

Understanding Primavera P6 Percent Complete Type

by Paul E Harris

1 Introduction

When you create a new project in P6 the default **Percent Complete Type** is **Duration**. Is this the best option and do you understand the difference between **Duration**, **Physical** and **Units Percent Complete**?

It is my opinion the this should always be changed to **Physical** for several reasons outlined in the recommendations paragraph at the end of this article.

2 The Four Percent Complete Fields to be Discussed

The **Percent Complete** type should be understood if it is intended to update (status or progress) a schedule. In Primavera this option may be set for each activity individually and the default for new activities is set in the **Percent Complete Type** drop down box. Primavera has many Activity Percent Complete fields that may be displayed in columns and we will discuss four of them now:

Activity % Complete, displayed on the **% Complete Bar**, may be linked to only one of the three % Complete following three fields:

- **Physical % Complete**
- **Duration %Complete**
- **Units % Complete**

There are three **Percent Complete** options; each new activity is assigned the project default **Percent Complete Type** and then this may be edited for each activity as required.

Therefore, if the option of **Physical % Complete** is selected for an activity then the **Activity % Complete** and the **Physical % Complete** are linked and a change to one will change the other.

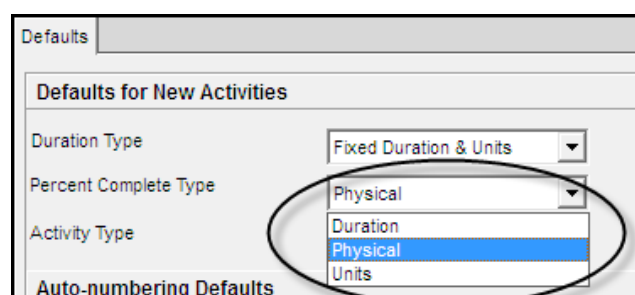
3 Activities Window – Percent Complete Types

There are three **% Complete** types which may be assigned to each activity. The default is adopted from the setting in the **Defaults** tab in the **Projects Window**.

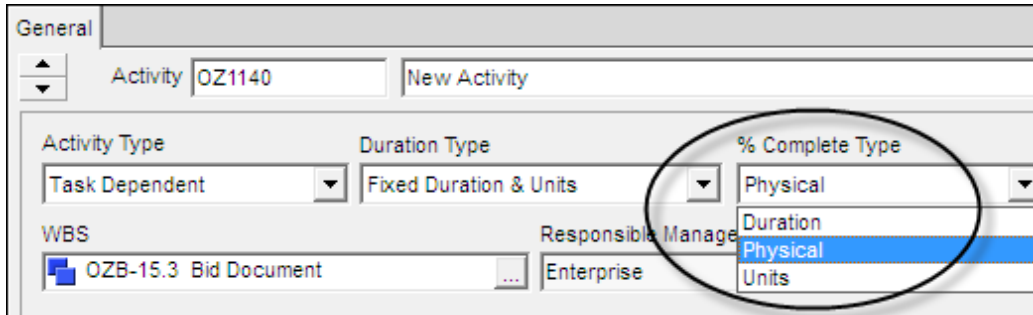
- **Physical**
- **Duration**
- **Units**

3.1 Assigning the Project Default Percent Complete Type

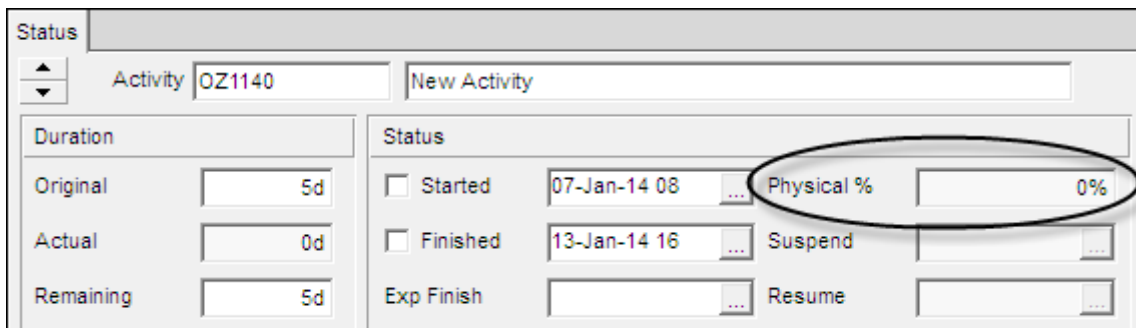
A project default **Percent Complete Type** is assigned in the **Defaults** tab of the **Projects Window** to each new activity created in a project. This may be changed at any time and only affects new activities created from that time onward:



After an activity has been created, the **Percent Complete Type** may be changed in the **General** tab of the **Activities Window**:



The Activity Percent Complete may be updated in the **Status** tab of the **Activities Window** where the **Percent Complete Type** is also displayed:



Each **Percent Complete Type** has its own data column and is always calculated.

There is also an **Activity % Complete** column which is linked to and displays the value from the **Percent Complete Type** column that has been assigned to the activity. See the following picture:

Percent Complete Type	Original Duration	Remaining Duration	Activity % Complete	Duration % Complete	Physical % Complete	Units % Complete	Actual Labor Units	At Completion Labor Units	Oct 24	Oct 31	Nov
% Co...	10d	6d		40%		33.33%	5	15			
Duration	10d	6d	40%	40%	5%	0%	0	0			
Physical	10d	6d	12%	48%	12%	0%	0	0			
Units	10d	5d	33.33%	50%	5%	33.33%	5	15			

The **Activity % Complete** is in turn linked to the Bar Percent Complete, therefore in effect the **Percent Complete Type** determines the way the percent complete is displayed on the bars.

3.2 Physical Percent Complete Type

An activity assigned Physical Percent Complete Type may have the % Physical Complete entered in the **Physical % Complete** or the **Activity % Complete**. This field has no impact on schedule calculations and is not linked to either the Resource Units or the Actual and Remaining Durations of the Activity.

Physical % Complete must be used when **Steps** are being used to record progress.

The **Physical Percent Complete** type is often used when the progress of an Activity is being measured outside Primavera. For example, an activity representing the installation cable that is measured by length of cable installed would have the percent complete calculated by:

- % Complete = Qty. of Cable Installed/Total Qty. of Cable to be Installed



For example, the activity may only have the installation labor assigned to it, and therefore the installation labor parameter may not be used for the measurement of the **Activity % Complete**. In addition, because the percent complete of the activity is based on the length of cable installed, the **Activity % Complete** (the progress of the work) may be compared to the resource **Units % Complete** (the amount of labor used) which is calculated from the formula:

- $\text{Units \% Complete} = \frac{\text{Actual Units}}{\text{At Completion Units}}$

This example is demonstrated in the following picture:

- The Activity Physical % Complete is set at 50%.
- The Activity Unit % Complete of 20% is calculated from the At Completion Units of 12.00 hrs and At Completion Units of 60.00 hrs and not the Budget Units of 48.00 hrs.

Percent Complete Type	Activity % Complete	Physical % Complete	Duration % Complete	Units % Complete	BL Budgeted Total Cost
Physical	50%	50%	0%	20%	\$1,296.00

Resources					
Activity		% Complete Physical			
AA1000					
Budgeted Units	Actual Units	Remaining Units	At Completion Units	Units % Complete	
48.00h	12.00h	48.00h	60.00h	20%	

After a second resource is added, the Activity Units % Complete of 40% is calculated from the addition of the two resource Actual Units and At Completion Units:

- $\text{Activity Unit \% Complete} = \frac{\text{Actual Labor Units}}{\text{At Completion Labor Units}}$
- Therefore, $40\% = \frac{12 + 36}{60 + 60}$

Percent Complete Type	Activity % Complete	Physical % Complete	Duration % Complete	Units % Complete	Actual Labor Units	At Completion Labor Units
Physical	50%	50%	0%	40%	48.00h	120.00h

Resources					
Activity		% Complete Physical			
AA1000					
Budgeted Units	Actual Units	Remaining Units	At Completion Units	Units % Complete	
48.00h	12.00h	48.00h	60.00h	20%	
48.00h	36.00h	24.00h	60.00h	60%	

3.3 Duration Percent Complete Type

With **Duration Percent Complete** there is a link established between:

- **Duration % Complete**
- **Original Duration**
- **Remaining Duration**



A **Duration % Complete** may only be entered after an Actual Start Date has been assigned and should be in the past with respect to the Current Data Date.

A change in one parameter will change one other:

- A change in the **Duration % Complete** will change the **Remaining Duration**, and
- A change in the **Original Duration** or **Remaining Duration** will change the **Duration % Complete**:

Percent Complete Type	Activity % Complete	Physical % Complete	Duration % Complete	Units % Complete	Actual Labor Units	At Completion Labor Units
Duration	40%	0%	40%	50%	16.00h	32.00h

Status	
Activity	AB1080
Duration % Complete	
Duration	Status
Original	5d
Actual	1d
Remaining	3d
Status	
<input checked="" type="checkbox"/> Started	27-Jun-03
<input type="checkbox"/> Finished	02-Jul-03
Exp Finish	
Duration %	40%
Total Float	
Free Float	

The **Actual Duration** is calculated from the duration of **Actual Start** to the **Current Data Date**.

The **Activity Units Percent Complete** is still calculated from the Resource Units.

3.4 Units Percent Complete Type

When **Units Percent Complete** type is selected:

- This option creates a link between the **Activity % Complete** and the activity **Units % Complete**, and
- The **Units % Complete** is calculated from the relationship between the **Actual Units** and **At Completion Units**.

Percent Complete Type	Activity % Complete	Physical % Complete	Duration % Complete	Units % Complete	Actual Labor Units	At Completion Labor Units
Units	50%	0%	33.33%	50%	24.00h	48.00h

Status	
Activity	AA1020
% Complete Type Units	
Duration	Status
Original	6d
Actual	2d
Remaining	4d
At Complete	6d
Status	
<input checked="" type="checkbox"/> Started	26-Jun-03
<input type="checkbox"/> Finished	03-Jul-03
Exp Finish	
Units %	50%
Total Float	6d
Free Float	4d



4 Using Steps to Calculate Activity Percent Complete

An activity **Physical** percent complete may be defined by using steps. A Step is a measurable or identifiable task required to complete an activity. Steps are useful to update activities that have many components, where the order of completion is not important but the measurement of progress is. Examples of the use of Steps:

- Driving of piles, with the **Step Weight** of each pile being the length of the pile,
- Pouring of footings, with the **Step Weight** being the m3 of concrete for each footing,
- Pulling of electrical cable, with the **Step weight** being the weight or length of each cable.

In summary, to use steps:

- A Step template may be created by selecting **Enterprise, Activity Step Template...** to open the **Activity Step Templates** form.
- Add as many steps as required and assign their weight which will be used to apportion the percent complete of an activity.
- Check the **Activity percent complete based on steps** check box in the **Projects Window, Calculations** tab,

- Select the **Physical** in the **% Complete Type** for each activity that is to be measured by steps in the **General** tab of **Activities Window**,
- Select the **Steps** tab in the **Activities Window**,
- Format the columns you wish to display,
- Add the number of steps you require or import from a Step Template,
- Edit the descriptions as required,
- Edit the **Step Weight** so the **Step Weight Percent** reflects the desired value of the Step,
- Check the **Completed** check box as each step is completed and this will update the percent complete.
- The **Remaining Duration** may be updated from the **Step % Complete** via the **Physical % Complete** using a **Global Change**.

Step Name	% Complete	Step Weight	Step Weight Percent	Completed
Specify Document Composition	100%	10.0	10.0	<input checked="" type="checkbox"/>
Document First Draft	100%	40.0	40.0	<input checked="" type="checkbox"/>
Final Draft and Internal Approval	0%	25.0	25.0	<input type="checkbox"/>
Client Approval	0%	25.0	25.0	<input type="checkbox"/>

5 Recommendation

Units Percent Complete may not be used when there are no resources assigned.

The major issue with **Duration Percent Complete** is that the **Remaining Duration** is linked to this value and it becomes hard to maintain **Remaining Durations** to round days which in turn makes activities start and finish at strange times and one day tasks span two days etc.

NOTE: This issue is overcome in products like **Powerproject** which has a function titles **Snapping** that keeps durations round irrespective of the percent complete value by rounding the Remaining Duration.

It is the author's preference to use **Physical % Complete**:

- **Physical % Percent Complete** also allows the **% Complete** to be entered independently of the **Remaining Duration** allowing **Remaining Durations** to be kept to round days which is preferable in many projects.
- **Physical % Percent Complete** allows the % of deliverables complete to be measured independently of the resource(s) doing the work, thus allowing a comparison of the deliverables completed against the resources consumed.
- Finally, **Physical % Complete** must be used with steps.

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