Project control

Project time control

* How to monitor time progress ?
* Why and how to crash the project time?
* What is what-if analysis?
* How to determine the extension of time in a contracted project ?
* What are the guidelines for reviewing work progress?

HOW TO MONITOR TIME PROGRESS

1 Measuring Time Progress

* At any point of time, activities can be classified into completed activities, in-progress activities and still-to-start activities.
* The state of activities is measured by comparing their actual progress against the baseline master schedule supported by monthly or quarterly bar chart work program and/or the sub-networks.
* The date on which the progress is measured is called data date.

2 Updating Time Progress

* Updating is the technique of depicting activity-wise progress of work on the planning charts on a given data date with a view to determine the time required for completion of the balance works of the project.

3. Analysing Time Progress

* **3. Analyzing Time Progress**
  * Time analysis of the updated sub-project/task plans and then transferring this information on the Project Master Construction Schedule (PMCS) will enable :
    * Determination of the completion time for the balance works.
    * Identification of the critical activities in the balance work.
    * Evaluation of the extent of time overrun, in the case of delays.
    * Approach for time reduction through time compression and time crashing techniques.

Measuring Physical Progress at Site

1. **Quantities** installed (m3 of RCC, masonary etc..)
2. **Percent complete:** estimate by concerned person
3. **Effort by support services:** cannot be easily quantified like logistics. These are measured by **time lapsed compared to planned total time allowed.**
4. **Milestones:**

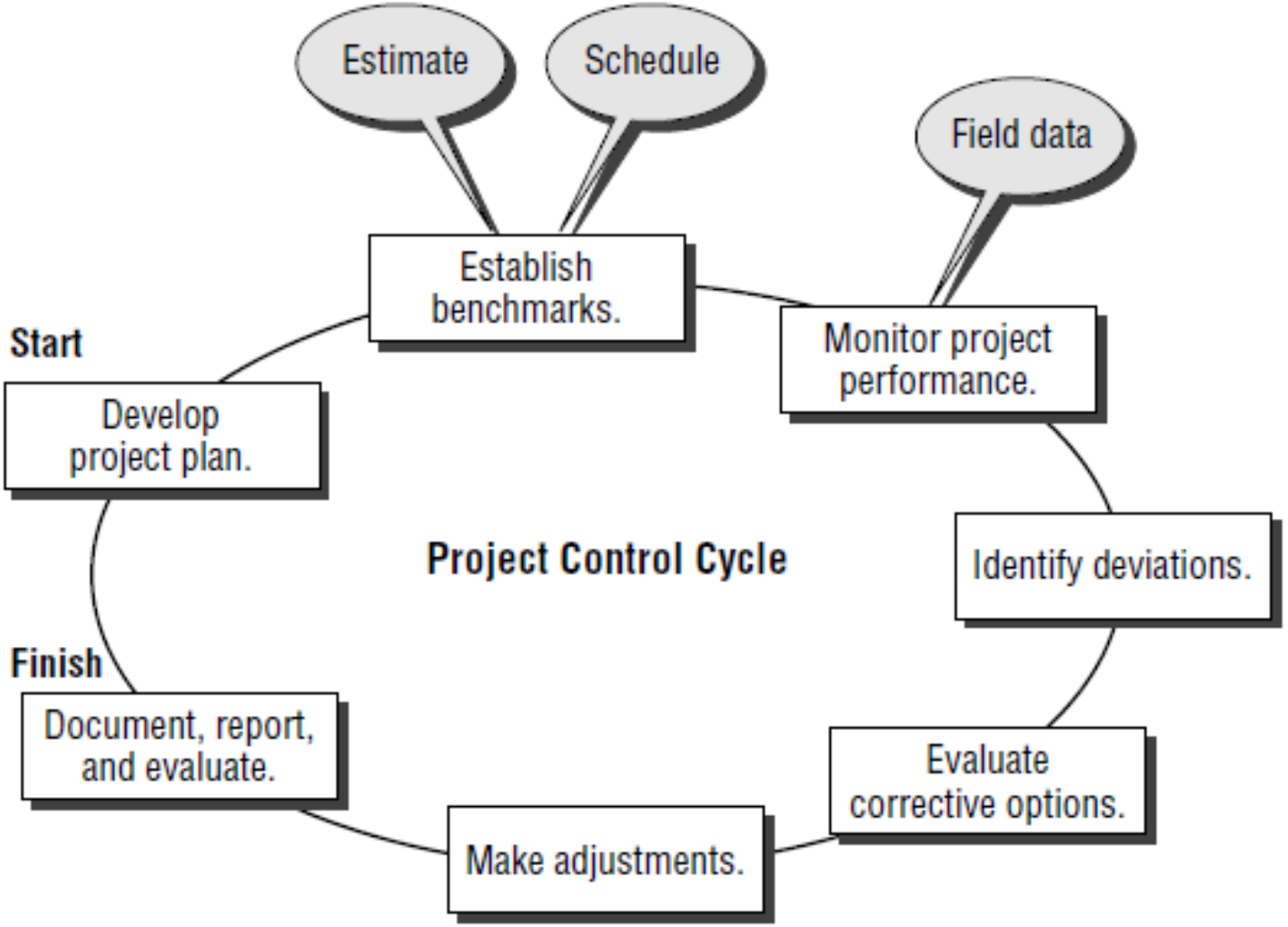
. For example: Completion of substructure for a multistoried building =25 per cent;
superstructure completion =40 per cent;
finishes completion = 15 per cent;
services completion 20 per cent.

5. **Tied to contract terms of payment:**
6. **Two-point measurement:** example, 50 per cent when all the materials required for the work are on site, and50 per cent on completion of the activity.
7. **Single-point measurement** employed when there are numerous small-value activities in a project. Here, the measurement point could be 100 per cent on completion only.

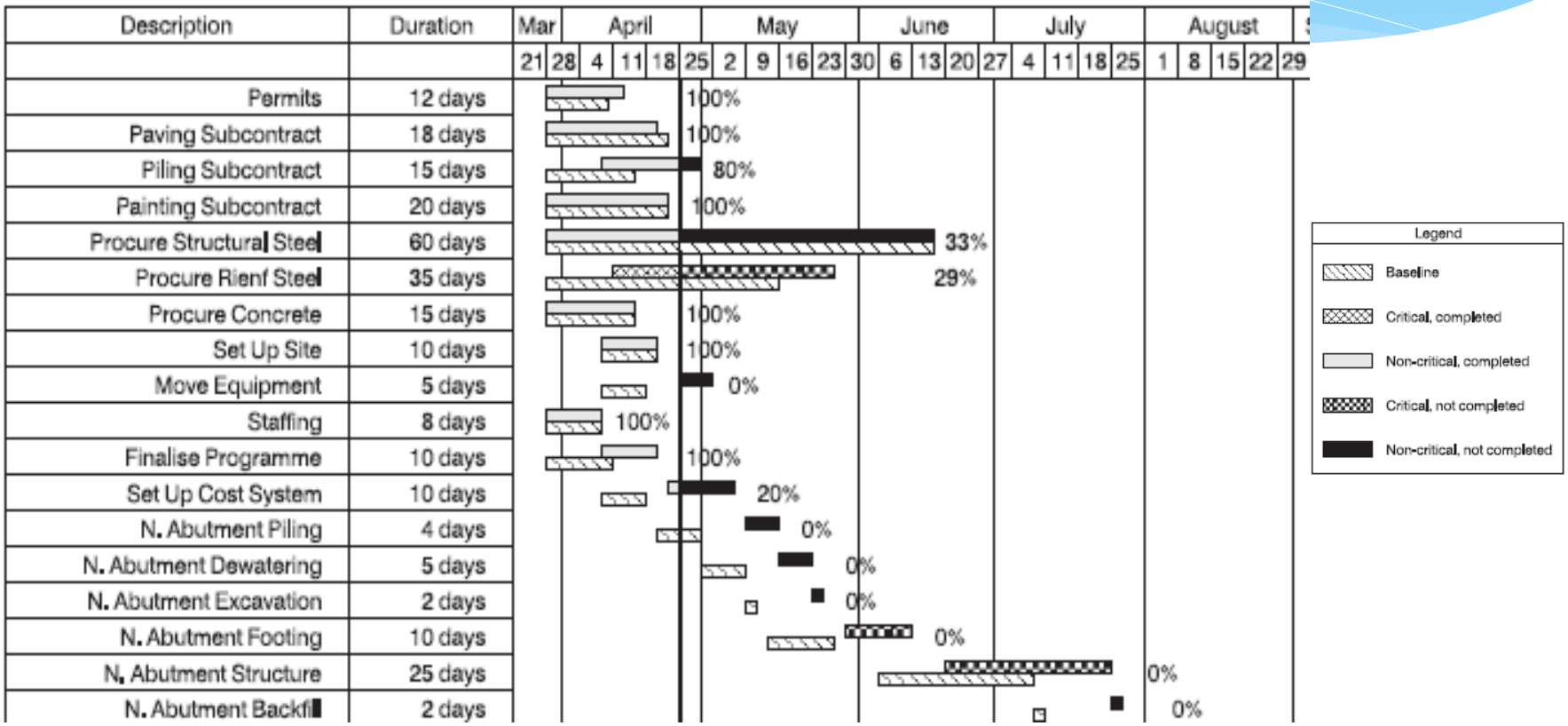
Need for Time Crashing

* To meet the management's needs for the early completion of the project wherein the cost to be paid for gaining time is acceptable.
* To avoid delays which may attract **heavy penalty** or less of goodwill.
* To **venture on another project** in the offing.
* To **earn bonus** for early completion, if found feasible and advantageous.
* To **transfer the resources** needed elsewhere.
* To **conform to a given resource availability** schedule.

Project Control Cycle



Example of updating



Updating should be done frequently to ensure that the network is relevant. The procedure is described below.

(1) Identify and mark all activities on which work is currently proceeding as 'live' activities. This is important as it focuses attention on the future. What has happened up to the present date must be accepted, and concentration must given to replanning and scheduling future activities.

(2) Introduce a new activity at the origin of the programme which has a duration equal to the time-interval between the start of the programme and the date of updating.

(3) Change the durations of all completed activities to zero.

(4) Calculate revised durations from the date of update for all live activities and all future activities, taking into account any changes in requirements or actual performance. Note that a completely new estimate of the amount of work remaining to be done should be made for each 'live or future' activity at each update. The revised activity duration is derived from this figure, and a reassessment value of the probable output of the relevant resources.

(5) Evaluate the programme in the normal way.

Project Monitoring and Control

* Monitoring – collecting, recording, and reporting information concerning project performance that project manger and others wish to know

* Controlling – uses data from monitor activity to bring actual performance to planned performance

Stages in Review

* 1. **Presenting updated current work pro**gram and sub-networks (as applicable) showing completed, in-progress and still-to-start activities, together with the start and completion dates.
* 2. **Comparing the actual work package progress with its base line** schedule and costs, as per the project master plan.
* 3. **Examining what can be done** to neutralize the time and cost overrun, such as:
  * (a) Time compress the schedule, without any appreciable increase in cost to shorten the time by:
    * Increasing resources of long-duration critical activities.
    * Splitting up the sequential critical activities into parallel components.
  * (b) Time crash the critical path to reduce the balance completion period by using alternate methods of construction, involving minimum increase in overall-project cost.
  * (c) Explore new methods of reducing the costs within the agreed specifications and time constraints.

* 4. **Replanning and rescheduling** the balance works, if necessary, for the completion of the project on time.
* 5. **Studying the emerging critical and near-critical activities** to anticipate the problems and device means to overcome them.
* 6. **Checking the resources at site** to see if adequate resources are available to execute the scheduled work and to verify that additional resources, when required, shall arrive on time.
* 7. **Evaluating the project cost status** and updating the forecasts for the future resources and costs for the remaining works.
* 8. **Verifying the health, safety and security** measures to prevent mishaps.

Project Monitoring and Control

* Why do we monitor?
* What do we monitor?
* When to we monitor?
* How do we monitor?

Why do we monitor?

* Simply because we know that things don't always go according to plan (no matter how much we prepare)

* To detect and react appropriately to deviations and changes to plans

What do we monitor?

* Men (human resources)
* Machines
* Materials
* Money
* Space
* Time
* Tasks
* Quality/Technical Performance

What do we monitor?

Inputs

* Time
* Money
* Resources
* Material Usage
* Tasks
* Quality/Technical Performance

Outputs

- Progress
- Costs
- Job starts
- Job completion
- Engineering / Design changes
- Variation order (VO)

When do we monitor?

- End of the project
- Continuously
- Regularly
- Logically
- While there is still time to react
- As soon as possible
- At task completion
- At pre-planned decision points (milestones)

Where do we monitor?

* At head office?
* At the site office?
* On the spot?
* Depends on situation and the ‘whats’

How do we monitor

* Through meetings with clients, parties involved in project (Contractor, supplier, etc.)
* For schedule – Update CPM, PERT Charts, Update Gantt Charts
* Using Earned Value Analysis
* Calculate Critical Ratios
* Milestones

* Reports
* Tests and inspections
* Delivery or staggered delivery
* PMIS (Project Management Info Sys) Updating

Meetings – Some monitoring issues

* What problems do you have and what is being done to correct them?
* What problems do you anticipate in the future?
* Do you need any resources you do not yet have?
* Do you need information you do not have yet?
* Do you know anything that will give you schedule difficulties?
* Any possibility your task will finish early/late?
* Will your task be completed under/over/on budget?

Project cost control

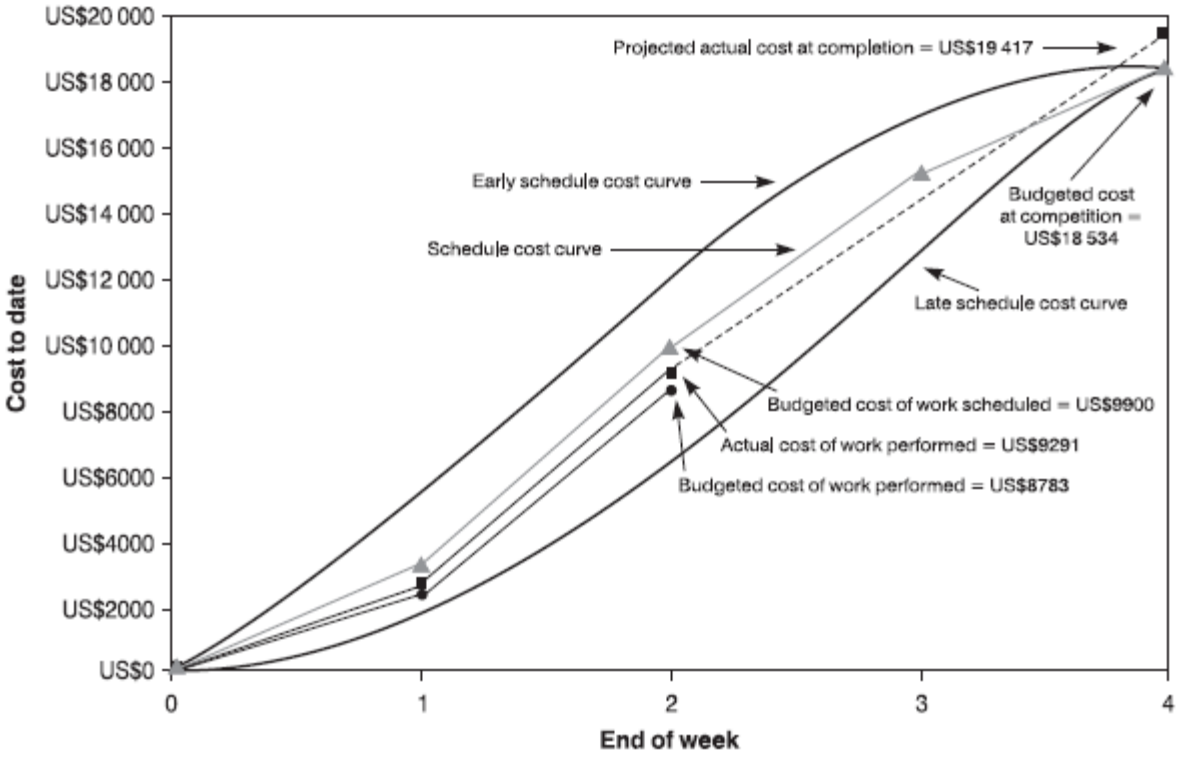


Figure 6.2 Concrete wall cost control curve.

Introduction

* *It involves*
  * *processing of the cost accounting reports received from various divisions,*
  * *comparing the cost incurred with the standards,*
  * *analyzing the reasons for variances and*
  * *presenting the monitored information to project management for making decisions.*
* This information is used to
  * minimize waste,
  * update current budget estimates,
  * forecast cost trends and make decisions about the future.

The cost control objectives of the client

* After taking into consideration the contract commitments, the escalation and the contingencies, the client formulates his cost budget for the project.
* He plans his cash flow on the basis of the progress pattern forecast prepared during the engineering stage.
* He employs an individual or a small group to monitor the costs, so as to keep the costs within the budgeted limits and to meet the cash flow requirement of the project.
* Through his limited cost control set-up, he keeps a constant vigil on the project activities to prevent cost escalations and not let costs expand without purpose.
* He tries to reduce his budgeted costs by various measures, such as economizing the scope of work by using value analysis techniques and offering incentives to contractors for early completion, which may yield him early revenue from the project than the completion time originally planned for.

* On the other hand, it is the contractor who executes the contracted works and it is he who bears the cost of the input resources employed by him for the execution of the work.
* These input resources and the site expenses include the cost of men, materials, machinery and capital.