

Construction Delays and Concurrent Delays

التأخيرات والتأخيرات المتزامنة في مجال الانشاءات

by

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**A dissertation submitted in fulfilment
of the requirements for the degree of
MSc CONSTRUCTION LAW AND DISPUTE RESOLUTION**

at

The British University in Dubai

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March 2018**

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ABSTRACT

This Dissertation explores all issues about construction delays, its definitions, causes and impact. Delay is considered as one of the fundamental issues that impinge projects due to its negative impact not only on time of delivery but also due to its associated ramifications, additional cost and losses. Its causes are spanned between the Contractor, Employer, third parties and project conditions.

Concurrent delays are considered as one of the law notoriously problematical areas and most complicated & controversial kind of delay disputes. This is due to its unique/complex nature and the fact that there is no one standard and agreed coherent definition or interpretation of concurrent delay. In Author's opinion, the term 'concurrent delays' must have a wider all-inclusive definition to cover all delay situations attributed to both parties that have an effect on time for completion. The Author herein proposed various options for definition of concurrent delays, which its selection depends on how both parties agreed to deal with concurrency, along with proposed contractual bespoke amendments to reflect the same.

This Dissertation identified and analysed the basis and rules governing the determination of EOT in cases of concurrency under various civil and common law jurisdictions along with court's relevant approach. It is concluded that Civil Law countries (such as USA, Scotland, Canada and Australia) preferred approach for concurrency is Apportionment. Similarly, UAE Civil Code provisions tend to support Apportionment as driven by Shariah, good faith, fairness and common sense principles. However, there is lack of reported court cases addressing concurrency in UAE, and UAE Civil Code does not have express articles that deal with concurrent delays nor it recognises concurrent delays on any organised basis.

The Author submits that UAE courts can learn from both Scottish and United State Courts, with respect to application of detailed CPM delay analysis and application of Dominant Cause if applicable, "time-but-no-money" approach or Apportionment (preferably Apportionment of Time). And, further recommended the establishment of a UAE dedicated Technology and Construction Court Division that will definitely allow for more efficient resolution of construction industry complex disputes.

الخلاصة

تستكشف وتدرس وتحلل هذه الرسالة جميع المسائل والمشاكل المتعلقة بتأخيرات مشاريع البناء ، متضمنة تعريفاتها ، وأسبابها وتأثيرها. حيث يعتبر التأخير أحد المشاكل الأساسية التي تؤثر على المشاريع بسبب تأثيرها السلبي ليس فقط على مدة تنفيذ المشاريع ولكن أيضاً بسبب تشعباتها والتكاليف والخسائر الإضافية التي تنتج عنها. وتمتد اسباب التأخيرات وتتشعب ما بين المقاول ، ورب العمل ، وأطراف ثالثة، او ظروف المشروع.

ويعتبر التأخير المتزامن كواحد من احدى المشاكل القانونية المشهورة في مجال الانشاءات وأكثر النزاعات تعقيداً وإثارة للجدل. ويرجع ذلك إلى طبيعته الفريدة والمعقدة، وحقيقة أنه لا يوجد معيار واحد ومتفق عليه أو تعريف متناسق ومتفق عليه للتأخير المتزامن. في رأي المؤلف ، يجب أن يشتمل مصطلح "التأخير المتزامن" على تعريف شامل لتغطية جميع حالات التأخير المنسوبة إلى الطرفين (رب العمل والمقاول) والتي تؤثر على وقت انتهاء المشروع. وعليه اقترح المؤلف خيارات متنوعة لتعريف التأخيرات المتزامنة ، والتي يعتمد اختيارها على كيفية اتفاق الطرفين على التعامل مع التأخيرات المتزامنة ، مع اقتراح التعديلات اللازمة لبنود العقد التي تعكس هذا الاتفاق.

حددت هذه الرسالة وحللت الأسس والقواعد التي تحكم تحديد التمديد الزمني لتاريخ انتهاء المشروع في حالات التأخيرات المتزامنة تحت عدد من السلطات القضائية المختلفة سواء الحكومة بالقانون المدني او القانون العام، جنباً إلى جنب مع نهج المحكمة ذي الصلة. وخلصت الرسالة إلى أنه في دول القانون المدني (مثل الولايات المتحدة الأمريكية واسكتلندا وكندا وأستراليا) يعتبر النهج المفضل في حالات التأخيرات المتزامنة هو "مبدأ التقسيم". وبالمثل ، تميل أحكام القانون المدني لدولة الإمارات العربية المتحدة إلى دعم مبدأ التقسيم على أساس مبادئ الشريعة ، وحسن النية ، والإنصاف ، ومبادئ المنطق السليم. ومع ذلك ، هناك نقص في عدد القضايا التي عرضت امام المحاكم والتي تتعامل مع التأخيرات المتزامنة في دولة الإمارات العربية المتحدة ، بالإضافة الى ذلك فان القانون المدني الإماراتي لا يحتوي على بنود صريحة تتناول التأخيرات المتزامنة ولا يحدد التأخير المتزامن على أي أساس تنظيمية.

ويؤكد المؤلف أن المحاكم الإماراتية يمكن أن تستفيد من كل من المحاكم الاسكتلندية ومحاكم الولايات المتحدة الأمريكية فيما يتعلق بتطبيق البرامج والوسائل الالكترونية الحديثة للتحليل الزمني للتأخيرات وتطبيق مبدأ "السبب المهيمن/الرئيسي" ان امكن، أو مبدأ "التمديد الزمني ولكن بدون تكلفة" أو مبدأ "التقسيم" (يفضل تقسيم الزمن). وأوصت الرسالة على تأسيس قسم مخصص لمحكمة التشييد والبناء في دولة الإمارات العربية المتحدة والذي سيسمح بالتأكيد بحل النزاعات المعقدة في مجال الانشاءات.

Acknowledgments

I would like to express my sincere appreciation to my Supervisor, Professor Abba Kolo, for his valuable guidance, direction and support, his efforts and support is really appreciated.

Moreover, this dissertation would not have been completed without the support of my family, especially my wife, for their understanding and support during the long days and months I have spent away from them to complete this dissertation.

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1. CHAPTER 1: INTRODUCTION

This Chapter provides overall introduction about construction delays, concurrent delay and its significance in projects. Then, it presents the study background, problem statement, aims of the study, research methodology and the structure of the dissertation.

1.1. Overview

Delays can be considered as one of the common events encountered in construction industry, whereby majority of projects¹ including in the Middle East², suffer delays. As per the World Bank (1990) figures; the percentage of projects that suffered delays during the years of 1974 to 1988 is ranging from 50% to 80%³, and as per the 2015 UK Industry Performance Report; UK projects that encountered time overrun during the years of 2000 to 2015 is ranging from 33% to 58%⁴. Similarly, in the United Arab Emirates (hereinafter “UAE”), Mr. Faridi and El-Sayegh⁵ in 2006 conducted a study, which revealed that about 50% of UAE construction projects encounter delays⁶.

Delays occur due to a plethora of reasons, either attributed to Employers, Contractors/Consultants, local Authorities, other stakeholders, site/project conditions or force majeure. The nature of construction projects being a product to be handed-over years after executing the contract, its complexity and multiplicity of its stakeholders drive such delays.

¹ D Bordoli and A Baldwin, “A methodology for assessing construction project delays” (1998), 16 *Construction management and economics*, 327 – 337, 327

² I have about 23 years’ experience in Middle East construction industry working for contractors and clients, and I had witnessed almost all projects suffers delays.

³ D Bordoli and A Baldwin, “A methodology for assessing construction project delays” (1998), 16 *Construction management and economics*, 327 – 337, 327

⁴ *Constructing Excellence*, UK Industry KPI’s report (2015), at 14

⁵ Dr in the American University of Sharjah

⁶ A S Faridi, & S M EL-Sayegh, 'Significant factors causing delay in the UAE construction Industry' [2006] 24 *Construction Management and Economics* 1167-1176, 1167

Delay is one of the fundamental issues that impinge projects due to its negative impact not only on time of delivery but also due to its associated ramifications, additional cost and losses. Therefore, when a construction project suffers delays (“time is money”); both parties supposed to exert their best endeavours to mitigate its consequences and will definitely seek available contractual and legal remedies to recover their losses. The contractor from one hand, will submit a claim for extension of time (hereinafter “**EOT**”) so as to avoid the application of the contractually stipulated and pre-agreed delay damages⁷ (typically referred to as Liquidated Damages “hereinafter “**LDs**”), and being longer on site to recover his general expenses such as wages, site running cost, company overhead and other related expenses (hereinafter “**Prolongation Cost**”)⁸. On the other hand, the employer will seek the application of LDs or general damages as per various applicable law provisions. As a result of such, disputes arise.

1.2. Background of the study

Delays are always a center of disputes between the contracting parties due to its negative consequences. For which various techniques for delay analysis have been developed/developing over the years in order to identify the requirements to perform the delay analysis, its suitability, the methodology of analysis and its potential outcomes. However, delays’ issues/disputes are extremely complex, whereby various international standard forms of contracts, professional bodies/institutions and legislators tried to provide guidance and regulation for the same. The matter became more complex and exacerbated when concurrent delays encountered, in simple words, it is delays attributed to both the contractor and the employer running simultaneously, whereby concurrent delay can be considered as one of the utmost complex/controversial features of construction disputes.

⁷ UAE Civil Transaction Code 1985, Article 390 (1) “The contracting parties may fix the amount of compensation in advance by making a provision therefor in the contract or in a subsequent agreement, subject to the provisions of the law.”

⁸ SCL Protocol (Core Principle no.16) describes Prolongation Cost as “Unless expressly provided for otherwise (e.g. by evaluation based on contract rates), compensation for prolongation should not be paid for anything other than work actually done, time actually taken up or loss and/or expense actually suffered.”

1.3. Problem statement

Due to the complexity of delay disputes and particularly concurrent delay disputes, professionals/practitioners/contract administrators and courts are facing great difficulties/challenges to identify the defaulted party and resultant compensations. Commentators have described concurrent delay complexity as a “minefield” in England⁹, a "knot" and “dogma” in the United States¹⁰, and as “unscrambling the egg” in Canada¹¹. Whereby, as a standard practise, delay analysis “takes a quantum leap” if concerned with concurrency.¹² Similarly, professional bodies such as the Society of Construction Law¹³ (hereinafter “SCL”) in its published protocol described concurrent delay, as:

*“Concurrency is a contentious issue, both because **there are differing views on the correct approach to dealing with concurrent delay** when analysing entitlement to EOT and because **there are differences about the meaning of concurrent delay itself**”.*¹⁴

Furthermore, it is argued that there are no simple/standard automatic rights to compensation following concurrent delays, and the courts did not apply consistent approach to determine entitlement to extensions of time and postulated losses.¹⁵

This dissertation shall explore, test and analyse the key questions surrounding concurrency: What is the best practical definition of concurrent delays? What techniques are available for delay analysis and what is the best practise? How faults/risks and damages can be allocated or apportioned to each party in concurrent delay situations? What key factors to take into account in determining entitlement of Prolongation Cost in

⁹ T Wrzesien "Concurrent Delay — A Map through a Minefield" (2005) 16 (10) Construction Law Journal 20-22, 20

¹⁰ J Bidgood, S Reed, and J Taylor, “Cutting the Knot on Concurrent Delay”, Construction Briefings No. 2008-2, Thomson Reuters.

¹¹ G Grenier “Evaluating Concurrent Delay — Unscrambling The Egg” (2006) 53 Constr. Law Reports (Canada) (3d) 46

¹² M Cocklin “International approaches to the legal analysis of concurrent delay: is there a solution for English law?” (2014) 30(1), Construction Law Journal, 41-56, 41

¹³ UK professional body founded in 1983 that Working to promote for the public benefit education, study and research in the field of construction law

¹⁴ SCL Protocol 2nd Edition, Feb 2017, paragraph 10.1 p.30, and similarly SCL Protocol, October 2002, paragraph 1.4.2, p.15

¹⁵ S Kauser, “Time Gentlemen Please?” (2002) 13(5) Construction Law Journal, 20.

concurrent delay situations? What are the approaches historically and currently implemented by the courts of various legal jurisdictions in current delay situations? And how UAE courts can learn from other jurisdictions in this regard?

1.4. Aim of the Dissertation

This dissertation aims to provide academic and practical guidance as well as in-depth analytical analysis/review in the context of construction delays/EOT and in particular concurrent delay doctrine, while comparing various international and national approaches under civil law countries (including UAE) and common law countries. This study will explore also how UAE courts and UAE construction industry can benefit from other legal jurisdictions, professional institutions and will examine available and alternative approaches of the concurrent delay doctrine that can be applied in or under UAE law. Finally, the Author will identify from his perspective, the best practise to be applied in UAE and how standard contract forms can be modified to reflect a concise doctrine for concurrent delay.

The significance of this dissertation is attributed to the dilemma surrounding concurrent delay along with its substantial consequences, and how this paper has thoroughly analysed all aspects of concurrent delays while providing practical and efficient recommendations and solutions in this regard. Moreover, this paper will provide thorough guidance to contractors, employers, consultants, practitioners and even judges while dealing with concurrent delays.

1.5. Research Methodology

The Author generally utilizes a doctrinal and comparative legal research methodology while exploring/interpreting/analysing/criticizing law provisions,

legislation, legal concepts, case law and relevant institutional provisions/effects¹⁶. However, for this research to be more proactive and intelligent, the research methodology is reinforced, supported and whenever applicable modified to take into account the Author's personal approach, own expertise and actual experience of Middle East construction industry as well as common sense.

1.6. Organization of Dissertation

The chapters flow logically from providing an overview of construction delays and concurrent delay through to the identification of delay analysis techniques with an overview of the Society of Construction Law Delay and Disruption Protocol (hereinafter “**SCL Protocol**”), and AACE International (formerly the American Association for the Advancement of Cost Engineering) (hereinafter “**AACE**”)¹⁷ Forensic Schedule Analysis Protocol (hereinafter “**AACE Protocol**”)¹⁸, to in-depth analysis of various approaches to concurrent delay under various jurisdictions (both civil law and common law countries) while exploring prolongation cost entitlement and finally conclusion and recommendation.

Chapter 2 will discuss delays in construction industry, its definition, causes and effects, and will explore in particular Concurrent Delay and its complexity. Chapter 3 will discuss the importance of delay analysis and analyse various available delay analysis techniques. Chapter 4 will explore the published well-known international protocol for delays/concurrent delays namely “The Society of Construction Law Delay and Disruption Protocol” and “AACE International Recommended Practice No. 29R-03 “Forensic Schedule Analysis” Protocol”, while analysing some of the international standard

¹⁶ Such as AACE Protocol, and SCL Protocol available at <https://www.scl.org.uk/resources>

¹⁷ AACE International is a USA professional body, a 501(c)(3) non-profit professional association serving the total cost management community since 1956

¹⁸ AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011), available at https://web.aacei.org/docs/default-source/toc/toc_29r-03.pdf?sfvrsn=4

contracts and bespoke contract amendments, which addressed concurrency within its terms. Chapter 5 will provide analysis and concise identification of internationally recognized approaches to Concurrent Delay namely “Dominant Cause”, “The Malmaison Approach”, “Apportionment” and “The Devlin Approach”. Chapter 6 will explore and compare various international and national approaches under civil law countries (including UAE) and common law countries namely “English Law”, “Scottish Law”, “United States Law” and “UAE Law”, while exploring/analysing various court cases. Finally, Chapter 7 will provide a conclusion of the dissertation and Author’s recommendation.

2. CHAPTER 2: DELAYS IN CONSTRUCTION INDUSTRY

2.1. Definition Of Construction Delays

As a start point for this study, it would be prudent to elucidate the meaning and terminology of delays in the construction context in order to avoid any misunderstanding. The Programme of construction works is a series of activities that is logically linked and inter-related to each other in order to achieve the ultimate goal for completing the project on time as scheduled. Some of these activities are located in the critical path of the project programme that if delayed will lead inexorably to delays for the overall completion of the project, while balance activities are not.

Delay can be defined, in simple words, as a delay in performing works' components/ activities, either a delay to start an activity or a delay to the period required to finish an activity. The AACE¹⁹ in its description of construction delay states:

“a state of extended duration of an activity, or a state of an activity not having started or finished on time, relative to its predecessor”²⁰

Delays can be categorised into three categories: i) excusable and compensable²¹, ii) excusable and non-compensable²², and iii) non-excusable²³. Whereby, the burden to prove the EOT entitlement is on the contractor. Thus, if he could not substantiate that the delay is excusable; it will be by default considered as a non-excusable, and the same applies for compensability²⁴. However, for a delay to be compensable, the contractor should demonstrate that no delays attributed to him were running concurrently with the

¹⁹ Association for the Advancement of Cost Engineering International

²⁰ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P32, , available at https://web.aacei.org/docs/default-source/toc/toc_29r-03.pdf?sfvrsn=4

²¹ i.e the Contractor shall be entitled for EOT and Prolongation Cost

²² i.e the Contractor shall be entitled for EOT only without Prolongation Cost

²³ i.e the Contractor in not entitled for EOT and delay damages shall be applied on him

²⁴ Dubai court of cassation No 253 of 2008 Commercial, “*And whereas the result reached by the judgment under appeal is sound and has proven evidence in the papers as **the appellant failed to prove the damage alleged by it, thus the challenge becomes unfounded and has no factual or legal foundation. In the light of the abovementioned, the appeal must be dismissed***”

claimed EOT. In other words, the damages should satisfy the but-for test i.e. the losses would not have been occurred but-for the claimed EOT²⁵. Moreover, it is noted that Delay forms part of any project risks, whereby all international standard forms of contract allocate such risk between the contracting parties by providing provisions for various delay situations while identifying the ‘employer’s risks’: risks/events that is excusable and/or compensable and the ‘contractor’s risks’: risks/events that is non-excusable. Moreover, it specifies the contractual mechanism to deal with such delay situations and the mechanism for EOT where applicable²⁶.

For the first category: ‘excusable and compensable’ delay, these are events that are part of the Employer’s risks or delays caused by him, which he has to grant EOT and compensate the contractor for the Prolongation Cost. The simple example is ordering variation or additional works that lead to a delay to the completion date.

For the second category: ‘excusable and non-compensable’ delay, these are events that are part of the Employer’s risks, however not caused by him and are attributed to a neutral cause, which he has to grant EOT but without Prolongation Cost. The simple example is unforeseen extremely adverse climate conditions, for which the works suffer delays or were suspended.²⁷

For the third category: ‘non-excusable’ delay (and definitely non-compensable), these are events that are part of the Contractor’s risks, or delays caused by the contractor, which the Employer will apply LDs. The simple example is the contractor’s default events such as slow of progress or lack of resources.

²⁵ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008) 76

²⁶ S.A Fawzy ; I.H El-adaway; and T. H Hamed “Contracting in a Global World: Application of the ‘Time at Large’ Principle” (March 2015), *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, ASCE, 1

²⁷ SCL Protocol, paragraph 1.2.6, p.11

2.2. Causes Of Construction Delays

As explained above, the causes of delays are either attributed to i) the Employer/his agents, or ii) the Contractor or iii) any other neutral events. The following represent some of the main delay's reasons as per these identified three categories:

i) Employer/his agents Delays, such as:

- Design delays²⁸ and delays due to design deficiencies;
- Delays to site possession or restricted site access;
- Delayed payments;
- Approvals' delay;
- Variations²⁹;
- Delay in sub-contractors' nomination.³⁰

ii) Contractor's Delays, such as:

- Shortage of resources;
- Financial issues such as cash flow deficit;
- Subcontractor delays³¹;
- Defects and poor workmanship;
- Slow in progress due to the contractor's default.

iii) Neutral Events³², such as delays attributed to:

- External stakeholders such as local Authorities;
- Unforeseen extremely adverse climate conditions;
- Unforeseen site conditions;
- Force majeure^{33,34};
- Change in legislation.

²⁸ Dubai Court of Cassation, 266/2008 [17 March 2009]

²⁹ UAE Civil Transaction Code 1985, Article 887 "If any variation or addition is made to the plan with the consent of the employer, the existing agreement with the contractor must be observed in connection with such variation or addition"

³⁰ Dubai court of Cassation (213/2008) Commercial Appeal [19 January 2009]

³¹ UAE Civil Transaction Code 1985, Article 890 (2) "The first contractor shall remain liable as towards the employer".

³² beyond the control of both parties or caused by a third party

³³ UAE Civil Transaction Code 1985, Article 878 "The contractor shall be liable for any loss or damage resulting from his act or work whether arising through his wrongful act or default or not, **but he shall not be liable if it arises out of an event which could not have been prevented**"

³⁴ UAE Civil Transaction Code 1985, Article 894 "If the contractor commences to perform the work and then becomes incapable of completing it **for a cause in which he played no part, he shall be entitled to the value of the work which he has completed** and the expenses he has incurred in the performance thereof up to the amount of the benefit the employer has derived therefrom".

With respect to actual reasons for delays from international perspective, historically many construction professionals/practitioners have carried out surveys for the main reasons for construction delays that was summarised in the paper written by *Lo, Tommy Y; Fung, Ivan W. H.; Tung, Karen C. F* in 2006. The following table³⁵ is an extract from this article that summarises the conducted survey outcome. As seen below, in UAE the key reasons were: lack of early planning of the project, delay in preparation and approval of design drawings, delay by the Employer in making decisions, shortage of manpower, inadequate site management/supervision and manpower low productivity, for which the Author concurs except for one additional item, namely delays attributed to local Authorities.

“Researchers	Country	Major Causes of Delay
Baldwin, J. R., Mathei, J. M., Rothbart, H., and Harris, R. B. (1971)	United States	<ul style="list-style-type: none"> - Inclement weather - Shortages of labour supply - Subcontracting system
Okpala and Aniekwu (1988)	Nigeria	<ul style="list-style-type: none"> - Shortages of materials - Failure to pay for completed work - Poor contract management
Dlakwa and Culpin (1990)	Nigeria	<ul style="list-style-type: none"> - Delays in payment by agencies to contractors - Fluctuations in materials, labour and plant costs
Mansfield, N. R., Ugwu, O. O., and Doran, T.(1994)	Nigeria	<ul style="list-style-type: none"> - Improper financial and payment arrangements - Poor contract management - Shortages of materials - Inaccurate cost estimates - Fluctuations in cost
Semple, C., Hartman, F. T., and Jergeas, G. (1994)	Canada	<ul style="list-style-type: none"> - Increases in the scope of the work - Inclement weather - Restricted access
Assaf, S. A., Al-khalil, M., and Al-Hazmi, M. (1995)	Saudi Arabia	<ul style="list-style-type: none"> - Slow preparation and approval of shop drawings - Delays in payments to contractors - Changes in design/design error - Shortages of labour supply - Poor workmanship

³⁵ T Y Lo, I Fung, and K Tung “Construction Delays in Hong Kong Civil Engineering Projects.” (2006) Journal of Construction Engineering and Management, ASCE, 132(6) 636- 649, 637

“Researchers	Country	Major Causes of Delay
Ogunlana, S. O., Promkuntong, K., and Jearkirm, V. (1996).	Thailand	<ul style="list-style-type: none"> - Shortages of materials - Changes of design - Liaison problems among the contracting parties
Chan and Kumaraswamy (1996)	Hong Kong	<ul style="list-style-type: none"> - Unforeseen ground conditions - Poor site management and supervision - Slow decision making by project teams - Client-initiated variations
Al-Khalil and Al-Ghafly (1999)	Saudi Arabia	<ul style="list-style-type: none"> - Cash flow problems/financial difficulties - Difficulties in obtaining permits - “Lowest bid wins” system
Al-Momani (2000)	Jordan	<ul style="list-style-type: none"> - Poor design - Changes in orders/design - Inclement weather - Unforeseen site conditions - Late deliveries
Arditi, D. and Pattanakitchamroon, T. (2006).	Turkey	<ul style="list-style-type: none"> - Shortages of resources - Financial difficulties faced by public agencies and contractors - Organizational deficiencies - Delays in design work - Frequent changes in orders/design - Considerable additional work
Lo, T. Y., Fung, I. W. H., and Tung, K. C. F. (2006).	Hong Kong	<ul style="list-style-type: none"> - Inadequate resources - Unforeseen ground conditions - Exceptionally low bids - Inexperienced contractor - Work in conflict with existing utilities - Poor site management and supervision - Unrealistic contract duration
Faridi and El-Sayegh (2006)	UAE	<ul style="list-style-type: none"> - Slow preparation and approval of drawings - Inadequate early planning of the project - Slowness of owner’s decision making - Shortage of manpower - Poor site management and supervision - Low productivity of manpower
Assaf and Al-Hejji (2006)	Saudi Arabia	<ul style="list-style-type: none"> - Change in orders by the owner during construction - Delay in progress payment - Ineffective planning and scheduling - Shortage of labour - Difficulties in financing on the part of the contractor”

2.3. Cause and Effect

As an established principle under national and international jurisdictions, delays and its losses are a matter of ‘creating liability and loss’ and shall be recognized if it satisfies and proven³⁶ that the cause of delay is one of party’s risks or breach of the contract “**cause**”, loss/delay was incurred, and the same was a natural result from such breach/risk “**effect**”³⁷. Causation, in addition of it being a matter of law and heavily relied on the proper interpretation of contractual provisions, is generally based on statements of fact, records and inter-relation between events and encountered delays, and to effectively link delays/loss to its root causes³⁸.³⁹

This was apparent in the Dubai court of cassation case No 253 of 2008 Commercial⁴⁰, the court stated:

“This ground of appeal is refutable because it is well settled as has been held in the precedents of this court that the contractual liability is materialized only in case its three essential elements namely the fault, the damage and the casual relationship between them are made out, so that if any essential elements is not made out, the liability shall not arise, and the obligee has to prove the obligor’s fault and the damage incurred by him; while the casual relationship between them will be presumed”

Lord Hoffmann clarified his exposition about the definition of causation as first a ‘matter of law’ (i.e. in the Author’s opinion, the express contractual terms/conditions and relevant law provisions if any), and then second a ‘matter of fact’, he said:

“One decides, as a matter of law, what causal connection the law requires and one then decides, as a question of fact, whether the claimant has satisfied the requirements of the law. There is, in my opinion, nothing more to be said”.

³⁶ Burden of proof is on the Claimant

³⁷ Wharf Properties v Eric Cumine Associates (1991) 52 BLR 1 & Rolls Royce v. Ricardo (2003) EWHC 2871 (TCC) & Mid Glamorgan County Council v. J. Devonald Williams & Partner (1993) 8 Const LJ 61

³⁸ D Chappell, V Powell-Smith & J Sims, Building Contract Claims (Fourth edn Blackwell Publishing Ltd, 2005) 144-145

³⁹ N. J Carnell, Causation and Delay in Construction Disputes (2nd edn Blackwell Publishing Ltd, 2005) 126-131

⁴⁰ A court case on delays and losses related to a construction of building consisting of basement + GF + 7 typical floors
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Lord Hoffmann went further to put out what in his opinion could have gone wrong while identifying the causation of any liability as a matter of law and the reason why such a rule creates a liability, he said:

*“the reason why courts get the wrong answer on questions of causation is not usually because they have misunderstood the facts or lack common sense but because they have got the law wrong. They have misconstrued the proper scope of the rule which imposes liability, the rule which provides the context in which the question of causation is being asked”*⁴¹

Moreover, it is worth mentioning that causation should be analysed with the perspective of common sense⁴² while utilizing ‘logical and methodical calculation’⁴³ to determine all relevant events causing delays, eliminate any anomaly in the analysis or outcomes and to conclude the EOT entitlement. The same was emphasised by SCL-Protocol in guidance Section 3, and was addressed as well in various court cases. In *Galoo Ltd v Bright Grahame Murray*⁴⁴, the Court of Appeal, did not approve to apply the but-for-test and stated that to answer the question of causation, the court must do so “by application of the court’s common sense”.

2.4. Concurrent Delay, Definition and its complexity

As explained above, there are various causes of delay; however it is very rare if only one of these occur in isolation of others. The common scenario is numerous competing causes attributed to both “employer and/or the contractor” happen either concurrently or consequently or independently and all affect the time for completion. Having said that,

⁴¹ Vincent Moran QC, “CAUSATION IN CONSTRUCTION LAW: THE DEMISE OF THE ‘DOMINANT CAUSE’ TEST?”, (November 2014) SCL paper 190, 2

⁴² See eg Lord Wright in *Yorkshire Dale Steamship Co v Minister of War Transport* [1942] AC 691 (HL), page 706; Lord Reid in *Stapley v Gypsum Mines Ltd* [1953] AC 663 (HL), page 681; *Galoo Ltd v Bright Grahame Murray* [1994] 1 WLR 1360, [1995] 1 All ER 16 (CA); and *John Doyle Construction Ltd v Laing Management (Scotland) Ltd* [2004] B.L.R. 295 (IH (Ex Div))

⁴³ *McAlpine Humberoak v McDermott International* (1992)& *John Barker Construction Ltd v. London Portman Hotel* (1996)

⁴⁴ *Galoo Ltd v Bright Grahame Murray* [1994] 1 W.L.R. 1360, CA

when delays occurred that are attributed in part to the Employer and in other part to the Contractor delay the project, this is considered as concurrent delay. Concurrent delay is considered as one of the law notoriously problematical areas, and most complicated & controversial kind of delay disputes. This is due to its unique/complex nature and the fact that there is no one standard and agreed coherent definition/interpretation⁴⁵ of concurrent delay, whereby the majority of practitioners have to contend with such uncertainty and with its substantial divergences. HHJ Seymour QC⁴⁶ stated that it is “necessary to be clear **what one means by events operating concurrently**”. Similarly, The SCL Protocol states:

“Concurrency is a contentious issue both because there are differing views on the correct approach to concurrency when analysing entitlement to EOT and **because there are differences about the meaning of concurrency itself**”⁴⁷.

In consideration of the foregoing, many commentators as well as jurists tried to specify what is meant by concurrent delay and whether it is related to the concurrent occurrence of delay events itself, and/or the concurrent effect of delay events, and/or concurrent versus sequential delays.

John Marrin QC⁴⁸ defined it as “*a period of project overrun which is caused by two or more effective causes of delay which are of approximately **equal causative potency***”⁴⁹, whereby Mr Justice Hamblen agreed with such sentiment in *Adyard Abu Dhabi v SD Marine Services*⁵⁰. This situation is considered as true concurrency (i.e. co-extensive, concurrent causes and concurrent effect, with same causative potency), whereas the effect of both is felt at the same period/time.⁵¹ In the same way, Judge Seymour QC⁵² clarified

⁴⁵ the same was explained by Lord Osborne in *City Inn v Shepherd* [2008] 8 BLR 269 (CSOH); [2010] BLR 473 (CSIH)

⁴⁶ In *Royal Brompton Hospital NHS Trust v Hammond* [2001] EWCA Civ 206

⁴⁷ SCL Protocol, October 2002, paragraph 1.4.2, p.15

⁴⁸ John Marrin QC is a barrister practicing at Keating Chambers in London

⁴⁹ J Marrin QC, “Concurrent Delay”, (2002) 18 *Construction Law Journal* 6, 436

⁵⁰ *Adyard Abu Dhabi v SD Marine Services* [2011] EWHC 848 Comm

⁵¹ J Marrin QC, “Concurrent Delay Revisited”, (2013) SCL paper 179, 1

⁵² In *Royal Brompton Hospital NHS Trust v Hammond* [2001] EWCA Civ 206

his position that concurrent delay and Contractor's entitlement for EOT only applies in true concurrency situations⁵³, and further contended that if two delay events occurred sequentially, the event that matter is the event that happened first which is considered as the direct cause of delay; whereas the second event is simply has no effect since delay already encountered⁵⁴.⁵⁵ However, the SCL-Protocol in its definition of **true concurrency** stated: "*..... is the occurrence of two or more delay events **at the same time**, one an Employer Risk Event, the other a Contractor Risk Event, and the **effects of which are felt at the same time.***"⁵⁶ SCL did not recognize the equal causative potency stated above, but was emphasizing about coincidence for the occurrence as well as the effect.

Conversely, and considering the fact that true concurrency will only occur rarely⁵⁷, this was argued in Keating, whereby true concurrency was considered as a narrow interpretation of concurrent delay⁵⁸. 2017-SCL-Protocol clarifies that a more common definition of concurrency is "*In contrast, a more common usage of the term 'concurrent delay' concerns the situation where two or more delay events arise at different times, but the effects of them are felt at the same time*".⁵⁹ Similarly, Lord Drummond Young in the leading Scottish case *City Inn*⁶⁰ disagreed⁶¹ with Judge Seymour QC, in his opinion, it does not matter which event happened first as far as both delayed the project, and in any

⁵³ "the works are proceeding in a regular fashion and on programme, when two things happen, either of which, had it happened on its own, would have caused delay, and one is a relevant event, while the other is not."

⁵⁴ "It does not mean, in my judgment, a situation in which, work already being delayed, let it be supposed, because the contractor has had difficulty in obtaining sufficient labour, an event occurs which is a relevant event and which, had the contractor not been delayed, would have caused him to be delayed, but which in fact, by reason of the existing delay, made no difference. In such a situation although there is a Relevant Event, 'the completion of the Works is not likely to be delayed thereby beyond the Completion Date'. **The relevant event simply has no effect upon the completion date.....**"

⁵⁵ D Thomas QC "Concurrent delay: separate paths within the UK?" (June 2008) Construction Law International Volume 3 No 2, 27-28

⁵⁶ SCL Protocol, October 2002, paragraph 1.4.4, p.16, and SCL Protocol, 2nd Edition Feb 2017, paragraph 10.3, p.30

⁵⁷ Ibid

⁵⁸ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012), para 8–025

⁵⁹ SCL Protocol, 2nd Edition Feb 2017, paragraph 10.4, p.30

⁶⁰ Outer House decision (i.e first instance) of *City Inn Limited v Shepherd Construction Ltd* [2007] CSOH 190

⁶¹ He stated, "It seems to turn upon the question of whether the shortage of labour and the relevant event occurred simultaneously; or at least it assumes that the shortage of labour and the relevant event did not significantly predate the relevant event. That, however, seems to me to be an arbitrary criterion. It should not matter whether shortage of labour developed, for example, two days before or two days after the start of a substantial period of inclement weather; in either case the two matters operate concurrently to delay completion of the works."

scenario for the order of events' occurrence, all should be considered as concurrent delay. He stated in his definition of concurrent delay: "*Where there is true concurrency between a Relevant Event⁶² and a contractor default, in the sense that both existed simultaneously, regardless of which started first*". Additionally, the court of appeal⁶³ for the same case agreed with the same.⁶⁴ Moreover, this was the same sentiment applied by the US court long time back in *Chas. i Cunningham*⁶⁵ (1957) case⁶⁶ and *Sun Shipbuilding & Drydock Co.*⁶⁷ (1968) case.⁶⁸ Comparably, SCL supported the concurrent effect approach⁶⁹; SCL interpretation of concurrent delay is "*In contrast, a more common usage of the term 'concurrent delay' concerns the situation where two or more delay events arise at different times, but the effects of them are felt at the same time.*"⁷⁰

However, the situation of sequential dependent concurrent delays has to be looked at with different perspective. This is a situation where for example, an Employer's risk event occurred and as a result of such the subsequent works' activities suffered delays which the employer argued that was a contractor culpable delay or the contractor elected reasonably/justifiably to pace the work⁷¹. In such scenarios, Contractor's delays can be treated as "side-effect" of the Employer's delay, and all delays can be attributed to the

⁶² Employer's Risk Event shall be defined herein as "Relevant Event"

⁶³ Inner House of the Court

⁶⁴ D Barry "Concurrent Delay in construction law: Lord Drummond Young's volte face" (2011), *Construction Law Journal* 27(3), 165-178, 169

⁶⁵ *Chas i. Cunningham Co IBCA 60 57-2 BCA 91541* (1957)

⁶⁶ US Board of Contract Appeals stated "Where a contractor finishes late partly because of a cause that is excusable under this provision and partly because of a cause that is not, it is the duty of the contracting officer to make, if at all feasible, a fair apportionment of the extent to which completion of the job was delayed by each of the two causes and to grant an extension of time commensurate with his determination of the extent to which the failure to finish on time was attributable to the excusable one."

⁶⁷ *Sun Shipbuilding & Drydock Co. ANBCA 11300, 68 BCA (CCN)* (1968)

⁶⁸ D Thomas QC "Concurrent delay: separate paths within the UK?" (June 2008) *Construction Law International* Volume 3 No 2, 28

⁶⁹ SCL Protocol, October 2002, paragraph 1.4.6 and 1.4.7, p.16 and SCL Protocol, 2nd Edition Feb 2017, paragraph 10.4, p.30

⁷⁰ SCL Protocol, 2nd Edition Feb 2017, paragraph 10.4, p.30

⁷¹ However, in the Author's opinion in situation of work pacing, the contractor should notify the Employer/Engineer for the same.

Employer, as far as the relevant Contractor's delay does not further impact the project completion date.⁷²

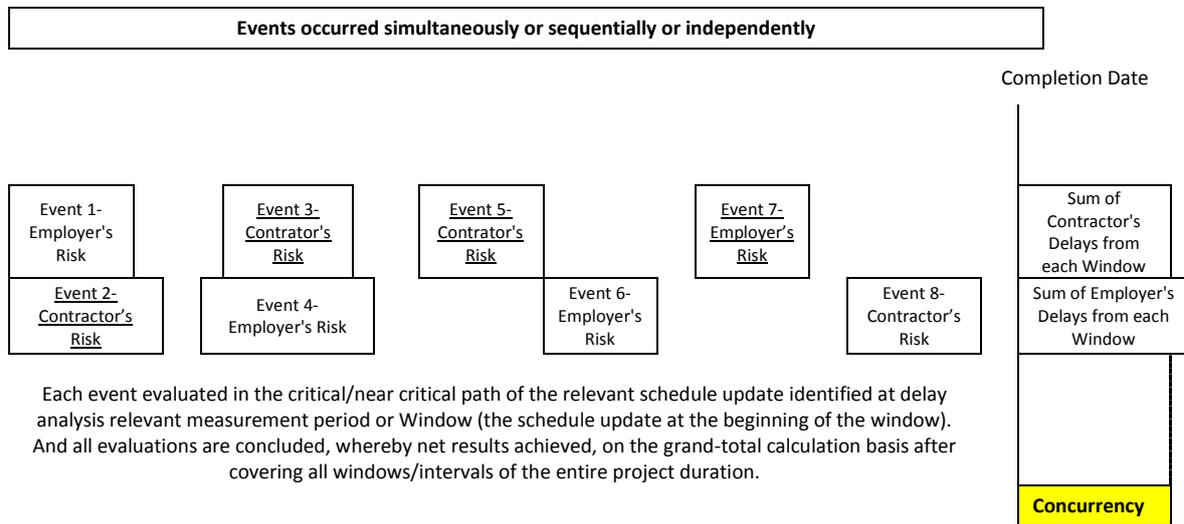
In the Author's opinion, the term 'concurrent delay' must have a wider all-inclusive definition to cover all delay situations attributed to both parties that each/together have an effect on time for completion, and to avoid various contentions about its applicability or definition. It doesn't matter if delay events occur on the same time, occur sequentially (but the second event is not a result of the first event) or occur independently, **as far as all are in the critical/near critical path and have delayed the project completion.** Similarly, the same applies to events' effect, it doesn't matter that the effects were felt on the same time or felt consecutively or felt individually as far as **all are in the critical/near critical path** and have delayed the project completion. On the basis thereof, in the Author's point of view, concurrent delay can be defined as:

“Various independent delay events, whereby some form part of the Employer's risk events and others form part of the Contractor's risk events, occur simultaneously or independently/sequentially or overlapped, and either in the same activities' path or other parallel or independent activities' path, and its effect either felt simultaneously or independently, which are on the pertinent critical/near critical path (that is identified at delay analysis relevant measurement period or window for dynamic methods, or baseline schedule for static method) of the programme of the Works⁷³ and each separately causes delay to project Time for Completion”. By such definition, all types of delay attributed to both parties are covered, however, it is significantly important to state that the appropriate way to deal with each situation is different from one case to

⁷² P TOBIN “CONCURRENT AND SEQUENTIAL CAUSES OF DELAY” (2007), The International Construction Law Review Pt 2, 142-167, 143

⁷³ i.e “an effective cause of Delay to Completion (not merely incidental to the Delay to Completion)”

another.⁷⁴ The following represent a graphical illustration of the Author’s definition of concurrent delay:



Additionally, in Author’s opinion to avoid disputes about pacing of the works⁷⁵, it is best practise that reasoned voluntarily party’s pacing of independent activities due to other party’s precedent parent delay must be notified in advance to the other party for consideration.

Moreover, the Author submits that such definition or any other coherent and express defined term of concurrent delay must be included within the international standard forms of contracts or parties agreed particular/special conditions of contract.

To conclude, the argument/dilemma will always be: i) is the contractor entitled for EOT? And if so is he entitled for Prolongation Cost?, or ii) the employer is entitled to apply LDs? Whereby, it is common practise that the other party is relying on concurrent

⁷⁴ This is addressed in other following chapters in the author’s analysis for different situations

⁷⁵ as illustrated by AACE in section 4.2 “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”

delay as a matter of counter-claim defence strategy⁷⁶. Furthermore, the Author submits as well that the key element that drives the complexity of concurrent delay is the ability to put separate borderlines between causes of delay and to segregate its effect on time for completion, in order to identify as well the applicability and extent of Prolongation Cost and overcome the challenges associated with indivisibility of the loss. This establishes the importance of Delay Analysis.

⁷⁶ B Bramble, H Callahan, Construction Delay Claims (4th edn United States, Aspen Publishers, 2011), 1-19

3. CHAPTER 3: DELAY ANALYSIS

3.1. Introduction

The main starting point of any delay analysis is a reliable/reasonable construction baseline programme and the availability of as-built data/programme as record of facts in order to factor all causes of delays and show its effects. The baseline programme shows the contractor's intention to carry out the works with respect to commencement, relationship, sequencing, logistics, duration and resources. While, the as-built programme shows exactly, and should be supported by evidences, what actually happened on site. However, the matter is not that simple; this is attributed to issues related to the "required versus available" level of accuracy and reasonableness of data and baseline programme, and the lack of as-built records, whereby it is said "*any form of delay analysis is only as good as the data on which it is based. The question is always - delay to what?*"⁷⁷

3.2. Why Do We Need it

Is it really essential to perform the delay analysis? The answer is Yes. The purpose from any delay analysis is to identify the cause and effect, i.e. to establish a logical and common sense analysis that satisfy all requirements necessary to identify the root causes of delays and resulting consequences in order to allow for identifying who is liable for such delays and resultant damages.⁷⁸

3.3. Delay Analysis Techniques

There are various available techniques for delay analysis, some are argued that provide reasonable outcomes and some argued that are not. However, in any technique, if the quality of Project schedules and/or delay analysis is poor; the results will be poor and

⁷⁷ N. J. Carnell, *Causation and Delay in Construction Disputes* (2nd edn Blackwell Publishing Ltd, 2005) 164

⁷⁸ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008) 76

unreliable as well. The selection of appropriate delay analysis depends upon many factors, such as, availability of reliable baseline programme, availability of contemporaneously as built records/programme, value of disputes, time constraints, timing of the analysis and availability of budget (how much) to conduct the analysis. Delay analysis can be as Prospective or Retrospective analysis. Prospective analysis is conducting the analysis during currency of the works/project when delay event arises by looking forward in terms of analysis timing and estimating of future events i.e. delay's impacts have not been materialized/concluded; hence the delay analyst determines/forecasts the most probable completion dates of future activities. While, Retrospective analysis is conducting the analysis after the delay event(s) transpired and its impacts are materialized/known by looking backwards in terms of analysis timing, this could be done during or after the project completion. It is noted that the term Prospective or Retrospective is correlated to the time when the delay analyst performed his analysis and either the delay impacts are known or not, hence any method of looking-forward analysis conducted after the delay impacts are known (such as Updated As-Planned Versus Updated As-Built) is a Retrospective analysis.⁷⁹

Generally, there are a well-known two categories of delay analysis, static and dynamic. Static methods rely on single fixed baseline/original schedule, whereby three methods have been developed namely “**As-Planned Versus As-Built**”⁸⁰, “**As Planned Impacted-single base**”⁸¹ and “**Collapsed As-Built**”⁸². Dynamic methods rely on various updated

⁷⁹ AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011), 13

⁸⁰ Also referred to as an “**observational/static logic gross (MIP 3.1) /periodic (MIP 3.2)**”, analysis, see AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011).

⁸¹ AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011) a “**modelled/additive/single base**” analysis

⁸² AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011) a “**modelled/subtractive**” analysis

schedules developed as the works progress while considering shifting of critical paths, whereby two methods have been developed namely “**Updated As-Planned Versus Updated As-Built**”⁸³ and “**As Planned Impacted- multiple base or Windows Analysis or Time Impact Analysis (TIA)**”⁸⁴. Each method can be conducted for the whole project duration as single analysis or, via a “Windows Analysis”⁸⁵ or “Watershed Analysis”⁸⁶ i.e. dividing the construction period into successive segments of specific period of time/intervals, fixed period for Windows and varied periods for Watershed analysis, whereas the effects of any former period/window is carried forward to the subsequent period/window. Nevertheless, at any scenario, delay analysis must be comprehensive and covers the whole project duration (not parts of it)⁸⁷ and covers all delay events (not some of it)⁸⁸ attributed to both the employer and the contractor.

Additionally, AACE-Protocol has divided the retrospective delay analysis into two main categories, “Observational” and “Modeled”. The Observational category is the methods of analysing the project schedule and comparing it to other schedule such as built schedule, without making any modifications to the schedule to simulate any scenario or to simulate the effect of delay events. While Modelled methods require more than an observation of schedules, it uses delay events or changes as schedule activities and insert it to the Project programme or extract it from the as-built schedule; to hypothetically check or simulate its impact and compares the Project schedule vs the simulated schedule

⁸³ AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011) an “**observational/dynamic logic/contemporaneous as-is**” analysis

⁸⁴ AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011). Although essentially this is a **contemporaneous delay analysis**, according to the taxonomy, if carried out retrospectively, this method would be a “**modelled/dynamic/modified or recreated/multiple base**” analysis

⁸⁵ AACE International Recommended Practice No.29R-03 (2009) “**fixed periods**”

⁸⁶ AACE International Recommended Practice No.29R-03 (2009) a “**variable windows or grouped**” analysis

⁸⁷ Mirant Asia-Pacific Construction (Hong Kong) Ltd v Ove Arup and Partners International Ltd [2007] EWHC 918 (TCC)

⁸⁸ US case, Gulf Contracting, Inc (1989) ASBCA Nos 30195 et al, 89-2 BCA, 21,812

calculated results i.e. before and after scenarios.⁸⁹ In the Author's opinion "Modelled Method" as presented by AACE-Protocol, can be integrated or used by the delay analyst in the aforementioned delay analysis methods whenever applicable to address any specific issues and enhance the analysis and conclusions/outcomes.

Furthermore, it is worth mentioning that different delay analysis methods produce different outcomes that are emanated from how the analysis is conducted, especially considering the fact that a wide consensus for the appropriate method do not generally exist.⁹⁰ For instance, as-planned impacted method (a static method) while considering the planned schedule; does not take into consideration the as built records, whereas the collapsed as-built method (a static method as well) while considering the as built records does not necessarily take into consideration the planned schedule. Likewise, the static method does not take into consideration updated programmes and critical path(s)/float shifting nature, while dynamic methods did.⁹¹ Therefore, the Author submits that selection of the appropriate method is subjective and subject to challenge.⁹²

Having stated that, a model was developed in order to theoretically decide on the most appropriate method in given case by providing selection criteria matrix vs given scores for each and the highest overall score represent the most appropriate method. The model identifies 18 selection criteria from the in-depth review of numerous delay/disruption literatures and a nation-wide questionnaire survey of recognized delay analysis experts in the UK.⁹³ This model is enclosed in Appendix-2 for reference.

⁸⁹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P13-14

⁹⁰ N Braimah "Selecting the appropriate delay analysis methodology: a decision-making model for facilitating the process" (2015) *Construction Law Journal*, 31(2), 97-107, 97

⁹¹ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-004 to 15-011.

⁹² Examples where UK courts commented on which method of proof is acceptable in particular situations, See for example, *Mirant Asia-Pacific Construction (Hong Kong) Ltd v Ove Arup and Partners International Ltd* [2007] EWHC 918 and *Costain Ltd v Charles Haswell & Partners Ltd* [2009] EWHC B25; [2010] TCLR 1

⁹³ N Braimah "Selecting the appropriate delay analysis methodology: a decision-making model for facilitating the process" (2015) *Construction Law Journal*, 31(2), 97-107, 97

The following sections present a concise analysis for afore mentioned recognized delay analysis techniques.

3.3.1. As-Planned Versus As-Built⁹⁴

It is one of the *observational* and *static* analysis, it is the analysis of comparing the planned schedule as initially envisaged (duration of baseline programme activities) to what actually happened as constructed (duration of as built activities that correspond to the planned activities)⁹⁵, then inferring/speculating from the differences between both, while dividing the causes of delay, the resulting effects and then the liability of each party, or calculates the effect by means of formula⁹⁶. This method is a simple method that generally applied to simple bar charts scheduling but can be applied as well to CPM schedules, and does not rely on impact analytical analysis of the cause and effect of the delay events encountered such as, inserting/extracting activities related to delay events then run the CPM model to calculate/compare the before/after status. Its outcome is not reliable to demonstrate causation if done as single/gross analysis/comparison for the whole construction period except for very simple cases., Such gross approach is considered as a global claim (total time) to calculate the overall difference as being both excusable and compensable, for which burden of proof lies on the contractor⁹⁷. However, better outcomes can be drawn if the analysis is conducted via windows or watershed analysis rather than single analysis for the whole construction duration, whereby each period is analysed in isolation of the other (i.e. no impact is carried forward to any

⁹⁴ Also referred to as an “**observational/static logic gross/periodic**” (MIP 3.1, MIP 3.2) analysis, see AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011).

⁹⁵ While identification of activities’ late start delay, extended duration or late finish delay

⁹⁶ K Pickavance, “Delay and disruption in construction contracts” (4th edn), see the formula provided para 15-058 “ $EOT = [C + (A + s) - (f - n)] - [(T - t) + (p^u + m^u) - (p^o + m^o)]$ ” contained in enclosed **Appendix-1**

⁹⁷ P. J. Keane & A. F. Caletka, Delay Analysis in Construction Contracts (3rd edn Blackwell Publishing Ltd, 2008), 151
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subsequent segmental period); but by breaking up project duration this will allow for better understanding of the differences between the two baselines.⁹⁸ The effectiveness of the as-planned versus as-built method is also reinforced by the delay analyst's ascertainment of the as built critical path, the delayed/critical activities that are evident by contemporaneous project records.⁹⁹

Furthermore, some commentators argued that this method could be considered as an efficient, reliable and most convincing method if reliable/reasonable baseline programme is available, comprehensive and accurate as built data is available and the delay analyst implements the same correctly.¹⁰⁰

This method strengths and weaknesses can be summarized as follows:

Strengths/advantages

- Simple, quick and easy to produce, since it requires only planned and as built data without the need of complex programmes or progress updates¹⁰¹ or modifying of the baseline programme to eliminate any anomaly;
- Inexpensive;
- Easy to be understood and verified;¹⁰²
- Can be produced even with rudimentary schedules (such as bar charts) and as-built records;¹⁰³
- Possibility of identification of concurrency during the actual relevant period by means of expert judgement;¹⁰⁴

⁹⁸ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-056 to 15-060

⁹⁹ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 160

¹⁰⁰ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 160

¹⁰¹ i.e changes to the baseline programme or sequence of the works other than originally planned

¹⁰² AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P43

¹⁰³ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P43

¹⁰⁴ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 161

- Based on the as-built critical path, hence closer to actual events.¹⁰⁵

Weaknesses/disadvantages

- No detailed analysis is possible, no analytical analysis of the cause and effect;
- Accuracy could be compromised, especially as analysis advances towards the later stages of construction period¹⁰⁶; ¹⁰⁷
- Results can be manipulated to suit the specific purpose;¹⁰⁸
- Not suitable for complex projects¹⁰⁹, long durations¹¹⁰, complex causes¹¹¹, intertwined or concurrent delay events¹¹², however establishing liabilities in these cases can be done via expert judgment driven by the available facts and supported by a correlation between activities and factual matrix¹¹³;
- Cannot take into account programme updates/changes or changes in the actual sequence of the works that could be the actual cause of delays, hence cannot be applied if the planned schedule is materially different than as-built schedule¹¹⁴;
- Cannot take into account critical path shifts;¹¹⁵
- No possibility to demonstrate the effects of acceleration or mitigation measures;¹¹⁶
- Cannot identify by itself, the as built critical path;¹¹⁷
- Can be considered as relatively time consuming if performed correctly.¹¹⁸

¹⁰⁵ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-061

¹⁰⁶ because baseline programme logic/sequence is superseded by the actual contemporaneous adjustments to the contractor's plan

¹⁰⁷ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P40

¹⁰⁸ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P44

¹⁰⁹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P44

¹¹⁰ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P40

¹¹¹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P41

¹¹² AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P44

¹¹³ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 160

¹¹⁴ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P40, 44

¹¹⁵ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P44

¹¹⁶ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P44

¹¹⁷ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P43

It was argued that such weaknesses/disadvantages could be mitigated if the analysis is done via windows or watersheds, but AACE International ¹¹⁹ as well as Keith Pickavance¹²⁰ contended this to be incorrect, and the Author agrees.

3.3.2. Updated As-Planned Versus Updated As-Built¹²¹

It is one of the *observational* and *dynamic* analysis ¹²², it is identical to the “As-Planned Versus As-Built” above method but the difference is, this method considers project various schedule updates¹²³ as works progressed such as changes in sequence¹²⁴ and critical path based on progress made.¹²⁵ It is the process of comparing the planned timing of activities on the first/former planned schedule update to what actually happened as constructed as depicted from the subsequent schedule update¹²⁶ while comparing the critical path(s) of the former update and the progressed update until developing a totally-progressed version of the first/former update from the successive schedule update up to the successive update’s data date¹²⁷, then inferring from the differences between both, while dividing the causes of delay, the resulting effects and then the liability of each party. This process is repeated between all consecutive schedule updates until the end of the project.¹²⁸

¹¹⁸ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-062 and 15-063

¹¹⁹ AACE International Recommended Practice No.29R-03 (2009), p.43

¹²⁰ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-063

¹²¹ AACE International Recommended Practice No.29R-03, Forensic Schedule Analysis (2011) an “**observational/dynamic logic/contemporaneous as-is (MIP 3.3) / Contemporaneous Split (MIP 3.4)**” analysis. Also referred to as “contemporaneous period analysis”, and sometimes incorrectly referred to as “Windows Analysis”

¹²² i.e uses project schedule updates as works progress

¹²³ Revised schedule update resulted on changes to balance activities durations/floats and critical path(s)/near-critical path(s)

¹²⁴ Changes in sequence can be attributed to site conditions/unforeseen conditions, late information/drawings issuance, late instruction, variations, plant breakdown, changed intentions...etc

¹²⁵ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-064

¹²⁶ Comparison can be made by implementing one of two approaches, i) between successive single updates or ii) by grouped of updates together; however first approach provides more information hence more reliable results.

¹²⁷ “forward- looking calculations made at the time the updates were prepared”

¹²⁸ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P53-54

This method strengths and weaknesses can be summarized as follows:

Strengths/advantages

- More complicated and consumes more time and efforts compared to the As-Planned Versus As-Built method, however present more reliable results since project schedule updates are in the core of the delay analysis;
- Easy to be understood and verified;¹²⁹
- More objective since it relies on project contemporaneous data;¹³⁰
- Takes into account critical path shifts, change of sequence, evolving events ...etc and considered as true representation of actual progress and actual works' sequence/methodology on site, hence accuracy is improved;¹³¹
- Uses the available project schedule updates that both parties are familiar with or agreed to it, hence areas of disputes about data sources are minimized;¹³²
- Can identify multiple critical paths;¹³³
- Can identify, demonstrate and differentiate acceleration or mitigation measures and its effects;¹³⁴
- Possibility of identification of concurrency during the actual relevant period by means of expert judgement;¹³⁵
- Ability to identify time savings or delays to certain activities;¹³⁶

¹²⁹ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 167

¹³⁰ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-069

¹³¹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P57

¹³² K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-069

¹³³ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 172

¹³⁴ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P55, 58

¹³⁵ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 167

¹³⁶ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P57

- Easier identification of delays/time savings attributed to pure progress updates vs non-progress updates (i.e. revisions to the programme/schedule)¹³⁷; ¹³⁸
- Outcomes are supported by as-built data/records.¹³⁹
- In the Author's opinion, contrary to As Planned vs As-Built, can be implemented in complex projects, long durations and complex causes.

Weaknesses/disadvantages

- Cannot be performed if contemporaneous data is not available;¹⁴⁰
- Can be considered as relatively time consuming;
- Depends on the legitimacy of schedule updates;¹⁴¹
- Analysis could be very hard if data constrains was substantially used in schedule updates;¹⁴²
- Results can be manipulated to suit the specific purpose;¹⁴³
- May not be an effective tool in cases of concurrency.¹⁴⁴

3.3.3. As-Planned Impacted (Single Base)¹⁴⁵

It is one of the *modelled* and *static* analysis, it is the analysis of comparing the: i) original single baseline programme, to ii) recalculated simulated programme, whereby delay events/issues are added as discrete programme activities (fragnet or sub-network) with

¹³⁷ Non progress updates means changes made to the planned programme such as addition/deletion of activities, combine/split of group of activities, changes in sequence or activities relationship/links/durations

¹³⁸ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P64, 65

¹³⁹ P. J. Keane & A. F. Caletka, Delay Analysis in Construction Contracts (3rd edn Blackwell Publishing Ltd, 2008), 172

¹⁴⁰ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P57

¹⁴¹ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-070

¹⁴² AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P58

¹⁴³ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-071

¹⁴⁴ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-071

¹⁴⁵ AACE International Recommended Practice No.29R-03 (2009), also referred to as a "modelled/additive/single base (MIP 3.6)" analysis. SCL Protocol refers it as "impacted as-planned".

activity time-duration and linked to other relevant activities (Predecessors/start constraints and Successors), to calculate their effects on the baseline programme. Then, the dates before and after and the difference in completion date between the original baseline programme and simulated programme represents the effect of the inserted delay event(s).¹⁴⁶

This method is considered as the simplest delay analysis technique since it involves the least number of variables, for which it only demonstrates “what if” theoretical scenario. That is why many commentators, SCL-Protocol as well as courts have criticized it and restrict its application. This method is recommended only if no as-built programme or data is available, and both parties agree to use it. Nevertheless, it is worth mentioning that it is essential for more reliable outcomes that the baseline programme is corrected, preferably by parties’ mutual agreement, for any known anomalies or errors before commencing any delay analysis.¹⁴⁷

Delay analysis under this methodology can be performed via three different methods depending on the purpose of delay analysis as follows:

- One at a time: if the purpose of analysis is to check the individual effect for each event. Each delay event is dealt with separately, whereas the insertion is performed separately in chronological order based on the inception date and the effect is calculated for this single event before any impact of the subsequent event.¹⁴⁸ This allows for checking which delay events is critical/more critical and by how many days. Employer’s delay events can be inserted separately in order to determine the excusable delay, or both Employer and Contractor’s delay events

¹⁴⁶ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-072 to 15-074

¹⁴⁷ P. J. Keane & A. F. Caletka, *Delay Analysis in Construction Contracts* (3rd edn Blackwell Publishing Ltd, 2008), 125, 126, 131

¹⁴⁸ AACE International Recommended Practice No.29R-03 (2009) also known as a “modelled/additive/single base/stepped insertion (MIP 3.6)” analysis

are inserted to determine an approximate compensable period of delay and approximate concurrency;¹⁴⁹

- All in one: if the purpose of analysis is to check the overall effect for all events. This is a Gross analysis by inserting all delay events together as activities and as one single calculation. Then check the overall effect by comparing the before/after states;¹⁵⁰
- All in one sequentially/chronological: Project duration divided into windows or watersheds to be analysed in turn and the insertion is performed sequentially in chronological order based on the inception date in each chronological window/watershed towards the end of the project.¹⁵¹

The As-Planned Impacted (Single Base) method strengths and weakness can be summarized as follows:

Strengths/advantages

- Simple, quick, easy to produce and inexpensive since it doesn't require as-built data or as-built schedule or contemporaneous schedule updates;
- Easy to be understood and verified, but is of limited reliable use;¹⁵²
- Less number of variables with respect to cause and effect's equation;¹⁵³
- Can be used as useful negotiation tools.¹⁵⁴

¹⁴⁹ P. J. Keane & A. F. Caletka, Delay Analysis in Construction Contracts (3rd edn Blackwell Publishing Ltd, 2008), 127-129

¹⁵⁰ Also known as “modelled/additive/**single** base/**global** insertion (MIP 3.6)”. See AACE International Recommended Practice No.29R-03 (2009).

¹⁵¹ AACE International Recommended Practice No.29R-03 (2011) for windows, the process is also known as a “modelled/additive/**multiple** base/**fixed** period (MIP 3.7)” analysis or, in the case of the watersheds: a “modelled/additive/multiple base/**variable periods or grouped** (MIP 3.7)” analysis

¹⁵² AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁵³ P. J. Keane & A. F. Caletka, Delay Analysis in Construction Contracts (3rd edn Blackwell Publishing Ltd, 2008), 126

¹⁵⁴ P. J. Keane & A. F. Caletka, Delay Analysis in Construction Contracts (3rd edn Blackwell Publishing Ltd, 2008), 129

Weaknesses/disadvantages

- Applicable to identify/calculate potential delays not actual delays;¹⁵⁵
- Hypothetical analysis and its outcomes are substantially compromised when the works were constructed differently and not in line with baseline programme;¹⁵⁶
- Not suitable for complex projects, long durations, complex causes and intertwined or concurrent delay events;¹⁵⁷
- Cannot be used to quantify compensable delays; since it does not account for concurrent delays or pacing delays, it is limited to quantify non-compensable EOT;¹⁵⁸
- Can be used to identify the expected acceleration not the actual acceleration;¹⁵⁹
- Cannot assess effectively acceleration, mitigation and re-sequencing issues;¹⁶⁰
- Subject to manipulation if only one party delays are inserted;¹⁶¹
- Its outcomes considerably affected by the order of inserted fragnet and its logic/relationship.¹⁶²

3.3.4. Windows Analysis or Time Impact Analysis (Author's Recommended Method)¹⁶³

It is one of the *modelled* and *dynamic* analysis, it is similar to aforementioned “As-Planned Impacted (Single Base)” but carried out in windows or watersheds’ analysis; so does consider the schedule updated programmes as works progress not only the baseline

¹⁵⁵ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁵⁶ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁵⁷ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-084

¹⁵⁸ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁵⁹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁶⁰ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-084

¹⁶¹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁶² AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75

¹⁶³ AACE International Recommended Practice No.29R-03 (2009), also referred to as a “modelled/additive/multiple base (MIP 3.7)” analysis. Also referred to as “Time Impact Analysis”.

programme, in addition to as-built data as well. The additive simulation is carried out on various multiple CPM models representing the baseline programme and all update schedules considering project contemporaneous records. Each model represents a window or a watershed for a defined period of the analysis that confines the delay impact quantification in that period, whereby impact events/fragnets are chronologically inserted into the proper updated programme¹⁶⁴.

This method strengths and weaknesses are similar to the “As-Planned Impacted (Single Base)” except that many weaknesses are mitigated by the said window analysis, whereas schedule updates are considered that by default incorporates as-built continuously updated data and includes the changes to the works’ sequencing and critical path(s).¹⁶⁵

It is noted that one of the key/important step of this delay analysis that is conducted at the end of each Window analysis is that each simulated impacted schedule is updated with as-built data/records, then these are compared with the hypothetical impacts/effects of delay events that resulted from the As-Planned Impacted programme to determine if actually the hypothetical impacted dates are actually greater than or less than actual activities’ dates. From this, EOT entitlement is recalculated, as well as issues related to concurrency, mitigation, recovery and acceleration can be identified and analysed, and overall outcomes can be carried forward to subsequent window analysis and its relevant updated programme¹⁶⁶ and updated impacted programme. The nature of window analysis of this Method ensures that all updated programmes¹⁶⁷ are utilized, actual status when a delay event occurred is considered, changes to works’ sequencing,

¹⁶⁴ At the time of the event.

¹⁶⁵ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P75-82

¹⁶⁶ new and updated schedule for this subsequent window

¹⁶⁷ updated to reflect the as-built conditions and progress of the project, particular when the change, or delay events occurred

recovery/mitigation, acceleration and concurrency are recognized and changes to the critical path(s) is in the core of delay analysis.¹⁶⁸

In the Author's opinion, this method is an appropriate retrospective delay analysis method, if both parties proactively when the delay event occurs **and its impact metalized/recognized** mutually agree to quantify and agree on the resultant EOT, hence revised anticipated completion date is agreed upon. Keith Pickavance¹⁶⁹ stated about this method, "*When properly used, this method produces the **most thorough and reliable technical proof of the effect of a causal event.***" This method has been supported by and expressly required to be implemented by US government contracts¹⁷⁰. Similarly, impliedly required by Engineering and Construction Contract, ECC2 and ECC3¹⁷¹, and is recognized by the CIOB Guide¹⁷² as the "*appropriate method for contemporaneous analysis*", and by the SCL Protocol as the "*appropriate method of contemporaneous analysis and the most thorough method of retrospective analysis*", and by the US Boards of Contract Appeals¹⁷³ as "*an appropriate method of analysis*".¹⁷⁴

In Author's opinion, due to the advance of computerized programing software and CPM scheduling, the current world-wide implementation of good project management and availability of as built records/data/schedules, this method is the most reliable method and is recommended to be implemented in any project.

¹⁶⁸ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-144 to 15-147

¹⁶⁹ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-144

¹⁷⁰ USACOE Modification Impact Evaluation Guide, EP415-1-3 and VACPM Handbook 4-08-11.

¹⁷¹ Clause 32 and 63.3

¹⁷² Chartered Institute of Building, Guide to Good Practice in the Management of Time in Complex Projects, 2010, para.4.5.15

¹⁷³ for example, Gulf Contracting Inc (1989) ASBCA No.30,195, 89-2 BCA (CCH) 22,812, affirmed (1990) 90-1 BCA (CCH) 22,393; Norair Engineering Corp (1990) ENGBCA 3804, et al., 90-1 BCA 22,327

¹⁷⁴ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-144

3.3.5. Collapsed As-Built¹⁷⁵

It is one of the *modelled* and *static* analysis, it is the analysis of comparing the: i) final As-built programme, to ii) recalculated simulated programme, whereby delay events/issues are subtracted as discrete programme activities (fragnet or sub-network) or as a calculated duration that represents the delay event effect, to calculate their effects on the final As-built programme. Then, the sates before and after and the difference in completion date between the final As-built programme and simulated programme represents the effect of the delay event(s). This method is considered more complicated than the As-Planned impacted method due to the necessity to create a workable but-for *new* programme, due to the fact that programme software considers as built dates as fixed dates and not subject to change or programme links; hence not feasible to be subjected to simulation. Therefore, the delay analyst in order to create this new programme, which is considered as a challenging task¹⁷⁶, has to delete as-built dates and substitute it as-planned dates while reconfiguring the programme logic/links to reflect the final as-built programme dates. Subsequently, he should subjectively identify/specify the delay events (whether and either attributed to the Employer and the Contractor) fragnets/activities duration and links in order to allow him to simulate its effects.¹⁷⁷ It is noted that the delay analysis can be performed via three methods similar to the As-planned Impact aforementioned methods either ‘One at a time’, or ‘All in one’ or ‘All in one sequentially/chronological¹⁷⁸’.¹⁷⁹

Quantification of EOT can be done via two sub-processes:

¹⁷⁵ AACE International Recommended Practice No.29R-03 (2009), also referred to as a “ modelled/subtractive/ single simulation (MIP 3.8)” analysis. Also referred to as “as-built but-for” and “ Modified as-built”.

¹⁷⁶ This is attributed to the fact that the As-built schedule contains the outcomes of both Programme logic/sequence as well as delays issues such as shortage of labor or materials... etc.

¹⁷⁷ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-112 to 15-119

¹⁷⁸ reverse chronological order of effect date

¹⁷⁹ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-131

- In the critical path, progressively and in a reverse chronological order, removes the Employer's delay fragnets/events/periods until another critical path(s) encountered, whereby at this point the Employer's risk events on this critical path cease to exist. Then, the other critical path(s) is examined to check if any other Employer's delay or Contractor's delay events exist and calculate its effects. Thereafter, determine EOT accordingly. This process is repeated and concluded when no other delay events are encountered in the balance critical path(s)¹⁸⁰.
- Similar but in a simpler process by assessing only the impact of Employer's delay events then determines the excusable delay. Thereafter, any excess delay shall be considered as the Contractor's culpable delay^{181, 182}

This method strengths and weaknesses can be summarized as follows:

Strengths/advantages

- Its concept is easy to be understood and presented;¹⁸³
- Utilizes as-built records and programme so it reflects actual events and delay events' effects on actual activities as constructed;¹⁸⁴
- Does not requires baseline or update schedules;¹⁸⁵
- Ability to separate delays attributed to the Employer from delays attributed to the Contractor if as built records and details are available;¹⁸⁶
- No requirements to check the reasonableness of baseline programme;¹⁸⁷

¹⁸⁰ also referred to as "modelled/subtractive/multiple simulation/stepped extraction", AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, p86

¹⁸¹ also referred to as "modelled/subtractive/multiple simulation/global extraction", AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, p86

¹⁸² K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-136 and 15-137

¹⁸³ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P89

¹⁸⁴ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-139

¹⁸⁵ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-139

¹⁸⁶ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P89

¹⁸⁷ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-139

Weaknesses/disadvantages

- Does not consider contemporaneous schedule updates or changes to the critical path(s);¹⁸⁸
- Hard to be implemented and requires delay analyst with significant experience, this is mainly attributed to the need of establishing the said new¹⁸⁹ programme;¹⁹⁰
- Subject to manipulation, either intentionally or unintentionally, due to subjectivity in as-built logic assignment or if only one party extracted delays are concealed or addressed. Whereas its outcomes considerably affected by the extracted fragnets logic/relationship;¹⁹¹
- Since it considers the as-built schedule after completion; only this schedule critical path is considered, whilst the other critical path(s) could exist at the time when delay events occurred;¹⁹²
- Cannot analyse effectively concurrent delays;¹⁹³
- Cannot assess acceleration¹⁹⁴, mitigation and re-sequencing issues, because the as-built programme already incorporates these.¹⁹⁵

¹⁸⁸ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-140

¹⁸⁹ Reconstructing the collapsed as-built schedule that entails subjectivity as well

¹⁹⁰ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-140

¹⁹¹ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P90

¹⁹² K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-142

¹⁹³ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-142

¹⁹⁴ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P90

¹⁹⁵ K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-142

3.3.6. Collapsed As-Built (Multiple Base)¹⁹⁶

It is one of the *modelled* and *dynamic* analysis, it is similar to aforementioned “Collapsed As-Built (Single Base)” but carried out in windows or watersheds’ analysis; so does consider the schedule updated programmes as works progress not only the final As-built programme. The subtractive simulation is carried out on various multiple CPM models representing the final As-built programme and all update As-built schedules considering project contemporaneous records. Each model represents a window or a watershed for a defined period of the analysis that confines the delay impact quantification in that period, whereby impact events/fagnets are chronologically subtracted from the proper As-built updated programme.

This method strengths and weaknesses are similar to the “Collapsed As-Built (Single Base)” except that many weaknesses are mitigated by the said window analysis, whereas As-built schedule updates are considered that includes the changes to the works’ sequencing and critical path(s).¹⁹⁷ However, Keith Pickavance¹⁹⁸ contended this to be incorrect and the Author agrees.

¹⁹⁶ AACE International Recommended Practice No.29R-03 (2009), also referred to as a “modelled/ subtractive /multiple base (MIP 3.9)” analysis. Also referred to as “Windows Collapsed As-Built”

¹⁹⁷ AACE International recommended Practice No. 29R-03 Forensic Schedule Analysis, P90-98

¹⁹⁸ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-143

4. CHAPTER 4: INTERNATIONAL PROTOCOLS FOR CONCURRENT DELAYS

This Chapter will explore published well-known international protocol for delays/concurrent delays namely “The Society of Construction Law Delay and Disruption Protocol” (SCL-Protocol) and “AACE International Recommended Practice No. 29R-03 “Forensic Schedule Analysis” Protocol” (AACE-Protocol), while analysing some of the international standard contracts and bespoke contract amendments, which addressed concurrency within its terms.

4.1. The Society of Construction Law Delay and Disruption Protocol

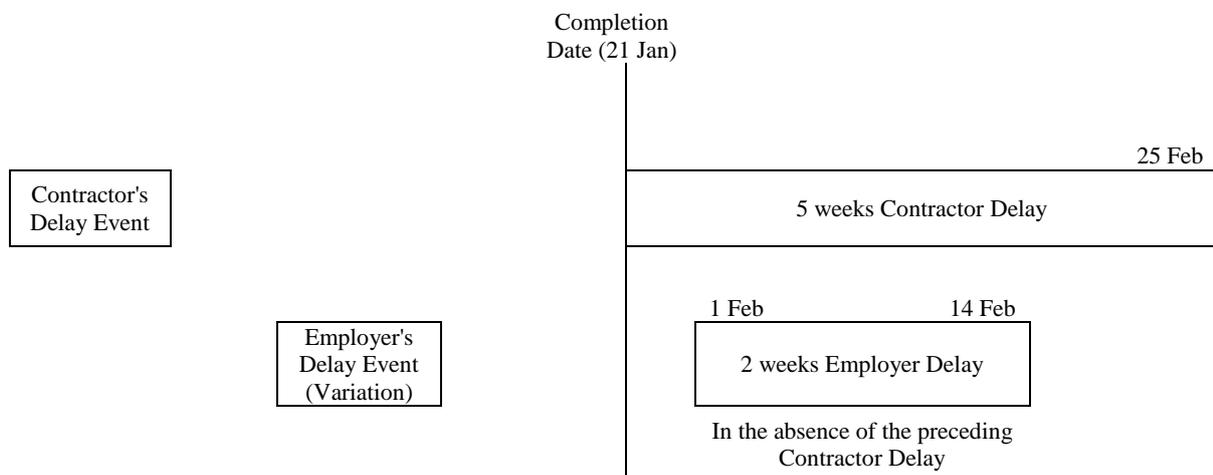
SCL-Protocol recommended method for delay analysis is what it named as “time-impact-analysis”, which is a modelled prospective delay analysis approach to be conducted as soon as the delay event transpired. The SCL-Protocol discourages the “*wait and see approach*”, and recommends that EOT submission, assessment and determination be carried out contemporaneously and “*as close in time as possible to the delay event*”¹⁹⁹; it elevates this approach as one of the SCL-Protocol core principle (no. 4). The SCL-Protocol further emphasized that there is no need to wait till the delay effect materialized and affected the work progress²⁰⁰, for which the Author does not agree because granting EOT should be based on actual records/data, to an acceptable extent, rather than theoretical expectation/calculation for the delay impact/effects.

With respect to concurrent delays, SCL-Protocol differentiate between two types of concurrent delay, i) true concurrent delays, whereby both happen at the same time and its effect felt at the same time, and ii) sequential delays with concurrent effect, whereby

¹⁹⁹ SCL Protocol 2nd Edition, Feb 2017, paragraph 4 p.5

²⁰⁰ SCL Protocol 2nd Edition, Feb 2017, paragraph 4 to paragraph 6 p.5-6

delays occur independently but its effect coincide. Furthermore, any delays to be considered should be an effective delay that lies in the critical path and each by itself, disregarding the effect of other delays, should lead to a delay to completion date. It went further to state that such effective delay should be effective cause and “*not merely incidental to the Delay to Completion*”²⁰¹. Having stated that, SCL-Protocol provides an example to illustrate when an Employer’s delay event that occurs after a Contractor’s delay event, and its effect is coincided with the Contractor’s delay event considered as effective, as shown below:



In this case of Contractor’s culpable delay, SCL identified that two approaches could be considered, i) for the period from 1 Feb to 14 Feb, both delays are effective; since each independently in the absence of the other cause a delay to completion date, hence it could be determined that there are 2 weeks of concurrent delays (i.e. during this period “time not cost approach applies”)²⁰². Or, ii) Project is already in greater delay due to the Contractor’s default and the Employer’s delay did not actually add any further delays; hence only the Contractor’s delay is considered effective and the Contractor is not

²⁰¹ This is supported by *Royal Brompton Hospital NHS Trust v Hammond* [2001] EWCA Civ 206, and *Adyard Abu Dhabi v SD Marine Services* [2011] EWHC 848 (Comm)

²⁰² This is supported by older English appeal court cases, such as *Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd* (1999) 70 Con. L.R. 32, QBD (TCC) and *Steria Ltd v Sigma Wireless Communications Ltd* [2008] BLR 79 and *Walter Lilly & Co Ltd v Mackay* [2012] EWHC 1773 (TCC).

entitled for EOT. SCL-Protocol recommends that above Employer's delay event does not exonerate the Contractor's delays and is not considered an effective cause of delay (i.e. recommends the second approach), since the Contractor's delay effect started and continued even after the Employer's delay effect. In other words, Contractor's delay is the longest path and the Employer's delay has no further delay effect above/over the Contractor's delay effect. Whereby, in such cases for an Employer's delay event to be considered effective it should have the longest path. The Author submits that this is a radical change introduced in the 2017-SCL-Protocol 2nd edition, changing the former 2002-SCL-Protocol approach for "time but no cost" approach, however, such change/approach introduced by SCL with a disclaimer that such recommendation is based on recent lower-level English court decisions and would be reconsidered if such decision is revoked by higher-level court decision. Such recommendation has been criticized because it opens the door widely to the Employer to get advantages of such situation and issue variations even after the original completion date and in the same time is still able to apply LDs, which raises issues about fairness and reasonableness.²⁰³ However, SCL illustrated that if the Contractor could have managed to accelerate the works at its own cost and recovered his delays that resulted in Employer's delay being the longest path; EOT should be granted and LDs is not applicable.²⁰⁴

The Author submits that based on the logic of above SCL recommended approach, even if both Employer and Contractor delays **started at the same time** but Contractor's delay has the longest path i.e. lasts longer, the Contractor will not be entitled for EOT. Similarly, if neither started nor ended together, for any overlapping period; the Contractor

²⁰³ S Lambert "New Guidance on Construction Delays and Disruption" (2017) Al Tamimi & Company law-update DEC-JAN 2017

²⁰⁴ SCL Protocol 2nd Edition, Feb 2017, paragraph 10 p.29-31

will not be entitled for EOT. Definitely, this approach is considered to be very favourable to any Employer, for which any Contractor's delays will exonerate any concurrent Employer's delays.

With respect to Prolongation Cost, SCL-Protocol made it clear that granting EOT does not automatically entitle the Contractor for Prolongation Cost.²⁰⁵ The Contractor will be compensated for any Prolongation Cost²⁰⁶ that is proven to be explicitly resulted **from and only from** the Employer's risk event, otherwise is not entitled for Prolongation Cost considering that he cannot fulfil the but for test; since he was already in culpable delay and in any case would have suffered such Prolongation Cost in the absence of the Employer's risk event.²⁰⁷

4.2. AACE International Recommended Practice No. 29R-03 "Forensic Schedule Analysis" Protocol

AACE Protocol promotes the use of Critical Path Method ("CPM") scheduling and delay analysis techniques and stated that identification and quantification of concurrency that is based on CPM is considered reliable and universally accepted.²⁰⁸ AACE Protocol divided delay analysis and its effect into two steps, the first step is who is liable for delays²⁰⁹ and the second is determination about concurrency. This is established in order to determine about excusability/non-excusability and compensability/non-compensability, the same is illustrated in "Figure 12 – Net Affect Matrix – Concurrent Delay" shown below. The compensability as recommended by AACE Protocol in concurrent delay scenarios is the "time no cost"²¹⁰ approach, it is stated that both the Contractor and the Employer are

²⁰⁵ SCL Protocol 2nd Edition, Feb 2017, paragraph 12 p.7 and paragraph 12 p.37

²⁰⁶ Actual incurred additional cost

²⁰⁷ SCL Protocol 2nd Edition, Feb 2017, paragraph 14 p.7 paragraph 14 p.39

²⁰⁸ AACE Protocol Section 4.2 (D), P104

²⁰⁹ Delays in this context are delays in the critical path that delay the overall completion of the Project.

²¹⁰ excusable and non-compensable

prevented from recovering any damages to the extent that both parties' delays offset each other²¹¹. Moreover, the AACE Protocol put the burden to establish entitlement for compensation of the party who seeks it to prove the absence of concurrent delays caused by his delays.²¹²

It is worth noting that AACE Protocol identifies four pre-requisite for delays to be considered concurrent, these are, i) delays must be independent/unrelated, ii) both parties are responsible of the concurrent delays or one of the delays is a force majeure event, iii) delays are not considered as pacing i.e. delays are involuntary, iv) delays are substantial and not easy to be recovered.²¹³

Delay Event	Concurrent with	Net Effect
Owner Delay	Another Owner Delay or Nothing	Compensable to Contractor, Non Excusable to Owner
Owner Delay	Contractor Delay	Excusable but Not Compensable to both Parties
Owner Delay	Force Majeure Delay	Excusable but Not Compensable to both Parties
Contractor Delay	Another Contractor Delay or Nothing	Non-Excusable to Contractor, Compensable to Owner
Contractor Delay	Force Majeure Delay	Excusable but Not Compensable to both Parties
Force Majeure Delay	Another Force Majeure Delay or Nothing	Excusable but Not Compensable to Contractor

AACE Protocol, "Figure 12 – Net Affect Matrix – Concurrent Delay"

²¹¹ AACE Protocol Section 4.1 (B) states: "That is, the contractor is barred from recovering delay damages to the extent that concurrent contractor-caused delays offset owner- caused delays, and the owner is barred from recovery liquidated/stipulated or actual delay damages to the extent that concurrent owner-caused delays offset contractor-caused delays"

²¹² AACE Protocol Section 4.1 (C), P100-101

²¹³ AACE Protocol Section 4.2 (C), P102-103

4.3. Standard Forms of Contract, Concurrent Delay Provisions

It is a statement of fact that the majority of International Standard Forms of Contract did not address or provide express terms for concurrent delay, however, some have attempted to address it; but the Author submits it was not comprehensive. The following represents some of these:

4.3.1. Australian Standard General Conditions of Contract²¹⁴, Concurrent Delays Provisions

Despite the standard form of “Australian Standard General Conditions of Contract, AS2124-1992” has been revised and re-designated as AS4000-1997, the AS2124-1992 under clause 35.5 states:

“Where more than one event causes concurrent delays and the cause of at least one of those events, but not all of them, is not a cause referred to in the preceding paragraph²¹⁵, then to the extent that the delays are concurrent, the Contractor shall not be entitled to an extension of time for Practical Completion.”²¹⁶

Pursuant to this clause, contractually the contractor is not entitled to EOT in case of any other delay event that is not stated in this clause preceding paragraph, occurred (even if not caused by the Contractor) concurrently with the stipulated Employer’s risk delay events. So, even if that other delay is a neutral delay²¹⁷ that forms part of the Contractor’s risk events²¹⁸, the Contractor will not be entitled to EOT. Having said that, is this reasonable or fair in cases of neutral delays? Whereby the Contractor will be denied from being granted a valid EOT due to the existence of said neutral event, which will entail an

²¹⁴ prepared by the Joint Standards Australia/Standards New Zealand Committee OB/3

²¹⁵ i.e not an Employer risk event

²¹⁶ Livengood J “Concurrency world tour” (March 2016) CONSTRUCTION LAW INTERNATIONAL, Volume 11 Issue 1, 14

²¹⁷ neither caused by the Employer nor caused by the Contractor, beyond both parties control, or caused by third party and not one of the Employer’s risk event

²¹⁸ for instance some Contract Particular Conditions of Contract transfer the risk for exceptionally adverse climatic conditions to the Contractor

application of LDs. In the Author's opinion, this is neither reasonable nor fair. The effect of such neutral delay events was conflicted either to entitle the Contractor for EOT or not, by the two conflicting Australian Supreme Court decisions, *Thiess Watkins White Construction Ltd v Commonwealth*²¹⁹ (it was held that the Contractor is entitled), and *Armstrong Construction v Council of the Shire of Cook*²²⁰ (it was held that the Contractor is not entitled).²²¹ Moreover, it is worth mentioning that the Australian Appeal court²²² held that Prevention Principle²²³ does not apply in cases of concurrent delays attributed to both Employer and Contractor, and clarified that the Contractor cannot rely on Prevention principle if himself due to his delays cannot complete the works at the contractual completion date.²²⁴

Another standard form is the Australian Standard General Conditions of Contract, AS4000-1997, whereby clause 34.4 states, "*When both non-qualifying and qualifying causes of delay overlap, the Superintendent shall **apportion** the resulting delay to WUC²²⁵ according to the respective causes' contribution. In assessing each EOT the Superintendent shall disregard questions of whether:*

- a) WUC can nevertheless reach practical completion without an EOT; or*
- b) the Contractor can accelerate,*

but shall have regard to what prevention and mitigation of the delay has not been effected by the Contractor."²²⁶

²¹⁹ Thiess Watkins White Construction Ltd v Commonwealth (1992) 14 BCL 61

²²⁰ JW Armstrong Constructions Pty Ltd v Council of the Shire of Cook (unreported, Supreme Court of Queensland, White J, 25 February 1994).

²²¹ McNair D (PwC publication, Jan 2106) "Concurrent Delay"

²²² Turner Corp Ltd v Co-ordinated Industries Pty Ltd (1995) 11 BCL 202 and on appeal (1996) 12 BCL 33, followed in *Austrialin Development Corp v White Construction* (1996) 12 BCL 317

²²³ In *Multiplex Constructions (UK) Ltd v Honeywell Control Systems Ltd* [2007] EWHC 447 (TCC), [2007] BLR 195, 111 Con LR 78, [2007] CILL 2458, para [47], Mr Justice Jackson said: "The essence of the prevention principle is that the **promisee cannot insist upon the performance of an obligation which he has prevented the promisor from performing.**"

²²⁴ Jim Doyle, (Doyle Construction Lawyer 2005 publication) "Concurrent Delays in Contract"

²²⁵ "the work which the contractor is or may be required to carry out and complete under the contract and includes variations, remedial work, construction plant and temporary works, and like works have a corresponding meaning."

²²⁶ D McNair and B Linke, (DLA PIPER publication 2013) "Asia Pacific Projects Update, Concurrent Delays"

This clause promotes the apportionment approach that the Author analysed in detail herein under below section 5.3, however the Author reiterates his preference for application of “Apportionment of Time” over “Apportionment of Fault” (Jury Verdict); since the later is hard to establish in cases of intertwine/complex/concurrent delay events.

4.3.2. Abu Dhabi Government Contract Concurrent Delays Provisions

Abu Dhabi Government standard Contract templates under clause 8.4 (g) stipulates a similar contractual provision to what is stipulated under the Australian Standard General Conditions of Contract, AS2124-1992. Clause 8.4 (g), after specifying the Employer’s risk events that entitle the Contractor to claim for EOT, states:

“but provided that : (g) Any such delay, which is **concurrent** with another delay for which the Contractor is responsible, **shall not be taken into account.**”

Pursuant to this clause, it is assumed that contractually Contractor is not entitled to EOT in case that any other delay event that not stated in this clause preceding paragraph, occurred (even if not caused by the Contractor) concurrently with the stipulated Employer’s risk delay events. However, the Author will provide hereinafter an argument and counter argument with respect to its interpretation and relevant UAE legal provisions (UAE Civil Code):

- **Definition and Interpretation:** To start with this standard form do not provide a defined term for “**concurrent delays**”, which may keep the door open for possible multiple definitions and accordingly multiple approaches for assessment and determination of its effect. However, the literal interpretation of the wording of this clause can be considered as “crystal clear” as marked by the English court in the case analysed below under section 4.3.3 of *North Midland Building Limited v*

*Cyden Homes Limited (2017)*²²⁷; since its wording is similar to the wording of this English case relevant Contract Clause 2.25.3 (b) “any delay caused by a Relevant Event which is concurrent with another delay for which the Contractor is responsible shall not be taken into account”.

Furthermore, UAE Civil Code Articles 257 to 266²²⁸ provide the rules of interpretation either i) Ambiguous expression: when it has two or more primary meanings, each of which may be adopted without distortion of the language, which in the Author’s opinion does not apply to Clause 8.4 (g). Or ii) Plain expressions: *“The primary rule is that words have their true meaning”* (Article 258). *“There is no scope for implications in the face of clear words”* (Article 259). *“If the wording is clear then it may not be departed from by way of interpretation to ascertain the intention of the parties”* (Article 265). So, two scenarios are available, either the expression is plain and conforms to the true will of the parties, or the words are also plain but the expression does not conform to that will. The Author submits that first scenario apply since Clause 8.4 (g) is a bespoke mutually agreed amendment to FIDIC standard contract and its wording is crystal

²²⁷ North Midland Building Limited v Cyden Homes Limited [2017] EWHC 2414 (TCC)

²²⁸ **“Article 258** (1) The criterion in (the construction of) contracts is intentions and meanings and not words and form, (2) **The primary rule is that words have their true meaning and a word may not be construed figuratively unless it is impossible to give it its direct meaning.”**

“Article 259. There shall be no scope for implications in the face of clear words.”

“Article 260. Words should be given effect to rather than ignored, but if it is impossible to give effect to words, they shall be ignored.”

“Article 265. (1) If the wording of a contract is clear, it may not be departed from by way of interpretation to ascertain the intention of the parties. , (2) If there is scope for an interpretative construction of the contract, an enquiry shall be made into the mutual intentions of the parties beyond the literal meaning of the words, and guidance may be sought in so doing from the nature of the transaction, and the trust and confidence which should exist between the parties in accordance with the custom current in (such) dealings.” (Refer to Dubai Cassation Court judgment No 125 of 2007).

clear to show the mutual intention of the parties in cases of concurrent delay that is the responsibility of the Contractor and the agreed clear/fundamental allocation of relevant risks to the Contractor.

- **Good Faith and Apportionment:** UAE Civil Code contains a provision under Article 246(1) that requires “ *The contract must be performed in accordance with its contents, and in a manner consistent with the requirements of good faith.*” So it is argued that UAE Court could apply the principle of good faith to apply value judgements and apportion culpability for time/cost in case of concurrent delays, considering as well the provision of Articles 290²²⁹, 291²³⁰, 389²³¹ and 390²³². However, these are counter-argued pursuant the fundamental principle of freedom of contract as stipulated under the UAE Code of Commercial Practice²³³ that allows parties to mutually agree on contractual terms/conditions as it legal, do not contradict with public policy or mandatory law provisions,²³⁴ and as specified under UAE Civil Code Article 257²³⁵. And is argued as well by the same Article 246(1) itself quote “*performed in accordance with its contents*”. Parties have agreed to a bespoke amendment in cases of concurrent delays that to be complied with.

²²⁹ **Article 290.** “It shall be permissible for the judge to reduce the level by which an act has to be made good or to order that it need not be made good if the person suffering harm participated by his own act in bringing about or aggravating the damage”

²³⁰ **Article 291.** “If a number of persons are responsible for a harmful act, each of them shall be liable in proportion to his share in it, and the judge may make an order against them in equal shares or by way of joint or several liability.”

²³¹ **Article 389.** “If the amount of compensation is not fixed by law or by the contract, the judge shall assess it in an amount equivalent to the damage in fact suffered at the time of the occurrence thereof.”

²³² **Article 390.** “(1) The contracting parties may fix the amount of compensation in advance by making a provision therefor in the contract or in a subsequent agreement, subject to the provisions of the law., (2) The judge may in all cases, upon the application of either of the parties, vary such agreement so as to make the compensation equal to the loss, and any agreement to the contrary shall be void.”

²³³ Article 2(1) of UAE Code of Commercial Practice

²³⁴ N Ikram, “Limits To Limiting Liability In The UAE” (Sep 2012) Society of Construction Law (Gulf) 1, 1

²³⁵ **Article 257.** “The basic principle in contracts is the consent of the contracting parties and that which they have undertaken to do in the contract.”

- **Abuse of Rights and Apportionment:** UAE Civil Code contains a provision under Article 106²³⁶(2) (c) that requires “(2) *The exercise of a right shall be unlawful: ... (c) if the interests desired are disproportionate to the harm that will be suffered by others;..*”. So, it is argued that a complete disentitlement of EOT and accordingly an application of LDs may be considered as *disproportionate to the harm that will be suffered by the Employer* since the project would have been delayed anyhow due to the Employer’s delays; hence the application of Clause 8.4 (g) is unlawful and it is open for the court to apply value judgements and apportion culpability for time/cost. This is counter-argued by the intention of both parties, including the contractor who is not considered as a layman like the Employer but a professional company expert in the field of construction and its conditions, to allocate the risk of concurrent delay to the Contractor under the agreed term 8.4 (g). So, the Contractor is aware from the onset of the tender stage as well as construction works of such risk and should have acted accordingly to include such risk in his tender price and to carry out all mitigations of his culpable delays such as acceleration to negate such risk. Moreover, since both parties aware and agreed for 8.4 (g), the requirements for Employer’s deliberate intention to harm the Contractor or a departure from ordinary behavior/action are not justified in this case.
- **Contributory Fault to Reduce Compensation:** UAE Civil Code contains a provision under Article 290 that allows “ *the judge to reduce the level by which an*

²³⁶ **Article 106.** “(1) A person shall be held liable for an unlawful exercise of his rights. (2) *The exercise of a right shall be unlawful: (a) if there is an intentional infringement (of another's rights); (b) if the interests which such exercise of right is designed to bring about are contrary to the rules of the Islamic Shari'ah, the law, public order, or morals; (c) if the interests desired are disproportionate to the harm that will be suffered by others; or (d) if it exceeds the bounds of usage and custom.*”

act has to be made good or to order that it need not be made good if the person suffering harm participated by his own act in bringing about or aggravating the damage.” It is argued that since the Employer played a role in delaying the project, courts have the power to assess the legal potency of all delay events and apply apportionment approach. This is counter argued, because the delay analysis that is conducted in order to determine cause/effect/concurrency, has identified each party default parts, nevertheless and based on the outcome of such delay analysis; parties have mutually agreed that upon identification of the same (i.e. coincide culpability of each party) to allocate the risk of concurrency to the Contractor.

- **Unjust Enrichment:** UAE Civil Code contains a provision under Article 318 and 319, which articulate the principle that a property of a person does not pass to another except in two situations: i) by agreement between them, or ii) if the law so dictates. Therefore, if property is transferred without lawful-cause, it must be restored to its titleholder. Hence, it is argued that exclusion of Employer's liability for its delays afforded to it by clause 8.4(g), and resulted application of LDs may be argued to otherwise result in unjust enrichment, since the Project would have been delayed anyhow by the Employer delays. This is counter-argued by the same way as elucidated in above items.

In view of the above, the Author believes that UAE court based on the rules of construction contained in UAE Civil Code Articles 257 to 266 analysed above, and aforementioned other provisions/analysis; will held the enforceability of clause 8.4 (g) to disentitle the Contractor from EOT. This will be similar to the recent approach that

English court took in *North Midland Building Limited v Cyden Homes Limited* (2017) and is in line with the 2017-SCL-Protocol 2nd edition recommended approach, as discussed under section 4.1 above.

4.3.3. FIDIC Standard forms of Contracts

All previous versions of FIDIC standard forms of contract have not addressed concurrent delays. However, the 2017 Yellow Book, Sub-Clause 8.5 states, “*If a delay caused by a matter which is the Employer’s responsibility is concurrent with a delay caused by a matter which is the Contractor’s responsibility, the Contractor’s entitlement to EOT shall be assessed in accordance with the **rules and procedures stated in the Particular Conditions** (if not stated, as appropriate taking due regard of all relevant circumstances).*”²³⁷ This clause encourages both parties to agree within their contract of a bespoke amendment within the particular conditions in order to clear the mud surrounding concurrent delay issues.

4.3.4. English Courts Approach for Contractual Provisions of Concurrent Delays

The English court in a recent interesting case in 2017 considered/clarified its position regarding enforceability of an agreed bespoke contractual term for the consequences of concurrent delays in *North Midland Building Limited v Cyden Homes Limited*²³⁸. The contract executed under a JCT Design and Building Contract (2005) as amended by the “Special Conditions” that includes a bespoke amendment related to extension of time, which stipulates in Clause 2.25.3 (b) “*any delay caused by a Relevant Event which is*

²³⁷ J Glover “What is the 2nd Edition of the SCL Delay & Disruption Protocol all about?” (November 13 2017)

²³⁸ *North Midland Building Limited v Cyden Homes Limited* [2017] EWHC 2414 (TCC)

*concurrent with another delay for which the Contractor is responsible shall not be taken into account. then, save where these Conditions expressly provide otherwise, the Employer shall give an extension of time*²³⁹.

The Project was substantially delayed and the Contractor submitted his claim for EOT attributed to Employer's delay events (Relevant Events), however, the Employer relied on Clause 2.25.3 (b) and rejected many elements of the Contractor's claim on the ground that these elements/delays that is attributed to Relevant Events was concurrent with other delays which the Contractor was responsible, thus reducing its entitlement to an award of an EOT and accordingly granted a partial EOT²⁴⁰. Therefore, Employer applied the contractually stipulated LDs²⁴¹. The Contractor disputed such determination and commenced this case seeking declaration for the true interpretation of clause 2.25.3(b) related to the contractor's entitlement to EOT in cases of concurrent delays. The Contractor argument was based on Prevention Principle; hence time is "at large" and no LDs can be applied.²⁴²

The court rejected the Contractor's argument²⁴³, while clarifying that the bespoke amendment was "crystal clear" for the correct application of excluding the contractor's concurrent delays period from any entitlement of EOT attributed to Relevant Events.

Moreover, it held that Prevention Principle simply does not rise in this case because EOT

²³⁹ Clause 2.25:

"1. any of the events which are stated to be a cause of delay is a Relevant Event; and
2. completion of the Works or of any Section has been or is likely to be delayed thereby beyond the relevant Completion Date,
3. and provided that (a) the Contractor has made reasonable and proper efforts to mitigate such delay; and
(b) **any delay caused by a Relevant Event which is concurrent with another delay for which the Contractor is responsible shall not be taken into account**

then, save where these Conditions expressly provide otherwise, the Employer shall give an extension of time by fixing such later date as the Completion Date for the Works or Section as he then estimates to be fair and reasonable."

²⁴⁰ i.e f when a delay existed due to Relevant Event and a contractor's culpable concurrent delay; then the contractor's delay simply cancelled out any entitlement to EOT during this concurrent delay period.

²⁴¹ £5,000 per week LADs provided for under the contract.

²⁴² Hugh James "Are parties permitted to allocate the risk on concurrent delay?"

²⁴³ ibid

contractual provisions were included²⁴⁴ and excluding concurrent delays that is agreed upon by both parties does not construed as the parties had failed to provide for EOT for acts of prevention²⁴⁵. Mr Justice Fraser stated: "*..there is no rule of law of which I am aware that prevents the parties from agreeing that concurrent delay be dealt with in any particular way....*", Judge noted to the claimant's counsel that "*... could point to no Authority that stated that a perfectly operable LAD clause (in the case of this contract, clause 2.29 in the standard form) would or could, as a result of an extension of time having been agreed by the parties to be calculated in a particular way, not be operated.*".²⁴⁶ The Judge clarified his position in reliance on previous well-known UK Court decisions²⁴⁷ that Prevention Principle does not apply in cases of concurrent delays, Coulson J in *Jerram Falkus Construction Ltd v Fenice Investments Inc*²⁴⁸ stated "[52] Accordingly, I conclude that, for the prevention principle to apply, the contractor must be able to demonstrate that the employer's acts or omissions have prevented the contractor from achieving an earlier completion date and that, **if that earlier completion date would not have been achieved anyway, because of concurrent delays caused by the contractor's own default, the prevention principle will not apply.**"²⁴⁹

The Author submits that considering the fundamental law principle/provision for "freedom to contract" and "pacta sunt servanda"²⁵⁰, if the parties had agreed upon a

²⁴⁴ Parties had included acts of prevention under clause 2.26 of the contract in the list of Relevant Events.

²⁴⁵ the Judge concluding that it: "*.... faced a rather insurmountable obstacle. This is, very simply, that there is no point of construction at issue on the clause in question in these proceedings at all. In my judgment, the prevention principle simply does not arise. This case is purely concerned with the correct construction of the clause agreed by the parties, in this case specifically agreed by the incorporation into it of a bespoke amendment.*"

²⁴⁶ Dr Tim Sampson, (News & Resources 9th Oct 2017, Lamb Chambers Barristers), "*North Midland Building Limited v Cyden Homes Limited [2017] EWHC 2414 (TCC)*"

²⁴⁷ *Multiplex Construction (UK) Ltd v Honeywell Control Systems Ltd.* [2007] BLR 195, and *Jerram Falkus Construction Ltd v Fenice Investments Inc* [2011] EWHC 1935 (TCC) (21 July 2011)

²⁴⁸ *Jerram Falkus Construction Ltd v Fenice Investments Inc* [2011] EWHC 1935 (TCC)

²⁴⁹ Dr Tim Sampson, (News & Resources 9th Oct 2017, Lamb Chambers Barristers), "*North Midland Building Limited v Cyden Homes Limited [2017] EWHC 2414 (TCC)*"

²⁵⁰ agreements must be kept

bespoke clear amendment for concurrent delays, the same must be honoured and enforced. This can be supported as well by the judgement of the leading English case *Walter Lilly & Co Ltd v Mackay*²⁵¹, despite the court held in favour of the Contractor for full EOT, Justice Akenhead in relation to concurrent delays stated “*there was **nothing in the wording of the clause** itself that suggested that there should be any **reduction** in an extension of time where some fault on the part of the **contractor could be established**”*, which means if the court found in the contract a bespoke term as stated in the above clause 2.25.3(b) of *North Midland Building Limited v Cyden Homes Limited* case, the court decision would have been different.

It is worth mentioning that same approach to deny granting EOT to the Contractor in concurrent delay cases was followed earlier in other recent cases of *Jerram Falkus Construction Ltd v Fenice Investments Inc*²⁵² and *Saga Cruises BDF Ltd v Fincantieri SPA*²⁵³, despite the fact that the contract did not have any express terms dealing with concurrency. Similarly, 2017-SCL protocol has adopted a similar position. So, the Author submits that Malmaison Approach or Walter Lilly Authority of “time-but-no-cost” in cases of concurrent delays is no longer the English law Authority and currently replaced by this new Authority of allocating the consequences of concurrent delays to the Contractor in such situations.

It is important to note that both *Fenice and Midland* were decisions of the English Technology and Construction Court (TCC); while both *Adyard* and *Saga Cruises* were decisions of the English Commercial Court.

²⁵¹ *Walter Lilly & Co Ltd v Mackay* [2012] EWHC 1773 (TCC)

²⁵² *Jerram Falkus Construction Ltd v Fenice Investments Inc* [2011] EWHC 1935 (TCC) (21 July 2011)

²⁵³ *Saga Cruises BDF Ltd v Fincantieri SPA* [2016] EWHC 1875 (Comm)

4.3.5. Proposed Contract Amendments to address Concurrent Delays

In this section the Author will provide his recommendation about proposed bespoke Contract Amendments to address Concurrent Delays.

It is considered crucial, from both parties perspective to avoid protracted disputes and outcomes contrary to parties' intention, to include express bespoke agreed terms within their contract, which clearly articulate the meaning of concurrent delays, its consequences and how to be dealt with including who bears the risk when concurrent delays arise.

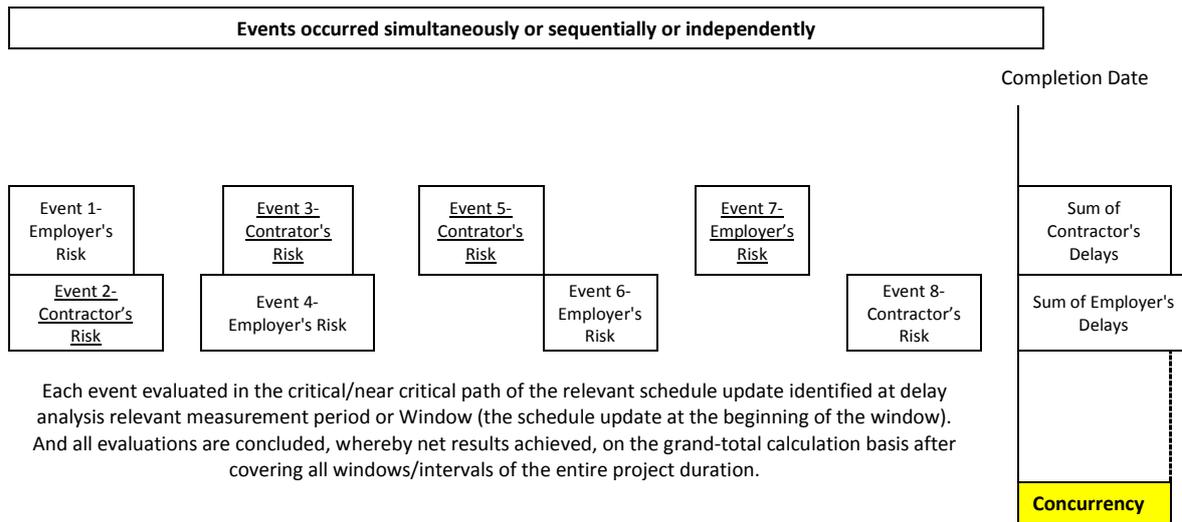
- **Definition of Concurrent Delays:**

One of the fundamental element that made concurrent delay as one of the law notoriously problematical areas, and most controversial kind of delay disputes is the absence of an agreed coherent definition/interpretation²⁵⁴ of concurrent delays. So, the first point to start with is to provide a defined term for Concurrent Delays, in order to clear the mud about issues related to its identification/interpretation. As the Author analysed in section 2.4 above, Concurrent Delays can be defined as follows:

“Various independent delay events, whereby some form part of the Employer’s risk events and others form part of the Contractor’s risk events, occur simultaneously or independently/sequentially or overlapped, and either in the same activities’ path or other parallel or independent activities’ path, and its effect either felt simultaneously or independently, which are on the pertinent critical/near critical path (that is identified at delay analysis relevant measurement period or window for dynamic methods, or

²⁵⁴ the same was explained by Lord Osborne in *City Inn v Shepherd* [2008] 8 BLR 269 (CSOH); [2010] BLR 473 (CSIH)

baseline schedule for static method) of the programme of the Works²⁵⁵ and each separately causes delay to project Time for Completion”. By such definition, all types of delay attributed to both parties are covered. The following represent a graphical illustration of the Author’s definition of concurrent delay:



- **Consequences of Concurrent Delays:**

Having identified the meaning of Concurrent Delays, the following step is to identify the consequences if it arises. The Author suggests the following could be included within the relevant EOT clause, which represent “no-time-no-cost approach”:

“Notwithstanding any other provisions of the Contract, after conducting the delay analysis and assessment for all delay events that are the responsibility of the Employer and of the Contractor, which is related to an extension of Time for Completion Claim or Employer’s determination of extension to the Time for Completion. In cases of Concurrent Delays as defined under the Contract, then to the extent of the Concurrent Delay that is the responsibility of the Contractor, such

²⁵⁵ i.e “an effective cause of Delay to Completion (not merely incidental to the Delay to Completion)”

Contractor's Concurrent Delay period shall not be taken into account and the Employer shall not give an extension of Time for Completion nor the Contractor will be entitled to an extension to the Time for Completion for this period".

Such clause allocates the associated risks to the Contractor in a crystal clear wording in order to avoid any potential disputes.

5. CHAPTER 5: APPROACHES TO CONCURRENT DELAY

This chapter will provide analysis and concise identification of internationally recognized approaches to Concurrent Delay, moreover, further in-depth analysis is provided within Chapter 6.

Numerous approaches have been developed and mooted internationally as briefed below, and it is worth mentioning that none of these has been included within any of the international standard forms of contract.

5.1. Dominant Cause

It is a principle²⁵⁶ well established under the law of insurance²⁵⁷ contracts²⁵⁸ whereby court thought it must select one of the causes as it is obliged to do pursuant to insurance terms/conditions²⁵⁹, and prevailed in UK construction industry during 1980s, **whereby it is obligatory to choose one of the events and consider it as the dominant cause of delay/loss**²⁶⁰. The Author shall define this herein as “**Ordinary Dominant Cause**” approach. In the context of concurrent delays, it is the principle/test that if **one** of the events can be considered as the dominant/effective cause of delay by applying common-sense standards, and considered “*as one that would by itself have prevented loss*”

²⁵⁶ Common Law approach “*If there are two causes, one the contractual responsibility of the Defendant and the other the contractual responsibility of the Plaintiff, the Plaintiff succeeds if he establishes that the cause for which the Defendant is responsible is the effective, dominant cause. Which cause is dominant is a question of fact, which is not solved by the mere point of order in time, but is to be decided by applying common sense standards.*” Keating (5th edition, Sweet & Maxwell, 1991), page 195

²⁵⁷ Leyland Shipping v Norwich Union [1918] A.C. at 370, HL; Yorkshire Dale Steamship v Minister of War Transport [1942] A.C. 691, HL; Monarch Steamship Co v Karlshamns Oljefabriker [1949] A.C. 196 at 227, HL; Boiler Inspection and Insurance Company v Sherwin- Williams [1951] A.C. 319, PD; Wayne Tank Co v Employers Liability [1974] Q.B. 57, CA; cf. Galoo Ltd v Bright Grahame Murray [1994] 1 W.L.R. 1360, CA

²⁵⁸ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012), para 9–070

²⁵⁹ D Barry “Concurrent Delay in construction law: Lord Drummond Young’s volte face” (2011), Construction Law Journal 27(3), 165-178, 171

²⁶⁰ J Marrin QC, “Concurrent Delay”, (2002) SCL paper 100, 12

*occurring if it had not occurred*²⁶¹, other minor causes/events are discharged/not considered and only this dominant cause shall be legally effective.²⁶²

The Scottish court, **in a more practical approach**, endorsed (obiter dicta) the Dominant Cause, as the *first-in-line* approach to be applied to concurrent delays analysis, *not as obligatory to be adopted*, if it could be established, in the recent two well-known Scottish cases of *John Doyle Construction Ltd v Laing Management (Scotland) Ltd*²⁶³,²⁶⁴ and *City Inn Ltd v Shepherd Construction Ltd*²⁶⁵.²⁶⁶ Such practicality of the approach arises from *not a must* to select one event but a *possibility* if could be achieved to consider one of the events as the effective dominant cause. The Author shall define this herein as “**Modern Dominant Cause**” approach.

In the Author’s opinion Ordinary Dominant Cause approach is considered impossible to be applied in complex competing/contemporaneous multi-causes cases, whereby causes have approximate causative potency or equal effect or both/all have a severe negative effect on work’s progress/completion date. Likewise, some commentators and judges did not accept the Ordinary Dominant Cause approach, while dealing with concurrent delays. The editors of Keating 9th edn stated about Dominant Cause “*However clearly this approach does not resolve the problem where there is **no one** dominant cause*”²⁶⁷. Moreover, in the arbitration appeal case of *H Fairweather & Co Ltd v*

²⁶¹ Devlin J definition of ‘effective cause’ in *Heskell v Continental Express Ltd* [1950] 1 All ER 1033 (KB)

²⁶² Vincent Moran QC, “CAUSATION IN CONSTRUCTION LAW: THE DEMISE OF THE ‘DOMINANT CAUSE’ TEST?”, (November 2014) SCL paper 190, 1-4

²⁶³ *John Doyle Construction Ltd v Laing Management (Scotland) Ltd* [2004] B.L.R. 295 (IH (Ex Div)). The court stated it is “the application of common sense to the logical principles of causation”

²⁶⁴ Lord MacLean stated “ *In this connection, it is frequently possible to say that an item of loss has been caused by a particular event notwithstanding that other events played a part in its occurrence. In such cases, **if an event or events for which the employer is responsible can be described as the dominant cause of an item of loss, that will be sufficient to establish liability notwithstanding the existence of other causes that are to some degree at least concurrent***”

²⁶⁵ [2010] CSIH 68, [2010] BLR 473, para [42]

²⁶⁶ In *City Inn*, Lord Drummond Young stated: “I agree that it **may be possible** to show that **either** a relevant event or a contractor's risk event **is the dominant cause of that delay**, and in such case **that event should be treated as the cause of the delay**.”

²⁶⁷ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012), para 9-065

*Wandsworth LBC*²⁶⁸, where the arbitrator based his award for EOT entitlement on a concept that the contract requires him to identify in the cases of concurrent delay which of the events is considered as a dominant cause and act accordingly^{269, 270} Judge James Fox-Andrews QC did not accept that, whereas he accepted the contractor's appeal and remitted the arbitrator award for reconsideration while clarifying that it was flawed to apply such concept. He said:

“Dominant has a number of meanings: “Ruling, prevailing, most influential”. On the assumption that condition 23 is not solely concerned with liquidated or ascertained damages but also triggers and conditions a right for a contractor to recover direct loss and expense where applicable under condition 24 **then an architect and in his turn an arbitrator has the task of allocating, when the facts require it, the extension of time to the various heads. I do not consider that the dominant test is correct.** But I have held earlier in this judgment that that assumption is false”²⁷¹

John Marrin QC²⁷² strongly disagreed with the application of Ordinary Dominant Cause approach due to its conflict with the but-for-test, its conflict with prevention principle and its impracticality of application²⁷³, accepted Judge James Fox-Andrews QC approach and went further to state that “*it is thought that the courts in England are unlikely to adopt the dominant cause approach – and would be disinclined to overrule the Fairweather case, were the point to arise again*²⁷⁴.”

Thus the Author concludes that, Ordinary Dominant Cause approach is more applicable where there is a single **effective**²⁷⁵ cause of delay that can be identified²⁷⁶, whereas there is a legal Authority (such as in UK insurance industry) or necessity (such as it is expressly stated in the contract conditions) that in the case of two/more causes;

²⁶⁸ H Fairweather & Co Ltd v London Borough of Wandsworth (1987) 39 B.L.R. 106

²⁶⁹ Condition of contract was JCT standard form; 1963 Edition, and the clause in reference is Clause 23

²⁷⁰ the Arbitrator decision was a strike causing a delay of (81) weeks was the dominant cause as opposed to Employer's variations at the project's beginning causing (18) weeks delay

²⁷¹ J Marrin QC, “ Concurrent Delay Revisited”, (2013) SCL paper 179, 13

²⁷² John Marrin QC is a barrister practicing at Keating Chambers in London

²⁷³ J Marrin QC, “ Concurrent Delay Revisited”, (2013) SCL paper 179, 14

²⁷⁴ J Marrin QC, “ Concurrent Delay”, (2002) SCL paper 100, 14

²⁷⁵ effective in that sense means if two causes exist however by fact-finding exercise, it can be revealed that either one cause was a result of the other, or, in reality it is only one event that considered as the genuine cause of delay.

²⁷⁶ Galoo Ltd v Bright Grahame Murray [1994] 1 WLR 1360, [1995] 1 All ER 16 (CA)

one of them *must* be selected as the dominant/effective cause²⁷⁷, while Modern Dominant Cause approach is more applicable as a *first-in-line* approach where there are intervening/cooperating/contributing events/causes and one of them did not break the chain of causation²⁷⁸, hence the other is considered as the dominant cause.

5.2. The Malmaison Approach²⁷⁹

This approach is named after the case law that has been considered to be initiated in, “*Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester)*”²⁸⁰. It is a “time but no money” approach, whereby the Contractor is entitled for full EOT resultant from the Employer’s risk event, however is not entitled for Prolongation Cost considering that he cannot fulfil the “but for test”; since he was already in culpable delay and in any case would have suffered such Prolongation Cost in the absence of the Employer’s risk event. Nevertheless, he can be compensated for any Prolongation Cost that is explicitly resulted from and only from the Employer’s risk event.²⁸¹

Dyson J in this aforementioned case²⁸² held that the architect in his determination of EOT claim should consider the impact of all other events relied upon by the parties not only

²⁷⁷ Heskell v Continental Express Ltd [1950] 1 All ER 1033 (KB); Banque Keyser Ullmann SA v Skandia (UK) Insurance Co [1990] QB 665 (QB and CA); and County Ltd v Girozentrale Securities [1996] 3 All ER 834 (CA)

²⁷⁸ as an example for this is Leyland Shipping Co Ltd v Norwich, Union Fire Insurance Society Ltd [1918] AC 350, A ship damaged by torpedo then back to port, however due to severe storm the ship bumped against the harbor walls, therefore port authorities decided to remove it outside the port but as a result of that damage weaken further due to high winds and seas and the ship sank. Court stated, “*would have been saved if she had been allowed to stay there*”. Insurance company argued that the cause was the torpedo (uninsured event), while the ship owner argued that the cause is the storm (insured event). It was held that the **torpedo is the real dominant cause**. Lord Shaw stated “*To treat proxima causa as the cause which is the nearest in time is out of the question ... The cause which is truly proximate is that which is proximate in efficiency ... Where various factors are concurrent, and one has to be selected, the matter is determined as one of fact, and the choice falls upon the one to which may be variously ascribed the qualities of reality, predominance, efficiency.*”

²⁷⁹ Common Law approach (the English current stance for concurrency)

²⁸⁰ Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd (1999) 70 Con. L.R. 32, QBD (TCC)

²⁸¹ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012), para 8–026 and para- 9-059

²⁸² Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd (1999) 70 Con. L.R. 32, QBD (TCC)

the Relevant Event, for which the Author agrees. He as well, recorded the parties' agreement in their contract about how concurrent delays will be dealt with as follows:

*“it is agreed²⁸³ that if there are two concurrent causes of delay, one of which is a relevant event and the other is not, **then the contractor is entitled to an extension of time for the period of delay caused by the relevant event notwithstanding the concurrent effect of the other event.** Thus, to take a simple example, if no work is possible on a site for a week not only because of exceptionally inclement weather (a relevant event) but also because the contractor has a shortage of labour (not a relevant event) and if the failure to work during that week is likely to delay the works beyond the completion date by one week, then if it considers it fair and reasonable to do so, **the architect is required to grant an extension of time of one week. He cannot refuse to do so on the grounds that the delay would have occurred in any event by reason of the shortage of labour.**”*

UK judges in various subsequent court cases considered Dyson J aforementioned statement about recording parties' agreement related to concurrent delays without any adverse comments or qualification, shows his endorsement for such approach. For instance, HHJ Stephen Davies in *Steria Ltd v Sigma Wireless Communications Ltd*²⁸⁴ stated, *“the fact that Dyson J, a judge with wide experience in the field, noted the agreement without adverse comment is a strong indication that he considered it correctly stated the position”*. Similarly, Akenhead J in *Walter Lilly & Co Ltd v Mackay*²⁸⁵ stated that Dyson J *“endorsed that common ground”*, and went further to state *“the English approach is that the Contractor is entitled to a full extension of time for the delay caused by the two or more events (provided that one of them is a Relevant Event)”*.²⁸⁶ However, the Author submits that such interpretation of Dyson J is arguable

²⁸³ i.e both parties agreed in their contract (not part of Dyson J judgment).

²⁸⁴ *Steria Ltd v Sigma Wireless Communications Ltd* [2008] BLR 79

²⁸⁵ *Walter Lilly & Co Ltd v Mackay* [2012] EWHC 1773 (TCC)

²⁸⁶ M Cocklin “International approaches to the legal analysis of concurrent delay: is there a solution for English law?” (2014) 30(1), *Construction Law Journal*, 41-56, 42

since Dyson J did not explicitly state his position, which if he wanted to express his assessment; he should have stated so taking into consideration the complexity and controversy of concurrent delay disputes that he is fully aware of. Moreover, Dyson J did in fact held, that the arbitrator had jurisdiction under the contract EOT provisions to consider Malmaison Hotel defence, and to assess other delay events (contractor culpable events) submitted by Malmaison Hotel to establish the causes of delay. Additionally, the *simple example*²⁸⁷ and analogy presented by Dyson J is a situation of true concurrency²⁸⁸, and the Author submits that Dyson J didn't mean for this principle to be applied in other situations such as consequential or independent delays.

However, Malmaison approach was followed by subsequent UK court cases²⁸⁹ and was titled as the “*English law benchmark*” and “*the general principle of English law on concurrent delay*”²⁹⁰, as well as, reinforced by the 2002-SCL Protocol, Core Principle 9 stated, “*Where Contractor Delay to Completion occurs or has effect concurrently with Employer Delay to Completion, **the Contractor’s concurrent delay should not reduce any EOT due***”²⁹¹.²⁹² Similarly, the editors of Keating 9th edn had supported the same²⁹³²⁹⁴

²⁸⁷ one week of delay because of exceptionally inclement weather and shortage of labor

²⁸⁸ HHJ Seymour agreed with the same in *Royal Brompton Hospital NHS Trust v Hammond*, however Lord Osborne did not agree with that in *City Inn Ltd v Shepherd Construction Ltd*

²⁸⁹ *Royal Brompton Hospital NHS Trust v Hammond* (No 7) [2001] EWCA Civ 206; 76 Con. L.R. 148 at [85]; *Steria Ltd v Sigma Wireless Communications Ltd* [2008] B.L.R. 79; 118 Con. L.R. 177; [2008] C.I.L.L. 2544 at [131]; *De Beers UK Ltd (formerly Diamond Trading Co Ltd) v Atos Origin IT Services UK Ltd* [2010] EWHC 3276 (TCC); [2011] B.L.R. 274; 134 Con. L.R. 151 at [177]; *Adyard Abu Dhabi v SD Marine Services* [2011] EWHC 848 (Comm); [2011] B.L.R. 384; (2011) 27 Const. L.J. 594 at [277]; *Walter Lilly & Co Ltd v Mackay* [2012] EWHC 1773 (TCC); [2012] B.L.R. 503; (2012) 28 Const. L.J. 622 at [370].

²⁹⁰ M Cocklin “International approaches to the legal analysis of concurrent delay: is there a solution for English law?” (2014) 30(1), *Construction Law Journal*, 41-56, 42

²⁹¹ see also SCL Protocol Guidance Sections 1.4.1 and 1.4.7

²⁹² S Cavaleri “Construction disputes in Denmark: the case of concurrent delay” (2015), *Construction Law Journal* 31(2), 57-68, 61

²⁹³ Para 8-026 stated, “*It is now generally accepted that under the Standard Form of Building Contract and similar contracts a contractor is entitled to an extension of time where delay is caused by matters falling within the clause notwithstanding the matter relied upon by the contractor is not the dominant cause of delay, provided only that it has at least equal “causative potency” with all other matters causing delay. The rationale for such an approach is that where the parties have expressly provided in their contract for an extension of time caused by certain events, the parties must be taken to have contemplated that there could be more than one effective cause of delay (one of which*

Moreover, it is submitted that Malmaison approach is supported by: i) Prevention principle, since the Contractor would have been granted EOT; hence there is no contradiction with Prevention principle and it would not be relied on, ii) this approach reflects the parties' intention under executed contract conditions²⁹⁵, whereby it is interpreted that despite the fact that parties were cognizant that delays may occur coincidentally due to events that are attributed to both Employer and Contractor, nevertheless they agreed on EOT clauses that entitle the Contractor for EOT in specific events without any qualifications about the occurrence of any other Relevant Events^{296, 297}.

5.3. Apportionment

Apportionment in the context of concurrent delays is the approach that could be construed as either:

Scenario (i): Apportioning faults between the Employer and the Contractor; and accordingly apportioning resultant damages. This is similar to apportioning liability considering contributory negligence or contribution among joint wrongdoers. For instance, assess that for a specific delay events, the Employer was responsible for x%

would not qualify for an extension of time) but nevertheless by their express words agreed that in such circumstances the contractor is entitled to an extension of time for an effective cause of delay falling within the relevant contractual provision."

Para 8-028 stated, "As summarised above, where there are concurrent causes of delay (one the responsibility of the contractor and the other of the employer) **the contractor may be entitled to an extension of time. In contrast, a contractor will normally not be entitled to receive payment for loss and expense in respect of a relevant matter in such circumstances. The fact that the works would have been delayed in any event by the concurrent delay event which is the contractor's responsibility probably does not deprive it of an extension of time entitlement in light of the Malmaison approach summarised above; but the fact that the "but for" test of causation cannot be satisfied in these circumstances is normally taken to deprive the contractor of a loss and expense claim in respect of the relevant matter"**

²⁹⁴ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012), para 8–026, para 8-028

²⁹⁵ this considering that parties did not include any specific provisions for concurrent delays in their contract, same as under JCT or FIDIC.

²⁹⁶ In Walter Lilly case it was held that "There is nothing in the wording of Clause 25 which expressly suggests that there is any sort of proviso to the effect that an extension should be reduced if the causation criterion is established."

²⁹⁷ J Marrin QC, "Concurrent Delay Revisited", (2013) SCL paper 179, 16

of it, and the Contractor was responsible for y% of it. Hereinafter called (“**Jury Verdict**²⁹⁸”), or,

Scenario (ii): Apportioning of time/delay arises from the competing causes of delays based on the party responsible for each cause/risk, whereby the decision maker identifies how many days of delay were attributed to the Contractor and how many days of delay were attributed to the Employer, accordingly assesses/allocates damages i.e. each party bears the damages for the period he is responsible of. For instance, by the means of thorough delay analysis, specific delay period was solely attributed to one party and subsequent delay period was solely attributed to the other party (such as “*the first 61 days of delay were wholly the contractor's fault, but the owner caused the next 60 days of delay*”).²⁹⁹ Hereinafter called (“**Apportionment of Time**”)

In the context of concurrent delay, the Author submits that: if the above scenario (i) “Jury Verdict” applied, the Employer and the Contractor will both together share the damage associated with delays based on the significance of delays impact on the project as a whole, therefore, LDs/Prolongation Cost will be partially granted on account of comparative fault basis, which is similar to tort principle of apportioning liability in cases of contributory negligence or contribution among joint-wrongdoers. And, if the above scenario (ii) “Apportionment of Time” applied, the net effect will apply, i.e. if the contractor is responsible for ‘x’ days delay after the completion date and the Employer is responsible for ‘y’ days delay after the completion date, and let’s assume x is bigger than y; then during the period ‘y’ time-but-no-cost approach will be applied (this analogous to

²⁹⁸ J Livengood “Comparison of English and U.S. Law on Concurrent Delay”, (2014) Insight To Hindsight Navigant Consulting, Inc. p8

²⁹⁹ J Finley and others “Concurrent Delay: Clearing Up The Confusion Over "Apportionment" In Construction Litigation”, 2

x equal y) similar to what is broadly implemented in England³⁰⁰ and United States³⁰¹, and for the period 'x-y' LDs will be applied.

It is worth mentioning that there has been substantial divergence around apportionment related to the aforementioned scenario (i) "Jury Verdict" and (ii) "Apportionment of Time", whereby misunderstanding sometimes arises about interpretation of a specific case law³⁰² or issue with respect to apportionment of fault OR apportionment of time^{303 304}.

Under American jurisdiction, apportionment is currently well recognized but only "*when clear apportionment of the delay attributable to each party has been established*"³⁰⁵, which became feasible after the advent of computer based delay analysis and critical path analysis method³⁰⁶.³⁰⁷ However, the general preferred trend of American courts, if apportionment is applicable, is Apportionment of Time (i.e. Scenario (ii) above) not apportionment on comparative fault basis "Jury Verdict".³⁰⁸ Nevertheless, in the context of concurrent delay, Apportionment approach was clarified not to be applicable in case of

³⁰⁰ See footnote 289

³⁰¹ *Blinderman Constr. Co. v. United States*, 695 F.2d 552, 559 (Fed. Cir. 1982)& *Morganti National Inc* (2001) 49 Fed. Cl. 110, affirmed (2002) 36 Fed. 452& *Weaver-Bailey Contractors Inc v The United States* (1990) 19 Cl. Ct. 474, 476& *Utlely-James Inc* (1985) 85-1 BCA 17,816, WL 13,874 (citing *Dawson Construction Co* (1975) 75-2 BCA 11,563, WL 1808)& *Essex Electro Engineers Inc v Richard J Danzig, Secretary of the Navy* (2000) 224 F.3d 1283, 1295-96 (Fed. Cir.)& *RP Wallace Inc v The United States* (2004) No. 96-222 C

³⁰² *Peak Construction Ltd v McKinney Foundations Ltd* (1970) 1 B.L.R. 111, see Furst S, Ramsey V, Keating on *Construction Contracts* (9th edn, London: Sweet & Maxwell, 2012), para 9-068, fn. 285, whereby it was stated that this case "*is sometimes referred to as an example of a similar approach being approved, although it is probable that the apportionment contemplated in this case related to splitting a period of delay between different causes, rather than of a situation where there were concurrent causes of a single period of delay*"

³⁰³ B McAdam "Apportionment and the common law: has City Inn got it wrong?" (2009) *Const. L.J.*, 25(2), 79-95, 84

³⁰⁴ J Finley and others "Concurrent Delay: Clearing Up The Confusion Over "Apportionment" In *Construction Litigation*", 2

³⁰⁵ *George Constr. Co. v. United States*, 64 Fed. Cl. 229, 238 (2005)& see also *Flatiron Lane v. Case Atlantic Co.*, 121 F. Supp. 3d 515, 541 (M.D.N.C. 2015)

³⁰⁶ the previous American approach was traditionally to reject apportionment because delays and losses were considered non-severable and apportionment could not be achieved due to absence of technological technics such as CPM. CPM allows for clear and acceptable segregation of activities and clear relations between activities, which allows for better ability of segregation of causes' responsibility and losses.

³⁰⁷ F Mastrandrea "CONCURRENT DELAY IN CONSTRUCTION – PRINCIPLES AND CHALLENGES" (2014, Pt1) *The International Construction Law Review*, 83-107, 103

³⁰⁸ J Finley and others "Concurrent Delay: Clearing Up The Confusion Over "Apportionment" In *Construction Litigation*", 2

concurrent or intertwined delays in the leading American Court of Federal Claims case *RP Wallace Inc v The United States (2004)*^{309, 310} Allegra J stated:

*“Thornier issues are posed by **concurrent or sequential delays**—the first occurring where both parties are responsible for **the same period of delay**, the second, where one party and then the other cause different delays **seriatim or intermittently**. Concurrent delay is not fatal to Contractor’s claim for additional time due to excusable delay, but precludes the recovery of delay damages. ‘If a period of delay can be attributed simultaneously to the actions of both government and Contractor,’ this court has stated, ‘there are said to be **concurrent delays, and the result is an excusable but not a reimbursable delay**.’ ... Summarizing the law on this point, the Federal Circuit, in *Essex Electro Engineers* ... recently reiterated that Contractor ‘generally **cannot recover for concurrent delays for the simple reason that no causal link can be shown: government’s act that delays part of the contract performance does not delay the general progress of the work when the prosecution of **the work as a whole would have been delayed regardless of government’s act**’”.***

Moreover, Allegra J carried out a thorough analysis and approved apportionment of liquidated damages in **sequential** delay situations, referring to the Authority of the American Supreme Court in *Robinson v United States (1923)*³¹¹.

Similarly, the American Court of Federal Claims in *Cumberland Cas & Sur Co v US*³¹² clarified that evidencing is of crucial importance to establish clear apportionment of delays/cost attributed to each party and stated in situations of concurrent delay *“apportionment of liability **may** be impossible”*.

Furthermore, the court to distinguish between **concurrent and sequential delays** provided two examples: 1) delay to the commencement of the works emanated from late approval of plans (Relevant Event) and late ordering of materials (Contractor’s default),

³⁰⁹ *RP Wallace Inc v The United States COFC (2004) No. 96-222 C*

³¹⁰ Wallace was subsequently approved by the Court of Federal Claims in: *George Sollitt Construction v United States (2005) 64 Fed Cl 229* & *Sunshine Construction & Engineering v United States (2005) 64 Fed Cl 346* & *Cumberland Cas & Sur Co v US Fed Cl – (2008) WL 2628433*

³¹¹ *Robinson v United States 261 US 486; 43 S Ct. 420; 67 L.Ed 760 (1923)*

³¹² *Cumberland Cas & Sur Co v US Fed Cl – (2008) WL 2628433*

is said to be concurrent and apportionment is not applicable, 2) Employer's delay in approving the location of a supply road (Relevant Event), then subsequently delayed delivery of materials (Contractor's default), **is said to be sequential and apportionment is applicable.** In a similar way, in Appeal of *Chas I Cunningham*³¹³, the court held *"Where a contractor finishes late partly because of a cause that is excusable under this provision and partly because of a cause that is not, it is the duty of the contracting officer to make, if at all feasible, a fair apportionment of the extent to which completion of the job was delayed by each of the two causes, and to grant an extension of time commensurate with his determination of the extent to which the failure to finish on time was attributable to the excusable one."*³¹⁴

Likewise, apportionment of fault "Jury Verdict" was approved under Scottish law. It was recognized in *John Doyle*³¹⁵ case, whereby Extra Division, Inner House Court of Session preferred to apply apportionment where no dominant cause can be identified.³¹⁶ Similarly, it was recognized in the recent leading case in both Outer House Court (i.e. first instance) and Inner House Court's (i.e. appeal court) decision of *City Inn Limited v Shepherd Construction Ltd*³¹⁷. Lord Drummond Young³¹⁸ stated:

*"Where there is true concurrency between a relevant event and a contractor default, in the sense that both existed simultaneously, regardless of which started first, it may be appropriate to apportion responsibility for the delay between the two causes; obviously, however, the basis for such apportionment must be fair and reasonable."*³¹⁹

³¹³ Appeal of Chas I Cunningham 57-2 BCA P, 164 Interior Dec 449, IBCA 60, 1957 WL 139 (IBCA).

³¹⁴ B McAdam "Apportionment and the common law: has City Inn got it wrong?" (2009) Const. L.J., 25(2), 79-95, 83-84

³¹⁵ Laing Management (Scotland) Ltd v John Doyle Construction Ltd [2004] B.L.R. 295.

³¹⁶ P Lane "Disruption and delay: fair entitlement and the regulation of risk" (2006), Construction Law Journal 22(2), 92-116

³¹⁷ City Inn Limited v Shepherd Construction Ltd [2007] CSOH 190; [2008] 8 BLR 269 (CSOH); [2010] BLR 473 (CSIH)

³¹⁸ City Inn Limited v Shepherd Construction Ltd [2007] CSOH 190

³¹⁹ this was endorsed in the appeal court (Inner House), by the majority represented by Lord Osborne.

Lord Drummond then remarkably clarified how apportionment is to be carried out that is similar to the situations of liability apportionment of contributory negligence or contribution among wrongdoers “Jury Verdict”, by assessing two main factors **the degree of culpability** of each cause (the less important and straightforward factor), and **the significance of each factor** in causing the delay. With respect to the significance of each factor, a cause that affects minor or small part of the works is not similar to a major delay or a delay that affects the whole of the works.

Conversely, Apportionment of fault “Jury Verdict” in the context of true concurrency or overlapped causes of delays was rejected in England and this was considered as good law and supported by the editors of Keating³²⁰ and numerous court cases³²¹. In *Walter Lilly & Company Ltd v Giles Mackay and DMV Developments Ltd [2012]*³²², Akenhead J stated “*There was nothing in the wording of cl.25 which expressly suggested that there was **any sort of proviso to the effect that an extension should be reduced if the causation criterion was established. The fact that the Architect has to award a "fair and reasonable" extension does not imply that there should be some apportionment in the case of concurrent delays... It therefore follows that, although of persuasive weight, the City Inn***³²³ *case is inapplicable within this jurisdiction*”.

It is worth noting that the argument against apportionment is sometimes surrounded by its argued contradiction with Prevention principle, because if the Contractor would not have been granted EOT or his entitlement of EOT is reduced; hence there is a contradiction

³²⁰ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012), para 9–068 stated “*there is no general ability to apportion damages between parties and that to the extent that City Inn decided otherwise that it did not represent the current position in English law*”

³²¹ *Walter Lilly & Company Ltd v Giles Mackay and DMV Developments Ltd [2012] EWHC 1733 & Adyard Abu Dhabi v. SD Marine Services [2011] EWHC 848*

³²² [2012] EWHC 1773

³²³ the leading Scottish court case, whereby apportionment was held for concurrent delays

with Prevention principle and it could be relied on. However, some commentators and courts contended this argument.³²⁴ It is contended that situations of true concurrency/‘equal causative potency’ in addition of being rare, there is no justification that apportionment cannot be applied in situations of ‘sub-equal potency causes’ which is excluded by the definition of true concurrency.³²⁵ Moreover, in *Jerram Falkus v Fenice Investments Inc [2011]*³²⁶, Coulson J stated, “*the contractor could not show that the employer's conduct made it impossible for him to complete within the stipulated time*” and hence Prevention principle cannot be relied on. He even went further to state that the learned editor of Keating was mistaken by expressing that “*the prevention principle probably applies even if the contractor has by his own delays disabled himself from completing by the due date*”.³²⁷

Notably, many other jurisdictions have in general endorsed the principles of Apportionment, such as Canada³²⁸, New Zealand³²⁹, Australia³³⁰, Hong Kong³³¹, Italy³³² and other civil law jurisdictions such as UAE³³³ whereby the principles of good faith, reasonableness, honesty and fairness represent core principles under the law.³³⁴

³²⁴ However, other commentators and courts endorsed prevention principle to apply in concurrent delay scenarios, see *De Beers UK Ltd v Atos Origin IT Services UK Ltd [2010] EWHC 3276 (TCC)*

³²⁵ F Mastrandrea “CONCURRENT DELAY IN CONSTRUCTION – PRINCIPLES AND CHALLENGES” (2014, Pt1) *The International Construction Law Review*, 83-107, 106

³²⁶ *Jerram Falkus v Fenice Investments Inc (No 4) [2011] EWHC 1935 (TCC)*

³²⁷ A Croft “Concurrent delay and the prevention principle” (2012) 23 *1 Cons.Law* 14, 4

³²⁸ *Doiron v Caisse Populaire D’Inkerman Limitée* (1985) 17 *DLR(4th)* 660. & *Tompkins Hardware Ltd v North Western Flying Services Ltd* (1982) 139 *DLR(3d)* 329 & *Evergreen Building Ltd v H Haebler Co Ltd et. al.* (1983) 5 *CLR* 70

³²⁹ e.g., *Mouat v Clark Boyce* [1992] 2 *NZLR* 559 (appealed, on different grounds, at [1993] 4 *All ER* 268 (PC))

³³⁰ By the use of express contract conditions, for example clause 34.4 of AS4000 – 1997

³³¹ for example, *W Hing Construction Co Ltd v Boost Investments Ltd [2009] HKCFI* 95

³³² Di Paola and Spanu, “Concurrent Delays” [2006] *ICLR* 373

³³³ UAE Civil Code, Article 290 and 291

³³⁴ F Mastrandrea “CONCURRENT DELAY IN CONSTRUCTION – PRINCIPLES AND CHALLENGES” (2014, Pt1) *The International Construction Law Review*, 83-107, 106

5.4. The Devlin Approach³³⁵

It is an approach initiated by the English Judge Devlin J back in 1950 in the case of *Heskell v Continental Express Ltd*³³⁶, whereas if there are two causes of loss; the breach of contract cause is the one who considered as the cause of loss. Judge Devlin said:

*“if a breach of contract is one of two causes of a loss, both causes cooperating and both of approximately equal efficacy, the breach is sufficient to carry judgment for the loss”*³³⁷

This approach was subsequently accepted and adopted by the UK House of Lords in *Banque Keyser Ullmann SA v Skandia (UK) Insurance Co (1991)*³³⁸ and by Judge HHJ David Wilcox in *Great Eastern Hotel Company Ltd v John Laing Construction Ltd (2005)*³³⁹, he said:

*“If a breach of contract is one of the causes both co-operating and of equal efficiency in causing loss to the Claimant the party responsible for breach is liable to the Claimant for that loss. The contract breaker is liable for as long as his breach was an “effective cause” of his loss”*³⁴⁰

However, such approach in the context of construction industry may lead to unaccepted and illogical outcomes if both/all causes of delays are breaches of contract, for which both the contractor’s claim as well as the employer’s counter claim will succeed, which is impossible to be held.³⁴¹

³³⁵ Common Law approach

³³⁶ *Heskell v Continental Express Ltd* [1950] 1 All E.R. 1033

³³⁷ R N.M. Anderson, “Analysing concurrent delays” (2008) *Construction Law Journal*, 24(7), 549-565, 550

³³⁸ *Banque Financiere de la Cite SA (formerly Banque Keyser Ullmann SA) v Westgate Insurance Co (formerly Hodge General & Mercantile Co Ltd)* [1991] 2 A.C. 249; [1990] 3 W.L.R. 364

³³⁹ *Great Eastern Hotel Company Ltd v John Laing Construction Ltd* [2005] EWHC 181

³⁴⁰ GORDON SMITH “WHAT IS THE MALMAISON APPROACH?”, 19, found at [http://www.gordonsmithlegal.com.au/resources/What%20is%20the%20Malmaison%20Approach%20-%20\(19022015\).pdf](http://www.gordonsmithlegal.com.au/resources/What%20is%20the%20Malmaison%20Approach%20-%20(19022015).pdf).

³⁴¹ K Pickavance, “Delay and disruption in construction contracts” (4th edn) Chapter 20, Sub-section 3, para 20-044

6. CHAPTER 6: INTERNATIONAL PRACTISE

This Chapter will explore and compare various international and national approaches under civil law countries (including UAE) and common law countries.

6.1. English Law

In examining English Law, the Author can identify two scenarios for concurrency:

6.1.1. First Scenario, Contract terms for Concurrency Exist

Where the contract contains express terms addressing concurrency, the Court will strictly apply what the parties have agreed for in their contract. This is supported by recent Court judgement in *North Midland Building Limited v Cyden Homes Limited*³⁴², whereby parties agreed to allocate the risks associated with concurrent delays to the Contractor³⁴³. The court rejected the Contractor's argument for Prevention Principle and held that the Contractor is not entitled for EOT. Similarly, this can be implied from the judgment in *Walter Lilly & Co Ltd v Mackay*³⁴⁴, despite the court held in favour of the Contractor for full EOT, Justice Akenhead in relation to concurrent delays stated "*there was nothing in the wording of the clause itself that suggested that there should be any reduction in an extension of time where some fault on the part of the contractor could be established*", which means if the court found bespoke contractual term for concurrency stipulates the contrary; it would have applied it. In the same way, this can be implied as well from the judgment in "*Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester)*³⁴⁵, whereby the court held in favour of the Contractor for full EOT as

³⁴² North Midland Building Limited v Cyden Homes Limited [2017] EWHC 2414 (TCC)

³⁴³ Clause 2.25.3 (b) "*any delay caused by a Relevant Event which is concurrent with another delay for which the Contractor is responsible shall not be taken into account. then, save where these Conditions expressly provide otherwise, the Employer shall give an extension of time.....*"

³⁴⁴ [2012] EWHC 1773 (TCC)

³⁴⁵ (1999) 70 Con. L.R. 32, QBD (TCC)

stipulated under the contract “*that if there are two concurrent causes of delay, one of which is a relevant event and the other is not, then the contractor is entitled to an extension of time for the period of delay caused by the relevant event notwithstanding the concurrent effect of the other event.*”

6.1.2. Second Scenario Contract terms for Concurrency Do not Exist

Where the contract is silent and does not contain any terms addressing concurrency, this is the controversial problematical area for disputes and is analysed below:

6.1.2.1 Balfour Beatty Ltd v Chestermount Properties Ltd

In examining the relevant English cases concerning concurrent delay³⁴⁶, the key starting point is the court’s decision in *Balfour Beatty Ltd v Chestermount Properties Ltd*³⁴⁷. Coleman J in *Balfour Beatty Ltd* provided direction and general tenet in the manner in which concurrent delays would be dealt with in future cases. Though the judge did not expressly deal with the issue of concurrency in his ruling, his determination of the treatment of EOT and Relevant Events have informed future decisions that led to key English approaches.

This case was about issuing variations after the contractual completion date while the contractor was already in culpable delays.³⁴⁸ Colman J agreed with the architect’s determination and held that the contractor is entitled for EOT to be calculated by adding

³⁴⁶ In most of the English cases to be analysed, other than *De Beers UK Limited v Atos Origin IT Services UK Limited* [2010] EWCH 3276 and *Adyard Abu Dhabi v. SD Marine Services* [2011] EWHC 848, the reference is the **JCT Standard Contract**. According to **Clause 25.3** of the contract, the architect is required to provide an extension of time after a fair and reasonable reasoning of the Relevant Event leading to the delay in question

³⁴⁷ *Balfour Beatty Ltd v Chestermount Properties Ltd* [1993] 62 BLR 1

³⁴⁸ The contract was for the construction of the shell and core of an office block in London by Balfour Beatty (contractor) and executed under the JCT 1980 Standard Form contract with original completion date of 17 April 1989 and revised completion date of **9 May 1989**. On Feb 1990, while Balfour Beatty (contractor) was in culpable delay, it was agreed to add fit-out works to the contractor’s scope, accordingly issuing variations for the same during February and July 1990. Contractor completed the original scope (shell& core works) by **12 October 1990** and fit-out works by 25 Feb 1991. The engineer granted two EOTs for the fit-out works, first EOT for 126 days and calculated it from the previously awarded EOT/revised completion date of **9 May 1989**, i.e a revised completion date of *12 September 1989*, and second EOT for 73 days and calculated it from the previously awarded EOT/revised completion date of *12 September 1989*, i.e a revised completion date of 24 Nov 1989. This revised final completion date is actually before the first variation instruction issued on Feb 1990. Chestermount Properties claimed £3,840,000 in LDs.

the period required for the variation works to the previous prevailing completion date and that the revised final completion date of 24 Nov 1989 as determined by the architect is reasonable despite the fact it was before the variation order issuance date³⁴⁹. This approach is called the ‘dot-on’ or ‘net’ approach.³⁵⁰ Colman J also highlighted his view on any variation works versus relevant critical path, he clarified that no EOT to be granted if such variation is not in the critical path of the work³⁵¹. The Author submits that court approach is reasonable and fair. Similarly, 2002-SCL-Protocol recommended the ‘dot-on’ approach as provided for in Appendix D-Figure 6 as well as the exposition for relation to the critical path.³⁵²

On the question of extension of time assessment, Coleman J clarified his view that the architect should first have assessed the period of delay to the works’ progress that had an effect on the completion date and had been the result of an Employer’s risk event, and extend the works’ period of completion by a similar period³⁵³, likewise the same was accepted by Hamblen J in *Adyard Abu Dhabi v SD Marine Services*³⁵⁴.

6.1.2.2 Prevention Principle and Concurrent Delay

Since the main argument from the Contractor side in cases of concurrent delays is the Prevention Principle, the Author shall explore court judgment in *Jerram Falkus*

³⁴⁹ I Dunbar and R Thomas “Extensions of time - delays after the completion date” (1995), Construction Law Journal 11(1), p1

³⁵⁰ the court stated that, **and the author agrees with Court exposition**, “The function of the completion date is to identify the end of the period of time commencing with the date of possession within which [contractor] must complete its works, including **variations** ... The completion date ... is thus not the date by which [contractor] ought to have achieved, or ought in the future to achieve, practical completion, **but the date which marks the end of the total number of working days starting from the date of possession** within which [contractor] ought fairly and reasonably to have completed the works.” However, despite JCT 1980 is silent on natural events, Colman J. (obiter) stated that EOT is not applicable in the case of natural events occurred during culpable delay period, which is contrary to the provision of ICC clause 47(6) of 7th Edition 1999 and contrary to what court held in *Amalgamated Building Contractors Ltd v. Waltham Holy Cross UDC* [1952] 2 All ER 452, 454 and in *Walter Lawrence & Sons Ltd v. Commercial Union Properties Ltd* (1984) 4 Con LR 37.

³⁵¹ GORDON SMITH “WHAT IS THE MALMAISON APPROACH?”, 10

³⁵² *ibid*, 11

³⁵³ Colman J stated “his [The Architect’s] objective must be the same: to assess whether any of the relevant events has caused delay to the progress of the Works and, **if so, how much**. He must then apply the result of his assessment of the amount of delay caused by the relevant event **by extending the contract period for completion of the works by a like amount** and this he does by means of postponing the completion date.”

³⁵⁴ [2011] EWHC 848

*Construction Ltd v Fenice Investments Inc*³⁵⁵, whereby in the Author's opinion Mr Justice Coulson had correctly addressed this issue. Coulson J held in favour of the Employer, denied granting EOT to the Contractor and concluded his judgement that Prevention Principle does not apply in situations of concurrent delay, he stated “[52] Accordingly, I conclude that, for the prevention principle to apply, the contractor must be able to demonstrate that the employer's acts or omissions have prevented the contractor from achieving an earlier completion date and that, **if that earlier completion date would not have been achieved anyway, because of concurrent delays caused by the contractor's own default, the prevention principle will not apply**”.

Coulson J relied on key relevant precedent cases for such conclusion. In *Multiplex v Honeywell*³⁵⁶, Jackson J stated that “ii) Acts of prevention by an employer **do not** set time at large **if the contract provides for extension of time in respect of those events**”. From which it is inferred that; since the contract already includes EOT terms that cover acts of prevention, so Prevention Principle does not apply. Similarly, in *Adyard Abu Dhabi v SD Marine Services*³⁵⁷, Hamblen J stated, “The conduct therefore has to render it impossible or impracticable for the other party to do the work within the stipulated time” The act relied on must **actually prevent** the contractor from carrying out the works within the contract period or, in other words, must cause some **actual delay**”. This indicates that Prevention Principle wouldn't in fact be triggered in cases of concurrent delays; since the contractor was already in culpable delays and in any case would not be able to finish the Project earlier in the absence of the Employer's risk event, i.e. the Employer hadn't prevented actual completion. Coulson J argued as well Keating on Construction Contracts, 8th edition paragraph 9-018, whereby it was stated that the prevention rule

³⁵⁵ [2011] EWHC 1935 (TCC) (21 July 2011)

³⁵⁶ [2007] Bus LR Digest 109

³⁵⁷ [2011] EWHC 848 (Comm)

"probably applies even if the contractor has by his own delays disabled himself from completing by the due date.", which is based on the Authority of *SMK Cabinets v Hili Modern Electrics*³⁵⁸ and others, he argued that these cases were not dealing with concurrent delays.³⁵⁹ This conclusion was followed as well in the recent cases of *Saga Cruises*³⁶⁰ *BDF Ltd v Fincantieri SPA*³⁶¹ and *North Midland Building Limited v Cyden Homes Limited*³⁶².

It is worth noting that both *Fenice and Midland* were decisions of Technology and Construction Court (TCC); while both *Adyard* and *Saga Cruises* were decisions of the Commercial Court.

6.1.2.3 Time But No Cost Approach

One another leading case is *Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester)*³⁶³ that initiated the Malmaison Approach "time-but-no-cost" approach in case of true concurrency, which the Author analysed thoroughly under section 5.2 herein. This is the case that was titled as the "English law benchmark" and "the general principle of English law on concurrent delay"³⁶⁴, and has been followed by various subsequent English cases³⁶⁵ such as *Royal Brompton Hospital NHS Trust v Hammond*³⁶⁶ and *Steria Ltd v Sigma Wireless Communications Ltd*³⁶⁷, and *Walter Lilly & Co Ltd v Mackay*³⁶⁸.

³⁵⁸ *SMK Cabinets v Hili Modern Electrics* [1984] VR 391 at 398

³⁵⁹ <http://www.bailii.org/ew/cases/EWHC/TCC/2011/1935.html>

³⁶⁰ Court clarified and stated that "the importance in concurrency arguments of distinguishing between a delay which, had the contractor not been delayed would have caused delay, **but because of an existing delay made no difference and those where further delay is actually caused by the event relied on.**"

³⁶¹ [2016] EWHC 1875 (Comm)

³⁶² *North Midland Building Limited v Cyden Homes Limited* [2017] EWHC 2414 (TCC)

³⁶³ *Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd* (1999) 70 Con. L.R. 32, QBD (TCC)

³⁶⁴ M Cocklin "International approaches to the legal analysis of concurrent delay: is there a solution for English law?" (2014) 30(1), *Construction Law Journal*, 41-56, 42

³⁶⁵ *Royal Brompton Hospital NHS Trust v Hammond* (No 7) [2001] EWCA Civ 206; 76 Con. L.R. 148 at [85]; *Steria Ltd v Sigma Wireless Communications Ltd* [2008] B.L.R. 79; 118 Con. L.R. 177; [2008] C.I.L.L. 2544 at [131]; *De Beers UK Ltd (formerly Diamond Trading Co Ltd) v Atos Origin IT Services UK Ltd* [2010] EWHC 3276 (TCC); [2011] B.L.R. 274; 134 Con. L.R. 151 at [177]; *Adyard Abu Dhabi v SD Marine Services* [2011] EWHC 848 (Comm); [2011] B.L.R. 384; (2011) 27 Const. L.J. 594 at [277]; *Walter Lilly & Co Ltd v Mackay* [2012] EWHC 1773 (TCC); [2012] B.L.R. 503; (2012) 28 Const. L.J. 622 at [370].

³⁶⁶ *Royal Brompton Hospital NHS Trust v Hammond* [2000] EWHC 39

³⁶⁷ *Steria Ltd v Sigma Wireless Communications Ltd* [2008] BLR 79

6.1.2.4 Concurrent Delay Redefined

Though the decision passed in the Malmaison case recognised provision of full extension of time when two delays were concurrent, it is the *Royal Brompton Hospital NHS Trust v Hammond*³⁶⁹ that defined the meaning of concurrency. HHJ Seymour QC started by clarifying on the meaning of concurrency, he stated:

“[31] *However, it is, I think, necessary to be clear what one means by events operating concurrently. It does not mean, in my judgment, a situation in which, **work already being delayed**, let it be supposed, because the contractor has had difficulty in obtaining sufficient labour, an **event occurs** which is a **Relevant Event** and which, had the contractor not been delayed would have caused him to be delayed, but which in fact, **by reason of the existing delay, made no difference**. In such a situation although there is a **Relevant Event, the completion of the Works is [not] likely to be delayed thereby beyond the Completion Date. The Relevant Event simply has no effect upon the completion date. This situation obviously needs to be distinguished from a situation in which, as it were, the works are proceeding in a regular fashion and on programme, when two things happen, either of which, had it happened on its own, would have caused delay, and one is a Relevant Event, while the other is not. In such circumstances there is a real concurrency of causes of the delay. It was circumstances such as these that Dyson J. was concerned with in the passage from his judgment in *Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd.*”***

Despite the judge interpretation of concurrency is the “true concurrent delays”³⁷⁰, he explained that when a delay transpired due to an Employer’s risk event that occurred during a period of Contractor’s culpable delay, the Employer’s risk event couldn’t be blamed for the delay. The fact is that even before the Employer’s risk event occurred, works had been already in delay; hence it made no difference, has no effect on completion date, and accordingly the Contractor is not entitled for EOT i.e. the

³⁶⁸ *Walter Lilly & Co Ltd v Mackay* [2012] EWHC 1773 (TCC)

³⁶⁹ *Royal Brompton Hospital NHS Trust v Hammond* [2002] EWHC 2037 (TCC)

³⁷⁰ See Section 4.1 for SCL-Protocol differentiation between two the types of concurrent delays

Contractor's delays is regarded as the cause of delay. In the Author's view, this is a fundamental principle for determination of EOT in case of concurrent delays. Similarly, the same approach was implemented in *the Adyard Abu Dhabi v. SD Marine Service*³⁷¹, whereby court clarified that the contractor is not entitled for EOT because the works were already in critical delay before the occurrence of the owner's risk event.

6.1.2.5 English Law and Apportionment in Concurrent Delay

From legislation perspective, the Contributory Negligence Act 1945 allowed tortious negligence claims to be reduced, so far as the court decides it just and equitable with regard to responsibility, on the basis of claimant's contributory negligence. The Act can apply in contract only if the defendant's contractual liability is the same as his tortious negligence independently of any contract, (i.e. not dependent on any contractual duty expressly imposed by the contract), which was confirmed by both Court of Appeal³⁷² and House of Lords³⁷³. Therefore, since the responsibility for concurrent delays arises from contractual duties, obligations and rights; the Act does not apply. Also, The Civil Liability (Contribution) Act 1978 does not apply, because it is related to the ability of a defendant to seek contribution from other parties (not the claimant) who would also be liable to the claimant.³⁷⁴

From case law perspective, despite the fact that there are some English Courts that have adopted apportionment in specific circumstances related to claims for damages³⁷⁵, there is no Authority for extending such approach to concurrent delays.³⁷⁶ However, the

³⁷¹ *Adyard Abu Dhabi v. SD Marine Service* [2011] EWHC 848.

³⁷² *Forsikrings Vesta v Butcher* [1989] AC 852

³⁷³ *Standard Chartered Bank v Pakistan National Shipping Corporation (Nos 2 and 4)* [2003] 1 A.C. 959

³⁷⁴ J Barber "Law of Contract, Part 2: Performance and Remedies" (King's College London, Module A: Introduction to Law 2008-2009 Notes) P 32-33, And B McAdam "Apportionment and the common law: has City Inn got it wrong?" (2009) *Const. L.J.*, 25(2), 79-95, 82

³⁷⁵ *Tennant Radiant Heat Ltd v Warrington Development Corp* [1988] 1 E.G.L.R. 41 & *W. Lamb Ltd v J. Jarvis & Sons Plc* (1998) 60 Con. L.R. 1 & *Bank of Nova Scotia v Hellenic Mutual Risks Association (Bermuda) Ltd* [1990] 1 Q.B. 818 and *Peak Construction Ltd v McKinney Foundations Ltd* (1970) 1 B.L.R. 111

³⁷⁶ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012) para 9-068

court made it crystal clear in *Walter Lilly & Co Ltd v Mackay*³⁷⁷. Despite the court concluded that the case was about causation and concurrent delay did not arise because actual causes of delays were design deficiency that is attributed to the Employer while other Contractor's delays/issues had no impact on the project overall delay, the judge has reaffirmed Malmaison Authority. The judge considered that where two or more effective causes of delays had occurred while one is attributed to the Employer, the contractor was entitled to the full extension of time for that event³⁷⁸. Most importantly, the key part of the judgement is the court's view about apportionment; it was held that Apportionment Approach does not reflect English Law and is inapplicable in England. Akenhead J stated, "*The fact that the Architect has to award a fair and reasonable extension **does not imply that there should be some apportionment in the case of concurrent delays. The test is primarily a causation one. It therefore follows that, although of persuasive weight, the City Inn case is inapplicable within this jurisdiction.***"

It is worth noting that Apportionment Approach was largely rejected as well in numerous English legal literatures, such as Keating³⁷⁹, "Concurrent Delay Revisited"³⁸⁰ by Marrin, and 12th edition of Hudson's Building and Engineering Contracts³⁸¹.³⁸²

³⁷⁷ [2012] EWHC 1773 (TCC)

³⁷⁸ Akenhead J stated "In any event, I am clearly of the view that, where there is an extension of time clause such as that agreed upon in this case and where delay is **caused by two or more effective causes**, one of which entitles the Contractor to an extension of time as being a Relevant Event, the Contractor is entitled to a full extension of time. **Part of the logic of this is that many of the Relevant Events would otherwise amount to acts of prevention** and that it would be wrong in principle to construe Clause 25 on the basis that the Contractor should be denied a full extension of time in those circumstances. More importantly however, there is a straight contractual interpretation of Clause 25 which points very strongly in favour of the view that, **provided that the Relevant Events can be shown to have delayed the Works, the Contractor is entitled to an extension of time for the whole period of delay caused by the Relevant Events in question. There is nothing in the wording of Clause 25, which expressly suggests that there is any sort of proviso to the effect that an extension should be reduced if the causation criterion is established. The fact that the Architect has to award a fair and reasonable extension does not imply that there should be some apportionment in the case of concurrent delays. The test is primarily a causation one. It therefore follows that, although of persuasive weight, the City Inn case is inapplicable within this jurisdiction.**"

³⁷⁹ Furst S, Ramsey V, Keating on Construction Contracts (9th edn, London: Sweet & Maxwell, 2012) para 9-068

³⁸⁰ J Marrin QC, "Concurrent Delay Revisited", (2013) SCL paper 179, 11

³⁸¹ Hudson's Building and Engineering Contracts, Twelfth Edition, Paragraph 6-062

³⁸² S Cavaleri "Construction disputes in Denmark: the case of concurrent delay" (2015), Construction Law Journal 31(2), 57-68, 62

6.1.3. Conclusion

Based on above analysis the following represent English Law current status with respect to concurrent delays:

- Prevention Principle does not apply in concurrent delay situations; since the contract already includes EOT terms that cover acts of prevention.
- Where the contract contains express terms addressing concurrency, the Court will strictly apply what the parties have agreed for in their contract.
- Malmaison Approach “time-but-no-money” approach is followed in “true concurrency” situations or in situations where delay transpired due to Contractor’s risk event that occurred during a period of Employer’s culpable delay. Whereby the Contractor is entitled for full EOT resultant from the Employer’s risk event, however is not entitled for Prolongation Cost considering that he cannot fulfill the “but for test”; since he was already in culpable delay and in any case would have suffered exactly the same loss in absence of the Employer’s risk event.
- Based on recent case law Authorities, in concurrent delay situations, where delay transpired due to an Employer’s risk event that occurred during a period of Contractor’s culpable delay, the contractor is not entitled for EOT because the works was already in critical delay before the occurrence of the Employer’s risk event.
- Apportionment Approach does not reflect English Law and is inapplicable in England.

6.2. Scotland Law

6.2.1. Scottish Courts Approach.

The Scottish court Authority had been shaped through the two leading recent cases of *John Doyle Construction Ltd v Laing Management (Scotland) Ltd*³⁸³ and *City Inn Ltd v Shepherd Construction Ltd*³⁸⁴.

In *John Doyle*³⁸⁵ despite it was a case of global claim³⁸⁶ not specifically a concurrent delay case, both first instance and appeal court rejected to deny the contractor's entitlement to recover part of the loss and held that: first; causal link must be established to identify who is responsible, second; in situations of concurrent causes Dominant Cause may/could be established based on “*the application of common sense to the logical principles of causation*”, for the possibility to identify the operative cause of the loss³⁸⁷ and hence establish its liability, and third if Dominant Cause could not be established; apportionment of losses³⁸⁸ between the causes “Jury Verdict”, even if it is truly concurrent causes, apportionment can be applied. The appeal court clearly stated, “*we are of opinion that apportionment of loss between the different causes is possible in an appropriate case. Such a procedure may be appropriate in a case where the causes of the loss are truly concurrent, in the sense that both operate together at the same time to produce a single consequence.... Apportionment in this way, on a time basis, is relatively straightforward in cases that involve only delay*³⁸⁹”.³⁹⁰ It is clear from these wording

³⁸³ *John Doyle Construction Ltd v Laing Management (Scotland) Ltd* [2004] B.L.R. 295 (IH (Ex Div)). The court stated it is “the application of common sense to the logical principles of causation”

³⁸⁴ [2010] CSIH 68, [2010] BLR 473, para [42]

³⁸⁵ *John Doyle Construction Ltd v Laing Management (Scotland) Ltd* [2004] B.L.R. 295 (IH (Ex Div)).

³⁸⁶ The Contractor submitted a claim for loss and expenses due to a combination of factors. The Employer argued that for a global claim to succeed, it must i) the contractor is not responsible for any and all parts of the claim or contributed in the increased cost, and ii) the employer was responsible for all causal factors that contributed to the additional costs. The employer submitted that part of the events was attributed to the contractor (delay in the preceding works package), hence the whole global claim should be dismissed and the contractor is not entitled to recover any of the losses. **However, both first instance and appeal Courts rejected that**, stated that “*It seems to us that in such cases the contractor should be able to recover for part of his loss and expense, and we are not persuaded that the practical difficulties of carrying out the exercise should prevent him from doing so.*”

³⁸⁷ Court said “notwithstanding that other events played a part in its occurrence”

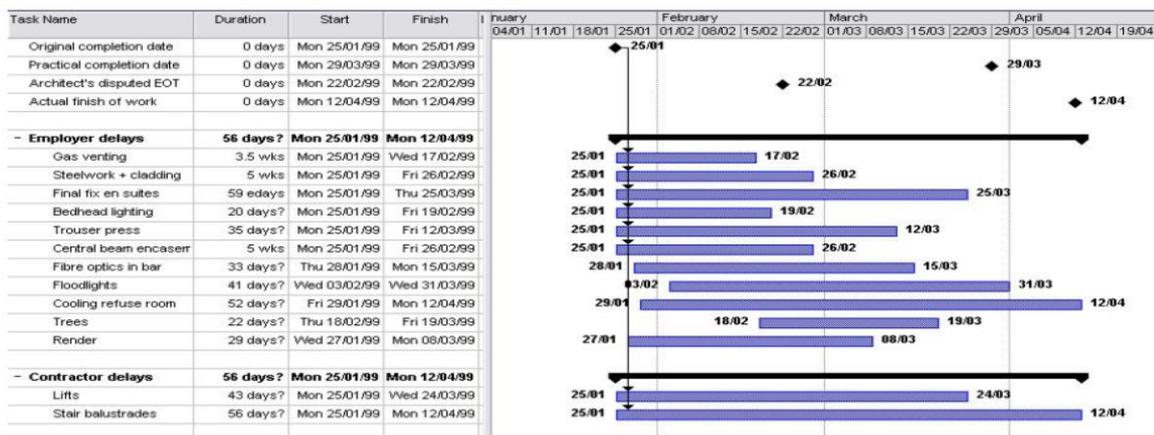
³⁸⁸ Court said “even if it cannot be said that events for which the employer is responsible are the dominant cause of the loss, it **may be possible to apportion the loss between the causes** for which the employer is responsible and other causes”

³⁸⁹ i.e does not include disruption

³⁹⁰ G Smith and J Perry, “The Evolution of Global Claims and *Laing Management (Scotland) Ltd V. John Doyle Construction LTD*” (2005) *The International Construction Law Review*, 2005 Pt 2, 212-247, p.218-219

that the court accepted the apportionment of responsibility “Jury Verdict” for delays and subsequently the resultant damages.

The aforementioned approach was further analysed, reinforced and clarified in the notorious *City Inn*³⁹¹ concurrent delay related case. *City Inn* contracted *Shepherd Construction* to build a hotel under standard form JCT 1980 Building Contract, whereby the project suffered various issues and delay events, however, practical completion was certified nine weeks late on 29 March 1999³⁹². The Project was subjected to various litigations, however the one that concern herein is the concurrent delays. This dispute was over 11 weeks EOT and resultant Prolongation Cost versus LDs, whereby the Architect certified only two (2) weeks EOT that neither satisfied *Shepherd* nor *City Inn*, but *City Inn* deducted relevant LDs. So, they proceeded with adjudication, and adjudicator decided that Contractor is entitled for a total of seven (7) weeks EOT and directed *City In* to payback LDs. Therefore, *City Inn* commenced litigation. The contested causes of delays form the Employer side were eleven (11) events: ten (10) late Architect’s instruction (four (4) of which were issued after the contractual completion date) and one (1) variation, versus two (2) delays from the contractor side related to installation of lifts and stair balustrades. As per the determination of the judge, delays were overlapped and Contractor’s delays were concurrent with the Employer’s delays “true concurrency” as shown below.³⁹³



³⁹¹ City Inn Ltd v Shepherd Construction Ltd [2010] CSIH 68, [2010] BLR 473, para [42]

³⁹² Contractual completion was 25 January 1999, on 29 March 1999 Practical completion was certified, (nine weeks late), but Works actually continued till 14 April 1990 (11.2 week late).

³⁹³ J Winter, “How Should Delay Be Analysed – Dominant Cause and Its Relevance to Concurrent Delay” (January 2009) SCL paper 153, P.2-3

Lord Drummond Young held that if any of the events might be considered as dominant/operative cause; hence liability established, he stated: “*I agree that it **may be possible** to show that either a relevant event or a contractor's risk event is the dominant cause of that delay, and in such case that event **should be treated as the cause of the delay.**”* But he found that none of the events could be considered as dominant cause because each of them has substantial effect on works’ progress and project’s completion.³⁹⁴ The Author submits such approach for Dominant Cause as stated, is a *first-in-line* approach to be applied to concurrent delays analysis, *not as obligatory to be adopted*, if it could be established³⁹⁵. Moreover, it is practically very hard if not impossible in many cases to determine such approach in cases on concurrent delays with its complexity.

Lord Drummond further clarified court’s position about concurrent and sequential delays, the court held that it does not matter which event happened first as far as both delayed the project, and in any scenario for the order of events’ occurrence, all should be considered as concurrent delay³⁹⁶. Lord Drummond stated, “*It seems to turn upon the question of whether the shortage of labour and the relevant event **occurred simultaneously**; or at least it assumes that the shortage of labour and the relevant event **did not significantly predate the relevant event.** That, however, seems to me to be **an arbitrary criterion.** It should not matter whether shortage of labour developed, for example, two days before or two days after the start of a substantial period of inclement weather; in either case the two matters operate concurrently to delay completion of the works.”³⁹⁷*

³⁹⁴ J Winter, “How Should Delay Be Analysed – Dominant Cause and Its Relevance to Concurrent Delay” (January 2009) SCL paper 153, P.9-10

³⁹⁵ “Modern Dominant Cause” approach as Author defined under section 5.1 herein.

³⁹⁶ The same was approved by Inner House Court of Appeal City Inn Ltd [2010] CSIH 68 at [49].

³⁹⁷ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 18-056.

Lord Drummond furthermore concluded that Employer's delay events have much greater effect than Contractor's events. Therefore, he held that in such a case apportionment is appropriate to be applied, which will reflect a *reasonable and fair* judgement as required under Clause 25³⁹⁸ of the Contract Conditions. Lord Drummond stated:

*“Where there is **true concurrency** between a relevant event and a contractor default, in the sense that **both existed simultaneously, regardless of which started first, it may be appropriate to apportion** responsibility for the delay between the two causes; obviously, however, the basis for such apportionment must be **fair and reasonable**.”*³⁹⁹

Lord Drummond then remarkably clarified how apportionment is to be carried out that is similar to situations of liability apportionment of contributory negligence or contribution among wrongdoers “Jury Verdict”, by assessing two main factors **the degree of culpability** of each cause (delay length that is caused by each of the causative events, the less important and straightforward factor), and **the significance of each factor** in causing the delay. With respect to the significance of each factor, a cause that affects minor or small part of the works is not similar to a major delay or a delay that affects the whole of the works. In view of the judge in-depth analysis and to take into consideration the contribution effect of Contractor's delays, he held that Contractor is entitled for nine (9) weeks EOT out of the eleven (11) weeks claimed to a revised completion date of 29 March 1999 that is the same practical completion date; hence no LDs is applicable.⁴⁰⁰

The Author highlights that Lord Drummond included in his analysis numerous English Authorities to support his decision, such as Percy Bilton⁴⁰¹, Peak v Mckinney⁴⁰², *Balfour*

³⁹⁸ Clause 25.3.1 stated “If, in the opinion of the Architect... any of the events which are stated by the Contractor to be the cause of the delay is a Relevant Event and ... the completion of the Works is likely to be delayed thereby beyond the Completion Date, the Architect shall in writing to the Contractor **give an extension of time** by fixing such later date as the Completion Date as he then estimates to be **fair and reasonable**.”

³⁹⁹ this was endorsed in the appeal court (Inner House), by the majority represented by Lord Osborne.

⁴⁰⁰ J Winter, “How Should Delay Be Analysed – Dominant Cause and Its Relevance to Concurrent Delay” (January 2009) SCL paper 153, P.10-11

⁴⁰¹ Percy Bilton Ltd v Greater London Council [1982] 1 WLR 794 at 801 “the employer is not entitled to liquidated damages if by his acts or omissions he has prevented the main contractor from completing his work by completion date”

⁴⁰² Peak Construction v Mckinney Foundation Ltd (1970) 1 BLR 111

v *Chestermount*⁴⁰³, *Henry Boot v Malmaison*⁴⁰⁴ and *Royal Brompton v Hammond*⁴⁰⁵, however the Author submit that none of these authorities approve or allow apportionment. Similarly, the American authority of *Appeal of Chas I Cunningham*⁴⁰⁶ that Lord Drummond referred to was argued to be a case of sequential delay⁴⁰⁷ not a concurrent delay as *City Inn* case. Moreover, as the Author analysed under section 5.3 herein, as per American Authorities, Apportionment is not applicable in situations of concurrent/intertwined delays where delays/effects cannot be separated⁴⁰⁸, however, Apportionment applies only in cases of sequential delays. Therefore, American law, same as English law, nor approves or allows apportionment in situations of true concurrent delays. Hence, both do not support Scots court decision in this case.

But what adds further weight to *City Inn* case is the approval of the Scots Appeal Court (Inner House Court)⁴⁰⁹ of the above first instance outer house decision, which made *City Inn* the current Authority of Scottish Law.

Appeal Court approved First Instance Court decision that there is no difference between simultaneous events or sequential events, both are considered as concurrent delays. Lord Osborne stated, “[49] *It might also be possible to describe events as concurrent in the broad sense that they both possessed a causative influence upon some subsequent event, such as the completion of works, even though they did not overlap in time. In other words, they might also be said to be contributory to or co-operative in bringing about some subsequent event. It is in this sense that the use of the term concurrent is*

⁴⁰³ Balfour Beatty Ltd v Chestermount Properties Ltd [1993] 62 BLR 1

⁴⁰⁴ Henry Boot Construction (UK) Ltd v Malmaison Hotel (Manchester) Ltd (1999) 70 Con. L.R. 32, QBD (TCC)

⁴⁰⁵ Royal Brompton Hospital NHS Trust v Hammond [2002] EWHC 2037 (TCC)

⁴⁰⁶ Appeal of Chas I Cunningham 57-2 BCA P, 164 Interior Dec 449, IBCA 60, 1957 WL 139 (IBCA)

⁴⁰⁷ B McAdam “Apportionment and the common law: has City Inn got it wrong?” (2009) Const. L.J, 25(2), 79-95, 84

⁴⁰⁸ in Hood Plumbing case, American Court held “neither the Government nor the contractor may recover unless the delays can be separated or apportioned”, However, recently due to the advance of CPM/forensic delay analysis such approach became less favorable and courts were able to apply Apportionment based on detailed programme analysis and assignment of liabilities could be applied

⁴⁰⁹ City Inn Limited v Shepherd Construction Limited [2010] CSIH 68

perhaps most likely to be of relevance in the application of clause 25.3 of the Standard Form conditions [JCT80]”⁴¹⁰

Appeal Court also approved the principle to apply Dominant Cause if feasible, same as First Instance Court. Lord Osborne, the Chairman of the appeal, held that “*if a **dominant cause** can be identified as the cause of some particular delay in the completion of the works, **effect will be given to that** by leaving out of account any cause or causes which are not material*”. Appeal Court further approved Apportionment, same as First Instance Court. Lord Osborne⁴¹¹, held that: “*Where there are delays due to relevant events and contractor risk events **acting concurrently, neither of which is dominant**, the decision-maker, acting in a **fair and reasonable** manner, can apportion responsibility for the delay to the completion of the Works between the causes acting concurrently.*”

In view of the above, it is hereby concluded that Apportionment of fault “Jury Verdict” is the current Authority under Scottish law. However, the Author submits that such approach entails a relatively subjective judgement by the Architect, Adjudicator, Arbitrator or Judge, which may open the door for challenging/appealing such decision based on how Apportionment is applied not Apportionment itself in view of his own assessment of factual records and common sense.

⁴¹⁰ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 18-057.

⁴¹¹ however, Lord Carloway, a member of the Appeal Court, dissented that. Lord Osborne provided the majority decision.

6.2.2. Conclusion

Based on above analysis the following represent Scottish Law current status with respect to concurrent delays:

- There is no difference between simultaneous events or sequential events and it does matter either they overlap or not or which one happened first, both are considered as concurrent delays.
- The first in line approach is to apply the Dominant Cause approach if feasible.
- If Dominant Cause cannot be established, in cases of concurrent delays it is appropriate to determine the extension of time as well as damages by apportioning the relative responsibility of the contractor and employer “Jury Verdict”, by assessing two main factors **the degree of culpability** of each cause (delay length that is caused by each of the causative events, the less important and straightforward factor), and **the significance of each factor** in causing the delay (cause that affects minor or small part of the works is not similar to a major delay or a delay that affects the whole of the works).

6.3. United States Law

US law on concurrent delay has been developing since more than a century, with substantial reported cases and Authorities in this regard.⁴¹² There are three approaches applied under US law that is mainly based on apportionment, ability to segregate delays/liability and the support recently provided by CPM delay analysis:

- Intertwined/Concurrent Delays
- Apportionment of Delays
- Jury Verdict Method of Delay Segregation.⁴¹³

6.3.1. Intertwined/Concurrent Delays

In Intertwined/Concurrent Delays situations, the previous American approach was traditionally to reject apportionment because delays and losses were considered non-severable and apportionment could not be achieved, this could be due the absence of technological technics such as currently available CPM.⁴¹⁴ So, in situations of concurrent/intertwined delays whereby delays/effects cannot be separated, apportionment is not applicable, and neither LDs nor Prolongation Cost is applied. It is the time-but-no-money approach.

This can be traced back to the 18th century on *Stewart v Ketetas*⁴¹⁵, whereby the court held that neither the employer nor the contractor can recover any damages because of mutual delays occurred. Similarly, later in 1909, the court in *Shook v. Dozier*⁴¹⁶

⁴¹² M Cocklin “International approaches to the legal analysis of concurrent delay: is there a solution for English law?” (2014) 30(1), Construction Law Journal, 41-56, 45

⁴¹³ J Livengood “Comparison of English and U.S. Law on Concurrent Delay”, (2014) Insight To Hindsight Navigant Consulting, Inc. p10, available at https://www.navigant.com/-/media/www/site/insights/construction/2014/comparisonenglishanduslawconcurrentdelay_ifh12.pdf

⁴¹⁴ F Mastrandrea “CONCURRENT DELAY IN CONSTRUCTION – PRINCIPLES AND CHALLENGES” (2014, Pt1) The International Construction Law Review, 83-107, 103

⁴¹⁵ *Stewart v. Keteltas*, 36 N.Y. 388, (1867)

⁴¹⁶ *Shook v. Dozier*, 168 F. 867, 874, C.C.A. 6th Cir 1909).

summarized the then-current law as: “.... *Therefore courts have laid down the very **salutary rule** to the effect that they **will not attempt to apportion delays** where the **causes have been mutual**, but will **refuse** under such circumstances to **enforce the penalty**.”⁴¹⁷*

And, the same was concluded in numerous court cases over years and years later^{418, 419}.

For instance, in *Hood Plumbing*⁴²⁰, the court held “*When delays by the Government are intertwined or concurrent with delays that are not compensable, **neither the Government nor the contractor may recover unless the delays can be separated or apportioned.***”.

And more recently on 2004, the American Authority for *concurrent or intertwined delays* was re-emphasised and clarified in the leading case *RP Wallace Inc v The United States*⁴²¹, Allegra J stated: “*Concurrent delay is not fatal to Contractor’s claim for additional time due to excusable delay, but precludes the recovery of delay damages. ‘If a period of delay can be attributed simultaneously to the actions of both government and Contractor,’ this court has stated, ‘there are said to be **concurrent delays, and the result is an excusable but not a reimbursable delay.***”⁴²²

However, recently due to the advance of CPM/forensic delay analysis, such approach became less favourable and courts were able to apply Apportionment based on detailed programme analysis and assignment of liabilities could be applied.

⁴¹⁷ J Livengood “Comparison of English and U.S. Law on Concurrent Delay”, (2014) Insight To Hindsight Navigant Consulting, Inc. p10

⁴¹⁸ *Caldwell & Drake v. Schmulbach*, 175 F. 429 (C.C.N.D. W. Va. **1909**); *Greenfield Tap & Die Corporation v. United States*, 68 Ct. C. 61, 1929 WL 2484 (**1929**); *Newport News Shipbuilding & Drydock Co. v. United States*, 79 Ct. Cl. 25, 1934 WL 2021 (**1934**); and *Commerce Intern. Co. v. United States*, 167 Ct. Cl. 529, 338 F.2d 81 (**1964**).

⁴¹⁹ J Zack and E Federico “Concurrent Delay – The Owner’s Newest Defense” (2011) Insight To Hindsight Navigant Consulting, Inc. p4

⁴²⁰ *Hood Plumbing*, AGBCA No. 84-181-1 (28 October 1987)

⁴²¹ *RP Wallace Inc v The United States COFC* (2004) No. 96-222 C

⁴²² Wallace was subsequently approved by the Court of Federal Claims in: *George Sollitt Construction v United States* (2005) 64 Fed Cl 229 & *Sunshine Construction & Engineering v United States* (2005) 64 Fed Cl 346 & *Cumberland Cas & Sur Co v US Fed Cl* – (2008) WL 2628433

6.3.2. Apportionment of Delays

This is the Apportionment of Time approach that the Author analysed under section 5.3 herein, whereby time is apportioned by allocating delays for different periods to the party responsible for it as well as resultant damages. Such Apportionment is currently well recognized under USA law as the modern commonly used rule, but only “*when clear apportionment of the delay attributable to each party has been established*”⁴²³.

This is attributed to the advance of CPM delay analysis, whereby it became feasible to have clear and acceptable segregation of activities, well-defined relations between activities and ability to conduct thorough analysis of cause/effect, which allows for better ability of segregation/allocation of causes’ responsibility, liabilities and losses.⁴²⁴

In *Fischbach & Moore International Corp.*⁴²⁵, the court held that “*With regard to the alleged intertwining of Government- caused and **concurrent** delays in this case, we have found, in the critical path analysis offered by appellant, a ready and reasonable basis for segregating the delays. If the delays can be **segregated**, responsibility therefore may be allocated to the parties. As will be seen in the discussion that follows, we have no such difficulty in segregating delays in the present case.*” In this case the Court, due to the availability of reliable CPM delay analysis, was able to disentangle the delays and the case turned from intertwined/concurrent delays to separated delays that can be allocated to each party.⁴²⁶

⁴²³ George Sollitt Constr. Co. v. United States, 64 Fed. Cl. 229, 238 (2005)& see also Flatiron Lane v. Case Atlantic Co., 121 F. Supp. 3d 515, 541 (M.D.N.C. 2015)

⁴²⁴ F Mastrandrea “CONCURRENT DELAY IN CONSTRUCTION – PRINCIPLES AND CHALLENGES” (2014, Pt1) The International Construction Law Review, 83-107, 103

⁴²⁵ Fischbach & Moore International Corp., ASBCA 14216, 71-1 BCA 8775, 59244.

⁴²⁶ J Livengood “Comparison of English and U.S. Law on Concurrent Delay”, (2014) Insight To Hindsight Navigant Consulting, Inc. p7

In *William F Klingensmith Inc v United States*⁴²⁷ the court made it crystal clear that apportionment is applicable only if can be established. The court stated, “*The general rule is that ‘where both parties contribute to the delay neither can recover damage, unless there is in the proof a clear apportionment of the delay and expense attributable to each party’*”⁴²⁸.

In *RP Wallace Inc v The United States (2004)*⁴²⁹, the Court has differentiated between concurrent delays and sequential delays. Allegra J stated: “*Thornier issues are posed by concurrent or sequential delays—the first occurring where both parties are responsible for the same period of delay, the second, where one party and then the other cause different delays seriatim or intermittently.*” And the Court further held that apportionment is applicable in situations of sequential delays. Similarly, in *Cumberland Cas & Sur Co v US*⁴³⁰, the court stated “*..... is said to be sequential and apportionable*”⁴³¹.

6.3.3. Jury Verdict Method of Delay Segregation

This is the Apportionment on account of comparative fault basis, which is similar to tort principle of apportioning liability in situations of contributory negligence or contribution among joint-wrongdoers that the Author analysed under section 5.3 herein, whereby the Employer and the Contractor will both together share the damage associated with delays based on the degree of culpability/responsibility and the significance of delays’ impact on

⁴²⁷ William F Klingensmith Inc v United States, 731 F 2d 805, 809 (Fed Cir 1984)

⁴²⁸ R Lowe, E Barba and G Lare “A View From Across the Pond: An American Perspective on the SCL Delay and Disruption Protocol” (May 2007) SCL Paper D78, p11.

⁴²⁹ RP Wallace Inc v The United States COFC (2004) No. 96-222 C

⁴³⁰ Cumberland Cas & Sur Co v US Fed CI – (2008) WL 2628433

⁴³¹ B McAdam “Apportionment and the common law: has City Inn got it wrong?” (2009) Const. L.J., 25(2), 79-95, 83-84

the project as a whole, therefore, LDs/Prolongation Cost will be partially granted. It is a method where no forensic delay analysis is applied.

Despite that American courts prefer Apportionment of Time following a detailed factual and forensic/CPM programme delay analysis, in some rare cases Jury Verdict was applied.⁴³² Nevertheless, two pre-requisites should be fulfilled. i) The existence of concurrent delays attributed to both parties and both resulted in a delay to completion date, whereby forensic delay analysis if available does not allow for segregation of delays/liabilities. And ii) the court must find a reason or justification to utilize Jury Verdict.⁴³³

In *PLC Construction Services, Inc. v. U.S.*⁴³⁴ despite the court found enough factual data to allocate responsibilities/damages, and did not resort to an application of “estimated apportionment” to segregate delays, the Court stated, ***“The rule against jury verdict is an old one whose underlying policies do not remain in full force We do not disagree with the difficulty of the task, but recovery should not be barred in every case by a rule of law that precludes examination of the evidence.”*** In a same way, this was the situation/outcomes with obiter dicta for the possibility of application of Jury Verdict in *Fischbach & Moore International Corp.*⁴³⁵. *Raymond Constructors of Africa, Ltd v. U.S.*⁴³⁶ is another case for which the Court held for a Jury Verdict due to lack of ability to quantify the causation of the identified three causes of project delay, the Court stated ***“Actually, there is no basis in the record on which a precise allocation of responsibility***

⁴³² Livengood J “Concurrency world tour” (March 2016) CONSTRUCTION LAW INTERNATIONAL, Volume 11 Issue 1, 16

⁴³³ J Livengood “Comparison of English and U.S. Law on Concurrent Delay”, (2014) Insight To Hindsight Navigant Consulting, Inc. p12.

⁴³⁴ *PLC Construction Services, Inc. v. U.S.*, 53 Fed Cl. 429, 484 (2002).

⁴³⁵ *Fischbach & Moore International Corp.*, ASBCA 14216, 71-1 BCA 8775, 59244

⁴³⁶ *Raymond Constructors of Africa, Ltd v. U.S.*, 188 Ct Cl. 147, 411 F.2d 1227 (1969).

*for the overall delay in completing the work under the contract **can be made** as between the defendant's delay in procuring equipment,... the government's delay in transporting equipment ...to the job site, and the subcontractor's shortcomings. **In such a situation, it seems that the only feasible thing to do is to make a finding in the nature of a jury verdict that the defendant's delay ... was responsible for one-third of the overall delay in the completion of the work under the contract and, hence, for one-third of the extra indirect expenses**".⁴³⁷*

6.3.4. Conclusion

Based on above analysis the following represent USA Law current status with respect to concurrent delays:

- In situations of concurrent/intertwined delays whereby delays/effects cannot be separated, apportionment is not applicable, and neither LDs nor Prolongation Cost is applied. It is the time-but-no-money approach.
- Apportionment of Time is currently well recognized under USA law as the modern commonly used rule when delays/liabilities can be segregated. This is attributed to the advance of CPM/Forensic delay analysis techniques.
- Apportionment is applied in sequential delays' situations.
- Jury Verdict is seldom used. It is the Apportionment on account of comparative fault basis, whereby reliable forensic delay analysis is not available and if available does not allow for segregation of delays/liabilities.

⁴³⁷ J Livengood "Comparison of English and U.S. Law on Concurrent Delay", (2014) Insight To Hindsight Navigant Consulting, Inc. p12

6.4. UAE Law

UAE is one of Civil Law Countries, whereby all civil matters and various contracts such as Construction contract are governed by the UAE Civil Transactions Code, Federal Law No. 5 of 1985 (“CTC” or “Civil Code”). Construction contract is defined as *Muqawala* under CTC with provisions stipulated under Articles 872 to 896, this in addition to general law principles as codified under the Civil Code. However, there are no express articles that deal with concurrent delays nor CTC recognises concurrent-delays on any organised basis.

In order to cover all aspects of UAE Law, this section is divided into two main parts, i) 1st part will analyse any relevant CTC provisions/articles that could deal with delays/concurrent delays, and ii) 2nd part will analyse some UAE courts’ approach while determining entitlement for delays/concurrent delays.

6.4.1. UAE Civil Code

As analysed by the Author under sections 5.3, 6.2 and 6.3 herein, it is tend to be that Civil Law countries⁴³⁸ preferred approach is Apportionment. Similarly, UAE Civil Code provisions as analysed below tend to support Apportionment as well driven by Shariah, good faith, fairness and common sense principles.

- **Good Faith:** CTC contains a provision under Article 246(1) that requires “*The contract must be performed in accordance with its contents, and in a manner consistent with the requirements of good faith.*” Such article is always relied upon by contractors as a defence or argument of their case.⁴³⁹ So, it is argued that if an Employer’s risk event materialized, the Employer should act in good faith

⁴³⁸ Such as USA, Scotland, Canada, New Zealand, Australia, Hong Kong and Italy.

⁴³⁹ D O’Leary “Dealing with Concurrency in Construction Delay Claims” (2014) Al Tamimi & Company law-update April 2014, p4

and award EOT. However, if such Employer's delay occurs with/during a contractor's culpable delay (i.e. concurrent delay), both parties are responsible for the delay encountered and as a matter of good faith each party should bear its share of the delay and its consequences. Hence, value judgements and apportioning culpability for time/cost should be applied. It is noted that this is supported as well considering the provisions of Articles 290⁴⁴⁰ (reduction of compensation due to contributory fault), 291⁴⁴¹ (apportionment of responsibility between wrongdoers of harmful act), 389⁴⁴² (compensation based on actual loss) and 390⁴⁴³ (court's desecration to adjust pre-agreed LDs based on actual loss).

- **Abuse of Rights:** CTC contains a provision under Article 106⁴⁴⁴(2) (c) that requires “(2) *The exercise of a right shall be unlawful: ... (c) if the interests desired are disproportionate to the harm that will be suffered by others;..*”. So, it is argued that a complete disentitlement of EOT and accordingly an application of LDs may be considered as *disproportionate to the harm that will be suffered by* the Employer since the project would have been delayed anyhow due to the Employer's delays. Similarly, awarding full EOT for concurrent delay period and accordingly awarding of Prolongation Cost may be considered as

⁴⁴⁰ **Article 290.** “It shall be permissible for the judge to reduce the level by which an act has to be made good or to order that it need not be made good if the person suffering harm participated by his own act in bringing about or aggravating the damage”

⁴⁴¹ **Article 291.** “If a number of persons are responsible for a harmful act, each of them shall be liable in proportion to his share in it, and the judge may make an order against them in equal shares or by way of joint or several liability.”

⁴⁴² **Article 389.** “If the amount of compensation is not fixed by law or by the contract, the judge shall assess it in an amount equivalent to the damage in fact suffered at the time of the occurrence thereof.”

⁴⁴³ **Article 390.** “(1) The contracting parties may fix the amount of compensation in advance by making a provision therefor in the contract or in a subsequent agreement, subject to the provisions of the law., (2) The judge may in all cases, upon the application of either of the parties, vary such agreement so as to make the compensation equal to the loss, and any agreement to the contrary shall be void”

⁴⁴⁴ **Article 106.** “(1) *A person shall be held liable for an unlawful exercise of his rights. (2) The exercise of a right shall be unlawful: (a) if there is an intentional infringement (of another's rights); (b) if the interests which such exercise of right is designed to bring about are contrary to the rules of the Islamic Shari'ah, the law, public order, or morals; (c) if the interests desired are disproportionate to the harm that will be suffered by others; or (d) if it exceeds the bounds of usage and custom.*”

disproportionate to the harm that will be suffered by the Contractor since the project would have been delayed anyhow due to the Contractor's delays. Hence the application of either of these two options can be construed as unlawful/abuse of rights, and it is open for the court to apply value judgements and apportion culpability for time/cost.

- **Apportionment of Responsibility Between Wrongdoers:** CTC contains a provision under Article 291 that allows “... *If a number of persons are responsible for a harmful act, each of them shall be liable in proportion to his share in it, and the judge may make an order against them in equal shares or by way of joint or several liability.*”. Despite, this article is related to tort, one of its possible interpretation is it applies as well to concurrent delays.⁴⁴⁵ So, it is argued that in concurrent delay situation, the court will apportion liabilities *in proportion* to each one *share in it*.
- **Contributory Fault to Reduce Compensation:** CTC contains a provision under Article 290 that allows “... *the judge to reduce the level by which an act has to be made good or to order that it need not be made good if the person suffering harm participated by his own act in bringing about or aggravating the damage.*”. So, it is argued that both the Employer and Contractor have played a role in delaying the project, neither of them solely can be held responsible for the project's delay and therefore court has the power to assess the legal potency of all delay events on account of comparative fault basis and accordingly applies apportionment. This approach is supported by the well-established tort legal

⁴⁴⁵ D O'Leary “Dealing with Concurrency in Construction Delay Claims” (2014) Al Tamimi & Company law-update April 2014, p5

principle of apportioning liability considering contributory negligence or contribution among joint wrongdoers.

- **Unjust Enrichment:** CTC contains a provision under Article 318 and 319, which articulates the principle that a property of a person does not pass to another except in two cases: i) by agreement between them, or ii) if the law so dictates. Therefore, if property is transferred without lawful-cause, it must be restored to its titleholder. So, it is argued that a complete disentitlement of EOT and accordingly an application of LDs may be considered as Unjust Enrichment, since the project would have been delayed anyhow due to the Employer's delays. Similarly, awarding full EOT for the concurrent delay period and accordingly awarding of Prolongation Cost may be considered as well as Unjust Enrichment, since the project would have been delayed anyhow due to the Contractor's delays. Therefore, to avoid such dilemma, apportionment of delays and resultant damages would be the appropriate determination.

6.4.2. UAE Courts' Approach While Determining Entitlement For Delays/Concurrent Delays

UAE Courts do not have separate technical division dealing with Construction cases, similar to English TCC⁴⁴⁶, whereby Construction cases lies under civil court jurisdiction. Therefore, generally UAE judges do not have sufficient construction/technical background and relied heavily on a Court appointed expert to provide his report and recommendation on all technical issues as well as his determination on the case in hand, including assessment of damages, dues, delays, work done/not done, defects...etc.

⁴⁴⁶ Technology and Construction Court, part of High Court of Justice of England and Wales

However, his report/recommendation is not binding on the court and it is for the trial judge absolute discretion/power to use/interpret/assess such expert's report, to accept or reject it or part(s) of it and to assess other submitted evidences/facts/documents to decide on the case in hand based on solid grounds⁴⁴⁷.

With respect of delays in construction projects, UAE Courts made it clear that the Contractor is not responsible for delays not caused by him, which is resultant from extraneous cause such as Employer, third party, force majeure...etc⁴⁴⁸, and accordingly delay damages do not apply⁴⁴⁹. In Dubai Court of Cassation case no. 266/2008, the Court stated “...*the head contractor, who will not be liable for any penalty for delay if it is demonstrated that his failure to hand over the building on the date specified in the contract was attributable to causes in which he played no part.*”

With respect to concurrent delays in construction projects, the following court cases will show part of UAE courts approach in cases on concurrent delays:

- **Dubai Court of Cassation case no. 184/2008 (Apportionment of Time):** this case was about construction of two buildings with commencement date of 5th March 2002 and completion date of 4th March 2003. The project suffered delays/suspension from its onset that is attributed to the Employer due to conflict with the foundations of adjacent existing building, which was resolved on 16 December 2002 (i.e. 286 days after commencement). The Works proceeded, however the project suffered other delays that were attributed solely to the contractor, and the Employer omitted about forty-seven percent of the works. The

⁴⁴⁷ Abu Dhabi Court of Cassation case no. 269/2003& UAE Union Supreme court, 729/Judicial Year 27

⁴⁴⁸ The same is supported by CTC general provision articulated under article 287 “If a person proves that the **loss arose out of an extraneous cause in which he played no part** such as a natural disaster, unavoidable accident, force majeure, act of a third party, or act of the person suffering loss, **he shall not be bound to make it good** in the absence of a legal provision or agreement to the contrary.”

⁴⁴⁹ Abu Dhabi Court of Cassation, 269/Judicial Year 3, 13 May 2009

contractor, demanding damages of AED 3,954,150.17 plus interest, filed before Dubai court of first instance, a Case no. 80/2007 commercial. In line with the report/recommendation of the court's appointed expert, the trial court held, among others, granting the Contractor EOT for the 286 days attributed to Employer's delays along with its prolongation cost, and with respect to the Contractor's delays; an application of delay damages in favour of the Employer amounting of its max amount of 10% of the contract price⁴⁵⁰. Both the Employer and Contractor appealed, whereby both appellant court and cassation court confirmed the trial court judgement.

The Author submits that this case is about **sequential** delays, whereby court applied Apportionment of Time approach⁴⁵¹ based on the party responsible for each cause/risk, and held how many days of delay were attributed to the Contractor and how many days of delay were attributed to the Employer, accordingly assesses/allocates damages i.e. each party bears the damages for the period he is responsible of. This is similar to the United States Courts' approach of Apportionment in sequential delays situations⁴⁵².

- **Dubai Court of Cassation case no. 1/2006 (Dominant Cause Approach):** this case was about construction of a residential building with contractual completion date of 10th April 2001, whereby the project suffered from various delay events/variations/modifications and eventually completed on 12th June 2002. It is noted that, on 14th July 2001, a variation was instructed with EOT of three months

⁴⁵⁰ Actual delays exceed its maximum contractual cap of 10%

⁴⁵¹ As analyzed under Section 5.3 herein

⁴⁵² RP Wallace Inc v The United States COFC (2004) No. 96-222 C & Fischbach & Moore International Corp., ASBCA 14216, 71-1 BCA 8775, 59244. Refer to the analysis under Section 6.3 herein.

from the date of the variation with further one month agreed EOT, i.e. revised contractual completion date of 15th November 2001; hence there is a delay of 209 days. The court's appointed expert determined that there were concurrent delays attributed to both Contractor and Employer, however despite of the contractor's delays and its slow of progress; the dominant cause of the Project delays was attributed to Employer's risk events namely variations for additional works, modifications for changing the project from residential to hotel apartment and Employer's failure to give sufficient right of access to and possession of parts of the Works' area. Therefore, he recommended granting the Contractor EOT until the actual completion date of 12th June 2002. The Court had accepted and held the same.

The Author submits that this approach is similar to Scottish court approach examined above in City Inn case⁴⁵³, to apply if possible the Dominant Cause approach as *first-in-line* approach to be applied to concurrent delays analysis, *not as obligatory to be adopted*, if it could be established⁴⁵⁴. Accordingly, apportionment in such cases, where Dominant Cause is established, is not applied by UAE courts.

The Author submits that UAE courts can learn from both Scottish Courts and United State Courts, with respect to the application of detailed CPM delay analysis and application of Dominant Cause if applicable, "time-but-no-money" approach or Apportionment (preferably Apportionment of Time).

⁴⁵³ Refer to Section 6.2 herein. Lord Drummond Young held that if any of the events might be considered as Dominant /operative cause; hence liability established, he stated: "*I agree that it **may** be **possible** to show that either a relevant event or a contractor's risk event is the dominant cause of that delay, and in such case that event **should be treated as the cause of the delay.***"

⁴⁵⁴ "Modern Dominant Cause" approach as Author defined under section 5.1 herein.

7. CHAPTER 7: CONCLUSION AND RECOMMENDATION

7.1. Conclusion

This thesis explored all issues about construction delays, its definitions, its causes and its impact. Delay can be defined as a delay in performing works' activities, either a delay to start a work activity or a delay to the period required to finish it. Delay is considered as one of the fundamental issues that impinge projects due to its negative impact not only on time of delivery but also due to its associated ramifications, additional cost and losses. Its causes are spanned between the Contractor, Employer, third parties and project conditions. Delays can be categorized into three categories i) excusable and compensable⁴⁵⁵, ii) excusable and non-compensable⁴⁵⁶, and iii) non-excusable⁴⁵⁷. As per law general provisions the burden of proof is on the Claimant, hence the Contractor is the party who should prove his entitlement for EOT and resultant Prolongation Cost.

Concurrent delay is considered as one of the law notoriously problematical areas and most complicated & controversial kind of delay disputes. This is due to its unique/complex nature and the fact that there is no one standard and agreed coherent definition/interpretation of concurrent delay. In the Author's opinion, the term 'concurrent delays' must have a wider all-inclusive definition to cover all delay situations attributed to both parties that each/together have an effect on time for completion, and to avoid various contentions about its applicability or definition. The Author herein proposed various options for definition of concurrent delays, which its selection depends

⁴⁵⁵ i.e the Contractor shall be entitled for EOT and Prolongation Cost

⁴⁵⁶ i.e the Contractor shall be entitled for EOT only without Prolongation Cost

⁴⁵⁷ i.e the Contractor in not entitled for EOT and delay damages shall be applied on him

on how both parties have agreed to deal with concurrency, this is summarised in below Section 7.2 from Author's own point of view and based on his expertise.

This dissertation has identified the major importance of delay analysis, being a main key to overcome the dilemma of concurrent delays and explored the available techniques and Author's recommended/favoured technique namely, retrospective "As-Planned Impacted (Multiple Base) or Window Analysis", also referred to as "Time Impact Analysis".⁴⁵⁸

This dissertation explored the well-known international protocols for delays/concurrent delays, namely SCL Protocol and AACE Protocol. SCL Protocol recommends "time-impact-analysis" method for delay analysis, which is modelled prospective method. It discourages the "*wait and see approach*", and recommends that EOT submission, assessment and determination to be carried out contemporaneously and "*as close in time as possible to the delay event*". Its approach to concurrent delay is "time-but-no-cost" approach, save for situations where Employer's delays occurred after and during substantial culpable Contractor's delays and its impact does not extend further the prevailing completion date, for which it does not recommend awarding any EOT to the Contractor. The Author submits that this is a radical change introduced in 2017-SCL-Protocol 2nd edition, changing the former 2002-SCL-Protocol approach for "time-but-no-cost" approach in all concurrent delay situations, however such change was introduced with a disclaimer that such recommendation for disentitling EOT is based on recent lower-level English court decisions and would be reconsidered if such decision is revoked by higher-level court decision.

⁴⁵⁸ AACE International Recommended Practice No.29R-03 (2009), also referred to as a "modelled/additive/multiple base (MIP 3.7)" analysis. Also referred to as "Time Impact Analysis".

Comparably, AACE Protocol promotes the use of CPM scheduling and delay analysis techniques and stated that identification and quantification of concurrency that is based on CPM is considered reliable and universally accepted. Similar to SCL, AACE recommends “time-but-no-cost” approach in concurrent delay situations.

One of the main key issues of the dilemma of concurrent delays is the lack of agreed contractual provisions, either within various international standard forms of contract or within parties’ mutual bespoke contract amendments. However, some standard forms have attempted to address such deficit, but the Author submits it was not comprehensive. One significant example of parties’ mutual bespoke amendments was explored in English case of *North Midland Building Limited v Cyden Homes Limited*⁴⁵⁹. Whereas, the contract executed includes a bespoke amendment related to extension of time, which stipulates in Clause 2.25.3 (b) “*any delay caused by a Relevant Event which is concurrent with another delay for which the Contractor is responsible shall not be taken into account. then, save where these Conditions expressly provide otherwise, the Employer shall give an extension of time.....*”. Whereby, TCC held the enforceability of such agreed contractual term and denied granting EOT to the Contractor due to his culpable concurrent delays. Therefore, the Author has proposed various specific bespoke Contract Amendments to address Concurrent Delays that are summarized in Section 7.2 below.

Moreover, this dissertation further analysed the various well-known international approaches to concurrent delays, namely Dominant Cause, Malmaison Approach, Apportionment and Devlin approach. The Author differentiates between what he defined

⁴⁵⁹ North Midland Building Limited v Cyden Homes Limited [2017] EWHC 2414 (TCC)

as “Ordinary Dominant Cause”, whereas only one event must be considered as the effective cause of delay and other events are discarded that is rarely appropriate in concurrent delay situations, and “Modern Dominant Cause” that is a more practical approach as a *first-in-line* approach to be applied to concurrent delays analysis, *not as obligatory to be adopted*, if it could be established. Such practicality of the approach arises from *not a must* to select one event but a *possibility* if could be achieved to consider one of the events as the effective dominant cause. Comparably, Malmaison Approach, which was defined as the English accepted approach, is the “time-but-no-cost” approach and was widely implemented under English courts. However, Apportionment approach is well recognized and implemented under civil law jurisdictions, including United State, Scotland and UAE. Whereas, Apportionment is categorized under two categories, i) Jury Verdict or Apportioning faults between the Employer and the Contractor⁴⁶⁰; and accordingly apportioning resultant damages. This is similar to apportioning liability considering contributory negligence or contribution among joint wrongdoers. And, ii) Apportionment of Time (Author’s recommended Apportionment category): Apportioning of time/delay arises from the competing causes of delays based on the party responsible for each cause/risk, whereby the decision maker identifies how many days of delay were attributed to the Contractor and how many days of delay were attributed to the Employer, accordingly assesses/allocates damages i.e. each party bears the damages for the period he is responsible of. Such Apportionment of time is supported by the advance of computerized reliable programing software, delay analysis, CPM

⁴⁶⁰ For instance, assess that for a specific delay events, the Employer was responsible for x% of it, and the Contractor was responsible for y% of it.

scheduling, and current worldwide implementation of good project management and availability of as built records/data/schedules.

With respect to Prolongation Cost, granting EOT does not automatically entitle the Contractor for Prolongation Cost. The Contractor will be compensated for any Prolongation Cost (Actual incurred additional cost) that is **proven** to be explicitly resulted **from and only from** the Employer's risk event, otherwise is not entitled for Prolongation Cost considering that he cannot fulfil the but for test; since he was already in culpable delay and in any case would have suffered such Prolongation Cost in the absence of the Employer's risk event.

With respect to Courts approaches, this dissertation provides in-depth analysis of various approaches to concurrent delay under various jurisdictions (both civil law and common law countries). **English** Courts' current approach is denying Apportionment and supporting/holding Malmaison Approach "time-but-no-money" approach in true concurrency situations or in situations where delay transpired due to Contractor's risk event that occurred during a period of Employer's culpable delay. However, based on recent case law Authorities, in concurrent delay situation, where delay transpired due to an Employer's risk event that occurred during a period of Contractor's culpable delay, the contractor is not entitled for EOT because the works was already in critical delay before the occurrence of the Employer's risk event. Moreover, English Court made it clear that in case where the contract contains express terms addressing concurrency, the Court will strictly apply what the parties have agreed for in their contract. Comparably, the **Scottish** courts' approach is the "Modern Dominant Cause"⁴⁶¹, and if Dominant Cause could not

⁴⁶¹ a first-in-line approach to be applied to concurrent delays analysis, not as obligatory to be adopted, if it could be established

be established, Jury Verdict or Apportionment of fault is applied by assessing two main factors the degree of culpability of each cause (delay length that is caused by each of the causative events, the less important and straightforward factor), and the significance of each factor in causing the delay. Comparably, the Author considers that the **United States** Courts' approach is the most advanced and appropriate one. US Courts held time-but-no-money approach in cases of concurrent/intertwined delays whereby delays/effects cannot be separated and apportionment is not applicable. However, Apportionment of Time is currently well recognized under USA law as the modern commonly used rule when delays/liabilities can be segregated. This is attributed to the advance of CPM/Forensic delay analysis techniques. And this is the case as well in sequential delays' situations. Moreover, in cases that forensic delay analysis is not available and if available does not allow for segregation of delays/liabilities; Jury Verdict (Apportionment on account of comparative fault basis) is seldom used. Comparably, the position under **UAE** law is not different than other civil law countries, whereby Apportionment is the preferred option. However, there is lack of reported court cases addressing concurrency and UAE Civil Code does not have express articles that deal with concurrent delays nor it recognises concurrent-delays on any organised basis. Such Apportionment approach is generally supported by Shariah, good faith, fairness and common sense principles. Nevertheless, UAE Civil Code contains general law provisions/articles that support Apportionment, namely i) "Good Faith" {Article 246(1)} whereas it is argued that apportionment is a reflection of good faith application, ii) "Abuse of Rights" {Article 106 (2) (c)} whereas it is argued that the application of LDs in concurrent delay situation is considered as abuse of rights since the project will be delayed anyhow due to the Employer's delay, iii) Apportionment of Responsibility

Between Wrongdoers (Article 291) whereas it is argued that both Employer and Contractor are responsible for delays; hence apportionment applies, iv) Contributory Fault to Reduce Compensation (Article 290) whereas it is argued that this is a kind of apportionment, and v) Unjust Enrichment (Article 318 and 319) whereas it is argued that either application of LDs or awarding EOT/prolongation cost is considered as Unjust Enrichment since the Project is delayed anyway by each of them disregarding the other party delays. The Author submits that UAE courts can learn from both Scottish Courts and United State Courts, with respect to application of detailed CPM delay analysis and application of Dominant Cause if applicable, “time-but-no-money” approach or Apportionment (preferably Apportionment of Time).

7.2. Recommendation

In this section the Author will provide his recommendation based on above analysis.

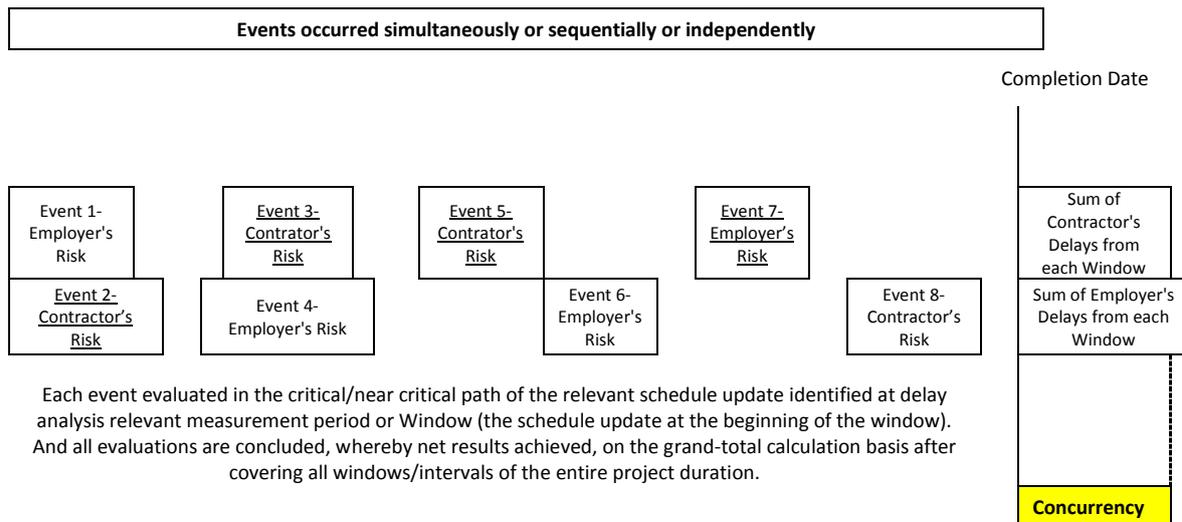
7.2.1. Definition of Concurrent Delay

One of the fundamental element that made concurrent delay as one of the law notoriously problematical areas, and most controversial kind of delay disputes is the absence of an agreed coherent definition/interpretation of concurrent delays. Therefore, to avoid protracted disputes and outcomes contrary to parties' intention, the Author recommends including express bespoke agreed terms/conditions within their contract, which clearly articulate the meaning of concurrent delays.

In the Author's opinion, the term 'concurrent delay' must have a wider all-inclusive definition to cover all delay situations attributed to both parties that each/together have an effect on time for completion, and to avoid various contentions about its applicability or definition. It doesn't matter if the delay events occur on the same time, occur sequentially (but the second event is not a result of the first event) or occur independently, **as far as all are in the prevailing critical/near critical path and have delayed the project completion**. Similarly, the same applies to events' effect, it doesn't matter that the effects were felt on the same time or felt consecutively or felt individually as far as **all** have delayed the project completion. On the basis thereof, in the Author's point of view, concurrent delay can be defined as:

“Various independent delay events, whereby some form part of the Employer's risk events and others form part of the Contractor's risk events, occur simultaneously or independently/sequentially or overlapped, and either in the same activities' path or other parallel or independent activities' path, and its effect either felt simultaneously or

independently, which are on the pertinent critical/near critical path (that is identified at delay analysis relevant measurement period or window for dynamic methods, or baseline schedule for static method) of the programme of the Works and each separately causes delay to project Time for Completion”. By such definition, all types of delay attributed to both parties are covered. The following represent a graphical illustration of the Author’s definition of concurrent delay:



7.2.2. Pacing of the Works:

Additionally, in Author’s opinion to avoid disputes about pacing of the works versus Concurrent Delays, it is best practise that reasoned voluntarily party’s pacing of independent activities due to other party’s precedent parent delay is defined under the contact as follows:

“Pacing of the Works is a reasoned conscious, voluntarily and contemporaneous party’s pacing/slowing of independent activities due to other party’s precedent parent delay. Such pacing must be notified in advance to other party for consideration.

Moreover, for avoidance of doubt, “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”⁴⁶².

7.2.3. Recommended Delay Analysis Technique

Due to the fact that different Delay Analysis Techniques result in different outcomes about EOT entitlement that are emanated from how the analysis is conducted, the Author recommends that Parties agree within their contract about which Delay Analysis Technique to be utilized. The Author recommends the Windows Analysis or Time Impact Analysis. This technique is what AACE International Recommended Practice No.29R-03 (2009) referred to as a “modelled/additive/multiple base (MIP 3.7)” analysis. It is a retrospective modelled and dynamic analysis that is analysed under section 3.3.4 above. In Author’s opinion, due to the advance of computerized programing software and CPM scheduling, current world-wide implementation of good project management and availability of as built records/data/schedules, this method is the most reliable method and is recommended to be implemented in any project.

7.2.4. Consequences of Concurrent Delays

The Author recommends as well including express bespoke agreed terms within the contract, which clearly articulate the consequences of concurrent delays and how to be dealt with including who bears the risk when concurrent delays arise.

The Author suggests that parties can agree on one of following four (4) options, Option 1 “time-no-cost” approach, Option 2 “no-time-no-cost” approach, Option 3-“time-no-cost” approach in cases of Contractor’s concurrent delays that are resultant from neutral events

⁴⁶² Extracted from as AACE Protocol section 4.2.

not caused by the Contractor, otherwise “no-time-no-cost” applies, and Option 4 “time-no-cost” approach save for situations of Employer’s delay occurred during Contractor’s culpable delay, whereby “no-time-no-cost” applies.

- **Option 1 “time -no-cost” approach:**

If both parties agree to award the Contractor EOT in situations of concurrent delays, however without Prolongation Cost, the following can be included within their contract:

“Notwithstanding any other provisions of the Contract, after conducting the delay analysis and assessment for all delay events that are the responsibility of the Employer and of the Contractor, which is related to an extension of Time for Completion Claim or Engineer/Employer’s determination of extension to the Time for Completion. In cases of Concurrent Delays as defined under the Contract, then to the extent of the Concurrent Delay that is the responsibility of the Contractor, such Contractor’s Concurrent Delay should not reduce any extension to the Time for Completion due and the Contractor will be entitled to an extension to the Time for Completion for the period of Employer Delay to completion resultant from Employer’s risk events pursuant to Clause XX⁴⁶³ of the Contract Conditions. However, the Contractor will not be entitled for prolongation cost or any cost or profit whatsoever during such Concurrent Delays period in respect of and due to this extension to the Time for Completion.”

The Author considers this Option as “Apportionment of Time” because the Contractor will be granted EOT for only concurrent delay period and any period behind that⁴⁶⁴, if any, which is attributed to the Contractor shall be his responsibility. The Author submits

⁴⁶³ This Clause XX is the EOT Clause for Employer’s Risk Events

⁴⁶⁴ true concurrency (i.e period of contractor delay equal the period of employer delay) is rarely happened

as well that this Option 1, when considered as Apportionment of Time, is consistent with UAE law and regulations, which promote apportionment within its provisions.

- **Option 2 “no-time -no-cost” approach**

If both parties agree to deny the Contactor any entitlement for EOT in situations of concurrent delays, the following can be included within their contract:

“Notwithstanding any other provisions of the Contract, after conducting the delay analysis and assessment for all delay events that are the responsibility of the Employer and of the Contractor, which is related to an extension of Time for Completion Claim or Engineer/Employer’s determination of extension to the Time for Completion. In cases of Concurrent Delays as defined under the Contract, then to the extent of the Concurrent Delay that is the responsibility of the Contractor, such Contractor’s Concurrent Delay period shall not be taken into account and the Employer shall not give an extension of Time for Completion nor the Contractor will be entitled to an extension to the Time for Completion for this period”.

The Author submits that this Option 2 do not allow for apportionment and transfer the risk of concurrent delay to the contractor for which he will not be entitled for EOT and subsequently LDs applied. The Author submits as well that despite this Option is not consistent with UAE law provisions that promote apportionment, UAE laws do not put any restrictions or mandatory statutory requirements that prohibit the parties to agree on such Option and such Option is enforceable under UAE jurisdiction as elucidated under Section 4.3.2 herein.

- **Option 3 “time-no-cost” approach for Neutral Events (Author’s preferred option)**

If both parties agree to deny the Contractor any entitlement for EOT in situations of concurrent delays, save for in situations where the Contractor’s culpable concurrent delays are resultant from a neutral delay event that is not caused by the Contractor, the following can be included within their contract. The rationale behind excluding neutral events is some contract conditions put the risk of some neutral events on the Contractor such as adverse climate conditions. So in case there are Employer’s delays, which are concurrent with neutral event that is Contractor’s risk event; it will not be fair for such neutral event to cancel the Employer’s delays and accordingly LDs will be applied.

“Notwithstanding any other provisions of the Contract, after conducting the delay analysis and assessment for all delay events that are the responsibility of the Employer and of the Contractor, which is related to an extension of Time for Completion Claim or Engineer/Employer’s determination of extension to the Time for Completion:

(a) In cases of Concurrent Delays as defined under the Contract, save for situation stated under paragraph (b) below, then to the extent of the Concurrent Delay that is caused by the Contractor, such Contractor’s Concurrent Delays period shall not be taken into account and the Employer shall not give an extension of Time for Completion nor the Contractor will be entitled to an extension to the Time for Completion for this period.

(b) However, to the extent of the Concurrent Delay that is the responsibility of the Contractor but resultant from a Neutral Event that is not caused by the Contractor,

such Contractor's Concurrent Delays should not reduce any extension of Time for Completion due and the Contractor will be entitled to an extension of Time for Completion for the period of Employer's delays to completion resultant from Employer's risk events pursuant to Clause XX⁴⁶⁵ of the Contract Conditions. Nevertheless, the Contractor will not be entitled for prolongation cost or any cost or profit whatsoever during such Concurrent Delays period in respect of and due to this extension to the Time for Completion. *Neutral Event is an event neither caused by the Employer nor caused by the Contractor, beyond both parties control, or caused by third party.*"

The Author comments stated above for Option 2 applies to Option 3 as well.

- **Option 4 "time-no-cost" approach save for situations of Employer's delay occurred during Contractor's culpable delay**

If both parties agree to award the Contractor EOT in situations of concurrent delays without Prolongation Cost, save for in situations of Employer's delay occurred during Contractor's culpable delay whereas no-time-no-cost approach will apply. The following can be included within their contract.

"Notwithstanding any other provisions of the Contract, after conducting the delay analysis and assessment for all delay events that are the responsibility of the Employer and of the Contractor, which is related to an extension of Time for Completion Claim or an Engineer/Employer's determination of extension to the Time for Completion, whereby determination of entitlement for extension to the

⁴⁶⁵ This Clause XX is the EOT Clause for Employer's Risk Events

Time for Completion shall be performed for each Employer's delay event separately according to the following:

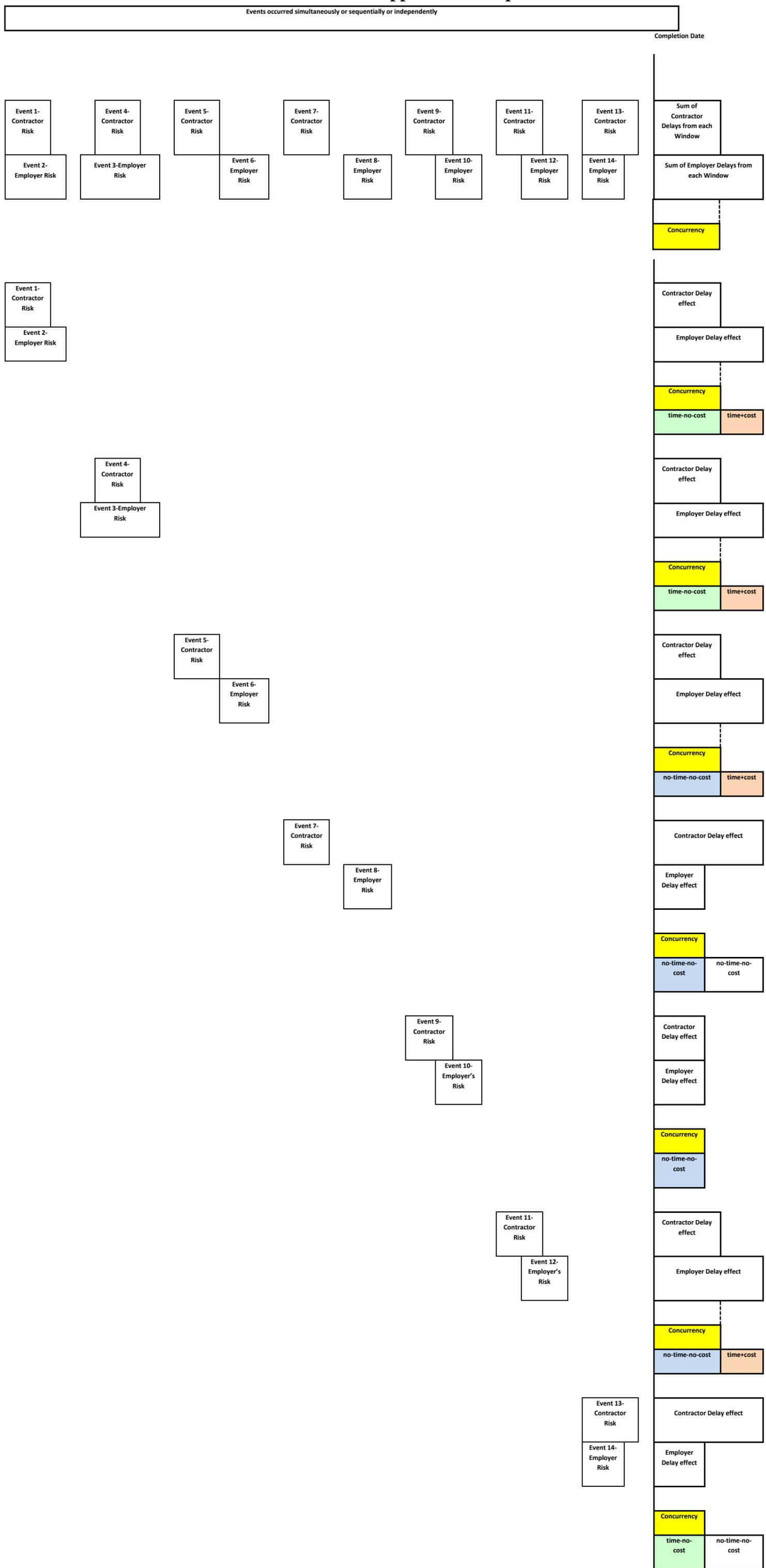
(a) In cases of Concurrent Delays as defined under the Contract, save for the situation stated under paragraph (b) below, then to the extent of the Concurrent Delay that is the responsibility of the Contractor, such Contractor's Concurrent Delay should not reduce any extension to the Time for Completion due and the Contractor will be entitled to an extension to the Time for Completion for the period of Employer Delay to completion resultant from Employer's risk events pursuant to Clause XX⁴⁶⁶ of the Contract Conditions. However, the Contractor will not be entitled for prolongation cost or any cost or profit whatsoever during such Concurrent Delays period in respect of and due to this extension to the Time for Completion;

(b) However, in situations of Employer's delay occurred during Contractor's culpable delay, then to the extent of the Concurrent Delay that is the responsibility of the Contractor, such Contractor's Concurrent Delay period shall not be taken into account and the Employer shall not give an extension of Time for Completion nor the Contractor will be entitled to an extension to the Time for Completion for this period."

The following chart elucidates the application of Option 4:

⁴⁶⁶ This Clause XX is the EOT Clause for Employer's Risk Events

Chart for Application of Option 4



7.2.5. UAE Courts proposed Technology and Construction Division

The Author strongly recommends that UAE Courts to establish a dedicated specialist Technology and Construction Division, similar to what DIFC Courts⁴⁶⁷ recently did. Such division will definitely allow for more efficient resolution of construction industry complex disputes. However, in order for such division to be efficient, its judges should possess the required technical expertise and must be trained for the same, otherwise it will not provide any difference to the existing conditions.

⁴⁶⁷ Dubai International Financial Centre (DIFC) Courts, “The DIFC Courts are an independent common law judiciary based in the Dubai International Financial Centre (DIFC) with jurisdiction governing civil and commercial disputes”.

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Appendix-1

Exact Extract from, *K Pickavance, "Delay and disruption in construction contracts" (4th edn), para 15-058*

“

- T = time allowed for completing the work as tendered for (the asplanned period)
- p^o = time allowed for as a result of scheduling errors by overestimate of time needed
- m^o = time allowed for as a result of overestimate of content of work tendered for
- t = time allowed for total float
- p^u = time not allowed in plan as a result of underestimate of time needed
- m^u = time not allowed in plan as a result of underestimate of content of work
- C = time actually taken to complete the contract work (the as-built period)
- f = time taken up by C's inefficiencies
- a = time taken up by D's time risk events
- w = time taken up by other risks not at C's risk
- e = time taken up by loss of efficiency caused by D's time risk events
- A = time saved by instructed, or constructive acceleration
- n = time saved by C's recovery measures to overcome its own inefficiencies
- s = time saved by instructed omissions from contract works
- EOT = extension of time

Then:

$$(T - t) + (p^u + m^u) - (p^o + m^o) = C + (A + s) - (f - n) - (a + e + w).$$

And where:

$$EOT = a + e + w;$$

$$EOT = [C + (A + s) - (f - n)] - [(T - t) + (p^u + m^u) - (p^o + m^o)]$$

So, for example, if:

- the planned contract period is 52 weeks ($T = 52$)
- there are no errors in the schedule, which would have added to the planned period ($p^u + m^u = 0$) period

- there is a two-week period of float ($t = 2$)
- there are errors in the schedule, which would have shortened the planned ($p^o + m^o = 1.5$) period by 1.5 weeks
- the construction period actually took 87 weeks ($C = 87$)
- Contractor's errors, and difficulties in getting labour and materials added 12 weeks to the ($f = 12$) construction schedule
- the decoration period was reduced, saving one week of the construction period ($n = 1$)
- employer omitted some fitted joinery, saving 1.5 weeks of the construction schedule ($s = 1.5$)
- employer instructed Contractor to work extended hours and weekends, saving one week ($A = 1$),

the formula $EOT = [C + (A + s) - (f - n)] - [(T - t) + (p^u + m^u) - (p^o + m^o)]$ demonstrates:

$$EOT = [87 + (1 + 1.5) - (12 - 1)] - [(52 - 2) + (0) - (1.5)]$$

$$EOT = [78.5 - 48.5]$$

$$EOT = 30 \text{ weeks.}$$

”468

⁴⁶⁸ K Pickavance, “Delay and disruption in construction contracts” (4th edn), para 15-058

Appendix-2

Based/Extract from, Braimah N “*Selecting the appropriate delay analysis methodology: a decision-making model for facilitating the process*” (2015) *Construction Law Journal*, 31(2), 97-107:

The model that was developed in order to theoretically decides on the most appropriate method in given case by providing selection criteria matrix vs given scores for each and the highest overall score represent the most appropriate method. The model identifies 18 selection criteria from the in-depth review on numerous delay/disruption literatures and a nation-wide questionnaire survey of recognized delay analysis experts in the UK, as shown in below table.⁴⁶⁹

“The application of the model involves first rating each method successively against each criterion in reflection of the extent to which the method is suitable to use given the criterion under consideration.

The ratings from all criteria are then multiplied by their respective weightings to obtain the suitability scores of the various methodologies. The total suitability score for each methodology is then computed by summing up all the suitability scores from the various criteria. Finally, the methodology with the highest total suitability score is selected as the most appropriate methodology to be used for the delay analysis.

Guidance on scoring the criteria and the computation of total suitability scores is provided in a worked example presented as follows.”

I. Model Criteria:

Group Factor	Selection Factor	Weights
Record Availability	Record Availability	1.00
Baseline programme characteristics	Baseline programme availability	0.86
	Nature of baseline programme	0.73
Contractual requirements	Updated programmes availability	0.72
	Applicable legislation	0.37
	Form of contract	0.61
	Dispute resolution forum	0.56
Timing of the analysis	Reason for the analysis	0.63
	Time of delay	0.64
Project characteristics	Project complexity	0.67
	The amount in dispute	0.75
	Size of the project	0.52
	Duration of the project	0.47

⁴⁶⁹ N Braimah “*Selecting the appropriate delay analysis methodology: a decision-making model for facilitating the process*” (2015) *Construction Law Journal*, 31(2), 97-107

Group Factor	Selection Factor	Weights
	Nature of delaying events	0.66
	Number of delaying events	0.68
	The other party to the claim	0.46
Cost proportionality	Cost of using method	0.59
	Skills of the analyst	0.67

II. Rating of the Criteria of the Model:

- Record Availability

Record	As planned v as-built	Impacted as-planned	Collapsed as-built	Windows Analysis
Outline of delay events	y	y	y	y
Start dates of delay events	y	y	y	y
Finish dates of delay events	y	y	y	y
Activities affected by delays			y	y
Duration of delay events	y	y	y	y
Original planned completion date (or as extended)	y	y		y
Actual completion date	y		y	y
As-planned critical path(s)	y	y		y
As-built critical path	y		y	
Updates critical or near critical paths(s)				y
Update, or schedule revision dates				y
Activity list with logic and lag	y	y	y	y
count of applicable requirements for each Method	9	7	8	11
count of actual available requiments in the Project (assume the ones shaded in yellow)	8	5	6	10
rating	8/9=0.89	5/7=0.71	6/8= 0.75	10/11=0.91

- **Baseline programme availability**

Record	As planned v as-built	Impacted as-planned	Collapsed as-built	Windows Analysis
Baseline programme availability	y	y	y	y
rating 0-1	1.00	1.00	1.00	1.00

- **Nature of baseline programme**

Nature of baseline programme	As-planned v as-built	Impacted as-planned	Collapsed as-built	Window Analysis
Available in CPM diagram	y	y	y	y
Includes all relevant activities	y	y	y	y
Reasonable activity durations	y	y	y	y
Reasonable activity relationships	y	y	y	y
Activities defined in appropriate detail	y	y	y	y
count of applicable requirements for each Method	5	5	5	5
count of actual available requirements in the Project (assume the ones shaded in yellow)	3	3	3	3
rating	3/5=0.60	3/5=0.60	3/5=0.60	3/5=0.60

- **Updated programme availability**

Updated programmes availability	As-planned v as-built	Impacted as-planned	Collapsed as-built	Window Analysis
Intermediate regular programme updates available				y
Final updated programme available (as-built programme)	y		y	y
count of applicable requirements for each Method	1	0	1	2
count of actual available requirements in the Project (assume the ones shaded in yellow)	1	0	1	1
rating	1/1=1	1.00	1/1=1	1/2=0.50

- **Applicable legislation**

It is assumed in this example that no legal procedures or rules were required to be followed; hence the rating is 1.0 for all methods

- **Form of contract**

It is assumed in this example that the terms of the contract require that the delay analysis should be based upon the actual effect of the delays on project completion.

In this case the methodology suitable to use should therefore be one capable of performing retrospective analysis of delays, hence the rating is 1.0 for all methods.

- **Dispute resolution forum**

It is assumed in this example that specific requirements; hence the rating is 1.0 for all methods

- **The reason for the delay analysis**

Claims update	As-planned v as-built	Impacted as-planned	Collapsed as-built	Window Analysis
Extension of time	y	y	y	y
Prolongation cost	y		y	y
Acceleration effects				y
Disruption effects				y
count of applicable requirements for each Method	2	1	2	4
count of actual available requirements in the Project (assume the ones shaded in yellow)	2	1	1	4
rating	2/2=1	1/1=1	1/2=0.50	4/4=1

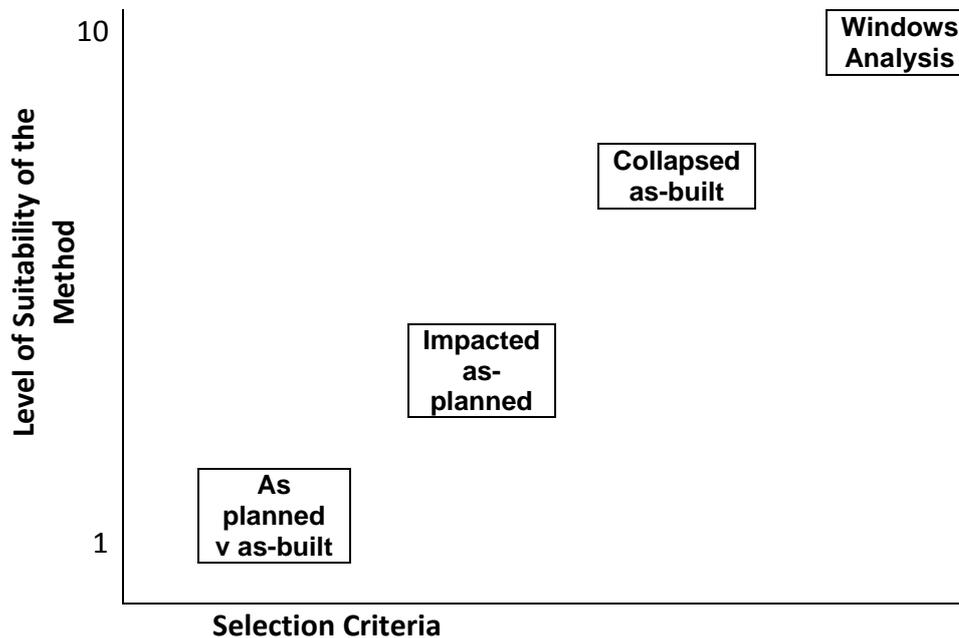
- **Project characteristics**

	1	2	3	4	5	6	7	8	9	10
	<i>Very insignificant</i>		<i>Insignificant</i>		<i>Moderate</i>		<i>Significant</i>		<i>Very Significant</i>	
Size of project (in terms of contract sum)	<£500,000		£500–£10 million		£11 million–£49 million		£50 million–£100 million		>£100 million	
Duration of project	<6 months		<6–12 months		<1–3 years		<4–6 years		>6 years	
Number of delays	<5		5–10		11–20		21–50		>50	
Amount in dispute	<50,000		50,000–199,000		200,000–499,000		500,000–1 million		>1 million	
Complex of project (in terms of activity relationships)	Very low		Low		Moderate		High		Very high	

Based on the attributes of the various Methods, Figure 1 below compares their suitability against a number of project characteristics criteria. For any given criterion, a number on the 1–10 scale is first selected in reflection of the characteristics of the project in dispute. A vertical should then be drawn through this number and the methodology that falls in line with this vertical or very close

to it will be the most suitable method with a rating of $10/10 = 1.0$. The other methods are rated in proportion to their relative positions to this vertical.

Figure 1



- project complexity**
 very complex projects to be rated = $10/10 = 1.0$.
- The amount in dispute**
 assume for this example it is above >£1 million, rating = $10/10 = 1.0$.
- Duration of the project**
 assume for this example it is above 6 years, rating = $10/10 = 1.0$.
- Size of the project**
 assume for this example it is above £100 million, rating = $10/10 = 1.0$.
- Number of delaying events**
 assume for this example it is above 43, rating = $43/50 = 0.86$.
- Cost of using the method**

least expensive is preferable. Figure 1 shows that Window Analysis is the most expensive method and thus ranks lowest on the scale or 1–10. Therefore its suitability rating on this criteria = 0.1

- The other party to the claim**
 Experience with the other party in previous claims matters or in prior settlement of the claims could inform the analyst of the extent to which the various DAMs are suitable for use in the delay claims in question. It is assumed in this case study that there was no prior unsuccessful

settlement of the claims in which Window analysis was employed. It was therefore very suitable to use this methodology and thus rates, rating = 1.0

- **Time of the delay**

Assume the time of the occurrence of delays relative to the current stage of the project requires that a retrospective analysis of delay be performed but not prospective analysis. Window Analysis is a retrospective methodology and so rates very suitable on the 0–1 scale. i.e. rating = 1.0

- **Nature of delaying events**

The capabilities of the various methods in dealing with important characteristics of delays are shown in below Table. As can be seen, Window Analysis is capable of dealing with concurrent delays and delays causing acceleration effects and loss of productivity. Assume these were issues of concern in this example, Window Analysis is very suitable to use and so rates highest on the 0–1 i.e rating = 1.0

Characteristics of the delay	As-planned v as-built	Impacted as-planned	Collapse d as-built	Windows Analysis
Delays occurred concurrently with others				y
Delays caused much changes in construction logic				y
Cause of delay is clearly definable	y	y	y	y
Delay cause productivity				y
Delay cause acceleration				y
Delays limited to specific definitive activities	y	y	y	y

- **The skills of the analyst**

It is assumed for this example that the analyst was very knowledgeable and skillful in all methods, hence rating is =1

III. Results for Window Analysis Methods:

Group factor	Selection Factor	Weight	Rating	Suitability Score
Record availability	Record availability	1	0.91	0.91
Baseline programme characteristics	Baseline programme availability	0.86	1.00	0.86
	Nature of baseline programme	0.73	0.60	0.44
Contractual requirements	Updated programmes availability	0.72	0.50	0.36
	Applicable legislation	0.37	1.00	0.37
	Form of contract	0.61	1.00	0.61
	Dispute resolution forum	0.56	1.00	0.56
Timing of the analysis	Reason of the analysis	0.63	1.00	0.63
	Time of the delay	0.64	1.00	0.64
Project characteristics	Project complexity	0.67	1.00	0.67
	The amount in dispute	0.75	1.00	0.75
	Size of the project	0.52	1.00	0.52
	Duration of the project	0.47	1.00	0.47
	Nature of delaying events	0.66	1.00	0.66
	Number of delaying events	0.68	0.86	0.58
	The other party to the claim	0.46	1.00	0.46
Cost proportionality	Cost of using method	0.59	0.10	0.06
	Skills of the analyst	0.67	1.00	0.67
			Total	10.22