Time Impact Analysis

Presented by Abe Nejad and Cody Belcher
Agenda

- Introduction
- Objective
- What, why and when to use a Time Impact Analysis (TIA)
- TIA Considerations
- TIA Process (TIA Timing: Prospective Vs. Retrospective)
- Concurrent Delays
- TIA Cost Considerations
- TIA from Subcontractors
- Summary
- Q/A
Objective

The objective of this presentation is to inform staff on the value and standard use of TIA in the firm. Specifically highlight:

- Claim Management Analysis
- What is a TIA?
- The advantage of a TIA “why use”
- Defining a standard to develop a TIA
- What TIA considerations should you understand
- What are the steps and LOE for TIA preparation
- Address concurrence in with a TIA
Claim Management

Claim Management is a method of entitlement analysis for incurred project impacts. This method considers multiple evaluations and considerations of the following:

- Contract Requirements (Plans & Specs)
- Financial Compensation
- Third Party affects
- Regulatory Compliance
- Stakeholder influence
- Time Impacts

This presentation will focus on the Time Impact Evaluation technique also known as TIA.
What is a Time Impact Analysis (TIA)

• A TIA is a schedule delay analysis procedure developed to facilitate the award of contract time extensions due to delays that are not the responsibility of the General Contractor.

• TIA is a “Forward Looking” prospective analysis which models and determines the impact of a delay to project completion on an excepted project schedule baseline or update.

• TIA preparation and presentation is defined by many accredited associations in the engineering and construction industry. Below are references to these associations.

AACE Article 52R-06

USACE Section 01.32
WIA vs. TIA

A What-If-Analysis is a exercise to look at potential options before a impact occurs. It also is a process to explore possible changes (owner/sub/GC impacted)

WERE AS......

A TIA focuses on impacts that have already occurred or occurring.
Why a TIA?

Why and When would you need to develop a TIA?

Why?
- Unforeseen Conditions
- Owner Equipment Delays
- Limited/Restricted Access
- Change in Design
- Change in Contract Requirements
- Environmental Impacts
- Excessive Adverse Weather
- Mitigate scope risk
- Request for Proposal
- Late NTP
- Undisclosed Site Conditions
- Defective Contract Documents
- Funding Changes
- Unreasonable Inspections
- Excessive RFI’s

When?
- Owner Directed Analysis
- Productivity Impacted Recovery
- Lost Days Recorded
- Budget Impacts
- Delays to the Contract Duration
- Contract Requirements
- Change Orders
During the schedule update process, delays may occur which will require analysis. These delays could be from any impact to the project schedule resulting from something quantifiable such as:

- Schedule slips beyond Contract Completion Date (CCD);
- Project Total Float set by a constraint becomes negative;
- Interim Contractual Milestones are delayed
- Major component of scope impacting other major scope components

The CDM Smith standard for determining the extend of impact to project completion from a potential or actual delay event (a.k.a) the Time Impact Analysis (TIA)
Change Management and TIA’s Require Proper Scheduling Standard Practices

A successful TIA requires a proper project baseline schedule be developed and routinely maintained (Reference lesson 2 and 3)

This routine schedule maintenance and documentation include:

• Maintaining a reasonable level of schedule detail;
• Correct activity and logic status;
• Consistent and documented changes during the update period

Without this effort noted above the LOE (time, cost and resources) to develop documentation after the fact takes much longer and increases project risk!
Prior to initiating a TIA, determine all contract requirements associated with a TIA (claim) and gather all contract documents to support the full analysis.

Most contract languages associated with a TIA is defined in the general conditions and supplemental conditions of the contract. Further details also can be found in Specification sections 01250 and 01310.

At a minimum standard CDM Smith has developed recommended language for TIA located in Section 01310.3.05 “ADJUSTMENT OF CONTRACT SCHEDULE AND COMPLETION TIME”
TIA Considerations (con’t)

- Risk allocation (sharing) in construction contracts (JV)
- Responsibly for mitigation of delay, regardless of source
- Format for dispute resolution
- Timely written notice
- Overcoming the “bottle Neck’n” to perform a TIA
  - No baseline
  - No proactive compliant updates
  - Lack of relevant documentation
  - Client sophistication on contract terms
  - Concurrence
  - LOE to recreating the story
  - Capture impacts costs
- Again……………Project (schedule) documentation!!
Steps for TIA Preparation

The TIA process can be segregated into five steps:

1. Identify impact events and build them into a schedule “Fragnet”; (MOST CRITICAL)
2. Identify schedule update version at the time when impact starts;
3. Model impact Fragnet into selected schedule;
4. Recalculate the schedule with the incorporated impacts;
5. Quantify resulting impact to existing schedule and perform entitlement analysis

Note: Although defining cost may be required to support a claim, it is intended that the TIA process separate time from cost considerations. Cost should be derived after time has been established, not traded back and forth as a negotiation positions. This traditionally would be negotiated to the benefit of both parties.
TIA Step 1

Identify Impact Events and Develop a Fragnet

- Locate pertinent contemporaneous documents (i.e., RFI’s, Change-In-Conditions, Change Orders, MODs, etc.);
- Identify impact causal factors and sequence of events;
- Identify added work impact activities;
- Identify and quantify impacts to existing baseline contract work activities;
- Segregate activities and establish start and finish dates

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<tr>
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<th>Activity Name</th>
<th>Dur</th>
<th>Start</th>
<th>Finish</th>
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</tbody>
</table>

![Gantt Chart](image)
TIA Step 1

Identify Impact Events and build them into a schedule “Fragnet”

• The schedule fragnet should consist of a subset of the activities in the project schedule that will be involved directly with the delay
• For ease of comprehension and review, the delay should be described as simply as possible
• Use the fewest number of activities and relationships added in order to substantially reflect the impact of the delay to the schedule
• Shown detail should be consistent with the nature and complexity of the change or delay being modeled
• Added activities should be numbered in a logical manner to make it easy to distinguish them as new activities associated with the delay
TIA Step 2

**Identify Schedule Update Version at the Time When Impact Starts**

- Based on schedule Fragnet, establish start of impact;
- Identify the appropriate schedule version at the time (Baseline or Monthly update) accepted immediately prior to start of impact event;
- Identify Critical Path Work;
- Identify forecasted overall project completion date

**TIA Timing: Prospective Vs. Retrospective**
TIA Step 2

Identify Schedule Update Version at the Time When Impact Starts – Practices

• Select the appropriate accepted schedule update in existence when the impact started.
  Example: The appropriate schedule should be the last Owner-accepted schedule update prior to the time of the change/delay – OR - The original baseline schedule should be used if the delay began prior to the first schedule update.

• If the time interval between the start of the delay and the last accepted schedule update is too great (or if significant deviation to the schedule was experienced between the last status date and the start of the delay), then provide a new schedule and update with a status date immediately prior to the start of the delay.

• The schedule to be impacted is called, “the contemporaneous schedule update baseline.” The data date should remain the same for both original schedule update and impacted TIA reference schedule.
TIA Step 3

Insert Impact Fragnet into Selected Schedule

• Identify schedule activities related to and potentially delayed by impact event;
• If necessary, split existing activities into two or more activities where impacted;
• Identify predecessor work activity completed prior to start of impact even;
• Identify Successors work activities completed after impact event;
• Identify ongoing work activities that may be extended as result of impact event;
• Insert logic relationship as required.

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<th>Finish</th>
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<td>C-650</td>
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<td>0 d</td>
<td>1/20/14</td>
<td>1/20/14</td>
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</table>

Inserted Delay Fragnet Activities “Modeled, Additive, Single base”
TIA Step 3

Insert Impact Fragnet into Selected Schedule – Practices

• Insert the fragnet into a copy of the contemporaneous schedule baseline update prepared as described previously.

• Using the accepted impact Fragnet as a template, add the impact activities and logic. Make the accepted activity adjustments to the existing activities as necessary to mirror the fragnet.

• Set the duration of the delay activities to zero and recalculate the CPM.

• At this point in the analysis, all forecasted and actual dates in the TIA schedule update should match that from the contemporaneous schedule update baseline. If all dates do not match, then review and correct the fragnet insertion relationships and lags as needed until they do match.
TIA Step 4

Recalculate the Schedule with the Incorporated Impacts

• Recalculate schedule with added Fragnet activities duration set to zero to verify integrity of logic relationships;
• Input actual duration of added Fragnet activities;
• Recalculate the schedule to identify changes to forecasted overall project completion date

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<td>C-450</td>
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<tr>
<td>C-650</td>
<td>Project Completion</td>
<td>0 d</td>
<td>1/20/14</td>
<td>1/20/14</td>
</tr>
</tbody>
</table>

Data Date: 4/30
Start of Impact: 7/2
End of Impact: 7/2
Project Completion: 1/20/14
TIA Step 4

Recalculate the Schedule with the Incorporated Impacts – Practices

• Insert the durations used in the fragnet into the added delay activities and re-compute the CPM.
• Address any schedule logic issues and document any logic edits
• Analyze if the added delay activities did or did not impact the Critical & Near-Critical Activities as well as Interim Project Milestone and completion
TIA Step 5

Quantify Resulting Impact to Existing Schedule

- By comparison to the un-impacted schedule, quantify delay to forecasted overall project completion date;
- Review and verify integrity of the Critical Path activities;
- Prepare a written narrative explaining:
  - What was supposed to happen,
  - What actually happened
  - Why the change occurred
  - Who is responsible
  - How much Time the Contractor is entitled to be granted/compensated
  - Separately determine Cost should be derived after time has been established
TIA Step 5

Quantify Resulting Impact to Existing Schedule – Practices

- Identify the activity indicating project completion and note any change in the project completion date.

- Determine the amount of time impact for the project. If the contract specifies work days, then this unit of measurement should be made in work days, vs for calendar days.

- Determine the actual dates of the impact. Using the original schedule update, determine if the added change activities were substantial enough to impact the project critical or sub-critical path.

- Quantify Excusable versus Non-Excusable Delay as well as Compensable versus Non-Compensable Delay

- Document the TIA process and the results
Camp Pendleton Project

DBOM II $160 M

SRTTP Process Areas Expansion
7.5 MGD

SRTP Process Area
7 MGD

HRTP Process Area 4 MGD

TAPS 12 Conveyance

Perc Pond Solar Arrays 4.3 MW

NRTTP Plant Solar Arrays

Multiple Delays for all Sub-Projects

P-1041 TIA No.1 $4.5 M

P-1043 TIA No.1 $12 M
Camp Pendleton TIA Example

Project Incurred an Excusable & Compensable Delay of 340 Days

Data Date

Camp Pendleton TIA Example

24

NRTTP Plant Construction

As-Planned

Gov’t Provide Site Access

CCD

10/12

Commissioning

Final Inspection & Closeout

NTP

9/27

Gov’t Delay

Original Contract Duration:

Gov’t Site Access Delay

CERS 1 Environmental Access Delays

New CCD

9/16

Impact Contract Duration: 1085 Calendar Days

NRTTP Plant Construction

Impacted

As-Planned

Gov’t Provide Site Access

NTP

9/27

Commissioning

Final Inspection & Closeout

Gov’t Site Access Delay

CERS 1 Environmental Access Delays

New CCD

9/16

Impact Contract Duration: 1085 Calendar Days
TIA Analytical Reports

Either required by the contract or agreed to by all parties, reports and graphics are essential in communicating critical information. The following are examples of some proven successful reports presented to illustrate different ways to establish your position in a TIA negotiation:

1. Variance Report
2. Fragnet
3. Critical and Near-Critical Activities
4. Network Logic Analysis

NARRATIVE EXAMPLES
Concurrent Delays

A concurrent delay occurs when a contractor and an owner have both caused independent critical path delays that affect the completion date of a project and are at the same approximate time period.

**Concurrent Delays Considerations**

- Identification of Critical and Near-Critical Paths (example)
- Whom/which party caused the delay and whom resolved the delay
- Are the delays even close to the critical path, prior and post impacts
- Are the delays independent or related (Inextricably intertwined)
- Whom was notified/whom knew of the delays
- Confirm concurrent delays has no bearing on a single issue TIA
Concurrent Delays Considerations (Cont.)

- Determination and Quantification of Excusable and Compensable Delay
  - Excusable and Compensable Delay (ECD)
  - Non-Excusable and Non-Compensable Delay (NND)
  - Excusable and Non-Compensable Delay (END)

- AACE 29R-03:

**Net Affect Matrix - Concurrent Delay**

<table>
<thead>
<tr>
<th>Delay Event</th>
<th>Concurrent With</th>
<th>Net Effect</th>
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<tbody>
<tr>
<td>Owner Delay</td>
<td>Another Owner Delay or nothing</td>
<td>Excusable &amp; Compensable to the Contractor</td>
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<tr>
<td>Owner Delay</td>
<td>Contractor Delay</td>
<td>Excusable but Not Compensable to both Parties</td>
</tr>
<tr>
<td>Owner Delay</td>
<td>Force Majeure Delays</td>
<td>Excusable but Not Compensable to both Parties</td>
</tr>
<tr>
<td>Contractor Delay</td>
<td>Another Contractor Delays or Nothing</td>
<td>Non-Excusable to Contractor, Compensable to the Owner</td>
</tr>
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<td>Contractor Delay</td>
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</tbody>
</table>
Concurrent Delays (examples)

1) Owner - Owner Provided Pump Equipment Delivery Delay
2) Contractor - Delay on Pump Pad Construction From Bad Concrete Pour

1) Project Delay From Encountered Unknown Bad Soils for Excavation
2) Contractor Delay from Internal Delayed Shoring P.O. and Submittals
TIA Cost Considerations

Although the intent of this exercise is not to provide process of how to cost load claims or change orders, there are several considerations for developing compensation associated with a TIA impact.

1. Verify and establish rules/requirements for cost assessment noted in the contract documents.
2. Define if cost in working days and calendar days
3. Acceleration evaluation and/or productivity impacts
4. Partial/full impacted days
5. Project re-sequence/logic changes to crew and resources availability
6. Design/subcontractor impacts (duration totals)
7. Define any office/overhead draw down periods
8. Define any concurrent delays or non-compensable time

Note: A TIA may conclude no additional days, but would have cost impacts (i.e. productivity, shipping)
Many times, time impacts are requested from our subcontractors. These impacts can be grouped into two categories, owner impacts and general contractor impacts.

**Owner Impacts**

Less contentious position, owner impacts to subcontractor work on the CP can easily follow the process noted before as requested days and compensation would be passed to the owner.

If the impacted work is not on the critical path, then an extension of the existing process would be required to justify subcontract impacts to their specific work.

**General Contractor Impacts**

In this matter, CDM Smith would evaluate a subcontractor TIA. It is recommended that the subcontractor also follow the process that CDM Smith would provide the owner.

Incorporate the subs impacts into the CDM Smith master schedule for further evaluation.
TIA Summary

At this point you should be able to demonstrate a clear understanding of the TIA process. Specifically the following:

- What is a TIA
- Why and when to develop and use a TIA
- Know the Contract TIA requirements
- Implement the 5-step TIA process
  1. Identify impact events and build them into a schedule “Fragnet”; (MOST CRITICAL)
  2. Identify schedule update version at the time when impact starts;
  3. Model impact Fragnet into selected schedule;
  4. Recalculate the schedule with the incorporated impacts;
  5. Quantify resulting impact to existing schedule
- Define types of TIA reports and narrative
- How to address concurrent delays
- Evaluate TIA cost considerations
- Resolve subcontract TIA