Proving a Delay Claim
(And defending against them)

By: Gregory S. Martin and Daniel G. Quackenbush, AIA

I. INTRODUCTION

You represent a client in a dispute where responsibility for delays on a project is at issue. Whether pursuing compensation for those delays (or merely seeking reimbursement of liquidated damages) or defending against such a claim, the immediate question should come to mind, "How am I going to prove my case?"[1] However, perhaps because it is perceived as more "black art" than science, delay analysis is often left to "the experts." Whether due to the highly technical nature of the evidence supporting a claim or the lack of real guidance from the judicial system, delay analysis is often the last considered subject when preparing for trial. Yet proof of responsibility for delays is the linchpin to success in trial.

This paper will first address the most common methods of delay analysis known by their more often used titles. Next, the state of the law (such as it is) together with an industry-wide effort to bring order to apparent chaos will be considered. More importantly, this paper and the forthcoming presentation will attempt to foster a free-flow of information on how best to prepare and present a delay analysis. Drawing on real experiences, this paper and presentation will consider the selection of an appropriate method of analysis, selection and management of the needed expert and what has and has not worked in presenting delay analyses to finders of fact. Like most things in trial practice, there is no singular right answer though there are certainly wrong ones. The ultimate point is that the attorney needs to organize and control the entire process and not cede control of the litigation approach or the claim presentation to the expert.

[1] While it remains a claimant's burden to prove entitlement to an extension of time (whether compensable or not), those defending against such claims would be remiss in not considering the same question. If left with no alternative but the claimant's, a judge or jury may select by default the only substantive choice given.

II. THE MOST COMMON METHODS – PROS AND CONS

While there are numerous methods of delay analysis which may be performed,[2] the following are the most common.[3] The selection of the most appropriate method for the dispute at issue will be discussed below, but consider the following when reviewing the process by which the analysis is performed and the "pros" and "cons" to each – *Who is the ultimate finder of fact and will the analysis performed be credibly received?* Debates rage about which method is the "best," "most accurate," and "most reliable." However, none of that matters if the analysis performed is not perceived to be credible and correct by those judging the outcome of the dispute. Certainly, the applicable contract and law must be considered, but in the end, it is who is *perceived* to be correct which determines the ultimate outcome.

A. Narrative

i. How is it done?

The narrative technique is no more than a written story of the issues the writer believes contributed to the project being delayed. Although a few dates may be referenced, no actual schedule analysis or schedule study is performed.

ii. Pros

- Simple to perform – does not require knowledge of CPM
- Simple to present and understand
- Can be difficult to refute

[2] DRI Construction Law Committee, 10/24-25/2002. "General Overview of Delay Claims and the Various Schedule Analysis Techniques." - Kenneth A. Slavens, Esq., Daniel G. Quackenbush PA.

[3] AACEI Recommended Practice 29R-03, Forensic Schedule Analysis - Pg 133. "Reliance on the name of the technique is unwise. Chart shows how many different analysis techniques are referred to by the same name such that the use of a name to describe a technique is insufficient for determining which technique has in fact been performed. One must understand the mechanics of the actual technique being offered in order to determine what form of analysis was in fact performed."

iii. Cons

- May provide no causal link
- No technical analysis is presented
- Assumes the expert can subjectively determine which delays are critical
- Assumes the expert can subjectively determine the number of days of delay
- Assumes the expert can subjectively determine concurrency of delays

B. Comparative Bar Charts

i. How is it done?

Typically an As-Planned Bar Chart is compared to either an As-Built Bar Chart or a Bar Chart with added Impacts.

ii. Pros

- Simple to perform – does not require knowledge of CPM
- Simple to present and understand
- Can be difficult to refute

iii. Cons

- May provide no causal link
- Minimal technical analysis is used
- Assumes the expert can subjectively determine which delays are critical
- Assumes the expert can subjectively determine the number of days of delay
- Assumes the expert can subjectively determine concurrency of delays

C. **SURT** – Summary Update Review Technique - (Sometimes Erroneously called the Windows Technique)

i. How is it done?

Monthly CPM Updates contemporaneously prepared during the project are grouped together into logical time periods. Projected completion dates are then compared between the selected groups of CPM Updates and the schedules are studied to assign reasons for the delays.

ii. Pros

- An excellent preliminary delay analysis
- Very quick and easy to perform
- Based only on data produced contemporaneously during the project
- Results of analysis are easy to present and represent graphically

iii. Cons

- Causal link may be based only on expert's testimony
- Other than a superficial presentation of the results, the explanations required to show how the delays were actually extracted are quite complex.
- Does not allow for logic adjustments between CPM Updates
- Does not measure mitigation efforts (Buries them in with the delays)
- Assumes the expert can subjectively determine concurrency of delays
- Subject to significant manipulation

D. Update Review

i. How is it done?

Monthly CPM Updates contemporaneously prepared during the project are studied and projected completion dates are compared to assign reasons for the delays. (Identical to the SURT only more detailed.)

ii. Pros

- An excellent preliminary delay analysis
- More accurate results than the SURT
- Very quick and easy to perform
- Based only on data produced contemporaneously during the project
- Results of analysis are somewhat easy to present and represent graphically

iii. Cons

- Causal link may be based only on expert's testimony
- Other than a superficial presentation of the results, the explanations required to show how the delays were actually extracted are complex.
- Does not allow for logic adjustments between CPM Updates
- Does not measure mitigation efforts (Buries them in with the delays)
- Assumes the expert can subjectively determine concurrency of delays
- Subject to minor manipulation

E. Measured Mile

i. How is it done?

This Technique is similar to the Measured Mile Analysis for lost productivity. Two identical (or nearly identical) work sequences, one impacted and one not impacted are compared to determine the measurement of the delay caused by the impact.

ii. Pros

- Can be very convincing when this approach is viable
- Relatively simple to perform when all data is available

iii. Cons

- Causal link may be based only on expert's testimony
- Only a viable approach in very rare instances when delays occur to one of two identical (or near identical) portions of a project.
- Even when this technique can be applied it is rare that all the delays on a project fall under this approach so an additional schedule analysis must be performed for the remainder of the potential delay issues

F. As-Planned vs. As-Built

i. How is it done?

The As-Planned Schedule is compared to an As-Built Schedule created during the project by the contractor, or created after the project by the expert. The differences between the As-Planned and the As-Built are used to assign delays to various issues.

ii. Pros

- Relatively simple analysis to perform
- Simple to present and understand
- Can be difficult to refute when As-Built is created during the project by the contractor

iii. Cons

- Causal link may be based only on expert's testimony

- Other than a superficial presentation of the results, the explanations required to show how the delays were actually extracted are complex.
- Does not allow for logic adjustments between CPM Updates
- Does not measure mitigation efforts (Buries them in with the delays)
- Assumes the expert can subjectively determine concurrency of delays
- As-Built schedules created by the expert can easily be attacked
- Subject to minor manipulation

G. Impacted As-Planned

i. How is it done?

The expert creates CPM Impact Activities (Fragnets) to represent significant delays to the project. These Impact Activities are added (one at a time or all at once) to a copy of the As-Planned CPM Schedule and the schedule is rerun to determine the measurement of the delays caused by the various impacts. A variation of this technique is to run the As-Planned Schedule with "as-planned" resource information and then run an Impacted As-Planned with some limitation or adjustment to the resources.

ii. Pros

- Based on schedule created prior to any knowledge of project delays.
- Simple to perform
- Simple to present and understand
- Allows maximum float to be available to minimize delay measurement
- Theoretically allows for concurrent delays
- Provides a documented causal link

iii. Cons

- Generally not favored because the approach does not allow for the ever-changing critical path or the likelihood that the contractor did not execute the project precisely as-planned.
- Does not reflect the potential for the contractor to change its approach to the project or to mitigate delays after one or more impacts.
- Does not separate out the contractor's performance either better or worse than what was planned in the schedule.

H. Collapsed As-Built[4]

i. How is it done?

An As-Built Schedule is created by the expert after the project is completed which contains discrete activities representing the significant impacts to the project. A copy of this As-Built is made wherein the impact activity durations are changed to zero duration and the schedule is rerun to determine when the project would have finished had the impacts not occurred. Typically two collapse runs are made, one for the owner delays and one for the contractor delays.

ii. Pros

- Presentation can be very convincing
- Results can be clearly demonstrated graphically
- Can be very difficult to refute without significant effort and time to delve into the details
- Theoretically segregates delays by responsible party
- Theoretically separates out concurrent delays
- Appears to provide a documented causal link

iii. Cons

- Expensive and time consuming to perform
- Can only be performed once project is completed
- As-Built Schedules created by the expert may be attacked
- If attacked successfully, the entire analysis is scrapped
- Arrives at different numbers of delay days depending on who is determined to be responsible for the delay issue.
- Subject to extreme manipulation

I. **Multiple TIA Technique** (Also properly called the Windows Technique)

i. How is it done?

A single TIA (Time Impact Analysis) run is performed by taking a copy of the appropriate CPM Schedule Update from the project and adding impact activities to that CPM

4 DRI Construction Law 3/7-8/1996. "How to Analyze and Attack Collapsed As-Built Schedule Analysis." Daniel G. Quackenbush PA.

Schedule Update and rerunning it to determine the effect of the impact on the project completion date.

The Multiple TIA Technique takes copies of all the appropriate CPM Schedule Updates and places all of the significant impacts into those schedules, one at a time, rerunning them to determine the effect of all of the various impacts on an individual basis.

ii. Pros

- Provides measurement of each delay individually without regard to responsibility for the delay.
- Measures delays using CPM Schedule in effect when the delay started.
- Can be performed on an ongoing project
- Provides a documented causal link
- Extremely difficult to manipulate and when manipulated it is obvious

iii. Cons

- Difficult to represent graphically.
- Moderately expensive and time consuming to execute
- Does not allow for mitigation or acceleration efforts
- Does not measure a contractor's failure to make progress as planned (or making progress better than planned).
- Does not allow for logic changes between updates

J. Contemporaneous[5]

i. How is it done?

A higher form of the Multiple TIA Technique which includes additional steps between each CPM Update to measure the contractor's lack of progress (or progress better than planned), mitigation and acceleration efforts and the effect of CPM logic changes made by the contractor between updates.

ii. Pros

- Provides measurement of each delay individually without regard to responsibility for the delay.

[5] Corps of Engineers - "Modification Impact Evaluation Guide." EP 415-1-3 7/2/79 - Rescinded 6/30/97

- Measures delays using CPM Schedule in effect when the delay started.
- Can be performed on an ongoing project
- Measures a contractor's failure to make progress as planned (or making progress better than planned) separately.
- Measures mitigation and acceleration efforts by any party separately
- Provides a documented causal link
- Can accurately measure an evolving delay
- Extremely difficult to manipulate and when manipulated it is obvious

iii. Cons

- Expensive and time consuming to perform
- Takes time to present so that it is understandable.
- Is difficult to represent graphically.

III. CURRENT STATE OF THE LAW

A. Florida Law:

There is a dearth of Florida case law which addresses the method by which delays on a construction project are to be proven. However, there are three cases which, though in the context of defining the requirements for recovering extended home office overhead, provide a glimpse as to how a court might evaluate the method used. These three cases are: 1) *Triple R Paving, Inc. v. Broward County*, 774 So. 2d 50 (Fla. 4th DCA 2000); 2) *Broward County v. Brooks Builders, Inc.*, 908 So.2nd 536 (Fla. 4th DCA 2005); and 3) *Martin County v. Polivka Paving, Inc.*, 44 So.3rd 126 (Fla. 4th DCA 2010). In each, the Fourth District plainly states that the burden is on the contractor to prove that a "government-imposed" delay occurred. However, as the issue in each case involved defining the requisite suspension of work by the government to trigger recovery by the contractor rather than measurement of delay, the court did not reach the question of the means by which a delay is to be proven. What is important, however, is the court relied heavily in each of these cases on case law coming out of the Court of Federal Claims in evaluating the method to prove entitlement to recovery. Thus, it is a fair assumption that at least

the Fourth District may be persuaded by federal case law on the appropriate method of analysis to use when proving a delay.

But, as will be discussed more fully below, even federal case law is not consistent or even sufficiently specific as to an accepted method of analysis. Further, depending on the nature of the delays encountered, a traditional Critical Path Method of analysis is not necessarily required. See e.g., *PCL Construction Services, Inc. v. U.S.*, 47 Fed. Cl. 745, 801 (2000)("**One established way** to document delay is through the use of Critical Path Method (CPM) schedules and an analysis of the effects, if any, of government-caused events upon the critical path of the project." However, "a general statement that disruption or impact occurred, absent any showing through use of updated CPM schedules, Logs or credible and specific data or testimony, will not suffice to meet the plaintiff's burden"); *Helena Associates, LLC v. EFCO Corp.*, 2008 WL 2117621, *4 (S.D.N.Y. 2008)("Under New York law, although CPM analyses are sometimes used, (internal citations omitted) there is no requirement that Helena employ a CPM in order to satisfy its burden."); *Triple R Paving, Inc. v. Broward County*, 774 So.2d at 58 (the court commented in dicta that the contractor "patently suffered delays as a result of the [owner's] action."); *Howard Contracting, Inc. v. G.A. MacDonald Construction Co., Inc.*, 71 Cal.App.4th 38, 52 (Cal. App. 2nd 1998)("Under the circumstances, MacDonald Construction was not required to use a critical path method schedule to establish the critical path delays in the Venice Canals project."). Notwithstanding, the greater weight of federal case law consistently refers to the use of a CPM analysis to demonstrate and prove delays to the Project.

B. **Federal Case Law**:

Several cases can be found coming out of the U.S. Court of Federal Claims (and its predecessors - U.S. Claims Court and U.S. Court of Claims) which address what a contractor must prove to be entitled to an extension of time and compensation for such additional time. Unfortunately, these cases tend to be extraordinarily fact specific and rarely address the appropriateness of one method of delay analysis in contrast to another. Instead, each tends to rely on general principles espoused in a much smaller subset of delay cases. Further, even this smaller subset of cases focuses on a more generalized level of proof as opposed to a particular method.

i. *Haney v. U.S.*, 676 F.2d 584 (Ct. Cl. 1982)

In one of the earliest cases which addressed Critical Path Method analysis with some clarity, the court described it as follows:

> Essentially, the critical path method is an efficient way of organizing and scheduling a complex project which consists of numerous interrelated separate small projects. Each subproject is identified and classified as to the duration and precedence of the work. (E.g., one could not carpet an area until the flooring is down and the flooring cannot be completed until the underlying electrical and telephone conduits are installed.) The data is then analyzed, usually by computer, to determine the most efficient schedule for the entire project. Many subprojects may be performed at any time within a given period without any effect on the completion of the entire project. However, some items of work are given no leeway and must be performed on schedule; otherwise, the entire project will be delayed. These latter items of work are on the "critical path." A delay, or acceleration, of work along the critical path will affect the entire project. Id. at 595.

Even with that introduction, though, the court did little to describe the actual method of analysis used. Instead, the court appears to have relied upon the work the contractor's expert did because the "Government agreed during the trial that the CPM methodology used by the plaintiff was correct and acceptable, and that the events described would cause a delay to the critical path of

the project as demonstrated by Haney's CPM analysis." *Id*. The court did note, however, that the analysis performed "gave appropriate credit for all of the delays alleged to have occurred."

ii. *G.M. Shupe, Inc. v. U.S.*, 5 Cl.Ct. 662 (1984)

In 1984, the court again addressed the use of CPM analysis to prove responsibility for delays to the project. Specifically, the court expanded its earlier comment in *Haney* regarding the significance of delays to the critical path of the project.

> In order to calculate delay damages, it is necessary to determine which work items on the Nambe Falls Dam project were on the critical path and the time period that these work items remained on the critical path. The reason that the determination of the critical path is crucial to the calculation of delay damages is that only construction work on the critical path had an impact upon the time in which the project was completed. If work on the critical path was delayed, then the eventual completion date of the project was delayed. Delay involving work not on the critical path generally had no impact on the eventual completion date of the project.

Id. at 728. However, when faced with two competing CPM analyses, (one from the contractor's expert and the other from the defendant's), the court did little more than to comment that it was "persuaded of the validity of the defendant's view" because it found the defendant's expert's work to be "logical and convincing." *Id*. at 729, 730. In fact, the court does not even discuss if two different methods were used, instead focusing on the outcome achieved by the experts rather than the process they employed. *Id.* Thus, it appears that the court's decision is not based upon the use of one particular method of analysis over the other, but whether one analysis comported better with the court's view of the facts and how the project unfolded.

iii. *Fortec Constructors v. U.S.*, 8 Cl.Ct. 490 (1985)

A year later while still wrestling with the evolution of delay analysis, the court plainly stated: "[I]f the CPM is to be used to evaluate delay on the project, it must be kept current and must reflect delays as they occur." *Id*. at 505. However, because the court found that the

Government failed to timely address the contractor's requests for time extensions during the project – effectively precluding the contractor from maintaining an updated schedule – the court essentially reverted to a more holistic approach to determine that the contractor suffered delays and was entitled to an extension of time. *Id*. at 507. Notwithstanding the ultimate ruling in the contractor's favor, *Fortec* remains a favorite of those defending against contractor's claims for delay when the contractor has failed to properly maintain the schedule during the course of the project.

iv. *Youngdale & Sons Construction Co., Inc. v. U.S.*, 27 Fed.Cl. 516 (1993)

In this case, the court took on the task of evaluating a particular method of analysis when considering a contractor's claim for delay. Essentially, the contractor's expert performed a collapsed as-built analysis by first developing an As-Planned Schedule and then an As-Built Schedule. The contractor's expert then "extracted" the delays the government allegedly caused to demonstrate the amount of time to which the contractor was entitled. *Id*. at 550, 551. Although the court found in favor of the contractor in part, the court's decision was not based on the schedule analysis performed, but rather the fact that the government essentially conceded liability for one of the differing site conditions the contractor claimed. *Id*. at 567. As for the schedule analysis, the court did not appear to take issue with the underlying methodolody; rather, the court excoriated the contractor's expert for the poor quality of the work he did perform. "[T]he court observed that there were numerous nebulous discrepancies in PX 165 which were irreconcilable to the testimony adduced at trial." *Id*. at 551. The court went on to describe the deficiencies in detail in an appendix to the opinion. The lesson here is obvious. No matter the correctness of the methodology to be used, it is only as good as the quality of the expert work

performed. The contractor was apparently lucky that the government had conceded liability or it would have likely had no recovery.

v. *R.P. Wallace, Inc. v. U.S.*, 63 Fed.Cl. 402 (2004)

In the mid-2000s, the court conducted an exhaustive examination of the development of the case law associated with delay analysis. First noting that a contractor was only entitled to an extension of time for issues for which the government was responsible and which delayed the critical path of the project, the court went on to address the "thornier issues" of concurrent and sequential delays. *Id.* at 409-10. Defining "concurrent delays" as those delays occurring at the same time for which both parties are responsible, the court noted that neither party is entitled to compensation as a result of the delay. Rather, the contractor is entitled to an extension of time only which naturally results in eliminating any previously associated liquidated damages. *Id.* at 410.

Defining "sequential delays" as two or more different delays occurring over time, not necessarily connected or in exact sequence, the court proceeded to discuss the evolution of how such delays should be evaluated for purposes of assessing liquidated damages. *Id*. at 410-413. Noting that there is a split of authority on whether any government delays constituted a completed waiver of liquidated damages, the court opted for an approach which allocated responsibility for the delays. *Id*. For those delays for which the contractor was responsible, the government was entitled to assess liquidated damages. *Id*. at 413-417. Conversely, though not found here, the contractor would be entitled to delay damages for that period of time which could be allocated to the government's responsibility. *See id.* at 418 (finding all of the government delay was not awardable to contractor as it was concurrent with contractor's delay).

vi. *George Sollitt Construction Co. v. U.S.*, 64 Fed. Cl. 229 (2005)

In the second of the two cases from the mid-2000s, the court provides an extensive examination of what a contractor must prove to be entitled to a compensable extension of time. This case should be considered the starting point from which any delay claim is considered (either prosecution or defense). Given the depth at which the court addresses the multiple facets of delay analysis, only the essential holdings of this decision are summarized:

1. The government must have caused the delay in the contractor's performance;
2. The contractor bears the burden of proving delays to the critical path;
3. This includes analyzing schedule updates because the critical path will change over time;
4. The government's delay must be unreasonable;
5. The government must be the sole proximate cause of the delay;
6. The contractor bears the burden of apportioning delays; and
7. If there is a concurrent delay, the contractor must apportion that concurrent delay.

Notwithstanding these tasks a contractor must perform to prove a compensable delay, the court still left open what precise methodology would be necessary to perform such an analysis. *Id.* at 236-43. Although the court did note that with respect to claims when multiple delays existed and concurrent delays are among them, "the only way to accurately assess the effect of the delays alleged … on the … project's progress is to contrast updated CPM schedules prepared *immediately* before and *immediately* after each purported delay. *Id.* at 243 (emphasis in original; internal citation omitted). However, from the tasks described, certain forms of analysis would appear to be excluded, such as an Impacted As-Planned analysis.

vii. *Sunshine Construction & Engineering, Inc. v. U.S.*, 64 Fed. Cl. 346 (2005)

Although this case does not extensively address the evolution of delay analysis through the Court of Federal Claims, it is relied upon primarily by secondary sources because of the court's comments regarding the specific analysis utilized by the government in defending against

the contractor's claim. In particular, the government's expert "identified the critical path on the as-built schedule, compared it to the critical path on the as-planned schedule, and analyzed [the differences between the planned and as-built activities]." *Id*. at 368-69. However, like the prior cases, *Sunshine* is less of an endorsement of one particular method of analysis over another than it is a commentary on the need to work closely with your expert and understand the process being undertaken. As the court stated earlier in its decision, "[t]he resolution of plaintiff's delays claims … must be based on the testimony of the parties' respective experts and their competing delay analyses." *Id*. at 368.

C. Conclusion:

While case law will address in broad strokes the various elements a contractor must prove to have a viable claim for delay (either excusable or compensable), case law does little to constrain the various methods that can be employed in an effort to satisfy that burden of proof. Further, even though the state of the industry and status of case law seemingly implies the use of CPM to prove delays, every rule has an exception. *See e.g., Helena* and *Howard Contracting, supra.* The type and depth of analysis is entirely dependent upon the particular facts of the case.

IV. THE AACEI'S RECOMMENDED PRACTICE 29R-03, FORENSIC SCHEDULE ANALYSIS

A. Overview

In June 2007, the Association for the Advancement of Cost Engineering International (AACE International) issued its Recommended Practice No. 29R-03, Forensic Schedule Analysis ("RP 29R-03")[6] with the stated purpose of "provid[ing] a unifying reference of basic technical principles and guidelines for the application of critical path method (CPM) scheduling in forensic schedule analysis." RP 29R-03, p. 9. Whether RP 29R-03 satisfies that stated purpose or not, a general overview of this technically dense, 134 page manuscript is in order before that

[6] Now in its third revision, references are made to that 2011 edition.

question can adequately be addressed. The RP begins by setting forth a number of "Basic Premises and Assumptions" including that it "will be used by practitioners to foster consistency of practice." RP 29R-03, p. 10. Further, it defines its "Scope and Focus" as, among other things, "an advisory document to be used in conjunction with professional judgment based on working experience and knowledge of the subject matter." RP 29R-03, p.11. The RP then proceeds to redefine the various methods of schedule analysis through a created "taxonomy" based upon the steps in the analysis being done.[7] *Id.* at 11-16.

With this ground work laid, the RP proceeds to discuss "Source Validation," "Method Implementation" and "Analysis Evaluation." Given the complexity of the subject addressed, there is no practical basis upon which the topics can be easily summarized. Notwithstanding, there are three comments which are worth noting; the first two because they reflect the overall concept of delay analysis and the last because it misperceives the role of the expert in litigation.

1. "Any analysis method, no matter how reliable and meticulously implemented, can fail if the input data is flawed." RP 29R-03, p. 18.

2. "[E]ach claim is unique in that each deals with a different project, different contract documents, different legal justifications, different dispute resolution mechanisms, and different fact patterns among other project execution factors." RP 29R-03, p. 125.

3. "[T]he selection decision [on what method of analysis should be performed] should be that of the analyst (i.e., expert) and not that of the client." RP 29R-03, p.126.

Delay analysis is complex, not simply because it often involves computerized simulations of work being performed in a technical industry with its own specialized terms of art. Delay analysis is complex because no two projects are the same and it requires an appreciation and

[7] As if schedule or delay analysis was not confusing enough to start, the AACE International proposes to rename all the methods to make them more scientific. One definition of "taxonomy" states: "Classification; *especially*: orderly classification of plants and animals according to their presumed natural relationships." Merriam-Webster online edition.

understanding for what actually occurred on the project *by the lawyer*. Therefore, to achieve a level of competency in any delay analysis, no matter how basic, requires work.

Experts do not try cases. Lawyers try cases.[8] Experts are witnesses who have only a momentary role in any trial. While experts may recommend how some part of the trial should be developed (in this situation, the delay analysis), the lawyer (with direction from the client) makes the decision how to proceed. Thus, it is with the above quote in mind that the functionality of the RP as a tool to be used in litigation must be considered.[9]

Yet, despite what some in the scheduling industry suggest, the RP is not without value to construction attorneys. For those of us who find schedule analysis mentally challenging (or just plain fun), the RP provides an in-depth discussion on the mechanics of the various methods of schedule analysis (even though the AACE International wants to change the names). More practically, the RP provides a "checklist" of factors to be considered when selecting the method of analysis to be used for any delay claim whether the taxonomically correct name is used or not. These factors are:

1. The Contract
2. Purpose of Analysis
3. Source Data Availability and Reliability
4. Size of the Dispute
5. Complexity of the dispute
6. Budget
7. Time allowed for analysis
8. Expertise of Expert
9. Dispute resolution forum
10. Legal or procedural requirements
11. Custom and Usage

Id. at 126-31.

[8] And, it is the client who reaps the rewards or who suffers the consequences.

[9] The RP is also rife with qualifications making it difficult, if not impossible, to "tie down" any expert even if they were to consider the RP as "authoritative."

In the Section below concerning practical tips for method selection, many of these same factors will be addressed. But before moving on from the overview of the RP, one last point is worth addressing:

> "This RP is **not** intended to override contract provisions regarding schedule analysis methods or mutual agreement by the parties to a contract regarding the same." RP 29R-03, p. 11.
>
> "Care should be taken to ascertain whether the contract actually mandates the use of this analytical method in forensic situations (retrospective delay analysis) or whether it is intended solely for use in prospective delay analysis to aid in negotiation of time impacts due to changes or other delays. If the latter is the situation, then the choice of methodology could be made based upon factors other than contractual language." RP 29R-03, p.126

These are cautionary quotes which a lawyer should consider carefully. There are those experts who subscribe that their method of analysis is "right" irrespective of the evidence against it including the contract. However, we all know courts are reluctant to re-write the terms of a contract particularly where a court has little expertise with the subject being addressed. As set forth in the factors to be considered above, the starting point for any delay analysis is *"What does the contract say?"*

B. Criticisms

Seemingly the loudest authored criticism of the RP is *A Critical Review of the AACEI Recommended Practice for Forensic Schedule Analysis*, published in *The Construction Lawyer* (Vol. 29, No. 4, Fall 2009). However, the authors summarize their own points into two which may be paraphrased as: 1) the RP is so flawed that it cannot reasonably be considered as authoritative; and 2) the RP ignores the vast legal precedent which has established the processes by which delay analysis can be performed. *Id.* at 9. To the first point, whether the RP is technically flawed can be debated *ad nauseam*. However, what seems beyond the realm of

rational debate is that the RP is rife with qualifications (as stated above) which makes its practical use as an authoritative manuscript for purposes of trial meaningless. Any reasonable expert should be able to point to one of the many qualifications in the RP to explain why their analysis remains viable, even if they subscribe to the RP as authoritative.

The second point would appear to ring hollow given the article's earlier recognition that the courts have helped little in defining the method of analysis to be used.

> If there is a single universal truism, it is that while several methods have been seriously questioned[10] and/or rejected[11] by the courts, *no single method has been adopted by the industry, the courts, or the boards of contract appeals as the correct or preferred method of analysis.*

Id. at 1 (emphasis and footnotes added). Thus, as set forth in the Section on Case Law above, certain courts have established or defined the burden of proof a contractor must achieve to establish entitlement to an extension of time without identifying an accepted method to do so. While the RP may not address the current state of the law, it does not appear to be a sound criticism of the RP to say it does not follow the law when the law itself does not endorse one method over the other.

Others too have taken issue with or raised criticisms regarding the RP. However, the practical use of the RP for the trial lawyer is limited whether the RP is meritorious or the criticisms are sound. At best, it is a guide, albeit a weighty guide; simply another tool to consider in an overall construction litigation practice.

V. SELECTING THE APPROPRIATE METHOD – PRACTICE TIPS

Selection of the "right" method of delay analysis cannot be understated (whatever "right" means). If a negotiated resolution favorable to the client's position is to be achieved, the delay

[10] Agreed.

[11] This position is not entirely clear. Even the cases upon which the authors rely to make their point seem only to say that a particular method has "limited value" not that it cannot be used even if the right circumstances arose.

analysis must be credible and believable from the opponent's perspective. For example, with as much as has been written about the inadequacies of the Impacted As-Planned analysis, selection of that method of analysis will create a challenge in fostering a favorable negotiated resolution even if its use is permitted by the court.

In the event a negotiated resolution is not achieved, the method selected must be acceptable to the court and believed by the trier of fact. Thus, a complex matrix of considerations can be developed and scored to determine the optimal delay analysis to be utilized. Yet, at its root, selection of an appropriate delay analysis comes down to four factors:

1. What does the contract say?
2. What are the factual considerations?
3. What are the presentation considerations?
4. What are the cost considerations?

If due consideration is given to each, the appropriate method of analysis should be apparent.

A. What does the Contract say?

A distinction does exist between a prospective versus retrospective analysis. Most, if not all, delay claims are considered retrospectively, well after the events on the project occurred. Therefore, as suggested by the RP above, many experts contend that they are free to present whatever delay analysis they believe is best suited for the circumstances. This is true even where the contract specifies a particular method of analysis to be used when a contractor seeks an extension of time during the project. In the face of such a contract provision the argument goes something like this: "The contract has established a method to prospectively analyze potential delays and provides a mechanism for the parties to negotiate a time extension. Now that the project is finished, we know how long the project has been delayed so there is no need to forecast the delays." However, if the contract simply states: "the contractor is responsible for requesting a time extension for any delay or disruption that in the opinion of the contractor

impacts the critical path of the current schedule update," does that necessarily mean it is only for prospective and not retrospective analyses? Further, is a court necessarily going to be able to distinguish between the two? If a court did decide that the provision required an analysis based on the update in place at the time the delay event occurred even though the project is finished, what becomes of the Collapsed As-Built analysis for which the client paid?

Another seemingly favorite contract provision many scheduling experts like to ignore is the provision which assigns ownership of all float to the owner. That may not be how the industry likes to consider float ownership, but if that is the contract to which the contractor agreed, how is it ignored? The contract terms and conditions can be "inconvenient," but they are only ignored at the peril of the lawyer and client. Question seriously any position which begins with "that's not how it's done in the real world" and ends with "so we don't need to worry about that provision."

B. Factual Considerations

A contractor promptly created a baseline schedule and religiously updated it as work progressed. A contractor created a baseline schedule, but stopped updating within months of starting work for whatever reason. No CPM schedule was required or created, but a bar chart was submitted to the owner and there exist good daily reports. These are but three examples in a set of innumerable possibilities of how the progress of the work was recorded during the project. Yet, in these three examples, it becomes apparent that there is no "one size fits all" delay analysis. Rather, there are those analyses which are better given the facts and disputes at issue.

C. Presentation Considerations – Know your audience.

The intended audience for a delay analysis is not the opposing party's expert. It is not the client or counsel either. While the opposing client and counsel are a consideration particularly if

a negotiated resolution is the ultimate target, the true audience for any delay analysis is who is going to ultimately decide the dispute. As set forth above, the Court of Federal Claims expects a relatively sophisticated analysis of what delayed the project and will expect the analysis to be presented in a cogent fashion. On the other hand, some jurisdictions do not even require a CPM analysis to prove entitlement to a time extension. Why develop a presentation about launching the space shuttle when all you really need is an explanation for a baking soda and vinegar rocket? Logic diagrams and Gantt charts may be exactly what the Court of Federal Claims may want, but a jury will always prefer a couple of pictures and a simple bar chart.

D. Cost Considerations

Some forms of delay analysis are expensive particularly where regular and routine updates are not performed during the course of the project; e.g., any analysis which requires a complete As-Built schedule to be created. This may be warranted if the dollars at issue are significant, but may not be if the cost of the analysis approaches or eclipses the amount in dispute. As more fully addressed below, this factor is best managed by management of the expert including a budget to start.

VI. MANAGEMENT OF THE EXPERT

A. Selection

In the RP above, the authors to the manuscript assert that it is for the expert to determine the appropriate method of analysis to be performed. RP 29R-03, p.126. However, no expert comes to a dispute with the full panoply of delay analyses at his or her disposal, nor would you expect them to do so. Rather, experts tend to gravitate to a method they prefer and promote that method over all others. In fact, it is likely that an expert with any depth of testifying experience will have touted his or her delay analysis over all others. Obviously, you do not want a

Collapsed As-Built analysis from an expert who has previously testified that such an analysis is a sham. Yet, based upon the nature of the project and the associated project records, a Collapsed As-Built analysis may be exactly what is needed.

Experts also come with cost considerations which must be weighed in comparison to the amount in controversy and the nature of the dispute. For example, as previously discussed, if no As-Built schedule exists, the creation of one can be costly. In comparison to the amount at issue, such a cost investment may not result in a return of any value. Thus, an expert who prefers an As-Planned v. As-Built analysis may not be the right choice because the cost of the analysis would overrun the amount in dispute.

Lastly, the expert must be able to communicate credibly and believably in terms laypeople understand. The most brilliant scheduling expert will lose everyone quickly if he or she can only speak in CPM nomenclature. (What is *criticality* anyways? Or, *taxonomy*?) Notwithstanding the numerous articles, papers and treatises written on the subject of schedule analysis, the most important factors when presenting a delay analysis whether to arbitrator, judge or jury are: 1) Is it understandable; and 2) Is it credible?

B. Collaboratively identifying the best method

Identifying the most appropriate method is a collaborative process between client, expert and **the lawyer**. Obviously, based on the discussion above, the lawyer should have some preliminary thoughts as to the type of analysis to be used. Without that, selection of the expert is more difficult. One solution, though, in advance of fully retaining the expert is to present enough of the project and its history to the potential expert and inquire as to the type of analysis the expert would propose. Then, a more in-depth discussion may take place regarding the strengths and weaknesses of the various methods available once the expert is fully engaged.

It is critical, though, that the lawyer be intimately involved in the selection of the analysis to be used. If the lawyer does not understand the mechanics or believe in the type of analysis being performed, the lawyer will have a more difficult time persuading others to understand and believe in the analysis as well. If judge or jury is being asked to understand and believe in an analysis being performed and presented, why should any less be expected of counsel?

C. Development of a budget and timeline

Due to the costs associated with many forms of delay analysis, there is a tendency to wait until the last possible moment before engaging a scheduling expert. While cost concerns may be legitimate, a more reasoned balance must be struck. A contractor wanting to persuade an owner that it is entitled to a compensable time extension may have no other choice but to submit a comprehensive delay analysis in accordance with the terms of the contract. However, in those situations where an earlier rather than later schedule analysis is not required, a deliberate decision should be made as to when to engage an expert.

The process of performing a delay analysis can assist in more fully investigating the claim in dispute. Further, it can assist in guiding the nature and amount of discovery needed. Lastly, a completed delay analysis can assist in guiding completion of discovery, facilitate negotiations and planning for trial. However, whether to engage an expert early in a case depends on the facts and circumstances surrounding the dispute at issue.

To assist in making such a decision, interviews should be done early. Once an expert is identified, request a budget for the work to be performed as well as a timeline for the delivery of the analysis. Obviously, it does no good to retain an expert to recreate an As-Built schedule (a task that typically takes months) on the eve of trial. Armed with both a budget and a timeline, the lawyer can better advise the client when the additional costs need to be expended and why.

D. An iterative process with the client

In a recent dispute, an owner retained a scheduling expert to assist in defending against a contractor's delay claim. Neither the owner nor its counsel was experienced in defending against construction delay claims. The scheduling expert prevailed upon the owner and its counsel that the As-Planned v. As-Built method of delay analysis was the only credible and accepted method. More significantly, the scheduling expert advised that he would need to create a complete As-Built schedule from the project records for purposes of performing the analysis. The expert then proceeded to take the next six months and several hundreds of thousands of dollars combing the owner's records and building an As-Built schedule.

However, when the owner's expert was deposed two things came out. First, the contractor had maintained schedule updates with as-built data throughout the project which had been reviewed and verified as complete and accurate by the *owner's* representative. Second, the owner's daily records were incomplete and consequently, the expert's created As-Built was flawed. Had the owner, its counsel and the expert worked together throughout the development of the analysis, they would have discovered the availability of an accurate and complete As-Built schedule contemporaneously created by the contractor. The owner would have saved the several hundreds of thousands of dollars expended. More importantly, the expert would have likely reached his different conclusion sooner and possibly avoid the need for the trial that occurred.

A trial lawyer is in many ways a conductor. A well-coordinated trial is like a symphony. One that is not well-coordinated is simply noise. To be well-coordinated, the trial lawyer must know, hear and understand each piece that will ultimately be played including the presentation of the delay analysis.

E. Discovery of drafts, communications, etc.

There exists some lack of clarity in Florida as to what may be discovered from a testifying expert witness. In *Fields v. Cannady*, 456 So.2d 1208 (Fla. 5th DCA 1984), the court quashed the production of otherwise privileged documents which the expert had reviewed, but claimed had not been relied upon. Further, the Florida Rules of Civil Procedure provide that "discovery of facts known and opinions held by experts" may occur only pursuant to somewhat limited conditions. Fla.R.Civ.P. 1.280(b)(4). The rule seems to restrict such discovery only to facts and opinions about which the expert is expected to testify. *Id.* Yet, what an expert considers, but then rejects would seem to be as significant as what is actually relied upon.

In fact, that is what the Federal Rules of Civil Procedure contemplate. Rule 26(4)(C) provides:

> *Trial-Preparation Protection for Communications Between a Party's Attorney and Expert Witnesses.* Rules 26(b)(3)(A) and (B) protect communications between the party's attorney and any witness required to provide a report under Rule 26(a)(2)(B), regardless of the form of the communications, except to the extent that the communications:
>
> (i) relate to compensation for the expert's study or testimony;
>
> (ii) identify facts or data that the party's attorney provided and that the expert **considered** in forming the opinions to be expressed; or
>
> (iii) identify assumptions that the party's attorney provided and that the expert relied on in forming the opinions to be expressed.

Id. (italics in the original, emphasis added). In *U.S. v. City of Torrance,* 163 F.R.D. 590, 593-594 (C.D. CA 1995), the court stated:

> The scope of discovery should not be limited to documents relied on by the expert in support of his opinions, but should extend to documents "considered but rejected by the testifying expert in reaching opinions." ... "[I]n fact, the documents considered but rejected by the expert trial witness could be even more important for cross-examination than those actually relied upon by him." . . . "Even if the work-product privilege

> applies, defendants' need to uncover facts to effectively cross-examine a significant expert witness on his interest in the case would constitute a showing sufficient to overcome the privilege."

Id. at 593-94 (first ellipsis in original, internal citation omitted).

The point here is not to explore fully the boundaries as to what is producible and what is not under Florida law. Rather, it is a cautionary comment. Particularly as it relates to e-mails, a lawyer's trial strategy and planning is often documented for all to see if the right requests for production are made or the right questions are asked during examination of the expert. Consideration should be given before fully embracing any testifying expert with respect to all facets of trial preparation and planning.

VII. PRESENTATION OF THE ANALYSIS

A. Know your audience

The method by which a case or claim is presented depends in large part upon the audience to whom the presentation is made. A presentation to skilled arbitrators intimately familiar with the construction industry should require less explanation of the basics of delay analysis than to a jury of lay people where the presentation cannot get much beyond the basics. The forum in which the presentation is made is also a related factor which must be considered. Importantly, these are considerations for the lawyer, not just the expert. As relayed above, the lawyer is responsible for the whole of the presentation whereas the expert at most makes a cameo appearance.

1. Mediation

Mediation is *not* the time to try to educate anyone regarding the fundamentals of delay analysis; rather a review of the methodology used and an explanation of why it was used should be sufficient. Quite simply there is not enough time to do more. Nor do you want to distract

from the real goal of mediation: a facilitated discussion focused on a negotiated resolution. Therefore, if an in-depth understanding of delay analysis is important to facilitating a negotiated resolution, select a mediator versed in the various methods of delay analysis.

What is important in a mediation presentation is that the expert is able to demonstrate that the analysis performed comports with the project history. Further, the expert must be able to clearly and credibly communicate the results of the delay analysis performed. Irrespective of the quality of the analysis performed, if it is not understood, it will not be believed. This is as important for mediation as it is for arbitration and trial.

2. Arbitration

It is often assumed that because the panel (whether one or three) are made up of construction industry professionals, presentation of a delay analysis is an easier task. However, even those with extensive construction backgrounds may not be well-versed in the mechanics of CPM or any particular method of delay analysis. While the panel may be familiar with the particular terms of art often bantered about, the panel's understanding may not extend much beyond general knowledge of the terms. Conversely, the panel (or one member) may hold strong opinions or views regarding delay analysis which, if not known, can torpedo a claim before it is ever fully presented. There are two opportunities which should be taken when proceeding down the path to arbitration to explore the level of presentation needed.

First, know your panel. Whether a private arbitration or through an organization such as AAA, investigate as much as you can the background of the panel members. Do not simply consider whether a panelist should be disqualified because of some conflict – real or perceived. Do not simply review a resume provided. If a private arbitration, ask for references and past panel or claim experience and then follow up. If through an organization such as AAA, contact

other members of the Bar and industry professionals to determine the potential panel members' depth of experience.[12]

Second, take advantage of the preliminary conference. Arbitrators consider the preliminary conference an opportunity to become educated about the nature of the dispute and how the parties plan to pursue the arbitration. However, the preliminary conference is the lawyer's opportunity to determine further the qualifications of the panel. Tell the panel the methodology used to determine responsibility for delays and ask to what extent the panel is familiar with the mechanics. Couch the question in terms of planning the length of the arbitration hearing. One scheduling expert suggests: "No matter the answer, start the presentation one level below that."

Irrespective of the panel's capabilities, planning and presenting a detailed, in-depth schedule analysis is difficult. Often, scheduling experts testify near the end of a party's case-in-chief. At that time, there is a tendency to "rush" through presentation to save time when coupled with the assumption that the panel will easily follow the truncated presentation. However, experience has shown that assuming that even a panel of industry professionals can perceive quickly the merits of a delay analysis is risky. Accordingly, a balance must be struck between presenting sufficient information about the analysis to demonstrate that it is reliable, credible and based upon actual project history and simply re-plowing the same ground which results in a waste of time.

From a trial lawyer's perspective, waiting until the end of your case-in-chief to present the "proof statement" through an expert for entitlement to a time extension places too much burden for success in the matter on the shoulders of a single witness. Whether in arbitration or

[12] It is interesting that voir dire is limited to jury trials and not used in a forum such as binding arbitration. Voir dire is more than simply determining potential biases. It is used, among other things, to determine level of sophistication of the trier of fact in a particular aspect of the case.

trial, the better practice is to develop entitlement to a time extension, or defend against it, through the series of witnesses that precede the expert. The expert is then in a position to "review" again what delayed the project rather than to "prove" what did. An example is set forth below.

3. Trial

The most significant similarity between a bench and jury trial is that neither judge nor jury is likely to understand even a basic CPM delay analysis.[13] Nor will they likely have any better understanding after a lengthy trial (despite what some in the scheduling field may believe). The most significant difference is that a judge may voice concerns, displeasure, lack of understanding, along with other similar comments during the presentation where a jury is silent until it renders its verdict. With either, though, clarity in communication throughout the trial is essential. It begins with laying the ground work for what delayed the project in the opening statement. It continues through presentation of fact witnesses leading to the expert. If the first discussions of delays and delay analysis are left to an expert who testifies for only a moment in time, the likelihood of conveying with clarity the position intended is unlikely.

B. Popular techniques for making CPM understandable.

Critical Path Method scheduling and the associated delay analysis first requires an understanding, at least generally, of the physical construction work associated with the project and an appreciation for the order in which the work must be performed. The project is then divided into "activities" which are logically sequenced in the order of performance. A duration for each activity is estimated and assigned. Once all of the activities are assigned a duration and logically sequenced, the longest path of logically connected activities leading to project

[13] The sole exception may be the Board of Contract Appeals or the Court of Federal Claims because they see delay claims more often. However, even in that setting, the better practice is to consider the judge in the same category as an arbitrator from the construction industry.

completion can be determined; i.e., the critical path. Lying just below the surface of this simple summary is a host of technical questions which must be addressed while developing the CPM and related delay analysis. Conveying that information in a form which is understandable to those not versed in CPM is the ultimate challenge.

One presentation theory essentially assumes that a lay person cannot understand CPM and the related delay analysis in the context of a construction project because the construction project itself is technical in nature and not readily understandable. Based on that assumption, two typical, illustrative examples have been developed – "Thanksgiving dinner" and "Going to work." Without belaboring the details of either, both essentially try to relate everyday life experiences in the context of CPM scheduling. Fake activities are identified (e.g., make pies, cook turkey, prepare sides and so on) and durations are assigned to each. The fake activities and durations are logically sequenced and the presenter defines and reviews the various CPM terms of art. Once the fake delay analysis is performed, as the theory goes, the delay analysis at issue is more easily understood.

The typical default presentation is to simply have the expert explain in detail the analysis performed and the results achieved. However, as stated above, no matter how carefully and precisely done, any presentation which begins with "I started with the Baseline Schedule and identified the critical path which is the longest series of logically connected activities leading to project completion …" has little chance of being understood by judge or jury and may even fall beyond the knowledge of an arbitrator). Identifying the audience and playing to it is critical to effective presentation of any delay analysis.

C. What has worked?

Almost to a certainty, the default presentation described above is not the answer. If the finder of fact cannot understand the presentation made, then the decision rendered is a "crap shoot" at best. While the "Thanksgiving dinner" and "Going to work" type presentations attempt to clear up the confusion associated with CPM delay analysis, they tend to have two negative effects which would seem to outweigh the benefit. First, these fake analyses have nothing to do with the project. Judge or jury has enough to remember about the project without trying to compare the slab to the "pie" or the "turkey." Second, these fake analyses run the risk of being insulting. While judge or jury may not be educated or sophisticated in CPM analysis, they will be offended if talked down to or demeaned. So what has worked?

No matter the complexity of the project, there are components of the work which can be understood and used to develop the layperson's understanding. For example, the site must be prepped before the footings are poured which must be done before the stem wall is constructed which must be done before the area is backfilled and the slab is poured. In that one sentence five activities are described which are connected logically in sequence. A delay to anyone of those activities will delay completion of the slab pour.

Using that same example, the education process begins during the opening statement and continues through the various fact witnesses especially if the example relates to one or more of the delay issues on the project. To make the illustration more complete, photographs, rather than logic diagrams, help to cement the understanding. By the time the expert testifies, judge or jury should begin to understand the fundamentals of CPM scheduling. More importantly, judge or jury has already started to form opinions about what delayed the project such that the expert's

testimony merely confirms what they already believe. The goal is perceived credibility and correctness of position, not a graduate level of understanding delay analysis.

VIII. Conclusion

There is no right answer in the method of delay analysis to be performed. There are better choices based upon the terms of the contract, the facts surrounding the dispute and the audience to whom the analysis will be presented. The real issue, though, is who makes the selection decision and manages the process – the lawyer or the expert? While any expert is expected to be versed in their respective field, it is the lawyer who tries the case. Experts may inform the process; they may even do significant work in support, but they simply do not try cases. At most, they testify for a moment in time for the span of the trial, leaving the lawyer to orchestrate how that testimony supports the remainder of the case.