Global Horizon
TRAINING CENTER

Training Course:
Production, Planning, Scheduling and Control

21 October - 1 November 2024
Boston (USA)

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Training Course code: PC4008 From: 21 October - 1 November 2024 Venue: Boston (USA) - Training Course Fees: 9920 Euro

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 course 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 brand new day course 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.

The Structure

Module 1 - Project Scheduling & Contingency Planning Skills

Module 2 - Project Cost Estimating Skills

Course Objectives of Production, Planning, Scheduling and Control

The Primary Objectives of the Seminar are to help delegates to:

- 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 systems.
- 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
- Effectively apply incentive arrangements to get the best results from the contract

Course Process of Production, Planning, Scheduling and Control

Delegates will develop advanced project management planning, performance, and control, and cost estimating and management skills and knowledge through formal and interactive learning methods. The program includes individual exercises, team projects, applicable case studies, group discussions and video material that bring to life the skills acquired throughout the course.

The material has been designed to enable delegates to apply all of the material with immediate effect at the office.

Additionally, the seminar does not assume prior knowledge of the topics covered in the course. New concepts and tools are introduced gradually to enable delegates to progress from the fundamental to the advanced concepts of project risk management.

Core Competencies of Production, Planning, Scheduling and Control

- Ability to deliver projects on time and within budget.
- Understanding of what it takes to be a successful project manager.
- Skill and confidence to plan and control projects successfully and the ability to sidestep the most common project management pitfalls and problems.
- Appreciation of the philosophy, framework, standards, and approaches to the delivery of the projects.
- Understanding and practicing effective project management techniques in successfully completing and handing over projects.
- Developing an initial project budget for the owner
- Determining project feasibility
- Designing the project within the owner's budget
- Evaluating alternative design concepts and project components
- Preparing bids
- Preparing cost proposals
- Establishing project budgets
- Determining the cost impacts of change orders
- Substantiating claims and resolving disputes
- Preparing a Schedule of Values
- Creating historical cost databases to improve future estimating accuracy

Course Outlines of Production, Planning, Scheduling and Control

Module 1:

Project Scheduling & Contingency Planning Skills

Day 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

Day 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

Day 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

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

Day 4: 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

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
- The 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

Day 5: 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

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

Module 2:

Project Cost Estimating Skills

Day 6: 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 a 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

Day 7: 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

Day 7: Budget Estimating Process

- Estimating by a design phase
    - Programming budget estimates
    - Schematic design budget estimates
    - Design development budget estimates
- Estimating pre-construction services
- Request for proposal
- Development of pre-construction services estimate
- Pre-construction services contract
- Budget control log

Day 8: Bid Contract Estimating Process

- Pre-estimate activities
    - Estimating process
    - Solicitation of lump-sum bids
    - Order-of-Magnitude estimates
    - Work Breakdown Structure
    - Estimating team
    - Scheduling the estimating work
    - Subcontractors and major suppliers
    - Estimating forms
    - Accuracy and error prevention
- Pricing self-performed work
- Recap sheet
- Materials
- Labour

- Applying pricing factors
- Summary recap
- Subcontractor work
- Project summary schedule
- Alternative techniques
- Elements of the estimate of the general condition
- Final document review
- Completing the bid summary
- Final mark-ups
- Sales tax
- Validating the estimate
- Estimating subcontractor work
- Estimating General Conditions
- Completing the estimate

Day 9: Unit Price Estimates

- Unit price bid forms
- Direct cost estimation
    - Materials
    - Labour
    - Indirect labor
    - Subcontractors
    - Recap summary sheet
    - Direct-to-indirect cost factor
- Mark-up determination
- Variation-in-quantity contract provision
- Risk analysis
- Bid finalization

Negotiated Contract Estimating

- Guaranteed Maximum Price Estimates
    - Contract procurement process
    - Documents
    - Strategies
    - Estimating process
    - Contingencies
- Fee determination for negotiated contracts
- Reimbursable versus Non-reimbursable costs
- Home office overhead
- Risk evaluation
- Fee structure
- Cost savings split
- Strategies for responding to the Request for Proposal
- Documents to be included with the Request for Proposal
- General Contractor interview and selection process
- Negotiated subcontracts
- Cost proposals for negotiated contracts

Day 10: Contract Types and Compensation Arrangements

- Risk distribution in contracting
- Project risk profiles
- Contract types according to risk distribution
- Fixed Price Contracts
    - Firm Fixed Price
    - Fixed Price with Economic Adjustment
- Incentive Contracts
- Fixed Price Incentive
- Cost Plus Incentive
- Cost Reimbursement
- Cost Plus Award Fee
- Cost Plus Fixed Fee
- Cost-Plus Contracts
- Time-and-Materials

Narrow Scope Cost Estimating Techniques

- Power-sizing techniques Capacity Ratios
- Factor estimates
- Cost estimating relationships CER
- Design-to-cost-estimates
- Target cost estimates
- Adjusting for Project Type and Quality Level
- Features Determining the Quality Level Grade of a Structure
- Adjusting for Quality Level by Using a Costing Publication
- Economic Constraints
- Parametric Cost Estimating
- Analysis of Estimating Accuracy

Registration form on the Training Course: Production, Planning, Scheduling and Control

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Complete & Mail or fax to Global Horizon Training Center (GHTC) at the address given below

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