CONTENTS

Introduction 1

01 Why is information security necessary? 9

The nature of information security threats 10
Information insecurity 12
Impacts of information security threats 13
Cybercrime 14
Cyberwar 15
Advanced persistent threat 16
Future risks 16
Legislation 19
Benefits of an information security management system 20

O2 The UK Combined Code, the Turnbull Report and Sarbanes-Oxley 23

The Combined Code 23
The Turnbull Report 24
The Revised Combined Code 25
Sarbanes-Oxley 28
Enterprise risk management 30
Regulatory compliance 32
IT governance 33

03 ISO27001 35

Benefits of certification 35
The history of ISO27001 and ISO27002 36
The ISO/IEC 27000 series of standards 37
Use of the standard 38
ISO/IEC 27002 39
The Plan-Do-Check-Act and process approach 40
Structured approach to implementation 41
Quality system integration 43
Documentation 44
Continual improvement and metrics 48

Organizing information security 51 04

Internal organization 52 Management review 54 The information security manager 54 The cross-functional management forum 56 The ISO27001 project group 57 Approval process for information processing facilities 62 Specialist information security advice 63 Contact with authorities and special interest groups 66 Independent review of information security 67 Summary 68

Information security policy and scope 69 05

Information security policy 69 A policy statement 75 Costs and the monitoring of progress 76

The risk assessment and Statement of Applicability 79 06

Establishing security requirements 79 Risks, impacts and risk management 79 Selection of controls and Statement of Applicability 92 Gap analysis 96 Risk assessment tools 96 Risk treatment plan 97 Measures of effectiveness 98

External parties 101 07

Identification of risks related to external parties 101 Types of access 103 Reasons for access 104 Outsourcing 105 On-site contractors 107 Addressing security when dealing with customers 108 Addressing security in third-party agreements 109

80 Asset management 113

Asset owners 113 Inventory 114 Acceptable use of assets 117

Information classification 117 Unified classification markings 120 Government classification markings 121 Information lifecycle 122 Information labelling and handling 122 Non-disclosure agreements and trusted partners 127

Human resources security 129 09

Job descriptions and competency requirements 129 Screening 131 Terms and conditions of employment 134 During employment 135 Disciplinary process 141 Termination or change of employment 141

Physical and environmental security 145 10

Secure areas 145 Public access, delivery and loading areas 153

11 **Equipment security** 155

Equipment siting and protection 155 Supporting utilities 158 Cabling security 159 Equipment maintenance 161 Security of equipment off-premises 161 Secure disposal or reuse of equipment 162 Removal of property 163

Communications and operations management 165 12

Documented operating procedures 165 Change management 167 Segregation of duties 168 Separation of development, test and operational facilities 168 Third-party service delivery management 169 Monitoring and review of third-party services 171 Managing changes to third-party services 172 System planning and acceptance 173

13 Controls against malicious software (malware) and back-ups 177

Viruses, worms and Trojans 177
Spyware 179
Anti-malware software 179
Hoax messages 180
Phishing and pharming 181
Anti-malware controls 182
Airborne viruses 184
Controls against mobile code 185
Back-up 186

14 Network security management and media handling 191

Network management 191 Media handling 193

15 Exchanges of information 197

Information exchange policies and procedures 197
Exchange agreements 200
Physical media in transit 201
Business information systems 202

16 E-commerce services 205

E-commerce issues 205
Security technologies 208
Server security 210
Online transactions 211
Publicly available information 212

17 E-mail, internet use and social media 215

Security risks in e-mail 215
Spam 217
Misuse of the internet 218
Internet acceptable use policy 220
Social media 222

18 Access control 223

Hackers 223 Hacker techniques 224 System configuration 228
Access control policy 228
User access management 230
Clear desk and clear screen policy 239

19 Network access control 241

Networks 241 Network security 245 Server virtualization 251

20 Operating system access control 253

Secure log-on procedures 253
User identification and authentication 254
Password management system 255
Use of system utilities 255
Session time-out 256
Limitation of connection time 256

21 Application access control and teleworking 259

Application and information access control 259 Mobile computing and teleworking 261 Teleworking 263

22 Systems acquisition, development and maintenance 267

Security requirements analysis and specification 267 Correct processing in applications 268

23 Cryptographic controls 273

Encryption 274
Public key infrastructure 275
Digital signatures 276
Non-repudiation services 277
Key management 277

24 Security in development and support processes 279

System files 279
Access control to program source code 280
Development and support processes 281
Vulnerability management 284

25 Monitoring and information security incident management 287

Monitoring 287
Information security events 291
Management of information security incidents and improvements 296
Legal admissibility 301

26 Business continuity management 303

ISO22301 303

The business continuity management process 304
Business continuity and risk assessment 305
Developing and implementing continuity plans 306
Business continuity planning framework 308
Testing, maintaining and reassessing business continuity plans 312

27 Compliance 315

Identification of applicable legislation 315
Intellectual property rights 328
Safeguarding of organizational records 332
Data protection and privacy of personal information 333
Prevention of misuse of information processing facilities 335
Regulation of cryptographic controls 335
Compliance with security policies and standards 336
Information systems audit considerations 338

28 The ISO27001 audit 341

Selection of auditors 341 Initial audit 342 Preparation for audit 343 Terminology 345

Appendix 1: Useful websites 347 Appendix 2: Further reading 353

Index 357