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Join us in moving science to solutions for...

# Mining



**NIOSH**





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The NIOSH Research to Practice (r2p) program seeks partners for improving workplace safety and health. The r2p program joins NIOSH researchers and outside partners throughout the research process—from identifying the problem to implementing effective solutions. Do you want to make a positive impact for workers? Contact the r2p program to find out how, working together, we can make an impact.

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# Preparing Miners for Underground Emergencies

*Partnership makes a difference . . . here is one example*

## ■ ■ ■ Challenge

Imagine trying to escape when working in an enclosed space hundreds of feet underground. Emergencies like fires or explosions are frightening potential hazards for the approximately 44,000 underground mine workers in the United States. U.S. law requires underground miners to participate in mine emergency evacuation drills, but these drills are conducted in smoke-free environments that do not fully prepare workers for conditions they might encounter in a real escape situation.

## ■ ■ ■ Approach

Several U.S. mining companies approached NIOSH to help them better prepare their workers for underground emergencies. Working with NIOSH researchers, the group created an innovative program to plan, conduct, and evaluate evacuation exercises using nontoxic smoke to simulate a real fire. Over 1,900 workers in nine mines traveled 700 to 1,000 feet through smoke-filled passages with visibility less than five feet. Miners used technologies identified or developed by NIOSH to assist their escape, such as chemical light sticks, audible strobe lights, reflective materials, directional lifelines, lighted vests, and hand-held laser pointers.

## ■ ■ ■ Impact

As a result of these exercises, several of the mining companies have installed directional lifelines in their escape ways, purchased chemical light sticks, and are exploring the use of hand-held lasers. The U.S. Mine Safety and Health Administration has also required directional lifelines in escape ways of underground coal mines that are ventilated with conveyor belt entry air. As word of the training spread, so did the number of mining companies that wanted to participate and include smoke simulation training at their facilities. The long-term outcome of this training is a workforce better prepared to deal with emergency situations in a safe manner.



Here are just a few of the businesses, organizations, labor groups,  
and research centers that have partnered with NIOSH.

American Academy of Clinical Toxicology  
American Association of Poison Control Centers  
American Chemistry Council Diisocyanates Panel  
American College of Medical Toxicology  
American Industrial Hygiene Association  
American Medical Response  
American Society of Safety Engineers  
Bureau of Labor Statistics  
Center for Business and Public Policy –  
Georgetown University  
Commonwealth of PA Bureau of Deep Mine Safety  
Dynamic Systems  
Electric Power Research Institute  
EPA Office of Research and Development  
FEMCO  
Finnish Institute of Occupational Safety and Health  
General Electric Energy and Resource Systems  
General Motors United Auto Workers  
Highmark, Inc.  
Joy Mining Machinery  
Korea Occupational Safety and Health Agency  
National Aeronautics and Space Administration  
National Center for Health Statistics  
National Health and Nutrition Examination Survey  
National Energy Technology Lab (DOE)  
National Institute of Environmental  
Health Sciences (NIEHS)

National Institute of Industrial Health  
National Institute of Mental Health  
National Institute of Occupational  
and Environmental Health  
National Institute on Aging  
NIEHS–National Toxicology Program  
National Wooden Pallet and Container Association  
Occupational Safety and Health Administration  
Employment Standards Administration –  
Office of Workers Compensation Program  
Phoenix Firefighter Department  
RM Wilson  
Sandia Corporation (DOE)  
Scag Power Equipment  
SIRTI  
SkyJack Inc.  
Springfield Pike Mine  
State of Alaska  
University of Connecticut  
University of Connecticut Health Center  
Veterans Health Administration  
West Virginia University  
Yale University

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