



# How to Properly Demonstrate Delays in a P3 Schedule to Support a Delay Claim

Michael E. Stone



## Construction Delays & CPM Schedules

- Recognize different types of delays
- Understand how to use P3 to measure and quantify the delay incurred
- Document the delay
- Request additional time

## Types of Delays

- Non-Excusable
- Excusable but Non-compensable
- Excusable and Compensable

## **Non-Excusable**

- Contractor did it to himself
  - Poor Performance
  - Missed the Estimate
  - Wrong Resources Employed

## **Non-Excusable (*cont.*)**

- Contractor gets NO additional TIME
- Contractor gets NO additional MONEY

## **Excusable but Non-compensable**

- Delay Event
  - Not controlled by the Owner
  - Not controlled by the Contractor

## **Excusable but Non-compensable (*cont.*)**

- Depends on contract, but typically:
  - Force Majeure Issues
  - Acts of God
  - National Strikes
  - War

## **Excusable but Non-compensable (*cont.*)**

- Granted Additional Time
- NO Additional MONEY



## **Excusable but Non-compensable (*cont.*)**

- Owner Caused the Delay
  - Defective design
  - Slow return of shop drawings
  - Change orders
  - Defective Owner-supplied equipment

## For Recovery of Time and Money

- First test a delay must pass...
  - Excusable
  - Compensable
  
- Second test a delay must pass...
  - Critical Delay
    - or -
  - Non-critical Delay

## Critical vs. Non-critical Delays

- Critical Delay – must impact project completion
- Non-critical Delay – does not impact project completion

## Importance of Longest Path

- No additional days unless project is delayed
- Critical Delays must be on the Longest / Critical Path
- Delayed activities that do not impact project completion merely consume float and are Non-critical Delays

(Float belongs to the project, unless otherwise noted in the contract)

## Ownership of Float

- Generally accepted principal that float belongs to the project
- First person who needs it can use float
- Can not hoard, squander, or waste float
- Contract may state unequivocally that float is owned jointly or belongs to one party or the other – in that case the contract rules

## **Schedule Must be a Real CPM**

1. Activities must resemble the work to be performed
2. Logic must be based upon the physical constraints of constructing the project
3. All of the Activities must be driven by valid and realistic logic

## **Schedule Must Be a Real CPM (*cont.*)**

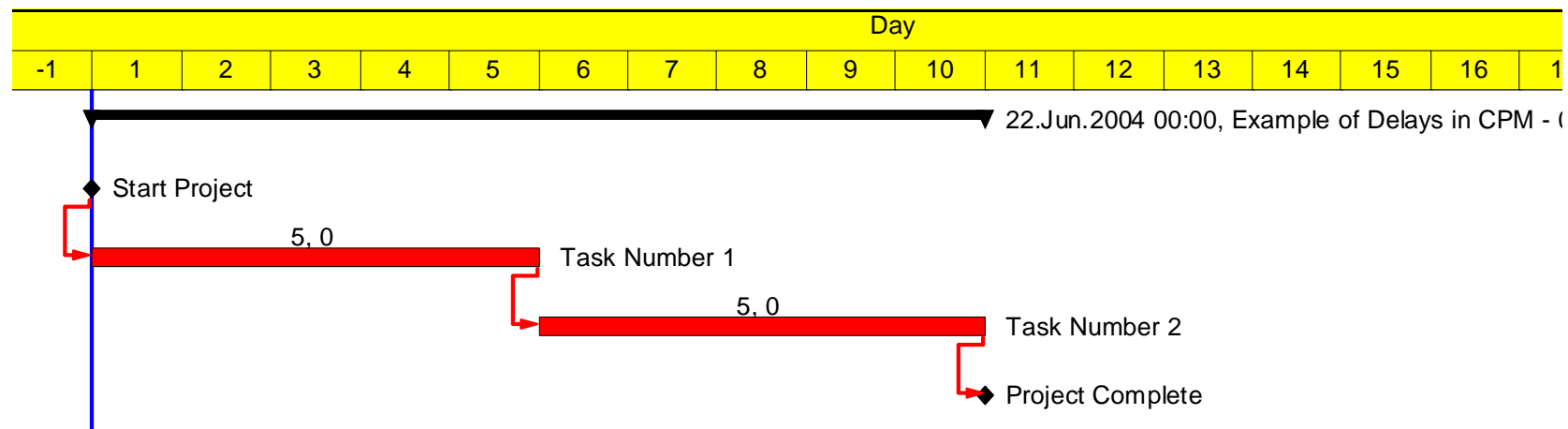
4. All activities must have a predecessor and a successor (except start and completion)
5. There has to be a critical path from the data date through completion
6. Avoid frivolous use of constraints
7. Avoid lags (absolutely no negative lags)

## **Schedule Must Be a Real CPM (*cont.*)**

8. Try to use Finish – Start as the primary logic tie
9. Accurately reflects actual progress  
(real actual starts and finishes – don't just plug 100%)
8. Correct logic busts or changes in the plan as they occur



# The Longest Path is the Critical Path



Any Delay on this path would impact project completion – Critical Delay

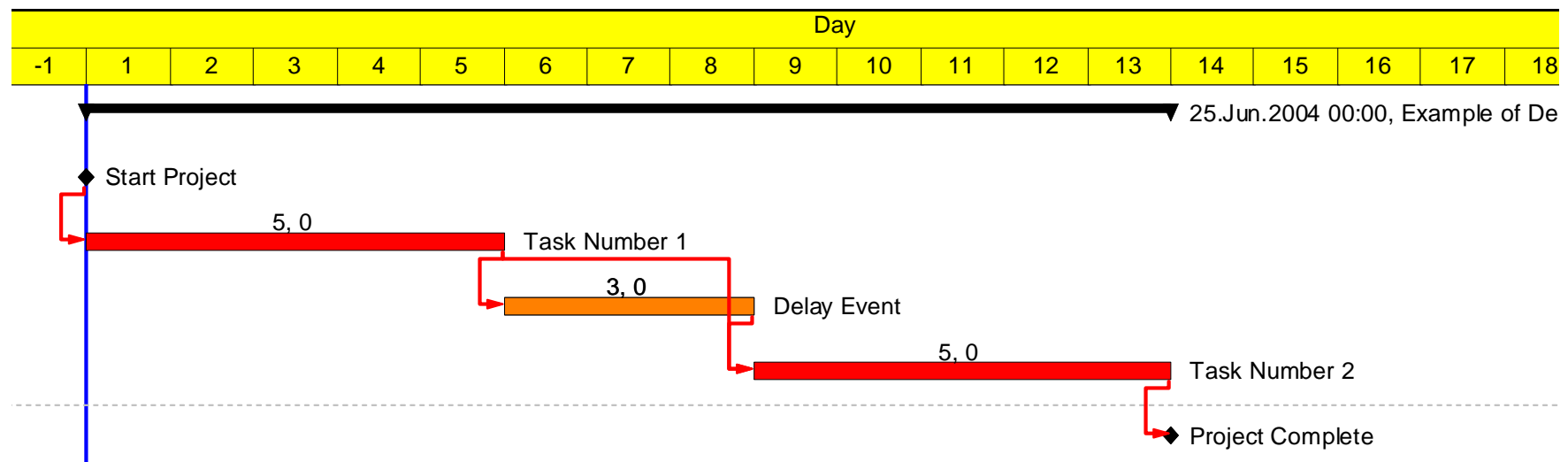
## Schedules Must be Reliable

CPM schedules are the best way to demonstrate a delay if used properly...

1. The schedule must be reliable
2. Delays must be shown properly

(Results should be repeatable by others)

# Delay Between Events



- Insert delay event into the schedule
- Don't change the logic of the schedule – add logic instead

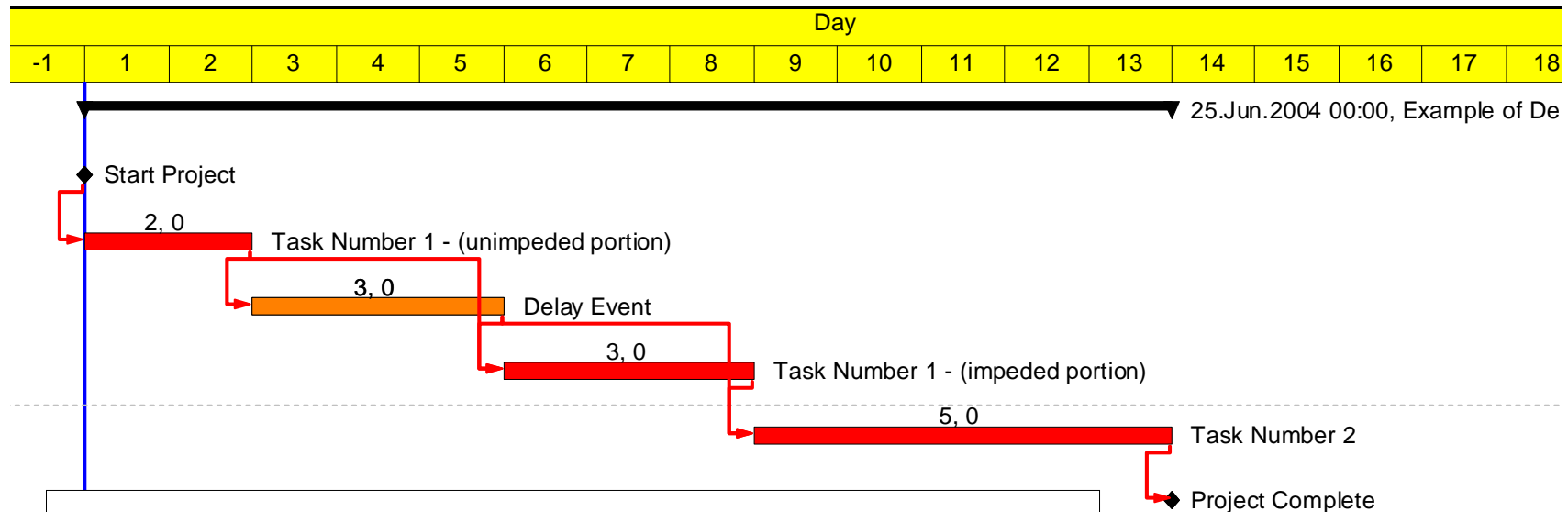
## Critical vs. Compensable

- Just because a delay is Critical does not mean that it is Compensable
- The Contractor **MUST** demonstrate the cause not only impacts the critical path but also that the owner is the cause of the delay event

## **For an Activity Delayed in Progress, Break Delayed Activity into Two Portions**

- First activity is the portion not delayed
- Add activities for
  - Delay Event
  - Unimpeded Portion of the Original Activity

# Activity Delayed In Progress

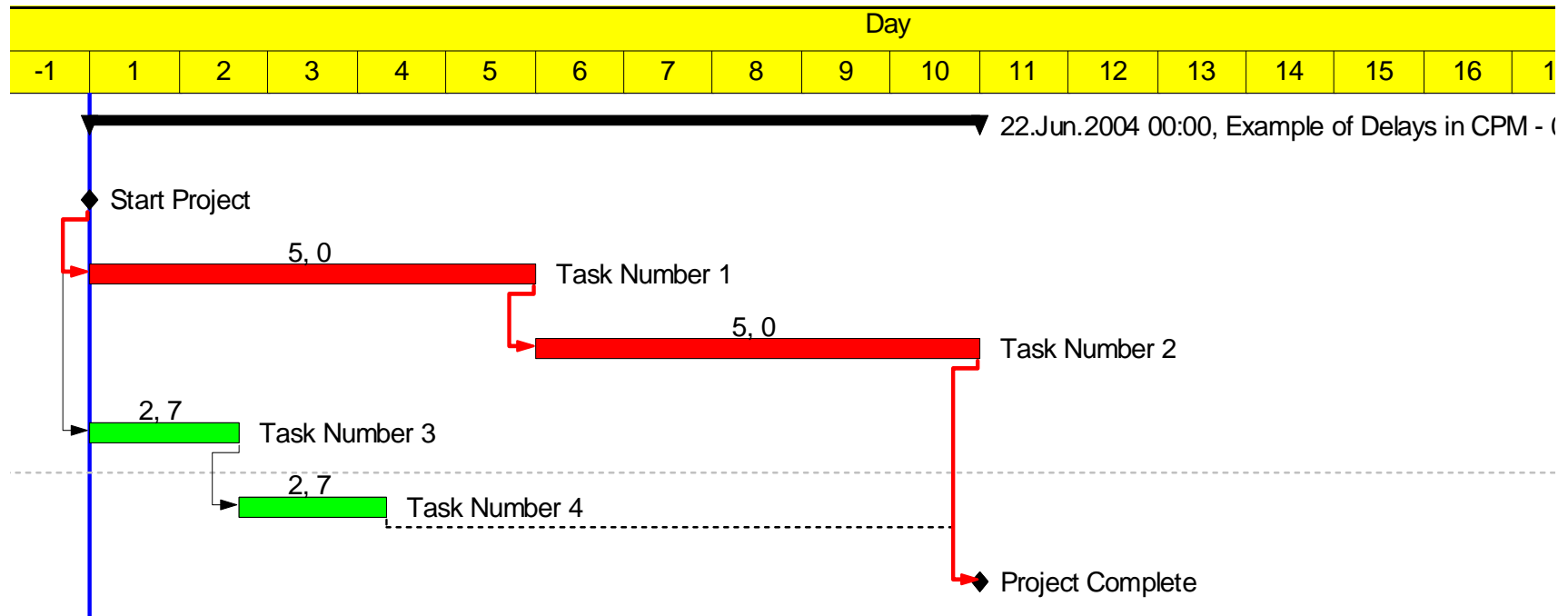


- Break the activity into two portions
  - Unimpeded & impeded portion
  - Total duration should be the same as the original
- Insert the delay event between the two portions

## **A Lesser Used or Claimed Delay**

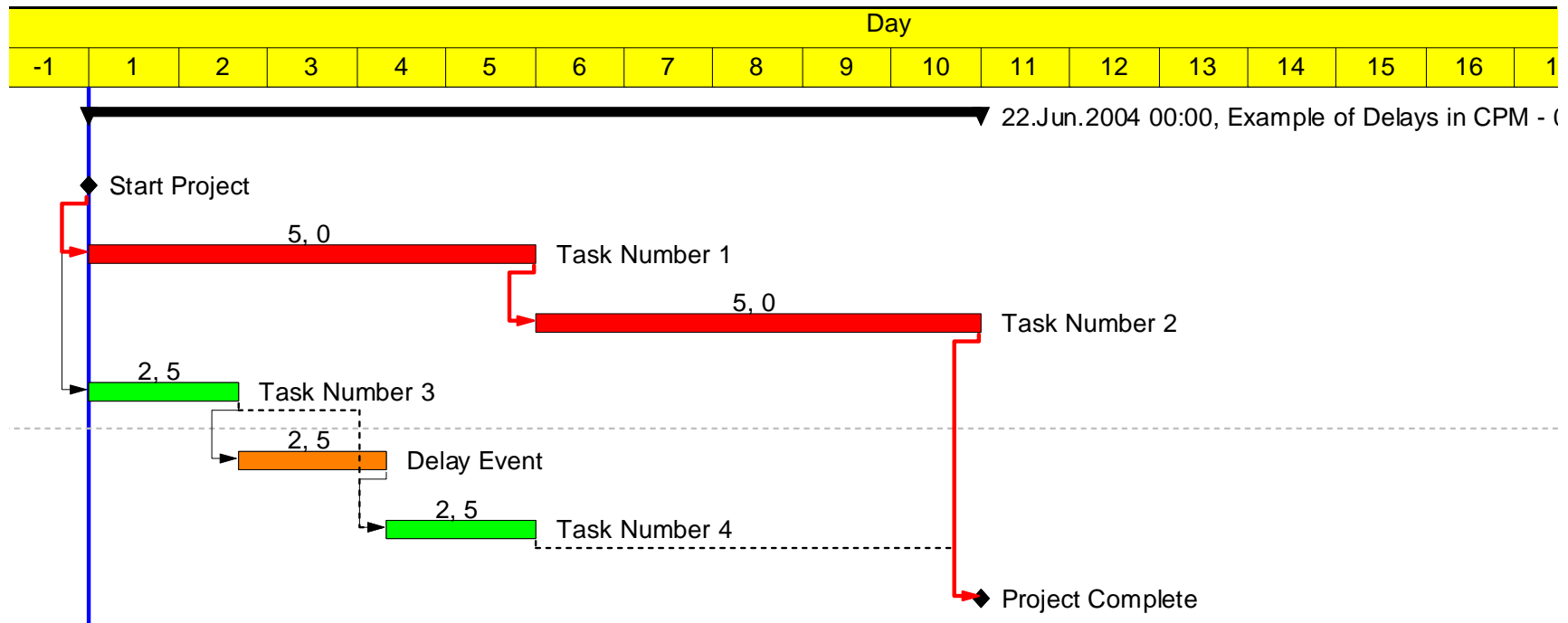
- Excusable and Compensable but not Critical
- Activity delayed, additional cost incurred, but project completion not impacted
- Very common but rarely claimed

# Delays and Float





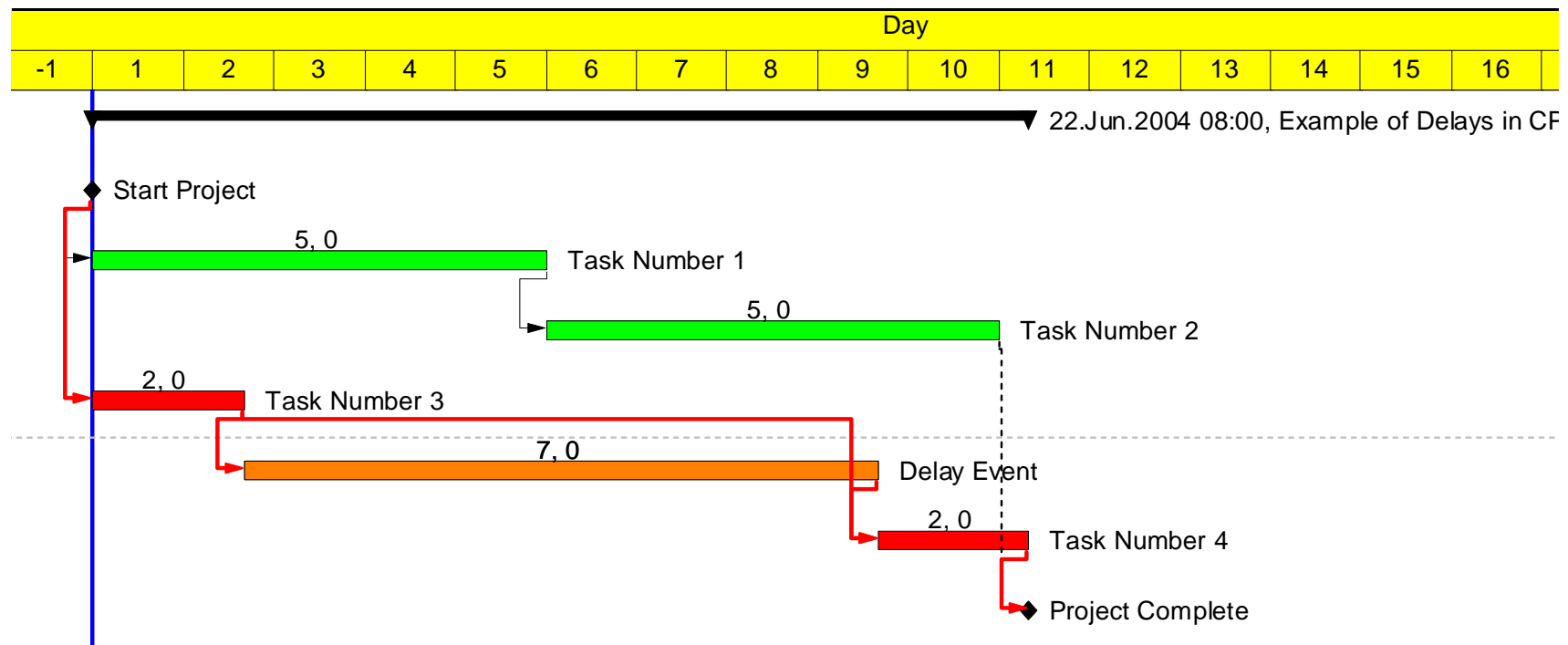
# Delay Event ? Compensable?



## Delay Event ?    Compensable? (cont.)

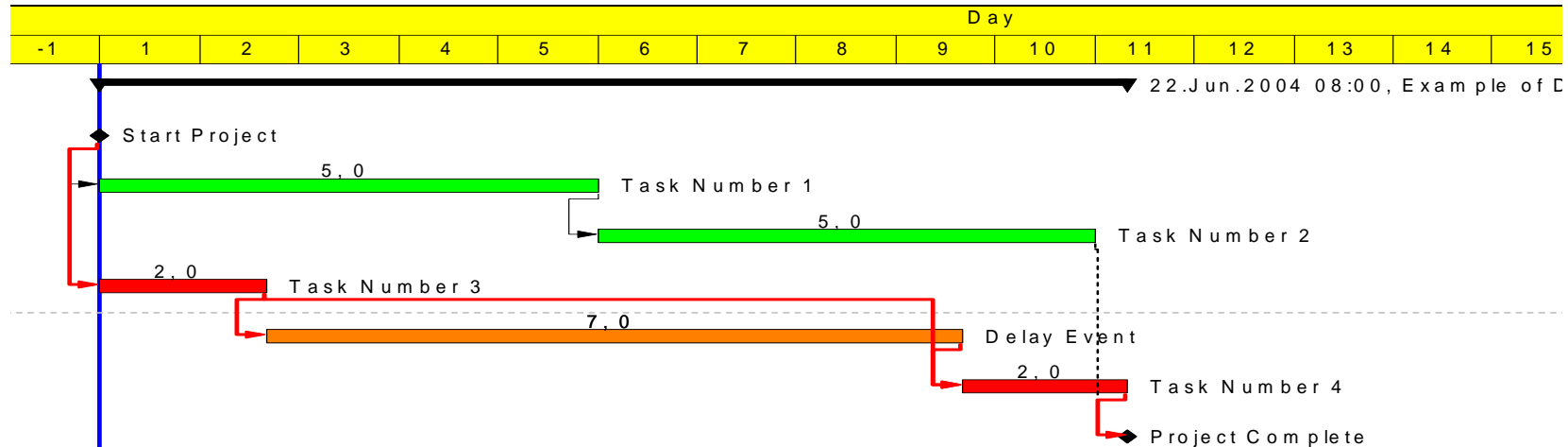
- Yes. It is a delay event...
- It may be compensable if it was caused by the owner or under the owner's control & increased the contractor's cost
- The project completion is not impacted, therefore it is not a CRITICAL DELAY
- No time extension is warranted

# Delay Event Changes Critical Path

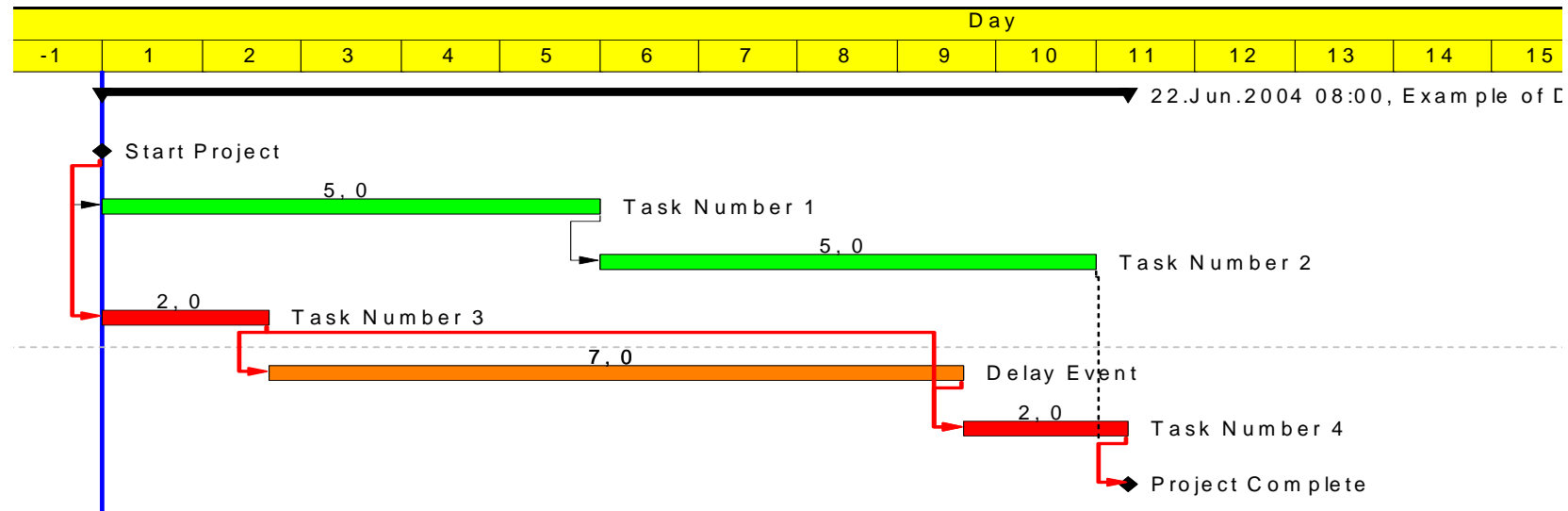


## **Non-critical Delay Becomes Critical**

- Delay event consumes all available float
- Original chain of two activities had a duration of 4 days with 7 days of float
- Now chain of three activities has a total duration of 11 days with Zero Float



- Delay was 7 days
  - May or may not be Excusable
  - May or may not be Compensable
  - It is definitely critical



- If the Delay was Excusable, the Contractor would receive a time extension of ONE (1) additional day  
 (doesn't matter if it is compensable or non-compensable)

## Documenting Your Delay

MUST follow the contract provisions

1. Preparation of the schedule
2. Notice of Delays (must be timely)
3. Proper backup documents, correspondence, change orders, meeting minutes, etc.
4. Demonstrate the delay using contemporaneously prepared schedules

## Typical Contract Language

*“No contract adjustment will be allowed unless the Contractor has submitted the request for an adjustment within the time prescribed.”*

*“Not filing a protest by the end of the next estimate period for any time statement will indicated the Contractor’s approval of the time charges as shown on that time statement and future consideration of that statement will not be permitted.”*

TxDOT



## Typical Contract Language

*“Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later. Claims must be initiated by written notice to Architect...”*

*AIA Documents*

## Typical Contract Language Requires

- Timely notice - extremely important
- Must connect cause to the delay
- Accurately document start and end of delay
- Demonstrate impact of delay event

## Evaluation and Presentation of Delay

Different names for the same thing

- Time Impact Analysis Statement
- Time Impact Evaluation Form
- Schedule Analysis
- Delay Analysis

# Examples of Time Impact Evaluation Forms

Borrowed from “CPM in Construction” by James J. O’Brien

CPM In Claims and Litigation 475

TIME IMPACT EVALUATION

PROJECT: JOHN DOE TIE #: 2  
 PREPARED BY: J. J. O'BRIEN DATE: 1/31/95

DESCRIPTION: STRUCTURAL STEEL DELIVERED IN 123 WORK DAYS RATHER THAN SCHEDULED 80

ACTIVITIES AFFECTED:  
29-30 "ERECT STRUCTURAL STEEL"

TYPE OF IMPACT:  
 INCREASED DURATION: 43 AMOUNT: \_\_\_\_\_  
 DELAYED DATE/SUSPENSION OF WORK: DELIVERED @ DAY 123

FRAGMENT:

EVALUATION/RESPONSIBILITY:  
STEEL DELIVERY HAD 8 DAYS FLOAT. THEREFORE DELAY IS (123 - 88) = 35

OWNER REQUIRED CHANGES. RESPONSIBILITY AS FOLLOWS: DESIGN CHANGES 15 DAYS  
 FABRICATION CHANGES 15 "

OWNER	30
FABRICATOR	5

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# Create & Use A TIA Form

No hard rules on what it looks like, but it must:

- Connect delays to cause of delay
- Connect delays to activities in the schedule
- Measure the delay

Time Impact Analysis Form	
<small>Michael E. Stone, PMP</small>	
<b>Project:</b>	TIA No:
<b>Prepared by:</b>	Date:
<b>Description of Time Impact Encountered:</b> <small>(When did delay begin? What happened? When did delay end?)</small>	
<small>(use additional sheets if required)</small>	
<b>Activities Affected:</b> <small>(List activities impacted)</small>	
<small>(use additional sheets if required)</small>	
<b>Type of Impact:</b>	
Days of Delay	Project Completion Delayed ( Y / N )
Cost of Impact	New Project Completion Date
<small>(use additional sheets if required)</small>	
<b>Fragnet:</b> <small>(sketch logic of portion of schedule impacted)</small>	
<b>Evaluation / Responsibility:</b> <small>(describe who is responsible)</small>	
<small>(use additional sheets if required)</small>	

# Example TIA Form

1. Tell a compelling story of what happened and why it is not your fault
2. Connect cause of the delay with activities in the schedule
3. Measure the impact of the delay event
4. DOCUMENT THE DELAY EVENT FOR THE RECORD

Time Impact Analysis Form  
Michael E. Stone, PMP

Project: Beltway 8 Overpass TIA No: 3  
 Prepared by: Mike Stone Date: 11/3/03

Description of Time Impact Encountered: (When did delay begin? What happened? When did delay end?)  
Shop drawings for pre-cast beams was not returned promptly delaying fabrication & delivery of beams.

(use additional sheets if required)

Activities Affected: (list activities impacted)		
1020 Prep Shop Dwg	10 day O.D.	Ø T.F.
1030 Review Shop Dwg	10 day O.D. → 35	Ø T.F.
1040 Fab & Deliver Beams	30 day O.D. → 28	Ø T.F.
1050 Set Beams	10 day O.D. → 10	Ø T.F.
9900 Project Completion	01 May 05 → 25 May 05	

(use additional sheets if required)

Type of Impact:  
 Days of Delay 25 Project Completion Delayed (Y/N)  
 Cost of Impact \$106,250 New Project Completion Date 25 May 05  
25 days extended O.H. cost (\$1,500/day)  
25 days standby time for beam crew (\$2,750/day)

(use additional sheets if required)

Fragnet: (sketch logic of portion of schedule impacted)

```

    graph LR
      A[1020 Prep Shop Dwg] --> B[1030 Review Shop Dwg]
      B --> C[1040 Fab & Del. Beams]
      C --> D[1050 Set Beams]
      D --> E[...]
      E --> F{Project completion 9900}
    
```

All activities on the critical path. Delay of shop drawings delayed setting beams thereby impacting end date of the project.

Evaluation / Responsibility: (describe who is responsible)  
 Per contract & schedule, engineer was to return shop drawings within 10 days of submittal. Shop drawings for bridge beams took 35 days to go through engineer's office therefore 25 days of delay is attributable to late shop drawing approval.  
 Responsibility: Engineer - failed to review submittals promptly.

(use additional sheets if required)

© ProjectSCTRA/Stone Parkway FlowTIA Form 04

## Issue of Concurrent Delays: Not a Problem if...

- Schedules are maintained as accurately as possible
- Contemporaneous schedules are used to measure delays
- Delays are measured one at a time, in chronological order, as they occur

# Ten Commandments of the Schedule Expert

1. Thou shall not rely on a schedule that was not followed during the project
2. Thou shall consider actual performance
3. Thou shall avoid “As-planned plus Impacts Analyses”
4. Thou shall establish a correlation between the plan, changes, actual performance, and contemporaneous records
5. Thou shall consider “Your Own Delays” in a delay analysis



# Ten Commandments of the Schedule Expert (*cont.*)

6. Thou shall keep schedules current and reflect delays as they occur
7. Thou shall involve the right people in the delay analysis
8. Thou shall be objective and avoid adversarial interests that damage credibility
9. Thou shall recognize the right to finish early
10. Thou shall recognize reasonable resource leveling

Borrowed from "Construction Law Handbook" by Robert Cushman & James Myers



*Questions?*