ARTICLE

Baseline As-Planned Programme Faults

Practitioners involved in the management of construction and engineering projects will be acutely aware that, when it comes to the analysis of delay, there are an array of recognised approaches or methodologies that can be adopted to establish the impact of delay events. Most are likely to involve a review or critique of the baseline as-planned programme as the starting point.

This article looks at the use of baseline as-planned programmes as a basis for conducting the analysis of delay, considers their reliability, identifies some of the common shortcomings, and provides commentary on how to potentially overcome or rectify deficiencies.

Baseline As-Planned Programme Flaws

In the analysis of delay on construction and engineering projects, critics and analysts frequently declare that the baseline as-planned programme is 'flawed' and as such is considered to be an unreliable basis for conducting any meaningful analysis of delay, unless and until the identified flaws (which usually extend to faults, omissions and errors), are corrected.

However, in my experience, it is common for defective and/or deficient baseline as-planned programmes to be 'contractually' approved by the Employer (albeit often subject to the resolution of 'outstanding comments') at the outset of a project, and for such programmes to be routinely used as the basis for monitoring and reporting on the progress, and against which the contractor'sperformance is measured throughout the duration of the project.

It is equally common for relevant risk events to be impacted against these imperfect or flawed baseline as-planned programmes to develop and substantiate contractual claims for critical delay as the basis for establishing contractual entitlements to extensions of time (EOT).

However, if the as-planned baseline programme is not sufficiently robust the resulting theoretical outcomes generated by impacting the delay events on a flawed as-planned baseline programme for delay and EOT claims will at best be unreliable and in the worst case simply not credible.

Similarly, if the as-planned baseline programme is not sufficiently developed, the outcome of any 'what if' scenarios cannot be accurately predicted, and the consequential effects relied on.

Prospective delay analysis requires a robust programme. In the absence of a credible as-planned baseline programme, it is hardly surprising that Architects, Engineers, Contract Administrators, Project Managers and indeed Tribunals, are often not convinced by the results generated.

Common Deficiencies

From my experience, baseline as-planned programmes invariably:

- Contain no detail of how the durations of the work activities were built-up and established;
- Do not provide any indication of resource levels required to achieve the planned work activity durations or overall programme objectives;
- Have no quantities or values assigned to the planned work activities;
- Have work activities missing and/or work activities are incorrectly sequenced;
- Have missing logic linkages rendering the programme network incomplete;
- Have fixed start dates and/or fixed end dates, without reason or explanation;
- Are not related to a method statement to complement the basic concept of how it is intended to carry out and sequence the works to accord with the as-planned programme intent;
- Request construction information earlier than is necessarily needed (resulting in 'built-in' float or 'buffer' periods);
- Lack detail with regard to lead-in procurement periods from receipt of design information, preparation of shop drawings, off-site manufacture and delivery to site;
- Do not provide for the structured release of information to meet the demands of the plan;
- Have sequences of work that might be preferential (i.e. resource driven) and so are open to other equally viable permutations without detriment to the overall period;
- Have activities that include certain elements of work that are deficiently described;
- Do not define in detail the essential elements of the design information that is required to enable the works to commence and to progress efficiently;
- Do not properly correlate with the tender bid and price with respect to method, resources, quantities, output rates, plant, equipment, calendar, working hours, sub-contracts and the like;
- Do not identify periods of available float on non-critical activities;
- Do not provide for any 'learning curve' allowance on repetitive work activities, with as-planned progress predicted as constant from start to finish;
- Group together elements of the works for certain activities without any consideration of the complexity of the coordinated sequence of the operations (e.g. MEP works); and
- Contain inconsistent durations for activities of similar work content.

The above are likely to generate concerns from the outset as to whether the baseline as-planned programme is either practical, feasible or achievable.

These issues commonly arise, in part, because there are many aspects of the baseline as-planned programme that will merely be indicative of what the planner drafting the programme felt was appropriate at the time, based on the planner's experience, ability, knowledge and the available information. Often the planner will have very little input or assistance from other key members of the project team, because they may have joined the project late, having been detained on 'closing out' previous projects, or for other similar reasons.

A further constraining factor facing the planner is that, when the baseline as-planned programme is being prepared early in the project, many of the key sub-contractors and suppliers will not yet have been selected and hence design periods, procurement lead-times and work package durations will not have been established.

Accordingly, when the sub-contracts and/or purchase orders are eventually placed, the design, procurement and installation activity strings, sequences and durations might differ to what had originally been planned based on the planner's initial assumptions.

Given such circumstances, the baseline as-planned programme should be amended to accord with the latest information as and when it becomes available. However,

by this time, the baseline as-planned programme may well have already been completed, issued and approved, and so becomes the contract master baseline as-planned programme, complete with all its deficiencies.

Baseline As-Planned Programme Reliability

A robust and reliable baseline as-planned programme would need to address the common deficiencies identified above to ensure that, as far as is practicable, it is free of faults and flaws, in order that the work activities, dependencies, and critical path accurately reflect the true criteria for the sequencing of the works.

In reality however, there are often numerous permutations as to how the works can be planned and sequenced. Also, there can be considerable vagueness, doubt and uncertainty when planning a project with multiple different influencing factors. This makes it almost impossible to develop a perfect model programme, that will accurately generate the consequential effects of progress and any delay events or failings on the part of the parties.

It is generally accepted that without a 'crystal ball' it is not possible to predict the future with any degree of accuracy for more than a brief period of time, even more so when it comes to complex one-off construction projects. Similarly, there is often an over-expectation of what a fully logic linked and networked as-planned programme can provide.

After all, an as-planned programme is essentially the planner's 'best guess' or an estimated forecast of what can be expected to happen in the future, based on current circumstances, what is known at the time and the extent of information that is contemporaneously available.

Of course, as the quality of the information improves, more detailed information becomes available, changes are introduced, different methods of working are recognised and alternative construction methods and sequences are realised, the programme of future intent will inevitably require adjustment. This process of refinement of the as-planned programme is often referred to as 'adaptive dynamic planning'.

It is acknowledged that the criticality of the works evolves and often changes as the project progresses. Accordingly, diligent ongoing planning and monitoring of the work is required to ensure that adequate production resources are allocated to the critical path activities to meet the planned outputs.

Despite this, it is often the original as-planned intent that forms/sets the contractual foundation for prospective delay analysis and the formulation of EOT claims, and so the baseline as-planned programme needs to be both reliable and credible.

Baseline As-Planned Programme Credibility

It is widely recognised that the programme should ideally:

— Be developed at an early stage;

— Incorporate all the elements of design;

— Afford adequate lead-in procurement times;

— Include all work activities;

— Utilise proven output rates;

— Coordinate the various trade interfaces;

— Be logically sequenced;

— Have a sensible Work Breakdown Structure (WBS);

— Create appropriate working calendars;

— Make allowance for any influencing factors (e.g. weather);

— Establish methods of execution;

— Allocate adequate labour resources;

— Ascertain the material requirements;

— Determine plant and equipment required;

— Allow for all temporary works requirements;

— Identify the critical elements of work; and

— Be costed to allow the generation cash-flow curves.

By accommodating the above, the planner will be able to generate the best/optimum credible programme solution for the project.

So Why Is This So Rarely Achieved?

It can be, but it will be dependent on the key information being available at an early stage, greater visibility of the complete design, access to materials take-offs, an accurate ground condition survey, a reliable and consistent labour force, predictable weather patterns and tried and tested output rates, amongst other criteria.

However, such predictable conditions are more akin to those achievable in a controlled factory environment where repetitive working with little deviation is common. It is unlikely that such predictable programming parameters would manifest on complex outdoor

construction projects due to a plethora of unpredictable variables.

With particular regard to calculating activity durations for developing as-planned baseline programmes, it seems that if a planner, was contractually obligated to calculate the duration of the work activities from:

— The quantities of work to be undertaken;

— The anticipated output/productivity rates; and

— The number of operatives assigned to the tasks.

Then this would dictate the need for more accurate project information to be generated from the outset and so ensure that the baseline as-planned programme would be developed from and be supported by robust back-up metrics and build-up data that would more realistically represent the planned intent.

As-planned programmes that are developed subsequent to both the tender and the contract baseline intent, tend to be more accurate and reliable, but often will not have any contractual status and therefore are unlikely to be accepted as the basis for establishing EOT entitlements.

This, no doubt, is probably why Tribunals of late favour the factual analysis of delay based on as-built records, as opposed to a theoretical analysis based on unreliable, defective and deficient baseline as-planned programmes, which have no basis in reality and can easily be criticised, undermined and de-constructed under cross-examination.

CLIVE HOLLOWAY
Senior Director
Contruction Solutions
+852 3769 4717
clive.holloway@fticonsulting.com