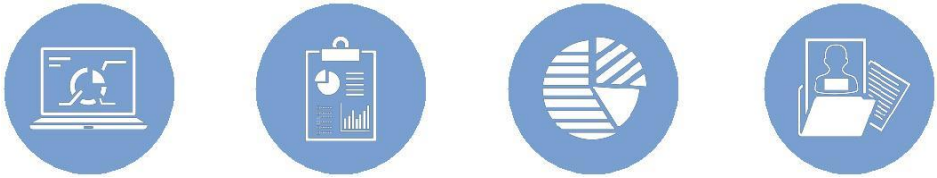
PMP® Certification Training

Brain Dump for PMP Preparation

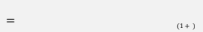


Based on PMBOK® Guide – Fifth Edition

Contents

Formulae used in PMP

Formulae

Section	Formula/Equation	Legend
Benefit-Cost Analysis; Project Selection Criteria		RoI = Return on Investment ARR = Average Rate of Return I = Initial Investment
		PV = Present Value FV = Future Value r = Rate of discounting N = Number of years
		NPV = Net Present Value Cf_i = Cash flow for year I r = Rate of discounting N = Number of years
	IRR	IRR = Internal Rate of Return; Rate of discount at which the Present Value of Benefits = Present Value of Costs; that is, in the NPV formula, treat "r" as a variable and equate NPV to zero.
		BCR = Benefit to Cost Ratio

Formulae (contd.)

Section	Formula/Equation	Legend
Time Management	= – = – = (–)/6 = (+ 4 +)/6	LS = Latest Start Time; LF = Latest Finish Time ES = Earliest Start Time; EF = Earliest Finish Time = Expected Time = Standard Deviation O = Optimistic Time Estimate P = Pessimistic Time Estimate M = Most Likely Time Estimate
Earned Value Management	= – = – = / = /	CV = Cost Variance SV = Schedule Variance EV = Earned Value PV = Planned Value AC = Actual Cost CPI = Cost Performance Index SPI = Schedule Performance Index

Formulae (contd.)

Section	Formula/Equation	Legend
Earned Value Management	EAC = AC + BAC-EV EAC = AC + Bottom-up ETC EAC = AC + [(BAC-EV)/(CPI*SPI)] = − C − = (−)/(−)	EAC = Estimate at Complete BAC = Budget at Complete ETC = Estimate to Complete CPI = Cost Performance Index VAC = Variance at Completion TCPI = To-complete cost performance index (to manage overall spent to target)
Channels of Communication	$= * \frac{(- 1)}{2}$	C = Number of channels of communication N = Number of team members
Risk	= (*)	EMV = Expected Monetary Value P = Probability of event I

Management			I = Impact of event i

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Important Definitions in PMP

Important Definitions

Term	Definition
Project	Temporary endeavor undertaken to create a unique product, service or result
Program	A group of projects managed in a coordinated way to obtain benefits or control not available from managing them individually
Portfolios	A collection of projects, programs, sub-portfolios and operations managed as a group to achieve strategic objectives
Stakeholder	An individual, group or organization who may affect, be affected by or perceive itself to be affected by a decision, activity or outcome of a project
Payback Period	Number of time periods it takes to recover the initial investment
Opportunity Cost	The value of the opportunity that was available but had to be given up in order to pursue another opportunity
Configuration Management Systems	A set of procedures used to apply technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a product, service or a result component

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Important Definitions (Contd.)

Term	Definition
Product Scope	Features and functions that characterize a product
Project Scope	The work that must be done to deliver a product, service or result with the specified features and functions
Control Account	The level of work at which the management wishes to exercise control
Work Package	A unit of work or deliverable at the leaf node of a work package
Rolling Wave Planning	An iterative planning technique in which the work to be accomplished in the near term is planned in greater detail while the work to be done in the future is planned at a higher level
Leads and Lags	A successor activity is said to have a lead when it can start in advance of the predecessor; it is said to have a lag when it has to wait for a certain period after the predecessor
Critical path	Longest path from start to finish in a project network diagram; All activities on the critical path have zero float

Important Definitions (Contd.)

Term	Definition
Crashing	Achieving reduction in time taken by increasing the cost
Fast Tracking	Achieving reduction in time taken by increasing the work being done in parallel
Resource optimization	Applying optimization techniques to achieve the desired level of utilization of resources
Depreciation	An accounting practice or entry that takes into consideration the reduction in the value of an asset over time
Quality	The degree to which a set of inherent characteristics fulfills requirements
Grade	A category assigned to deliverables having the same functional use but different technical characteristics
Cost of Quality	All the costs incurred over the life of a product to ensure that it conforms to the requirements
RACI	A common type of responsibility assignment matrix that uses responsible, accountable, consult and inform statuses to define the involvement of stakeholders

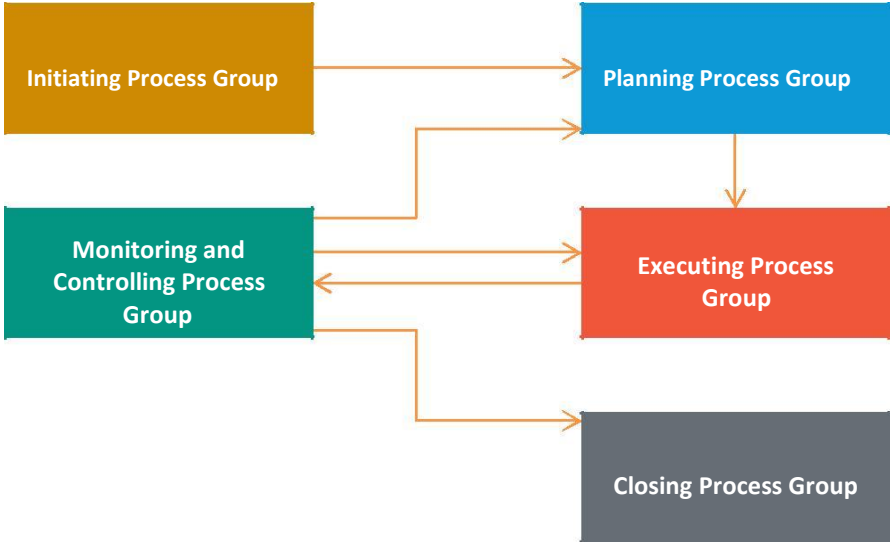
Important Definitions (Contd.)

Term	Definition
Risk	An uncertain event or condition that, if it occurs can have a positive or negative effect on a project's objectives
Contract	A mutually binding agreement that obligates the seller to provide the specified products or services or results and the buyer to provide the monetary or other valuable consideration
Cost Reimbursable Contract	A form of contract that requires the buyer to pay the seller for all the costs incurred, plus a fee representing the seller's profit
Fixed price contract	A form of contract that sets the fee to be paid for a defined scope of work regardless of the cost of effort to deliver it

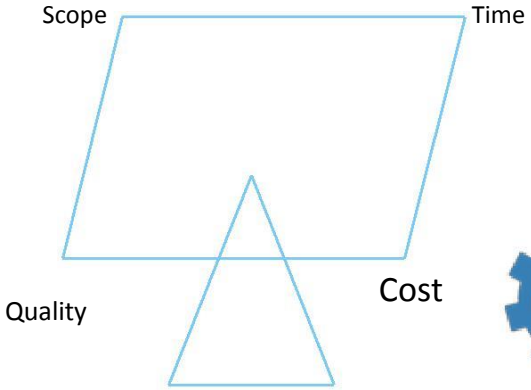
Important Concepts

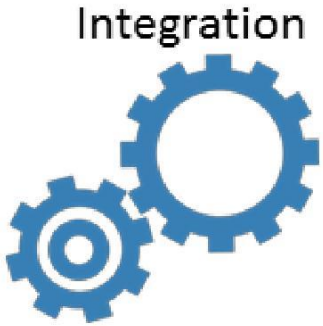
PMP Framework

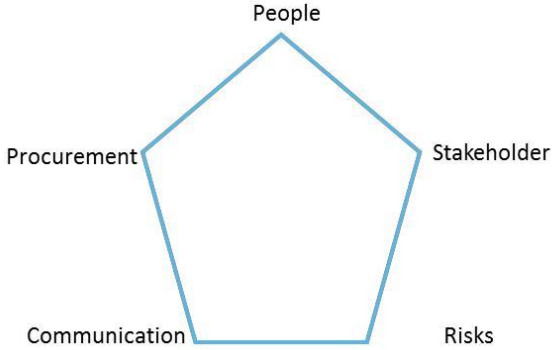
Process Groups of Project Management



Knowledge Areas of Project Management







Influence of Organizational Structure on Projects

Organization Type	Matrix				
Project Characteristics	**Functional**	**Weak Matrix**	**Balanced Matrix**	**Strong Matrix**	**Projectized**
Project Manager's Authority	Little of None	Limited	Low or Moderate	Moderate to High	High to almost Total
Percent of Performing Organization's Personal Assigned full Time to Project Work	Virtually None	0-25%	15-60%	50-95%	85-100%
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Common Titles for Project Manager's Role	Project Coordinator/ Project Leader	Project Coordinator/ Project Leader	Project Manager/ Project Officer	Project Manager/ Program Manager	Project Manager/ Program Manager
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

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Important Concepts

Project Integration Management

Change Management Steps

Important Concepts

Project Time Management

Relationship Types

The activity relationship types are as follows:

- Finish to Start
- Start to Start
- Finish to Finish
- Start to Finish

Network Diagramming Techniques

Network diagrams can be drawn in one of the following ways:

- Precedence Diagramming Method (PDM) or Activity on Node (AON) – Arrows indicate relationships
- Arrow Diagramming Method (ADM) or Activity on Arrow (AOA) – Direction of the arrows indicates relationships

Types of Estimation

Estimation can be done in the following ways:

- Top-down
  - Expert
  - Analogous
  - Parametric
- Bottom-up or detailed

Critical Chain Method

In this method, logical and resource dependencies between activities are simultaneously considered to determine a critical path.

Properties of Normal Distributions

Normal distributions have the following properties:

- 68% observations are between 1 standard deviation from the mean
- 95% observations are between 2 standard deviations from the mean
- 99.73% observations are between 3 standard deviations from the mean
- 99.999966% observations between 6 standard deviations from the mean

Float or Slack and Schedule Compression Techniques

Float or slack refers to the amount of time an activity can be delayed without delaying the project.

$$\text{Free Float} = ESj - EFi$$

Schedule compression techniques include:

- Crashing – Increasing cost to save time
- Fast tracking – Performing activities in parallel to save time

Important Concepts

Project Quality Management

Optimal Quality

Marginal quality or optimal quality is reached when the cost of achieving additional quality is matched by the additional revenue it brings.

Quality Management Philosophies

Key philosophies for quality management include:

- Total Quality Management (TQM) – Integrated management philosophy
- Kaizen – Small improvements to make things better
- Deming cycle – Plan-Do-Check-Act (PDCA)
- Kanban – A pull-based system for management of inventory that operates on just in time (JIT) principles

Quality Assurance and Quality Control

Quality Assurance and Quality Control are described below:

Quality Assurance

- Is ongoing during execution
- Focuses on the process
- Involves audits, reviews, and similar activities

Quality Control

- Inspects specific results or deliverables
- Focuses on the products or results
- Involves testing, inspection, and similar activities

Cost of Quality

Cost of Quality = Cost of Conformance + Cost of Non-Conformance

Cost of Conformance	=	Prevention Costs (Training, documentation)	+	Appraisal Costs (Testing)

Cost of Non- Conformance	=	Internal Failure Costs (Rework, scrap)	+	External Failure Costs (Warranty, recall)

7 Basic Quality Tools

The 7 basic quality tools include:

- Control chart – used to observe variation in a process to make sure it is in control
- Cause and effect (Ishikawa or Fishbone) diagram – used for root-cause analysis
- Flow chart – used to visualize flow in a process
- Histogram – used to assess frequency for a certain category
- Pareto diagram – based on the 80-20 rule, used for prioritization
- Scatter diagram – used to assess the correlation between two variables
- Check sheet – used to organize data for inspection or presentation

Important Concepts

HR Management

Stages of Team Formation

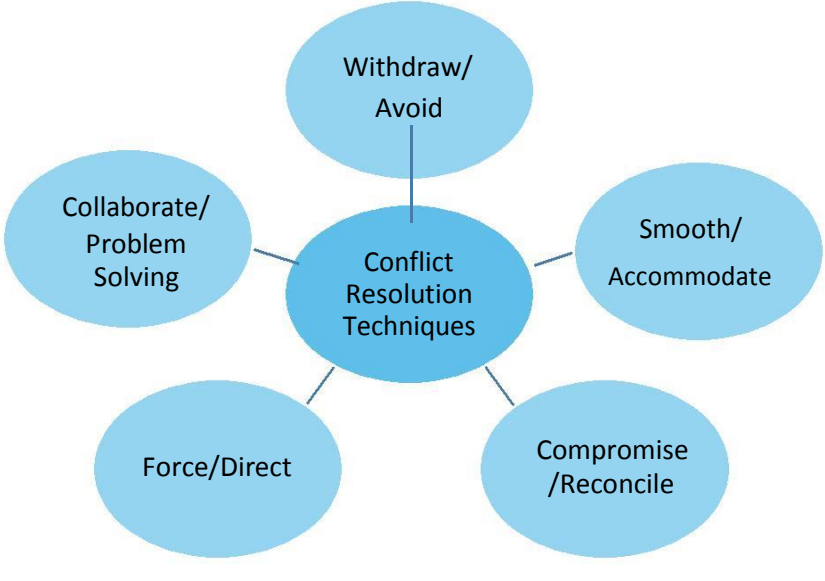
Sources of Conflict

The sources of conflict in a team include:

- Resources
- Scheduling
- Personality

Conflict Resolution Techniques

The conflict resolution techniques are listed below:



Forms of Authority

Managers can adopt any of the following forms of authority:

- Formal
- Expert
- Reward
- Penalty
- Referent

Organizational Theories

The different organizational theories are listed below:

Maslow's hierarchy	Physiological, Safety, Social, Esteem, Self-Actualization
Herzberg's theory	Hygiene factors, Motivating agents
McGregor	X theory (people want to avoid work), Y theory (people are self-motivated)

Leadership Styles

Different leadership styles include:

- Autocratic/Authoritarian
- Participative/Democratic
- Delegative/Laissez-Faire

McKinsey's 7-S Framework

The seven elements of McKinsey's 7-S framework are listed below.

Hard Elements

- The three hard elements are:
  - Strategy;
  - Structure; and
  - Systems.

Soft Elements

- The four soft elements are:
  - Shared values;
  - Skills;
  - Style; and
  - Staff.

Important Concepts

Risk Management

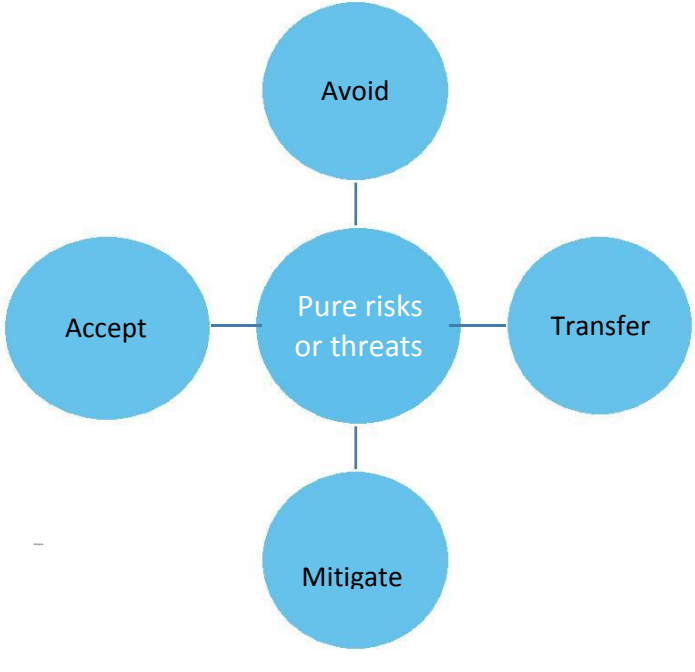
Types of Reserves

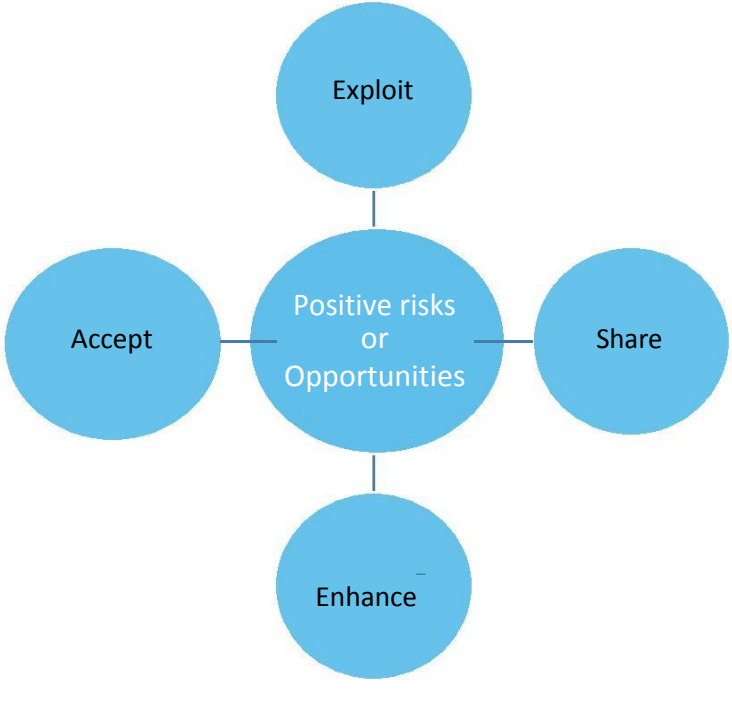
Types of reserves in risk management include:

- Contingency reserves – for known unknowns
- Management reserves – for unknown unknowns

Strategies

Strategies for responding to risk:





Important Concepts

Procurement Management

Contract Types

The different types of contracts are as listed below:

Cost Reimbursable

Buyer pays all costs plus a profit

- Cost risk lies with the buyer
- Used when the scope and duration is uncertain

Time and Material

Buyer pays at a certain rate

- Seller doesn't have to worry about the scope, as the buyer is in control

Fixed Price

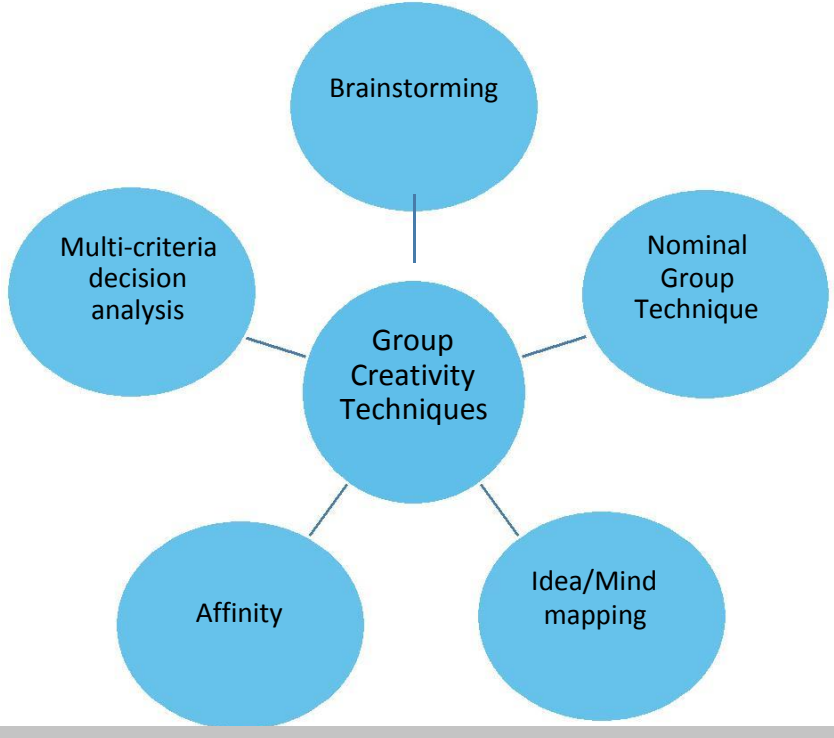
Buyer pays a fixed fee

- Cost risk lies with the seller
- Used when the scope is well known and stable

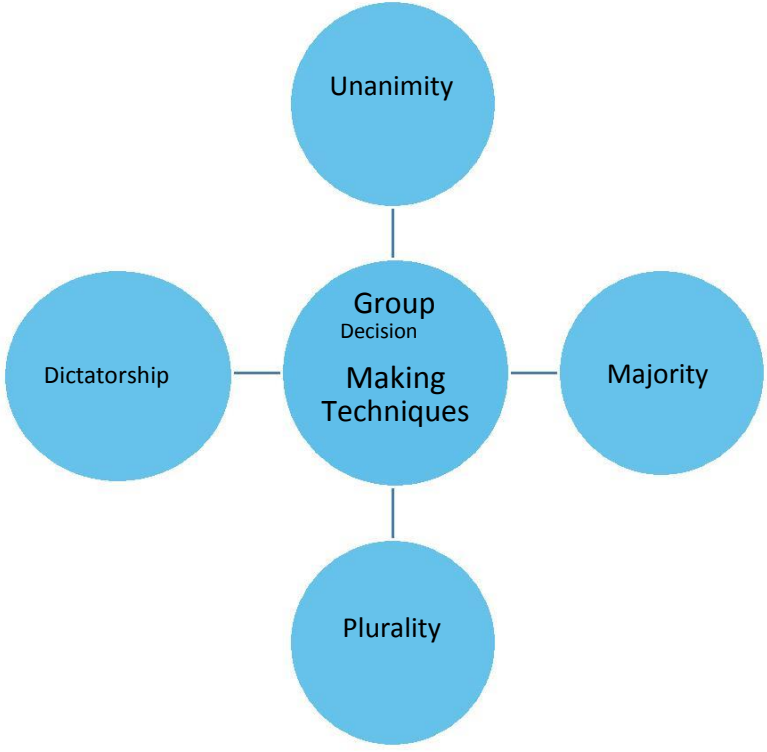
Important Concepts

Other Concepts

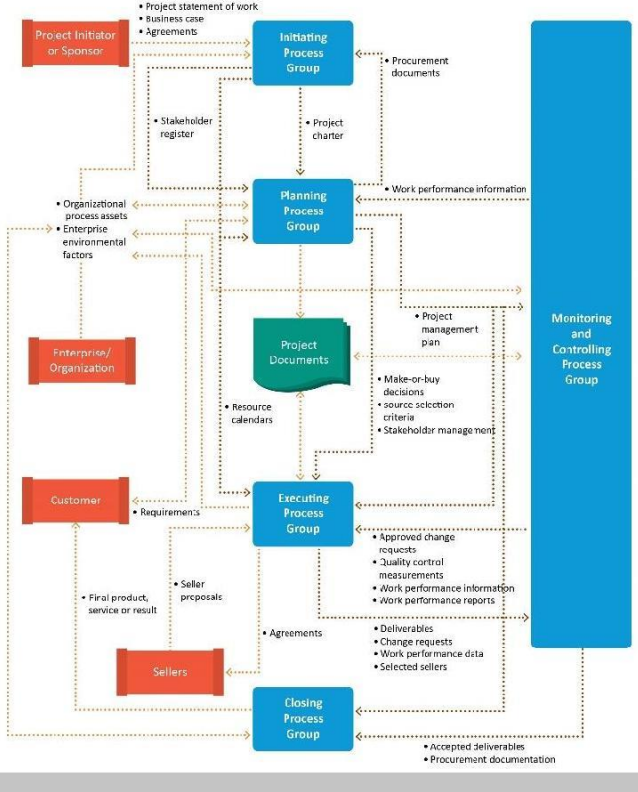
Group Creativity Techniques



Group Decision Making Techniques



Data Flows in Project Management



Common PMP Abbreviations

Common Abbreviations

Term	Abbreviations	Term	Abbreviations
AC	Actual Cost	CPM	Critical Path Method
ACWP	Actual Cost Of Work Performed	CV	Cost Variance
BAC	Budget at Completion	EAC	Estimate at Completion
CCB	Change Control Board	EF	Early Finish
COQ	Cost of Quality	EMV	Expected Monetary Value
CPAF	Cost Plus Award Fee	ES	Early Start
CPFF	Cost Plus Fixed fee	ETC	Estimate to Complete
CPI	Cost Performance Index	EVM	Earned Value Management
CPIF	Cost Plus Incentive Fee	FF	Finish-to-Finish

Common Abbreviations (contd.)

Term	Abbreviations	Term	Abbreviations
FFP	Firm Fixed Price Contract	OBS	Organizational Breakdown Structure
FMEA	Failure Mode and Effect Analysis	PDM	Precedence Diagramming Method
FP-EPA	Fixed Price with Economic Price Adjustment	PMBOK	Project Management Body of Knowledge
FPIF	Fixed Price Incentive Fee	PV	Planned Value
FS	Finish to Start	QFD	Quality Function Deployment
IFB	Invitation for Bid	RACI	Responsible, Accountable, Consult, and Inform
LF	Late Finish	RAM	Responsibility Assignment Matrix
LOE	Level of Effort	RBS	Risk Breakdown Structure
LS	Late Start	RFI	Request for Information

Common Abbreviations (contd.)

Term	Abbreviations
RFQ	Request for Quotation
SF	Start-to-Finish
SOW	Statement of Work
SPI	Schedule Performance Index
SS	Start-to-Start
SV	Schedule Variance
SWOT	Strengths, Weaknesses, Opportunities, and Threats
T&M	Time and Material Contract
WBS	Work Breakdown Structure
RFP	Request for Proposal

Thank You