CHPRA Strategies

CHPRA is organized to facilitate researcher interaction, promote new and innovative research, and transfer emerging results to business and government, responding flexibly to changing needs and challenges. The interdisciplinary nature of the center enhances research by facilitating the sharing of expertise, experience, and information across areas of specialization. The Center is also well positioned to partner with major corporations in high-technology industries to identify effective and efficient resource allocation strategies.

Core Capabilities

- Risk analysis
- Reliability analysis
- Decision analysis
- Systems analysis
- Uncertainty analysis
- Game theory
- Operations research

Center Director Vicki Bier has more than twenty years of experience in risk analysis and risk management of hazardous technologies. Her work has included applications to nuclear power safety, aerospace risks, risk communication, and homeland security.

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Center for Human Performance and Risk Analysis

The Center for Human Performance and Risk Analysis conducts multidisciplinary investigations of safety and security in complex systems. Faculty and scientists in engineering and the physical, biological, and social sciences provide analytical tools for effective resource allocation in risk management. Established in 1994 at the University of Wisconsin-Madison College of Engineering, the center is overseen by an executive board drawn from engineering, social science, business, and medicine. An advisory board of public and private sector agencies and companies ensures that the Center focuses on vital issues and viable solutions for today and tomorrow.

Mission Statement
Enhancing security through the use of risk analysis.

Vision Statement
A multidisciplinary research community working with the private and public sectors to address risks in complex systems involving humans and technology.

Enhancing Safety and Security
In today’s uncertain world, managers and decision makers are increasingly concerned with competing risks associated with accidents, natural disasters, terrorism, human errors, and disease. Risk management requires sophisticated tools for risk assessment and risk communication. Understanding the nature of risk in complex systems requires a broad interdisciplinary mix of expertise. The Center for Human Performance and Risk Analysis draws on faculty from engineering, medicine, and the physical and social sciences to address all aspects of risk. Center researchers are familiar with the chemical and petrochemical, defense, medical, electrical power, transportation, and food and agriculture industries. The Center’s advisory board provides strategic advice on current and future research needs. This ensures that the research of the Center addresses problems of concern to government and industry, taking real-world constraints into account.

Infrastructure Protection
The Center is applying a variety of disciplines to the protection of critical national infrastructures. Applications include engineering analysis of infrastructure systems, analysis of human factors in infrastructure protection, methods for vulnerability assessment, and computer-science approaches such as automatic intrusion detection. These assessments focus on ensuring the integrity and availability of complex networked systems such as computer or telecommunication systems.

Supply Chain Security
For the Department of Homeland Security, the Center is using uncertainty analysis, decision analysis, and game theory to determine cost-effective improvements to supply chain security, and enable identification of the most effective strategies for prevention and response. This work is currently focusing on the food and livestock industries.

Other Areas of Application
• Emergency planning and response
• Incident reporting systems
• Risk communication
• Risk-based decision making
• Effects of management factors on risk

Funding Sources
The Center has been funded by private industry, the Department of Homeland Security, the Army Research Office, and others.

Pictured at left: CHPRA researchers study the energy, transportation, defense, chemical, medical, and food and agriculture industries. Shown here is the air traffic control room at the airport in Madison, Wisconsin.