BEWARE THE DARK ARTS!
DELAY ANALYSIS AND THE PROBLEMS WITH RELIANCE ON TECHNOLOGY

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‘Beware the dark arts’ was the sage advice of Albus Dumbledore to the young Harry Potter. Besides budding wizards, construction clients (at the project or dispute resolution stages), contractors and lawyers would be equally well served by this advice when it comes to the difficult subject of delay analysis.

Project scheduling (programming) in general, and delay analysis in particular, suffers from its own particular technical jargon, with terms such as ‘critical path’, ‘free float’, ‘logic links’ and ‘concurrent delay’ being cited with free abandon. Moreover, delay analysis, like Lord Voldemort, comes in many guises and it seems there is a spell for every circumstance. ‘What would you like conjured … err … proven, sir? Let me just mix up some ‘fragnets’, ‘lags’, eye of newt and … hey presto!’

Let us also not forget the delay analyst’s best friend, the computer. One speculates at times about who is controlling who. Is it any wonder that scepticism about delay analysis is rife? The irony is that it all stems from a most practical industry, construction.

This paper seeks to assist the sceptics, by providing some general clarity as to what each of the commonly used delay analysis techniques are, what they do, what they do not do, and when they may appropriately be applied; it also discusses the relationship between scheduling and technology.

Delay analysis methods

There are five commonly used delay analysis techniques:¹

- Impacted as-planned method;
- Time impact analysis method;
- Collapsed as-built or ‘but-for’ analysis method;
- Snapshot/windows/time slice analysis method;
- As-planned versus as-built windows analysis method.

¹ A word of warning about titles – there are no set, or agreed, labels for the various delay analysis methods employed today. One might find that certain analysts use the term ‘time impact analysis’ when in fact they are using the method I refer to as ‘time slice analysis’. Indeed in recent important judgments about delay (particularly Mirant & City Inn) the titles used by the programming expert witnesses and referred to by the judges are at odds with the descriptions I set out in this section. I suggest that one should never presume to understand the analysis technique employed by an analyst simply on the basis of what label he gives his analysis, rather one should investigate the technique to establish a clear understanding of the methodology employed.
Each method is discussed below in terms of technique and application. However, it is first important to provide some definitions.

**Prospective v retrospective**

Delay analysis techniques are either ‘prospective’ or ‘retrospective’. Prospective analyses refer to the future, and seek to determine the likely impact of actual progress or a particular event(s) on project completion. Retrospective analyses refer to the historic, and usually seek to determine the actual impact of events upon progress and completion.

**Dynamic v static**

Dynamic analyses involve schedule calculations, through simulation using computers and scheduling software. Static analyses rely on the components and common sense of the schedule while avoiding significant computer calculations.

**Baseline schedule**

This is the schedule which best represents how the contractor intends to satisfy its responsibility to complete the works within the contract period. This schedule can sometimes be engrossed into the contract; more often, it is required to be produced and agreed shortly after the contract is awarded (such as a Clause 14 programme under most civil engineering forms of contract). In the absence of a clear contractual baseline schedule, it tends to be the schedule prevailing at the time the contract is awarded or work commences on site. Determining the baseline schedule is a matter of reasonable and objective analysis, with the contract documents being the first point of call.

**Networked schedule**

A networked schedule is one that has been produced in scheduling software, such as Primavera or Microsoft Project. It will contain activities (representing the work content) and logic links (representing the relationships between activities). The combination of software, activities and logic links will allow the schedule to be updated with progress data, and will enable the effects of change to be simulated.

Turning now to the most common methods of delay analysis:

1. **The impacted as-planned analysis method**

The overall thrust of this method is to establish the hypothetical impact of delay events on the baseline schedule. It is a ‘prospective’ analysis method. It is also a ‘dynamic’ method, and therefore requires a networked schedule. The delay events that the analyst wishes to model are introduced into the baseline schedule, and linked in an appropriate manner.\(^2\) Having incorporated the

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\(^2\) For example, if during excavations access to the site was denied for a week, then the delay event could be introduced by imposing on the excavation activities a ‘no-work’ calendar constraint for that week. Alternatively, a new one week long activity entitled
delay events, the schedule is then modelled/recalculated. Any resultant impact upon completion is determined to be the critical delay impact of the introduced delay event(s).

There are really only three significant tasks required of the analyst in carrying out this technique. Firstly, he must establish that the baseline schedule was achievable, otherwise the hypothetical delay he calculates may not be correct – for the simple reason that some or all of the delay he has calculated may have been inevitable notwithstanding the delay event. Secondly, the analyst will need to ensure that the schedule is suitable for dynamic simulation. Most project schedules are not. It is usually the case that the analyst will have to make adjustments to the schedule’s logic, particularly in replacing applied constraints, so that the activities can react appropriately during the recalculation process. Thirdly, the analyst must establish the nature, extent and relationships of the delay event(s) to be introduced, so that it can be appropriately linked in the schedule.

The impacted as-planned analysis method enjoys the benefit of simplicity, and will therefore be inexpensive to prepare. Its disadvantages, however, are substantial particularly when used in post contract disputes.

Obviously this technique does not establish whether delay to completion was actually incurred as a consequence of the modelled delay events. My experience is that most decision makers (be they judge, arbitrator or adjudicator) are primarily interested in this key causation factor. Moreover, this technique does not even establish if delay was likely to occur as a consequence of the introduced delay events, because it ignores the effect of actual progress on the works, or schedule for the works, up to the time of the event. The timing of the delay event is just not considered: it is possible that at the point in time when the delay event occurred it was unlikely to have any impact upon project completion due to progress or events elsewhere. Moreover, it is widely recognised that the impacted as-planned analysis method lacks balance and fairness because it typically includes only one party’s delay events, while at the same time assuming perfection from the other party.

My view is that this method should only be employed when the contract specifically requires its use, or perhaps where the delay events being modelled are all incurred right at the outset of the project.

One interesting question, however, is whether this method might be used to model the effects of unforeseen conditions which are later discovered. The principle being that these delay events did actually exist at the outset, and the works related thereto were inevitable, just nobody knew about them.

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3 A constraint relates to an absolute condition that can be assigned in schedule software to an activity, for example ‘Activity A may not commence before 1 October 2008’. Such constraints have the potential to skew the results of any change simulation exercise.
2. The time impact analysis method

I have devoted more of this paper to the time impact analysis method than the other methods because it is the method recommended by the SCL Delay and Disruption Protocol,\(^4\) and it is presently used extensively. Like the impacted as-planned method (discussed above) this is both a ‘prospective’ and ‘dynamic’ method. However, time impact analysis overcomes some of the key disadvantages of the impacted as-planned method, insofar as it takes account of the effect of progress and the timing of delay events on the works.

The time impact analysis method therefore requires good as-built data with which to update the schedule. If detailed and regular progress data is not available then it is unlikely that this method can be used.

The time impact analysis technique is precisely the same as the impacted as-planned method (discussed above) but with the following highly significant variant. For each introduced delay event the ‘networked’ baseline schedule is first updated with progress to a point in time just before the delay event arose (for example, the day upon which a specific variation instruction was issued). If the updated schedule identifies a delay to completion this is registered (say, five days). The delay event is then introduced into the schedule to establish the likely impact upon completion, given the status of the works at the time the delay event arose – using exactly the same technique as described under the impacted as-planned method above. The schedule is recalculated, and the new calculated delay to completion is registered (say, 15 days). It follows, in the example, that the incremental likely delay to completion due to the delay event is ten days. This is an iterative process repeated for each and every selected delay event.\(^5\)

In principle this is an appropriate method for use during a project, and it usually sits in harmony with most standard delay/extension of time contract clauses (in their contemporaneous project context). In this connection, the difficulty is not the principle behind the method but its reliability, more of which later.

The application of this method in post-contract dispute resolution is deeply questionable, however. Proponents of the SCL Protocol will not appreciate this view, as the Protocol states that:

‘[Time Impact Analysis] is the preferred technique to resolve complex disputes related to delay and compensation for that delay.’\(^6\)

‘The Protocol recommends that this methodology be used wherever the circumstances permit …’\(^7\)

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\(^5\) Where there are a great number of delay events to be introduced, analysts will tend to impact the monthly schedules with the events that arise in that month, rather than create numerous ‘eve’ schedules.

\(^6\) *SCL Protocol*, see note 4, paragraph 4.8.

\(^7\) *SCL Protocol*, see note 4, paragraph 3.2.11.
‘… in deciding entitlement to EOT, the adjudicator, judge or arbitrator should so far as is practicable put him/herself in the position of the CA [Contract Administrator] at the time the Employer Risk Event occurred.’

In the post-contract dispute, it is perhaps incongruous to establish the likely impact of something that has already occurred. The delay events complained of have happened in the past. The impact of these delays should be a matter of fact, and provided the information is available, capable of analysis and determination. I once heard a leading arbitrator QC put it more eloquently; ‘Why look in the crystal ball when you can read the book?’

Time impact analysis can be used to demonstrate why a significant switch in emphasis or strategy occurred at a particular point in time: ‘as a consequence of the likely impact of Delay Event X, we re-sequenced’. However, assuming the analysis was not carried out contemporaneously, it seems to me that the true justification for such a switch will either be a matter of fact or impression. Time impact analysis may be used to back up such evidence, but perhaps should not be used as primary proof.

It has been my experience that arguments in favour of the use of prospective time impact analysis in post-contract delay analysis tend to rely on the usual, and indeed sensible, contract provisions that require contemporaneous notice, particulars and/or assessment of the entitlement to an extension of time. It can be argued that such a justification for a prospective approach usually takes these contract provisions out of context. Experienced project managers and planners are well aware that these provisions are there to facilitate contemporaneous project and contract management, and to provide a balanced and fair approach to resolving what can be complex programming matters in a timely manner, which will facilitate the future planning of the works. These provisions are drafted in the knowledge that one has to operate in imperfect circumstances during the course of the project and rely where necessary upon estimates. These provisions recognise, indeed are motivated by, the situation that the full matrix of facts relevant to delay and progress will not be available until after the event.

If either party has not operated these provisions, for whatever reason, during the currency of the works, then it follows that the full matrix of facts will be available by which to assess delay and extension of time entitlement. The assessor is then in the fortunate position that he can proceed not on the imperfect world of estimates, but on the basis of fact (including taking account of whether mitigation measures were actually employed). In such a manner, a fair and balanced assessment can be achieved.

The aspect of the SCL Protocol’s recommendation of time impact analysis that bothers me most is the relationship between the following statements (all of which I individually agree with):

‘Entitlement to an EOT does not automatically lead to entitlement to compensation …’ and ‘… compensation for prolongation should not be

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8 SCL Protocol, see note 4, paragraph 4.19.
paid for anything other than work actually done, time actually taken up or loss and/or expense actually suffered.’

‘… the amount of EOT [determined by Time Impact Analysis] may not precisely reflect the actual delay suffered by the Contractor.’

‘Time impact analysis … is generally the most time-consuming and costly when performed forensically.’

What one can take from this is that the best one can do from a time impact analysis is secure an extension of time, and presumably relief from liquidated and ascertained damages (LADs): forget, however, about recovering loss and expense associated with delay. Having spent a fortune on the initial analysis, the poor old contractor has to go back to the delay analysis drawing board (certainly if he hopes to recover damages, which he usually does!). Perhaps the SCL Protocol drafting committee might have considered suggesting that a less expensive and more useful (in recovery terms) delay analysis be carried out first. This could then be followed up with a time impact analysis if there was a legal basis for getting relief from LADs beyond the excusable actual delay suffered (for which an extension of time has already been established by the preceding retrospective analysis).

In my view, the unfortunate ringing endorsement of time impact analysis in the SCL Protocol does not serve the industry at large but rather the delay analysts required to satisfy the recommendation. However, I recognise there may be circumstances where an after-the-fact analysis of ‘likely’ delay assessed by time impact analysis is required, and certainly I applaud its use contemporaneously.

Experience tells me that time impact analysis is difficult to produce reliably. To do that the following criteria need to be satisfied:

- The baseline schedule (which is hosting the analysis) must be shown to be achievable before embarking on the analysis;
- The logic in the schedule must be capable of correctly simulating the likely effect of the delay event. The significant potential for skewed results arising from inappropriate programming logic must be removed;
- The progress/as-built data incorporated into the schedule must be detailed and accurate;
- The remaining planned sequence of the schedule for each time slice prior to impacting the delay event must reflect the contractor’s known future intentions;
- The delay events to be introduced should be based only upon information known at the date of the time slice;

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9 *SCL Protocol*, see note 4, Core Principles 14 and 16, page 8.
10 *SCL Protocol*, see note 4, paragraph 4.8.
11 *SCL Protocol*, see note 4, paragraph 4.16
12 That is, the point in time of each iterative analysis; usually the day on which the particular delay event arose.
o All known delay events as of the data date of the time slice (irrespective of whether they are the liability of the employer or the contractor) should be taken into account, both in terms of progress updating and future forecasting.

One final comment regarding time impact analysis relates to the sequence in which numerous delay events are introduced. The key factor is usually the date upon which the delay event manifested itself. This can be very subjective of course: was it the date the signed variation order was issued, the date the contractor first became aware a change would be forthcoming, or the date when the designer first realised the need for change, etc? Time impact analysis methodology says that the delay events should be inserted strictly in chronological sequence. At first blush, sensible! However, consider the following example:

- On day 3, the contractor starts excavating the foundations of a building;
- On day 5, a variation is issued to the flagpole atop the building (which is scheduled to be installed 18 months hence) – the likely resulting delay is 50 days;
- From days 10-40 the contractor suffers 25 days of culpable delay to the building during the excavation works;
- On days 50-70 weather (neutral event) resulted in a suspension to the works;
- Assume the rest of the project went according to plan, and the flagpole arrived as expected 50 days late.

A mechanistic delay analysis methodology will ensure that both the contractor’s culpable delay and the neutral weather delay are concealed by something which may be happening far in the future, despite the fact that the two earlier delays will actually be critical. I believe this is generally inappropriate.

3. The collapsed as-built or ‘but-for’ analysis method

Unlike the previously discussed ‘impact’ methods, the ‘but-for’ analysis method is ‘retrospective’.

This method should have the benefit of working from the full factual matrix. The host schedule for the analysis should be a detailed and accurate as-built schedule. The ‘but-for’ method is however ‘dynamic’ (see definitions above) and therefore requires a networked schedule. As one would expect an as-built schedule has no programming logic (ie linked activity relationships). While the as-built schedule may have been produced during the project by progressively updating the baseline schedule (which would contain the original links), the influence of these links will have been entirely overwritten in the updating process.

The key difficulty in this method of analysis is in developing retrospectively the logical relationships between as-built activities. Rarely is this a simple
exercise: indeed on a complex project, such as a building involving extensive fit-out, it is near impossible.

Assuming, however, that the logic between as-built activities can be developed appropriately, the next task is for the analyst to identify the incidence of delay within the activities on the as-built schedule. For example, one might identify that remedial works were required as a consequence of a defective roof installation, which served to extend the overall roof installation activity by three months. The analyst, usually with some schedule fettling work, then ensures that the delay aspect of the relevant activity can be removed, in order to simulate what the as-built schedule would have looked like if the delay event had not in fact occurred. Using the example above, if the completion date of the whole project improved by a single month due to the removal of the three month delay to the roofing works, then the conclusion is that the incremental critical impact of that delay event is one month.

While this method is comfortably based upon the facts, it should be kept in mind that the conclusion reached is a hypothesis and not a fact. A practical, common sense and intensive review of the hypothetical conclusion must be undertaken. Perhaps the sequencing of the works would have been entirely different had the event not occurred, and therefore simply extracting a discrete delay event does not represent fairly the ‘but-for’ hypothesis.

The collapsed as-built method very much favours a defensive view point, largely because most schedules involve a significant number of activities and sequences which culminate in completion. The collapsing of one particular path or sequence, in my experience, will rarely lead to any significant improvement in the completion date. The next available near-critical path will simply pop up and prevent any substantial collapsing. This method is therefore often used, perhaps unfairly, to demonstrate to a contractor that it would have been substantially late in any event.

This method can only be used satisfactorily in very discrete circumstances, such as where the key delay being addressed is very close to the end of the project, or where the project is wholly linear in nature (eg a simple tunnelling project).

4. **Snapshot analysis method**

This method is sometimes referred to as the time slice method or the windows method. This is also a ‘retrospective’ and ‘dynamic’ analysis method. It requires both a networked baseline or host schedule, and good as-built data to allow progressive updating.

Simply put, the baseline schedule is updated at regular intervals, usually monthly. Each update provides a ‘snapshot’ of status at that point in time, and from which one can discern two important pieces of evidence. Firstly, the sequence of activities which represents the critical path to completion at that date, and secondly, the extent of actual delay incurred to completion as at that date.
To take an example, assume a ‘snapshot’ schedule update of 1 June 2008 shows that there is no delay to completion, and the critical path runs through the façade installation. Then a ‘snapshot’ schedule update of 1 July 2008 shows that there is a ten day delay to completion and the critical path continues to run through the façade installation. The analyst will conclude at this point that ten days of critical delay were incurred in this period and these delays relate to the critical façade installation activities. Thereafter a forensic trawl through the critical path façade records for the period should usually reveal the causes of the ten day delay. If the critical path changes between updates, one usually tries to establish (through more interim snapshots or objective pro-rating) where the switch occurred.

This method can be very effective and reliable, provided that the snapshot schedules accurately and reasonably reflect the status of the works on the respective dates. There are three criteria that influence the analysis’ reliability. Firstly, the baseline or host schedule must be detailed and ‘networked’ (see the explanation above). The logic relationships within the schedule electronic file must facilitate reasonable and practical conclusions: the potential for skewed results is substantial, and must be eliminated.

Secondly, the historic element of each snapshot schedule must be developed from accurate and detailed as-built data. Frankly, if regular detailed progress data is not available then it is highly unlikely that this method of analysis can be used. Inaccurate as-built data can substantially affect the results reached, particularly the critical path route conclusions.

Finally, the future element of each snapshot schedule should accurately and reasonably represent the status of the works on the analysis date. Too often this aspect is ignored and the analyst will rely entirely upon the original schedule’s sequencing and logic. If so, this type of method can easily be undermined.

5. As-planned versus as-built windows analysis method

This method is ‘retrospective’ and ‘static’. Windows are used to break the project into manageable sections or periods. The focus of the as-planned versus as-built windows method is to establish the incidence, extent and causes of actual delay to completion. It operates on the principle that actual delay to completion must by definition be found on the actual critical path of the project. The as-planned versus as-built windows method therefore seeks to first locate and identify the project’s actual critical path, and only then the causes of delay.

Before seeking to determine the actual critical path, the analyst needs to gain an excellent and detailed understanding of the project scope, the plan (schedule, method statements, resources etc), the actual as-built progress data and the contemporaneous records of the project, including photographs, correspondence, reports, minutes etc. Having achieved this understanding, the following progressive sequences of analysis/review are applied:
- Apply common sense in reviewing the as-built progress in the context of the plan and factual matrix;
- Apply practical planning and project management experience in reviewing the as-built progress in the context of the plan and factual matrix;
- Apply discrete schedule calculations using planning software where it is necessary to distinguish the relative criticality of competing paths. This should be used sparingly and with great care.

It is my experience that the actual critical path can be discerned on most construction projects through the progressive application of the above principles. There is no magic or ‘dark art’ to this method, and if successful the conclusions should be capable of being effectively presented and understood, even in the difficult environment of a trial. Sometimes it will be impossible to separate a couple or more of near competing paths, other than through artificially precise schedule calculations. This should be avoided; instead a range of opinion or conclusions should be produced.

Having established the actual critical path from start through completion, it can be compared to the corresponding planned activities, and from this the incidence and extent of delay can be adduced. For example, if it is determined that the critical path ran through piling into the generator slab construction, a simple comparison of the planned and actual data might reveal that piling started five days late on 1 June 2008 and the generator slab started 20 days late on 1 September 2008. Therefore it can be concluded that 15 days of critical delay were incurred in this window/time period, and the delays are to be found in the piling activities (as this has previously been determined to be on the actual critical path). From that point a careful forensic analysis of the piling records and related data will usually reveal the cause of the delay.

**Choosing a methodology**

There are effectively four main criteria for selecting which delay analysis methodology to use. These are:

- What does the contract require?
- Which approach is appropriate, correct, sustainable?
- Does a lack of information preclude the use of any of the approaches?
- Do time/cost constraints eliminate certain options?

This paper may lend some assistance in answering the second and third questions.

‘Effect and cause’ not ‘cause and effect’! One principle that I firmly support is that when analysing delay to a project, one should establish the effect first (ie the incidence and extent of delay) and only then move to establish the cause of that delay. In such a manner both accuracy and objectivity are
ensured. My experience is that an approach which starts with the question ‘what was the impact of this delay?’ (ie what was the effect of this cause) can be self-serving (whether by design or accident) and is prone to result in an incorrect conclusion.

In post-contract disputes I usually recommend a retrospective approach that is focussed on establishing actual delay. Theoretical delay is far less compelling, and of course, importantly, does not assist with the recovery of loss and expense associated with prolongation.

**Technology and scheduling**

Let us consider the modern schedule/programme on a substantial construction project. It will usually include several hundreds of work activities; indeed many project schedules will contain thousands of activities. Moreover, one can usually expect, as a rule of thumb, that at least three times as many logic relationships will be required to ‘connect’ these activities. In addition, there may be many different and discrete rules that need to be applied to specific activities or groups of activities, such as calendar rules and constraints. One might also find that the schedules are resource and/or cost-loaded, which add to the schedule’s complexity. The typical major project construction schedule might therefore contain between 1,000 and 10,000 components.

Without computer hardware and scheduling software, it would be near impossible to construct and publish a substantial project schedule wherein the timing context and relative criticality of all construction activities could be detailed and accurately established. Moreover, while one could chart-out a substantial schedule by hand, it would be extraordinarily difficult to keep it current and updated throughout the project.

So how is it, one might ask, that construction projects got completed in the days before the computer arrived on our desktops? Well, the answer is to be found in the woods and not the trees. Smart and experienced construction professionals were and continue to be adept at understanding what is approximately critical on a project, and did not concern themselves with calculating float down to the nearest single day. It mattered little to them whether a particular group of low priority activities had 150 or 175 days of float. Indeed, the best people in our industry are very capable of walking onto a construction site and judging within a short period of time what are this week’s, or month’s, critical activities. The best forensic planners are usually

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13 This is often referred to as ‘logic’, ie the rules which govern one activity’s relationship to another (eg Activity 2 ‘construct wall’ cannot commence until Activity 1 ‘construct foundation’ is complete).

14 For example, electrical installation activities may be scheduled on the basis of a five day week, whereas brickwork activities may be scheduled on the basis of a six day week.

15 Indeed, well developed schedules (through the resource loading application) will establish the durations of key work by calculating the time required on the basis of a set quantity of labour and/or equipment resources. For example, if a project has a requirement for 10,000m² of brickwork, and the contractor has available to him only two bricklayers who can each complete 75m² per day, then through the resource loading application the software will determine that 67 work days will be required to complete this work.
capable of researching the history of a well-documented project and discerning what the actual critical path was throughout the project, and while they would be greatly assisted by a CPM schedule, it is not an absolute necessity. Do not believe for a minute what many forensic planners would suggest, that the absence of a CPM schedule means one is ham-strung from determining the critical path!

So do we really need sophisticated computer generated schedules? Yes. Creating a detailed construction schedule forces us to plan and think-out the works in advance and in detail. The old carpenter’s adage of ‘measure twice, cut once’ is particularly relevant to the construction industry, and it is always beneficial to contractually insist upon detailed planning. Maintaining the schedule forces us to re-plan and optimise our resources (including time and money) in the face of progress and change. A CPM schedule allows us to quantify time on a priority basis (ie float), and this can provide very valuable insight to a stretched and stressed management team. The CPM schedule allows us to record on screen and paper what otherwise might exist only within the head of a valuable and experienced colleague (watch out for that bus!). It also provides a focus and medium for coordinating the input of all key parties, and allows us to accurately integrate the client, designers and interested third parties into the project’s strategy and tactics. Finally, the baseline schedule and its subsequent updates will usually provide the parties with an excellent basis from which to consider extensions of time and time related loss and expense issues.

So, in my view, CPM scheduling is a modern and valuable tool, and when used and applied correctly it can be very powerful. It is much better to have it than not. However, the use of technology in delay analysis brings with it a number of problems; so to the extent that it features in a dispute you are involved in, I recommend the exercise of extreme caution.

Construction schedules can be very complex, involving many thousands of components, as discussed above. Most of those components are not on display in the powerful and effective graphics that are routinely produced today, and are really only capable of being investigated by skilled planning personnel. It is very easy to incorporate a significant flaw into the schedule either by accident or design, and it can be very difficult to locate this flaw. Moreover, just one rogue component in a schedule of say 10,000 components may result in a misleading conclusion.

Most major construction contracts require that regular updates be produced. Technology allows us to update schedules in a vastly more efficient manner than was available before the computing age. However, an accurate updating exercise is still very time consuming, largely because inputting progress tends to overwrite some of the schedule’s logic, and therefore significant new logic can be required. Moreover, things change and plans need to be adjusted as the project progresses. Most schedules are susceptible to the domino effect, and therefore it is not always simple to incorporate a change in strategy or tactics. It is not unusual to discover that even ‘good faith’ schedule updates misrepresent the true mathematical contemporaneous status of the project.
Sadly, many CPM schedules (both baselines and updates) are produced for ‘tick-the-box’ purposes. The contract requires it, so a glamorous schedule is produced by the contractor and then ignored. It is not unusual to find that the contractor publishes one suite of schedules for the client’s benefit while working to his own internal schedules. Moreover, it is often the case that the project is really run on the basis of two or four weeks look ahead schedules, and upon investigation it is revealed that these bear little relationship to the overall project schedule. While technology has made it efficient to produce and publish schedules, it is wrong to presume that the published schedules are rigorous and accurate. Check the context, check the content.

As discussed above, some of the delay analysis techniques require significant adjustment to the logic within the project schedules, as well as the introduction of new activities to represent delay events. Whenever this is required, supreme caution is needed to ensure an objective and accurate result is returned. While the marriage of computing and construction planning has provided the modern project manager, planner and delay analyst with a most powerful tool from which to launch ‘dynamic’ delay analyses, great caution is needed – for therein lie the dark arts!

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‘The object of the Society
is to promote the study and understanding of
construction law amongst all those involved
in the construction industry’

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