PLANNING & CONTROL USING

ORACLE® PRIMAVERA® P6

VERSION 18 TO 23 PPM PROFESSIONAL

PAUL E. HARRIS

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Welcome to the
Eastwood Harris Pty Ltd
Primavera P6
Versions 18 to 23
PPM Professional
3 day training course

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IMPORTANT POINTS FOR INSTRUCTOR

- See notes below.

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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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Sample P6 PPM Versions 18 to 23 Instructors PowerPoint Slide Show

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Course Agenda

Day 1 Modules

Planning Projects without Resources

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

Filters, Layouts, Printing and Reports

12 - Group, Sort and Layouts
13 - Filters
14 - Printing, Reports and Visualizer

Baselining and Updating an Unresourced Schedule

15 - Schedule Options and Setting a Baseline
16 - Updating an Unresourced Schedule

Creating a Resourced 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

Controlling Projects with Resources and Costs

20 - Resource Optimization
21 - Updating a Resourced Schedule

Setting up and administering a database plus advanced features

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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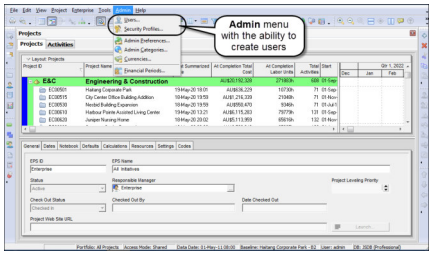
Windows Client with PPM Database

- Admin menu included when opening a PPM database:



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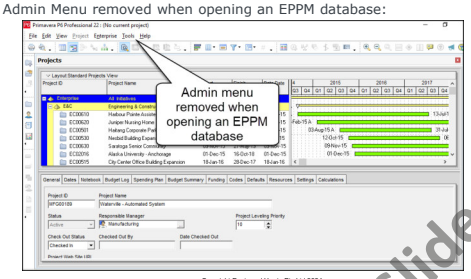
Windows Client with EPPM Database

- Admin Menu removed when opening an EPPM database:



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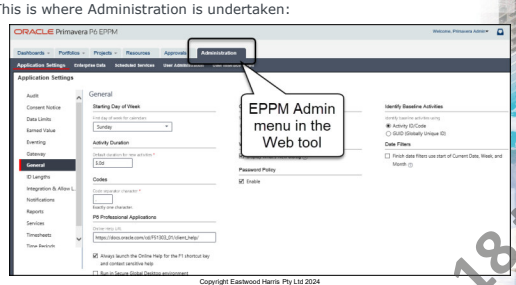
Web Client Version 17 and Later

- This is where Administration is undertaken:



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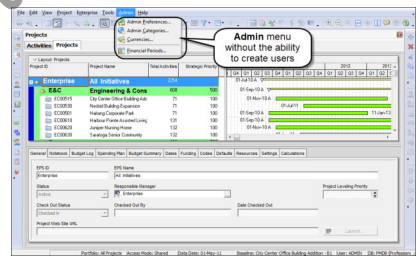
Stand-Alone Load

- The database is loaded on the PC and
- Admin menu is included but does not have the ability to create users:



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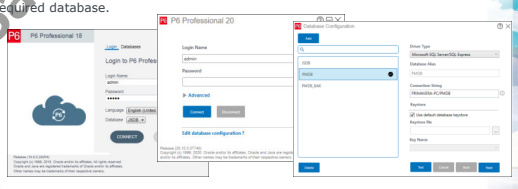
3.1 - Logging In

- Click on the icon on your desktop or the menu item from the programs list to start the software,
- Enter the correct username and password, and click OK,
- Version 18 and again in Version 20 changes were made to the login screen, but the information was the same,
- Select the appropriate Database to access if the displayed one is not the required database.



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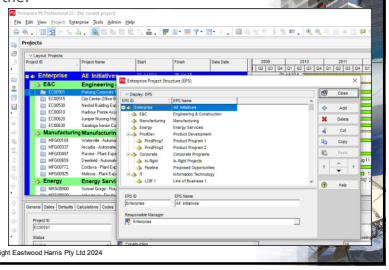
3.2 - The Projects Window

If you do not see the **Projects** window select **Enterprise**, **Projects** or click on the button and you will see the:

- Enterprise Project Structure
- Projects
- Project Columns
- Project Gantt Chart
- The lower Window

NOTE: Some data displayed in the columns will be incorrect unless the database has been **Summarized** or the project is open and incorrect if the project has been edited since the project was last **Summarized**.



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5.8 - Inherit Holidays and Exceptions from a Global Calendar

- This function will link the calendar holidays from the selected Global Calendar into the displayed calendar,
- The Global and the new Project or Resource calendars holidays will remain linked and a change to the Global Calendar Holidays will change your Resource or Project calendar,
- It is recommended that you do not use this function and create separate standalone calendar for every project.

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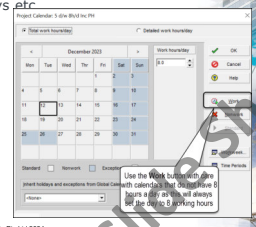
5.9 - Adjusting Calendar Working Hours

- It is strongly recommended that the working hours per day are all the same for all calendars assigned to a project, or at least have the same start and finish time; otherwise one day activities may span two days and two day activities may span three days etc.
- There are two methods of editing the hours per day:
  - **Total work hours/day**, or
  - **Detailed work hours/day** which gives a better understanding of the calendar, see next slide,
- Use the **Work** button with care with calendars that do not have 8 hours a day as this will always set the day to 8 working hours.



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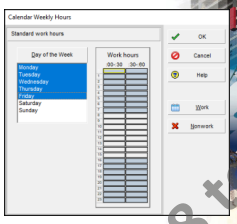
Adjusting Calendar Working Hours...

Editing Calendar Weekly Hours

- Select **Total work hours/day** then select workweek or
- Select **Detailed work hours/day**



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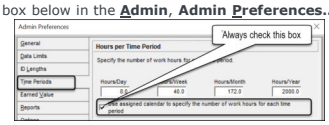
5.10 - Calculation of Activity Durations in Days, Weeks or Months

- P6 records durations in hours and the display of durations in days, weeks or months of activities is a mathematical calculation,
- In P6 this may be made in one of two methods:
  - Individually for each Calendar in the **Calendar** form - the **RECOMMENDED METHOD**, or
  - Globally for All Calendars - **NOT RECOMMENDED** (this was the only method in P6 Version 6.2 and earlier).
- Always check the box below in the **Admin**, **Admin Preferences...**, **Time Periods** tab:



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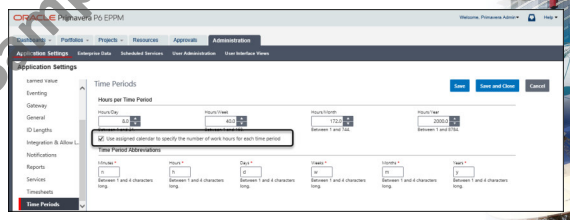
5.10 - Calculation of Activity Durations in Days, Weeks or Months

In the P6 Windows Client, when opening an EPPM database then this is set in the Web Client:



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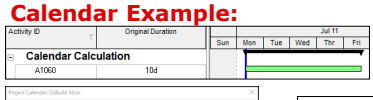
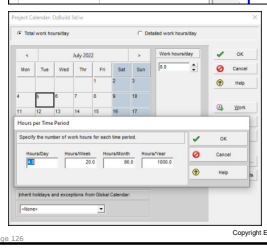
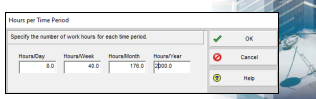
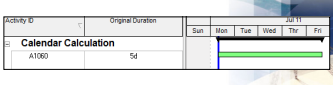
Calendar Example:









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Sample of PPM Versions 18 to 23 Instructors PowerPoint Slides Now

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8.1 - Formatting the Project Window

- The formatting of the Project Window is very similar to the formatting of the Activity Window and will not be covered in detail separately,
- Formatting the display, Filters and Layouts all work in the same way in the Projects Window as the Activities Window, except one is dealing with projects and not activities.

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8.2 - Understanding Forms

- Unlike many software packages Primavera has sorting and filtering functions in most forms and the principals are the same in all of them:
  - Clicking in the **Resource ID** column of the Resources Window take the formatting from hierarchical to alphabetical to reverse alphabetical and back to hierarchical,
  - The **Assign Successors** form has a **Filter** and **Group and Sort By** option which affect which data and how it is Grouped,
  - The **Assign Resource** form has **Columns**, **Filter** and **Group and Sort By** option which affect what data is available.

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8.3 - Formatting Bars

- The bars in the Gantt Chart may be formatted to suit your reporting requirements,
- Primavera does not have the option to format individual bars as in Microsoft Project and Elecosoft Powerproject. The coloring of specific activities maybe achieved by creating a bar style (with the desired colors) with a filter to assign the bar style to select the activities requiring specific formatting, or using Visualizer,
- At the time of writing this book the author had placed P6 layouts on www.eh.com.au **Software and Downloads** tab that has the bar formatting issues that are inherent with the default load of P6 fixed,
- It is suggested that downloading this layout will save users a significant amount of formatting time,
- These should be unzipped before importing into P6, say by opening the file and dragging the file onto your desktop, then importing using the **Open Layout** form.

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8.3.1 - Formatting the Bars

- To format the Activity bars you must open the **Bars** form by :
  - Select **View, Bars**, or
  - Click on the **Bars** toolbar icon, or
  - Right-click in the bars area and select **Bars** from the menu,
- Each bar listed in the table may be hidden or displayed on the bar chart by checking the box in the **Display** column,
- New bars may be added by clicking on the **Add** icon and deleted by clicking on the **Delete** icon,
- The bar at the top of the list is placed on the screen and then the one below drawn over the top of it, so it would be simple to hide one bar with a second.

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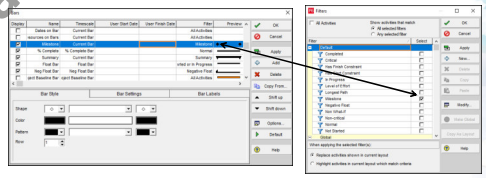
Formatting the Bars....

- The **Name** is the title assigned to the bar and may be displayed in the printout legend,
- The **Timescale** option enables the nomination of a predefined bar which is selected from the drop down box,
- Double clicking on a cell in the **Filter column** opens the **Filters** form which will determine which activities are displayed with the assigned bar format:



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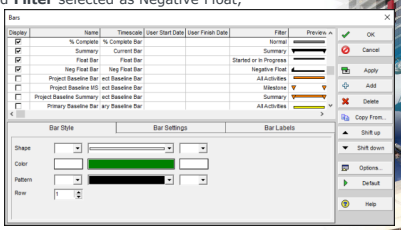
Formatting the Bars....

- **Negative Float** is displayed in a similar way as in Microsoft Project and requires another bar in addition to the **Positive Float** bar and both the **Timescale** and **Filter** selected as Negative Float,
- The **Float** bar shows **Total Float**
- There is no **Free Float** bar available,
- The **% Complete** bar is linked to the **Activity % Complete.**



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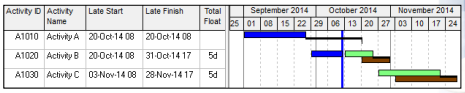
Late Start and Late Finish

- These are latest dates that unstarted activities or the incomplete portions of in-progress activities may start or finish based on calendars, relationships and constraints,
- A complete activity has the **Late Dates** set the date that is equivalent to the latest point in time that the activity could be restarted and completed,
- The **Total Float** on the complete activity is "Null" but the default Layout shows a **Float Bar**,
- **Note:** The end of the **Total Float** bar is the same date and time as the **Late Finish**.



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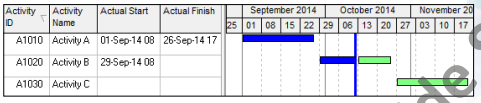
Actual Start and Finish

- These dates are manually applied, representing when an activity started or finished, and override constraints and relationships. These dates should be set in the past in relation to the **Data Date**,
- **Note:** Actual dates should never change after they are assigned but both the **Apply Actuals** and **Update Progress** functions may change **Actual Dates** and these functions must be used with extreme caution.



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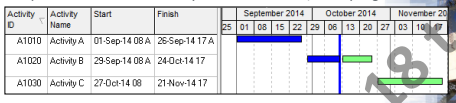
Start and Finish

- The **Start** is set to the **Early Start** when the activity has not started and the **Actual Start** when it has started,
- The **Finish** is set to the **Early Finish** when it is not complete and the **Actual Finish** when it is complete,
- An "A" is placed after the date when an **Actual Start** or **Actual Finish** has been set, and
- An "*" is placed after the date when a constraint has been applied to the activity,
- These date fields allow the **Early** and **Actual Start** and **Finish** dates to be displayed as expected when the activity has not started, is in progress or complete.



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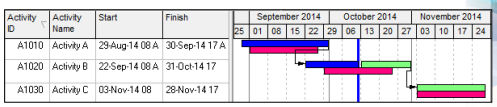
Planned Start and Finish

- The **Planned Dates** are very complex and their calculation method is outlined in the book, in summary:
  - When an activity is **Complete** or **In-progress** they match the status of the activity just before it was marked as started,
  - When an activity has **Not Started** they match the **Early Start** and **Early Finish**.



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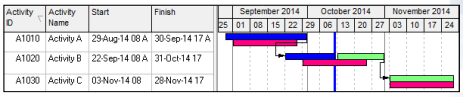
Planned Dates Issues

- The **Planned Dates** are dates that most schedulers would not want displayed,
- These dates are displayed as the **Project Baseline** bars and **Primary User Baseline** bars when no baseline has been assigned,
- These dates are used by the **Apply Actuals** function when activities are set to **Auto Compute Actuals**, and the **Update Progress** function,

continued...



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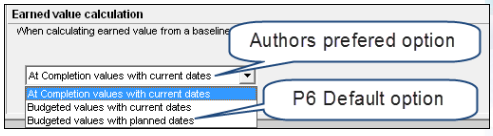
Earned value calculation setting – PPM Database

- In a PPM database the **Planned Dates**, which may contain irrelevant data from a **Baseline** will be displayed as the **Baseline Bars** when the the **Admin**, **Admin Preferences...**, **Earned Value** tab is set to the default of **Budget values with planned dates** and should not be used,
- The recommended setting is **At Completion values with current dates:**



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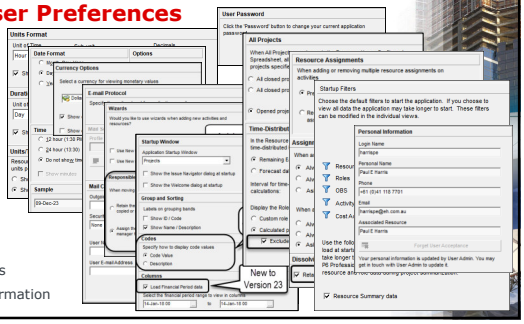
17.1 - User Preferences

- Time Units
- Dates
- Currency
- E-Mail
- Assistance
- Application
- Password
- Resource Analysis
- Calculations
- Startup Filters
- Personal Information



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17.2 - Admin Menu - Create Users

- When you open a PPM database with P6 you will have access to an **Admin** menu and you may administer users from the Windows Client,
- When you open a EPPM database with P6, then you will not see an **Admin** menu as the Admin functions of an EPPM database are administered in the Web Client,
- The options in the Web Client are the same as the Windows Client,
- If you have opened a PMM database, then select **Admin** to display the **Admin** menu:

Users...
Security Profiles...

- We will now cover the **Users...** and **Security Profiles...** functions and see how these are used to control user access.

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Security & Access - Whole Picture

A **person** is created as a **User** and is assigned a **Password** that the user may change and is assigned:

- A **Global Security Profile** → This allows access to **Global data** such as EPS, OBS etc.
- A **Project Security Profile** for each assigned **OBS Node** → This allows access to **one or more Projects**
- Access to one resource node in Version 18 and earlier and up to 5 **Resource Nodes** in Version 19 and later → This allows access to one or more **Project WBS Nodes**
- **A software license** → Allows the **assigning of Resources** under this Node
- A optional **Resource ID** → Allows the software to be started
- A **Resource ID** may be assigned as a **Timesheet approval Manager** → This allows **Timesheeting**

A **Role** may be assigned to one or more Resources → This allows **Timesheet approval**

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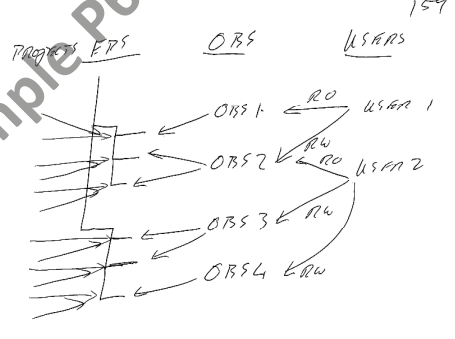

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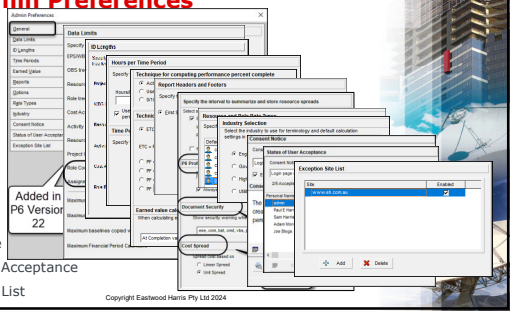
17.3 - Admin Preferences

- General
- Data Limits
- ID Lengths
- Time Periods
- Earned Value
- Reports
- Options
- Rate Types
- Industry
- Consent Notice
- Status of User Acceptance
- Exception Site List



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20.10 - What to look for if Resources are Not Leveling

- Have you selected a resource to level in the **Select Resources** form?
- Have you set the **Limits** in the **Resource** window?
- A resource will not be leveled when you assign a resource to an activity with a Units per time period greater than value set in the resource dictionary,
- Decreasing **Durations** of **Fixed Units** and **Fixed Duration and Units** will increase the **Units/Timeperiod**,
- Have you assigned a **Mandatory Constraint** to an unleveled activity?
- Have you checked **Level resources only within activity Total Float** option?

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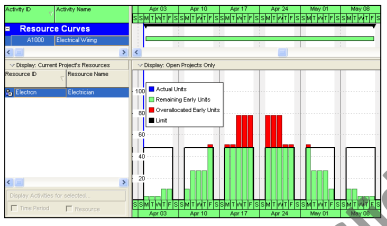
20.11 - Resource Curves

- **Resource Curves** enable a non-linear assignment of resources to schedules,
- **Resource curves** are assigned in the **Curve** column in the **Resources** tab of the **Activities Window**:



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20 - RESOURCE OPTIMIZATION - SUMMARY

20.1 - Reviewing Resource Loading
20.2 - Resource Assignments Window
20.3 - Copying and Pasting into Excel
20.4 - Other Tools for Histograms and Tables
20.5 - Methods of Resolving Resource Peaks & Conflicts
20.6 - Resource Leveling
20.7 - Leveling Examples - Not covered
20.8 - Resource Shifts - Not covered
20.9 - Guidelines for Leveling
20.10 - What to Look for if Resources Are Not Leveling
20.11 - Resource Curves.

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20.12 - Workshop 17 - Resources Optimization

- We will review the resource loading of the schedule.

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21 - UPDATING A RESOURCED SCHEDULE

21.1 - Understanding Budget Values and Baseline Projects
21.2 - Understanding the Current Data Date
21.3 - Information Required to Update a Resourced Schedule
21.4 - Project Window Defaults for Updating a Resourced Schedule
21.5 - Activity Window - Percent Complete Types
21.6 - Using Steps to Calculate Activity Percent Complete
21.7 - Updating the Schedule
21.8 - Updating Resources
21.9 - Updating Expenses
21.10 - Workshop 18 - Updating a Resourced Schedule.

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Updating a Resourced Schedule

- It is often considered best practice to update a project between 10 and 20 times in its lifecycle. Some companies update schedules to correspond with accounting periods, which are normally every month. This frequency is often too long for projects that are less than a year in duration, as too much change may happen in one month. Therefore, more frequent updating may identify problems earlier,
- Updating a project with resources employs a number of preferences and options, which are very interactive and will require a significant amount of practice by a user to understand and master them,
- It must be decided if the software will calculate the Actual costs and units from the Units percentage complete or if this data is to be collected and entered into the software.

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23.6 - Duration Calculations with Global Change

- **NOTE:** When calculating Durations remember that P6 calculates in hours,
- If you are displaying durations in days then you will need to divide or multiply as appropriate the durations by 8 to obtain the correct duration.

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23.7 - (Any of the following) and (All of the following)

- There are two options under the **Parameter** title in the **If** section, **(Any of the following)** and **(All of the following)**,
- These are used with the **If** statements in the same way as with filters.

Select Subject Area: Activities — Global Change Name: Change Original Durations

If	Parameter	Is	Value	High Value
	(All of the following)			
Where	(All of the following)	equals	2d	
And	(Any of the following)	is under	OZB.2	

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23.8 - Temporary Values

- Some calculations require more than one operation to achieve the required change,
- A **Temporary Value** may be stored in a **User Defined Field**,
- This **Temporary Value** may then be used on a subsequent line,
- Any **User Defined Field** may be created and used as a Temporary Value:

Select Subject Area: Activity Resource Assignments — Global Change Name: Calculate Costs to Complete

If	Parameter	Is	Value	High Value
	(All of the following)			
Where	At Completion Labor U	is not equal to	0h	
And	Units % Complete	is greater than	30%	

Then	Parameter	Is	Parameter/Value	Operator	Parameter/Value
	Temporary Value	=	Actual Cost	/	Actual Regular Labor Units
And	Remaining Cost	=	Temporary Value	*	Remaining Labor Units

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23.9 - Global Change Functions

- There are some functions that may be used with Global Change in the **Parameter/Value** field in the **Then** and **Else** fields:

Global Change Function	Function Operation
DayOfWeek (Parameter)	Selects the weekday number of the date.
LeftString (Parameter,*)	Selects * of characters from the start of a field.
RightString (Parameter,*)	Selects * of characters from the end of a field.
SubString (Parameter,a,b)	From character "a" selects "b" number of characters.

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23.10 - More Advanced Examples of Global Change

- Changing Activity ID by adding a Middle Character,
- The following Global Change adds a "C" after the second character of the Activity ID:

Select Subject Area: Activities — Global Change Name: Modify Activity ID's

If	Parameter	Is	Value	High Value
	(All of the following)			
Where				

Then	Parameter	Is	Parameter/Value	Operator	Parameter/Value
	Temporary 1	=	LeftString(Activity ID,2)	&	C
And	Temporary 2	=	SubString(Activity ID,3,20)		
And	Activity ID	=	Temporary 1	&	Temporary 2

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23.10 - More Advanced Examples of Global Change

- Adding Resources with Global Change,
- The following example assigns a resource, ARL Angel Lowe, to the Sales Engineer Role when the Start Date is greater than the Current Data Date:

Select Subject Area: Activity Resource Assignments — Global Change Name: Assign Resources to Roles

If	Parameter	Is	Value	High Value
	(All of the following)			
Where	Role	equals	Sales Engineer	
And	Start	is greater than	CD	

Then	Parameter	Is	Parameter/Value	Operator	Parameter/Value
	Resource ID Name	=	AR.Angel Lowe		

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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	BL Project Total Cost	Earned Value Cost	BL Project Labor Units	Earned Value Labor Units
Earned Value Percent Complete						
Activity % Complete						
A1000	50%	50%	$9,600	$4,800	80h	40h
WBS Milestone Percent Complete 75%						
A1010	50%	75%	$9,600	$7,200	80h	60h
0/100						
A1020	50%	0%	$9,600	$0	80h	0h
50/50						
A1030	50%	50%	$9,600	$4,800	80h	40h
Custom percent complete at 10%						
A1040	50%	10%	$9,600	$960	80h	8h

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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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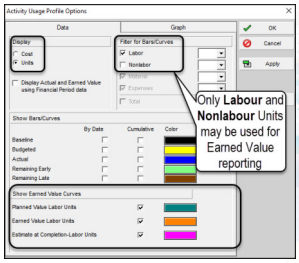
27.6 - Activity Usage S-Curve Options

- The instructor will step through the options:



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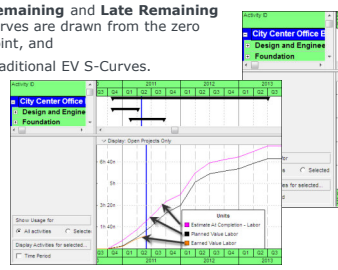
27.7 - Sample Graphical S-Curves

- **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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End of video

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