

PLANNING & CONTROL USING
ORACLE PRIMAVERA P6
VERSION 8 to 20 PPM PROFESSIONAL

PAUL E. HARRIS

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Welcome to the
**Eastwood Harris Pty Ltd
Primavera P6
Versions 8 to 20
PPM Professional**
3 day training course

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Administration

- Evacuation procedure
- Facilities, timings and meals
- Mobile phones & Emails
- Introductions:
 - Your name,
 - The types of projects you are involved in,
 - Your experience in scheduling software,
 - What you seek from this course and
 - What version of P6 does your company use,
- Course attendance sheet.

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Course Objectives

This objectives of this course are to teach participants:

- Introduction to the user interface,
- How to plan projects without resources,
- Filters, layouts and printing,
- Baselines, and updating an un-resourced project,
- Creating and assigning roles and resources,
- Controlling projects with resources and costs,
- Setting up and administering a database plus advanced features including import/export,
- Activity Codes, Custom Data Fields and Global Change,

Successful completion of all the course workshops will confirm that the objectives have been met.

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Course Conduct

The course consists of:

- The instructor demonstrating the software using a combination of:
 - A PowerPoint slide show and
 - Live software demonstrations,
- Most chapters are then reinforced with student workshops working through a scenario of creating a small project planning the submission of a bid,
- The book is for you to keep,
- Ask any questions as the course progresses.

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Course Agenda

Day 1 Modules

- 1 - Introduction
- 2 - Creating a Project Plan
- 3 - Starting Up and Navigation
- 4 - Creating a New Project
- 5 - Defining Calendars
- 6 - Creating a Primavera Project WBS
- 7 - Adding Activities and Organizing Under the WBS
- 8 - Formatting the Display
- 9 - Adding Relationships
- 10 - Activity Network View
- 11 - Constraints.

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Course Agenda

Day 2 Modules

- 12 - Group, Sort and Layouts
- 13 - Filters
- 14 - Printing, Reports and Visualizer
- 15 - Schedule Options and Setting a Baseline
- 16 - Updating an Unresourced Schedule
- 17 - User and Administration Preferences
- 18 - Creating Roles and Resources
- 19 - Assigning Roles, Resources and Expenses.

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Course Agenda

Day 3 Modules

- 20 - Resource Optimization
- 21 - Updating a Resourced Schedule
- 22 - Other Methods of Organizing Project Data
- 23 - Global Change
- 24 - Managing the Enterprise Environment
- 25 - Multiple Project Scheduling
- 26 - Utilities
- 27 - Earned Value.

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1 - INTRODUCTION

- 1.1 - Purpose of the Course
- 1.2 - Required Background Knowledge
- 1.3 - Purpose of Planning
- 1.4 - Project Planning Metrics
- 1.5 - Planning Cycle
- 1.6 - Levels of Planning
- 1.7 - Monitoring and Controlling a Project.

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1.1 - Purpose of the course

- Provide a method for planning, scheduling and controlling projects using Primavera,
- Within an established Enterprise Project database or a blank database,
- Up to an intermediate level.

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1.2 - Required Background Knowledge

- The ability to use a personal computer and understand the fundamentals of the operating system,
- Experience using application software such as Microsoft Office and
- An understanding of how projects are planned, scheduled and controlled, including understanding the project management processes applicable to your projects.

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1.3 - Purpose of Planning

- The ultimate purpose of planning is to build a model that allows you to predict which activities and resources are critical to the timely completion of the project,
- Strategies may then be implemented to ensure that these activities and resources are managed properly, thus ensuring that the project will be delivered both **On Time** and **Within Budget**.

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3.9 - Start Day of the Week – EPPM Version 17 and Later

To set the default starting day of the week,

- Set in **Administer, Application Settings, General Tab**,
- The Default activity Duration is also set here:

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3.10 - Admin Preferences - Set Industry Type

- Engineering and Construction and Utilities, Oil and Gas:

- All other Industry Types **Government, Aerospace, and Defense plus High-Technology, Manufacturing and Others**

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3.11 - Application of Options within Forms

- Selecting the icon
- Selecting the icon
- Menu items within Forms
- Hierarchical and alphabetical display of data

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3.12 - Do Not Ask Me About This Again

- This sentence is often displayed in forms,
- This option will hide the form when the function is used the next time,
- In earlier versions of P6 it was not possible to see this form again through the user interface,
- But in Version 8 this option is reset the next time you run the application.

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3.13 - Right-clicking with the Mouse

- Right clicking in all screens will present menu functions quickly, you will need to experiment:

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3.14 - Accessing Help

- Local Help** earlier versions only and when installed by pressing the Ctl+F11 key,
- Online Help**, takes you to an Oracle website, by pressing Ctl+Alt+F11,
- NOTE:** This is the only method of accessing Help with later versions of P6,
- Select the **Help** menu,
- View, Hint Help** is a very useful feature for understanding how fields are calculated and
- www.primavera.com.au** has a large number of useful links and papers.

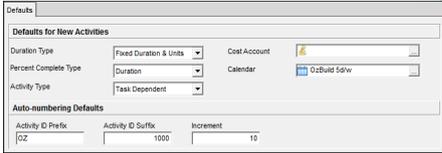
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7.1 - New Activity Defaults

- After creating a new project and before adding activities it is important to set the defaults settings,
- These defaults are set in the **Defaults** tab of the **Project window, Lower Pane**:



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7.1.1 - Duration Type

- None of the **Duration Type** options affects how the schedule calculates until one or more resource is assigned to an Activity,
- The following options are available:
 - Fixed Units**
 - Fixed Duration and Units/Time**
 - Fixed Units/Time**
 - Fixed Duration & Units**
- If you do not plan to add resources to Activities, then you do not need to assign a **Duration Type** and it may be left as the default,
- This topic will be covered in detail in the **Assigning Roles, Resources and Expenses** chapter.

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7.1.2 - Percent Complete Type

- Activity % Complete** – This is displayed in the Activity Details form may be linked to one only of the three following % Complete fields and is always linked to the % Complete displayed on the bars:
 - Physical % Complete** – This is independent of activity resources and durations, the recommended setting,
 - Duration % Complete** – This is which is linked to activities durations, and
 - Units % Complete** – This is which is linked to resource. Units.

Percent Complete Type	Orig Dur	Rem Dur	Activity % Complete	Duration % Complete	Physical % Complete	Units % Complete	Actual Labor Units	At Completion Labor Units	Jan 05	Jan 12
Duration	10d	6d	40%	40%	12%	0%	0	0	■	■
Physical	10d	6d	12%	40%	12%	0%	0	0	■	■
Units	10d	6d	60%	40%	12%	60%	12	20	■	■

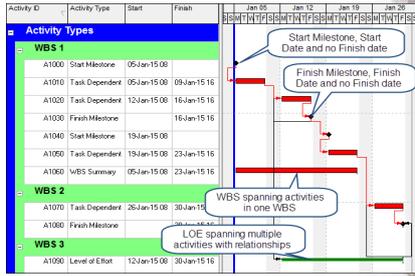
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7.1.3 - Activity Types & Milestones

- Finish Milestone
- Level of Effort
- Resource Dependent
- Start Milestone
- Task Dependent
- WBS Summary.



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7.1.4 - Cost Account

- This selects the default Cost Account for all new Resources and Expenses and is blank by default,
- This is not the normal way Cost Accounts are applied in cost management software; normally different types of resources are assigned different Costs Accounts.
- E.g. A Cost Account would be set up for resources such as Temporary Materials, Permanent Materials, Inhouse labor, Hired Labor, Owned Plant and Hired Plant etc. Then a report may be run for the accountants to calculate depreciation by resource type. The P6 function applies the same Cost Account to each resource and does allow this to happen.
- If you require Cost Accounts then these may be set up with a resource Code.

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7.1.5 - Calendar

- A **Default Project Calendar** is assigned to each project from the **Global** or **Project** calendar list,
- All new activities are assigned the project **Default Project Calendar** when they are created,
- Individual calendars may be assigned to each activity after it has been created,
- Changes may be made to multiple calendar assignments by:
 - The **Edit, Fill Down** command, or
 - Creating and running a Global Change.

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9.9 – Reviewing Relationships, Leads and Lags – V 15 & Earlier

- In P6 Version 15 and earlier it is not possible to view the leads or lags in columns,
- Relationships **WITHOUT** lags may be viewed by:
 - By displaying the predecessor or successor column,
 - In the "Schedule Report - Predecessors & Successors",
 - Display the relationships on bars
 - In the Activity Network View,
- Relationships **WITH** lags may be viewed by:
 - Activity Details form tabs displays with lags, or
 - The Relationships Report, or
 - As an export to Excel and this is a place where the leads and lags may be displayed in columns:

	A	B	C	L	M
1	pred_task_id	task_id	pred_type	lag_hr_cnt	delete_record_flag
2	Predecessor	Successor	Relationship Type	Lag(d)	Delete This Row
3	SH2002	SH2010	FS	5	
4	SH2010	SH2020	FS	5	
5	SH2020	SH2030	FS	5	

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9.10 - Lag and Relationship Type Displayed in the Activity Table

Version 16.1 has added two more columns to the Activity View titled **Predecessor Details** and **Successor Details**,

- These columns display the relationship type and leads or lag in the Activity Table,
- A filter may be created to filter on relationship types:

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9.11 - Ladder Scheduling

- Large negative lags are normally unacceptable in any schedule,
- Ladder Scheduling** is a technique used to link a set of activities that have substantial overlap, such as pipe laying operations,
- Some contracts specifically specify that negative lags are not to be used in a contract program.
- Most products allow multiple relationships between two activities, as per the P6 example below, where the activities are linked using two relationships, a SS+3d and a FF+3d:

Activity ID	Activity Name	Original Duration	Predecessor Details	Apr 22	Apr 28	May 05	May 12	May 20
A1000	Trench	15d						
A1010	Padding	15d	A1000 SS 3d A1000 FF 3d					
A1020	Laying	15d	A1010 SS 3d A1010 FF 3d					
A1030	Backfill	15d	A1020 SS 3d A1020 FF 3d					

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9.12 - Relationship Comments

- P6 Version 20 introduced a Comments column that may be added to the Activities window Relationships, Predecessor and Successor tabs:

- The comment is seen in both the Predecessor and Successor window of each relationship assigned a comment,
- This is a very useful function and in the past one had to either use a Note or a UDF assigned to either the predecessor or successor activity to record notes about a relationship,
- This function is also useful for recording changes to relationships,
- The Comments column is available in the Activity Relationship report.

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9 - ADDING RELATIONSHIPS - SUMMARY

- 9.1 - Constrains
- 9.2 - Understanding Relationships
- 9.3 - Understanding Lags and Leads
- 9.4 - Formatting the Relationships
- 9.5 - Adding and Removing Relationships
- 9.6 - Dissolving Activities and Retain Lag
- 9.7 - Circular Relationships
- 9.8 - Scheduling the Project
- 9.9 - Reviewing Relationships, Leads and Lags
- 9.10 - Lag and Relationship Type Displayed in the Activity Table
- 9.11 - Ladder Scheduling
- 9.12 Relationship Comments.

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9.13 - Workshop 7 – Adding the Relationships

- You have determined the logical sequence of activities,
- So you may now create the relationships.

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Remaining Late Start and Finish

- These are the latest dates that the incomplete portions of activities may start and finish,
- They are blank when an activity is complete and may not be edited,
- They are set to equal the Late Dates.

Activity ID	Activity Name	Remaining Early Start	Remaining Early Finish	September 2014							October 2014							November 2014							Days						
				25	01	08	15	22	29	06	13	20	27	03	10	17	24	01	08	15	22	29	06	13		20	27	03	10	17	24
A1010	Activity A			[Gantt chart showing activity bars]																											
A1020	Activity B	13-Oct-14 08	31-Oct-14 17	[Gantt chart showing activity bars]																											
A1030	Activity C	03-Nov-14 08	28-Nov-14 17	[Gantt chart showing activity bars]																											

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15.2 - Schedule Options – General Tab

- This form is opened by selecting **Tools, Schedule, Options**,
- The **Schedule Options** form **General** tab has a number of options that need to be understood when progressing a schedule,
- Could you select **Tools, Schedule, Options**, to open the **Schedule Options** form.

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Ignore relationships to and from other projects

- Relationships may be created between two projects when:
 - Two or more projects are opened together, or
 - When using the "Select project" option in the Predecessor or Successor forms to create a relationship to an unopened project,
- Checking this option will ignore relationships with other projects that are not currently open,
- Also activities which have been imported with External Early Start and External Late Finish dates have these constraints ignored when checked, covered later.

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Make Open-ended Activities Critical

- This option makes activities without a successor that would normally have float as critical,
- This option makes the **Late Dates** equal the **Early Dates** when an activity has no successor,
- Open-ends Not Critical:**

Total Float	Oct 12	Oct 19	Oct 26	Nov 02
0	[Gantt chart showing activity bars]			
10	[Gantt chart showing activity bars]			

- Open-ends Critical:**

Total Float	Oct 12	Oct 19	Oct 26	Nov 02
0	[Gantt chart showing activity bars]			
0	[Gantt chart showing activity bars]			

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Make Open-ended Activities Critical

- This also allows the user to display multiple **Critical Paths** in one project without the use of constraints:
- Open-ends Not Critical:**
- Open-ends Critical:**

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Use Expected Finish Dates

- This option turns on or off Expected Finish Constraints that have been assigned against activities,
- An Expected Finish Constraint Calculates the Remaining Duration, for both un-started & in-progress activities,
- This is usually not turned off:

Activity ID	Activity Name	Expected Finish	Start	Finish
Project A				
A1000	Activity Original Duration 5 Days	30-Jul-11 16	04-Jul-11 08	29-Jul-11 16
A1040	Activity Original Duration 5 Days	06-Jul-11 00	06-Jul-11 00	12-Jul-11 16
Project B				
A1000	Activity Original Duration 5 Days	19-Jul-11 16	06-Jul-11 08	15-Jul-11 16

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User Preferences Applicable to Assigning Resources

- Select **Edit, User Preferences...** to open the **User Preferences** form, **Calculations** tab, **Assignment Staffing** section,
- The **Assignment Staffing** option are self explanatory and should be considered carefully when resources and roles have different rates. If the are not understood and set incorrectly the resource may end up with the incorrect unit rate when assigned to a Role or existing Resource,
- Note:** When two users have different settings this may result in a schedule having two different rates for the same resource.

Assignment Staffing

When assigning a resource to an existing activity assignment:

- Always use the new resource's Units per Time and Overtime factor
- Always use current assignment's Units per Time and Overtime factor

Ask me to select each time I assign

When a resource and role share an activity assignment:

- Always use resource's Price per Unit
- Always use role's Price per Unit
- Ask me to select each time I assign

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19.4 - Activity Window Resource Preferences and Defaults

- The **Status** form has a section titled **Labor Units** at the right side as seen in the following picture. The drop-down menu enables you to select which data is to be displayed in this section of the form,
- It is possible to enter a **Labor Unit** value in the **Status** tab and not assign a resource. When a resource is assigned the resource will adopt this value in the Status tab,
- Note:** When there is no resource assigned, the Labour Cost is calculated from the **Project Window, Calculations** tab, **Activities Default Price / Unit** for activities without resource or role **Price / Units**.

Labor Units

- Labor Units
- Nonlabor Units
- Labor Cost
- Nonlabor Cost
- Material Cost
- At Complete

20h
20h
0h
20h

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Activity Type and Resources

The following Activity Types are available:

- Task Dependent** – ignores resource calendars,
- Resource Dependent** – like P3 and SureTrak Independent Activities and resources do not have to be available at the same time to work,
- NOTE:** A **Resource Dependent** activity still acknowledges the Activity Calendar for the start of an activity:

Activity Type	Calendar	Resources
Resource Dependent	5 x 8 No.Hols	
Resource Dependent	5 x 8 No.Hols	24 h/d 7d/7u
Resource Dependent	7 x 24 No.Hols	24 h/d 7d/7u

Aug 03
This activity is scheduled to start on the project start date ONLY when both the resource and activity are assigned 24x7 calendars

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Activity Type and Resources

The following activity types are available continued:

- Level of Effort (LOE)** – It spans from the start or finish of one or more predecessor activities to the start or finish of one or more successor activities which are linked by relationships. Thus, a LOE activity may span from the end of one activity to the start of another and may also be used to fill a gap,
- Start Milestone** – scheduled at the start of a work period and has a start date and time and no finish date and time, MAY NOT be assigned a Resource,
- Finish Milestone** – scheduled at the finish of a work period and has a finish date and time and no start date and time, MAY NOT be assigned a Resource,
- WBS Summary Activity** – this Activity type calculates in the same way as Elecosoft (Asta) Powerproject and Microsoft Project Summary activities and they span all activities with the same WBS code, but without relationships that are used with LOEs.

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Activity Type continued...

Activity ID	Activity Type	Jan 06	Jan 13	Jan 20	Jan 27	Feb 03
Activity Type						
WBS 1						
A1000	Start Milestone					
A1010	Task Dependent					
A1020	Task Dependent					
A1030	Task Dependent					
A1040	Finish Milestone					
A1070	WBS Summary					
WBS 2						
A1050	Task Dependent					
A1060	Task Dependent					
A1080	Task Dependent					
WBS 3						
A1090	Level of Effort					

WBS Activity spans all tasks in a WBS Node

LOE Activity spans tasks in any WBS using relationships

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Duration Type

- The **Duration Type** becomes effective after a resource has been assigned to an activity,
- The default **Duration Type** for all new activities is set in the **Defaults** tab in the **Projects Window**,
- The **Duration Type** for each new activity may be changed in the General tab in the Activities Window or by displaying the **Duration Type** column,
- Note:** The **Duration Type** works in conjunction with the **Edit, User Preferences, Calculations, Resource Assignments** option.

Defaults

Defaults for New Activities

- Duration Type: Fixed Duration & Units
- Percent Complete Type: Fixed Duration & Units
- Fixed Duration: Fixed Units/Time
- Fixed Units: Fixed Units/Time
- Activity Type: Fixed Units/Time

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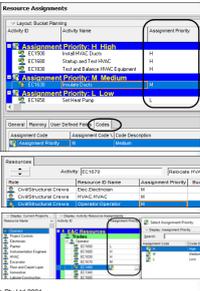
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22.8 – Assignment Codes...

Assignment Codes are assigned to Resource or Role Assignments in the:

- Codes tab in the Resource Assignment window, or
- Displaying the Assignment Code column in the Activities window Details pane, Resources tab, or
- Displaying the Assignment Code column in center section of the Resource Usage Spreadsheet.



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22 - OTHER METHODS OF ORGANIZING PROJECT DATA - SUMMARY

- 22.1 - Understanding Project Breakdown Structures
- 22.2 - Activity Codes
- 22.3 - User Defined Fields
- 22.4 - WBS Category or Project Phase
- 22.5 - Resource Codes
- 22.6 - Cost Accounts
- 22.7 - Owner Activity Attribute
- 22.8 - Assignment Codes.



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22.9 - Workshop 19 - Activity Codes & User Defined Fields (UDF)

This workshop will look at creating an Activity Code and some UDFs,

- We will create an Activity Code to represent the Departments' responsibilities for the Project,
- We will also create some UDFs and then in the next workshop you will populate these UDFs using a Global Change.



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23 - GLOBAL CHANGE

- 23.1 - Introducing Global Change
- 23.2 - The Basic Concepts of Global Change
- 23.3 - Specifying the Change Statements
- 23.4 - Examples of Simple Global Changes
- 23.5 - Selecting the Activities for the Global Change
- 23.6 - Duration Calculations with Global Change
- 23.7 - (Any of the following) and (All of the following)
- 23.8 - Temporary Values
- 23.9 - Global Change Functions
- 23.10 - More Advanced Examples of Global Change
- 23.11 - Workshop 20 - Global Change.



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23.1 - Introducing Global Change

- Global Change is a facility for changing more than one data item in one step.
- Examples of uses of Global Change are:
 - Assigning Resources to Roles,
 - Increasing or decreasing durations of selected activities by a factor,
 - Creating new activity descriptions by placing activity codes at the beginning or at the end of the original description,
 - Removing constraints,
 - Changing Calendars.



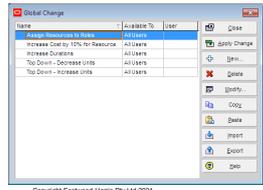
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23.2 - The Basic Concepts of Global Change

- A Global Change may be created, saved, and used at a later date,
- A Global Change may be Imported or Exported,
- A Global Change may not be "Undone",
- Select **Tools, Global Change...** to open the Global Change form:



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27.2 - Planned Value

The **Planned Value** may be displayed as:

- **Tabulated Data** in locations such as the:
 - **Activity Usage Spreadsheet,**
- **Graphical Data** in locations such as the:
 - **Activity Usage Profile,**
 - **Tracking Window** by creating a **Project Gantt/Profile,**
- **Columns Data** in locations such as the:
 - **Tracking Window** by creating a **Project Table,**
 - **Activities Window** using **Planned Value Cost** or **Planned Value Units:**

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Planned Value

- There are no options for selecting and displaying the following data from a progressed schedule:
 - The **Late Baseline** values
 - **Planned Material Units**
 - **Planned Expense Units**
- Planned data in the following windows or panes display the Budgeted field values read the **Current Schedule Planned** dates and **Current Schedule Budget** values and should be used with caution:
 - **Resource Usage Spreadsheet**
 - **Resource Usage Profile**
 - **Resource Assignments.**

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27.3 - Earned Value

- P6 has a field titled **Performance % Complete** which is used to calculate the **Earned Value** for each activity,
- In P6 there are some options for calculation of the **Performance % Complete** for all activities in each **WBS Node** which is, in turn, is used to calculate the **Earned Value:**
 - The defaults are set in the **Admin, Admin Preferences...**, **Earned Value** tab,
 - The options are managed at WBS Node for all activities assigned to a specific WBS Node, and each WBS Node may have different values,
 - Open the **WBS Window, Earned Value** tab to see the options which are mainly self-explanatory.

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Earned Value

- Example of the Calculation of the Earned Value:

Activity ID	Activity % Comp.	Performance % Complete	EL Project Total Cost	Earned Value Cost	EL Project Labor Units	Earned Value Labor Units	Aug 23							Sep 01						
Earned Value Percent Complete																				
Activity % Complete																				
A1000	50%	50%	\$9,600	\$4,800	60h	40h														
WBS Milestone Percent Complete 75%																				
A1010	50%	75%	\$9,600	\$7,200	60h	60h														
0/100																				
A1020	50%	0%	\$9,600	\$0	60h	0h														
50/50																				
A1030	50%	50%	\$9,600	\$4,800	60h	40h														
Custom percent complete at 10%																				
A1040	50%	10%	\$9,600	\$960	60h	6h														

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27.4 - Actual Costs

- These are the costs actually incurred in performing the work,
- Actual Costs are often calculated from the amount paid plus accruals,
- Actual Costs and Actual Units may be recorded in Primavera and displayed in two methods:
 - The total to date, or
 - Calculated from the **Financial Periods** values when Period values are stored.

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27.5 - Estimate to Complete

- P6 has two separately calculated estimate to complete fields:
 - Estimate to Complete from Resource and Expense Units and Costs, usually titled **Remaining Costs** or **Remaining Units** and
 - Estimate to Complete from P6 Earned Value Calculations, titled **Estimate to Complete** (costs) or **Estimate to Complete Labor Units,**
- **NOTE:** It is very important that users understand the differences between these two fields and know which they are using and displaying.

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27.6 - Activity Usage S-Curve Options

- The instructor will step through the options:

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27.7 - Sample Graphical S-Curves

- Remaining and Late Remaining curves are drawn from the zero point, and
- Traditional EV S-Curves.

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27 - EARNED VALUE MANAGEMENT WITH P6 - SUMMARY

- 27.1 - Performance Measurement Baseline
- 27.2 - Planned Value
- 27.3 - Earned Value
- 27.4 - Actual Costs
- 27.5 - Estimate to Complete
- 27.6 - Activity Usage S-Curves
- 27.7 - Sample Graphical S-Curves.

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Review Expectations

- Any questions,
- Complete Feedback Sheet,
- Course Certificates,
- Have we met your expectations?

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Database Cleanup at end of course, if required:

Please could you delete all:

- User Filters
- User Layouts
- The resources created but NOT your Resource node
- Your projects.

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Thank you for attending

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