# ARC 226 CONSTRUCTION SCHEDULING

Chapter 16

Cost Schedule Control System Criteria

# Introduction

- CPM is generally used for controlling time
  - It can also be effectively used to control quality, safety, and costs
- Time and costs are typically tracked separately
  - If a project is ahead of schedule it may not be on budget
    - Excessive use of equipment, workers, etc.
- How do we measure progress by considering both time and costs?
  - Cost/Schedule Control System Criteria (C/SCSC)

# Performance Measures

- Three key performance measures:
  - Budgeted cost of work scheduled (BCWS) - original budgeted or planned cost of the work scheduled to be accomplished through the analysis date
    - Could be a percent complete if the activity is not finished
  - Budgeted cost of work performed (BCWP) – original planned cost of the actual work that has been accomplished
    - Could be a % complete
    - Total amount of money that the owner owes
  - Actual cost of work performed (ACWP) – cost of the work that has been accomplished

# Variances

- Variance-
  - Deviation from the planned costs or schedule to the actual costs or schedule
  - Can be favorable or unfavorable
- Three types
  - Cost variance (CV)
  - Schedule variance (SV)
  - Total variance (TV)

# Cost Variance

- CV – comparison between the budgeted cost of the work performed and the actual cost of work performed
  - CV = BCWP – ACWP
    - Positive CV = costs under budget
    - Negative CV = costs over budget
- Percent cost variance (PCV)
  - CV / BCWP or PCV = (BCWP – ACWP) / BCWP

# Schedule Variance

- SV – comparison between the budgeted cost of the work performed and the budgeted cost of the work scheduled
  - SV = BCWP – BCWS
  - Used when activity progress is measured based on the budget (50% of budget expended, activity is 50% complete)
    - Positive variance is good
  - Does not indicate the number of days the project is ahead or behind
- Percent schedule variance (PSV) = SV / BCWS

# Total Variance

- TV – comparison between the budgeted cost of work scheduled and the actual cost of work performed
  - TV = BCWS – ACWP
    - Positive TV is favorable, but this could be because the project is behind schedule
- Percent total variance (PTV) = TV / BCWS
  - Or PTV = (BCWS – ACWP) / BCWS

# Performance Indexes

- Cost performance index (CPI) –
  - Alternate form of comparison for the project
    - CPI = BCWP / ACWP
    - If the CPI is > 1 the project is under budget
- Schedule performance index (SPI) –
  - SPI = BCWP / BCWS
  - If the SPI > 1 the project is ahead of schedule

# Graphical Representations

- The C/SCSC data can be represented in graphical form
- See pg 191
- Works well with a computer
  - Excel, Project

# Conclusion

- The Cost/Schedule Control System Criteria helps the management to analyze time and costs together
  - Costs and time streams are kept separate
    - Actual costs are compared to budgeted costs
    - Actual durations are compared to budgeted durations
- Action can be taken when variances become unacceptable
- Gives the manager another tool for analyzing the progress of the project