

# CONTENTS

Foreword - *all editors* vii

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## Part A: Introduction

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Ch.A.1	Introduction: The Goals of Event Analysis - <i>Hale</i>	1
Ch.A.2	Structure of Event Analysis - <i>Freitag and Hale</i>	11
Ch.A.3	Event Analysis and Responsibility in Complex Systems - <i>Leplat</i>	23
Ch.A.4	Organisational Epidemiology: A Tool for Investigating Organisational Factors Related to the Occurrence and Prevention of Accidental Chemical Releases - <i>Rosenthal</i>	41

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## Part B: Methods and Applications

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Ch.B.1	The Effect of the Accident Inquiry Process Within the Railway Industry - <i>Maidment</i>	63
Ch.B.2	Accident Scenarios as a Tool for Safety Enhancement Strategies in Transportation Systems - <i>Stoop</i>	77
Ch.B.3	Deriving Organisational Principles for Safety Management Systems from the Analysis of Aircraft Ramp Accidents - <i>McDonald</i>	95
Ch.B.4	Event Analysis as Problem Solving Process - <i>Fahlbruch and Wilpert</i>	113
Ch.B.5	Using MORT to Generate Organisational Feedback from Single Accidents at Work - <i>Koornneef and Hale</i>	131

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## Part C: Generic Problems

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Ch.C.1	Shame, Blame and Liability: Why Safety Management Suffers Organisational Learning Disabilities - <i>Baram</i>	161
Ch.C.2	Major Event Analysis in the United States Chemical Industry: Organisational Learning vs. Liability - <i>Rosenthal</i>	179
Ch.C.3	Event Analysis and Regulation: Are We Able to Discover Organisational Factors? - <i>Becker</i>	197
Ch.C.4	Responding to Public Criticism of Safety Management Systems - is the Response Always Effective and Appropriate? - <i>Maidment</i>	217

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Conclusions: After the Event: What Next? - *Wilpert* 233

# FOREWORD

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This volume is part of a long running scientific endeavour emerging from an international, interdisciplinary study group on "New Technologies and Work (NeTWork)". NeTWork is sponsored by the Werner-Reimers-Foundation (Bad Homburg, Germany) and the Maison des Sciences de l'Homme (Paris). The study group has set itself the task of scrutinising the most important problem domains posed by the introduction, spread and control of new technologies in work settings. Such a problem focus requires a strong multidisciplinary co-operation. For the last 15 years the group has organised a yearly workshop in Bad Homburg which tackles an emerging or problematic theme in this area. NeTWork operates with a small core group, which chooses the annual themes and plans and evaluates the workshops. Each workshop is coordinated by two or three "godfathers", who detail the theme, propose the prospective participants, structure the workshop and undertake, where possible, the production of a book based on the rewritten contributions, enriched by the discussions which take place in the three days. The participants are drawn from research, industry and government, in order to balance the insights from theory with the practical realities of work and organisation. Contributions are invited from both established and up-and-coming researchers. In its 15 years more than 150 persons from 20 countries have participated, and this will be the ninth book which has resulted from the workshops. Three more are in preparation. It is always the aim of the books to be more than a collection of disparate contributions. The editors structure and order the chapters into a framework, in order to underline the advances and highlight the still remaining gaps and questions. In this way we hope that the books can serve as a reflection of the state of the art at the cutting edge of the subject. They are aimed at both researchers and at the advanced practitioners who have to struggle with the realities of managing or regulating the new technologies.

While the original activities of NeTWork began with a wide coverage of themes, ranging from human error, training, information technology and distributed decision making, recently its pre-occupation has been more specifically on a theme of great scientific and social significance: the safety of high technology systems and the role of the human and management contribution to their breakdown and control. This focus is justified by the public and scientific concern of the past years following major disasters afflicting a wide range of complex technologies; nuclear power plants, ferries, aircraft, chemical installations, spacecraft, oil tankers, offshore platforms, trains, hazardous good transport and motorway pile-ups, telecommunications and complex computer systems such as the stock exchange.

## After the Event: from Accident to Organisational Learning

These "modern" disasters strike very different technologies, but share many factors in common; their occurrence in well-defended complex systems; the complexity of their causal roots; the dominance of human, rather than technical failures. They represent the visible tokens of the limits of our ability to control complex systems. It is these limits and the ways of both expanding them and yet staying securely inside them that the more recent workshops have explored.

This book, drawn from the thirteenth workshop in 1995, falls squarely in this tradition. It starts from the premise that complex systems cannot be perfectly constructed in one go, but must grow, learn and adapt, both to the increasing insights into their own technology and functioning, and to the changing world in which they find themselves. Vital to this is that the managements which run them must be open and alert to learning opportunities. Not only must they direct the changes needed in the technology and workforce within the system, but they must, above all, recognise the constant need to adapt their own behaviour, management systems and decision making when events show that it is flawed. As well as being a challenge, learning can be a painful process, especially since it requires an initial recognition of personal fallibility and ownership of the problem. Where that problem is an actual or potential disaster, with many dead and injured, millions in damage and the reputation of the organisation, or even the whole technology, in the balance, the issue is particularly sharp. The following chapters explore this dilemma and the ways we are devising to try to soften or overcome it.