

## EXPOSURE ASSESSMENT

### RADIATION GRANTS AND COOPERATIVE AGREEMENT PROGRAM

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**PURPOSE:** Provide external support for NIOSH's analytic epidemiology research program concerned with energy-related health effects at DOE facilities.

**RESEARCH SUMMARY:** NIOSH supports applied field research to identify and investigate the relationships between health outcomes and occupational exposure to radiation and other hazardous agents, epidemiologic research relevant to energy-related occupational health, and research related to assessing occupational exposures to hazardous agents at nuclear weapons facilities and in other energy-related industries.

This program uses academic and nonprofit organizations to propose and support research that focuses on current and former worker populations at energy-related sites and expands the literature on such research. These extramurally generated projects provide a point of view different from NIOSH intramural research concepts. Unique exposures in special populations, such as job stress in downsized workers or lung fibrosis in plutonium workers, and surveillance methods are evaluated by academic researchers and labor, either independently or in collaboration with NIOSH partners. Several studies specifically addressed the occupational exposure characteristics of personnel in the construction trade crafts, including exposure history reconstruction, participatory job task analysis, and mechanisms for hazard exposure identification and surveillance.

Most of the study procedures include meta-analysis, combined analysis methodologies, and combined cohort studies across sites, and provide an opportunity for an intervention component. Results of this study should contribute significantly to the understanding of health effects associated with low-level exposures to ionizing radiation and other hazardous agents at DOE sites. All study records will become part of the DOE Comprehensive Epidemiologic Data Resource.



**KEYWORDS:** Epidemiology, exposure assessment, nuclear workers

#### RECENT CITATIONS:

Bingham, E. Work histories evaluating new participatory methods. University of Cincinnati. Available at <http://www.cdc.gov/niosh/2001-133.html>.

Barnhart, S. Comprehensive occupational health surveillance. University of Washington. Available at <http://www.cdc.gov/niosh/2001-133.html>.

Tankersley, W. Improved Systems for worker exposure surveillance. Oak Ridge Associated Universities. Available at <http://www.cdc.gov/niosh/2001-133.html>.

# OCCUPATIONAL LEAD EXPOSURE: RISK TO THE AGING WORKER

**KEYWORDS:** Effectiveness research, neurotoxicology, lead

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**PURPOSE:** Examine long-term changes in neuropsychological performance in a cohort of workers chronically exposed to lead.

**RESEARCH SUMMARY:** Exposures to lead remain a significant issue for occupational and environmental health, in part because new research continues to demonstrate adverse effects at levels formerly thought to be innocuous. Few studies up to this point have been able to examine the effects of lead in relation to quantitative measures of chronic occupational exposure. The study will also add to our understanding of the effects of lead in older people, which is important as the working population ages.

People with past and current exposure to lead are being compared to a demographically similar unexposed control group. Between 1981 and 1984, 288 lead-exposed workers and 182 unexposed controls were evaluated as part of an epidemiological study of lead carried out at the University of Pittsburgh. At the time of the initial evaluation the workers had a mean age of 35 (range 21-60). The current tests will repeat the neuropsychological test battery, collect information on current and past psychiatric history and current blood lead levels, and measure lead concentration in bones using x-ray fluorescence (XRF). To date, we have re-evaluated 117 subjects. For the current assessment, lead-exposed subjects and unexposed controls do not differ in age, but overall education is higher for controls. Sixty percent of the workers have not worked with lead for over a year, while 40% are currently working or have worked with lead within the past year.

The specific aims are to test four hypotheses:

1. That exposed subjects will have poorer neuropsychological test scores and more psychiatric dysfunction;
2. That exposed subjects will show steeper performance declines across the age range when compared to controls;
3. That exposure will be predictive of performance, with a dose-response pattern; and
4. That higher bone lead concentrations will co-vary with current blood lead levels.

# APPLICATION OF A TASK-BASED EXPOSURE ASSESSMENT MODEL (T-BEAM) TO CONSTRUCTION SAFETY AND HEALTH PROGRAMS, EDUCATION, AND TRAINING

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**PURPOSE:** Develop a health hazard assessment and control methodology for construction that cultivates safety and health expertise within the construction workforce.

**RESEARCH SUMMARY:** *Construction safety and health specialists.* Journeymen from several trades have been trained to collect exposure data and assist in control technology evaluations throughout the United States. Educational programs are in place at Marshall University with the International Union of Painters and Allied Trades and at Drexel University with building trades workers in Philadelphia and southern New Jersey to provide college-credit courses in occupational safety and health for construction.

*Silica surveys.* Over 40 personal exposure measurements of respirable dust and respirable quartz were collected at 13 sites from painters, bricklayers, operating engineers, and laborers. Exposures to respirable quartz were over 500 times the NIOSH Recommended Exposure Limit (REL) for painters engaged in abrasive blasting, over 20 times the NIOSH REL for bricklayers, and over 10 times the NIOSH REL for operators and laborers engaged in road milling operations.

*Welding fume and metal exposure hazard evaluation.* Approximately 200 personal exposure measurements of fumes and various metals were collected among welders during welding and torch-cutting. Measurements have been collected with and without ventilation. Use of ventilation showed a statistically significant reduction in exposure. Hexavalent chromium and other metal exposures among construction workers are currently being evaluated based on field surveys of welding and abrasive blasting operations and review of the literature.

*Engineering and Work Practice Controls Work Group.* CPWR and NIOSH co-chair a standing work group that directs, develops, and evaluates control technologies for construction health hazards. The group convened its tenth meeting in March 2002. Videos graphically demonstrating the effectiveness of local exhaust ventilation for drywall finishing dust and welding have been developed. Low-hazard abrasive blasting methods and materials and engineering controls for masonry work are currently being evaluated.

Other collaborators on this project include the United Association of Plumbers and Pipefitters, the International Union of Bricklayers and Allied Crafts, Philadelphia Apprenticeship Coordinators Association, Harvard University, and the University of North Carolina.



**KEYWORDS:** Exposure assessment, silica, metals, control technology, education and training

## RECENT CITATIONS:

Susi, P., M. Goldberg, and P. Barnes. 2000. The use of a task-based exposure assessment model for assessment of metal fume exposure. *Applied Occupational and Environmental Hygiene*, v. 15, pp. 26-38.

Rappaport, S.M., M. Weaver, D. Taylor, L. Kupper, and P. Susi. 1999. Application of mixed models to assess aerosol exposures measured by construction workers during hot processes. *Annals of Occupational Hygiene*, v. 43, no. 7.

Weaver, M., L. Kupper, D. Taylor, H. Kromhout, P. Susi, and S. Rappaport. 2001. Simultaneous assessment of occupational exposures from multiple worker groups. *Annals of Occupational Hygiene*, v. 45, no. 7, pp. 525-542.

Susi, P. *Welding: A Control Technology*. 2000. Video 1-00. Silver Spring, MD: The Center to Protect Workers' Rights. 8 minutes.

## CONSTRUCTION POLICY RESEARCH

### CONSTRUCTION POLICY RESEARCH CENTER AT HARVARD UNIVERSITY

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**CONSORTIUM:** Center to Protect Workers' Rights

**PURPOSE:** Serve as the focus for quantitative and qualitative research in the full range of issues affecting the construction workforce.

**RESEARCH SUMMARY:** The Center will engage faculty, researchers, and students from the Harvard School of Public Health, the Harvard Trade Union Program, and other programs at Harvard University, as well as extramural collaborators such as the Maine Building Trades Council and the Boston School of Management. Faculty will be drawn primarily from the Department of Environmental Health, the Harvard Trade Union Program, and Massachusetts Institute of Technology. The Center will serve as a link between these administratively independent units to foster collaborative arrangements that cross organizational boundaries. The Center will promote the purposes of academic programs, interdisciplinary research projects, and outreach.

The theme of the Center is the integration of policy, engineering principles, and environmental and workplace issues and strategies, with a particular emphasis on human health. A wide range of topics will be studied, such as high-performance building technologies, the management of capital budgets and investments as a factor in construction technology, the economics of labor in modern construction, and holistic approaches to the conception, construction, and operation of "green" buildings. A major goal is to facilitate productive interactions between researchers and practitioners in basic and applied science, engineering and architecture, urban planning, public policy analysis and administration, and construction management.

The work of the Center will be conducted at two sites: the Harvard School of Public Health, Boston, MA, and the Harvard University Trade Union Program, Cambridge, MA.

**KEYWORDS:** Policy, intervention, management, engineering, architecture, planning, high-performance buildings

# CONSTRUCTION POLICY RESEARCH CENTER AT THE UNIVERSITY OF MARYLAND

**KEYWORDS:** Best-value contracting, worker's compensation data, construction policy development

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**CONSORTIUM:** Center to Protect Workers' Rights

**PURPOSE:** Development of a Construction Policy Research program to study the effects of construction activities on societal values such as health and safety, quality, cost efficiency, and community development.

**RESEARCH SUMMARY:** Construction industry contractors, subcontractors, contractor associations, project owners, architects, engineers, safety specialists, construction-related procurement officers in federal and state governments, building trade union members, and university researchers have joined together to discuss how the Construction Policy Research program could best serve the construction community and generate ideas for program projects. An advisory committee has been established to represent the broad range of construction industry interests.

Two research tasks have been developed as part of the program.

*Workers Compensation:* Meetings were held with the key players involved in the administration and development of policy for the Maryland workers' compensation system. These meetings led to a better understanding of particular interests and concerns about the system in the region. After examination and discussions about the system and its data sources, participants in these meetings have agreed that a significant problem exists concerning the adequacy of the data collected by the system and that deficiencies in the existing data make it difficult to assess system effectiveness. Project staff determined that initial research will focus on examining Maryland's data collection system to determine what changes might be made to assure that sufficient data exist on which to base proposals for policy reform. As part of this work, the workers' compensation data collection systems in other states will be examined to provide a context in which to examine the Maryland system.

*Best-Value Contracting:* Construction contractors have begun to recognize that the traditional method of low-bid contracting has significant limitations and that the results have often failed to satisfy customer (and their own) needs. Low bids can contribute to poor quality, delayed schedules, accidents, cost overruns, and high accident rates. "Best-value contracting" is an alternative approach that permits project owners to make decisions based on the value of materials and work instead of price alone. Under this bidding method, contracting officials evaluate and select contractors on the basis of key performance and quality factors, including safety records, as well as cost. As a result of project work, a survey is being drafted to collect data on the use of best-value contracting and the different types of systems used. A research and analysis plan will be devised to assess the effect of best-value contracting on several major performance criteria, including safety.

# CONSTRUCTION POLICY RESEARCH CENTER ON INTEGRATED SAFETY SYSTEMS

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**CONSORTIUM:** Center to Protect Workers' Rights

**PURPOSE:** Establish a multidisciplinary Construction Policy Research Center (CPRC) applying Quality Management (QM) techniques and principles, human factors engineering, and industrial and construction engineering approaches to occupational safety and health in the construction industry.

**RESEARCH SUMMARY:** Trends in the safety community suggest that Quality Management (QM) or Total Quality Management (TQM) principles can provide an appropriate framework for improving worker safety and health. A growing body of industry experience also supports the effectiveness of the QM approach to safety and the correlation between quality and safety performance.

Many companies that adopted QM have benefitted from the unexpected side effect of lower injury and illness rates. For example, safety team members at a Georgia Gulf plant in Delaware City, DE, reported a downward trend in both incidents and quality problems since 1989 when the "Use Your Head To Erase All Dangers" program was initiated. Another example comes from the Phelps Dodge copper mine in Morenci, AZ, which, after changing its management approach, tripled its copper production per employee while reducing the number of injuries sevenfold. A QM process implemented by Texas Instruments to enhance contractor performance and overall savings achieved the following outcomes: a reduction of reworking from a level in excess of 11% to less than 1% of project value, improved safety and health among workers, and reduced workers' compensation insurance.

The implementation of QM principles, practices, and techniques has the potential to benefit quality and productivity, but also to improve occupational safety and health. The building and construction industry could benefit tremendously from lessons learned in other branches of industry. However, it has become clear that it will not be easy to implement QM in the construction industry. Special tools and techniques need to be developed, especially to integrate QM with safety and health procedures. The CPRC will develop an agenda and a program of applied research to safety systems with QM and construction management processes.

The CPRC's first year objectives include—

- Further development and definition of ties to construction companies and unions,
- Building networks, structures, and interfaces among all participating parties,
- Planning education programs addressing integrated safety systems applications to the construction industry,

- Presenting education programs in a variety of ways, including college-level engineering courses and short courses, and
- A pilot study using QM techniques and principles in the building and construction industry.

**KEYWORDS:** Occupational safety and health, safety systems, Quality Management

## DATABASES

### ELECTRONIC LIBRARY OF CONSTRUCTION OCCUPATIONAL SAFETY AND HEALTH (eLCOSH)

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**PURPOSE:** Reduce the high toll in injuries, illnesses, and deaths in construction by making top-quality information on safety and health easily accessible to workers and others.

**RESEARCH SUMMARY:** eLCOSH is a user-friendly, searchable Website ([www.elcosh.org](http://www.elcosh.org)) containing more than 500 documents on construction safety and health. More than 30 of the postings are in Spanish (along with a Spanish site map), and some documents are provided in other languages, such as Creole, Italian, and Polish. The intended audience is anyone interested in improving construction safety and health in the construction industry, including researchers, but a key goal is to provide workers with information about how to protect themselves. Contributors include federal and state agencies, newspapers, trade magazines, university researchers, and labor unions. The collection includes pocket cards and brochures for workers, Power Point presentations, checklists, statistics, and information on regulations in the United States and elsewhere. Some of the documents are not available anywhere else.

A few one-page postings written by the staff of the Center to Protect Workers' Rights provide basic information that is often hard to pin down, such as "When do you need fall protection?" The site is organized by *hazard*, *trade*, (type of) *job site*, and *other*, with a separate section on *training* and more than 40 annotated links to other sites on construction safety and health. eLCOSH is updated quarterly and provides a *What's New* section. A 7-minute CD-ROM presentation (in English) provides a tour of the site and is available upon request. The site was first posted in August 2000. As of September 2001, eLCOSH had 12,500 visits per month and 57,500 hits.

**KEYWORDS:** eLCOSH, database, training, hazards, trades, prevention, workers, Web, Internet, safety, health

#### RECENT CITATIONS:

Seegal, J., and S. Benjamin. 2002. A Web-based resource for construction safety and health. *Applied Occupational and Environmental Hygiene*, v. 17, no. 4, pp. 244-46.

# DATA CENTER AT THE CENTER TO PROTECT WORKERS' RIGHTS

**RESEARCHER:** Sue Dong

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**PURPOSE:** Monitor the health and safety of workers in the construction industry, provide ongoing measures to assess the effectiveness of interventions, and provide detailed data on the health and safety of workers in each construction trade quickly so they can be used to answer questions raised by people in the construction industry, by researchers, and by the general public.

**RESEARCH SUMMARY:** The data from the Census of Fatal Occupational Injuries (CFOI) and the Annual Survey of Occupational Injuries and Illnesses (both put out by the Bureau of Labor Statistics [BLS]) are used to follow trends in the health and safety of workers. The Center to Protect Workers' Rights (CWPR) has obtained CFOI data on all work-related fatal injuries annually from BLS since 1992 and is completing an analysis that looks at trends in death rates from 1992 through 2000. These data indicate that death rates in the construction industry have remained roughly unchanged at around 14 deaths per 100,000 full-time workers. In those occupations with consistently high death rates—laborers, roofers, ironworkers, and electrical workers—the accident narratives have provided useful clues to aid in the development of targeted interventions.

Since 1992, CPWR has been charting trends in nonfatal injury rates in the construction industry using the annual survey data. Although these data show a downward trend in nonfatal injury rates, questions remain regarding the validity of the trend. About 20%-25% of the workers in the construction trades are self-employed and therefore are excluded from the survey; in addition, the survey includes only the private sector. Other factors that may lead to underreporting of injuries are that (1) many occupational diseases have long latency periods and often go untracked and (2) injuries among temporary workers at work sites are usually reported to staffing agencies that are not considered part of the construction industry. These and other reasons lead us to believe that the number of nonfatal injuries and illnesses in construction are significantly underreported. Discussions are being held with OSHA to study ways to improve record-keeping systems for OSHA's 300 logs that form the basis of the survey.

A third project at the Data Center aims to assess the effects of training interventions on work-related injuries among construction laborers in Washington State. We have been able to link data on workers' compensation claims and safety training received by some 600 members of the Northwest Laborers' Health and Welfare Fund during 1993-1994. Although we are in the initial stages, we hope this study will provide evidence that safety and health training can be an effective intervention.

**KEYWORDS:** Data analysis, injury, illness, fatalities, rates, trends, training

## RECENT CITATIONS:

Pollack, E.S., and R.T. Chowdhury. 2001. Trends in work-related death and injury rates among U.S. construction workers, 1992-1998. Silver Spring, MD: Center to Protect Workers' Rights.



# DEVELOPING SCALABLE DATABASE FOR CONSTRUCTION SAFETY

**RESEARCHERS:** Mark Carrozza and Ronald Freyberg

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**CONSORTIUM:** Construction Safety Alliance

**PURPOSE:** Develop a scalable database to warehouse data on occupational fatalities, injuries, and illnesses in the construction industry collected from disparate sources.

**RESEARCH SUMMARY:** Data on occupational fatalities, injuries, and illnesses in the construction industry currently exists in many national, regional, and state data systems. The Bureau of Labor Statistics (BLS) annually reports on the number of workplace injuries, illnesses, and fatalities; state information on fatal accidents is available through NIOSH's Fatal Accident and Circumstance Epidemiology (FACE) system; and the National Center for Health Statistics' (NCHS) National Health Interview Survey (NHIS) produces accident and injury data based on its annual nationwide survey. More-detailed safety and health data are collected at the individual worker level and are maintained by labor unions, individual construction companies, and trade associations.

A single, scalable database was designed and developed that is capable of housing this information from both a summary level (for example, BLS and FACE data) and at the worker level. The database was developed using Microsoft SQL Server, version 7.0, and can grow efficiently and economically as new data are collected.

A limited Web-based application was also developed that allows access to the data over the Internet. The custom application, developed using the Internet "middleware" software ColdFusion, takes the user's selection criteria and builds a query using standard structured query language (SQL) statements. SQL is then used to query the underlying SQL database and returns the results to the user's Web browser. The combination of Microsoft SQL Server and ColdFusion produces a highly scalable and reliable application that allows users to access and summarize quickly the comprehensive information maintained in the database.

This database will provide a single, comprehensive means of access to data that describe the health and safety status of the construction industry. Longitudinal data will allow investigations of possible trends over time for selected safety and health outcomes. Individual worker characteristics can be linked to health and safety outcomes. The data could also be used to generate hypotheses for epidemiology studies or, ultimately, to suggest strategies aimed at reducing fatalities, injuries, and illnesses in the construction industry.

A Partnership To Prevent Injuries and Fatalities in the Construction Industry  
**Construction Safety Alliance**  
Bureau of Labor Statistics Survey of Occupational Injuries and Illnesses

The Bureau of Labor Statistics annually reports on the number of workplace injuries, illnesses, and fatalities. Since 1972, the survey has reported annually on the number of workplace injuries and illnesses in private industry and the frequency of those incidents. With the 1992 survey, BLS began collecting additional information on the more seriously injured or ill workers in the form of worker and case characteristics.

The Survey of Occupational Injuries and Illnesses is a Federal/State program in which employer's reports are collected annually from about 178,000 private industry establishments and processed by State agencies cooperating with the Bureau of Labor Statistics. Summary information on the number of injuries and illnesses is copied by these employers directly from their recordkeeping logs to the survey questionnaire. The questionnaire also asks for the number of employee hours worked (needed in the calculation of incidence rates) as well as its average employment (needed to verify the unit's employment-size class).

To generate selective statistics for non-fatal occupational injuries and/or illnesses, please make your selections below.

**Select Case(s)**  
All Cases  
Total recordable cases  
Lost Workday cases  
Cases involving days away from work

**Select Datatype(s)**  
All Datatypes  
Rate of illness cases per 10,000 full-time workers  
Rate of injury cases per 100 full-time workers  
Rate of injury & illness cases per 100 ft workers

**Select Year(s)**  
All Years  
1991  
1993  
1994

**Select Industry(s)**  
All Industries  
1500 - General Building Contractors  
1520 - Residential Building Construction  
1530 - Operative Builders

Submit Clear Form

This research is funded by National Institute of Occupational Safety and Health, and incorporating with:  
Purdue University  
University of Cincinnati  
University of Florida  
University of Texas  
Construction Industry Institute

The figure is a reduced view of the Website screen.

**KEYWORDS:** Database, construction safety, Website

# DEVELOPING CONSTRUCTION SAFETY ALLIANCE WEBSITE

## Construction Safety Alliance

Sponsored by  
**NIOSH**  
National Institute for Occupational Safety and Health

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**PURPOSE:** Provide other construction stakeholders, including small-to-medium-sized construction company managers, health departments, safety professionals, and workers, with practical, up-to-date safety and health information.

**RESEARCH SUMMARY:** The Website contains pertinent summaries of research from partners in the Construction Safety Alliance (CSA) and safety education and training material relating to the focus areas of CSA's research projects. The Website serves as a clearinghouse for construction safety and health education and information resources. It also provides links to other relevant Websites, such as those maintained by NIOSH, OSHA, the Construction Industry Institute, the Center to Protect Workers' Rights, the Construction Safety Association of Ontario, and the Principal Contractors Safety Alliance. The Website is designed to be user friendly and easily understandable to both safety professionals and construction workers.

The Website also allows users to query the data and download extracts for additional analysis. The data are accessible at two levels.

- The first level includes only CSA access for sharing data and information resources associated with ongoing research and surveillance projects. This access is password-protected for CSA members and their designated collaborators.
- The second level is for general use for accessing all information, published data, and resources as CSA makes it available. This level requires no password and will be advertised in trade journals and other construction-related publications.

The Website is currently being tested by construction safety professionals and at this stage primarily serves as a communication portal for CSA members. The prototype Website can be accessed through the link (<https://engineering.purdue.edu/CSA>). More information will be added as research projects within CSA are developed.

The figure is a reduced view of the Website screen.

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In the demanding global marketplace, ensuring that human fit, form and function are comprehensively addressed is becoming an increasingly important aspect of design. Manufacturers and designers strive to develop products that conform to all relevant Health and Safety standards and are "user-friendly" while still maximizing the productivity of their own workforce. Digital human modeling technology can assist a designer to determine the performance of people in the context of a workplace or a product before it exists and throughout its entire lifecycle.

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**KEYWORDS:** Website, construction safety, database, safety education, safety training

## NIOSH SERVICES

### HEALTH HAZARD EVALUATIONS AND TECHNICAL ASSISTANCE

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**AFFILIATION:** National Institute for Occupational Safety and Health

**PURPOSE:** Support the NIOSH Hazard Evaluations and Technical Assistance program.

**RESEARCH SUMMARY:** NIOSH's Hazard Evaluation and Technical Assistance (HETA) program offers assistance to employers and employees in industry and government at the local, state, and federal level with regard to whether chemical, physical, biological, or other agents found in the workplace are hazardous or pose a health and/or safety risk to workers.

A staff of industrial hygienists, engineers, occupational physicians, epidemiologists, and other health professionals located in Cincinnati and three field offices (Atlanta, Denver, New England), in collaboration with appropriate personnel in other NIOSH divisions, respond to approximately 450 requests for assistance each year. Site visits are conducted if warranted (over 200 site visits were carried out during FY 2000). Interim and final reports are prepared and distributed to employers, employees, and relevant state and federal agencies. The results of these individual evaluations may trigger wider studies of similar exposures in other settings or may stimulate recommendations for implementation or modification of health standards. Control procedures, improved work practices, and medical programs to reduce exposure levels and prevent adverse health effects may be recommended. Other NIOSH documents that are more widely disseminated may also be prepared.

This program is mandated by Section 20(a)(6) of the Occupational Safety and Health Act and implemented by regulations based on 42 CFR 85. More than 10,000 evaluations have been completed since the inception of the HETA program.



**KEYWORDS:** Hazard identification, exposure assessment, risk assessment, medical evaluation, field investigations

# FATALITY ASSESSMENT AND CONTROL EVALUATION (FACE)

**RESEARCHER:** Virgil Casini, Jr.

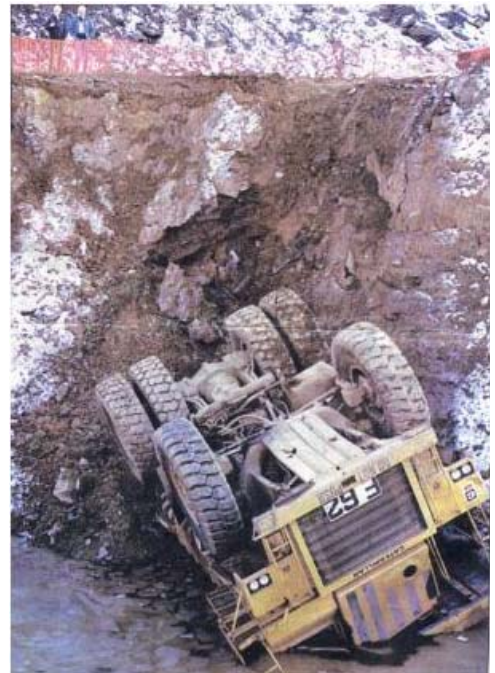
**AFFILIATION:** Division of Safety Research  
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**PURPOSE:** Identify work environments that place workers at high risk for fatal injury, identify potential risk factors, and formulate and disseminate prevention strategies to those who can intervene in the workplace.

**RESEARCH SUMMARY:** The Fatality Assessment and Control Evaluation (FACE) project is a research program for the identification, investigation, and prevention of fatal occupational injuries through surveillance, on-site investigations, and prevention activities using traditional epidemiologic and public health models. The goals are to prevent fatal work injuries by identifying work situations at high risk of fatal injury and developing prevention strategies for those who can intervene in the workplace.

NIOSH is voluntarily notified of selected occupational fatalities (machine-related, workers under 18 years of age, and highway construction work zones) by the Departments of Labor in the states of North Carolina, Pennsylvania, South Carolina, Tennessee, and Virginia. Through on-site fatality investigations, FACE personnel then collect agent, host, and environmental information from the pre-event, event, and post-event phases of the fatal incident via a case series designed to facilitate descriptive analyses of the incidents. The resulting analyses identify factors contributing to these fatalities and aid in the development of recommendations for preventing similar deaths. Investigation findings and prevention recommendations are incorporated into health communication documents for broad dissemination and are used by employers to increase worker safety, by manufacturers to modify machinery and equipment to increase worker safety, and by OSHA and other organizations in the promulgation of safety standards and compliance directives.

The project has the unique capability to reach workers at risk and provide timely intervention strategies to targeted areas. Information collected from initial surveillance and subsequent investigations are used by NIOSH, OSHA, and the Wage and Hour Division of the Department of Labor to support the promulgation of safety and labor standards and to develop and disseminate prevention recommendations. These cooperative efforts have led to close working relationships between NIOSH and the participating agencies to improve workplace safety and health.



**KEYWORDS:** Fatalities, hazard identification, intervention

## RECENT CITATIONS:

Higgins, D.N., V.J. Casini, P. Bost, W. Johnson, and R. Rautiainen. 2001. The Fatality Assessment and Control Evaluation program's role in the prevention of occupational fatalities. *Injury Prevention*, v. 7, Supplement 1, pp. i27-i33.

National Institute for Occupational Safety and Health. 2001. Preventing injuries and deaths from falls during construction and maintenance of telecommunication towers. NIOSH Alert. DHHS (NIOSH) Pub. 2001-165.

National Institute for Occupational Safety and Health. 2000. Worker deaths by falls: A summary of surveillance findings and investigative reports. DHHS (NIOSH) Pub. 2000-116.



# STATE-BASED FATALITY ASSESSMENT AND CONTROL EVALUATION

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**PURPOSE:** Identify work environments that place workers at high risk for fatal injury, identify potential risk factors, and formulate and disseminate prevention strategies to those who can intervene in the workplace.

**RESEARCH SUMMARY:** The State-Based Fatality Assessment and Control Evaluation (FACE) project is a continuing extramural program of surveillance and epidemiologic investigation of selected occupational fatalities. The objective of the FACE project is to prevent fatal work-related injuries through an integrated program of surveillance, on-site investigation, and dissemination and prevention activities. The project is implemented through cooperative agreements with health departments, labor departments, and workers' compensation commissions in 15 states (Alaska, California, Iowa, Kentucky, Massachusetts, Minnesota, Nebraska, New Jersey, New York, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin).

Cases are identified through active surveillance of all external causes of occupational death. In-depth evaluations are conducted for targeted categories of fatal injuries as determined by national and regional priorities. Detailed information is collected on the circumstances of selected fatalities through on-site investigations using a standardized investigation protocol. Agent, victim, and environmental information is evaluated in relation to the pre-event, event, and post-event phases of the incident. The project's ability to couple case identification with on-site investigations yields detailed information beyond that normally produced by other surveillance systems. Recommendations for preventing similar deaths and injuries are developed for each investigation. Because the project is state based, these recommendations are readily adaptable to specific regional needs and can be disseminated rapidly to the audience best suited to implementing workplace controls.

In addition, NIOSH frequently provides FACE data in response to requests from OSHA in support of the development and promulgation of occupational safety standards and recommendations for intervention and prevention. Since its beginning in FY89, over 10,678 work-related fatalities have been identified and over 1,117 fatality investigations conducted.



**KEYWORDS:** Intervention, cooperative agreement, fatalities

## RECENT CITATIONS:

Helmkamp, J., and W. Lundstrom. 2001. Bridge construction-related deaths in West Virginia, 1990-1999. *Professional Safety*, Dec., pp. 18-22.

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