

Until every construction worker  
is protected and every jobsite's safe...

CPWR [●]

a **MISSION**  
to **Serve**





# CONTENTS

<b>CPWR AT A GLANCE</b> .....	<b>2</b>
<b>FOREWORD</b> – Sean McGarvey, Chairman of the Board and President, CPWR.....	<b>3</b>
<b>EXECUTIVE DIRECTOR’S MESSAGE</b> – Pete Stafford.....	<b>4</b>
<b>RESEARCH</b> .....	<b>5</b>
<b>Improving Safety Culture and Climate</b> .....	<b>6</b>
Making Connections between General Contractors and Subcontractors	
Creating the Foundation for Being an Effective Safety Leader	
Using Pre-Qualification Procedures to Predict Safety Performance	
<b>Analyzing Data to Identify Research Needs and Track Progress</b> .....	<b>7</b>
Informing Research through Surveillance	
Identifying Disparities	
Taking Advantage of New Sources	
<b>Empowering the Next Generation</b> .....	<b>8</b>
Giving Workers a Safety Voice	
Integrating Safety and Health into Career Technical Education	
<b>Reducing the Risk for Existing and Emerging Hazards</b> .....	<b>9</b>
Harnessing Technology to Create Demand for Safer Equipment	
Preventing Occupational Illnesses from Chemical Exposures	
Exploring an Emerging Hazard	
<b>Exploring Promising New Research through Small Studies</b> .....	<b>10</b>
Assessing the Impact of Safety Training on Injury Rates	
Evaluating the Effect of PtD in Green Construction	
Creating a Safety Application for BIM	
<b>Bringing Research Findings to the Jobsite</b> .....	<b>11-13</b>
Making Solutions Accessible	
Creating an Ongoing r2p Dialogue	
Mapping the Pathway for Change	
Partnering to Protect Workers	
Connecting Trainers & Researchers for Better Outcomes	
Measuring Our Reach	
<b>TRAINING</b> .....	<b>14</b>
<b>Environmental Hazard Training</b> .....	<b>14-16</b>
Providing Environmental Hazard Training	
Creating Opportunities for Vulnerable Populations	
ECWTP Success	
<b>OSHA Training</b> .....	<b>16</b>
Preparing for Disasters	
<b>SERVICE</b> .....	<b>17</b>
<b>Saving Lives through Early Detection</b> .....	<b>18</b>
<b>Making the Connection between Occupational Exposures and COPD</b> .....	<b>18</b>
<b>Two Different Workers, Similar Cancer</b> .....	<b>19</b>
<b>CPWR RESEARCH PROJECT LEADS</b> .....	<b>20</b>
<b>SPECIAL THANKS</b> .....	<b>21</b>
<b>OVERSIGHT &amp; ADVISORY BOARDS</b> .....	<b>22</b>
<b>CPWR STAFF</b> .....	<b>23</b>
<b>ONLINE RESOURCES</b> .....	<b>24</b>

# CPWR AT A GLANCE


## Research



**2015 Stand-Down**  
May 4 - 15  
StopConstructionFalls.com

FALLS CAMPAIGN  
**2 MILLION**  
WORKERS REACHED

**11** WEBINARS



It's common for construction workers to have the hearing of workers twice their age.

25 YEAR-OLD (construction worker) ↔ 50 YEAR-OLD (average non-noise exposed worker)

Is it too loud at work? Talk to your employer about quiet tools and machinery.

**16** NOISE INFOGRAPHICS



**153**  
REQUESTS FOR MATERIALS

**40,000+** MATERIALS DISTRIBUTED

**32** PUBLICATIONS

**14** CPWR UPDATE E-NEWSLETTERS

**18** KEY FINDINGS FROM RESEARCH

**72** PRESENTATIONS

**3** ABSTRACTS & POSTERS

**17** NEW RESEARCH PROJECTS



**+19%**  
FACEBOOK LIKES

**26,683** YouTube Channel Views



**897,841** WEBSITE VISITS



**+227%** TWEETS  
**+55%** RETWEETS

## Training

**6,083** CLASSES CONDUCTED

**1,436** TRAINERS TRAINED

**75,791** Workers Trained

## Service

**811** Low-dose CT Scans Conducted This Year

**32,400** CONSTRUCTION WORKER SCREENINGS CONDUCTED SINCE 1997



**98%** SATISFACTION RATE

## FOREWORD



Sean McGarvey

For too long, many in our industry were quick to accept that construction work is hazardous – end of story. Thanks to the work of CPWR – The Center for Construction Research and Training, that ending is being re-written. Today, a growing number of contractors and workers are rejecting the notion that injuries and illnesses are the price of working in construction. Due to the support of North America’s Building Trades Unions, contractors,

and other stakeholders, CPWR’s work is changing the industry’s safety culture, creating demand for evidence-based solutions for existing and emerging safety and health hazards, and leading to new partnerships committed to making the industry safer by putting research findings into practice.

That is the good news. The bad news is that due to the industry’s loss of skilled workers during the last recession, the large number of new

entrants into the workforce, and the decentralized nature of our work and workforce, the risks for occupational illnesses, injuries, and, sadly, deaths remain at unacceptable levels. According to recent data, on average, 400 construction workers are injured and two are killed on the job every day. These statistics underscore the critical need for CPWR’s work and reinforce our support for its mission: *to reduce occupational injuries, illnesses, and fatalities among U.S. construction workers through research, training, and service programs conducted in partnership with industry stakeholders, health and safety professionals, academics, and key government agencies.*

As you read about CPWR’s accomplishments in this report, I encourage you to think about how you can use the research findings and services, and partner with North America’s Building Trades Unions, our contractors, and others in our industry, to advance CPWR’s work and help fulfill its mission – *because, as we can all agree, one injury, one illness, one death, is one too many.*

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CPWR’s work  
is changing  
the industry’s  
safety culture...

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### **Sean McGarvey**

Chairman of the Board and President, CPWR  
President, North America’s Building Trades Unions

## EXECUTIVE DIRECTOR'S MESSAGE

I am pleased to report that 2015 marked another year of progress toward fulfilling our mission and reinforcing our position as a world leader in safety and health research, training, and service for the construction industry.

As you will read in this report, although we are in the early stages of new cooperative agreements with the National Institute for Occupational Safety and Health, the National Institute of Environmental Health Sciences, and the Department of Energy, efforts to further integrate the work of our three core programs – research, training, and service – enhanced our ability to positively influence the industry's safety culture, identify and fill training gaps, find solutions for existing and emerging hazards, advance use of solutions on jobsites through new partnerships and translational materials, and serve contractors and North America's Building Trades Unions.

The reach of our training programs continued to grow, ensuring that industry trainers and construction workers nationwide have access to the latest in safety and health training. This year alone, we provided training directly or through our affiliated unions to more than 1,400 trainers and 75,000 workers. The launch of a new program, TRU-Net, was met with enthusiasm and marked an important step in creating an ongoing

dialogue between our researchers and trainers to identify research needs and help get findings used in the field, as we continue to serve as the leader in research to practice (r2p) in our capacity as the NIOSH-funded National Construction Center.

The success of our DOE-supported medical screening program can best be measured by the high satisfaction rate reported by participants and those who benefited from our staff's advocacy on their behalf. Providing at-risk workers with access to CT scans to ensure early detection of cancer is one of our BTMed program's latest achievements.

The accomplishments described in this report are the direct result of countless hours of work by our dedicated staff, a consortium of researchers at the top of their fields, highly skilled trainers, and committed service providers and industry partners. Together, we are well positioned to make further advancements in the year ahead.

We remain committed to developing and promoting the use of research-based safety interventions, finding new and innovative ways to share this vital information with contractors and workers, and working with you to make the construction industry a safer industry.

**Pete Stafford**  
Executive Director

# RESEARCH

## Understanding the Hazards, Developing Evidence-Based Solutions & Putting Research into Practice

In 1990, the National Institute for Occupational Safety and Health (NIOSH) began its construction safety and health research initiative and entered into its first cooperative agreement with CPWR. Since then, our research has been directed toward preventing worker injuries, illnesses, and deaths by:

- Exploring and developing information and methods that can improve safety and health conditions on jobsites;
- Identifying emerging hazards and offering guidance to reduce the risk of injury and illness;
- Monitoring and analyzing industry data to track safety and health trends, support research efforts, and identify research needs;
- Translating research findings into practical information, tools, and materials to encourage the development and widespread adoption of evidence-based solutions by contractors and workers.

In 2015, we built on our progress with new research initiatives, including use of emerging media to share research findings and engage stakeholders.

FALLS CAMPAIGN  
**2 MILLION**  
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# RESEARCH

## Improving Safety Culture and Climate

Our groundbreaking report *Safety Culture and Climate: Bridging the Gap Between Research and Practice* has inspired an ongoing dialogue about the construction industry's "safety culture" and "safety climate." We have distributed 3,500 hard copies of the workbook, *Strengthening Jobsite Safety Climate: Eight Worksheets to Help You Use and Improve Leading Indicators*, and users have downloaded 5,000 digital worksheets. Three new research projects build on this work by exploring how general contractors' safety programs influence the safety culture and performance of their subcontractors, developing pre-qualification tools to encourage subcontractors to adopt better safety management systems, and producing a leadership training program based on the premise that frontline leaders – supervisors and foremen – are key to promoting a healthy safety climate.

### Making Connections between General Contractors and Subcontractors

Working with an advisory panel including general contractors, subcontractors, and labor and management trade organizations, we identified 20 critical elements for measuring the effectiveness of a safety program in commercial construction projects. We also developed a multi-level safety climate survey as part of a safety/ergonomics survey, tested the survey with 83 workers from two projects and the St. Louis Carpenters' Joint Apprenticeship Program, and collected information on current ergonomic practices. These data will inform not only this work, but also that of a newly established Ergonomics Community of Practice (see page 12).



PHOTO COURTESY OF WUSTL SCHOOL OF MEDICINE

**Project: Interventions to Improve Safety Climate and Ergonomics in Construction Small and Medium Sized Contractor Enterprises**

### Using Pre-Qualification Procedures to Predict Safety Performance

Many large construction owners and general contractors use pre-qualification tools or companies in an attempt to keep subcontractors with poor safety records off their jobsites. The efficacy of these common pre-qualification approaches has not been validated. We are exploring whether pre-qualification procedures reengineered to focus on *leading* indicators may identify the contractors with better safety management systems. In the first year of the project, we examined leading and lagging indicators for more than 4,800 subcontracting companies, identified 43 different contractor pre-qualification tools, and conducted 12 interviews with industry leaders and safety professionals on the formal and informal procedures used to measure a company's safety performance. These initial steps revealed important gaps in available pre-qualification tools and practices, and influenced the design of a new pre-qualification procedure to be pilot-tested in the upcoming year.

**Project: Development and Evaluation of Contractor Safety Pre-Qualification Tool**

### Creating the Foundation for Being an Effective Safety Leader

With the help of a multidisciplinary Curriculum Development Team, we are developing a 2.5-hour leadership training module called the Foundations for Safety Leadership. This training module focuses on five critical safety leadership concepts, and our aim is to have it incorporated into the OSHA 30-hour course, which is widely used by contractors for their supervisors' training needs. OSHA 30-hour trainers, OSHA Training Institute leaders, and representatives of the target audience have reviewed all of the training materials developed to date and the module is being pilot-tested on construction sites. We will be evaluating the final materials in years 2 and 3 of the project using surveys to determine the effectiveness of the training on a variety of safety and leadership outcomes.

**Project: Enhancing Safety Climate through Leadership**



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# Analyzing Data to Identify Research Needs and Track Progress

Our Data Center's analysis of government, industry, and other data sources informs new research, reveals critical trends, and reminds all stakeholders that more needs to be done to protect construction workers. Research underway is helping the industry understand how changing demographics influence safety and health, and keeping stakeholders informed of emerging trends.

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## Informing Research through Surveillance

Several of the projects undertaken this past year served as grim reminders of the risks construction workers in every part of the country face daily. These projects include: the ongoing Construction Fatality Map ([www.stopconstructionfalls.com](http://www.stopconstructionfalls.com)); three critical studies – *Occupational and non-occupational factors associated with work-related injuries among construction workers in the USA*, *Long-term health outcomes of work-related injuries among construction workers*, and *Economic consequences of workplace injuries in the US*; and the database development and analysis using NIOSH Fatality Assessment and Control Evaluation (FACE) reports. In 2015, we stepped up efforts to distribute new findings with the timely release of *Quarterly Data Reports*, presentations, webinars, and use of social media (see page 13). In the coming year, we will introduce the *e-Chart Book*, a more time-sensitive digital version of our flagship publication, and publish findings from the NIOSH FACE Database.

**Project: Data Tracking and Support Services**



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## Identifying Disparities

Public audiences within and beyond the construction industry are following our research on occupational safety and health disparities among construction workers – young, older, Hispanic, temporary, and those employed by small employers. A new project analyzing data from the Mexican Migration Project, an international survey program, provided much-needed information about the safety and health risks faced by this hard-to-reach, vulnerable demographic. A key early finding underscored the importance of bringing occupational safety and health information to this population: almost 40% of Mexican immigrant construction workers had *not* worked in construction prior to coming to the U.S.

**Project: Disparities Surveillance Research**

## Taking Advantage of New Sources

We are strengthening our data tracking by partnering with Dodge Data & Analytics (formerly McGraw-Hill Construction), a leading construction market research and media company, to conduct periodic surveys of U.S. construction employer safety policies, programs, and practices. Our first joint effort was in 2012 on a safety in construction market research study – *Safety Management in the Construction Industry – SmartMarket Report*.<sup>1</sup> The study provided a benchmark for how a representative group of U.S. contractors and specialty sub-contractors are adopting safety practices and the value of specific safety and health program elements. Having established the baseline, we have joined with Dodge Data & Analytics to conduct a follow-up survey to track industry trends and best practices. The survey has been completed, with preliminary findings released in December 2015. A construction *SmartMarket Report* will be released in early 2016, and we will publish findings in a 2016 *Quarterly Data Report*.

**Project: Data Tracking and Support Services**

<sup>1</sup> *Safety Management in the Construction Industry: Identifying Risks and Reducing Accidents to Improve Site Productivity and Project ROI* <http://www.cpw.com/sites/default/files/publications/SafetyManagementinConstructionSMR-2013.pdf>

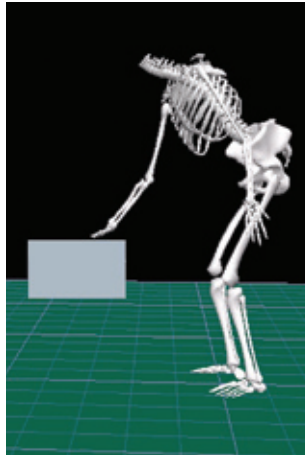
## Empowering the Next Generation

Ongoing research on health and safety disparities (see page 7) found that younger workers and new entrants to the construction workforce are at a greater risk of injury because they lack job-related knowledge, skills, and training, and are less likely to recognize hazards and speak up when faced with a hazardous situation.<sup>2</sup> Two of our new research projects aim to reduce the risk for these workers.

### Giving Workers a Safety Voice

We teamed up with the Masonry r2p Partnership (see page 12) to conduct focus groups with masonry trainers and contractors, and to field a nationwide survey on the use of technology among masonry apprentices that resulted in a 70% response rate. The results of both efforts are informing the development of several training modules aimed at teaching apprentices how to prevent musculoskeletal injuries and find and use their “safety voice” when faced with ergonomic hazards.

**Project: Safety Voice for Ergonomics (SAVE)**



Lifting and laying block over rebar

### Integrating Safety and Health into Career Technical Education

To ensure that young workers and other new entrants to construction receive the safety and health training needed to work safely, we are conducting a nationwide assessment of the training provided by the nation’s extensive network of Career Technical Education programs (CTE, once known as “vo-tech”).

## A nationwide assessment of the safety and health training provided by CTE programs

Focus groups with subject matter experts and an advisory group of educators experienced with CTE and young workers have provided input on essential program components. This has guided our development of survey instruments, aimed respectively at administrators and instructors in CTE construction programs, for the year 2 survey.

**Project: OSH Education in Post-secondary Career Technical Education (CTE) Construction Programs**

<sup>2</sup> *Overlapping Vulnerabilities: The Occupational Health and Safety of Young Immigrant Workers in Small Construction Firms*, NIOSH and ASSE Report, May 2015

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# Reducing the Risk for Existing and Emerging Hazards

**T**raumatic deaths and injuries on the job draw headlines, but occupational illnesses, such as those caused by long-term exposure to hazardous noise, vibration, dusts, fumes, and chemicals, are estimated to afflict *10 times* as many U.S. workers. Eliminating such known hazards and proactively identifying and addressing emerging issues is the aim of three projects focused on construction worker health.

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## Harnessing Technology to Create Demand for Safer Equipment

The noise, vibration, and dust generated by powered hand tools can lead to injuries and illnesses. Most develop over time and can lead to serious, disabling, and sometimes deadly illnesses.

In a previous project, we developed equipment to reduce musculoskeletal risks associated with overhead and lateral rock and concrete drilling; that equipment is in commercial production. We are now evaluating the health and productivity factors associated with use of a variety of hammer drills. In year 1, we designed and validated a test bench system to assess the ergonomic and respiratory hazards created when using hammer drills. In year 2, we will evaluate different bits, dust capture systems, and drill types. Ultimately, these results will help contractors and other end-users select safer equipment.



The test bench system

**Project: Test Bench for Evaluating Concrete Drilling Methods**

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## Preventing Occupational Illnesses from Chemical Exposures

The link between isocyanates in spray polyurethane foam (SPF) insulation and an increased risk for occupational asthma was documented in an earlier CPWR research project. Prompted by that study, we are assessing respiratory and dermal exposures to isocyanates in various construction trades, as well as testing the efficacy of protective

gloves, fabrics, and clothing used during SPF applications. In the coming year, we will develop new methods for measuring exposures to epoxies, expand the current exposure assessment to cover other construction sectors, and identify exposure controls.

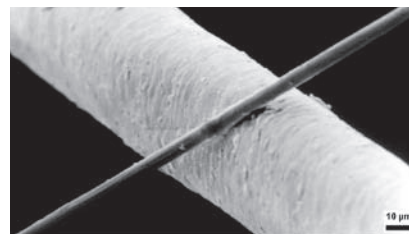
**Project: Assessment and Control of Exposures to Reactive Chemical Resins in Construction**

## Exploring an Emerging Hazard

While dust, vibration, and noise are known hazards, unknown or emerging hazards also put construction workers at risk. We are working with the NIOSH Nanotechnology Research Center to understand the possible dangers posed by the manufactured nanoparticles found in a growing number of construction materials.

As a first step in raising awareness and identifying protective measures, we developed a web-based inventory of construction products reported to be nano-enabled: *eLCOSH NANO* ([www.nano.elcosh.org](http://www.nano.elcosh.org)). We are also measuring worker exposures during tasks involving selected construction products. Using presentations, webinars, articles, and social media posts, we have been able to reach a worldwide audience with information on this emerging hazard.

**Project: Nanomaterials in Construction: Tracking Product Diffusion and Measuring Exposures**



A carbon nanotube laying across a human hair

PHOTO CREDIT: ANTON/WIKIMEDIA COMMONS/CC-BY-SA-3.0/GFDL (ORIGINAL UPLOAD OCT 2004 GERMAN WIKIPEDIA)

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SPF insulation: spraying, trimming, and cleanup

# RESEARCH

## Exploring Promising New Research through Small Studies

Through our Small Study Program we provide funding to investigate promising new research initiatives. Past projects have resulted in new materials and resources, as well as valuable information that paved the way for major lines of more in-depth research (example, see page 9, *Test Bench for Evaluating Concrete Drilling Methods*). During this past year, three new studies were initiated covering new technology, the influence of design on safety, and the impact of safety training programs.

### Assessing the Impact of Safety Training on Injury Rates

OSHA's peer-led 10- and 30-hour courses serve as the benchmark for construction safety and health training, but little is known about the impact of this training on work-related injury rates. Researchers at Duke University are using eight years of membership, eligibility, and workers' compensation claims data supplied by the Carpenters' training program in Washington State to identify the impact of these training courses on injury rates, gaps in current training programs, and opportunities to strengthen and expand the reach of quality occupational safety training and education.

**Project: Effectiveness of OSHA Outreach Training on Construction Work-Related Injury Rates**

### Evaluating the Effect of PtD in Green Construction

The benefits of green construction are well-documented, but the unintended health and safety hazards that may result are not. Researchers at East Carolina University are working to fill this knowledge gap by evaluating the effect of the United States Green Building Council's (USGBC) new Prevention through Design (PtD) credit. This credit requires projects seeking LEED certification to conduct formal early stage reviews to identify and address potential hazards in all phases of construction. Outputs from this project will include training materials that describe known green project hazards and related PtD best practices that can be used moving forward to implement the credit.

**Project: Evaluating Effectiveness and Building a Foundation for Implementation**



### Creating a Safety Application for BIM

The Building Information Modeling (BIM) system provides a single, real-time platform for contractors and other project stakeholders to share, view, and modify project-specific information, and includes key information such as costs, schedules, design modifications, and materials tracking. Researchers at the University of Alabama believe that the BIM system can be modified to improve safety. Using the Open Application Programming Interface (API), which is already accessible in BIM software, they are developing a safety data visualization tool that will allow stakeholders to visualize near misses and thus gain a better understanding of hazardous areas and conditions within a given construction site.

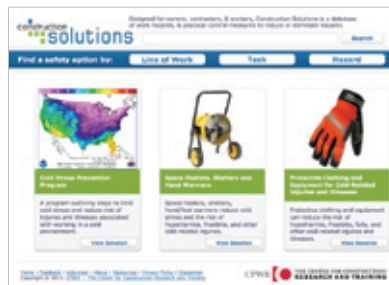
**Project: Near Miss Information Visualization Application for BIM**

# Bringing Research Findings to the Jobsite

Safety and health research is critical, but research alone will not lead to fewer injuries, illnesses, and fatalities unless the results reach those who determine the equipment, materials, and work practices used on construction jobsites. With the help of industry partnerships and collaborations, we are building a research to practice (r2p) infrastructure to translate research findings into practical information, tools, and materials and make them accessible to contractors and workers to improve jobsite safety.

## Making Solutions Accessible

Each month, on average, 4,500 workers, contractors, and other stakeholders accessed CPWR's online *Construction Solutions* resource to find practical solutions to construction safety and health challenges. During the last year, we added eight new hazard analyses and 29 new solutions to the website, and added two new return-on-investment (ROI)



[www.cpwrconstrutionsolutions.org](http://www.cpwrconstrutionsolutions.org)

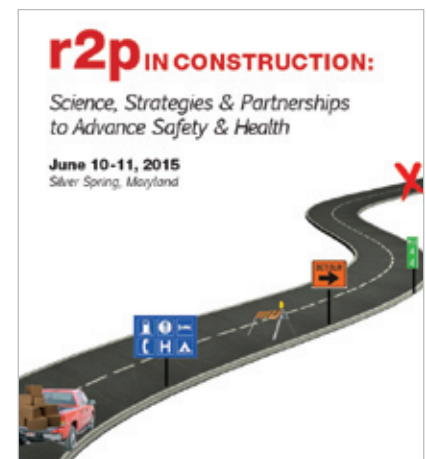
calculations for drywall tools to the inventory of ROI examples found on its companion website, *Construction Solutions ROI* ([www.safecalc.org](http://www.safecalc.org)). To raise awareness of *Construction Solutions*, we conducted a webinar on fall hazards and solutions and another on heat hazards and solutions, created a "showcase page" on LinkedIn, and increased use of social media. We are in the process of expanding our Solutions Program from its original focus on musculoskeletal disorders and safety risks to health hazards and related controls.

**Project: Construction Solutions**

## Mapping the Pathway for Change

Our work with CPWR and NIOSH researchers led to broader use of, and improvements to, our r2p roadmap and triage tools, as well as a new r2p Library of tools and partnership resources. The triage tool was used with eight completed projects and the findings influenced our r2p and dissemination priorities. Use of the r2p roadmap tool expanded to all 14 internal and external projects and was introduced to new audiences, including a hands-on workshop with four first-time users at the American Psychological Association and NIOSH Work, Stress, and Health meeting.

**Project: r2p Coordinating Project**



## Creating an Ongoing r2p Dialogue

Our first r2p seminar and partnership workshop, *r2p in Construction: Science, Strategies & Partnerships to Advance Safety & Health*, was an important step toward creating an ongoing dialogue on how to partner to reduce construction injuries and illnesses by increasing the use of research findings and interventions. Roughly 98% of participants said they received information that provided them with ideas to improve their r2p efforts, and 93% said they made valuable connections that will be helpful to their work. A major focus for 2016 will be on using social marketing principles for r2p.

**Projects: r2p Coordinating Project; Prevention Partnerships in r2p**



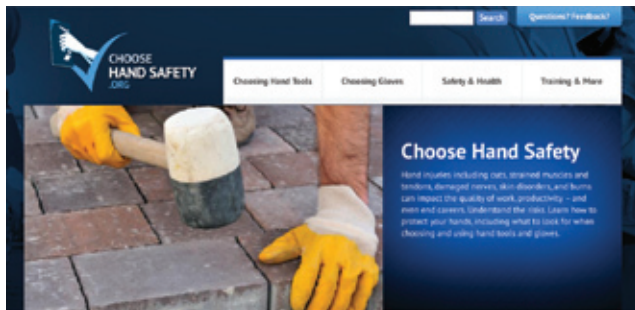
Panelists June 2015. From left to right: Dr. Julie Sorensen, Director, Northeast Center for Occupational Health and Safety; Christy Forrester, Health Scientist, Western States Division, NIOSH; Dr. Amanda Azman, Research Audiologist, NIOSH Office of Mine Safety and Health Research

# RESEARCH

## Partnering to Protect Workers

Two industry partnerships are informing our work on the role of sustainable partnerships in helping to advance r2p and identify new research needs (practice to research or p2r).

■ The Masonry r2p Partnership, between the International Union of Bricklayers and Allied Craftworkers (BAC), the International Council of Employers, and the International Masonry Institute (IMI), continued efforts to reduce hand-related injuries by incorporating the *ChooseHandSafety* website into IMI's instructor training. This training reached 48 instructors and will help to ensure that research on hand safety makes it into practice.



■ A newly formed partnership between the National Roofing Contractors Association and the United Union of Roofers, Waterproofers and Allied Workers took on the emerging issue of radiofrequency (RF) radiation. This effort led to the establishment of a multi-trade labor-management RF Work Group focused on developing awareness training and materials. A first product was the Hazard Alert Card *RF Radiation – An invisible danger*.

Input from partnership and stakeholder representatives prompted use of the “group” feature on the popular social networking platform LinkedIn to begin establishing a network of construction safety and health partnerships and communities of practice around key safety and health issues, starting with ergonomics. Two virtual roundtable discussions led to an opportunity to partner with the American Society of Safety Engineers (ASSE) to conduct formative research and a data-driven evaluation of how use of toolbox talks can build the occupational safety and health capacity of small employers, educate and engage their employees, and improve jobsite safety.



**Projects: Prevention Partnerships in r2p; r2p Coordinating Project**

“Through our Partnership, we now have a system to get input from a broad cross-section of members, contractors, and trainers on safety and health priorities and collectively promote research-based solutions.”

— **Gerard Scarano**, BAC Executive V.P., & Masonry r2p Partnership member, speaking at the 2015 r2p seminar and partnership workshop

## Connecting Trainers & Researchers for Better Outcomes

The October 2014 CPWR Trainer Enhancement Program served as the platform for the formal launch of our new Trainers and Researchers United Network (TRU-Net) initiative to facilitate greater collaboration between our training and research networks to advance research to practice. This initiative connects our

union safety and health trainers (see page 14) with CPWR and NIOSH safety and health researchers, allowing them to share information, ask questions, and participate in research projects. The first TRU-Net research initiative was a survey of trainers regarding noise-related hazards and training. Twenty-one

percent of the trainers surveyed responded, providing important information that will inform the development of dissemination materials to trainers and a survey of workers on noise and hearing loss in the coming year.

**Projects: r2p Coordinating Project; Training Programs**

# MEASURING OUR REACH



tweets up **227%** impressions up **143%** retweets up **55%**

**YouTube** **26,683**  
VIEWS

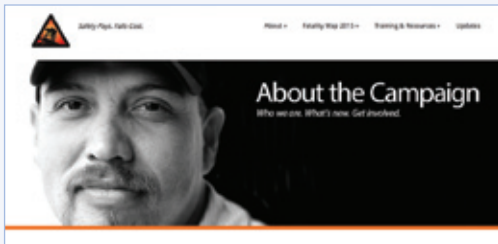
**11**  
educational  
webinars



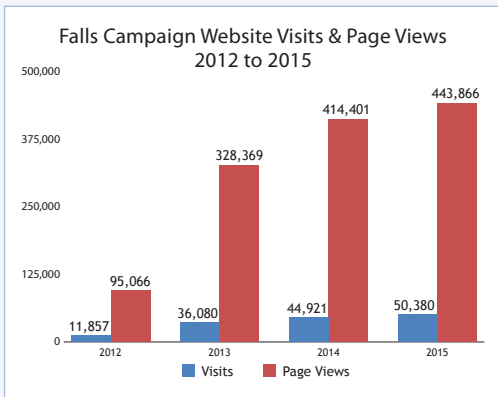
**897,841**  
WEBSITE VISITS



LIKES UP  
**19%**



This National Campaign to Prevent Falls in Construction between CPWR, OSHA, and NIOSH reached more than 2 million workers and contractors in 2015 through events, workplace “Stand-Downs,” and the campaign website ([www.stopconstructionfalls.com](http://www.stopconstructionfalls.com)), which includes the latest fatalities data, training materials, and information on how to join the campaign.



**153**  
requests  
for materials

**40,000+**  
reports, handouts and  
DVDs distributed

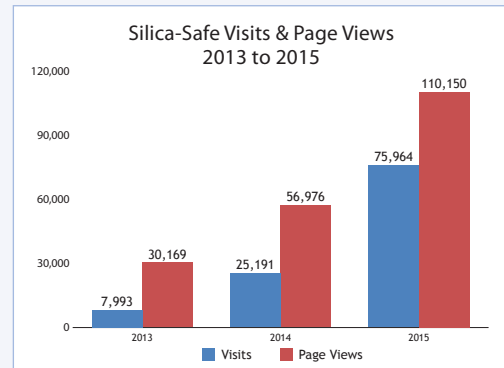


**50** Scholars  
engaged in development of an  
Interdisciplinary Bibliography  
of Construction Occupational  
Safety and Health

**5,000**  
opinion leaders  
identified to help  
share findings



The silica-safe website ([www.silica-safe.org](http://www.silica-safe.org)), developed under the guidance of the OSHA-NIOSH-CPWR r2p Working Group, has rapidly become the one-stop source of information on the hazard and controls for the construction industry.



Projects: r2p Coordinating Project; Communications Plan

# TRAINING

## Setting the Gold Standard for Training North America's Building Trades

**W**e take great pride in our extensive network of highly skilled and knowledgeable safety and health trainers and recognize the critical role they play in bridging the gap between safety and health research and what happens on construction sites. These trainers support research initiatives and ensure that members of North America's Building Trades Unions (NABTU) have the awareness, knowledge, and skills to identify hazards and use the latest control technologies and best practices. In the past year, we strengthened the link between research and training, upgraded instructional materials, conducted 6,083 classes, and provided training directly or through our affiliated unions to 1,436 trainers and 75,791 workers.

**75,791**  
Workers Trained

**6,083**  
CLASSES CONDUCTED

**1,436**  
TRAINERS TRAINED

---

## Environmental Hazard Training

**T**he National Institute of Environmental Health Sciences (NIEHS) once again recognized the value and strength of our hazard and environmental training programs with the award of a new five-year cooperative agreement (2015-2020) for the Environmental Hazard Training Program, the Environmental Career Worker Training Program, and the Hazmat Disaster Preparedness Training Program. Our training programs are responsive to the needs of our construction partner unions and their signatory contractors.

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### Providing Environmental Hazard Training

Our hazardous waste training program continues to be recognized throughout the construction industry. This past year, we conducted 435 classes and trained 6,935 construction workers from our 11 partner unions. These workers took advantage of a variety of health and safety training courses, including Hazardous Waste Worker, Confined

Space Entry, Asbestos Abatement, General Construction Safety, and Train-the-Trainers, among others. Always seeking to improve and build on what we know, we developed and released a new Hazardous Waste Worker curriculum, which includes a participant's manual and an instructor's manual that work seamlessly together for an

improved teaching and learning experience. The curriculum includes the latest regulatory and industry information, and hands-on simulations continue to be an integral and critical part of the program. To aid in learner retention, the "Assertion-Evidence" methodology was used to develop visuals.

## Creating Opportunities for Vulnerable Populations

Over the past year, the Environmental Career Worker Training Program (ECWTP) provided at-risk and disadvantaged residents in several communities with the training needed to pursue long-term careers in construction or environmental remediation fields. This training was conducted with the support of community-based partner organizations: JobTrain in East Palo Alto, CA; Central South Carpenters' Regional Council Training Fund of Louisiana in New Orleans, LA; and Merrick Community Services in St. Paul, MN. The ECWTP provided training to 60 ethnically diverse disadvantaged residents, including two Asians, three Native Americans, 33 African Americans, 12 Hispanics, four Pacific Islanders, and six identified as "other." These individuals participated in 64 courses and 46,968 hours of training covering life skills, basic construction skills, and technical environmental and green building skills. Fifty-six of the participants graduated, and 45 were placed in jobs earning an average hourly wage of \$17.79 – exceeding our job-placement projections and improving lives.



PHOTO COURTESY OF JOBTTRAIN

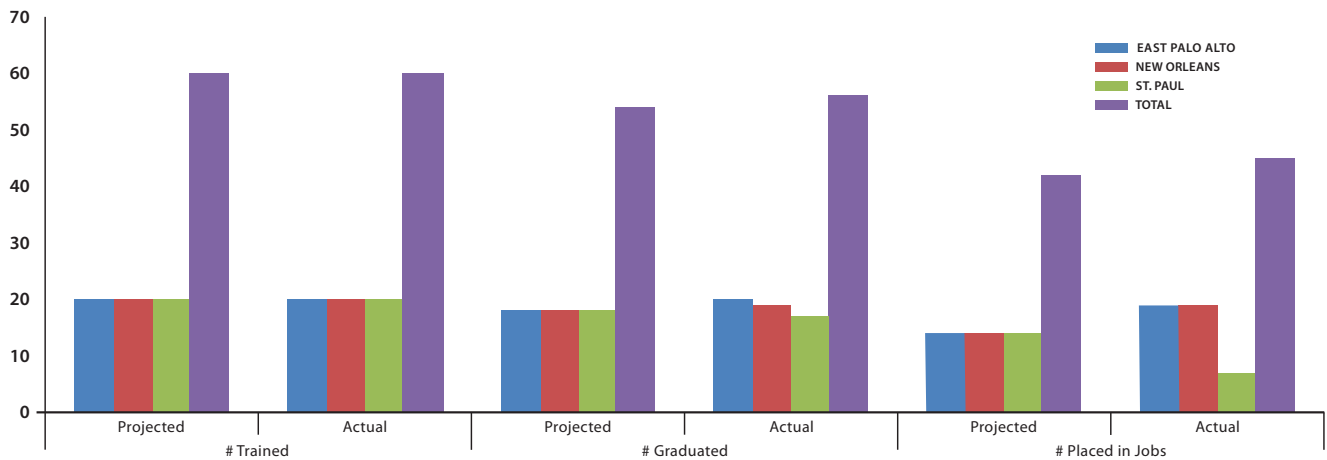
ECWTP students in East Palo Alto, CA participating in the 40-Hour Hazardous Waste Worker training



PHOTO COURTESY OF JOBTTRAIN

ECWTP students in East Palo Alto, CA building houses

### 2014-2015 CPWR ECWTP Accomplishments



# TRAINING

## ECWTP Success

Crystal Fassitt is one of our Environmental Career Worker Training Program's (ECWTP) many success stories.

After being laid off from her job as a hotel night auditor, Fassitt joined the ECWTP and that's when things began to turn around for her. Upon graduating, she became a first-year apprentice with Carpenters' Local 1846 and landed a job with Freeman Decorating, making \$14.27/hour and \$7.85/hour in fringe benefits.

Fassitt then continued to pursue her long-term career goals by obtaining a Transportation Worker Identification Credential. She then went on to pass the Nuclear Academy for Nuclear Training



PHOTO COURTESY OF CENTRAL SOUTH CARPENTERS REGIONAL COUNCIL TRAINING FUND OF LOUISIANA

2013–2014 ECWTP graduate Crystal Fassitt

Electronic Learning exams, enabling her to secure jobs at nuclear power plants in Louisiana, Pennsylvania, and Texas.

## OSHA Training

Our National Resource Center is an OSHA Training Institute Education Center. Working with NABTU trainers, we delivered 101 OSHA 500, 502, and 510 trainer courses, reaching 1,436 trainers last year. As more construction owners and states require the workers they hire to have the OSHA 10-hour training, and their supervisors and foremen to have the OSHA 30-hour training, demand for this training continues to grow. Last year, CPWR-affiliated trainers delivered 3,825 OSHA 10-hour classes to 46,678 construction workers and 1,584 OSHA 30-hour classes to an additional 21,896 construction workers, supervisors, and foremen throughout the country – many of these classes relied on NABTU's Smart Mark curriculum.

### Preparing for Disasters

As part of our NIEHS cooperative agreement and our OSHA training program, we continue to train trainers to deliver the OSHA 15-hour Disaster Site Worker (DSW) course. We trained 965 trainers to deliver this program last year, and provided financial support to conduct worker training for 222 workers. We also worked with OSHA to develop a one-day, 7.5 hour version of the

DSW course. This course, scheduled to be available early in 2016, will allow trainers to deliver critical safety training in a shorter time. Through our involvement in the National Response Team's Worker Safety and Health Committee, we are staying abreast of federal-level disaster response and preparedness activities, and ensuring that participating federal agencies remain aware of NABTU's efforts to

prepare construction workers to assist emergency responders in the event of a large-scale natural or man-made disaster. In addition, by encouraging those who complete our DSW training to participate in the Department of Homeland Security's Community Emergency Response Team training, a division of Citizen Corps, we are building sustainability through local emergency response networks.

# SERVICE

## Building Trades National Medical Screening Program: A Lifeline for Thousands of Construction Workers

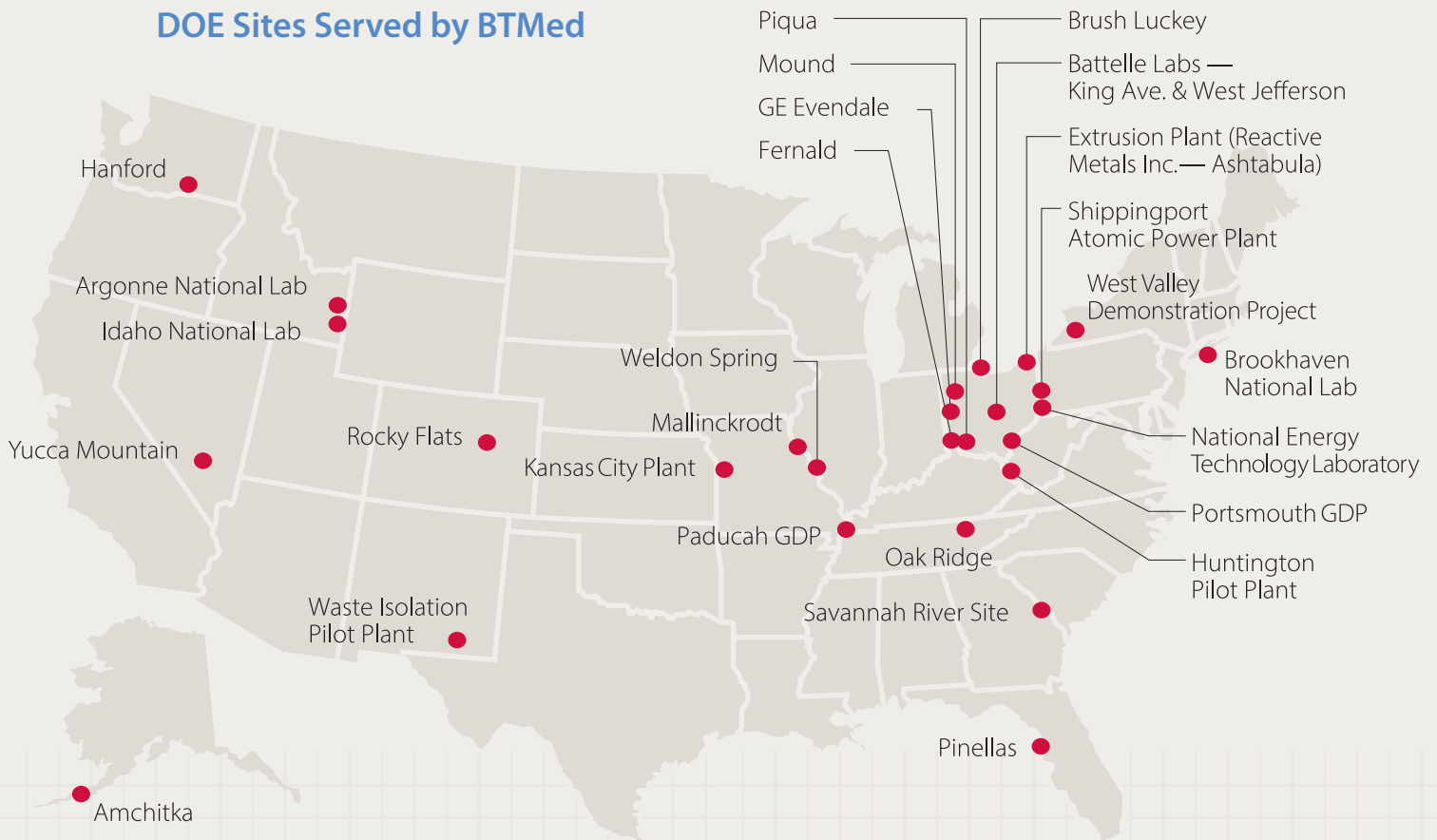
The Building Trades National Medical Screening Program (BTMed) identifies construction workers who have been employed on Department of Energy (DOE) sites and screens them for occupational illnesses. Since its launch in 1997, BTMed ([www.btmed.org](http://www.btmed.org)) has delivered nearly 32,400 exams to more than 23,000 workers across the country, with a 98% satisfaction rate.

**811**  
Low-dose CT  
Scans Conducted  
This Year

**98%**  
SATISFACTION  
RATE

**32,400**  
CONSTRUCTION WORKER  
SCREENINGS

### DOE Sites Served by BTMed



# SERVICE

## Saving Lives through Early Detection

Exposure to radiation, workplace dust, and toxins increases the risk for lung cancer. BTMed's Early Lung Cancer Detection (ELCD) program provides eligible participants with access to low-dose CT scans that can detect cancer earlier and save lives. Since the ELCD program's launch in 2011, use of this service has grown, with 811 scans being performed in the last year. Today BTMed offers low-dose CT scans in Augusta, GA, Knoxville, TN, Richland, WA, Cincinnati, OH, and Seattle, WA. ELCD is already saving lives. The scans have identified early-stage lung cancers in 11 workers.



Dr. Laura Welch meets with BTMed participant Lawrence Sutton, a member of UA Local Union 72, before his CT scan.

## Making the Connection between Occupational Exposures and COPD

COPD is on the rise in the general population and among construction workers. We joined with researchers at Duke University to conduct a large case-control study of construction worker COPD rates based on patient data from the BTMed program. Work histories of 834 BTMed participants with COPD were compared to 1,243 controls without it. The research findings, published in the *American Journal of Industrial Medicine*,<sup>3</sup> found a correlation between general

exposures to vapors, gases, dusts, and fumes (VGDF) and the risk for COPD. Workplace exposures to an unhealthy combination of VGDF accounted for nearly one in five COPD cases. Many workers with COPD had never smoked a day in their lives; one-third of these cases were attributable to workplace exposure.

To spread the word, the findings were presented during a webinar with 60 workers and other concerned stakeholders. In addition, 40 people

who expressed interest, but were unable to participate in the webinar, were sent the presentation, the study report, and a recording of the webinar. The on-demand version of the webinar has been viewed 19 times since. In addition, we posted the study and related information on our websites, OSHA ran a brief article in its *QuickTakes* e-newsletter, and other online newsfeeds and sources reported on the findings from the study.

**“The screening is very important. There were some problems I had that without the screening I would not know I had.”**

— BEN CREECH, III

United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada (UA), Local 421, Savannah River Site



<sup>3</sup>A case-control study of airways obstruction among construction workers; John Dement, PhD; Laura Welch, MD; Knut Ringen, Dr.PH; Patricia Quinn, BA; Anna Chen, BS and Scott Haas, MJ (2015) [http://www.silica-safe.org/pdf/Dement\\_et\\_al-2015-AJIM-COPD-in-Construction-Workers.pdf](http://www.silica-safe.org/pdf/Dement_et_al-2015-AJIM-COPD-in-Construction-Workers.pdf)

## Two Different Workers, Similar Cancer

*Two UBC members from Oak Ridge tell how BTMed's CT scan program saved their lives*

When asked what the most dangerous thing he remembers doing in his years working different jobs at the three Oak Ridge DOE sites, Larry Rosenbalm simply states, "Let's be realistic, it's all dangerous." A member of Carpenters' Union Local 50, Larry first stepped onto Oak Ridge's X-10 site in 1992, continuing to work on and off for different subcontractors between X-10, Y-12, and K-25 through the late 2000s.

"I was at K-25 and I was being told constantly about how it was low-level radiation, nothing to be concerned about," he remembers. And most of the time, he probably had no reason to think differently. But some things that happened on the site made him suspicious, like the day when he was asked to 'double dress out' for a job, meaning he had to put on two sets of protective Tyvek suits



PHOTO COURTESY OF LARRY ROSENBALM

instead of one. "I said, wait a minute, you don't 'double dress out' for low-level radiation."

Charles Sweet, a millwright with Local 50 who worked at K-25 for almost 30 years, remembers the site before many of the safety measures that Larry may have used ever existed. "We didn't have any respirators in the late 60s or early 70s," Charles recalls. "And we only had about three Health Physicists in

the plant from the late 60s to around the middle 80s."

There is something else that these two Local 50 members have in common, besides working at Oak Ridge. They have both been diagnosed with lung cancer, and, thanks to BTMed, both cancers were detected early enough to treat.

Today, Charles is cancer-free and being monitored to make sure he stays that way. Larry, whose cancer was more advanced when it was found, was able to receive treatment so that the mass on his lung shrunk in size. He remarks, "People see me today and they say 'you've got cancer? You don't look like somebody with cancer'. People walk around with cancer and don't know they have it until it's advanced. I'm going to be straight about it. If it had not been for BTMed, I would never have known I had cancer."



PHOTO COURTESY OF THE U.S. DEPARTMENT OF ENERGY

Oak Ridge

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## CPWR RESEARCH PROJECT LEADS

### EXTERNAL

Assessment and Control of Exposures to Reactive Chemical Resins in Construction

**Dhimiter Bello, ScD**

*University of Massachusetts, Lowell*

Development and Evaluation of Contractor Safety Pre-Qualification Tool

**Jack Dennerlein, PhD**

*Northeastern University*

Interventions to Improve Safety Climate and Ergonomics in Construction Small and Medium Sized Contractor Enterprises

**Ann Marie Dale, PhD**

*Washington University in St. Louis*

OSH Education in Post-secondary Career Technical Education (CTE) Construction Programs

**Diane Bush, MPH**

*University of California, Berkeley*

Safety Voice for Ergonomics (SAVE)

**Daniel C. Anton, PhD**

*Eastern Washington University*

Test Bench for Evaluating Concrete Drilling Methods

**David Rempel, MD, MPH**

*University of California, San Francisco*

### INTERNAL

Communications Plan

**Clayton Sinyai, PhD**

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Construction Solutions

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Disparities Surveillance Research; Data Tracking and Support Services

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*CPWR*

Enhancing Safety Climate through Leadership

**Linda Goldenhar, PhD**

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Nanomaterials in Construction: Tracking Product Diffusion and Measuring Exposures

**Bruce Lippy, PhD, CIH, CSP**

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r2p Coordinating Project; Prevention Partnerships in r2p

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### SMALL STUDY GRANTEES

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Evaluating Effectiveness and Building a Foundation for Implementation

**Michael Behm, MS, PhD**

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Near Miss Information Visualization Application for BIM

**Eric Marks, PhD, PE**

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## SPECIAL THANKS

Our work to protect workers in the construction industry would not be possible without the ongoing and dedicated support of the following researchers, government agencies, and stakeholder organizations. We gratefully acknowledge their expertise and contributions.

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North America's Building Trades Unions, and Affiliated Councils

International Association of Bridge, Structural, Ornamental and Reinforcing Iron Workers

International Association of Heat and Frost Insulators and Allied Workers

International Association of Sheet Metal, Air, Rail and Transportation Workers

International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers

International Brotherhood of Electrical Workers

International Brotherhood of Teamsters

International Union of Bricklayers and Allied Craftworkers

International Union of Elevator Constructors

International Union of Operating Engineers

International Union of Painters and Allied Trades

Laborers' International Union of North America

Operative Plasterers' and Cement Masons' International Association of the United States and Canada

United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada

United Brotherhood of Carpenters and Joiners of America

United Union of Roofers, Waterproofers and Allied Workers

### CONTRACTOR ASSOCIATIONS

Associated General Contractors

The Association of Union Constructors

International Council of Employers of Bricklayers and Allied Craftworkers

Mechanical Contractors Association of America

National Electrical Contractors Association

National Roofing Contractors Association

North American Contractors Association

Sheet Metal and Air Conditioning Contractors' National Association

### U.S. GOVERNMENT AGENCIES

U.S. Department of Energy

U.S. Department of Labor

Environmental Protection Agency

National Institute for Occupational Safety and Health, CDC

National Institute of Environmental Health Sciences

State Departments of Health

### BUSINESS

Zenith American Solutions

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## ONLINE RESOURCES



[www.cpwr.com](http://www.cpwr.com)

At CPWR's home on the web you can find our publications and products in electronic format, most available for download — from our popular line of toolbox talks to the *Construction Chart Book* reference volume to *CPWR Reports* and *Key Findings* from the latest construction safety and health research.

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[www.elcosh.org](http://www.elcosh.org)

eLCOSH, the electronic Library of Construction Occupational Safety and Health, is the premier online source for construction safety and health information, with research, training materials, fact sheets, and more.

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**Work Safely  
with Silica**

[www.silica-safe.org](http://www.silica-safe.org)

This one-stop source of information on how to prevent silica hazards and protect workers includes the latest research, ways to control exposures, the status of regulatory efforts, and an easy-to-use online tool to create a silica control plan.

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**Safety Pays. Falls Cost.**

[www.stopconstructionfalls.com](http://www.stopconstructionfalls.com)

Falls kill — they are the top cause of construction fatalities and account for one-third of on-the-job injury deaths in the industry. Visit the website and learn how you can join the campaign and help stop this preventable tragedy.

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[www.cpwrconstructionsolutions.org](http://www.cpwrconstructionsolutions.org)

*Construction Solutions*, designed with construction contractors and workers in mind, contains information on common construction hazards and practical solutions to reduce the risk for injury and illness.

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[www.safecalc.org](http://www.safecalc.org)

The ROI calculator allows contractors to calculate their potential return on investment from adopting a safer tool, material, or work practice, and includes specific examples that can be modified using the contractor's historic cost data.

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**NailGunSafety:  
TheFacts**

[www.nailgunfacts.org](http://www.nailgunfacts.org)

Injuries resulting from use of nail guns hospitalize more construction workers than any other tool-related injury. Learn the facts here and work safely.

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[www.choosehandsafety.org](http://www.choosehandsafety.org)

*ChooseHandSafety.org* provides construction workers and contractors with information and training materials that can be used to reduce the risk of work-related hand injuries, dermatitis, and related hand and skin disorders.

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Production of this publication was supported by NIOSH cooperative agreement OH009762, DOE cooperative agreement DE-FC-01-06EH06004, NIEHS cooperative agreements ES009764 and ES006185, and DOL contract DOLJ119E32607. The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH, DOE, NIEHS, or DOL.

Until every construction worker  
is protected and every jobsite's safe...

CPWR [●]  
a **MISSION**  
to **Serve**

Because one injury,  
one illness, one death, is **one too many**

