

Scheduling Best Practices

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What Makes a Good Schedule

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Simply stated, one could argue that any schedule which keeps its stakeholders apprised of where the Project stands at regular intervals and results in an on-time performance is a good schedule and contains all the necessary elements thereto. In very broad terms, the above statement has merit; however, as Planning and Scheduling professionals, we recognize that the components that comprise a good schedule go wider and deeper than the “motherhood and apple pie” statement above. Additionally without early identification, structure or consistency to those elements, one really wouldn’t know if the schedule was a good, useable document until the Project completed, which by then is too late.

This article will address elements that experience has indicated are keys to providing a good plan and schedule to the Project team thus enabling timely decisions to be made and steers the Project to its successful completion. Characteristics of a good, solid schedule indicates that it is:

- A Complete Schedule;
- A Full Term Schedule;
- Meets the Contractual Requirements/Milestones;
- Indicative of How the Project Will Be Built in the Field;
and that:
- Activity Durations are Reasonable;
- Activity Relationships are all defined;
- The Critical Path Makes Sense;
- It Considers Procurement and Material and Equipment Deliveries;
- It Is Resource Loaded; and,
- It Passes the “Sniff Test.”

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Elements of a Good Schedule

Before issuing the Project Schedule to the Project Team and Client, the schedule should be reviewed to ensure that it considers the above mentioned criteria. These criteria are applicable not only to the initial project baseline schedule but also to each and every schedule revision and/or update. The discussion below elaborates on the importance of each element mentioned above.

A Complete Schedule

When embarking on a detailed review of the Project schedule, one of the first items to investigate is if the schedule activities accurately reflect the Project's Contract Scope of Work. Each discrete schedule activity represents a portion of the Contract scope of work. It is necessary, then, to determine if the sum of these discrete schedule activities equals or represents the total scope of work for the Project, as provided for under the Contract.

Additionally, as the project evolves and change orders are authorized, it is recommended that the schedule be revised to reflect the additional work scope.

A Full Term Schedule

Not only should the Project Schedule depict the total scope of work for the Project, it should commence at the award or notice to proceed date identified by the Contract and complete in accordance with the Contract, thus the schedule duration is a full term schedule that meets the Contract requirements. Typically, most baseline schedules are full term schedules when issued. On rare occasions some baseline schedules show an early completion to the Contract required date. Generally, this occurs when the contractor is confident that he can indeed improve upon the completion date required by the Owner and when the early completion date exhibited does not become the new Contract completion date by which liquidated damages or other contractual consequences can be applied.

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Meets the Contractual Requirements/Milestones

A review of the Project schedule should be made to determine compliance with the Contract. If the schedule produced fails to meet the Contract requirements or Milestone Completions, it should be analyzed as to why the failure is occurring and be remedied, if possible.

Additionally, the schedule should be reviewed to determine if the level of detail within the schedule activities meets the requirements of the Contract. For example, if the Contract states that the Project Schedule must conform to a Level III Schedule, then it is incumbent on the Contractor to provide a detailed schedule that conforms to a Level III.

Indicative of How the Project Will Be Built in the Field

The Project schedule must be indicative of how the work will be executed in the field. This is, in essence, a “no-brainer.” A schedule that is not aligned with the construction execution plan has little or no value to the team that is relying on the tool to plan upcoming work, indicate project status, identify problem areas and project completion. In fact, a schedule not representative of how the work will be executed in the field most likely will not be used by the Project team.

Activity Durations are Reasonable

There are a number of factors that must be considered in determining if the schedule activity durations are reasonable. Activity durations must be predicated on the quantity of work to be accomplished and the resources available to be applied to that work. This typically includes labor, material and equipment. Additionally, the physical conditions that will be in play when the work is planned for execution must be considered in determining if the durations are reasonable.

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A schedule that contains unreasonable activity durations loses its effectiveness as both a schedule and as a project management tool.

Activity Relationships Are All Defined

Simply stated activity relationships have to be complete. A logic review of the schedule must take place to ensure that all relationships have been included and are valid and redundancies eliminated. This includes review of the logical sequence to validate that the construction approach is reflected in the schedule logic and that the logic sequence is not flawed. Failure to employ all of the necessary activity relationships within the schedule logic results in an inaccurate schedule and management ineffectiveness due to the inaccurate nature of the schedule. Logic “open ends” should be limited to the first and last activity in the schedule network.

The Critical Path Makes Sense

When reviewing the Project schedule, one of the first activities to undertake is to review the Critical Path to make sure it is reasonable and makes sense. The question that must be answered when performing this review is should the activities on the Critical Path be critical and thus determine the minimum project duration? If not, it is incumbent that a review of logic and activity durations be performed to determine if these typically non-critical activities should be on the critical path, in this case. Conversely, for example, if you are working on a project that is going to have a new distributive controls system developed and installed and it's one that hasn't got a track record and it is absent from the critical path, you probably should look at that string of activities to determine if it should be there.

Additionally the Critical Path should reflect and be consistent with the construction execution plan. Sometimes projects have multiple critical paths. When this occurs, it requires the Project Team to focus its attention on both parallel critical paths. This must be recognized and acted upon timely if the Project is to be completed on time.

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It Considers Procurement and Material and Equipment Deliveries

If delivery of material and engineered equipment cannot meet the requirements of the construction execution plan, it is obvious that the work cannot progress in accordance with that plan. It is important that the schedule incorporate current material and equipment deliveries in order that the schedule may be adjusted to fit the delivery time projected or that the material or equipment delivery be expedited to support the schedule. The process of what drives that decision is dictated by the Project Team.

It Is Resource Loaded

Typically, the Project Team benefits greatly from a resource loaded schedule. Manpower requirements can be planned in advance of its need. Also, manpower problems can be anticipated and mitigated.

Resource loaded schedules also provide benefit when analyzing concurrent work activities and helps in determining if there may be a manpower density problem or issues due to the scheduling of concurrent work tasks in the same location. Resulting from these findings the Project Team can make prudent schedule adjustments to keep the Project on track.

It Passes the “Sniff Test”

The term “sniff test” is not a highly technical term but in my vernacular, the term is used to describe a schedule that passes the scrutiny of not only the above mentioned necessary elements of a good schedule but also considers if the total schedule, as it currently stands, makes good overall sense.

For example, if the schedule depicts that the bulk of the civil/concrete work is to be performed in the winter, does the schedule durations for the work consider that fact? Additionally, does the monthly progress curve indicate that the most progress scheduled to be earned on the Project is between Thanksgiving and Christmas?

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If so, we know that the schedule must be adjusted as typically this just doesn't happen and it shouldn't be expected to happen here. There are other examples but I'm confident we all understand what I'm referring to here.

Conclusion

The above discussion identified and discussed the key elements of a good schedule. Implementation of these elements on a continuous basis throughout project execution while not a guarantee that the Project will complete on time, will give the Project Team every chance to deliver an on time performance. Schedules absent these elements have a very poor prospect of completing on time.

This article is intended to serve as a general guide and should always be considered in combination with the needs of your specific project and the requirements of your contract. Your contract documents may contain specific requirements and directions that will take precedence over anything stated in any of these articles. We look forward to developing this dialogue with you over the coming months, and to provide you Warner's tips for best practices in scheduling.