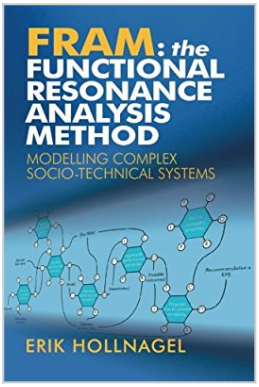

FRAM: The Functional Resonance Analysis Method: Modelling Complex Socio-technical Systems

By Erik Hollnagel

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Resilience engineering has consistently argued that safety is more than the absence of failures. Since the first book was published in 2006, several book chapters and papers have demonstrated the advantage in going behind 'human error' and beyond the failure concept, just as a number of serious accidents have accentuated the need for it. But there has not yet been a comprehensive method for doing so; the Functional Resonance Analysis Method (FRAM) fulfils that need. Whereas commonly used methods explain events by interpreting them in terms of an already existing model, the FRAM is used to model the functions that are needed for everyday performance to succeed. This model can then be used to explain specific events, by showing how functions can be coupled and how the variability of everyday performance sometimes may lead to unexpected and out-of-scale outcomes - either good or bad. The FRAM is based on four principles: equivalence of failures and successes, approximate adjustments, emergence, and functional resonance. As the FRAM is a method rather than a model, it makes no assumptions about how the system under investigation is structured or organised, nor about possible causes and cause-effect relations. Instead of looking for failures and malfunctions, the FRAM explains outcomes in terms of how functions become coupled and how everyday performance variability may resonate. This book presents a detailed and tested method that can be used to model how complex and dynamic socio-technical systems work, to understand why things sometimes go wrong but also why they normally succeed.

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Editorial Review

Review
'One of Hollnagel's strengths is tenacity. Rather than completing a method and declaring victory, he continues to explore issues of how to understand complex socio-technical systems. Rather than a destination, FRAM is the most recent step in Erik Hollnagel's continuing quest for relevance, and we are fortunate to share the trip.' --Cognition, Technology and Work, No 15, 2013

The author makes a convincing case that the FRAM will allow analysis of any accident, to all levels of contributory causation, without the rigidity and scale invariance of other prescribed models. --Aviation, Space, and Environmental Medicine x Vol. 84, No. 11 x November 2013

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Erik Hollnagel (Ph.D., psychology) is Professor at the Department of Public Health, University of Southern Denmark, Industrial Safety Chair at MINES Paris-Tech (France), Professor Emeritus at University of LinkÃ¶ping (Sweden), and Visiting Fellow of the Institute for Advanced Study of the Technische UniversitÃ¤t MÃ¼nchen (Germany). Since 1971 he has worked within universities, research centres and industries in several countries facing problems from several domains, including nuclear power generation, aerospace and aviation, air traffic management, software engineering, healthcare, and land-based traffic. His professional interests include industrial safety, resilience engineering, accident investigation, cognitive systems engineering and cognitive ergonomics. He has published more than 250 papers and authored or edited 18 books, some of the most recent titles being The ETTO Principle (Ashgate, 2009) and Resilience Engineering in Practice (Ashgate, 2011). Erik Hollnagel is also Editor-in-Chief of the book series Ashgate Studies in Resilience Engineering.

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