

Assessing time effects of variations and change in quantities

PHILIP ALLINGTON – DIALES EXPERT, SUMMARISES A TALK DELIVERED IN OCTOBER 2014 TO THE LIGHTHOUSE CLUB CONFERENCE IN HONG KONG, WHICH CONSIDERED MANAGING CHANGE IN CONSTRUCTION.

The Nature of Change

Change affecting time in construction contracts may be in several forms. It commonly starts with changes in the quantity of described work or corrections to documents, bills, and drawings; and commonly results in effects on the contractor's methods and sequences, or the work and sequences of others. There may be change from imposed restrictions, altered works sections and dates, or from unexpected natural events. As a matter of organisation the contract should define the extent of work, the authority to impose change, and the process or remedy for dealing with disturbance to the programme.

Effects and Remedies

Programmes may be disturbed in one of three ways.

- Delay that results in overrun (where it is critical delay).
- Reduced working efficiency - disruption.
- Mitigation required to overcome the disturbance - acceleration.

For the contractor, all three generally result in additional cost as well as the effects on timing. The costs may be reimbursable if the disturbance can be established as a recognisable default by the employer. But, while contracts neatly parcel up defaults and remedies, the incremental nature of change on site can be difficult to fully account for¹.

Systems of Analysis

Many techniques have been developed for analysing programme disturbance. They differ in the focus of their output and complexity in use. Their selection may be considered relative to key criteria.

- Desired outcome - Whether the remedy is extension of time (EOT) or the costs of prolongation, disruption, mitigation, and acceleration; for example, different systems of analysis are more or less applicable.
- Availability of information - Information required for systems of analysis increases with complexity (which may affect the ability to complete the analysis).
- Dispute Process - Different dispute resolution processes have varying requirements for time, depth, and accuracy in analysis.
- Appetite - As systems vary in complexity they also vary in the time and costs to complete them. How far will you go?

Contracts

Contracts and commentaries tend to focus on delay and EOT. They may set out types of events and requirements for the contractor to give notice of likely, or actual, effects. There may be a requirement to provide event particulars - either complete or ongoing - and on receipt, the contract administrator will consider entitlement to EOT and give a decision. For all of this, timescales and systems may be specified.

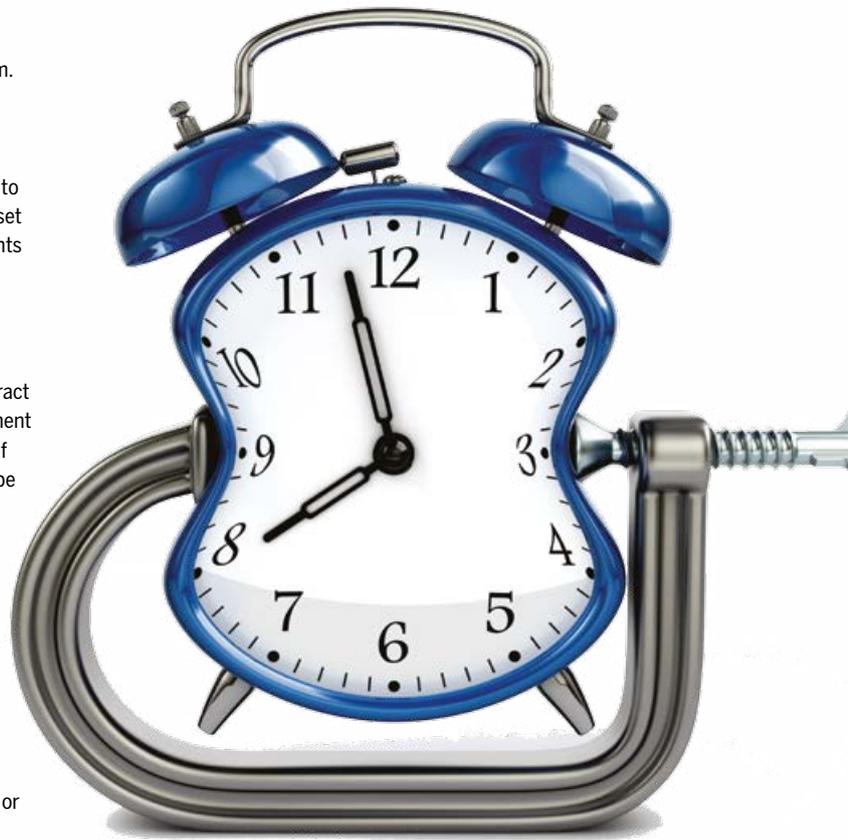
Contracts and commentaries generally have less to say about disruption, which may be no more than an implied term whereby the employer is not to hinder the contractor's progress of the agreed works. The remedy tends to be for settlement through the cost clauses, either through adjustment of the bill of quantities (BOQ) rates or actual cost.

Advice on Methods of Assessment

From the turn of the century, a debate on systems of analysis has raged, but it is noticeable that it has been focused on the analysis of EOT entitlement. Considerably less has been said regarding disruption analysis. This is an odd situation, since many more contract variations will have disruptive effects than lead to critical delay. A prime reference is the UK Society of Construction Law's (SCL) Delay and Disruption Protocol,

an advisory document published in November 2002. The largest part of the Protocol concerns EOT-oriented delay, whereas only two pages relate to disruption. As Bailey says²:

What, however, is signally absent from the Protocol in relation to disruption is the type of detailed recommendations that the Protocol offers in relation to delay. So, insofar as delay is concerned, the Protocol recommends that the Contractor be required to submit to the Contract Administrator a "properly prepared



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programme” which, if kept updated during the course of a project, may be used as a basis for assessing any EOT applications that the Contractor may make. In relation to disruption, the Protocol makes no equivalent recommendation. It simply entreats contractors to keep adequate records to demonstrate the existence of disruption.

For disruption, the Protocol describes work carried out less efficiently, loss of rhythm, out of sequence work, congestion, stacking, etc. It entreats contractors to make prompt notices and keep good records to allow the contract administrator to make assessments. Compensation for disruption caused by variations should be agreed as soon as possible after completion of the variation – suggesting a retrospective analytical process.

For analysis, only the ‘Measured Mile’ technique is highlighted; whereby a period of relatively uninterrupted or efficient progress is compared to an interrupted and inefficient period and tied to disruptive events.

The New Engineering Contract (NEC) offers a different process and timing under the umbrella of ‘Compensation Events’³.

- Clause 60.1.1 notes changes to the Works information through instruction.
- Clause 61.3 requires notification regarding changes in prices or dates and sets a time limit.
- Clause 63.6 discusses the assessment of the effects of the notified compensation events.

Kennedys⁴ advises that such events include disruption and that

the contractor must show that issues have a good chance of occurring. Since, under NEC, assessment should be based on the current programme and earlier versions are disregarded, the analysis of disruption must be prospective (contrary to the scheme in the SCL Protocol).

A final piece of advice is given by Bailey² as follows:

If, at the outset of a project, a contractor were required to provide an indication of its anticipated productivity levels, and the basis upon which it had calculated or estimated those productivity levels, and if during the course of the project the contractor’s actual productivity levels were then determined (to provide a “measured mile”, of sorts), one would expect the incident of disputes over disruption to be reduced, as the contractor’s productivity levels will be monitored by itself and the contract administrator throughout the course of the project. This could be expected to be a pro-active measure for managing disruption issues, just as the Protocol advocates the pro-active management of delay issues.

Considerations affecting assessment strategies

The high degree of certainty, assumed by complex systems of programming analysis, is often misplaced due to uncertainty commonly found in construction projects.

This applies to disruption through variations as well as delay analysis.

Where change is through variations, contracts point to valuation starting with the bills of quantities. The prices in the bills should include rates for labour and equipment. However, Sims and Powell-Smith⁵ note that ease of change creates a lack of incentive to make firm design decisions before the work starts. This also relates to an ethical issue, described by Judge Thornton (after Uff QC)⁶, where information gaps at tender stage lead to delay, disruption, and a failure in risk identification and allocation.

The apparent certainty of a bill of quantities disguises the reality that it is actually an approximation. But that problem notwithstanding, the first challenge is to ensure that the programme explicitly relates to the bill items. In the event of change, the



challenge is to be able to identify a measurable difference between the original and the varied programme. Also, in making a claim for loss of efficiency, one has to show that the programme represented the optimum and achievable efficiency, and that this is reduced by the changes (Pickavance 2000).

Considerations in activity planning and disruption analysis

A construction project planner seeks to define the work in terms of activities, their interrelationships, and durations. This may be through estimation considering scope and influence of several factors:

- Quantity of work broken down to work activities.
- Production rates (and their reliability).
- Resource/method practicality in the project work situation.
- Environment at the actual location.
- Efficiency, motivation, and skill.
- Constraints on the organisation, methods, and working times.
- Competence of planners at different supply chain levels.

It is possible to compile programmes on limited information; for example, defining only activities and relationships with assumed durations. But this provides insufficient reference for making disruption claims, which rely on demonstration of productivity. Similarly, for a claim for disruption the records should match the plan, with the addition of records to show the cause of the variance in achievement. Bar charts may be supplemented with process information in, for example, production S curves measuring effort

or achievement against time. As-built bars may be treated in the same way. Comparison of the planned and as-built production information will show achievement ahead or behind the plan – the beginning of a disruption or acceleration claim⁷.

Summary

Programme disturbance through change and variation leads to disruption as well as delay. Debate and advice has been limited by focus on EOT entitlement analysis, while disruption has been left behind despite its prevalence in life on site. Notwithstanding uncertainties, construction project planning should fully address process and output as well as linear time measurement. Records are important and they should include evidence of production achievement and events affecting it. ■

¹ Readers wanting to investigate this further may consult Pickavance’s chapter on variation and change including the section on constructive change: Pickavance, K. (2000) Delay and Disruption in Construction Contracts – second edition, Pub LLP.

² Bailey J (2014) The SCL Delay & Disruption Protocol: A Retrospective Analysis. – paper for the Construction Law International Conference, Kuala Lumpur Sep 2014.

³ NEC3 Core Clauses April 2013 Section 6 – Compensation Events.

⁴ Kennedys Law LLP (2014) – Construction E-Update, NEC3: managing time and risk Jan 2013.

⁵ Sims J and Powell-Smith R (1988) Building Contract Claims 2nd edition, Chapter 3, Variations – Pub. BSP Professional Books.

⁶ His Honour Judge Thornton A (2003) Lessons in Civility, article in Building Magazine 28 November 2003.

⁷ See also Schumacher L (2012) Loss of Labor Productivity: Quantification Methods and Practical Considerations. Arcadis’ Construction Claims Solutions Newsletter Spring 2012.