

Occupational Health and Safety - Program 62

Program Overview

Program Description

Workplace injuries affect employee health, productivity, and job satisfaction and increase the cost of doing business. Efforts to reduce injuries and illnesses, medical costs, and productivity losses are a critical part of electric power company operations. In addition, companies must develop strategies for compliance with Occupational Safety and Health Act requirements for workplace safety and for implementation of ergonomics guidelines. Companies also need strategies for meeting Occupational Safety and Health Administration (OSHA) exposure standards.

Products, tools, and strategic research from the Electric Power Research Institute's (EPRI's) Occupational Health and Safety Program help electric power companies maintain safer, healthier work environments and control labor-related costs. The program identifies injury and illness trends, develops cost-effective ergonomic interventions and design, and addresses critical occupational exposure issues. The program serves as the foundation for occupational safety-related work at EPRI.

Research Value

EPRI is an innovative leader in occupational ergonomics specifically for the electric power sector. The Occupational Health and Safety Program develops cost-effective ergonomic interventions for a range of workers and tasks and develops specifications for the ergonomic design of electric power facilities and equipment. In addition, the program's Occupational Health and Safety Database, which now contains more than one million worker-years of information from electric power companies, is a valuable resource for tracking and benchmarking occupational injury and illness rates and costs. The program also investigates occupational exposures that can affect health and is developing a comprehensive job-exposure matrix to provide a holistic view of exposures, illnesses, and injuries.

Approach

This program delivers research, data, analyses, and expertise that help electric power companies effectively address occupational health and safety issues. More specifically, this program delivers

- access to comprehensive, standardized information on injury and illness rates and statistical analyses drawn from a unique, industry-specific database;
- easy-to-read handbooks and instructive DVDs describing ergonomic interventions and design guidelines;
- presentations on ergonomics to members, the scientific community, and regulatory agency staff;
- electricity industry representation on the advisory council for the National Institute for Occupational Safety and Health's National Occupational Research Agenda; and
- research on toxic and potentially toxic workplace exposures that provides data for OSHA guideline setting and compliance with OSHA regulations.

Accomplishments

The Occupational Health and Safety Program provides timely, reliable and comprehensive solutions to industry-specific needs and offers practical implementation guidance. The program's accomplishments have resulted in

- improved worker health and safety through reduced workplace injuries (ergonomic solutions reduced strain and sprain injuries among power plant and line workers);
- reduced health care costs, now estimated at millions of dollars per injury case for some injuries for individual electric companies and at billions of dollars annually for ergonomics-related injuries alone for the industry;

- improved productivity and morale in a healthier workforce, as well as improved product quality; and
- the first ergonomic power plant design handbook, a key reference for design engineers.

Current Year Activities

Program R&D for 2010 will focus on assessing ergonomic fleet vehicle design, characterizing occupational exposure to metals in welding fumes, and developing a comprehensive, industry-specific job-exposure matrix. Specific efforts will

- develop interventions to prevent chronic injuries resulting from inefficient design of tasks, tools, and equipment;
- provide accurate, quantitative data and statistical analyses on injury rates and trends and associated costs, including the 2010 *Annual Occupational Health and Safety Statistics Report*;
- minimize the impact of specific occupational health outcomes through understanding relationships among occurrence rates, occupational exposures, and lifestyle factors;
- provide relevant scientific data for setting occupational guidelines on hexavalent chromium exposure; and
- develop ergonomics videos for worker safety training and webcasts for occupational health and safety staff education.

Estimated 2010 Program Funding

\$1.3 M

Program Manager

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Summary of Projects

Project Number	Project Title	Description
P62.001	Occupational Health and Safety Database	This project produces the Occupational Health and Safety Database, a unique source of detailed, comprehensive, standardized injury and illness rates and statistical analyses specifically for the electricity industry. The database is updated with new information from multiple electric companies on an annual basis. An annual report on major injury trends and costs is prepared from information drawn from the database. The database also helps guide program priorities.
P62.002	Ergonomics Research	This research determines the role of ergonomic factors in current work task design and in implementation of tools and equipment, and suggests remedial interventions. Results provide impartial information for dealing with costs and complying with ergonomics guidelines and regulatory needs. In 2010, this project will address ergonomics issues related to the purchase, retrofit, operation, and maintenance of fleet vehicles.
P62.003	Occupational Exposure and Health Studies	This research investigates relationships among injury and illness occurrence rates, lifestyle factors, and workplace exposures. Exposure characterization and epidemiologic research address occupational and lifestyle factors potentially associated with injuries and illnesses, and statistical analyses of existing occupational exposure and health information provide further insight. Current issues include exposure to crystalline silica, arsenic, and hexavalent chromium.

P62.001 Occupational Health and Safety Database (101907)

Key Research Question

To maintain a healthy workforce, improve productivity, and control health care costs, electric power companies need access to accurate illness and injury incidence rates and cost impacts. Only a comprehensive, industry-specific database populated with information from multiple companies can provide accurate, quantitative data. For comprehensive databases, the National Academy of Sciences recommends coding of injury/illness data using standardized procedures and precise, consistent descriptions. The EPRI database meets these criteria.

Approach

The Occupational Health and Safety Database is a unique source for detailed, comprehensive, standardized injury and illness rates across the electricity industry. The database also enables monitoring and evaluation of workforce injury and illness trends and provides a basis for identifying high-risk occupations, quantifying costs and lost time, and setting research priorities. In addition, the database is a powerful tool for benchmarking and safety program evaluation for participating companies. The database is the source of information for tailored analyses for individual electric companies and for the *Annual Occupational Health and Safety Statistics Report*, providing statistical analyses for the electricity industry.

Impact

- Enables medical cost control by identifying injury trends and tracking related costs
- Contributes to reduction of injury and illness rates
- Enables benchmarking and continual injury monitoring
- Provides information for establishing health and safety program priorities and for estimating the impact of prevention programs
- Provides guidance for developing targeted health and safety research
- Reduces uncertainties associated with occupational health and safety issues

How to Apply Results

Occupational health and safety staff at participating electric companies will use project information and analyses to monitor and control health care costs, improve health and safety programs, and reduce occupational illness and injury rates. Information from this project can also be used to identify health and safety research needs.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
Annual Occupational Health and Safety Statistics Report: This annual report will continue to provide quantitative, detailed injury and illness incidence rates and strategic economic impacts from trends analyses based on information from the Occupational Health and Safety Database.	12/31/10	Technical Report

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Annual Occupational Health and Safety Statistics Report: Future annual reports will continue to provide quantitative, detailed injury and illness incidence rates and strategic economic impacts from trends analyses based on information from the Occupational Health and Safety Database. Special emphasis will be placed on evaluating the effectiveness of ergonomics interventions.	12/31/11	Technical Report

P62.002 Ergonomics Research (102993)

Key Research Question

Musculoskeletal (strain and sprain) injuries currently account for more than 40% of total medical costs for electric power companies. EPRI statistical analyses found that in just four companies, there was a loss of more than 70 full-time-equivalent employees for one full year owing to these injuries. Reduction of injury rates and associated costs depends on prevention of chronic injuries resulting from inefficient design of tasks, tools, and equipment. Evaluation of existing designs and development of ergonomic interventions are essential to strain and sprain injury prevention.

Approach

The aim of this research is to develop specific interventions to prevent chronic injuries resulting from inefficient design of tasks, tools, and equipment. Effective ergonomic interventions can reduce injury rates and associated costs. Research results also provide objective information relevant to compliance with ergonomics guidelines and regulations. Previous research in this project focused on distribution and power plant workers and tasks; in 2010, research will focus on ergonomics issues related to fleet vehicles in the electric power industry.

Impact

- Provides ergonomic evaluation and intervention that can help companies reduce injury rates and associated costs through prevention. One company documented a six-month payback for a \$1.3 million investment in implementing just one ergonomic intervention for overhead distribution line workers that was based on recommendations in an EPRI ergonomics handbook.
- Helps improve job satisfaction and productivity.
- Helps ensure compliance with ergonomics guidelines and regulations.

How to Apply Results

Application of EPRI ergonomics research results can help prevent chronic injuries among electricity industry workers through improved work practices and ergonomically designed tools and equipment. These interventions can also help ensure workforce compliance with ergonomics guidelines and regulations. Results from the fleet vehicles project can help electric companies prevent vehicle-related injuries associated with ergonomically poor entry and exit design, seating, and access to parts, tools, and equipment. Implementation of ergonomic interventions requires an investment of time and money; however, many recommended interventions are of low cost. With additional funding, EPRI provides assistance tailored to the needs of individual companies.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
Ergonomic Fleet Vehicle Design, Retrofitting, and Selection: Progress Report: This interim technical report will provide an update on work to assess ergonomic fleet vehicle design and retrofitting and to develop a cost-effective vehicle selection process.	12/31/10	Technical Report

Future Year Products

Product Title & Description	Planned Completion Date	Product Type
Ergonomic Fleet Vehicle Design, Retrofitting, and Selection: Final Report: This final report will present the results of work to assess the ergonomic design of original and retrofitted fleet vehicles and to develop a cost-effective process for selecting and purchasing ergonomically designed vehicles.	12/31/11	Technical Report

P62.003 Occupational Exposure and Health Studies (055833)

Key Research Question

Adverse health effects can result from occupational exposure to dust, fine particles, or toxic substances such as hexavalent chromium. In a comprehensive standard introduced in 2006, OSHA significantly lowered permissible exposure limits for hexavalent chromium. Feasible engineering controls must be implemented by 2010. The new standard allows the use of objective data in lieu of measurements to determine whether control measures are necessary. Objective, in-depth analysis of existing exposure data and collection of new data are critical for complying with OSHA regulations and minimizing occupational exposures.

Approach

Scientific research in this project provides relevant data for OSHA guideline setting and for developing appropriate strategies to comply with OSHA regulations for exposure to hexavalent chromium and other toxic substances. A 2008 feasibility assessment study showed that available data on hexavalent chromium exposure can be collected and assembled to meet OSHA's objective data requirement. Research started in 2009 will include analysis of air sampling data from multiple electric power companies to determine the potential for overexposure to hexavalent chromium in various work situations. Engineering controls will also be evaluated. Work to develop a job-exposure matrix (JEM) that captures a wide range of occupational exposures is also planned for 2010.

Impact

- Provides knowledge necessary for developing preventive measures to minimize the health impact of environmental exposures
- Helps ensure compliance with exposure standards
- Offers the opportunity to improve worker health, morale, and productivity
- Reduces health-related costs
- Provides information about health risks associated with power plant occupational exposures that can be used to address proposed regulatory limits and to effectively protect and communicate with workers

How to Apply Results

Results from this work can be used to assess potential health risks associated with occupational exposures and to develop preventive measures, including appropriate work practices, that electric companies can implement. Electric company occupational health and safety staff also will use results to determine compliance with exposure standards. In addition, results may provide input to exposure standard formulation.

2010 Products

Product Title & Description	Planned Completion Date	Product Type
Job-Exposure Matrix: Developing an extensive job-exposure matrix for a wide spectrum of occupational work practices is the first step in addressing possibly associated health effects. Such a matrix will be developed in coordination with Project Sets 60B and 60C. The matrix also will be useful in assessing compliance with exposure standards.	12/31/10	Technical Report