CPWR THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

HIGHLIGHTS 2022

CPWR AT A GLANCE

RESEARCH

19 WEBINARS

5,063 ATTENDEES

16,158 ON-DEMAND VIEWS

185,087 CPWR.COM SESSIONS

11 KEY FINDINGS

87,743 YOUTUBE VIEWS

Includes on-demand webinar views

13 UPDATE NEWSLETTERS

15,565 SUBSCRIBERS

16% SUBSCRIBER INCREASE

2,954 LINKEDIN FOLLOWERS

54% LINKEDIN FOLLOWERS INCREASE

3,107 TWITTER FOLLOWERS

24% TWITTER FOLLOWERS INCREASE

12 INFOGRAPHICS

TRAINING

5,745 COURSES OFFERED

2,354 TRAINERS TRAINED

64,697 WORKERS TRAINED

SERVICE

SINCE BTMED PROGRAM BEGAN:

43,800 CONSTRUCTION WORKER SCREENINGS

8,800 LOW-DOSE CT SCANS

100% SATISFACTION RATE IN 2022

All figures cover the 12 months since Highlights 2021.

CONTENTS

FOREWORD

At the center of NABTU's work this year was infrastructure. The expertise CPWR provided for keeping workers on those projects safe and healthy not only benefited them—it also highlighted hazards our industry must continue to address if every construction worker is going to come home safely every day.

SEAN MCGARVEY
Chairman of the Board and President, CPWR
President, NABTU

Since President Biden signed the Bipartisan Infrastructure Investment and Jobs Act late in 2021, NABTU and our affiliates have been committed to making sure that the bill's once-in-a-generation provision of more than $1 trillion will grow the economy, improve public safety, and create hundreds of thousands of good-paying jobs. But that will only happen if construction workers with the skills our country needs are actually on the job—not sick, injured, or worse.

The entire construction industry is fortunate to have CPWR to show how to accomplish that. In its Infrastructure Safety Briefing, CPWR collected and shared resources to help employers quickly find tools to plan safe work, use existing training programs and materials, understand best practices and solutions, and discover relevant research.

Addressing hazards such as struck-by incidents or RF radiation is even more important because of the number of new workers and new employers on these projects. Fortunately, CPWR has been a leader in safety training for decades, particularly through the consortium embedded across the NABTU family. This fall OSHA recognized the consortium's success when it again selected CPWR and its partner West Virginia University as OSHA Training Institute Education Center.

That partnership is just one example of the network that makes CPWR so effective. University-based researchers examine topics from drones to mentorships for women sheet metal workers. The Building Trades National Medical Screening Program works with clinics across the country to provide thousands of screenings to former construction workers who built and maintained our nation's nuclear weapons sites. CPWR collaborates with key federal agencies, including NIOSH, OSHA, and NIEHS, as well as with state and local governments. And every day it connects with contractors, consultants, and others.

CPWR uses many approaches to improving safety and health. This year's 19 webinars attracted more than 5,600 attendees, with another 6,000 watching recordings on demand. Drawing on its experiences during the pandemic, the Training Department conducted our industry's first comprehensive evaluation of how to successfully deliver safety and health training through distance learning. CPWR also launched two free websites. The Safety Culture—Safety Management Information System enables contractors to assess their safety climate, then implement appropriate tools to strengthen it. The Nano SDS Improvement Tool helps manufacturers, distributors, and importers of products containing nanomaterials evaluate and improve their safety data sheets.

CPWR remains dedicated to addressing falls, COVID-19, and struck-by incidents. The workshop it organized this summer, which brought together more than 50 practitioners and experts, expanded our industry's work to reduce suicides and overdoses. The Data Center continues to provide unparalleled access to information on topics like employment, injuries, and mental health.

The following pages describe how CPWR is helping build safety, and build safely, across the country.

EXECUTIVE DIRECTOR'S MESSAGE

This year saw increased movement back towards normal, both in the country and in construction. CPWR shared in that shift, addressing ongoing, crucial safety and health issues while continuing to respond to the pandemic.

CHRIS TRAHAN CAIN, CIH
Executive Director

While COVID-19 is less prominent than a year ago, it remains a serious risk to workers. Our efforts to provide current information included our ongoing COVID-19 webinar series with NIOSH, including a look at "back to basics;" our Data Dashboard on vaccination rates among construction workers, which was regularly cited by the media; and our downloadable resources, such as a Toolbox Talk and infographics.

We've used our experiences since 2020 to do more than share knowledge about COVID-19. The most notable example of that came in the summer, when we published a report evaluating the factors affecting the success of safety training delivered by distance learning. Based on courses our training consortium was forced to shift to distance learning because of COVID-19, it found that synchronous, interactive distance learning can be effective and provided guidance for how to produce that result.

OSHA recognized our Training Program's exceptional work when it chose CPWR, along with our partner West Virginia University, to continue to serve as the Region III OSHA Training Institute Education Center. This selection highlights the partnership's ability to support OSHA's efforts to provide safety and health training to workers and employers.

The pandemic added to the mental health challenges facing people across the country, including those in construction. In the summer, CPWR built on our previous projects by hosting a two-day workshop that brought together people from unions, contractors, universities, government, safety and health organizations, insurance companies, and nonprofits to develop a roadmap to address the high rates of suicide and overdose deaths in construction.

Our commitment to addressing both persistent and emerging hazards remained at the center of what we do. Magnifying the importance of our efforts, as President McGarvey notes on the facing page, was the federal new infrastructure bill. The numbers of new firms and new workers in the field significantly increases the need to make sure construction workers come to the job site prepared for safety.

Examples from across CPWR show the many ways in which we support workers. Our Building Trades National Medical Program resumed vital health screenings to former construction workers on U.S. Department of Energy nuclear weapons sites. We continue to lead the Campaign to Prevent Falls in Construction, adding new emphasis to the fact that preventing falls is a year-round effort.

Our research projects supported by NIOSH are already expanding our field's knowledge. For example, one is examining and improving job hazard analysis; another, how to promote safety and well-being among female sheet metal apprentices; a third, offering a free tool to improve safety data sheets for products containing nanomaterials.

Although what we do ranges widely, every part of it shares the same goal: keeping construction workers safe on the job.

RESEARCH
CPWR HIGHLIGHTS 2022

Improving Workers' Safety and Health Through Research and Dissemination

Our Research Program works across the construction industry—with contractors, unions, government officials, insurers, researchers, and others—to help keep workers safer on the job. This collaboration produces data, guidance on safe practices, webinars and podcasts, job site handouts, research papers and presentations, and other resources that address both persistent and emerging hazards

Expanding and Evaluating Our Outreach

Our communications work this year featured three main efforts. We continued to expand our network: subscribers to our main mailing list grew 16%; our Instagram followers, 35%; and our LinkedIn followers, 54%. We developed more sophisticated tools for understanding how people interact with us, including detailed dashboards for each of our family of 15 websites and reports showing us which participants in our webinar series and in the Falls Stand-Down were new and who had been involved before. And we conducted both quantitative and qualitative research on attitudes about Prevention through Design, including the barriers to broader adoption of this effective method for reducing job site injuries.

PROJECT: Communications, Outreach and Education Core (CPWR)

Improving Contractor Resources for Reducing MSDs

Over the past year this project, which is evaluating the benefits of the Best Built Plans (BBP) program's resources to reduce risks to workers from manual material handling, has shifted its focus to revising the BBP materials. After evaluating the first wave of contractor risks and use of program materials, the research team and CPWR's r2p team reconvened the Ergonomics Community of Practice. This group, which brings together staff from contractors, insurance firms, equipment vendors, and universities, will be making recommendations to improve the usability of and content on the BBP webpages; this feedback will supplement the ideas provided by the contractors in the project's first stage. The researchers will review all the proposed modifications, then test them with a new group of contractors over the next year.

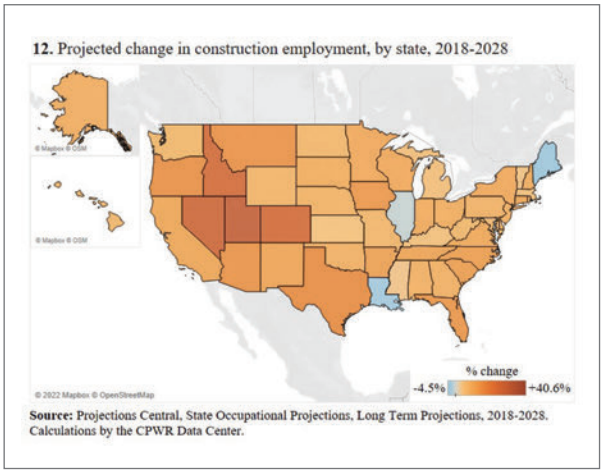
Building Bloc Building Services, LLC

PROJECT: Evaluation of the Best Built Plans Manual Material Handling Tool for Construction (Washington University in St. Louis)

Data Center Remains Unparalleled Source of Information

Our Data Bulletins continue to be a leading source of accessible, timely statistics on the construction industry. This year's six Data Bulletins focused on employment trends and projections; fatal and nonfatal injuries; OSHA inspections and citations; and three on COVID-19 trends—safety management, mental health, and the pandemic's long-term impact on the industry. Many of the Data Bulletins had a corresponding Data Dashboard (see below), which provided a deeper dive into the topic. The Construction Chart Book continues to be a vital resource, with 750 downloads and nearly 14,000 page views this year. As a leading source of statistics on construction safety and health, the Data Center also regularly receives data requests, responding to over 70 this year.

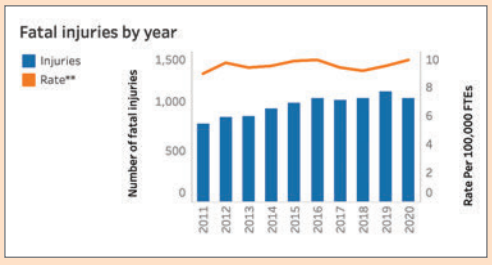
PROJECT: Construction Industry Data and Statistical Core (CPWR)



Data Dashboards Collection Continues To Grow Rapidly

Launched in 2021, CPWR's Data Dashboards have quickly become a powerful tool for understanding conditions and trends in construction. There are now more than 20 dashboards, including 16 added this year, on topics from mental health to employment trends to occupational exposures. All are free, make the underlying data easy to download, and provide multiple filters so users can customize based on their interests. The data for the dashboards is regularly updated, and new topics continue to be added. The value of the dashboards is clear both from comments by organizations such as the National Roofing Contractors' Association, which says they help improve construction worker safety, and from web traffic, which shows more than 15,000 page views over the past year. The Data Center is now organizing the dashboards into a framework for an interactive Construction Chart Book.

PROJECT: Construction Industry Data and Statistical Core (CPWR)



Examining Data on Mental Health Concerns

Mental health is an increasing concern among construction workers, as illustrated by the industry's disproportionately high suicide rate, and the COVID-19 pandemic exacerbated many of these issues and highlighted mental health in general. In response, the Data Center published a variety of resources examining mental health among construction workers. The January 2022 Data Bulletin "Construction Worker Mental Health During the COVID-19 Pandemic" and the corresponding Data Dashboard examined anxiety and depression symptoms or medication use before and during the pandemic. The peer-reviewed paper "Psychological Distress and Suicidal Ideation Among Male Construction Workers in the United States," which highlighted data about construction workers from the National Survey of Drug Use and Health, was published in the *American Journal of Industrial Medicine*.


CPWR Data Bulletin
JANUARY 2022
Construction Worker Mental Health During the COVID-19 Pandemic
THIS ISSUE
OVERVIEW
KEY FINDINGS
NEXT DATA BULLETIN
Employment Trends and Projections in Construction

PROJECT: Construction Industry Data and Statistical Core (CPWR)

Moving Ahead with Exoskeleton Research

This year this project's research team analyzed results from their quantitative survey of more than 250 construction industry stakeholders and 25 qualitative interviews with workers and supervisors. They found that attitudes about exoskeleton (EXO) technologies were generally positive, and important drivers of EXO use are likely to be perceived usefulness and usability, enhanced productivity, and reduced fatigue and pain. The researchers have also nearly completed laboratory testing to assess potential effects of exoskeletons on workplace performance and safety. While some effects were found, these greatly depended on the task and EXO design. To facilitate implementation of EXOs on the job, algorithms using sex, height, and weight to predict optimal fit and level of support were developed and evaluated for three exoskeletons. The project is now transitioning to additional laboratory-based task simulations, including overhead and flooring work.

PROJECT: Evaluation of Trunk and Arm Support Exoskeletons for Construction (University of California, San Francisco and Virginia Tech)

Potential Hazards from Part B Chemicals

This project continues to generate new exposure and biomonitoring data that can guide interventions that will reduce exposures to hazardous chemicals in Part B of spray polyurethane foam (SPF) and metal structure coating systems. The researchers are the first to document personal inhalation and potential skin exposures to a panel of amine hardeners/catalysts in SPF and industrial coatings. The researchers used air and glove dosimeters to quantify organophosphate flame retardants, and they also conducted urinary biomonitoring in pre- and post-shift samples of SPF workers. The health impact on construction workers of mixed chemical exposures were assessed through a panel of acute kidney toxicity and systemic oxidative stress biomarkers in urine samples. The data highlight several opportunities to reduce workers' exposures to Part B chemicals, and these results are being disseminated through conferences, webinars, and meetings with industry groups.

PROJECT: Reactive Chemical Systems: Part B—Developing Data-Driven Interventions (University of Massachusetts Lowell)

Evaluation of the OSHA 10-Hour

This project continued to evaluate the OSHA 10-hour Construction Safety and Health training, one of the most common approaches for providing basic safety training to construction workers. The research team focused on the project's developmental phase, using the analysis of interviews and document data from earlier in the project to develop four surveys that will be used for the evaluation phase. These instruments include the Trainer Questionnaire, Training Evaluation Tool, and the Knowledge Assessment, which students will complete both prior to and after the course. Results from earlier focus groups led to the addition of the fourth instrument, the Student Evaluation of Training, which will capture impressions of training quality. These findings are helping the team structure the next stage of its work, developing an enhanced OSHA 10 approach and determining if it is more effective in improving workers' safety knowledge.

Tiffany Rice, West Virginia University

PROJECT: Evaluation and Improvement of OSHA 10-Hour Construction Safety Training (West Virginia University, Boise State University)

Neil Lippy

Studying graphene exposures during tuckpointing in collaboration with the International Masonry Institute.

Developing and Sharing Knowledge about Nanomaterials Controls

This project continued to investigate possible hazards of nanomaterials in construction and exposures, controls, and effective safety training. The researchers' work this year included adding new products and articles weekly to the eLCOSH Nano inventory of nanomaterials in construction and studying exposure controls during cutting, grinding, and tuckpointing of concrete and mortar strengthened with graphene, a carbon-based nanomaterial. The researchers also launched an online tool for improving safety data sheets and provided input on OSHA's proposed revision to the hazard communication standard. Train-the-trainer sessions for CPWR's Annual Trainer Enhancement and for the Insulators Union were another way the team shared its knowledge, with follow-up evaluations showing that union instructors believe the curriculum effectively trains workers about nanomaterial applications, health risks, exposures, and controls. One indication of the quality of the team's work: its recent study of silver nanoparticles received an award at the American Industrial Hygiene Conference and Expo.

PROJECT: Manufactured Nanomaterials in Construction: Evaluating Exposures, Controls and Worker Training (CPWR)

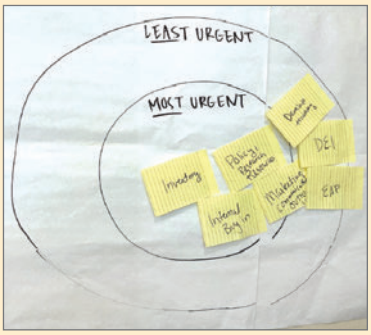
Increasing Adoption of Respiratory Controls

This project continued its examination of methods for increasing the use of interventions that control respiratory risks facing construction workers. This year the researchers tested a strategy to improve perceptions of hazard control innovations with workers in masonry, concrete, and asphalt roofing. They developed a web-based intervention, based on the Prevention through Design Adoption Readiness Model, that included information on a range of topics: the health impacts of construction hazards; side-by-side videos of both conventional and innovative tools; control effectiveness; productivity; and task performance. The researchers collected data through both a pre-test and a series of post-tests, which took place immediately, three months, and six months after the intervention. The tests found significant improvements in perceived ease of use and perceived impacts on productivity in all intervention groups about the interventions. In addition, significant improvements in health knowledge, risk, and adoption readiness were found in the asphalt roofing group.

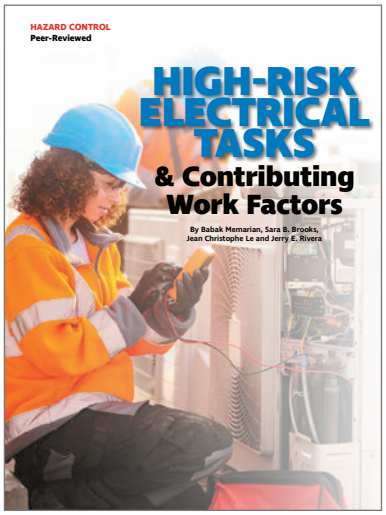
PROJECT: Health Hazard Controls Industry Diffusion: Evidence-based Intervention Strategy (Virginia Tech)

Responding to Mental Health Needs of Construction Workers

Mental health issues such as suicide and opioid use disorder profoundly affected construction workers even before COVID-19. The pandemic has exacerbated those issues, and CPWR has been collaborating with industry partners to respond. Our work this year included leading train-the-trainer sessions for the NABTU Opioid Awareness Training, updating the materials for that course with the latest resources and data, sharing our opioid-related work at the American Public Health Association's annual conference, hosting a mental health awareness and suicide prevention webinar, and partnering with local unions and building trades councils to create short videos highlighting CPWR resources. We also published an article in the journal *New Solutions* detailing our efforts to reduce opioid-related harms in construction. Feedback about the mental health section of the Awareness Training is now helping us create a separate discussion- and activity-based course on that topic for apprentices and other trainers that is currently being pilot-tested.



Improving Safety and Health Through Better Pre-Task Planning



This project aims to improve the safety and health of workers and their overall performance by optimizing the pre-task planning process, specifically in electrical construction. This year, researchers interviewed 90 electrical workers on six projects. They used the findings from these interviews to create a repository of task factors and project attributes that increase workers' task difficulty and exposure to hazards for 15 electrical tasks. The researchers paired this information with recommended interventions to draft Electrical Task Analysis documents to help contractors improve pre-task planning and training. The team published two peer-reviewed journal articles, which were the basis for one of CPWR's most popular webinars this year, "Improving JHA and Pre-Task Planning in Electrical Construction: A Worker's Perspective." The research team is also developing a tool to help contractors identify areas for improvement in their pre-task planning process.

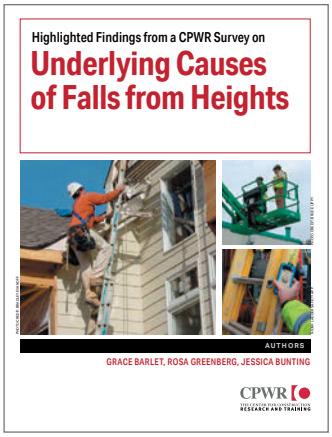
PROJECT: Prevention through Augmented Pre-Task Planning (CPWR)

Webinars Provide a Valuable Dissemination Tool

CPWR's webinar series continues to be a wide-ranging success, as three examples from this year's 19 webinars demonstrate. Working with OSHA, the Associated General Contractors of America, and the National Electrical Contractors Association, we held two webinars on electrical hazards, a topic we had not previously covered. They proved enormously popular: the March session on protecting workers against electrical hazards was attended live by more than 1,100 participants and has been viewed on-demand over 400 times. The August webinar on job hazard analysis and pre-task planning had 450 attendees and nearly 200 on-demand views. Our webinar program increased awareness of the suicide and opioid epidemics sweeping through the construction industry, as we hosted a webinar during National Suicide Prevention Week with representatives from OSHA and the Missouri Works Initiative of the state's AFL-CIO. A portion of this webinar was also turned into a CPWR Construction Safety & Health podcast episode, which is available in both English and Spanish.

PROJECT: Research to Practice (r2p) Core (CPWR)

New Reports on Falls and Struck-by Hazards

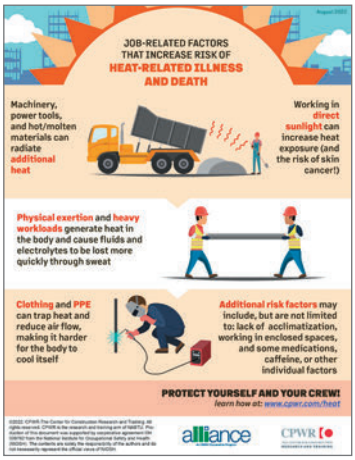


This year, the r2p Program completed analysis of our survey aimed at understanding root causes of falls. By partnering with the NORA Construction Sector Council Falls Work Group and the ANSI/ASSP Z359 National Work at Heights Task Force, we heard from almost 500 people who had experienced, witnessed, or investigated a workplace fall. The report shows that contractor planning, employee training, and management emphasis on fall protection policies are critical to worker safety. With assistance from the NORA Construction Sector Council Struck-by Work Group, we conducted a survey to inform a new research project testing the use of choice architecture techniques to influence pre-job and pre-task planning to prevent struck-by incidents. The resulting report addresses causes of these incidents, barriers to prevention, measures currently being taken to protect workers, and ways to raise awareness and influence uptake of safe practices.

PROJECT: Research to Practice (r2p) Core (CPWR)

Partnering to Address Priority Hazards in Construction

CPWR's r2p Program continues to work across the industry—including with contractors, unions, OSHA, NIOSH, and the NORA Construction Sector Council Work Groups—to address persistent and emerging hazards. Over the past year, we have added to our library of Toolbox Talks, infographics, and other resources in support of the National Campaign and Safety Stand-Down to Prevent Falls in Construction, the National Stand-Down to Prevent Struck-by Incidents, the Safe and Sound Campaign, and OSHA's Heat Illness Prevention Campaign. The EPA's Let's Talk About Heat Challenge awarded CPWR an honorable mention for our recent strengthening and reorganization of our Working in Hot Weather topic page and creation of new resources, including three recently published infographics and several in-progress CPWR-OSHA Alliance materials, such as planning checklists for contractors and workers to protect against heat-related illness and death.



PROJECT: Research to Practice (r2p) Core (CPWR)

Robot Drywall System Wins Liberty Mutual Safety Innovation Award

DPR Construction's collaboration with Canvas to pilot the latter's robotic drywall finishing tool—which features a sprayer system, lift station, mechanical arm, and vacuum sanding system—received the 2022 Liberty Mutual Safety Innovation Award in Construction for how it mitigates the riskiest aspects of drywall work. The award, now in its third year, recognizes innovative evidence-based technologies, work practices, and programs designed to reduce or eliminate hazards that lead to injuries and pain in the construction industry. Honorable mentions went to two recipients: the Studson SHK-1 Industrial Safety Helmet, which utilizes Koryod™ material to offer breathability and direct and angled head protection, as well as featuring an NFC Chip to store emergency medical information; and the RECLEAN Pilot Study, which helps construction workers reduce the likelihood of secondary lead exposures to children and other family members.

FSL4Res, Developed to Reduce Falls in Residential Construction, Now Online

This project is adapting CPWR's Foundations for Safety Leadership (FSL) training to create the FSL4Res (Foundations for Safety Leadership for Residential Construction), which teaches key leadership skills that frontline crew leaders and supervisors in the residential sector can use to strengthen safety climate and improve crew safety behaviors. The FSL4Res teaches these skills via real-life scenarios—often in videos—centered around reducing fall risks, which cause two-thirds of job site fatalities in residential construction. In addition to the 2.5-hour classroom training format used by the FSL, the FSL4Res can also be delivered in several shorter sessions at the worksite. The research team is currently disseminating and evaluating the FSL4Res program, which is now available for free on the CPWR website.

PROJECT: Improving Safety Leadership and Fall Prevention Training in Residential Work (Washington University in St. Louis)

Thousands Begin Using New Safety Climate and Safety Management Tool

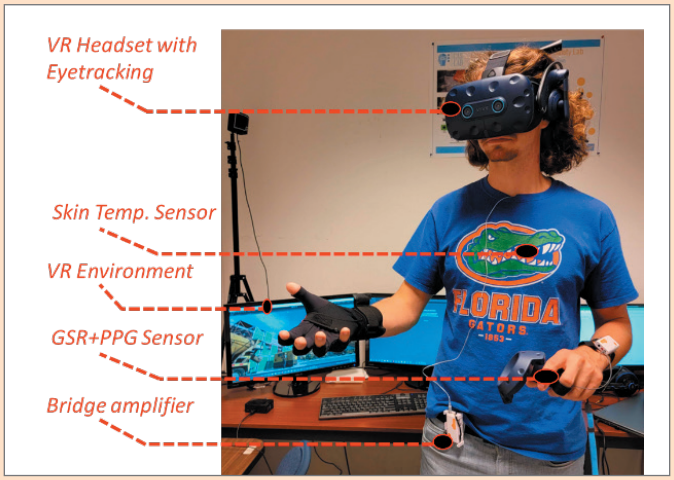
The new Safety Climate-Safety Management Information System (SC-SMIS), launched last January, gives companies a powerful tool to engage in continuous safety management and safety climate improvement. Already over 8,000 people around the world, most in the U.S. and Canada, have explored the resources www.scsmis.org offers, including the proven Safety Climate Assessment Tool (S-CAT) and the Safety Climate Assessment Tool for Small Contractors (S-CAT^{SC}). More than 450 firms have begun using the SC-SMIS to improve their job site safety climate, and the 90 safety management resources in the site's repository have been downloaded a total of more than 17,000 times. "Accessing all this can make all the difference in the world," said the director of risk management at one firm now using the SC-SMIS, "especially for smaller contractors and businesses that don't have the full-time professionals or the resources."

PROJECT: Safety Climate-Safety Management Information System (SC-SMIS) (CPWR)

Small Studies Examine Drones, Hearing Protection, and Job Hazard Analysis

Our Small Study Program provides researchers with up to $30,000 to research topics such as new technologies, reaching high-risk sectors, and small employers, and advancing research-to-practice. Three final reports were issued this year:

- **A study at Clemson University aimed to increase auditory awareness of workers exposed to loud noise** with a new hearing protection technology that uses artificial intelligence to both amplify safety-critical sounds and greatly attenuate ambient noise. The researchers proceeded in three phases: (a) collecting audio data of construction equipment, (b) developing a machine learning model for automated detection of collision hazards to be integrated into intelligent hearing protection devices, and (c) conducting field experiments to investigate the system's efficiency and latency.
- **A study by the University of Florida evaluated the impact of working with or near UAVs for construction workers at height.** A virtual construction site was developed to simulate different high-risk scenarios, and user experiments were conducted to evaluate, using wearable sensors and self-reported questionnaires, how UAVs affected workers' attentional and psychophysiological states.



- **A study at the University of Houston examined the effectiveness of a virtual reality (VR) application for job hazard analysis (JHA)**, designing, developing and implementing two interventions, a VR-based application for JHA and a paper-based JHA, and compared their effectiveness.

Study team members toured a sheet metal fabrication shop in south Seattle, led by a mentor in the program.

Continued Development of Mentorship Program for Female Sheet Metal Workers

This project is developing a mentorship program to promote safety and well-being among female apprentices with the International Association of Sheet Metal, Air, Rail and Transportation Workers (SMART). This year the study team concluded the first round of its mentor training, including collecting evaluation data to assess the program's value for the mentors. In the fall of 2021, mentor and mentee pairs had begun working together,and the study team checked in regularly to evaluate their progress. After the initial set of mentor/mentee relationships officially concluded in September 2022, the researchers began recruiting new mentees to work with the existing mentors, as well "control" apprentices. The second round of the program began in December. The researchers have drafted a paper for publication outlining the educational approach of the hybrid training program and have also begun filming additional skill-based example videos.

PROJECT: Promoting Safety and Well-being among Sheet Metal Worker Women through Mentoring (University of Washington)

Training Workers, Increasing Safety, Building Careers

CPWR's training consortium, which we lead in coordination with NABTU, this year conducted more than 5,700 courses across the country. Benefiting were 65,000 construction workers, including more than 2,300 trainers who will share the knowledge they gained with others. The consortium—the largest in the industry—offered courses from the introductory OSHA 10-hour course to train-the-trainer courses on topics such as confined space and hazardous waste. Our research team increased CPWR's impact by offering products—including Hazard Alert Cards, Training Programs, Toolbox Talks and infographics, many available in English and Spanish—that cover topics from aerial lifts to work zone safety.

Cleaning Up Hazards, Creating Jobs

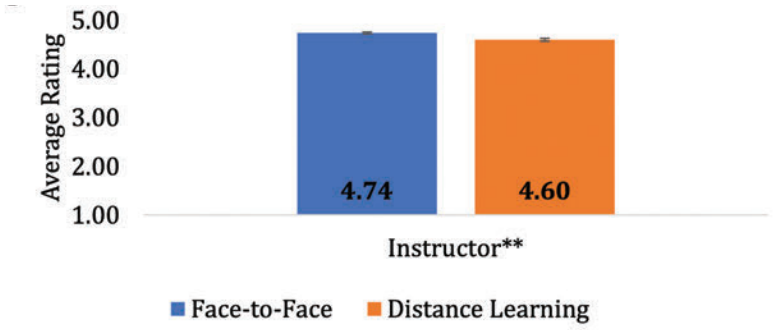
Two projects more than 1,000 miles apart illustrated the importance of, and the benefits from, the hazardous waste training our consortium offers. In upstate New York, members of Sheet Metal Workers Local 58 needed to replace existing ducts so a firm could bring additional semiconductor manufacturing to the area. They had to work carefully: hydrofluoric acid had formed crystals and puddled inside the existing ducts, and the training showed the workers how to safely remediate the duct work in preparation for installing new ducts and tooling. In New Orleans, Charity Hospital—a 20-story, million-square-foot Art Deco building—has never reopened after being flooded nearly 20 years ago during Hurricane Katrina. CPWR is training workers on asbestos abatement training so local developers can convert this landmark into a mixed-use complex anchored by Tulane University's academic and research presence.

Hazardous waste training in Syracuse.

Assessing and Strengthening Distance Learning

From the start of the pandemic, CPWR's training consortium recognized the importance of adapting its courses to the restrictions placed on in-person gatherings. Instructors responded by creating new exercises, particularly by taking advantage of functions in the distance-learning platforms such as polls and breakout rooms and third-party, interactive apps. This year CPWR issued its second report on the effectiveness of distancing learning for safety and health training. The study, which was also examined in a CPWR webinar, supported the effectiveness of synchronous, interactive distance learning techniques. It identified trainee characteristics and other elements that are critical for success in technology-based formats, as well as offering recommendations for continuous quality improvement and suggestions for future research.

Mean Instructor Effectiveness for OSHA 510 Courses



Environmental Career Worker Training Program Continues to Serve Underserved Communities

At the 2022 NABTU Tradeswomen Build Nations conference: Dr. Sue Ann Sarpy (CPWR consultant); Steve Surtees (ECWTP director); TaiekaMarie Duplessis and Tania Hernandez (New Orleans); and Suzy Correia, Tia Ferrie, and Edan Pesetsky (Boston).

The NIEHS-funded Environmental Career Worker Training Program (ECWTP) continued to bounce back from the obstacles created by the pandemic. In each of ECWTP's four cities—Boston; East Palo Alto, California; Flint, Michigan; and New Orleans—the program moved strongly back towards fulfilling its ambitious goal: to provide residents of underserved, low-income communities the opportunity to develop meaningful, sustainable careers in environmental remediation and construction. This year, nearly 80% of graduates found jobs, just under the program's long-term average, and their average hourly wage was $21.77, the highest in ECWTP's history. The U.S. government recognized the NIEHS ECWTP's 25 years of impact by including it as a pilot program under its Justice40 initiative which aims to ensure that 40% of the benefits of relevant federal investments go to disadvantaged communities.

Building the Safety of Workers at Department of Energy Sites

Two events this year highlighted CPWR's continuing work on U.S. Department of Energy (DOE) nuclear sites. First, DOE's Safety Culture Improvement Panel asked the Training Department to describe how it has supported the department's safety culture initiative. The resulting presentation focused on two courses CPWR has taught multiple times: our Safety Orientation for DOE Workers, which covers worker health and safety within the context of existing DOE policies and procedures; and our Foundations for Safety Leadership for DOE, which adapts a successful CPWR training program to introduce construction workers at DOE facilities, particularly those with supervisory responsibilities, to critical safety leadership skills and provides actions they can take to improve job site safety climate. Second, this summer DOE Secretary Jennifer Granholm visited a CPWR 40-hour Hazardous Waste Worker class at the Volpentest HAMMER Federal Training Center at the Hanford Site in Richland, Washington. Funded by the National Institute of Environmental Health Sciences (NIEHS), the training prepares construction workers to handle hazardous waste cleanup at the site.

Secretary Granholm with Ed Seitz, one of CPWR's worker trainers.

Labor Dept. Selects CPWR-WVU Partnership for OSHA Training Institute Education Center

CPWR, in partnership with West Virginia University (WVU), has once again been awarded a non-financial cooperative agreement to continue to offer OSHA Training Institute Education Center courses under our National Resource Center. This selection recognizes the partnership's ability to support OSHA's training mission to provide safety and health training to workers and employers. CPWR offers these courses through the Building Trades Unions and to the public in OSHA Region III in partnership with WVU.

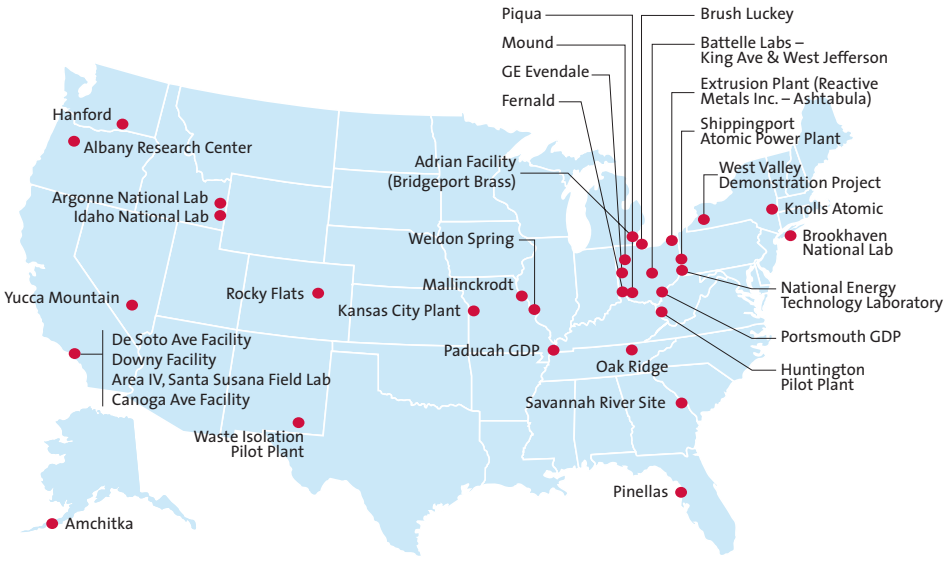
Supporting Hurricane Recovery after Ian

This year the state of Florida testified to the impact of CPWR's Disaster Response Training Program. This program is designed to better prepare workers to recognize hazards, select and use the right personal protective equipment, recognize proper decontamination procedures, and know how they fit into the Incident Command System. Ten members of the Florida Conservation Corps, as well as three staff members, who received the training were deployed to conduct damage assessments, roof tarping, and hazardous tree removal after Category 4 Hurricane Ian tore through the state. One of the staff made clear the training's value: "We will definitely be reaching out the beginning of next year to have you come and give the new team the training as well."

Improving the Health of Former DOE Workers

For more than 25 years, the Building Trades National Medical Screening Program (BTMed) has provided free, ongoing medical screening exams to construction workers previously employed at U.S. Department of Energy (DOE) nuclear weapons sites. These workers may have been exposed to toxic substances and hazardous conditions, increasing their risk for occupational illnesses. The screenings—which workers are eligible for every three years—help identify work-related health conditions at an early, more treatable stage and contribute to these workers' overall health and well-being. Funded by a cooperative agreement from DOE, BTMed is administered by CPWR in partnership with Stoneturn Consultants, Duke University Medical Center, University of Maryland Medical Center, and Zenith American Solutions. So far in 2022, BTMed has completed 1,700 screening exams and 950 CT scans, similar to the figures before the pandemic.

DOE Sites served by BTMed



Reaching the Workers

BTMed outreach staff remain busy enrolling new participants and engaging existing ones through multiple methods:

- Attending building trades meetings and community fairs, placing newspaper ads, posting on social media, and promoting a BTMed informational video.
- Dr. Stella Hines, BTMed's co-medical director, led a group from DOE, the U.S. Department of Labor, and other DOE Former Worker Programs in a workshop at the 2022 American Occupational Health Conference.
- This fall BTMed partnered with DOE and other FWP's to hold the first DOE/FWP webinar. It exceeded all expectations with 676 registrants, 378 of whom attended, and is now available on demand.

Dr. Stella Hines (center), BTMed's co-medical director, joins other FWPs, DOE and DOL at the AOHC.

Using Research to Improve Health

Our research team continues to publish peer-reviewed articles based on the experiences of BTMed participants. This year, the *American Journal of Industrial Medicine* published two studies:

- Hearing Impairment and Tinnitus among Older Construction Workers Employed at DOE Facilities. Occupational hearing loss is the most common work-related illness in the U.S. and can lead to anxiety and an overall loss in quality of life. Researchers gathered audiometric data from BTMed participants, as well as self-reports of tinnitus, and analyzed the prevalence of hearing impairments by job category, sex, and age. More than half of the study cohort suffered from hearing impairments, including 57.7% of men and 26.8% of women. The research reinforces the need to promote noise reductions and hearing conservation in construction.
- Beryllium Disease Among Construction Trade Workers at Department of Energy Nuclear Sites: A Follow-up. BTMed participants are screened to identify DOE-related occupational illnesses, including beryllium sensitization (BeS) and chronic beryllium disease (CBD). The study estimated beryllium disease risks and the CBD claims acceptance rate in EEOICPA., a federal compensation program for former DOE workers. The researchers found that years of DOE work predicts risk of developing CBD and getting a claim for CBD accepted, and they recommended ongoing surveillance and increased awareness of the risk of beryllium exposure and CBD as an occupational disease among construction workers.

"This CT Scan saved my life because it showed a tumor on my kidney that I didn't know was there. Now it's gone, and I am cancer free!"

– Ron VanderMeeden
Former Savannah River Site Worker
Plumbers & Pipefitters Local #447

"BTMed doctors are proactive about detecting cancer. They saved my nose from skin cancer. I feel blessed to be in the program. And my family feels blessed, too."

– Eugene Clampitt
Former Hanford Worker
Laborers Local #348

"I'd like to take this time to express my appreciation for this program and others like it that have helped construction workers identify workplace illnesses."

– William "Butch" Kalt
Former Savannah River Site Worker
Operating Engineers Local #470

"The doctor I saw was terrific. If I ever need to change my primary doctor, she will certainly be considered."

– Steve Danay
Former Brookhaven National Lab Worker
Ironworkers Local #361

CPWR RESEARCH PROJECT LEADS

2019-2024 EXTERNAL

Evaluation and Improvement of OSHA 10-Hour Construction Safety Training
Mark Fullen, EdD
West Virginia University
Kimberly Rauscher, ScD, MA
Boise State University

Evaluation of the Best Built Plans Manual Material Handling Tool for Construction
Ann Marie Dale, PhD
Bradley Evanoff, MD, MPH
Washington University in St. Louis

Evaluation of Trunk and Arm Support Exoskeletons for Construction
Carisa Harris-Adamson, PhD, CPE, PT
University of California, San Francisco
Maury Nussbaum, PhD, *Virginia Tech*

Health Hazard Controls Industry Diffusion: Evidence-based Intervention Strategy
Deborah Dickerson, PhD, MS, CIH
Virginia Tech

Improving Safety Leadership and Fall Prevention Training in Residential Work
Bradley Evanoff, MD, MPH
Ann Marie Dale, PhD
Washington University in St. Louis

Promoting Safety and Well-being among Sheet Metal Worker Women through Mentoring
Marissa Baker, PhD
University of Washington

Reactive Chemical Systems: Part B—Developing Data-Driven Interventions
Dhimiter Bello, ScD, MSc
Anila Bello, ScD
University of Massachusetts Lowell

2019-2024 INTERNAL

Communications, Outreach and Education Core
Bill Wright

Construction Industry Data and Statistical Core
Amber Trueblood, DrPH

Manufactured Nanomaterials in Construction: Evaluating Exposures, Controls and Worker Training
Gavin West, MPH

Prevention through Augmented Pre-Task Planning
Babak Memarian, PhD

Research to Practice (r2p) Core
Jessica Bunting, MPH

Safety Climate-Safety Management Information System (SC-SMIS)
Linda Goldenhar, PhD

SMALL STUDY PROJECTS

A practical model for measuring and mitigating safety hazards generated by using UASs in construction
Yelda Turkan, PhD
Orgon State University

Assessment of construction workers' mental health to improve wellbeing
Mohammed S. Hashem M. Mehany, PhD
Colorado State University

Development of rule-based safety checking system for autonomous heavy construction equipment
Kyungki Kim, PhD
University of Nebraska Lincoln

Effects of subcontracting on construction injuries
Peter Philips, PhD
University of Utah

Improving the assessment of noise exposure and warning signal audibility on construction sites
Nikolina Samardzic, PhD
Lawrence Technological University

SMALL STUDY PROJECTS
(cont.)

Leveraging immersive virtual technology for job hazard analysis
Zia Din, PhD
University of Houston

Physiological strain of outdoor construction workers in the southwest of US: A preliminary study
Fabiano Amorim, PhD
University of New Mexico

Safety challenges of UAV integration in the construction industry: Focusing on workers at heights
Idris Jeelani, PhD, MS
University of Florida

Safety meetings in small construction companies
Joseph Allen, PhD
University of Utah

SETU: A smartphone-based training for worker safety in excavation trenching
Erica Cochran Hameen, PhD
Carnegie Mellon University

Sheet Metal & HVAC safety intervention adoption and best practices
Kenneth Sullivan, PhD
Arizona State University

Using Building Information Modeling (BIM) for job hazard analysis of retrofit buildings
Mohammad Gharipour, PhD
Morgan State University

Using community-based organizations and partnerships to enhance reach and engagement of small construction establishments
Sue Ann Sarpy, PhD, MS
Sarpy and Associates, LLC

Using immersive storytelling to create engagement and motivation during fall prevention training
Ricardo Eiris, PhD
Michigan Technological University

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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

LABOR ORGANIZATIONS

NABTU 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

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National Institute of Environmental Health Sciences

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ONLINE RESOURCES

cpwr.com — The first stop for information on our research, training, service programs, and related products and resources.

elcosh.org — An online library of safety and health materials for construction workers, employers, researchers, and other stakeholders.

nano.elcosh.org — An inventory of the use of nano-enabled products — those to which nanomaterials have been added or the nano-structure has been altered — in construction. Its goal is to inform workers about these products as a first step to protecting them from hazards.

nanosds.elcosh.org — This tool is designed to help manufacturers, distributors, and importers of construction products containing nanomaterials evaluate and improve their safety data sheets (SDS).

covid.elcosh.org —The COVID-19 Construction Clearinghouse offers a central resource for construction employers and workers to find the latest research, guidance documents, training and other resources to help prevent the spread of COVID-19.

covidcpwr.org —This free Planing Tool takes you step-by-step through developing your plan to protect employees from and prevent the spread of COVID-19, including what to consider when conducting a job hazard analysis, selecting appropriate controls, screening workers and visitors, training employees, and implementing the plan.

safeconstructionnetwork.org — Use this site to connect with others interested in advancing construction safety & health, uncover new resources or share your own, and identify new research or community partners.

bestbuiltplans.org — Provides contractors and workers with practical tools and information to plan for safe materials handling while staying productive and profitable. Access the jobsite planning tool, training resources, and interactive coaching exercises created to reduce manual materials handling (MMH) and prevent sprain and strain injuries.

ecd.cpwrconstructionsolutions.org — An interactive tool for the construction industry that helps predict exposure to workplace hazards using objective exposure measurements.

stopconstructionfalls.com — Visit our website and join the ongoing Campaign to Prevent Falls in Construction.

silica-safe.org — A one-stop source of information on how to prevent a silica hazard and comply with the standard, including a free online planning tool to create a silica control plan.

scsmis.com — Contractors can use the SC-SMIS free of charge to assess their safety climate, select and implement appropriate tools to strengthen it, and engage in continuous safety climate improvement.

cpwrconstructionsolutions.org — Find practical control measures to reduce or eliminate a variety of construction hazards.

safecalc.org — Evaluate the financial impact of a safer solution using this free online calculator.

choosehandsafety.org — Find information on the risks and ways to prevent hand injuries, including what to look for when choosing hand tools and gloves.

btmed.org — Learn about the Building Trades National Medical Screening Program and its goal to provide free medical screenings to construction workers who helped build our nation's nuclear defense sites.

esmartmark.org — Contact your international union to access this site created by NABTU to distribute the Smart Mark training curriculum.

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