

# € TRAINING

Planning Projects for Performance  
Excellence





## Planning Projects for Performance Excellence

### Introduction:

The late delivery of projects has become the scourge of project professionals worldwide. Countless numbers of projects undertaken by organizations in the private and public sectors significantly overrun the project schedule and budget, and as a consequence fail to achieve the organization's financial and strategic objectives, often with sizable increases in costs and with substantial financial losses to the organization. Why?

This is due mainly to the failure of many project professionals to successfully apply the tools and techniques of modern project planning, scheduling, and control to their projects. Likewise, the development of reliable cost estimates during the design and early conceptual stages of a proposed project is of critical importance to the success of the project.

The decision to proceed with a project is often based almost exclusively on early conceptual cost estimates, and these estimates provide the basis for the cash flow projections and forecasts used during the project feasibility study. Unreliable cost estimates can result in significant cost overruns later in the project life when it is too late to contain them.

In addition to the potential financial losses suffered by the organization, many such projects subsequently fail to deliver the required quality of outcomes intended for the project as a direct consequence of poor estimating. Budgeting inaccuracies inevitably result in lower quality workmanship and materials.

The estimating techniques and processes covered in this conference will provide delegates with the necessary skills to forecast accurately the anticipated costs of projects with a focus on budget estimates, estimates for pre-construction services, estimating contractor and sub-contractor work, estimating general conditions, pricing self-performed work, estimating negotiated contracts, and performing lump sum and unit-price estimates.

This conference will significantly enhance the skills and knowledge of delegates and improve their ability to properly plan and schedule their projects, as well as perform estimates at both the conceptual and detailed levels, and to compare feasible alternatives quickly and efficiently.

## Conference Objectives:

At the end of this conference the participants will be able to:

- Gain knowledge of techniques used in project estimating, from the conceptual stage to the final detailed estimate.
- Understand the different types of estimates used to accurately and progressively estimate project costs.
- Understand the different types of contracts based on the distribution of risk between contracting parties.
- Gain knowledge of techniques used in resource planning and control.
- Understand the time-cost trade-offs.
- Identify risk sources and minimize their impact and learn how to sustain project momentum.
- Learn how to administer project documentation and reporting.
- Develop effective performance monitoring and control system.
- Effectively apply incentive arrangements to get the best results from the contract.
- Gather and organize information and cost relevant to the design aspects of the project.
- Demonstrate a better understanding of the key functions performed by key components of the design.
- Critically assess and evaluate the relationships among key attributes such as cost, value, and function.
- Report effectively to top management and project stakeholders in the context of proposing new design alternatives that improve the overall project value.
- Demonstrate proficiency in applying life-cycle costing principles.
- Objectively present a convincing case in support of certain design alternatives.

## Targeted Audience:

- Project Managers
- Project Cost Estimators
- Cost Controllers
- Project Planners
- Contract Professionals
- Project Procurement Staff
- Individuals who are interested in Project Initiation, Project Estimating and Budgeting, and Development

## Conference Outlines:

### Unit 1: Project Scope Planning and Definition Fundamentals:

- Scope Planning
- Work Breakdown Structures WBS
- Work Packages
- Statement of Work SOW - Technical Baseline
- Scope Execution Plan
- Triple Constraints - Time, Cost, Scope
- Project Quality Issues
- Project Risk Analysis
- Project Deliverables
- Resource Requirements

## Unit 2: Project Schedule Planning and Critical Path Method:

- Precedence Network Diagramming
- Job Logic Relationship Chart
- Critical Path Analysis
- Project Float Analysis
- Lead and Lag Scheduling
- Activity Duration Estimation
- Milestone Charts
- Gantt Chart - Schedule Baseline
- Project Estimating Processes
- Production and Productivity Planning
- Resource and Cost Allocation

## Unit 3: Resource Allocation and Resource Levelling:

- Management of Resources
- Planning and Scheduling Limited Resources
- Resource Allocation Algorithms for Resource Prioritisation
- Solving Resource Contention
- Resource Levelling when Project Duration is Fixed
- The Brooks Method of Resource Allocation
- Increasing the Workforce
- Solving Interruptions to the Schedule
- Scheduling Overtime

## Unit 4: Accelerating the Project Schedule:

- Circumstances Requiring Project Acceleration
- Time-Cost-Scope Trade-off
- Project Time Reduction
- Direct Project Costs
- Indirect Project Costs
- Options for Accelerating the Schedule
- Crashing the Schedule - How?
- Pre-Accelerated Schedule
- Developing a Crash Cost Table
- Acceleration in Practice
- The Optimal Acceleration Point
- Gantt Chart for Accelerated Schedule
- Network Activity Risk Profiles
- Additional Considerations
- Multiple Critical Paths
- Project Cost Reduction

## Unit 5: Project Contingency Planning:

- Program Evaluation and Review Technique PERT
- Path Convergence Analysis
- Solving the Path Convergence Problem
- Network Risk Profile Types
- Normal Distribution
- PERT, Probability and Standard Deviation Formulae
- Calculating the Standard Deviation
- Standard Deviation for Critical Path
- Z-Values: The Probability of Project Completion at a Required Date
- True Critical Path
- Network Activity Risk Profiles
- Application: Estimating Project Duration

## Unit 6: Line of Balance Scheduling - The Planning of Recurring Activities:

- Preparing a Line of Balance Schedule
- Velocity Diagrams and Linear Scheduling
- Velocity Diagram Production Rate Calculations
- Linear Sequence of Activities as a Series of Velocity Diagrams
- Balancing the Schedule
- Calculations for a Line of Balance Schedule
- Line of Balance Formulae
- Target Units per Week
- Determining Crew Size
- Actual Rate of Output
- Time to Complete One Activity
- Elapsed Time for Recurring Activity
- Slope of Line from Activity Start to Activity Finish
- Balanced Project Schedule without Buffers Finish-Start
- Inserting Buffers
- Comparison of Unbalanced with Balanced Schedules
- Measuring Planned Progress on Schedule
- Velocity Diagram Reflecting Expected Conditions
- Actual Progress and Work Conditions
- Variable Conditions

## Unit 7: Project Execution Management, Control and Reporting:

- Progress Tracking and Monitoring
- Project Cost Management
- Earned Value Control Process
- Schedule Variances
- Cost Variances
- Progress Control Charts - Trend Analysis
- Schedule and Cost Variance Forecasting
- Labour Management and Cost Control
- Materials Management and Cost Control
- Earned Value Analysis
- Earned Value Reporting

## Unit 8: Project Recovery Plan Development:

- Project Variance Analysis and Quantification
- Schedule Performance Index SPI
- Cost Performance Index CPI
- Setting Schedule and Cost Control Limits
- Project Recovery Data Assessment
- Schedule and Cost Recovery Analysis
- Schedule and Cost Recovery Plan
- Project Recovery Baselines and Controls

## Unit 9: Cost Estimating Basics:

- The estimating life cycle
- Phases of the Design Process
- Programming phase
- Schematic design
- Design development
- Construction documents
- Estimating accuracy by phase
- Conceptual Cost Estimates
- Rough Order of Magnitude Estimates Broad Scope Estimates
- Assemblies cost estimates
- Cost indices
- Semi-detailed Estimates Narrow Scope Estimates
- Definitive Estimates Detailed Scope Estimates
- Basic procedures
- Lump-sum contracts
- Unit-price contracts
- Cost-plus contracts
- Cost-plus contract with the guaranteed maximum price GMP
- Time-and-Materials contracts
- Bid method
- Negotiated method
- Quantity take-off
- Types of construction contracts
- Procurement methods
- Pre-construction services
- Risk analysis and contingencies



## Unit 10: Broad Scope Cost Estimating Techniques:

- Adjustments to Project Cost for Broad Scope Estimates
- PERT Project Cost Analysis
- PERT Unit Cost Estimates
- Formulae for Cost Estimating
- The Normal Distribution Curve
- Z-Value Table
- The Probability of Project Completion within Budget
- Estimating Project Unit Cost by Using the Standard Deviation
- Estimating the Project Unit Cost at a Required Probability
- The Probability of Completing the Project at a Required Cost
- PERT vs. Standard Deviation & Z-Values
- Adjustments to Estimates Based on Previous Projects
- Adjustments for Time
- Review: Future Value of Money
- Review: Present Value of Money
- Equivalent Annual Interest Rate
- Index to Adjust for Time
- Equivalent Compound Interest
- Location Index for Construction
- Adjustments for Location
- Adjustments for Size
- Combined Adjustments
- Economic Price Adjustment
- Estimating Durations based on the Learning Curve Effect
- Estimating Costs based on the Learning Curve Effect
- Unit-Cost Adjustments
- Learning Curves