

# **ESTABLISHING GOALS FOR CONSTRUCTION SAFETY AND HEALTH TRAINING AND EDUCATION IN SUPPORT OF A NATIONAL OCCUPATIONAL RESEARCH AGENDA**

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## **ABSTRACT**

In 2006, the U.S. National Institute for Occupational Safety and Health (NIOSH) formed a Construction Sector Council to determine safety and health priorities in support of a National Occupational Research Agenda (NORA). The NORA Construction Sector Council is comprised of invited stakeholders and subject matter experts from government, academia, industry groups, organized labor, and private consulting. Through the council, priority topic areas were identified using a process of face-to-face discussions and multi-voting processes. Among eight topic areas identified, training issues were determined to be a priority area. A core Training Issues workgroup was formed and additional corresponding members were recruited based on expertise and interest throughout 2007. The mission of the workgroup has been to assess training needs, resources, and tools to address occupational safety and health hazards in the construction industry. The activities of the Training Issues workgroup have led to development of goals targeting gaps in current training and the resources which can best be applied to address them. Details of the resulting draft goals framework are presented, focusing on barriers as well as best practices and strategies for developing and delivering effective training and guidance to prevent illness and injury for construction workers.

Keywords: Construction, Education, Health, Research, Safety, Training

## **1. INTRODUCTION**

Training is recognized as a key factor for addressing and preventing hazards in construction; yet, to be meaningful, training must be considered in the context of a comprehensive safety and health program that includes management commitment, employee participation, hazard identification and abatement, and program evaluation as well as the training program itself.

Challenges related to training include quality of training available, frequency of training, audience specific training materials (language and literacy-appropriate resources, trade or activity specific training), and evaluation of effectiveness (e.g., ability to evaluate the influence of training on safety behavior and culture versus teaching knowledge and

skills). Training effectiveness research has shown that training can improve levels of knowledge and skills for workers, which can be a contributing factor in increasing awareness of hazards and recommended safe work practices in construction. However, additional research (including behavioral observation and evaluation) is needed to determine whether these precautions are exercised and to validate the true effectiveness of training as a contributing factor to avoiding hazards by utilizing recommended controls and taking appropriate precautions. Further evaluation is required to characterize the effectiveness of training, targeting outcomes such as increased use of recommended controls, personal protective equipment, and improved work practices.

Obstacles to use of training include time management issues, language barriers, failure to perceive hazards or a need for training, and additional costs. The persistence of hazards and associated injuries and fatalities could indicate that training is not the appropriate solution in some situations, or that training is ineffective, not frequent enough, not understood, or not consistent with expected practices on worksites. There exists a need for better characterization of the role that safety and health training plays in the construction industry, and how training is developed, delivered, and assimilated into construction practices.

## **2. METHODS**

The NORA Construction Sector Council was formed in 2006, and is comprised of invited stakeholders and subject matter experts from government, academia, industry groups, organized labor, and private consulting. During its initial face-to-face meetings, the Construction Sector Council identified priority topic areas through a series of discussions and multi-voting processes. Among the resulting eight topic areas identified, training issues were determined to be a priority area for assessing research needs as well as the translation and dissemination of best practices for preventing hazards in construction through effective training. A core training issues workgroup was formed from volunteers on the Sector Council with interest and experience in this topic area. Additional corresponding members were recruited through the Sector Council in February 2007.

The mission of the NORA Construction Sector Council workgroup on Training Issues for Construction Safety and Health was to assess training needs, resources, and tools to address occupational safety and health hazards in the construction industry. The charge of the Training Issues workgroup was to provide leadership in the development of goals and priorities which identify gaps in current training and the resources which can best be applied to address them. Towards this end, the Training Issues workgroup sought to identify barriers as well as best practices and strategies for developing and delivering effective training and guidance to address construction-related hazards and prevent illness and injury for construction workers. These activities were performed through a series of facilitated discussions, including four face-to-face meetings and multiple teleconferences throughout a two-year period (2006 and 2007).

An overall strategic goal was established for the Training Issues topic:

To increase the recognition and awareness of construction hazards and the means for controlling them through broad dissemination of quality training for construction workers, including non-English speaking workers.

Four intermediate goals dealing with specific aspects of training were also established to support the overall strategic goal. For the strategic goal and each intermediate goal, performance measures were specified for use in tracking progress towards meeting the goals. In addition, each of the intermediate goals has subgoals (12 total) to specify supporting activities which relate either to research or research-to-practice. The latter category (research-to-practice) refers to research translation, dissemination, or implementation of solutions derived from research.

The goals of the Construction Sector Council are established for a 10-year period according to the NORA schedule, beginning its second decade in late 2006/early 2007 and running through 2016/2017.

### **3. CHARACTERISTICS OF THE CONSTRUCTION INDUSTRY**

Initial discussions of training issues factors and priorities for construction industry focused on determining characteristics of industry and the target audience. Employment in the construction industry is expected to grow at ~1.2% over the period from 2000 to 2010, creating 825,000 new wage and salary jobs (Berman, 2001; CPWR, 2002). Growth is projected to be higher in residential construction trades over that period (~9%), while growth in heavy construction employment (highway, bridge, and street construction) and special trades will be consistent with the industry average. Given the anticipated growth, demand for training for new construction workers is also expected to rise. Consequently, identification of relevant training materials and methods, appropriate delivery to target audiences, and evaluation of training effectiveness are several of the key issues facing the construction industry.

It was also determined that the construction industry is diverse, not only with respect to multiple and specialized trades, but also comprised of a broader audience of associated professions, organizations, and demographic groups. Among those groups likely to be impacted either as providers or users (intermediate customers) of training methods and materials are the following:

- Banking, mortgage, lending, insurance, and financing organizations
- Construction owners, users, and developers
- Architecture, engineering, and design firms
- Construction managers, supervisors, and workers
- Contractor, industry, and trade associations
- Training organizations and universities
- Federal, State, and local government

- Trade unions and organized labor groups
- Immigrant workers and worker centers
- Equipment rental, supply, and repair contractors

#### **4. DRAFT GOALS FOR TRAINING ISSUES IN THE CONSTRUCTION INDUSTRY**

The draft goals listed below were established by the Training Issues workgroup of the NORA Construction Sector Council and disseminated to a broader audience for review and comment in December 2007. Based on feedback from stakeholders and other reviewers, the goals may be revised accordingly.

**Strategic Goal:** Increase the recognition and awareness of construction hazards and the means for controlling them through broad dissemination of quality training for construction workers, including non-English speaking workers. (There are multiple occupational hazards associated with the construction industry which warrant attention, and priority areas identified by the NORA Construction Sector Council include falls, electrocution, struck-by hazards, noise and hearing loss, silica exposures and illnesses, welding fumes, and musculoskeletal disorders.)

**Performance Measure:** Demonstrate a minimum set of safety and health competencies required for all workers on construction sites to recognize hazards and the methods to control or avoid them through access to quality training and educational materials.

**Intermediate Goal 1** – Perform a construction training needs analysis.

**Performance measure** -- Assess current state of training needs for at least 3-5 major construction trades within 3 years, and expand to include 3-5 more additional trades every year after over 10 years.

Research Goal 1.1 – Identify existing and potential surveillance tools for tracking the use of training and its impact in construction trades. Use and organize existing databases, surveillance systems, and other information.

Research Goal 1.2 – Harmonize training needs analysis to include intermediate and supporting goals from other NORA Construction Sector Council workgroups. Communicate with other NORA Construction Sector workgroups to identify, assess, and coordinate training needs and solutions as they relate to those workgroups' goals.

**Intermediate Goal 2** – Survey current training programs, models, materials and best practices to identify the scope of training resources available.

**Performance measure** – Create an inventory or clearinghouse repository of model programs within 3 years that could serve as resources to other industry sectors for

effective identification of training needs, and developing sector specific resources to address those needs. Maintain the repository by updating it at least annually.

Research Goal 2.1 – Identify programs used to provide training on safety and health core competencies. Develop and define a description of safety and health core competencies required for construction workers, construction trainers, and construction employers, and encourage identification or development of programs which meet these requirements.

Research Goal 2.2 – Identify existing quality training materials (e.g., toolbox talks, simple solutions, and industry and trade materials).

Research Goal 2.3 – Compile resources from peer-reviewed literature on construction safety and health training.

Research Goal 2.4 – Identify methods used to provide training for construction safety and health (e.g., each one teach one approaches, coaching worker-trainers).

Research Goal 2.5 – Identify methods of analysis and measures for effectiveness evaluation of training.

**Intermediate Goal 3** – Develop new or improved training programs, models, materials, and methods.

**Performance measures** – Conduct baseline survey of construction safety and health toolbox talks available via electronic libraries initially within 3 years and conduct surveys periodically thereafter to determine availability of new materials. Demonstrate an increase in publication of peer reviewed literature on construction safety and health training.

Research Goal 3.1 – Develop, evaluate, and implement new materials and methods for delivering effective training on safety and health core competencies.

Research Goal 3.2 – Identify best methods of analysis and appropriate measures and indicators for effectiveness of training. Promote funding for training intervention effectiveness research.

**Intermediate Goal 4** – Promote the dissemination and use of construction training best practices, materials, and methods.

**Performance measure** – Increase the number of construction workers provided with the core competencies for understanding construction hazards and their prevention.

Research/Research to Practice Goal 4.1 – Plan a national state-of-the-science conference on construction training issues, resources, and needs. (Options could include convening a dedicated national conference, participation in sister safety and health

conferences, and piggy-backing onto existing safety and health conferences to focus on discussion of construction safety and health training issues.)

Research Goal 4.2 - Research and develop or refine approaches to institutionalize change. Examples might include: funding research and assisting with dissemination and use of results; publicizing practitioner success stories; using awards and other social marketing approaches.

Research to Practice Goal 4.3 - Improve training delivery and transfer of knowledge to small and self-employed construction contractors. Utilize or develop better surveillance tools to improve delivery systems for reaching smaller construction contractors (the majority of the industry).

Research to Practice Goal 4.4 - Increase communication with other construction safety and health researchers to integrate research findings into training programs. Encourage diffusion of research findings through multiple venues including web-based information sources, peer-reviewed literature, professional organizations, construction user groups, contractor associations, and construction worker unions.

## **5. CONCLUSIONS**

Establishing these goals will help to guide efforts for understanding and enhancing the role of occupational safety and health training in construction. These goals are not static and will need to be revised periodically as performance measures indicate the level of success with which the objectives are met. In addition, training issues are viewed as one of multiple factors impacting safety and health in construction; as such, the training issues topic fits into a suite of topics (both outcomes and contributing factors) the NORA Construction Sector Council has determined to be priority areas for research and implementation of research findings (i.e., research-to-practice).

The impact of addressing challenges related to training, and conducting additional research and evaluation, will ultimately be judged against measures that translate into fewer injuries and fatalities by eliminating or mitigating hazards. A reduction in the occurrence of accidents and injuries will not only save lives and improve the quality of life for workers, it can also result in lower workers' compensation claims and other financial expenditures for contractors and owners of construction projects.

### **Disclaimer**

The findings and conclusions in this paper have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

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