

The Risk Management Universe

A guided tour

Edited by

David Hillson

First published in the UK in 2006 by
BSI
389 Chiswick High Road
London W4 4AL

© British Standards Institution 2006

All rights reserved. Except as permitted under the *Copyright, Designs and Patents Act 1988*, no part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means – electronic, photocopying, recording or otherwise – without prior permission in writing from the publisher.

Whilst every care has been taken in developing and compiling this publication, BSI accepts no liability for any loss or damage caused, arising directly or indirectly in connection with reliance on its contents except to the extent that such liability may not be excluded in law.

The right of the contributors to be identified as the authors of this Work has been asserted by them in accordance with sections 77 and 78 of the *Copyright, Designs and Patents Act 1988*.

The authors have made every effort to seek permissions for all material used. Any omissions that are drawn to the attention of the publisher will be included in any future editions of the book.

Typeset in Sabon by
Florence Production Ltd, Stoodleigh, Devon
Index compiled by Indexing Specialists (UK) Ltd
Printed in Great Britain by
Hobbs the Printers Ltd, Totton, Hampshire

British Library Cataloguing in Publication Data
A catalogue record for this book is available from
the British Library

ISBN 0 580 43777 9

Contents

| | |
|--|-----|
| List of Figures | vii |
| List of Tables | x |
| Notes on the Contributors | xi |
| Foreword | xix |
| <i>Steve Fowler, CEO, Institute of Risk Management</i> | |
| 1. Surveying the Risk Management Universe – Where Are We Now? <i>David Hillson</i> | 1 |
| 2. Strategic Risk Management <i>Richard Anderson</i> | 10 |
| 3. Corporate Governance <i>David Smith and Rob Politowski</i> | 42 |
| 4. Financial Risk Management <i>David Bobker</i> | 68 |
| 5. Business Continuity Management <i>John Sharp</i> | 98 |
| 6. Reputational Risk <i>Arif Zaman</i> | 126 |

vi *Contents*

| | |
|---|-----|
| 7. Risk-assessed Marketing Planning <i>Terry Kendrick</i> | 155 |
| 8. Operational Risk Management <i>Keith Blacker</i> | 183 |
| 9. Project Risk Management <i>Stephen Ward</i> | 210 |
| 10. Environmental Risk Management <i>Simon Pollard and Peter Young</i> | 239 |
| 11. Legal and Contractual Risk Management <i>Anthony Cherry</i> | 264 |
| 12. Technical Risk Management <i>Tyson Browning</i> | 292 |
| 13. Managing Fraud Risk <i>Jon Finch</i> | 321 |
| 14. Counter-terrorism Risk Management <i>Richard Flynn</i> | 350 |
| 15. Understanding The Risk Management Universe – Consensus and Controversy <i>David Hillson</i> | 375 |
| Index | 385 |

Figures

| | | |
|-----|---|-----|
| 2.1 | Relationship of attribute to long-term performance | 28 |
| 2.2 | Balanced risk: mapping all four attributes | 29 |
| 2.3 | Enron risk culture | 29 |
| 2.4 | UK plc risk culture? | 30 |
| 2.5 | Target risk culture? | 31 |
| 2.6 | COSO: elements of control | 32 |
| 2.7 | COSO: the enterprise control framework | 33 |
| 2.8 | A new approach to controlling risk | 34 |
| 3.1 | Components of successful corporate governance | 44 |
| 3.2 | Corporate governance organigram | 52 |
| 3.3 | Relationship between threat and opportunity | 53 |
| 3.4 | Process for managing threats and opportunities | 56 |
| 3.5 | Risk matrix | 58 |
| 3.6 | IMS model | 65 |
| 4.1 | BP Ordinary share price 4 Jan 1993 – 31 Dec 2004 | 71 |
| 4.2 | US\$/GB£ Rate Oct 1993 – Apr 2005 | 72 |
| 4.3 | Three-month US Treasury Bill rate 1954–2005 | 73 |
| 4.4 | Four simulated Brownian sample paths | 73 |
| 4.5 | The normal distribution assumed for market risk | 75 |
| 4.6 | One-sided loss curve – credit risk/operational risk | 76 |
| 4.7 | Simulated total corporate profit | 83 |
| 5.1 | External drivers for introduction of BCM | 101 |
| 5.2 | BCM as a unifying process | 105 |
| 5.3 | The BCM life cycle | 106 |
| 5.4 | Possible BCM structure | 107 |
| 5.5 | High-level process mapping example | 110 |
| 5.6 | Detailed process mapping example | 110 |
| 5.7 | Mapping resources to critical activities | 111 |
| 5.8 | Example of a risk matrix | 112 |

| | | |
|------|--|-----|
| 5.9 | Frequency of BCP rehearsals | 121 |
| 5.10 | Results of BCM rehearsals | 121 |
| 6.1 | Stakeholder expectations | 127 |
| 6.2 | Business challenges | 128 |
| 6.3 | Trust in leaders | 129 |
| 6.4 | A model of business relationships | 130 |
| 6.5 | Two ways to think about a business | 132 |
| 6.6 | Reputational risk and value creation | 133 |
| 6.7 | Customer loyalty across BTC and BTB markets | 135 |
| 6.8 | Customer, corporate and brand values | 137 |
| 6.9 | The six components of stakeholder sensitivity | 151 |
| 7.1 | The marketing planning process and risk | 159 |
| 7.2 | Addressing risks to the customer portfolio | 169 |
| 7.3 | A probability and consequences matrix for marketing planning | 173 |
| 8.1 | The jigsaw of operational risk responsibility | 187 |
| 8.2 | Core operational risk management model | 189 |
| 8.3 | Information flow for an incident database | 191 |
| 8.4 | Approaches to measuring operational risk | 194 |
| 9.1 | The SHAMPU process: flow chart portrayal | 226 |
| 10.1 | Fundamental concept of risk management showing regions of high (H), medium (M) and low (L) risk and objective of risk management | 240 |
| 10.2 | Framework for environmental risk assessment and management | 244 |
| 10.3 | Example conceptual model showing potential environmental exposures at a petrol retail forecourt | 254 |
| 10.4 | Example event tree for the release of flammable liquid from a process facility | 255 |
| 10.5 | The risk hierarchy from strategic to operational risk, applied here to the water utility sector | 259 |
| 11.1 | Illustration of crisis handling costs | 269 |
| 11.2 | Typical process flow | 276 |
| 12.1 | Example of a traditional process for managing technical risk | 294 |
| 12.2 | Standard risk model | 295 |
| 12.3 | Expected loss formula | 296 |
| 12.4 | Risk exposure in terms of probability and impact | 297 |
| 12.5 | Example risk reduction profile | 298 |
| 12.6 | Risk decreases with availability of useful information | 300 |
| 12.7 | Example TPM tracking chart for UCAV mission range | 303 |

| | | |
|-------|--|-----|
| 12.8 | Conversion of week zero's three-point estimate to triangle distribution | 305 |
| 12.9 | Triangle distribution function showing relative probability of various range TPM outcomes at project start | 305 |
| 12.10 | CDF for UCAV range TPM | 306 |
| 12.11 | Utility curve for aircraft range | 307 |
| 12.12 | Reduction in unacceptable outcomes from week 0 to week 14 | 312 |
| 12.13 | TPM profiles and risks during the UCAV preliminary design project | 314 |
| 12.14 | Overall risk profile for the UCAV preliminary design project | 315 |
| 13.1 | A schematic overview of the cyclic Fraud Risk Management Plan | 339 |
| 14.1 | Legal definition of terrorism | 357 |
| 14.2 | Terrorist attacks worldwide – by sector | 358 |
| 14.3 | Sources of information about terrorism | 361 |
| 14.4 | The components of a resilient business | 365 |
| 14.5 | The risk matrix | 368 |

Tables

| | | |
|------|---|-----|
| 1.1 | Risk management professional bodies | 3 |
| 1.2 | Risk management standards and guidelines | 4–5 |
| 3.1 | Cascade of risk management system | 55 |
| 5.1 | Drivers for introduction of BCM, by sector | 102 |
| 5.2 | Drivers for introduction of BCM, by company size | 103 |
| 6.1 | Organizational memory and corporate amnesia | 139 |
| 6.2 | Reputational risk and employee branding | 141 |
| 6.3 | Reputational risk and intangible assets | 153 |
| 7.1 | Responses to risk | 175 |
| 8.1 | Comparison of people risk in industrial and financial settings | 203 |
| 9.1 | Typical uncertainty management issues in each stage of the project life cycle | 213 |
| 9.2 | Levels of objectives for project risk management | 219 |
| 9.3 | A nine-phase portrayal of the SHAMPU process | 225 |
| 11.1 | Example of expansion of subcategories of risk within each of the major categories | 274 |
| 12.1 | TPM data and risk levels at the beginning of the UCAV project | 313 |
| 13.1 | Sample FRMP content | 343 |
| 14.1 | Top 10 threats and disruptions to business | 360 |
| 14.2 | Some examples of threat, vulnerability and business impact | 369 |

Notes on the Contributors

Richard Anderson is a Director of Corporate Risk Group (<http://www.co-risk.com>) which he founded in conjunction with Professor Robert Baldwin of the London School of Economics in 2001. Corporate Risk Group advises organizations on how to develop their risk management programmes so that they are focused on generating performance gains rather than simply being compliance exercises. Richard worked with Professor Baldwin to develop a suite of diagnostic tools to help in this process and to assist companies in becoming Risk Intelligent Organizations. Richard has a particular interest in developing understanding around Balanced Risk and Risk Maturity. Richard advises organizations that include some of the world's largest companies headquartered in the UK and public sector equivalents.

Richard is a Chartered Accountant and a graduate of the London School of Economics. He regularly speaks at conferences and contributes articles to journals.

Dr Keith Blacker BSc FCA MBA FIIA DBA is a Director of Risk DNA Limited (<http://www.riskdna.co.uk>), a specialist risk management consultancy business. His expertise in risk management and business analysis has developed over many years both as an operational manager and as an adviser to businesses. Most of his 30-year career has been spent in the financial services industry both in the UK and abroad and he has been actively involved in implementing risk management frameworks in a number of organizations. Keith has a doctorate in Operational Risk Management from Henley Management College and has published a number of papers on the subject.

Keith is also a Director of the Henley Centre for Value Improvement, a research centre at Henley Management College, and Protection & Investment Ltd, a firm of Independent Financial Advisers regulated by

the UK Financial Services Authority, where he has responsibility for all corporate governance matters.

Dr David Bobker MA DPhil ACA is founder and Director of Real Assurance Risk Management (<http://www.realassurance.com>) which specializes in risk management, regulatory compliance, corporate governance and internal audit, delivering both consulting and training. He holds a First Class BA, MSc and DPhil in Mathematics all from Oxford University and is a Chartered Accountant.

David has spent a long and varied career in the financial services industry where he worked as an external auditor and an internal auditor (having been Head of Group Audit both for Alliance & Leicester plc and Norwich Union plc). He has authored a number of articles on internal audit and spoken widely at conferences in the UK and abroad. His interests also include corporate governance, having taken a keen interest in the original Turnbull consultation, and compliance, having been a group compliance officer and a supervisor at the Building Societies Commission (now part of the FSA) with responsibility for capital adequacy rules.

As well as supplying outsourced internal audit services, his recent consulting work has included quantified risk analysis and systems for clients. Always taking a keen interest in IT, he has now developed specialist Monte Carlo modelling software for the assessment and management of operational risk, as well as carrying out credit and market risk assignments. The other active area of work is training where over a three-year period he has delivered specialist courses on quantified risk methods to over 200 senior internal auditors and operational risk managers.

Dr Tyson R. Browning is Assistant Professor of Enterprise Operations at the M J Neeley School of Business at Texas Christian University in Fort Worth, Texas, USA. He teaches Operations Management (MBA Core) and Project Management (MBA elective) and conducts research on enterprise operations, process modelling, product development, project management, engineering management and systems engineering. He previously worked for Lockheed Martin Aeronautics Company, where he was the technical lead and chief integrator of the enterprise process architecture and author of company policies and processes driving the transition to a process-based company. Before joining Lockheed Martin, he worked with the Lean Aerospace Initiative at the Massachusetts Institute of Technology, conducting on-site research

at Boeing, Texas Instruments, General Electric, Daimler Chrysler and several other companies. Browning has also worked for Honeywell Space Systems and Los Alamos National Laboratory. He received a Bachelor's degree from Abilene Christian University and two Master's degrees and a PhD (in Technology Management and Policy) from MIT. He has authored over 20 papers on engineering management, risk management, the design structure matrix, organization design, process modelling and value measurement – publishing in *IEEE Transactions in Engineering Management*, *Systems Engineering*, *Project Management Journal*, *Technology Management Handbook* and others. He is a member of the International Council on Systems Engineering (INCOSE) and the Institute for Operations Research and the Management Sciences (INFORMS), and he also serves on the Editorial Board for *Systems Engineering*.

Anthony Cherry is a Partner in the national law firm, Beachcroft Wansbroughs. After graduating in Law from Manchester University in 1976 and serving Articles in the City he worked for three years in the legal department of ICL. Since 1983 he has been with his present firm and its predecessors. He is responsible for developing and delivering services, including Risk Counsel, which bring legal skills and experience to bear on business risk and opportunity in new and flexible ways. He also chairs the firm's Risk Management Directorate and contributes to its policy on Corporate Social Responsibility. He lives in Clevedon, North Somerset with his wife and three children.

Jon Finch retired in 2002 after 31 years in risk management, most recently as ICL/Fujitsu Services Group Business Risk Manager where he carried corporate responsibility for business risk management policy and processes. Based in corporate Internal Audit he worked to achieve protection against business risk. Jon Finch is well regarded within the UK risk management community as a specialist in business risk and practical business problem resolution. He was employed in commerce from 1961, in the UK Electricity and Gas Industries before ICL, initially as an accountant and later in IT system design and development. After joining ICL in 1971 he performed a significant number of internal and customer related troubleshooting assignments on behalf of the Board of ICL, of STC, and on secondment to major clients. Over the years Jon has succeeded in resolving crises in over 40 mainly litigious situations on behalf of ICL in 18 countries including Hong Kong, South Africa, New Zealand, Malaya, France, Germany, Hungary and Portugal.

Jon is semi-retired, writing and speaking on business risk management topics. He has the reputation of being an entertaining speaker in his field. He is married to an actress, has three children and lives in the Fens near Cambridge.

Richard Flynn BSc (Hons) MSc RGN FRSA is a serving Police Officer and is currently seconded to a national police unit providing protective security advice to the business community. He is the author of national guidances 'Expecting the unexpected' and 'Secure in the knowledge', both written to aid the business community in the development of security and business continuity plans. He has a wealth of experience working with the business community and his research interests include how organizations perceive and manage risk, and how crime prevention strategies can assist in the prevention of terrorism.

Dr David Hillson PMP FIRM FAPM MCMI is an international risk management consultant, and Director of Risk Doctor & Partners (<http://www.risk-doctor.com>). He is a frequent conference speaker and author on risk. David is recognized internationally as a leading thinker and practitioner in the risk field, and has made several innovative contributions to improving risk management. He is well known for promoting the inclusion of proactive opportunity management within the risk process, and has recently been working on applying emotional literacy to understand and manage individual and corporate risk attitudes.

David is active in the Project Management Institute (PMI) and was a founder member of its Risk Management Specific Interest Group. He received the 2002 *PMI Distinguished Contribution Award* for his work in developing risk management. He is an elected Fellow of both the Institute of Risk Management (IRM) and the Association for Project Management (APM), as well as being a member of the Chartered Management Institute.

Terry Kendrick is Director of the Centre for Marketing and Risk at the University of East Anglia (UEA). He has been a strategic marketing planning consultant for the past 18 years and has undertaken marketing planning projects in 17 countries for over 50 large organizations. He is particularly interested in the risks to effective marketing planning and has written both academic papers and managerial briefings on this topic. Terry is a member of the Chartered Institute of Marketing and contributes sessions to the MBA programme at UEA.

Robert J Politowski ACIB Dip Mgt Stud. MCFI LCIPD is a Director of IMS Risk Solutions. Rob has accomplished managerial and advisory skills at senior level with particular interest in Operations, Risk Management, Customer Service and Human Resources. Rob has over 20 years' experience in the retail financial sector in the UK. During this time he worked in various departments of a major UK Clearing Bank. He has substantial experience in the management and delivery of operations support through centralized operating centres including back office processing, customer service delivery and call centre operations. Additionally, he has significant experience in the management of operational risk issues within a wide range of banking operations encompassing credit risk, compliance and a range of special investigations having been an Auditor in the Group Audit function.

Professor Simon Pollard was appointed to the Chair in Waste and Environmental Risk Management at Cranfield University in September 2002. He obtained his PhD in Environmental Engineering from Imperial College in 1990. Simon has formerly held appointments at the Universities of Alberta and Edinburgh, with consultants Aspinwall & Company, with the Scottish Environment Protection Agency, and as the Environment Agency's Head of Risk Analysis. Simon's research and teaching interests are in sustainable technology systems, the management of wastes, contaminated land and environmental risk. He is the author of over 100 publications, Associate Editor of *Science of the Total Environment* and Director of Cranfield University's Integrated Waste Management Centre, coordinating activity on waste and resource management across the University. Simon has held professional appointments on the Government's Interdepartmental Liaison Group on Risk Assessment (ILGRA), the Executive Committee of the engineering institutions' Hazards Forum and has recently been elected to the Scientific and Technical Committee of the Chartered Institution of Wastes Management.

John Sharp FBCI (Hon) FCFI MCIM is recognized worldwide for the contributions he has made to Business Continuity Management. In 2004 he was made an Honorary Fellow of the Business Continuity Institute and received a special award for his outstanding contribution to the industry. Currently John is Policy and Development Director with Continuity Forum, an educational and development body. From 1997 until 2004 he was the Chief Executive Officer of the Business Continuity Institute where he was responsible for delivering services

to members throughout the world and working with all facets of industry, commerce and government to enhance the understanding and commitment to business continuity as a key management discipline.

John Sharp was chair of the committee that produced BSI's *Guide to Business Continuity Management* (PAS 56), and was also a member of the team producing BCM guidance for the UK Civil Contingencies Act. He works closely with government, regulators, police, security organizations and is a member of the London Resilience Business Team. John is a regular conference speaker and author on Business Continuity Management and has provided input to newspaper articles, radio, television and educational films.

David A Smith BSc MSc Chartered Chemist is Managing Director of IMS Risk Solutions with many years' experience of Health and Safety and Environmental Management Systems. He chairs a variety of important BSI Committees and represents the UK on ISO and CEN Committees on management systems standards and has substantial international experience in training, consultancy and auditing for a wide variety of clients in industry, government and the academic sector throughout the world. He has authored and edited a variety of books on management systems, most recently including a series of nine books on Integrated Management Systems published by British Standards Institution (BSI). He is co-author of the BSI publication *Managing Risk for Corporate Governance* – PD 6668:2000. Further publications include *Managing the Environment the 14001 Way* (1999, 2nd edn. 2005) – published by British Standards Institution – which is an award winning publication and provides comprehensive guidance on appropriate methodologies for effective environmental risk management systems. *Managing Safety the Systems Way* (1998) is a comprehensive guide to the implementation of Occupational Health and Safety Management systems to meet ILO and UK standards including the internationally recognized specification OHSAS 18001:1999 and BS 8800:2004.

Stephen Ward is Professor of Risk Management at the School of Management, University of Southampton, UK. He holds a BSc in Mathematics and Physics (Nottingham), an MSc in Management Science (Imperial College, London), and a PhD in developing effective models in the practice of operational research (Southampton). He is a member of the PMI and a Fellow of the UK Institute of Risk Management. He is Director of the School's MSc program in Risk Management.

Professor Ward's teaching interests cover a wide range of management topics including: decision analysis, managerial decision processes, insurance, operational and project risk management, and strategic management. For more than 20 years his research and consulting activities have been concerned with project risk management systems and the effective management of uncertainty. His latest book, *Risk Management – Organization and Context* (2004), discusses organization-wide approaches to integrated risk management, building on emergent issues in project risk management.

Peter Young has over 25 years experience as an environmental consultant specializing in research, policy and practical implementation of risk management programmes associated with waste, soil and water contamination. He has a First Class Honours degree in Environmental Chemistry from Edinburgh University, is a Chartered Chemist and an active member of the Chartered Institutes of Water and Environmental Management and Waste Management. He is currently Strategy Director of Enviro Consulting formed some years ago by the amalgamation of several UK consultancies, including Aspinwall and Co. where he was formerly Managing Director. He has published over 80 scientific and technical papers, contributed to statutory environmental guidance published by UK, Singapore and Hong Kong governments, and is a long-term member of the UK BSI Soil Quality Committee EH/4 and ASTM Committee D34 on Waste.

Arif Zaman BA (Hons) MBA FRSA is Visiting Fellow in the John Madejski Centre for Reputation and the Centre for Board Effectiveness. He is the author of *Reputational Risk* (Financial Times Executive Briefing, 2004) developed from research at Henley Management College. He recently returned to British Airways, where he leads several commercial projects, after a two-year sabbatical as an Associate Fellow at Chatham House, where he authored *Corporate Responsibility in Japan* (2003), and managing projects for policy-makers and corporates in Asia as an Advisor to the Commonwealth Business Council (CBC) and the Asian Productivity Organisation. In 2005 he was a member of Mitsubishi Corporation's Stakeholder Panel and in 2004 served on the drafting committee of the European Conference on CSR, at the invitation of the Dutch Presidency of the EU. He remains an advisor to the CBC. Previously he was Global Market and Industry Analyst at BA from 1993 to 2002 where he received a 'Recognising our People' award for his contribution to the Code of Conduct and BA's first Social Report

and Sustainability Policy, and the leading award from the air cargo industry for his research on logistics and global supply chains. Prior to this, he was at Valin Pollen, a leading financial PR consultancy, and HSBC. He is on the Board of the Strategic Planning Society and the Editorial Board of the US-based *Journal of Business Strategy* and was a contributor to *Strategic Thinking in Tactical Times* (Palgrave, 2004). He is a Director and trustee of the Strategic Planning Society and the Red Shift Theatre Company. He is also an Associate of the Foreign Policy Centre, a Fellow of the Royal Asiatic Society and a Fellow of the Royal Society of Arts.