Index
Balance (Continued)
  subenabler 5.2.8. 179
  technical and business, xxvii, 2. 39
Ballistic missile program, 1
Bandwidth
  LEISE to INCOSE, 277
  subenabler 3.8.1, 162
Baseline, 15, 34
Batch-and-queue, 12, 256
Benchmarking, 59, 185
Best Practices, 59, 61–62, 185
Beta, 55, 56
Big bang, 203
Big guns, 145
Body of knowledge, 3, 51
  LEISE to INCOSE, 278
  subenabler 5.4.8, 195
Body language, 227
Boeing, 777, 11
Bonus(es), 202, 204, 217, 222, 236
Bottom up
  LEISE to INCOSE, 273, 280
  subenabler 5.7.1, 202
  subenabler 5.7.3, 202
  subenabler 6.2.10, 221
Brainstorming, 22, 36, 40, 56
  and root causes, 22, 201
Breakaway, 33, 40
Buffer(s), xi, 6, 32, 99–100, 139, 276
Budget, 38, 43
Bureaucracy, bureaucratic, 2, 11, 16
  LEISE to INCOSE, 278
  subenabler 5.4.5, 193
Burning platform, 220
Business Week, 10
Bus(es)
  LEISE to INCOSE, 274, 279
  subenabler 2.4.1, 108
  subenabler 5.6.1, 199
Capability Maturity, 60, 254
Capacity, 29, 39
  reserve
  subenabler 2.2.12, 99
Case Studies, 249–253
EADS and AFIS, 252
Rafael, 251–252
Rockwell Collins, 250–251
Thales Aerospace, 251
Toyota, 253
Certification(s), 101, 112, 132
Cessna Citation − X, 11
Challenger, 14
Change request, 57
Charter, 51, 266
Checklist, 33
  LEISE to INCOSE, 273
  subenabler 5.3.2, 181
  subenabler 5.6.1, 199
Chief Engineer
  attributes, 39
  enabler 5.5, 197
  LEISE to INCOSE, 274
Chief executive officer (CEO), 202, 206
China, 5, 18, 50
Clarification
  LEISE to INCOSE, 272, 274, 279
  subenabler 3.2.1, 119
  subenabler 3.5.9, 145
Clarity, crystal
  LEISE to INCOSE, 278
  subenabler 3.5.8, 145
Classified, 249
Coast Guard, 44
Collision, 43
Co-location, 18
  LEISE to INCOSE, 276, 277
  subenabler 2.2.4, 90
  subenabler 6.2.14, 227
Columbia space shuttle, 44
Common sense, 115, 223
Communication
direct
  LEISE to INCOSE, 273
  subenabler 4.2.7, 167
effective
  enabler 3.5, 136
informal
  LEISE to INCOSE, 272
  subenabler 3.5.5, 141
plan
  LEISE to INCOSE, 276
  subenabler 2.2.1, 88
Community(ies) of practice, 7, 229
  LEISE to INCOSE, 274
  subenabler 6.3.1, 229–230
Compensation, 39
Competition, 28, 217
  ignorance of, 186
Complex, complexity, 46
  excessive, 19
  LEISE to INCOSE, 278
  subenabler 3.8.5, 162
  system, 1, 2, 5, 50
Computer screen
  LEISE to INCOSE, 272
  subenabler 3.7.2, 159
Concept-to-Beta team, xxxi
Concurrent, concurrency
Engineering (CE), 10, 126
Conflict(s)
LEISe to INCOSE, 271, 273
subenabler 1.2.5, 75
subenabler 6.2.9, 219
CONOPS, 150
Consensus, 33
LEISe to INCOSE, 271
subenabler 1.2.5, 75
Constraints
LEISe to INCOSE, 275
subenabler 3.3.2, 126
Context, 268
LEISe to INCOSE, 272, 278
subenabler 3.2.1, 119
subenabler 3.5.8, 145
Contingency, 99
Continuous improvement (CI)
LEISe to INCOSE, 273, 280
subenabler 5.2.6, 178
subenabler 6.2.10, 221
Contractor, 256, 257
prime, 15, 52, 75, 112
Cooperation, 23, 43, 248
Coordination
LEISe to INCOSE, 272, 274, 277, 278
subenabler 5.5.5, 197
Core team, 29–42
Corporate, 2, 10, 22, 258
Corporation, 179, 215
Corrective action
LEISe to INCOSE, 280
subenabler 5.3.3, 183
Corolla (Toyota), 41
Cost
LEISe to INCOSE, 273
subenabler 6.2.10, 221
Critical chain, 32
Crisis
and heroic action, 22, 64
LEISe to INCOSE, 273, 276
subenabler 2.3.4, 106
subenabler 5.2.2, 171
Cross-functional
LEISe to INCOSE, 276, 277
subenabler 2.2.2, 90
subenabler 2.3.1, 103
subenabler 3.5.7, 143
Culture, defensive, 89
Current state, 35, 93, 94
Courses, 39, 213
Customer(s), 2–4, 14–17, 21, 39, 50–53
culture, 52, 67
subenabler 1.2.6, 77
enabler 1.2, 69
enabler 1.3, 79
enabler 4.2, 165–169
external
subenabler 1.2.1.a, 69
subenabler 1.3.2, 81
subenabler 3.7.1, 159
first
subenabler 1.3.1, 79
internal
subenabler 3.4.2, 133
subenabler 4.2.4, 167
subenabler 4.2.5, 167
subenabler 4.2.6, 167
involvement
LEISe to INCOSE, 271–278
military, 52
order, 2, 29
satisfaction, 10, 39
subenabler 1.2.3, 71
subenabler 1.2.4, 73
subenabler 1.3.3, 83
subenabler 1.3.4, 84
subenabler 2.2.13, 101
subenabler 3.2.2, 119
subenabler 3.2.3, 119
subenabler 3.2.4, 119
subenabler 3.6.2, 150
value, 4, 12, 17, 20
subenabler 1.2.2, 69
subenabler 1.2.3, 71
subenabler 2.6.2, 115
subenabler 4.2.9, 167
Cycle time, see Time, cycle

Database, 155
central, 155, 193, 196
know-how, 195
Database (continued)
    LEISE to INCOSE, 272
    subenabler 3.6.5, 155
Deadline, 31–35
Decision flow,
    LEISE to INCOSE, 272
    subenabler 3.6.1, 148
Defects, 3, 6, 16, 29, 45
Defense
    Acquisition University, 6
    programs, 38
    Secretary of, 10, 46
    Undersecretary of, 10
Delay, 49
    LEISE to INCOSE, 272
    subenabler 3.7.3, 159
Deming, Edward, 9, 10, 12, 209
Department of Defense (U.S.), 6, 10, 42, 46
Design
    changes, 37
    for Manufacturing (and Assembly and testing) (DFMAT), 234
    methodologies, 11
    space, 33
Direct channels, 146
Directory
    LEISE to INCOSE, 277
    subenabler 5.4.6, 189
Discipline, disciplined
    LEISE to INCOSE, 273
    subenabler 5.2.5, 176
Disposal, 2, 44
Disposal, 2, 44
Domain, 23, 39
Dos and don’ts, xxiv, 36, 55
Drawings, 19, 62
Dry-erase board, 101

EADS, 252
Earned value, 72, 156
Education
    public, 10
    subenabler 6.4.1, 235
    subenabler 6.4.2, 235
EdNet, 49, 50
Eigenvalues, 13
Eigenvalues, 13
Einsteins, Albert, xiii, 130, 275
Email, 16, 18
    subenabler 5.4.4, 189
Emergency, 42
Emerging field, 1, 3, 7, 24
Employee, 16
    subenabler 5.7, 202
    LEISE to INCOSE, 275, 279
    subenabler 1.2.6, 77
    subenabler 6.3.3, 233
    suggestion, 10, 11, 170
Empowerment
    LEISE to INCOSE, 273
    subenabler 6.2.3, 208
Enabler, xxiv, 54–63
Engineers, engineering
    losing esteem, 215
    practice, 13, 27, 271
Enterprise, 3, 60, 268
    LEISE to INCOSE, 274
    management, 4
    preparations, 20
    Preparation Process (EPP), 269–271
    subenabler 2.6.3, 115
    subenabler 3.5.3, 141
    subenabler 5.4.8, 195
    subenabler 6.2.2, 207
Enterprise level, 20
    Enterprise management, 2, 4, 55, 134, 169
    Enthusiasm, 191, 203, 208
    Ergonomic, 29, 30
Evolved Expendable Launch Vehicle, 48
Execution, 19
    enabler 3.2, 119
    LEISE to INCOSE, 273
    subenabler 4.2.5, 167
Experience, 39
    LEISE to INCOSE, 273, 276
    subenabler 2.3.1, 105
    subenabler 5.3.2, 181
Expertise
    LEISE to INCOSE, 272, 277
    subenabler 3.6.2, 150
    subenabler 5.2.8, 179
Experts, 18, 39, 56, 69
    LEISE to INCOSE, 272, 273, 277
    subenabler 2.4.3, 110
    subenabler 6.4.3, 237
Expeditionary Fighting Vehicle, 48, 49
Export, 10
External customer, see Customer, external

F-35 aircraft, 47
F117 aircraft, xxviii, 5
Fail early-fail often
    LEISE to INCOSE, 275
    subenabler 3.2.5, 122
Failure(s), 42–44, 60
    LEISE to INCOSE, 273
    subenabler 5.2.3, 174
Faster, better, cheaper, 42. See also FBC
FBC, 42, 43
INDEX

Fear
− LEfSE to INCOSE, 273
− subenabler 6.2.9, 219

Fidelity, 33

Fighting fires, 234

Finland, xxviii, 5

Five whys, 183

Flow, 12, 17, 20–23, 28, 30–41, 116–163
− predictable, 27
− robust, 176
− single-piece, 12
− smooth, 85, 117
− subenabler 2.2.9, 96
− subenabler 2.2.11, 98
− subenabler 2.2.12, 99

Flawless, 50, 53

Focusing(3), 2, 3, 39, 50, 60, 61
− LEfSE to INCOSE, 274, 278
− subenabler 2.3.2, 103
− subenabler 2.6.2, 115

Forgiveness
− LEfSE to INCOSE, 273
− subenabler 6.2.12, 219

Forms, electronic
− LEfSE to INCOSE, 272
− subenabler 3.5.6, 143

France, xxviii, 5, 251

Freedom of action, 39

Front-loading
− enabler 2.3, 103

Frustrations, 39

Funding
− instability, unstable, 28, 135

Future
− Combat System, 48
− state, 35–37, 194

Fuzzy, 43, 86

Gantt chart, 36

Gates, Bill, 206

Gemba, 223, 224

Gemini program, 38

Geographical distribution, 28, 124

Global, 28

Goals, 61
− LEfSE to INCOSE, 272
− subenabler 3.2.6, 124

Government
− Accountability Office (GAO), 4, 7, 57, 59
− acquisition, 26, 44, 52
− oversight, 43

Handoffs,
− LEfSE to INCOSE, 272, 277

subenabler 3.6.3, 152

subenabler 3.8.1, 162

Hands-off, 79, 188

Hazy, 43

Heavyweight, 26

Hero behavior, heroic, 64
− LEfSE to INCOSE, 273, 276
− subenabler 2.3.4, 106

subenabler 5.2.2, 171

High performance, 13, 22

Hiring, 191, 217

Homework, 30

Honda, 26, 29

Honesty, 208

Honour, Eric, 15, 253

House remodeling, 15

Hughes, Howard, 38, 197

Hughes Space and Communications, 228

Human factors, 243
− LEfSE to INCOSE, 274

Idle time, 20, 45

“If Japan Can...” NBC program, 9

Imperfection, 159, 174

Implementation, 117, 126, 129, 130, 247–253

INCOSE
− 26 processes, 8, 55, 268
− Handbook, 50, 55
− Product of the Year Award, 4, 63
− web page, 265

Industrial engineering
− rhapsodized, 12

Industry, U.S, 9, 10

Infighting, 16

Information
− flow of
− LEfSE to INCOSE, 277
− subenabler 3.8.1, 162

need
− LEfSE to INCOSE, 275
− subenabler 4.2.1, 165

Infrastructure, 20–23, 27, 32, 220, 236
− LEfSE to INCOSE, 268–271, 279

Inspection, 19, 172–173
− final, 10, 171

− LEfSE to INCOSE, 280
− pass rate, 171

Integrated Product Team (IPT)
− LEfSE to INCOSE, 274, 277
− subenabler 3.2.2, 119

subenabler 5.2.8, 179

Integrative events, 20, 32, 33
− LEfSE to INCOSE, 272

subenabler 3.6.1, 148
Interdependence, 179
Interfaces, 29, 55, 85
Internal customer, see Customer, internal
International Standards Organization, ISO
15288, 6, 55
9000:2000, 10
Interpersonal skills, 38, 39
Interview(s), interviewee, 191, 192
Intranet, 250
Inventory, 12, 30
Israel, 5, 27, 249, 251, 282
Issue(s), 77, 105, 143, 148
Italy, xxviii, 5
Iterations, 4, 16–21, 33
and single pass, 4, 69, 106
Jobs, Steve, 206
Johnson, Kelly, 38, 197, 206
Joint Strike Fighter (see F-35)
Just-in-time (JIT), 21, 23, 30, 112–113
Kanban, 23
Kennedy, JF, President, 53
Key enabling factors, 59
KISS principle, 130
Know how, 181, 195, 197
Knowledge
expert, 23
explicit, 181
sharing, 225, 229
sticky, 181
tacit, 55
LAI Educational Network, see EdNet
LAI, see Lean Advancement Initiative
Lagging factor(s), vii, 32
Latest, greatest, gold-plated, 109, 130, 163
Layoff(s), 209, 220, 226, 238, 242
Lead time, 12, 25, 52, 112, 113, 187
Leader, leadership, 4, 38, 40
Leading indicators, 87
enabler 2.6, 115
LEISE to INCOSE, 278
Lean
accounting, 234
administration, 234
Advancement Initiative (LAI), 102–103
enterprise, 22, 27
fundamentals, 14–24
holistic paradigm, 2
knowledge driven, 3
manufacturing, 29–30
principles, 19–22
Product Development (PD), 25–41
production, 12
second pillar of, 17
Six Sigma, 9–13
supply chain, 87
thinking, 14, 16, 25, 51
tools	enabler 3.8, 162
LEISE to INCOSE, 277
wisdom of, 51, 67, 86
Lean Advancement (formerly Aircraft, Aerospace) Initiative (LAI), 26, 49–50
Lean Enablers for System Engineering, see LEISE
Lean Product Development Flow (LPDF), 7, 28–41
Lean Systems Engineering, (LSE), 1, 3, 4
enabling field, 7
Working Group, 4
Lean Thinking, see Lean
Learning, 134, 174, 181, 205, 235–244
enabler 6.4, 237–244
LEISE, 26, 38
development, 55–58
ever use studies, 249–253
guidance for implementing, 247–249
organization, 64–67
tables with, 67–246
Legacy, 33
Legitimate, 164–165
Lessons learned, xvi, 105, 136, 170, 174
enabler 5.3, 181–188
Lifecycle, 50, 53
Lobbying, lobbyists, 15, 28, 52
Lockheed, 59
Long term, 28, 32
Low-balling, 48
Loyola Marymount University, LMU, 50, 268
Malcolm Baldridge Award, 10
Management, manager
automated, 77
culture, 11, 12
dissolved, 28, 52
paradigms, 9–13
Manufacturing, 10–16, 29–30, 41
LEISE to INCOSE, 274
subenabler, 5.6.2, 199
Map the Value Stream, 17, 20, 31, 35–38
lean principle 2, 85–116
Margins, 3
INDEX

LEfSE to INCOSE, 274
  subenabler 2.3.2, 103
Marketing, 26
Matrix
  LEfSE to INCOSE, 277
  subenabler 5.2.8, 179
Mature Robust Modules (MRM), 182
Meeting(s)
  ad-hoc, 40
effective, 89
milestone, 89
stand-up, 20
Memo(s), memorandum, 34
  LEfSE to INCOSE, 272
  subenabler 3.5.6, 143
Mentoring
  LEfSE to INCOSE, 274, 279
  subenabler 5.4.3, 189
  subenabler 5.6.3, 199
  subenabler 6.4.1, 235
  subenabler 6.4.3, 237
Meritocracy, meritocratic
  LEfSE to INCOSE, 272, 279
  subenabler, 3.6.2, 150
  subenabler, 6.2.6, 215
Merit review, 200
Metrics, 61
effective, 85
  enabler 2.6, 115
  LEfSE to INCOSE, 272, 278, 280
  subenabler 3.6.4, 154
  subenabler 5.3.5, 187
Milestone, 26, 111
Military
capability, 46, 48
  industrial base, 10
Mission assurance, 2, 4, 264
MIT
  International Motor Vehicle Program, 11
  Lean Advancement Initiative (also Aerospace, also Aircraft), 26
Mitigation, 31, 35, 37
  subenabler 2.4.3, 110
Modal analysis, 13
Models, 61
  subenabler 3.2.4, 119
  subenabler 3.2.5, 122
Modularity, see also Modules, 86
Modules, see also Modularity
  LEfSE to INCOSE, 279
  subenabler 2.4.1, 108
Monument, 19, 163
  LEfSE to INCOSE, 278
  subenabler 3.8.5, 162
Motivation
  subenabler 6.2.3, 208–209
Moving line, 12, 29, 30, 37
Movement, waste of, 45
Myopic view, 77
Nation, national
  programs, 52
  security, 46
NASA, 42, 44, 57, 59–61
NBC, 9
Negotiation(s), 37, 57
Nervous system, 6, 55
Netherlands, 252
Non-value added, see Value added
Northrop, Jack, 38, 197, 206
Nuclear submarine program, 5, 38, 206
Nunn-McCurdy breach, 46
NUUMI plant, 40, 202, 219–222
Objectives
  LEfSE to INCOSE, 272
  subenabler 3.2.6, 124
Obsolescence, 21
Optimization, 33, 247
  sub-optimization, 11
Options
  subenabler 3.6.1.d, 148
Organization(al) chart, 32
  subenabler 5.4.6, 189
Otsuka, Akihido, 206
Overprocessing, 45–46
  subenabler, 5.2.7, 178
Overproduction, 45
  subenabler 5.2.7, 178
Overutilization, 19
  Over the wall, 132, 142, 147, 188, 213
Payback, 36, 94
Payroll, 79
People
  enabler 5.4, 189
  lean principle 6, 206–246
Paradigms, 9–13
  industrial, 6, 9–12
Parametric, 127
Parsing, 35, 37
Partnership
  subenabler, 2.5.2, 112–114
Pathological, 174
Payback, 36, 94
Padding, 32, 35, 100
Pathway, 132, 142, 147, 188, 213
People (Continued)
LEfSE to INCOSE, 280
most valued assets, 64
enabler 6.5, 245
LEfSE to INCOSE, 274
subenabler 2.3.1, 103
subenabler 3.8.4, 162
subenabler 5.2.3, 174
subenabler 5.5.2, 197
subenabler 5.5.4, 197
Perfection, 17, 21, 169–170
lean principle 5, 171–204
Perfection Principle, 23, 169, 174
Performance, 268
subenabler 1.2.1.e, 69
subenabler 5.3.5, 187
subenabler 6.2.7, 217
LEfSE to INCOSE, 271, 279, 280
Perpetual, 174
Pileup, 29
Plan, Do, Check, Act (PDCA)
LEfSE to INCOSE, 280
subenabler 5.2.1.f, 171–172
Planning, 20–40, 210, 234, 250–251, 270, 276
Platforms
subenabler 2.4.1, 108
subenabler 5.6.1, 199
Point design, 18
subenabler 2.3.2, 103
subenabler 3.3.2, 126
Poland, v, 5
Politicians, 15, 52
Precedence, 18
LEfSE to INCOSE, 276
subenabler 2.2.7, 93
subenabler 2.2.10, 96
Predictable flow, see Flow
Preparations, 3, 4
Prioritize
enabler 3.2, 19
Prius, 127, 199
Presidential helicopter, 48, 52
Procedure, 268
subenabler 3.5.8, 145
Process(es), processing, 18, 21
agile
LEfSE to INCOSE, 276
subenabler 1.2.4, 73
capable, 11
defect-free, 11, 12
flow
subenabler, 3.6.1.b, 148
holistic, 7, 28
repeatable, 107, 200, 243
Product development (PD), 25–41
enabler 3.4, 133
LEfSE to INCOSE, 274, 276, 278
subenabler 2.2.3,
subenabler 2.5.2,
subenabler 3.4.1, 127
subenabler 5.5.3,
subenabler 6.2.5,
Product of the year (INCOSE Award), 4, 63
Productivity
improvement(s), 48
reserve, 25, 26, 45, 54
Profit(s)
subenabler 2.6.2, 115
Program(s)
assets
subenabler 2.4.1, 108
closure, 15
cost, 4, 46–49
duration(s), 28, 179
front loading, 20, 129
planning, 3, 20, 85
schedule, 2, 17, 157, 178
stability
subenabler 3.6.2, 150
unneeded, 26
value, 247
Project
administration, 29
Project Manager, 29, 39. See also Chief Engineer
Proposal, 36, 110
Proprietary, 55
Prototype
of LEfSE, 55–62
subenabler 3.2.4, 119
Pull,
enabler 4.2, 165–168
Purpose, agenda, time, intent (PATI), 89, 189
Pyramids, 42
Quality, 2
built-in, 12
LEfSE to INCOSE, 279, 280
subenabler 5.2.1, 171
technical, 15
Queuing, 99
Quick Reference Guide, 57, 266
INDEX

RAA (responsibility, authority, accountability) 
LE to INCOSE, 277
subenabler 6.2.8, 219
Rafael, 251
Rankings of importance and use
Raytheon, 59
Receiver, see Internal customer
Refinement
subenabler 5.2.7, 178
Reinventing the wheel, 18, 36
Relationship
buyer-supplier, 113, 146, 187
Required non-value added, 154
Required non-value added (RNVA), 16
LEfSE to INCOSE, 272
subenabler 3.6.4, 154
Requirement(s), 268, 270
ambiguity, 52
capture, 67
changes
LEfSE to INCOSE, 274, 276
subenabler 1.3.3, 83
subenabler 2.2.13, 101
communicative disjunctions, 52
compliance, 15
conflicted, 52
creep, 15
LEfSE to INCOSE, 272
subenabler 3.2.1, 119
derived, 51
enabler 3.2, 119
formal, 77, 84
instability, 52
LEfSE to INCOSE, 272, 274–278
runaway, 24, 48
subenabler 1.3.4, 184
subenabler 2.2.13, 101
subenabler 3.5.8, 145
subenabler 4.2.6, 167
Stability Index (RSI), 120
top level, 52, 53
unspoken
subenabler 3.2.3, 119
unstable, 19, 28, 48
Research
show-stopping, 277
LEfSE to INCOSE, 277
subenabler 2.4.3, 110
and development, 10
Resource allocation, 267
Respect for People, 22, 204–205
lean principle 6, 206–246
LEfSE to INCOSE, 273
Responsible, approving supporting, informing 
(RASI),
LEfSE to INCOSE, 276
subenabler 2.2.10, 96
Resume
scanning, 191, 192, 207, 211
LEfSE to INCOSE, 279
subenabler 6.2.4, 211
Return on investment, (ROI), 37, 248, 251
Reuse, 33
subenabler 2.4.1, 108
Rework
LEfSE to INCOSE, 272, 277
subenabler 3.6.3, 152
subenabler 4.2.6, 167
RFP, 150
Rhythmic, 29
Rich, Ben, 206
Rickover, Hyman, Adm., 38, 206
Right the first time, 4, 15, 16, 200, 247, 269
LEfSE to INCOSE, 271, 276, 280
subenabler 1.2.1.c, 69
subenabler 2.2.4, 106
subenabler 5.2.7, 178
Risk(s), 7, 33, 39
LEfSE to INCOSE, 277, 279
low, 28
management, 50
subenabler 2.3.3, 105
subenabler 3.5.9, 145
Rivalry, 209, 217, 226
Robust, robustness, 60
subenabler 1.2.3, 71
subenabler 2.3.4, 106
subenabler 2.4.2, 110
subenabler 5.2.1.a, 171
Rockwell Collins, 227, 247, 250
Root cause, 22, 256
subenabler 5.3.3, 183
Rotation(s), 20
LEfSE to INCOSE, 279
subenabler 5.6.3, 199
Russian, 44
Schedule, 2, 4, 34–35, 47, 49, 62
adherence, 159
LEfSE to INCOSE, 276
subenabler 2.2.11, 98
subenabler 2.2.12, 99
subenabler 2.2.13, 101
Screen(s)
LEfSE to INCOSE, 272
subenabler 3.7.2, 159

291
Seamless teaming
  LEfSE to INCOSE, 276
subenabler 3.4.1, 133
Secrecy 102, 161
Secretary of Defense, 10, 46
Set based, 126
Shingo Award, xxvii, 4, 63, 249
Silo, 152, 153, 158
Simplest solution, 127
  LEfSE to INCOSE, 275
subenabler 3.3.4, 130
Simulation(s), 61
  LEfSE to INCOSE, 275
subenabler 3.2.4, 119
subenabler 3.2.5, 122
Single piece flow, 12
Six Sigma, 9–13
design for, 11
  LEfSE to INCOSE, 280
subenabler 5.7.3, 202
Skunk Works, 38, 206, 227
Software
  subenabler 2.4.1, 108
subenabler 3.2.4, 119
subenabler 3.8.3, 162
Space Based Infrared System (SBIRS), 46, 47
Spiral development
  LEfSE to INCOSE, 275
subenabler 3.2.5, 122
Splitting, 30, 37
Stakeholder, 15, 33, 50, 53, 268, 270
  LEfSE to INCOSE, 272, 274, 276
program, 51
satisfaction, 3, 58
subenabler 2.2.1, 88
subenabler 2.2.2, 90
subenabler 3.2.6, 124
subenabler 5.7.2, 202
value
  subenabler 1.2.5, 75
Standards, Standardization, 268
design
  enabler 5.6, 199
LEfSE to INCOSE, 272, 274, 279
measurement
  subenabler 3.6.5, 155
skill set
  enabler 5.6, 199
subenabler 2.4.1, 108
subenabler 3.8.1, 162
subenabler 5.2.8, 179
subenabler 5.7.2, 202
subenabler 6.4.7, 243
State of the art, 27–28, 52, 114, 185
Statistical Process Control, statistical control
  (SPC)
  LEfSE to INCOSE, 273
subenabler 4.2.4, 167
Stopping the line, 175
Stovepipe, 141, 142
Strategy
  in development of LEfSE, 54–55
  LEfSE to INCOSE, 278
subenabler 5.4.8, 195
Streamlining, 6, 10, 12
subenabler, x–xix, 57, 64–67
Suboptimized, 52
Success(es, ful), 42–44, 60
  LEfSE to INCOSE, 272, 274
subenabler 3.2.6, 124
subenabler 5.5.1, 197
subenabler 5.5.4, 197
Suggestion system, 169, 170, 222
Supplier(s)
capable, 187
cheapest, 113, 146
inputs, process, outputs, customer (SIPOC),
  LEfSE to INCOSE, 273
subenabler 4.2.4, 167
performance
  LEfSE to INCOSE, 280
subenabler 5.3.5, 185
seamless partnership, 146, 147
  LEfSE to INCOSE, 278
Supply chain management, 3, 55
Survey, 56–59
Sweden, xxvii, 5
Synchronicity, 37, 40, 94
Synergy, 3, 50, 51
System domain, 23
Systems
  architecting, 129
ingeering
    definition, 2
traditional, 42–49
  engineering and technical assistance (SETA), 1
Life Cycle Process Overview, 55
management, 61
thinking, 42
Tacit knowledge, 55, 181
Tailoring, 70, 85, 94, 270, 280
Takt period(s), 37
Takt time, see Time, takt
Task(s)
  owner, 21
predictable, 98
sheet, 36, 40
Team, teaming, teamwork, 54–58, 101, 247

LEfSE to INCOSE, 273–280

subenabler, 2.3.1, 103
subenabler 2.5.2, 112
subenabler 2.5.3, 112
subenabler 2.5.4, 112
subenabler 3.4.1, 133
subenabler 3.4.3, 134
subenabler 4.2.4, 167
subenabler 5.4.1, 189
subenabler 5.4.6, 189
subenabler 5.4.8, 195
subenabler 5.7.2, 202
subenabler 5.7.3, 202
subenabler 6.2.3, 208
subenabler 6.2.7, 217
subenabler 6.2.14, 227

Technology
acquisition, 17, 42, 43
complex, 52, 247
equisite, 48
rate of change, 179
Readiness Level (TRL), 110–111

Test(ing)
as you fly, 24, 43
Thales, 227, 251
Theory X, 202, 219
Y, 219

Threats, 17, 26
Throughput time, see Time, throughput

Time
buffers, 32, 99, 139
cycle, 30, 34–35, 96
padding, 100
takt, 29–31
LEfSE to INCOSE, 277
subenabler 3.8.1, 162
throughput, 34, 35

Tool(s), 3, 50, 51
enable 3.8, 162
monument
subenabler 2.2.10, 96
subenabler 3.2.4, 119

Top down, 11, 13

Total Quality Management, 6, 9. See also TQM

Toyoda, Akido, 2, 3

Toyota, 127, 131–132, 146, 208, 253
Production System, 11, 131, 220
subenabler 3.5.6, 143
Way, 159, 233

TQM, 9–13. See also Total Quality Management

Tradeoff, 33

LEfSE to INCOSE, 272

subenabler 3.6.1.d, 148

Trade space, 248, 256
LEfSE to INCOSE, 274
subenabler 2.3.2, 103

Traditional
process(es), 67
Systems Engineering, see Systems engineering, traditional

Traffic cop, 157, 167
Traffic light, 217

Training, 2, 51, 57
LEfSE to INCOSE, 274, 277, 279, 280

on the job
subenabler 3.8.1, 162
subenabler 5.3.3, 183
subenabler 5.4.3, 189
subenabler 5.4.6, 189
subenabler 5.6.3, 199
subenabler 6.3.3, 233
subenabler 6.3.4, 233
subenabler 6.4.1, 235
subenabler 6.4.8, 243

Trends, 88, 215

Trial and error, 243, 256, 269

Trust
LEfSE to INCOSE, 273, 278, 279
subenabler 4.2.8, 167
subenabler 6.2.3, 208

TRW, 227

U2 aircraft, 5, 53

United Auto Workers (UAW), 220

Uncertainty
LEfSE to INCOSE, 271
subenabler 1.2.1.b, 69

Union(s), 220

United Kingdom, xxviii, 5, 255

United States, v, 9

Units, 88

University of Michigan, 55

Upgrades
LEfSE to INCOSE, 279
subenabler 2.4.5, 108

U.S. Congress, 2, 3, 43, 46

Use ranking, 58, 66

V-22 aircraft, 48, 49

Value, 14–15, 17, 20, 67–68
added (VA), 16, 45
clarification, 15
definition, 15
expectations, 17
formulation, 52

lean principle 1, 69–85
Value (continued)

LEfSE to INCOSE, 272–280
non-V added (NVA), 16, 45
proposition, 21, 23, 30, 33, 34, 39
required non-V added (RNVA), 16
stream, 35–38, 85–87
lean principle 2, 88–116
subenabler 4.2.3, 165
subenabler 4.2.4, 167
subenabler 4.2.7, 167
subenabler 4.2.9, 167
subenabler 5.2.7, 178
to customers 79
Variation
arrival time
subenabler 2.2.11, 98
Verbose, 34
LEfSE to INCOSE, 272
subenabler 3.5.6, 143
Video, 57
Virtual co-location
LEfSE to INCOSE, 277
subenabler 6.2.14, 227
Visibility to all, 101
Vision, visionary, 60, 61, 64
LEfSE to INCOSE, 277
subenabler 6.2.1, 206
Visual control(s)
LEfSE to INCOSE, 272
Visual methods
LEfSE to INCOSE, 276
subenabler 2.2.13, 101

Volutility, 179

Waiting, 4, 18, 45
Wall Street, 28, 38, 215
War room, project room, 34, 40, 90, 94
Waste, 15–17, 44–49
categories of, 18
definition, 16
enabler 4.2, 165–168
enabler 5.6, 199–201
Product Development (PD)
LEfSE to INCOSE, 280
subenabler 2.2.5, 93
of measuring waste, 11
societal, 26
Weapon(s), 10, 49
subenabler 6.4.4, 233
Work
cell, 30
LEfSE to INCOSE, 277
subenabler 3.8.1, 162
package, 31, 44
Work Breakdown Structure (WBS), 94
Workforce
LEfSE to INCOSE, 279, 280
subenabler 5.3.3, 183
subenabler 6.3.2, 231
Working Group, Lean Systems Engineering, of
INCOSE, 50–51, 249
Xerox, 113, 187