

How CPM Scheduling Techniques Are Used to Prove Delay

Prepared by:
Victor F. Luke, Esq.
Gibbs Giden Locher Turner Senet & Wittbrodt LLP



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HOW CPM SCHEDULING TECHNIQUES ARE USED TO PROVE DELAY

Generally, the first step in proving a delay claim is to determine the as-planned schedule, which depicts how the contractor planned to perform the project, which usually consists of the original approved schedule for the project. The second step is to prepare the as-built schedule, which depicts how the project was actually built. That schedule is prepared from contemporaneous project records (i.e., schedules, daily reports, minutes of meetings, correspondence, transmittals, photographs, videotapes, payment applications, testing lab reports, etc.). The third step is obvious: one compares the differences between the as planned schedule and the as-built schedule to illustrate which critical activities were, in fact, delayed.

The final step is to prepare the entitlement schedule, which shows the delays for which the contractor is entitled to recover damages. This is a crucial step, as it requires an analysis of why the activities on the critical path were delayed and who was responsible for those delays. This, likewise, is determined by a detailed review of the project documents, coupled with interviews of the percipient witnesses. Entitlement schedules are usually one of two types: an as planned schedule extended by owner-caused delays, or an as-built schedule collapsed by removing owner-caused delays, thereby depicting the date by which the contractor could have completed the work but for the owner's delay.³⁸

In doing a critical path delay analysis, one must also consider concurrent delays; that is, contractor-caused delays that are concurrent with owner-caused delays. If the owner causes a delay to an activity on the critical path, but the contractor is simultaneously delaying the same work, then the contractor will not be entitled to any compensation. The reasoning is that the owner's concurrent delay is immaterial because those critical activities would have been delayed regardless by the contractor. Several cases can be cited to support this principle.

In *John Murphy Construction Co.*,³⁹ the Agricultural Board of Contract Appeals (AGBCA) denied the contractor's delay damages claim, stating that “it does not appear from the record that but for the government caused delays the contractor could have completed the work on time.... The contractor was at least concurrently responsible for the delay.”⁴⁰ In *Fischbach & Moore International Corp.*,⁴¹ the ASBCA stated: “[I]t is axiomatic that a contractor asserting a claim against the government must prove not only that it incurred the additional costs making up its claim but also that such costs would not have been incurred but for government action.”⁴²

The effect of concurrent delay was also explained in *Cline Construction Co.*⁴³ as follows:

Concurrent delay does not bar extensions of time, but it does bar monetary compensation for daily fixed overhead costs ... because such

³⁸The entitlement schedules can be used to calculate delay damages (Cannon Constr. Co., ASBCA No. 16142, 72-1 B.C.A. (CCH) ¶9404), evaluate acceleration claims (Kenneth Reed Constr. Corp., ENGBCA Nos. 2748 et al., 72-1 B.C.A. (CCH) ¶9407), and assess liquidated damages (Hardeman-Monier-Hutcheson, ASBCA No. 104444, 67-1 B.C.A. (CCH) ¶6158).

³⁹AGBCA No. 418, 79-1 B.C.A. (CCH) ¶73,836.

⁴⁰79-1 B.C.A. (CCH) ¶73,836, at 13,836.

⁴¹ASBCA No. 18146, 77-1 B.C.A. (CCH) ¶12,300.

⁴²77-1 B.C.A. (CCH) ¶12,300, at 12,300.

⁴³ASBCA No. 28600, 84-3 B.C.A. (CCH) ¶17,594.

costs would be incurred on account of the concurrent delay even if the government responsible delay had not occurred.⁴⁴

Of course, there are occasions when there are concurrent delays, but the owner delays or the contractor delays are of different, though perhaps overlapping, durations. With modern CPM scheduling techniques, these events can be graphically depicted so that the party responsible for the longer delay can be made to bear the expense of the extended delay beyond the other party's shorter, concurrent delay. The burden of proof for both the owner and the contractor in such circumstances was explained in *Bigelow, Inc.*⁴⁵ as follows:

The government has the burden of proof with respect to the contractor's failure to perform pursuant to the terms and conditions of the contract. If this proof burden is satisfied and the contractor believes that its failure is excusable, then the contractor has the burden of coming forward with proof that the performance failure was due to causes beyond its control and without its fault or negligence. When a contractor is seeking extensions of contract time, for changes and excusable delay, which will relieve it from the consequences of having failed to complete the work within the time allowed for performance, it has the burden of establishing by a preponderance of the evidence not only the existence of an excusable cause of delay but also the extent to which completion of the contract work as a whole was delayed thereby.⁴⁶

The court in *Bigelow* went on to state:

“[T]he government, by establishing that the contract was incomplete on its due date, ... has satisfied its burden of proof with respect to the contractor's failure of performance. Thus we are left with a legal evaluation of the excuses proffered by the contractor for its untimely performance.”⁴⁷

As a result, if a contractor completes a project beyond the scheduled contract completion date, the burden of proof shifts to the contractor to explain why. This was described in *Bell Construction Co.*⁴⁸ as follows:

In order to prevail on a claim of excusable delay ... a contractor ... must go beyond mere allegations and demonstrate with credible proof the existence of certain facts and the satisfaction of certain criteria. First, there must be an identification of the work as controlling the overall completion of the contract. Second, it must be established that this controlling work was delayed by the weather. Thirdly, it must be established that the weather experienced was unforeseeable, i.e., unusually severe.

The Department of Transportation Board of Contract Appeals (DOTBCA) described the contractor's burden of proof as follows:

A contractor must demonstrate that its performance was actually delayed

⁴⁴84-3 B.C.A. (CCH) ¶17,594 at 87,661.

⁴⁵ASBCA No. 24376, 81-2 B.C.A. (CCH) ¶15,300.

⁴⁶81-2 B.C.A. (CCH) ¶15,300 at 75,737.

⁴⁷*Id.*

⁴⁸ASBCA No. 23376, 79-2 B.C.A. (CCH) ¶13,908, at 68,272.

by the government's action before it is entitled to a time extension and commensurate costs. A contractor carries this burden if it demonstrates that work on an item on the critical path to job completion was delayed by an act of the government.⁴⁹

A delay to an activity that is not on the critical path will not delay the project as a whole; only delays to critical path activities delay the project as a whole. See *Blinderman Co. Company v. United States*,⁵⁰ wherein the Court of Federal Claims stated the following:

Where, as in the case at bar, the parties use CPM to evaluate contract performance, Courts consistently hold that no proven injury results from construction delays unless it is shown that the activities delayed are on the project's critical path. *Fortec Constructors v. United States*, 8 Cl.Ct. 490, 595 (1985), aff'd, 804 F.2d 191 (Fed.Cir. 1986); *Wilner v. United States*, 23 Cl.Ct. at 244 (citing *Broome Constr. v. United States*, 203 Ct.Cl. 521, 528, 482 F.2d 829, 833 (1924)); *Youngdale*, 27 Fed.Cl. at 550 (citing *Haney v. United States*, 230 Ct. Cl. at 167-168, 676 F.2d 584; *G.M. Shupe, Inc. v. United States*, 5 Cl.Ct. 662, 728 (1984)); *Mega Constr.*, 29 Fed.Cl. at 424.⁵¹

The contractor's burden of proof was clearly stated in *Appeals of Santa Fe Engineers, Inc.*, ASBCA LEXIS 102, 94-2 B.C.A. (CCH) ¶26,872 as follows:

Thus, it is well established that appellant must prove that the changes caused some increase in the time required for performance. *Wunderlich Contracting Co. v. United States*, 173 Ct. Cl. 180, 351 F.2d 956 (1965). In this regard, the Court stated in the *Wunderlich Contracting* case: 'A claimant need not prove his damages with absolute certainty or mathematical exactitude. It is sufficient if he furnishes the court with a reasonable basis for computation, even though the result is only approximate. Yet this leniency as to the actual mechanics of computation does not relieve the contractor of his essential burden of establishing the fundamental facts of liability, causation, and resultant injury. It was plaintiffs' obligation in the case at bar to prove with reasonable certainty the extent of unreasonable delay which resulted from defendant's actions and to provide a basis for making a reasonably correct approximation of the damages which arose therefrom. Broad generalities and interferences to the effect that the defendant must have caused some delay and damage because the contract took 318 days longer to complete that anticipated are not sufficient.... It is incumbent upon plaintiffs to show the nature and extent of the various delays for which damages are claimed and to connect them to some act of commission or omission on defendant's part.' (Citations omitted; 173 Ct. Cl. at 199-200, 351 F.2d at 968-69.)

⁴⁹Appeal of Ealahan Elec. Co., DOTBCA No. 1959, 90-3 B.C.A. (CCH) ¶23,177, at 116,325.

⁵⁰39 Fed. Cl. 529 (1997).

⁵¹39 Fed. Cl. at 584.

TYPE OF DELAY MUST BE DETERMINED

Once the actual delays to the job have been determined by using the CPM techniques and analyses, the type of delay must be determined to ascertain which party, if any, is entitled to compensation or damages for the delay. All delays fall into one of three categories: (1) excusable; (2) inexcusable; or (3) compensable. Excusable delays are those caused by factors beyond the control of either the owner or the contractor; examples include weather, strikes, and acts of God. Because neither the owner nor the contractor can control this type of delay, the contractor is entitled to a time extension but no additional compensation. This is sometimes referred to as excusable/noncompensable delay.

The second type of delay, inexcusable, includes any delay that is within the control of the contractor, such as failure to properly man the job, properly schedule the work, timely provide equipment or material to the project, and other types of delay for which the contractor is responsible. Inexcusable delays do not entitle the contractor to a time extension or compensation; but in fact make the contractor liable for damages the owner may sustain, such as lost rents, loss of use, extended finance costs, and the like.

The third type of delay is compensable delay, which includes any delay to the job caused by the owner and/or by agents for whose acts and omissions the owner is responsible, such as the owner's architect or construction manager. Sometimes called owner-caused delay, examples include failure to grant site access; provision of defective plans and specifications; delays in responding to RFIs (requests for information), shop drawings, or submittals; or other acts or omissions of the owner that delay work on the critical path. For compensable delay (owner-caused delay), the contractor is entitled to both a time extension and additional compensation.

Sometimes the various types of delay will overlap, which is also referred to as concurrent delay. If an excusable or compensable delay occurs concurrently with an inexcusable delay, the overlapping portion of the delays is inexcusable because the contractor would have been unable to work due to its concurrent, inexcusable delay. If an excusable delay occurs concurrently with a compensable delay, the same logic dictates that the delay will be considered excusable, because the contractor would have been unable to work notwithstanding the owner's (compensable) delay, and therefore the contractor is entitled to a time extension.

Generally, it is owners who attempt to use concurrent delays as a defense. When the contractor submits a claim for additional compensation due to alleged owner-caused (compensable) delay, the owner will attempt to find evidence that there was a concurrent, inexcusable (contractor-caused) delay to avoid liability for delay damages. An example of this is found in *Beckman Construction Co.*,⁵² wherein the contractor contended that the owner (government) caused a constructive change in the requirements for a material-handling system, which, in turn, caused a 72-day delay in obtaining that equipment. The owner was able to present evidence to show that the contractor was behind schedule in constructing the space that housed the equipment and, therefore, could not have installed the equipment even if it had been delivered timely.

In *Cline Construction Co.*,⁵³ inaccurate contract drawings delayed the work by six weeks. The owner (government) was able to show that, concurrent with this delay, the contractor was prevented from working in any event by the failure of one of its suppliers to deliver equipment.⁵⁴

⁵²ASBCA No. 24725 (1983).

⁵³ASBCA No. 28600, 84-3 B.C.A. (CCH) ¶17,594 (1984).

⁵⁴See also Appeal of Rivera Contracting, ASBCA No. 28888 (1985); Appeal of Volpe-Head, Joint Venture, ENGBCA No. 4722, 89-3 B.C.A. (CCH) ¶22,105 (1989).

The modern trend is to apportion the resulting damages when one delay overlaps another. For example, in *Toombs & Co. v. United States*,⁵⁵ design errors required the owner (government) to stop work on one part of the project. Problems then developed with the performance of the contractor's masonry subcontractor. The initial delay caused by the government was treated as compensable, but when the problems with the masonry subcontractor became concurrent, the government was held to have no further liability for the delay.

When there is no claim by the contractor for delay damages, as when there are concurrent delays, the question arises as to whether the contractor is nevertheless entitled to a time extension so as to avoid the owner's damages claims (e.g., liquidated damages or actual damages). In *Hood Plumbing*,⁵⁶ the owner (government) delayed finalizing the terms of a contract modification, however concurrently the contractor was having problems with a supplier; therefore, the AGBCA held that delay to be inexcusable (that is, an inexcusable delay concurrent with an excusable/compensable delay). As a result, the AGBCA held that the contractor was not entitled to a time extension and therefore remained liable to the owner for liquidated damages.

For a contrary case, see *C. G. Norton Co.*,⁵⁷ in which an owner's design error was concurrent with a delay caused by the contractor's fabricator. The ENGBCA did not assess liquidated damages against the contractor; rather, it refused to attempt to allocate blame for the delay or to hold either the government or the contractor liable. It was therefore a wash. The contractor could not recover delay damages, and the government could not recover liquidated damages.

A case in which the ASBCA did apportion and allocate fault for delay is *B.D. Collins Construction Co.*,⁵⁸ in which the government issued 10 change orders that extended project completion by 153 days. During performance of the work, the contractor suffered two delays to the critical path: a 37-day labor strike (excusable/noncompensable) and a 70-day delay caused by the contractor (inexcusable). The ASBCA subtracted those two delays ($37 + 70 = 107$) and allowed the contractor 46 days of extended field overhead ($153 - 107 = 46$).

Suppose that both the owner and the contractor concurrently contribute to the *same* delay. Generally, when both parties contribute to the same delay, it is impossible to apportion fault and the result will be a wash. Neither the contractor nor the owner will be able to recover delay damages from the other.⁵⁹

Critical path scheduling may come into play in this area as well, as illustrated by *Wilner v. United States*.⁶⁰ In that case, there was an owner-caused (compensable) delay concurrent with a contractor-caused (inexcusable) delay. The contractor was able to show that the government's delay was to the critical path, whereas the contractor's delay was to a construction activity off the critical path. As a result, the contractor was allowed to recover delay damages, because the critical path of the project was, in fact, delayed by the owner but not by the contractor.

⁵⁵4 Cl. Ct. 535 (1984).

⁵⁶AGBCA No. 84-181-1 (1987).

⁵⁷ENGBCA No. 5182 (1988).

⁵⁸ASBCA No. 42662.

⁵⁹See *C.G. Norton Co.*, ENGBCA No. 5182 (1988); *Appeal of J.B.L. Constr. Co.*, VABCA No. 1799, 86-1 B.C.A. ¶18,529 (1985); *Appeal of Coffey Constr. Co.*, VABCA No. 3361 (1993); *J.A. Jones Constr. Co. v. Greenbriar Shopping Ctr.*, 332 F. Supp. 1336 (N.D. Ga. 1971). See also *Beckman Constr. Co.*, ASBCA No. 24725, 83-1 B.C.A. (CCH) ¶16,326 (1983); *S.O.G. San Ore Gardner v. Missouri Pac. R.R.*, 658 F.2d 562 (8th Cir. 1981); *Blinderman Constr. Co. v. United States*, 695 F.2d 552 (Fed. Cir. 1982); *Midstate Constructors, Inc.*, PSBCA No. 913, 81-1 B.C.A. (CCH) ¶14,898 (1991).

⁶⁰23 Cl. Ct. 241 (1991).

When delays are sequential and not concurrent and can be apportioned, each party may recover damages against the other in proportion to the net amount of critical delay actually caused by each party. This is illustrated by *Williams Enterprises v. Strait Manufacturing & Welding, Inc.*,⁶¹ a case in which a steel tower collapsed, stopping steel erection for three months. The steel erection sub-subcontractor sued the steel fabrication subcontractor; the steel fabrication subcontractor sought indemnity from the prime contractor; and the prime contractor countersued the steel fabrication subcontractor for the delay. The steel fabrication subcontractor and steel erection sub-subcontractor both contended that they were not liable for delay damages, because the contractor had concurrently delayed the project through late approvals of shop drawings for exterior precast panels. They contended that the project would have been delayed by the precast panels, even if the tower collapse had never occurred. The court found that the delays by the prime contractor in approving the shop drawings did, in fact, delay the job. The prime contractor, in its CPM analysis, showed that the tower collapse caused a 106-day delay. It also showed that only 23 days of that delay were concurrent with the prime contractor's delay in approval of the shop drawings. As a result, the contractor was entitled to recover delay damages for a net critical path delay of 83 days ($106 - 23 = 83$).

As shown above, one of the key elements in any delay analysis is the classification of the type of delay. This determines which way the damages will flow. For an excusable delay (force majeure, strike, weather, act of God, etc.), the contractor will be entitled to a time extension but no additional compensation. For a compensable (owner-caused) delay, the contractor will be entitled to a time extension *and* additional compensation. For an inexcusable (contractor caused) delay, the contractor will not be entitled to either a time extension or compensation and may be liable to the owner for liquidated or actual damages.

⁶¹728 F. Supp. 12 (D.D.C. 1990).

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