Index

@Risk 156, 162, 166, 167, 170, 220, 224, 225

accountability 17, 24, 25, 31, 118, 125
accuracy, estimating 193–4
Acumen Risk 166
alliance contracting 134, 228–9
As Low as Reasonably Practicable (ALARP) 304, 322
assessment scales see consequence scales;
likelihood scales
Association for Project Management (APM) 353, 359
assurance of risk management 17, 79, 92, 119–20
audits 79, 92, 119–20, 123
Australian and New Zealand Standard
AS/NZS 4360 354
AS/NZS 5050 108

Barbecana 166
Bayesian revision process 231
benefit-cost analysis see cost-benefit analysis
Beta distribution 168, 223
biometric identification 175, 177, 180–1
BOOT model 284
brainstorming 70–1
checklists 71, 72–3
experience with similar projects 72
workshop participants 71–2
build-own-operate-transfer (BOOT) 284
business case 15–16

calendar 201, 213
capability to manage risk 29–31
capital cost 154, 156, 158, 160, 185, 221–8, 230–1, 233–5, 237–8, 242
capital evaluation 219–39
discounted cash flow 220–1, 230, 238
incentive contracts 228–9, 238
integrated cost, revenue and schedule analysis 237–8
project financial structure 227–8
of resource processing plant 221–7
technology choice 229–32
timber development planning (case study) 232–6
cascade links between distributions 158
catastrophe area 91
cause and effect links between distributions 158
Chazop studies 310
checklists 71, 72–3
process checklist 361–4
client quality risks, treatments for 390
client record management system 203–7
checklists 361
process checklist 361–4
client quality risks, treatments for 390
client record management system 203–7
correlations 206
quantitative assessment 206–7
representation of uncertainty 205
sources of uncertainty 204–5
climate change 345–9
context 346–7
risk identification, analysis and evaluation 347–8
risk treatment 349
commercial risk 381–2
common cause links between distributions 158
communication 37, 41–7, 387
engagement of people through 41–3
environmental risk management 324–5
plan 47
with stakeholders 37
competent independent review 17–19
complexity factors 96
compounding consequence links between distributions 158
concept hazard analyses 305–7
consequences 80–6, 107–8
indicators 98
opportunities 133
ratings, scales 81–3, 84–6, 145
semi-quantitative 96–9
consultation see communication
context 37–8, 49–67, 346–7, 361–2
context review summary 60–1, 368
external 52–4, 362
internal 54–5, 362
opportunities 129, 130, 133
risk management process 56
risk modelling process 159–60
contingency planning 105, 106, 108
continual improvement 7, 31–2
contracts 108, 253–64, 271
asset delivery and service projects 263–4
closure 263
cost-plus 256
drafting 257–8
firm-price 255
fixed-price 255
general conditions 382
incentive-fee 256
limits of liability 260–2
management 262
negotiation 260
price basis 254–5
procurement life cycle, risks through 257
risk allocation 253–4
tender documents and tender evaluation 258
tenderers’ consideration risk 259
tenderers’ risk management capabilities 258–9
control effectiveness 78–9, 91
rating scale 79
Controlled Interval and Memory approach (Chapman) 170
controls 17, 78–9, 117, 118
control assurance 17, 92
control owner, 118
monitoring 118
copyright 278
corporate knowledge and skills, loss in outsourcing 278
correlation 158–9, 189–90, 206, 212–13, 236
cost-benefit analysis 111, 243–4
cost control 52
cost-estimating 154, 157–8, 160–2, 173–95
business system renewal case 174–84
frameworks 160
mine development case 185–93
processes 193–4
cost modelling tools 166–8
cost-plus contract 254, 256, 263
counterparty risks 382
criteria, project 57–60
checklist 362
environmental risk management 326
investment 12–14
summary 61, 369
water pipeline 144
Crystal Ball 166, 167
culture 6, 387
customs 387
delivery risks, treatment for 389
dependence see correlation
design 16
deterministic calendars 201
discounted cash flow (DCF) 12, 220–1, 230, 238
documentation, model 165
economic appraisal 241–2, 242–3
economic risks 382–3
engineering plant case study 208–17
areas of uncertainty 209–10
calendars 213
correlations 212–13
events 211–12
interpretation of results 216–17
model structure 208–11
remaining uncertainty 213–15
sensitivity analysis 215–16
environment 14
environment-related risk management 323–44
approaches to 332
benefits 323–4
case study 332–43
communication and consultation 324–5
context 325–8
criteria and consequences 326
environmental aspects 326–9
iterative risk analysis approach 330–1
key elements 326–8
risk identification 328–30
risk treatment strategies 331–2
environmental management systems (EMS) 326
environmental risk 383
estimating risk worksheet 380
ethics, environmental risk management
and 323

event tree analyses 318–20, 322
in environmental risk management 330
exposure, potential see potential exposure
extreme risk area 90

failure modes and effects analysis (FMEA) 73, 310, 330
failure modes, effects and criticality analysis (FMECA) 310
farm-in arrangements 133
fault tree analysis 313–18, 320
financial feasibility 242
financial risks 383
firm-price contract 254, 255
fit to business strategy 13
fixed costs 234, 238
fixed-price contract 254, 255
f-N curve 321
framework documents and information 123–4
Full Monte 166, 170

Gantt chart 169, 204, 209
government projects 51

hazard and operability analyses see Hazop
hazard identification 310–11, 330
hazard study techniques 309, 312–13
Hazop 73, 310, 311–13, 322
Hazop record sheet 380
health and safety 14
environment, outsourcing and 278–9
health risks 387–8
histogram 181, 189, 191
human factors 6

implementation 115
incentive contract, incentive fee contract 228–9, 238, 255, 256
individual risks, priorities for 96
industrial relations 383
information, sources of 5, 43, 74–5
initiation 361
insurance 91, 109
Intaver 166
integrated cost, revenue and schedule analysis 237–8
intellectual property, loss of control in outsourcing 278

internal rate of return see rate of return
International Electrotechnical Commission (IEC) 353
International Organization for Standardization (ISO) 353
ISO 14000 series 326
interpretation of brief 383–4
investment criteria 12–14
evaluation for large projects 219–39
governance framework 15
opportunity management 10–12
returns 13
iso-risk contours 100, 101, 102
iterative risk assessment 330–1, 348–9

joint ventures 133, 384

key controls see controls
key elements 61–7
checklist 362
description 371
for defence project 64
for environmental risk assessment 326–8
for facility construction 62–3
semi-quantitative risk assessment 96
for structuring risk assessment 62
summary table 370
system components for an electricity sub-station 64
for technical project 63

language 388
large projects, investment evaluation for 219–39
lead indicators 118
learning lessons 120
legal risks 384, 388
lessons learned 120
levels of risk 79–80, 88, 90–1, 130–3
matrix 79, 80, 88, 131, 132, 145
licences 14
likelihood 78, 86–8, 90, 91, 107
indicators 98
opportunities 131
ratings, scales 86–8, 145
semi-quantitative 96–9
M_o_R guidelines (Management of Risk) 354, 356, 357–8, 359
Management of Risk (M_o_R) Guideline 354, 356, 357–8, 359
mandate 24
market testing 271–82
master plan 198–200
maturity factors 96–8
method of moments 170
Microsoft Project (MSP) 169–70
model documentation 165
ModelRisk 166, 167
monitoring and review 39, 117–20, 363–4
Monte Carlo simulation see simulation
natural events 384
net present cost (NPC) 220, 289
net present value (NPV) 13, 154–5, 220–1, 224–5, 230, 231, 243
nodal bias 200, 201–3
objectives 3–4, 50–2, 361
Office of Government Commerce (OGC) 353, 354
offshore location 388
offshore skills 388
operating costs 220, 222, 224, 226, 233–5
operating revenues 224
opportunities
   analysis 130–3
   examples 134–9
   identification of 130
   treatment 133–4
out-of-area project risks 387–9
treatments for 390–1
outsourcing 271–82
   advantages 272
   adverse impacts 272
case study 279–82
definition 271
treatment 271
examples 271–2
phantom benefits 279
process 273–4
risk management processes 274–7
risks of 278–9
partnerships 42, 133, 384
payback period 225, 243
performance indicators 25, 30, 31
permits 14
Pert distribution 168, 223
PESTLE framework 52
plan, definition 198
PMBOK 354–6, 359
policy 26, 27, 51
political risks 384
political skills 388–9
post-execution review 19–20
post-investment review 19–20
potential exposure 88–9, 92
PRAM Guide 354, 356–7, 359
preliminary hazard analyses 305
primary risk 112, 113
Primavera Risk Analysis (PRA) 166, 169–70
PRINCE2 guidelines 357
priorities for individual risks 96
private financing (PF) see public–private partnerships (PPP)
probabilistic calendars 201
probability trees 245–6
problem area 90
process documents and information 124
procurement 51
product maturity 384
project activity networks 160
project cost benchmark (PCB) 285, 288–90, 292
project execution plan 16
project life cycle model 10
Project Management Body of Knowledge (PMBOK) 354–6, 359
Project Management Institute (PMI) 353, 354
project manager, questions for 37
project phases 9–21
Project Risk Analysis and Management (PRAM) Guide 354, 356–7, 359
project risk management plan 26–9
project risk management policy 26, 27
project risk management process 35–40
   approach 36–7
   overview 35–6
project structure risks, treatments for 390
public–private partnerships (PPP) 134, 264, 283–301
communication and reporting 296
case study 286
treatment 296–300
extraneous risks 291
payment structuring 291
qualitative risk analysis 286–7
risk allocation and pricing 287–8
risk allocation table 292–6
risk management and 285–6
risk premiums 291–2

qualitative risk analysis 78–93
quantitative measures of project success 154
quantitative risk analysis 78, 153–72
application 155
general approach 155–8
risk modelling processes 160–4
quantitative technical risk analyses 320–2

rate of return (ROR) 13, 57, 154, 200, 220, 221, 224, 243
records 123–7
regulatory risk 384, 388
religion, risk and 388–9
reporting 123–7
request for tender (RFT) 258, 266
resources 385
responsibility for risks see risk owner
return on capital employed (ROCE) 220
review 39, 118–19, 262
competent independent review 17–19
post-execution review 19–20
post-investment review 19–20
review points 10, 15–17
risk, definition 4, 129–30
Risk Action Plan 113
risk allocation 287–8
in a contract 253–4
risk allocation table 292–6
risk analysis 38–9, 51
checklist 362–3
risk assessment
definition 78
simplified, water pipeline case study 143–9
risk contour diagram 100, 101, 377
risk contours 320–1
risk description work sheet 73, 74, 372
risk documentation 73
risk evaluation 38–9, 89–92
checklist 363
risk factors
calculating 100–2
priorities and 100
ranking 96, 100, 102
risk identification 38, 61, 67, 69–75, 78, 143
brainstorming 70–1
checklist 362

environmental risk management 328–30
tools and techniques 70
risk levels see levels of risk
risk lists 71
risk management framework 23–32
background 23
components 24
expression of intention for risk management 24–5
risk management information systems (RMIS) 124–6
Risk Management Plan 26–9, 42–3, 118–19
progress report 126
risk management process
checklist 361–4
context 56
simplification of 142–50
systematic, structured and timely approach 5
risk management standards and guidelines 353–4
comparisons of approaches 358–9
sources of information 359
risk modelling processes 159–64
context 159–60
implementation 162
model documentation 165
organisational aspects 165–6
structuring 160–2
validation 163–5
risk owner 73–4, 92, 93, 117
risk premiums 291–2
risk profile 100, 102
risk register 38, 39, 93, 118, 124, 170–1, 373–4
risk reporting 123–7
risk retention 109
risk review workshop 143
risk sharing 108
risk threshold curve 321
risk treatment 39, 105–15, 160
analysis of treatment actions 125–6
checklist 363
environmental risk management 331–2
feasible responses 363
options 106–7, 110–12
overview 105–6
scenarios 112
secondary risks 112–13
value creation 363
risk treatment options worksheet 378
risk treatment plan 113–14, 363
treatment plan summary 114, 379