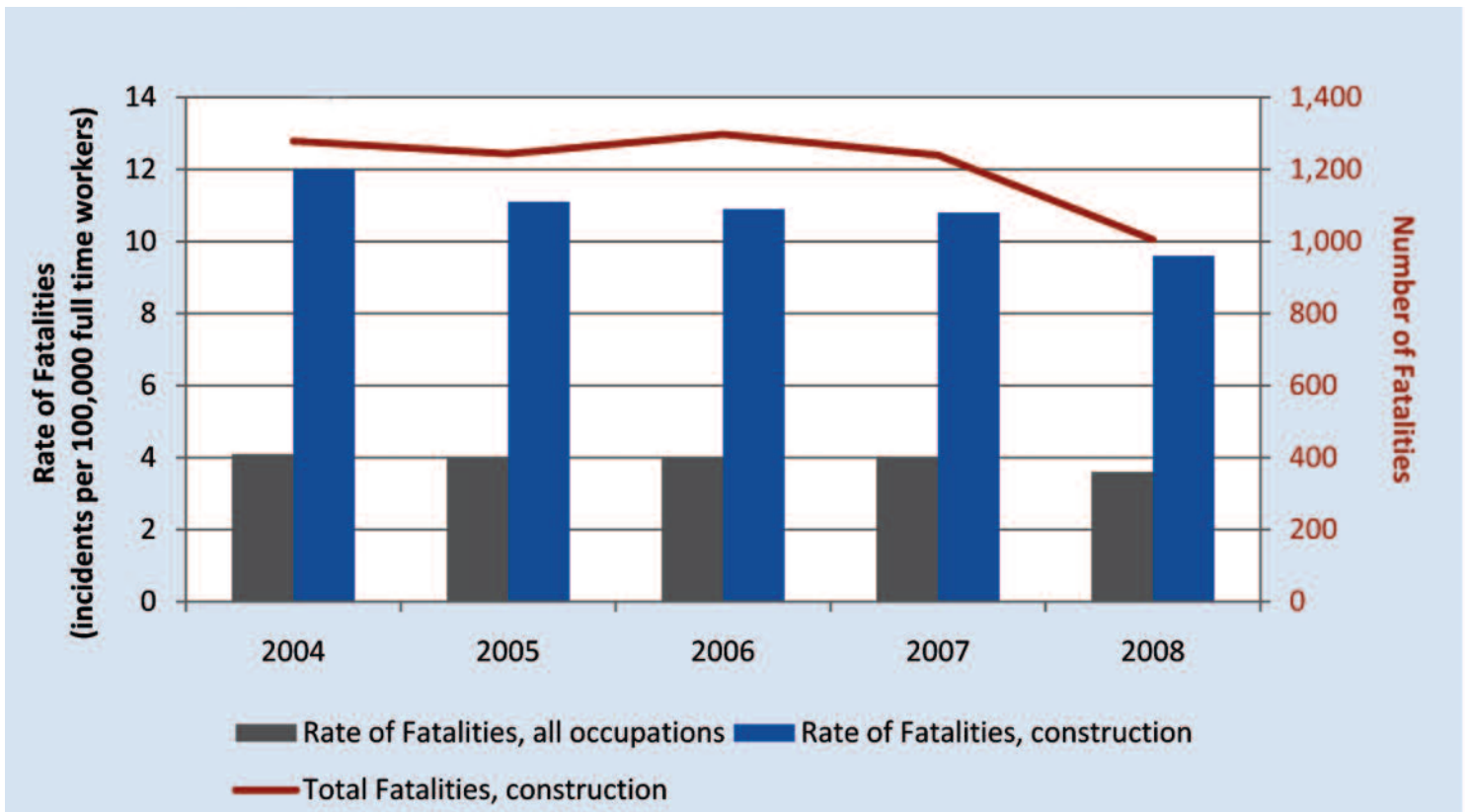


Table 1
Construction Fatality Rates in U.S. by
Occupation Per 100,000 Full-Time Workers

Occupation	2007	2008	Change
All construction occupations	10.8	9.6	-11%
Helpers in construction trades	15.7	6.6	-58%
Carpenters	6.3	4.7	-25%
Construction laborers	20.8	16.0	-23%
Electricians	10.1	8.3	-18%
Pipelayers, plumbers, pipefitters and steamfitters	7.0	6.4	-9%
Structural iron and steel workers	47.8	46.4	-3%
Roofers	33.4	34.4	3%
Painters, construction and maintenance	6.6	8.6	30%
Operating engineers/construction equipment operators	10.6	15.8	49%

Table 2
Construction Fatalities for
Select Metropolitan Areas

Metropolitan Area	2004	2005	2006	2007	2008
United States	1,278	1,243	1,297	1,239	1,005
Atlanta-Sandy Springs-Marietta, GA	42	25	21	30	21
Boston-Cambridge-Quincy, MA-NH	14	9	14	17	12
Chicago-Naperville-Joliet, IL-IN-WI	29	28	30	33	21
Dallas-Fort Worth-Arlington, TX	32	30	29	37	18
Detroit-Warren-Livonia, MI	7	10	13	4	9
Houston-Baytown-Sugar Land, TX	25	44	19	36	26
Los Angeles-Long Beach-Santa Ana, CA	32	35	41	17	21
Miami-Fort Lauderdale-Miami Beach, FL	25	26	34	33	15
New York-Northern New Jersey-Long Island, NY-NJ-PA	53	53	68	56	56
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	28	19	23	22	15
San Francisco-Oakland-Fremont, CA	16	7	8	8	8
Washington-Arlington-Alexandria, DC-VA-MD-WV	28	38	26	20	18

Subcontractor Safety Orientation*continued from page 1*

ly have an on-site SH&E professional on the team. In addition to providing technical expertise and guidance, the on-site SH&E professional usually conducts the safety orientation. I have conducted hundreds of subcontractor safety orientations both indoors and outdoors, in formal conference rooms with 75 people as well as in front of a pickup truck's headlights with two men at 5:00 a.m. in frozen January.

However, not all projects have a full-time SH&E professional on site. Many factors, including the size of the project, location and complexity, may lead to a site having only one or two construction manager representatives, one of them being the project superintendent.

In general, the superintendent is responsible for supervising and coordinating all on-site subcontractor operations, including quality, performance, production and safety. In my opinion, superintendents have so many things to do on any given day that it does not seem possible they can do it all. Because of their extensive knowledge, experience and presence on the site, I recommend that the superintendent be tasked with one more responsibility—conducting a safety orientation for subcontractors—whenever possible.

I have worked in the construction industry for almost 25 years. Each year, I become more convinced that the key to a profitable and safe project rests in the superintendent's hands. When we discuss the components of building and maintaining a safety culture, visible advocacy is a key element. Visible advocacy and leadership from executive management are needed; there is nothing quite as reinforcing as watching someone walk the talk. A jobsite safety orientation is an opportunity to communicate the rules and regulations and to influence a tradesperson to make good decisions.

WHEN & HOW TO CONDUCT A SAFETY ORIENTATION

If a safety orientation is worth doing, then it is worth doing right. The optimum time to hold a safety orientation is as soon as the subcontractor shows up on site, when the most influence can be exerted.

If a superintendent gives the safety orientation for the workforce, the superintendent must give an orientation to each subcontractor as soon as they set foot on a project. This is an enormous commitment.

The first hour of any job is hectic. Requiring a subcontractor employee to read a handout of the rules or to

watch a safety video is much easier than talking with them. However, it pales in comparison to the impact a direct face-to-face communication has during which the importance of following the rules and making good decisions are stressed by a person in charge.

Superintendents are the most visible leaders in the construction industry. A good superintendent is the person in charge and whatever his/her methods, everyone on site knows and understands that.

The safety orientation must be delivered with passion. One of the most passionate resources in the construction industry is the person who makes it happen every day—the project superintendent.

Whether it is having a toolbox talk with subcontractor foremen, conducting a safety orientation or stopping a work operation due to its unsafe nature, it is all about passion for safety. This is a reach for many superintendents. Good superintendents are passionate about and take great pride in their work and it is our job to help make them be passionate about safety.

A safety orientation may be conducted in many ways, but it can be divided into two basic types: formal and informal.

Formal safety orientations involve components, such as use of audiovisual materials, handouts and prominent display of safety information signs and posters. Audiovisual materials are safety videos or PowerPoint presentations typically delivered lecture-style. Attendees sign in and watch either a safety orientation video or sit in front of a computer or projector screen.

Informal safety orientations are either conducted by the presenter using an outline that has talking points or a combination of audiovisual materials and discussion.

Both types of safety orientation must be documented. While both formal and informal safety orientations have their time and place, I believe that an informal orientation is the most effective. Essentially, it boils down to one person talking with another person about safety. Many superintendents are excellent communicators when it comes to coordinating work but struggle when it comes to talking about safety. Only with practice does it become more natural.

PERSONAL EXPERIENCES

Many years ago, I coauthored a corporate safety orientation video for a large construction management company. We wrote the script, hired a videographer, flew around from jobsite to jobsite with the videographer and approved the final editing. The intent was to have a consistent, uniform message during safety orientation to all sites around the country. We were proud of the accomplishment and we deemed it to be a tremendous success. It was simple and easy to deliver, but as time went on, the organization discovered that as the company's approach toward safety evolved, the format did not have the anticipated impact. Subcontractors leaving the orientation did not get the message and we ended up scrapping the video in favor of something a little more personal.

No safety orientation for the construction industry is a one-size-fits-all solution. Construction projects may have similarities, but they have different scopes, hazards and people. If it is worth doing, it is worth taking the time to do it right.

When I was younger, my father and I would attend high school sports events together. He would point out older students for me to watch and use as role models. I could not figure out why he did not always point out the player who scored the most touchdowns, made the most baskets or hit the most home runs. As I got older, I realized he was trying to teach me that in a team environment, it was not always the most skilled player who was made the team captain. To be a leader, skill and ability are needed, but the way to get the letter “C” put on the jersey was the ability to inspire others and to show unbridled passion for the task at hand.

BECOMING PASSIONATE ABOUT SAFETY ORIENTATIONS

How can superintendents become passionate about giving a safety orientation? They must first have a firm grasp of OSHA regulations and of a company’s safety program and policies. In addition, superintendents should receive training and guidance in hazard recognition and abatement, and should also be urged to immerse themselves in the “people side of safety.” My father used to say, “You cannot teach heart,” but we can give superintendents the tools that help them develop a passion for something that safety professionals practice every day.

Having an OSHA 10- or 30-hour card is not enough safety education for a superintendent to run a safe job-site. A superintendent will benefit greatly from attending in-house interactive workshops that include a heavy focus on people-based safety, such as public speaking, human behavior, personality types and communication styles and power of persuasion.

A superintendent’s attitude toward safety can be influenced in many ways. While many field people may not initially see the purpose in attending workshops such as these, they will eventually reinforce the concept of people-based safety. The rewards will be satisfying to the individual as well as to the company.

TALKING POINTS & TIPS

A site-specific safety orientation should include the following talking points:

- brief overview of the project, including major upcoming activities;
- introduction of the project team;
- location of stairs, hoists, elevators or other means of access/egress;
- review of the emergency action plan;
- hazards unique to the site, such as owner operations, overhead power lines and former land use;
- overview of hazard communication program;
- location of MSDS;
- injury reporting procedure;
- fire extinguisher locations and use;
- weekly toolbox talk (day, time and location where held);
- sanitary facilities;
- PPE;

•why safety is important to you.

Superintendents should spend the most time explaining why safety is important to them. Even if the orientation is formal, with slides or a video, this point should be discussed with the media device turned off so that everyone can have a face-to-face discussion with no distractions.

Additional tips for superintendents to keep in mind as they give an orientation include:

- 1) Do not attempt to give an orientation without an outline. Even the best speakers need notes to keep on track.
- 2) Go around the room and ask each person to introduce him/herself by name and company.
- 3) During the orientation, ask an attendee (by first name) an open-minded question, such as “What do you think of that?”; “Can you give me an example of why this might be important?”; or “Do you remember a time when . . . ? Tell us about it.”
- 4) Practice taking your eyes off the paper in front of you as you go through the material. Look at who you are talking to—they are real people.



5) Share a personal story about safety. It helps the group see you as a person with real feelings, not just the person in charge.

6) Use the words “we” and “us” instead of “you” whenever possible.

7) Conduct orientations in areas away from major distractions.

8) Never give a prepared safety speech. It is counter-productive.

With constant reinforcement from the SH&E professional and the company coupled with the interactive workshops, honest and genuine safety discussions will naturally occur.

No safety orientation for the construction industry is a one-size-fits-all solution. Construction projects may have similarities, but they have different scopes, hazards and people. If it is worth doing, it is worth taking the time to do it right. ☺

Neil Webster, CSP, OHST, is safety director at Columbia Construction Co. in North Reading, MA. He is also the Assistant Administrator of the Construction Practice Specialty.

If a superintendent gives the safety orientation for the workforce, the superintendent must give an orientation to each subcontractor as soon as they set foot on a project. This is an enormous commitment.



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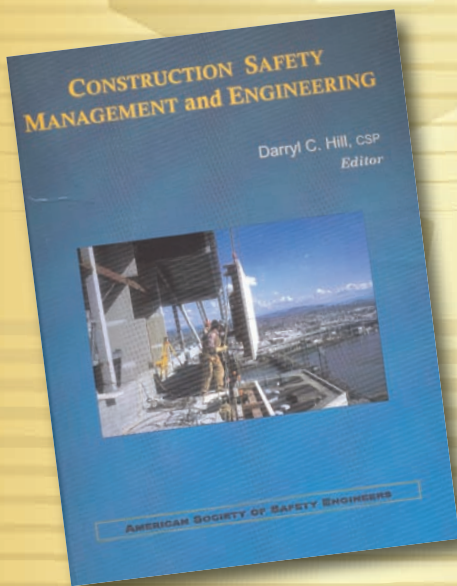


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