ARC 226 CONSTRUCTION SCHEDULING

Chapter 9

Calculating Total, Shared, Free, Independent, and Negative Float

INTRODUCTION

- With a better understanding of the different types of float a project can be managed more efficiently
- With CPM the critical activities are recognized
  - The critical activities must be managed effectively in order to keep the project on schedule
  - The critical activities allow no flexibility with respect to cash flows or resource levels
- The float activities allow for precise management
  - Leveling resources and costs is possible with float activities
- How can a manager use float to the benefit of the project?

TOTAL FLOAT

- Difference between ES and LS or EF and LF
  - TF = LS-ES or LF-EF
- The individual activities have float, but that float does not necessarily belong to that activity alone
  - A use of float on one activity may affect the float on the successor activities

SHARED FLOAT

- If each activity in a string uses all of the activity float, the project will be delayed
  - See pg 93 figure 9.1
- The use of float by one activity pushes back the starting date of the successor activities
  - The float is shared between a number of activities
    - If the first activity in a string uses all of the available float, the activities become critical
  - Not all activities share float
- Also called string or path float

FREE FLOAT

- Free float-
  - Amount of time an activity can be delayed without delaying the early start of activities that follow it
    - Amount of time an activity can be delayed without taking float from successor activities
  - Subtract an activity's earliest finish time from the earliest start time of the successor activities
- In a string of activities that shares float, the last activity will have free float
- Free float should be conserved as much as possible at the beginning of a project
  - Once the float is used, the path becomes critical

INDEPENDENT FLOAT

- Independent float-
  - Float that belongs to one activity and that activity alone
    - It can not be used by a predecessor
    - If used by the activity it will not delay a successor
- Free float can become independent float if all the predecessors in a string are complete and there is still float available
- The float is independent if it is not shared in either direction
- Most of the time, float is shared, not independent

FLOAT ON THE ACTIVITY BOX

- Float is put in cells below the LS and LF cells
  - Include a legend to prevent confusion
- Shared float (SF) – lower left corner cell
- Free float (FF) – lower center cell
- Independent float (IF) – lower right corner cell
- Total float (TF) – between LS and LF (above the other types of float)
- Computers may not automatically compute all types of float

NEGATIVE FLOAT

- The project must have a fixed start and finish date
  - The set finish date is earlier than the finish date arrived at by the forward pass
- Negative float- the project starts that many days behind schedule
  - Immediately shows where the project must be accelerated and the number of days that need to be made up
- Negative float is shared along a string of activities
- If the set finish date is later than the forward pass finish date the critical path is the path with the least amount of total float

USING FLOAT TO MANAGE THE PROJECT

- A particular activity may have a window in which to be completed
  - When should float be given away and when should it be kept hidden?
    - Much depends on the circumstances of the project, subcontractor involved, etc.
- In general, float should be shared in such a way as to ensure success and make the project easier to manage

WHO OWNS FLOAT?

- Most GCs believe that float belongs entirely to them
  - Subs are held to ES and EF only
    - Delays from the sub cause delays for the other subs
      - The PM for the GC must contact all the successor subs
      - Scheduling for subs gets to be tricky business
  - If it will be beneficial to the success of the project, share the float with all the subs
    - Allows for some flexibility in scheduling
    - Keep the ES and EF dates, increase the durations

FLOAT AND THE PROJECT OWNER

- The project owner sometimes feels that all float belongs to the owner
  - All activities must start as early as possible and finish as early as possible
    - All activities become critical
- This may not be in the best interest of the owner
  - The owner must pay on all completed activities, but does not get any return until the project is completed
    - Causes increased interest payments
- The best idea is to consider float to belong to the project

CONCLUSION

- Understanding the different types of float will help a PM to manage a project more efficiently
- Managing float can take pressure off many activities
  - The goal is to minimize the number of critical activities
- The project should be viewed as a collaboration
  - Subs, GC, vendors, designer, owner
  - Float should be managed from the standpoint of what is most beneficial for the project based on prioritized needs