Table of Contents

Chapter 1
Introduction to Utility Management 1

1.1 Effective Management 2

1.2 Manager's Functions 4

1.2.1 Planning 6
- 1.2.1.1 Planning Process 7
- 1.2.1.2 Types of Plans 8

1.2.2 Organizing 9

1.3 Workforce Development and Staffing 13

1.3.1 Workforce Development 14
1.3.2 Staffing 16
1.3.3 Workforce Analysis 17
1.3.4 Staffing Plan 17
1.3.5 Qualifications Profile 18
1.3.6 Screening and Evaluating Candidates 19
1.3.7 Onboarding 23
1.3.8 Employment Policies and Procedures 24
- 1.3.8.1 Introductory Period 24
- 1.3.8.2 Compensation 24
- 1.3.8.3 Training and Certification 24
- 1.3.8.4 Leadership Development 25
- 1.3.8.5 Performance Evaluation 26
- 1.3.8.6 Dealing with Disciplinary Problems 29

1.3.9 Contracting for Work 33
- 1.3.9.1 Advantages and Limitations of Contracting 33
- 1.3.9.2 Contract Development and Management 34

1.4 Information Management and Recordkeeping 36

1.4.1 Types of Records 36
1.4.2 Plant Operations Data 37
1.4.3 Procurement Records 38
1.4.4 Inventory Records 38
1.4.5 Human Resources Records 39
1.4.6 Disposition of Plant and System Records 39

1.5 Communications and Public Outreach 40

1.5.1 Communication System 41
- 1.5.1.1 Customer and Stakeholder Communications 43
- 1.5.1.2 Crisis Communication and Planning 44

1.5.2 Media Relations and Interviews 45
1.5.3 Individual Communication Skills 45
- 1.5.3.1 Oral Communication 47
- 1.5.3.2 Written Communication 48

1.5.4 Hazard Communication Standard 50

1.6 Resilience Through Assessment and Planning 61

1.6.1 Physical Security 63
1.6.2 Cyber Security 67
1.6.3 Risk and Resilience Assessment and Emergency Response Plan 70
- 1.6.3.1 Risk and Resilience Assessment 70
- 1.6.3.2 Risk Assessment 72
- 1.6.3.3 Emergency Response Plan 74

Chapter Review 77

Chapter 2
Managing for the Future 81

2.1 Finance and Funding 82

2.1.1 Expenses 82
- 2.1.1.1 Operating Expenses 84
- 2.1.1.2 Capital Expenses 84
- 2.1.1.3 Reserve Fund Contributions 85

2.1.2 Revenues 88
2.1.2.1 Rate Setting 89
2.1.3 Budgeting and Financial Policies 91
2.1.3.1 Long-Term Financial Planning 91
2.1.3.2 Inflation 92
2.1.4 Financial Indicators 93

2.2 Asset Management 95

2.2.1 Asset Management Program Benefits 97
2.2.1.1 Maximizing Asset Life 97
2.2.1.2 Informed, Financially Sound Decision Making 98
2.2.1.3 Computer Maintenance Management Systems 99
2.2.2 Program Components 100
2.2.2.1 Level of Service 101
2.2.2.2 Accurate Asset Inventory 103
2.2.2.3 Asset Condition Assessments 106
2.2.2.4 Risk Assessment and Capital Improvement Planning 107
2.2.2.5 Implementing a Computer Maintenance Management System 113
2.2.3 Implementation and Maintenance 113

2.3 Managing Change and Challenges 115

2.3.1 Problem-Solving Skills 115
2.3.2 Decision Making 117
2.3.3 Organizations and Culture 118

2.4 Additional Resources 120

Chapter Review 121

Answer Key 125
Glossary 127
Index 129

Index

The letter f following a page number denotes a figure and the letter t following a page number denotes a table.

A

Accountability, 10
Accurate asset inventory, 103–105, 105f
Americans with Disabilities Act (ADA), 16
Asset management, 5
  CMMS, 99–100
  history, 97
  implementation and maintenance, 113–115
  informed, financially sound decision making, 98–99
  maximizing asset life, 97–98
  program components
    accurate asset inventory, 103–105, 105f
    CMMS, 113
    condition assessments, 106–107, 106t, 107t
    development, 100, 101f
    level of service, 101–103, 102t
    risk assessment and CIP, 107–113, 108t–109t, 109f, 111f, 112f
  water and wastewater systems connections to homes, 95, 96f
Authority, 10

B

Budgeting, 91–93

C

Call date, 87
Capacity, management, operation, and maintenance (CMOM), 45
Capital improvement fund, 86–88
Capital improvement plan (CIP), 5, 91, 98. *See also* Risk assessment
Certification examinations, 25
Certified operator, 25
Checkup Program for Small Systems (CUPSS), 105, 113, 114t
Communication
  audience groups, 42, 43f
  crisis communication and planning, 44–45, 44t, 46f
  customer and stakeholder, 43–44
  elements, 41–42, 42f
  HCS. *See* Hazard Communication Standard (HCS)
  media relations and interviews, 45
  mission and objectives, 41
  oral, 47
  public trust level and transparency, 40, 40f
  written, 48–50, 50t
Community water systems (CWS), 63, 70
Computer maintenance management system (CMMS), 36, 97, 99–100, 113
Consumer Price Index (CPI), 90, 92
Continual improvement management, 118–120
Coverage ratio, 93
Culture, 118–120, 118f, 119f
Cyber security, 67–68, 69f, 70t

D

Debt service, 83
Decision-making process, 98–99, 117
Delegation, 10
Depreciation, 84

E

Emergency response plan (ERP), 74–75, 75f, 76t
Equal Employment Opportunity (EEO) Act, 16
Equipment repair/replacement fund, 85–86
Expenses
  capital expenses, 84–85
  operating expenses, 84
  reserve fund contributions
    capital improvements and future funding, 86–88
    equipment repair/replacement fund, 85–86
  utility cost categories, 82, 83t

F

Family and Medical Leave Act (FMLA), 16
Finance and funding
  budgeting and financial policies, 91–93
  expenses. *See* Expenses
  financial indicators, 93–95
  revenues
    rate setting, 89–90
    sources, 88, 89t
Financial indicators, 93–95
Financial policies, 91–93

G

Globally Harmonized System of Classification and Labeling of Chemicals (GHS), 50
Gravity sewer risk assessment, 110–111

H

Hazard Communication Standard (HCS), 61
  federal and state laws, 51
  formal training program, 60
  hazard pictograms, 57, 58f
  HMIS, 57, 59, 59f
  labeling requirements, 59–60
  NFPA system, 57, 59f
  operators, 51
  program elements, 52, 53t, 54t
  quality and consistency, 50–51
  rulemaking options, 60
  SDS, 54, 54t–56t, 57
Hazardous Materials Identification System (HMIS), 57, 59, 59f
Hazard statement, 57
Human resources (HR), 16

I

Inflation, 92–93
Information technology (IT), 67, 68

L

Level of service (LOS), 101–103, 102t
Life-cycle costing, 98
Long-term financial planning, 91–92

M

Management
  asset. *See* Asset management
  attributes, 2, 3f
  communication. *See* Communication
  evaluation, 2, 3t–4t
  organizing, 5, 9–13, 11f, 12t
  planning
    community sustainability, 6
    component, 6
    definition, 5
    emergency response plan, 7
    process, 7–8, 7t, 8f
    types, 8–9
  recordkeeping, 36–39
  resilience
    cyber security, 67–68, 69f, 70t
    ERP, 74–75, 75f, 76t
    malevolent acts, 63, 63t
    natural hazards, 63, 64t
    NIPP, 61, 62f
    physical security, 63–67
    RRA, 70, 71f, 72–74, 73f
    threats and hazards, 61
  staffing, 13
    contract work, 33–35
    employment policies and procedures, 24–33, 27f–28f
    job performance, 16
    onboarding, 23
    planning, 17
    qualifications profile, 18
    screening and evaluating candidates, 19–20, 20t–21t, 22–23
    workforce analysis, 17
    workforce development, 14–15, 15f

N

National Fire Protection Association (NFPA) system, 57, 59f
National Infrastructure Protection Plan (NIPP), 61, 62f
National Pollution Discharge and Elimination System (NPDES), 45
National Terrorism Advisory System (NTAS), 66–67

O

Occupational Safety and Health Act of 1970 (OSH Act of 1970), 57
Operating expenses, 84
Operating ratio, 93
Operation and maintenance (O&M), 7
Organizations, 118–120, 118f, 119f
Organizing, 5, 9–13, 11f, 12t
OUCH principle, 22

P

Physical security, 63
  coordination, 65–66
  investments, 66
  NTAS, 66–67
  priority for employees, 65
  recommendations, 65
  responses to terrorist activities, 66
  terrorist attack, 64
  water distribution pipelines, 64
Pictogram, 57
Planning
  community sustainability, 6
  component, 6
  crisis communication, 44–45, 44t, 46f
  definition, 5
  emergency response plan, 7
  process, 7–8, 7t, 8f
  types, 8–9
Polymer injection system, 110
Precautionary statement, 57
Present worth, 87
Preventive maintenance, 86
Problem-solving skills, 115–117, 116f
Process control systems (PCS), 67
Procurement, 38
Producer Price Index (PPI), 92
Pump station, 108–109

R

Rate setting, 89–90
Reactive maintenance, 86
Recordkeeping
  human resources, 39
  inventory records, 38–39
  plant and system records, 39
  plant operations data, 37–38
  procurement records, 38
  types, 36
Request for proposals (RFP), 34, 35
Reserve fund contributions
  capital improvements and future funding, 86–88
  equipment repair/replacement fund, 85–86
Resilience, 70
  cyber security, 67–68, 69f, 70t
  ERP, 74–75, 75f, 76t
  malevolent acts, 63, 63t
  natural hazards, 63, 64t
  NIPP, 61, 62f
  physical security, 63–67
  RRA, 70, 71f, 72–74, 73f
  threats and hazards, 61
Responsibility, 10
Revenues
  rate setting, 89–90
  sources, 88, 89t
Right-to-know (RTK) laws, 50, 51
Risk Analysis and Management for Critical Asset Protection (RAMCAP) process, 73
Risk and resilience assessments (RRA), 70, 71f, 72–74, 73f
Risk assessment
  CIP, 112
  gravity sewer, 110–111
  likelihood and consequence of asset failure, 108, 108t, 109f
  LOS agreement, 107
  O&M costs, 112–113
  phases of asset life cycle, 112
  polymer injection system, 110
  pumping station, 108–109
Run-to-failure (RTF), 97

S

Safety data sheets (SDSs), 50, 54, 54t–56t, 57
Sector-specific plans (SSP), 61
Signal word, 57
Staffing, 13
  contract work
    advantages, 33–34
    development and management, 34–35
    limitations, 33–34
    options, 33
  employment policies and procedures
    certification program, 25
    compensation, 24
    dealing with disciplinary problems, 29–33
    introductory period, 24
    leadership development, 25

performance evaluation, 26, 27f–28f, 29
training, 24–25
job performance, 16
onboarding, 23
planning, 17
qualifications profile, 18
screening and evaluating candidates, 19–20, 20t–21t, 22–23
workforce analysis, 17
workforce development, 14–15, 15f
State revolving fund (SRF) programs, 88
Supervisory control and data acquisition (SCADA) systems, 84

U

US Environmental Protection Agency (EPA), 2

W

Water Infrastructure and Resiliency Finance Center (WIRFC), 90
Water Infrastructure Finance and Innovation Act (WIFIA) program, 88
Workforce analysis, 17