

Executive Summary Faa Human Factors Division

This book addresses new technologies being considered by the Federal Aviation Administration (FAA) for screening airport passengers for concealed weapons and explosives. The FAA is supporting the development of promising new technologies that can reveal the presence of not only of metal-based weapons as with current screening technologies, but also detect plastic explosives and other non-metallic items and objects, and is concerned that these new technologies may not be appropriate for use in airports for other than technical screening. This book presents discussion of the health, legal, and public acceptance issues that are likely to be raised regarding implementation of improvements in the current electromagnetic screening technologies, implementation of screening systems that detect trace amounts of explosive materials on passengers, and implementation of systems that generate images of passengers beneath their clothes for analysis by screeners.

As part of the national effort to improve aviation safety, the Federal Aviation Administration (FAA) chartered the National Research Council to examine and recommend improvements in the aircraft certification process currently used by the FAA, manufacturers, and operators. Most aviation accidents are attributed to human error, pilot error especially. Human error also greatly effects productivity and safety. In his overview of this collection of papers, the editor points out that these facts are often misinterpreted as evidence of deficiencies of operators involved in accidents. Human factors research reveals a more accurate and useful perspective: The errors made by operators - such as pilots, controllers, and mechanics - are not root causes but symptoms of the way industry operates. The findings in this volume have strongly influenced modern thinking about why skilled experts make errors and how to make aviation error less likely.

Improving the Continued Airworthiness of Civil Aircraft

Hearings Before a Subcommittee of the Committee on Appropriations, United States Senate, One Hundred First Congress, First and Second Sessions, H.R. 3015

Advances in Human Factors and Systems Interaction

Human Factors in Simple and Complex Systems

FAA Oversight of the Commuter Airline Industry

Federal research and technology for aviation.

The National Research Council (NRC) of the National Academies was asked by NASA and the Office of Management and Budget to perform an assessment of NASA's Aerospace Technology Enterprise. The first such review, which began in early 2002, examined Pioneering Revolutionary Technology (now known as Mission and Science Measurement Technology). The assessment presented here, of the Aeronautics Technology Programs, began in early 2003 and is the second in the review series. The Aeronautics Technology Programs has three

components: the Vehicle Systems Program, the Airspace Systems Program, and the Aviation Safety Program. To conduct this review, the NRC established three panels, one for each of the component programs. The NRC also established a parent committee, consisting of the chairman and a subset of members from each panel. The committee and panels comprised a cross-section of experts from industry, academia, and government and included senior-level managers and researchers in the aeronautics field. Biographical information on the committee and panel members is found in Appendix A. Review of NASA's Aerospace Technology Enterprise: An Assessment of NASA's Aeronautics Technology Programs contains the committee's assessment of the Aeronautics Technology Programs. Chapter 1 presents a top-level assessment, and Chapters 2 through 4 provide the assessments of the Vehicle Systems Program, the Airspace Systems Program, and the Aviation Safety Program, respectively. Fratricide has been defined as firing on your own forces, when mistaking them for enemy forces, which results in injury or death. Rates of fratricide incidence have been steadily increasing and the complexity of the contemporary operating environment may lead to a continuation of this trend. Although the majority of research into fratricide has focused on the development of technological decision aids, recent explorations highlight the need to emphasise the social aspects within a socio-technical framework. This book presents and validates, via the use of case studies, a model of teamwork and decision-making factors that are associated with incidents of fratricide. In summary, it offers a review and evaluation of contemporary theoretical perspectives on teamwork and fratricide, as well as a range of accident analysis approaches. A novel theory of fratricide is then presented followed by a new methodology for assessing fratricide. Naturalistic case studies of teams are undertaken in the military domain. These studies illustrate the approach and offer early validation evidence. In closing, the book presents a series of principles designed to reduce the likelihood of fratricide in the future.

In the well-established aviation system, the importance of sound human factors practice, based on good aviation psychology research, is obvious from those incidents and accidents resulting from its neglect. This carefully structured book presents an up-to-date review

of the main areas in the field of Aviation Psychology. It contains current thinking mainly from Europe, but with input from Australia and North America, from specialists involved in research, training and operational practice. Spanning six parts, the book covers: Human Engineering, Occupational Demands, Selection of Aviation Personnel, Human Factors Training, Clinical Psychology, Accident Investigation and Prevention. Looking at the six parts - in human engineering, the reader learns about human-centered automation as well as human factors issues in aircraft certification. Results derived by job analysis methods are presented in the next part and serve as basic information in the design of selection and training programs. In selection, computerized testing or behaviour-oriented assessments are challenging approaches for personnel recruitment. Cost-benefit analyses in selection reveal convincing results, enabling organizations to save huge amounts of inappropriate training investment by the application of proper selection tests. The NOTECHS method is described which helps to assess CRM capabilities in training and can also be used to measure training effects in systematic validation studies. Although operational personnel in aviation are usually able to cope with stress more efficiently than other occupational groups, individual problems might develop as reactions to traumatic influences. Either a psychological evaluation or a proper treatment or both is then required as described in the 'Clinical Psychology' part of the book. The readership includes: aviation psychologists and flight surgeons, training, selection and recruitment specialists, instructor pilots, CRM facilitators, personnel managers, accident investigators, safety pilots, air traffic controllers, aircraft engineers and those dealing with human-machine interfaces.

Department of Transportation and Related Agencies Appropriations for 2000

Department of Transportation and Related Agencies Appropriations for 2000: Testimony of members of Congress and public witnesses

Report on the Interfaces Between Flightcrews and Modern Flight Deck Systems

The Future of Air Traffic Control

Aviation security : longstanding problems impair airport screeners' performance : report to congressional requesters

Airline Passenger Security Screening

Automation in air traffic control may increase efficiency, but it also raises questions about adequate human control over automated systems. Following on the panel's first volume on air traffic control automation, Flight to the Future (NRC, 1997), this book focuses on the interaction of pilots and air traffic controllers, with a growing network of automated functions in the airspace system. The panel offers recommendations for development of human-centered automation, addressing key areas such as providing levels of automation that are appropriate to levels of risk, examining procedures for recovery from emergencies, free flight versus ground-based authority, and more. The book explores ways in which technology can build on human strengths and compensate for human vulnerabilities, minimizing both mistrust of automation and complacency about its abilities. The panel presents an overview of emerging technologies and trends toward automation within the national airspace system--in areas such as global positioning and other aspects of surveillance, flight information provided to pilots and controllers, collision avoidance, strategic long-term planning, and systems for training and maintenance. The book examines how to achieve better integration of research and development, including the importance of user involvement in air traffic control. It also discusses how to harmonize the wide range of functions in the national airspace system, with a detailed review of the free flight initiative.

Simulation continues to be a growth area in transportation human factors. From empirical studies in the laboratory to the latest training techniques in the field, simulators offer myriad benefits for the experimenter and the practitioner. This book draws together current trends in research and training simulators for the road, rail, air and sea sectors to inform the reader how to maximize both validity and cost-effectiveness in each case. Simulators for Transportation Human Factors provides a valuable resource for both researchers and practitioners in transportation human factors on the use of simulators, giving readers concrete examples and case studies of how simulators have been developed and used in empirical research as well as training applications. It offers useful and usable information on the functional requirements of simulators without the need for any background knowledge on the technical aspects, focusing on the state of the art of research and applications in transport

simulators rather than the state of the art of simulation technology. The book covers simulators in operational terms instead of task simulation/modelling and provides a useful balance between a bottom-up, academic approach and a top-down, practical perspective. This book reports on cutting-edge research into innovative system interfaces, highlighting both lifecycle development and human-technology interaction, especially in virtual, augmented and mixed-reality systems. It describes advanced methodologies and tools for evaluating and improving interface usability and discusses new models, as well as case studies and good practices. The book addresses the human, hardware, and software factors in the process of developing interfaces for optimizing total system performance, while minimizing their costs. It also highlights the forces currently shaping the nature of computing and systems, such as: the importance of portability and technologies for reducing power requirements; the necessity of a better assimilation of computation in the environment; as well as solutions to promote accessibility to computers and systems for people with special needs. The book, which is based on the AHFE 2019 International Conference on Human Factors and Systems Interaction, held on July 24-28, 2019, in Washington D.C., USA, offers a timely survey and practice-oriented guide for systems interface users and developers alike.

Practical Guidance and Case Study Applications

Aviation Psychology: Practice and Research

Human Operators and Automation

Hearing Before the Subcommittee on Investigations & Oversight of the Committee on Public Works and Transportation, House of Representatives, One Hundredth Congress, Second Session, September 28, 1988

Department of Transportation and Related Agencies Appropriations for Fiscal Year 1990:

Department of Transportation, General Accounting Office

Federal Research and Technology for Aviation

Praise for the first edition: "This excellent text will be useful to every system engineer (SE) regardless of the domain. It covers ALL relevant SE material and does so in a very clear, methodical fashion. The breadth and depth of the author's presentation of SE principles and practices is outstanding." -Philip Allen This textbook presents a comprehensive, step-by-step guide to System Engineering analysis, design, and development via an

integrated set of concepts, principles, practices, and methodologies. The methods presented in this text apply to any type of human system -- small, medium, and large organizational systems and system development projects delivering engineered systems or services across multiple business sectors such as medical, transportation, financial, educational, governmental, aerospace and defense, utilities, political, and charity, among others. Provides a common focal point for “bridging the gap” between and unifying System Users, System Acquirers, multi-discipline System Engineering, and Project, Functional, and Executive Management education, knowledge, and decision-making for developing systems, products, or services Each chapter provides definitions of key terms, guiding principles, examples, author’s notes, real-world examples, and exercises, which highlight and reinforce key SE&D concepts and practices Addresses concepts employed in Model-Based Systems Engineering (MBSE), Model-Driven Design (MDD), Unified Modeling Language (UMLTM) / Systems Modeling Language (SysMLTM), and Agile/Spiral/V-Model Development such as user needs, stories, and use cases analysis; specification development; system architecture development; User-Centric System Design (UCSD); interface definition & control; system integration & test; and Verification & Validation (V&V) Highlights/introduces a new 21st Century Systems Engineering & Development (SE&D) paradigm that is easy to understand and implement. Provides practices that are critical staging points for technical decision making such as Technical Strategy Development; Life Cycle requirements; Phases, Modes, & States; SE Process; Requirements Derivation; System Architecture Development, User-Centric System Design (UCSD); Engineering Standards, Coordinate Systems, and Conventions; et al. Thoroughly illustrated, with end-of-chapter exercises and numerous case studies and examples, Systems Engineering Analysis, Design, and Development, Second Edition is a primary textbook for multi-discipline, engineering, system analysis, and project management undergraduate/graduate level students and a valuable reference for professionals.

The fourth edition of the Handbook of Human Factors and Ergonomics has been completely revised and updated. This includes all existing third edition chapters plus new chapters written to cover new areas. These include the following subjects: Managing low-back disorder risk in the workplace Online interactivity Neuroergonomics Office ergonomics Social networking HF&E in motor vehicle transportation User requirements Human factors and ergonomics in aviation Human factors in ambient intelligent environments As with the earlier editions, the main purpose of this handbook is to serve the needs of the human factors and ergonomics researchers, practitioners, and graduate students. Each chapter has a strong theory and scientific base, but is heavily focused on realworld applications. As such, a significant number of case studies, examples, figures, and tables are included to aid in the understanding and application of the material covered.

At a time of increasing regulatory scrutiny and medico-legal risk, managing serious clinical incidents within

primary care has never been more important. Failure to manage appropriately can have serious consequences both for service organisations and for individuals involved. This is the first book to provide detailed guidance on how to conduct incident investigations in primary care. The concise guide explains how to recognise a serious clinical incident, how to conduct a root cause analysis investigation, and how and when duty of candour applies covers the technical aspects of serious incident recognition and report writing includes a wealth of practical advice and 'top tips', including how to manage the common pitfalls in writing reports offers practical advice as well as some new and innovative tools to help make the RCA process easier to follow explores the all-important human factors in clinical incidents in detail, with multiple examples and worked-through cases studies as well as in-depth sample reports and analysis. This book offers a master class for anyone performing RCA and aiming to demonstrate learning and service improvement in response to serious clinical incidents. It is essential reading for any clinical or governance leads in primary care, including GP practices, 'out-of-hours', urgent care centres, prison health and NHS 111. It also offers valuable insights to any clinician who is in training or working at the coal face who wishes to understand how serious clinical are investigated and managed.

Department of Transportation and Related Agencies Appropriations for Fiscal Year 1990

Oversight on the FAA's Fiscal Year 1990 R&D Program

Scientific and Technical Aerospace Reports

Aviation Psychology in Practice

Proceedings of the AHFE 2019 International Conference on Human Factors and Systems Interaction, July 24-28, 2019, Washington D.C., USA

Human Factors in Air Traffic Control

In 2000, the Conference on Automation joined forces with a partner group on situation awareness (SA). The rising complexity of systems demands that one can be aware of a large range of environmental and task-based stimulation in order to match what is done with what has to be done. Thus, SA and automation-based interaction fall naturally together and this conference is the second embodiment of this union. Moving into the 21st century, further diversification of the applications of automation will continue--for example, the revolution in genetic technology. Given the broad nature of this form of human-machine interaction, it is vital to apply past lessons to map a future for the symbiotic relationship between humans and the artifacts they create. It is as part of this ongoing endeavor that the present volume is offered.

In research and application of Human Factors in Air Traffic Management (ATM) systems design, development and operation, there remains a lack of clarity regarding the range and integration of activities associated with the need for greater attention to issues such as human error, interface design and teamwork, especially in systems with increased levels of

automation. This book seeks to redress this situation by presenting case studies of human factors applications in which there is demonstrable success in terms of improvement in operational systems. Individual examples are used to outline how each human factors study evolved, what it entailed, how it was resourced and how the results contributed to operational performance. Case studies include training methods, human error, team resource management, situation assessment, terminal automation replacement systems, collaborative decision-making to improve the effectiveness of traffic-flow management and the role of human factors in ATM.

Despite the strong safety record of the national airspace system, serious disruptions occasionally occur, often as a result of outdated or failed equipment. Under these circumstances, safety relies on the skills of the controllers and pilots and on reducing the number of aircraft in the air. The current and growing pressures to increase the capacity to handle a greater number of flights has led to a call for faster and more powerful equipment and for equipment that can take over some of the tasks now being performed by humans. Increasing the role of automation in air traffic control may provide a more efficient system, but will human controllers be able to effectively take over when problems occur? This comprehensive volume provides a baseline of knowledge about the capabilities and limitations of humans relative to the variety of functions performed in air traffic control. It focuses on balancing safety with the expeditious flow of air traffic, identifying lessons from past air accidents. The book discusses The function of the national airspace system and the procedures for hiring, training, and evaluating controllers. Decisionmaking, memory, alertness, vigilance, sleep patterns during shift work, communication, and other factors in controllers' performance. Research on automation and human factors in air traffic control and incorporation of findings into the system. The Federal Aviation Administration's management of the air traffic control system and its dual mandate to promote safety and the development of air commerce. This book also offers recommendations for evaluation the human role in automated air traffic control systems and for managing the introduction of automation into current facilities and operations. It will be of interest to anyone concerned about air safety--policymakers, regulators, air traffic managers and controllers, airline officials, and passenger advocates.

Workshop on Aeronautical Decision Making (ADM).

Transformation Will Require Cultural Change, Balanced Funding Priorities, and Use of All Available Management Tools : Report to Congressional Requesters

Transportation Systems Center Bibliography of Technical Reports; January - December 1978

Executive summary

Development of New Security Technology

The Human Factors of Fratricide

Catalog of reports, decisions and opinions, testimonies and speeches.

Recently, there have been a number of advances in technology, including in mobile devices, globalization of companies, display technologies and healthcare, all of which require significant input and evaluation from human factors specialists. Accordingly, this textbook has been completely updated, with some chapters folded into other chapters and new chapters added where needed. The text continues to fill the need for a textbook that bridges the gap between the conceptual and empirical foundations of the field.

The Next Generation Air Transportation System's (NextGen) goal is the transformation of the U.S. national airspace system through programs and initiatives that could make it possible to shorten routes, navigate better around weather, save time and fuel, reduce delays, and improve capabilities for monitoring and managing of aircraft. A Review of the Next Generation Air Transportation provides an overview of NextGen and examines the technical activities, including human-system design and testing, organizational design, and other safety and human factor aspects of the system, that will be necessary to successfully transition current and planned modernization programs to the future system. This report assesses technical, cost, and schedule risk for the software development that will be necessary to achieve the expected benefits from a highly automated air traffic management system and the implications for ongoing modernization projects. The recommendations of this report will help the Federal Aviation Administration anticipate and respond to the challenges of implementing NextGen.

Implications and Importance of System Architecture

An Assessment of NASA's Aeronautics Technology Programs

Patient Safety

Federal Aviation Administration's Research and Development Program

Review of the FAA 1982 national airspace system plan.

Human Performance, Situation Awareness, and Automation

This book seeks to extend the boundaries of aviation psychology in two interrelated ways: by broadening the focus of aviation psychology beyond the flight deck to the whole aviation system; and by discussing new theoretical developments which are shaping this applied discipline. A key feature of these theoretical advances is that they are grounded in a more developed, ecologically valid, understanding of practice. Among the issues addressed in this new integration of theory and practice are the following: what goes on in the flight deck is dependent on the wider organisational context; human factors issues in aircraft maintenance and grounding are critical to aviation safety; our capacity to learn from aviation accidents and incidents needs to be supported by more systematic human factors investigation and research; we must also develop our understanding of the human factors of accident survival as well as accident prevention; theories of crew coordination and decision making must be supported by an analysis of how decisions are actually made in the real world with all its stresses and constraints; training should be grounded in a thoroughgoing analysis of the complexity of the job and a full understanding of the training

process itself. The text will be of interest to human factors researchers and practitioners in aviation and related areas. It will be of particular relevance to those who have a role in training, management or regulation throughout the aviation system.

This book provides an overview of, and practical guidance on, the range of human factors (HF) methods that can be used for the purposes of accident analysis and investigation in complex sociotechnical systems. Human Factors Methods and Accident Analysis begins with an overview of different accident causation models and an introduction to the concepts of accident analysis and investigation. It then presents a discussion focussing on the importance of, and difficulties associated with, collecting appropriate data for accident analysis purposes. Following this, a range of HF-based accident analysis methods are described, as well as step-by-step guidance on how to apply them. To demonstrate how the different methods are applied, and what the outputs are, the book presents a series of case study applications across a range of safety critical domains. It concludes with a chapter focussing on the data challenges faced when collecting, coding and analysing accident data, along with future directions in the area. Human Factors Methods and Accident Analysis is the first book to offer a practical guide for investigators, practitioners and researchers wishing to apply accident analysis methods. It is also unique in presenting a series of novel applications of accident analysis methods, including HF methods not previously used for these purposes (e.g. EAST, critical path analysis), as well as applications of methods in new domains.

Examines the Federal Aviation Administration's (FAA) efforts to develop new equipment for detecting explosives and methods to improve aircraft survivability. Recommendations in this report will ensure that (1) FAA's process for approving new explosive detection equipment can provide the aviation community and the flying public with effective and reliable technology, and (2) FAA's research efforts are properly managed to meet the threats to aviation. Charts and tables.

Current Research and Trends HPSAA II, Volumes I and II

A Strategy for the FAA's Aircraft Certification Service

Simulators for Transportation Human Factors

Investigating and Reporting Serious Clinical Incidents

Research and Practice

Review of NASA's Aerospace Technology Enterprise