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THE CENTER FOR CONSTRUCTION  
RESEARCH AND TRAINING

## r2p Dissemination Case Examples

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## INTRODUCTION

Research to practice (r2p) emphasizes a systematic approach to promote the broad-based application of research-based solutions to improve health and safety practices in the construction industry. A variety of dissemination strategies can be used in r2p efforts, such as technology transfer, policy, training, and new and traditional communications methods. Effective use of these strategies relies on input and support from key stakeholders, including workers, contractors, health and safety professionals, equipment designers and suppliers, policy makers, and others in a position to improve safety and health.

The case studies in this document highlight how a range of dissemination strategies have been used by researchers and other stakeholders to advance the use of research-based solutions and reduce the risk for occupational injuries and illnesses on construction sites. They are designed to provide researchers and their dissemination partners with ideas and inspiration for ensuring their own health and safety research has the greatest impact in the real world.

# Technology Transfer

Technology transfer is the conversion of scientific and technological advances into marketable goods or services. Early and regular involvement of key stakeholders, such as manufacturers, end-users, and regulators, in the development, design and testing of research-based interventions is a critical part of a successful technology transfer r2p strategy.

The feasibility of a technology transfer effort is influenced by various factors, including: the perception that a new technology is better than existing technologies or work practices; the compatibility of the new technology with the existing needs and values of potential adopters; and the cost, complexity, and accessibility of the new technology. Additionally, the ability to try out or experiment with the new technology on a limited basis before making a purchase, access to formal training on the proper use of the new technology, and endorsement of the new technology by respected leaders (workers and/or contractors) in the field can help facilitate the transfer of a new technology to the construction site.

## **Resources**

- ➔ Case Studies – Best Practices for Health and Safety Technology Transfer in Construction  
[http://www.cpwr.com/sites/default/files/research/CaseStudies2\\_o.pdf](http://www.cpwr.com/sites/default/files/research/CaseStudies2_o.pdf)
- ➔ Technology Transfer Innovation and Successful Diffusion in the Construction Industry  
<http://www.cpwr.com/sites/default/files/research/TechTransferandDiffusionbackgroundpiece.pdf>
- ➔ Intellectual Property Patent & Licensing Guide for Construction Safety & Health Researchers and Inventors  
<http://www.cpwr.com/whats-new/intellectual-property-patent-licensing-guide-construction-safety-health-researchers>

## **Technology Transfer Case Examples**

### **Inverted Drill Press**

A research team from the University of California, San Francisco and the University of California, Berkeley successfully took to market an inverted drill press they designed in partnership with more than 20 contractors and labor unions. This new device aimed to alleviate the soft-tissue injuries construction workers experience from using six- to twelve-pound hand-held rotary hammer drills to bore holes in ceilings for anchor bolts.

Four generations of the new technology were tested in the field with more than 100 workers. Their input was used to re-design and improve the device until it met the workers' needs and reduced their risk for injury. The research team's translation and dissemination activities included the development of an innovative "loaner program" for the drill, demonstrations of the technology with manufacturers and at safety conferences, presentations at trade shows, a website with videos and pictures, PowerPoint presentations, articles, and peer-to-peer dissemination.

The “loaner program” the researchers created provided contractors with the opportunity to try out the inverted drill press with their employees before making a purchase. This effort helped generate demand for the tool, leading to many rentals and purchasing requests from contractors. Researchers engaged manufacturers through demonstrations of the new technology that showed how the inverted drill press would be a complement to their existing product lines.

Interest created by involving end-users of the inverted drill press in the development and testing of the tool, making it available to contractors to try out, and the outreach to manufacturers ultimately led to a technology transfer success. A manufacturing company has adapted, marketed, and made their own version of the tool commercially available, and two large contractors have used original design plans to fabricate their own site-specific versions.

### **Resources**

- ➔ CPWR IMPACT – Reducing the Pain and Fatigue of Overhead Drilling  
<http://www.cpwr.com/sites/default/files/publications/ReducingthePain-OverHeadDrillingIMPACTCardPDF.pdf>
- ➔ Case Studies – Best Practices for Health and Safety Technology Transfer in Construction (page 19)  
[http://www.cpwr.com/sites/default/files/research/CaseStudies2\\_o.pdf](http://www.cpwr.com/sites/default/files/research/CaseStudies2_o.pdf)
- ➔ Inverted Drill Press (video)  
<http://elcosh.org/video/1371/a000070/inverted-drill-press.html>

## **Safety Rail System**

Researchers with the National Institute for Occupational Safety and Health (NIOSH) developed a multi-functional, adaptable guardrail system that could be used in a range of settings to protect workers who work near roof edges, skylights, roof and floor openings, and stairs without installed handrails. The concept grew out of efforts to evaluate the effectiveness of “job-built” versus “commercial product” guardrails installed around roof openings by residential carpenters. The resulting system was designed to be easy to install and to exceed OSHA’s requirement for top-rail strength (a 200-pound weight falling against it).

After consulting with the Center for Disease Control and Prevention’s (CDC) Technology Transfer Office, an application was filed in 2005 and a patent issued over three years later. During this period, the research team approached 12 companies to explore the possibility of collaborating to manufacture the system and take it to market. In the end, NIOSH-CDC signed an exclusive licensing agreement with one of the manufacturers, and the system is now commercially available under the trade name Gorilla Rail™.

Steps taken during the development of the safety rail system contributed to the success of this technology transfer initiative. By involving trade unions, professional societies, and other organizations early on, for example, the researchers were able to educate potential end-users on the technology and use their input to ensure that features of the system would be useful on the job site. Patenting the new technology and licensing it to a manufacturer was also a critical step toward its commercialization. However, attempting to commercialize the new safety rail system during a severe economic downturn proved to be a key challenge to dissemination.

## **Resources**

- ➔ Case Studies – Best Practices for Health and Safety Technology Transfer in Construction (page 2)  
[http://www.cpwr.com/sites/default/files/research/CaseStudies2\\_o.pdf](http://www.cpwr.com/sites/default/files/research/CaseStudies2_o.pdf)
- ➔ NIOSH Safety Rail System (PDF)  
[http://www.cdc.gov/niosh/r2p/pdfs/NIOSH\\_Innovations\\_SafetyRailSystem.pdf](http://www.cdc.gov/niosh/r2p/pdfs/NIOSH_Innovations_SafetyRailSystem.pdf)

# Policy

Policy can be defined as a statement or course of action proposed by a governing entity. A wide range of public and private policy initiatives can impact occupational safety and health. Research can be used to justify a policy change or new policy, and policies, in turn, can have broad impacts on practices in the field. Changing occupational safety and health policy often requires the use of strong science and concerted action by stakeholders working in partnerships.

Occupational safety and health (OSH) policy can be government mandated or voluntary, developed by non-governmental organizations or professional associations, or established through legislation at the federal, state or county/municipal level. Good policy is based on sound science and addresses important social priorities. Governmental policy can include legally enforceable regulations, voluntary guidance, or technical assistance.

The Occupational Safety and Health Administration (OSHA) establishes and enforces occupational safety and health regulations, or standards, at the federal level that apply to the private sector workforce, develops enforcement strategies and guidance documents, and provides technical assistance. Federal OSHA also oversees State Plans, or OSHA-approved programs at the state level, to ensure they provide the same level of safety and health protection as the federal requirements. State Plan states are often able to develop and implement safer standards at a more rapid pace than at the national level. States, counties, and municipal governments can also implement legislation or ordinances to address specific hazards.

Other types of policy efforts include safety-related specifications in purchasing contracts and bidding documents, and language in union contracts (collective bargaining agreements) that promotes safer work practices.

## **Resources**

- OSHA Website  
<https://www.osha.gov>
- OSHA- Approved State Plans  
<https://www.osha.gov/dcsp/osp/index.html>
- How Can Research Organizations More Effectively Transfer Research Knowledge to Decision Makers? (Article)  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2690219>

## Policy Case Examples

### Standards – State and Federal (Silica)

OSHA published a 2013 proposed standard to reduce workers' exposure to respirable crystalline silica dust and the associated health risks. The need for, and provisions included in, the proposed standard were based on a large body of research on health outcomes such as silicosis, lung cancer, and renal disease, dose-response data, exposure assessment research, and intervention availability and effectiveness. This research was critical since, as part of the rulemaking process, OSHA must demonstrate a need for the standard as well as the feasibility of measurement and abatement procedures. Studies conducted by CPWR and its consortium researchers, as well as tools and resources, such as the Work Safely with Silica website ([www.silica-safe.org](http://www.silica-safe.org)), provided important supporting data in these efforts and were used extensively in evidence submitted and testimony given for the rulemaking process.

Leading up to this federal effort, California and New Jersey passed state-level requirements to protect workers from silica exposure that relied on CPWR and other health and safety research. In 2008, California implemented a state-level regulation to reduce silica exposure to construction workers engaged in several specific tasks: Cal/OSHA Title 8: §1530.1. Control of Employee Exposures from Dust-Generating Operations Conducted on Concrete or Masonry Materials. This state-level initiative was driven by the International Union of Bricklayers and Allied Craftworkers Local 3 CA and relied on hazard-specific research and expertise provided by CPWR. In 2004, the state of New Jersey issued a law that prohibits the dry cutting and dry grinding of masonry.

#### Resources

- ➔ OSHA rulemaking process:
  - <https://www.osha.gov/silica/index.html>
  - <http://www.silica-safe.org/regulations-and-requirements/status-of-regulatory-efforts>
- ➔ Cal/OSHA Title 8: §1530.1. Control of Employee Exposures from Dust-Generating Operations Conducted on Concrete or Masonry Materials.  
[http://www.dir.ca.gov/Title8/1530\\_1.html](http://www.dir.ca.gov/Title8/1530_1.html)
- ➔ NJ: "An ACT prohibiting the dry cutting and dry grinding of masonry in certain instances and supplementing P.L.1962, c.45 (C.34:5-166 et seq.)"  
[http://www.njleg.state.nj.us/2004/Bills/PL04/172\\_.PDF](http://www.njleg.state.nj.us/2004/Bills/PL04/172_.PDF)
- ➔ Building and Construction Trades Department testimony and evidence:
  - Comments: <http://www.regulations.gov/#!documentDetail;D=OSHA-2010-0034-2371>
  - Testimony: <http://www.regulations.gov/#!documentDetail;D=OSHA-2010-0034-3581>
  - Post Hearing Brief: <http://www.regulations.gov/#!documentDetail;D=OSHA-2010-0034-4223>

### Professional Organizations' Policies in Support of the OSHA Silica Standard

A number of professional organizations played an important role in strongly supporting the 2013 proposed OSHA silica standard. One of these organizations, the American Public Health Association (APHA), which has backed better regulations to control silica since 1995, submitted a letter of support, gave oral testimony, and provided follow up information focusing on public health concerns. APHA's participation in the 2014 rulemaking process was based on an

existing policy statement with updated scientific references. Members of APHA went through the organization's formal policy setting approach in which members first submit well-referenced policy statements to internal committees for review before moving on to the APHA Governing Council for approval.

In addition to APHA, several other professional organizations, including the American Industrial Hygiene Association (AIHA), the American Society of Safety Engineers, the American Thoracic Society, and the Association of Occupational and Environmental Clinics, all testified in support of the proposed OSHA silica standard, and the American Medical Association adopted a supportive policy which was referenced in other stakeholder testimony and evidence.

### **Resources**

- APHA Policy Statement – Prevention of Silicosis  
<http://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/30/11/35/prevention-of-silicosis>
- AIHA Testimony on the OSHA Proposed Silica Standard  
<https://www.aiha.org/government-affairs/Pages/AIHA-Testimony-on-the-OSHA-Proposed-Silica-Standard,-Presented-by-AIHA-Vice-President-Daniel-Anna.aspx>
- American Society of Safety Engineers Comments on OSHA's Silica Proposed Rule  
<http://www.asse.org/asse-comments-on-oshas-silica-proposed-rule>

## **Model Specifications Bid Language**

Model safety and health bid specification language provides a template for municipalities, private industry, or government agencies to use when soliciting contract bids for construction projects. Bid specifications that include safety and health language have been used by state departments of transportation in highway and bridge repair contracts in over 20 states.

The "Model Specifications for the Protection of Workers from Lead on Steel Structures" was developed by CPWR in 1993 to address the risks and negative health effects of lead poisoning among bridge repair workers. The model language reflected research on effective interventions that were well-documented in the scientific literature. This model specification language was incorporated into bid documents to reduce lead exposure on bridge repair construction sites. Efforts by the North America's Building Trades Unions (Building Trades) and others, using CPWR research, also resulted in the adoption of an OSHA lead standard for construction in the same year. CPWR's model specifications complemented the standard and contributed to wider use of protective measures.

### **Resources**

- OSHA Lead Standard  
[https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10641](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10641)
- Model Specifications for the Protection of Workers from Lead on Steel Structures  
<http://elcosh.org/document/1652/d000562/model-specifications-for-the-protection-of-workers-from-lead-on-steel-structures-revised-september-2002.html>

## Hexavalent Chromium and Portland Cement – OSHA Enforcement Policy

Addressing the hazards of hexavalent chromium in portland cement is an example of how OSHA enforcement policy can be leveraged to protect the health and safety of workers. OSHA develops regulatory enforcement policy that may focus on specific regulations or may reference the “general duty” of each employer to provide a worksite free of known serious hazards. Enforcement policy can include local or national emphasis programs targeting specific hazards.

CPWR conducted research on the severity of skin hazards from exposure to wet portland cement and interventions. This information was used during the OSHA hearings on the Hexavalent Chromium Standard to demonstrate why exposure to wet portland cement, which includes hexavalent chromium, should be covered in the standard. When the final standard was issued without a provision for wet portland cement, the Building Trades sued OSHA.

The lawsuit led to a 2007 settlement agreement in which OSHA agreed to include additional requirements related to portland cement in its compliance directive that would guide inspections. This directive requires inspectors to check construction sites that used portland cement for compliance with other existing standards, including airborne dust, personal protective equipment, sanitation, hazard communication, and recordkeeping, and to use an explicit protocol to target the hazard. The OSHA Regional Administrators collected the existing standards into a checklist, “Inspection Procedures for Construction Sites Using Portland Cement,” for the regions to implement. This checklist includes provisions to protect workers from skin hazards through the use of gloves and other personal protective clothing and equipment.

The Mason Contractors Association of America requested an exemption from the requirement for wearing gloves when working with wet portland cement. This was denied in an OSHA Letter of Interpretation, another mechanism OSHA uses to clarify questions of enforcement. In this Letter of Interpretation, OSHA referenced its own guidance document “Preventing Skin Problems from Working with Portland Cement,” which in turn cited CPWR research.

Through the Masonry r2p Partnership between the International Council of Employers, the International Union of Bricklayers and Allied Craftworkers, and the International Masonry Institute, further steps were taken to use CPWR research to make compliance with this Letter of Interpretation, the protection of workers, and the use of available interventions easier. In 2014, the Partnership released safety and health information, training materials, and information on appropriate glove selection through a website [www.choosehandsafety.org](http://www.choosehandsafety.org).

### **Resources**

- OSHA General Duty Clause  
[https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=OSHACT&p\\_id=3359](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=OSHACT&p_id=3359)
- Inspection Procedures for Construction Sites Using Portland Cement  
[https://www.osha.gov/dep/hexchrom/BCTD\\_settlement\\_memo\\_20070416.html](https://www.osha.gov/dep/hexchrom/BCTD_settlement_memo_20070416.html)
- OSHA Letter of Interpretation  
[https://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=INTERPRETATIONS&p\\_id=27422](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=INTERPRETATIONS&p_id=27422)
- Preventing Skin Problems from Working with Portland Cement  
<https://www.osha.gov/dsg/guidance/cement-guidance.html>

- Masonry Research to Practice Partnership  
<http://www.cpwr.com/research/masonry-research-practice-partnership>
- ChooseHandSafety.org  
<http://www.choosehandsafety.org>

## Local Policy Action

Local policy action can be an influential tool for applying health and safety research to protect workers in construction. Occupational safety and health requirements can be established through city council ordinances, action through schools (establishing contract specifications for repair or construction work as described above), building code requirements, or other public or environmental health requirements. Partnerships, particularly with the public, unions, and other groups representing affected workers, are critically important for pursuing these policy interventions.

Several examples exist of municipal policies helping to translate research into practice. From October 2008 to January 2009 the community-based Workers Defense Fund (WDF) partnered with researchers at the University of Texas at Austin and the University of Illinois at Chicago to survey 312 construction workers and found that 41% were not given rest breaks and 27% were not provided drinking water. Following the release of these findings, the WDF mobilized community support for passage of an Austin city ordinance requiring rest breaks for workers on construction sites.

Several local policy initiatives have also targeted dust control. In Chicago, building code requirements include specific industrial hygiene interventions to suppress dust at its source during demolition activities as well as during grinding and sandblasting operations; Philadelphia's Department of Public Health has issued a dust control guidance document for construction, renovation, and other demolition activities; and in Boston, air quality requirements mandate wet saws for brick and masonry cutting, and vacuum systems or similar methods for mechanical grinding taking place during re-pointing (mortar removal) work.

## Resources

- Austin Rest Break Ordinance  
<http://www.austintexas.gov/department/rest-break-ordinance>  
<http://www.austintexas.gov/edims/document.cfm?id=140407>
- Chicago Building Code  
[http://www.cityofchicago.org/content/dam/city/depts/cdph/environmental\\_health\\_and\\_food/Asbestosdemorenovs\\_andblagrindInfo.pdf](http://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/Asbestosdemorenovs_andblagrindInfo.pdf)
- Philadelphia Dust Control Guidance Document  
<http://www.silica-safe.org/regulations-and-requirements/Philadelphia-Dept-of-Public-Health-Air-Mgmt-Services-Dust-Control-Guidance.pdf>
- Boston Environment Department Guidelines for Construction  
[http://www.cityofboston.gov/Images/Documents/construction\\_guidelines\\_tcm3-16289.pdf](http://www.cityofboston.gov/Images/Documents/construction_guidelines_tcm3-16289.pdf)

## Voluntary Consensus Standards and Certification Programs

Voluntary consensus standards and certification programs are widely used in the construction industry, and scientists and their research can influence the directions they take. In the U.S., the American National Standards Institute (ANSI) works

to create a variety of consensus standards and to document adherence to specific International Organization for Standardization (ISO) standards. The ANSI A10 Committee focuses on the development of construction standards and has significant participation from other stakeholders including the Building Trades and CPWR who are able to provide technical expertise on health and safety issues.

The Leadership in Energy & Environmental Design (LEED) program is a voluntary certification program for planning, constructing, and maintaining energy efficient buildings. LEED was developed through voluntary policy established by the U.S. Green Building Council (USGBC), a non-governmental organization. Studies conducted by CPWR consortium researchers demonstrated that green buildings are not necessarily safe for the construction workers building or maintaining them, and in some cases may even be more hazardous. Using this information, NIOSH developed an approach to sustainable construction that incorporates a life cycle assessment, job hazard analysis, and prevention through design. In 2015, through the ongoing efforts of NIOSH and its meetings with the USGBC, a pioneering new pilot credit for "Prevention through Design" was made available which can be applied toward LEED certification.

### **Resources**

- ➔ NIOSH – Safe, Green, And Sustainable Construction  
<http://www.cdc.gov/niosh/topics/greenconstruction/default.html>
- ➔ LEED – Prevention through Design  
<http://www.usgbc.org/credits/preventionthroughdesign>
- ➔ American National Standards Institute (ANSI)  
<http://ansi.org>
- ➔ CPWR Green Construction Update  
[http://www.cpwr.com/sites/default/files/publications/Data\\_Brief\\_Green-Construction-02-2014.pdf](http://www.cpwr.com/sites/default/files/publications/Data_Brief_Green-Construction-02-2014.pdf)
- ➔ Green and Healthy Jobs (CPWR Report)  
<http://www.cpwr.com/sites/default/files/publications/Green-Healthy%20Jobs%20ofnl%20for%20posting.pdf>
- ➔ Investigation of the Viability of Designing for Safety (CPWR Report)  
<http://www.cpwr.com/sites/default/files/publications/krigambatese.pdf>

### **Support for Safety Language in Union Contracts (Ergonomics)**

Collective bargaining agreements can also promote safety and health at the worksite, and scientific evidence can provide important support for including health and safety language.

For example, in 2011, St. Louis members of the International Union of Bricklayers and Allied Craftworkers Local 1 Missouri were faced with challenging contract negotiations with their employers. Among the issues was a proposal by the employer association to raise the allowable weight lifted by one individual from a thirty-pound block to a forty-pound block. The union was able to make its case for retaining language in the agreement that limited the amount of weight one worker could lift by using research conducted by CPWR and research consortium members. The research included a study from Eastern Washington University, the University of Oregon, and the University of Iowa which demonstrated the reduction in risk for back injuries when two-person lift teams were used for weights above a certain level as well as the conclusions of a two-day meeting of masonry experts, ergonomists, and other stakeholders that identified promising practices for preventing musculoskeletal disorders in masonry.

## **Resources**

- ➔ Construction Solutions Two-Mason Lift Technique  
[http://www.cpwrconstructionsolutions.org/general\\_labor/solution/689/two-mason-lift-technique.html](http://www.cpwrconstructionsolutions.org/general_labor/solution/689/two-mason-lift-technique.html)
- ➔ CPWR IMPACT – Best Practices for Reducing Physical Injuries Among Masonry Workers  
<http://www.cpwr.com/sites/default/files/publications/MasonryIMPACTcard.pdf>
- ➔ Best practices for preventing musculoskeletal disorders in masonry: stakeholder perspectives (Article)  
<http://www.ncbi.nlm.nih.gov/pubmed/17097597>

# Training

Training involves teaching skills and instilling knowledge to target audiences such as workers, contractors, and employers, and can be an essential link in promoting safety and health on the job. Research and research-based practices can be disseminated to end-users through training, and when required by law or when programs are part of large, well-established systems, training has the potential for broad and impactful reach.

Labor-management sponsored apprenticeship and training programs and career technical education (CTE) programs offered at secondary and postsecondary educational institutions are well-positioned to disseminate information on research-based solutions. Through such programs there are opportunities to raise awareness of hazards and of research-based solutions, provide hands-on training, reinforce the need for such solutions, and teach critical thinking and communication skills.

## Training Case Examples

### Apprentice Carpenter Fall Prevention Training Program

Researchers at Washington University in St. Louis worked with the local Carpenters union and residential employers to develop a fall-prevention training program. The Fall Prevention and Safety Communication (FPSC) program included training tailored for apprentices, foremen, and contractors in residential construction. The curriculum was developed through a combined effort by instructors from the Carpenters Joint Apprenticeship Program and researchers. Evaluation included surveys and worksite audits to measure the effect on knowledge, confidence, beliefs, and prevention behaviors, and findings suggested significant improvements in key areas.

New apprentices were trained with a modified curriculum on working safely at heights. Through the hands-on curriculum, students practiced identifying and addressing hazards while engaged in construction activities, such as building model sections of homes and pulling up floors.

Training for more experienced foremen and contractors involved learning to select fall prevention methods appropriate for different situations and how to communicate these methods to workers. Foremen who participated were found to have increased fall prevention knowledge, and notably, similar results were also found in crewmembers working under these foremen. The results demonstrated the effectiveness of using training to disseminate information on safer work practices.

### Resources

- ➔ Outcomes of a revised apprentice carpenter fall prevention training curriculum  
<http://www.cpwr.com/sites/default/files/publications/KaskutasFallPreventionTrainingProgramKF.pdf>
- ➔ Fall Prevention in Residential Construction  
<http://www.cpwr.com/research/fall-prevention-residential-construction>  
<http://www.cpwr.com/research/fall-prevention-training-among-residential-carpenters>

## Smart Mark

By the mid-1990s, programs designed to meet OSHA training guidelines were in use; however, concerns about program inconsistencies, cost effectiveness, quality, and how to address common multi-craft hazards remained. CPWR researchers worked with industry partners to identify the common elements to be incorporated into a basic hazard awareness training program for construction workers. Utilizing the research findings, the Building Trades joined in a partnership with national contractor associations to guide the development of a new standardized hazard awareness-training program. In 1997, this labor-management partnership received a grant from the Federal Mediation and Conciliation Service to support its safety and health training efforts.

The partners identified a national delivery system and developed a single cost-effective program that would meet OSHA's 10-hour safety awareness training requirements for workers and its 30-hour training requirements for supervisors and others with safety responsibilities. Through CPWR's Master Trainer system, more than 5,000 instructors have completed the OSHA 500 instructor-training course and are authorized to teach the Smart Mark program, and the curriculum has been used to train workers throughout the Building Trades' apprenticeship and other training programs. The Smart Mark curriculum has evolved from a set of 10 one-hour modules into a program with interchangeable modules that address craft-specific topics.

An evaluation of the curriculum found that workers and employers who participated in the training made improvements in their safety practices after Smart Mark training was introduced, including increased use of personal protective equipment and changes in worksite safety policies and practices. In addition, a survey of trainees documented greater knowledge and improved attitudes toward safety among those who had participated in Smart Mark training.

### **Resources**

- ➔ CPWR IMPACT – Smart Mark Hazard Awareness Training  
<http://www.cpwr.com/sites/default/files/publications/SmartMarkIMPACT.pdf>
- ➔ Evaluation of Smart Mark Safety and Health Training for Construction Workers  
<http://www.cpwr.com/research/evaluation-smart-mark-safety-and-health-training-construction-workers>
- ➔ Smart Mark Website  
<http://www.esmartmark.org/>
- ➔ CPWR Smart Mark Webpage  
<http://www.cpwr.com/training/smart-mark-training>

## Day Laborer Safety and Health Project

A CPWR supported initiative involving researchers at Rutgers University Occupational Training and Education Consortium (OTEC), the University of Medicine and Dentistry of New Jersey's School of Public Health, the New Labor worker center, and the NJ Laborers Health and Safety Fund explored day laborers' health and safety needs and developed and disseminated a Spanish language training program specifically targeted to Latino day laborers.

The OTEC employed their unique participatory, learner-centered model to develop a health and safety awareness program. Using worker feedback, researchers produced the Day Laborers' Health and Safety Workbook with a curriculum based on OSHA's 10-hour construction health and safety program. It includes 14 team-based activities to help workers

recognize job-site safety and health hazards, take steps to protect themselves, and understand their rights. When an OSHA certified trainer delivers this course, participants who complete the course can be issued an OSHA 10-hour card.

The Workbook was used to deliver training and mentoring to more than 30 workers as peer trainers/facilitators, who in turn offered classroom training to some 450 immigrant construction workers in New Jersey. Several hundred more workers participated in street-corner demonstrations of fall-protection and personal protective equipment.

An evaluation of this participatory training program found improvements in workers' safety and health knowledge, attitudes, and work practices, including increased use of hard hats, work boots, safety vests and harnesses. In follow-up interviews, participants reported that the training empowered them to more easily ask employers for safety equipment or take actions to work more safely, and focus groups revealed that participants were teaching their co-workers about safe practices and workers' rights to a safe workplace.

The OTEC/New Labor training model not only made a difference to workers "on the corner," at training sessions, and at worksites in New Jersey, it is now gaining traction across the nation as new partnerships take root.

### **Resources**

- ➔ The Day Laborers' Health and Safety Workbook  
<http://www.cpwr.com/sites/default/files/publications/DayLaborersTrainingGuide-UIC-edition-English.pdf>
- ➔ Trainer's Companion Guide to the Day Laborers' Health and Safety Workbook  
[http://www.cpwr.com/sites/default/files/publications/Training%20Guide-English\\_Latino%20S-H%20Workbook.pdf](http://www.cpwr.com/sites/default/files/publications/Training%20Guide-English_Latino%20S-H%20Workbook.pdf)
- ➔ CPWR IMPACT– Empowering Day Laborers to Work Safely in Construction  
<http://www.cpwr.com/sites/default/files/publications/EmpoweringDayLaborersIMPACTCardPDF.pdf>
- ➔ The National Day Laborer Organizing Network  
<http://www.ndlon.org/en/our-members>

# Communications

Communications is the process of imparting information to target audiences and is both a stand-alone r2p strategy as well as an essential component of any r2p effort. It is used to connect various stakeholders, such as workers, contractors, health and safety professionals, equipment designers, manufacturers and suppliers, and policy makers, in order to improve safety and health. Communications involves translating research-based knowledge, tools, and information into readily accessible formats tailored for target audiences.

Communications outreach efforts can involve mass media, social media, presentations by trained professionals, and/or the distribution of translational materials written and designed for end-users. Social media efforts such as Facebook, Twitter, and Instagram offer an added benefit by allowing target audiences to participate and quickly provide feedback. Involving specific target audiences in the identification of communication methods can lead to more effective dissemination initiatives.

## Communications Case Examples

### National Falls Campaign

The National Campaign to Prevent Falls in Construction is a multi-stakeholder effort, spearheaded by OSHA, NIOSH, and CPWR, to encourage the use of safe equipment and work practices to prevent falls from roofs, ladders, and scaffolds with the message to construction contractors to: PLAN ahead to get the job done safely, PROVIDE the right equipment, and TRAIN everyone to use the equipment safely.

Key to the dissemination strategy was the development of a campaign website ([www.stopconstructionfalls.com](http://www.stopconstructionfalls.com)) that houses information on how to get involved in the campaign, updates on related activities, resources on fall prevention, and interactive fatality maps of the United States to raise awareness of the high rate of construction fatalities, particularly those due to falls. Each pin on the "Construction Fatalities" map represents a construction worker killed on the job and each pin on the "Fatal Construction Falls" map reflects a construction worker killed from a fall.

The website provides campaign branded materials and information to help plan campaign-related activities, connect with other partners, and access guidance, posters, fact sheets, wallet cards, and other resources.

In 2014, the campaign initiated another strategy, the National Safety Stand-Down, which encourages employers and jobsites to engage in activities focused on preventing falls. This strategy reached more than 1.5 million workers through a variety of employer-based events and activities, including tool box talks and special job-site events. Social media was used to connect stakeholders and reinforce the fall prevention message via Facebook and Twitter. In addition, employers and others who notified OSHA of their participation and activities received a certificate of participation signed by the U.S. Secretary of Labor.

## **Resources**

- OSHA National Campaign to Prevent Falls in Construction Website  
<https://www.osha.gov/stopfalls/>
- Stop Construction Falls Website  
<http://stopconstructionfalls.com/>
- NIOSH Falls Prevention Website  
<http://www.cdc.gov/Features/PreventingFalls/>
- National Safety Stand-Down  
<https://www.osha.gov/StopFallsStandDown/>

## ***Don't Fall For It! Video***

A multi-stakeholder collaboration between CPWR and union, industry, and government partners was undertaken to develop and disseminate the 11-minute *Don't Fall For It!* video. The video aimed to bring a human face to the issue of ladder fall hazards by featuring real first-person accounts of workers who have fallen from ladders as well as emotional testimony from the family of a worker who suffered a fatal fall. Primary messages delivered in the video include the importance of selecting the safest ladder for a particular job, inspecting a ladder before use, and following a simple checklist for safe use. Four fact sheets that accompany the video focus on choosing, inspecting, setting up, and climbing ladders safely.

The video was pilot tested with New Jersey building trades apprentices, apprenticeship and training committee members, researchers, insurance company representatives, and safety and health professionals. Their feedback led to the production of the materials in both English and Spanish. Surveys administered by the researchers before and after training with the *Don't Fall For It!* video and related materials found a positive impact. Pre-training, only 44% of those surveyed said they inspected ladders for damage before use compared to 83% post-training. Follow-up phone surveys found actual worksite changes, with the most impact among younger workers and workers who had previously experienced a fall. More than 50,000 people have viewed *Don't Fall For It!*, and over 5,000 copies of the DVD have been distributed to unions and labor-management training programs, construction companies, OSHA Training Institute programs, insurance companies, federal agencies, and state and local public health departments. In addition, the materials have reached many underserved workers through the federal Susan Harwood Training Grant programs, CPWR's web-based library, eLCOSH ([www.elcosh.org](http://www.elcosh.org)), and the national falls prevention campaign website ([www.stopconstructionfalls.com](http://www.stopconstructionfalls.com)).

## **Resources**

- CPWR *Don't Fall for It!* Video  
[http://stopconstructionfalls.com/?page\\_id=15](http://stopconstructionfalls.com/?page_id=15)
- *Don't Fall For It!* Fact Sheets  
[http://stopconstructionfalls.com/?page\\_id=962](http://stopconstructionfalls.com/?page_id=962)
- CPWR IMPACT – Don't Fall For It!  
<http://stopconstructionfalls.com/wp-content/uploads/2012/03/Impact-Card-Dont-Fall-For-It.pdf>

## Heat Illness Campaign

The National Heat Campaign began as a state-level initiative in California to educate workers and employers about the 2006 California Heat Illness Prevention standard. California's Department of Industrial Relations contracted with the Labor Occupational Health Program at UC Berkeley, who worked in collaboration with UCLA-Labor Occupational Safety and Health, UC Davis Western Center for Agricultural Health and Safety, and Underground Advertising to develop the campaign.

The California Heat Illness Campaign was launched in 2010 as a public awareness campaign focused on the most underserved populations of outdoor workers in agriculture, construction, and landscaping. The campaign addressed heat safety precautions and worker rights. The campaign slogan, "Water, Rest, Shade," was used to reach out to workers through statewide radio and billboard advertisements from Cal/OSHA in five languages — Spanish, Hmong, Punjabi, Mixteco, and English.

In 2011, OSHA turned the campaign into a nationwide Heat Illness Prevention Campaign, including a website in English and Spanish. The website includes a variety of resources including an online toolkit, fatality map, and educational resources, such as fact sheets, posters, quick cards, training guides and wallet-sized information cards. The campaign is estimated to have reached more than 10 million people in agriculture and construction.

### Resources

- ➔ California Campaign Website  
<http://www.ggcalor.org/english.html>
- ➔ OSHA Water, Rest, Shade Website  
<https://www.osha.gov/SLTC/heatillness/index.html>
- ➔ OSHA Quick Card: Protecting Workers from Heat Stress  
<https://www.osha.gov/Publications/osh3154.pdf>

## The Construction Chart Book: The U.S. Construction Industry and Its Workers

CPWR developed the Construction Chart Book in 1997 to present the most recent data on the entire U.S. construction industry in the following areas: economic, demographic, employment/income, education/training, dangerous chemicals, and safety and health. Using data from a wide variety of trusted sources, the Chart Book identifies trends and issues impacting construction workers and the industry, including green jobs, displaced workers, the aging workforce, the Latino workforce, union membership, OSHA inspections, and health disparities. The Chart Book can be accessed online at no charge through the CPWR website, including PowerPoint files of the book's charts.

Publicity efforts conducted following the release of the 2013 Construction Chart Book including a podcast in cooperation with the American Painting Contractor magazine, which also used CPWR's article about the book as its cover story, fueled demand for the publication and its content.

## **Resources**

→ The Construction Chart Book Webpage

<http://www.cpwr.com/publications/construction-chart-book>

## **Silica-Safe Website**

The Work Safely with Silica website ([www.silica-safe.org](http://www.silica-safe.org)) was developed as a joint CPWR, NIOSH, and OSHA effort to make research on the silica hazard and solutions readily accessible and useful to construction contractors and workers. At each stage of the development process, input was solicited from contractors, workers and other stakeholders through focus groups, webinars and presentations.

The site, which was launched in late 2012, contains information and tools to help stakeholders understand the health risk, identify the hazard, learn more about research-based solutions, and stay informed about new silica research findings, news, and regulatory efforts. A unique feature of the site is a three-step "Create-A-Plan" tool to help contractors develop jobsite specific plans for controlling silica exposures. The website also provides access to training and educational materials such as presentations, videos, handouts, and training guides, and includes an interactive capability for users to share successes and challenges.

Information on the website, its content, research components, and use have been disseminated through presentations at national and local conferences and meetings, articles in stakeholder publications, webinars, social media (Facebook and Twitter), and links from government, insurance, union, trade association, and other industry and safety and health websites. It has also been used in support of silica policies developed by a variety of organizations and as one of only six scientific and technical resources on the OSHA silica rulemaking website. Since its launch, visits to the site have increased steadily, with more than 35,000 visits through August 31, 2014.

## **Resources**

→ Work Safely with Silica Website

<http://www.silica-safe.org/>

→ OSHA Silica Rulemaking – Scientific and Technical Resources

<https://www.osha.gov/silica/#4B>

# R2p Resources

In addition to these case studies, CPWR has developed several tools to help researchers and industry partnerships establish and implement r2p dissemination plans:

The **r2p Roadmap** is a tool designed to help researchers identify the outputs their project will generate and develop strategies for dissemination to the construction industry.

→ <http://www.cpwr.com/sites/default/files/Roadmap%20and%20Worksheet%20FINAL.pdf>

The **r2p “Triage”** tool was developed to assess the dissemination status of completed research projects, including dissemination efforts made, target audiences reached, specific research-based solutions ready to advance to the next stage on the research to practice pathway, and areas where additional dissemination support is needed.

→ <http://www.cpwr.com/sites/default/files/research/TriageToolInterventionStage.pdf>

The **r2p Partnership Toolkit** was created to support the establishment and sustainability of safety and health partnerships. The Toolkit discusses dissemination in Section 5 and includes a model planning tool in the Appendix.

→ <http://www.cpwr.com/research/construction-research-practice-partnership-toolkit>

**CONDOR** is a database compiled by CPWR, OSHA, and NIOSH of thousands of contacts including construction contractors, workers, health and safety professionals, government officials, labor representatives, researchers, and press contacts. This resource allows for the targeted dissemination of information through email, telephone or mail distribution networks. To learn more contact [cpwrwebsite@cpwr.com](mailto:cpwrwebsite@cpwr.com).

