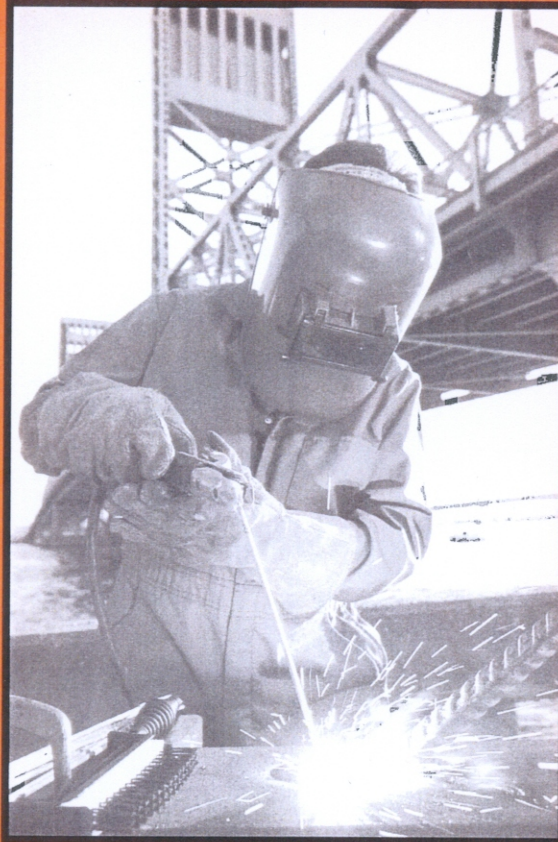
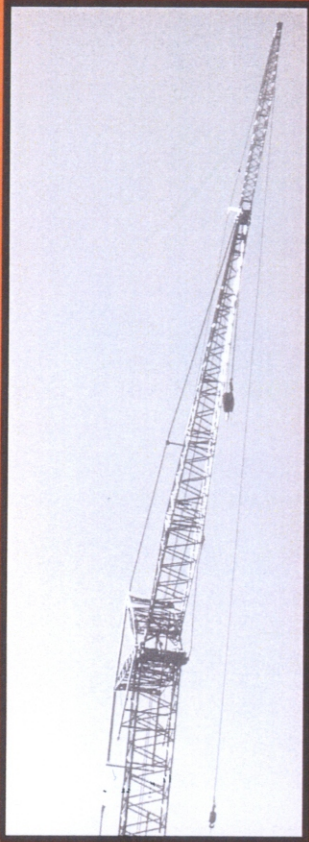




Workplace
Safety and Health

A Compendium of NIOSH Construction Research

2002



Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health



**A COMPENDIUM
OF NIOSH CONSTRUCTION RESEARCH
2002**

U.S. Department of Health and Human Services
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health
Washington, DC

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FOREWORD

Ensuring the safety and health of America's construction workers continues to be a top priority for NIOSH. Our construction program began in 1990 as Congress began to appropriate funds for the expansion of surveillance, research, and intervention activities for construction safety and health. Since then, NIOSH has developed a national infrastructure to address issues affecting workers in this industry. The program includes intramural research performed by NIOSH staff across a broad range of construction topics, as well as targeted surveillance activities involving a number of state health departments. It also includes extramural projects conducted by academic and related researchers through grants and cooperative agreements, as well as the involvement of two consortia. The first, organized by the Center to Protect Workers Rights in 1990, involves the participation of over 16 universities and organizations. The second, the Construction Safety Alliance, is a consortium of four universities that received initial funding in 2001. Overall, NIOSH supports construction research in 22 states.

The research program described in this compendium addresses a variety of important safety and health hazards and conditions. The projects cover the public health spectrum, from identifying and characterizing problems to quantifying and prioritizing risk factors, developing prevention strategies, evaluating results, and disseminating information to construction industry users.

Significant progress has been made in certain construction performance measures. For example, the rate of occupational injuries and illnesses has declined from 14.2 total cases per 100 full-time workers in 1990 to 8.3 total cases in 2000. However, challenges remain in many areas. The fatality rate in construction has not improved over time, and the construction sector continues to account for the largest number of fatal injuries. Progress on occupational disease is more difficult to track, and much work remains to be done.

It takes the collaboration of many parties, including labor, industry, academia, private organizations, and government, to maximize the return on research. Construction partners play an important role in translating safety and health knowledge into effective preventive actions. Partnerships among researchers and the construction industry are essential. By providing brief project descriptions and contact information, we hope this compendium will provide a tool to improve networking among researchers, foster communication between researchers and construction end-users, and stimulate thinking on new research ideas and new ways to apply research results. We all share the same goal: to make a real difference for the health and safety of American construction workers.



John Howard, M.D.
Director, National Institute for Occupational Safety and Health
Centers for Disease Control and Prevention

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COMMON AGENCY ACRONYMS USED IN THIS REPORT

AFL-CIO	American Federation of Labor-Congress of Industrial Organizations
CDC	Centers for Disease Control and Prevention
EPA	Environmental Protection Agency
DOE	Department of Energy
HUD	Housing and Urban Development
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration

INTRODUCTION

ABOUT THE COMPENDIUM

This Compendium of NIOSH Construction Research for 2002 includes 49 NIOSH intramural and 67 NIOSH-funded extramural construction projects. Projects included in this compendium were selected on the basis of their relevance to construction, and each principal investigator was asked to describe their project in one page and submit a graphic of some sort to illustrate the narrative. The descriptions were then grouped by topic categories.

A few explanations and caveats are provided here to assist users of this document.

- The projects in this compendium have construction as the major focus. Projects that look at the etiology of a certain health effect or which address construction as part of a multi-industry approach may not be included even though they may have relevance for construction. In addition, research targeting the agriculture and mining sectors may address hazards (e.g., hand tools, hearing loss, electrical hazards) and produce solutions (e.g., ventilation of equipment cabs) that can be applied to the construction sector and vice versa. NIOSH mining-related projects are described in *A Compendium of NIOSH Mining Research 2002* (DHHS, NIOSH Publication No. 2002-110), which can be downloaded from the NIOSH Web site at www.cdc.gov/niosh. Interested readers are encouraged to examine both research compendia for synergistic health and safety projects.
- The one-page format focuses on key items. Projects are included in only one topic category, even though many can be considered as cutting across a number of categories.
- Space limitations may have resulted in some co-investigators or research partners being omitted. Readers should contact the researchers directly for more information or with any questions.

ABOUT NIOSH EXTRAMURAL RESEARCH

NIOSH extramural projects are based on proposals submitted by academic and other researchers under NIOSH'S "R01" grant program. Applications for these awards are accepted three times a year, and researchers interested in construction are encouraged to apply. Additional details are available on the NIOSH Website.

Many extramural projects are channeled through two consortia—the Center to Protect Workers Rights and the Construction Safety Alliance. The Center to Protect Workers Rights is funded through a 5-year cooperative agreement directed to encourage research on (1) innovative pilot or feasibility studies to reduce injury and illness in construction, (2) evaluations of interventions geared to developing and testing best practices, (3) disseminating information and technology transfer, (4) reviewing preventive systems (e.g., policies, procedures, organizational factors) that affect construction, (5) on-going surveillance, and (6) establishing and reviewing research priorities. The Construction Safety Alliance is funded by a 2-year NIOSH grant to Purdue University and brings together several programs focusing on construction engineering approaches.

ABOUT NIOSH'S CONSTRUCTION PROGRAM AND STEERING COMMITTEE

The NIOSH Web page includes a construction topic page with links to many NIOSH construction publications, as well as other useful links such as eLCOSH (the Electronic Library for Construction Safety and Health).

An Institutewide Construction Steering Committee, with representatives from each division and laboratory, oversees the NIOSH construction program and advises NIOSH leadership. The committee serves as an advocate for construction-related activities within NIOSH and acts to facilitate communication, partnering, project planning, and strategic planning on construction issues. Current members include—

Christine (Lani) Boldt, Spokane Research Laboratory
James Cawley, Pittsburgh Research Laboratory
Robert Cutlip, Health Effects Laboratory Division
Cherie Estill, Division of Applied Research and Technology
David Fosbroke, Division of Safety Research
Matt Gillen, Office of the Director
Ted Katz, Office of the Director
Kenneth Linch, Division of Respiratory Disease Studies
Greg Piacitelli, Division of Surveillance, Hazard Evaluations, and Field Studies
Marie Haring Sweeney, Education and Information Division
John Talty, Office of Extramural Programs

The Construction Steering Committee has identified a number of high-priority construction topics and emerging areas of interest where research is most likely to make a difference. The committee is interested in encouraging new intramural and extramural projects in the areas below.

Outcome topics

- Fatal injuries in construction
- Other traumatic injuries
- Respiratory disease (airway disease, asthma, chronic obstructive pulmonary disease, silicosis)
- Hearing loss
- Low-back injuries
- Cumulative, work-related musculoskeletal disorders
- Psychological and neurological disorders

Overexposure topics

- Vibration
- Asphalt fumes
- Lead
- Dust and particles

Approach and sector topics

- Information and technology transfer—how to best translate research into prevention
- Addressing issues affecting small and self-employed contractors
- Evaluating the role of design as a primary prevention tool for addressing construction hazards
- Work organization in construction and how it relates to health and safety
- Special populations at risk—the impacts of diversity and aging

- Working with building owners and clients (e.g., federal building managers) to promote and evaluate construction best practices
- How to leverage research results from related sectors, such as mining and agriculture, into construction and vice-versa

Please contact the NIOSH Construction Steering Committee chair to share your ideas about research needs and priorities, partnership opportunities, and suggestions for translating research into applications for the construction industry.

ACKNOWLEDGMENTS

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