CPM Progress Update Considerations

Of the projects I have observed finishing significantly late, I estimate that for 85%, the reason can be traced to timely management of material submittal and approval process.

This document offers suggestions which will provide increased accuracy in evaluation of project progress without a tremendous increase in effort, from that generally put forth, on the part of individuals responsible for project progress performance and schedule monitoring.

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CPM Monthly Update Considerations

Many contractors, vendors and subcontractors are not familiar with Critical Path Method (CPM)/Network Analysis System (NAS) scheduling methods. We will address a few considerations and procedures which may assist contractors with the CPM schedule progress update process.

You may discover a new meaning of the terms “submittal”, “approval” and “delivery” when used in the performance of CPM schedules.

Managers not familiar with CPM schedules probably utilize bar charts. The effect of the submittal, approval and delivery time frames are probably given passive consideration during bar chart preparation. Generally, a single activity is shown for submittals. In any event, progress for these items will not show any effect on work in place activity progress.

Submittal’s are probably considered as the physical data prepared by a vendor or subcontractor. Approval is probably considered to be “we have it in hand with the architects stamp on it.” Delivery is “when we get it on the job.”

In CPM schedules, “submittals”, “approvals” and “deliveries” are processes involving time.

The major shock for those not familiar with CPM scheduling is the impact that untimely action in the submittal, approval and delivery process has on the project progress.

The status of in place work activities is relatively easy to determine. Updating of submittal, approval and delivery activities require more consideration.

A consistent method of evaluation that all participants are aware of is important.

The common problem of updating submittal/approval/delivery activities generally results from inadequate, or inconvenient records during the “rush to get updated.”

Recording dates on a copy of the logic diagram will make it easier to assimilate data for updates. When an activity starts or finishes, mark it on the diagram. This process is more expedient and consistent than searching through records.

Use color markers to track activity progress. When start or finish dates have been incorporated into the schedule update, mark through the date. At the next update you will only be concerned about dates which have not been “marked through.”

For the purpose of this narrative the term “owner” refers to an architect, owner, Corps of Engineers, Base Civil Engineers or other authority that would issue approvals prior to release of materials for fabrication.
We will address two types of material submittal/approval processes. They will be referred to as:

(1) Part A-Contractor Approved and Owner approved.
   This is the normal process for Corps of Engineers projects.
(2) Part B-Contractor Approved and owner furnished “information” copies.

**Part A - Contractor Approved and Owner Approved**

**Submittal Activities**

In this process material and equipment are not released for delivery until approval of submittal data is received from the owner.

The CPM submittal activity consists of two stages which are combined for the total submittal process duration. These stages are; (1) the period of time from the start of the project until the appropriate submittal data is received by the contractor quality control organization for approval review and (2) the period of time necessary for the contractor quality control organization to review the submittal.

The duration of a submittal activity defines the time period required from the start of the project until the submittal is forwarded for the owner’s approval.

The submittal preparation process by a vendor/subcontractor may actually begin prior to the project official start date. This is an excellent situation. However, for progress schedule purposes, the relevant activity start date cannot be prior to the schedule beginning date.

At the first schedule update, all submittal activities should be shown as started. An effort should be made to determine the preparation status of all submittal items.

Verifying the status of all submittals is time consuming. The administrator will occasionally find suppliers and subcontractors “vague” as to when submittals can be provided. Efforts should be made to determine job requirements for submittals. Do not allow vendors and subcontractors to continue a “don’t know” attitude.

The status of items which will be utilized early in the project should be confirmed. Items such as concrete and reinforcing steel are an example of materials for which approval and delivery may be crucial to project progress.

For submittal activities that have significant float, 60 days or more, the following procedure could be considered. Update the percentage of completion as 15% to 25%. It is not recommended that this percentage be updated on subsequent updates until the status of the submittal is verified.
This update percentage rate should provide an adequate reminder if activity float is monitored. It is imperative the manager maintains knowledge of the submittal preparation status of the various vendors and subcontractors.

In the event of a particularly long submittal duration, and a submittal which is on or close to the critical path, efforts should be made to verify the anticipated actual submittal receipt date. The actual estimated percentage of completion can then be considered in the schedule update.

If a submittal activity has negative float or less than 35 days float, attention must be given to the submittals status. This will require verification with the appropriate vendor/subcontractor when the submittal is expected to be complete. The actual estimated percentage of completion of the submittal preparation should then be used for updating purposes.

When specific submittals have not been received and have sufficient float, some contractors do not update the submittal process. The thought behind this is reducing float from update to update will help flag the particular activity for attention at future updates.

This generally does not happen unless managers review the status of activities at the time of the current schedule update. Discovering an activity may cause negative float at the next update is not desirable. A review of the float report will reveal what items require attention prior to the next update.

Often we may consider the submittal process float and determine that adequate time for action exists. Remember, float is applicable to the following approval and delivery activities path.

If the submittal process for an activity is “slow”, possibly the approval process and most likely the delivery process will be slow.

Float must be considered through the path of numerous activities and not necessarily, in overall project performance, a “luxury” for the current activity.

Particular attention should be made at each update to those activities that have 35 days or less float. Updates are usually on a 30 day basis. Any activity (submittal, approval, delivery or work in place) which has float equal to or less than the duration between updates without progress prior to the next update may create negative float. If an activity has 10 days float in the current update and no progress takes place, it may cause 20 days negative float (behind schedule) 30 days later.

Points to Ponder:
Verify that submittals are complete and correct before forwarding to the owner.

Incorrect or incomplete submittals extend the submittal process time.

On projects that are 75% to 90% complete and the completion date does not appear achievable, the majority of the time this can be attributed to the submittal/approval process. This situation has resulted from untimely preparation of the submittals or untimely approval of submittals or both. The untimeliness usually has resulted because of multiple submission.
Evaluate the strength of your subcontract agreement in terms of submittals and performance.

Concentrate on submittals by considering when the materials will need to be incorporated and delivery fabrication time.

Don’t allow vendors/subcontractor’s to be “vague” about dates.

If a vendor/subcontractor doesn't know when a submittal will be in, chances are they are not currently preparing the submittal.

**Approval Activities**

The approval process activity start date is after approval of the submittal data by the contractor quality control organization. The approval activity start date should be the date the submittal data is forwarded for owner approval. The working day prior to that date is the completion date of the submittal process for continuity purposes.

The completion date of the approval activities would be the date contractor receives the submittal back from owner review.

If a submittal requires re-submittal and/or additional data, the contractor must consider; (1) The time it will take to notify the vendor/subcontractor for corrective action of the submittal; (2) The time it will take to receive, review and forward the revised submittal and (3) the owners review period for the re-submittal. Remember, the owner will also need a performance period for the review of the resubmitted or additional data.

In the event an item requires re-submittal for approval after return from the owner, the following action is recommended:

1. Review the current schedule and confirm criticality of the approval.
2. If a project progress delay is indicated, immediate action should be implemented to resolve submittal deficiencies.
3. Take appropriate actions toward expediting the re-submittal process.
4. Confirm that logic of the “work in place” activity which is restricted by the submittal/approval/delivery process is reasonably accurate.
5. Maintain communication with the vendor/subcontractor to confirm the importance of immediate action.
6. Communicate with the owner representative. Usually, when a realistic evaluation of the situation is made, an owner’s representative will make every effort to assist with expedition of actions.
7. Don’t “abuse” an owner’s willingness to expedite and assist by making requests for help a “habit” because you or your vendors/subcontractors are not acting timely.

If resubmittal is required, the aforementioned must be considered with regard to project progress. A submittal being disapproved has the potential to delay project progress.

If re-submittal is for confirmation purposes or record purposes only, and the order for material can progress, it is not necessary to include this time in the approval process.

It is probably not feasible to determine the percentage of completion based on the duration of approval activities. Owner’s are not inclined to take the time to evaluate each approval’s status.

A reasonable rule of thumb would be to show the submittal as 10% complete if it has been submitted up to 15 days prior to the schedule calculation cutoff date. If the submittal was made 16 to 30 days prior to the schedule calculation cutoff date, a percentage of 25% might be appropriate.

If 15% is used, at the next update if the approval status is not known, the activity percentage of completion could be increased to 25%. Leave the approval percentage of completion at this level and monitor activity float. In effect, you are monitoring the approval time status for the owner. This may be okay, but don’t drop “surprises” on them at the last moment.

This method should help identify potential schedule problems with the approval time period. It is imperative that the owner is notified of approvals which may potentially effect project progress if not handled timely.

The activity will be shown 100% on date the approved submittal is received back from the owner. If not approved, no more than 50% complete should be shown. If a resubmittal is required prior to ordering/releasing materials, the duration should be revised to reflect the time necessary for this action.

Points to Ponder

If an approval is crucial, advise the owner.

Don’t allow more than 45 days to go by for an approval even if adequate float appears to exist. Contact the reviewer and discuss the item. A problem may exist.

Don’t expect owners to get in the habit of expediting every submittal because your vendors/subcontractors have taken “forever” to get a submittal in.

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Delivery Activities

The start date of the delivery activities should be the day after the submittal data is received from the owner.

Submittals should be returned to the vendor/subcontractor immediately. It is suggested that the vendor/subcontractor be verbally notified of the approval.

Normally, delivery activities can be shown as 25% complete on the schedule update for activities with a delivery period of 30 days or less. For longer delivery period activities the percentage of completion initially may be in the 10% to 25% range.

For major material/equipment delivery activities and delivery activities with float of 35 days or less, special emphasis should be made to determine the actual estimated delivery date. The percentage of completion can then be determined accordingly.

It is recommended that a confirmation of the material delivery dates be made when a submittal is returned. It is probably good procedure to verify the vendor/subcontractor’s original projected delivery period. Asking for written confirmation may also be a good policy to implement.

Points To Ponder:

Trains wreck. Trucks crash. Strikes happen. People forget to place orders. Confirm, confirm and confirm.

Part B - Contractor Approved/Owner Information Data

Submittals

In this process material and equipment is released for delivery after approval by the contractor quality control organization.

The CPM submittal process is the period of time from the start of the project until the appropriate submittal data is received by the contractor quality control organization for approval review.

The duration of a submittal activity defines the time period planned from the start of the project until the submittal is received by the contractor quality control organization for review.

Other considerations of the submittal process are the same as in Part A.
Approvals

The CPM approval process is the period of time beginning the day after receipt of the submittal data until the date the data is approved by the contractor quality control organization.

Other considerations of the approval process are the same as in Part A.

Deliveries

The CPM delivery process start date would be the day after submittals are approved by the contractor quality control organization.

Caution. The possibility exists that the owner review may determine a deficiency which was not caught by the contractor quality control organization. This obviously could have a major effect on the delivery of equipment and materials. This is an additional reason that submittal data must be prepared in a timely, correct and complete manner.

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General Comments (you will probably get mad at me, or I will be surprised if you have read this far)

The previous comments can be a guide for a starting point for NAS update considerations. There are many considerations/variations which have not been discussed in this narrative. I believe as you experience CPM schedules you will see the benefits. Yes, I know you don't want to do them and people like me take up your valuable time and you are even having to pay us to do it! Schedules are a tool to help you finish the job timely (profit) and the owner obtain possession of the project without inconvenience plus your being made (contract requirement) to do the thing anyway so why not try to get some benefit beyond getting your money every month.

The fear words are "we have negative float", which means the job is behind schedule. This is not necessarily bad. The schedule is a reminder. The participants need to evaluate why the schedule is negative. It may just require a minor logic change. Possibly a duration(s) is not reasonable. Maybe an activity was missed when compiling the update information. Maybe you have a real problem. If a problem exists, it might as well be acknowledged (I don't like to do this either) and evaluated because it will not go away. The quicker action is taken, the less impact the situation will have on project progress. The primary point is that all participants, owner and contractor, know why and what.

Project participants (owners, contractors, subcontractors, vendors) occasionally attempt to "hide" or ignore situations and responsibilities. But remember this. If situations are allowed to ultimately turn to crap, attorneys, claims specialist, and auditors will earn a lot of someone's money figuring out what happened and who did what to whom. Ultimately, responsibility will be assessed.

One day while I'm at your office, I may make up an excuse to see your CPM and this narrative, just to find out if you can actually find them. If you can, I'll buy lunch.

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