

WINDOW ANALYSIS

Plain and Simple

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INITIAL CHIT CHAT

I seriously studied the process of Windows Analysis in about 1988 when I began working for Larry Hampton at High-Pointe Schaer in Phoenix, Arizona. We were still using the DOS operating system and using P3 (Primavera Project Planner) or Finest Hour for our schedule analysis. I remember well, as I created the first Window Analysis System reading data directly from Btrieve into DOS-based dBASE III. It was even written up in the Primavera magazine. I know because I had a company contact me saying that they had trademarked the phrase "Window Analysis" (WA) and I spoke with Joel Koppelman about the phrase and my concerns about the trademark. Needless to say, today it is a household word used by scheduler professionals around the world.

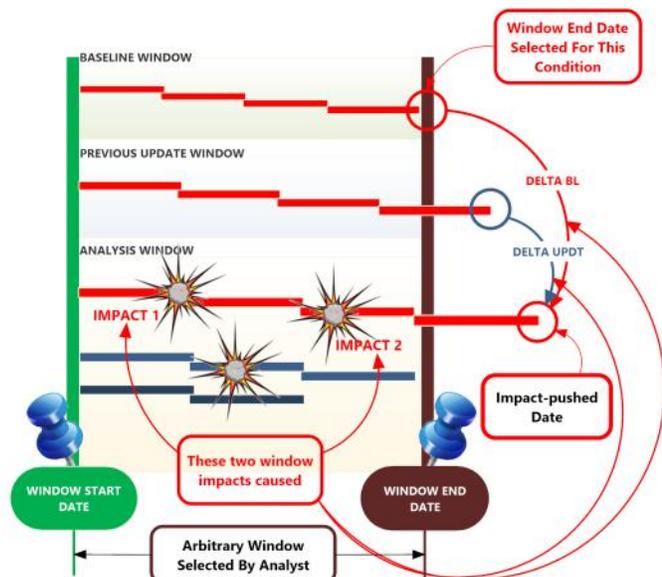
At that time the window analysis process, was really nothing more than identifying the differences between schedule updates; it took many more to turn the process into what it is today. What this tells me is I better spend some time attempting to explain what window analysis is really all about as it is used today. To do this, I needed to start by reading what our contemporaries in scheduling expertise say and teach. Down deep inside this miracle analysis, it still studies the differences in the start and finish of selected time periods in the course of constructing a project (any type of project). WA simply carries the process a great deal further to allow the establishment of cause-and-effect and responsibility for the cause.

WHEN IS IT A CORRECT ANALYSIS TO APPLY

Window Analysis is Not a snake oil remedy and to do it correctly is a long rigorous job very dependent on the completeness and quality of project documentation. To quote Bill Ma, the best defense for a claim (I'll add, offense) is 1) Documentation, 2) Documentation, and 3) Documentation. You need facts and understanding to do any historic investigation, otherwise it is only supposition.

If you cannot clearly identify the impacts that have occurred during a time window, you cannot connect the impacted activities to a driving critical path. Let's see why using a diagram:

Essentially, we are working with a reactive network (can be calculated in the scheduling software) to allow us to find the time impact caused by one or many critical driving delay issues. In order to have the window under analysis reactive (without actuals) requires that we work with the last schedule update, I.E., one with its data date equal to (or real close to) the start date of the window. The end of the time window should be selected such that it closely coincides with either



baseline (or previous update) critical milestones and activity finishes. This makes total delay through the window easy to quantify.

If the conditions described above do not exist, Window's Analysis may well not be the way to go.

WINDOW ANALYSIS BY ANY OTHER NAME

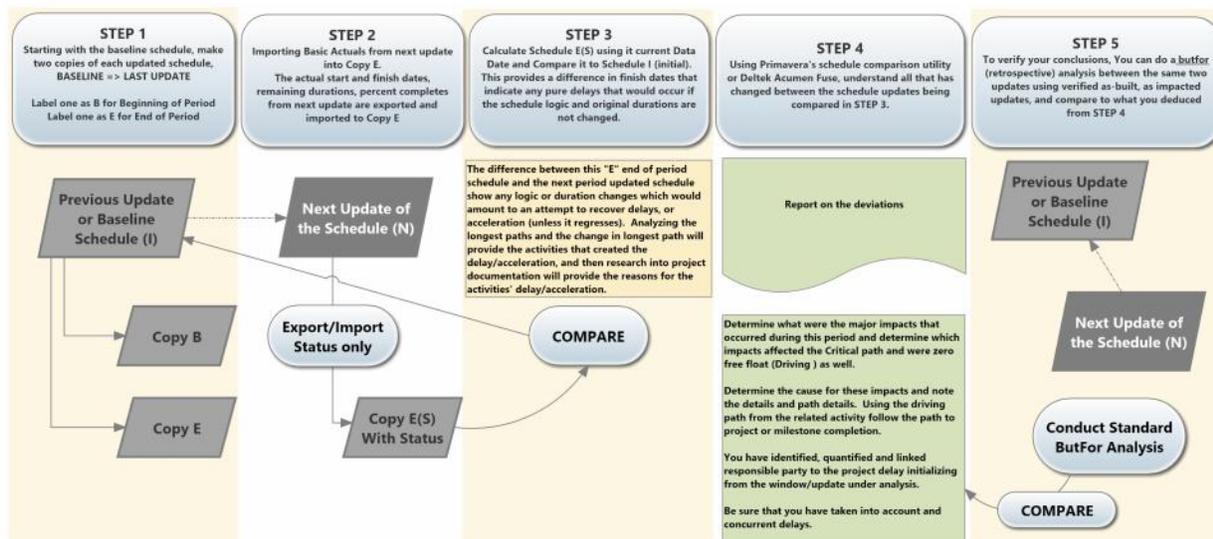
Window analysis has been labeled by many practitioners creating a Window-like analysis over many years, some of these names are:

-  Schedule Window Analysis
-  Contemporary Window Analysis
-  Retrospective Window Analysis
-  Schedule Period Analysis
-  Window Impact Analysis
-  Window Delay Analysis

No matter what twist was put on the analysis method, if it includes the work Window, IT IS WINDOW ANALYSIS. In my personal survey of the Web, I have found few who have disagreed that the analysis methodology is forward-looking which means that it is a window by window impacted as-planned method and therefore needs a logic network which can be calculated in scheduling software or by manual methods.

LET'S TAKE A TOUR THROUGH THE PROCESS

If a picture is worth a thousand words this next great diagram several sentences.



Unfortunately, each analysis step depends on the previous step. Therefore, a mess at the beginning equals mess in the entire analysis. So, be complete and accurate through every step. The exact step description may vary so, depending on what software you choose to use

and its capabilities. If I was you, I would have a copy of DelTek's Acumen Fuse or 360 software available for the analysis process. My other recommendation is to develop a clear numbering/labeling system to easily identify the purpose of each schedule copy in the analysis process. I STRONGLY RECOMMEND THIS!

THE PROCESS – Step 1 (One Iteration Required)

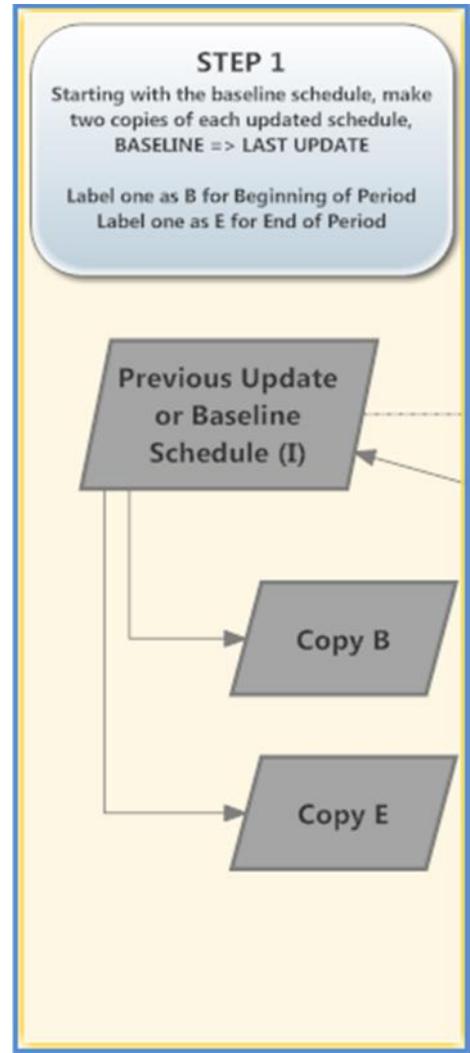
(Screen captures are from P6.8.3 Professional and we are assuming 6 Time Periods (Windows))

Your EPS might look like:

EPS ID	EPS Name
└─ Gowanus	Gowanus Pumping Station
└─ PROJECT ANALYSES	Project Window Analysis
└─ WINDOW 1 - BL	Window #1 Contract Baseline
└─ WINDOW 2	Window #2
└─ WINDOW 3	Window #3
└─ WINDOW 4	Window #4
└─ WINDOW 5	Window #5
└─ WINDOW 6	Window #6
└─ BASELINES	Baselines
└─ NOV13 UPDATE	November 2013 Update
└─ DEC13 UPDATE	December 2013 Update
└─ JAN14 UPDATE	January 2014 Update

Your Project List might look like:

Project ID	Project Name
└─ Gowanus	Gowanus Pumping Station
└─ PROJECT ANALYSES	Project Window Analysis
└─ WINDOW 1 - BL	Window #1 Contract Baseline
└─ BASELINE B	Primary Contract Baseline Rev 0 (B)
└─ BASELINE E	Primary Contract Baseline Rev 0 (E)
└─ BASELINE PBL	Primary Contract Baseline Rev 0 (PBL) for Primavera Baselining
└─ BASELINE1	Primary Contract Baseline Rev 0
└─ WINDOW 2	Window #2
└─ MONTH 1 UD1	Month 1 Update 1 Rev 0
└─ MONTH 1 UD1 - B	Month 1 Update 1 Rev 0 (B)
└─ MONTH 1 UD1 - E	Month 1 Update 1 Rev 0 (E)
└─ MONTH 1 UD1 - PBL	Month 1 Update 1 Rev 0 (PBL) for Primavera Baselining
└─ WINDOW 3	Window #3
└─ MONTH 2 UD2	Month 2 Update 2 Rev 0
└─ MONTH 2 UD2 - B	Month 2 Update 2 Rev 0 (B)
└─ MONTH 2 UD2 - E	Month 2 Update 2 Rev 0 (E)
└─ MONTH 2 UD2 - PBL	Month 2 Update 2 Rev 0 (PBL) for Primavera Baselining
└─ WINDOW 4	Window #4
└─ WINDOW 5	Window #5
└─ WINDOW 6	Window #6
└─ BASELINES	Baselines
└─ GFB2	GOWANUS FACILITIES UPGRA
└─ GFB2-SAFE	GOWANUS FACILITIES UPGRAD
└─ NOV13 UPDATE	November 2013 Update
└─ G45A-1	GOWANUS FACILITIES UPGRADE
└─ G45A-SAFE	GOWANUS FACILITIES UPGRADE
└─ DEC13 UPDATE	December 2013 Update
└─ G46A	GOWANUS FACILITIES UPGRADE



Obviously, we are suggesting that a time window equal an update you will find that this is far less confusing than picking arbitrary time windows. Data is far easier to obtain and checking

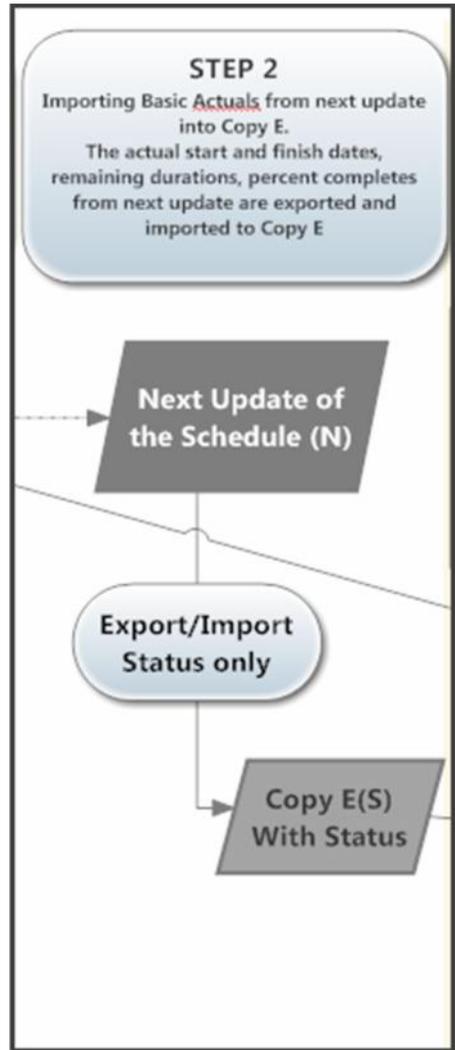
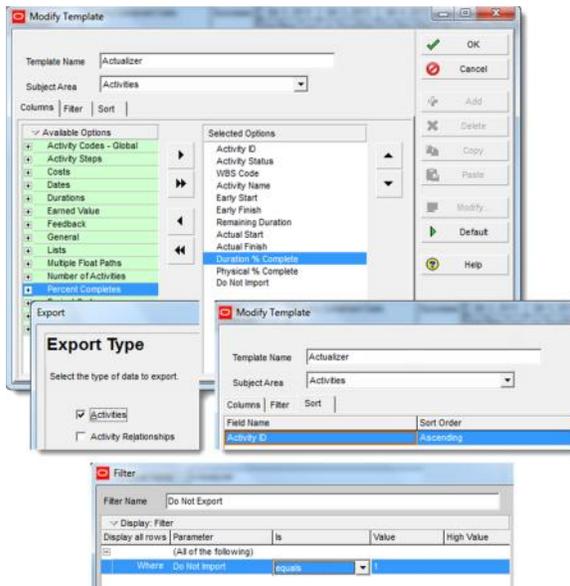
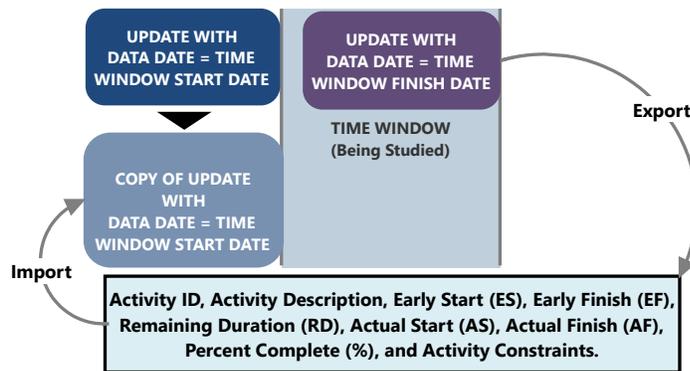
data is much easier and more reliable. Completing all of step 1 for all projects (Schedule Updates) makes the process far simpler.

Before beginning Step 2, I highly suggest that you verify that the schedules are in sufficiently good shape to be used in the analysis. If they do not appear to be good enough to use, go first to the section titled Schedule Repair.

IMPORTING BASIC ACTUALS - Step 2

Taking extremely good care to label each project (Schedule) correctly and organize them carefully allows you to move onto the next step, STEP 2. This next step is accomplished by setting up and running simple updates.

Here is the process in P6:



Now, complete the import.. We now have a project (schedule) that contains the status only (Non-impact update information only representing the conditions at the end of the Time Window.

Be careful that you do not let the import add any new activities exported from the Update with Data Date equal to Time Window Finish. This means add an activity code, keep it current and us it in the above Export. To exclude impact(ed) activities.

Do this for all schedules representative of all windows. Be extremely careful to select the export project and the import project pair. Double check each time.

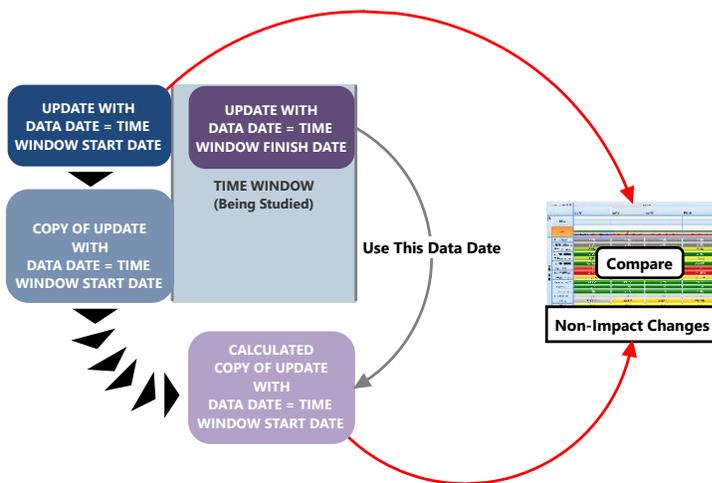
We are now ready to take the next step.

CALCULATE THE SCHEDULE – Step 3 **Iterative through all Time Windows**

PART A

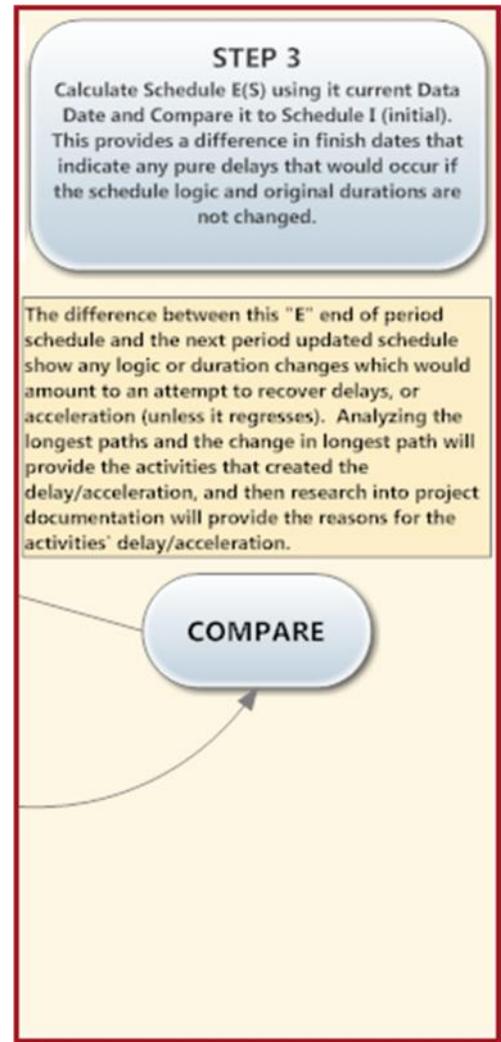
Step 3 is by far the largest time consumer of the entire Window Analysis. It is in this step that you must isolate the impacts and their related delay paths and magnitude. You must also determine the root cause for each impact and identify the party behind this root cause. This is the analysis part of the Window Analysis.

I, personally, begin this step using a great piece of software, Deltek Acumen 360 (or Fuse). We are first comparing the following two schedule iterations:



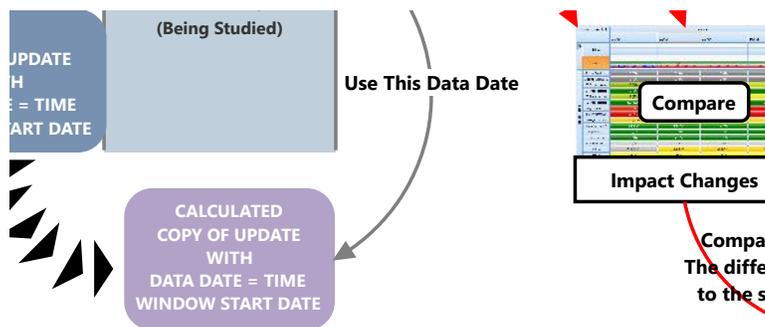
PART B

Now we can bring in the impacted logic. We are probably close to having the schedule iterations needed for this comparison. But, maybe not all the way there. The answer to this question lies in how well the schedule updates incorporated the impact logic and dates. This also depends on if you did a good job checking and verifying the schedule updates (Discussed

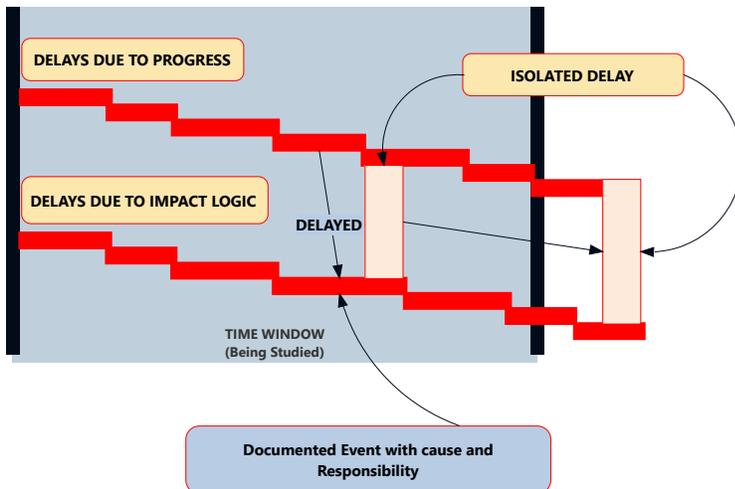


Later). You may need to check the schedules against contemporaneous documents now, or better.

Once you believe that the schedule update depicts the impact logic to a satisfactory level of correctness, we will now make the comparison. This comparison is done as follows:



UNCOVERING THE IMPACTS (Impacted Activities) – Step 4 Iterative through all Time Windows



STEP 4
Using Primavera's schedule comparison utility or Deltek Acumen Fuse, understand all that has changed between the schedule updates being compared in STEP 3.

Report on the deviations

Determine what were the major impacts that occurred during this period and determine which impacts affected the Critical path and were zero free float (Driving) as well.

Determine the cause for these impacts and note the details and path details. Using the driving path from the related activity follow the path to project or milestone completion.

You have identified, quantified and linked responsible party to the project delay initializing from the window/update under analysis.

Be sure that you have taken into account and concurrent delays.

To solidly make this determination requires complete and accurate documentation (Contemporaneous if at all possible). This includes but is not limited to:

- 📄 Daily Field Reports
- 📄 Daily Inspection or Oversight Reports
- 📄 Photographs/Videos
- 📄 Detailed Cost Records (Identified by Activity)
- 📄 Field Personnel Time Cards
- 📄 Impact Reports
- 📄 RFIs
- 📄 Phone Memos

When the delay scenario is documented through research these documents must be referenced.

RESEARCHING THE IMPACT CAUSE-AND-EFFECT TRAILS

This step is the detailed extension of STEP 4. Create an organized folder or binder in a chronological order by impact issue, annotate the documents to show how they quantify and support each isolated impact, how the impact (Delay) periods intermix and ripple. Keep from coming back later to add notes. This folder/binder will be the storyline and backup for the analysis. Don't be afraid to sketch-out your storyline, you will be amazed at how this process clarifies your timeline and shows where chunks of your storyline are sketchy, non-coherent or missing. If you are afraid of hard work do not attempt this type of analysis.

REVIEW OF SCHEDULE UPDATES

As stated earlier, you may not trust the baseline and updates and need to do a careful review. We will discuss here some of the most important mistakes or shortcomings that require correction in order to do this analysis. Don't aim for perfection, you will never get there. Don't even start this process unless you have reviewed the contract documents, and have seen pictures taken during and after the job has completed. Your comments can sound very stupid if you are talking without the proper knowledge.

The basic guidelines for this review are:

- ✓ Logic sequences must be constructible and not missing important items
- ✓ The full project scope must be represented at some level of detail
- ✓ Full major procurement chains must be depicted and properly connected to field activities
- ✓ Activity titles must be unique and clear so that work is identifiable
- ✓ Responsible parties must be identified and singular on an activity
- ✓ The schedule requirements of the contract specifications must be followed
- ✓ Activities must have both their start and finished connected to logic (relationships)
- ✓ There shall be no negative lags (often called leads)
- ✓ Negative items as reported in a scheduling report (P3 or P6) must absent

Be sure to note all negative items found and how/if you will be fixing them prior to your analysis.

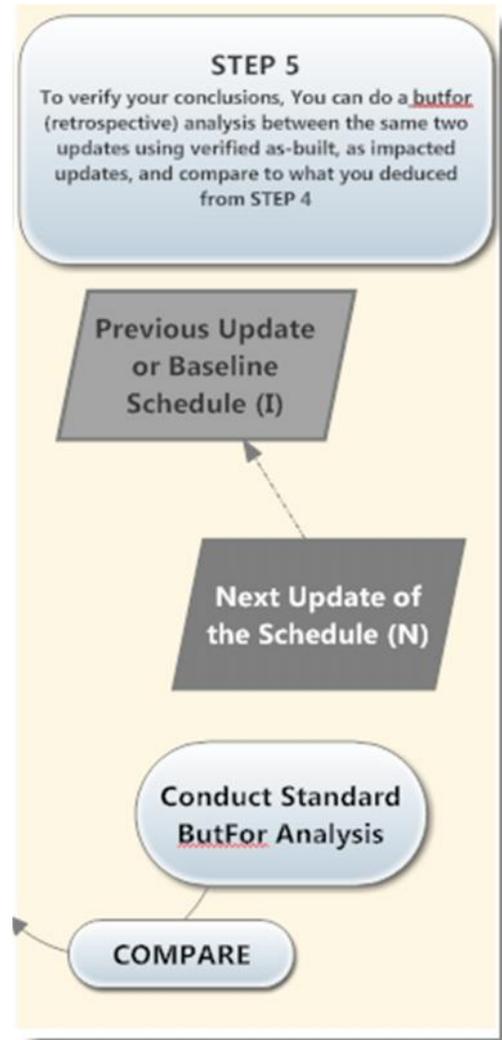
VERIFICATION – Step 5

This step is not mandatory, but useful if you must testify on the results and basis of your report.. Since this paper does not cover the ButFor method of schedule analysis we will simply outline the process. This step, if you decide to do it will add a great deal more time to this analysis.

- 1) Use the impacted window logic schedule

UPDATE WITH
DATA DATE = TIME
WINDOW FINISH DATE

- 2) Assure that all impact logic is included
- 3) Make a copy
- 4) Deactualize the copy
- 5) Compare the original to the copy
- 6) Correct logic in the copy so the original and copy match (do 4 & 5 until the match is exact
- 7) Make a copy of the adjusted copy
- 8) Using the copy, remove the impact logic
- 9) Calculate the schedule
- 10) Compare decrease in time to increase found in steps 1 through 4
- 11) If they are very close or match, you have verified your calculated effect of the delay



SUMMARY AND REPORT

From the notes you have maintained throughout the analysis:

- ✓ Summarize your findings by window and then as a whole
- ✓ Explain the process you used to do the analysis
- ✓ List the windows selected and the updates included in each window
- ✓ Explain what created your choice of window start and end dates
- ✓ Identify the impacts discovered, their effect on the project, and who owns the causation

A special thank you to Chris Carson for providing research material and his help.