HIGHLIGHTS 2007

THE CENTER TO PROTECT WORKERS' RIGHTS

CPWR

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FOREWORD

A construction site is one of the most hazardous places you could find yourself. An average of four construction workers a day suffer a fatal accident on the job and tens of thousands more are injured each year. Thousands more will experience debilitating illnesses later in life from work-related hazardous materials that appeared harmless. Too many of these individuals will never recover and eventually will succumb to a work-related disease.

Fortunately, construction workers have a trusted resource in helping them stay safe and healthy on the job – the Center to Protect Workers' Rights. Since 1990, CPWR has followed its mission to identify the causes of construction safety and health hazards, investigate possible solutions to the problems plaguing workers, then develop and evaluate training to educate workers on safety and health issues.

It is my great pleasure to introduce this overview of the many projects CPWR is managing in our three-pronged efforts of research, training and service. With a great diversity of research projects, the *Highlights 2007* gives a snapshot of each research project in its five-year cycle. Researchers can be involved in any phase of activity, from collecting and analyzing data, to testing interventions or announcing preliminary findings and disseminating results. Much of the research work you will read about is made possible because of our world-class collaborators in academia, government and industry. They form our research partners and serve as thoughtful advocates for safe working conditions on construction sites.

The *Highlights 2007* also profiles our training programs, both specialty programs such as disaster relief and environmental training to general safety training. The staff of CPWR's training department has developed a network of trainers: 80 Master Trainers this year trained 3,200 Outreach Instructors. It is these instructors who will bring critical safety and health information to the hundreds of thousands of construction workers in the building trades. Any one of these dedicated men and women could very well be responsible for saving a life, although they may never know it – or get the credit. Let me thank them now for giving workers the tools to stay safe on the job.

Even the best research remains nothing more than pure knowledge if it is not communicated to the people who can put it to use. CPWR develops materials for workers, contractors and industry stakeholders to use, such as educational DVDs, our information-rich websites and our popular Hazard Alert cards. In recent years, our outreach to construction workers who worked at Department of Energy nuclear sites has helped identify people at risk for job-related (and unusual) diseases. For those who have been diagnosed with diseases such as radiation-induced cancer caused by working near radioactive material, we have helped these workers access medical services and the federal compensation system devised to treat these illnesses. We seek justice for these workers long after their service to this nation has ended.

We look toward 2007 with a continued sense of mission as we pursue efforts to identify interventions to reduce construction safety and health hazards, provide training to workers, and disseminate our findings to the people who need it most – the men and women in the building and construction trades.

Edward C. Sullivan, President
Building and Construction Trades Department, AFL-CIO,
and The Center to Protect Workers' Rights

January 2007

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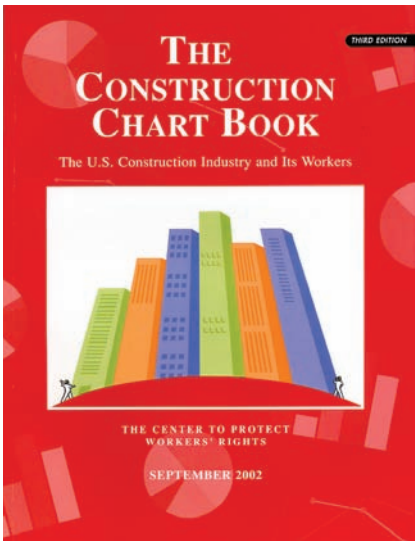
Statistical Research

CPWR and cooperating researchers use statistics to identify trends in occupational injuries and illnesses among construction workers, characterize the construction industry and workforce, and the impact of changing industry and demographics on construction safety and health. CPWR's Data Center staff is constantly responding to requests for data from government policymakers, unions, and industry stakeholders. The director, Xiuwen (Sue) Dong, DrPH, has been working with the Bureau of Labor Statistics staff and other government researchers to seek improved safety and health surveillance data for construction research.

Safety and Health Surveillance

The Data Center analyzes statistics from the Bureau of Labor Statistics, the Census Bureau, the National Institute for Occupational Safety and Health, the National Center for Health Statistics, workers' compensation programs, and other sources.



An outgrowth of this continuing research, the fourth edition of *The Construction Chart Book: The U.S. Construction Industry and Its Workers* will be published in the fall of 2007. This unique reference book, first published in 1997, is the leading reference of its kind for the industry. The new edition will not only cover the industry's demographics, economics, and safety and health issues, and discuss data sources and limitations, but it also will expand with more topics and detailed statistics, including:

- Effects of the North American Industry Classification System (NAICS) and other data system changes on safety and health statistics
- Job openings, hires, and separations
- Foreign-born workers/immigrants
- Time use and hours worked
- Injury rates by demographic, employment category (age, race/ethnicity, foreign-born, size, length of service), and state
- Costs of occupational injuries by construction industry and occupation
- Hazards and work-related illnesses, selected states

Hispanic Construction Workers

Continuing research focuses on workplace safety, health services for work-related injuries, costs of health care, and sources of payment for health care among this rapidly growing workforce in construction. The goal is to identify disparity between Hispanics and other population groups and factors underlying the disparity in order to improve safety and health of this worker group.

Economics of Safety and Health

Costs of occupational injuries in construction

Data Center staff continue to work with the Pacific Institute for Research & Evaluation to estimate costs of injuries and illnesses in construction using workers' compensation data and other data sources.

Construction Economics Research Network

The Economics Research Network, originated by CPWR in 1994 with former Secretary of Labor John W. Dunlop, meets twice a year. The network, now chaired by David Weil, PhD, of the Kennedy School of Government and Boston University, draws 20 labor and health researchers from universities, government, and the private sector to examine economic effects on construction worker safety and health. Dale Belman, PhD, Michigan State University, coordinates the meetings.

Analyses of DOE Injury Data

A pilot study undertaken by James Beavers, PhD, of the University of Tennessee will evaluate data entry and coding practices, quality and completeness of injury and incident data contained in the U.S. Department of Energy (DOE) Comprehensive Accident/Incident Reporting and Recordkeeping System (CAIRS), to which the investigators have been granted access. Investigators will compare DOE maintenance and construction operations for different construction occupations. Researchers will assess whether the data set contains the necessary information to draw conclusions about the causes of construction injuries, as well as situational/organizational circumstances that contribute to the risk of injury on DOE sites.

RESEARCH

Traumatic Injuries Research

Injuries at work killed more than 1,186 construction workers in 2005; for at least a decade, falls have caused about 30 percent of the deaths.

Falls

Prevention of falls from ladders

Melissa Perry, ScD, of the Harvard School of Public Health and Gordon Smith of the Liberty Mutual Research Institute for Safety have been analyzing data from the Bureau of Labor Statistics, the CDC, and other federal agencies to zero in on the causes of falls from ladders. Although ladders are one of the oldest and most common tools in construction, they're still a major injury hazard. Perry and Smith have used the government data to develop a detailed questionnaire to interview workers who are injured using ladders. The goal is to work with union leaders, safety engineers, and others to reduce ladder-related hazards through both supervisor training and task redesign or task substitution.

Analyses

CPWR is analyzing causes of death involving heavy equipment in excavations, deaths involving dump trucks, and fires and explosions on construction sites.

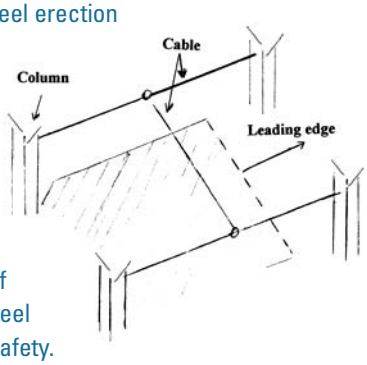
Ladder safety campaign: "Don't Fall for It"

The incidence of falls from ladders in the construction industry is an important public health problem that needs attention. Despite great safety advancements in the construction industry, ladder safety is still overlooked by far too many even though ladders are one of the most common pieces of equipment in construction. Fatalities from ladder falls are entirely preventable, yet they are increasing. Over the last 10 years (1995-2005), ladder-related construction fatalities in the United States increased 25 percent according to the Bureau of Labor Statistics. Of the 141 fatalities involving ladders in 2005, 56 percent occurred in the construction industry.

Since 2003, CPWR has been developing materials for a pilot research and marketing campaign to help reduce injuries in construction. Janie Gittleman, associate director of Safety and Health Research, MRP, PhD, working with the New Jersey Building and Construction Trades Council and the New Jersey Department of Health and Senior Services, developed a DVD and four tip sheets about ladder safety for construction workers. The 10-minute DVD, "Don't Fall for It," mixes interviews with survivors of ladder falls (or victims' survivors) and information about safe procedures. Between June of 2005 and June 2006, nearly 500 construction workers across the construction

Leading-edge fall protection system for decking

Michael McCann, CPWR director of safety research, is working with the Ironworkers Union and contractors to produce a 13-minute DVD and workbook on a new fall protection system for ironworkers installing decking. Ironworkers have been reluctant to use personal fall-arrest systems when installing a deck, the support for a floor, for fear that harness lanyards attached to an anchor below shoulder level could get tangled and cause their own safety problems. And, with anchors below shoulder level, there was the chance a worker would hit the deck below in a fall. In an evaluation by CPWR and Innovative Safety, an Avon, Conn.-based consulting firm, the new leading edge fall protection system, which attaches to cables seven feet above the decking, has stopped falls and ironworkers were able to rescue themselves. The researchers will evaluate how well the new training materials enable a steel erection contractor to implement the fall-arrest system in a pilot intervention. Partners include The Association of Union Constructors and the developers of the system, Capco Steel Inc. and Innovative Safety.



trades in New Jersey were shown the Don't Fall For It DVD and given a short pre-test and post-test to assess knowledge, attitude and behavior regarding ladder safety. The tests yielded interesting results: Participants had significant changes in knowledge, attitude, and behavior in the desired direction on survey questions after viewing the educational DVD. Positive results in retention were seen even one month after training via telephone surveys, which tracked the transference of relevant information on ladder safety. Younger workers reported significantly fewer safe baseline behaviors than older workers, and workers who had had a previous fall tended to report using ladders less safely than those who had not fallen, suggesting that younger workers and those with prior fall histories may benefit most from the film.

The results of the pilot study confirmed that a short educational film presenting easy-to-understand safety tips and emotional appeals from real workers and their families, reinforced by fact sheets, can have a powerful impact on intended safety practices. Next steps on this project will be to conduct the intervention on a broader scale in several states (Conn., R.I., Mass., and N.Y.), to incorporate the training into the OSHA 500 Courses taught nationwide, and to conduct workgroup meetings with small residential employers to assess effectiveness for use on residential construction sites.

Nail Guns

In recent years, researchers in Washington University and at Duke University have documented a growing number of injuries caused by the use of pneumatic nail guns in wood-frame residential construction. The tools are easy to use and are often given to relatively unskilled workers, placing apprentice carpenters at particularly high risk. Hester Lipscomb, PhD, of Duke University, is approaching the problem in several ways. She is working with the Carpenters District Council of Greater St. Louis and vicinity, home-builders associations in St. Louis and S. Illinois, and two affiliated training schools. Information is being collected from apprentices on their use of nail guns, plus their training and any injuries. James Nolan, Local 2119, and Dennis Patterson, Local 1310, collect questionnaire data and interview injured apprentices in detail. In addition, the project is assessing the effects of a May 2003 voluntary industry standard (American National Standards Institute) – it calls for shipping framing nailers with safer sequential triggers – by monitoring the types of tools carpenters use, contractors' purchasing decisions and policies, and injury rates. Preliminary findings show that injury rates among apprentices are higher than previously thought; nearly half of apprentices have at least one nail-gun injury before completing the four-year training program. Workers with the least carpentry experience and no training are at greatest risk; injury rates are twice as high with use of the more common contact-trip trigger, even after taking into account training and experience. The data will be used to provide feedback to the International Staple Nail and Tool Association about safety materials included in tool packaging. At the same time, the research team is comparing the productivity of the two types of triggers when used by experienced journeymen.

Fall prevention training for residential carpenters

In another approach to the persistent problem of falls, researchers at Washington University School of Medicine, with the St. Louis Carpenters Joint Apprenticeship Training Program, are assessing fall-protection training in the four-year apprenticeship program. The researchers are analyzing injury data and, with apprenticeship instructors, are reviewing the curriculum. Based on results from focus groups of apprentices, Bradley Evanoff, MD, MPH, and the others are developing questionnaires for a worksite survey on knowledge, attitudes, and barriers to fall-prevention on the job. In addition, experienced carpenters are auditing safety practices on worksites. The findings, with input from contractors, will be used to direct changes in training. After any changes are implemented, the effects on attitudes and behavior will be assessed. Other participants in the project are the Carpenters District Council of Greater St. Louis and Vicinity; Hester Lipscomb, Duke University Medical Center; and Roz Sherman Voellinger, a labor educator at the University of Missouri St. Louis.

Safety Training and Safety Campaigns across Three Regions

The Plumbers and Pipefitters Union (UA) is helping Peter Chen, PhD, and John Rosecrance, PhD, of Colorado State University to find new ways to improve construction safety and then spread the word. First, Chen, a psychologist, and Rosecrance, a physical therapist and expert in ergonomics, and their team are identifying key barriers to safety and implementing new training to address them. With UA locals 208 (in Colorado), 420 (Pennsylvania), and 290 (Oregon), contractor associations, and insurers, the researchers identified barriers that are organizational and psychological, involving workers and management. The barriers include a lack of a safety climate, poor leadership skills, a lack of

recognition of employees' ability to contribute safety solutions, poor safety communication techniques, and conflict between the pressures of work and family. In 2006, researchers administered final pilot versions of three training modules to UA apprentices and later conducted focus groups with stewards on ways to best disseminate safety messages to workers. The research team is developing strategies to spread findings on psychological safety research and best practices throughout the construction industry. Using those strategies, the team later will develop, implement, and evaluate the effectiveness of a new communications campaign. The intent is to benefit researchers, contractors, insurers, managers, and workers and their families in all parts of the industry. Partners include Pinnacol Assurance, the largest workers' compensation insurer in Colorado; Liberty Mutual Research Center for Safety; Associated General Contractors of Colorado; and the Mechanical Contractors Association of Colorado, Oregon, and Eastern Pennsylvania.

NIOSH Collaborations

CPWR has been collaborating with NIOSH research groups on a number of diverse projects. Ted Scharf of Division of Applied Research and Technology in Cincinnati and Bill Wiehagen of Pittsburgh Research Laboratory (PRL) are working with CPWR on the research projects, *Hazard Recognition: Preventing Falls and Close Calls and Construction Site Ladder Exercise*. Ron Repman of the District Council of Northern New Jersey Ironworker Training Program is also a partner on that project. Chris Pan of the Division of Safety Research in Morgantown, W. Va., is conducting research on machinery safety, fall protection and prevention, and special technology development for aerial lifts. Jim Cawley of PRL is developing a protocol for testing crane proximity warning alarms to alert crane operators to the presence of energized overhead power lines. Emmett Russell, safety director of the International Union of Operating Engineers (IUOE), is also involved in Cawley's joint project with CPWR; CPWR and IUOE have conducted interviews with crane operators using proximity alarms.

Design for Equipment and Process Safety in Construction

The Hazard Information Foundation, Inc. (HIFI) took a practical approach to reducing construction hazards by defining five basic principles for professional engineers to aid in eliminating or controlling certain construction hazards. The Washington Group International has committed to train 1,800 of its engineers and procurement staff globally using these principles. To mainstream these safety concepts for construction equipment and facility planning, McGraw Hill will be publishing the book *Construction Safety Engineering Principles*, available in January 2007, that includes 50 examples of applications of safer design. Development of seminars and online training sessions on these principles is underway to supplement education in this exciting new direction of construction safety.

Heavy Equipment

ROLLOVER PROTECTIVE STRUCTURES (ROPSs). With the International Union of Operating Engineers, CPWR is helping to draft an OSHA safety standard for ROPS and seatbelt use on compactors/rollers. The union and the Association of Equipment Manufacturers in 2005 presented results of a CPWR small study to OSHA's Advisory Committee on Construction Occupational Safety and Health. The Advisory Committee on Construction Safety and Health (ACCSH) agreed to set up a workgroup on the issues.

SLIPS, TRIPS, AND FALLS. At the request of the Teamsters Union, CPWR has been holding focus groups with Ready Mixed concrete truck drivers about the hazards, in order to develop recommendations for improvements in procedures and truck designs. This was a follow-up to the CPWR small study, *Ready Mixed Concrete Truck Drivers: Work-Related Hazards and Recommendations for Controls.*

Safety Practices and Immigrant Construction Workers

A new project, led by Bruce Nissen, PhD, of Florida International University, will compare safety practices and jobsite safety and health conditions faced by immigrant and non-immigrant construction workers: Does the length of time in the U.S., construction experience, union and immigration status correlate with safety outcomes? The researchers will survey 200 Hispanic immigrant construction workers in Miami-Dade County, Fla., and 100 non-immigrant counterparts, on their workplace safety and health practices. The study will collect data on safety and health training, use of personal protective equipment on the job, safe (or unsafe) employer practices, and recent workplace accidents serious enough to lose at least a day's work. Employer cooperation is not required for this survey, to avoid a self-selection bias toward respondents whose employers are confident of their own safety practices. Results will pinpoint the primary factors that influence immigrant construction worker safety and health, which is an important step toward improving future interventions to prevent injuries.

Disease Monitoring and Prevention Research

Work-related disease is clearly a hazard in construction, where workers are exposed to dusts containing asbestos, silica, and other life-threatening toxins, plus heavy metals like cadmium, lead, and others. Add in solvents and biological agents ranging from bacteria to molds to viruses and it's easy to see how statistical studies based on death reports show some trades at high risk for lung disease and other illnesses.

Yet, the occurrence of work-related illness is difficult to gauge because it is difficult to document construction workers' exposures. Consider that a bricklayer could be exposed to welding fumes as a bystander. The lag between many exposures and the diagnoses of diseases, including cancers and nervous system disorders, compounds the problem.

Lung Disease in Sheet Metal Workers

CPWR, in partnership with John Dement, PhD, of the Duke University Medical Center and the Sheet Metal Occupational Health Institute, is using medical screenings and work histories of more than 17,000 union members to study risk factors for lung disease. Over the past 20 years the study has documented the extent of asbestos-related disease among sheet metal workers, and now is focusing on other lung diseases, particularly chronic obstructive pulmonary disease. The analysis will determine what factors in sheet metal work are associated with lung disease and identify the most important respiratory hazards for future interventions.

Cause of Death in Sheet Metal Workers

CPWR, again partnering with Duke University Medical Center, is investigating the cause of death for 10,000 sheet metal workers who participated in the early years of the screening program described above. The study will identify important work-related risk factors for lung cancer and chronic obstructive pulmonary disease, as well as document the risk of death from other cancers, heart disease, and a range of other causes. Once risk factors are identified, medical screening and medical treatment can be recommended for workers at high risk of cancer and other serious diseases.

Task-Based Controls

Pam Susi, MSPH, of CPWR has been working with university and government researchers and unions for more than a decade to measure and reduce worker exposures to jobsite health hazards, such as dusts, fumes and noise (*see* page 6). A changing worksite and other factors make estimation or measurement of exposures difficult. A CPWR-NIOSH Engineering and Work Practices Controls Work Group has met since 1994 to develop methods to accurately measure the hazards/exposures and to evaluate potential protections for workers. Generally, engineering protections or changes in work practices are preferable to workers wearing personal protective equipment.

Exposure data analysis

CPWR continues to work with the Harvard School of Public Health, Hunter College, and the Bricklayers and the International Masonry Institute, as well as the Plumbers and Pipefitters Unions, to measure possible worker exposures to silica dusts, welding fumes, manganese, and hexavalent chromium, while further refining survey/research methods.

Researchers at the University of North Carolina are using those exposure data to determine the extent to which workers are exposed to hazardous agents and the effects engineering controls have on reducing exposures. To assess controls for manganese and total welding fume, CPWR, with the Ohio Building and Construction Trades Foundation and the Plumbers and Pipefitters Union, has been comparing exposures with and without local-exhaust ventilation and two types of protective hoods. Silica dust from rock and concrete can cause silicosis, an incurable lung disease.

Controlling Silica and Noise Exposures for Concrete Cutting and Drilling

Susan Woskie, PhD, and Susan Shepherd, ScD, of the University of Massachusetts, Lowell, have partnered with the New England Laborers Training Center and the Operating Engineers Local 4 Training Center to measure exposures to silica, noise and dust. UMass Lowell researchers are currently testing the effectiveness of controls such as local-exhaust ventilation and water sprays on power hand tools to reduce dust and silica as well as vibration-reducing saw blades to reduce noise at the Laborers Training Center and at jobsites around Massachusetts. Silica in rock and concrete can cause silicosis, an incurable lung disease, and is associated with other respiratory diseases. Noise-induced hearing loss is common in construction and is entirely preventable.

Tools and programs for improving occupational health conditions in construction (TAPS)

Mark Goldberg, PhD, of Hunter College (City University of New York), Robert Herrick, SD, of the Harvard School of Public Health, John Meeker, PhD, of the University of Michigan, the Ohio Building and Construction Trades Council, and the International Masonry Institute are testing tools for controlling exposure to welding fumes and silica dust, while also addressing hexavalent chromium exposure among tile and terrazzo workers. The team has collected cement samples from throughout the United States to measure the range of hexavalent chromium in Portland cement. Hexavalent chromium is associated with lung cancer, occupational asthma, and skin problems so severe that some workers are forced to leave the trades.

Barriers to reducing bricklayers' silica exposures

Once controls are developed, researchers must work with contractors and workers to overcome any barriers to their use. As part of the TAPS project, researchers at Hunter College are working with CPWR, the Bricklayers Union, International Masonry Institute, and Masonry Contractors of New Jersey to find ways to encourage contractors to use engineering controls (such as ventilation) to protect workers from silica. One approach is a planned certification program for contractors who agree to use engineering controls as part of a comprehensive silica control program.

Musculoskeletal Disorders and Ergonomics Research

The physically demanding nature of construction work, including lifting of heavy materials, the need to work in awkward and static postures, and tasks that require repetitive motion, helps explain why musculoskeletal disorders (MSDs) – strains and sprains – are the most common type of work-related injury in the industry. MSDs account for one-quarter of injuries and illnesses requiring time off to recover.

Masonry Ergonomics

Masons and mason tenders (assistants), who lift as much as 6,000 pounds of block in a day, suffer a high rate of work-related MSDs, especially low-back pain. Those injuries, in turn, can cause long absences from work. Medical and safety researchers at the Universities of Iowa and Oregon are identifying tools, materials, and work practices that could reduce the risks for MSDs in masonry. The research involves documenting how effective some approaches are and how decisions are made by contractors and workers whether to use them. Focus groups with masons from the northwestern, north-central, and eastern U.S. identified best practices, but showed that their use varies by type of work, by region and climate, and even by collective bargaining agreement. The researchers are meeting with masons and contractors to pursue the questions before compiling a list of best practices to promote. At the same time, the University of Iowa biomechanics lab is developing a model to predict back injury from manual materials handling that will be used to show changes in back movements with the use of such aids as scaffolding and material platforms that alter the height of mortar and block and reduce the need for lifting and bending.

New Methods for Overhead Drilling

Drilling overhead into concrete can take a toll on workers' shoulders, necks, and lower backs because of the heavy weight that must be supported and the awkward posture required for long periods. David Rempel, MD, Demetra Dalamagas, and Billy Gibbons of the University of California, San Francisco surveyed proposed and existing designs, including some built by construction workers. Two designs were chosen to manufacture for field trials, an inverted drill press and a foot-lever drill press. The researchers are working with electrical, mechanical, and sheet metal contractors, an architect, and project owner, plus members of the Electrical Workers and Sheet Metal Workers Unions in Oregon and Washington. Workers have been trying the devices and making suggestions for improvements, in terms of usability, fatigue levels, and basic design. Based on feedback from workers, several new designs have been built. A final, third generation design is being studied to compare body posture, muscle fatigue, hand vibration, and productivity

between use of the new drilling device and the conventional overhead drilling methods.

Work-related Disease and MSD among Roofers

CPWR Medical Director Laura Welch, MD, and the Roofers International Union are studying how work-related injuries and illnesses lead to disability, retirement, or job changes for roofers. The study shows a high rate of illnesses and musculoskeletal disorders, some limits on work that can be done afterward, and financial effects of the illnesses and lost worktime.

After the initial interviews, researchers found 69 percent of participating roofers said they had at least one medical condition or MSD. Low-back/sciatica problems were the most common health problem. MSDs accounted for seven of the 10 most reported health problems. Respiratory problems were higher than normal: 15 percent of roofers reported asthma or chronic obstructive pulmonary disease, compared to 9 percent of the overall U.S. population.

One year later, CPWR researchers interviewed 773 of the original 979; about 10 percent of these roofers had stopped working. Sixty percent of the roofers who stopped work did so because of a health problem. During those interviews, researchers found nearly 75 percent of these roofers had a health condition or an MSD.

Researchers determined that having an MSD made a worker eight times more likely to leave roofing compared to a worker without this health problem. In fact, having a medical condition made leaving seven times more likely compared to roofers with no MSD or health condition. Roofers who left work for a health-related reason were more likely to have financial problems than the roofers who stayed at work. As the roofers got older they were more likely to leave work due to a health-related reason.

The NIOSH-funded research continues to study the personal, financial, and social effects of work-related injuries and illnesses. CPWR plans to use this study to make recommendations about job accommodations and job design, to keep roofers working longer without injury and disability.

Encouraging ergonomic change

Marc Weinstein, PhD, and Jennifer Hess, PhD, at the University of Oregon's Labor Education and Research Center, are developing a model diffusion strategy to promote the use of ergonomic innovations in construction. They have been working with tool vendors, contractors, architects, engineers, and members of building trades unions in Oregon and Washington to identify tools, materials, and work practices that can be introduced on worksites to reduce the risks of sprains and strains. In the first year, the group evaluated penetration and diffusion of an extended-handle screw gun, a tool that allows carpenters to work on decking, subflooring, and forms construction in a standing posture. In 2006, the researchers expanded their work to develop ways to promote the use of ergonomic improvements in masonry. In addition to the Willamette Carpenters Training Center, project partners include the Construction Ergonomics Initiative, the Greater Portland Construction Partnership, and the Laborers-AGC Education and Training Fund.

Hearing Conservation Research

By age 50, more than half the construction workforce has experienced work-related hearing loss. Hearing loss impairs quality of life (and health) on and off the job, and it can increase the risk of injuries, as when a worker can't hear approaching vehicles or warning signals. OSHA's standard for construction is not protective enough, allowing noise levels that are dangerously high, so labor and management must cooperate to protect workers.

Hearing Loss Prevention in Road Construction

In the spring of 2004, Washington state's Division of Occupational Safety and Health (DOSH) began a "noise in road construction" program to reduce construction workers' hearing loss. This initiative included both consultation and targeted enforcement. William Daniell, MD, MPH, of the University of Washington, is working with DOSH inspectors to evaluate the impact of their noise-related inspections. Inspectors record findings about noise monitoring, controls, training, use of hearing protection, hearing tests, and the type of work done on the site using a standard form, which researchers analyze in conjunction with other DOSH records. In 2007, UW researchers will conduct a telephone survey of road construction companies to evaluate current practices after two years of the DOSH initiative.

Gas-powered Chop Saw Noise Levels (Preliminary Results)

EQUIPMENT	NOISE LEVEL	
Saw motor only (from pilot)	89 dBA	NA
BLADE TYPE	FREE-RUNNING	CUTTING CONCRETE PIPE
Gulleted Carbide	107 dBA	102 dBA
Turbo Carbide	100 dBA	99 dBA
Carbide Blade with holes	110 dBA	102 dBA
Gulleted Diamond	113 dBA	104 dBA

Permissible exposure limit (PEL) as determined by OSHA is 90 dBA over an 8-hour period or 110 dBA for 15 minutes a day. The levels in the above chart were measured over a period of 1 to 7 minutes.

Noise Control in Concrete Cutting

The University of Massachusetts, Lowell, is working with the Laborers and Operating Engineers unions to evaluate noise controls for small powered tools, such as low noise saw blades for portable concrete (chop) saws, other controls for jackhammers, and on heavy equipment, such as rock crushers (*see* TAPS, page 6).

RESEARCH

Pilot Research Grants: Small Studies

The Small Studies Program provides a unique and integral means of helping workers stay safe as it helps define jobsite problems, quickly initiate research and identify needed policy changes or potential interventions. These studies also can be used to determine whether a large-scale investigation is warranted. Each study is expected to last from one to two years and is funded at a maximum of $30,000. Funding is available to staff of hospitals, universities, and other public and private sector institutions and organizations, such as construction unions and employer groups. Awards are determined after reviews by CPWR staff and outside experts, including members of CPWR's Technical Advisory Board and researchers from the National Institute for Occupational Safety and Health (NIOSH), the organization that has supported the program since its inception in 1993. A study may be proposed at any time.

Proposals are sought for studies that encourage innovation, develop interventions, use and improve data sets, evaluate effectiveness of interventions, and show better ways to disseminate information about construction safety and health.

In the 13 years of its operation, the Small Studies Program has brought new investigators into the field of construction safety and health research and has encouraged investigations into new and innovative areas. The program was designed to respond to opportunistic situations and has accomplished fast turnarounds on study approval to initiate research quickly.

In total, more than 110 letters of intent have been received and more than 50 studies have been approved and funded. The funded projects have provided an impressive diversity in terms of scientific aims, the types of applicant organizations, and geographic representation. Not only have new investigators emerged, several new partnerships involving non-academic and academic investigators have been created. New prevention measures have been proposed and a broad range of construction activities and prevention and control methods addressed.

Examples of Completed and Current Studies

Dr. Christine Oliver and Heidi Miracle-McMahill, analyzed responses to questionnaires used on Boston's Big Dig in *Asthma in Heavy and Highway Construction Workers Exposed to Silica*. The report in 2003 found that, of 300 construction workers believed to be exposed to silica on the massive project, more than 25 percent reported symptoms consistent with asthma. Yet the workers'

responses suggested the asthma had gone largely undiagnosed and untreated.

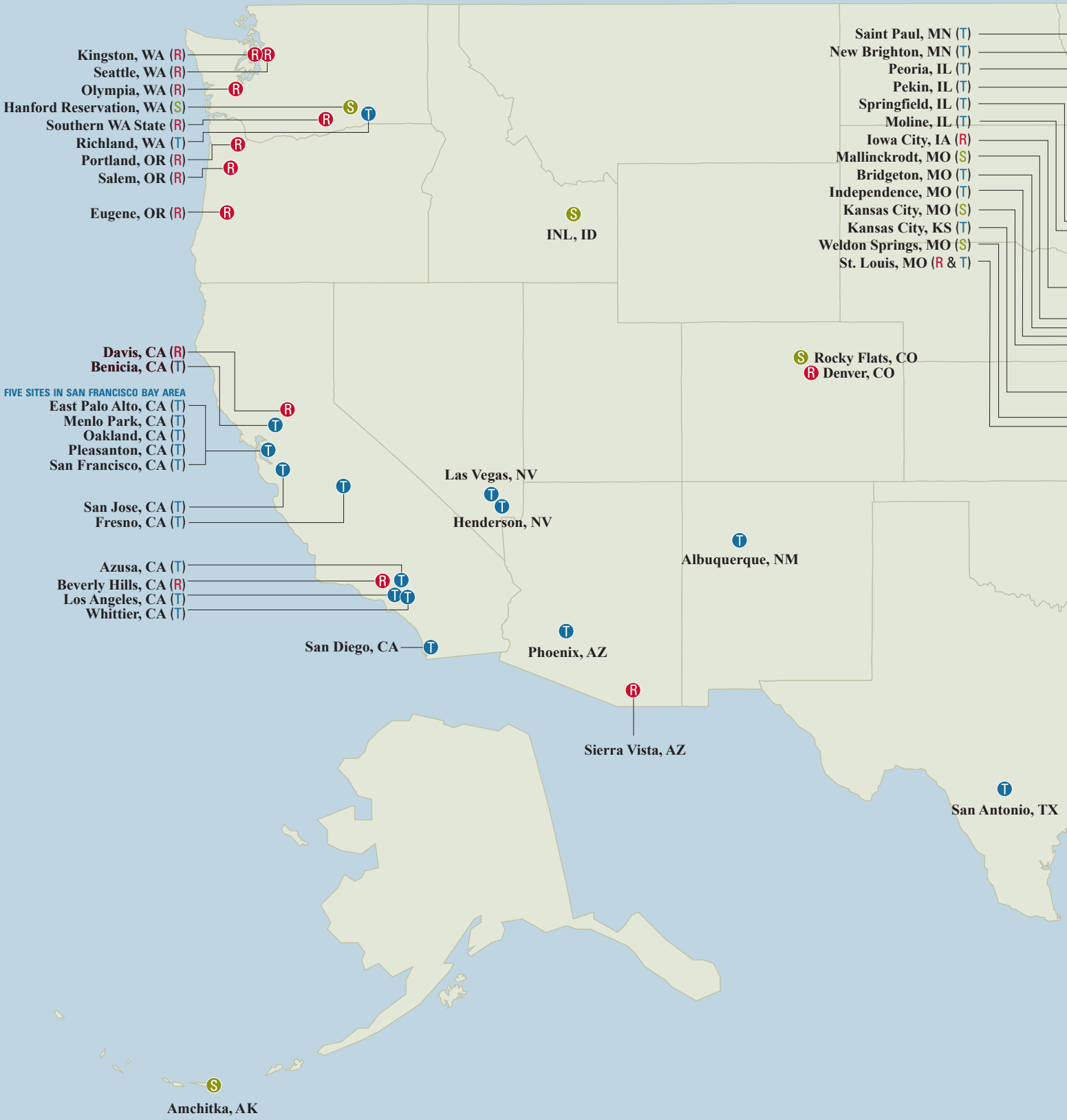
Dr. William Heitbrink and Scott Collingwood reported their preliminary recommendations in 2005 for a set-up to protect tuckpointers, who remove old mortar from masonry, from silica dust. The authors attached an industrial vacuum cleaner, hose, and shroud to a grinder. While their research continued, they thought the findings were important and circulated them early, as "Protecting Tuckpointing Workers from Silica Dust: Draft Recommendations for a Ventilated Grinder." Preliminary data will also help select adequately performing vacuums for silica dust control. Heitbrink also received funding in 2006 to study a water induction nozzle as a dust control for abrasive blasting.

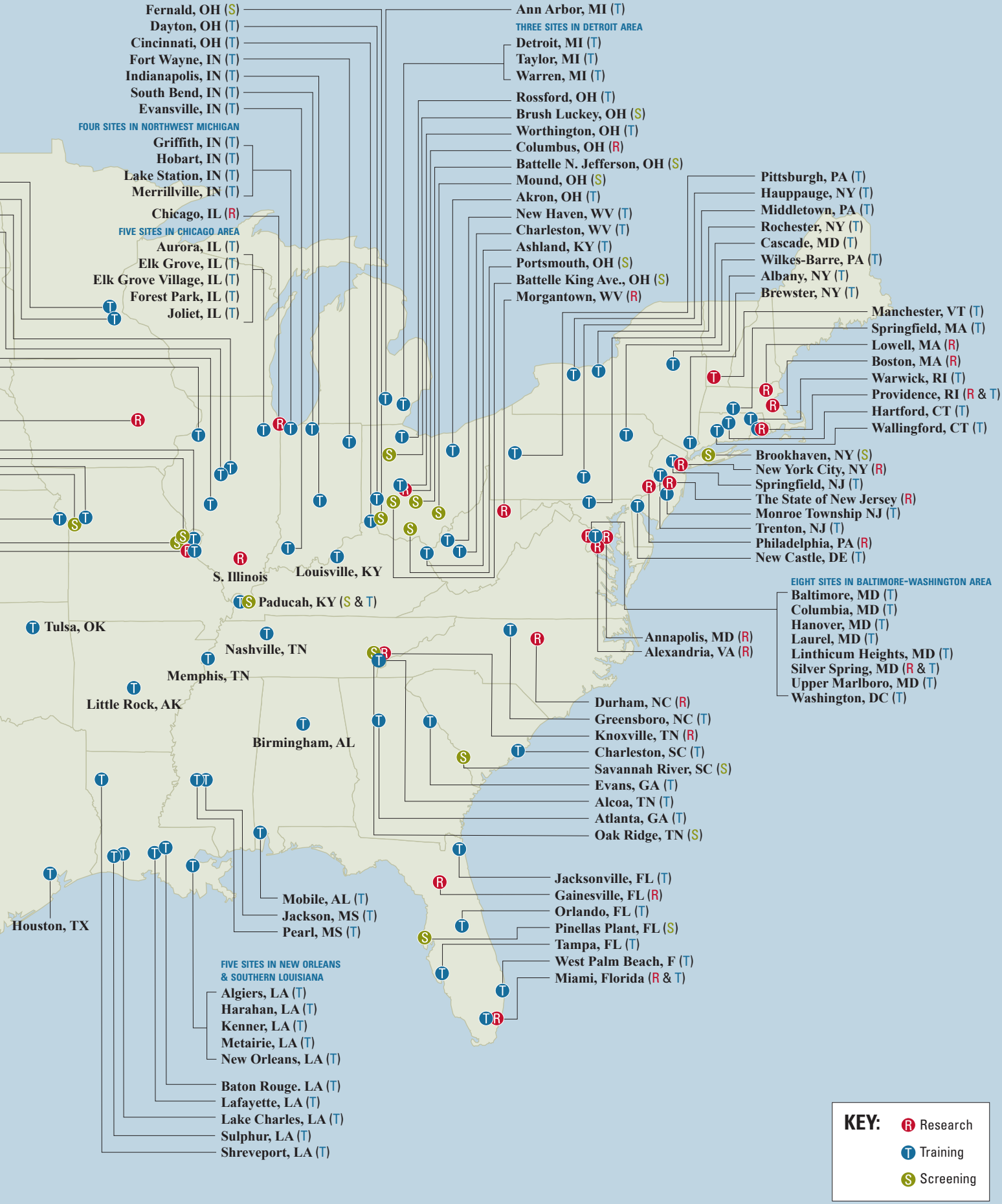
Dr. Ken Silver of East Tennessee State University received funding in 2006 to examine workers' knowledge, attitudes and beliefs on the subjects of genetic susceptibility and testing in relation to workplace exposure to beryllium. Many thousands of nuclear energy and other workers have been exposed to beryllium, which causes a chronic disease that is often fatal and always costly. Genetic tests, soon to be available, promise to provide exposed workers with better information about their individual chances of getting the disease. But genetic information in the workplace can raise difficult ethical, legal and social issues. The study will ask workers and their families about their attitudes and beliefs regarding this kind of testing, using accepted methods of social science.

Selected small studies, 1993-2006

- *Analysis of Surface Slip Resistance of Steel Erection Working/Walking Surface*, Iron Workers International Union and William English, Alva, Fla.
- *An Assessment of Metal Maintenance Workers—Solvent Exposures*, Hunter College, New York, N.Y.
- *Immunocytochemical Analysis of Oncoproteins and Growth Factors in Human Malignant Mesothelioma*, Mount Sinai Medical Center, New York, N.Y.
- *Lyme Disease Prevalence among Construction Workers on Long Island, New York*, State University of New York at Stony Brook and the Building and Construction Trades Council, Nassau and Suffolk Counties, N.Y.
- *The Effects of the Repeal of Various State Prevailing Wage Laws on the Incidence and Severity of Worker Injuries in the Construction Industry*, University of Utah, Salt Lake City, Utah.
- *Reducing Sprains and Strains in Construction through Worker Participation* (focusing on scaffold erection), NIA TNO, The Netherlands.
- *Unsound Conditions: Work-Related Hearing Loss in Construction, 1960-75*, University of Utah, Salt Lake City, Utah.
- *Ready Mixed Concrete Truck Drivers: Work Related Hazards and Recommendations for Controls*. Mount Sinai School of Medicine, N.Y.
- *Asthma in Heavy and Highway Construction Workers Exposed to Silica, Occupational Health Initiatives*, Brookline, Mass.
- *Safety Hazards to Workers in Modular Home Construction, Safety and Health Extension*, West Virginia University, Morgantown, W. Va.
- *Nail Gun Injuries Treated in Emergency Rooms*, Duke University Medical Center, Durham, N.C.
- *Strategies to Prevent Trenching-Related Injuries and Deaths*, University of California, Berkeley.
- *Task Specific Silica Exposure During Concrete Polishing*, Medical College of Ohio, Toledo, Ohio.
- *Construction work organization: Developing a representative survey*, Michigan State University, East Lansing, Mich.

Key Research, Training and DOE Screening Locations, 2006




Fernald, OH (S)
Dayton, OH (T)
Cincinnati, OH (T)
Fort Wayne, IN (T)
Indianapolis, IN (T)
South Bend, IN (T)
Evansville, IN (T)
FOUR SITES IN NORTHWEST MICHIGAN
Griffith, IN (T)
Hobart, IN (T)
Lake Station, IN (T)
Merrillville, IN (T)
Chicago, IL (R)
FIVE SITES IN CHICAGO AREA
Aurora, IL (T)
Elk Grove, IL (T)
Elk Grove Village, IL (T)
Forest Park, IL (T)
Joliet, IL (T)
Ann Arbor, MI (T)
THREE SITES IN DETROIT AREA
Detroit, MI (T)
Taylor, MI (T)
Warren, MI (T)
Rossford, OH (T)
Brush Luckey, OH (S)
Worthington, OH (T)
Columbus, OH (R)
Battelle N. Jefferson, OH (S)
Mound, OH (S)
Akron, OH (T)
New Haven, WV (T)
Charleston, WV (T)
Ashland, KY (T)
Portsmouth, OH (S)
Battelle King Ave., OH (S)
Morgantown, WV (R)
Pittsburgh, PA (T)
Hauppauge, NY (T)
Middletown, PA (T)
Rochester, NY (T)
Cascade, MD (T)
Wilkes-Barre, PA (T)
Albany, NY (T)
Brewster, NY (T)
Manchester, VT (T)
Springfield, MA (T)
Lowell, MA (R)
Boston, MA (R)
Warwick, RI (T)
Providence, RI (R & T)
Hartford, CT (T)
Wallingford, CT (T)
Brookhaven, NY (S)
New York City, NY (R)
Springfield, NJ (T)
The State of New Jersey (R)
Monroe Township NJ (T)
Trenton, NJ (T)
Philadelphia, PA (R)
New Castle, DE (T)
EIGHT SITES IN BALTIMORE-WASHINGTON AREA
Baltimore, MD (T)
Columbia, MD (T)
Hanover, MD (T)
Laurel, MD (T)
Linthicum Heights, MD (T)
Silver Spring, MD (R & T)
Upper Marlboro, MD (T)
Washington, DC (T)
Annapolis, MD (R)
Alexandria, VA (R)
S. Illinois
Louisville, KY
Paducah, KY (S & T)
Tulsa, OK
Nashville, TN
Memphis, TN
Little Rock, AK
Birmingham, AL
Durham, NC (R)
Greensboro, NC (T)
Knoxville, TN (R)
Charleston, SC (T)
Savannah River, SC (S)
Evans, GA (T)
Alcoa, TN (T)
Atlanta, GA (T)
Oak Ridge, TN (S)
Jacksonville, FL (T)
Gainesville, FL (R)
Orlando, FL (T)
Pinellas Plant, FL (S)
Tampa, FL (T)
West Palm Beach, F (T)
Miami, Florida (R & T)
Houston, TX
Mobile, AL (T)
Jackson, MS (T)
Pearl, MS (T)
FIVE SITES IN NEW ORLEANS & SOUTHERN LOUISIANA
Algiers, LA (T)
Harahan, LA (T)
Kenner, LA (T)
Metairie, LA (T)
New Orleans, LA (T)
Baton Rouge. LA (T)
Lafayette, LA (T)
Lake Charles, LA (T)
Sulphur, LA (T)
Shreveport, LA (T)
KEY:
Research
Training
Screening

Training and Disaster Response

Training is a key to improved safety and health on the job – letting workers, trainers, and supervisors know of best practices, including research findings from the CPWR consortium. Courses, many of them hands-on, are delivered to thousands of building trades trainers and workers throughout the United States annually by trainers from CPWR and building trades unions. Development, delivery, and evaluation of training are funded through the National Institute of Environmental Health Sciences (NIEHS) and the National Institute for Occupational Safety and Health (NIOSH).

Disaster Response Training for Construction Workers

After September 11, CPWR worked with the New York City Building Trades Council to protect recovery workers at the World Trade Center site. CPWR worked with Bechtel Corporation to develop the site safety plan in the early days following the disaster. Based on this plan, CPWR's Director of Disaster Response Training Chris Trahan, CIH, developed a three-hour hazard awareness training program for site workers. CPWR sent senior staff to New York City to coordinate worker training efforts. Once the 1,800 construction workers on site had received the training, CPWR evaluated the training to determine where best to use limited resources to prepare safety-and-health training for future disasters.

The DVD and a Network of Trainers

CPWR staff in the training and research departments developed a training program to distribute to instructors nationwide to enable them to immediately begin providing effective safety-and-health training to skilled support personnel in the event of another disaster – be it naturally occurring like a series of tornadoes, or a man-made disaster like a gas explosion. The interactive training program on DVD, *CPWR Disaster Response Safety and Health Training for Construction Workers*, is delivered by authorized instructors and covers hazard recognition, personal protective equipment, decontamination, and the incident command system. The program has been developed and implemented in partnership with OSHA and its Office of Training and Education, NIOSH, the International Association of Fire Fighters and its HazMat Training and Education Department, and NIEHS. Building Trades Master Instructors have trained more than 3,200 Outreach Instructors who are prepared to train local workers. CPWR continues to train trainers, and is coordinating and delivering disaster training to workers across the nation.

Follow-up to Hurricane Katrina

The day after Hurricane Katrina struck the Gulf Coast on Aug. 29, 2005 and devastated much of the region, CPWR staff were contacting trainers to help arrange for safety-and-health training for building trades workers in cleanup and recovery operations. By Sept. 1, after the Building and Construction Trades Department agreed to coordinate worker training in the area for some contractors, CPWR staff identified training sites in Baton Rouge, New Orleans, and elsewhere. At the request of NIEHS, CPWR sent training staff to Louisiana to coordinate training through that state's federal response center. From November 2005 through the end of April 2006, CPWR delivered training for more than 1,500 federal responders and clean-up workers in Louisiana through courses ranging from "Debris Inspector" to "Asbestos Worker."

CPWR has translated to Spanish training presentations and booklets developed by the National Institute of Environmental Health Sciences, which are being distributed and are posted at www.wetp.org and www.cpwr.com.

Minority Worker Training in the Gulf States

CPWR's Kizetta Vaughn has been developing minority worker training in Alabama, Louisiana, and Mississippi for residents of the areas devastated by Hurricane Katrina. Working with the Building and Construction Trades Department, CPWR forged alliances with a building trades center in each state to provide a condensed version of its minority worker curriculum. The goal is to bring trained apprentices into the building trades in the region. In addition to basic construction skills, the course covers job readiness/life skills, hazardous waste worker training, mold remediation awareness, and disaster preparedness. Training began in March 2006 with local affiliates in New Orleans and is ongoing.

Minority Worker Training

CPWR has trained more than 1,200 members of minority groups since 1999 under two programs funded by the National Institute of Environmental Health Sciences and U.S. Environmental Protection Agency.

Minority Worker Training

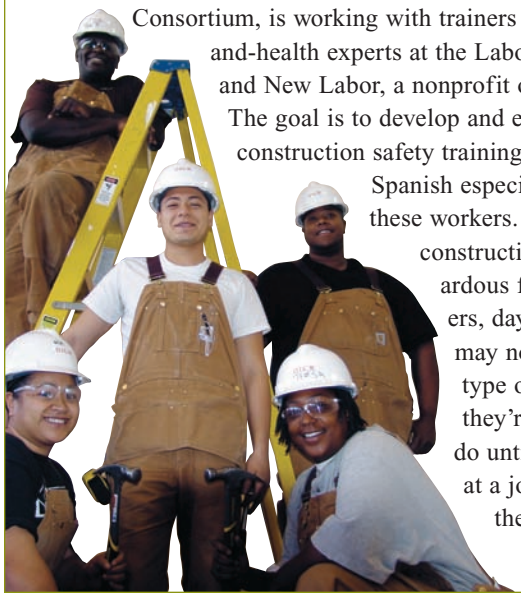
CPWR trains workers in targeted areas in life skills, basic construction skills, and environmental worker courses (asbestos abatement, lead abatement, confined space, and hazardous waste worker). Partners include Building and Construction Trades Councils, the Carpenters Union, plus community colleges and community-based organizations in Baltimore, New Orleans, and Oakland.

EPA Brownfields Worker Training

CPWR prepares residents of federally designated Brownfields Communities to clean up contaminated land and blighted buildings. As part of the preparation, students receive training in life skills, basic construction skills, environmental technologies, and worker training (asbestos abatement, lead abatement, and hazardous waste worker). Also, students receive assistance with job placement. Partners in this activity are Building and Construction Trades Councils, the Carpenters Union, plus community colleges and community-based organizations in Boston, East Palo Alto, Los Angeles, and St. Paul.

Hispanic Day Laborers

Hispanic day laborers in construction are at high risk for work-related injuries for a mix of reasons, one of which is a lack of safety-and-health training. Michele Ochsner, PhD, at the Rutgers University Occupational Training and Education Consortium, is working with trainers and safety-and-health experts at the Laborers' Union and New Labor, a nonprofit organization. The goal is to develop and evaluate a construction safety training program in Spanish especially for these workers. Although construction is hazardous for all workers, day laborers may not know what type of work they're expected to do until they arrive at a job site, and they may have difficulty understanding supervisors' instructions in English, both of which can compound the hazards. Thus, project staff are adapting Smart Mark, the 10-hour OSHA-approved course developed by the construction unions and CPWR (*see* page 17), to the needs of Hispanic day laborers in residential construction. The project has trained a group Hispanic immigrant workers as "peer researchers," who have conducted interviews and led focus groups in central and northern New Jersey to learn about any special curriculum needs, among other things. Formal training was to begin in early 2006 and includes a train-the-trainer program to enable Hispanic day laborers to teach their peers. Partners in the Laborers' Union include the New Jersey Laborers' Health and Safety Fund and Local 1030, in North Bergen.



Evaluating Construction Fall-Prevention Information Transfer in a Telenovela

Telemundo Network LLC, NIOSH, CPWR, and the Hollywood Health and Society project at USC Annenberg's Norman Lear Center are working together to develop and broadcast public service ads for prevention of construction injuries. CPWR also is working with NIOSH to develop a Spanish-language website containing basic construction safety and health information. The Spanish-language ads will appear during "Dame Chocolate," a telenovela that features construction workers, and the website link will appear on the show's home page. These popular media offer an opportunity to reach out to high-risk Hispanic small businesses, construction workers and their families, and the self-employed.

Immigrant Construction Workers: Union and Safety Case Studies


SAVE THE DATE
April 12-13, 2007
National Conference on Immigrant Workers in Construction
Holiday Inn Sacramento Capitol Plaza
Sacramento, California
Is your union organizing or training immigrants?

CPWR is working with University of California at Berkeley's Labor Occupational Health Program and the California State Building Trades Council to identify diverse examples of local programs that interact more effectively with recent immigrants. The construction workforce is transforming rapidly, and this project should inform discussions of ways to respond.

Environmental Training

Since 1999, CPWR has been working with most building trades unions to provide safety-and-health training to thousands of workers annually to ensure that a trained workforce is available at high-hazard Department of Energy and EPA Superfund sites.

The programs are funded by the Department of Energy and the Environmental Protection Agency, but administered by the National Institute of Environmental Health Sciences, a part of the National Institutes of Health. The courses stress hands-on learning – wearing full-body level A suits, using respirators correctly, entering confined spaces safely, using a fall-protection harness. Construction workers and apprentices learn how to recognize hazards and to work safely in environments where there might be asbestos, heavy metals, solvents, or other hazardous materials. Feedback from trainers suggests that the program helps improve training generally throughout the building trades.

The participating unions are the Asbestos Workers, Boilermakers, Bricklayers, Carpenters, Cement Masons, Electrical Workers, Ironworkers, Painters, Plumbers and Pipefitters, Roofers, and Sheet Metal Workers.

DOE Training

CPWR and its union partners trained nearly 5,000 workers and apprentices this year in hazardous waste worker and annual refresher, lead worker and annual refresher, confined space, asbestos worker and annual refresher, OSHA 10- and 30-hour (safety and health), and train the trainer. Much of the training is provided at the Hanford reservation in eastern Washington.

EPA Training

To help prepare about 3,500 construction workers each year for work at Superfund sites, training is provided in hazardous waste cleanup, confined-space safety, and train the trainer programs.

Trainer enhancements

Trainers have been meeting annually since 1999 for lectures and workshops to consider new ways to conduct training in the asbestos, lead, and hazardous-waste remediation courses, some of which must be repeated yearly to maintain worker certification. At the same time, the enhancements are used to update trainers on new construction techniques and changes in regulatory requirements. In October of 2006, CPWR's Don Ellenberger conducted the annual training at the newly opened Kirkland Center at the National Labor College in Silver Spring, Md. Eighty-three trainers from 10 international construction unions attended workshops on CPWR's new supplied-air respiratory equipment, radiological hazards, asbestos analysis, and other health and safety training concerns.

General Safety Training

Electrical safety inspections

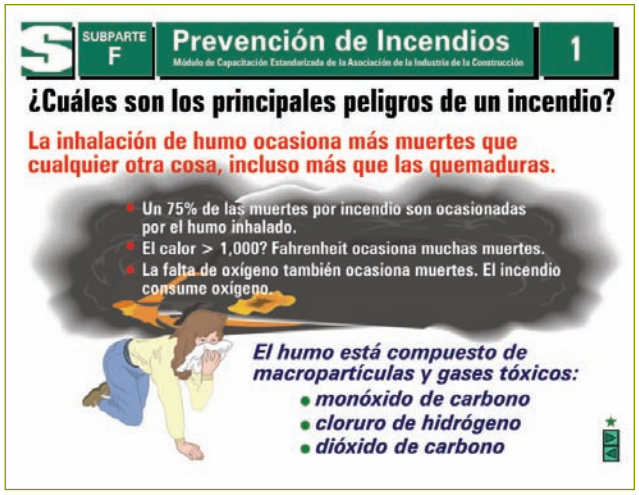
In an attempt to enlist workers to improve safety (and cut costs), West Virginia University Safety and Health Extension will train a union electrician to conduct electrical safety inspections twice weekly on a West Virginia construction site for six months in 2007. The inspection findings will be used by subcontractor foremen who will certify in writing when and how any hazards are corrected. The correction of hazards will be verified in writing by the site superintendent or a representative. This program grew out of a CPWR study which found that inspections by a safety professional with careful follow-up can reduce the number of electrical hazards on a construction site. The earlier study found a problem, however, in the cost of having a safety professional conduct so many inspections. For this new approach, West Virginia University's Safety and Health Extension developed a checklist that is entered into a hand-held electronic device and loaded onto a computer. CPWR is working with the International Brotherhood of Electrical Workers and West Virginia University Safety and Health Extension. The data are to be analyzed in terms of types of hazards found, how often each type of hazard is identified, and how long it takes to fix each one.

Smart Mark

More than 200,000 building trades workers since 1998 have completed this standardized version of the OSHA 10-hour hazard-awareness curriculum for construction workers. The course was developed by CPWR, with construction employers and affiliate unions of the Building and Construction Trades Department. The 13 one-hour modules allow instructors flexibility, depending on the students' needs, as to which topics to cover. Modules include confined spaces, ergonomics, materials handling, and stairways and ladders. OSHA-authorized building trades outreach instructors deliver the course nationwide – in English or Spanish.

National Resource Center for OSHA Training (OSHA Region III Education Center)

The National Resource Center is a U.S. Department of Labor OSHA Training Institute Education Center based at the National Labor College in Silver Spring, Md. CPWR, a partner in the center, uses the facility to train union instructors and members from all around the country. The goal of the National Resource Center since its founding in 1994 is to ensure that construction unions have enough safety-and-health trainers. Construction-related courses cover a wide range of topics, including OSHA 500, confined-space entry, and trenching and excavation. Since 2000, the National Resource Center has trained about 6,700 building trades instructors who are employed by local joint labor-management trusts. The instructors, in turn, train an estimated 120,000 workers annually. Partners include the Building and Construction Trades Department, AFL-CIO, and the Safety and Health Extension, West Virginia University.



Train the Trainer

About 5,000 construction union trainers nationwide have completed the OSHA 500 instructor course on construction safety-and-health regulations. The trainers, who have extensive experience in construction, provide OSHA 10- and 30-hour construction hazard awareness training to 6,000 workers per week. In July 2005, for the first time, CPWR conducted a train-the-trainer course specifically for Spanish-speaking instructors.

Smart Mark training evaluation

The University of Illinois-Chicago has developed a survey questionnaire in English and Spanish to assess Smart Mark trainees' attitudes and work practices, and what they know about workplace safety and health before and after training. Rosemary Sokas, MD, and her team have worked with about 245 journeymen and apprentices in Roofers Local 11 and Plumber and Pipefitters Local 597, both in the Chicago area. The team's preliminary information, presented at the NIOSH National Occupational Research Agenda meeting in April 2006, indicates that both U.S.-born and Mexican-born union members are better able to identify hazards if they have previously had safety training. The research team is publishing one segment of the survey as a revised safety climate scale and is now at work designing a large-scale evaluation of Smart Mark's effects on workplace practices and injury outcomes.

SERVICE

Building Trades National Medical Screening Program (BTMed)

The Building Trades National Medical Screening Program (BTMed) serves the more than 700,000 building trades workers whose service to our country's nuclear weapons programs during World War II and afterward puts them at risk for life-threatening ailments. Trish Quinn of CPWR coordinates this national program that provides free medical screenings for these workers. Our dedicated website is www.btmed.org.

Screenings for Former Department of Energy Construction Workers

The BTMed program opened its first outreach office in Pasco, Wash., in March 1998 to serve construction workers from the Hanford Reservation. After Congress mandated that the Department of Energy (DOE) fund a screening and treatment program, the BTMed has grown to more than 15 sites nationwide, with additional sites being added in 2007. More than 20,000 former workers have signed up to participate in the program (see map, pages 12-13).

CPWR works with local building trades unions to reach out and inform members about the program. Each participant completes a work history interview, conducted by specially trained building trades workers. The participant is offered a free medical screening examination with tests for any exposures identified in the interview. Some participants are referred for further medical attention. Former construction or maintenance workers in the weapons program who may have had significant exposures to asbestos, beryllium, cadmium, chromium, lead, mercury, noise, radiation, silica, solvents or other health hazards are eligible.

The screenings have:

- Determined that construction workers are at significant risk for illnesses as a result of having been exposed to health hazards in DOE facilities. (This program was the first to document that construction workers are at risk for beryllium disease.)
- Identified untreated medical problems, which has enabled hundreds of workers to get better medical care. As the largest medical study of older construction workers in the United States, the screenings have highlighted the need for better medical care for workers.
- Provided key evidence that led Congress to enact the Energy Employees Occupational Illness Compensation Program Act in 2000, and, in particular, to include construction.
- Provided valuable work history and site information to NIOSH on how to improve radiation dose reconstructions for construction workers on DOE sites.

Employment Verification

After denying for years that its nuclear operations harmed anyone, the federal government launched a program in 2000 to compensate atomic workers sickened by workplace exposures. The Energy Employees Occupational Illness Compensation Program Act delivers benefits to eligible employees and former employees of the U.S. Department of Energy, its contractors and subcontractors, or to certain survivors.

Because the DOE does not have work records for subcontractors, the Department of Labor had difficulties approving the claims. The DOL asked that CPWR work with local building trades unions to obtain records from union and union-employer trust funds, such as dispatch cards or pension contribution receipts, to help with employment verification.

Since 2003, CPWR has assisted with more than 6,400 verification requests. Most of the verifications were completed in less than 30 business days and enabled the Department of Labor to complete decision-making. An estimated 18 to 33 percent of the building trades workers who worked in the nuclear program might be eligible for compensation. Claimants can receive cash benefits and medical costs related to a covered illness from the time a claim is filed with DOL.

Organizations participating with CPWR

State and local building and construction trades councils in Augusta, Ga., Central Washington, Colorado, Dayton, Fla., and Florida Gulf Coast, Greater Cincinnati, Greater Kansas City (Missouri), Idaho, Knoxville/Oak Ridge, Tenn., Nassau and Suffolk Counties, N.Y., Tri-State (Kentucky, Ohio, West Virginia), Western Kentucky, various others councils as well as Duke University Medical Center; University of Cincinnati Medical Center; Zenith Administrators.

Outreach

In addition to providing safety-and-health training and technical assistance for the industry and government, CPWR produces videos/DVDs, maintains two websites, and participates in or organizes conferences/exhibits at the regional, national, and international levels. Publications range from the CPWR newsletter *On Center* and technical reports, to magazine and journal articles. The Hazard Alert pocket cards, in English and Spanish, cover more than 25 topics, from aerial lift safety (or Seguridad en los elevadores de obra) to welding fumes and gases (El trabajo de soldadura), and may be downloaded from CPWR's website and eLCOSH. Nearly 1 million of the pocket cards have been distributed since 1996.

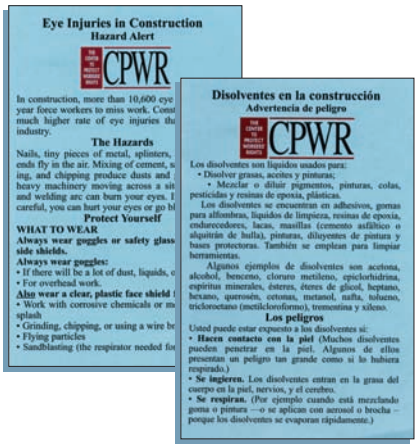
Electronic Library of Construction Safety and Health (eLCOSH)

The website www.eLCOSH.org, coordinated by CPWR since 2000, has provided user-friendly safety-and-health information – in English and Spanish – for construction workers and others on a wide range of topics and sources. Some 850 documents and videos, more than 150 of them in Spanish, are posted using English and Spanish site maps. eLCOSH provides a global resource for English and Spanish construction safety and health training and management documents, with more than 50 annotated site links provided. Contributors range from the Government of Spain, the U.S. Army Corps of Engineers, NIOSH, and state agencies to private-sector authors, university researchers, trade magazines, and building trades safety-and-health programs. The website received approximately 478,000 hits in one year, averaging 1,310 hits a day.

SalusLink

Commercial and heavy construction project schedules typically do not include safety management tasks, despite a high level of interest in promoting safety on construction sites. To remedy this, CPWR, in partnership with Conceptual Arts, Inc., of Gainesville, Fla., has developed a new software application, SalusLink, to work with scheduling software and enable safety managers to link safety activities and documents to line items in Primavera P3 or SureTrak schedules. SalusLink is being field-tested currently. (*See* www.saluslink.com.)

www.cpwr.com



Construction Solutions

CPWR is developing Construction Solutions, an on-line databank of practical ways to improve construction safety and health. Workers and contractors will be able to look up hazards for various trades and tasks, then learn about potential solutions. CPWR's partners are Conceptual Arts Inc. and the University of Iowa; the project will parallel a NIOSH Workplace Solutions database for general industry, also under development.

International Activities

For 15 years, CPWR has initiated regular interactions with international labor, management, government, and academic experts on construction safety and health. CPWR staff participate in international technical meetings to exchange policy and program information, develop evidence-based best-practice guidelines, and learn from international research-to-practice initiatives.

Selected Recent CPWR-Supported Publications

CPWR PUBLICATIONS*

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Dong, Xiuwen, Yurong Men, and Elizabeth Haile. *Work-Related Fatal and Nonfatal Injuries among U.S. Construction Workers,* 1992-2003. 2005.

McCann, Michael. Journeyman Technical Information Paper 2. *Protection from Electric Shock and Arc Flash*. 2003.

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McCann, Michael. Explosion and Asphyxiation Deaths among Contract Employees in Industrial Plants. 2003.

Susi P, Goldberg M, Pellegrino A. *Model Specifications for the Protection of Workers from Lead on Steel Structures*. Updated, 2002.

Ruttenberg, Ruth, and Maria Lazo. *Spanish-Speaking Construction Workers Discuss Their Safety Needs and Experiences*. 2004.

Weil, David. *Making OSHA Inspections More Effective: Alternatives for Improved Inspection Targeting in the Construction Industry*, June 2004.

CPWR VIDEO/DVD

A Leading Edge Fall Protection System for Metal Decking, 2006.

Don't Fall For It, 2006.

CPWR Disaster Response Safety and Health Training for Construction Workers, 2005.

JOURNAL ARTICLES AND BOOKS, 2005-2006

Bingham E, Ringen K, Dement J, Cameron W, McGowan W, Welch L and Quinn P [2006]. Frequency and Quality of Radiation Monitoring at Two Gaseous Diffusion Plants. *Annals of the New York Academy of Sciences* 1076:394-404.

Hecker SF, Schneider S, Hess JA, Kincl LD [2006]. Chapter 50: Ergonomics in general construction. In: Marras WS, Karwowski W, eds. *Occupational Ergonomics Handbook*. 2nd ed. Boca Raton, FL: CRC Press, pp 50-1-50-30.

Lipscomb HJ, Dement JM, Nolan J, Patterson D [2006]. Nail gun injuries in apprentice carpenters: Risk factors and control measures. *AJIM* 49:505-513.

McCann M [2006]. Heavy equipment and truck-related deaths on excavation work sites. *Journal of Safety Research* 37:511-517

Meeker JD, Susi P, Pellegrino A [2006]. Comparison of Occupational Exposures Among Painters Using Three Alternative Blasting Abrasives. *Journal of Occupational and Environmental Hygiene* 3:D80-84.

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Smith GS, Timmons RA, Lombardi DA, Mamidid DK, Matz S, Courtney TK, Perry MJ [2006]. Work-related ladder fall fractures: Identification and diagnosis validation using narrative text. *Accident Analysis and Prevention* 38:973-980.

Anton D, Rosecrance JC, Gerr F, Merlino LA, Cook TM [2005]. Effect of concrete block weight and wall height on electromyographic activity and heart rate of masons. *Ergonomics* Vol. 48, No. 10, 15 August 2005, 1314 - 1330.

CPWR and the Construction Literature

CHANGES IN CONSTRUCTION RESEARCH. A comparison of research in the early 1990s to recent years shows a growing emphasis on studies of specific hazards in construction, and to targeted studies of exposure and controls. CPWR supported 50 percent of all studies on ergonomic hazards and controls and 17 percent of the studies on health hazards and controls. As expected from CPWR's emphasis on identification and control of respiratory hazards, 38 percent of studies on silica were CPWR-sponsored. CPWR supported 50 percent of the studies reporting on development of interventions or exposure assessment methods.

PEER REVIEW. In the five years 1999-2004, CPWR-sponsored research accounted for one-quarter of all peer-reviewed publications in construction safety and health, and half of those dealing with interventions or exposure assessment methods.

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Meeker JD, Susi P, Pellegrino A [2005]. Exposure to Silica and Metals Among Painters Using Specular Hematite Abrasive (column). *Journal of Occupational and Environmental Hygiene* 2:D60-64.

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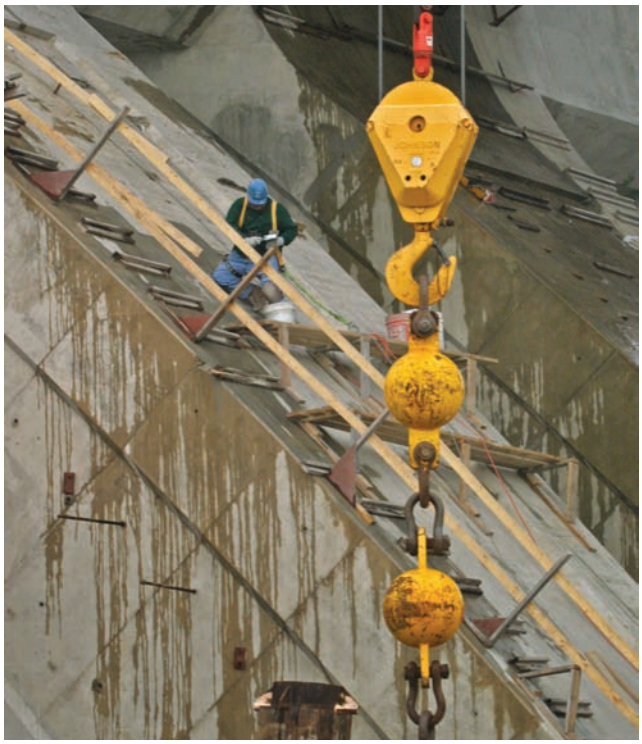
*For more listings, *see* Small Studies, page 11.



Strategic Goals

CPWR is working with the National Institute for Occupational Safety and Health (NIOSH) to define eight strategic goals for research in construction. The work, begun in 2005, should affect NIOSH and industry research priorities for the next decade. Although priority areas such as traumatic injury and hearing loss have previously been identified and have guided research, the proposed goals go further by identifying performance measures and intermediate and longer-term outcomes to target, such as numbers of injuries and illnesses. CPWR has provided input for a document to present the content and rationale for the proposed goals, which include reducing falls to a lower level and improving surveillance. A new NIOSH NORA Construction Sector Research Council will further develop these national construction research goals.

Articles "In Press"

A number of articles authored by CPWR staff or consortium members are slated for publication in upcoming issues of peer-reviewed journals. Subject matter can be gleaned by the article titles: *Under-reporting of Injuries in Construction, An English-Spanish Safety Climate Scale for Construction Workers, Reporting Asbestos Research Results in 18,000 Sheet Metal Workers, Work-Related Injuries Among Hispanic Construction Workers—Evidence from a Population Survey*. Other topics include the results of a survey on disease and MSD among roofers, trainer evaluation of Smart Mark, and a report on the results of a masonry focus group.

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PHOTO CREDITS: Earl Dotter, www.earldotter.com; Dan Anton, Don Ellenberger, Hester Lipscomb, Susan Shepherd, Pam Susi, Kizetta Vaughn. Special thanks to Michelle Alban/Telemundo and Chris Trahan.

 CPWR is a research, training, and service arm of the Building and Construction Trades Dept., AFL-CIO: CPWR, Suite 1000, 8484 Georgia Ave., Silver Spring, MD 20910. This booklet was made possible by grant U54 OH008307 from the National Institute for Occupational Safety and Health, Department of Energy grant DE-FC01-06EH06004, Department of Labor contract DOLJ059E22270, and grants U45-ES09764 and U45-ES06185 from the National Institute of Environmental Health Sciences. The contents are solely the responsibility of the authors and do not necessarily represent the official views of NIOSH, DOE, DOL, or NIEHS.

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