

cause & effect

news from CPMI® on construction claims analysis and resolution

Techniques and Methods for Assessing Delays

Francis J. Brennan, P.E. and Michael F. D'Onofrio, P.E.

Time is important to everyone, especially to those in the construction industry. Every construction contract stipulates either a time of performance or a specific project completion date. Yet, with so much attention to time, construction projects are frequently subject to delays. Sorting out the issues and determining which party is responsible often proves difficult and time-consuming. Though many techniques are available for determining schedule impacts, not all produce valid results.

Just as network scheduling has become an important tool in managing a project, it has also become an important evidentiary tool in the presentation and defense of delay and disruption claims in litigation. Courts and boards have held that Critical Path



The differences between delay analysis techniques involve the baseline schedule, the point in time when the delay is measured, and the treatment of concurrent delay.

time durations and logic relationships are identified, a mathematical calculation can be performed on the schedule network to determine the earliest and latest date each activity may be performed within the framework of the contract schedule. The longest path of interrelated activities through the schedule network is defined as *the critical path*.

Float is the amount of time a specific activity may slip before it affects project completion. Activities on the critical path have no float. In order to calculate delay damages, it is necessary to determine which work activities and delays were on the project's critical path.

Delay analysis techniques can be classified into three separate categories: the Foresight Method, the Hindsight Method, and the Contemporaneous Method.

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Method (CPM) schedules are the most effective model for evaluating construction delays.

CPM is a network-based scheduling technique in which work activities with identified time durations are tied together with logic relationships indicating the flow of work. Once the

Capital Project Management, Inc.



Dear Friends and Colleagues:

Welcome to the inaugural edition of the CPMTM® newsletter.

CPMTM specializes in the analysis, resolution, and prevention of complex construction disputes. Collectively, our principals have assessed more than \$5 billion in contract claims involving everything from office buildings and power plants to public transportation and manufacturing programs. Over the years, we've gained a wealth of experience and we'd like to share it with you. We hope you'll find this newsletter useful in addressing some of the issues and events you may encounter.

Many thanks to our clients for their support and continued reliance on our services. We've enjoyed getting to know you, and we're happy to count you among our many friends and associates.

We look forward to strengthening our current relationships, renewing our past relationships, and building new ones. If you have any comments or questions



pertaining to this newsletter, or if we can help you in any other way, please call us in Pennsylvania at 267-464-0500 or in New Jersey at 973-276-0540.

Sincerely,



Michael F. D'Onofrio, P.E.
President

The differences between these delay analysis techniques involve the baseline schedule used for measuring the delay, the point in time when the delay is measured, and the treatment, if any, of concurrent delay.

The Foresight Method, commonly thought of as the simplest and easiest, generally employs two approaches: *Impacted As-Planned*, where only the owner-caused delays are identified, and *Adjusted As-Planned*, where only contractor-caused delays are

identified. In both approaches, the alleged delays are reviewed to determine where and how the revisions should be incorporated into the as-planned or baseline schedule. The result of these implanted activities is an adjusted project completion date, which demonstrates, either directly or indirectly, the owner's impact on the contractor's planned schedule of performance.

The Foresight Method is not generally favored by courts and boards, because it ignores the as-built history of the project; it produces theoretical results; it does not measure the effect of delay on actual performance; and it assumes that the as-planned schedule does not change.

The Hindsight Method centers on an as-built schedule — a schedule depicting the dates that events actually occurred. Delaying events are normally depicted as distinct activities on the as-built schedule, which are invariably tied to the critical path. Typically, under this method, there are two approaches: *As-Built Critical Path*, which allocates time by determining the responsibility for the delays on the so-called critical path of the project, and *Collapsed As-Built*, which removes delays caused by one party to determine when the work would have been completed, if not for the delays of the other party.

The Hindsight Method has a number of disadvantages that include difficulty determining which work activities or delay events controlled the pace of the work; not considering what was critical at the time a delay occurred; not considering float

through various paths at different periods of time; not accounting for concurrent delay; and not attempting to determine the individual impact of each delay.

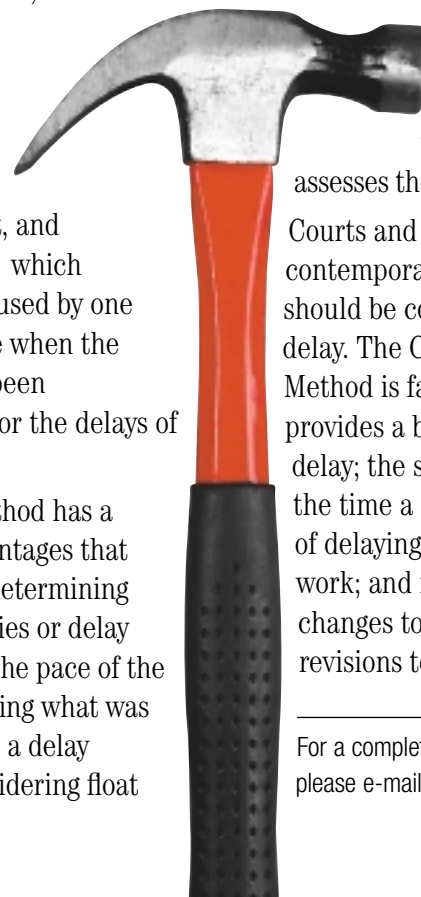
The Contemporaneous Method

hinges on the principle that in order to determine the impact of delaying events, the status of the project must be established at the time those events occurred. In essence, the schedule needs, first, to be updated at the time of the delay and, second, to be updated to incorporate any planning changes to coincide with the contractor's plan for pursuing the work. The goal of this method is to develop a freeze-frame picture of the project — identifying the delaying event, the impact of the delay, and the plan to complete the remaining work at the time the delay occurred.

Two approaches are commonly used as part of this method: *Time Impact Analysis*, which looks at a particular point in time and utilizes a series of chronological time slices to evaluate major scheduling variations that occurred during the project, and

Window Analysis, which examines the critical path between two points in time and assesses the delay as it occurs.

Courts and boards hold that contemporaneous schedule updates should be considered in evaluating delay. The Contemporaneous Method is favored because it provides a baseline for measuring delay; the status of the project at the time a delay occurs; the impact of delaying events on remaining work; and insight into float, changes to critical path, and revisions to the plan to complete.



For a complete discussion of this topic, please e-mail jfrench@cpmteam.com



Standards of Proof for Contractor Time Delay Claims

Jon M. Wickwire, Esq.

Recent legal decisions provide substantial guidance about the proof required for contractor time delay claims. Consider the following key points:

- Any analysis must begin with a realistic baseline that establishes a starting point for the work and the contractor's intent (i.e., based on realistic durations and logic as to when the contractor intended to perform each phase of the work).
- Where the contracting company pursues an early completion or a recovery schedule, it is required to establish how the schedule improvements were achieved and, specifically, whether the early completion schedule is reasonable.
- In any analysis of project delays, the contractor is required to take into account realistic resource leveling. Schedules containing unrealistic resource leveling cannot form the basis for a delay claim by the contractor.
- Where schedule updates are utilized to status the project and analyze the effect of fragments on project delays, the contracting company is required to start with a reasonable and realistic plan and then prove, with respect to project updates, that it has taken appropriate action to:
 - Correct schedule logic to reflect the actual sequence followed in the field;
 - Revise durations to reflect actual experience in the field (as better or worse than planned);
 - Revise logic to address out-of-sequence work, so that the contractor and the owner actually have a network analysis system that reflects the true status of the project and the actual status and location of the critical path;
 - Obtain permission for cut logic ties; and
 - Reflect actual start and finish dates.
- The contracting company must abstain from any manipulation of logic in updates to conceal activities that it could not complete in the scheduled time.

For more information, please contact jwickwire@wickwire.com

Plan to get the most out of your schedule

Construction scheduling can be burdensome, but today, the successful completion of



complex construction projects often depends on a detailed pre-construction Critical Path Method (CPM) schedule. There's just no getting around it.

CPM is a management technique that helps predict when the activities required for a project are expected to occur. This approach compels management to plan ahead and to think logically from start to finish. The method requires a team effort on the part of all responsible parties; however, it is the contractor who must develop the CPM schedule, since he is ultimately the one responsible for project completion.

CPM consists of three phases: planning, scheduling, and monitoring. The planning phase is by far the most important, the most time-consuming, and, unfortunately, the most often given short shrift. It is during the planning phase that all of the necessary input data is developed and the contractor determines how the project will be built. With CPM, decisions can be expressed through the use of logic diagrams, time estimates (durations), cost estimates, and resource estimates. Generally, most contractors employ the diagram and duration features. If planning proceeds appropriately, intimate and early knowledge of the job — including insights into potential problems — can be obtained. A CPM schedule and proper planning can make all the difference on your next project.



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Upcoming Events

April 24, 2002

Lorman Educational Services

Lorman Educational Services, a leader in continuing education for professionals, will present "Pennsylvania Construction Law: Start to Finish — Creative Strategies for Project Completion and Litigation Avoidance." CPMI president, Mike D'Onofrio, will speak as part of a panel discussion during this full-day symposium held in Philadelphia, PA. For more information, call 715-833-3940. Or to register, call 715-833-3959.

April 18-19, 2002

ABA Forum on the Construction Industry, Annual Conference

Visit the CPMI booth at this annual event held at The Sheraton Palace Hotel in San Francisco, CA. For more information, visit <http://www.abanet.org/forums/construction/html/programs.html>.

June 12, 2002

Lorman Educational Services

Lorman Educational Services will present "New Jersey Law for the Design Professional." CPMI executive vice president, Francis J. Brennan, P.E., will speak as part of a panel discussion during this symposium held in East Brunswick, NJ. For more information, call 715-833-3940. Or to register, call 715-833-3959.

October 3-4, 2002

ABA Forum on the Construction Industry, Fall Educational Program

CPMI will exhibit at this two-day conference at The Hilton Hotel, Minneapolis, MN. For more information on the ABA forums, visit <http://www.abanet.org/forums/construction/home.html>.

December 12-13, 2002

The "Contractor's" Construction Superconference

Be sure to visit the CPMI booth at this two-day conference held at The Sheraton Palace Hotel in San Francisco, CA.



For more information

Visit our website at
www.cpmiteam.com

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