Pacing Delays – The Practical Effect on Construction Projects & Delay Claims[1]

Philip M. Spinelli[2]
&
James G. Zack, Jr., CCM, CFCC, FAACE, FRICS[3]

Abstract: This paper is focused on pacing delay, a controversial delay issue in the construction industry. Currently there is little literature on pacing delay and case law is a bit sparse. Thus, owners and contractors often find themselves at odds with one another over the practical effect of pacing delay in a delay claim situation. This paper defines the term; identifies what constitutes pacing delay; and sets forth the contractor's legal right to pace an owner caused delay and addresses the practical impact of a pacing delay, both to the project as well as to a delay claim. This paper is intended to assist in a better understanding of pacing delay and how the issue may be dealt with by both owners and contractors.

Introduction

This paper addresses a controversial type of delay that has arisen in the construction claims field known as "pacing delay". One of the authors wrote an early paper on the

---

[1] The opinions and information provided herein are provided with the understanding that the opinions and information are general in nature, do not relate to any specific project or matter and do not necessarily reflect the official policy or position of Navigant Consulting, Inc. Because each project and matter is unique and professionals may differ in their opinions, the information presented herein should not be construed as being relevant or true for any individual project or matter. Navigant Consulting, Inc. makes no representations or warranties, expressed or implied, and is not responsible for the reader's use of, or reliance upon, this paper, nor any decisions made based on this paper.

[2] Director, Navigant Consulting, Inc., New York, NY.

[3] Executive Director, Navigant Construction Forum™, "The industry's resource for thought leadership and best practices on avoidance and resolution of project disputes globally", Boulder, CO.

subject of pacing delay which was published in 1999.[4] The purpose of the original paper was to identify, define and discuss pacing delays. The paper also offered commentary on the practical effects of pacing delay and how these issues impact the contractor's right to recover delay damages arising from pacing delay. Although pacing delay is no longer a new type of delay, there aren't many studies exploring pacing delay although this form of delay can be considered, under some circumstances, highly controversial. The authors believe it is time to update this paper in light of significant developments in forensic scheduling and pacing delay. This "revisited" paper includes more case citations than the original paper; adds significantly to the discussion of the practical problems arising from pacing delay; and offers recommendations concerning the management of the pacing delay issue from both the contractor's and the owner's viewpoint.

Types of Delays

The majority of construction contracts in the United States use risk sharing principles with respect to delays and time extensions. Most construction contracts allocate the responsibility for delay to the party that caused the delay to the project. Further, most contracts share the risk for delays caused by outside causes or situations ***not*** under the control of either the owner or the contractor. The issue of delay is typically addressed in the contract documents in terms of assignment, assumption and sharing of risk. As a result, in most construction contracts, there are four types of delay. Generally, the four types of delay are identified as non-excusable, excusable, compensable and concurrent delay. A brief description of each type of delay is set forth below. For the purposes of this paper the term "delay" is defined as impact to the end date of the project or impact to the project's critical path.

- **Non-Excusable Delay** – Non-excusable delay is normally defined as a delay caused by the contractor or one of their subcontractors, suppliers, or materialmen, at any tier. The concept behind non-excusable delay is that a party to a contract should ***not***

[4] James G. Zack, Jr., *Pacing Delays – The Practical Effect*, AACE Transactions, 1999.

benefit from their own errors or mistakes, nor should they be relieved of responsibility when mistakes occur or caused by that party or some party for which they are responsible. Thus, in such situations, the contractor is ***not*** entitled to a time extension ***nor*** are they allowed to recover delay damages. Typically, the contractor either has to make up the time lost on the project or pay the late completion damages called for in the contract. The first course of action, of course, calls for acceleration at the contractor's sole expense while the latter situation calls for paying either liquidated or actual damages, whichever is specified in the contract documents.

- **Excusable Delay** – Excusable delay is generally classified as unforeseeable project delay brought about by third parties or by situations ***not*** under the control of either the owner or the contractor or anyone for which either party is responsible such as force majeure events or acts of God. Many contracts that share risk in this manner contain a list of causes of excusable delay. Frequently, these lists include delays brought about by fires, floods, strikes, freight embargoes, acts of God, acts of war, acts of the public enemy, acts of the government in its sovereign capacity, etc. Courts that have addressed the issue are uniform by ruling that such lists of excusable delay are examples of delay and ***not*** all inclusive lists, unless the contract so states that the list is all inclusive. The issue of excusable delay typically rests on whether the delay situation was foreseeable at the time of bidding, was beyond the control of both the owner and the contractor and could not be prevented by action of either the owner or the contactor. If the delay meets these criteria, then the contractor is normally due a time extension but ***no*** delay damages while the owner is required to extend the time of performance of the work and give up their right to late completion damages for the time resulting from the delay. The concept is that since neither party caused the delay, then neither party should benefit nor should either party be damaged as a result of the delay. Thus, the outcome of such a delay situation is to leave the parties where they were immediately prior to the event – no better off, nor any worse off (at least in terms of time). Some question why the contractor is due a time extension while the owner is entitled to nothing in an

excusable delay situation. The reason is pretty straight forward. To leave the contractor in the same relative position after the delay as before and to forgive imposition of late completion damages, the owner must adjust the time of performance by issuing a time extension; or, in the case of a working day contract, ***not*** count the days of excusable delay against the contract's working days. Absent a time extension, the contractor would ***not*** be in the same position and would be subject to damages under the contract.

- **Compensable Delay** – Compensable delay is generally discussed in terms of delays caused by the owner, by some agent for which the owner is responsible (i.e., architect, engineer, construction manager), or brought about by an event for which the owner has assumed liability under the contract such as a differing site condition. Compensable delays typically entitle the contractor to ***both*** a time extension and delay damages such as extended field office overhead and either extended or unabsorbed home office overhead costs, depending upon whether the contract is with a Federal, State, or local governmental entity. (This statement presumes, of course, that the contract does ***not*** contain a "No Damages for Delay" clause or the contract is issued in a State where such clauses are contrary to public policy.) The concept is simple. The owner, or someone for whom the owner is responsible, brought about the delay and therefore the owner is responsible to compensate the contractor for the results of the delay.

- **Concurrent Delay** – Concurrent delay is generally described as a situation where two or more delays arise, within the same time period, both of which impact the project's critical path either of which would have impacted the critical path on their own even in the absence of the other delay. Concurrent delay is defined as, "Two or more delays that take place or overlap during the same period, either of which occurring alone would have affected the ultimate completion date."[5] The delays need not be caused by different parties but they must be different events, resulting

[5] AACE International Recommended Practice No. 10S-90, Cost Engineering Terminology, AACE International, Morgantown, WV, January, 2014.

in project delay, arising from different causes and within the same timeframe.[6] Concurrent delay generally results in a "no harm, no foul" outcome if the concurrent delays are caused by both the owner and the contractor. Most often, the result of a concurrent delay situation is the issuance of an excusable, non-compensable time extension. That is, the contractor typically receives a time extension but no delay damages while the owner grants a time extension and foregoes the contract's late completion damages.[7] The concept goes back to the fundamental rule that no party should be able to benefit or profit from their own mistakes. In a typical concurrent delay situation, where one delay is owner caused while the other is contractor caused, the equitable adjustment theory calls for simply restoring both parties to the same position after the delays as they were in prior to the delay. Thus, a time extension is granted to the contractor but neither party is entitled to compensation. The Veteran's Administration Board of Contract Appeals discussed this issue, as follows.

> "The general rule is that, where both parties contribute to the delay, neither can recover damages, unless there is in the proof a clear apportionment of the delay and expense attributable to each party. Courts will deny recovery where the delays are concurrent and the contractor has not established its delay apart from that attributable to the government."[8]

Pacing Delay – Introduction

Having described the four types of delay typically discussed in a construction contract,

---

[6] The term "the same timeframe" does not mean that both delays start and end on the exact same dates. Rather, the term means that the two delays overlap one another for one or more days. This overlapping time is the concurrency of delay.

[7] The authors acknowledge that there are exceptions to this rule, but it is not within the scope of this paper to describe all the rules governing concurrent delay as they are many, varied and intensely fact driven.

[8] *Coffey Construction Company, Inc.*, VABCA No. 3361, 93-2 BCA 25 (1993)

what is a "pacing delay"? A pacing delay can best be described in the context of a project situation. When a contractor is involved in a project and realizes that there is, or will be, an owner caused delay to the critical path, a contractor may decide to slow down selected work activities in an effort to "keep pace with the owner's delay". The thinking typically expressed by contractors is "Why should I hurry up and wait?" The argument, when analyzed in the legal context of delays, is analogous to deceleration. Deceleration is the exact opposite of acceleration. Deceleration is the deliberate slowing down of work on the project and is generally presented as mitigating the owner's damages.

The distinction between concurrent delay and pacing delay has been discussed in the following manner.

> "Pacing occurs when one of the independent delays is the result of a conscious, voluntary and contemporaneous decision to pace progress against the other delay. The quality that distinguishes pacing from concurrent delay is the fact that pacing is a conscious choice by the performing party to proceed at a slower rate of work with the knowledge of the other contemporaneous delay, while concurrent delays occur independently of each other without a conscious decision to slow the work"[9]

Thus, in the example above, the contractor's pacing delay is not independent of the owner's delay because it is the result of a conscious and contemporaneous decision by the contractor to slow down its work as a result of the owner's delay.

Pacing Delay – Definition

Based upon the above discussion, a working definition of the term pacing delay is the following:

---

[9]AACE International Recommended Practice No. 29R-03, Forensic Schedule Analysis, AACE International, Morgantown, WV, April, 2011.

> "Deceleration of the work on the project, by one of the parties to the contract, due to a delay or potential delay to the end date of the project caused by the other party, so as to maintain steady progress with the revised overall project schedule."[10]

An alternative definition of pacing delay was posed in an article published in the 2006 AACE Transactions:

> "A delay resulting from a conscious and contemporaneous decision to pace progress of an activity against another activity experiencing delay due to an independent cause."[11]

A different author defined pacing delay as follows:

> "The dictionary defines pacing as an act of stretching or spreading out, and in the construction industry, pacing one's work is quite common."[12]

Literature discussing pacing delay defines two types of pacing delays as follows.

- **Direct Pacing** – This situation occurs when the duration of a successor schedule activity is extended due to a delay in a predecessor activity on which the progress of the successor activity is directly dependent. An example would be that the duration of wire pulling is delayed because conduit installation is taking longer than anticipated due to the lack of conduit materials on the site. This is pacing delay, not concurrent delay because the cause of one delay is the result of the other delay.

- **Indirect Pacing** – In this situation, the paced activity has no dependency on the other activity. For example, a contractor deliberately slows down piping installation in one area of the project due to an owner caused delay in another area of the

---

[10] James G. Zack, Jr., *Pacing Delays – The Practical Effect*, 1999.
[11] Kenji P. Hoshino, *Proposed Specification Language Regarding Pricing*, AACE Transactions, 2006.
[12] Ronald J. Rider and Thomas E. Finnegan, *Pacing: An Excuse for Concurrent Delay?*, AACE International Transactions, 2005.

project. The owner caused delay creates float while the contactor's decision to slow down piping installation consumes this float.[13]

Pacing Delay – Examples

Some examples of project situations that may lead to pacing delay are set forth below.

- **OFCI Delays** – Owner furnished, contractor installed ("OFCI") material or equipment is routine in construction contracting. In a power plant project, the owner may opt to procure and furnish some major, long lead pieces of equipment for the contractor to install in order get the completed project operational at an earlier date. If, for example, the owner chooses to furnish the steam turbine generators ("STG") and the heat recovery steam generators ("HRSG") the owner will typically provide the contractor at the outset of the project anticipated dates for the delivery of the OCFI equipment. If, during the course of construction, the contractor becomes aware of the fact that this equipment will not arrive on time, the contractor may opt to slow down their work to pace the late delivery of the OFCI equipment. The contractor's argument is simple. Why work hard to maintain the current schedule when late delivery of the OFCI equipment will cause a delay to the overall project? This is particularly true on very labor intensive projects like power plants and industrial project where the daily burn rate on labor is extremely high.

- **Parallel Prime Delays** – It is not uncommon in hotel/casino projects for the owner to retain specialty contractors, in a multiple or parallel prime contract arrangement, to install restaurant equipment, gaming equipment and even hotel room fit out. If one or more of the specialty contractors become aware of the fact that the general contractor (who is totally independent and ***not*** under their control) is delayed in performing their work, some or all of the specialty contractors may choose to slow own their work to pace the delay of the general contractor. Again, the thinking is

[13] Ronald J. Rider and Richard J. Long, Analysis of Concurrent/Pacing Delay, Long International, Littleton, CO, 2013. See also, Kenji P. Hoshino, *Proposed Specification Language Regarding Pacing*, 2006.

straight forward. If the general contractor is late in performing their work, why try to maintain the original schedule and potentially incur storage and other charges, since it will not impact the outcome of the project?

- Owner Caused Delays – In other situations, the contractor may become aware of a situation where actions solely under the control of the project owner have been or are about to be delayed. The contractor may opt to slow down their efforts to keep pace with the owner's delay. Examples of this sort of delay which may give rise to a pacing delay include the following:
  - The owner fails to furnish the permits required to complete some portion of the project but which were ***not*** required to commence the work of the project;
  - On a project where the work site is made available to the contractor on a phased or piecemeal basis, the owner fails to turn over some portion of the site as planned; or
  - A differing site condition (changed condition), change order or design error delays some portion of the work on the critical path but allows other non-critical portions of the work to proceed.

In each situation, a contractor may decide to slow down or decelerate the unimpacted portions of the work to keep pace with the owner caused delay and, perhaps, to save some money on the project. Again, the prevalent thinking is, "Why hurry up and wait?"

Lest one thinks that pacing is always brought about by contractors, pacing may also be caused or brought about by owners as a result of contractor caused delay. If a project is behind schedule due solely to contractor caused delay, an owner may opt to slow down their operations. Examples of owner pacing delay include the following:

- Owners may take longer than normal to respond to requests for information or review and respond to contractor submittals; or

- When an owner recognizes a contractor caused delay on a project the owner may provide owner furnished equipment later than planned. Like the contractor asserting the pacing delay argument, the owner will typically argue, "Why should I work harder or faster when the contractor is not ready to receive and install the equipment anyway?"

Pacing delays may be caused by either owners or contractors. However, the purpose of this paper is to explore pacing delays brought about by contractors. Accordingly, the remainder of the paper will focus solely on contractor-caused pacing delays.

Pacing Delay – The Contractor's Legal Right

Does the contractor have a right to slow down their work in the face of an owner caused delay to the critical path? Owners are quick to criticize contractors for such decisions, asserting that the contractor is somehow obligated to maintain the schedule to the maximum extent practicable in spite of the owner-caused delay. For example, owners often point to contract language requiring the contractor to, "diligently pursue the work". As noted in one article:

> "…nearly all construction contracts provide an implied warranty that allows a contractor to enjoy a least cost performance. Thus, contractors are driven to maximize profits by keeping their costs down."[14]

Various Boards of Contract Appeals ("Boards") have considered and addressed the issue of whether the contractor has a legal right to pace an owner caused delay. Some of the decisions are summarized below.

> "When a significant owner caused construction delay, such as the RW 11 design conflict occurs, the contractor is not necessarily required to conduct all of his other construction activities exactly according to his pre-delay schedule, and without regard to the changed circumstances resulting from

[14] Rider and Finnegan, *Pacing: An Excuse for Concurrent Delay?*, 2005.

> the delay. ... The occurrence of a significant delay generally will affect related work, as the contractor's attention turns to overcoming the delay rather than slavishly following its now meaningless schedule."[15]

Another Board addressed the issue in similar fashion:

> "Where the government causes delays to the critical path, it is permissible for the contractor to relax its performance of its work to the extent that it does not impact project completion."[16]

Other legal decisions related (both remotely and directly) to a contractor's legal right to pace an owner caused delay are summarized below:

- Contractors have no duty to hurry up and wait during an owner caused delay;[17]
- Contractors must mitigate the delaying effect of owner caused delay;[18]
- Contractors can be merely pacing the work by utilizing the available float caused by an owner caused delay;[19]
- Float is an available resource to be utilized by all parties in "good faith";[20] and

---

[15] *John Driggs Company, Inc.*, ENG BCA No. 4926, 5061 & 5081, 87-2 BCA 19,833; *Harry & Keith Mertz Constr., Inc.* ASBCA Nos. 94-165-1, et al., 97-1 BCA 28,802; *Bechtel Environmental, Inc.*, ENGBCA No.6137 et al., 97-1 BCA 28,640 at 143, 021-22, *recon Denied*, 97-1 BCA 28,851; *Cogefar-impresit*, 97-2 BCA at 142,207;*Essex Electro Engineers, Inc. v. Danzig*, 224 F.3d 1283 (Fed. Cir. 2000); *George Sollitt Construction Co. v. United States*, 64 Fed. Cl. 229 (U.S. Claims 2005);

[16] *Utley-James, Inc.*, GSBCA No. 5370, 85-1 BCA 17,816, aff'd, *Utley-James, Inc. v. United States*, 14 CL. Ct. 804 (1988). See also, *Bechtel Environmental, Inc.*, ENGBCA No. 6137, 6166, 97-1 BCA 28,640.

[17] *C.E.R., Inc.*, ASBCA Nos. 41767, 44788, 96-1 BCA 28,029; *MCI Constructors, Inc.*, DCCAB N0. D-924, 1996 WL 331212 (June 4, 1996).

[18] *Amelco Electric*, VABCA No. 3785, 96-2 BCA 23,381.

[19] *Tyger Construction Co., Inc. v. United States*, 31 Fed. Cl. 177 (Fed. Cl. 1994); *Jay P. Altmayer*, GSBCA No. 12639, 95-1 BCA 27,515 at 137, 122-23; *H&S Corp.*, ASBCA No. 29,688, 89-3 BCA 22,209 at 111, 720-21.

[20] *Titan Pacific Construction Corp.*, ASBCA Nos. 24148, 24616, 26692, 87-1 BCA 9,626; *Williams Enter. v. Strait Mfg. & Welding, Inc.*, 728 F. Supp. 12 (D.D.C. 1990); *Weaver-Bailey Constructors, Inc.* v. United States, 19 Cl.

- Once an excusable delay has been encountered by a contractor, the contractor may reschedule its work without fear that it will be held responsible for a concurrent delay.[21]

While it is significant that Boards and Courts have acknowledged a contractor's right to slow down their work and pace an owner caused delays, it is ***not*** illogical. The right to a pacing delay appears to be in keeping with other fundamental contractor rights recognized by Boards and Courts in the U.S., such as the following:

- Selection of means and methods;
- Use of project float time; and
- Right to complete the project early.

In each instance, Boards and Courts appear to acknowledge the fact that a contractor has the right to manage the project as they see fit, in order to maximize their profit. The right to manage a project is fairly well unlimited, so long as the contractor's management decisions do ***not*** violate some requirement of the contract entered into with the project owner.

Pacing Delay – Practical Problems

Having defined what a pacing delay is and shown how a contractor is legally allowed to pace their work in tandem with owner delays, let's examine the practical effect of this decision to decelerate work. When an owner caused delay has, or will, extend the end date of the project and the contractor decides to slow down their work efforts, what are some of the practical implications and problems resulting from such a decision?

- **Lack of Definition** – While the term "pacing delay" is casually used throughout the

---

Ct. 474, 475, 481-82 (Cl. Ct. 1990); *Ealahan Elec. Co.*, DOTBCA No. 1959, 90-3 BCA 23,177; *Dawson Constr. Co.*, GSBCA No. 3998, 75-2 BCA 11,563.

[21] *John Driggs Company, Inc.*, ENG BCA No. 4926, 5061 & 5081, 87-2 BCA 19,833.

construction industry, many, if not most, people do not really know the definition of this term. It is noted that in the authors' experience, neither have ever seen a contract that contains a definition of the term "pacing delay".

> "It is common for construction contracts to not address or define concurrent delays, let alone "pacing". Most construction contracts contain specific language such as, "time is of the essence" or "a contractor shall diligently perform the work" which requires the contractor to expedite the completion of the work. Consequently, most construction contracts do not inherently sanction a contractor to "pace" its work when delayed by owner caused impact to the critical path."[22]

In the absence of definitions of the terms "concurrent delay" and "pacing delay" it is likely that most owners and owner representatives will perceive an alleged "pacing delay" as another term for "concurrent delay" – making the issue more complicated and more difficult to resolve.[23]

- **Notice Issue** – In the experience of the authors, a classic owner argument raised to fend off a pacing delay claim is lack of notice resulting in the classic "no notice, no claim" rebuttal. Again, in the authors' experience, lack of pacing delay notice is more common than not on the part of contractors.

> "Be aware, however, that paced performance is inherently risky. Why? Because it is counterintuitive for any party to intentionally delay its performance on a project where time is of the essence. In order to mitigate such risk, it is always recommended that the party claiming the privilege provide the party responsible for the parent delay with notice of its intent to pace its performance. Unfortunately, such notices are rare."[24]

---

[22] Ronald J. Rider and Richard J. Long, Analysis of Concurrent/Pacing Delay, 2006.
[23] See Ronald J. Rider and Thomas E. Finnegan, *Pacing: An Excuse for Concurrent Delay?*, 2005.
[24] John Livengood and Thomas F. Peters, The Great Debate: Concurrency vs. Pacing – Slaying the Two

Contractors often attempt to get around the lack of formal, written notice to the owner positing one or more of the following arguments:

- **Constructive notice** – "My monthly schedule updates and status reports clearly showed us pacing your delay."
- **Actual notice** – "We discussed this issue multiple times in project meetings and the meeting minutes reflect these discussions."
- **Lack of prejudice or material harm** – "Even if I had provided written notice of pacing delay, what would you have done differently?"

  Notwithstanding the above arguments, almost all construction contracts are replete with formal, written notice requirements concerning delays and other impacts. The intended purpose of such notice is to provide information concerning potential impacts to the owner in a timely manner such that they may get involved with resolving issues as the arise and mitigate their own damages. The lack of pacing delay notice denies the owner the opportunity to mitigate their damages and may cause a Court or arbitration panel to deny the pacing delay claim.

- **No Contractual Control** – Even if the owner includes definitions for concurrent delay and pacing delay in the contract, there still needs to be a notice requirement, and a general condition or general requirement section setting forth what actions the contractor and the owner must take upon notice of pacing delay. For example, this section of the contract should clearly state what information must be provided in the notice of pacing delay (e.g., what activities are late due to owner caused delays; what activities are being paced; what will the contractor do or not do in order to implement pacing; and an estimate of the cost savings resulting from pacing when compared to the estimate delay damages if the owner delay is ***not*** paced. There should also be a requirement for the contractor to submit their "pacing plan" within

Headed Dragon, AACE International Transactions, 2008.

a specified number of days after providing the notice. This section should also require that the owner and the contractor meet and confer within a specified number of days to reach agreement on the pacing plan. Additionally, this section should address the recoverability of costs resulting from implementation of the pacing delay plan.[25] The authors acknowledge that it may be very difficult to identify and implement some of the components of the pacing plan, especially within days of the occurrence of the owner delay. However, timely notice of the contractor's decision to pace its work, or a portion thereof, is particularly important given the relative lack of understanding and experience with pacing delay claims.

- **Inherent Risk** – There is a significant risk inherent in the contractor's decision to pace an owner's delay, which is often not well considered by the contractor. If, for example, the OFCI refrigeration and air handling units for a high rise hotel are to be provided by the owner, the owner must furnish projected dates for the delivery of this equipment so the contractor can include delivery of the equipment in the baseline schedule. Assume, for example, the OFCI equipment is scheduled for delivery to the site on July 1st. The contractor has several crews (e.g., ductwork, HVAC control systems, electrical, etc.) working to complete the predecessor work to be ready to receive and install the OFCI equipment on or before July 1st. On May 10th, the owner advises that the OFCI equipment will be delivered late, no earlier than October 15th. The contractor faces a practical choice – maintain the crew levels and the original plan which results in completion of their work by July 1st but no follow on work for these crews to perform until October 15th, when the OFCI equipment arrives. As an alternative, the contractor may decide to selectively lay off half these crews allowing the remaining crews to pace this delay. So far, so good. In early July, at another project meeting, the owner announces that the OCFI equipment delivery date has been changed yet again – to September 1st! The contractor's business decision to pace the owner delay by laying off crews now is in danger of putting the contractor's incomplete preparatory work on the project's

[25] See, for example, Kenji P. Hoshino, *Proposed Specification Language Regarding Pacing*, 2006.

critical path – exposing the contractor to liquidated damages.

- **Impact of Pacing Delay on Forensic Schedule Analysis** – Another practical effect of a pacing delay is to relieve the owner of some of the delay damages they otherwise may owe the contractor. To understand this impact, a basic discussion of forensic scheduling (schedule delay analysis) techniques is necessary.

  There are, generally, nine techniques commonly recognized and used to analyze project delay in the construction industry.

  - **Observational/Static/Gross (MIP 3.1)**[26] – This forensic schedule analysis methodology is also known as an As Planned vs. As Built Analysis. This is an observational technique that compares the baseline, or other planned schedule, to the As Built schedule, or a schedule update that reflects progress, and then calculates how late the project was completed. The resulting schedule analysis attempts to illustrate that the project would have been completed exactly as planned were it not for certain delays. The delays identified in the analysis purportedly explain the late completion. Boards and Courts disfavor this method as it most often appears to be a "total time" claim unless the analyst allocates delay responsibility. Even then, all delay is imported into the original as planned or baseline schedule in a single analysis which results in a schedule that does not reflect the reality of what actually happened on the job and when it occurred.

  - **Observational/Static/Period (MIP 3.2)** – This technique is often referred to as a Windows Analysis because it analyzes the project schedule periodically. Like the above analytical technique, this method is an observational technique that compares the baseline or other planned schedule to the As Built schedule or a schedule update that reflects progress. But, this method analyzes the project in

[26] "MIP" refers to Method Implementation Protocol. All forensic schedule analyses methodologies (MIPs) discussed in this section of this paper have been taken from AACE International's Recommended Practice 29R-03, Forensic Schedule Analysis, AACE International, Morgantown, WV, April 2011.

multiple segments rather than in one whole continuum. This is essentially an enhancement of the previous methodology. The baseline schedule and each schedule update submitted on the project are examined separately and an explanation of what caused the delay on each update is offered. No attempt is made to modify any schedule update.

- **Observational/Dynamic/Contemporaneous As Is (MIP 3.3)** – This methodology is often called a Contemporaneous Period Analysis, a Time Impact Analysis, or a Windows Analysis. The methodology is a retrospective technique that uses the project schedule updates to quantify the loss or gain of time along a logic path that was, or became, critical and then identify the activities responsible for the critical delay or gain. Although this method is a retrospective technique, it relies on the forward looking calculations made at the time the updates were prepared. That is, it primarily uses the information to the right of the updates' data dates. It is an observational technique since it does not involve the insertion or deletion of delays but instead is based on observing the behavior of the network from update to update and measuring schedule variances based on essentially unaltered, existing schedule logic. Because the method uses schedule updates whose logic may have changed from the previous updates as well as from the baseline, it is considered a dynamic logic method.

- **Observational/Dynamic/Contemporaneous Split (MIP 3.4)** – Like the above methodology, this technique is referred to as a Contemporaneous Period Analysis, a Time Impact Analysis or a Windows Analysis. This method is identical to the above technique in all respects except that for each update an intermediate file is created between the current update and the previous update consisting of progress information without any non-progress revisions. Generally, the process involves updating the previous update with progress data from the current update and recalculating the previous update using the current data date. This is the intermediate schedule or the half step schedule. The process allows the analyst to bifurcate the update to update schedule variances based on pure progress by evaluating the difference between the previous update and the

half step, and then the variance based on non-progress revisions by observing the difference between the half-step and the current update.

- **Observational/Dynamic, Modified or Recreated (MIP 3.5)** – This technique is also known as a Contemporaneous Period Analysis, a Time Impact Analysis, or a Windows Analysis. This analytical methodology looks very like the above two except that it uses contemporaneous schedule updates that were extensively modified or "updates" that were completely recreated. This method is usually implemented when contemporaneous updates are ***not*** available or ***never*** existed. The fact that it does ***not*** use the contemporaneous updates places this method in a fundamentally different category from the standpoint of the nature of source input data. It is a retrospective technique that uses the modified or recreated schedule updates to quantify the loss or gain of time along a logic path that was, or became, critical and identifies the activities responsible for the critical delay or gain. Although this method is a retrospective technique, it relies on the forward-looking calculations made at the time the updates would have been prepared. That is, it primarily uses the information to the right of the updates' data date. This method is not favored by Boards and Courts as it is an "after the fact" analysis ***not*** based on contemporaneous updates.

- **Modeled/Additive/Single Base (MIP 3.6)** – This technique is generally called the Impacted As Planned technique. This technique is a modeled technique since it relies on a simulation of a scenario based on a Critical Path Method ("CPM") model. The simulation consists of the insertion or addition of activities representing delays or changes into a network analysis model representing a plan to determine the hypothetical impact of those inserted activities to the network. Hence, it is an additive model. As all delays are added to the baseline schedule at one time it cannot deal with changes in logic or durations, concurrent or pacing delay. The resulting analysis tends to produce a hypothetical analysis and, as a result, is disfavored by Boards and Courts.

- **Modeled/Additive/Multiple Base (MIP 3.7)** – This methodology of often referred to as a Time Impact Analysis, Windows Analysis, or Impacted As Planned technique. It is a modeled technique since it relies on a simulation of a scenario based on a CPM model. The simulation consists of the insertion or addition of activities representing delays or changes into a network analysis model representing a plan to determine the hypothetical impact of those inserted activities to the network. Hence, it is an additive model. It is a multiple base method, distinguished from the above technique, which is a single base method. The additive simulation is performed on multiple network analysis models representing the plan, typically an updated schedule, contemporaneous, modified contemporaneous or recreated. Each base model creates a period of analysis that confines the quantification of delay impact. Because the updates typically reflect non-progress revisions, it is a dynamic logic method as opposed to a static logic method.

- **Modeled/Subtractive/ Single Simulation (MIP 3.8)** – This technique is frequently called a Collapsed As Built, But For, or Time Impact Analysis method. It is a modeled technique relying on a simulation of a scenario based on a CPM model. The simulation consists of the extraction of entire activities or a portion of the As Built durations representing delays or changes from a network analysis model representing the as built condition of the schedule to determine the impact of those extracted activities on the network. Hence, it is a subtractive model. The subtractive simulation is performed on one network analysis model representing the as built schedule. Because it uses one network analysis model, it is technically a static logic method as opposed to a dynamic logic method. The significance of the distinction rests in the fact that the project undergoes non-progress revisions reflecting the as built conditions in contrast to the original baseline logic. And in view of that, a method that dynamically considers how the original logic changed is thought to be more forensically accurate than that which statically relies solely on the baseline logic. Therefore, in that context, the distinction in the case of this methodology is irrelevant since it relies on the as

built as the starting point. However, as this analytical method is not built on contemporaneous updates and removes all delays in a single analysis, it is not favored by Boards and Courts.

- **Modeled/Subtractive/Multiple Base (MIP 3.9)** – Like the above methodology, this technique is frequently called a Collapsed As Built, But For, Time Impact Analysis, or Windows Analysis method. Like the above technique this method is a modeled technique relying on a simulation of a CPM model scenario. The simulation consists of the extraction of entire activities or a portion of the as built durations representing delays or changes from a network analysis model representing the as built condition of the schedule to determine the impact of those extracted activities to each network model. Hence, it is also a subtractive model. It is also a multiple base method, distinguished from the above method which is a single base method. The subtractive simulation is performed on multiple network analysis models representing the as-built schedule, typically updated schedules, which may include contemporaneous, modified contemporaneous or recreated schedules. As the project undergoes non-progress revisions in reaction to the as-built conditions, in contrast to the original baseline logic, this method considers those logic changes. Therefore, it is thought to be more attuned to the perceived critical path, in addition to the actual critical path that existed during the project than methods which rely solely on the initial baseline or the final as built. Because the updates typically include non-progress revisions, this method is a dynamic logic method as opposed to a static logic method. This methodology may not be accepted by Boards and Courts as it is not built around contemporaneous updates but starts with an as built schedule prepared by the analyst and removes only those delays the analyst chooses to remove.

There are, of course, numerous variations of these delay analysis techniques but the nine delay analysis techniques described above generally encompass the current world of forensic schedule analysis. Four of these techniques, however, appear to be more favored today by Boards and Courts than others. The preferred delay analysis

techniques appear to be MIPs 3.2, 3.3, 3.4, and 3.7; all of which are classified as Contemporaneous Period Analysis, Time Impact Analysis, or Windows Analysis. These forensic schedule analysis techniques appear to meet the basic tests established by Boards and Courts. Boards and Courts have historically cited the following methodological analyses types to be acceptable.

> "Plaintiff … failed to evaluate the significance of these allegations in light of the critical path. In fact, [the contractor] failed to provide the court with any coherent analysis of critical path delays, presumably leaving to the court the task of disentangling critical and noncritical delay with the use of the as-planned and critical path charts. These charts were of no value to the court in dissecting delay to the contract."[27]

> "Plaintiff's failure to provide a critical path analysis is a substantial deficiency in his proof because the opinion in *Wilmer I* warned that only defendant's critical path expert analysis afforded the court a basis for evaluating plaintiff's critical path claim … Chary of proving its opponent's case, defendant this time did not supply expert testimony and a critical path chart. Despite his close call in *Wilmer I*, plaintiff offered no critical path expert analysis, but rested his case on truncated charts depicting only the construction activities for which he seeks compensation. This approach was as unorthodox as it was frustrating to parse out under legal standards applicable to delay claims."[28]

While all of the above listed forensic schedule analysis methodologies meet the test of being "CPM based" MIPs 3.1, 3.5, 3.6, 3.8 and 3.9 are not favored by Boards and Courts[29] for a variety of reasons including the fact that some of these analytical

---

[27] *Mega Construction Co. v. United States*, 25 Cl. Ct. 735 (1992).
[28] *Wilmer v. United States*, 26 Cl. Ct. 260 (1991), *aff'd*, 994 F. 2d 783 (Fed. Cir. 1993), *vacated & remanded on other grounds*, 24 F. 3d 1397 (Fed. Cir. 1994).
[29] Jon M. Wickwire, Thomas J. Driscoll, Stephen B. Hurlbut and Mark J. Groff, Construction Scheduling: Preparation Liability and Claims, Aspen Publishers – Wolters Kluwer Company, New York, 2013.

techniques do not rely on contemporaneous schedule updates; others produce only hypothetical analytical results; etc. While the various methodologies differ in how they are performed, they are all similar in their goal. That is, each attempts to calculate when the project ***would have been completed*** were it not for certain delaying events which were the responsibility of the other party (this is the classic "But for the delays caused by the owner, we would have completed work by "x" date."). That is, all forensic scheduling techniques intend to perform a delay analysis with an eye toward calculating how much delay was caused by each of the parties. The delay caused by one party serves as the foundation for the delay damages claimed against the other party.

What effect do pacing delays have on a forensic schedule analysis? If a contractor perceives an owner caused delay has or will take place and subsequently determines to pace the owner delay, they are, in effect, delaying other activities. This may be actual delay or may only be float consumption. But, in either event, it is clearly contractor caused delay resulting from the contractor's decision to slow down some or all of their work in order to pace the owner delay.

When a forensic schedule analysis is later performed, ***on behalf of the contractor***, it is looking for the answer to the question, "When would the project have been completed but for the owner's delay?" or "How much delay did the owner cause?" That is, the ***contractor's forensic schedule analysis*** intends to measure the time differential between the actual project end date and when the project would have ended but for owner delay(s). Pacing delays, however, tend to reduce this calculated time differential. That is, if a contractor pacing delay pushes non-critical activities further out in time then, for all practical purposes, the time difference between these activities and the end date of the project is less than it otherwise would have been had the contractor maintained the original schedule. Thus, practically speaking, pacing delay decreases the impact of owner caused delay resulting in less time being owed. In turn, pacing delay decreases delay damages because it shortens the time differential, the compensable time, between when the project would have ended but for the owner caused delays.

Pacing Delay – Damages Recoverable?

When a contractor seeks a time extension they seek, in the first instance, relief from actual or liquidated damages owed to the owner. Then, if possible, contractors seek compensation for the costs incurred (if any) due to pacing the owner delay. As previously discussed, pacing tends to minimize compensable delay. Despite this, it is not uncommon for contractors to argue that pacing was caused by an owner caused delay. Thus, contractors argue, they are entitled to compensable delay from the time they "should have" or "would have" finished (including the pacing time) until the date they actually finished. Contractors making this argument go beyond the but for test discussed above. They no longer want compensation only for the time between when the contract actually ended and when it would have ended but for the owner delay. They also seek compensation for the time between when the contract actually ended and when it would have ended without the pacing. So the question arises, can contractors expect additional compensation for pacing? The typical reasons for denial of additional compensation include the following.

- **Hypothetical Damages** – The contractor seeking recovery for a pacing delay is clearly entitled to the delay time between when the project actually ended and when it would have ended but for the owner delay. However, to argue that contractors are owed time and compensation for the duration of the pacing delay means that owners must pay for damages not actually incurred (i.e., hypothetical damages). Pacing time is ***not*** easily calculated. Further, if the contractor did ***not*** pace the owner delay, who can say that a contractor caused delay would ***not*** have arisen during this same period, thus converting the situation to a concurrent delay? So, while pacing is easily asserted, it is ***not*** easily shown in a forensic schedule analysis.

  > "Pacing arguments are most often made at the end of a project, when an as-built programme analysis reveals that activities which were not affected by any employer instructed variations or other excusable events appear to have been delayed. When pacing is argued with hindsight, it should be treated with both caution and skepticism, especially when the

assertion is unsupported by contemporaneous records."[30]

To compensate the contractor for this type of delay is to compensate the contractor for a delay which cannot be actually documented through forensic schedule analysis. Additionally, noting a contractor's obligation to mitigate damages, if a contractor opts to do so by decelerating other work activities and thus experiences some cost savings (i.e., lower production costs or decreased labor costs) and then demands full compensation for the pacing delay period, would not such recovery be "over compensation"?

- **Self-Imposed Delay** – Pacing delay results from a business decision on the part of the contractor. That is, the contractor decides to decelerate some or all of their operations to pace an owner caused delay. The contractor saves (or thinks they will save) money as a result of this decision. For example, the contractor mobilizes only two electrical crews rather than the three crews originally planned. The contractor is entitled to make this decision. (The authors acknowledge the fact that the contractor is faced with such a decision solely because of an owner delay, which is a change from the conditions known to the contractor at the outset of the project.) However, some contractors argue that the delay resulting from such decisions should also be compensable. Such claims, in effect, are asking for compensation for self-imposed delay. That is, they want the owner to pay additional monies for deceleration the contractor imposed on themselves.

- **Float Consumption** – When owner caused delay arises on a project, the end date of the project is extended. Assuming all other schedule activities remain the same, then the amount of float increases on these activities as a result of the owner delay. If the other non-impacted activities are then decelerated, such deceleration (or slowing down of work) consumes float. If a contractor carefully controls the decelerated activities they consume the float created by the owner delay. If this is accomplished, the float consumption keeps pace with and will ***not*** exceed the owner

[30] P.J. Keane and A.F. Caletka, Delay Analysis in Construction Contracts, Wiley-Blackwell, London, 2008.

caused delay. As noted earlier, contractors are generally entitled to the use of float on a project. But, as noted earlier, contractors are only entitled to compensation for owner caused delays. Contractors are generally ***not*** entitled to compensation (time or money) for float consumption.

- **Concurrent Delay** – If there are ***parallel critical paths*** at the time the owner caused delay arises and the contractor opts to pace the owner caused delay, then it can be said that the two project delays arose in the same timeframe. Obviously, this meets the definition of concurrent delay. In the absence of parallel critical paths, pacing delay overlapping owner delay also rises to the definition of concurrent delay. In either event, as outlined above, contractors are ***not*** entitled to compensation (either time or costs) arising from concurrent delay.

- **Impact Damages** – As noted earlier in this paper, if a contractor decides to pace an owner delay, they should provide formal written notice of pacing to the owner. Subsequently a contractor should prepare a written "pacing plan". This plan should include a description of how the contractor plans to pace the owner delay, including the anticipated cost. The pacing plan should also include the anticipated delay cost in the event the contractor decides to maintain the original schedule and then encounter a pure owner caused delay situation. If a contractor's pacing decision is correct and the pacing plan is well prepared, it should document the cost mitigated as a result of pacing. Once the written pacing plan is complete, a contractor would be well advised to submit it to the owner and then meet with the owner to attempt to obtain agreement on the details of the pacing, as well as compensation for the cost of the pacing plan. If the pacing plan is prepared properly there exists the possibility that the owner will agree to pay the impact cost arising from the pacing rather than force the contractor to maintain the original schedule and submit a large delay claim. If the owner disagrees with the plan or refuses to pay the impact costs and later argues the contractor's pacing caused project delay, a Board or Court may well conclude –

"We agree with MCI that the delays attributable to MCI by the District

were not critical path delays and generally come within the category of 'why hurry up and wait'?"[31]

Pacing Delay – Owner Defenses

- **No Notice, No Claim** – As noted previously, if the contractor encounters owner delay and decides to pace the owner delay, but fails to provide notice of pacing an owner later may raise the "no notice, no claim" defense. In many jurisdictions the lack of notice is enforceable in arbitration or litigation. And, in those jurisdictions where lack of notice is ***not*** strongly enforced, there is still a chance that the trier of fact will agree with the argument that the lack of notice of pacing denied the owner the opportunity to mitigate their damages.

- **Contractor Caused Impact or Delay** – Whether the decelerated activities have float or are on parallel critical paths, it is arguable that the delay or impact to these activities is clearly brought about solely by contractor action. That is, the contractor determines on their own to slow other work activities down rather than maintaining scheduled work progress and risk being idled at some later point in time. The thrust of this defense is that the contractor should not be entitled to compensation resulting from their own decisions.

- **Concurrent Delay** – If the decelerated work activities are on the critical path along with the owner caused delay, or if they are on parallel critical paths or a subcritical or near critical path[32], then it appears clear that pacing delay rises to the level of concurrent delay. That is, there are two or more separate delay events arising within the same timeframe. In this event, the owner most likely will argue that the most the contractor is entitled to is forgiveness of late completion damages.

- **Float Consumption** — In the instance when the owner-caused delay clearly impacts

[31] Appeal of MCI Constructors, Inc., D.C.C.A.B. No. D924, 1996 WL 331212 (D.C.C.A.B. 1996)
[32] "Subcritical path" or "near critical path" is, for the purposes of this paper, any chain of activities that has 30 calendar days or 20 work days or less of float.

the project's critical path while the pacing delay impacts only non-critical activities, it is arguable that the contractor's pacing delay simply consumes float on non-critical chains of activities because the owner caused delay is creating, day by day, float on non-critical paths. Where the contractor paces non-critical activities while critical activities are delayed by the owner, it is easily arguable that the contractor consumed float on these chains of activities but did not cause a project delay, and is not entitled to compensation for such float consumption.

Pacing Delay – Recommendations for Contractors

Based upon the discussions in this paper, the authors offer the following recommendations for contractors concerning pacing delay situations:

- Maintain a well thought out, detailed and routinely updated schedule;
- When an owner caused delay arises, provide prompt notice of delay;
- Analyze the owner delay to determine whether pacing is logical and cost effective;
    - If so, provide written notice of pacing to the owner;
- Prepare a written pacing plan showing the cost of pacing and the anticipated delay cost;
- The pacing plan should also demonstrate the work the contractor plans to pace was, until the advent of the owner delay, being performed as planned in the current schedule;
- Submit the pacing plan to the owner seeking their agreement with the plan; and
- If the pacing plan is implemented, carefully track which activities were slowed down, how they were slowed, and what cost impacts were incurred.

Pacing Delay – Recommendations for Owners

The authors also offer the following recommendations for owners concerning pacing delay situations.

- Include definitions of specific terms in contract documents including "Concurrent Delay", "Pacing Delay", "Free Float", "Total Float" and perhaps some other terms as

necessary;

- Include a General or Supplemental Condition clause that deals with pacing delay including:
    - A notice of pacing requirement including what should be included in the notice;
    - A requirement for preparation and submittal of a pacing plan to the owner; and
    - Other provisions appropriate for such a clause.
- Upon receipt of a notice of pacing from the contractor and submittal of their pacing plan, meet with the contractor to discuss the pacing plan and its implementation.

Conclusion

Pacing delay is a legitimate business management decision on the part of a contractor when they encounter owner caused delay. The issue has been addressed by Boards and Courts and it is clear that contractors have a legal right to pace an owner delay. Pacing delay may have some unintended consequences for contractors. At a minimum, pacing delay decreases the amount of time between the actual end date of the project and the but for end date, potentially reducing a contractor's recovery of delay and delay damages. At present, there are a number of defenses against contractor recovery of compensation for cost impacts resulting from pacing delay.

Contractors seeking to maximize recovery due to compensable delay should ***not*** attempt to pace an owner delay. Cost recovery for delay ***may*** actually increase if the contractor maintains their original schedule to the maximum extent practicable, thus increasing the time between the actual end date and the but for date. Maintaining the original project schedule, to the maximum extent practicable, increases the potential for maximizing delay damages.

Contactors who determine to pace an owner delay in order to mitigate damages should provide written notice of pacing, fully advising the owner of how they intend to pace the owner delay. They should also prepare and submit a written pacing plan and attempt to get agreement with the owner concerning the issue of impact costs.