

BY IAN CARTWRIGHT, C. ENG.

This is the second part of a three-part series on scheduling specifications, and readers who missed the introduction in Part One can access it through the PinnacleOne web site at: [www.pinnacleone.com](http://www.pinnacleone.com). I received numerous comments on the first article and I sincerely thank those people, and others, who offered to participate in interviews for the research. In anticipation of one of the conclusions, and related to the first theme in this part, I include the following sentiment from a respondent:

“The crux of the question is how to promote cooperation versus exploitation, because you can’t legislate cooperation.”

### OVER-REGULATION

Over-regulation is an endemic problem that I believe is largely responsible for burdensome schedule specifications. To understand over-regulation one should review *Death of Common Sense*, the outstanding book by Philip K. Howard, on how law is suffocating America<sup>1</sup>. Using quoted reviews, the book is variously:

- A detailed and remarkably passionate account of how pointless regulation has replaced common law and common sense. *Houston Post*
- A devastating indictment of the micro-managerial excess of regulatory law based upon the creation of artificial rights. *Commonweal Magazine*
- An explanation of why too many laws and regulations are everyone’s nightmare. *Lexington Herald-Leader*

In short, *Death of Common Sense* addresses the virtual obsession of regulating everything we do rather than relying upon the use of common sense; in other words, regulation in place of communication.

The obsession of regulation is based on the ideal of making the world ubiquitously fair to everyone. The problem is that regulations do not always afford the required degree of protection. In fact, regulations often have unintended and undesirable side effects that are worse than the problem the regulation was designed to address. Many may question what the outcome will be in this utopian environment when parties are free to act without the damnable limits of regulation. Will the simple, straightforward approach encourage parties to act based on their mutual interests, or will self-interests and behaviors surface?

This book and its topic remind me of scheduling specifications. First, there is the over-arching contentious legal environment in which construction contracts operate. Construction case law has handed down various (though not consistent) decisions about construction delays assisted

by schedule “experts.” Consequently, many owners fear that schedules can be used to “prove” a delay.

Enter schedule specifications (the regulations); these attempt to control how contractors develop their schedules to prevent inaccurate delay claims. The outcome is specifications that often do not recognize the different variables inherent in a construction contract, which results in schedules that are inappropriate for the work and do not promote good project management. To be clear, scheduling specifications are not the root cause of problem projects. However, scheduling specifications that are incomplete or inappropriate for the circumstance can be just as problematic as a design error or omission.

Paradoxically, the emphasis on CPM schedule specifications provides certain legitimacy to the use of CPM schedules in the claim situation. In essence, detailed schedule specifications, and the owner’s “approval” of the schedules produced, can assist the contractor in presenting and justifying their claims.

My suggestion is that owners move back towards common sense and (better or improved) project management communication instead of unduly relying on schedule specifications alone. Owners and contractors are now more evenly matched in terms of expert resources and should not feel that they are disadvantaged or “outgunned.” The law is far from certain or definitive about schedule analysis and so it makes little sense to regulate by the use of burdensome schedule specifications...especially since it is questionable whether they assist in the management of contract time and may, in fact, be aggravating problems.

### GETTING BACK TO BASICS

Getting back to a common sense approach necessarily means getting back to basics. In this section, I will explore some basic principles that have come to influence the perceived need for detailed schedule specifications and attempt to diffuse them so that they cease to be a burden on effective project management.

#### Contractor Considerations and Perspectives

- The contractor owns the contract time.
- They bid the work in knowledge of the contract time and they are entitled to receive the full amount of that time and the owner should acknowledge this.
- Barring express provisions to the contrary, they can choose to perform the work in (much) less time.
- The contractor is responsible for determining how they will perform the work.
- Accordingly, and within reason, contractors are *entitled* to change their schedule to suit circumstances as they develop or arise during the course of the project.

One way in which CPM scheduling specifications have attempted to influence these contractual considerations is by attempting to regulate ownership of float. This often leads to extended discussions on activity durations and logic during the baseline schedule review because the owner may feel the contractor is attempting to hide float. This is discussed in detail in Part Three of this series of articles, but suffice to say here that owners should carefully consider their position and expectations regarding this topic.

The preparation of a contractually required schedule does not ostensibly establish contractual obligations or restrictions that did not exist before on the parties. For example, if, by virtue of the contractor revising his schedule, he advances certain deliverables due from the owner, and assuming that the revisions by the contractor are reasonable, then the contractor can reasonably assume that the owner will support the contractor's schedule. Alternatively, in the face of drastic or unreasonable revisions, owners may argue that they relied on the contractor's original schedule as a basis of their plan for execution of their obligations and the revisions have compromised the owner's ability to support the revised schedule.

If the owner maintains that he cannot honor the revised obligations resulting from revisions to the contractor's schedule, then controversy will ensue due to a disconnect in terms of expectations.

Schedule specifications typically require detailed justification for changes to the schedule and define the process for making such revisions. This can lead to contention and the consumption of considerable time on behalf of both parties as they argue the whys, wherefores, and the scheduling technicalities for such changes.

The primary purpose of the schedule is to serve as a forward-looking tool. Providing that each schedule forecasts the remaining work in a reasonably accurate way, then a contractor might argue that there should be no protracted discussions about why things have changed. The "why" question may have to be answered, but that is a separate issue and should not affect the on-going management of the project.

#### Understanding Delay

The word "delay" in the context of this section refers to a delay to the project end date or a contractual milestone.

The requirement for detailed schedule specifications is often based on the notion that a "better" produced schedule will yield a more reliable evaluation of delays. Therefore, it is important to understand what we mean by "delay," since the interpretation of delay can be fundamentally different depending upon when one asks the question (i.e., contemporaneously during the project or as a forensic exercise).

Consider the following:

*Question:* Mid-way through a one year contract, a contractor takes two weeks longer to complete a critical path activity than the time depicted on his baseline schedule. Did he delay the project?

*Answer:* Not necessarily. The contractor's baseline schedule is only an estimate of the time to perform the work. If he takes longer, for whatever reason, the only conclusion that can be drawn is that his estimate for this activity was exceeded and/or inaccurate. If the contractor can reschedule the project in the next update – or otherwise mitigate this estimating inaccuracy – and still reasonably project an on-time completion, then he has not delayed the project. Only if the delay suffered by the contractor causes an indisputable and inevitable delay to the end date of the project will the answer be, "yes."

The answer above is the correct answer from the perspective of dynamic scheduling. However, it is easy to understand how the same question, when considered as part of a forensic schedule analysis, might be answered in the affirmative...which appears wrong to a contractor scheduling his work.

A contractor's variance from their baseline schedule does not purportedly constitute a contractor delay. The contractor's contractual obligation is to deliver the project by the contract end dates. Provided that the contractor can or could have done so, then they have not or did not delay the project at the time in question.

#### Burden of Proof

Bringing a delay claim to an owner lays the burden of proof in "proving" on the contractor, meaning the contractor must prove how they were delayed. In the first instance, this proof lays ostensibly in the contemporaneous project records which — to the extent they are properly recorded — are largely indisputable. It is the cause-effect relationship or schedule analysis that is subject to opinion. In this regard, forensic schedule analysis is subject to differing opinions and no legally accepted ranking of the various methodologies adopted currently exist.

Secondly, contractors may choose to ignore the project CPM schedule for their analysis and proof of delays, albeit at the risk of challenge by the owner that the contractor is bound to their schedule. The contractor may argue that the project CPM schedule was inappropriate for the project and may choose to offer an alternative analysis and presentation, perhaps consistent with their alleged actual management of the project.

If contractors manage a project and their schedule in a way that compromises their ability to accurately prove or argue their delay then the owner is right to be concerned.

A contractor's failure to provide reasons for their delay and fails to contemporaneously update his schedule compromises the owner's ability to assess the compliance of the contractor's performance and to manage any activities that may be closely coordinated with the contractor's performance. It is insufficient for the owner to be solely concerned with how the contractor will meet the end date from the present time forward.

Given these considerations, there seems to be specific, but difficult to realize, benefits for the owner to specify the details of the contract schedule.

### Subcontractors

Subcontractors perform the majority of construction work today. It is not typical that subcontractors plan their work to the level of detail (in terms of the number of scheduled activities) required of schedule specifications. This makes it difficult for the general contractor to include the required level of detail in the contract schedule. Subcontractors are concerned primarily that they remain productive, and secondarily concerned about where they work. The general contractor and owner may benefit from the inherent flexibility that subcontractor planning provides. If this flexibility is not reproduced in the schedule – and it is difficult to show in detailed CPM schedules – then it may exacerbate the presentation or analysis of a subcontractor claim. Additionally it is not always possible to account for the detailed schedule requirements of all subcontractors on day one. Thus, contractors are frequently challenged at the early stages of a project to comply with a baseline schedule requirement.

## GETTING INTO DETAILS

### Schedule Types

Today, schedule specifications most often specify CPM schedules. Many require a CPM schedule independent of consideration of the nature of the project or the contractor's method of management. Linear type projects, such as highways, rail projects, and transmission lines, may not readily translate into CPM schedules. These projects can often be better scheduled with linear schedules.

CPM schedules on building projects can experience difficulty after the building is enclosed and when they are driven more by resources and the amount of work performed than by the specific order of work. Repetitive-type building projects are often better represented by line of balance scheduling.

What commonly occurs is that a contractor will plan his work consistent with their preferred method and then attempt to convert this plan into a CPM schedule. In the process of translation, inconsistencies between the plans may occur; akin to forcing square pegs into round holes.

What results is a process that requires the contractor to spend additional resources (or divert existing resources) to produce a CPM schedule that is, at best, an accurate reproduction of his original plan, and at worst, a plan that is different from what is intended by the contractor. This potential problem may contribute to considerable discussion and controversy during the submission and review of the baseline schedule and updates.

I have worked with contractors who maintain their own "real" working schedule while making the monthly schedule submissions to the owner for contract compliance. Imagine the claim situation when the contractor, under his burden of proof, produces his "real" schedule record. Would it not be far better for the owner and contractor to have worked together on the real record throughout the project?

Schedules should be selected for their ability to model the work and the ability to measure and monitor progress. Both parties have an interest in the suitability of the schedule.

### Baseline Schedules

An inordinate amount of time can (and often is) spent on developing the baseline schedule. Much of this time is spent on complying with the specification requirements or on differences of opinion between the contractor and owner about the number of activities, durations, float, and how work should be represented.

Since many projects proceed very well at the outset without an agreed upon baseline, what does this say about the difficulties of developing an acceptable CPM schedule? In fact, most projects now include requirements for an initial schedule submittal. This initial submittal covers only the first 90 days since the complexity and controversy around a complete baseline frequently delays the two parties from reaching an agreement on a comprehensive baseline. The absence of a baseline compromises the owner and the contractor.

It is very important that a contractor's proposed methods and sequences of work be known to the owner at the outset. This provides the owner with the knowledge and assurance of the contractor's plan and helps to avoid the rearguard action by contractors whereby they claim that the actual method employed was different from the anticipated method. This can be done equally well by requiring the contractor to submit a detailed work plan or method statement at the outset, which should include all the contractor's major assumptions.

### Number of Activities

Unreasonable requirements that specify the number of activities in a CPM schedule (e.g., by dollar value

of the project) may be problematic if the requirement unnecessarily increases the number of activities. The number of activities should be *appropriate to the type and complexity of the project* wherever possible. Consider the construction of a foundation; we have all seen the typical sequence of events:

*Excavate, Erect Forms, Fix Rebar, Erect Form, Place Concrete, Strip Forms*

In some circumstances, this sequence may be replaced with one activity; *construct foundation*. It makes the schedule simpler and therefore more user-friendly. In addition, the focus, from the owner's perspective, can be on the construction elements and not the details.

By way of an analogy, consider getting a set of Mapquest® directions from Central Park in New York to Disneyworld in Florida. The route is 1100 miles, most of which is on I-95. Imagine how many pages of directions you'd get if every five-or ten-mile section of the I-95 portion was detailed. What would be the benefit?

One argument for breaking down activities into individual trade activities is to assist in resource leveling. Not all contractors resource load their schedule and, if they do, it may not be down to the day. Some projects simply do not permit that level of precision. The reason is that the variables and changes inherent in construction projects render it imprecise. The owner is concerned with the overall progress of the project and how the contractor's performance is moving him towards the completion date or intermediate milestones. The owner desires the detail of resource loading to understand and document the contractor's plan. If an activity is delayed then the reasons should be known to the owner if it is his delay. If it is a contractor-caused delay, then why does it matter which trade delayed the foundation in the above example? An owner will seek the answer in anticipation of a claim by the contractor.

Series of activities, having only themselves as predecessors/successors, can often be merged into a single activity to describe the work element. The problem here is that many activities can be made to have more than one predecessor simply by including an activity for the requisite submittal. This begs the question should, "Submittal activities be included?" (I can hear the shouts now!) I was once of the

opinion that they should, but have changed my stance. There is much on a construction project that is routine and obvious and I do not believe it serves a useful purpose to incorporate every possible activity and process just because we can. We might demonstrate our familiarity with the construction process, but does it improve construction management and maximize the benefit of the schedule? It is impossible to incorporate every activity in a schedule; we always have to draw a line and make assumptions. Presently, that line is often too close to the unnecessary, detailed end of the spectrum.

Before CPM schedules, contractors maintained a submittal log and submittal schedule; most still do independently of the CPM schedule. Is this not sufficient? What about non-CPM schedules? If a contractor desires to integrate his submittal schedule into the CPM schedule, then he is likely capable of effectively doing so. To require it as a matter of routine seems unnecessary to the contractor. Submittals for proprietary, unusual, and knowingly complex items always warrant specific consideration. But do routine submittals (e.g., concrete, rebar, paint, GWB) demand such consideration? I think not, given that dates can always be reconciled with the schedule and potential problems will always be aired during progress meetings.

#### CONCLUSION OF PART TWO

This concludes Part Two of this article. Limited space prevented me from addressing other "popular" areas regulated by schedule specifications, such as resource allocation, float ownership, and progressing versus updating. These will appear in Part Three of this series.

In Part Three, I will make some general summary statements and advance some ideas about how we might improve project management as an industry through an effective scheduling process.

Part Three will also include an invitation to take part in an online survey that will test some of the principles discussed and attempt to gauge how the various parties in the industry perceive schedule specifications. The survey will attempt to determine the underlying need for schedule specifications, the extent to which the specifications realize the underlying objectives, how successful they are in practice, and to identify what improvements need to be made. I hope you will participate.

#### ABOUT THE AUTHOR-

**Ian Cartwright, C. Eng.** — Mr. Cartwright is a professionally registered engineer, quantity surveyor, and builder with 20 years experience of technical, contractual and financial aspects of capital construction. He has been involved with all stages of construction projects from inception through completion. Mr. Cartwright's experience covers highways and bridges, railroad electrification, power generation, transmission and distribution, oil and gas processing, institutional buildings, recreational facilities, cold storage and refrigeration. He has provided expert services for Contractors' Counsel, State Agencies, City Law Departments and Attorney General's Office in support of negotiation, arbitration and litigation. Mr. Cartwright is based in PinnacleOne's Middletown, Connecticut office.