

# Time Impact Analysis



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# 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



**DELAYED**

# Objective

The objective of a 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

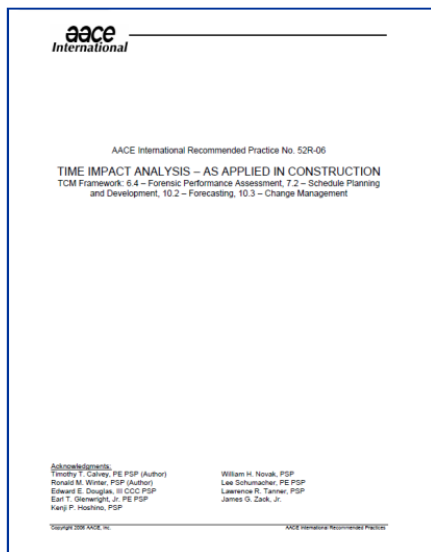
This presentation will focus on the Time Impact Evaluation technique also known as TIA



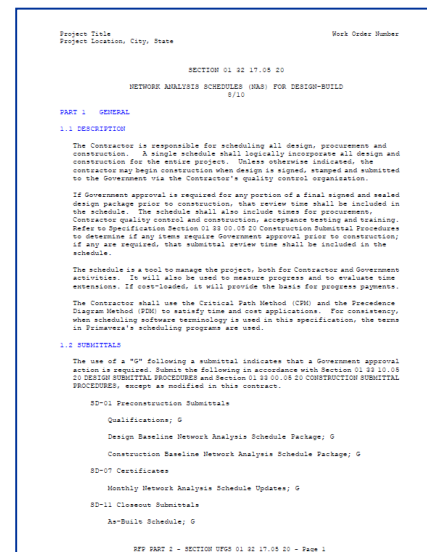
# What is a Time Impact Analysis (TIA)

- 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

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A What-If-Analysis is an exercise to look at potential options before an 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?

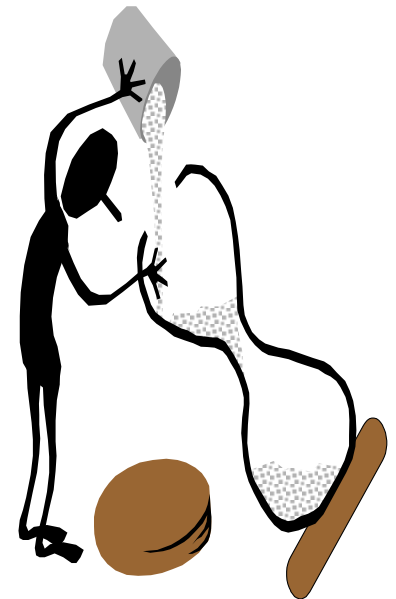
## Why and When would you need to develop a TIA?

### 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



# Project Delay Analysis



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!



# TIA Considerations

Prior to initiating a TIA, determine all contract requirements associated with a TIA (claim) and gather all contract documents to support the full analysis.

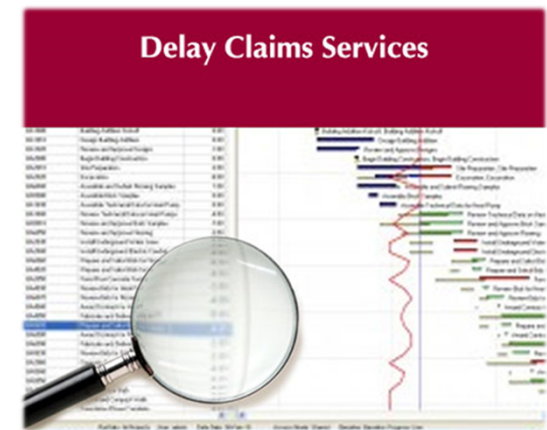
Most contract languages associated with a TIA is defined in the general conditions and supplemental conditions of the contract. Further details also can be found in Specification sections 01250 and 01310.

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"

CONSTRUCTION SCHEDULING	
PART 1 GENERAL	
1.01 PROGRAM DESCRIPTION	
A. A Critical Path Method (CPM) construction schedule shall be used to control the Work and to provide a basis for determining job progress. The construction schedule shall be prepared and maintained by the Contractor. All work shall be done in accordance with the established CPM schedule. The Contractor and all subcontractors shall cooperate fully in developing the construction schedule and in executing the work in accordance with the CPM schedule.	
B. The construction schedule shall consist of a computerized CPM network (diagram of activities) presented in a time-scaled graphic (print-out) with reports, as specified herein.	
C. [For projects that involve multiple prime contractors (in lieu of a single general contractor), the general subcontractor is usually the prime contractor and it shall prepare and maintain the project schedule and be responsible to coordinate all other subs for scheduling into a cohesive integrated plan.]	
1.02 QUALIFICATIONS	
A. The Contractor shall have the capability of preparing and utilizing the specified CPM schedule, or engage the services of a specialized scheduling professional to do so. Within seven days of the award of contract, provide a resume or qualifications statement for the individual within the Contractor's organization, or the outside consultant, who is being proposed as the responsible party for development and maintenance of the CPM schedule. The resume or qualifications statement shall demonstrate that the proposed responsible party has successfully developed and maintained CPM schedules for at least three construction projects of the same size or greater than this project. The proposed responsible party for the CPM schedule is subject to approval by the [Engineer] [Construction Manager] and Owner. If the proposed responsible party for the CPM schedule is not approved by the [Engineer] [Construction Manager] and/or Owner, Contractor shall resubmit a more-appropriate candidate for approval.	
1.03 SUBMITTALS	
A. Contractor shall submit Interim, Preliminary, Baseline (also known as "as-planned") CPM schedules, revisions, and Monthly Status Reports, all including graphics, reports, and narratives, and an as-built schedule, as specified herein.	
PART 2 PRODUCTS	
2.01 SOFTWARE	
A. Unless otherwise approved by the [Engineer] [Construction Manager], the computer-based schedule shall be generated using Oracle Primavera Contractor, or P6 Professional Project Management Software.	
[B. Provide [two] copies of the scheduling software program (with license) being used by the Contractor, for use by the [Engineer] [Construction Manager] and/or Owner, during	
JOB NO.	(01 3200) (01310) -1

# TIA Considerations (con't)

- Risk allocation (sharing) in construction contracts (JV)
- Responsibility 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

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The TIA process can be segregated into five steps:

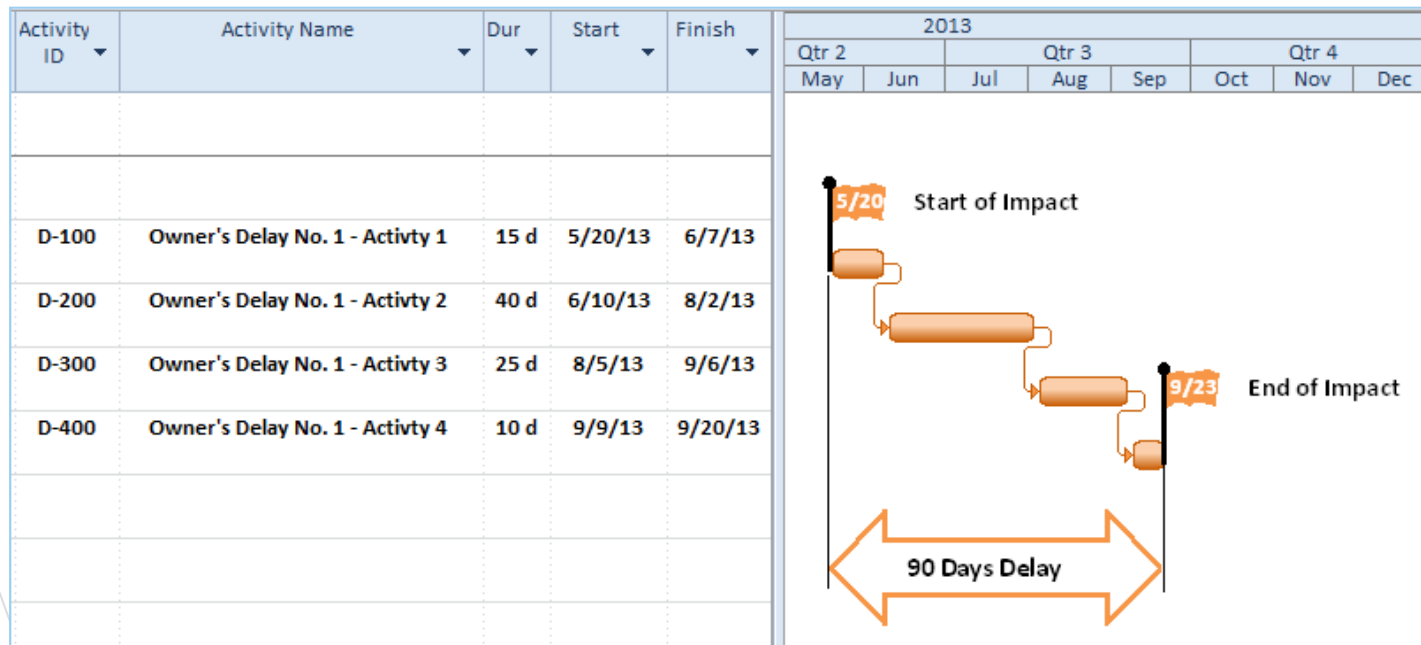
1. Identify impact events and build them into a schedule “Fragnet”;  
(MOST CRITICAL)
2. Identify schedule update version at the time when impact starts;
3. Model impact Fragnet into selected schedule;
4. Recalculate the schedule with the incorporated impacts;
5. Quantify resulting impact to existing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



# TIA Step 1

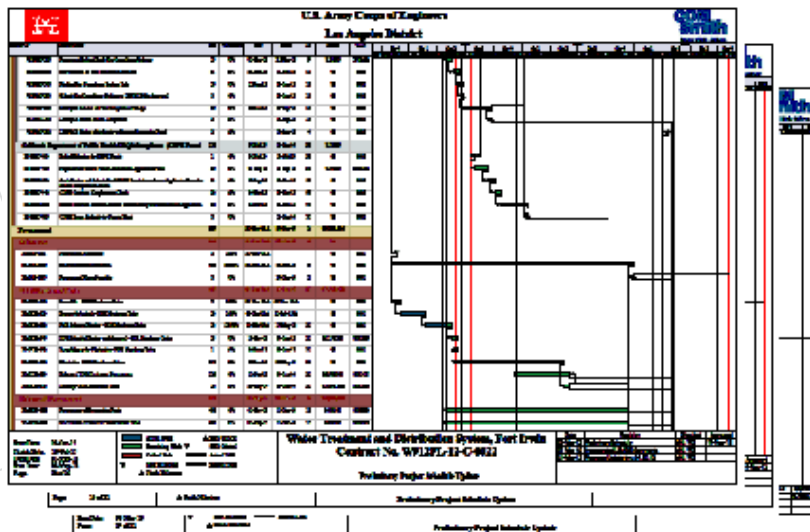
## Identify Impact Events and build them into a schedule “Fragnet”

- 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

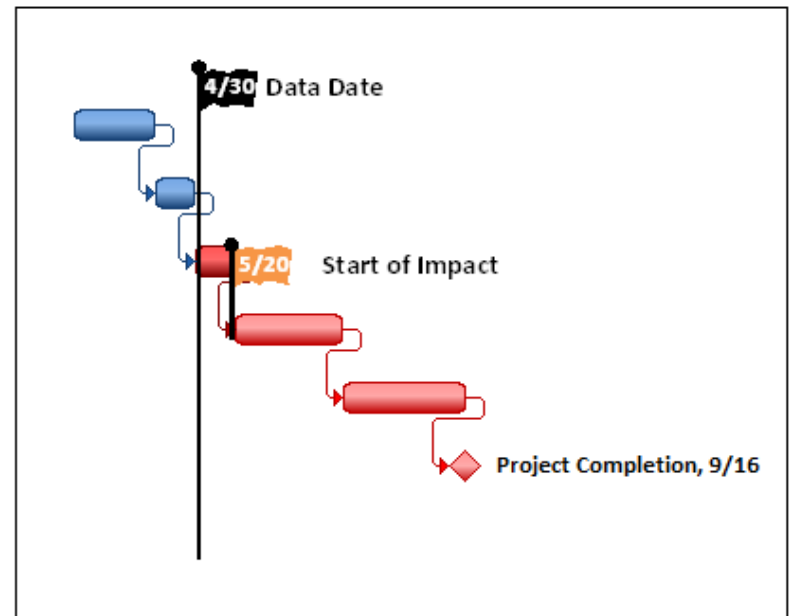
# TIA Step 2

## 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



2013												
Qtr 1		Qtr 2			Qtr 3			Qtr 4			Qtr 1	
Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb



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 – 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

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## 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

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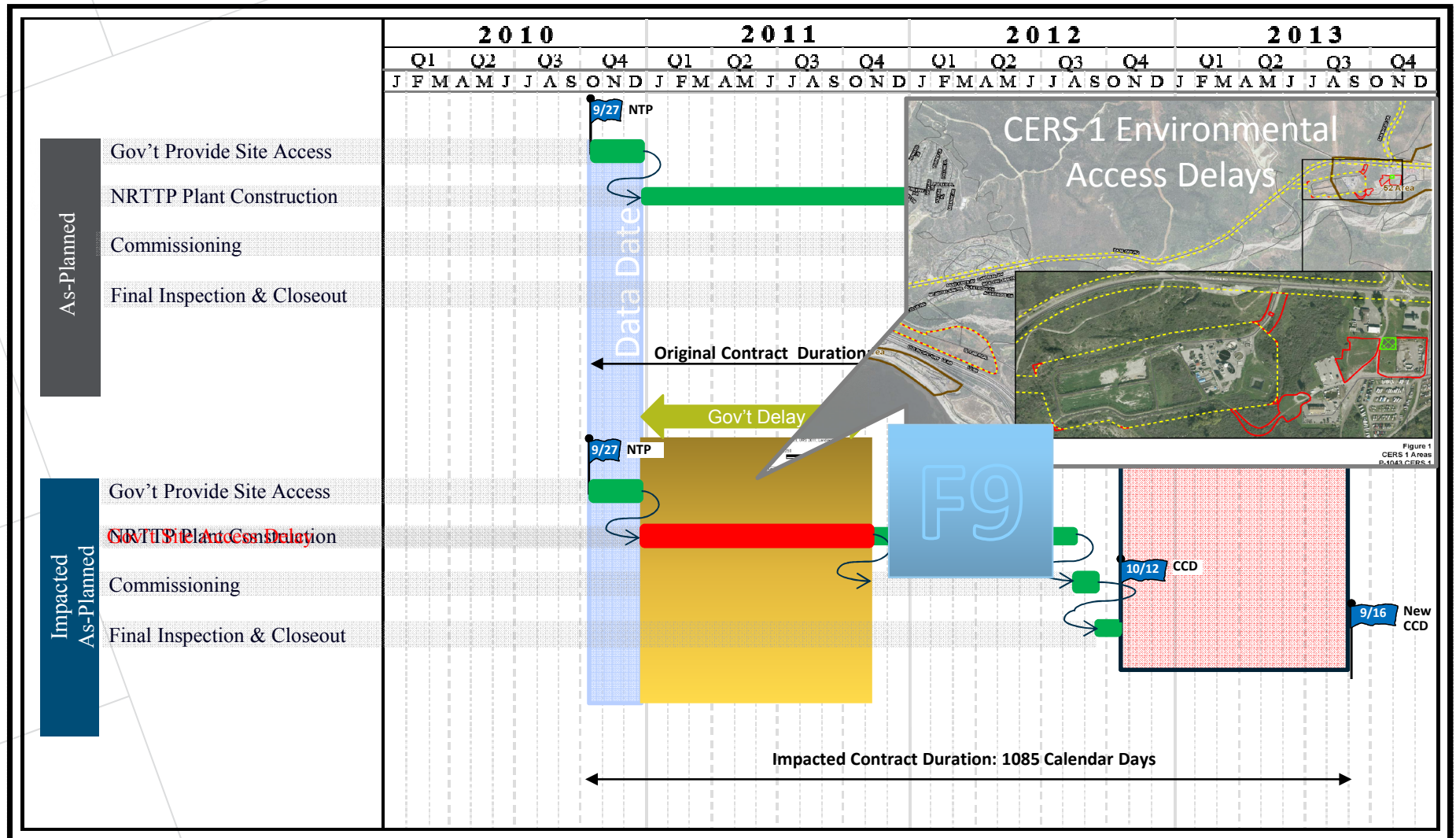
## Quantify Resulting Impact to Existing Schedule – Practices

- 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



# Camp Pendleton TIA Example

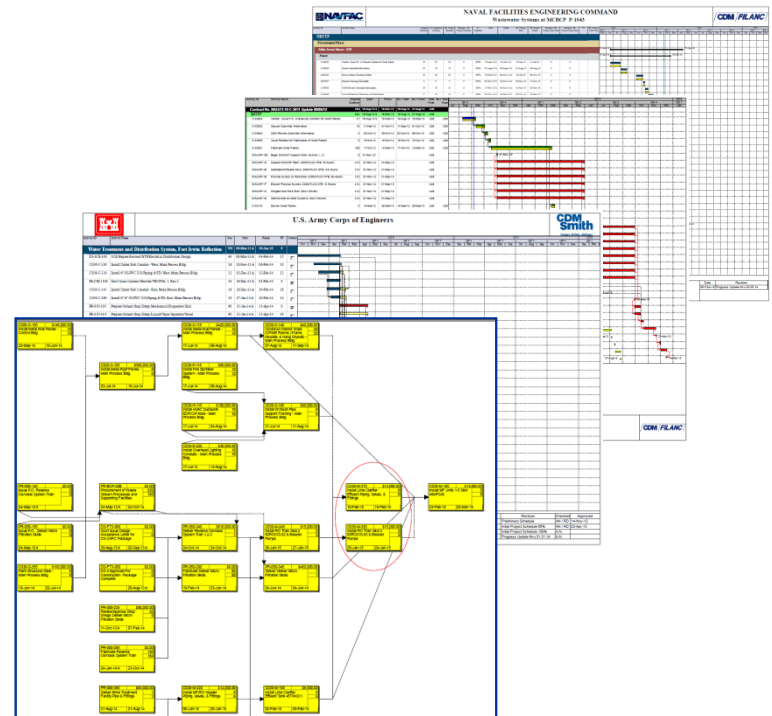




# TIA Analytical Reports

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

Time Impact Analysis Narrative Report		
<b>US Army Corps of Engineers</b>	<b>CDM Smith</b>	
Contract NO W9121L-12-C-0022	Contract (Project) Name Water Treatment and Distribution System, Fort Irwin	Issue Date 24-Jan-14
USACE District Los Angeles	Address Officer Schultz, Gregory	TIA Electronic XER Provided Date 24-Jan-14
Schedule Impact Period 10-May-13 thru 20-Jun-13	CDM Project NO 84234	TIA Supporting Documents Provided Date 24-Jan-14
<b>Executive Summary</b>		
<p>On 22 May 2013, CDM Smith submitted a "Notice of Change" regarding the design of evaporation ponds in accordance with Contract BAA Clause 22.2(3-7) "NOTIFICATION OF CHANGES (APR 1984)" stating that with the Government's non-approval of DS-02, Contractor is not able to meet the project Contract Completion Date, and therefore, this Government caused delay will result in additional time and costs to complete the project. On 29 May 2013, the Government directed CDM Smith to utilize revised design parameter in sizing the evaporation pond portion of the project, which represented a changed condition to the original Contract Baseline.</p> <p>In accordance with Specification Section 01.32.01.00 Part 3.7 "Request for Time Extensions" for Design-Build contract, CDM Smith is submitting this Schedule Time Impact Analysis (TIA) for unanticipated changes contemplated by the Government which impacted the project Critical Path and project completion date.</p> <p>As established within this Time Impact Analysis, CDM Smith is entitled to an Excusable and Compensable delays of 31 calendar days and requests that a Contract Modification be issued to increase the Contractual Completion Date by 31 Calendar days from 18-Oct-2018 to 08-Dec-2018.</p>		
Notice To Proceed (Project Start)	Contractual Completion Date (Project Completion)	Total Float (Prior to Impact)
18-Oct-12	18-Oct-12	0 DF
Schedule Baseline Utilized for TIA		Baseline Date Date
Last Contemporaneous Schedule Update Prior to Impact		01-May-13

# 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.)

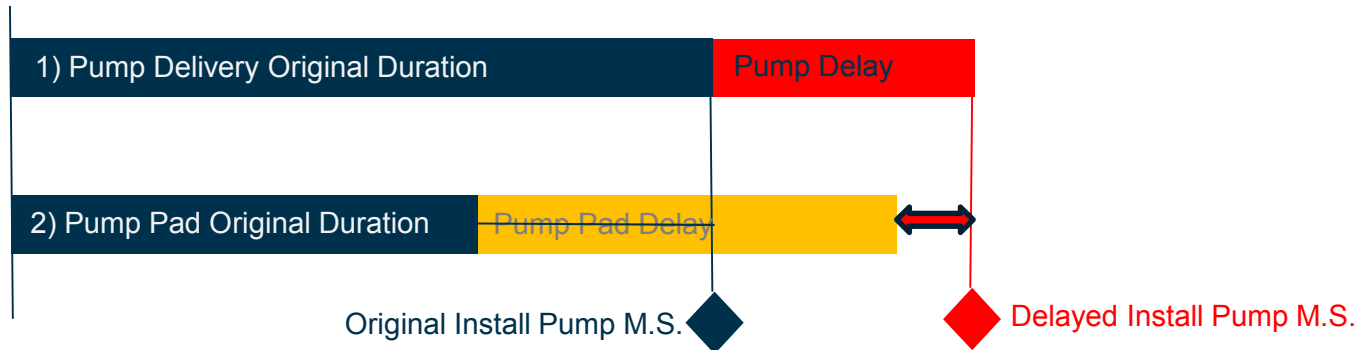
- Determination and Quantification of Excusable and Compensable Delay
  - Excusable and Compensable Delay (ECD)
  - Non-Excusable and Non-Compensable Delay (NND)
  - Excusable and Non-Compensable Delay (END)
  
- AACE 29R-03:

## Net Affect Matrix - Concurrent Delay

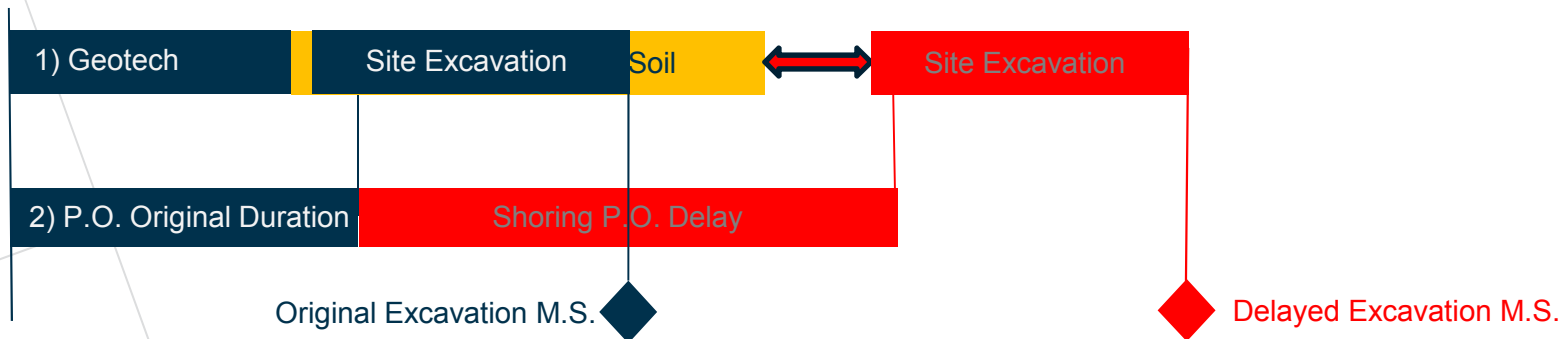
Delay Event	Concurrent With	Net Effect
Owner Delay	Another Owner Delay or nothing	Excusable & Compensable to the Contractor
Owner Delay	Contractor Delay	Excusable but Not Compensable to both Parties
Owner Delay	Force Majeure Delays	Excusable but Not Compensable to both Parties
Contractor Delay	Another Contractor Delays or Nothing	Non-Excusable to Contractor, Compensable to the 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

# 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)



# TIA from Subcontractors

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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

