Session 3B

TIME IMPACT ANALYSIS BASED ON RETROSPECTIVE VIEW

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SPEAKER : Jungjoo, Im

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- **Arbitrator / Expert of KCAB**

Over his 25-year career span in the construction industry, he has been standing by his clients to successfully deliver complex and high-profile construction projects. His experience encompasses a wide variety of market sectors including oil & gas facilities, power plants, large commercial & residential development, telecommunication and infrastructure around the world including Europe, Asia and the Middle East.

He witnessed construction projects which focus on the cost management often neglecting a series of risks arising from a poor time management. As an industry veteran with a specialty managing time risks factored in contracts, claims and construction, he offers The TEAM's service to provide clients with a comprehensive project management service through each phase. Prior to founding The TEAM Co. Ltd., He was Team Leader of Prime Contract Team, SK E&C.

1. Introduction

- Among the various techniques used for analyzing delays, four methods are widely used:

Method	Approach	Strengths	Weaknesses	Reliability
Impacted As-Planned	Additive	Easy to understand	Theoretical results	Low
Time Impact Analysis	Additive	Contemporaneously	Technically complex	High
Collapsed As-built	Subtractive	Relies on As-built	Reconstructing	Medium
As-Planned vs As-Built	Analytical	Easy to understand	As-built required	Medium

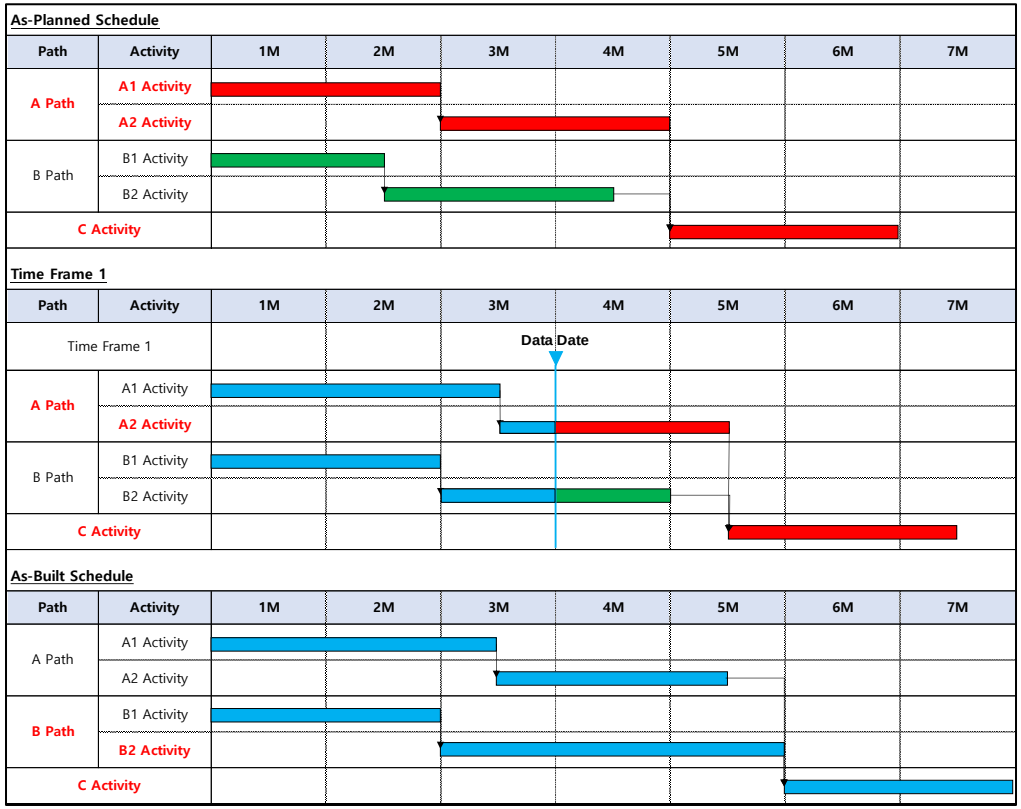
- **Core Principle 4:** TIA is recognized as a primary, precise, and structured method for assessing EOT entitlements.
- **Core Principle 11:** Prospective TIA may be inappropriate when EOT is assessed retrospectively after completion or long after an Employer Risk Event.

- This creates a practical dilemma for practitioners because:

  ✓ **Parties often fail to reach agreement on time impact during execution**
  ✓ **EOT procedures frequently begin only as projects near completion**
  ✓ **Full impact duration is difficult to determine while events are ongoing**

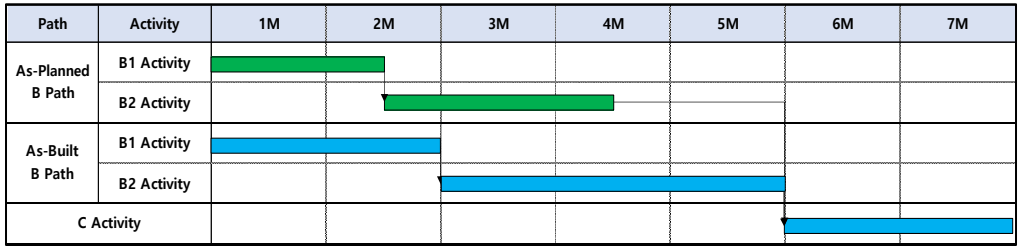
2. Weaknesses in As-Planned vs As-Built Method Approach

- Time Frame or Window



	A	B
Time Frame 1	15	-
As-Built	-	15
Total	15	15

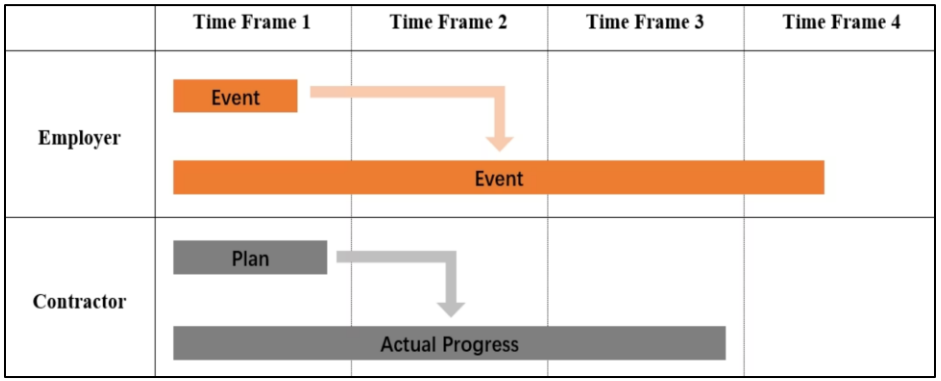
- As-Planned vs As-Built



	A	B
As-Built	-	30

3. Challenges in Applying TIA Retrospectively

- Retrospective TIA creates methodological challenges.
- Timing misalignments may distort delay assessment accuracy.



Event Timing Distortion

Retrospective modeling extends Employer Risk Event impact to later frames, inflating delays and obscuring intervening events.

Contractor Delay Overstatement

In contractor's activities, retrospective use of actual completion may overstate Contractor delays in earlier frames

Technical Safeguards Required

Mitigation requires isolating delay impacts by discrete time-frame analysis before projecting outcomes.

4. Methodological Enhancement Requirements

- Retrospective TIA requires methodological refinements for accuracy, defensibility, and focus on three key components.

Risk Events

Model events as Fragnets, distinguishing Delayed Actions vs. Significant Changes with proper time-frame considerations.

Progress Tracking

Input progress at each data date based on foreseeable conditions, not retrospective outcomes.

Relationship Logic

Define logic to reflect true sequence and causation, not retrofitted to as-built data.

- Adopting refinements enables precise, structured, and defensible retrospective TIA analysis.

5. Risk Events: TIA and Windows Analysis

- Major differences between TIA and Window Analysis

No.	Title	Time Impact Analysis	Windows Analysis
1	Delay Allocation Method	• Delays are measured by inserting fragnet(s) at the Data Date and • Each Time Frame isolates new delay impacts, while excluding previously analyzed delays.	• Delays are strictly confined within predefined analysis windows. • Delay impact must be measured only within the boundaries of each window.
2	Analysis Approach	• Adopts a forward-looking, prospective method, evaluating how a delay would affect the project from the point it occurs.	• Uses a retrospective, segmented approach, analyzing the schedule in sliced time periods.
3	Analysis Period Definition	• The “analysis period” begins at the Data Date and extends through the project’s forecasted schedule.	• The “analysis period” is a fixed window.

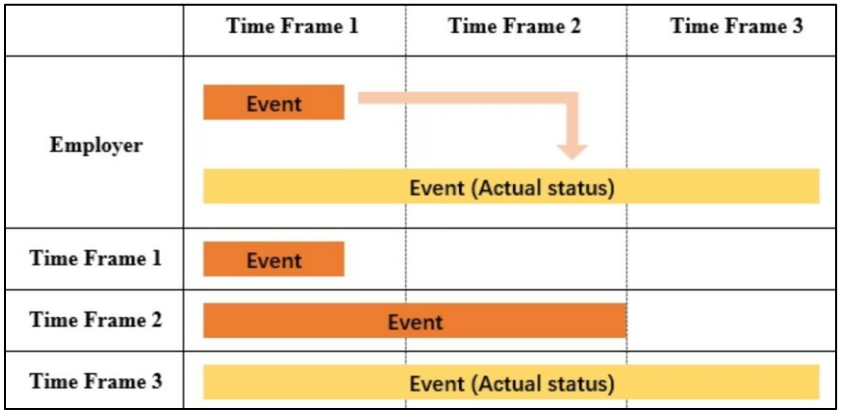
- This distinction is essential when choosing the appropriate method for delay analysis, particularly in forensic review, where accurate attribution of responsibility is critical.

6. Risk Events: Classification and Modelling

- When applying TIA retrospectively, events should be modeled as Fragnets with a clear distinction between two types:

Delayed Action

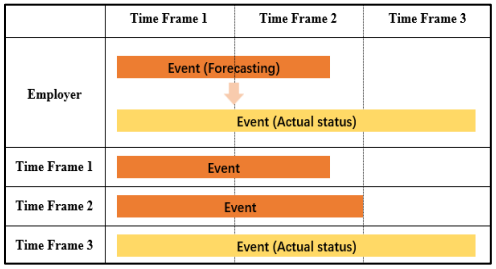
Employer-caused delays (late decisions/instructions) require progressive impact updates per time frame with available information.



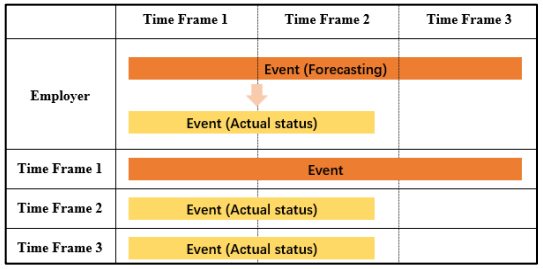
Significant Change

Substantial scope/execution deviation; if foreseeable, include projected effects beyond initial time frame.

1. First Scenario

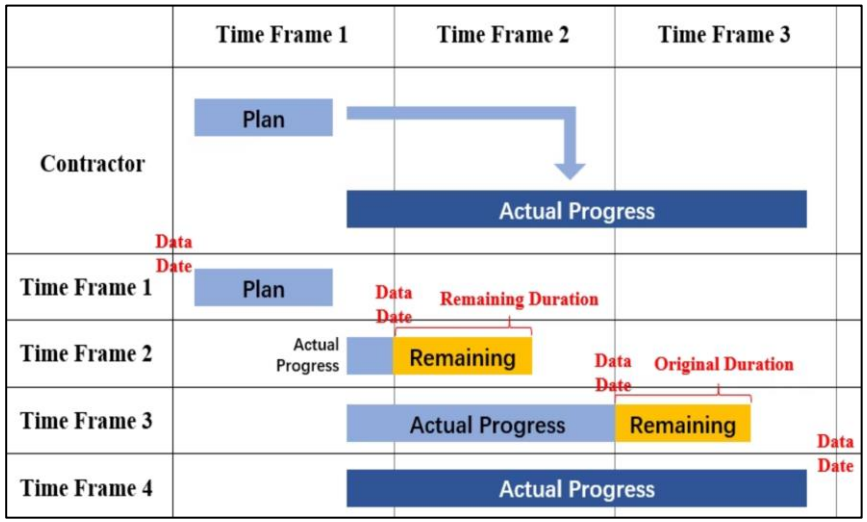


2. Second Scenario



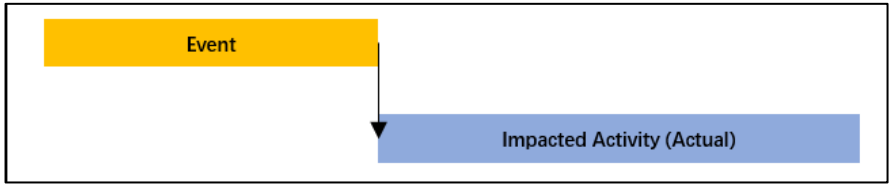
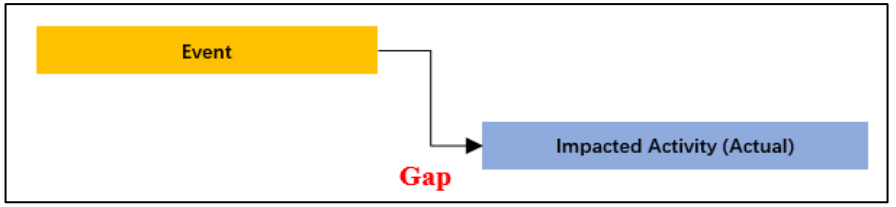
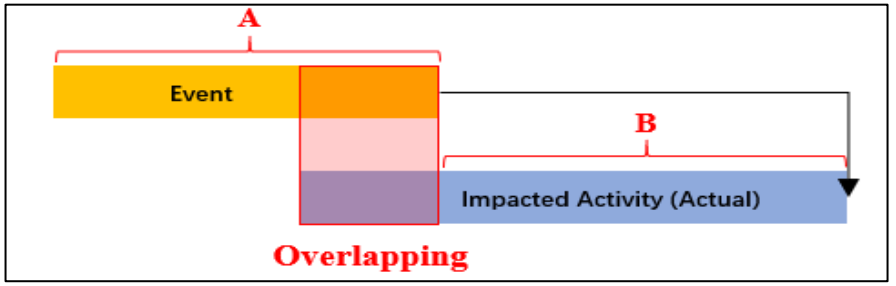
7. Progress: Accurate Time Frame Assessment

- In TIA, Contractor's progress is input by Data Date, enabling identification of delays or mitigation within each period.
- Significant delays require careful assessment of how progress and remaining duration are recorded across Time Frames.



Time Frame	Description
1	• With Data Date at the beginning, no actual progress exists; activities right of it represent forecasted work.
2	• Key is the anticipated completion date at that time, not the actual date
3	• Actual completion must be considered; if forecast exceeds it, adjust Remaining Duration to align with actual completion.
4	• Finalize progress by recording the activity's actual completion date from site.

8. Relationships: Logical Connections Between Activities

Case	Description		Figure
1	Sequential Completion	• If Event completion aligns with Impacted Activity start, apply FS link without lag to represent dependency accurately.	
2	Gap Between Activities	• If a gap exists, avoid adding lag; it may indicate Contractor delay, not Employer responsibility.	
3	Overlapping Activities	• For overlapping Event and Impacted Activity, use FF with a measured lag reflecting actual influence, not exceeding the Event's duration.	

- The calculated delay period should never exceed the maximum duration of the Event or input value defining its impact scope, as the purpose is to calculate the pure delay attributable to the Event itself.

9. Conclusion: Enhancing Retrospective TIA

- TIA method, while originally intended for prospective use, can be effectively applied retrospectively when EOT claims are prepared toward project completion.

Model Events Appropriately

Distinguish ‘Delayed Actions’ (each frame) from ‘Significant Changes’ (foreseeable impacts) to preserve progressive analysis integrity.

Input Progress Accurately

Reflect reasonable expectations at each Data Date-not as-built. RD must never exceed OD unless formally agreed.

Define Relationships Logically

Logic types must reflect actual sequence and dependency observed at the time - not just match completion dates.

- With proper refinements, retrospective TIA provides objective, defensible delay quantification, mitigates hindsight bias, and supports forensically credible, contractually sound, fair dispute resolution.