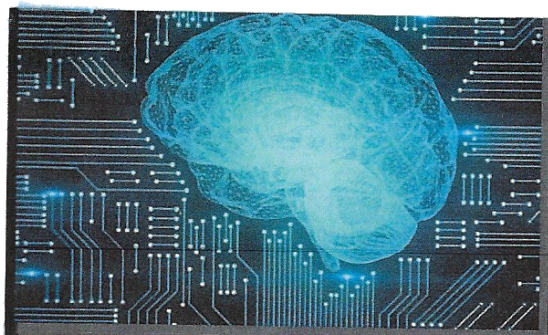

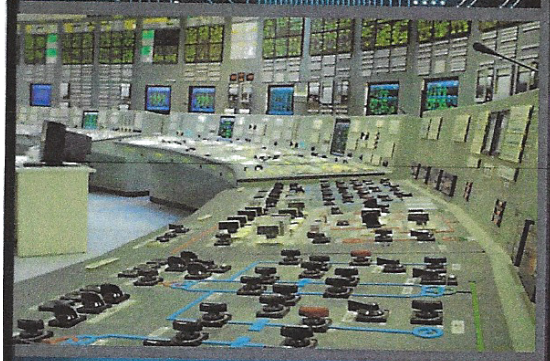

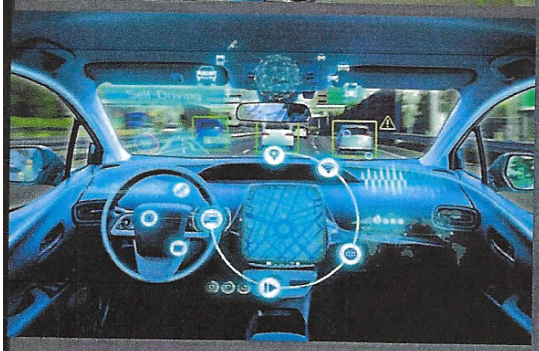

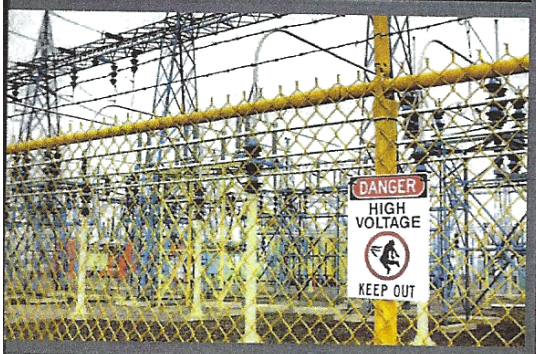

FORENSIC HUMAN FACTORS AND ERGONOMICS

Case Studies and Analyses

Edited by
Michael S. Wogalter

CRC Press
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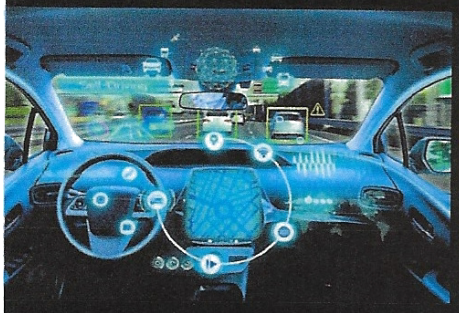
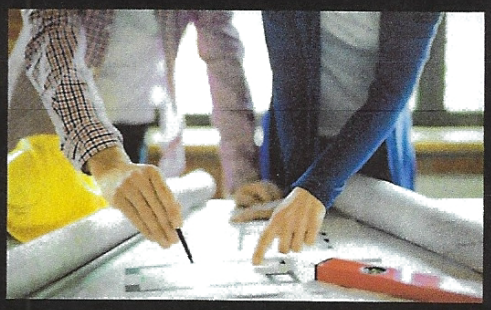
ERGONOMICS & HUMAN FACTORS





This book has 18 case study chapters investigating various injury scenarios through the use of a Human Factors and Ergonomics (HFE) analysis. Each injury scenario derives from one or more similar lawsuits (but names, places and some of the details are fictionalized). The scenarios describe a 'slice of life' of people interacting with products, equipment, tasks, and environments before they are seriously hurt. The forensic analysis that follows each scenario gives a background of prior similar events and systematically examines potential causes leading to the injury event. There is emphasis on the person-machine interface, human error, hazard analysis, hazard control and a model of communication-human information processing (C-HIP). Chapters are authored by highly experienced expert witnesses in HFE. The methods used are general techniques that can be applied to other injury scenarios, but would be better if employed earlier in a product's life cycle to prevent or limit injury. The first three chapters introduce concepts useful for the analyses in the case study chapters. The last chapter offers some broad take-away points that cut across several of the case studies.

- Features contributions by persons who have extensive experience in HFE and who have served professionally in the role of an expert witness in various legal cases mostly in product liability
- Gives a broad range of situations to illustrate where HFE considerations could improve product or environmental safety. There is an emphasis on children/caregivers, and adult activities such as driving
- Uses mitigation strategies to reduce the likelihood of occurrence and severity of adverse events
- Includes a first-person scenario at the beginning of each chapter
- Allows the lessons learned to be adaptable to other domains where people interact with products and environments

Michael S. Wogalter, Ph.D.

Mike Wogalter is a Professor Emeritus of Psychology at North Carolina State University. His interests are in the areas of cognitive ergonomics, hazard communication, human-technology systems interaction, and forensic human factors. He has authored more than 370 publications, including books, journal articles, chapters, and conference proceedings articles. He has participated in hundreds of cases as an expert witness on issues associated with human perception, cognition, and warnings.

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Case Studies and Analyses

Edited by
Michael S. Wogalter

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In loving memory of my mom, Laura, and in honor of my dad, Ralph.

Also a grateful acknowledgement to Kenneth R. Laughery, Sr.,

my distinguished mentor and friend.

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Human Factors and Ergonomics Book Series Foreword

This book is an important part of a growing Human Factors and Ergonomics book series by Taylor & Francis Group/CRC Press. *Forensic Human Factors and Ergonomics: Case Studies and Analyses* illustrates how injury cases can be viewed and analyzed using a human factors and ergonomics viewpoint. Useful lessons can be learned that are generalizable to other kinds of products, equipment, systems, environments, and tasks that will surely help to avoid or reduce injuries. This book is destined to become a classic worldwide and will be read for many years to come.

Waldemar Karwowski
Series Editor

Foreword

Human Factors and Ergonomics (HFE) concerns the interface between people and products they use, environments in which they function, and jobs/tasks they do. It is a discipline that discovers and applies information and knowledge about human behavior, including using information about people's characteristics, abilities, and limitations, so that their activities using products in disparate environments are productive and safe.

The past several decades have seen a substantial increase in HFE specialists serving as expert witnesses in product liability and personal injury litigation. The role of the forensic HFE expert witness in such litigation is to analyze the facts and issues in the case from an HFE perspective and to formulate opinions based on the results of the analyses. The expert may be called upon to provide his/her opinions verbally, by written reports, and/or by deposition. Should the case go to trial, the role of the expert is to educate the jury regarding the HFE issues.

A main purpose of this book is to show how the HFE professional can offer useful analyses of injury cases. Accordingly, a number of cases in which a product or environment was involved in severe injury, death, or property damage are described. Each case includes an HFE analysis of such an event, a discussion of better alternatives, and lessons learned. People's interaction with products, tasks and environments are complex, and not all interactions are "obvious" or generally known by the public. An HFE professional can offer insight on potential causes of injury events based on principles and research of which laypersons, including members of a jury, may be unaware without having formal training and experience in the discipline.

Of the 22 chapters in this book, 18 are case studies. The vast majority of the authors are HFE specialists who have considerable experience (and credentials) in the HFE discipline and who have served in the role of an expert witness in various product or premises liability cases.

A broad spectrum of HFE issues are presented using a range of products, concepts, tasks, and environments. The book focuses on how injury scenarios can be analyzed from an HFE perspective. In general, the book does not focus or describe particulars of the experts' role in litigation processes; there are many other books that address those matters. The attempt is to show that the HFE profession can offer insights that might be useful in litigation and also most importantly provide solutions to enhance future safety.

Chapters 1, 2, and 3, authored by the editor, Michael Wogalter, are intended to provide the reader with some background and perspective before reading the case studies in Chapters 4 through 21. Chapter 1 introduces the book and previews its purpose and content. Chapter 2 reviews the topics of hazard analyses and the basic hazard control hierarchy, which provide methodologies central to the analysis of many of the case studies. Chapter 3 describes the Communication-Human Information Processing (C-HIP) Model, a relevant theoretical model for analyzing warning effectiveness. The final chapter (Chapter 22), also by the editor, describes several main topical points that cut through several of the chapters and gives some final thoughts.

Because this book focuses on HFE analysis, its main utility is to provide guidance in fulfilling an important part HFE expert's role in litigation. It centers on analyzing descriptive injury scenarios using principles and methodologies of the HFE discipline. It is thus not

intended to be a compendium of tasks that an expert witness might do in the course of being retained in cases.

Forensic Human Factors and Ergonomics: Case Studies and Analyses can be used as a supplementary reading text in a general HFE or a forensic safety course. It could be primary text concerning forensic safety or a specialized safety psychology course. The book will be useful as reference for attorneys, engineers, designers, and architects.

Kenneth R. Laughery, Sr.
Professor Emeritus, Rice University
January 2018