Assigning & Updating Activity Costs in Primavera P6 Pro

Possible Methods for Assigning Costs to Activities:

Consider an activity "A" that has a duration of 4 days, a cost rate of $200/day, and a total cost of $800. What is the best way to associate this cost information with activity "A" in P6 Pro?

In P6 Pro, there are essentially two ways to associate an activity with its cost:

- By assigning an "Expense". Expenses are tied to Activities and all project Expenses can be seen by selecting from the main menu "Project" > "Expenses…". The costs of an Expense can accrue in three ways:
  - Start of Activity: It causes the actual cost to occur as soon as the activity begins.
  - End of Activity: It causes the cost to be delayed until the activity ends.
  - Uniform over Activity: It spreads the cost in time uniformly across the activity.
- By defining a new "resource", e.g., "$U" (for $ Units) with a "Price/Unit" (e.g., $1/day) and assigning a certain number of "Units" (i.e., "resources per day") to the activity (e.g., 200 Units) to give the desired cost rate (e.g., $200/day) and activity total cost (e.g., $800).

Expenses are simple, but do not provide access to P6 "Cost" and "Unit" views, reports, and fields. To have greater flexibility, it is necessary to use a "resource" to associate each activity with its cost.

P6 Pro supports three "types" of resources:

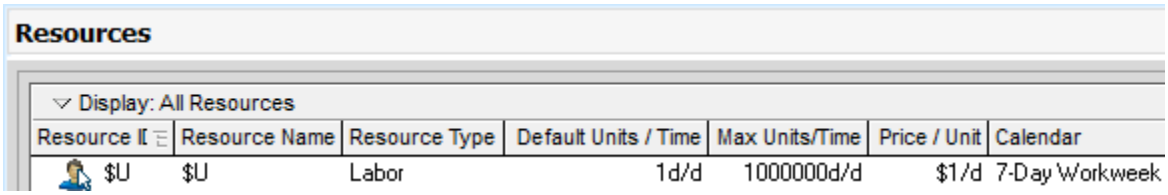
- Labor (intended primarily for labor)
- Nonlabor (intended primarily for equipment)
- Material (intended primarily for material, e.g., steel, concrete, timber, etc.)

In principle, any one of these three resource types could be used to model activity costs. Using a "material" resource, however, is not a good choice because several P6 tables and graphs can only display information about labor and nonlabor resources. Also, using a "nonlabor" resource is not the best choice because the "Activity Usage Profile" (a key P6 report) can display Earned Value Curves for "labor" units but not for "nonlabor" units.

From these observations it follows that the best way to associate each activity with its cost in P6 Pro is to define and use a "labor" resource that represents activity cost (money) as described below.

Define a Labor Resource to represent Activity Cost (money):

To define a labor resource that represents money, start with the main menu "Enterprise" > "Resources…" to show the Resources tab. To add a new resource, click on the "+" sign on the top-right-hand-side of the screen to bring up the "New Resource Wizard". Enter the information shown below:



This defines a new "labor" resource with the name "$U" (i.e., "$ Unit") and initials "$U". Any descriptive name and initials can be chosen for this resource.

Also, it is good practice to set the "Price/Unit", i.e., the daily cost for this resource, to "$1/d" (if using days for activity durations), or to $1/w (if using weeks for activity durations), etc.

To avoid messages about "overallocated resources", set "Max Units/Time" to a very large value that exceeds the maximum $/day that might be needed by the project on any given day.

Assign the Resource "$U" to Activities

To illustrate how to associate activities with their cost, consider the sample project used in the textbook to introduce "Time-Cost S-curves". The activity cost data for this project appear in Table 9.1:

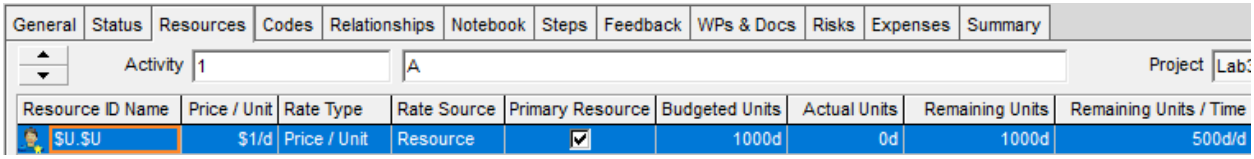
TABLE 9.1

Sample Project Cost Data

Activity	Duration (Days)	Cost Rate ($/Day)	Total Cost ($)
A	2	500	1,000
B	17	200	3,400
C	3	3,000	9,000
D	5	1,000	5,000
E	6	2,000	12,000
F	2	500	1,000
G	1	1,000	1,000

The most straightforward way to assign resources to activities in P6 Pro is to display the Gantt Chart in the top pane and the activity details in the bottom pane.

To assign resources to an activity use the "Resources" tab in the activity details pane. The figure below shows how to enter the above Cost Data for activity "A" in the "Resources" tab.



To enter the cost data for activity "A" start by assigning the resource "$U" to activity "A". To do that, click on the button "Add Resource" (on the bottom-left of the "Resources" tab) and choose "$U" from the list of all defined resources that will be displayed by P6 to make a selection.

The "Cost Rate" for activity "A" is $500/day. Enter it in the field "Remaining Units/Time" as 500d/d. Because activity "A" has not started yet, this will also set (automatically) both fields "Budgeted Units" and "Remaining Units" to 1000d to represent the "Total Cost" of $1,000. Thus, for an activity that has not started, the relationship between these three cost fields and duration is given by the formula:

(Budgeted Units) = (Remaining Units) = (Remaining Units/Time) * (Duration)
(mandays) = (men) * (days)
(Total Cost for Activity, $) = (Cost Rate, $/d) * (Duration, d)

Note that in P6 Pro, "Budgeted Units" and "Remaining Units" are shown as "1000d" where the suffix "d" should be understood as "mandays" (or, "resourcedays"). Similarly, "Remaining Units/Time" are shown as "500 d/d" where the "d" in the numerator should be understood as "mandays" (or, "resourcedays") while the "d" in the denominator should be understood as "days".

The Relationship between Units (i.e., Work) and the Cost of Activities

As stated earlier, it is good practice to set the resource "$U" to have "Price/Unit = $1/d" (where "d" should be understood as "manday" or "resourceday"). This choice makes "Cost" have the same numerical value as "Units".

Thus, if we ignore the fact that "Cost" and "Units" use different units of measure, we have:

"Remaining Units/Time" = "Dollars/Time" = "Cost Rate" for the activity
"Budgeted Units" = "Remaining Units" = "Dollars" = "Total Cost" for the activity

When interpreted in this manner, the numbers in the "Resource" tab above show both resource "Unit" and "Cost" information for each activity.

Entering Data and Saving the Budgeted Cost of Work Scheduled (BCWS)

The steps for entering the time and cost data needed for the BCWS "S-Curve" are described below. The Activity durations and cost data for the example project is shown in Table 9.1 above. The target (baseline) schedule for the project is the early-start schedule shown in Fig. 9.5 below.

Note: *For this example, the "General" tab of the "Activity Details" pane for all activities is set to "Task Dependent", "Fixed Duration & Units", and "% Complete Type" = "Duration". This makes the P6 results for "Percent Complete" as well as "Earned Value" match those produced by MS Project.*

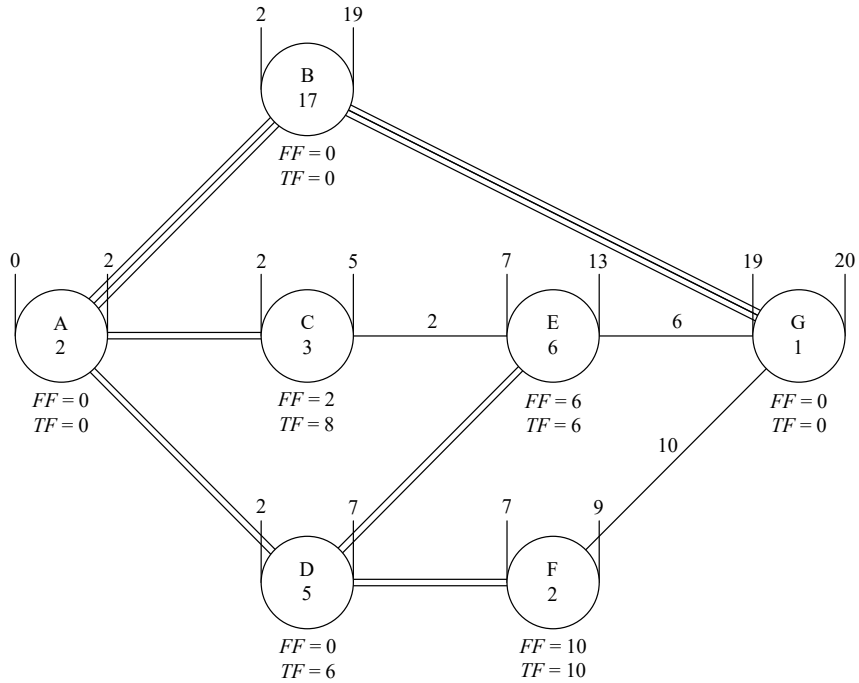


Figure 9.5 Early Start Tree

Steps to enter time and cost data for the target schedule and BCWS:

1. Enter the activities, their durations and their predecessors using the activity details pane and the information in the above network. These are sufficient for performing scheduling calculations.
2. Define the labor resource "$U" as described earlier.
3. Assign the resource "$U" to each activity using the "Resources" tab in the activity details pane. Set the value in the "Remaining Units/Time" field equal to the activity's "Cost Rate" (as shown in Table 9.1 above).
4. Press F9 to "Schedule" the project.
5. Develop a table with the columns shown below to view a summary of the results. As mentioned earlier, the early-start schedule for this project is also the Target schedule. As a result, the current schedule shown in the table contains all the necessary logic, time and cost information for the project's BCWS S-Curve (it is based on the target schedule and on budgeted costs).

Activities **Projects**

Layout: 20 F-Lab4-ActCost_Target Filter: All Activities

ID	Act	Pred	BL20 Dur	@Cmpl Dur	Act Dur	Rem Dur	% Comp	ESD	EFD	LSD	LFD	FF	TF	Res IDs	Rem Lbr Units
1	A		2d	2d	0d	2d	0%	01-11-	02-11-	01-11-	02-11-	0d	0d	$U	1000
2	B	1	17d	17d	0d	17d	0%	03-11-	19-11-	03-11-	19-11-	0d	0d	$U	3400
3	C	1	3d	3d	0d	3d	0%	03-11-	05-11-	11-11-	13-11-	2d	8d	$U	9000
4	D	1	5d	5d	0d	5d	0%	03-11-	07-11-	09-11-	13-11-	0d	6d	$U	5000
5	E	4, 3	6d	6d	0d	6d	0%	08-11-	13-11-	14-11-	19-11-	6d	6d	$U	12000
6	F	4	2d	2d	0d	2d	0%	08-11-	09-11-	18-11-	19-11-	10d	10d	$U	1000
7	G	2, 5, 6	1d	1d	0d	1d	0%	20-11-	20-11-	20-11-	20-11-	0d	0d	$U	1000

6. Save the current (Target) schedule as a Baseline and "assign it" as the "Project Baseline". Setting the Baseline is the key step that saves the cost and schedule data for the Budgeted Cost of Work Scheduled (BCWS). This allows actual project performance data to be entered and compared against the baseline (schedule and costs) to perform Earned Value calculations.

Method 1 & Method 2 for Entering Actual & Estimated Activity Progress Data

Once a Baseline is saved, the project can be updated to reflect actual and estimated time and cost performance as of the Data Date.

As described in "***Steps to Update a Schedule in Primavera P6 Pro***" there two methods to enter actual/estimated data as of a certain Data Date into P6: **Method 1** and **Method 2**.

Method 1: There is no checkmark next to "***Link Budget and At Completion for not started activities***" in the "Calculation" tab for the project (in the P6 "Projects" tab).

Method 1 does not change the Planned durations, dates, and units for not-started activities. They are **not** set equal to the At-Completion values.

Method 1 is not recommended. It is difficult to apply without making mistakes and produces "% Complete" values that can be misleading because they do not reflect all the information available. It is described only in broad terms below

Method 2: There is a checkmark next to "***Link Budget and At Completion for not started activities***". Moreover, the option "*Reset Original Duration and Units to Remaining*" is selected.

Method 2 changes the Planned durations, dates, and units for not-started activities and sets them equal to their At-Completion values.

Method 2 is the recommended method to use. It uses the scheduling power of P6 to avoid making mistakes and produces "% Complete" values that (a) reflect all the information available and (b) agree with Microsoft Project.

Overview of Entering Activity Progress Data for both Method 1 & Method 2

Although the detailed steps for Methods 1 & 2 are different, the overall process for entering activity progress data is similar and uses the activity details pane as follows:

- Enter the remaining duration and actual dates on the Status tab
- Enter actual units and remaining units for each resource on the Resource tab
- Enter the % complete manually (only if "physical % complete" has been chosen for the activity).

A major difference between Method 1 and Method 2 is the setting of the current Data Date when the project is first recalculated using the Schedule command (F9). Method 1 sets the Data Date to "today", enters all progress information, and then recalculates the project. Method 2 leaves the Data Date to its previous Data Date value (e.g., at time "zero"), enters (partial) progress information, and recalculates the project. Method 2 then completes entering actual progress information, sets the Data Date to "today" and recalculates the project.

When in doubt, it is very important to remember that P6 always performs the forward-pass scheduling calculations starting from the "Data Date" and uses only "Remaining Durations". P6 does not use any other durations for calculating the schedule.

Fields for Entering Budgeted, Actual, and Remaining Cost Data

Actual and estimated cost data are entered as "Actual Units" and "Remaining Units" in the Resource tab of the activity details pane. Thus, entering actual cost data is similar to entering the original cost data that became part of the baseline and BCWS. The difference is that actual cost data are entered in the "current" project whereas the budgeted costs for BCWS have been saved in the Project Baseline.

There are four fields on the Resource tab that can be used to enter updated unit data for each resource:

- "Budgeted Units"
- "Actual Units"
- "Remaining Units"
- "Remaining Units/Time"

Budgeted Units: The field "Budgeted Units" represents the work for **this activity** in **this (the current) schedule**. Thus, the field "Budgeted Units" can be changed to indicate a change in the total amount of work relative to the baseline. This means that setting the "Budgeted Units" for this (the current) schedule does not change the "Budgeted Units" saved in the "Project Baseline". (A possible use of the field "Budgeted Units" is to allow earned value calculations for a project that does not have an assigned baseline. For many activities, there is no reason to change the field "Budgeted Units".)

Changing the field "Budgeted Units":

For an Activity that **has not started:**

- Method 1: Does not change the "Remaining Units" and does not change the "Remaining Units/Time" (the "Actual Units" are zero).
- Method 2: Changes the "Remaining Units" to equal the "Budgeted Units" (since the "Actual Units" are zero), and changes the "Remaining Units/Time" to match:

"Remaining Units/Time" = "Remaining Units" / "Remaining Duration"

For an Activity that **has finished**

- Method 1 & Method2: Changes the "Actual Units" to equal "Budgeted Units" (since the "Remaining Units" are zero). The "Remaining Units/Time" are not changed.

For an activity that has started and is **in progress** (i.e., not finished),

- Method 1 & Method2: Changes all three: "Actual Units", "Remaining Units", and "Remaining Units/Time":

"Budgeted Units" (Before the change) = ["Actual Units" + "Remaining Units"] (After the change)

"Remaining Units/Time" = "Remaining Units" / "Remaining Duration"

The rationale and algorithm for changing "Actual Units" and "Remaining Units" is unclear.

Actual Units: The field "Actual Units" is used to enter the actual amount of work done up to the Data Date. It could also represent the "Actual Cost" of the activity up to the Data Date.

Changing the field "Actual Units" does not change the field "Budgeted Units", but does change the field "Remaining Units" so that their sum ("Actual Units" + "Remaining Units") remains the same before and after the change (this sum may not equal the field "Budgeted Units"). The change in "Remaining Units" is done for convenience because for many activities, the total amount of "Units", i.e., work, does not change, and the user should not have to update both fields manually. It also changes the field "Remaining Units/Time" to match "Remaining Units":

"Remaining Units/Time" = "Remaining Units" / "Remaining Duration"

Remaining Units: The field "Remaining Units" is used to enter the latest estimate for the amount of work remaining after the Data Date. Thus, it may also represent the "Remaining Cost" of the activity after the Data Date. Updating the field "Remaining Units" manually or automatically (i.e., by updating the field "Actual Units") changes only the field "Remaining Units/Time" to match:

"Remaining Units/Time" = "Remaining Units" / "Remaining Duration"

Changing the field "Remaining Units" does not change "Actual Units" or "Budgeted Units". This is important because it is makes it possible for the sum "Actual Units" + "Remaining Units" to represent a different "total amount of work" for the activity (as estimated at the Data Date). This "total amount of work" is used by P6 for computing "Unit % Complete". Moreover, this updated estimate for the "total amount of work" can be different from the "Project Baseline" and also from the "Budgeted Units".

Remaining Units/Time: The field "Remaining Units/Time" can be used to enter the latest estimate for the daily amount of work remaining after the current Data Date. It could also represent the "Remaining Cost Rate" for the activity after the Data Date.

Changing the field "Remaining Units/Time:

For an Activity that **has not started:**

- Method 1: Changes only the field "Remaining Units" to match:

  "Remaining Units" = "Remaining Units/Time" * "Remaining Duration"

- Method 2: Changes both the field "Remaining Units" and the field "Budgeted Units".

  "Budgeted Units" = "Remaining Units" = "Remaining Units/Time" * "Remaining Duration"

For an Activity that **has finished:**

- Method 1 & Method2: Does not change other fields because "Remaining Duration" = 0.

For an activity that has started and is **in progress** (i.e., not finished),

- Method 1 & Method2: Changes only the field "Remaining Units" to match:

  "Remaining Units" = "Remaining Units/Time" * "Remaining Duration"

Method 1—Entering Actual *Schedule* (*Time*-related) Project Information as of the Data Date

The required steps for updating actual time-related information can be summarized as follows (for more details see "*Steps to Update a Schedule in Primavera P6 Pro*"):

- Set the Data Date.
- Show the "Progress Line" in the Bar Chart.
- Show appropriate columns for "% Complete", "Durations" and "Actual Dates" (see the figure above).
- Enter Actual [Start | Finish] Dates (in the Status tab) for activities that have [started | finished].
- Enter Actual and Remaining Durations (in the Status tab) for finished and ongoing activities.
- Control-click to select all activities that have started and progressed as scheduled in the baseline. To have P6 set their status automatically, select in the menus, "Tools" > "Update Progress" and then select "Update Progress for selected activities only".
  This is an easy way to update activities that satisfy both of the following two conditions:
  1. They have started as early as their predecessors allow and have either finished or are still going on, and
  2. Their durations have not changed from the baseline.

  P6 uses the defined Data Date to mark the selected activities as started/finished and updates their remaining duration appropriately (so that they do not have to be updated manually).

Important: When P6 "schedules" the project again (F9 key), all other activities (i.e., those that have not been started either manually or automatically) will be scheduled by P6 to start on or after the Data Date based on their predecessors and according to their remaining durations.

Important: As mentioned earlier, Method 1 Is not recommended. The recommended steps are those of Method 2, which are described below using a detailed example.

Method 2—Things to Remember when Entering Activity Time and Cost Progress Data

Useful facts to remember when entering Time and Cost data as of the Data Date:

- P6 does not automatically reschedule the project when the user makes any changes to activities.
- P6 reschedules a project only when the user selects "Schedule" or presses the "F9" key.
- P6 only uses two things for scheduling: The Data Date and the Remaining Durations of activities.
- When P6 reschedules a project, all scheduling starts at the Data Date (all work that has been entered as "actually performed" before the Data Date is ignored).
- When P6 reschedules a project, it uses only the Remaining Duration of activities. All other durations defined in P6 are ignored.
- For an in-progress activity that has been marked as "Actually Started", but has not been marked as "Actually Finished", the duration from the Actual Start date to the Data Date (i.e., the actual-duration-to-date) is ignored. When P6 schedules the project (F9), the activity ESD will be the Data Date and the activity's duration will be its Remaining Duration.
- When P6 schedules a project (F9), it ignores activities with "Actual Finish" dates that are earlier than the Data Date. It is as if they do not exist.
- P6 also ignores the precedence links between an activity with an "Actual Finish" date (earlier than the Data Date) and any successor activities.
- P6 allows the user to set any date as the "Actual Start" of an activity, even a date that is clearly in the future, i.e., the "Actual Start" date of an activity can be set later than the Data Date.
- P6 also allows setting any date as the "Actual Finish" of an activity, even a date that is clearly in the future, i.e., the "Actual Finish" date of an activity can be set later than the Data Date.
- P6 allows the violation of precedence links. A user is allowed to enter an "Actual Start" date for a successor activity that is clearly earlier than the "Actual Finish" date of a predecessor activity.
- If activity "A" is set by the user to have both "Actual Start" and "Actual Finish" later than the Data Date, then "A" is treated like a zero-duration dummy activity and the ESD of its successors will be the maximum of the EFD of the predecessors of "A" and the Data Date. This will violate the Finish-to-Start precedence link between "A" and its successor activities.
- To explore the day-by-day effects of changing Actual and/or Remaining resource units and/or time fields (dates and durations), it is best to show the Activity Usage Spreadsheet on the top pane and the Activity Details on the bottom pane.
- In "Activity Details", setting the "Remaining Units/Time" for an activity, changes the "Remaining Units" based on the "Remaining Duration" of the activity as follows:

  "Remaining Units" = "Remaining Units/Time" * "Remaining Duration"

  "$ Cost of remaining Activity" = "$/d for the remainder of the Activity" * "Remaining Duration"
- In "Activity Details", setting the "Actual Units" for an activity changes the "Actual Units/Time" based on the "Actual Duration" of the activity as follows:

  "Actual Units/Time" = "Actual Units" / "Actual Duration"

  "Actual $/d during Actual Duration" = "Actual $ Cost" / "Actual Duration"

  Notice that the "Actual Units" are reported as "Actual Labor Units" or "Actual Nonlabor Units" and that the "Actual Units/Time" are best seen in the Activity Usage Spreadsheet or the Resource Usage Spreadsheet.

Method2—Example "Actual and Estimated Data" for Entering Revised Time and Cost as of Data Date

The following table is a continuation of the "Time-Cost S-Curves" example and shows possible actual and remaining time and cost data as of **Data Date = 8 days**.

The "actual" and "remaining" time and cost data shown below were chosen deliberately for this example so that there would be several changes in time and/or cost (relative to the Project Baseline).

Layout: 20 -Lab4.3-ProjCtrl_SprdSht_Cost_EV | Filter: All Activities

ID	Act	Pred	BL20 Dur	@Cmpl Dur	Actl Dur	Rem Dur	Start	Finish	% Cmpl	BL Cost	BCWS (PVC)	@Cmpl Cost	ACWP	BCWP	CVar	SVar
Total			20d	19d	8d	11d	01-11- A	19-11-		32,400	18,700	30,500	12,900	14,633	1,733	(4,067)
1	A		2d	3d	3d	0d	01-11- A	03-11- A	100%	1,000	1,000	900	900	1,000	100	0
2	B	1	17d	15d	5d	10d	04-11- A	18-11-	33.33%	3,400	1,200	3,600	1,200	1,133	(67)	(67)
3	C	1	3d	6d	5d	1d	04-11- A	09-11-	83.33%	9,000	9,000	7,200	6,000	7,500	1,500	(1,500)
4	D	1	5d	4d	4d	0d	05-11- A	08-11- A	100%	5,000	5,000	4,800	4,800	5,000	200	0
5	E	4, 3	6d	8d	0d	8d	10-11-	17-11-	0%	12,000	2,000	12,000	0	0	0	(2,000)
6	F	4	2d	2d	0d	2d	09-11-	10-11-	0%	1,000	500	1,200	0	0	0	(500)
7	G	2, 5, 6	1d	1d	0d	1d	19-11-	19-11-	0%	1,000	0	800	0	0	0	0

Notes: The many changes in activity durations, from target to "actual or remaining", result in several new ESD and EFD for successor activities, that are difficult to keep track of manually. (P6 does not automatically reschedule the successors when a change is made to the duration of a predecessor.)

Also, P6 ignores activities that are marked with an "actual finish" when rescheduling their successor activities. This makes it possible for the user to make a mistake (when entering actual data) and accidentally schedule successor activities to start earlier than the finish of their predecessors.

Thus, Method 1 for entering actual and estimated time and cost data into P6 can be quite challenging. It is easy to make mistakes by entering data in the wrong order. And because P6 does not have a complete "undo" function, it is difficult to go back and correct mistakes.

Hence, for this example, **Method 2 is the preferred method**. It is much easier for entering the above actual and estimated data into P6 and produces better %Complete. The reasons are the following:

- The entry of the changed "Remaining Durations" is done without advancing the current Data Date (i.e., the Data Date is kept at 0 days), i.e., all activities are still "not-started".
- Changing the "Remaining Duration" of activities that are "not-started" also changes their "Original Duration" to match. (The "Actual Duration" is still zero.)
- Changing the "Original Duration" to match the latest estimate (as of the Data Date) of the activity total duration produces a better "%Complete" for the activity that matches that calculated by MS Project. (The "%Complete" calculated by Method 1 is counter-intuitive because it is based on the original "Original Durations", i.e., the durations saved in the Project Baseline and used for determining the Target schedule and the BCWS).
- The P6 scheduling engine can be used to recalculate the revised ESD and EFD (that will later become the "Actual" Start and Finish dates) of all activities based on their revised durations (that will later become the "Actual" and "Remaining" Durations). This P6-assisted recalculation of ESD and EFD reduces the required manual effort significantly, and also reduces the likelihood of making mistakes that are often difficult to correct.

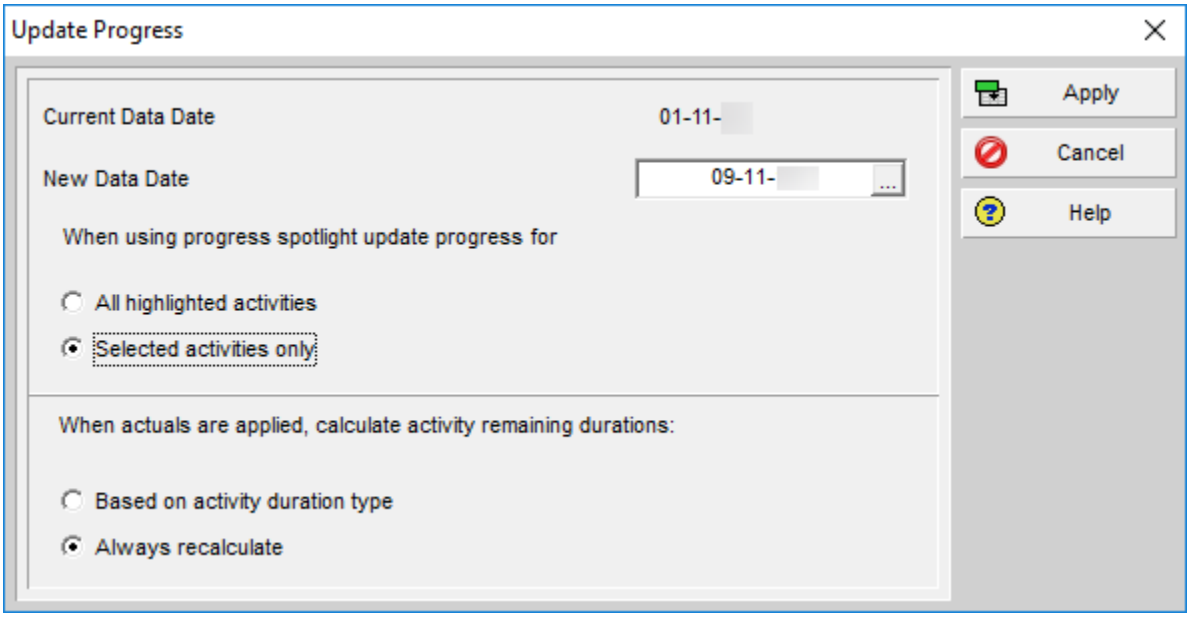
Method 2 — Steps for Example Project: Entering Activity Time and Cost Progress Data

Follow the steps below to enter the Activity Time and Cost Progress Data shown in the above table:

- Save the Target Schedule as a "Project Baseline". This saves the schedule and activity costs that become the BCWS.
- Important: Leave the Data Date = 0. (This will allow P6 to help later by scheduling activities that have revised activity durations and with the allocation of the revised activity daily costs.)
- Change the "Remaining Duration" for each activity (using the "Status" tab of "Activity Details") to match its "At-Complete Duration" (shown in the column "@Cmpl Dur" in the above table). For this example, only activities A, B, C, D, and E, are affected. This step is similar to redefining the project activities to have entirely new durations.[1]
- Change the "Remaining Units" for each activity (using the "Resources" tab of "Activity Details") to match its "Estimate at Completion Cost" (shown in the column "@Cmpl Cost", which in this case is the actual and estimated cost of the activities). Notice that this changes
  "Remaining Units/Time" to = ("Remaining Units")/("Remaining Duration").
  Again, this is similar to redefining the activities to have entirely new Total Costs and Cost Rates.
- Press the F9 key to schedule the project (again) starting from DD=0.
  The result is a new version of the project whose activities have durations equal to the "actual" or "remaining" durations and whose activity costs have been (a) updated and (b) distributed evenly over the entire activity duration.
- It is a good idea to save the resulting schedule as an interim project in P6 and continue work on a copy. This copy of the project can be used to set the actual start dates for activities.
- Because of the above rescheduling, all activities have the required ESD, except for activity D whose "Actual Start" date (5 Nov) is different from its computed ESD (4 Nov).
- In the "Status" tab of the "Activity Details" view, set the Actual Start date for activity D to 5 Nov and check the "Finish" box.
- The above table shows that Activities A, B, and C, are the only other activities that have actually started by the Data Date =8d. However, because their ESD (already calculated by P6 based on their revised durations) are identical to their "Actual Start" dates, it is possible to update these activities easily as follows.
- Select the three rows for Activities A, B, and C in the Gantt Chart.
  Important: Do not select any other activities that have not actually started yet, such as activity F.
- In the P6 menu select: "Tools" > "Update Progress…".
  Set the Data Date to 8 days. Notice that in P6 this is done by setting the project Data Date to the

[1] Important Note: Entering the revised "Remaining Duration" at DD=0 without marking an activity as "Started", also sets its "Original Duration":= "Remaining Duration". This makes "% Complete based on Duration" in P6 work the same way as in MS Project. For example, activity B had Baseline Duration = 17d. When at DD=0 the Remaining Duration is revised from 17d to 15d, without marking B as "Started", its "Original Duration" is revised to 15d, too. As a result, when later, at DD=8, B is "Started" and the "Remaining Duration" is set to 10d, then
"%Complete based on Duration" = 1 - "Remaining Duration" / "Original Duration" = 1 -10/15 = 33% (correct)
However, if updating was done using "Method 1", i.e., at DD=0 no change to "Remaining Duration" = 17d is made, and at DD=8 activity B is marked "Started", and then its Remaining Duration is revised from 17d to 10d, the "Original Duration" remains at 17d. As a result, when at DD=8, Remaining Duration is set to 10d, then
"%Complete based on Duration" = 1 - "Remaining Duration" / "Original Duration" = 1 -10/17 = 41% (incorrect)

morning of the 9th day.
Choose "Selected activities only" (as shown below).
Click Apply.



- This will mark the "Started" checkbox for Activities A, B, and C, and will also set their "Actual Start" date to the "Early Start" date already recalculated (correctly) by P6.
- It will also recalculate their "Actual Duration" = "Data Date" - "Actual Start" date.
- It will also recalculate their "Remaining Duration" = "Original Duration" – "Actual Duration".
- Activities E, F, and G, have not started. As a result, no specific entries are required.
- Press F9 to have P6 "Schedule" all activities based on their remaining durations starting at the Data Date = 8d.

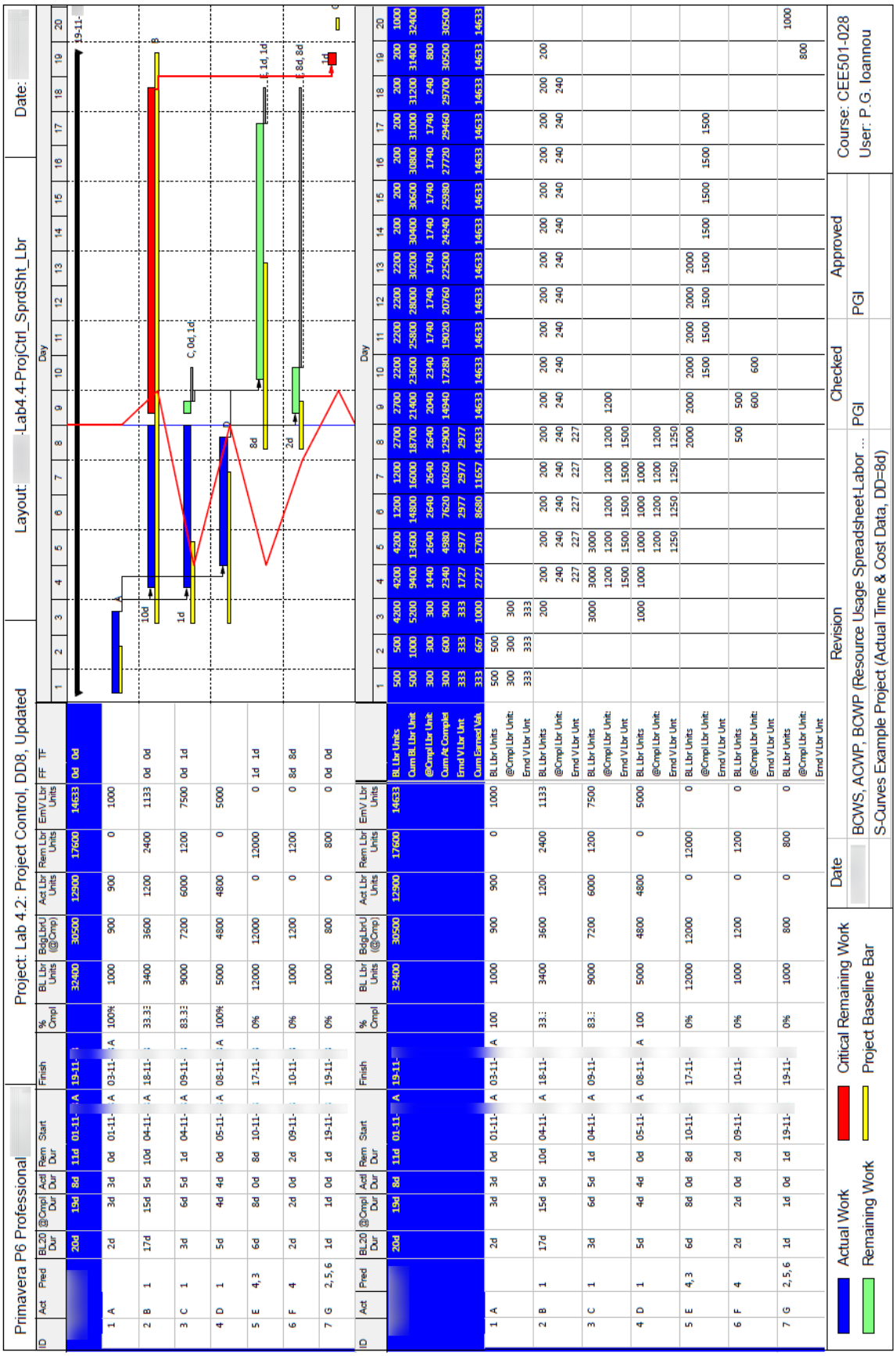
This concludes entering activity time and cost progress data for the example project as of Data Date = 8 days.

Activity Usage Spreadsheet (Cost-loaded Bar Chart)

Both the "Activity Usage Spreadsheet" view and the "Resource Usage Spreadsheet" view include a spreadsheet on the right-hand side that, for each activity, can show "Units/Time" (or "Cost/Time") or "Cumulative Units/Time" (or "Cumulative Cost/Time"). These spreadsheets are highly customizable and their appearance is similar to a cost-loaded bar chart.

As an example, the bottom pane of the figure below, shows the "Activity Usage Spreadsheet", as of Data Date = 8 days, for the "S-Curve" example project that was examined in detail above. The table on the left is similar to the one above showing updated time and cost activity data. On the right, the spreadsheet shows in bar-chart format the following "Units/Time", $/day, for each activity:

- "Baseline (BCWS)" $/day
- "At Completion" $/day, i.e., "ACWP" $/day up to the Data Date; "Estimated ACWP" $/day after the Data Date
- "Earned Value (BCWP)" $/day


Primavera P6 Professional
Project: Lab 4.2: Project Control, DD8, Updated
Layout: -Lab4.4-ProjCtrl_SprdSht_Lbr
Date:
Actual Work
Remaining Work
Critical Remaining Work
Project Baseline Bar
Date
Revision
Checked
Approved
BCWS, ACWP, BCWP (Resource Usage Spreadsheet-Labor ...
PGI
PGI
S-Curves Example Project (Actual Time & Cost Data, DD=8d)
Course: CEE501-028
User: P.G. Ioannou

Project Performance Metrics

The Labor Units shown in rows 1,3,5, of the blue spreadsheet header represent $/day and are the sum of the "Cost Rates", $/day, for the activities that are performed on that day. The Cumulative Labor Units shown in rows 2,4,6, of the blue spreadsheet header represent $ up to that day and are the sum of the $/day over all days up to that day.

Row 2 shows the Cumulative Baseline Labor Units and represents the BCWS which reaches its maximum value on day 20 at which point it equals the BAC (Budget at Completion) = $32,400.

Row 4 shows the Cumulative at Completion Labor Units which up to the Data Date = 8 days, represents the ACWS. After the Data Date, Row 4 represents the "Estimated ACWP" which reaches its maximum value on day 19 at which point it equals $30,500.

Row 6 shows the Cumulative Earned Value Labor Units and represents the BCWP which is reported only up to the Data Date = 8 days at which point BCWP = $14,633.

(Note that the blue spreadsheet header shows six rows of metrics, whereas only three rows of metrics (corresponding to rows 1,3,5, in the header) are shown for each activity. P6 cannot produce such a report. The above report was produced by copying and pasting the spreadsheet header from a different report that showed six rows of metrics for each activity but was too long to fit in a single page.)

On the Data Date = 8 days: The cumulative rows show the following project control metrics:

Cumulative Baseline Labor Units =
BCWS = Budgeted Cost of Work Scheduled = 500+500+4200+4200+4200+1200+1200+2700 = **$18,700**

Cumulative at Completion Labor Units =
ACWP = Actual Cost of Work Performed = 300+300+300+1440+2640+2640+2640+2640 = **$12,900**

Cumulative Earned Value Units =
BCWP = Budgeted Cost of Work = 333+333+333+1727+2977+2977+2977+2977 = **$14,633**

CV = Cost Variance = $14,633 - 12,900 = **$1,733** (favorable)

SV = Schedule Variance = $14,633 – 18,700 = **-$4,067** (unfavorable)

Notice that the Schedule Variance is negative (unfavorable), which typically indicates that the project is behind schedule. In this case, however, this is a false alarm because the current estimate for the duration of the project is 19 days, which is one day earlier than the original duration of 20 days for the target schedule.

This example makes it clear that the Schedule Variance is not an infallible metric for the evaluation of schedule performance. Schedule Variance is helpful but can also be misleading. It can indicate that the project is ahead of schedule when it is behind schedule and it can indicate that the project is behind schedule when it is not (as is the case here). Prudent management requires that other metrics should also be used to obtain an accurate assessment of schedule performance.