Solution Bulletins

The Myths of "Out-of-Sequence" and "Retained Logic vs. Progress Override"

Document No: SB002-P3   Revision No: Last Updated: April 8. 2003

Software Version: P3, Version 3.1   Author: Eric Chou

BRIEF

People often are confused with the term - "Out-of-Sequence", and use them in inappropriate ways. While we talk about "Out-of-Sequence", we also need to discuss the difference between "Retained Logic" and "Progress Override". Almost all scheduling specifications require the use of "Retained Logic". Unfortunately, some specifications or Owners (or their representatives) require the use of 'Progress Override". Hopefully, the following examples will improve some people's understanding.

SOLUTION

"Out-of-Sequence"? Of What?

Speaking of the term "Out-of-Sequence", we often use them in two environments: Scheduling software and the legal environment. They really mean different things in each environment.

CPM software such as P3 uses the term - "Out-of-Sequence progress" to simply depict the situation that the successor activity starts before its predecessor finishes.

When "Out-of-Sequence" is used as a legal term, it essentially means a disruption to the Contractor's schedule. For example, the crews lost time in hopscotch from one floor to another floor as the Contractor is held up by owner's interference. However, to quantify the labor inefficiency due to such situation is very difficult.

The other extreme example is that the Contractor is forced to work on floor covering such as carpet before painting walls. As a result, the flooring may need to be protected or replaced. The Contractor then incurred the additional expenses. It is hard to believe that any Contractor would choose to do that without the Owner's approval to pay for the extra. However, the Contractor should have carefully evaluated their options before putting themselves in such situations. If the hold-up is caused by the Owner. The Contractor would normally just wait for the decision and give the delay notice to the Owner, which will then become a simple delay case.

On the other hand, most General Contractors may perform works out-of-sequence slightly to mitigate various delays among his subcontractors.

HTC PROJECT CONTROLS
Services

Westlake Village, CA 91361
Phone: (805) 777-9267

Solution Bulletins

The Myths of "Out-of-Sequence" and "Retained Logic vs. Progress Override"

Document No: SB002-P3   Revision No: Last Updated: April 8. 2003

Software Version: P3, Version 3.1   Author: Eric Chou

The Level of Detail

When a Baseline schedule is setup, the logic ties of Finish-to-Start are often used to establish the required duration to complete the tasks. In reality, those activities should have been "staggered" each other with the logic ties of Start-to-Start, especially when those activities are depicting more generic area such as floor.

For example, in each room (or space) Framing always proceeds before the Drywall. Well, it can't be the other way around in this case. However, if the schedule activities were depicting a large area such as floor, the drywall construction would certainly have started before the last stud faming is completed. Therefore, the schedule update will show that Drywall has been started before the Framing is completed, which is a normal construction situation.

This is an out-of-sequence progress situation in P3 environment. However, this is definitely not an out-of-sequence performance from legal point of view.

On the other hand, if the schedule activities are depicted by each room, an out-of-sequence progress may certainly be an out-of-sequence performance situation. Unfortunately, the level of detail in a normal construction schedule is often determined by the economy of project and the accuracy of the update, not by the technical requirements.

Retained Logic vs. Progress Override

As a result of out-of-sequence progress, P3 suggest two ways to calculate the schedule. One is Retained Logic; the other one is Progress Override.

It is important to note that Retained Logic or Progress Override affects a schedule only if one or more activities with the conventional Finish-to-Start ties show out-of-sequence progress.

By default, the Retained Logic is used for schedule calculation. When Retained Logic is chosen, P3 schedules the Early Finish date of a progressed activity according to network logic, which calculates the Early Finish date with the consideration of the remaining durations of the incomplete predecessors with Finish-to-Start relationship.

HTC PROJECT CONTROLS
Services

Westlake Village, CA 91361
Phone: (805) 777-9267

Solution Bulletins

The Myths of "Out-of-Sequence" and "Retained Logic vs. Progress Override"

When Progress Override is chosen, P3 ignores network logic and schedule the Early Finish date of a progressed activity based upon it's own remaining duration. In other words, its predecessor relationship of finish to start is invalidated, which means the progressed activity can be forecasted to be completed earlier than its predecessor.

Unfortunately, some people think that out-of-sequence progress need to be corrected by setting schedule calculation to "Progress Override" instead of "Retained Logic" in P3. By doing that, it actually forecasts an impossible situation such as drywall can be completed before framing, even worse, it can forecast an earlier completion date, which can be misleading.

Please see the following examples:

1. Assume the following is an approved Baseline. Owner approves the logic and the fact (most importantly) that this project will start on 3/26/02 and complete on 4/22/02,which will take 20 working days to complete.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	MAR / APR / MAY
1	Stud Framing	15	15	0	03/26/02	04/15/02	Stud Framing
11	Drywall	5	5	0	04/16/02	04/22/02	Drywall

2. This is the update as of 4/9/02: On the day 10 (4/9/02), Activity – Stud Framing is on schedule, 5 days of work remained. Activity - Drywall has started on 4/8/02. However, it still needs 5 days to finish its work. Based on "Retained Logic" calculation, the forecast completion date is still 4/22/02, which makes sense.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	MAR / APR
1	Stud Framing	15	5	67	03/26/02A	04/15/02	Stud Framing
11	Drywall	5	5	0	04/08/02A	04/22/02	Drywall

3. However, if the schedule is calculated by using "Progress Override", the forecast completion date becomes 4/15/02, which is making no sense. First, it is false to conclude that the project is ahead of schedule. Secondly, Contractor is being "penalized" by no reason, which his entitlement has been cut short by 5 days.

HTC PROJECT CONTROLS
Services

Westlake Village, CA 91361
Phone: (805) 777-9267
Page 3 of 6

Solution Bulletins

The Myths of "Out-of-Sequence" and "Retained Logic vs. Progress Override"

Document No: SB002-P3   Revision No: Last Updated: April 8. 2003

Software Version: P3, Version 3.1   Author: Eric Chou

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	
1	Stud Framing	15	5	67	03/26/02A	04/15/02	Stud Framing
11	Drywall	5	5	0	04/08/02A	04/15/02	Drywall

Let's see another example:

2B. Assuming the project is slightly behind schedule as of 4/9/02. On the day 10 (4/9/02), Activity – Stud Framing is <u>behind schedule</u>, 8 days of work remained. Activity - Drywall has started on 4/8/02. However, it still needs 5 days to finish its work. Based on "Retained Logic" calculation, the forecast completion date is 4/25/02, which makes sense.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	
1	Stud Framing	15	8	47	03/26/02A	04/18/02	Stud Framing
11	Drywall	5	5	0	04/08/02A	04/25/02	Drywall

3B. However, if the schedule is calculated by using "Progress Override", the forecast completion date becomes 4/18/02, which is making no sense. First, the Drywall activity is to be completed before the Stud Framing activity. Secondly, the calculation is showing ahead of schedule progress while the project is actually behind schedule.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	
1	Stud Framing	15	8	47	03/26/02A	04/18/02	Stud Framing
11	Drywall	5	5	0	04/08/02A	04/15/02	Drywall

HTC PROJECT CONTROLS
Services

Westlake Village, CA 91361
Phone: (805) 777-9267

Solution Provider for Construction Project Controls
www.HTCProjectControls.com
Copyright © respective authors
Editor: Eric Chou, PE

Solution Bulletins

The Myths of "Out-of-Sequence" and "Retained Logic vs. Progress Override"

Document No: SB002-P3   Revision No: Last Updated: April 8. 2003

Software Version: P3, Version 3.1   Author: Eric Chou

Out-of-Sequence Progress in Cyclical Network

The other situation which causes some confusions is when out-of-sequence progress involves with a number of cycles of a group of activities such as concrete slab/wall pour cycles are different from the originally planned schedule. The decision to use Progress Override to correct out-of-sequence progress is definitely invalid. After all, the Contractor should diligently update the schedule per the current sequence and plan even though this may be a tedious process.

Please see the following examples:

1. Assume the following is an approved Baseline. Owner approves the logic and the fact (most importantly) that this project will start on 3/26/02 and complete on 5/6/02,which will take 30 working days to complete. To simply this example, each activity represents a group of activities.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	MAR / APR / MAY 2002
21	FRP Wall Pour # 1	10	10	0	03/26/02	04/08/02	FRP Wall Pour # 1
31	FRP Wall Pour # 2	10	10	0	04/09/02	04/22/02	FRP Wall Pour # 2
41	FRP Wall Pour # 3	10	10	0	04/23/02	05/06/02	FRP Wall Pour # 3

2. After the baseline is approved, the Contractor decided to pour wall pour # 2 first, then Pour # 3 and 1. On the day 10 (4/9/02), Activity – FRP Wall # 2 is complete. Activity – FRP Wall # 3 just started. Based on "Retained Logic" calculation, the forecast completion date is still 5/6/02 without changing any logics, which is still making sense. However, the forecast dates for the rest of pours are definitely not correct.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	MAR / APR / MAY 2002
21	FRP Wall Pour # 1	10	10	0	04/09/02	04/22/02	FRP Wall Pour # 1
31	FRP Wall Pour # 2	10	0	100	03/26/02A	04/08/02A	FRP Wall Pour # 2
41	FRP Wall Pour # 3	10	10	0	04/09/02A	05/06/02	FRP Wall Pour # 3

3. However, if the schedule is calculated by using "Progress Override", the forecast completion date becomes 4/22/02, which is making no sense. First, it is false to conclude that the project is ahead of schedule. Secondly, the Contractor is being "penalized" by no reason, which his entitlement has been cut short by 10 days.

HTC PROJECT CONTROLS
Services

Westlake Village, CA 91361
Phone: (805) 777-9267

Solution Provider for Construction Project Controls
www.HTCProjectControls.com

Solution Bulletins

The Myths of "Out-of-Sequence" and "Retained Logic vs. Progress Override"

Document No: SB002-P3　　　Revision No:　　　　　　　　Last Updated: April 8. 2003

Software Version: P3, Version 3.1　　　　　　　　　Author: Eric Chou

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	
21	FRP Wall Pour # 1	10	10	0	04/09/02	04/22/02	FRP Wall Pour # 1
31	FRP Wall Pour # 2	10	0	100	03/26/02A	04/08/02A	FRP Wall Pour # 2
41	FRP Wall Pour # 3	10	10	0	04/09/02A	04/22/02	FRP Wall Pour # 3

4. The best approach is to change the logics to reflect the current sequence and calculate the schedule by using Retained Logic as illustrated below.

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish	
21	FRP Wall Pour # 1	10	10	0	04/23/02	05/06/02	FRP Wall Pour # 1
31	FRP Wall Pour # 2	10	0	100	03/26/02A	04/08/02A	FRP Wall Pour # 2
41	FRP Wall Pour # 3	10	10	0	04/09/02A	04/22/02	FRP Wall Pour # 3

Conclusion

Out-of-sequence progress (I mean a P3 term) and Retained logic are not that bad at all. However, it is important to update schedule diligently to reflect the current plan. Those who review contractors' schedules do not just hand over a list of out-of-sequence report from P3 to the Contractor, and ask them to correct each out-of-sequence situation. You have to do your homework. After all, it is not that difficult to figure out which activities are actually performed out-of-sequence (I mean a legal term).

HTC PROJECT CONTROLS
Services

Westlake Village, CA 91361
Phone: (805) 777-9267

Solution Provider for Construction Project Controls
www.HTCProjectControls.com