

CPWR [●]

THE CENTER FOR CONSTRUCTION
RESEARCH AND TRAINING

HIGHLIGHTS 2016

EXPANDING **our** REACH





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Thank You

FOR YEARS OF DEDICATED SERVICE!

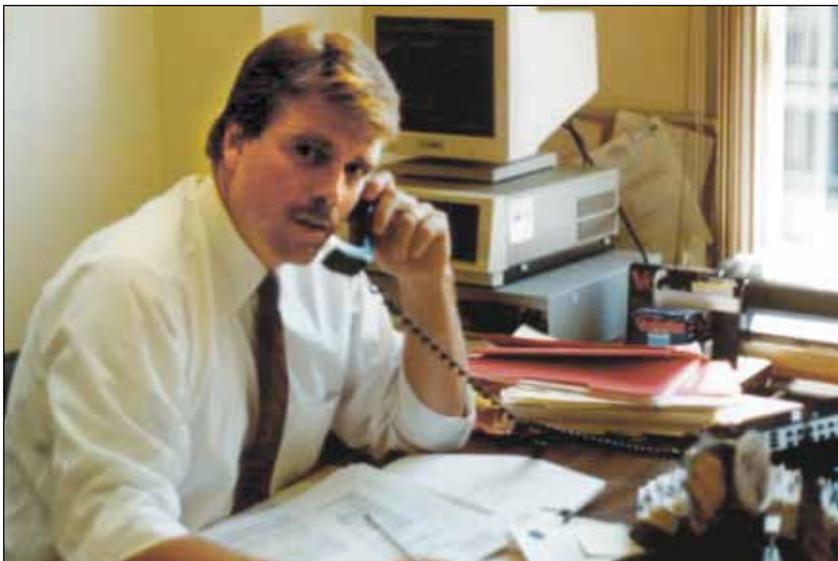
2016 MARKED A YEAR OF CHANGE for CPWR with the retirement of two dedicated leaders, Pete Stafford, our Executive Director, and Ralph Frankowski, Chair of our Technical Advisory Board. Both have been dedicated to the organization and its mission. They will be missed in these leadership roles, but will continue to be valuable resources and supporters of CPWR's ongoing efforts to prevent construction injuries and illnesses and save lives.

“I appreciate Pete’s strong voice as an advocate for the safety and health of construction workers, and his efforts to improve the construction industry as a whole. His leadership at CPWR—The Center for Construction Research and Training has guided the organization to new levels of accomplishment. NIOSH appreciates his service. Thank you!”

— John Howard, MD, MPH, JD, LLM, MBA (2016)

“Pete’s wealth of knowledge and experience on a wide range of construction health and safety matters makes him an ideal choice to chair this important committee [ACCSH]. We appreciate his commitment to protect the welfare of our nation’s construction workers and look forward to his leadership.”

— Assistant Secretary of Labor for Occupational Safety and Health Dr. David Michaels (2011)



Looking back, Pete Stafford at the start of his career with CPWR



Pete Stafford, left, presenting Dr. Ralph Frankowski with a plaque for years of dedicated service to CPWR at the October 2016 TAB Meeting

“We are delighted to have Pete Stafford take the helm [of CPWR]... He has demonstrated a talent for focusing stakeholders on the public health needs of construction workers and is dedicated to improving safety and health in our industry.”

— Edward C. Sullivan, then president of the Building and Construction Trades Department (BCTD), AFL-CIO, and of CPWR (2001)

FOREWORD



IF WE WANT TO PROTECT THE MEN AND WOMEN

working on our nation's construction sites, we cannot wait until the workday starts, nor can we limit ourselves to the perimeter of the jobsite. Architects, engineers, project owners, contractors, tool and equipment manufacturers, apprenticeship instructors,

and teachers at technical schools make choices that help – or hamper – worker safety long before anyone punches in for the job.

That's why CPWR has made *Expanding Our Reach* a top priority. As always, we want to provide solid information and solutions to the superintendent, foreman, and worker on the job; however, we also must work with tool manufacturers who can produce quieter and safer tools, and with project owners who can choose contractors with superior safety and health management programs – not just low bids. We need to partner with builders seeking to improve the safety culture of their organizations and to enhance the safety leadership skills of their frontline managers. We already work with our apprenticeship programs to make safety a value for the next generation of workers, but we also need to spread the word to the community colleges and technical schools providing career and technical education. In this year's *Highlights* you will learn how CPWR is doing all of these, and much more.

As we move forward, North America's Building Trades Unions (NABTU) will continue its focus on building partnerships with our owner community and other construction industry stakeholders. In the field of construction safety and health, it has been particularly rewarding to see CPWR play a leading role in bringing research and government partners together with our building trades unions, contractors, owners, insurance providers, and other interested stakeholders to advance worker safety and

health. In this year of his retirement, I would like to take this opportunity to acknowledge and thank CPWR's Executive Director, Pete Stafford, for his efforts to connect all such partners with an interest in construction safety and health.

Pete has been part of CPWR for a quarter-century, and was actually its first and only full-time employee when NIOSH initiated its construction safety and health research program in 1990. Over the years Pete served in various capacities as CPWR was getting its program off the ground, taking over as deputy director in 1993 and then as executive director in 2001. In that time, CPWR has grown to become a leader in the field of construction safety and health. It has an outstanding reputation in the construction industry and within the safety and health research and training communities, and is widely recognized as a leading national and international resource for construction safety and health information. I know Pete would say there are many others who are responsible for CPWR's success, and I would not disagree, but I would be remiss if I did not acknowledge Pete's contribution to an organization that brings so much value to NABTU and the entire construction industry.

Fortunately for us in the construction industry, Pete is leaving CPWR in capable and experienced hands: CPWR's Deputy Director Chris Trahan Cain will be assuming the responsibilities of the Executive Director. Chris has worked with NABTU to promote worker safety and health for more than 20 years, **expanding our reach** by building relationships with labor organizations, community groups, government partners, and safety and health professionals in academia and in practice. I am confident that she will be expanding CPWR's reach for years to come!

Sean McGarvey
Chairman of the Board and President, CPWR
President, North America's Building Trades Unions

EXECUTIVE DIRECTOR'S MESSAGE

Our title, *Expanding Our Reach*, is very fitting, I believe, to explain some of the highlights you are about to read for 2016. The work of the OSHA-NIOSH-CPWR r2p Working Group, for instance, has continued to **expand its reach** to all construction industry stakeholders to make them aware of the national construction fall prevention campaign and its annual Safety Stand-Down. Millions of construction workers have been reached since the campaign was launched in 2012 and all indications are that the campaign will only continue to grow. Planning is already well underway for 2017, with the Stand-Down scheduled for the week of May 8, 2017.

Also in 2016, through a cooperative effort between CPWR and our consortium research partners, and construction industry stakeholders, OSHA and ACCSH, our new *Foundations for Safety Leadership (FSL)* training module was completed and approved as a 2.5-hour elective module in the OSHA 30-hour course. It will be available to all OSHA training providers effective January 1, 2017. We know from our bi-annual surveys with Dodge Data & Analytics that a significant percentage of U.S. construction contractors (over 80% of large ones) rely on the OSHA 30-hour course as their primary supervisory safety training program. At the same time, I believe I'm on safe ground when I say that all industry stakeholders, including OSHA, agree that the OSHA 30-hour course was not designed to be a leadership training program, which is why we are so optimistic the FSL will fill this gap. We've already received tremendous feedback from those who have tried it, and with the reach of the OSHA series training courses we believe our new FSL has the potential to reach thousands after its official launch by OSHA in January 2017.

On the research side of the house, you will also read about the great work of our Data Center and its 2016 products, including its *Quarterly Data Reports*; the growth of our eLCOSH Nano Inventory and status of exposure monitoring; research findings from our small studies program; r2p developments and the number of products and resources now available as a result of our r2p team's efforts and continued reach to our industry stakeholders; the status of our *Construction Solutions* program; and the combined safety climate work with

our r2p office to make our popular Safety Climate Assessment Tool (S-CAT) available online. In addition to these internal CPWR research activities, you will also be updated on the progress of our consortium partner research projects and other research planning activities.

As for our service programs, you'll see in 2016 our Building Trades National Medical Screening Program (BTMed) celebrated its 20th year of providing important medical screenings to construction workers employed at DOE sites across the country. You'll also read a first-hand account from one of our program participants about what BTMed's CT scan program meant to him. Finally, on the training side of the house you'll see the impressive number of construction workers trained in 2016, our trainer enhancement efforts, and development of new training programs, including a new Infection Control Risk Assessment (ICRA) course for our construction industry population working in hospitals and other health care facilities.

As you'll see, 2016 was obviously another productive year for CPWR. As you read in President McGarvey's foreword, 2016 will also be my last year as CPWR's Executive Director. I couldn't be more proud of the organization as I turn over the reins to Chris Trahan Cain effective January 1, 2017. The transition has been in the making since I asked Chris to be my first Deputy Director five years ago. I was the first full-time CPWR employee when we began our construction safety and health initiative in 1990, and I've had the great pleasure to watch the organization grow into a leading organization in the field of construction research and training from its beginning. I've met and worked with many wonderful people along the way, including our own awesome CPWR staff (past and present), CPWR's officers and Board, colleagues in the building trades and contractor communities, government, academia, training, insurance, and others who share our common aim of improving construction worker safety and health.

CPWR is on a sound financial footing and the future is bright. Chris will be an excellent Executive Director. She has the full support of President McGarvey and our Board of Directors, an exceptional CPWR staff, and the respect of our funding agencies and stakeholders. I want to thank all of you. It's been an honor.

Pete Stafford
Executive Director

INCOMING EXECUTIVE DIRECTOR'S MESSAGE

Greetings! For those of you who have not yet met me, I'm Chris Trahan Cain. For the last five years, I've served as CPWR's Deputy Director, and it's now my honor and privilege to assume the duties of Executive Director.

I'm grateful for the confidence that President McGarvey and the CPWR Board have placed in me, but humbled to be following in Pete Stafford's footsteps. Since joining CPWR's staff in 1990, Pete has transformed a fledgling occupational safety and health startup into a construction industry institution, respected by practitioners and academics alike. His will be big shoes to fill.

My background with Pete and CPWR goes back 20 years. I first met Pete while working on CPWR-funded research and training projects at a sister non-profit. When he invited me to join CPWR's staff in 1998, I leapt at the opportunity. After all, I loved working in construction, and I understood that CPWR would be the best place in America to promote occupational safety and health on behalf of our nation's construction workers. Pete would prove to be a remarkable supervisor and mentor in the years that followed.

Throughout his tenure, Pete recruited top-quality staff, showed appreciation for initiative, and encouraged every staff member's professional development. His energetic leadership style and profound respect for our team of researchers, training staff, consultants, and advisors – not to mention our consortium research and training partners, and the team that carries out our medical screening program – has positioned CPWR as a leader in construction safety and health research, training, and service.

When Pete asked me to serve as his Deputy Director, I knew the day would come when he would retire. That does not make his departure as Executive Director any easier; however, I am pleased to report that he has committed to staying on board as a consultant to ensure a smooth transition and help launch CPWR into its future.

Thank you, Pete, for your years of service to CPWR and America's construction workers!

Chris Trahan Cain

Deputy Director (Incoming Executive Director effective January 1, 2017)



“Thank you, Pete, for your years of service to CPWR and America’s construction workers!”

RESEARCH

Reducing Risks through Research *and* Practice

Since the inception of the construction safety and health research program we have partnered with NIOSH to reduce or eliminate workers' risks for occupational injuries and illnesses from existing and emerging hazards.

Over time, as the NIOSH Construction Center, our focus has evolved from surveillance and needs determination to intervention evaluation. When the National Academies challenged NIOSH to find ways to “get vital information to the worker ‘in the trench’ or ‘on the steel’” and to “persuade contractors and workers to effectively use the interventions that are developed through research,” we expanded our focus and took a lead role in the translation and dissemination of evidence-based best practices – research to practice (r2p).

Our focus has evolved from surveillance and needs determination to intervention evaluation...[to] research to practice.

Our current research projects aim to develop and promote practical interventions, tools, and materials to reduce injury, illness, and fatality risks for construction workers on the job. Through these projects, we are **expanding our reach** and engaging a broad group of industry stakeholders including:

- ▶ Project owners, who have the power to select design teams and builders committed to safety;
- ▶ Tool and equipment manufacturers, who can engineer out many hazards before the job begins;
- ▶ Foremen, who can shape safety culture and expectations on the job today; and
- ▶ Apprenticeship instructors and career and technical education faculty who can influence the next generation of workers.

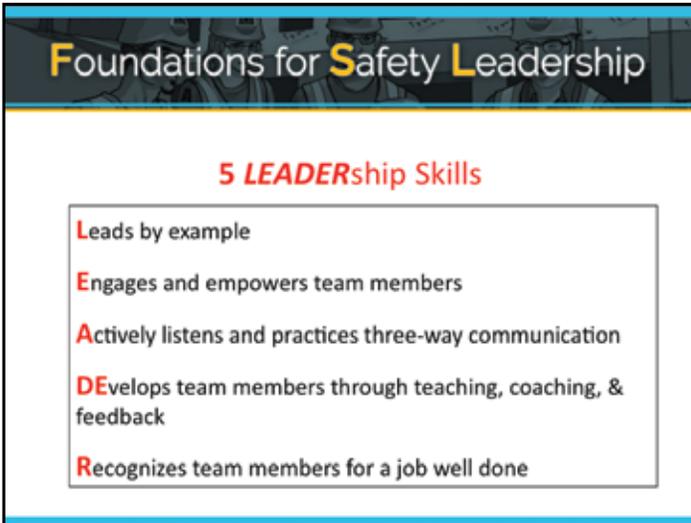
In year two of our current grant cycle, we introduced new awareness programs, identified opportunities for greater safety and health education, tested tools, and explored emerging hazards. We introduced new translational products, and increased efforts to reach workers and contractors, listen to their concerns, and use this information as the basis for our r2p and p2r (practice to research) initiatives.

Foundations for Safety Leadership: Skills Training Designed to Strengthen Jobsite Safety Climate

Each year, more than 100,000 construction workers, foremen, and other supervisory personnel take the OSHA 30-hour outreach training course to learn how to identify and control occupational hazards. Over the years, many construction contractors have told us that they send their newly promoted lead workers to the course to learn leadership skills that they can use to more effectively address safety and health situations when they arise; however, the OSHA 30-hour does not include leadership skills training. To respond to this gap, we convened a curriculum development

team made up of experienced OSHA 10- and 30-hour outreach trainers, construction workers, safety and health professionals, and leadership and safety climate specialists to develop a safety leadership course that could be used on its own or as an OSHA 30-hour elective module.

The 2.5-hour *Foundations for Safety Leadership (FSL)* training module has two sections. The first contains foundational material about the costs of ineffective and the benefits of effective safety leadership. This section



also introduces students to five critical leadership skills and practices which they will need to become real safety leaders.

The second section of the FSL contains seven short scenarios formatted to be presented as a narrated video, written script, or role-play in which foremen, superintendents, workers, and owners are shown using or not using the leadership skills when responding to real-world construction site hazards. The instructor guide contains questions and classroom activities that can be used to engage students in a discussion about what occurred in the scenario and how and if the safety leadership skills were applied.

This year, the research team pilot-tested the FSL on four construction projects after which they began the formal evaluation. Preliminary data from surveys administered before and after participating in the FSL found a statistically significant increase in participants' understanding of safety leadership skills, and a significant positive change in self-reported safety leadership intentions and behavior. As one company participant noted: "What a wonderful experience...the program was impactful."

The quality of the FSL and the positive response from the industry prompted OSHA's Directorate of Training and Education to incorporate it into the national OSHA 30-hour program as an elective effective January 1, 2017.

**"What a wonderful experience...
the program was impactful."**

OSHA's acceptance of the FSL, along with a commitment from our partners in the industry and the building trades to implement it with the tens of thousands of workers trained each year, will allow us to **expand our reach** to a broader audience of frontline supervisors, helping to ensure that it has a positive impact on construction safety climate and safety outcomes nationwide (see page 17).

Project: Enhancing Safety Climate through Leadership (CPWR)



Workers at Dimeo Construction and its subcontractors participate in the Foundations for Safety Leadership training

Courtesy of Dimeo Construction

Reaching the Next Generation of Construction Workers

Partnering to Give Apprentices a Safety Voice

Our Safety Voice for Ergonomics (SAVE) research team worked with the Masonry r2p Partnership to develop a program to teach apprentices – new entrants to the industry – how to identify ergonomic hazards and use their “safety voice” to raise awareness of these hazards and prevent injuries (see page 15). The team received input from masonry instructors, apprentices, and contractors when creating draft SAVE training units. The online and classroom training units were piloted by 28 apprentices and seven instructors at two masonry training centers and one job corps center. Input received during the pilot testing resulted in important changes in the program’s length and structure. These changes will ultimately increase the likelihood of the final program’s use in the masonry industry and the potential for future adoption by other construction sectors.

Project: SAVE (Eastern Washington University)



Courtesy of Dan Anton/Eastern Washington University

Use of a best practice – the two man lift team – to avoid MSDs

Promoting OSH Training for Post-secondary CTE Students

Career Technical Education (CTE) programs currently provide training to roughly 70,000 individuals interested in a career in construction. Understanding and influencing the occupational safety and health (OSH) training provided to these future construction workers can have a significant impact on what happens once they leave the classroom and move to the jobsite. Our current research project is addressing two critical questions: *What are the key elements of effective OSH education? What should be included in post-secondary CTE programs so that graduates are able to identify hazards, take preventive action, and avoid occupational injuries and illnesses?* With help from project partners

including the National Council on Workforce Education and the Association for Career and Technical Education, 352 administrators, instructors, and students in postsecondary CTE programs were surveyed to find answers to these questions and to identify gaps in the safety and health preparation currently offered. We also conducted three site visits including 30 interviews. The results of the survey and site visits will be analyzed in the year ahead, and shared and used with project partners to develop a guidance document and recommendations that will be shared with CTE programs.

Project: OSH Education in Post-secondary CTE Construction Programs (University of California, Berkeley)

Data Mining for Critical Trends

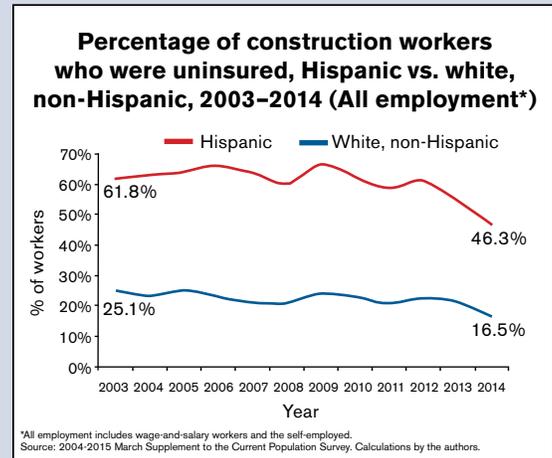
The term “data mining” may be new to some industry sectors, but our Data Center has a proven track record analyzing large data sets, or data mining, to generate information on the construction industry. Using data from the Bureau of Labor Statistics, OSHA and other federal agencies, we have been able to identify occupational safety and health trends and changes

in workforce demographics that have significant implications for the construction industry as well as the overall economy. As a trusted source for data, our research has received growing public and media attention this year, allowing us to reach audiences ranging from workers to policymakers within and beyond the construction industry.

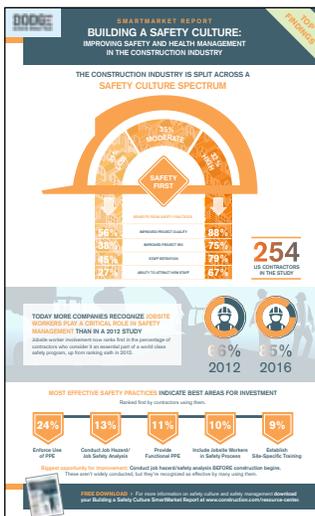
Keeping the Industry Informed

Through in-depth studies and our Quarterly Data Reports (QDRs) we are continuing to keep the industry informed of new and emerging trends. The QDR – *Impact of the Affordable Care Act on health insurance coverage and healthcare utilization among construction workers*, for example, provided timely data-driven evidence of how the Act is benefiting construction workers and was picked up by labor and industry press. In 2017, we will roll out a contemporary, digital version of our flagship reference guide, *The Construction Chart Book: The U.S. Construction Industry and Its Workers*. The new e-Chart Book will provide users with timely access to the latest industry statistics and analysis.

Project: Data Tracking and Support Services (CPWR)



Providing Insights into “Building a Safety Culture”



Our ongoing partnership with Dodge Data & Analytics created an opportunity to examine safety management practices and take a close look at 33 indicators of safety culture. The report *Building a Safety Culture: Improving Safety and Health Management in the Construction Industry*, which was featured in *ENR: Engineering News-Record* and other leading industry publications, found that “encouraging a safety culture is critical, that safety investments in the industry are clearly paying off and that jobsite workers are increasingly recognized as playing a critical role in ensuring high safety performance at construction companies.” However, the survey results also indicated that small

construction firms lag behind larger firms in most of the safety management and safety culture measures. This finding prompted us to take a more in-depth look at the differences between large and small contractors. This analysis, presented in the QDR – *Safety Management and Safety Culture among Small Construction Firms*, confirmed the critical need to provide small construction firms with the information and resources to improve their safety culture.

Project: Data Tracking and Support Services; Disparities Surveillance Research (CPWR)

Revealing the Economic Burden of Workplace Injuries

The economic burden of workplace injuries is frequently measured by workers’ compensation claims, but our analysis of data from the National Longitudinal Survey of Youth found that this conventional measure could underestimate the cost. We found that injured workers experienced significant income loss post-injury. Workers who reported an occupational injury resulting in days away from work lost on average \$3,715 (in 2000 dollars; \$5,208 in 2016 dollars) annually in income growth during the ten years post-injury, when compared to their non-injured counterparts.

Project: Data Tracking and Support Services (CPWR)

Improving the Industry's Safety Climate

Researchers and industry stakeholders agree that a strong positive safety climate is critical for reducing injuries, illnesses, and fatalities on construction worksites (see page 9). The fragmented organization of construction work is a major challenge, but one that can be turned into an opportunity by working with owners

and insurance companies *upstream* to help improve the safety climate of contractors and subcontractors *downstream*. Three of our research projects are furthering the industry's ability to take advantage of these relationships to positively influence jobsite safety climate and **expand our reach**.

ACES: Assessing Contractor Safety

Choosing safe contractors is fundamental to creating safe construction worksites. We are engaged in several research activities to improve the safety component of the contractor pre-qualification process. The ACES project is testing the theory that contractors with stronger safety management systems – with an emphasis on leading indicators of safety – will have better safety outcomes on projects, and that workers who are employed by contractors with more effective safety management systems will report a stronger safety climate. The ACES pre-qualification procedure is in the final stage of pilot-testing with project partners, including project owners, general contractors, and subcontractors, with input from labor unions, safety professionals and insurance experts. ACES will



be evaluated by examining injury data and worker perceptions of safety climate, safety leadership, training, safety communication, and other worksite measures. The goal is to widely disseminate the ACES tool through our network of construction industry and safety professionals and to promote the use of leading indicators of safety in contractor pre-qualification.

Project: Development and Evaluation of Contractor Safety Pre-Qualification Tool (Northeastern University)

Tools to Answer the Question: What is Your Safety Climate?

Providing contractors and workers with tools to assess and improve their company's safety climate continues to be one of our top priorities. This year, we issued a second edition of our safety climate workbook called *Worksheets and a Rating Tool to Help You Strengthen Jobsite Safety Climate*. The new publication includes updated worksheets based on feedback from users and input from the NORA Construction Sector Council, and our new *Safety Climate Assessment Tool (S-CAT)* that contractors and workers can use to get a sense of their company's level of safety climate maturity. In addition, we developed editable online versions of the new safety climate worksheets to give companies the flexibility to edit the text to match their needs, and created a



new S-CAT website. This website lets individuals and companies learn more about the eight leading safety climate indicators, complete the S-CAT online, and receive a report comparing their level of safety climate maturity to other construction companies in the S-CAT database.

Project: Improving Jobsite Safety Climate through Research and Research-to-Practice (CPWR)

Interventions to Improve Safety Climate & Ergonomics

In St. Louis, we are working with general contractors to explore whether their safety programs foster a positive safety climate – and sound ergonomic practices – among sub-contractors. This year, we began collecting data on two major construction projects to learn about workers' perceptions of safety climate and safety performance and general and sub-contractor safety programs. We also began collecting researcher observations of ergonomic hazards and controls for the hazards from three sites, along with worker-completed pre-task safety analysis forms to code for recognition of ergonomic and safety hazards and controls. The

results to date have demonstrated gaps in ergonomic information and enforcement of ergonomic principles within the existing safety management programs, inconsistent communication about ergonomics, and opportunities to improve the focus on ergonomics. Better understanding of the general contractors' influence over sub-contractor safety practices and how this influence can address a leading cause of injury will have benefits beyond this market.

Project: Interventions to Improve Safety Climate and Ergonomics in Construction Small and Medium Sized Contractor Enterprises (Washington University in St. Louis)

Connecting the Dots – From the Lab to the Jobsite

Research conducted in the lab to measure exposures allows us to assess risk, test engineering controls, and gather feedback from manufacturers and other stakeholders before new controls are introduced in the field for further testing and use.

Our network of researchers, contractors, and trainers connects what researchers learn in the lab with what happens on jobsites and what happens in the field to new research.

A New Test Bench to Evaluate Equipment & Exposures

To help contractors select safer concrete cutting and drilling equipment, we developed an automated test bench system to provide standardized data that can be used by tool manufacturers and contractors to better understand how differences in tool designs and tool use can reduce exposure to hazardous noise, respirable silica dust, and hand vibration. Recent test bench studies have found that as drill bits become dull there is more handle vibration, more respirable silica dust, and a big reduction in productivity. The findings from this study will provide guidelines for replacement of dull bits in order to reduce exposures, and are being shared with drill manufacturers for use in the design of new, safer equipment and products. Manufacturers are also working with the laboratory to test new dust control systems.

Project: Test Bench for Evaluating Concrete Drilling Methods (University of California, San Francisco)



This system was developed at the University of California at Berkeley, Ergonomics Program

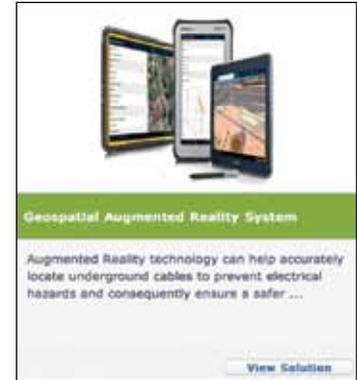
Nanotechnology: Contributing to the World-Wide Dialogue

Tiny engineered nanoparticles are used in a growing number of construction materials, but there is no requirement or consistent approach for labeling nano-enabled products and little is known about the potential health risks associated with occupational exposure. We are conducting exposure monitoring during tasks with construction materials we have verified contain nanoparticles and adding commercial products reported to be nano-enabled to our eLCOSH Nano inventory. This year, we reported results from worker exposure testing of zinc oxide nanoparticles in a wood stain product; in the coming year we will conduct exposure testing for other construction materials. Working in close collaboration with NIOSH's Nanotechnology Research Center and colleagues in other countries, we are contributing to the construction industry's understanding of and the international dialogue on potential risk. Our recent journal article, *Toward responsible development and effective risk management of nano-enabled products in the U.S. construction industry*, made an important contribution to this dialogue.

Project: Nanomaterials in Construction: Tracking Product Diffusion and Measuring Exposures (CPWR)

Fostering a National Focus on Solutions

Identifying safer equipment that contractors and workers can readily find and use on their projects and evaluating promising new solutions continued to be a central focus of our Construction Solutions project and Engineering Controls Work Group (ECWG). A collection of solutions and two related examples that show the potential return on investment were added this year to address various construction hazards.



www.w.cpwr.constructionsolutions.org

Tens of thousands of contractors and workers accessed these and other solutions during the year. In addition, many more took advantage of two webinars on the use of Construction Solutions, a seminar for several major electrical contractors, and the ECWG meeting to get answers to questions directly from the research team and engage in more in-depth discussions about these and other solutions.

Project: Construction Solutions (CPWR)

Understanding the Risks from Spray Polyurethane Foam (SPF) Insulation

Epoxies and isocyanates are widely used in construction and there is growing evidence of occupational skin disorders and asthma risks associated with these products. We are exploring ways to reduce exposures to reactive isocyanates (and other harmful agents), and have collected exposure data on airborne, dermal, and urinary biomarkers of exposure. Current data indicate high potential for dermal exposure during SPF and industrial coating. Field observations and estimates based on the Dermal Exposure Assessment Method (DREAM) during various tasks (e.g. in SPF and industrial coatings) revealed that hands are at higher exposure risks compared to other body parts. The identification of high exposure tasks and evaluation of appropriate personal protective equipment is ongoing. Along the way, we are sharing our findings with research partners and the broader construction industry through webinars, presentations, and technical assistance.

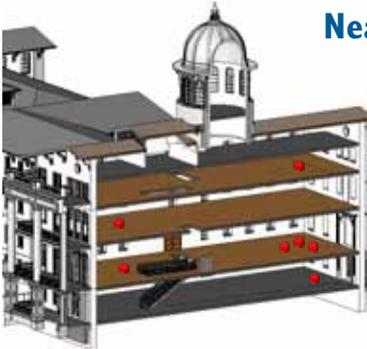


Cleaning a clogged SPF spray gun in the field puts a worker at risk of hand contact with raw SPF components

Project: Assessment and Control of Exposures to Reactive Chemical Resins in Construction (University of Massachusetts, Lowell)

Small Studies: Engaging New Researchers and Audiences

Our Small Study Program creates opportunities for both members of our Research Consortium and others interested in doing safety and health research for the construction industry to explore promising new technologies and investigate emerging hazards and issues. This year, the results of two small studies contributed to the industry's understanding of the potential impact of safety training and Building Information Modeling (BIM) on injury rates.



The red circles indicate a near miss event visualized within BIM

Near Miss Tool for BIM Designed to Improve Construction Safety

Building Information Modeling (BIM) is used to track construction plans and schedules through the life cycle of a project. Our small study, *Near Miss Information Visualization Application for BIM*, resulted in a new near miss database created in a commercially available version of BIM software and a related visualization tool. Using this tool, construction personnel can enter near miss data and use this data to identify hazardous areas throughout the construction site and take corrective action to reduce injuries. Moving forward, we are working with the University of Alabama-based research team to make this tool available to end-users.

Project: Near Miss Information Visualization Application for BIM (University of Alabama)

Impact of OSHA Outreach Training on Injury Rates

There is limited information available on the impact of OSHA 10- and 30-hour training on construction work-related injuries. To increase the industry's understanding, this small study led by Duke University researchers analyzed union membership, training, and workers' compensation claims data linked at the individual level for approximately 17,000 union Carpenters in Washington State over a nine-year period. Though the findings were modest overall, the study found that the benefits of OSHA training were more pronounced for those involved primarily in drywall installation, apprentices, and those with increasing time since training. The study noted that "it is unrealistic to expect OSHA Outreach Training alone to have a large effect on...rates of work-related injury," and highlighted the importance of combining training with other approaches such as a sound safety and health program and a positive safety climate to reduce injuries.

Project: Effectiveness of OSHA Outreach Training on Construction Work-Related Injury Rates (Duke University)

What's Next?

Small studies currently underway are looking at a wide range of issues, including:

- ▶ **Aluminet: An intervention for heat-related illness among construction workers.** Researchers at Auburn University are testing whether an aluminum reflective vest can reduce heat-related illness among construction workers.
- ▶ **Applying prevention through design (PtD) to solar systems in small buildings.** Researchers at the University of Washington and Oregon State University are investigating how to apply PtD principles to eliminate existing hazards associated with solar panel installations on small buildings.
- ▶ **Improving work zone safety utilizing a new mobile proximity sensing technology.** Georgia Tech researchers are testing whether Bluetooth technology can be used effectively to turn a worker's smartphone into a warning device to prevent struck-by and back-over injuries.
- ▶ **Mistakeproofing the design of construction process.** Researchers at the University of California, Berkeley are investigating whether "mistakeproofing" devices and techniques familiar in lean production can be implemented in construction to improve safety.
- ▶ **USGBC's PtD Pilot Credit: Evaluating effectiveness and building a foundation for implementation.** Researchers at East Carolina University are assessing the effectiveness of the U.S. Green Building Council's LEED Pilot Credit for Prevention through Design (PtD).

r2p: Increasing the Use of Evidence-Based Interventions

Building and testing the construction research to practice (r2p) infrastructure required to effect positive change on jobsites continued to be a central focus. This year, with critical input from our Research Consortium, NIOSH researchers, and industry partnerships and stakeholders, we introduced new translational materials, r2p tools, and opportunities for researchers, industry stakeholders, and trainers to connect, network, and partner to reduce occupational illnesses and injuries and **expand our reach**.

Expanding the Dialogue

The 2016 r2p seminar and partnership workshop [meeting], *r2p in Construction: Increasing the Use of Evidence-Based Interventions through Social Marketing, Networking & Other Strategies* brought together an interdisciplinary group of CPWR and NIOSH researchers and government, insurance and construction industry representatives to discuss r2p. Presentations showcased the synergy between research projects underway and created an opportunity to share r2p challenges and research findings. Workshops introduced social marketing as a promising r2p approach and engaged attendees in a discussion on building a safety and health network that would expand their individual and our collective reach. All of the participants who responded to the evaluation survey rated the meeting as “good” to “excellent,” and said the sessions were relevant to their work and gave them ideas to improve their own r2p efforts.

Project: r2p Coordinating Project; Prevention Partnerships in r2p (CPWR)



Using Social Marketing to Reach & Influence the Industry

Presentations at the 2015 r2p seminar and partnership workshop introduced the concept of social marketing and generated requests for more information. In response, we developed and distributed the *Construction Safety and Health Social Marketing Toolkit* at this year's meeting and used it, along with an early draft of an ergonomics pilot social marketing plan being developed by our ergonomics community of practice, to engage participants in a discussion on how they could apply social marketing principles to their own r2p efforts. As one attendee noted, “[I] will be able to use [this] information and [the] CPWR toolkit to better plan outreach/roll-out activities.”

Project: Prevention Partnerships in r2p (CPWR)

“[I] will be able to use [this] information and [the] CPWR toolkit to better plan outreach/roll-out activities.”

Building a Safety and Health Network for r2p and p2r

Creating connections between construction safety and health partnerships, organizations with a safety and health focus, and collaborators to share lessons learned, pursue joint initiatives, promote the use of safer work practices with a broader audience of industry stakeholders, and identify stakeholder-driven research needs (practice to research, or p2r) is the goal of our r2p safety and health partnership network now under development. A workshop at this year's meeting used

presentations on four existing networks to: demonstrate how their reach would expand if connected to one another; raise awareness of the benefits of such a network; and solicit input on how it should be structured and function. Based on this input, wireframes for the online network have been developed, which will be used in web-based focus groups to gather additional input from stakeholders.

Project: Prevention Partnerships in r2p (CPWR)

Where Do You Get Your Information?

CPWR's reach alone extends to thousands of construction safety practitioners, from company safety directors to OSHA outreach trainers. An analysis of a survey fielded to identify the best ways to communicate research findings and translational materials to occupational safety and health professionals found that OSHA's website and e-newsletter (*QuickTakes*) had significant market penetration, and that LinkedIn was the social media channel used most frequently for work-related content. To single out the best targets for future promotional efforts, we cross-referenced metrics on major digital and social media channels currently disseminating construction occupational safety and health information with results from the market survey and web/email analytics to identify 100 leading online disseminators. These results will influence future dissemination efforts.

Project: Communications Plan (CPWR)

Partnering for r2p and p2r

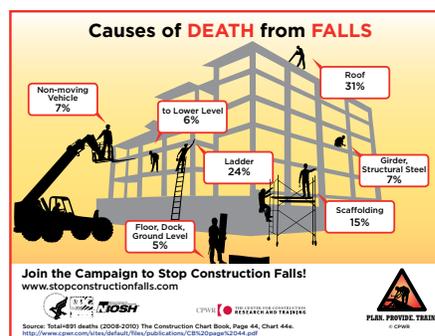
Our work with industry partnerships allowed us to respond to industry research needs (p2r) and develop new translational materials (r2p), and furthered our understanding of the role of partnerships in r2p.

- ▶ The **Roofing r2p Partnership's** identification of radiofrequency (RF) radiation as an emerging hazard for the construction industry led to the establishment of a multi-trade labor-management RF Radiation Work Group. With the partnership taking the lead, this Work Group developed the *RF Radiation Awareness Program for the Construction Industry*. This program has already been delivered to workers and contractors in several trades, and the Hazard Alert card *RF Radiation – An invisible danger* was shared at the 2016 International Roofing Expo attended by roughly 9,500 industry representatives. It was also the most requested Hazard Alert this year with more than 4,700 hard copies distributed and many more downloaded.
- ▶ Supporting new research and disseminating research findings and translational products continued to be the focus of the **Masonry r2p Partnership**. The partnership-initiated Choose Hand Safety website was accessed by masonry and non-masonry audiences, prompting a large general contractor to say that this website is “yet another brilliant idea, and addresses the largest source of recordable injuries of our tradespersons.”

This website is “yet another brilliant idea, and addresses the largest source of recordable injuries of our tradespersons.”

Research projects involving the partnership demonstrated the benefits of engaging labor-management partnerships in research. A pilot study supported by the partnership to reduce silica exposure during tuckpointing, for example, led to the funding of a follow-up study. Similarly, the partnership's involvement in the SAVE project paved the way for the research team to access the individuals and facilities needed to pilot test their training program (see page 8).

- ▶ The OSHA-NIOSH-CPWR r2p Working Group's collaboration continued to increase all three organizations' r2p capacity. A mobile app, developed for the 2016 National Falls Campaign Stand-Down in collaboration with a campaign partner, and five



CPWR-NIOSH co-branded infographics helped raise awareness of the campaign and Stand-Down activities. In addition, the Working Group used the formal

research side of the Trainers and Researchers United Network (TRU-Net; see page 16) to gather valuable information from trainers on noise hazards and barriers to use of interventions. Based on trainer feedback, we are now working with our training staff to develop noise-related training materials and, with trainer support, fielding a follow-up survey to more than 5,000 workers. The results of this survey and the earlier trainer survey will be used to support future research and policy initiatives.

Project: r2p Coordinating Project; Prevention Partnerships in r2p (CPWR)

TRAINING

Training to Improve Jobsite Safety

Working with North America’s Building Trades Unions (NABTU) we have assembled the nation’s largest safety and health training network, including thousands of trainers representing every construction trade.

Every day these trainers deliver OSHA 10- and 30-hour courses, and training on handling hazardous waste and responding to disasters. They also conduct a variety of specialized construction safety and health courses. This year we exceeded all of our training projections, conducting 6,309 classes, and providing training directly or through our affiliated unions to 1,263 trainers and 79,620 workers.

Strengthening the Safety Trainer-Researcher Connection

The connection between our extensive networks of safety and health trainers and researchers (TRU-Net) continued to strengthen during the year, ensuring that trainers are involved in, have access to, and incorporate into their training the latest construction safety and health research (see page 15). By involving trainers in research and including research findings in training, NABTU members are better prepared to respond to ever-changing worksites and new hazards facing the construction industry. During our annual Trainer Enhancement Program, trainers visited two NIOSH research facilities to see first-hand how research is conducted, provide researchers with feedback, and learn how to more effectively communicate research results to their members. The value of this connection can be seen in the creative ways trainers are using our research findings and products. “I’ve found that incorporating CPWR’s materials and online resources into my training programs helps students understand the hazards they’re learning about and where to go for more information when

“I’ve found that incorporating CPWR’s materials and online resources into my training programs helps students understand the hazards they’re learning about...”

they leave the classroom,” says Jerry “Dean” Beaver, a CPWR instructor at the Department of Energy HAMMER Federal Training Center. “Instead of focusing on ‘what could happen,’ I now focus on incidents that have already happened. We then go to CPWR’s websites and I show them the resources and tools that could have been used to raise awareness of the hazard and prevent the incident. They’re always amazed at the amount of information they find that will help prevent future incidents.”



OSHA Training

The OSHA 10- and 30-hour training programs are the fundamental building blocks for a successful construction safety and health program. As an OSHA Training Institute Education Center, our National Resource Center delivers OSHA 500, 502 and 510 classes to NABTU trainers, and OSHA 10- and 30-hour classes to construction workers, foremen, and supervisors. During the year, we delivered 51 OSHA Trainer classes to 910 trainers. These trainers used NABTU's Smart Mark curriculum or one developed by their union to deliver 5,710 OSHA 10- and 30-hour classes to 72,153 construction workers, foremen, and supervisors. Through a collaborative effort with the University of Texas-Arlington, we developed a web-based portal to collect our network's OSHA outreach training data. The portal also serves as a one-stop national database allowing us to identify pre-trained disaster response trainers and workers from within NABTU's network.

In 2016 we also implemented a new OSHA Outreach card system for the 10- and 30-hour and Disaster Site Worker training. These cards have a QR code that can be used by contractors and others to immediately verify a worker's credentials.

Our training staff participated in the development of the new *Foundations for Safety Leadership (FSL)* module, which fills a gap in the existing OSHA 30-hour training program (see page 6).

Along with NABTU, we promoted Rowan University's construction management degree program. This program allows building trades workers and instructors to earn college credits for specialized union training and apprenticeship programs, including several CPWR courses, that count toward their degree.

Help in Hard Times: Disaster Response Training

Whether a disaster is natural or man-made, our Disaster Response Training Program prepares building trades workers to respond safely. This year we delivered 71 classes to 1,110 students. We also updated the *Disaster Site Worker Curriculum* and began using the new version in June. The new curriculum is delivered on a platform that is more flexible, easier to navigate, and adaptable for pre-incident and post-incident training. The curriculum now includes the existing focus areas and topics specific to hazards found after major flooding, hurricanes, tornadoes, earthquakes, and other natural disasters. Along with redesigning our curriculum, we assisted OSHA in their efforts to develop a one-day hazard awareness class option as part of their 15-hour *Disaster Site Worker Course*. Further strengthening our influence in this area, our Director of the Disaster Response Program was appointed to a National Advisory Committee for Occupational Safety and Health subcommittee tasked with rewriting the OSHA standard for Emergency Response and Preparedness.



Environmental Hazard Training

Through a cooperative agreement with the National Institute of Environmental Health Sciences (NIEHS) our Environmental Hazard Training Program, Environmental Career Worker Training Program, and the Hazmat Disaster Preparedness Training Program continued to meet the demand for trained construction workers.

Construction Workers Train to Clean up Contaminated Sites

The addition of the International Union of Operating Engineers to our program **expanded our reach** and ensured their members receive the necessary environmental hazard training to keep them safe and productive. Working in collaboration with our network of 12 international unions, we conducted 471 classes and trained 7,446 workers, technicians and support staff, while continuing to receive positive feedback from participants. As one trainee said, “As an apprentice this course was very informative, one of the best I’ve taken so far.” Another noted the training “helped me [know] what to look for to be more prepared and recognize potential hazards.” In response to OSHA regulatory changes, we updated our confined space training curriculum. This training prepares students to work in both general industry and construction.



Workers in Level A Hazmat

Courtesy of State of Hawaii Department of Health

We also began updating the *Hazardous Waste Worker Instructor Guide* to align it with the new student manual developed in 2015. Lesson plans and classroom activities were rewritten to incorporate the assertion-evidence teaching methodology used throughout the new hazardous waste curriculum.

Training for Hazards in Healthcare Construction

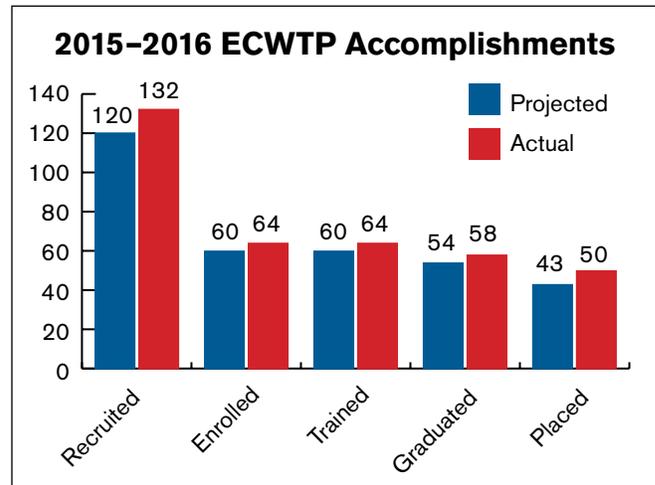
Infection Control Risk Assessment, or ICRA, is an essential element in healthcare construction, renovation, maintenance, and demolition. Hospitals and other healthcare facility owners performing construction work require proper containment and work practices to protect patients from exposure to pathogens – and for their own protection, construction workers need to understand the hazards unique to healthcare settings. This year, CPWR’s environmental training program responded to this emerging field

with an ICRA training course. The types of information covered include: hospital-acquired infections; ICRA construction techniques like barriers and negative air pressure; and proper handling of materials and construction waste. During the year, two pilot ICRA classes and three train-the-trainer classes were held, which were attended by 59 trainers representing 11 different unions. In addition, the program was introduced to a broader construction audience as part of our r2p project’s webinar series.

ECWTP: Responding to Community Needs

The Environmental Career Worker Training Program (ECWTP) continued its mission to provide vulnerable populations with access to training for careers in construction or environmental remediation. This year, we once again exceeded our recruitment, training, graduation, and placement goals for our community partners (East Palo Alto, CA; New Orleans, LA; and St. Paul, MN). We recruited 132 individuals, and enrolled and trained 64 ethnically diverse at-risk and disadvantaged residents of our three ECWTP sites. The majority, 58, graduated, and 50 were placed in jobs with an average wage of \$17.58 per hour.

We also **expanded our reach** by applying our successful ECWTP model to train disadvantaged residents responding to the community's lead crisis in Flint, Michigan. Ten trainees completed the initial training program and eight were placed in jobs with an average wage rate of \$19.05 per hour. The success of this program has drawn attention from local and national media, including *ENR: Engineering News-Record*. An additional training cycle for 15 trainees is scheduled to begin in early 2017.



Building Trades Cooperation Leads to Success in Flint

Cooperation among the Building Trades can be credited for helping students in the first Flint ECWTP class succeed. One of the graduates placed with the United Association of Plumbers and Pipefitters (UA), Anthony Jones, first served his country in the Gulf War before deciding to serve his community and help solve the water crisis. Upon completing the program, Jones went to work at the new Genesee County Water Treatment Plant. Similarly, the Michigan Bricklayers and Allied Craftworkers (BAC) Lansing Training Center provided two of the bricklayer placements each with a \$400 set of tools, and with support from our NIEHS grant, provided the metatarsal protection upgrade required for work on the refractory jobs where they had been placed.



Anthony Jones, a Gulf War veteran and UA Local 370 apprentice at work at the Genesee County Water Treatment Plant

Courtesy of Howard Hipes, Apprentice & Training Coordinator, MI BAC Training Center



Courtesy of Howard Hipes, Apprentice & Training Coordinator, MI BAC Training Center

Flint program graduate and BAC member Emily Williams working on a refractory brick project

SERVICE

BTMed Reaches Service Milestone

In 2016, the Building Trades National Medical Screening Program (BTMed) celebrated its 20th year of providing valuable health information and medical screenings to thousands of construction workers who have been employed on Department of Energy (DOE) sites.

Since its start, BTMed has delivered more than 34,000 exams to more than 25,000 workers across the country, and conducted more than 3,000 low-dose CT scans. According to the DOE's latest *Former Worker Medical Screening Program Annual Report*, more than a fourth of the medical exams performed through a former worker program have been conducted through BTMed. The guiding philosophy of BTMed's staff has been and continues to be that all of the more than 600,000 construction workers who worked on DOE sites deserve to have someone looking out for their health. Their dedication to providing these often life-saving services has earned them a 98% satisfaction rating from the workers they serve.

Recent Findings

The importance of BTMed screenings is reflected in the numbers. Of those screened to date:

- ▶ 18% had abnormal chest x-ray (CXR) findings
- ▶ 40% had abnormal pulmonary function test (PFT) findings
- ▶ 64% demonstrated hearing loss
- ▶ 1.5% had at least one abnormal beryllium lymphocyte proliferation test (BeLPT)
- ▶ 12 had stage one lung cancers, 1 stage two, and 5 stage four

When caught early enough, these conditions can be better treated and lives can be saved. In addition to identifying potentially life-threatening conditions, this program has contributed to the industry's understanding of the risk for other health issues that affect a worker's quality of life, including hearing loss. Hearing tests conducted found that 64% of workers screened through BTMed suffer from hearing loss.



The BTMed team

Different Stories – One Life-Saving Program

Ironworker tells how BTMed's CT scan program finds life-threatening condition just in time

The son of a coal miner, Leonard Hooks got a job as an ironworker at the DOE's Oak Ridge complex in the early 1960s after serving in the army. He would end up staying there until 2006, working at all three Oak Ridge sites. Between Y-12, K-25, and X-10, he believes he worked in every building in the entire complex. Looking back to his early days at Oak Ridge, he recalls seeing "puddles of mercury" and not "a whole lot of protection."

During nearly 40 years at Oak Ridge, Leonard would do plenty of welding on old metal structures that had decades of radioactive or chemical contamination. "I've seen asbestos in the air look like snow when they opened the skylights up to bring iron down with a crane," he says. "You could see it just floating around."

Despite being in good shape and always feeling healthy, Leonard knew that a lifetime of exposure to asbestos, radiation, and chemicals could not be good for his body. That's why he took advantage of BTMed's free medical screenings. As part of the screening process,



Leonard Hooks, Ironworkers Local 384

he participated in a work history interview that proved to be critical (see box below). His work history documented that he had engaged in work that put him at a high risk for lung cancer.

After his screening, he was identified as being eligible for a CT scan. The CT scan didn't find lung cancer, but it did find a condition that would have drastically

"This program with the Building Trades is a very good thing. I credit it with me living today."

Why Conduct a Work History Interview?

Work history interviews are conducted by individuals who have worked at DOE sites and others who are well aware of the working conditions and hazards. These interviews help to ensure that participants receive thorough exams, and are used to gather information that may be needed for compensation claims filed with the Energy Employees Occupational Illness Compensation Program (EEOICPA).

impacted his life if it had not been discovered early. He immediately got in touch with specialists who were able to perform a surgery that he believes added years to his life. "I'm thankful the Building Trades has this program," he says. "I know it's helped me and I know it's helped a lot of other people. A lot of people have died too early because of these work-related issues. This program with the Building Trades is a very good thing. I credit it with me living today."



“Thanks to the CT Scan I found out I had an abdominal aneurysm and COPD. I was losing air but I thought I was just getting old. Without the scan I’d never have found any of that. Thanks to the Building Trades I’ll be able to watch my grandkids grow up.”

— Rick Gehring, Carpenters Local 698, Fernald

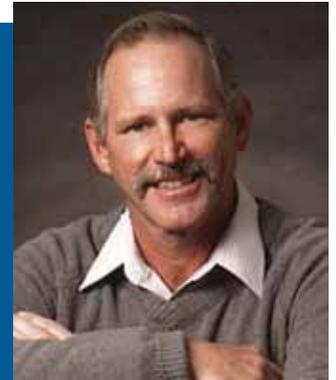
“Go get that free physical. It could save your life. I can’t say it any better than that.”

— Fred Dopp, IUPAT Local 764, INL



“I’d like to thank everyone involved that made this exam possible, start to finish. You’ve shown you care. Job well done!”

— Clark Mann, Ironworkers Local 17, Ashtabula



Staying Connected

This year we introduced a new Facebook page to make it easier to reach and connect with workers. Through this social media platform, we are reaching more workers who may be eligible for BTMed services and, as a result, saving more lives.



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

CPWR

Construction Solutions

Babak Memarian, PhD

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Disparities Surveillance Research; Data Tracking and Support Services

Sue Dong, MS, DrPH

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Enhancing Safety Climate through Leadership

Linda Goldenhar, PhD

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Nanomaterials in Construction: Tracking Product Diffusion and Measuring Exposures

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Oregon State University

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

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Duke University

USGBC's PtD Pilot Credit: Evaluating Effectiveness and Building a Foundation for Implementation

Michael Behm, MS, PhD

East Carolina University

Improving Work Zone Safety Utilizing a New Mobile Proximity Sensing Technology

Yong Cho, BSc, MSc, PhD

Georgia Tech

Mistakeproofing the Design of Construction Process

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Near Miss Information Visualization Application for BIM

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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

LABOR ORGANIZATIONS

North America's Building Trades
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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
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States and Canada

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and Joiners of America

United Union of Roofers,
Waterproofers and Allied Workers

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Online Resources



www.cpwr.com

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



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.

**Work Safely
with Silica**

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.



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 National Campaign to Prevent Falls in Construction.



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.



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 a contractor's historic cost data.

**S –
CAT**

www.safetyclimateassessment.org

The S-CAT website includes information on the eight leading indicators of jobsite safety climate and the online version of the Safety Climate Assessment Tool (S-CAT), which lets individuals and companies compare their level of safety climate maturity to that of other construction companies.

NailGunSafety:
TheFacts

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.



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.

CPWR AT A GLANCE

RESEARCH

15 WEBINARS

21 KEY FINDINGS
from research

138 Requests for
MATERIALS
94,000+
MATERIALS distributed

5



FALLS INFOGRAPHICS

98 PRESENTATIONS

13 CPWR UPDATE
e-newsletters



1 million+
WEBSITE VISITS

39 PUBLICATIONS

7 Abstracts
& posters



+216% TWEETS
+325% RETWEETS

2 SMALL
studies



26,574

YouTube CHANNEL
VIEWS



+30%
FB LIKES

TRAINING



6,309
CLASSES
conducted

1,263
TRAINERS trained



79,620
WORKERS trained

SERVICE SINCE PROGRAM BEGAN

34,000+
construction worker
SCREENINGS

3,000+
low-dose CT scans



98%
SATISFACTION
RATE



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