

Appendix C Human Factors Wildfirelessons

"TRB's Hazardous Materials Cooperative Research Program (HMCRP) Report 9: A Compendium of Best Practices and Lessons Learned for Improving Local Community Recovery from Disastrous Hazardous Materials Transportation Incidents explores how local communities can develop or improve recovery planning and operations in response to hazardous materials transportation incidents"--Publisher's description. Dialogue provides practical guidelines for one of the essential elements of true partnership--learning how to talk together in honest and effective ways. Reveals how problems between managers and employees, and between companies or divisions within a larger corporation, stem from an inability to conduct a successful dialogue. Managing wildland fire in the U.S. is a challenge increasing in complexity & magnitude. The goals & actions presented in this report encourage a proactive approach to wildland fire to reduce its threat. Five major topic areas on the subject are addressed: the role of wildland fire in resource management; the use of wildland fire; preparedness & suppression; wildland/urban interface protection; & coordinated program management. Also presented are the guiding principle that are fundamental to wildland fire management & recommendations for fire management policies. Photos, graphs, & references.

Shortlisted for the 2013 Royal Society Winton Prize for Science Books Leading psychologist Charles Fernyhough blends the most current science with literature and personal stories in *Pieces of Light: How the New Science of Memory Illuminates the Stories We Tell About Our Pasts*. A new consensus is emerging among cognitive scientists: rather than possessing fixed, unchanging memories, they have found that we create recollections anew each time we are called upon to remember. According to psychologist Charles Fernyhough, remembering is an act of narrative imagination as much as it is the product of a neurological process. An NPR and Psychology Today contributor, Dr. Fernyhough guides readers through the fascinating new science of autobiographical memory, covering topics such as: navigation, imagination, and the power of sense associations to cue remembering. Exquisitely written and meticulously researched, *Pieces of Light* brings together science and literature, the ordinary and the extraordinary, to help us better understand our powers of recall and our relationship with the past.

Ten Questions About Human Error asks the type of questions frequently posed in incident and accident investigations, people's own practice, managerial and organizational settings, policymaking, classrooms, Crew Resource Management Training, and error research. It is one installment in a larger transformation that has begun to identify both deep-rooted constraints and new leverage points of views of human factors and system safety. The ten questions about human error are not just questions about human error as a phenomenon, but also about human factors and system safety as disciplines, and where they stand today. In asking these questions and sketching the answers to them, this book attempts to show where current thinking is limited--where vocabulary, models, ideas, and notions are constraining progress. This volume looks critically at the answers human factors would typically provide and compares/contrasts them with current research insights. Each chapter provides directions for new ideas and models that could perhaps better cope with the complexity

of the problems facing human error today. As such, this book can be used as a supplement for a variety of human factors courses.

A complete set of nomographs for estimating surface fire rate of spread and flame length for the original 13 and new 40 fire behavior fuel models is presented. The nomographs allow calculation of spread rate and flame length for wind in any direction with respect to slope and allow for nonheading spread directions. Basic instructions for use are included.

Includes introductory chapters on basic ecology and geology to familiarize the reader with the climate, rocks, soil, plants, and animals in each distinctive region of California and shows how the state's natural history is uniquely interwoven with its human history.

Fire events often have a large impact on recreation and tourism, yet these issues had not been addressed from a social science perspective. There are three distinct lines of research to address: examine values/attitudes and behaviors of recreation residence owners and year-round residents in the wildland-urban interface; examine recreationists' perceptions about fire suppression and postfire forest health issues; and examine perceptions and beliefs about recreation activities and impacts to fire-prone ecosystems in the wildland-urban interface.

This report includes 17 of these studies grouped into four major topical headings: recreation use research, commun. research, program eval. and interface residents research, and trust research. Charts and tables.

Wildland fire has and continues to impact humans and our environment both positively and negatively. Being able to co-exist with fire on the landscape is becoming increasingly more important as man expands his use of the world's ecosystems. This book is the latest contribution dedicated towards the scholarship surrounding the subject of wildland fires. The present volume consists of a collection of essays covering fire science and technology topics that support the management of wildfires and prescribed fires written by specialists in their respective fields. The nine chapters cover the following: (i) the need of fire and the consequences of policies of attempted fire exclusion to try and manage the wildfire problem; (ii) a review of the current state-of-knowledge of the role of remote sensing technologies in managing wildfires; (iii) a description of how the Canadian system of forest fire danger rating has been introduced into Argentina; (iv) the rationale for adding an "QA" for anchor point(s) to the LCES (Lookout(s)--Communication(s) -- Escape routes -- Safety zone(s)) safety system for wildland firefighters, thus denoting LACES; (v) a case study involving the use of cloud-based geographic information system on the 2013 Silver Fire in southern California; (vi) the deaths that have occurred amongst rural firefighters and members of the public in Greece since 1997; (vii and viii) two separate overviews of the history, ecology and management of two large Argentinian regions of South America; and (ix) an assessment undertaken of wildland firefighter fatalities in South Africa over the past twenty years or so.

The National Wildfire Coordinating Group provides national leadership to enable

interoperable wildland fire operations among federal, state, local, tribal, and territorial partners. Primary objectives include: Establish national interagency wildland fire operations standards. Recognize that the decision to adopt standards is made independently by the NWCG members and communicated through their respective directives systems; Establish wildland fire position standards, qualifications requirements, and performance support capabilities (e.g. training courses, job aids) that enable implementation of NWCG standards; Support the National Cohesive Wildland Fire Management Strategy goals: to restore and maintain resilient landscapes; create fire adapted communities; and respond to wildfires safely and effectively; Establish information technology (IT) capability requirements for wildland fire; and Ensure that all NWCG activities contribute to safe, effective, and coordinated national interagency wildland fire operations. The objectives of the "Interagency Helicopter Operations Guide" (IHOG) are to: Promote safe, cost-efficient and effective aviation services in support of agency and interagency goals and objectives; Define and standardize national, interagency helicopter management and operational procedures for helicopter users from participating agencies; Through standardization, facilitate the ability of personnel from different agencies to work cooperatively on incidents or projects; and Provide a framework within which areas, regions, states, and local units can provide supplemental, site-specific guidance. The procedures contained in this guide apply to helicopter operations conducted by providers and users of helicopters from participating agencies. This guide addresses both incident and resource helicopter operations.

The wildland fire community has spent the past decade trying to understand and account for the role of human factors in wildland fire organizations. Social research that is relevant to managing fire organizations can be found in disciplines such as social psychology, management, and communication. However, such research has been published primarily for scientific and business audiences, and much of the fire community has not been exposed to it. Here, we have compiled and organized knowledge from a variety of social science disciplines so that it can be used to improve organizational practices related to firefighter and public safety, to assess the effectiveness of safety campaigns, and to improve firefighter safety trainings. This annotated reading list summarizes approximately 270 books, articles, and online resources that address scientific and management concepts helpful for understanding the human side of fire management. The first section, Human Factors and Firefighting, introduces readers to key workshops and writings that led to the recognition that human factors are prime ingredients of firefighter safety. The second section, Foundations for Understanding Organizations, consists of social science research that provides a foundation for understanding organizational dynamics. This section includes readings on decision making and sensemaking, organizational culture, identification and identity, leadership and change, organizational learning, and teams and crews. The third section, Understanding Organizations in High Risk Contexts, explores organizations that deal regularly with risk, uncertainty and crisis. This section includes readings on risk and uncertainty, high reliability organizing, and crisis communication. The

publication concludes with Internet resources available for those interested in the management of fire organizations.

This reference work encompasses the current, accepted state of the art in the science of wildfires and wildfires that spread to communities, known as wildland-urban interface (WUI) fires. 171 author contributions include accepted knowledge on these topics from throughout the world, all written by the leading researchers, experts, practitioners, and academics. This encyclopedia is an invaluable reference for newcomers to the field, as well as researchers, students, developers, and professionals who are interested in exploring this dynamic area. General Sections include: Combustion Coordination System Locations Fire Whirls Firebrands and Embers Incident Management Team (IMT) Support Locations Incident Response Support Locations On-the-Incident Locations Soot and Effects on Wildland/WUI Fire Behavior Weathering Effects on Fire Retardant Wood Treatments Wildland Firefighting Locations Wildland Fuel Treatments This report describes a new set of standard fire behavior fuel models for use with Rothermel's surface fire spread model and the relationship of the new set to the original set of 13 fire behavior fuel models. To assist with transition to using the new fuel models, a fuel model selection guide, fuel model crosswalk, and set of fuel model photos are provided.

Accident investigation and risk assessment have for decades focused on the human factor, particularly 'human error'. This bias towards performance failures leads to a neglect of normal performance. It assumes that failures and successes have different origins so there is little to be gained from studying them together. Erik Hollnagel believes this assumption is false and that safety cannot be attained only by eliminating risks and failures. The alternative is to understand why things go right and to amplify that. The ETTO Principle looks at the common trait of people at work to adjust what they do to match the conditions. It proposes that this efficiency-thoroughness trade-off (ETTO) is normal. While in some cases the adjustments may lead to adverse outcomes, these are due to the same processes that produce successes.

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in accordance with applicable procurement regulations. - Management and tracking of government property. - Financial coordination with the jurisdictional agency and maintenance of finance, property, procurement, and personnel records, and forms. - Use and coordination of incident business management functions as they relate to sharing of resources among federal, state, and local agencies, including the military. - Documentation and reporting of claims. - Documentation of costs and cost management practices. - Administrative processes for all-hazards incidents.

Although ecosystems, humans, and fire have coexisted for millennia, changes in geology, ecology, hydrology, and climate as well as sociocultural, regulatory, and economic factors have converged to make wildland fire management exceptionally challenging for U.S. federal, state, and local authorities. Given the mounting, unsustainable costs and difficulty translating existing wildland fire science into policy, the National Academies of Sciences, Engineering, and Medicine organized a 1-day workshop to focus on how a century of wildland fire research can contribute to improving wildland fire management. This publication summarizes the presentations and discussions from the workshop.

While many organizations see the value of creating a just culture they struggle when it comes to developing it. In this Second Edition, Dekker expands his views, additionally tackling the key issue of how justice is created inside organizations. Dekker also introduces new material on ethics and on caring for the 'second victim' (the professional at the centre of the incident). Consequently, we have a natural evolution of the author's ideas.

The true story behind the events that inspired the major motion picture *Only the Brave*. A "unique and bracing" (Booklist) first-person account by the sole survivor of Arizona's disastrous 2013 Yarnell Hill Fire, which took the lives of 19 "hotshots"--firefighters trained specifically to battle wildfires. Brendan McDonough was on the verge of becoming a hopeless, inveterate heroin addict when he, for the sake of his young daughter, decided to turn his life around. He enlisted in the Granite Mountain Hotshots, a team of elite firefighters based in Prescott, Arizona. Their leader, Eric Marsh, was in a desperate crunch after four hotshots left the unit, and perhaps seeing a glimmer of promise in the skinny would-be recruit, he took a chance on the unlikely McDonough, and the chance paid off. Despite the crew's skepticism, and thanks in large part to Marsh's firm but loving encouragement, McDonough unlocked a latent drive and dedication, going on to successfully battle a number of blazes and eventually win the confidence of the men he came to call his brothers. Then, on June 30, 2013, while McDonough--"Donut" as he'd been dubbed by his team--served as lookout, they confronted a freak, 3,000-degree inferno in nearby Yarnell, Arizona. The relentless firestorm ultimately trapped his hotshot brothers, tragically killing all 19 of them within minutes. Nationwide, it was the greatest loss of firefighter lives since the 9/11 attacks. *Granite Mountain* is a gripping memoir that traces McDonough's story of finding his way out of the dead end of drugs, finding his purpose among the Granite Mountain Hotshots, and the minute-by-minute account of the fateful day he lost the very men who had saved him. A harrowing and redemptive tale of resilience in the face of tragedy, *Granite Mountain* is also a powerful reminder of the heroism of the people who put themselves in harm's way to protect us every day.

California and other wildfire-prone western states have experienced a substantial

increase in the number and intensity of wildfires in recent years. Wildlands and climate experts expect these trends to continue and quite likely to worsen in coming years. Wildfires and other disasters can be particularly devastating for vulnerable communities. Members of these communities tend to experience worse health outcomes from disasters, have fewer resources for responding and rebuilding, and receive less assistance from state, local, and federal agencies. Because burning wood releases particulate matter and other toxicants, the health effects of wildfires extend well beyond burns. In addition, deposition of toxicants in soil and water can result in chronic as well as acute exposures. On June 4-5, 2019, four different entities within the National Academies of Sciences, Engineering, and Medicine held a workshop titled Implications of the California Wildfires for Health, Communities, and Preparedness at the Betty Irene Moore School of Nursing at the University of California, Davis. The workshop explored the population health, environmental health, emergency preparedness, and health equity consequences of increasingly strong and numerous wildfires, particularly in California. This publication is a summary of the presentations and discussion of the workshop.

This title was first published in 2002: This field guide assesses two views of human error - the old view, in which human error becomes the cause of an incident or accident, or the new view, in which human error is merely a symptom of deeper trouble within the system. The two parts of this guide concentrate on each view, leading towards an appreciation of the new view, in which human error is the starting point of an investigation, rather than its conclusion. The second part of this guide focuses on the circumstances which unfold around people, which causes their assessments and actions to change accordingly. It shows how to "reverse engineer" human error, which, like any other component, needs to be put back together in a mishap investigation. Nineteen hotshot firefighters died on the Yarnell Hill Fire in central Arizona on June 30, 2013 after deploying fire shelters. They were members of the Granite Mountain Interagency Hotshot Crew (IHC), hosted by the Prescott Fire Department. This report has two parts. Part One includes the fact-based Narrative of the incident and offers the Team's Analysis, Conclusions, and Recommendations. Part Two, the Discussion section, is meant to prompt discussion and facilitate learning. It explores multiple concepts and perspectives, in order to support the broader community seeking to make sense of the accident and to improve safety and resilience. Appendices provide technical details and other supplemental information.

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wildland fire operations. The "NWCG Standards for Airspace Coordination" standardizes safe, consistent approaches to issues involving airspace and agency land management responsibilities. This is an educational process that will contribute to a clear understanding of flight and coordination within the complexities of the National Airspace System (NAS). Additionally, it promotes airspace coordination with respect to environmental issues. The objectives of the "NWCG Standards for Airspace Coordination" are: Describe the components of the NAS, and define airspace coordination responsibilities among the various agencies and users of the NAS; Describe the processes and procedures that an agency should employ so that users may: Coordinate, deconflict, and conduct flight missions safely within the NAS with respect to safety concerns and operational requirements; Coordinate, deconflict, and respond to airspace issues relating to the environment; Provide educational material aimed at both agency and military aviation and airspace managers that will contribute to a clear understanding of the complex nature of the airspace in which we all share; and Identify airspace coordination responsibilities for agency personnel. Airspace coordination and deconfliction is a shared responsibility among pilots, Air Traffic Controllers, dispatchers, trainers, on-scene personnel, and managers of resources, operations, safety, and airspace. The primary focus in airspace coordination is mid-air collision avoidance. When performing most agency aviation tasks, the pilot's attention will be diverted out of the aircraft toward the ground, conflicting with their primary responsibility to "see and avoid" other aircraft or obstructions. Other users of this airspace may have similar workload distractions. As airspace becomes more complex, effective processes are needed that will identify issues and facilitates coordination efforts. The FAA and Department of Defense (DoD) are our primary collaborative partners in minimizing risk during flight operations. An understanding and awareness of the procedures in this publication will improve aviation safety through coordinated use of the NAS. A consistent approach will also maximize agency effectiveness as resource managers, and ensure compliance with the National Environmental Policy Act (NEPA) when responding to airspace proposals.

The Human Contribution is vital reading for all professionals in high-consequence environments and for managers of any complex system. The book draws its illustrative material from a wide variety of hazardous domains, with the emphasis on healthcare reflecting the author's focus on patient safety over the last decade. All students of human factors - however seasoned - will also find it an invaluable and thought-provoking read.

Reference Manual 18: Wildland Fire Management, Chapters 1 through 20 represents the most detailed and comprehensive guidance on implementing Servicewildland fire management policy for the National Park Service. Reference Manual 18(RM18) provides NPS field employees legal references, operating policies, standards, procedures, general information, recommendations, and examples to assist them in carrying out Management Policies and Director's Orders.

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