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ENGINEERING MANAGEMENT

(GE 404)

LECTURE #10

Project Time-Control

Contents

Objectives of the Present lecture

- *To discuss process involved in project time-control*
- *To explain how to carry out project rescheduling (or Network updating)*

Project Time-Control

- Project time-control can be reduced to two basic components:

1. Monitoring
   - Monitoring consists of a means of understanding ***what is happening on a project***, obtaining information about the project by some means
2. Control
   - Control consists of ***action taken in response to the information***

Process of Project Time-Control

- Establish an operational schedule
- Measure the progress and report the progress
- Compare actual achievement with planned
- Check and analyze time progress and determine effect on completion date and milestones
- Plan for corrective action
- Implement corrective action
- Update operational schedule

Establish Operational Schedule

- For project control purposes a hierarchy of schedules may be needed, depending on who will use it
- Key Dates Schedule
  - For owners and top-level management in terms of MILESTONES or KEY DATES.
- Detailed Schedule
  - For engineers, work supervisors, material suppliers and subcontractors
  - A schedule of that particular engineer/supervisor work responsibility
  - Provide him with a day-to-day forecast of field operations
  - Critical activities and free float values should be noted
  - Covers limited time spans (2 weeks or 30 days)
  - Tabular listings and computer-printed bar charts are common forms

Measure and Report Progress

Methods:

- Estimated number of working days required to complete the activity
- Estimated % completion of the activity
- Quantities of work units put in place

Equations

- Based on the assumption of straight-line variation between time and work accomplishment
- Working days to complete = d (1 - P/100)
- Working days to complete = d (1 – (W/T))

  d= total activity duration in working days

  P = estimated percentage of completion

  W= number of work units put into place

  T= total number of work units associated with the activity

Contd.

- Weekly Progress reports
  - A common procedure in many industries
  - Listing those activities that started, finished, or were in progress during the week and indicating their stages of completion
  - Must include procurement, material delivery information etc.
  - Chose a cutoff date, to be selected to serve both time management and labor cost accounting

Contd.

WEEKLY PROGRESS REPORT

Project: Highway bridge ***Week ending:*** Wednesday, July 21 (working day 27)
Job. No: 7903-50 ***Prepared by:*** K.M.

Activity	Activity Number	Date Started	Date Completed	Percent Complete	Working days to complete
A	110	-	July 15	**100**	**0**
B	115	-	-	**-**	**13**
C	130	-	-	**80**	**2**
D	150	July 15	July15	**100**	**0**
E	160	July 16	July 21	**100**	**0**

Contd.

Field Progress Narrative

- To accompany weekly progress reporting
- Discussion of projected project features
- General statement about time status
- Critical or low float activities in difficulty
- Potential trouble spots
- Exceptionally well project areas

Compare and Analysis of Project Progress

- Concerned primarily with determining the effect of the latest information on the project completion date and any milestone goals

1st - A quick and simple check for critical activities status

2nd - Check the possibility of a new critical path

Signs of Danger

- Activities fall behind LS schedule
- Resource availability delays
- Realizing that time duration of future activities have been materially underestimated
- Change logic becomes necessary

Corrective Actions

- When there are small delays that are within network time contingency, no action is usually required
- Otherwise use Time Reduction Technique to bring project back on schedule
- Make periodic (Weekly, biweekly, or monthly) job progress meetings with project managers, field supervisors, major subcontractors, material suppliers, and owner representative to enhance time management efficiency

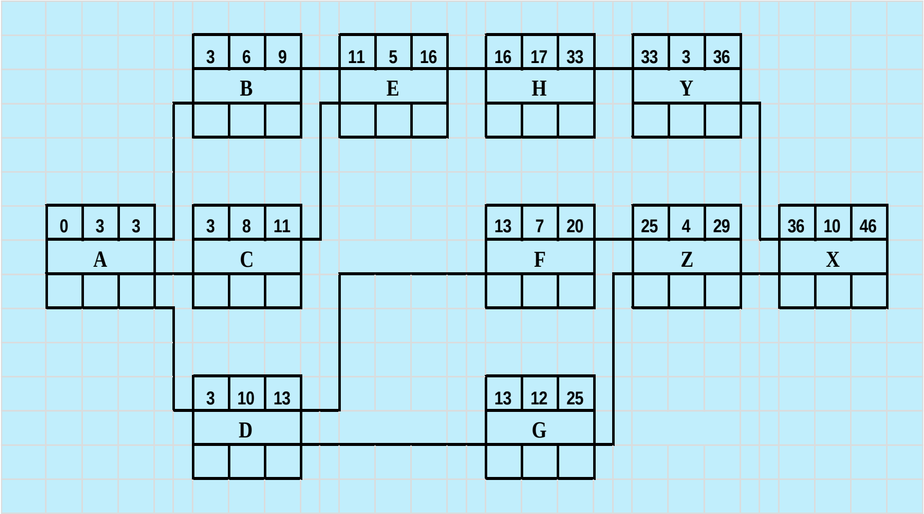
Network Updating (Rescheduling)

- Concerned with determining the effect of schedule deviations and plan changes on the portions of the project yet to be constructed
- This requires making necessary network corrections and re-computing activity times and float times
- Information required for Rescheduling
  - New activities to be added
  - Existing activities to be deleted
  - Changes in the resource availability and delivery dates
  - Changes in the job logic
  - New estimate of the time (for completing unfinished activities)
  - Changes in the scope of work etc.

Problem-1

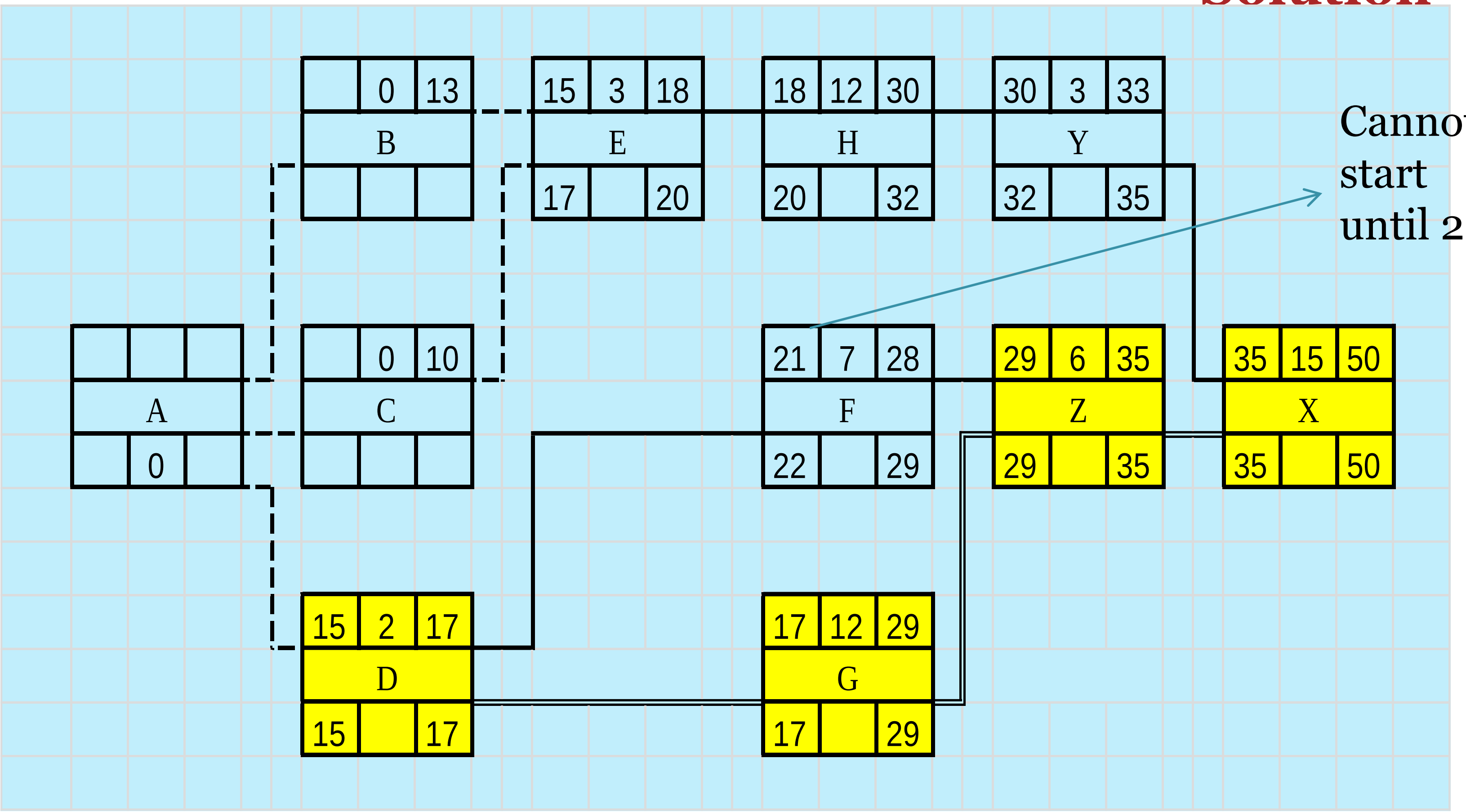
The initial AON diagram for a small engineering project is shown below with its planned activity times in days. ***At the end of the 15^th^ day,*** the field progress report gives you the following information:

- Activity "A" was completed on schedule
- Activity "B" started as planned but four days were lost due to waiting for the required resources
- Activity "C" was completed one day earlier
- The remaining duration of Activity "D" is 2 days
- The duration of activity "H" will be reduced to 12 days instead of 17 days.
- The activity "F" cannot start until the morning of day 22
- Activity "Z" is expected to take two days more
- Due to owner requirement the volume of work of activity "X" will be increased by 50%



Construct the updated AON diagram, calculate the early and late start times of each activity, and indicate the critical path.

Solution



Note: In duration cell, mention the time required/ remained w.r.t. date of reporting.

Note: ES of Activity E and D should be 15 since work in progress in these two activities

For activity E: 13-5-18 is changed to 15-3-18

- ES is changed from 13 to 15 because the current date of rescheduling is Day 15
- Duration is changed from 5 to 3 because EF = 18 has to be maintained

Further Reading

Read more about the Project Monitoring and Control from:

Jimmie W. Hinze. "Construction Planning and Management," Fourth Edition, 2012, Pearson.

Thank You

Questions Please