Prospective Time Impact Analysis (TIA) Challenges and Enhancements

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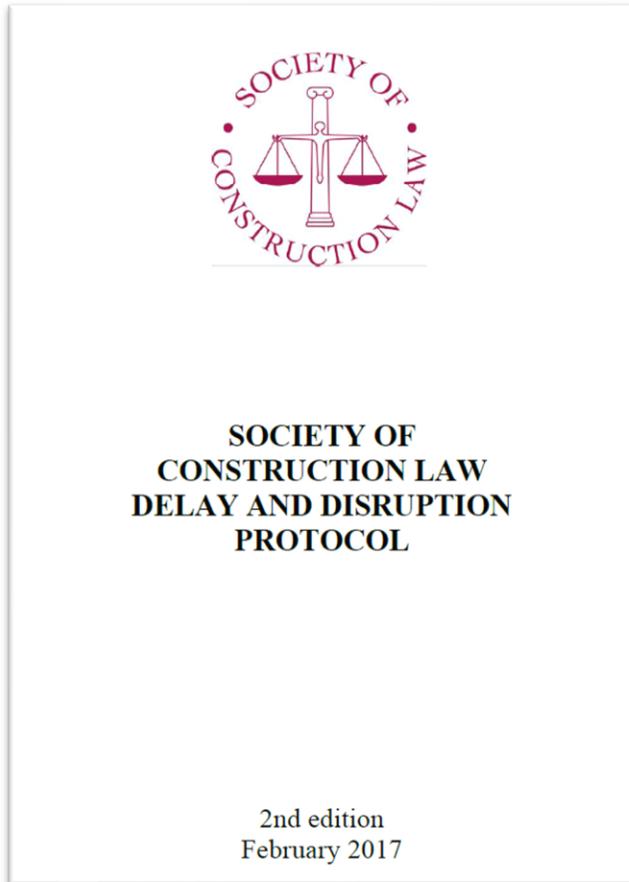
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Definitions

Delay Analysis is the analysis of delay events and the **quantification** of their effect upon the project completion date to determine <mark>**excusability**</mark> **(extension of time 'EOT' entitlement) and** <mark>**compensability**</mark> **(prolongation cost).**

Prospective Delay Analysis estimates the likely impact of delay events on a completion date. The conclusions of a prospective delay analysis may not match the as-built programme because the Contractor's actual performance may well have been influenced by the effects of attempted acceleration, re-sequencing or redeployment of resources in order to try to avoid liability for liquidated damages or due to other Employer and Contractor Risk Events.

Retrospective Delay Analysis (Forensic Schedule Analysis) identifies the actual impact of the delay events on the identified actual or as-built critical path.

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Key References

SOCIETY OF
CONSTRUCTION LAW
DELAY AND DISRUPTION
PROTOCOL

2nd edition
February 2017

AACE INTERNATIONAL RECOMMENDED PRACTICE

52R-06

PROSPECTIVE TIME IMPACT ANALYSIS - AS APPLIED IN CONSTRUCTION

AACE INTERNATIONAL

AACE INTERNATIONAL RECOMMENDED PRACTICE

29R-03

FORENSIC SCHEDULE ANALYSIS

AACE INTERNATIONAL

Forensic Schedule Analysis – AACE RP

Forensic Schedule Analysis: A technical field of studying and investigating the schedule calculation using different methods (usually requires many subjective decisions by professionals) to measure and quantify delay focusing on causation to resolve EOT disputes.

Project Planning and Scheduling	Forensic Schedule Analysis	Legal Proceeding and Aspects

WHICH TECHNIQUE TO USE?

No forensic schedule analysis method is exact. The level of accuracy of the answers produced by each method is a function of the quality of the data used therein, the accuracy of the assumptions, and the subjective judgments made by the forensic schedule analyst.

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Prospective vs Retrospective

The court, in *Fluor v Shanghai Zhenhua Heavy Industry Co. Ltd* (2018), indicated that a **prospective approach** to delay analysis is <u>the correct approach</u> of awarding of an extension of time. <u>From a practical perspective</u>, it is <mark>for the interests of business efficacy</mark> to deal with the extension of time applications and assessments at the earliest possible opportunity.

However, this approach would remain theoretical in nature despite best endeavours to be as accurate as possible in any forecasts because of that the eventual actual delay caused by the event would be affected by <mark>subsequent progress of the works</mark>.

Thus, it was <mark>further added in the same judgment</mark> that some form of **retrospective analysis** is required because a retrospective review of the facts would take into account any subsequent measures taken by the contractor to mitigate delay by way of re-sequencing, resource reallocation or acceleration.

Overall, <u>prospective analysis</u> is helpful for the parties to <mark>move with lights on</mark> about the potential effect of the delay and the extension of time entitlement. On contrary, it can never be accurate due to blindness about what will be the actual effects and damages. Therefore, logic <u>retrospective analysis</u> is then helpful to move the assessment from foresight to hindsight.

TIA Procedure and Steps

Procedure - SCL

Society of Construction Law, UK

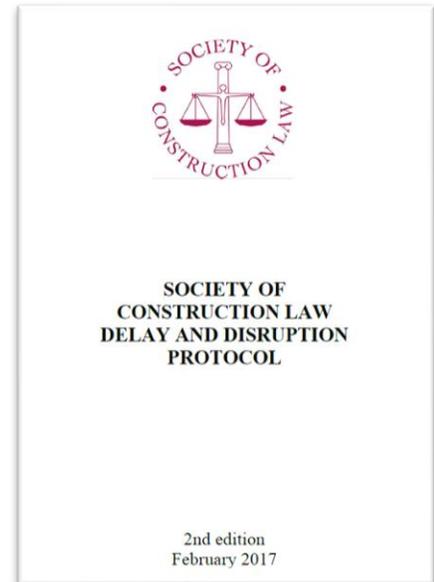| Method of Analysis |
|---|
| Impacted As-Planned Analysis |
| Time Impact Analysis |
| Time Slice Windows Analysis |
| As-Planned versus As-Built Windows Analysis |
| Retrospective Longest Path Analysis |
| Collapsed As-Built Analysis |

<u>Prompt Action – Prospective Analysis</u>
4. Do not 'wait and see' regarding impact of delay events (contemporaneous analysis)

Applications for an EOT should be made and dealt with as close in time as possible to the delay event. A 'wait and see' approach to assessing EOT is discouraged.

Where the Contractor has <u>complied with its contractual obligations</u> regarding delay events and EOT applications, the Contractor should not be prejudiced in any dispute with the Employer as a result of the CA **failing** to assess EOT applications.

EOT entitlement should be assessed by the CA <u>within a reasonable time</u> (4.1: not later than one month) after submission of an EOT application by the Contractor.

The Contractor potentially will be **entitled to an EOT** only for those events or causes of delay in respect of which the Employer has assumed risk and responsibility (called in the Protocol Employer Risk Events) that impact the critical path.

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Contemporaneous analysis of delay - SCL
(Is it an ERE?)

4.3 The Contractor should generally submit a sub-network (sometimes called a 'fragnet') showing the actual or anticipated effect of the Employer Risk Event and its linkage into the Updated Programme.

Simply stating that Employer Risk Events have **occurred and claiming** the whole of any delay apparent at the time of the events is not a proper demonstration of entitlement.
4.4 These events vary between the different standard forms of contract, and care is needed when reading them.

When granting or refusing an EOT, the CA should **provide sufficient information** to allow the Contractor to understand the reasons for the CA's decision.

Incremental review of extension of time - SCL

Where the full effect of an Employer Risk Event cannot be predicted with certainty at the time of initial assessment by the CA, the CA should **grant an EOT for the predictable effect**. The EOT should be considered by the CA at **intervals as the actual impact** of the Employer Risk Event unfolds and the EOT increased (but not decreased, unless there are express contract terms permitting this) if appropriate.

TIA Eight Steps – AACE RP 52R-06

Association of Advancement of Cost Engineering International

Time Impact Analysis - Steps (1-4)

1/8 A Schedule Franget: Subset of activities involved directly with the event (Collect data – Use simple description – Fewest no. of Activities – Logic insertion – Split the existing delayed activity into two activities).

2/8 Selecting the Unimpacted Schedule: The last reviewed update prior the event. If doesn't exist, then it should be prepared. Constraints to be reviewed and the normal schedule checks between the actual dates and data/status date.

29R-03 MIP 3.6.: Select the planned network to be utilized as the "un-impacted schedule (**the baseline, or the contemporaneous update that existed just prior to the initial delay**).

3/8 Franget Insertion: Inserting the accepted fragnet to the unimpacted schedule. Check the logic (zero duration check).

A TIA is only valid if the CPM software being used to model the effects of an event properly shows the effects of the CPM calculations.
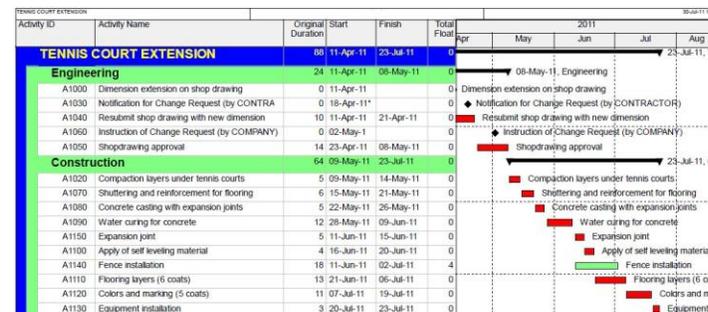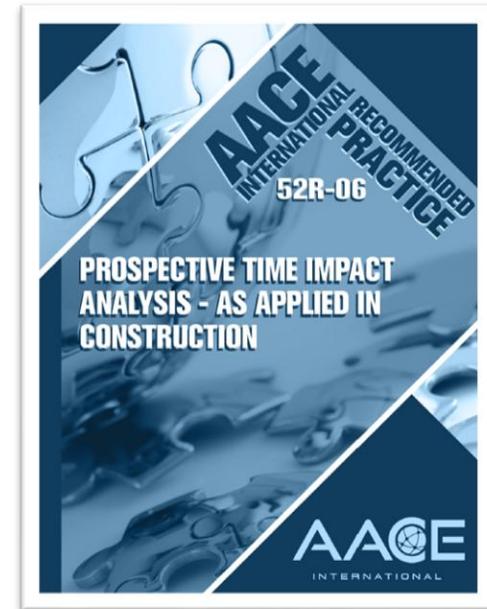
Fragnet Calculation and Insertion

(Collect data – Use simple description – Fewest no. of Activities – Logic insertion – Split the existing delayed activity into two activities).

The new activities can be in a separate WBS or added using activity code

A productivity sheet can be added to justify the durations of the activities in the fragnet:

SR	Activity Name	Duration	Unit	Quantity	Resource	Productivity	Mandays
Phase		**299**					
Building No. - Type		**262**					
Substructure		**49**					
8	Setting out & Excavation	4	m3	1,304	Unskilled labor	140	10
9	Anti termite &	3	m2	1,441	Unskilled labor	250	6

The mitigation duty by the contractor should be considered in sequence & activities if applicable. **Mitigation** to be considered if applicable or already performed/forensic mainly for the delayed path including the out of sequence activities (if not, to be stated). This should be documented in the narrative or schedule basis.

TIA Steps (5-8) AACE RP 52R-06

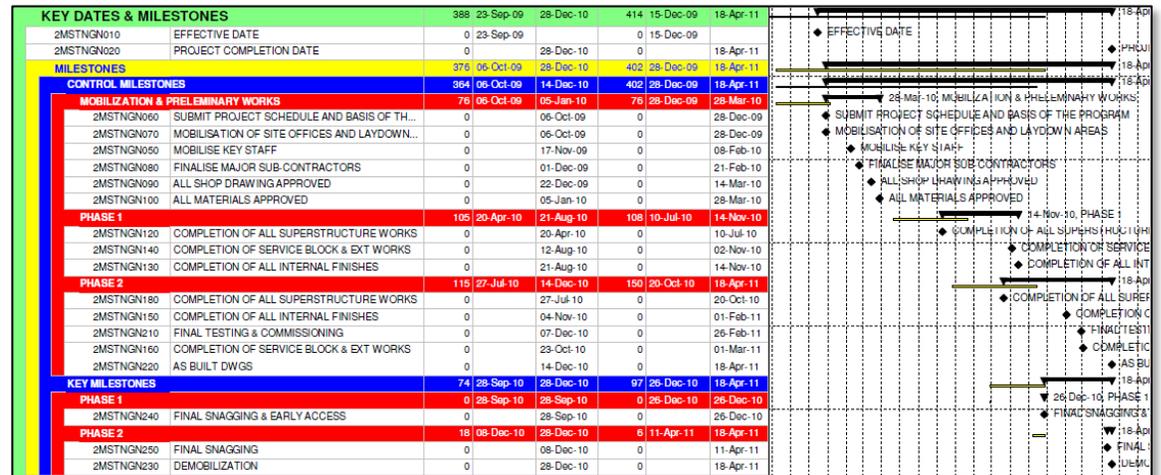**4/8 Re-compute the CPM.**

5/8 Paths Analysis: <mark>Identify the activity that will be used to measure the impact</mark> by the analysis of all critical and near critical paths, noted and documented.

6/8 Determine the Correct Impact. Use the unit of measurement specified in the contract whether it's working days or calendar days.
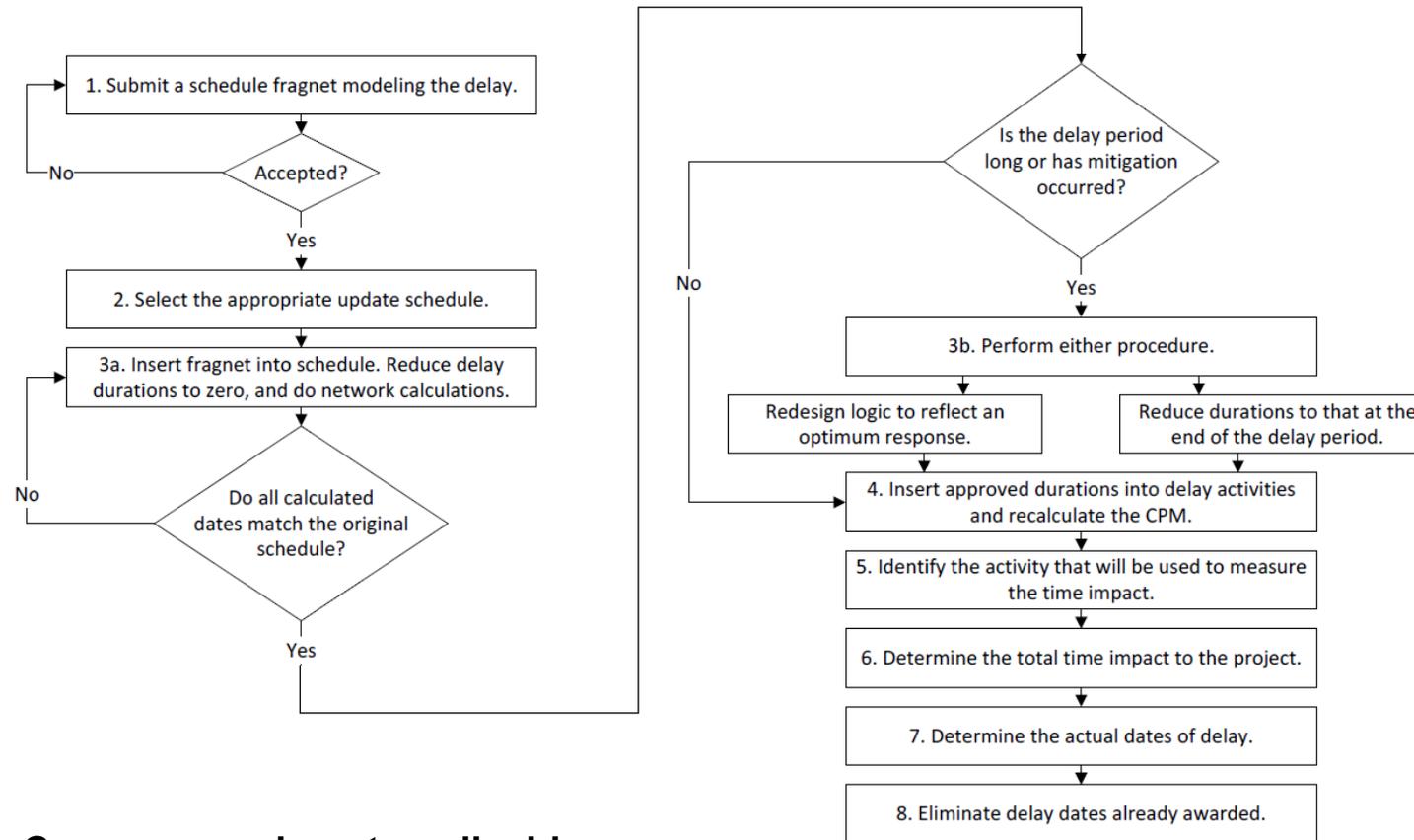
7/8 Determine the Delay: The delay can be different from the duration of the event. <u>The float belongs to whom uses it first</u> (The contractual and legal requirements to be checked).

8/8 Eliminate pervious concurrent EOTs. No single date may be assigned more than the excusable delay.

Comparing with Actual Observance (Common Sense Test).

TIA Flow Chart - AACE RP 52R-06

Left flow:

1. Submit a schedule fragnet modeling the delay.

↓

Accepted? — No (loops back to step 1)

↓ Yes

2. Select the appropriate update schedule.

↓

3a. Insert fragnet into schedule. Reduce delay durations to zero, and do network calculations.

↓

Do all calculated dates match the original schedule? — No (loops back to 3a)

↓ Yes

Right flow:

Is the delay period long or has mitigation occurred?

No → (to step 4)

Yes ↓

3b. Perform either procedure.

- Redesign logic to reflect an optimum response.
- Reduce durations to that at the end of the delay period.

↓

4. Insert approved durations into delay activities and recalculate the CPM.

↓

5. Identify the activity that will be used to measure the time impact.

↓

6. Determine the total time impact to the project.

↓

7. Determine the actual dates of delay.

↓

8. Eliminate delay dates already awarded.

Note: Concurrency is not applicable.

TIA Enhancements

Forensic Analysis (RP 29R-03) Enhancements

Taxonomy		RETROSPECTIVE												
		OBSERVATIONAL						MODELED						
		Static Logic			Dynamic Logic			Additive				Subtractive		
		3.1 Gross	3.2 Periodic		Contemporaneous Updates (3.3 As-Is or 3.4 Split)		3.5 Modified / Reconstructed Updates		3.6 Single Base²		3.7 Multi Base¹		3.8 Single Simulation		3.9 Multi Simulation¹
			Fixed Periods	Variable Windows	All Periods	Grouped Periods	Fixed Periods	Variable Windows	Global Insertion	Stepped Insertion	Fixed Periods	Variable Windows or Grouped	Global Extraction	Stepped Extraction	Fixed Periods	Stepped Extraction
Common Names		As-Planned vs As-Built	Window Analysis		Contemporaneous Period Analysis, Time Impact Analysis, Window	Contemporaneous Period Analysis, Time Impact Analysis, Window Analysis	Contemporaneous Period Analysis, Time Impact Analysis	Window Analysis, Time Impact Analysis	Impacted As Planned, What-If	Time Impact Analysis, Impacted As Planned	Time Impact Analysis	Window Analysis, Impacted As-Planned	Collapsed As-Built	Time Impact Analysis, Collapsed As-Built	Time Impact Analysis, Collapsed As-Built	Time Impact Analysis, Window Analysis, Collapsed As-Built

Observational: Examining the schedule itself analytically.
Static: Same network - **Dynamic:** updates with variations.

Modeled: Representing delay events in schedule.
Additive: add to a base - **Subtractive:** from as-built.

MIP 3.6 Modeled/Additive/Single Base

It relies on a simulation of a scenario based on a CPM model - it is a static logic method performed on one network analysis model representing the plan - MIP 3.6 can be used prospectively (TIA) or retrospectively.(Impacted as-planned).(SVP 2.1, 2.3, 2.4 & Enhanced SVP 2.2).

E. Minimum Recommended Implementation Protocols.

Identify and quantify delays that are to be evaluated - Select the planned network to be utilized as the "un-impacted schedule (the baseline, or the contemporaneous update that existed just prior to the initial delay) - Insert the fragnet & schedule – (Zero duration check) - Ensure that at least one continuous critical path - Compare the Project completion date - **Tabulate and justify each change** - Quantify net delays and gains.

F. Enhanced Implementation Protocols:

-Compare the impacted schedule to the as-built: explain the variances between the two schedules for all significant chains of activities.

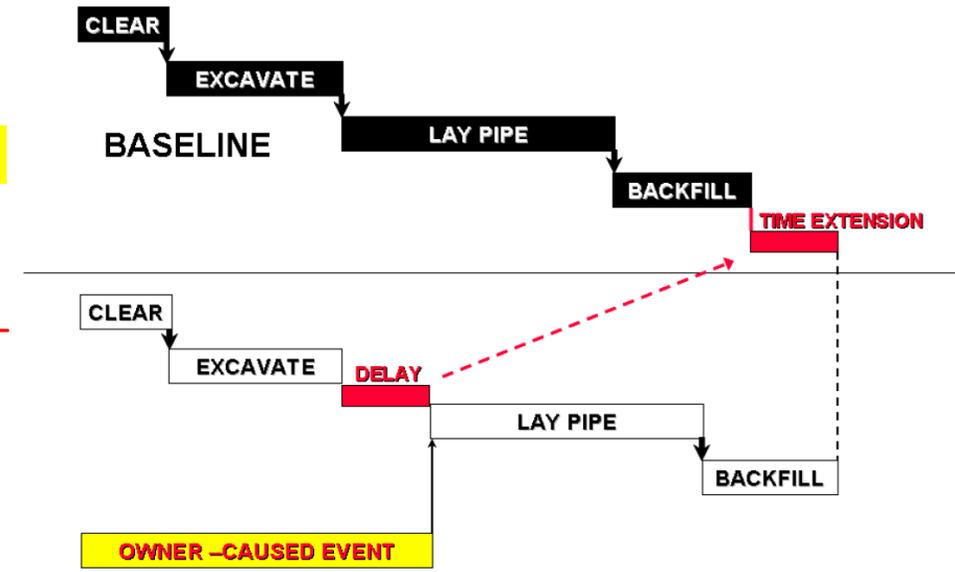Delaying event inserted into the baseline.

Figure 5 – Graphic Example: Modeled, Additive, Single Base

Enhancement & Consideration – 29R-03

The MIP of the modeled additive method (3.6 MIP) can be also applied when required as per AACE RP 29R-03 (Forensic Schedule Analysis).

I. Determination and Quantification of Excusable and Compensable Delay. An additive-modeled schedule by itself does not account for concurrent delays and compensability. However, it is possible to analyze for approximate concurrency by **comparing two additive-modeled schedules** (one by inserting all owner-caused and force majeure-caused impact events into the baseline & another one by inserting all contractor-caused impact events into the baseline).

K. Specific Implementation Procedures and Enhancements. Global Insertion (total impact)- Stepped Insertion (in chronological order).

L. Considerations in Using Min Protocol. Suited primarily for the use in identifying and quantifying potential delays rather than actual delays - Easy & doesn't need as-built schedule - Does not account for concurrent/pacing delays/acceleration .

Additional Validation –29R-03

Additional (SVPs)

The SVPs of the modeled additive method (3.6 MIP) can be also applied when required as per AACE RP 29R-03.

Baseline

Enhancement: Each ==activity== to be 0.5% to 5% of contract value - Separate as per responsible party - Add activities to enhance the ==level of detail== - Divide act.s based on progress records.

Update

Investigation: If update is the primary source, ==check==: (Actual dates vs data date - Using the most reliable source/ interviews if possible - Changes in IDs & scope) - ==Accuracy of dates== of significant activities to be 1 working day, and other activities to be 5 days - Consistency of dates along the updates - ==Change== in longest path/ controlling activities.

Enhancement: ==Tabulate all sources of data== - Show discrete activities for delay events and influences - Subdivide vague or general activities.

Evaluate Pacing or Acceleration (if exist).

Common Sense - SCL

4.14 Although the Updated Programme should be the primary ==tool== for guiding the CA in its determination of an EOT, it should be used in conjunction with the ==contemporary evidence== to ensure that any resulting EOT is **both reasonable and consistent with the factual circumstances**.

It will also be necessary for the parties to apply **common sense and experience** to the process to ensure that all relevant factors are taken into account, and that any **anomalous results** generated by the delay analysis are properly managed.

Any resulting EOT must be consistent with the contractual requirements regarding entitlement.
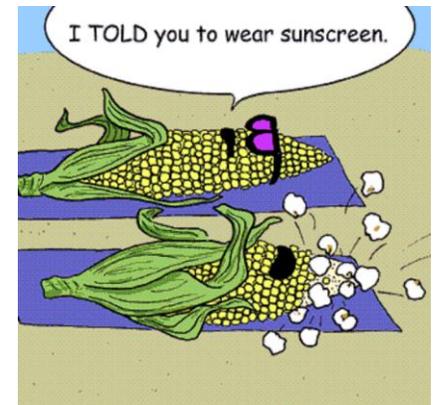
Practical Challenges

1- Causation

Causation is a term used in <mark>tort and contract</mark>. It is a topic that plays a key role when dealing with commercial disputes.

Sometimes, one delay event may cause other delay events. In this case, these events are dependent, not the dominant cause (Civil law: productive reason) of the delay.

Legal Causation

One type of causation is legal causation. It analyzes the breached duty. In such cases, <mark>contract</mark> provisions define the events that lead to the contractor's entitlement to an extension of time.

Factual Causation

Factual causation checks the (proximate cause). The first step in establishing causation, after identification of possible events, is to **eliminate irrelevant causes** with consideration of common sense. This is the purpose of the <mark>"but for" test</mark>.

Mainly, the courts are concerned with assigning responsibility for the damage by identifying the effective cause of them with consideration of common sense, not to explore all possible causes of a particular incident.

RESPONSIBILITY FOR DELAY

9.1 A Schedule Expert Typically Can Identify the Party Responsible for a Delay from the Contemporaneous Records, Interviewing Project Personnel, and Reading Deposition Testimony, and May Rely on Technical Experts or Fact Witnesses in Opining on Liability

9.2 During a Project, the Contractor Should Provide the Owner with a Notice of Delay for Excusable Delays, Followed by a Request for a Change in Accordance with the Contract.

9.3 Responsibility Analysis Should Be Supported by a Factual Chronology Based on the Contemporaneous Project Performance Records and Referencing the Remedy-Granting Clause of the Contract

9.5 Schedule Experts Should Not Opine Beyond Their Expertise. If Necessary, a Technical Expert Should Be Engaged on Whose Opinion the Schedule Expert Can Rely

9.6 Once a Technical Expert's Finding as to Which Party Was Liable for the Delay Event Is Formed, a Legal Review May Be Made with Counsel Consistent with Legal Precedent in the Project Jurisdiction
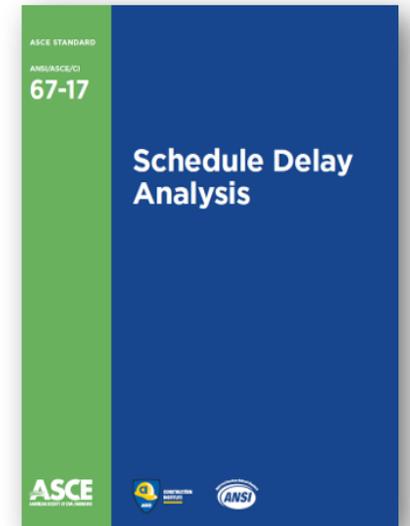
Standard Forms of Contract

The FIDIC & NEC forms of contract contain language which appears to be more <mark>prospective</mark> in terms of the approach to delay analysis.

However, the Northern Ireland High Court (2017) in (NEC3 contract) decided that although the **prospective direction of the contract**, a **retrospective approach** to assessing extension of time was permissible <u>in line with the general approach to the assessment of damages</u>.

The JCT Standard Forms provide for an extension of time to be assessed during the currency of the works which would suggest that it would lend itself towards assessment of delay **prospectively** although this would not preclude the use of a **retrospective approach** … (although there is <mark>no opportunity to reduce</mark> any previously awarded extension of time unless in case of omission).

2.28 Fixing Completion Date

.5 After the Completion Date for the Works or for a Section, if this occurs before the date of practical completion, the Architect/Contract Administrator may, and not later than the expiry of 12 weeks after the date of practical completion shall, by notice to the Contractor, giving the details referred to in clause 2.28.3:

.1 fix a Completion Date for the Works or for the Section later than that previously fixed if in his opinion that is fair and reasonable having regard to any Relevant Events, whether on reviewing a previous decision or otherwise and whether or not the Relevant Event has been specifically notified by the Contractor under clause 2.27.1; or

.2 subject to clauses 2.28.6.3 and 2.28.6.4, fix a Completion Date earlier than that previously fixed if in his opinion that is fair and reasonable having regard to any instructions for Relevant Omissions issued after the last occasion on which a new Completion Date was fixed for the Works or Section; or

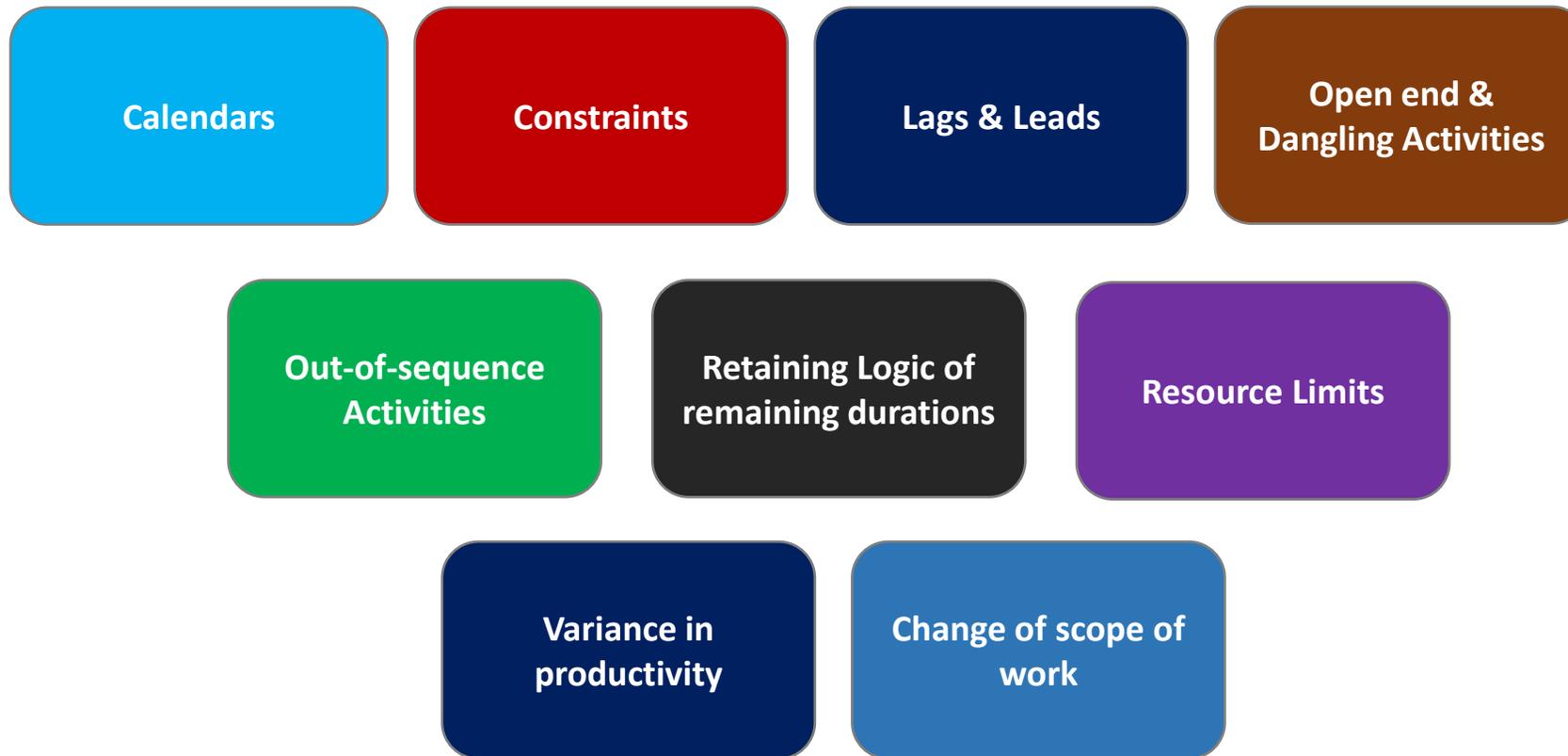.3 confirm the Completion Date previously fixed.

Contractual Entitlement

CAUSES OF DELAYS - RELATED FIDIC 2017 CLAUSES

1- Clause 1.9: Delayed Drawings or Instructions

2- Clause 2.1: Right of Access to the Site

3- Clause 4.12: Unforeseeable Physical Conditions

4- Clause 4.23: Archaeological and Geological Findings

5- Clause 8.5: Extension of Time for Completion

6- Clause 8.6: Delays caused by Authorities

7- Clause 13.3: Variation Procedure

8- Clause 13.6: Adjustments for Changes in Laws

9- Clause 16.1: Suspension by Contractor

10- Clause 19: Exceptional Events
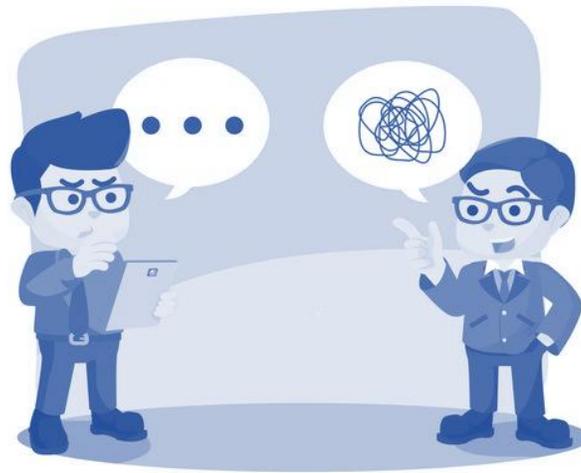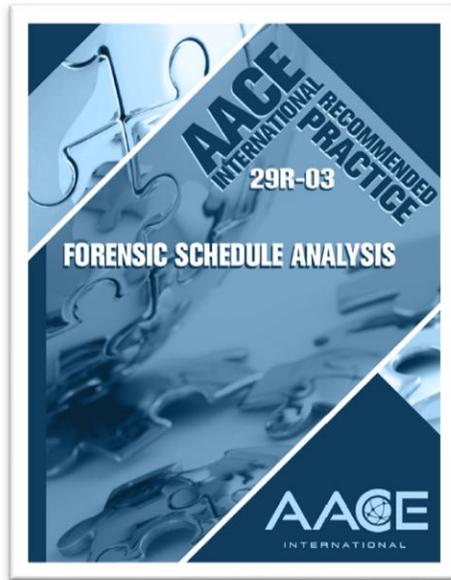
2- Technical Factors Affect the CP Calculation

The critical path and float values of uncompleted work activities in CPM schedules change over time affected by:

Calendars	Constraints	Lags & Leads	Open end & Dangling Activities

Out-of-sequence Activities	Retaining Logic of remaining durations	Resource Limits

Variance in productivity	Change of scope of work

AACE Neutralization & Simplification

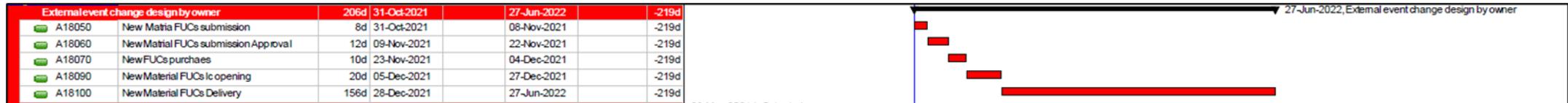**The policy of the AACE RP** is to be '<mark>software neutral</mark>'. This means that procedures and recommendations are made without regard to the brand or version of software used for analysis.

3- Contribution of the Event in the Delay

Fragnet –ve Float

	External event change design by owner		206d	31-Oct-2021		27-Jun-2022		-219d
	A18050	New Matria FUCs submission	8d	31-Oct-2021		08-Nov-2021		-219d
	A18060	New Matrial FUCs submission Approval	12d	09-Nov-2021		22-Nov-2021		-219d
	A18070	New FUCs purchaes	10d	23-Nov-2021		04-Dec-2021		-219d
	A18090	New Material FUCs lc opening	20d	05-Dec-2021		27-Dec-2021		-219d
	A18100	New Material FUCs Delivery	156d	28-Dec-2021		27-Jun-2022		-219d

27-Jun-2022, External event change design by owner

Identify the activity that will be used to measure the impact.

Check the impact on certain activities path / milestones.

HCP-XI.2.2 Phase 2 - 2 Buildings (G+5) & Remaining works + Project close out		201	22-Jul-21	14-Mar-22	10-Aug-22	-103
A5400	All Substructure works	0		22-Jul-21	22-Jul-21 A	
A5410	All Superstructure works	0		02-Nov-21	02-Nov-21	50
A5420	All Internal Fnishes & MEP works	0		07-Feb-22	01-Mar-22	29
A5440	Final testing & commissioning	0		22-Feb-22	07-Jun-22	-60
A5430	Service block & All External works	0		01-Mar-22	28-Jun-22	-72
A5450	Final snagging & Hand over to End users	0		14-Mar-22	10-Aug-22	-103
HCP-XI.2.4 Close out		12	28-Mar-22	11-Apr-22	07-Sep-22	-127
A1330	As built & Close out report	0		28-Mar-22	24-Aug-22	-115
A1290	Demobilization (Project Complete)	0		11-Apr-22*	07-Sep-22*	-127

Analysis of all critical and near critical paths should be noted and documented.

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4- Multiple Events in Different Timing

Multi-base Fixed Periods / Multiple Periods

Update For Period Ending On	Excusable Delays		Non-Excusable	Total
	Compensable	Non-compensable	Delays	Project Delays
29-Nov-05	0	5	0	5
13-Dec-05	3	5	0	8
27-Dec-05	0	0	5	5
07-Jan-06	2	0	0	2
TOTAL	5	10	5	20

Grouped Addition of Events
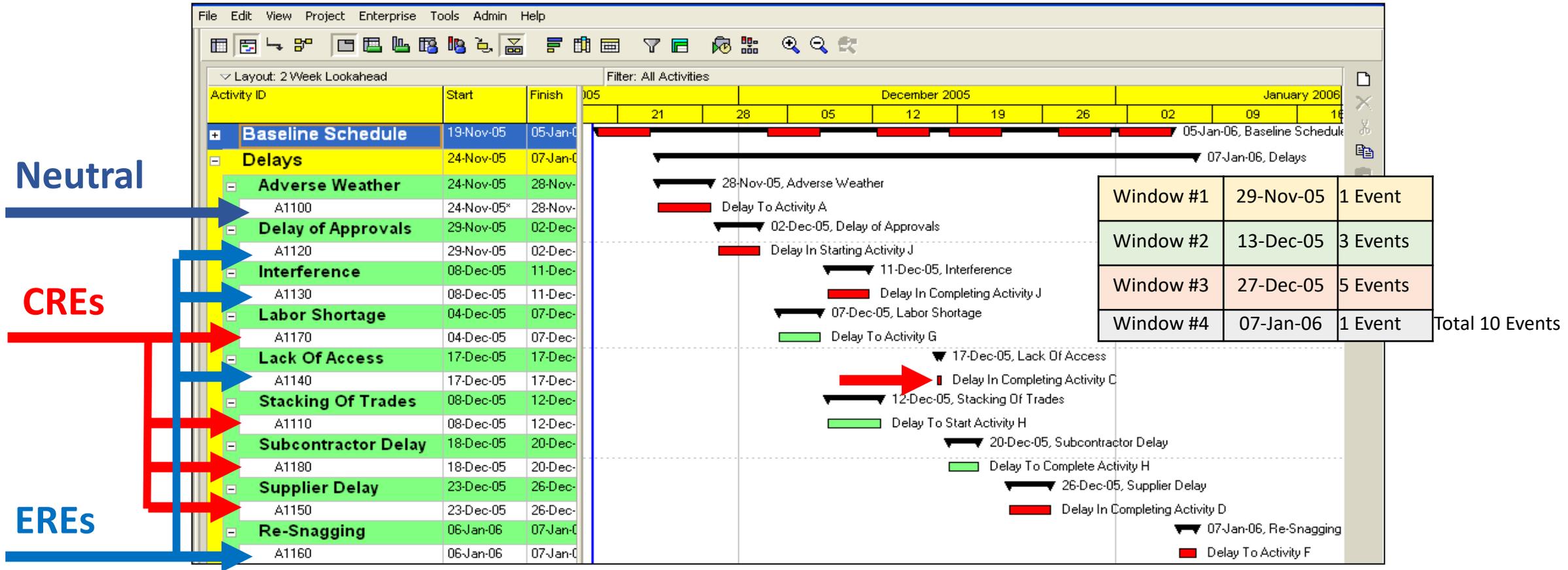
Grouping be the Responsible Party:

Neutral & EREs = 15 Days, EOT

Keep CREs only = Concurrency (10 Days, non-compensable)

Compensation = 5 Days (EREs without concurrency)

CHRONOLOGY OF DELAY

7.1 Delays Should Be Evaluated as They Occur in Chronological Sequence

7.2 A Schedule Delay Analysis Should Reflect an Analysis of Prior Entitlement so as to Reflect a Current Adjusted Completion Date Prior to Evaluating Delay

7.3 Consideration Should Be Included as to How Delays Were Evaluated by the Participants During the Project

7.4 Evaluation of Delay Chronology Should Be Documented and Supported with Contemporaneous Records
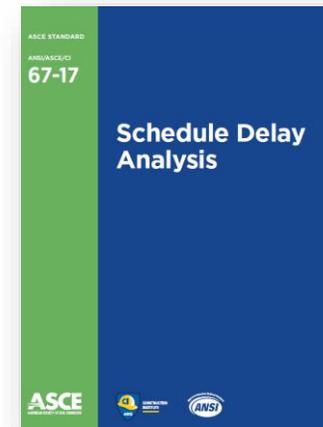
Float Paths Analysis

- Identify the <mark>critically delayed activities</mark> at every measuring point.

- Review the planned logic and evaluate any likely changes based on contemporaneous evidence.

- Be focused on the <mark>critical path and sub-critical paths</mark> or on key events and activities only, to reduce both the cost and the complexity of the analysis.

- Work plans involving physical process steps dependent (hard logic) upon earlier work being completed (serial in nature) will likely be <mark>harder to mitigate</mark>.
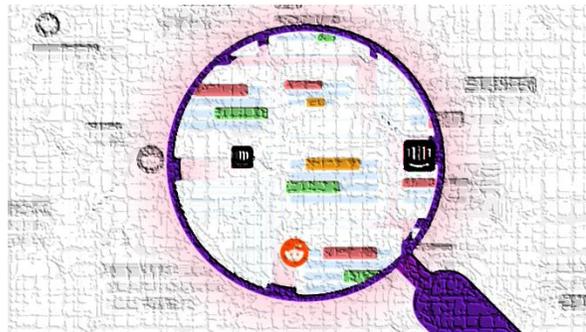
Excusability and Compensability
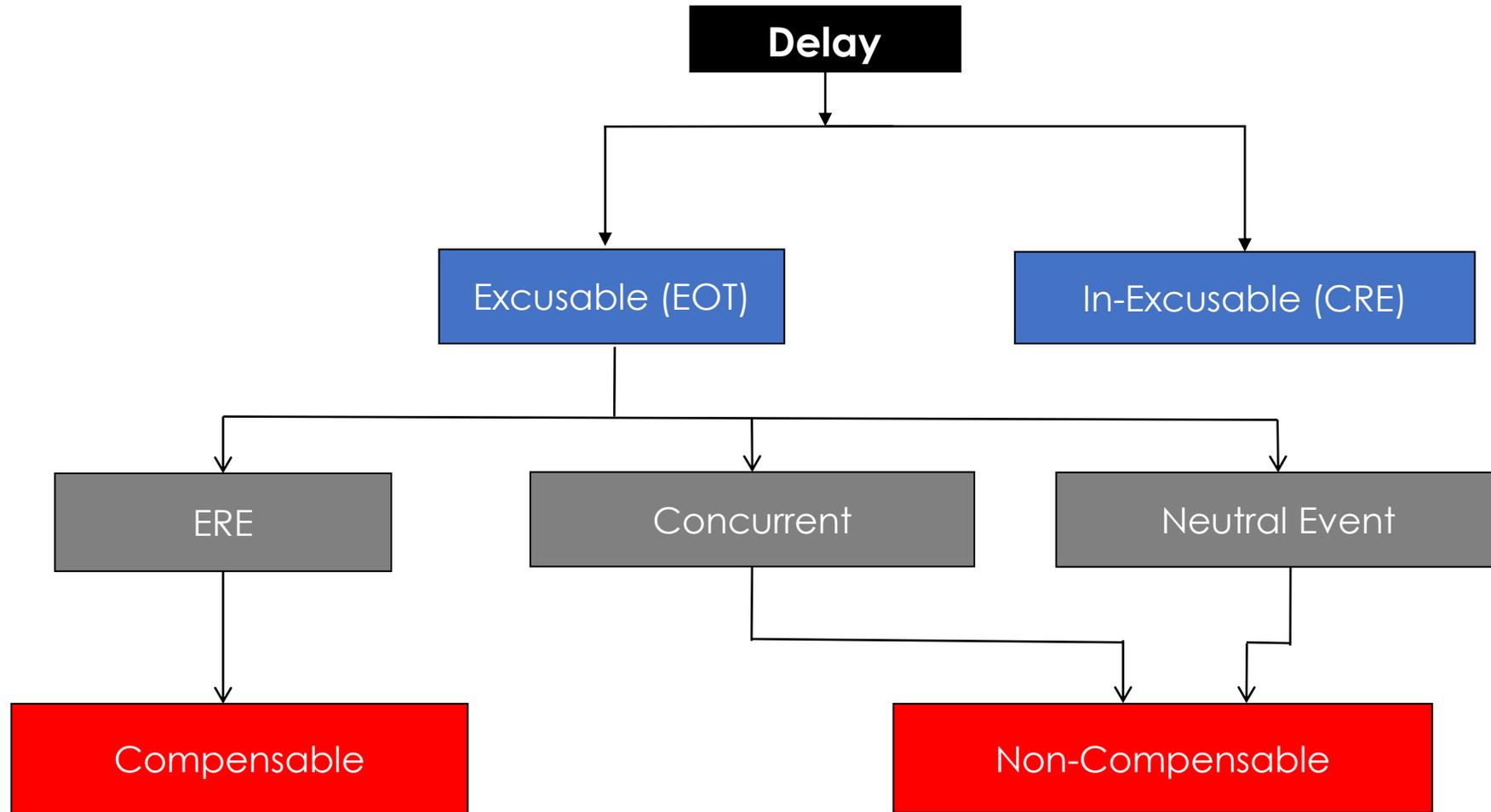
-CRE: Contractor Risk Event
-ERE: Employer Risk Event

5- Concurrent Delay Challenge

It is a primary condition to have a concurrent delay which is that the delay events are independent. This is one of the first checks to be done in analyzing the causation of the concurrent delay. **Overall, causation is a troublesome issue, particularly when there is a concurrent delay.**

True Concurrency Challenge

SCL Protocol: The term "concurrent delay" is often used to describe the situation where two or more delay events arise at different times, but the effects of them are felt (in whole or in part) at the same time. To avoid confusion, this is more correctly termed the "concurrent effect" of sequential delay events.

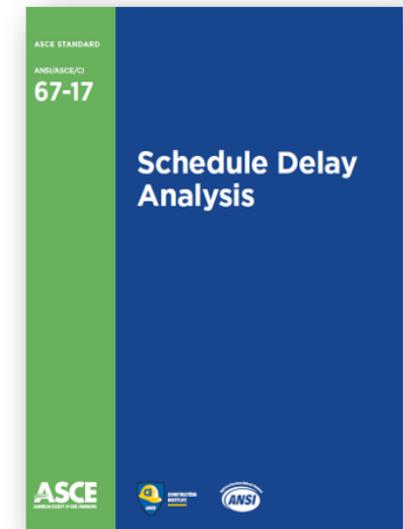**AACE differentiated** between literal concurrency (true concurrency-SCL) and functional concurrency (concurrent effect) considering that the functional theory recognizes the real-world limitations of exact measuring of delays and inaccuracy of programmes.

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**CONCURRENT DELAY - Description and Consequences (SDAS - ASCE, USA)**

8.1 Concurrent Delay Can Be Described as a Situation Where Two or More Critical Delays Are Occurring at the Same Time During All or a Portion of the Delay Time Frame in Which the Delays Are Occurring

8.2 Concurrent Delay ==Typically Is Excusable but Noncompensable==, Meaning a Time Extension Is Given but No Costs Are Recovered by Either Party

ASCE STANDARD
ANSI/ASCE/CI
67-17

Schedule Delay Analysis

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Concurrency Legal Principles

1. **Establishing Causation (Legal: breach or Factual: but for)**

2. **Prevention Principle**

3. **A Party Shall Not Benefit of Its Own Wrong**

4. **Contributory Negligence**

5. **Contractual Mechanism for Extension of Time**

6. **The "Dot On" Principle**

7. **Other Legislations - CMS**

CMS
Law.Tax

CMS Guide to Concurrent Delay

July 2020
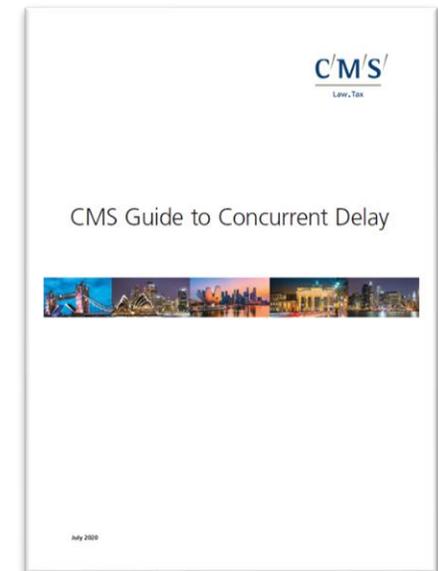
Concurrent Delay Approaches

Time-but-no-money Approach	Dominant Cause Approach	First-in Line Approach	Apportionment Approach	Full period-Malmaison & Burden of Proof Approach

In conclusion, Malmaison approach (English School) looks mainly for the extension of time entitlement, and the burden of proof approach can examine the compensation and damages.

On the other hand, dominant cause (all-or-nothing) and apportionment approaches (Scottish school) assign the full liability to one party or apportion the liability of delays and decide the extension of time and damages accordingly.

Overall, the "time but no money" approach can be considered a fair solution as an application of sett off (USA: no harm, no fool).

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Evaluation Example

<u>Determination and Quantification</u> of Excusable and Compensable Delay. An additive-modeled schedule by itself does not account for concurrent delays and compensability. However, it is <u>possible to analyze for approximate</u> concurrency by comparing two additive-modeled schedules (one by inserting all owner-caused and force majeure-caused impact events into the baseline & another one by inserting all contractor-caused impact events into the baseline).

Delay NO	start Date	New Comletion Date	Description	EC	EN	NN
1	02-Jan-22	11-Apr-22	Normal case without any delay	0	0	0
2	02-Jan-22	26-Jun-22	Building (A) is delayed for 4 months in the skeleton	0	0	76
3	02-Jan-22	07-Sep-22	The owner changed the design of MEP The material required will be delivered after six months	149 / 73	76	0
4	02-Jan-22	26-Jun-22	when fragnet = zero .			

- The Project delay by Contract (76 days) is Non Excusable Non Compensable.

- The Project delay by Owner (149 days) is Excusable.
- The Extension of time = 149 days.
- The approx. compensable prolongation (Excusable Compensable) =149-76= 73 days.

Prolongation Cost (Compensation)

Unless expressly provided for otherwise in the contract (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.

I   Preliminaries (works package contract)

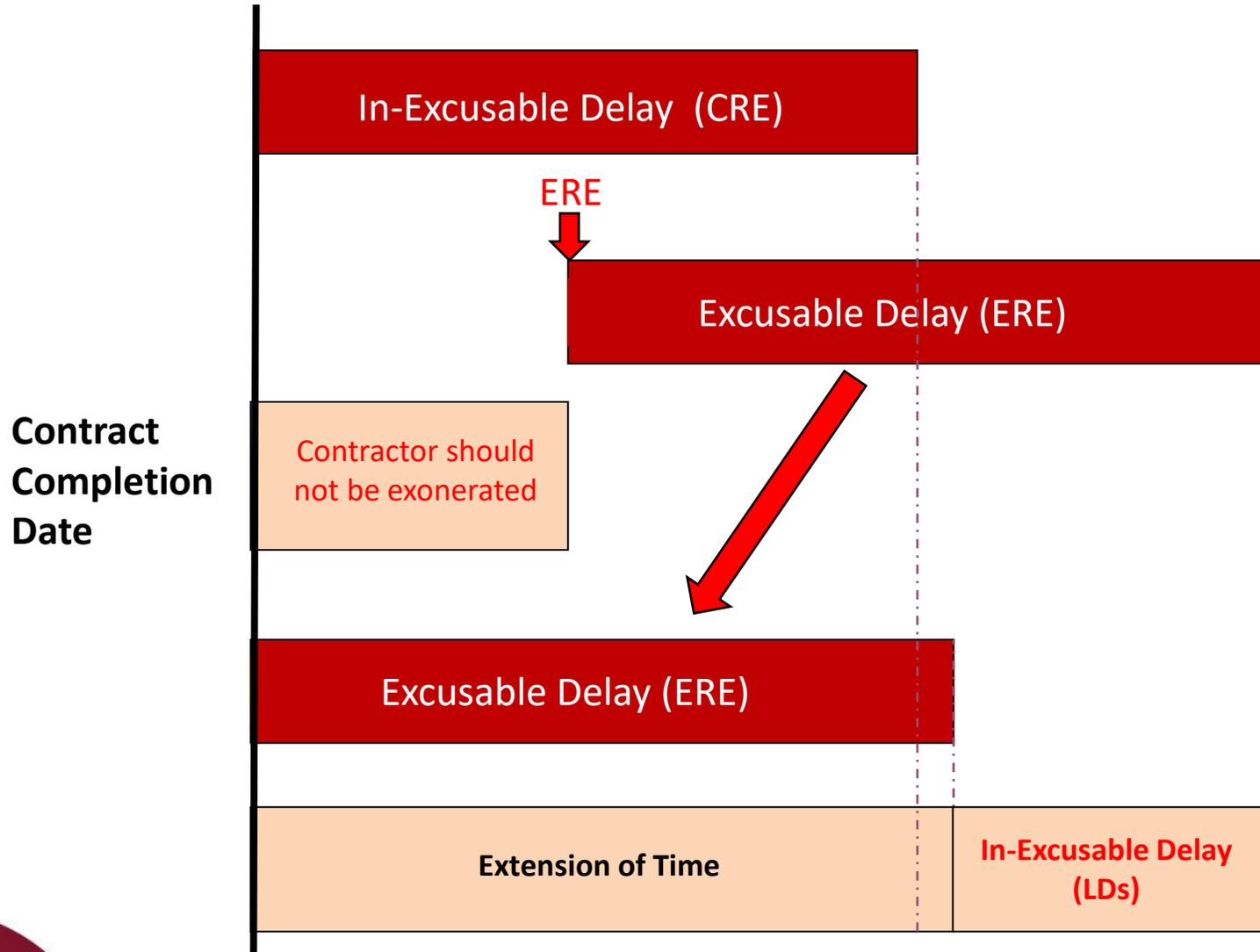RICS · NRM 2 · 2nd edition UK October 2021

Cost centre	Component	Time-related charges	Fixed charges	Total charges
		£ p	£ p	£ p
1	Preliminaries			
1.1	Employer's requirements			
1.1.1	Site accommodation			
1.1.2	Site records			
1.1.3	Completion and post-completion requirements			
1.2	Main contractor's cost items			
1.2.1	Management and staff			
1.2.2	Site establishment			
1.2.3	Temporary services			
1.2.5	Safety and environmental protection			
1.2.6	Control and protection			
1.2.7	Mechanical plant			
1.2.8	Temporary works			
1.2.9	Site records			
1.2.10	Completion and post-completion requirements			
1.2.11	Cleaning			
1.2.12	Fees and charges			
1.2.13	Site services			
1.2.14	Insurance, bonds, guarantees and warranties			
	Totals	£		
	Total carried to main summary		£	

1.2.3	Temporary services			
1.2.3.1	Temporary water supply			
1.2.3.2	Temporary gas supply			
1.2.3.3	Temporary electricity supply			
1.2.3.4	Temporary telecommunication systems			
1.2.3.5	Temporary drainage			
1.2.4	Security			
1.2.4.1	Security staff			
1.2.4.2	Security equipment			
1.2.4.3	Hoardings, fences and gates			
1.2.5	Safety and environmental protection			
1.2.5.1	Safety programme			
1.2.5.2	Barriers and safety scaffolding			
1.2.5.3	Environmental protection measures			

6- Special Case: ERE after the contract completion date

SCL 10.14: Employer Delay to Completion does not exonerate the Contractor for all its delays prior to that Employer Delay to Completion occurring. **The effect of the Employer Delay should be assessed and any EOT determined due should simply be added** to the contract completion date.
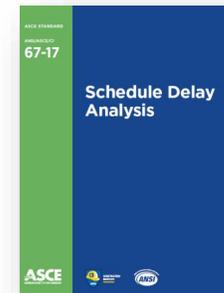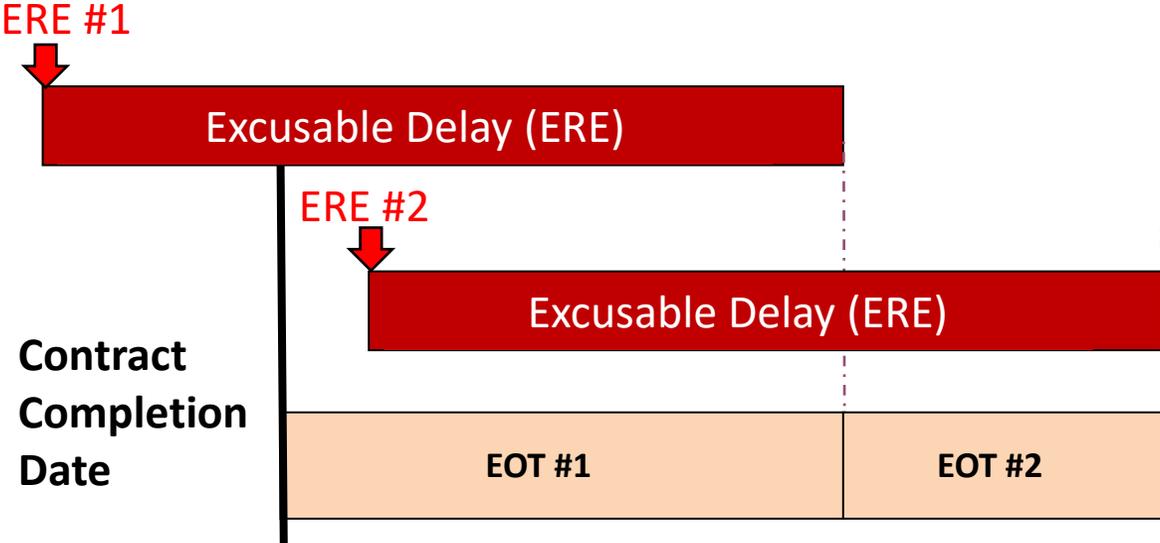
ASCE DAS 4.6: This type of delay is referred to as "offsetting delay" recognizing that an owner-caused delay may result in recognizing a noncompensable time extension to offset all or a portion of any potential liquidated damages.

Extending Project Duration

The "Dot On" Principle

The Net Method vs The Gross Method

The "dot on" principle adds the **duration of the extension of time** to the current completion date, not to the date of the event (the gross method). Therefore, each time the contractor gets an extension of time, it should be added contiguously according to *Balfour Beatty* (1993) and *Carillion Construction* (2017).

ERE #1

Excusable Delay (ERE)

ERE #2

Excusable Delay (ERE)

Contract Completion Date

EOT #1	EOT #2

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Challenge → Tactics and Techniques

Causation and Responsibility
→
Contractual Risk Allocation

CPM Calculation
→
Validation and Neutralization

Contribution among Events
→
Fragnet Negative Float

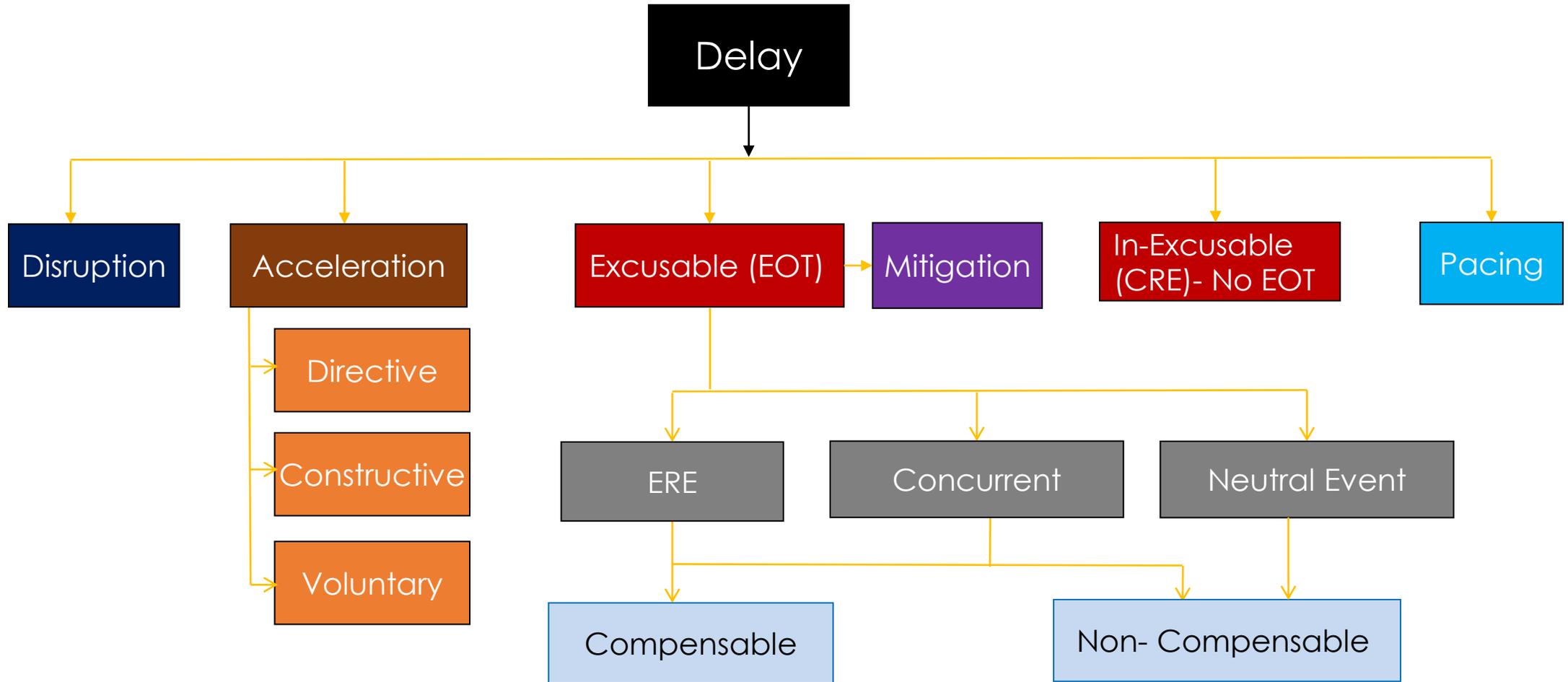**Delay Events Timing**
→
Multi-base Windows

Concurrent Delay
→
Agreeing on the Approach

ERE after Completion Date
→
Dot-on Principle

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Delay Related Measures

Excusability is a prerequisite to compensability

Closing Notes

EOT Claims Procedure

-Contractual entitlement
Typically, construction contracts contain provisions entitling the contractor to an extension of time on the occurrence of a particular event provided the progress of the works or time for completion is delayed as a consequence.

-Contractual compliance
Generally within an extension of time clause, the contractor will be obligated to submit notice(s) and detailed particulars within a specified time frame.

-Governing Law
FIDIC 2017 for Construction: **1.4 Law ..**

The Contract shall be governed by the law of the country (or other jurisdiction) stated in the Contract Data (if not stated, the law of the Country), excluding any conflict of law rules.

FEATURE ARTICLES

FIDIC's clause 20.1 – a civil law view

Mauro Rubino-Sammartano
Bianchi Rubino-Sammartano e Associati, Milan

One contracting party should be prevented from oppressing another contracting party. This article offers a civil law view on one of the most delicate provisions of the FIDIC forms of contract: clause 20.1, which deals with claims for extensions of time and/or additional payment.

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Logic and Common Sense

Unquestionably, critical path analysis is a helpful evidential tool, but it is not always determinative as it has some limitations according to *Mirant Asia Pacific* and *London Underground Ltd v Citylink Telecommunications Ltd*.

If there are insufficient records, the analyst will be in serious difficulty. Furthermore, quality of data is crucial, and it may **affect the correctness of the analysis**.

These limitations are clear from the fact that **analysts may produce different assessments**, whether, or not, they have used the same data and methodology because of the level of subjectivity and amount of assumptions they involve in identifying the sequence and interpreting results.

Therefore, as it is subjective in nature, it should consider applying common-sense tests.

In *John Barker Construction,* the judge said that: "the architect, amongst other things, must make a "logical analysis" in a methodical way of the impact which the relevant matters had or were likely to have on the contractor's planned programme." Logical analysis should be based on facts and common sense in order to reach **reliable results**.

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Dispute Crystallization

SCL 4.6 If the **Contractor does not agree** with the CA's decision, it should so <u>inform the CA immediately</u>. Disagreements on EOT matters should not be left to be resolved at the end of the project. If no agreement can be reached quickly, steps should be taken by either party to have the dispute or difference resolved in accordance with the **<u>contract dispute resolution procedures</u>**.

BUILDING DISPUTES

My Related Publications

Project Planning and Scheduling	Delay Analysis	Contractual and Legal Aspects

Scheduling Fundamentals
Planning and Control
Ver.05 (50 Procedures)

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Fundamentals of Construction Contracts
Ver. 2021 (50 Topics with examples)

Prepared by:
Mohamed Maged, MBA, PGDIP, CCP, PMP
Profile:
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Thank You