

Conducting Effective Tailgate Trainings

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The California Department of Health Services' Occupational Health Branch and others have identified the construction industry as being at high risk for injuries, illnesses, and fatalities. Effective tailgate trainings (brief job site safety meetings) can be a powerful tool to promote hazard awareness and safe work practices. The authors found that many contractors and supervisors conducted ineffective tailgate trainings. They developed the BuildSafe California Project to assist contractors to have more effective programs by holding 25 training-of-trainers sessions reaching 1,525 participants. The needs assessment, intervention, and evaluation results from the first 18 trainings are presented. Eighty-six percent of the participants found the program "very helpful." Participants used the materials and made improvements in the quality and frequency of trainings. Supervisors must be skilled at conducting tailgate trainings as part of their responsibilities. There is a serious need to provide more culturally appropriate safety training in a workforce increasingly made up of Latino workers.

Keywords: *training-of-trainers; tailgate trainings; jobsite safety meetings; tool-box safety meetings; construction health and safety; intervention research*

In 2001, the Occupational Health Branch (OHB) of the California Department of Health Services was funded by the National Institute for Occupational Safety and Health to track several types of workplace

injuries and illnesses in California. Another component of the proposed project was to work with stakeholders to conduct an intervention to promote the health and safety best practices in the construction industry, an industry that has widely been identified as having a high incidence of illness and injury, including fatalities.

Construction is a unique and very complex work environment that is marked by an astounding pace of change, with projects of short duration and a contingent workforce so that achieving and measuring change is difficult (Ringen & Stafford, 1996). The recruitment of construction companies (especially small companies) in safety training and evaluation research presents many challenges (Kidd, Parshall, Wojcik, & Struttmann, 2004).

Despite these barriers, we chose to work with construction industry stakeholders with the expectation that, by involving them in the process from the beginning and presenting the promise of together fulfilling a desired outcome, they could become enthusiastic supporters. We also expected to learn from their experiences, tap into their interests and priorities, and gain assistance from them.

► BACKGROUND

In 2001, more than 684,000 workers were employed in California's construction trades. This figure reflected a 5.5% increase over the previous year (U.S. Department of Labor, 2001). Injury rates in California among construction workers were 32% higher than the U.S. average (incidence in California of total lost work day cases in construction = 5.3/100 workers and U.S. = 4.0/100.0) ($5.3/4 = 1.325$) [$(5.3 - 4) / 4 * 100 = 32.5\%$] (U.S. Department of Labor, 2001). In addition, the dramatic and sudden increase in the proportion of Hispanics (herein referred to as Latinos, because *Hispanic* is a labor statistics term, whereas *Latino* better captures the culture of the workers) in the California construction workforce has left

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many contractors/supervisors facing a challenge for which they are ill prepared.

Most construction companies are small (less than 10 employees; U.S. Census Bureau, 1998), and the way in which health and safety practices are conducted in small companies may be substantially different from larger ones (Eakin & MacEachen, 1998). Small contractors are an especially difficult audience to reach with a safety message, and yet, there are thousands of them

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across the United States who, on a daily basis, direct thousands of employees in their work. The characteristics and barriers in this industry that make it difficult to implement successful prevention and training programs that reach, educate, and motivate small contractors have been described (Kidd et al., 2004; Ringen, Englund, & Seegal, 1995; Ringen & Stafford, 1996; Wolford, 1996). These characteristics include diffuse worksite control; short-term worksites; multiemployer worksites; ever-changing working conditions; episodic employment; working for more than one employer; lack of trained health and safety staff; and fierce bidding competition, making safety budgets inadequate.

Adding to the complexity is that, in 1990, Latinos made up 27% of the California construction workforce; by 2000, there were 294,946 Latino construction workers in California, 41% of the industry workforce (U.S. Census Bureau, 2000). The disproportionately high injury and fatality rates for Latino workers are thought to be due, in part, to disproportionate representation in high hazard trades (Devora, 2002). The language barrier is also often cited as a major reason, primarily because it impedes the ability of supervisors to properly communicate with and provide safety training to workers (Dong & Platner, 2004). In 2002, nearly one third of U.S. Latino construction workers spoke only Spanish (Center to Protect Workers' Rights, 2002). Nationally, the composition of the Hispanic construction workforce is 55% Mexican, 20% Mexican American/Chicano, 14% Central/South American, 3% Puerto Rican, 3% Cuban, and 5% Hispanic of other countries of origin (Platner & Dong, 2001).

Although the language and cultural barriers undeniably play a significant role for Latino/immigrant workers' safety, these are really part of the broader issue of inadequate safety supervision of all construction workers, including inadequate orientation and skills assessment; inappropriate expectations and task assignment; inadequate direction, training, and warnings; and inadequate oversight, correction, and motivation (Ringen et al., 1995). For Latino/immigrant workers, low safety expectations, low self-esteem, and acculturated unsafe work practices (Brunette, 2004) are additions to the list.

Supervisors provide one of the most significant enabling or reinforcing factors for health and safety on the jobsite, and the training of supervisors has therefore been identified as being just as important as training workers in this area (Ringen & Stafford, 1996). A high priority for construction managers is to focus on conducting and knowing how to conduct interesting, meaningful safety trainings (Gillen, Baltz, Gassel, Kirsch, & Vaccaro, 2002). Supervisors who lack good safety supervision skills place all construction workers, including Latino/immigrant workers, at increased risk.

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Although there are limited educational resources available to help build the safety supervision skills of supervisors and foremen (such as union apprenticeship programs and Occupational Safety and Health Administration [OSHA] training institutes), many motivated contractors told us that cost, location, accessibility, and time prevent them from sending their foremen to such trainings. Typically, these skills are picked up informally, as part of on-the-job training. The extent to which these skills are mastered depends on informal resources such as upper management commitment, individual aptitude and motivation, and peer example and mentoring.

Cal/OSHA regulations require that contractors conduct tailgate trainings (brief job site safety meetings) every 10 working days. However, our needs assessment, described herein, found that the tailgate trainings were, for the most part, perfunctory and of poor quality. Few supervisors receive training on how to conduct effective tailgate trainings, provide site safety supervision and leadership, and address issues dealing with Latino and other immigrant workers who come from different work cultures and speak different languages. Although contractors perceive safety training as a means to increase the safety and health of the work environment, productivity, employee morale, quality of work, and company profits, many construction companies do not or infrequently conduct safety training (Goldenhar, Moran, & Colligan, 2001). One barrier to this is the lack of affordable, short training programs. Small construction companies are reluctant to send employees to trainings that last more than a few hours and are expensive. Although tailgate trainings are not the only type of trainings required in construction, we found that contractors were missing an

opportunity to conduct site-specific participatory trainings that would help create a better safety environment.

METHOD, STRATEGIES, AND INTERVENTION

Needs Assessment

Our information-gathering and needs assessment process included reviewing the scientific literature on construction health and safety (particularly intervention efforts), compiling available injury and illness statistics, obtaining input from California construction industry stakeholders through an advisory committee process, conducting 12 key informant interviews of industry experts, and undertaking research on prior intervention programs as suggested by the advisory committee and key informants.

We established stakeholder advisory committees in Northern and Southern California and announced that we had been the recipient of a grant and were looking for their guidance on the focus for a construction industry intervention project. The stakeholders recruited included small and large contractors, contractor trade associations, local and statewide construction union representatives, representatives from day laborer programs, and staff from Cal/OSHA and other public agencies.

In our first round of meetings with industry stakeholders in both Northern and Southern California, we provided an overview of the project's purpose and a brief outline of the 4-year work plan. Then, we asked participants to brainstorm a list of the most important health and safety issues they faced, identify programs or approaches they knew of that successfully reduced injuries and illnesses, and discuss how the OHB could work with them to make the construction industry safer.

Choosing the Intervention Focus

Our project staff took the stakeholder advisory committees' initial input, the needs assessment results (literature search, key informant interviews, surveillance data from OHB and other sources, results of a few worksite investigations), and descriptions of work done by others, and formulated numerous proposals for potential intervention projects. We then outlined eight possible intervention projects and used internally developed rating criteria to narrow the eight projects down to four possibilities.

At a second series of advisory committee meetings in Northern and Southern California, we presented four possible interventions with background information, relevant data supporting each one, and our assessment of the strengths and weaknesses of each proposed intervention. The four proposed projects included (a) conducting a

TABLE 1
Average Rankings of Construction Safety and Health Proposals, by Stakeholder Group, California, 2001

<i>Group (n)</i>	<i>Tailgate Training</i>	<i>Ladder Video</i>	<i>Day Laborer Health & Safety</i>	<i>Fall Prevention</i>
Contractors/contractor organizations (16)	2.0	2.3	3.1	2.0
Union representatives (17)	2.3	2.5	2.9	1.8
Community-based organizations (8)	2.0	3.3	1.5	3.5
Public agencies (3)	1.7	3.3	2.0	3.0
Overall (44)	2.1	2.6	2.7	2.3

NOTE: The scale for ranking was constructed such that a low number indicates the highest priority.

program to improve tailgate safety training, (b) developing a new ladder safety video, (c) implementing a day laborer safety training program, and (d) implementing a fall prevention program.

We then asked the advisory committee members to use criteria to provide us with written feedback and a preferred ranking of these four proposals (from “most preferred” to “least preferred”). Each proposed project was to be rated based on the extent to which it would (a) address one or more significant health and safety problems, (b) build on successful efforts by others, (c) have a statewide focus, (d) involve collaborations with many partners, (e) reach significant numbers or test an approach that could be expanded later to reach larger numbers, and (f) create resources to last beyond the funded project period.

Overall, advisory committee participants identified training of contractors, foremen/supervisors, and union journeymen who conduct tailgate trainings as the highest priority. The results of rankings by advisory group constituent members are summarized in Table 1; the scale for ranking was constructed such that a low number indicates the highest priority.

Carefully considering all available input, project staff made the final selection of improving the quality of tailgate safety training as the focus of the intervention. The key reasons for selecting this project were that it was ranked the top choice by advisory group members, was designed to affect a large number of construction workers across the state through “train the trainer” programs, would provide participants with the *Cal/OSHA Pocket Guide for the Construction Industry* and tailgate training materials in English and Spanish for multiple health and safety hazards, and would allow OHB to work extensively with construction industry partners across the state. It was thought that focusing on tailgates might motivate some contractors to enhance Injury and Illness

Prevention Program activities (a Cal/OSHA requirement), and tailgates, if done well, would be a powerful tool toward creating a safer work environment on jobsites and in the company itself.

We were particularly interested in focusing our training toward supervisors/foremen because (a) episodic worker employment, changing work assignments/site conditions, and multiple contractors on the jobsite are factors that make supervisors critical to jobsite safety; (b) supervisors can provide one of the most significant encouraging or reinforcing safety factors on the jobsite; (c) most supervisors do not get training on how to train and be a site safety leader; (d) having trained supervisors helps companies comply with Cal/OSHA regulations; and (e) thousands of workers can potentially be reached by tailgate trainings, which, for some workers, may be the only training they will ever receive. The intervention focus on supervisors reflected both the stakeholders’ thinking and the conclusions found in the work and research by Ringen et al. (1995), Ringen and Stafford (1996), Wolford (1996), Kidd et al. (2004), and Gillen et al. (2002).

Our educational approach drew on the theories of diffusion and adoption of innovations (Rothman, 1974), empowerment education (Freire, 1973), and the health belief model (Rosenstock, 1974). The diffusion and adoption approach is a process by which new ideas and practices are propagated and gain acceptance by groups of people. Empowerment education is an approach to learning that is participatory, based on the students’ real-life experiences, incorporates dialogue between and among educators and students, seeks to give students the ability to identify and solve problems collectively, and critically analyzes the organizational and systemwide causes for problems. The health belief model maintains that individuals take action to avoid disease when motivated by certain factors.

From our needs assessment, we learned that said supervisors needed to be better trained and motivated to adopt a more effective and innovative way (adoption of innovation) to deliver tailgate trainings. Educating supervisors in a different training approach that recognizes and incorporates people's (workers') knowledge and experience through dialogue and participatory exercises would lead to increased worker participation and investment (empowerment education) in hazard identification and problem solving. Using this approach over time would lead to increased worker and supervisor investment in and control of jobsite safety conditions, which would contribute to a safer and healthier work environment for everyone (health belief).

Our training program content and approach emphasized to the participants a multistep causal analysis of construction health and safety problems and solutions. Through the utilization of effective tailgate trainings, there would be opportunities to promote any number of possible interventions—some behavioral, some engineering controls, some organizational, and some administrative (Goldenhar & Schulte, 1996; Vojtecky, 1988).

Developing the Intervention Curriculum and Materials

We titled the intervention project “BuildSafe California: Conducting Effective Tailgate Trainings” and determined that the objectives would be as follows:

- Deliver statewide, 15 half-day training-of-trainer programs on conducting effective tailgate trainings;
- Train 450 to 1,500 supervisors, foremen, and union representatives positioned to deliver or ensure delivery of tailgates;
- Improve the capacity of supervisors, competent persons, and union representatives to deliver short on-site safety trainings;
- Develop new “Safety Break” training materials in English and Spanish, and other resources;
- Partner with organizations to reach contractors and workers;
- Evaluate whether participants improved the frequency and quality of their tailgate trainings leading to jobsite safety changes;
- Identify barriers, possibilities, and best practices; and
- Make policy recommendations.

For the development of the curriculum and materials, we contacted contractors to determine the characteristics of tailgate training they were currently providing (e.g., content, length and timing of trainings, materials used, who delivers trainings, recordkeeping practices, oversight done to ensure trainings are delivered); observed tailgate

trainings at residential, commercial, and heavy construction jobsites; videotaped tailgate trainings conducted by others at several worksites; interviewed company and union trainers on what they felt were the barriers, benefits, and best approaches to delivering tailgates; and reviewed tailgate training materials developed by others.

We aimed to maximize interaction between participants and integration of the material through discussion, questions and answers, and participatory exercises. We recruited speakers from Cal/OSHA Consultation Service and peer contractors and worked with them to develop their role in the curriculum.

We decided to use videotaped examples of tailgate trainings as a key teaching tool because they provided concrete examples of trainings, they allowed for a discussion of effectiveness of training techniques without critiquing the performance of a participant, it was easier to talk about real trainings than abstract ones, it demonstrates that effective tailgates can be done quickly, and it illustrates well how a “canned” or scripted tailgate can be greatly improved using a few simple techniques.

Training Curriculum

We identified four key themes to be emphasized in the training curriculum to convey and illustrate the “best practices” of tailgate training. We also encouraged attendees to come back to these theme questions whenever doing a tailgate training to assess how well they were doing and when they responded to our 6-month follow-up survey. The criteria for success or what makes for an effective tailgate training include affirmative responses to the following:

- **Does the topic fit the job?** Training must be made relevant by talking about hazards the crew is facing, or about to face, on that job.
- **Does the crew participate?** Get the crew involved with questions, ideas, observations, stories, and solutions.
- **Do I demonstrate what I am talking about?** Whenever possible, have crew members show and demonstrate tools, equipment, or procedures.
- **Does the tailgate lead to action?** Follow up on good ideas that come out of the training. Focus on concrete changes in the way the job is set up or run.

The 4-hour training curriculum included these main components: (a) Introduction: present the purpose of the training; (b) Pairing Off: participants introduce selves, discuss the main barriers/challenges they encounter in doing tailgate trainings, and then report back to the group; (c) Contractor's Perspective (peer contractor): short motivational pitch about tailgate training and how he or she built his or her safety program; (d) Learning From Other

Contractors' Tailgates: two videotapes shown of short tailgate trainings with group discussion of what participants consider good points and what could be improved; (e) Elements of a Good Tailgate Training: effective adult learning techniques and the best practices of tailgate training; (f) What Cal/OSHA Looks for in a Safety Program: presentation and questions/answers; (g) How to Use the Safety Break Tailgate Materials: distribution of resource folder, discussion of how Safety Break materials were designed to be used, and review of other resources provided; (h) Putting It All Together: small group exercise where participants are given a jobsite scenario and asked to brainstorm topics for a tailgate training, go through the process of designing a tailgate training, and discuss results in the large group; (i) Tailgate Trainings—Problems and Solutions (peer contractor): contractor shares tips about how he or she carries out a tailgate training program and discusses with the group solutions to the problems raised in the initial brainstorming activity; (j) Wrap-Up: re-emphasize the four main themes of effective tailgate training and distribute evaluation forms; and (k) distributing certificates, lunch, and networking.

Educational Materials and Resources

To assist participants in delivering tailgate trainings, we developed a set of "Safety Break" cards in both English and Spanish (<http://www.dhs.ca.gov/ohb/buildsafe>). The Safety Break cards were designed to help the trainer to prepare quickly, promote discussion and problem solving ("active learning"), provide content information on 22 common topics, include illustrations with simple graphics, refer to regulations and background material on each topic from the *Cal/OSHA Pocket Guide for the Construction Industry*, cover content in both English and Spanish versions, give users a template to guide development of tailgates on new topics, and include a training documentation form.

While in a draft stage, the cards were reviewed by experts, contractors, workers, union representatives, and others for accuracy, usefulness, and understandability. Spanish language cards (translated by bilingual OHB staff) were reviewed by bilingual construction personnel and a Mexican native-speaking translator for translation and understandability issues.

Other resources were also assembled for distribution to participants in a resource folder. These included the *Cal/OSHA Pocket Guide for the Construction Industry* in English (http://www.dir.ca.gov/dosh/dosh_publications/const_guide.pdf) and Spanish (http://www.dir.ca.gov/dosh/dosh_publications/constr_g_sp.pdf) and a listing developed by OHB of Web sites with tailgate training materials or other useful information that trainers can use

to develop their programs (<http://www.dhs.ca.gov/ohb/BuildSafe/links.htm>).

Cosponsors and Endorsers

We obtained the cosponsorship of State Compensation Insurance Fund (SCIF), the workers' compensation carrier that insures a majority of small construction contractors in California; Cal/OSHA Consultation Service; and the Golden State Builders Exchange (statewide contractor trade association). We anticipated that these cosponsors would contribute to the project in various ways, including providing additional resources necessary to carry out the intervention.

SCIF provided services for invitation design, undertook large mailings to their insured, coproduced the Safety Break training cards (including providing funds for the initial printing run), supported a special reprinting of the *Cal/OSHA Pocket Guide for the Construction Industry*, and provided training locations at their district office sites, which are centrally located throughout the state. These substantial contributions were essential to the implementation and success of the project.

Cal/OSHA Consultation Service staff developed a module on the agency's expectations for a construction site safety program and handouts to accompany it; provided speakers at each training who focused on these issues and answered attendees' regulatory questions; and provided copies of the *Cal/OSHA Pocket Guide for the Construction Industry* in English and Spanish.

The Golden State Builders Exchange and local county affiliates provided outreach and publicity among members and training locations. Under some circumstances, the local Builders Exchange offices hosted the trainings at their offices or another site.

We also obtained the endorsement of 15 contractor organizations and the state building construction union organization. All of these organizations assisted in doing publicity and outreach to recruit participants to the trainings.

Outreach and Marketing

Because many small contractors do not belong to an organization, our project's outreach and marketing strategy was to use a number of approaches simultaneously, including working with SCIF on doing outreach to their insured and working with other stakeholders to conduct outreach to their members and beyond.

Outreach and publicity methods used to recruit contractors, supervisors, and foremen to attend the trainings included large mailings by SCIF to their insured; mailings using an OHB database of more than 1,800 contractors

who previously attended lead safety trainings; articles in the Contractors State Licensing Board (CSLB) newsletter, which goes to every licensed contractor in the state; contractor organizations doing announcements to members through their newsletters, Web sites, mailings, and fax announcements; union publicity to signatory contractors and union representatives; public agency publicity to bidders and other purchasers of construction services; and e-mail announcements with an attached pdf registration form and link to the OHB Web site.

Based on previous experience recruiting for construction industry trainings, we learned that our best turnouts took place when we were able to reach busy contractors at least three times through three different media. Reaching that level of exposure often required having local affiliates of statewide contractor organizations take ownership of the event by publicizing the event locally through various means cited above. Meanwhile, the recipient would read about it in a SCIF mailing and perhaps also in the CSLB newsletter.

The training invitation stated clear and desirable objectives to the potential participant. It was titled "Conducting Effective Tailgate Trainings: What every supervisor needs to know for conducting effective tailgate trainings."

Evaluation Design

We conducted formative and process evaluation to get feedback from the participants on the quality of the training program and materials, for the purpose of making improvements during the course of the intervention period. At each training, we collected feedback from participants via a one-page questionnaire.

Our impact evaluation was designed to determine if, 6 months after having attended the training, it had made an impact on their tailgate trainings. Impact evaluation included a baseline questionnaire at the time of the training asking about the current frequency and quality of the trainings. We followed up 6 months later with a survey using the same questions and some additional questions concerning tailgate training improvements, the usefulness of the resources, and other indicators of jobsite safety. Because there was a 6-month lag time between the surveys and an additional 6- to 8-week lag time while attempting to obtain a response, we limited participation in the follow-up survey to the first 18 trainings.

For the 6-month survey, we tried to reach contractors by e-mail and regular mail. This was our first time using e-mail to recontact people and to have them respond by using a Web-based survey instrument. We made a total of three attempts at 2- to 3-week intervals to obtain a response. When the e-mail addresses were

rejected, we switched over to regular mail. Successful completion of the Web-based survey provided the participant with electronic access to free online health and safety resources.

For both the baseline and 6-month follow-up surveys, we asked questions that were frequency related, such as, How often

- are tailgate trainings conducted?
- are topics chosen because of what's happening on the jobsite?
- does the crew speak up during the tailgate?
- do you demonstrate what you are talking about?
- does the tailgate cause a change in equipment or work method that will improve jobsite safety?

For the 6-month follow-up survey, we also asked some additional questions, including

- Has the effectiveness of your trainings increased?
- How often do workers raise safety concerns?
- Has worker compliance with safety rules increased?
- Has workers' role in solving safety problems increased?
- How useful were the "Safety Break" cards?
- Was the blank card a useful tool for creating new tailgate topics?
- What other Safety Break card topics would be useful?
- How useful were the Web sites we provided?
- What other improvements have been made?

Intervention Results

Over a 3-year period, we conducted 25 half-day trainings throughout the state, attended by 1,525 contractors, supervisors, foremen, managers, and union representatives. Based on job titles self-reported by attendees, we found that we were successful in reaching the types of personnel we sought, such as those who directly delivered tailgate trainings and those responsible for overseeing such a program and other health and safety issues. The breakdown of attendees (for the first 18 of the 25 trainings) by job title appears in Table 2.

Table 3 shows the various types of construction trades as self-reported by attendees (for the first 18 of the 25 trainings); more than one third were general building contractors.

Formative and Process Evaluation Results: Training Program Quality

We analyzed formative evaluation data collected from participants via a one-page questionnaire from the first 18 of the 25 trainings (1,195 attendees) to get feedback from

TABLE 2
BuildSafe Seminar Attendees by Job Title

<i>Job Title</i>	<i>Number</i>	<i>Percentage</i>
Foreman	267	24
Owner/CEO/VP	187	17
Management/admin.	160	14
Superintendent	154	14
Safety director	142	13
Project manager	123	10
Other (includes union rep.)	90	8
Total	1,123	100

TABLE 3
BuildSafe Attendees by Type of Construction or Trade

<i>Type of Work</i>	<i>#</i>	<i>Type of Work</i>	<i>#</i>
General	310	Tile	16
Painting	81	Remodeling	16
Electrical	66	Engineering	14
Public works	53	Telecommunications	12
Roofing	38	Structural steel	10
Concrete	37	Masonry	10
Landscape	34	Underground/ pipeline	10
Plumbing	31	Demolition	8
Drywall and plastering	31	Glass	7
HVAC	29	Acoustical	7
Framing	26	Highway	6
Environmental	22	Unions	14
		Total	888

the participants on the training program and materials quality and for the purpose of continuous improvement of the curriculum. Based on 972 valid responses, 86% (832) found the trainings very helpful; 14% (138) found the trainings somewhat helpful; and less than 1% (2) found the trainings not so helpful.

When asked, “What was the most useful thing you learned at the training?” the top four responses were as follows: (a) how to conduct a tailgate training (226); (b) resources provided (160); (c) regulations discussed (90); and (d) importance of employee involvement in tailgates (74).

When asked, “How could the training be improved?” the top five responses were as follows: do not change anything (110); use more demonstration, visual aids, or real

examples (64); make the program longer (59); give the Cal/OSHA speaker more time (54); and get more participation from the audience (41).

After each training, we read and discussed all suggestions for improvement and made changes such as introducing an initial exercise to get people to interact and find out their biggest barriers or challenges in doing tailgate trainings and increasing the time allotted for the Cal/OSHA speaker.

Participants reported a wide range of barriers and challenges in doing tailgate trainings, and this informed the focus of the problem-solving segments at each training. The most frequently cited barriers and challenges included the issue of when was the best time to do tailgates; having no time to do them; how frequently should they be done; having too many worksites; multiple language barriers; wondering who should do them (the foreman, supervisor, front office staff?); problem of repetitive topics and maintaining employee interest; that employees don’t care/won’t listen; that bosses don’t care; not knowing what topic(s) to cover; and not being able to find good training materials to use.

Impact Evaluation Results

Our impact evaluation was designed to determine if, 6 months after having attended the training, it had made an impact on their tailgate trainings and workplace safety environment. Approximately one third of eligible attendees provided valid responses to the 6-month follow-up survey; 335 contractors out of 1,053 responded, for a response rate of 32%. We were far more successful in obtaining responses through hard-copy mailings (211 responses; 63%) as compared with sending e-mails directing participants to the Web-based survey (124 responses; 37%).

One of our most important concerns was determining how many contractors were meeting the requirement for doing a tailgate training at least every 10 days. When attendees were asked this question at the time of the training, they reported a very high level of compliance; 71% said they were doing trainings at least every 10 days. Our assessment of this finding is somewhat skeptical, as attendees were repeatedly told during the training that holding trainings every 10 days was a Cal/OSHA requirement, and attendees completing this questionnaire were asked to identify themselves (so we could contact them 6 months later). For those contractors who completed both a baseline (disclosing their identity) and a follow-up survey 6 months after attending a training, 84 reported not being in compliance initially. Of these 84 contractors, 65 (77%) had increased the frequency of their training by the time of the follow-up survey.

Another question we asked was about the perceived effectiveness of attendees' tailgate trainings based on the 4-point criteria described above in the curriculum section. The majority of contractors said their training effectiveness had either increased, or increased greatly, after 6 months. They reported the following: increased greatly, 15% (49); increased, 63% (209); decreased, less than 1% (1); stayed the same, 20% (66); and did not know, 3% (9).

We wanted to know whether workers were raising safety concerns more often after their contractor or supervisor attended our training. A large proportion of contractors, 56% (186), said workers were raising safety concerns just as often after the training as before. Slightly more than one third, 38% (126), said workers were raising safety concerns more often, 2% (8) said less often, and 4% (14) did not know.

We also wanted to find out how worker attention to company safety rules might have changed since taking the training. The majority of contractors said that worker attention to company safety rules had increased, 54% (180), rather than decreased, less than 1% (1); the remainder responded with stayed the same, 41% (136), or did not know, 5% (17).

We asked about whether workers' role in solving safety problems had changed since taking the training. Contractors indicated that workers' role in solving problems had changed with 55% (183) reporting an increased role; the remainder responded with decreased, less than 1% (1), stayed the same, 40% (132), or did not know, 5% (18).

At the 6-month survey, we asked how useful the Safety Break cards were. Most contractors said the cards were either very useful, 42% (140), or somewhat useful, 41% (136). Only a few contractors thought the cards were not useful, 4% (13), and some contractors acknowledged that they had not used the cards, 13% (44).

We asked participants whether the blank template card for creating new tailgate topics was useful; 42% (137) said that it was, and 5% (18) said it was not. The remainder, 53% (175), did not use the card.

We provided attendees with a resource list of Web sites that had valuable and free tailgate training materials and other construction health and safety resources that attendees could use to prepare tailgate trainings. Similar to the findings for Safety Break cards, a total of 40% of the attendees said that the Web sites were either very useful, 17% (56), or somewhat useful, 33% (110). Very few contractors thought the Web sites were not useful, less than 1% (2), and some contractors acknowledged that they did not use the Web sites, 49% (165).

When we asked an open-ended question concerning what other improvements attendees made as a result of

attending the training, 60% reported making other improvements. The top five improvements mentioned, grouped by category and in order of frequency, were as follows: (a) better and more frequent tailgate and other safety meetings; more demonstration; "better" topics; added Spanish language training; (b) more safety awareness; employees are "looking out for each other"; more compliance with the safety program; (c) more employee involvement: participation, talking, information sharing, and more employees are involved in conducting the trainings; (d) programmatic and structural changes; more organization; better documentation; and (e) creation or improvement of Injury and Illness Prevention Programs and/or Codes of Safe Practices.

We also asked a health and safety policy question concerning whether all contractors should be required to send someone to a basic health and safety training. We received a very positive response: yes, 74% (256); no, 14% (46); and did not know, 10% (32).

Upon completion of most of our trainings, we further distributed the tailgate training kit (including Safety Break tailgate cards) and other health and safety resources by posting them on the OHB Web site. From the initial posting in February 2004 to the end of December 2006, we recorded 47,878 visits to the BuildSafe Web site, with the downloads of the Spanish-language Safety Break tailgate cards being the most popular.

OHB has received numerous e-mails and letters complimenting us for conducting the project. A contractor who attended wrote to us,

You and your team did an excellent job at the training, hitting on the important topics in a short period of time. Following your program we will move from going through the motions at tailgate meetings to implementing meetings that coincide with the tasks being performed at the time. I am going to tailor a six-month tailgate program that follows the sequence of events in the building work we do. Thanks for your efforts.

Reporting Back to Advisory Committee, Stakeholders, and Others

At the conclusion of the project, we held meetings in Northern and Southern California to report back to the advisory committee members on the evaluation findings and to get their feedback on the project process, products, and outcomes. We asked stakeholders to provide feedback and comments on a number of questions, including how the project was useful to their organization; feedback on the Safety Break cards; how we could have done a better job of involving them; and proposals for how to continue the BuildSafe California type of work in the future.

To reach stakeholders who could not attend these meetings as well as a broader audience, we mailed out more than 300 letters and packets to inform people and organizations about the project's findings. We also wrote an article for the CSLB newsletter where we informed all licensed contractors about the project's results and the availability of the tailgate training materials for their use.

► DISCUSSION AND CONCLUSIONS

The BuildSafe California: Conducting Effective Tailgate Trainings intervention project aimed to partner with other organizations to reach contractors and workers and to improve the capacity of supervisors, competent persons, and union representatives to deliver short, onsite safety trainings. Our evaluation of this effort was designed to determine whether participants had improved the frequency and quality of their tailgate trainings, which would help contribute to a safer work environment.

We tied our evaluation findings to the intervention theories based on the questions that were posed to the participants at the baseline and 6-month follow-up surveys. The questions asked about the adoption of creative tailgate training methods (adoption of innovation) and how they increased and improved worker participation in the trainings and jobsite safety (empowerment), which would lead to jobsite safety improvements helping to promote health and safety (health belief). We provided participants with criteria by which to grade their achievements.

Our assessment is that we have met and in some cases exceeded the goals and the objectives of this project. We successfully recruited and engaged construction industry stakeholders in a project planning process that led them to become the strongest supporters of the project. From attendees and stakeholders we received a lot of immediate feedback on the project (process and formative evaluation) that provided opportunities to make various timely changes as described.

We successfully reached a difficult-to-reach target audience of foremen, supervisors, union representatives, owners of small construction companies, and others to improve their or their company's capacity to deliver effective tailgate trainings. Because of the popularity of the program and success in recruiting attendees at locations across the state, we conducted a number of additional trainings and exceeded the number of attendees we had originally targeted. In fact, since the end of the grant period, we have continued to receive requests for trainings.

We created a new set of tailgate safety training materials, Safety Break cards, and other resources, including a listing of useful Internet-based materials, that continue to be available via our Web site despite the conclusion of the grant period. The feedback we have received about these

resources has been very positive, and the number of Web site downloads for Spanish-language Safety Break cards indicates the need for and interest in conducting safety training in Spanish.

We can have some confidence in the validity of the evaluation responses, given that we are relying on self-reported data with all of its limitations, because we see a trend in the direction that shows that the training and materials appear to have generally improved the frequency and quality of attendees' tailgate trainings. The very act of participating in the training caused many to be motivated toward making improvements in their existing tailgate training and safety programs.

This is a difficult industry, audience, and type of intervention project for which to conduct impact evaluation. Some of the difficulties we encountered in obtaining responses to follow-up surveys were not unexpected, considering that we were dealing with a very transient work population that works in a very busy, production-driven environment. We did not have the evaluation resources or capacity to measure changes in morbidity and mortality attributable to the intervention or to follow up with workers subsequently participating in tailgate trainings conducted by attendees or to visit jobsites to conduct observational evaluation. We were limited to conducting a follow-up survey assessing intermediate measures that reflect the attendees' perceptions of improvements in their trainings. We had some difficulties with the follow-up survey including the following: Comparison with initial responses was problematic due to possibly inflated self-reported assessments on the baseline survey; we obtained a relatively low (35%) response rate; administering a survey via e-mail was time-consuming for us but a less expensive data collection method; the limitations of self-reported data are well known; we found that many contractors (both small and large) are irregular e-mail users; and because the "digital divide" exists in the construction world, we found we needed to reach contractors via hard copy as well as electronically.

We conclude that conducting effective tailgate trainings can be a powerful tool toward building a safety program in an industry known for high rates of injuries, illnesses, and fatalities. We believe that well-conducted tailgate trainings, having the characteristics described above, can contribute significantly in raising safety awareness and building a safer working environment in this industry. Contractors, supervisors, and lead workers need to be trained and skilled at conducting tailgate trainings as part of their site safety supervision responsibilities. It is apparent that our participants agreed with this point of view, because when asked in the survey, a substantial number, 74% (256), thought that completing this type of training should be mandatory.

We recommend that more opportunities be created for improving skills in the delivery of tailgate safety trainings and, in particular, expanding the capacity to provide Spanish-language safety training in a workforce increasingly made up of Latino construction workers.

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