PROSPECTIVE Vs. RETROSPECTIVE DELAY ANALYSIS

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ABSTRACT

Infrastructure, construction and energy disputes commonly involve issues which require delay to be assessed. Delay experts are often engaged by parties to prepare reports analyzing the delays on a project. A range of delay analysis methodologies exist and there is broad consensus that no single methodology is to be preferred in all cases. The choice of methodology has both legal and factual aspects: it must meet the requirements of the legal issue under consideration, be consistent with the requirements of the contract and must also be appropriate to the evidence available and the factual characteristics of the project in question.

The vast majority of major construction program today contains Critical Path Method (CPM), scheduling specification requiring evaluating the time-related effect of changes and delay in the work of project's schedule and the contract time. These requirements typically require a contractor to prepare schedule "*fragnets*" (fragmentary networks) and "*utilizes the schedule updates in effect at the time a change is issued or delay occurs*" for purpose of substantiating, prospectively a contractor's entitlement to an extension of the contract time.

A broad distinction between delay analysis methodologies can be made between those which are "***Prospective*** (in advance of performance)" and those which are "***Retrospective*** (after the fact)". In today's construction arbitrations and disputes, this is the most common issue of contention, on what methodology to be used in undertaking delay analysis.

Prospective methodologies (such as "time impact" or "impacted as-planned" analyses) involve assessing criticality and delay contemporaneously at the time the events in question occurred. By contrast, Retrospective methodologies take into account subsequent events and attempt to establish whether the events in question actually caused delay to completion when the progress of the work as a whole is considered. The outcome of the two analysis generally differ. There have been recent judgements to this effect, wherein, several courts and arbitrators have tried to reason the use of one technique over other, however, the matter remains to be contentious.

This article is written to explain fundamental differences between a prospective and a retrospective type of delay analysis and which one is to be undertaken in which circumstances.

PROSPECTIVE ANALYSIS:

The word "prospective" is defined as "likely to come about: expected to happen". Accordingly, a prospective analysis is one prepared in advance of delaying events or change work, to model what is likely to happen as a result of the subject event(s). Amercian Association of Cost Engineers Recommended Practice AACE-RP 29R-03 defines prospective analyses as:

*"**Prospective analyses are performed in real-time prior to the delay event or in real-time, contemporaneous with the delay event. In all cases prospective analysis consists of the analyst's best estimate of future events. Prospective analysis occurs while the project is still underway and may not evolve into a forensic context...**"*

Generally, there are five major steps in the procedure for performing a prospective analysis:

1. The analyst must first identify that there is a change or potential change in the work (e.g., change order, construction bulletin, Request for Proposal, etc.) or a foreseeable potential delaying event for which there may be entitlement to a time extension (i.e., a delaying event that might be critical and which may extend the projected date of project completion.)

2. The contractor should identify the most recent, approved/ accepted schedule update, which we call the "unimpacted" or "original" as-planned schedule. The contractor should identify the activities in the schedule that may be affected and the project completion date (or other milestone) to which delay is being measured.

3. The contractor should create a fragnet (or fragmentary network of activities) to represent the delaying event or change work in question. The fragnet should be the analyst's best projection of the work activities required to complete the change work, or the best representation to model a potential delay issue. It is noted that these fragnet activities are "projections" of work to be completed or impacts that may be encountered.

4. Determine how the developed fragnet "fits into" or is logically tied to the current schedule. The analyst should input the fragnet activities into a copy of the "unimpacted" schedule, ensuring the fragnet's first and/or last activities are tied to other activities in that schedule. The result of this step is the "impacted schedule."

5. Reschedule the impacted schedule as of the same data date as the "unimpacted schedule," and determine the difference in project completion (or other milestone to which a delay may be measured) between the "unimpacted" and the "impacted" schedule.

The prospective analysis should be submitted timely in accordance with the contract requirements, presumably with a written narrative explaining the issue in question, a listing and explanation of the activity(ies), durations, and logic used to develop the **fragnet**, the reasoning of the logical relationships tying this work into the un-impacted schedule, and a calculation of the impact (the difference between the completion date of the un-impacted schedule vs. the impacted schedule.) This narrative may also include, if required, a discussion of the contractor's resources in support of the activity durations to accomplish the change or impacted work, and any potential mitigation of delay it might have considered.

With regard to delay mitigation, the contractor should ensure that the proposed **fragnet** takes into consideration alternate ways to perform its work. In other words, it should look at the schedule logic to determine whether the subject logic ties are mandatory or preferential, and to the extent any relationships are preferential, consider if there is a way to more efficiently perform the work.

In this regard, it is noted that usually the function of a Prospective analysis is to model a projection of an impact for purposes of negotiation of a time extension. In general, negotiations tend to be more successful if the model is realistic and sufficient consideration is provided with regard to potential contractor delay mitigation.

It is also noted that separate from this prospective analysis submission should be a negotiation regarding direct cost issues and/or relief from liquidated damages. As will be discussed further below, a Prospective analysis does not generally deal with delay concurrency, and thus is a poor tool to definitively determine delay compensability. Rather, because this is a negotiation tool, both parties may agree to treat the delays

as *"excusable-non compensable"* or *"excusable-compensable"*, depending on the outcome of the negotiations.

The determination of delay concurrency is a necessary prerequisite to providing guidance as to whether a delay is compensable or non compensable. In this regard, while the prospective analysis process may be able to model various simultaneous impacts or delays, the *prospective analysis process does not explicitly deal with concurrent delay issues. It is major industry misconception that an entitlement in time automatically entitles the contractor to prolongation cost.*

To the extent the change work or delay event cannot fully estimate delay as of the issuance of the prospective analysis (due to unknowns, complexities, or other issues), the contractor's best strategy is to provide notice to the owner of the issues it is experiencing. Furthermore, if delay issues are not settled contemporaneously and the project ends up in a claim situation (be it a **Request for Equitable Adjustment (REA)**, or a claim in court or arbitration), a Retrospective Analysis may need to be performed to establish entitlement to a contract time extension, delay damages, relief from liquidated damages, or other impact costs. However, the idea of conducting retrospective analysis, at the end of the project, in cases of disputes wherein, the contract administrator has not resolved the dispute during the currency of the project is challengeable and different courts have taken different view of the same.

RETROSPECTIVE ANALYSIS:

The word Retrospective is defined as "of or relating to the past or something that happened in the past." Thus, a retrospective analysis is one prepared after the delaying event(s) or change work has been performed, such that the actual sequence, timing, and resources of the work related to the subject event(s) is known. AACE RP 29R-03 defines Retrospective analyses as:

"Retrospective analyses are performed after the delay event has occurred and the impacts are known. The timing may be soon after the delay event but prior to the completion of the overall project, or after the completion of the entire project... In other words, even forward-looking analysis methods implemented retrospectively have the full benefit of hindsight at the option of the analyst."

The key, as emphasized in the RP 29R-03 definition above, is a retrospective analysis is performed with the "**full benefit of hindsight**." A Retrospective analysis, in general terms, is a method of analysis in which, after the delaying event has occurred, an "**as-built**" **fragnet** is inserted into a planned baseline schedule. This is a similar procedure, and has similar flaws, to the hypothetical "**impacted as-planned (IAP)**" analysis that courts and boards of contract appeal have rejected as an inappropriate forensic schedule methodology.

There is some evidence from court and board decisions, to conclude that a Retrospective analysis should generally be substantiated in a forensic evaluation by an observational method of analysis to determine what actually occurred on the **project's as- built critical path**, should be utilized. In such cases, as built schedule based delay analysis techniques are best utilised.

The importance of "hindsight" in this regard is that the contractor or schedule analyst should be able to analyse the true nature of project impacts on the project's as-built critical path and should not have to perform a modeled analysis.

A *Windows Analysis* (or an **As-Planned vs. As-Built**) can be a more reliable forensic retrospective delay analysis tool, as it deals with the *critical and near-critical path activities without the need to model individual delay events*, of which there are many on a typical project. Furthermore, a windows or as-planned vs. as-built analysis "allows the analyst to determine *which delay impacts are concurrent, which are staggered, and which are near critical versus precisely critical with less subjectivity than if only projected dates were used*."

So, what happens if a Prospective delay analysis is required by contract to deal with time extensions, negotiations of time extensions during the course of a project fail, and an after-the-fact delay-related claim or request for equitable adjustment (REA) needs to be submitted for arbitration or trial?

Outside of recommendations regarding proper documentation and notice, and adhering to the requirements of the contract in this regard as discussed above. When choosing which type of analysis to perform in a retrospective situation, the first place to go is the contract. Does the contract offer any guidance as to what type of analysis is required in a forensic environment? The analyst should also consult with Section 5 of AACE RP29R-03 and Society of Construction Law Delay Protocol (SCL) that has an extensive discussion of how to choose a methodology.

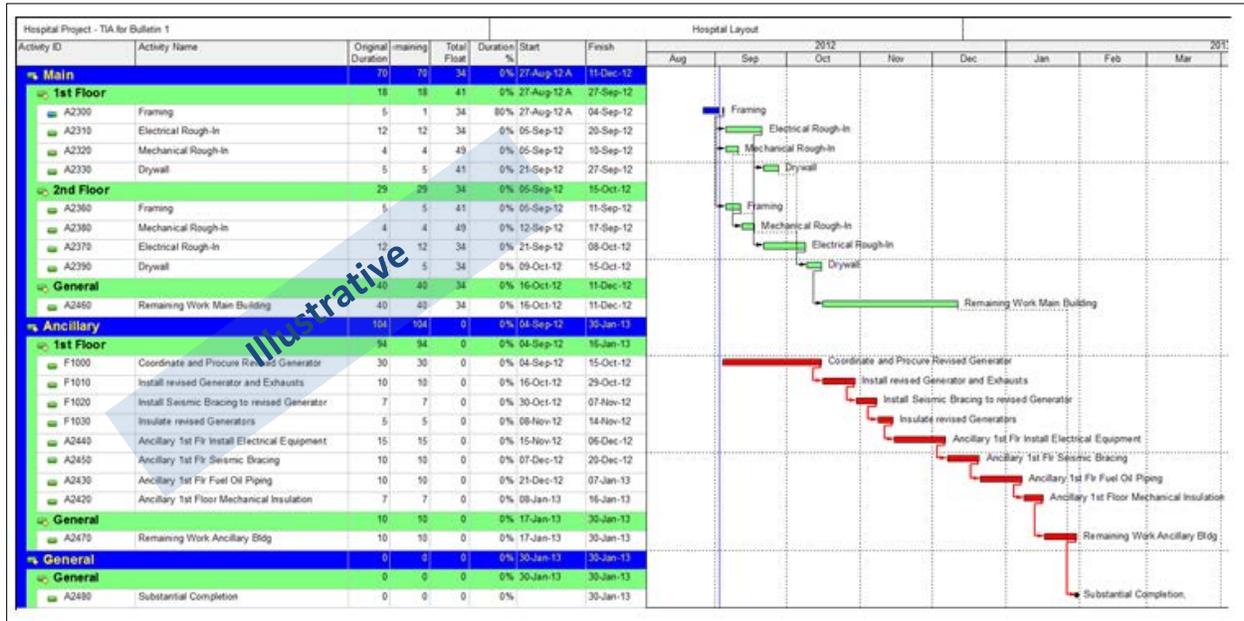## Analysis: To be performed with help of Primavera (Illustrative)

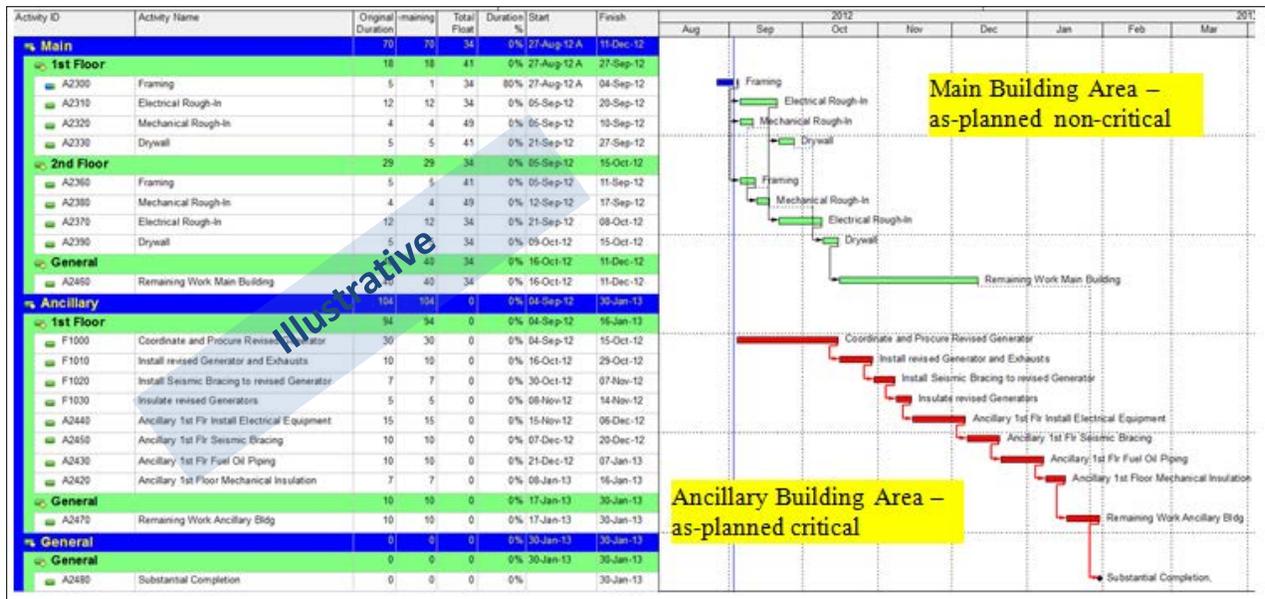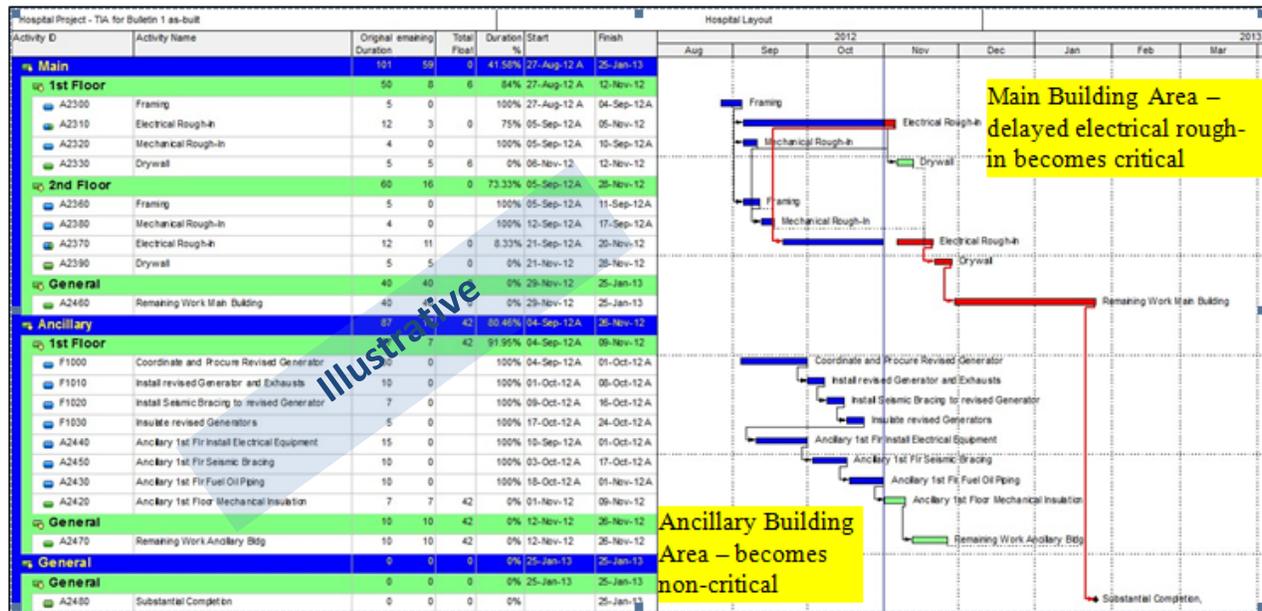Original   Unimpeded   Schedule:
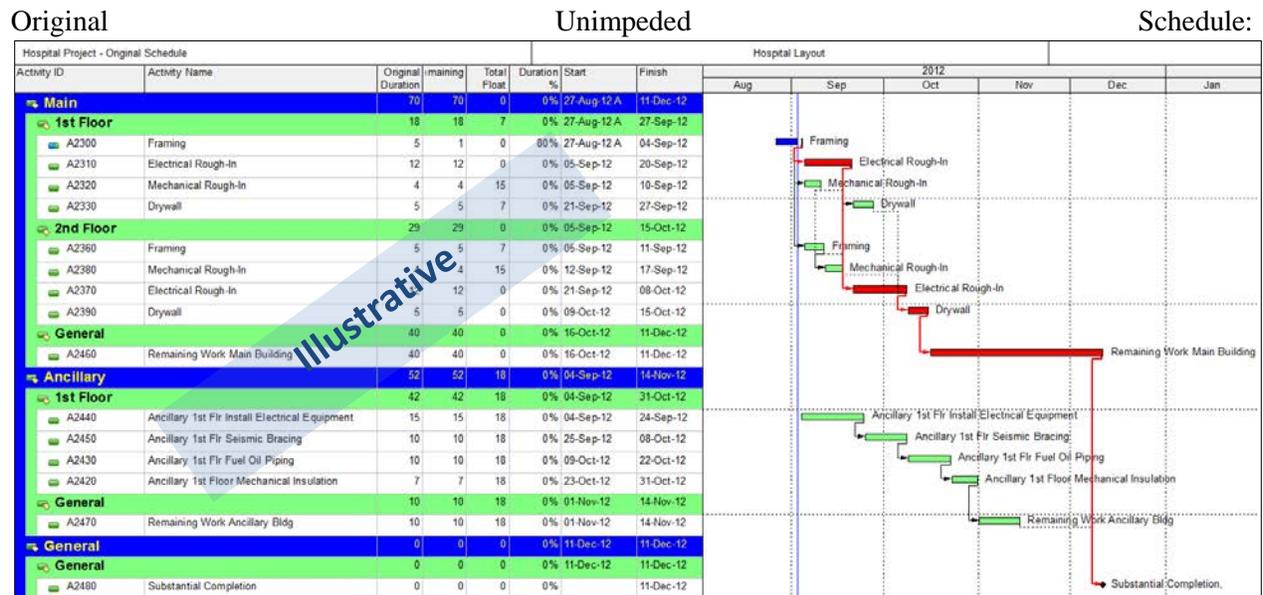
Impacted" schedule containing insertion of Fragnet:

Comparison between original "as planned" Fragnet vs "as-built" Fragnet:

WHICH ONE IS PREFERRED?

The delay analysis provisions included in contracts vary significantly from contract to contract, while the vast majority of these requirements include provisions relative to performance of **Prospective analysis**, the majority of them do not include requirements for performing **Retrospective analysis**.

The circumstances in which the law might prefer a prospective approach over a retrospective approach are unsettled. Insofar as extensions of time are concerned, the original version of the Society of Construction Law (SCL) Delay and Disruption Protocol had stated a preference for a prospective methodology in all cases, even where an analysis was to be carried out after the event by a judge, arbitrator or adjudicator. This had been criticized and the 2nd Edition of the Protocol now states that where an extension of time claim is being assessed at a time distant from the events in question, a *"prospective analysis of delay … may no longer be appropriate"*.

The contractual provisions dealing with *extensions of time* are important in this regard. Few contract, in addition to assessing extensions of time applied for during the course of the Works (which would by necessity be carried out on a prospective basis), the Architect / Employer is required to carry out a final extension of time exercise after Practical Completion, although at that time cannot reduce any previously awarded extension. This is often said to support a retrospective approach.

On the other hand, several contracts contain language which at first glance would appear to require a prospective approach to extensions of time. However, an attempt to require a prospective approach has failed in many cases.

SUMMARY / CONCLUSION:

In conclusion, a Prospective analysis can have significant value during a project to contemporaneously deal with the negotiation of a request for an extension of contract time, However, a Prospective analysis only deals with an estimate of what might happen on a project in advance of the delays actually unfolding

and does not generally take into consideration concurrent delays and compensability matters. In a retrospective situation, an analyst should deal with the best information available, as-built data, and prepare an observational analysis to establish the "as-built" critical path to project completion and to apportion the source, magnitude, causation and responsibility of the associated critical delays to the responsible parties. An exception to this may be when a contract requires the use of a particular type of analysis in a retrospective or forensic situation. In such cases, it is advisable to perform both the Prospective analysis and a more appropriate retrospective analysis.

It is important for a schedule delay analysis to take into consideration delay mitigation. In a prospective analysis, potential mitigation should be accounted for in the development of a fragnet and addressed during negotiations. Retrospectively, contractor mitigation should be analyzed to determine the true effect of any delays in question.

ABOUT THE AUTHORS

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