

Managing Projects in Primavera P6 Professional Rel 8.0

Volume II • Student Guide

D67338GC10
Edition 1.0
December 2010
D71648

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Table of Contents

Lesson 1 – Project Management Life Cycle	1
Project Management Definitions	3
Project Management Life Cycle	4
Initiating Process Group.....	5
Planning Process Group	6
Executing Process Group	7
Controlling Process Group	8
Closing Process Group	9
Lesson 2 – Understanding Data in P6	11
P6 EPPM.....	13
P6.....	14
P6 Professional.....	15
Other Applications	16
Enterprise Project Structure	17
EPS and Security	21
Organizational Breakdown Structure (OBS)	22
Enterprise Data and Project-Specific Data	23
Enterprise Data.....	24
Project-Specific Data.....	25
Lesson 3 – Overview and Navigation	27
Windows and Menus.....	29
Tabs and Toolbars.....	30
Layouts.....	31
Details	32
Logging In.....	35
Opening a Project.....	36
Access Modes.....	37
Tabbed Windows	38
Tab Groups.....	40
Tab Groups	40
Toolbars and Menus.....	41
Commonly Used Toolbars.....	42
Viewing Toolbars.....	43
Customizing Toolbar Location.....	44
Customizing Toolbar Icons	45
Customizing Menu Commands	46
Layouts.....	47

Opening an Existing Activity Layout	48
Gantt Chart.....	50
Activity Usage Spreadsheet	51
Activity Network	52
Activity Table	53
Customizing a Layout.....	54
Selecting Columns	54
Using Hint Help in the Columns Dialog Box	55
Displaying Activity Details.....	56
Selecting Details Tabs.....	57
Saving Layouts.....	58
Closing a Project.....	60
Lesson 4 – Creating a Project	63
Project	65
Creating a Project.....	66
Creating a Project with the Create a New Project Wizard.....	69
Entering a Project Name	71
Entering Project Start and End Dates.....	72
Entering a Responsible Manager	73
Selecting the Assignment Rate Type	74
Completing the Wizard	75
Viewing Project Details	77
General Tab.....	78
Dates Tab	79
Notebook Tab.....	80
Codes Tab	82
Type Ahead and Search in Dialog Boxes	83
Defaults Tab	84
Budget Log Tab	85
Lesson 5 – Creating a Work Breakdown Structure	87
Definition of Work Breakdown Structure.....	89
Viewing WBS Elements	94
Creating the WBS Hierarchy	95
Lesson 6 – Adding Activities	101
Definition of Activity.....	103
Activity Components	104
Activity Type	105
Start Milestone.....	106
Finish Milestone.....	107

Task Dependent.....	108
Resource Dependent.....	109
How Activity Type Affects Dates	110
Level of Effort.....	113
WBS Summary.....	114
Activity Codes	115
Three Levels of Activity Codes.....	116
Adding an Activity via the New Activity Wizard	119
Enabling the Wizard.....	120
Launching the Wizard	121
Naming the Activity and Specifying a WBS.....	122
Assigning Activity Type	124
Completing the New Activity Wizard.....	125
Adding an Activity via Activity Details	127
General Tab	128
Status Tab.....	129
Notebook Tab.....	130
Adding Activity Information via Columns	131
Adding Steps to an Activity.....	134
Activity Codes	135
Assigning Activity Codes.....	135
Assigning Activity Codes to Multiple Activities	136
Streamlined Process to Add Activity Code Values	137
Case Study 1 – Creating a Project	141
Lesson 7 – Assigning Calendars	147
Calendars.....	149
Calendar Pools	150
Resource Calendars	152
Work Time Types	153
Calendars and Activity Types	154
Viewing the Global Calendar Pool	156
Viewing a Global Calendar.....	157
Adding a Project Calendar.....	158
Linking the Holidays Calendar and Setting the Workweek.....	159
Setting Non-Work Time	160
Setting Exceptions	161
Viewing and Assigning Calendars.....	162
Lesson 8 – Creating Relationships	165
Network Logic Diagram	167

Precedence Diagramming Method.....	168
Relationship Types.....	169
Finish to Start (FS).....	170
Start to Start (SS).....	171
Finish to Finish (FF).....	172
Start to Finish (SF).....	173
Relationships with Lag	174
Creating Relationships in the Activity Network.....	180
Creating a Start to Start Relationship.....	181
Creating Relationships in Activity Details	182
Using the GoTo Feature.....	183
Assigning Lag	184
Viewing Relationships in the Gantt Chart	185
Lesson 9 – Scheduling	187
Critical Path Method Scheduling	189
Data Date	191
Forward Pass.....	193
Backward Pass	195
Total Float.....	197
Must Finish By Date	200
Circular Relationships (Loops).....	202
Open Ends.....	203
Scheduling a Project	209
Viewing the Schedule Log.....	211
Driving Relationships	212
Lesson 10 – Assigning Constraints	215
Constraints	217
Must Finish By.....	218
Start On or After	219
Additional Constraints	220
How Constraints Affect Activity Dates	223
Assigning a Must Finish By Constraint to a Project.....	225
Rescheduling the Project.....	226
Assigning a Constraint to an Activity.....	227
Adding a Notebook Topic.....	228
Lesson 11 – Creating Layouts	231
Grouping	233
Sorting.....	235
Filtering.....	236

Grouping Data.....	240
Group and Sort Dialog Box	241
Grouping by Date	243
Collapsing/Expanding Grouped Data.....	245
Sorting Activities	246
Sorting by a Single Criterion.....	246
Filtering Activities	248
Filters Dialog Box	249
Applying a Default Filter.....	250
Creating a Filter	252
Using Multiple Filters.....	255
Applying the <i>All Activities</i> Filter	256
Lesson 12 – Managing Work Products and Documents	259
Project Documents	261
Linking Documents.....	262
Assigning Documents	263
Creating a Document Record.....	265
The General Tab.....	266
Files Tab.....	267
Assigning a Project Document to an Activity.....	268
Viewing Document Details.....	270
Case Study 2 – Scheduling the Project	273
Lesson 13 – Understanding Roles and Resources	277
Roles and Resources	279
Relationship Between Roles and Resources.....	282
Resource Types	283
Viewing the Roles Dialog Box	285
Prices Tab.....	286
Limits Tab.....	287
Viewing Resources.....	289
Resource Details	290
General Tab	290
Codes Tab.....	290
Details Tab	291
Units & Prices Tab	292
Lesson 14 – Assigning Roles and Resources	295
Assigning Resources.....	298
Steps for Resource Management	299
Assigning Roles to an Activity	303

Assigning Multiple Roles to an Activity.....	305
Assigning a Single Role to Multiple Activities	306
Steps for Resource Management	309
Assigning Resources by Role	310
Assigning by Role to Multiple Activities	312
Adjusting Resource Assignment Units	313
Assigning a Resource to a Level of Effort Activity.....	313
Assigning a Resource Directly.....	314
Adjusting Budgeted Units/Time to Specify Resource Quantity	315
Designating a Primary Resource.....	316
Assigning a Material Resource	317
Planning Costs	318
Resource Costs.....	318
Expenses	319
Summary Tab.....	320
Lesson 15 – Optimizing the Project Plan	323
Project Constraints.....	325
Analyzing Schedule Dates	326
Shortening the Project.....	327
Analyzing Resource Allocation	328
Analyzing the Budget	329
Comparing the Calculated Finish Date to the Must Finish By Date.....	332
Focusing on Critical Activities	333
Shortening the Project.....	335
Refining Duration Estimates.....	335
Modifying Relationships.....	336
Modifying Constraints	337
Confirming Project Dates	338
Analyzing Resource Allocation	340
Identifying the Cause of Resource Overallocation	341
Correcting Overallocation.....	342
Replacing a Resource.....	346
Analyzing the Budget	348
Lesson 16 – Baselining the Project Plan	351
Baseline?	353
Managing Baselines.....	356
Creating a Baseline	357
Categorizing the Baseline	358
Assigning a Baseline.....	359
Update Baseline Options.....	360

Viewing Baseline Bars.....	362
Bar Style Tab.....	362
Displaying Baseline Bars	363
Customizing the Activity Table.....	364
Saving the Layout.....	365
Bar Labels Tab	366
Lesson 17 – Importing and Exporting Data	369
Import/Export Wizards	371
Reasons to Import/Export Project Data	372
Import/Export Formats.....	373
Export Wizard.....	375
Project(s) to Export	376
File Name	377
Import Wizard.....	378
Import Format.....	378
File Name	379
Import Project Options	380
Updating Project Options	381
Modifying Import Configuration.....	382
Completing the Import	383
Viewing the Import Log File.....	384
Viewing the New Project.....	385
Case Study 3 – Optimizing and Baselining	387
Lesson 18 – Methods of Applying Progress	391
Updating a Project.....	393
Spectrum of Updating Methods	395
Update Progress.....	396
Auto Compute Actuals	397
Recalculate Units, Costs When Duration % Complete Changes.....	399
Manually Update	401
Timesheets.....	402
Delegating Status Updates.....	404
Lesson 19 – Executing the Project Plan	407
Updating a Project.....	409
Data Date	410
The Updating Process	411
Defining a Status Updating Period	414
Progress Spotlight	415
Establishing the Status Period	416

Entering Actuals.....	417
Updating Milestones	418
Updating Activities to Completion	419
Updating a Mid-Project Milestone.....	423
Updating Activities in Progress	424
Suspending an Activity.....	426
Updating Completed Activities.....	428
Rescheduling the Project.....	430
Viewing the Rescheduled Project	431
Lesson 20 – Reflection Projects	433
Creating a Reflection Project.....	437
Making Changes to the Reflection Project	440
Merging Reflection into Source Project	444
Previewing Changes.....	445
Merging Reflection into Source Project	447
Viewing Updated Source Project.....	448
Lesson 21 – Analyzing the Updated Project	451
Steps for Analyzing the Updated Project.....	453
Questions to Determine How to Adjust a Schedule.....	454
Shortening the Project.....	455
Analyzing the Updated Project	457
Shortening the Schedule	459
Analyzing Resources	462
Analyzing Costs	464
Lesson 22 – Reporting Performance	467
Methods for Reporting Performance	469
Running an Existing Report.....	472
Run Report Dialog Box	473
Print Preview.....	474
Printing Reports	475
Report Wizard.....	476
Create or Modify Report.....	476
Configure Selected Subject Areas.....	478
Adding a Report Title	480
Generating the Report.....	481
Print Preview.....	482
Saving a Report.....	483
Assigning Report Group and Report Scope.....	484
Creating a Time-Distributed Report	485

Creating a Report Using the Current Layout	491
Creating Batch Reports.....	495
Running Batch Reports	496
Viewing the Report	497
Case Study 4 – Execution and Control	499
Lesson 23 – Duration Types	507
Time and Work	509
Duration Type	511
Choosing a Duration Type	512
Recalculating the Time/Work Equation.....	513
Duration Type: Fixed Units/Time.....	514
Duration Type: Fixed Duration and Units/Time.....	516
Duration Type: Fixed Units	518
Duration Type: Fixed Duration & Units.....	520
Assigning a Duration Type	523
Modifying an Activity with Fixed Units/Time Duration Type..	525
Changing Units.....	525
Changing Duration	526
Changing Units/Time	527
Adding a Resource	528
Lesson 24 – Calculating Percent Complete	531
Percent Complete	533
Duration Percent Complete	534
Units Percent Complete	535
Physical Percent Complete.....	536
Weighted Steps.....	537
Assigning a Percent Complete Type	539
Updating Activities Based on Physical Percent Complete	541
Updating Activities Based on Duration Percent Complete.....	543
Updating Activities Based on Units Percent Complete	544
Weighted Steps	546
Setting Up Weighted Steps.....	546
Adding Weighted Steps to Activities	548
Updating Weighted Steps.....	549
Lesson 25 – Earned Value	551
Earned Value Analysis.....	553
Essential Performance Variables.....	554
Simplified Example of Earned Value Analysis.....	555
Planned Value Cost	556

Earned Value Cost	557
Actual Cost	558
Schedule Variance	560
Cost Variance.....	561
Variance vs. Performance Index	562
Schedule Performance Index	563
Cost Performance Index.....	564
Estimate to Complete.....	565
Performance Factor.....	566
Earned Value Graph.....	567
Earned Value Project Background.....	570
Calculating Planned Value Cost	571
Calculating Actual Cost.....	572
Calculating Earned Value Cost.....	573
Performance % Complete	574
Weighted Milestones	575
Creating Weighted Milestones.....	576
Updating Weighted Milestones.....	577
Effect of Weighted Milestones on Activities.....	578
50/50	579
Activity Percent Complete.....	580
Conclusions Based on Earned Value	581
Schedule Performance	581
Cost Performance.....	581
Cost and Schedule Performance Indices.....	582
Cost Performance Index (CPI).....	582
Schedule Performance Index (SPI).....	583
Calculating Estimate to Complete	584
Using Remaining Cost for Activity to Calculate ETC.....	585
Using CPI to Calculate ETC	586
Using CPI and SPI to Calculate ETC.....	588
Lesson 26 – Managing Multiple Projects	591
Benefits of Multiple Projects	593
Viewing Multiple Project Activities	596
Viewing Activities Assigned to a Resource in Multiple Projects	597
Applying Progress Across Multiple Projects.....	598
Viewing the Project ID of Predecessors and Successors.....	601
Scheduling Multiple Projects	602
Setting the Default Project.....	603
How Project Elements are Handled in Multi-Project Mode	604

Lesson 27 – Advanced Scheduling	607
Critical Path	609
Multiple Float Paths.....	611
Scheduling Out-of-Sequence Activities.....	612
Calendar Effect on Lag	613
Multiple Float Paths	616
Scheduling Out-of-Sequence Activities.....	619
Using Retained Logic.....	620
Using Progress Override	621
Calendar Effect on Lag	622
Using the Predecessor Calendar	623
Using the Successor Calendar	625
Appendix A – Using P6 Professional with Spreadsheets	629
Exporting to a Spreadsheet Application	631
The Export Wizard.....	633
Export Type.....	634
Select Projects	634
Select Template	635
Add Columns to the XLS file.....	636
Assign a Sort Order	637
Select the XLS File Location	638
Summary	639
Updating Data in a Spreadsheet Application	641
Importing from a Spreadsheet Application into P6 Professional.....	644
Reviewing Import Updates in P6 Professional.....	646
Adding New Schedule Data via a Spreadsheet Application.....	647
Importing New Project Data into P6 Professional.....	650
Appendix B – Claim Digger	653
Understanding Claim Digger	655
Configuring Projects and Output Options.....	658
Choosing Comparison Options.....	660
Reviewing the Report	661
Appendix C – Creating Output	663
Output Controls.....	665
Printing Layouts and Page Setup	667
Page Tab.....	667
Margins Tab	668
Header Tab	669
Footer Tab	672

Options Tab.....	674
Print Setup.....	676
Attachment Tools.....	677
Curtain Tool.....	677
Text Tool.....	678
Customizing Data Date Style.....	679
Appendix D – Timescaled Logic Diagrams	681
Using Timescaled Logic Diagrams.....	683
Timescaled Logic Diagrams	686
Choosing a Template	687
Specifying the Timescale.....	688
Other Timescale Logic Diagram Options	689
Appendix E – Case Study Solutions	693

Course Objectives

Managing Projects in Primavera P6 Professional R8 will cover the following topics:

Section I: Overview and Creating a Project

Lesson 1 - Project Management Life Cycle

- Identify the five process groups in the Project Management Life Cycle.
- Describe the steps included in each process group.

Lesson 2 - Understanding Data in P6

- Describe functionality and technical environment of P6 (EPPM).
- Describe the Enterprise Project Structure.
- Describe the Organizational Breakdown Structure.
- Distinguish between enterprise data and project-specific data.

Lesson 3 - Overview and Navigation

- Log in to P6 Professional.
- Open an existing project.
- Open and navigate among different windows.
- Open an existing layout.
- Customize a layout.
- Save a layout.

Lesson 4 - Creating a Project

- Create a project.
- Navigate in the Projects window.
- View and modify information in Project Details.

Lesson 5 - Creating a Work Breakdown Structure

- Define a Work Breakdown Structure (WBS).
- Create multiple levels of a WBS hierarchy.

Lesson 6 - Adding Activities

- Describe an activity and its components.
- Describe activity types.
- Add activities.
- Add a Notebook topic to an activity.
- Add steps to an activity.
- Assign activity code values to activities.

*Case Study 1 - Creating a Project***Section II: Scheduling the Project and Managing Data***Lesson 7 - Assigning Calendars*

- Define work time and non-work time.
- Explain the differences between global, project, and resource calendars.
- Create a new project calendar.

Lesson 8 - Creating Relationships

- View a network logic diagram.
- Describe the four relationship types.
- Create relationships in the Activity Network.
- Create relationships in Activity Details.

Lesson 9 – Scheduling

- Describe Critical Path Method (CPM) Scheduling.
- Perform a forward and a backward pass.
- Describe float and its impact on a schedule.
- Identify loops and open ends.
- Calculate a schedule.

Lesson 10 - Assigning Constraints

- Describe available constraint types.
- Apply Must Finish By constraint to a project.
- Apply a Start On or After constraint to an activity.
- Add a Notebook topic to a constrained activity.

Lesson 11 - Creating Layouts

- Group activities according to specific criteria.
- Sort activities.
- Apply a filter.
- Create a filter.

Lesson 12 - Managing Work Products and Documents

- Describe the difference between a work product and a reference document.
- Create a document record.
- Link the document record to a project document or work product.
- Assign the project document to an activity or WBS.

*Case Study 2 - Scheduling the Project***Section III: Assigning Resources and Baselining***Lesson 13 - Understanding Roles and Resources*

- Describe roles.
- View the roles dictionary.
- Describe resources.
- Identify the differences between labor, nonlabor, and material resources.
- View the resource dictionary.

Lesson 14 - Assigning Roles and Resources

- Assign roles to an activity.
- Assign rates on roles.
- Assign resources to an activity by role and directly from the resource dictionary.
- Adjust Budgeted Units/Time for a resource.
- Assign expenses to activities.

Lesson 15 - Optimizing the Project Plan

- Analyze schedule dates.
- Shorten a project schedule.
- Analyze resource availability.
- Resolve resource overallocation.
- Analyze project costs.

Lesson 16 - Baselining the Project Plan

- Create a baseline plan.
- Display baseline bars on the Gantt chart.
- Modify the bars on the Gantt chart.

Lesson 17 - Importing and Exporting Data

- Describe the process of importing and exporting data.
- Export a project.
- Import a project.

Case Study 3 - Optimizing and Baselining

Section IV: Project Execution and Control

Lesson 18 - Methods of Applying Progress

- Describe methods for applying progress to a project.

Lesson 19 - Executing the Project Plan

- Use Progress Spotlight.
- Update the status of completed activities and activities in progress.
- Reschedule the project.

Lesson 20 - Reflection Projects

- Create a reflection project.
- Merge changes from reflection project into source project.

Lesson 21 - Analyzing the Updated Project

- Analyze schedule dates, resource availability/allocation, and project costs.
- Identify areas where the project is falling behind schedule or exceeding planned costs.
- Make changes necessary to address variances.
- Understand the importance of analyzing a project after every status update.

Lesson 22 - Reporting Performance

- Describe reporting methods.
- Run a schedule report.
- Create a resource report with the Report wizard.
- Create a time distributed report.
- Create a report using the current layout.

Case Study 4 - Project Execution and Control

Section V: Advanced Project Analysis

Lesson 23 - Duration Types

- Determine which duration type works best in a given situation.
- Assign a duration type to an activity.

Lesson 24 - Calculating Percent Complete

- Describe the three Percent Complete types.
- Determine which Percent Complete type to use based on how your organization reports progress.
- Explain how activity percentages are calculated based on the Percent Complete type chosen.
- Use weighted steps to calculate Percent Complete.

Lesson 25 - Earned Value

- Define earned value.
- Define Performance Percent Complete.
- Review the results of different earned value techniques.
- Recognize the benefits of using earned value analysis.

Lesson 26 - Managing Multiple Projects

- Filter and apply progress to multiple projects.
- Set the default project for multiple projects.
- Explain how project elements are handled in multi-project mode.

Lesson 27 - Advanced Scheduling

- Calculate multiple float paths when scheduling.
- Explain the difference between scheduling logic options.
- Describe a calendar's effect on lag.

Section VI: Appendices

Appendix A - Using P6 Professional with Spreadsheets

- Export activity data to a spreadsheet application.
- Modify project information in the spreadsheet application.
- Import project information from the spreadsheet application.
- Importing a new project from the spreadsheet application.

Appendix B - Claim Digger

- Describe how Claim Digger compares project plans.
- Create a comparison report in Claim Digger.

Appendix C - Creating Output

- Customize the appearance of headers and footers.
- Insert and format the curtain and text attachment tools.
- Format the appearance of the data date.

Appendix D - Timescaled Logic Diagrams

- Describe what a timescaled logic diagram is.
- Explain the value of timescaled logic diagrams.
- Create a timescaled logic diagram.

Appendix E - Case Study Solutions

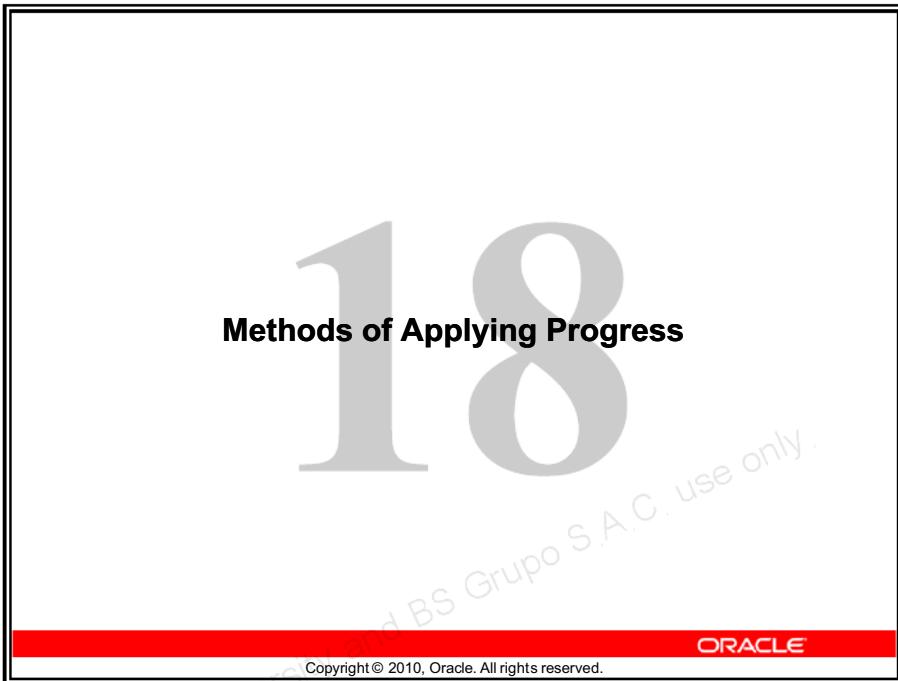
SECTION IV

Project Execution and Control

**Methods of Applying Progress
Executing the Project Plan
Reflection Projects
Analyzing the Updated Project
Reporting Performance**

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Lesson 18 – Methods of Applying Progress

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
30				30

Objectives

After completing this lesson, you should be able to:

- Describe methods for applying progress to a project.

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Updating a Project

- After a project has started, actual project data should be updated regularly.
- Updates can be monthly, weekly, daily, or hourly depending on project length and the precision of project control.
- A variety of methods can be used for updating the project.
- A single method need not be used exclusively. Multiple updating methods can be used within a single project.

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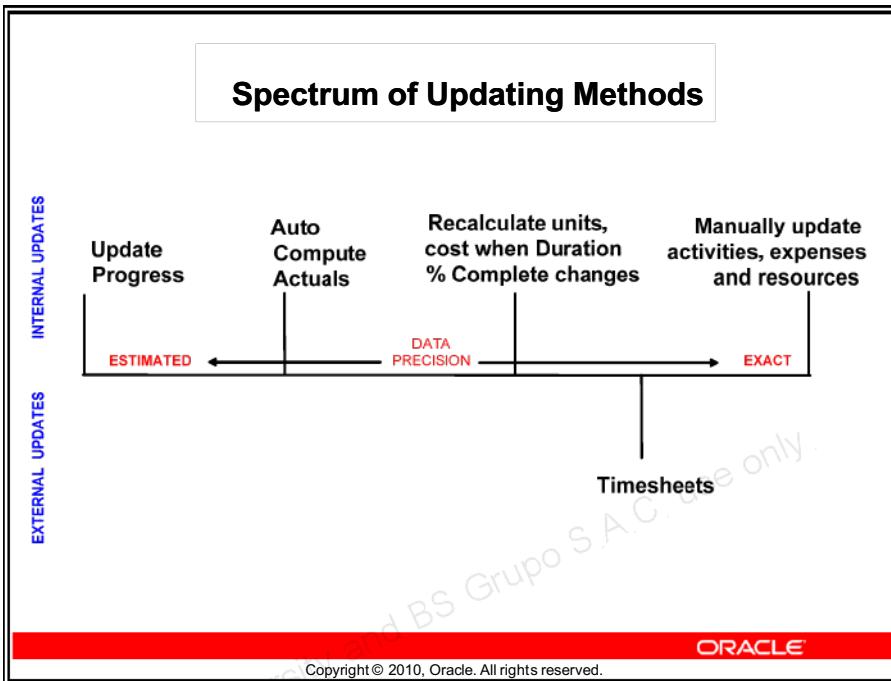
Updating a Project

Consider these factors when deciding on a method:

- Data precision: The degree to which project data is exact (based on manual data entry) or estimated (based on automated calculations).
 - Is project data entered manually?
 - Is project data automatically calculated and applied?
- Internal or external: The extent to which individuals other than the project manager are empowered to update project data.
 - Do other persons – resources, for example – update project data?

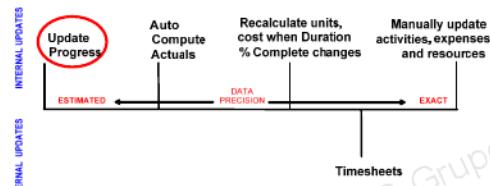


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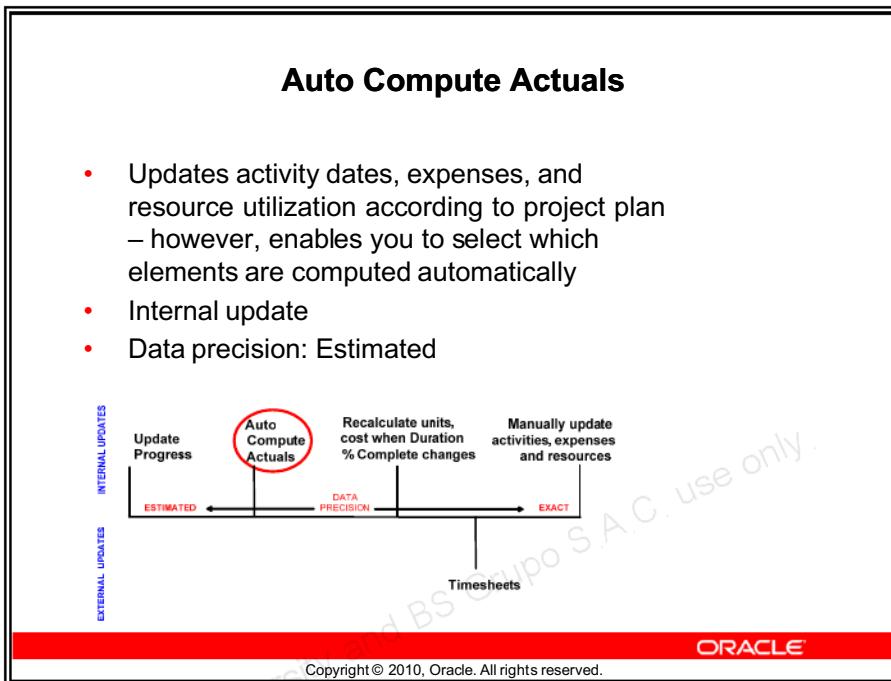
Update Progress

- Updates activity dates, expenses, and resource utilization according to project plan
- Internal update
- Data precision: Estimated



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Auto Compute Actuals

- Values are computed based on element you select for auto compute:
 - If activity is selected, resources and expenses also automatically updated.
 - If just resource or expense is selected, only those elements are automatically updated.
- Doesn't affect successor activities outside of status period until project is scheduled.

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Recalculate Units, Cost When Duration % Complete Changes

- Project-level setting computes units based on Duration % Complete
- Internal update
- Data precision: Units and costs estimated based on exact Duration % Complete

The diagram illustrates the range of data precision for project management. It features a horizontal axis with three markers: 'ESTIMATED' on the left, 'EXACT' on the right, and 'DATA PRECISION' in the middle. Above the axis, three actions are listed: 'Update Progress' (aligned with ESTIMATED), 'Auto Compute Actuals' (aligned with DATA PRECISION), and 'Manually update activities, expenses and resources' (aligned with EXACT). A red circle highlights the action 'Recalculate units, cost when Duration % Complete changes', which corresponds to the DATA PRECISION level. A vertical line labeled 'Timesheets' connects all three levels of precision. On the far left, the text 'INTERNAL UPDATES' is written vertically, and on the far right, the text 'EXTERNAL UPDATES' is written vertically. The ORACLE logo is at the bottom right.

INTERNAL UPDATES

Update Progress Auto Compute Actuals Recalculate units, cost when Duration % Complete changes Manually update activities, expenses and resources

ESTIMATED DATA PRECISION EXACT

EXTERNAL UPDATES

Timesheets

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Recalculate Units, Cost When Duration % Complete Changes

- Based on Budgeted Units/Time, application calculates Actual Units and subtracts from Budgeted Units
- Example: 10-day activity with 80 Budgeted Units
 - 2 days progress (Duration % Complete = 20%)
 - Actual Units automatically recalculated to 16h
 - Remaining Units automatically recalculated to 64h

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Manually Update Activities, Expenses, and Resources

- Manually enter values for each element.
- Internal update
- Data precision: Exact

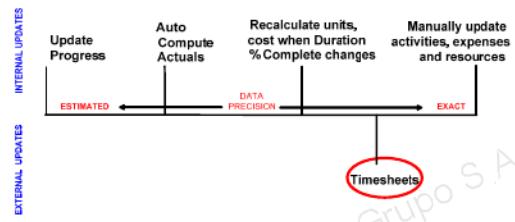
The diagram illustrates the spectrum of data precision. It features a horizontal axis with arrows pointing towards two extremes: 'ESTIMATED' on the left and 'EXACT' on the right. Between these extremes is a central label 'DATA PRECISION'. Above the axis, four specific update methods are listed: 'Update Progress', 'Auto Compute Actuals', 'Recalculate units, cost when Duration % Complete changes', and 'Manually update activities, expenses and resources'. The method 'Manually update activities, expenses and resources' is circled in red, indicating it is the most precise method shown. The left side of the diagram is labeled 'INTERNAL UPDATES' and the right side is labeled 'EXTERNAL UPDATES'.

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Timesheets

- Resources record hours worked.
- Manager approves / rejects timesheets and then applies actuals
- External update
Data precision: Exact

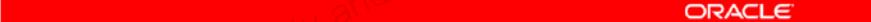


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Timesheets

- Resources record hours worked against activities.
- Primary resource also can mark activities started or finished and update Remaining Duration.
- After approving / rejecting timesheets, manager applies actuals.
 - Only statused activities are recalculated.
 - Does not affect activities not in the status period.
 - Activities within the status period that are not progressed are pushed out to new data date.

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Delegating Status Updates

Project updates can be delegated to external resources, such as subcontractors. Methods include:

- Reflection project
 - Reflection project is updated by subcontractor, resource, or individual designated as Activity Owner.
 - Can status activities, update resource assignments
 - Project manager has ability to view and then approve/reject updates before merging reflection project into source project.
 - Available in P6 Professional only.
- Import updated project
 - Copy of project updated by another individual and then imported.

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Questions

- Which update method(s) do you use?
- What are advantages and disadvantages?

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Notes



19

Executing the Project Plan

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Lesson 19 – Executing the Project Plan

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	15	45	5	75

Objectives

After completing this lesson, you should be able to:

- Use Progress Spotlight.
- Update the status of completed activities and activities in progress.
- Reschedule the project.

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Updating a Project

Once a project has started, actual activity information should be updated at regular intervals.

- Schedule dates and durations
- Resource usage
- Expenses

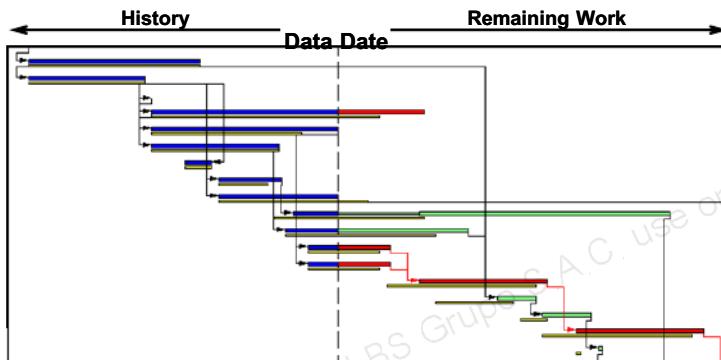


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Data Date

The data date is the date up to which actual performance data is reported and the date from which future work is scheduled. The data date always starts at the beginning of the day.



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The Updating Process

Standard project update procedures should be established, including how data is collected and how often it is updated.

- Create a baseline plan (optional).
- Identify the new data date.
- Enter activity progress.
- Report resource use and costs to date.
- Use Suspend and Resume dates as necessary.
- Reschedule using the new data date.

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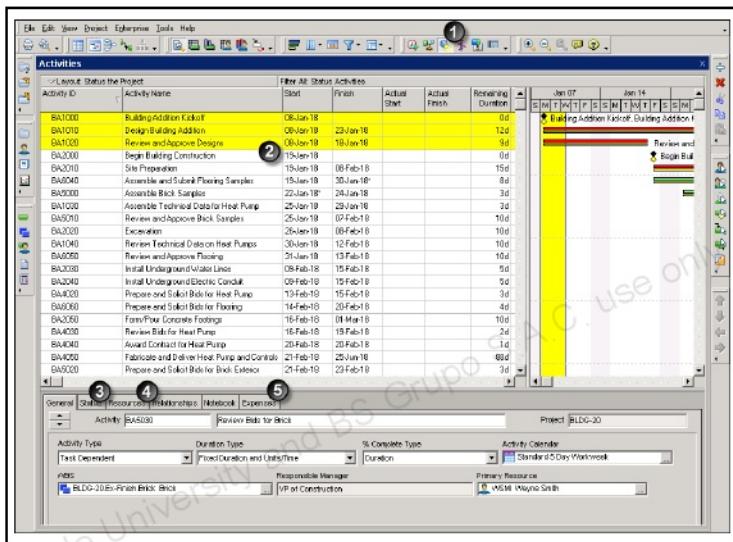
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Notes



Overview: Executing the Project Plan

Updating the project plan is done in the Activities window. An updating period is displayed in the Gantt chart and in the Activity Table, and activity progress information is entered in the appropriate tabs in Activity Details.



- ① Use Progress Spotlight to define a status updating period and identify activities on which progress has occurred.
- ② Use the Activity Table to select activities to update.
- ③ Use the Status tab in Activity Details to enter actual schedule dates and duration information for completed activities and activities in progress.
- ④ Use the Resources tab in Activity Details to enter actual resource usage information.
- ⑤ Use the Expenses tab in Activity Details to enter actual non-resource costs for activities being updated.

Practice: Executing the Project Plan

In this practice you will:

- Use Progress Spotlight to define a status updating period.
- Enter Actual Start and Actual Finish dates for completed activities.
- Adjust Remaining Duration for an activity in progress.
- Suspend and resume an activity in progress.
- Adjust Actual Regular Units and Remaining Units for an activity resource.
- Adjust Actual Cost and Remaining Cost for an activity expense.
- Reschedule the project after updating activities.

Defining a Status Updating Period

Define the status updating period before you begin to update activities. In general, the updating period begins at the current data date and ends at a point in the future. The length of the updating period depends on the frequency of your updates. You could, for example, create an updating period that extends one week from the current data date. The end of the updating period will become the new data date — the date up to which actual performance is measured.

Note that even as you establish a new status updating period, you must still manually change the new data date in the Schedule dialog box.

Progress Spotlight

Progress Spotlight establishes a status updating period of one week from the current data date, based on the minor date interval of the Gantt chart timescale. You can click and drag the right edge of the Spotlight to increase or decrease the status updating period.

It also provides a highlighted list of activities that should show progress during the updating period.

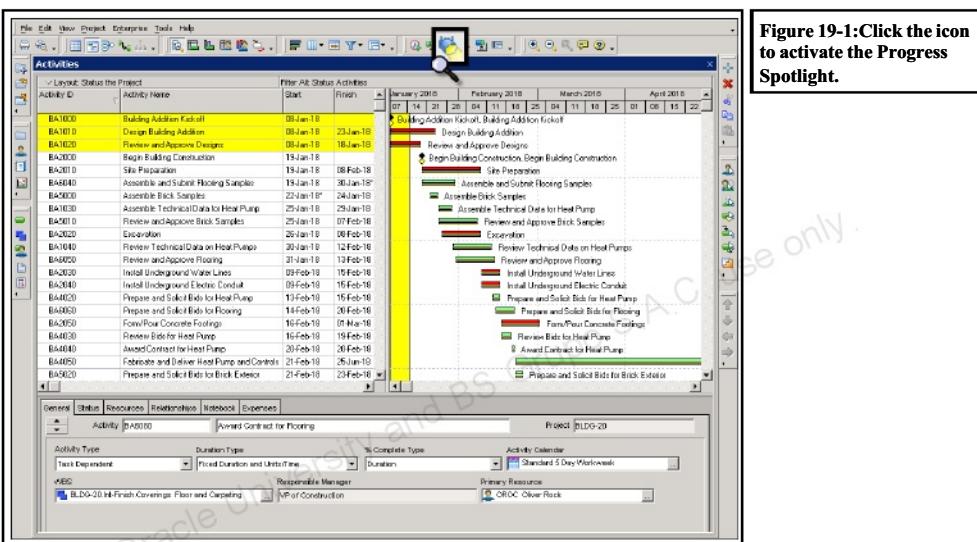


Figure 19-1: Click the icon to activate the Progress Spotlight.

Activate the Progress Spotlight.

1. Open a project, *BLDG-19 – BLDG - Executing the Project Plan*.
2. Confirm that you are in the Activities window. (Or on the Project menu, click *Activities*.)
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Status the Project* and then click *Open*.
5. On the View menu, click *Progress Spotlight*.

Establishing the Status Period

Drag the line in the Gantt chart to the desired date to highlight the activities you want to update. Note the date tag on the cursor, which changes as you drag the line. The end of the status period should coincide with the new data date you will use when rescheduling the project.

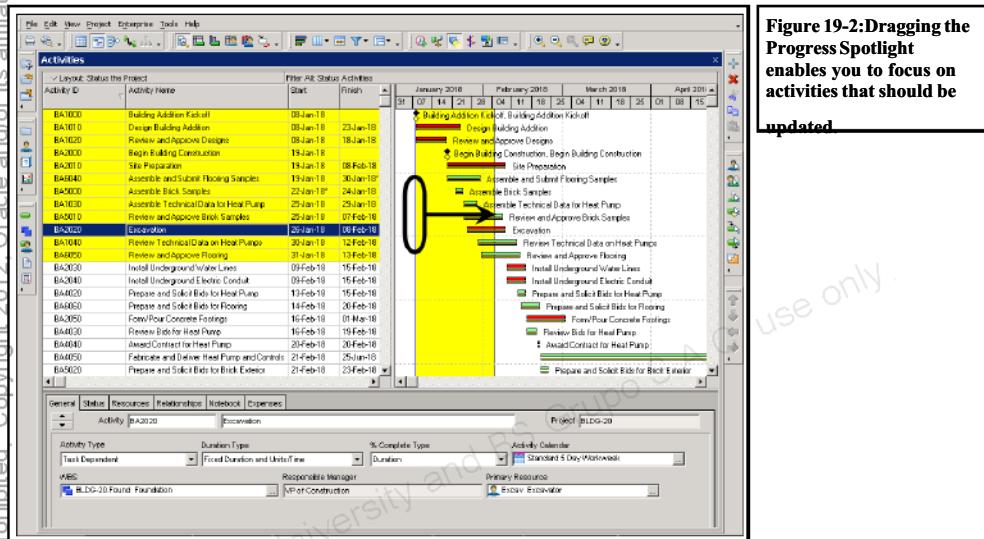


Figure 19-2: Dragging the Progress Spotlight enables you to focus on activities that should be updated

Use Progress Spotlight to establish status period.

1. Use your mouse cursor to click and drag the Progress Spotlight to *5-Feb-18*.

Entering Actuals

Enter schedule, resource, and cost data in the following order:

- **Completed activities:**
 - ◆ Actual Start and Actual Finish dates
 - ◆ Actual Regular Units/Costs
 - ◆ Actual Cost for expenses
- **Activities in progress:**
 - ◆ Actual Start date
 - ◆ Percent Complete and/or Remaining Duration
 - ◆ Actual Regular Units/Costs and Remaining Units/Costs
 - ◆ Actual and Remaining Costs for expenses

If activity work is temporarily halted, use Suspend/Resume dates.

Updating Milestones

To update a start milestone, select the *Started* check box and enter the Actual Start date. You do not need to enter data in the *Finish* field because the activity type is a *Start Milestone* which has zero duration.

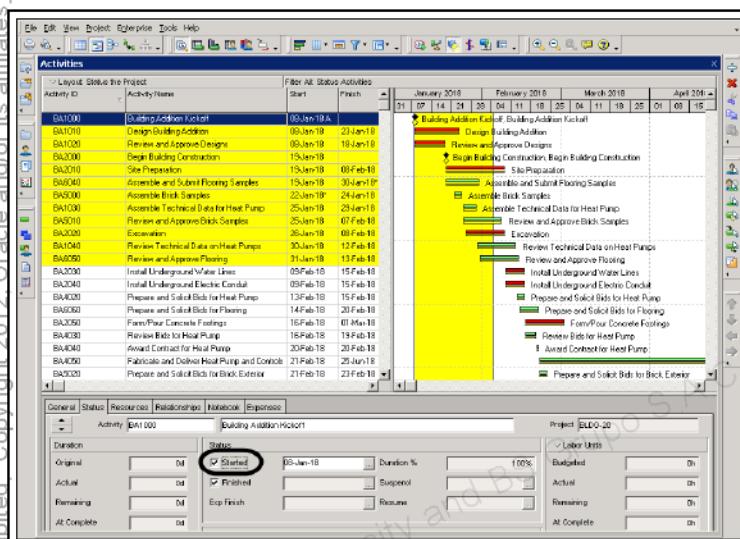


Figure 19-3: Select the *Started* checkbox in the Status tab.

Update a Start Milestone activity.

1. In the Activity Table, select an activity, *BA1000 – Building Addition Kickoff*.
2. In Activity Details, click the Status tab.
3. Select the *Started* check box.
4. Confirm the Actual Start date, *08-Jan-18*.

Updating Activities to Completion

Three steps must be performed to update an activity to completion:

- Enter Actual Start and Actual Finish dates.
- Enter Actual Regular Units for resources.
- Enter Actual Cost for expenses.

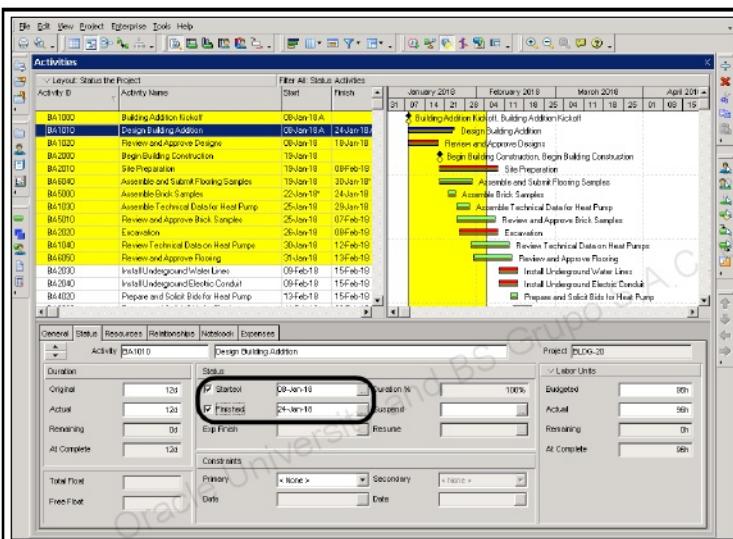


Figure 19-4:Mark *Start* and *Finished*check boxes and confirm/change dates in the Status tab.

Update an activity that started and finished on time.

1. In the Activity Table, select an activity, *BA1010 – Design Building Addition*.
2. On the Status tab, select the *Started*check box.
3. Confirm the Actual Start date, *08-Jan-18*.
4. Select the *Finished*check box.
5. Confirm the Actual Finish date, *23-Jan-18*.

Note that when you selected the *Finished* check box, the bar for the activity in the Gantt chart turned blue, indicating that the activity was completed and has actual values.

Next, you will check the Actual Regular Units for the activity. Note that in this example, data in the *Actual Regular Units* field is automatically completed because *Recalculate Actual Units and Cost when duration % complete changes* is selected on the Calculations tab in Project Details.

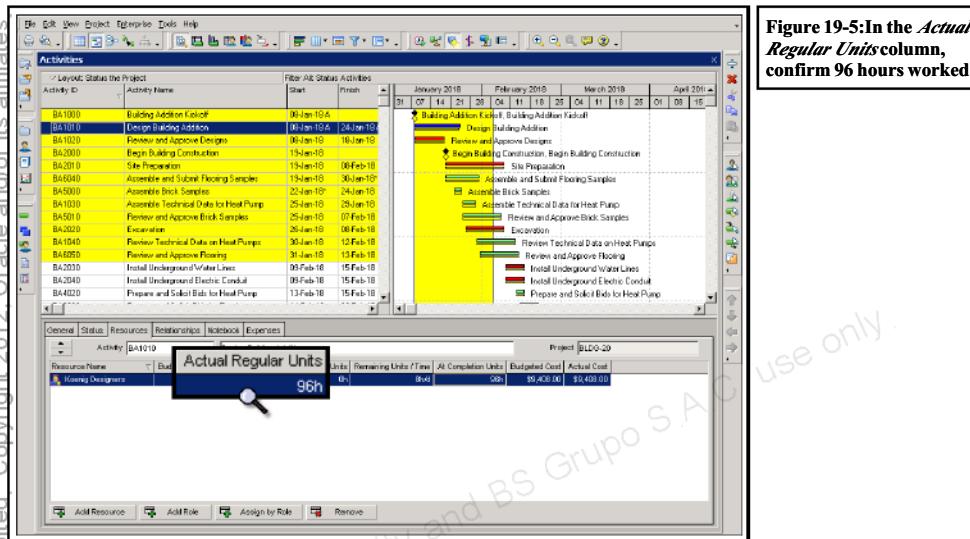


Figure 19-5: In the *Actual Regular Units* column, confirm 96 hours worked.

Confirm Actual Regular Units for an activity resource.

1. In the Activity Table, confirm that activity *BA1010 – Design Building Addition* is selected.
2. In Activity Details, click the Resources tab.
3. In the *Actual Regular Units* column for the resource, *Koenig Designers*, confirm the number of hours worked, *96h*.

You will now update the status of activity *BA1020 – Review and Approve Designs*, which was completed during this status updating period. The activity started on time but finished one day late. Resource Paul Kim worked an additional 8 hours on the activity.

When selecting a new date for the *Started* or *Finished* field on the Status tab, select the check box first and then select the date.

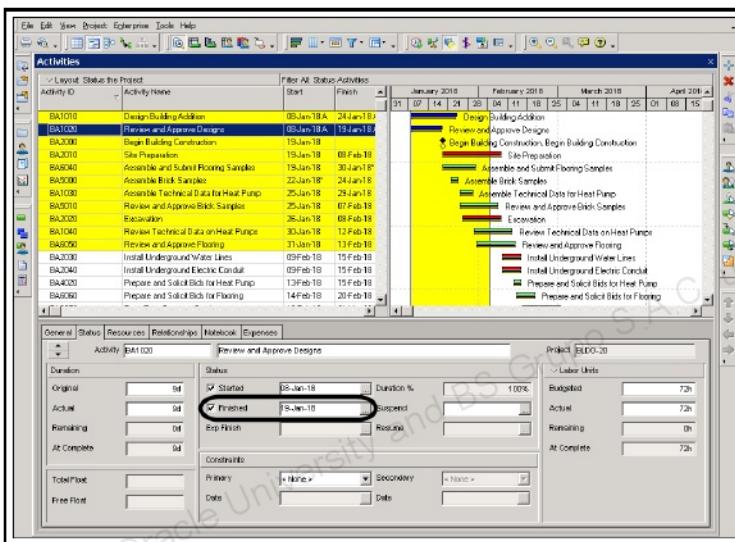
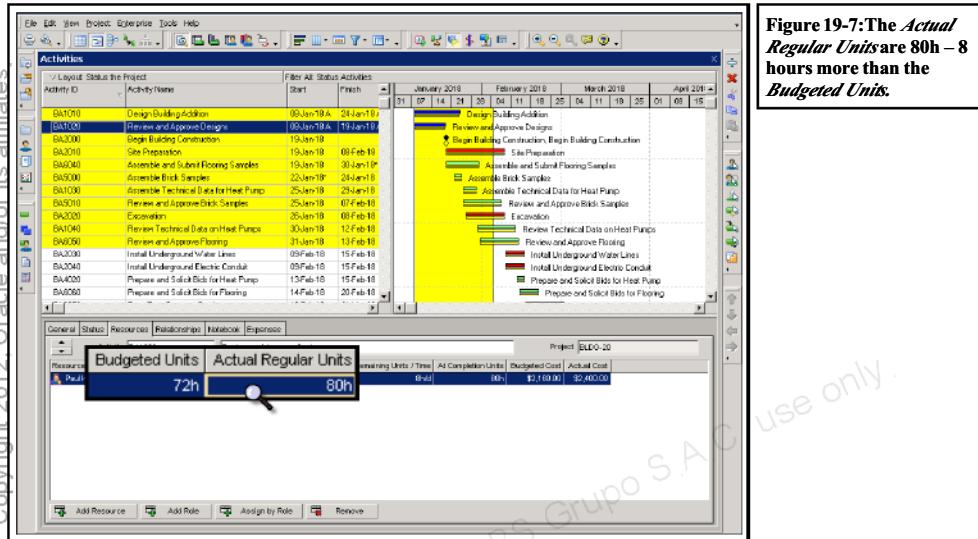


Figure 19-6: Select the *Finished* check box before selecting a new date.

Update the status of an activity.

1. In the Activity Table, select an activity, *BA1020 – Review and Approve Designs*.
2. In Activity Details, click the Status tab.
3. Select the *Started* check box.
4. Confirm the Actual Start date, *08-Jan-18*.
5. Select the *Finished* check box.
6. In the *Finished* field, click .
7. Select the Actual Finish date, *19-Jan-18*, and then click *Select*.

You have updated the Actual Finish date. Now you must update the actual hours that the resource worked.



Update *Actual Regular Units* for a resource.

1. In Activity Details, click the Resources tab.
2. In the *Actual Regular Units* column for Paul Kim, type <80>.
3. Press *Enter* on your keyboard.

Updating a Mid-Project Milestone

A Start Milestone is updated the same way whether it occurs at the beginning of a project or in mid-project. Select the *Started* check box and then enter the Actual Start date.

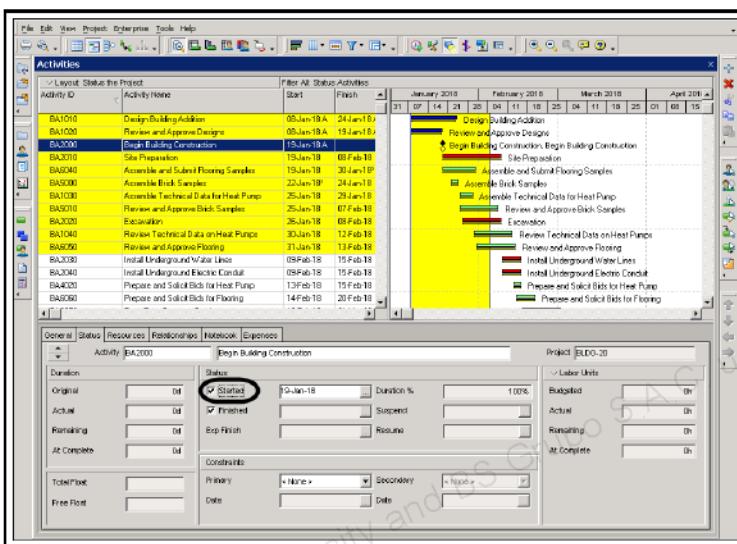


Figure 19-8:Select the *Started* check box for the Start Milestone activity.

Update a mid-project Start Milestone.

1. In the Activity Table, select an activity, *BA2000 – Begin Building Construction*.
2. In Activity Details, click the Status tab.
3. Select the *Started* check box.
4. Confirm the Actual Start date, *19-Jan-18*.

Updating Activities in Progress

You must complete the following four steps to update an activity in progress:

- Enter Actual Start date. (The *Started* check box must be selected before a new date is selected.)
- Enter Percent Complete and/or Remaining Duration.
- Enter Actual Regular Units and Remaining Units for resources.
- Enter Actual Cost and Remaining Cost for expenses.

In the following example, activity *BA2010* was started during the status period but is now falling behind schedule. You will indicate this by increasing the Remaining Duration.

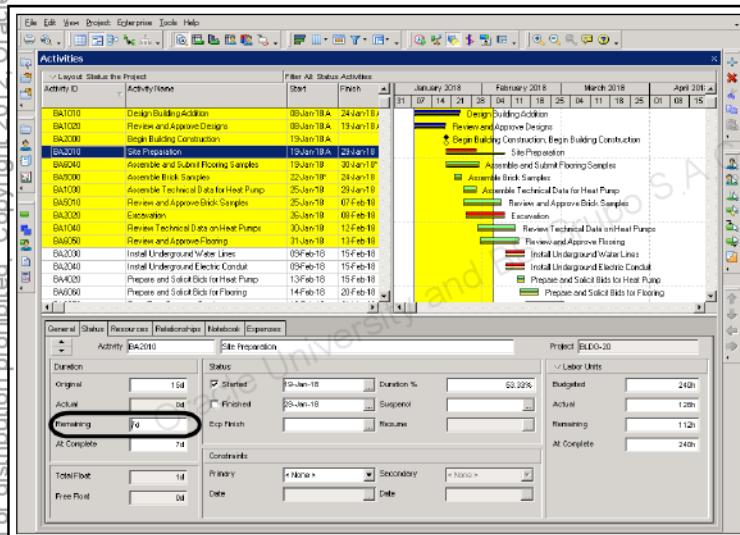


Figure 19-9: Type a new Remaining Duration.

Update an activity in progress.

- In the Activity Table, select an activity, *BA2010 – Site Preparation*.
- In the Status tab in Activity Details, select the *Started* check box.
- Confirm the Actual Start date, *19-Jan-18*.
- In the *Remaining* field in the Duration section, type *<7>*.
- Press *Enter* on your keyboard.

Actual Regular Units is the number of units that a resource actually worked on the activity. Remaining Units is the amount of work (units) required to complete the activity.

The formula for calculating Remaining Units is:

Remaining Units = Remaining Duration x Remaining Units/Time.

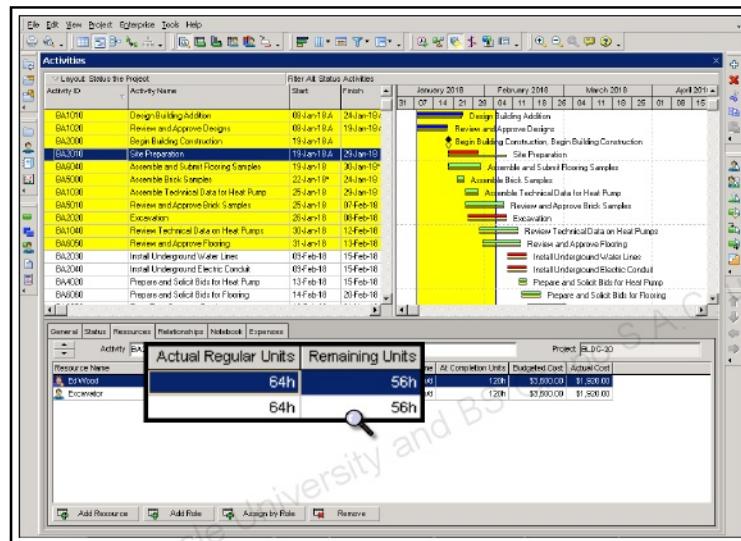


Figure 19-10: Review
Actual Regular Units and Remaining Units in the Resources tab.

Review Actual Regular Units and Remaining Units for activity resources.

1. In Activity Details, click the Resources tab.
 2. In the *Actual Regular Units* column, confirm that *Ed Wood* and the *Excavator* have each worked *64* hours so far.
 3. In the *Remaining Units* column, confirm that *Ed Wood* and the *Excavator* each have *56* hours of work remaining.

Suspending an Activity

When an activity starts but is unexpectedly delayed or stopped for a period of time, you may suspend it.

- A suspended activity must have an Actual Start.
- Use the Status tab to enter Suspend and Resume dates.
 - Suspend date** – The last day that work was conducted on the activity.
 - Resume date** – The first day that work will continue on the activity.
- The actual duration excludes suspension time.
- Use the Notebook tab to document the reason for the suspension.

In the following exercise, the *Excavation* activity was suspended due to a snowstorm. Also, storm damage necessitated several days of additional work.

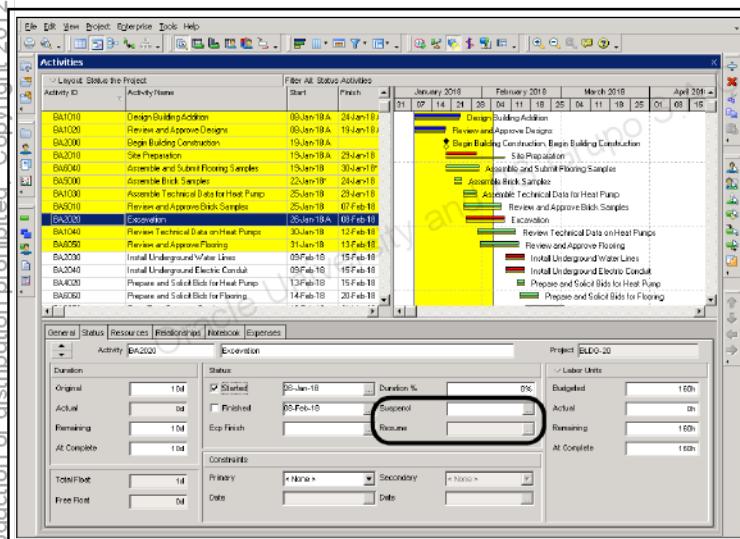


Figure 19-11: Enter Suspend and Resume dates on the Status tab.

Enter Suspend and Resume dates for an activity.

- In the Activity Table, select an activity, *BA2020 – Excavation*.
- In Activity Details, click the Status tab, and then select the *Started* check box.
- Confirm the Actual Start date, *26-Jan-18*.

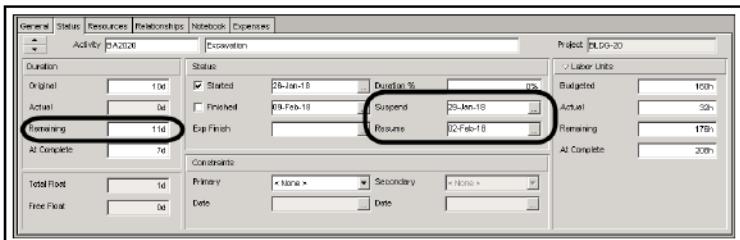


Figure 19-12: Actual Start, Remaining Duration, and Suspend and Resume dates have been updated.

4. In the *Remaining* field in the Duration section, type <11>, and then press *Enter* on your keyboard.
5. Click the Resources tab.
6. In the *Actual Regular Units* fields for both resources, *Excavator* and *Rose Danner*, type <16> and press *Enter*.
7. Click the Status tab.
8. In the *Suspend* field, click and then select a date, *29-Jan-18*.
9. Click *Select*.
10. In the *Resume* field, click and then select a date, *02-Feb-18*.
11. Click *Select*.

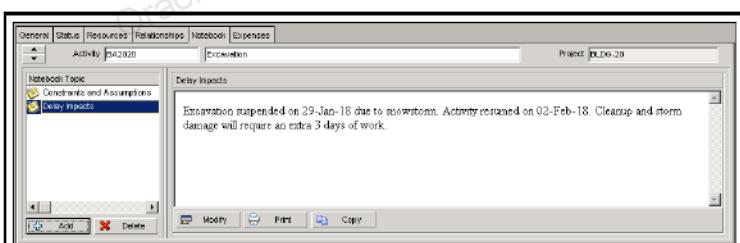


Figure 19-13: Add a Notebook topic description to document the activity suspension.

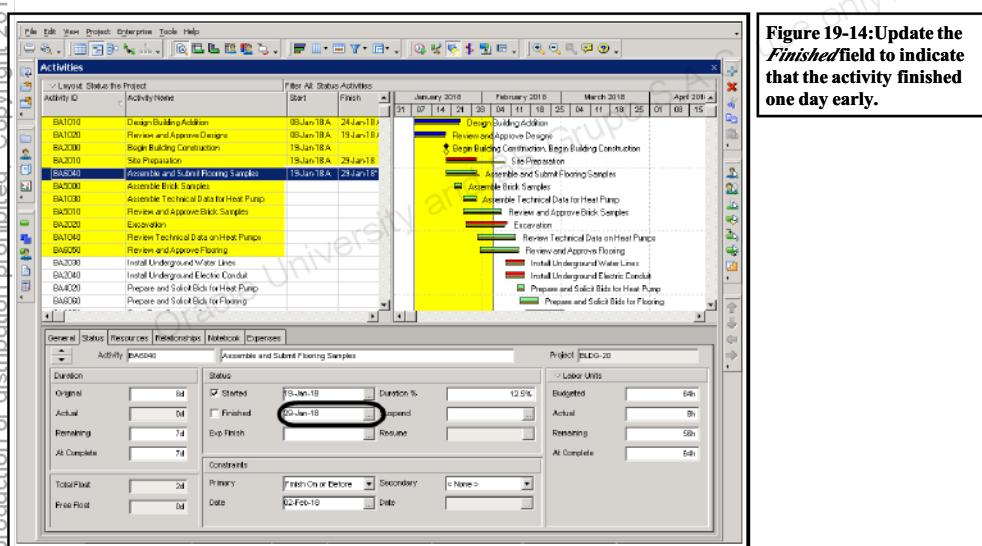
12. Click the Notebook tab.
13. In the Notebook Topic section, click *Add*.
14. Select a topic, *Delay Impacts*, and then click
15. Click

16. In the Delay Impacts details section, click *Modify*.
17. Click in the editor window and type a topic description, <**Excavation suspended on 29-Jan-18 due to snowstorm. Activity resumed on 02-Feb-18. Cleanup and storm damage will require an extra 3 days of work.**>
18. Click *OK*.

Updating Completed Activities

For the remainder of the practice, you will update one more activity that has been completed during the status updating period.

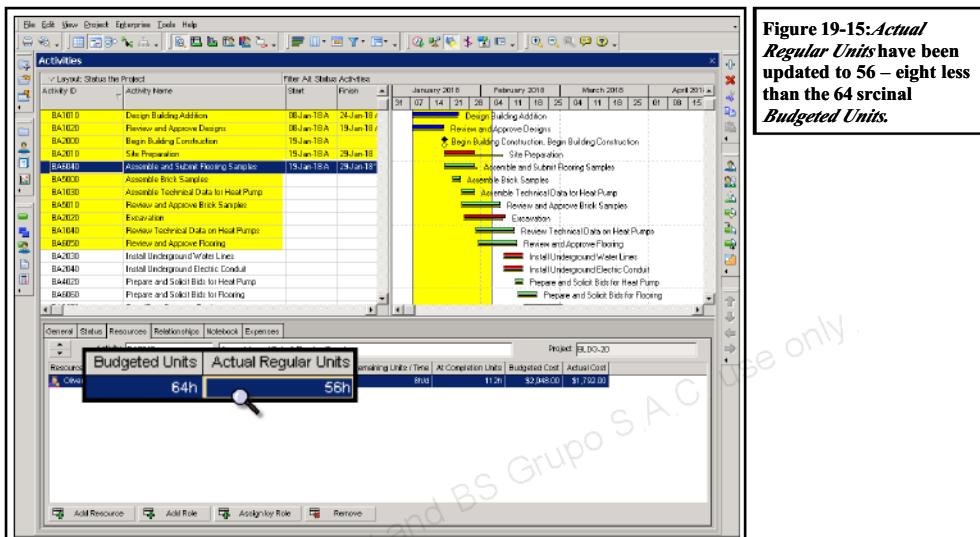
The *Assemble and Submit Flooring Samples* activity has finished one day early. Resource Oliver Rock worked eight hours less than planned on the activity. You will update Actual Units to 56 hours.



Update the Actual Finish date and the Actual Units of a completed activity.

1. In the Activity Table, select an activity, *BA6040 – Assemble and Submit Flooring Samples*.
2. In Activity Details, click the Status tab.
3. Select the *Started* check box.
4. Confirm the Actual Start date, *19-Jan-18*.

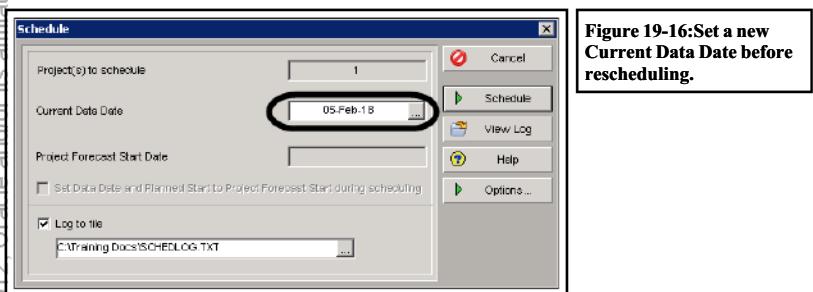
5. Select the *Finished* check box, and then click 
6. Select the Actual Finish date, *29-Jan-18*, and then click *Select*.



7. In Activity Details, click the Resources tab.
8. In the *Actual Regular Units* column for Oliver Rock, type <56>.
9. Press *Enter* on your keyboard.

Rescheduling the Project

Now that actuals have been entered for the activities in the status updating period, it is necessary to reschedule the project based on the new data date. Any activities that did not finish on time will delay their successor activities.



Reschedule the project using a new data date.

1. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
 2. In the *Current Data Date* field, click .
 3. Select a date, *05-Feb-18*, and then click *Select*.
- ! Why did you select this date as the new data date?**
4. Click *Schedule*.

Viewing the Rescheduled Project

After rescheduling, check to see if the project will still be completed by its Must Finish By date.

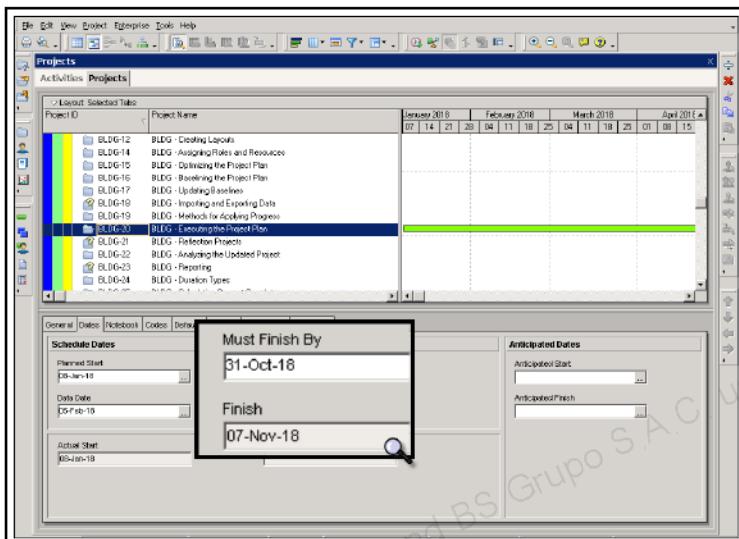


Figure 19-17: After rescheduling, the project's calculated Finish date is later than its Must Finish By date.

Compare a project's calculated Finish date and its Must Finish By date.

1. Click the Projects tab at the top of the screen.
2. In the Project Table, select the open project, *Bldg-19*.
3. In Project Details, click the Dates tab.
4. Compare the project's calculated Finish date with its Must Finish By date.

? *Is the project still on schedule?*

Lesson Review

Key Concepts

- When updating a project, actuals are recorded relative to the data date. The data date is the date up to which actual performance data is reported and from which future work is scheduled.
- To update the status of completed activities, update Actual Start and Actual Finish dates, Actual Regular Units/Costs, and Actual Costs for expenses.
- To update the status of activities in progress, update Actual Start date, Percent Complete and/or Remaining Duration, Actual Regular Units/Costs and Remaining Units/Costs, and Actual and Remaining Costs for expenses.
- After actuals are entered, reschedule the project based on the new data date. Activities that did not finish on time will affect successor activities.

Review Questions

- Arrange the following in the recommended order for updating an activity in progress.

- Actual Regular Units and Remaining Units
- Actual Start date
- Percent Complete/Remaining Duration
- Actual/Remaining Costs for expenses

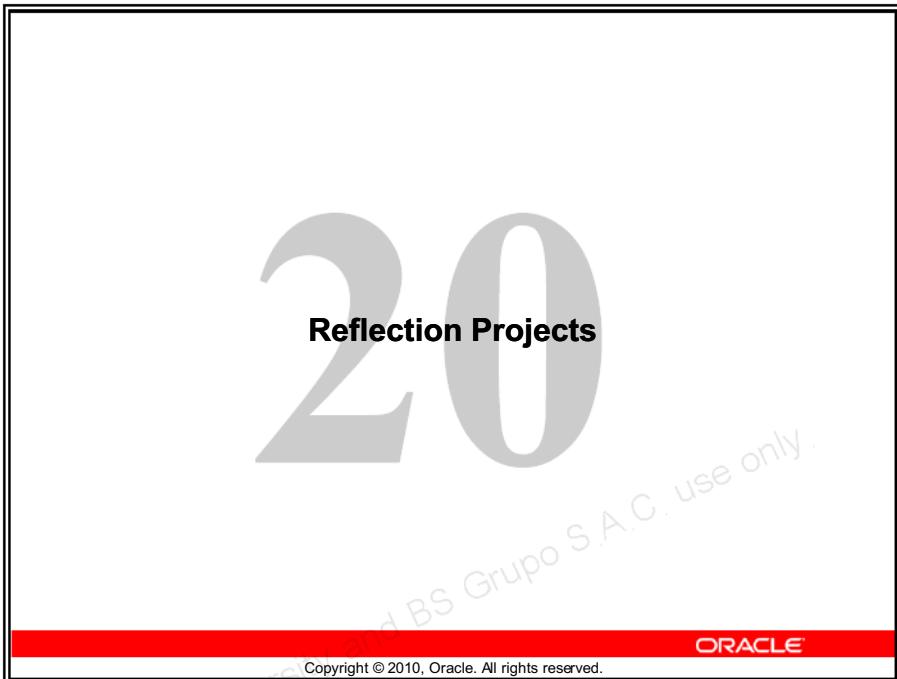
Step 1: _____

Step 2: _____

Step 3: _____

Step 4: _____

- True or False:** The data date is scheduled at 5 pm, the end of the work day.



Lesson 20 – Reflection Projects

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	10	20	5	45

Objectives

After completing this lesson, you should be able to:

- Create a reflection project.
- Merge changes from reflection project into source project.



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Reflection Projects

A copy of a project used for updating or to conduct what-if analysis.

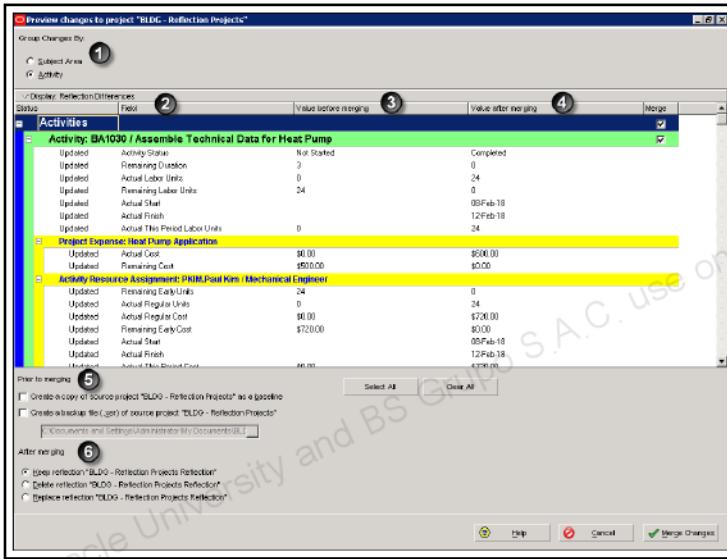
- Team members or other P6 Professional users can update status of activities in which they are designated Activity Owner.
- Review and decide which changes to merge into the source project.
- What-If status.
- Baselines in the source project are copied to the reflection project.
 - Enables you to convert reflection project into active project with baseline data in place.

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Overview: Creating and Updating a Reflection Project

The Preview Changes dialog box is displayed before you merge the reflection into the source project. It enables you to view changes made in the reflection project. You can group values either by subject area or activity. For each grouping, values before merging and values after merging are displayed.



- ① Display the list of changes in groups based on subject area or display the list of changes in groups for each activity.
- ② *Field* column lists the data item that was updated in the reflection project.
- ③ *Value before merging* column lists the original value any update.
- ④ *Value after merging* column lists the new value based on the update.
- ⑤ Select the check boxes to create a baseline to the source project or to create a backup of the reflection.
- ⑥ Choose how you would like P6 Professional to handle the reflection after merging the information into the source project.

Practice: Creating and Updating a Reflection Project

In this practice you will:

- Create a reflection project.
- Update the reflection project.
- Merge changes into source project.
- Assign Activity Owner to activities in reflection project.

Creating a Reflection Project

A reflection project is created in the Projects window. To create a reflection project, select a project, right-click in the Project Table, and then click *Create Reflection*. If the source project has a baseline, the Copy Baselines dialog box will display, asking you to specify which baselines to copy when creating the reflection project.

The reflection project has the following characteristics:

- Same name as the original source project, with reflection appended to it.
- What-If status.
- Contains an internal link to the source project that allows the application to merge changes to the reflection into the source project.
- Contains baseline data.

In the following exercises, a subcontractor needs to report progress on a project. You will create a reflection project to send to the primary resource, who will then update the reflection project. You will merge updates into the source project.

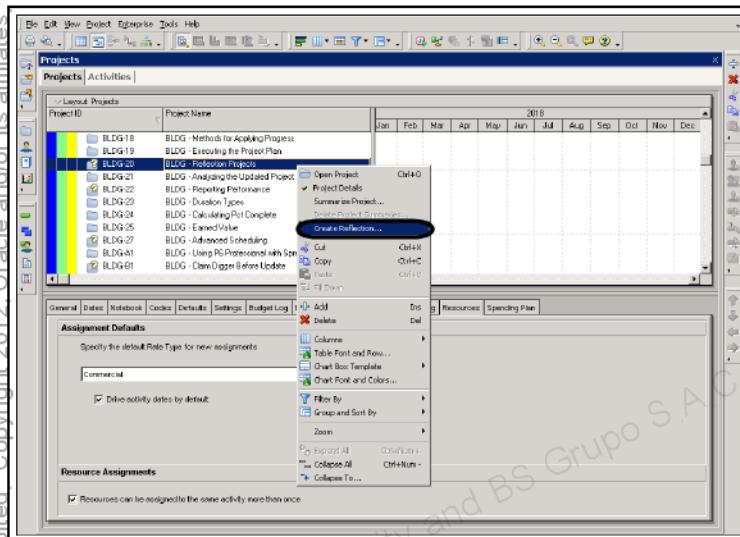


Figure 20-1: Right-click in the Projects Table and select *Create Reflection*.

Create a reflection project.

1. On the Enterprise menu, click *Projects*.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Projects*, and then click *Open*.
4. In the Projects window, select a project, *Bldg -20 Reflection Projects*.
5. Right-click in the Project Table, and then click *Create Reflection*.
6. Click *OK* in the Copy Baselines dialog box.

Add a column, *Source Project*, in the Projects window to view the reflection project's source project.

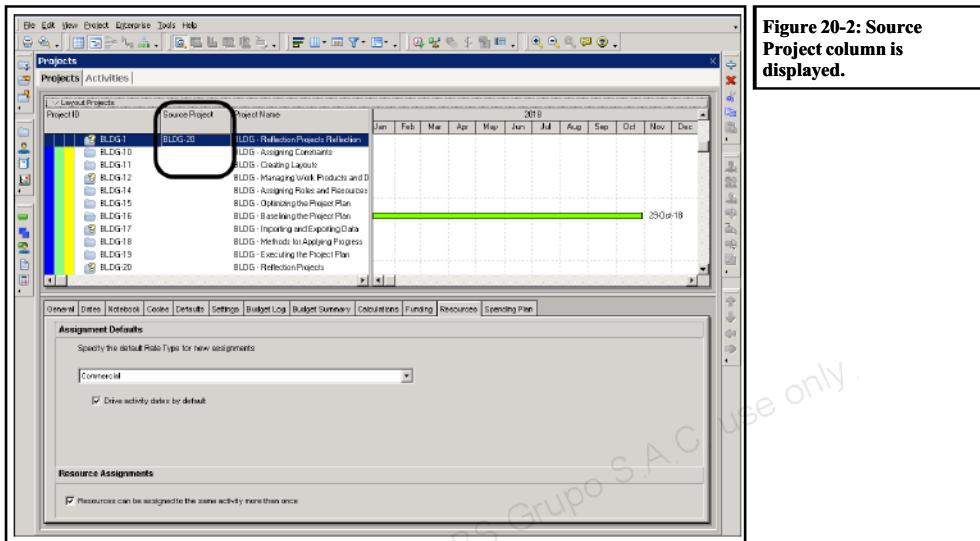


Figure 20-2: Source Project column is displayed.

Add the *Source Project* column to Projects window.

1. On the Layout Options bar, click *Columns, Customize*
2. In the Available Options section, click + to expand the *General* grouping band.
3. Select a data item, *Source Project*
4. Click to move it to the Selected Options section.
5. Click *OK*.

Making Changes to the Reflection Project

Use the reflection project to test different project scenarios and then merge selected changes back into the source project. Or, designate other individuals to update the project and then review their work before merging the changes into the source project:

- **Import/Export** — Export a reflection project as an .XER file and then send it to third parties — subcontractors, for example — who import the file into their database. After making changes to the project, third party users can export the file and send the resulting .XER file back to you. By importing the .XER file back into your reflection, you can decide which changes to keep when you merge the reflection back to the source.
- **Activity Owner** — An Activity Owner can update the status and other details of activities in which they are designated as owners. By offering an Activity Owner OBS access to a reflection project — rather than its associated active source project — you can collect the data you require and, through a review process, ensure data integrity for the active project.

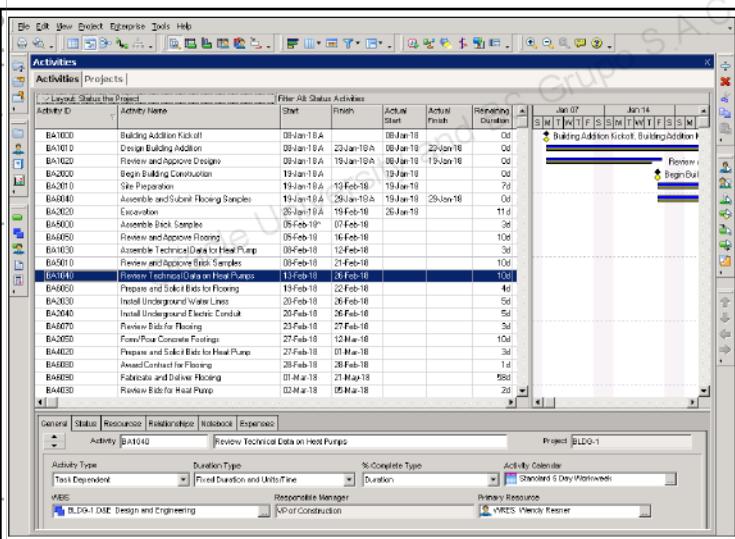


Figure 20-3: Reflection project is opened.

View reflection project in Activities window.

1. On the File menu, click *Open*.
2. Select the reflection project, *BLDG-1 - Reflection Projects Reflection*, and then click *Open*.
3. Confirm you are in the Activities window. (Or, on the Project menu, click *Activities*.)

4. On the Layout Options bar, click *Layout, Open*.
5. Select a layout, *Status the Project* and then click *Open*.

After opening the reflection project, you can make changes to it, including changing activity status and resource assignments. In the example below, a subcontractor is updating activities in the reflection project that you will later merge into the source project.

In the reflection project, update status for two activities and one expense.

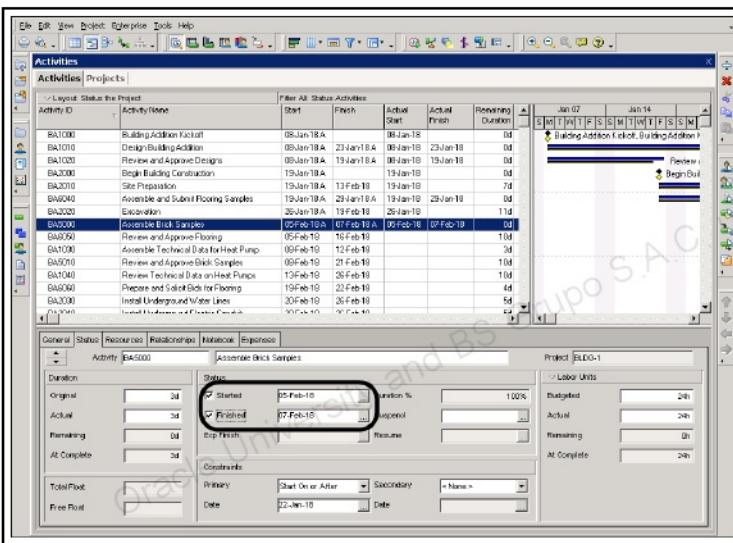


Figure 20-4: Confirm the Actual Start and Finish dates for the activity

☛ Update activity status.

1. In the Activity Table, select an activity, *BA5000 – Assemble Brick Samples*.
2. In Activity Details, click the Status tab.
3. In the Status section, select the *Started* check box.
4. Select the Actual Start date, *22-Jan-18*.
5. Select the *Finished* check box.
6. Select the Actual Finish date, *24-Jan-18*.

Next, update the *Assemble Technical Data for Heat Pump* activity, which was also started and finished during the status period.

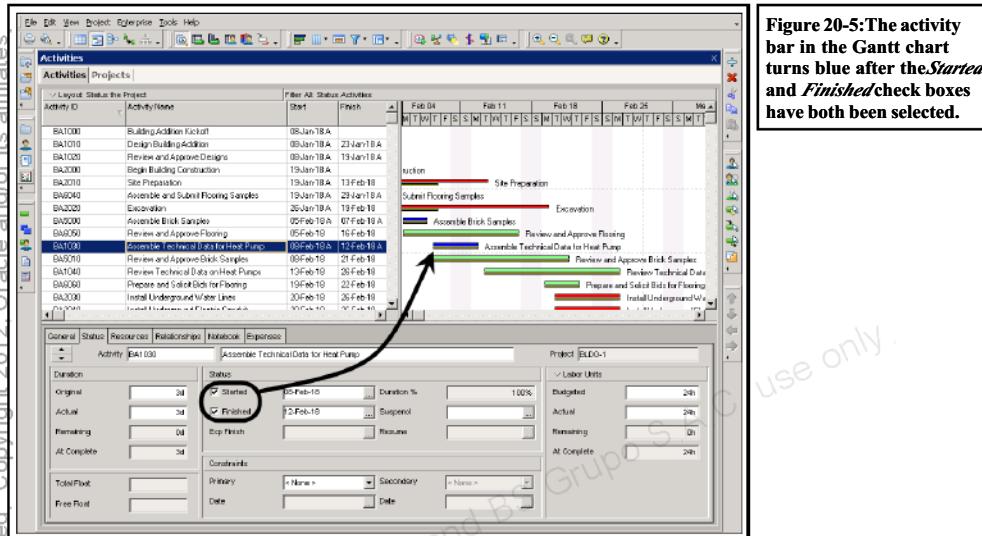


Figure 20-5: The activity bar in the Gantt chart turns blue after the *Started* and *Finished* check boxes have both been selected.

Update a completed activity and add the Actual Cost for an expense.

1. In the Activity Table, select an activity, *BA1030 – Assemble Technical Data for Heat Pump*.
2. On the Status tab in Activity Details, select the *Started* check box.
3. Select the Actual Start date, *25-Jan-18*.
4. Select the *Finished* check box.
5. Confirm the Actual Finish date, *29-Jan-18*.

While the Actual Start and Actual Finish dates need no modification, the *Assemble Technical Data for Heat Pump* activity has an expense that has run over its budgeted amount. You will update the appropriate entries in the Expenses tab to reflect the additional spending.

On the Expenses tab, the value in the *At Completion Cost* field is calculated by adding the Actual Cost (\$600) + the Remaining Cost (\$0). After updating the relevant fields, compare the At Completion Cost to the Budgeted Cost to determine how much the expense is over-budget.

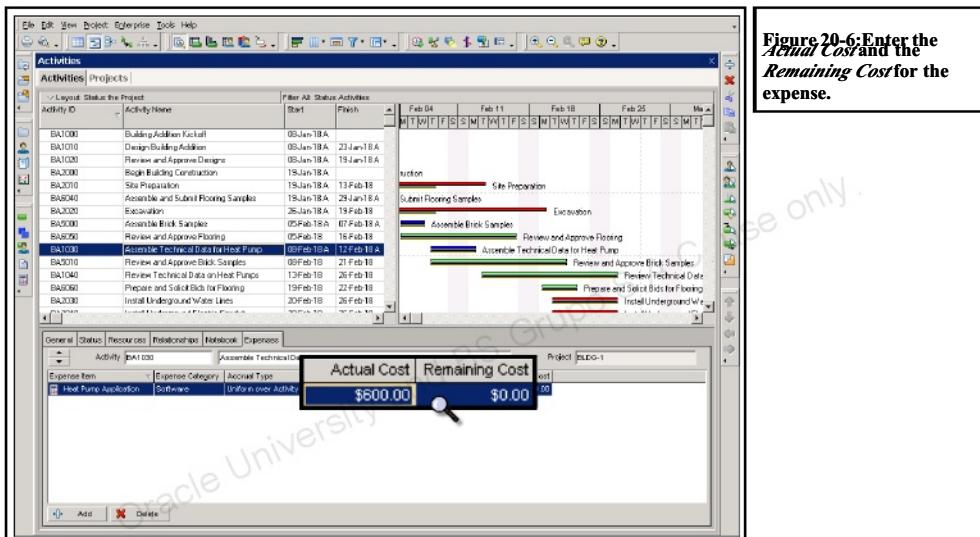


Figure 20-6: Enter the Actual Cost and the Remaining Cost for the expense.

6. Click the Expenses tab.
7. Confirm that an expense, *Heat Pump Application*, is selected.
8. In the Actual Cost column, type <600>, and then press *Enter* on your keyboard.
9. In the *Remaining Cost* column, confirm \$0.00.

? How far over budget is the *Heat Pump Application* expense?

Merging Reflection into Source Project

When the changes are complete, close the project and return to the Projects window, where you can merge the reflection project into the source project.

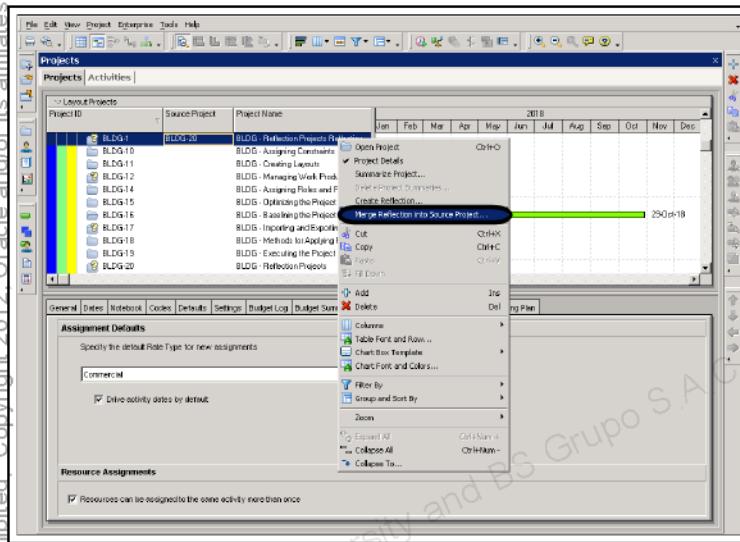


Figure 20-7: Select this option on the right-click menu.

Merge reflection data into source project.

1. On the File menu, click *Close All* to close the project.
2. Confirm you are in the Projects window. (Or, on the Enterprise menu, click *Projects*).
3. In the Projects Table, select the reflection project, *BLDG-1 - Reflection Projects Reflection*.
4. Right-click, and then click *Merge Reflection into Source Project*.

Previewing Changes

The Preview Changes dialog box enables you to view changes made in the reflection project prior to merging them into the source project. For each grouping, values before merging and values after merging are displayed. You can group the page by:

- **Subject Area** — Show all changes made to the project by subject. In the sample below, subject areas for Activities and Activity Resource Assignments are listed.
- **Activity** — Show all changes made to an activity under an activity band. When grouped by activity, a *Merge* column is displayed for each band. Select the *Merge* check box to merge all changes for the activity; clear the check box to not merge changes for the activity. Or, you can mark:
 - **Select All** — Select all Merge check boxes.
 - **Clear All** — Clear all Merge check boxes.

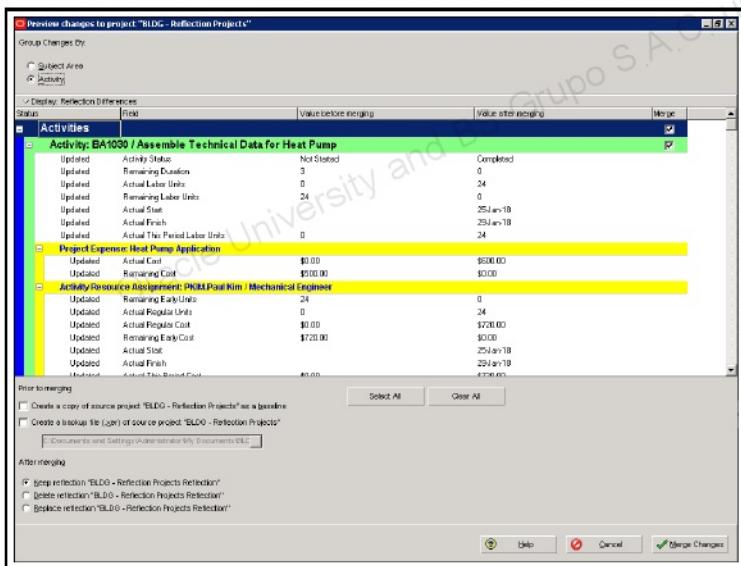


Figure 20-8: The Preview Changes dialog box.

View grouping options in Preview Changes dialog box.

1. In the *Group Changes by* field, select *Subject Area*.
2. In the *Group Changes by* field, select *Activity*.

You also have options that can be applied to the source project prior to merging, and to the reflection project after merging.

Prior to merging:

- Create a copy of source project as a baseline**— Select this check box to create a baseline from the source project that you can use to roll back the changes you made after merging the projects.
- Create a backup file (.xer) of source project**— Select this check box to create a .XER file that you can use to rollback the changes you made after merging via an XER import.

After merging:

- Keep reflection**— Keep the reflection project in the database after merging it with source project.
- Delete reflection**— Delete the reflection after merging it with the source project.
- Replace reflection**— Replace the reflection with an updated reflection based on the current data in the source project after the merge.

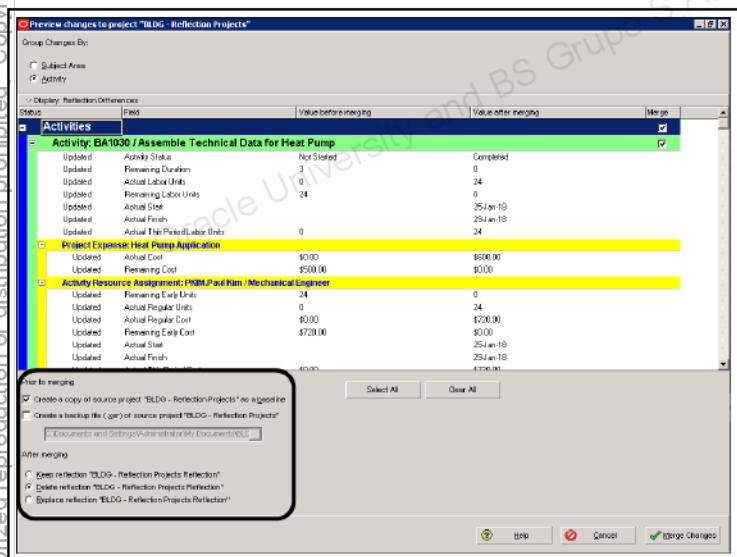


Figure 20-9: Select options before merging.

Select merging options.

1. Select the *Create a copy of source project BLDG – Reflection Projects as baseline* check box.
2. Select *Delete "BLDG – Reflection Projects Reflection"*.

Merging Reflection into Source Project

After reviewing changes, confirm that the *Merge* check boxes are selected and then click *Merge Changes*. Note that merging will not remove items from the source project that have been deleted from the reflection. If major elements of a project have been deleted from the reflection, you will have to manually delete them from the source project if you do not want to keep the elements in the source project.

Elements that are not deleted during a merge include activities, resource assignments, WBS elements, work products and documents, expenses, issues, and risks.

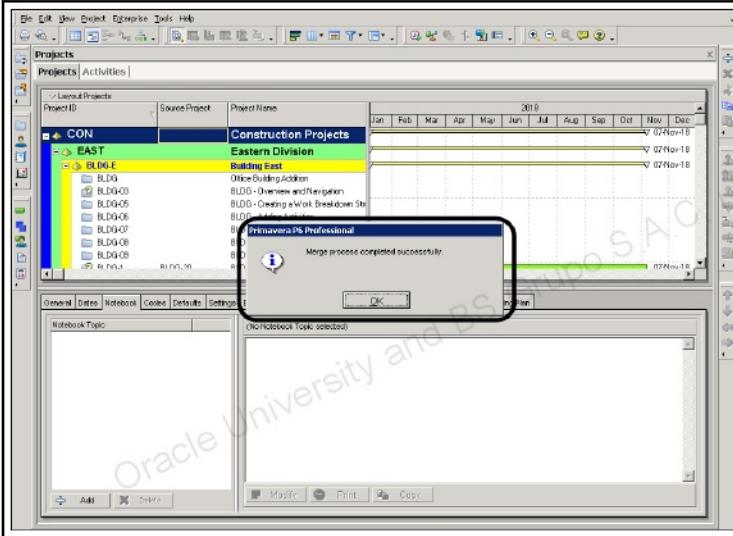


Figure 20-10: Click *OK* to complete the merge.

merge reflection into source project.

1. Click *Merge Changes*.
2. Click *OK* when prompted.

Viewing Updated Source Project

After merging, open the source project and confirm changes. Activities updated in the reflection are updated in the source project. You will reschedule the source project.

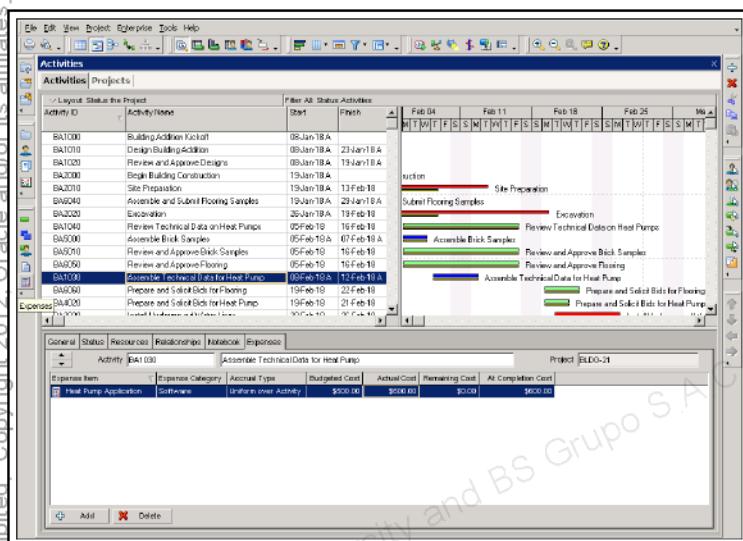


Figure 20-11: The activities in the Activity Table reflect the updates to activity **BA5000** and **BA1030**.

Reschedule the source project.

1. Open a project, *BLDG-20 – BLDG - Reflection Projects*.
2. Confirm you are in the Activities window. (Or, on the Project menu, click *Activities*.)
3. Confirm the opened layout, *Status the Project*.
4. View activities that were updated in the reflection project:
 - a. Select activity *BA5000 – Assemble Brick Samples*, and then view the updates.
 - b. Select activity *BA1030 – Assemble Technical Data for Heat Pump*, and then view the updates.
5. On the Tools menu, click *Schedule*.
6. In the *Current Data Datefield*, confirm *05-Feb-18*.
7. Click *Schedule*.
8. On the File menu, click *Close All*.

Lesson Review

Key Concepts

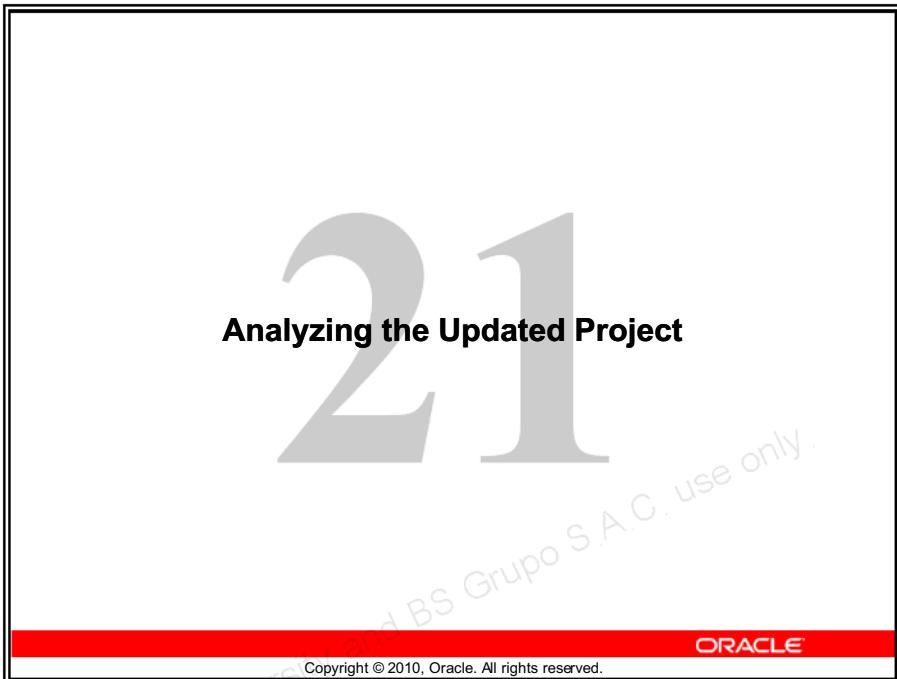
- A reflection is a copy of a project that enhances your ability to conduct what-if analysis and have team members or other users update status of activities.
- Use the reflection project to test different project scenarios and then merge selected changes back into the source project. Or, you can designate other individuals to update the project and then review their work before merging the changes into the source project.
- The Preview Changes dialog box enables you to view changes made in the reflection project prior to merging them into the source project. For each grouping, values before merging and values after merging are displayed.

Review Questions

1. **True or False:** Baselines cannot be copied into the reflection project.
2. Which of the following is not an option after merging the reflection project into the source project?
 - a. Export reflection
 - b. Keep reflection
 - c. Delete reflection
 - d. Replace reflection
3. **True or False:** Merging will not remove items from the source project that have been deleted in the reflection.

Notes





Lesson 21 – Analyzing the Updated Project

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	10	20	5	45

Objectives

After completing this lesson, you should be able to:

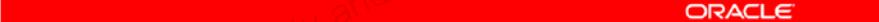
- Analyze schedule dates, resource availability/allocation, and project costs.
- Identify areas where the project is falling behind schedule or exceeding planned costs.
- Make changes necessary to address variances.
- Understand the importance of analyzing a project after every status update.

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Steps for Analyzing the Updated Project

1. Perform a baseline analysis.
 - Compare current plan to baseline plan to analyze variances.
 - Compare calculated Finish and Must Finish By dates.
2. Make changes to restore important schedule milestones.
 - Focus on critical activities.
3. Perform a resource usage analysis.
 - Identify availability or allocation issues.
 - Adjust resource assignments to resolve issues.
4. Perform cost analysis.
 - Compare Total Cost to the Original Budget.

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Questions to Determine How to Adjust a Schedule

- Can the Finish date of the project slip?
- Can the scope of the activity/project decrease?
- Were the planned hours over- or under-estimated?
- Can any relationships be changed?
- Can additional resources be assigned?
- Can resources work overtime?

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Shortening the Project

- Focus on critical activities.
- Refine duration estimates.
 - Break down long activities.
 - Assign additional resources to reduce duration.
- Use relationships to overlap activities.
- Apply/modify constraints.
- Change calendar assignments.
 - Put critical activities on a longer workweek.
 - Add exceptions to non-work time.

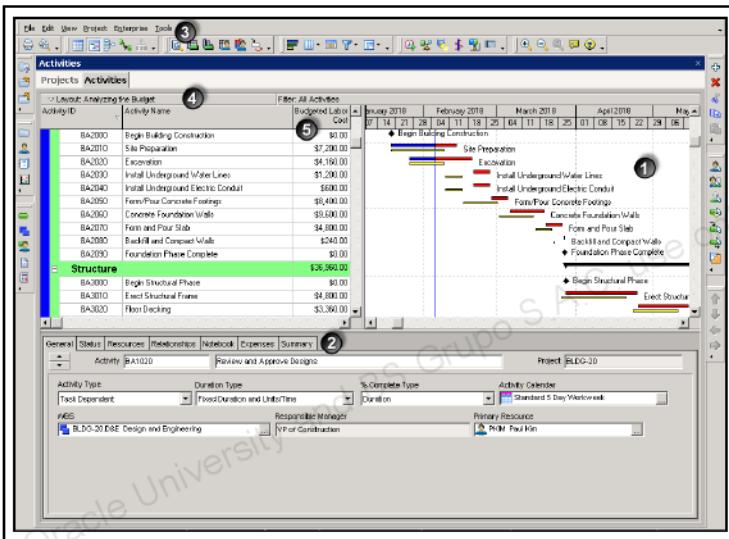
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Overview: Analyzing the Updated Project

Analyzing the project plan for schedule dates, resource usage, and costs is part of the status updating process and should be done every time the project is updated. Once the updated project has been analyzed, take the necessary steps to ensure that it finishes before its Must Finish By date, that no resources are overallocated, and that its costs remain within budget.



- 1 Compare current project bars and initial project baseline bars in the Gantt chart for a visual indication of whether the project is on schedule.
- 2 Use the Status, Resources, and Relationships tabs in Activity Details to make changes to the project schedule and ensure that it meets important project dates.
- 3 On the Tools menu, click *Schedule* to reschedule the project after making changes.
- 4 On the Layout Options bar, click *Show on Bottom, Resource Usage Profile* to check allocation of project resources.
- 5 Use Activity Table columns displaying different cost categories to analyze project costs.

Practice: Analyzing the Updated Project

In this practice you will:

- Analyze the schedule and make changes to enable the project to meet its Must Finish By date.
- Analyze resource usage and cost in the updated project.

Analyzing the Updated Project

The *Building Addition* project has been updated through 05-Feb-18 and rescheduled. A quick comparison of the calculated Finish and Must Finish By dates at the time of rescheduling disclosed that the project is behind schedule. In this practice, you will take a closer look at the project and devise corrective actions to put it back on schedule.

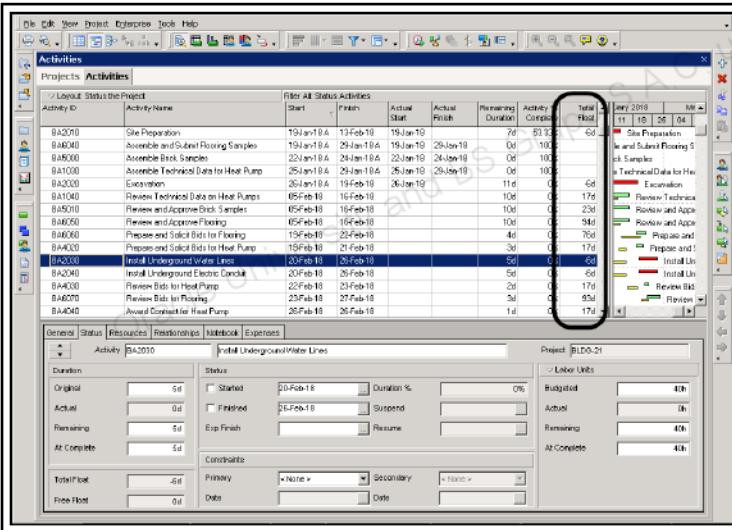


Figure 21-1: Drag the vertical split bar to the right to expose the *Total Float* column and check the *Total Float* of critical activities.

Open a project and layout.

- Open a project, *BLDG-21 BLDG – Analyzing the Updated Project*.
- In the Activities window, open a layout, *Status the Project*
- Click the *Start* column to sort by Start date.

? How far behind schedule is the project?

In the Gantt chart, compare the current project bars to the initial plan baseline bars to see which activity was first delayed and the impact of that delay on successor activities. Filter the Gantt chart to focus on critical activities.

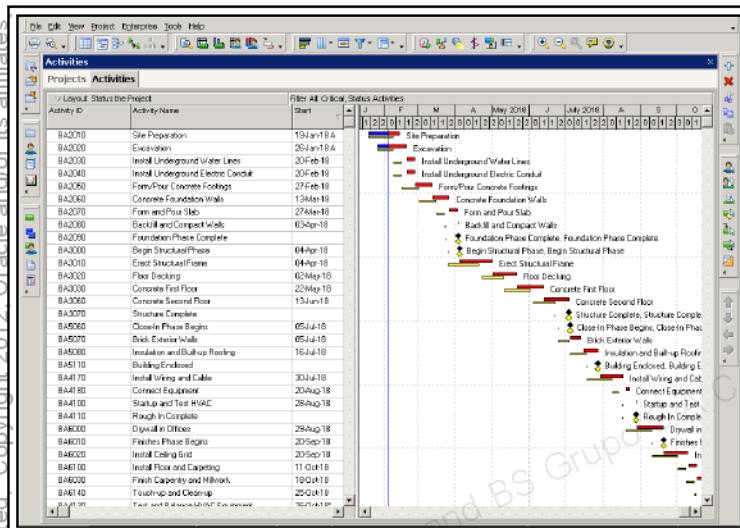


Figure 21-2: Compare current bars against the initial plan baseline bars in the Gantt chart.

Filter for critical activities and compare current and baseline activity bars.

1. On the Layout Options bar, click *Show on Bottom, No Bottom Layout*.
2. On the Layout Options bar, click *Filters*.
3. Select the *Critical*/check box, and then click *OK*.
4. In the Gantt chart, review the critical activities.

Note that by comparison to their baseline bars, all of the project's critical activities are now behind schedule.

? Which project activity was first delayed?

Shortening the Schedule

The project is six days behind schedule due to a snowstorm and extra repair work that caused activity *BA2020* to be suspended.

You will now work on putting the project back on track by increasing resources on critical activity *BA2050* to shorten that activity's duration.

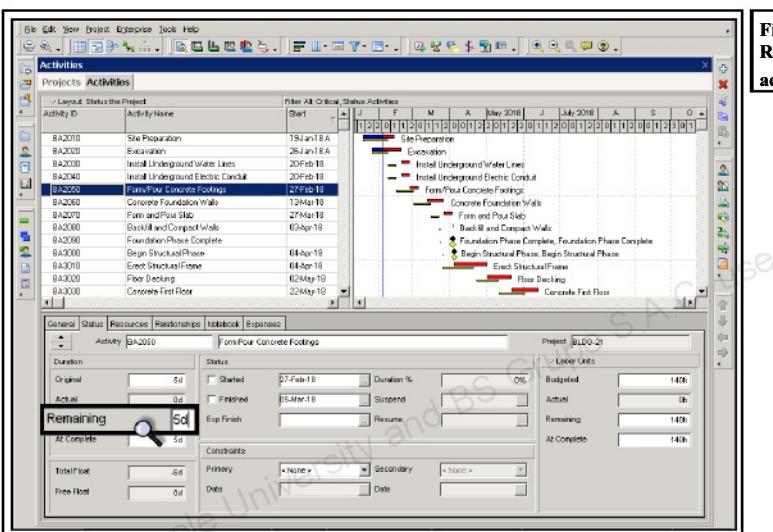


Figure 21-3: Type a new Remaining Duration for activity BA2050.

Increase resources on an activity and reschedule the project.

1. In the Activity Table, select an activity, *BA2050 – Form/Pour Concrete Footings*.
 2. On the Layout Options bar, click *Show on Bottom, Activity Details*.
 3. Click the Resources tab and view Budgeted Units for each resource.
- Note that Budgeted Units are 40 hours for Go Concrete and 80 hours for each of the other resources.
4. Click the Status tab.
 5. In the *Remaining*(duration) field, type <5> and press *Enter* on your keyboard.

Resource Name	Budgeted Units	Actual Regular Units	Remaining Units	Remaining Units/Time	At Completion Units	Budgeted Cost	Actual Cost
Go Concrete	40h	20h	20h	20h/d	40h	\$1,200.00	\$0.00
Ironworker	80h	0h	80h	16h/d	80h	\$2,400.00	\$0.00
Operating Engineer	80h	0h	80h	16h/d	80h	\$2,400.00	\$0.00
Rough Carpenter	80h	0h	80h	16h/d	80h	\$2,400.00	\$0.00

Figure 21-4: Doubling the Remaining Units/Time for each resource restores its original Budgeted Units.

- Click the Resources tab.

Note that Budgeted Units for each resource have been reduced by half due to the change in the activity's remaining duration. You will double the Remaining Units/Time for each resource in order to restore each resource's original Budgeted Units.

- Type new values into the Remaining Units/Time column as specified in the table below:

Resource	Remaining Units/Time
Go Concrete	8 h/d
Ironworker	16 h/d
Operating Engineer	16 h/d
Rough Carpenter	16 h/d

- On the Tools menu, click *Schedule*.
- Leave the Current Data Date unchanged and click *Schedule*.

? *Is the project still behind schedule?*

You still need to reduce project duration by 1 day to meet the Must Finish By date. You will do that by reducing the lag on a relationship between two activities.

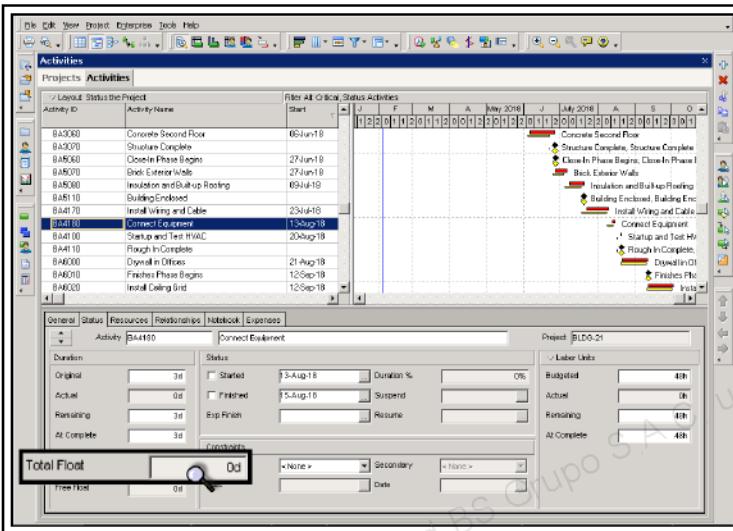


Figure 21-5: After rescheduling the project, Total Float is zero days.

Adjust lag on a relationship and reschedule the project.

1. In the Activity Table, select an activity, *BA4180 – Connect Equipment*.
2. In Activity Details, click the Relationships tab.
3. In the Successors pane, in the *Lag* field for activity BA4100, type **<2>**, and then press *Enter* on your keyboard.
4. On the Tools menu, click *Schedule*.
5. In the Schedule dialog box, leave the Current Data Date unchanged and click *Schedule*.

? Is the project still behind schedule?

Analyzing Resources

Now that the project is back on track to meet its Must Finish By date, use the Resource Usage Profile to ensure that schedule changes have not caused any resource allocation conflicts.

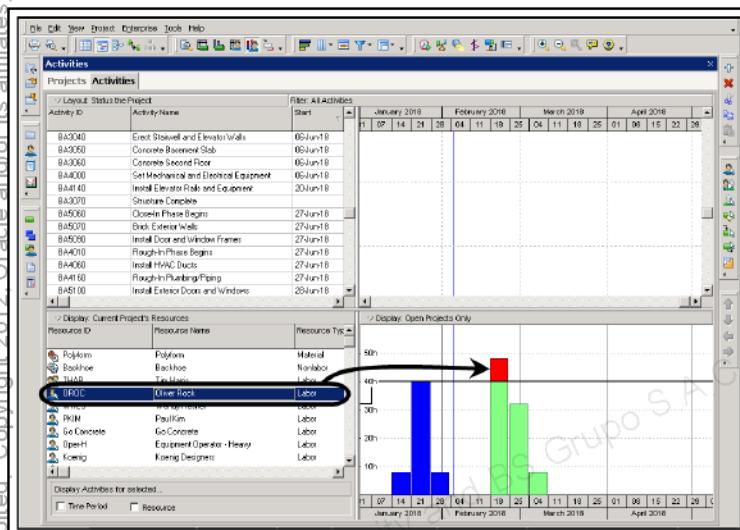


Figure 21-6: The Resource Usage Profile indicates resource overallocation.

Use the Resource Usage Profile to check project resources for overallocation.

1. On the Layout Options bar, click *Filters*.
2. In the Filters dialog box, select the *All Activities* check box, and then click *OK*.
3. On the Layout Options bar, click *Show on Bottom Resource Usage Profile*.
4. On the Resource Usage Profile's left Display Options bar, click *Filter By, Current Project's Resources*.
5. On the right Display Options bar, click *Show All Projects* to remove the check mark and show *Open Projects Only*.
6. In the left pane of the Resource Usage Profile, select each of the current project's resources while checking the graph in the right pane for red overallocation bars.

! Are any of the current project's resources overallocated?

! Which activities are causing the overallocation?

Resolving Overallocation

The Resource Usage Profile indicates that Oliver Rock is overallocated during the week of February 18. To resolve the overallocation, you will replace Oliver Rock with Paul Kim on activity BA6070.

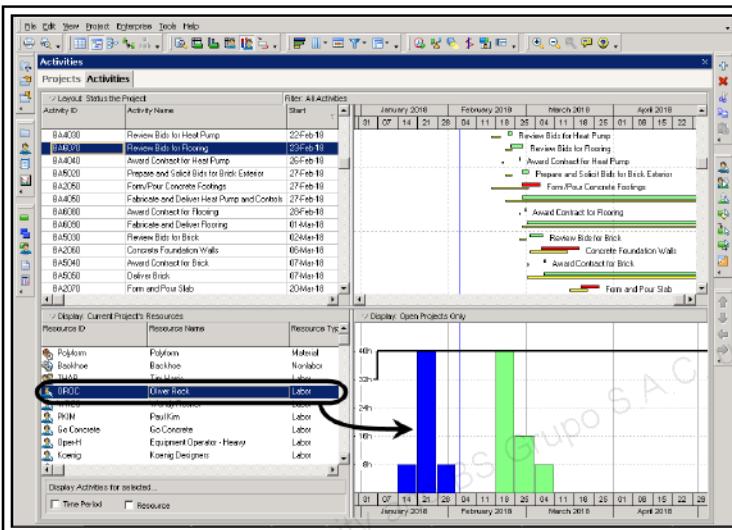


Figure 21-7: Resource overallocation has been resolved.

Replace a resource on an activity.

1. In the Activity Table, select an activity, *BA6070*.
2. On the Layout Options bar, click *Show on Bottom, Activity Details*.
3. On the Resources tab, click *Add Resource*.
4. In the Assign Resources dialog box, select a resource, *Oliver Rock*, and click .
5. In the Replace selected resource(s) with dialog box, select a resource, *Paul Kim*.
6. Click  to assign Paul Kim, and then click  to close the Assign Resources dialog box.
7. On the File menu, click Refresh Data (or press *F5* on your keyboard).
8. On the Layout Options bar, click *Show on Bottom, Resource Usage Profile*.

? Are any project resources still overallocated?

Analyzing Costs

Finally, check costs to ensure that changes to the project plan have not caused the project to exceed its original budget of \$275,000.

The screenshot shows the Oracle Project Management software interface. The main window displays the 'Activities' table for the project 'BLDG - Analyzing the Updated Project'. The table includes columns for Activity ID, Activity Name, Budgeted Labor Cost, Budgeted Material Cost, and Budgeted Total Cost. A large yellow box highlights the 'Budgeted Total Cost' column, which shows a total value of '\$251,116.45'. The table is organized into sections: 'Design and Engineering' and 'Foundation', each containing multiple activities. The 'Design and Engineering' section includes tasks like 'Building Addition Endoff', 'Design Building Addition', and 'Review and Approve Design'. The 'Foundation' section includes tasks like 'Begin Building Construction', 'Site Preparation', and 'Excavation'. The bottom of the table shows a summary row for the entire section.

Figure 21-8: Activity Table columns displaying different cost categories are used to analyze project costs.

View project costs in columns in the Activity Table.

1. On the Layout Options bar, click *Layout, Open*.
2. Select a layout, *Analyzing the Budget*, and click *Open*.
3. Scroll to the top of the layout and check the Budgeted Total Cost for the entire project.

? *Is the project still within its original budget?*

Lesson Review

Key Concepts

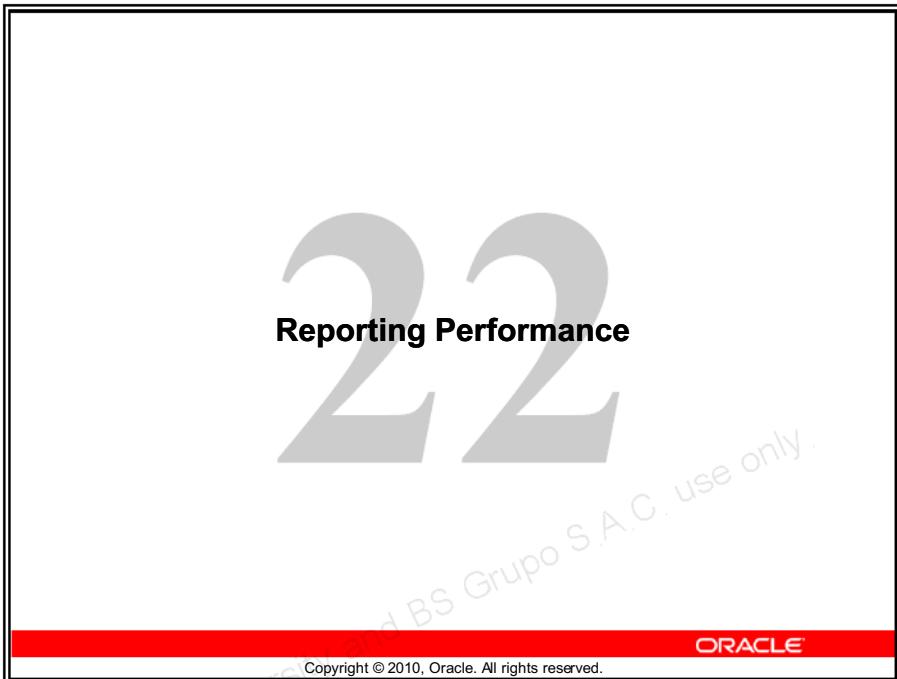
- Analyzing schedule dates, resources, and costs is part of the project status updating process and should be done every time the project is updated. Effective project management requires continual updating, analyzing, and making corrective changes to the project plan.
- If a project's calculated Finish date is later than its Must Finish By date (dates can be compared on the Dates tab in Project Details), the project can be shortened by refining duration estimates, changing relationships, adding resources, adjusting constraints, or changing calendars. Focus on critical activities.
- Use the Resource Usage Profile to ensure that project resources are not over allocated.
- View costs in Activity Table columns to ensure that the project can be completed within budget.

Review Questions

1. **True or False:** Some projects may not require an analysis following a status update.
2. When analyzing the project, on which activities should you focus?
 - a. Activities with long durations.
 - b. Activities with constraints.
 - c. Activities near the end of the project.
 - d. Activities on the critical path.
3. Which of the following is a valid way to shorten a project?
 - a. Refining duration estimates.
 - b. Using relationships to overlap activities.
 - c. Adding a Must Finish By constraint.
 - d. **a and b**
 - e. **a and b and c**
4. **True or False:** Unless new activities are added, changes to a project plan should not cause resource overallocation.

Notes





Lesson 22 – Reporting Performance

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	15	40	5	70

Objectives

After completing this lesson, you should be able to:

- Describe reporting methods.
- Run a schedule report.
- Create a resource report with the Report wizard.
- Create a time distributed report.
- Create a report using the current layout.



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Methods for Reporting Performance

- Reports from layouts
- Reports from Report wizard
- Reports from Report editor

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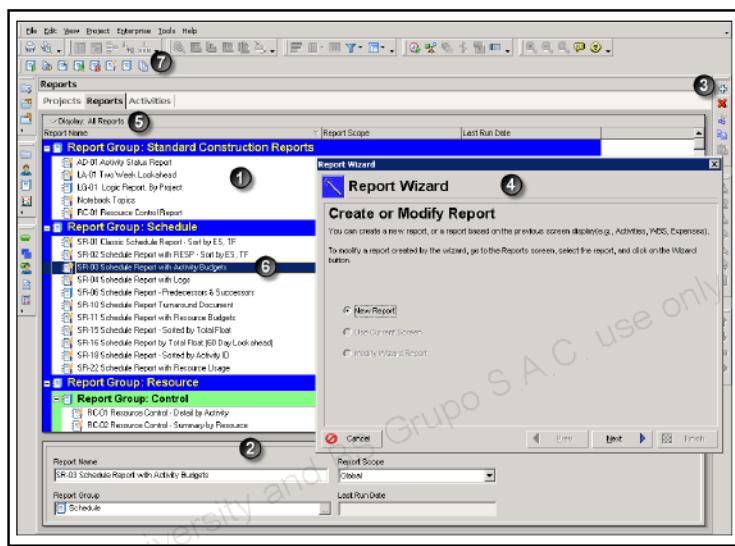
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Notes



Overview: Using the Report Wizard

Most of the procedures relating to reports are performed in the Reports window. This is where you create, edit, run, and store reports. On the Tools menu, click *Reports* to access the Reports window.



- ① The Reports window displays the reports available for an open project or for all projects.
- ② Use Report Details to name reports, assign them to report groups, and specify their scope (whether they are global or project-specific).
- ③ Click to launch the Report wizard. You can also select *Report Wizard* on the Tools menu.
- ④ The Report wizard provides tools for creating new reports from scratch or by using an existing layout as a template. It also enables you to modify existing reports.
- ⑤ Click the Display Options bar to sort and filter reports and to define fonts/colors in the Reports list.
- ⑥ Right-click and select *Modify* to run the Report editor.
- ⑦ Use the Reports toolbar options to organize, edit, and run reports.

Practice: Using the Report Wizard

In this practice you will:

- Run an existing report.
- Create a report using the Report wizard.
- Create a time distributed report.
- Create a report using the current activity layout.

Running an Existing Report

You can report schedule performance using a pre-defined schedule report. The  icon indicates that a report was created via the Report wizard.

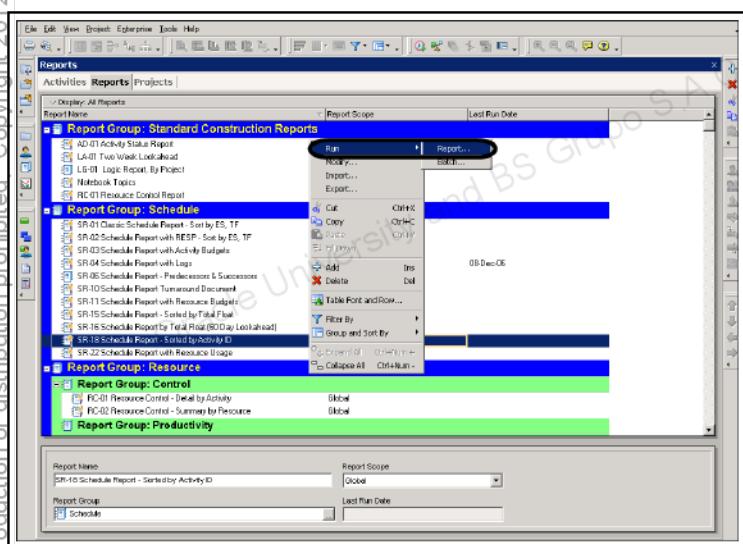


Figure 22-1: Right-click on a report, and then click *Run, Report*

Run an existing report.

1. Open a project, *BLDG-22 BLDG - Reporting*.
2. On the Tools menu, click *Reports, Reports*.
3. In the *Report Group:Schedule* grouping band, select *SR-18 Schedule Report-Sorted by Activity ID*.
4. Right-click the report and select *Run, Report*.

Run Report Dialog Box

Use the Run Report dialog box to compile and print the selected report.

- **Print Preview** –Preview the report before printing it.
- **Directly to Printer** –Compile and print the report.
- **E-mail Attachment** – Compile and attach the report, as an HTML file, to a new e-mail message.
- **HTML File** –Compile and save the report as an HTML file.
- **ASCII Text File** –Compile and save the report as a delimited text file (.txt).
 - ♦ **Field Delimiter** – Select the character used to separate categories of information that you save in delimited text format (i.e., comma, tab, space).
 - ♦ **Text Qualifier** – Select the character used to separate categories of data that you save in delimited text format (.txt) if the data contains the field delimiter you specify, such as quote marks ("").
- **Output file** – If you choose HTML File or ASCII Text File, click to specify the file name and location where you want to save the report.
- **Store report in Work Products and Documents for this project** –Create a work product and document record for the report. If the output file is saved in an accessible network location, users can launch the report in P6.
- **Notes** – Use to add a comment to the report. Comment appears directly under the report title

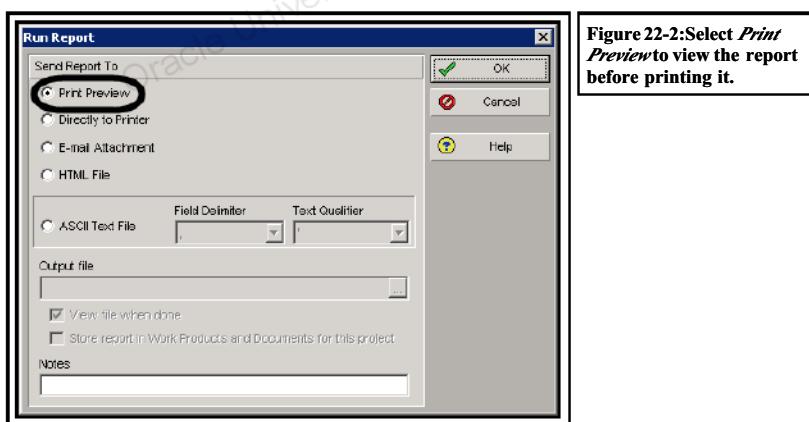


Figure 22-2:Select *Print Preview* to view the report before printing it.

View options in the Run Report dialog box.

1. In the Run Report dialog box, confirm that *Print Preview* is selected, and then click OK.

Print Preview

Print Preview allows you to modify the report layout before printing.

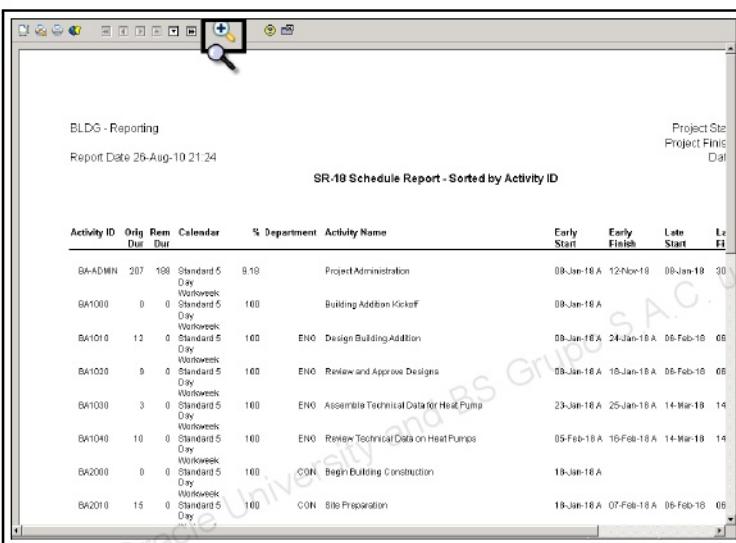
Figure 22-3: Icons in Print Preview are explained in table below.

Icon	Functionality
	Page Setup: Define report's header/footer, margins, and orientation.
	Print Setup: Select default printer, print size.
	Print the selected report.
	Publish the report in HTML format.
	Navigate in report: Previous/next page, left, right, up, down.
	Zoom in and out.
	Open Help.
	Close Print Preview.

Printing Reports

Printing reports is an effective way to communicate project information with resources and other project managers.

The report below displays the Original Duration, Remaining Duration, Percent Complete, Activity Name, Early Start, Early Finish, Late Start, Late Finish and Total Float of all the activities in the project.



Activity ID	Orig Dur	Rem Dur	Calendar	% Department	Activity Name	Early Start	Early Finish	Late Start	Late Finish	Tot Fl
BA-ADMIN	207	198	Standard 5 Day Workweek	9.19	Project Administration	09-Jan-18 A	12-Nov-18	08-Jan-18	30	
BA1000	0	0	Standard 5 Day Workweek	100	Building Addition Kickoff	09-Jan-18 A				
BA1010	12	0	Standard 5 Day Workweek	100	EN0 Design Building Addition	09-Jan-18 A	24-Jan-18 A	06-Feb-18	06	
BA1020	9	0	Standard 5 Day Workweek	100	EN0 Review and Approve Designs	09-Jan-18 A	16-Jan-18 A	06-Feb-18	06	
BA1030	3	0	Standard 5 Day Workweek	100	ENO Assemble Technical Data for Heat Pump	23-Jan-18 A	25-Jan-18 A	14-Mar-18	14	
BA1040	10	0	Standard 5 Day Workweek	100	EN0 Review Technical Data on Heat Pumps	05-Feb-18 A	10-Feb-18 A	14-Mar-18	14	
BA2000	0	0	Standard 5 Day Workweek	100	CON Begin Building Construction	19-Jan-18 A				
BA2010	15	0	Standard 5 Day Workweek	100	CON Site Preparation	18-Jan-18 A	07-Feb-18 A	06-Feb-18	06	

Figure 22-4: Click to zoom in/out when viewing reports.

Report Wizard

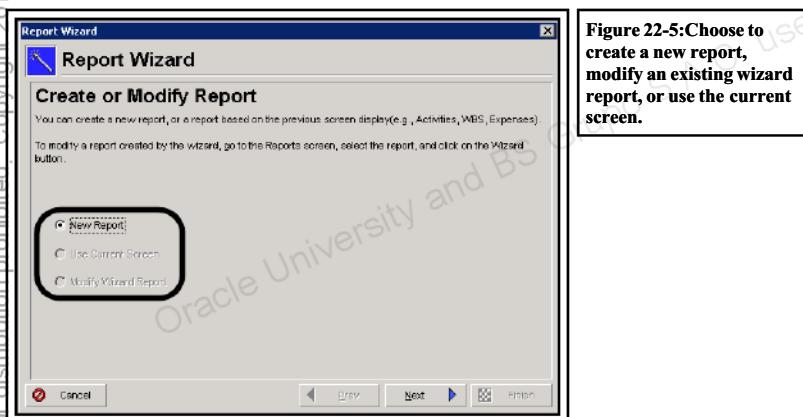
The Report wizard enables you to easily create a wide variety of reports. Modify a report as you build it, or reopen and modify it later. If you want to modify a report but also might want to reuse the original report in the future, make a copy of it first.

To create a report using the wizard:

- Select a base table and pertinent data fields.
- Organize the data via grouping, sorting, and filtering options.

Create or Modify Report

You will now use the wizard to create a report that shows resource assignments on the project and their related notebook topics.



① Create a report using the Report wizard.

1. Click to launch the Report wizard.
2. In the Report wizard, confirm that *New Report* is selected.
3. Click *Next*.

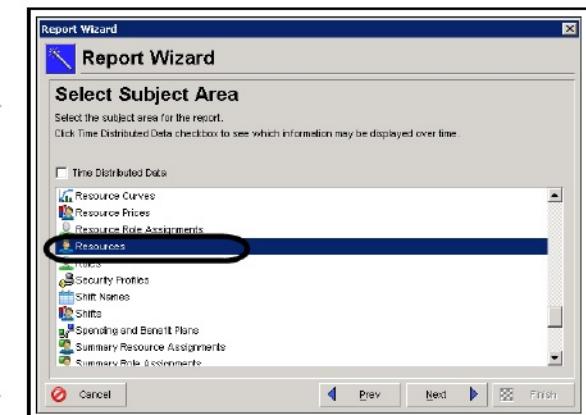


Figure 22-6:Select Resources as the primary subject area.

4. Select a subject area, *Resources*.
5. Click *Next*.

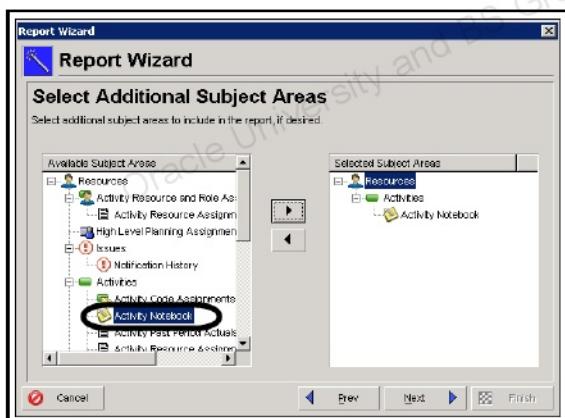


Figure 22-7: Select an additional subject area, *Activity Notebook*.

6. In the Available Subject Areas section, select an additional subject area, *Activity Notebook* (in the *Activities* grouping).
7. Click .
8. Click *Next*.

Configure Selected Subject Areas

Select the columns you would like to use in the report.

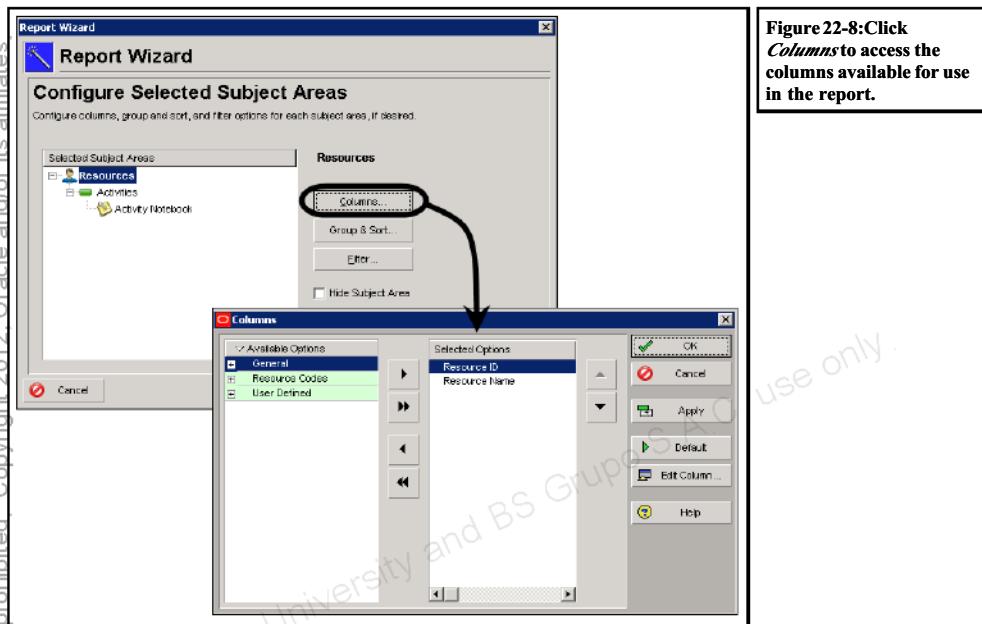
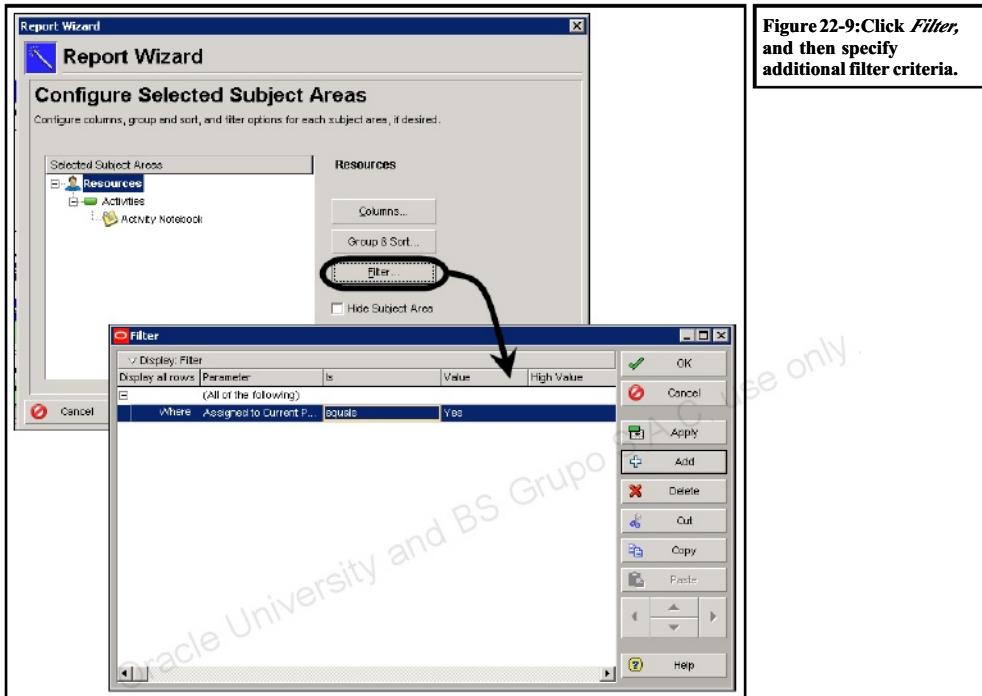


Figure 22-8: Click **Columns** to access the columns available for use in the report.

Adding a Filter to the Report

Select the filter you would like to use in the report.



Specify a filter for the report.

1. In the Report wizard, click *Filter*.
2. Double-click on *Any of the following* and select *All of the following*.
3. Click *Add* to add another line to the filter.
4. In the bottom row, double-click in the *Parameter* field and select *Assigned to Current Project*.
5. In the *Is* field, confirm *equals*.
6. Double-click in the *Value* field and select *Yes*.
7. Click *OK*.
8. Click *Next*.

Adding a Report Title



Figure 22-10: Type a report title.

Type a report title.

1. Type a descriptive report title <**Resource Activity Assignments with Notebooks**>
2. Click *Next*.

Generating the Report

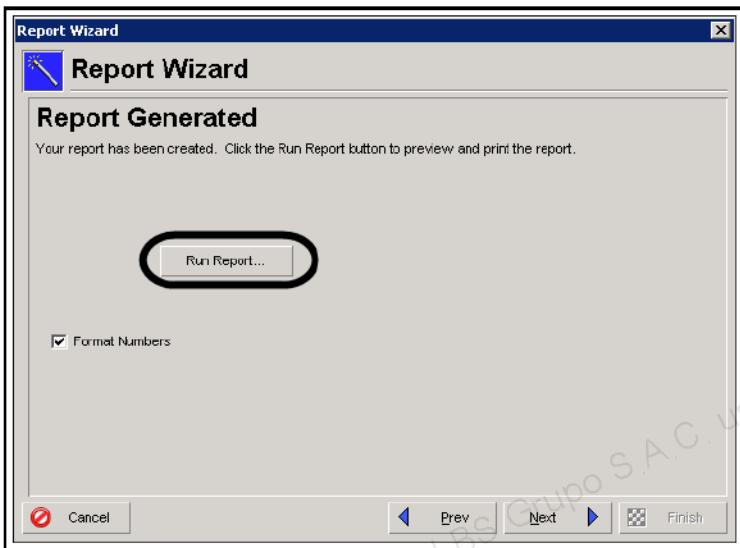


Figure 22-11: Click *Run Report*, and then confirm that *Print Preview* is selected.

Print Preview

You can preview the report before printing. To print, click .

Resource Activity Assignments with Notebooks		
Resource ID	Resource Name	
THAR	Tim Harris	
Activity ID	Activity Name	Activity Status
BAADMIN	Project Administration	In Progress
WRES	Wendy Reamer	
Activity ID	Activity Name	Activity Status
BA1040	Review Technical Data on Heat Pumps	Completed
PKIM	Paul Kim	
Activity ID	Activity Name	Activity Status
BA1020	Review and Approve Designs	Completed
BA1030	Assemble Technical Data for Heat Pumps	Completed
BA0050	Review and Approve Planning	Completed
BA1060	Final Walkthrough	Not Started
BA100	Customer Signoff	Not Started
EWOD	Ed Wood	
Activity ID	Activity Name	Activity Status
BA2010	Site Preparation	Completed
BA000	Prepare and Solicit Bids for Flooring	Not Started
JDAW	John Dawkins	
RDMN	Rose Danner	
WSMI	Wayne Smith	
Activity ID	Activity Name	Activity Status
BA010	Review and Approve Brick Samples	Completed
BA0020	Prepare and Solicit Bids for Brick Exterior	Not Started
ORDC	Oliver Rock	
Activity ID	Activity Name	Activity Status
BA0020	Prepare and Solicit Bids for Heat Pump	Not Started
BA0030	Review Bids for Heat Pump	Not Started
BA0040	Award Contract for Heat Pump	Not Started
BA0030	Review Bids for Brick	Not Started
BA0040	Award Contract for Brick	Not Started
Notebook Topic: Contract for brick must be awarded by April 2 to ensure the delivery of brick is delivered.		
Constraints and		

Figure 22-12: The report is displayed in Print Preview.

Saving a Report

After reviewing your report, you can save it and assign it to a specific report group.



Figure 22-13: Click to save the report.

Assigning Report Group and Report Scope

To make locating a report easier, assign it to a report group. A report can be assigned to only one report group. You can also assign a report scope of *Global* or *Current Project*. You can run Global reports for any project and you can run Current Project reports for the open project only.

The new report you just created is a resource report, so you will assign it to the Resource-Loading report group.

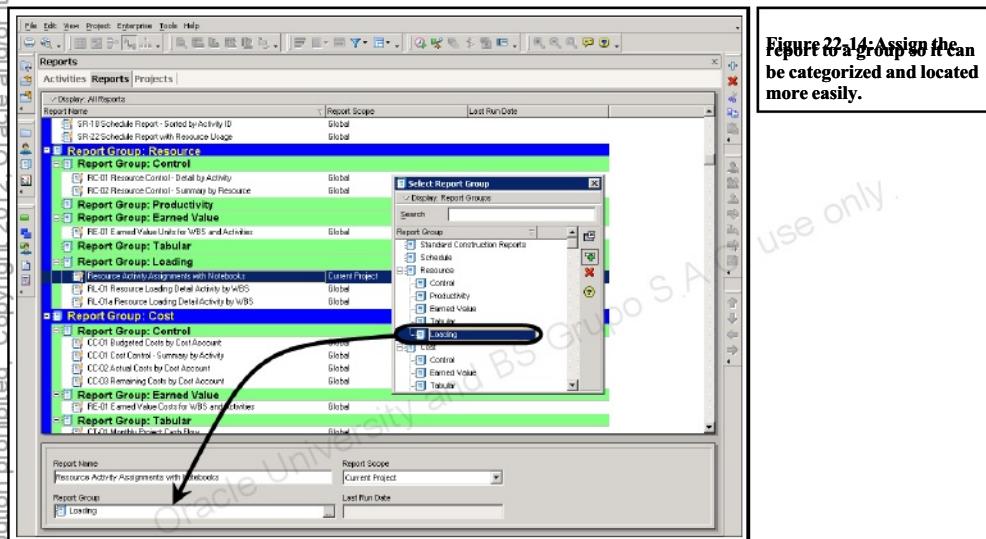


Figure 22-14: Assign the report group so it can be categorized and located more easily.

Assign a report to a report group.

1. In the Reports List, select the new report, *Resource Activity Assignments with Notebooks*.
2. In the *Report Group* field in Report Details (bottom of screen), click
3. Select *Resource, Loading*, and then click
4. In the Report Table, locate the newly created report in the report group, *Resource, Loading*, and confirm that it is still selected.
5. In the *Report Scope* list in Report Details, select *Current Project*.

Creating a Time-Distributed Report

A time-distributed report enables you to create reports that display time-phased unit or cost data.

In the following example, your organization requires that you report project-related expenses on a quarterly basis. Below you will create a report that lists expense costs – actual, budgeted, and remaining – in the *BLDG-22* project for the first quarter of 2018.

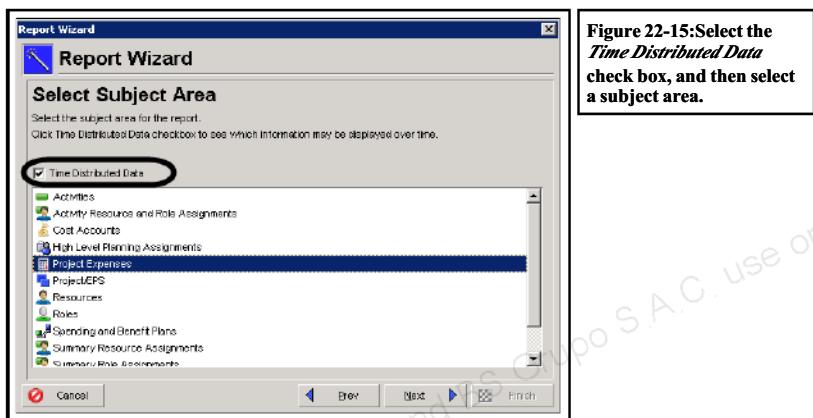
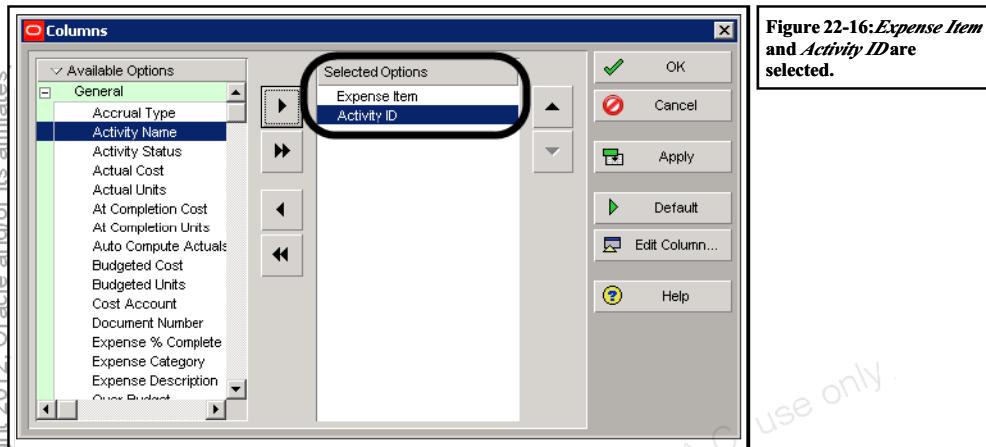


Figure 22-15:Select the *Time Distributed Data* check box, and then select a subject area.

Use the Report wizard to create a time-distributed report.

1. Click .
2. Confirm that the option, *New Report*, is selected.
3. Click *Next*.
4. Select the *Time Distributed Data* check box.
5. Select a subject area, *Project Expenses*.
6. Click *Next*.

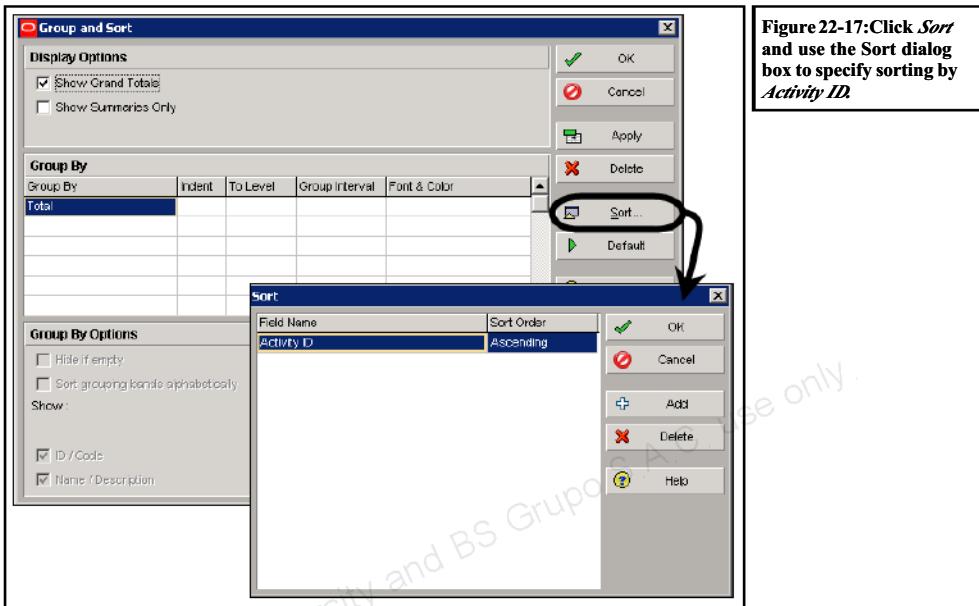
Next, select the columns for the report.



Select columns for a report.

1. Click *Columns*.
2. Click to remove all data items from the Selected Options section except for *Expense Item*.
3. In the Available Options section, select *Activity ID* and click to move it to the Selected Options section.
4. Click *OK*.

Next, select parameters for grouping and sorting in the report.

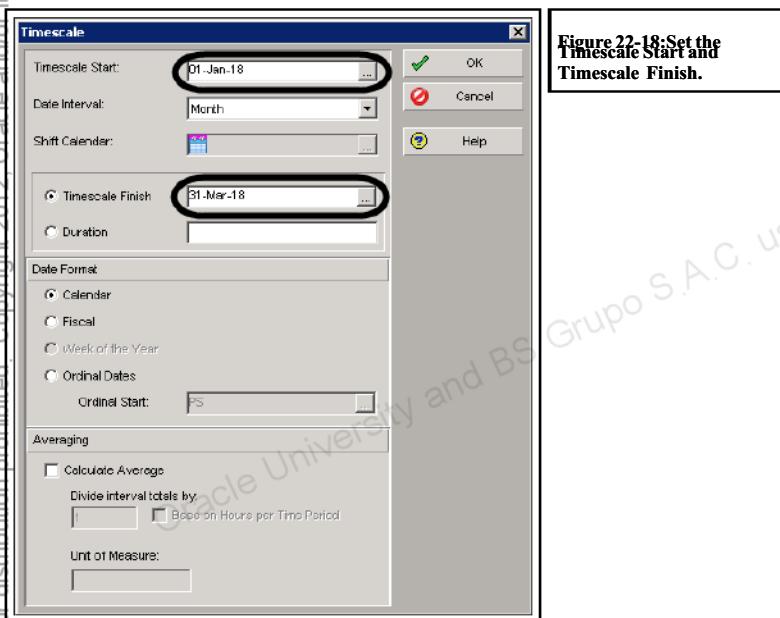


Set grouping and sorting parameters.

1. In the Report wizard, click *Group and Sort*.
2. Select the *Show Grand Totals* check box to include a grand total row in the report.
3. In the *Group By* column, confirm *Total*.
4. Click *Sort*.
5. Click in the *Field Name* list, and then select *Activity ID*.
6. Click *OK* twice to exit each of the dialog boxes.
7. In the Report wizard, click *Next*.

The Timescale dialog box enables you to specify the date range for your time distributed report. Select a Timescale Start, Date Interval, and Timescale Finish. You can customize the Timescale fields by adding a + or a -. For example, PS + 1M equals Project Start plus one month.

The Duration option is used to specify a Finish date for the report. For example, if the Duration is 2 and the Date Interval is Weeks, the report will include information for a two-week period following the specified start date.



⑧ Set the timescale for a report.

1. Click *Timescale*.
2. In the *Timescale Start* field, click 
3. Click *Custom Date* and then select *01-Jan-18*.
4. In the *Timescale Finish* field, click 
5. Click *Custom Date* and then select *31-Mar-18*.
6. Click *OK*.

Next, select time interval fields.

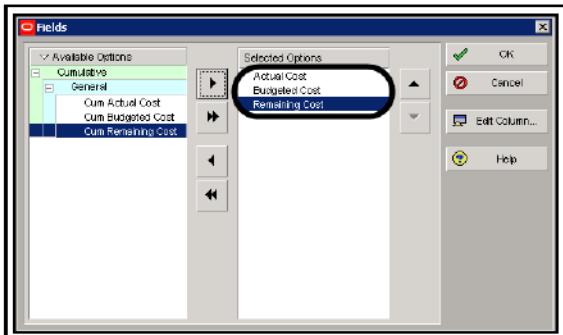


Figure 22-19:Data items in the Selected Options section.

Select time interval fields.

1. Click *Time Interval Fields*.
2. In the Available Options section, click to expand *Time Interval* and *General* grouping bands.
3. Click to move *Actual Cost*, *Budgeted Cost*, and *Remaining Cost* to the Selected Options section.
4. Click *OK*.

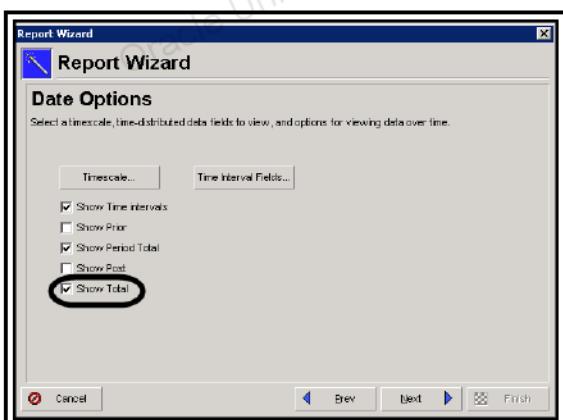


Figure 22-20:Select the Show Total/check box.

5. Select the *Show Total*/check box.
 6. Click *Next*.
-

Finally, you will title the report and view it.

Figure 22-21: The report, displayed in Print Preview, lists expense costs in the first quarter of 2018.

 Type a title and view the report.

1. Type a title <**First Quarter Expenses**>.
 2. Click *Next*.
 3. Click *Run Report*.
 4. Confirm that *Print Preview* is selected, and then click *OK*.
 5. After viewing the report, click  to close Print Preview.
 6. Click *Next*.
 7. Click *Save Report*.
 8. When prompted, click *OK*.
 9. Click *Finish*.

Creating a Report Using the Current Layout

The Report wizard can also be used to create reports based on a currently displayed layout. Reports can be modified as they are built through the wizard.

Activity ID	Activity Name	Budgeted Cost	Actual Total Cost	Remaining Total Cost
B4-02000	BLDG - Reporting	\$50,000.00	\$48,200.00	\$1,800.00
B4-02010	Project Administration	\$9,000.00	\$9,400.00	\$410.00
B4-02020	Design and Engineering	\$29,100.00	\$21,500.00	\$7,600.00
B4-02030	Architectural Drawings	\$4,400.00	\$3,100.00	\$1,300.00
B4-02040	Review and Approve Targets	\$2,300.00	\$1,100.00	\$800.00
B4-02050	Assemble Technical Data for Heat Pump	\$1,200.00	\$1,200.00	\$0.00
B4-02060	Review Technical Data on Heat Pump	\$7,300.00	\$5,500.00	\$8,800.00
B4-02070	Building Addition Plan	\$0.00	\$0.00	\$0.00
B4-02080	Foundation	\$64,200.00	\$11,720.00	\$52,480.00
B4-02090	Site Preparation	\$7,200.00	\$7,200.00	\$0.00
B4-02100	Excavation	\$4,160.00	\$4,160.00	\$0.00
B4-02110	Install Underground Water Lines	\$1,200.00	\$1,200.00	\$0.00
B4-02120	Install Underground Electric Conduit	\$600.00	\$120.00	\$480.00
B4-02130	Pour/Pour Concrete Footings	\$9,300.00	\$9,300.00	\$0.00
B4-02140	Concrete Foundation Walls	\$20,400.00	\$8,000.00	\$12,400.00
B4-02150	Form and Pour Slab	\$5,200.00	\$5,200.00	\$0.00
B4-02160	Backfill and Compact Walls	\$6,240.00	\$6,240.00	\$0.00
B4-02170	Foundation Phase Complete	\$0.00	\$0.00	\$0.00
B4-02180	Begin Building Construction	\$0.00	\$0.00	\$0.00
B4-02190	Structure	\$43,900.00	\$1,000.00	\$42,900.00
B4-02200	Begin Structural Phase	\$0.00	\$0.00	\$0.00
B4-02210	Excavate Shallow Pits	\$6,400.00	\$6,400.00	\$6,400.00
B4-02220	Form Decking	\$4,400.00	\$4,400.00	\$4,400.00
B4-02230	Concrete First Floor	\$8,400.00	\$8,400.00	\$0.00
B4-02240	Excavate Shallow and Elevate Walls	\$2,400.00	\$2,400.00	\$2,400.00
B4-02250	Concrete Basement Slab	\$13,800.00	\$13,600.00	\$2,200.00
B4-02260	Concrete Second Floor	\$8,400.00	\$8,400.00	\$0.00
B4-02270	Structure Complete	\$0.00	\$0.00	\$0.00
B4-02280	Mechanical/Electrical Systems	\$42,964.00	\$0.00	\$42,964.00
B4-02290	Set Mechanical and Electrical Equipment	\$3,800.00	\$0.00	\$3,800.00

Figure 22-22: The layout name is indicated in the Layout Options bar.

>Create a report using the current layout as a template.

1. Click the Activities tab at the top of the screen.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Budgeted and Actual Costs*, and then click *Open*.



Figure 22-23:Select *Use Current Screen* in the Report wizard.

Run the Report wizard from the Activities window.

1. On the Tools menu, click *Report Wizard*.
2. Select *Use Current Screen*
3. Click *Next* to advance through the next two screens, reviewing the data selected for each screen.
4. In the Configure Selected Subject Areas screen, click *Group & Sort*.
5. In the Group and Sort dialog box, click *Default*, and then click *OK*.
6. Click *Next*.



Figure 22-24: Type a title for the report.

Budget and Actual Costs by WBS					
WBS	Activity ID	Activity Name	Budgeted Total Cost	Actual Total Cost	Remaining Total Cost
BLDG - Reporting	BA-ADMIN	Project Administration	\$8,315.00	\$855.00	\$8,480.00
	Design and Engineering				
	BA1010	Building Action Review	\$0.00	\$0.00	\$0.00
	BA1010	Design Building Addition	\$8,498.00	\$8,498.00	\$0.00
	BA1010	Review and Approve Design	\$2,110.00	\$2,110.00	\$0.00
	BA1010	Assembly Technical Data for Heat Pump	\$1,210.00	\$1,220.00	\$0.00
	BA1010	Review Technical Data on Heat Pumps	\$7,242.00	\$8,610.00	\$0.00
	Subtotal		\$20,710.00	\$21,204.00	\$0.00
Foundation	BA2010	Begin Building Construction	\$0.00	\$0.00	\$0.00
	BA2010	Site Preparation	\$7,210.00	\$7,000.00	\$0.00
	BA2010	Excavation	\$4,160.00	\$4,160.00	\$0.00
	BA2010	Install Underground Water Line	\$1,210.00	\$1,240.00	\$0.00
	BA2010	Install Underground Burner Casing	\$0.00	\$10.00	\$0.00
	BA2010	Form/Floor Concrete Footings	\$8,210.00	\$8,200.00	\$0.00
	BA2010	Concrete Foundation Walls	\$20,400.00	\$20,400.00	\$0.00
	BA2010	Form and Pour Slab	\$5,210.00	\$5,200.00	\$0.00
	BA2010	Brickwork and Concrete Walk	\$8,240.00	\$8,240.00	\$0.00
	BA2010	Foundation Piers Complete	\$0.00	\$0.00	\$0.00
	Subtotal		\$84,210.00	\$11,720.00	\$0.00
Structure					
	© Oracle Corporation		Page 1 of 8		

Figure 22-25: The report is based on the current layout.

View and save a report.

1. Confirm that *Print Preview* is selected.
2. Click *OK*.
3. After viewing the report, click to close Print Preview.
4. In the wizard, click *Next*.
5. Click *Save Report*, and then click *OK*.
6. Click *Finish*.

Creating Batch Reports

Batch Reports enables you to run a series of global or project reports at one time. When creating a batch report, choose the type of batch report to create:

- **Global** – Create a batch of global reports.
- **Project** – Create a batch of project reports. This option is only available if projects are open.

After defining the batch report, assign global or project reports to the batch report.

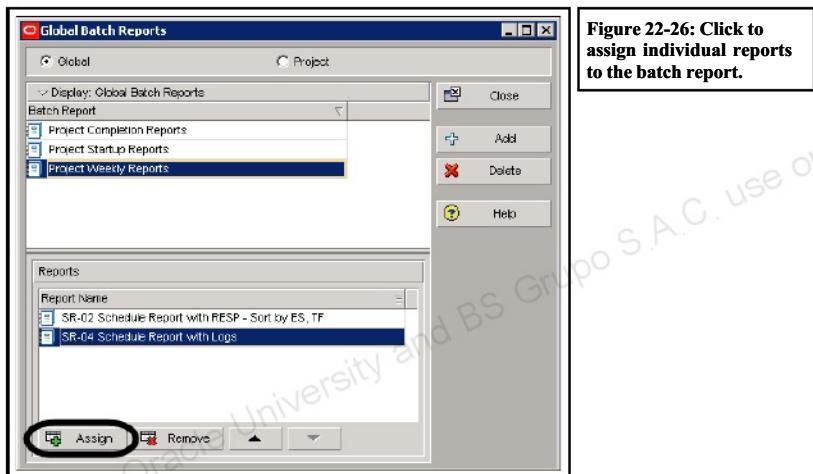


Figure 22-26: Click to assign individual reports to the batch report.

>Create a report batch.

1. On the Tools menu, click *Reports, Batch Reports*.
2. Select the batch report type, *Global*.
3. Select the batch report, *Project Weekly Reports*.
4. In the Reports section, click *Assign*.
5. Ctrl+Click and select the following reports, *SR-02 – Schedule Report with RESP – Sort by ES, TF* and *SR-04 – Schedule Report with Logs*.
6. Click .
7. Click  and then click *Close*.

Running Batch Reports

Run batch reports from the Reports window. Select the report batch you want to run, and then right-click and select *Run, Batch*.

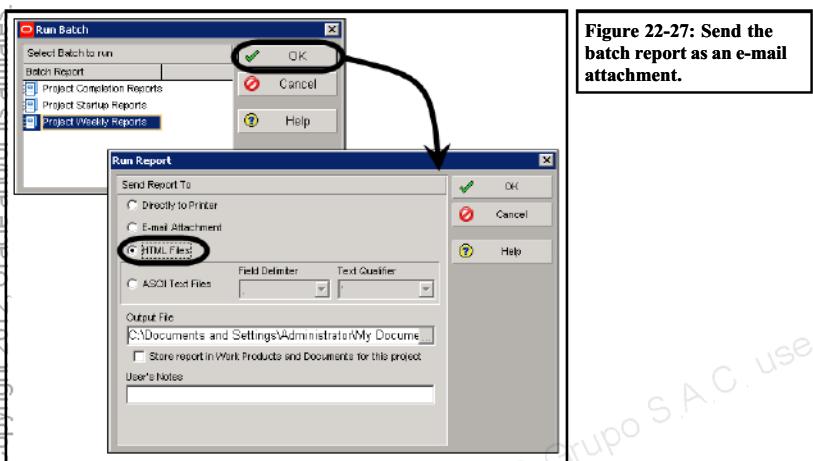


Figure 22-27: Send the batch report as an e-mail attachment.

Run a batch report.

1. Right-click in the Reports window and select *Run, Batch*.
2. In the *Batch Report* column, select *Project Weekly Reports*.
3. Click *OK*.
4. In the Run Report dialog box, select *HTML Files*.

Viewing the Report

You can view report from the batch report in an internet browser.

ID	Activity ID	Original Dur.	Calendar Dur.	%	RESP Activity Name	Early Start	Early Finish	Late Start	Late Finish	Total Float
SR-02-M01	206	189	Standard 5 Day	8.25	Project Administration	09-Jan-10 A	07-Nov-10	09-Jan-10	30-Oct-10	-6
SR-02-000	0	0	Standard 5 Day	100	Building Address Incident	09-Jan-10 A				
SR-02-010	12	0	Standard 5 Day	100	00 Review Building Address	09-Jan-10 A	23-Jan-10	26-Jan-10	26-Jan-10	
SR-02-020	9	0	Standard 5 Day	100	00 Review and Approve Design	09-Jan-10 A	19-Jan-10	26-Jan-10	26-Jan-10	
SR-02-030	0	0	Standard 5 Day	100	Wkndk	19-Jan-10 A				
SR-02-040	0	0	Standard 5 Day	100	WL Begin Building Construction	19-Jan-10 A				
SR-02-050	15	0	Standard 5 Day	100	WL Site Preparation	19-Jan-10 A	15-Feb-10 A			
SR-02-060	0	0	Standard 5 Day	100	WL Assemble and Subordn Flooring Sampled	19-Jan-10 A	20-Jan-10 A	19-Jan-10	19-Jan-10	
SR-02-070	10	11	Standard 5 Day	0	WL Enclosure	25-Jan-10 A	10-Feb-10	26-Jan-10	09-Feb-10	-6
SR-02-080	3	3	Standard 5 Day	0	JN Assemble Back Kamper	09-Feb-10	07-Feb-10	30-Feb-10	22-Feb-10	11
SR-02-090	10	10	Standard 5 Day	0	JN Review and Approve Flooring	05-Feb-10	16-Feb-10	19-Jan-10	29-Jan-10	94
SR-02-100	3	3	Standard 5 Day	0	00 Assemble Technical Data in Heat Pump	09-Feb-10	12-Feb-10	23-Feb-10	27-Feb-10	11
SR-02-110	10	10	Standard 5 Day	0	JN Review and Approve Grade Sampled	08-Feb-10	21-Feb-10	09-Mar-10	21-Mar-10	20
SR-02-120	10	10	Standard 5 Day	0	00 Review Technical Data in Heat Pump	13-Feb-10	26-Feb-10	29-Feb-10	13-Mar-10	11
SR-02-130	4	4	10th Day	0	UH Prepare and Select Bid for Fixing	19-Feb-10	22-Feb-10	02-Mar-10	05-Mar-10	76
SR-02-140	5	5	Standard 5 Day	0	WL Install Underground Water Line	20-Feb-10	26-Feb-10	12-Feb-10	19-Feb-10	-6
SR-02-150	5	5	Standard 5 Day	0	WL Install Electrical Conduit	23-Feb-10	26-Feb-10	12-Feb-10	19-Feb-10	-6
SR-02-160	2	2	Standard 5 Day	0	UH Review Model for Flooring	23-Feb-10	27-Feb-10	05-Mar-10	30-Mar-10	92
SR-02-170	10	10	Standard 5 Day	0	WL Pour/Pour Concrete Footings	27-Feb-10	10-Mar-10	19-Feb-10	02-Mar-10	-6
SR-02-180	3	3	Standard 5 Day	0	JN Prepare and Select Bid for Heat Pump	27-Feb-10	01-Mar-10	14-Mar-10	15-Mar-10	11

Figure 22-28: Click the report link to view the report.

Viewing the HTML reports.

1. Click *OK*.
2. Click the report title, *SR-02 Schedule Report with RESP – Sort by ES, TF*
3. Close the browser window.

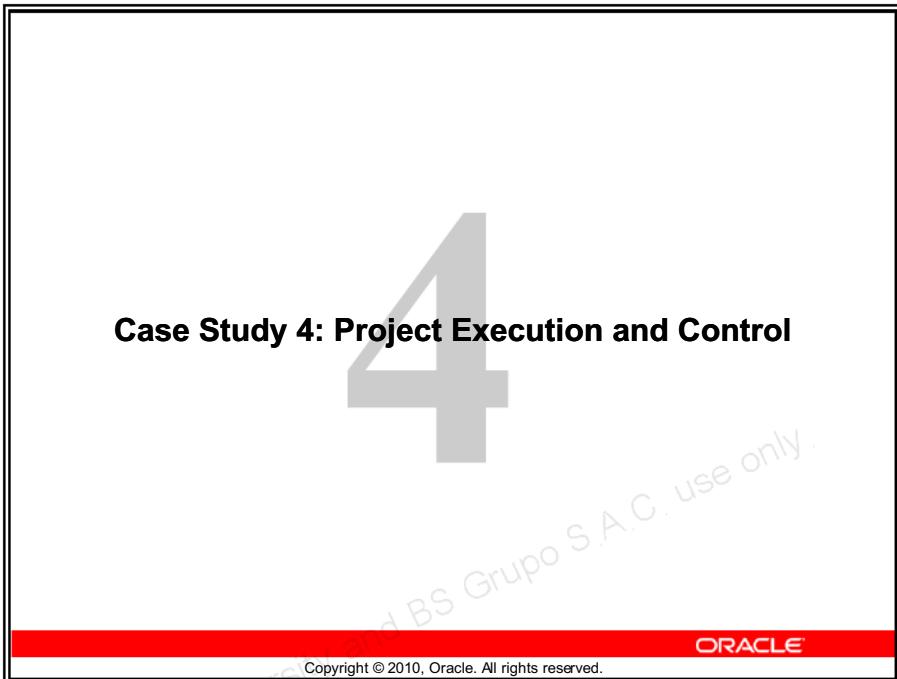
Lesson Review

Key Concepts

- The Reports window displays reports for schedule, resource, and cost.
- You can report schedule performance by choosing one of the pre-defined schedule reports listed in the Reports window.
- The Report wizard enables you to easily create a wide variety of reports. The reports can be modified as they are built, or they can be reopened and modified later. To create a wizard report:
 - ◆ Select a base table and pertinent data fields.
 - ◆ Organize the data via grouping, sorting, and filtering options.
- The Report wizard can also be used to create reports based on the layout that is currently displayed.

Review Questions

1. **True or False:** Reports can be assigned to multiple report groups.
2. Which of the following can be modified in the Report wizard?
 - a. Data items
 - b. Grouping
 - c. Filters
 - d. All of the above



Case Study 4 – Execution and Control

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
				75

Project Execution and Control

Background

The project started on 5-Mar-18 as planned and has been updated at weekly intervals to 23-Apr-18. So far, the project is progressing according to plan. In this case study, you will update the project through the next three status updating periods.

Please note: Although Actual Units are automatically calculated based on the Percent Complete of an activity, you will manually update the Actual Units of some activities below to account for changes in the project plan.

Objectives

1. Open a project, *RENO-4 RENO – Project Execution and Control*. In the Activities window, open a layout, *Classic WBS*.
2. Update the project for the status period 23-Apr-18 to 30-Apr-18.
 - a. Activate the Progress Spotlight, and confirm the status updating period, 23-Apr-18 to 30-Apr-18.
 - b. On the Status and Resources tabs in Activity Details, update or confirm activity data as specified in the following table:

Activity	Updating Actions	Actual Units
A1060	Finished on 26-Apr-18.	Bryce Manthorne: 30h Laborer-Renovation: 60h Laborer/Supervisor-Renovation: 60h
A1070	Started on 27-Apr-18. Remaining Duration = 2d.	
A1110	Finished on 24-Apr-18.	Inspector-Renovation: 5h Laborer-Renovation: 40h Laborer/Supervisor-Renovation: 40h
A1120	Started on 25-Apr-18. Remaining Duration = 12d.	
A1140	Work continued on activity. Remaining Duration = 4d.	

c. Reschedule the project with a new data date of 30-April-18.

d. Is the project still on schedule? _____

3. Next you will update the project for the status period from 30-Apr-18 to 7-May-18. During this period, it was discovered that vandals had gained access to the work site over the weekend and caused damage to several floor structures and to the hydraulic equipment being used to repair them. Work on activity *A1120* was suspended to enable an inspection by insurance adjusters and an investigation by local police. Replacement parts for the damaged hydraulic equipment were ordered through suppliers.
- Activate the Progress Spotlight, and confirm the status updating period, 30-Apr-18 to 7-May-18.
 - On the Status and Resources tabs in Activity Details, update or confirm activity data as specified in the following table:

Activity	Updating Actions	Actual Units
A1070	Finished on 1-May-18.	Backhoe: 12h Bryce Manthorne: 6h Earth Compactor: 12h
A1330	Started on 2-May-18. Remaining Duration = 1d.	
A1120	Work suspended on 30-Apr-18. Remaining Duration = 12d.	
A1140	Finished on 3-May-18.	Bryce Manthorne: 34h Carpenter-Renovation: 65h Laborer-Renovation: 135h Laborer/Supervisor-Renovation: 135h
A1170 A1180 A1190	Started on 4-May-18. Remaining Duration = 14d.	

- The vandalism to the work site must be documented. On the Notebook tab for activity *A1120*, add a Notebook topic, *Problems Encountered*, and type a description <**Work site vandalized during the weekend of April 28/29. Work on A1120 suspended on April 30. New parts ordered for hydraulic jacks.**>
- On the Expenses tab, enter a new expense for activity *A1120* as specified in the table below:

Data Field	Entry Value
Expense Item	Replacement parts for hydraulic jacks
Expense Category	Equipment
Accrual Type	Start of Activity
Budgeted Units	1.00
Price / Unit	\$8,000.00
Budgeted Cost	\$8,000.00
Actual Cost	\$8,000.00
Remaining Cost	\$0.00

- e. Reschedule the project with a new data date of 7-May-18.
 - f. Is the project still on schedule? _____
4. Next you will update the project for the status period 7-May-18 to 14-May-18. During this time, work resumed on activity *A1120*.
- a. Activate the Progress Spotlight and confirm the status updating period, 7-May-18 to 14-May-18.
 - b. On the Status and Resources tabs in Activity Details, update or confirm activity data as specified in the following table:

Activity	Updating Actions	Actual Units
A1100	Started on 8-May-18. Remaining Duration = 1d.	
A1330	Finished on 7-May-18.	Inspector-Renovation: 4h Laborer-Renovation: 32h Laborer/Supervisor-Renovation: 32h
A1120	Work resumed on 10-May-18. Remaining Duration = 10d.	
A1150	Started on 8-May-18. Remaining Duration = 1d.	
A1170 A1180 A1190	Remaining Duration = 9d.	
A1200	Started on 8-May-18. Finished on 11-May-18.	High Pressure Washer: 32h Inspector-Renovation: 4h Laborer-Renovation: 32h Laborer/Supervisor-Renovation: 32h

- c. On the Notebook tab for activity A1120, update the *Problems Encountered* topic to reflect that work resumed on the activity on 10-May-18.
 - d. Reschedule the project with a new data date of 14-May-18.
 - e. How far behind schedule is the project now? _____
5. Due to the vandalism and the suspension of activity *A1120*, the project has slipped significantly behind schedule. You will add a second laborer to the activity, enabling the activity to be completed in half the time: 5 days instead of 10 days. Show the addition of a second laborer by doubling the Remaining Units/Time from 8h/d to 16 h/d. This reflects two laborers, each working 8 h/d.
- a. Select activity *A1120*. On the Status tab in Activity Details, change Remaining Duration to *5d*.

When you changed the Remaining Duration to 5 days above, P6 Professional calculated that 10 days of work have already been done: Original Duration (15d) – Remaining Duration (5d) = 10d. However, in reality, only 5 days of work have been completed.

You will manually change values on the Resources tab in Activity Details to reflect the revised Remaining Duration and the addition of a second laborer.

- b.** On the Resources tab, customize columns and update resource data as indicated in the table below:

Column	Value	Explanation
Budgeted Units	120h	This reflects 40h/week for the original 15d duration of the activity
Actual Units	40h	This reflects the 40h already performed by the laborer before the activity was suspended.
Remaining Units	80h	This reflects the remaining work for two laborers each working 40h to complete the activity in the 5d Remaining Duration.
Remaining Units/Time	16h/d	This reflects the combined remaining units of two laborers each working 8h/d.

- c.** Press *F5* on your keyboard to refresh the data.
- d.** Schedule the project with a data date of 14-May-18.
- e.** Is the project on schedule now? _____
- 6.** To put the project fully back on schedule, you will make a change to the relationship between two successors to activity *A1120*, which were all affected when *A1120* was suspended. There is a Finish to Start relationship between activity *A1130 – Install subflooring* and its successor, *A1370 – Build new interior non-bearing walls*. Instead of waiting for the subflooring to be completed, however, there should be enough subflooring installed after a couple of days to begin building the interior walls
- a.** Select activity *A1130*. Change the Finish to Start relationship with its successor, *A1370*, to a Start to Start relationship with 2 days of lag.
 - b.** Add a Finish to Start relationship between *A1130* and its successor, *A1280*, to close the open end on *A1130*.
 - c.** Schedule the project with a data date of 14-May-18.
 - d.** Is the project on schedule now? _____
- 7.** Now that the project is back on track to meet its *Must Finish By* date, use the Resource Usage pane to check the project's resources for overallocation. (On the Resource Usage left-pane Display Options bar, click *Filter By, Current Project's Resources* and on the right-pane Display Options bar, click to remove the check mark in front of *Show All Projects*)
- a.** Are any resources overallocated?

8. After analyzing the schedule and resources and re-optimizing the project plan, check for the impact of the changes on the project's budget.
- a. Open a layout, *Analyzing the Budget*, and add an *At Completion Total Cost* column to the layout.
 - b. Is the project still within its Original Budget of \$190,000?

Notes



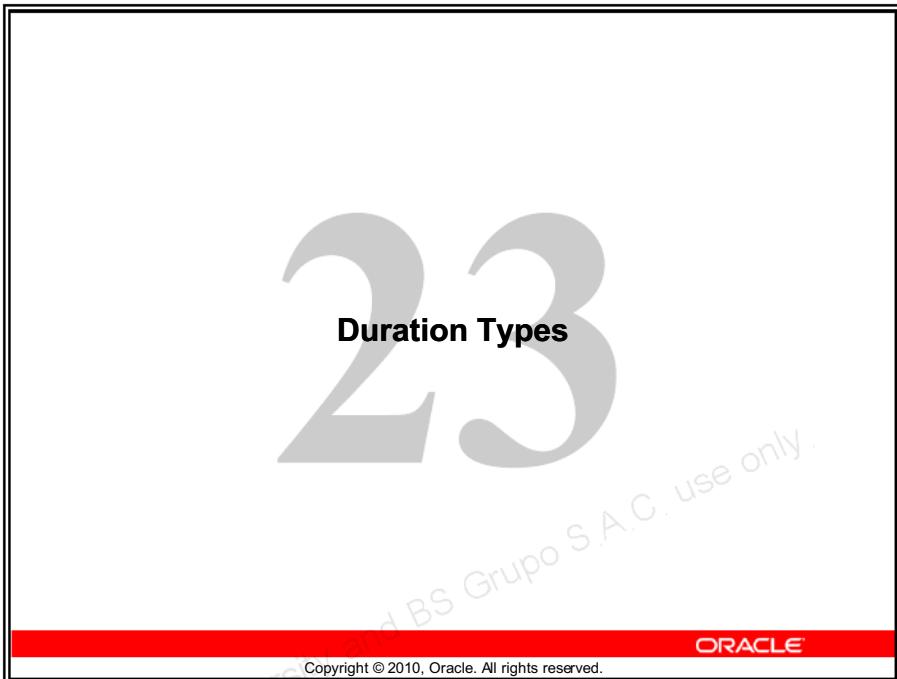
SECTION V

Advanced Project Analysis

Duration Types
Calculating Percent Complete
Earned Value
Managing Multiple Projects
Advanced Scheduling

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Lesson 23 – Duration Types

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
30	10	20	5	65

Objectives

After completing this lesson, you should be able to:

- Determine which duration type works best in a given situation.
- Assign a duration type to an activity.



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Time and Work

This equation expresses the relationship between the length of time a resource spends on an activity and the amount of work that the resource performs.

Duration X Units/Time = Units

Examples:

$$2 \text{ days} \times 8 \text{ hrs/day} = 16 \text{ hours}$$

$$3 \text{ days} \times 4 \text{ hrs/day} = 12 \text{ hours}$$

$$5 \text{ days} \times 16 \text{ hrs/day} = 80 \text{ hours}$$

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Time and Work

For a Non-Progressed Activity:

$$\text{Original Duration} \times \text{Budgeted Units}/\text{Time} = \text{Budgeted Units}$$

For a Progressed Activity:

$$\text{Remaining Duration} \times \text{Remaining Units}/\text{Time} = \text{Remaining Units}$$

Related equations:

$$\text{Actual Units} + \text{Remaining Units} = \text{At Completion Units}$$

$$\text{Budgeted Units} - \text{At Completion Units} = \text{Variance (in Units)}$$

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Duration Type

Duration Type controls how P6 Professional recalculates the time/work equation when one of the equation's variables is changed.

There are four Duration Types:

- Fixed Duration & Units
- Fixed Duration and Units/Time
- Fixed Units
- Fixed Units/Time

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Choosing a Duration Type

Use the following table as a reference when selecting Duration Types:

Duration X Units/Time = Units

If you do not want P6 Professional to recalculate...	...then use:
Budget or work effort	Fixed Units
Daily resource allocation	Fixed Units/Time
If you do not want P6 to recalculate the schedule and...	...then use:
Budget or work effort	Fixed Duration & Units
Daily resource allocation	Fixed Duration and Units/Time

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Recalculating the Time/Work Equation

This table indicates which of the equation's values recalculates when one of the variables is changed.

Duration X Units/Time = Units

Duration Type	When duration is changed, what is recalculated?	When units/time is changed, what is recalculated?	When units are changed, what is recalculated?
Fixed Units/Time	Units	Duration	Duration
Fixed Duration and Units/Time	Units	Units	Units/Time
Fixed Units	Units/Time	Duration	Duration
Fixed Duration & Units	Units/Time	Units	Units/Time

- If the duration is fixed, P6 Professional will never recalculate the duration.
- If the duration is not fixed, P6 Professional will always recalculate the duration.

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Duration Type: Fixed Units/Time

- Indicates that resource availability is limited.
- Choose Fixed Units/Time if you are planning the activity according to the resources assigned to the activity and need to focus on:
 - Resource availability
 - Resource overallocation or underutilization

Duration Type	When duration is changed, what is recalculated?	When units/time is changed, what is recalculated?	When units are changed, what is recalculated?
Fixed Units/Time	Units	Duration	Duration



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Duration Type: Fixed Units/Time

Fill in the columns in the table below so that the equation remains true.

Duration X (Fixed) Units/Time = Units

	Duration	Fixed Units/Time	Units
	10 d	8 h/d	80 h
Change Duration	5 d		
Change Units/Time		4 h/d	
Change Units			120 h

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Duration Type: Fixed Duration and Units/Time

- Indicates that duration and units/time are not subject to change regardless of the number of resources assigned to the activity.
- Choose Fixed Duration and Units/Time if:
 - You are planning the activity in terms of the calendar or schedule dates.
 - The activity has a “drop-dead date.”
 - You are entering an actual duration value for the activity rather than budgeted labor units.

Duration Type	When duration is changed, what is recalculated?	When units/time is changed, what is recalculated?	When units are changed, what is recalculated?
Fixed Duration and Units/Time	Units	Units	Units/Time

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Duration Type: Fixed Duration and Units/Time

Fill in the columns in the table below so that the equation remains true.

(Fixed) Duration X (Fixed) Units/Time = Units

	Fixed Duration	Fixed Units/Time	Units
	10 d	8 h/d	80 h
Change Duration	5 d		
Change Units/Time		4 h/d	
Change Units			120 h

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Duration Type: Fixed Units

- Indicates that the work effort (labor units) assigned to the activity is not subject to change. Since cost is directly correlated with units, it is also not subject to change.
- Choose **Fixed Units**, if:
 - You are planning the activity in terms of work effort or budget.
 - You are entering Budgeted Labor Units for the activity rather than Original Duration.

Duration Type	When duration is changed, what is recalculated?	When units/time is changed, what is recalculated?	When units are changed, what is recalculated?
Fixed Units	Units/Time	Duration	Duration



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Duration Type: Fixed Units

Fill in the columns in the table below so that the equation remains true.

Duration X Units/Time = (Fixed) Units

	Duration	Units/Time	Fixed Units
	10 d	8 h/d	80 h
Change Duration	5 d		
Change Units/Time		4 h/d	
Change Units			120 h

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Duration Type: Fixed Duration & Units

- Indicates that the Units/Time should be recalculated if either the duration or units are changed.
- Choose Fixed Duration & Units if:
 - You are planning the activity in terms of schedule dates and its work effort.
 - The activity has a “drop-dead date,” and you know the total effort required to complete the activity.

Duration Type	When duration is changed, what is recalculated?	When units/time is changed, what is recalculated?	When units are changed, what is recalculated?
Fixed Duration & Units	Units/Time	Units	Units/Time



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Duration Type: Fixed Duration & Units

Fill in the columns in the table below so that the equation remains true.

(Fixed) Duration X Units/Time = (Fixed) Units

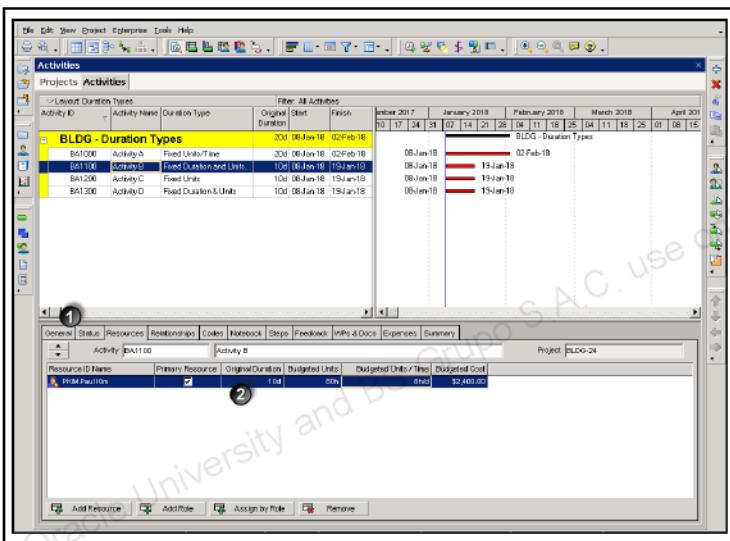
	Fixed Duration	Units/Time	Fixed Units
	10 d	8 h/d	80 h
Change Duration	5 d		
Change Units/Time		4 h/d	
Change Units			120 h

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Overview: Using Duration Types

Duration Type controls how P6 Professional handles the relationships between duration, units, and units/time for activity resource assignments. A default duration type can be specified for all new activities on the Defaults tab in Project Details. If necessary, an individual activity's Duration Type can be modified on the General tab in Activity Details.



- ➊ Click the General tab in Activity Details to access the Duration Type setting for individual activities.
- ➋ Use the Resources tab in Activity Details to enter changes to a resource assignment's duration, units, or units/time.

Practice: Using Duration Types

In this practice you will:

- Assign a default Duration Type at the project level.
- Assign a Duration Type to an activity.
- Make changes to a resource assignment's duration, units, and units/time values and observe which elements of the time/work equation are recalculated in response to each change.

Assigning a Duration Type

The default Duration Type assigned to all new activities is set at the project level.

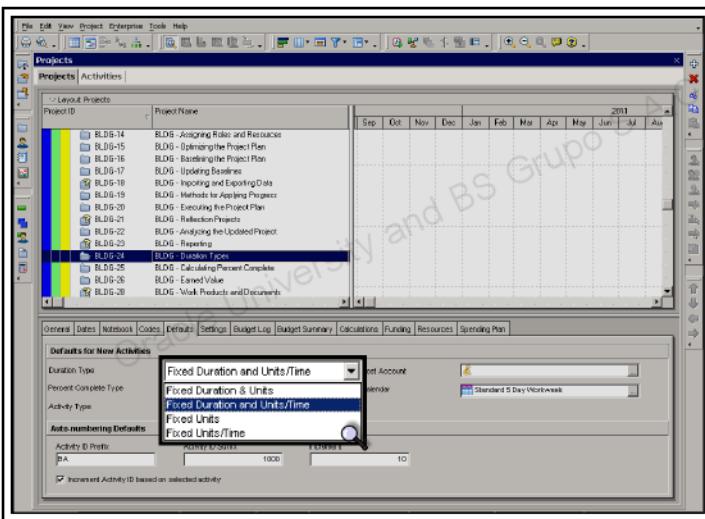


Figure 23-1: Use the *Duration Type* list on the Defaults tab in Project Details to select a default Duration Type for new activities in the project.

Assign a default Duration Type for a project.

1. Open a project, *BLDG-23 BLDG – Duration Types*.
2. Click the Projects view tab near the top of the screen to navigate to the Projects window.
3. In the Project Table, select the open project, *BLDG-23*.
4. In Project Details, click the Defaults tab.
5. In the *Duration Type* list, select *Fixed Duration and Units/Time*.

You can modify the Duration Type for each activity.

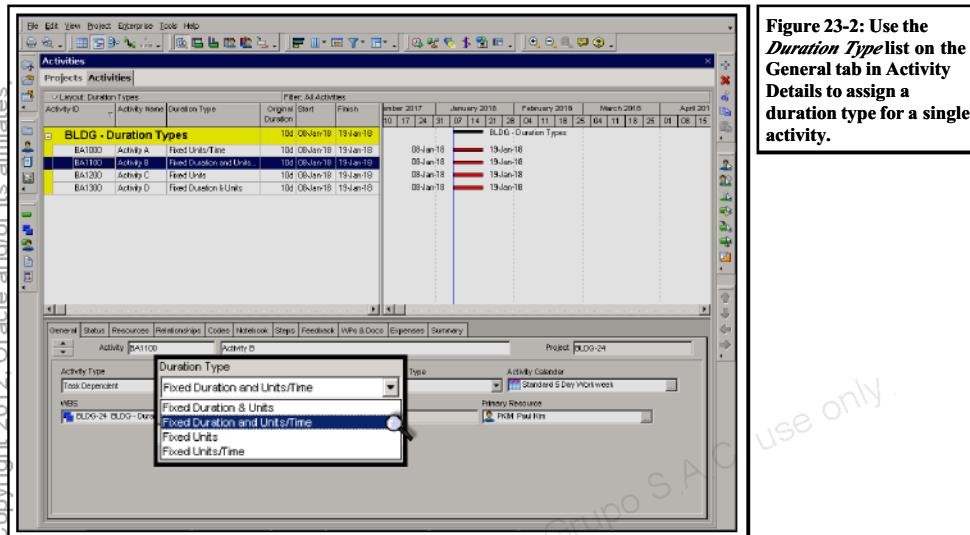


Figure 23-2: Use the Duration Type list on the General tab in Activity Details to assign a duration type for a single activity.

Change the Duration Type for an activity.

1. Click the Activities tab at the top of the screen.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Duration Types*, and then click *Open*.
4. Select an activity, *BA1100 – Activity B*.
5. In Activity Details, click the General tab.
6. In the *Duration Type* list, select *Fixed Duration and Units/Time*.

? *Why didn't the activity's Duration Type change when you changed the default Duration Type on the previous page?*

Modifying an Activity with Fixed Units/Time Duration Type

In the following series of exercises, Paul Kim's availability is fixed. He will work 8 hours per day unless you enter a new Units/Time value. In turn, you will enter new Budgeted Units, Original Duration, Budgeted Units/Time, and add a new resource on the activity in order to view how each change causes other elements of the equation to recalculate.

Changing Units

You will enter new Budgeted Units for Paul Kim. Because Paul's Units/Time is fixed (8 h/d), the duration of the activity will automatically recalculate.

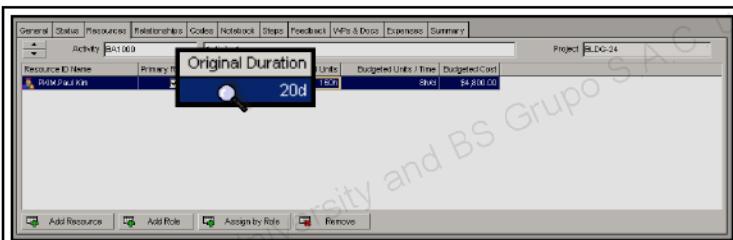


Figure 23-3: When Budgeted Units are doubled – from 80h to 160h – the Original Duration recalculates from 10d to 20d.

 Enter new Budgeted Units for a resource.

1. Select an activity, *BA1000 – Activity A*.
 2. View the Duration Type on the General tab.
 3. In Activity Details, click the Resources tab.

? *What is the Original Duration of Paul Kim's resource assignment?*
 4. In the *Budgeted Units* column, type <160> and press *Enter* on your keyboard.

? *Now, what is the Original Duration of Paul Kim's resource assignment?*

Changing Duration

In the next exercise, you will increase the duration of Paul Kim's resource assignment. Since Paul's Units/Time remains fixed at 8 hours per day, the amount of work (units) will also increase.



Figure 23-4: Changing duration causes the number of Budgeted Units to recalculate.

- #### **Increase the duration of the resource assignment**

1. In the Activity Table, confirm that activity *BA1000 – Activity A* is selected.
 2. In the *Original Duration* column in Activity Details, type <40> and press *Enter* on your keyboard.

?

What are Paul Kim's Budgeted Units now?

?

Have there been any other changes caused by the new duration?

Changing Units/Time

Next, you will assign Paul Kim to work 4 hours per day. The amount of work does not change so the duration is recalculated. After noting the recalculated duration, you will restore Paul's Units/Time to 8 hours per day.

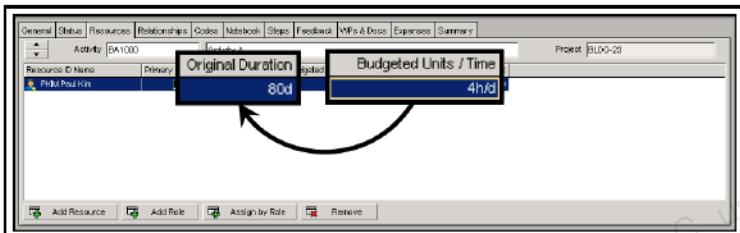


Figure 23-5: When Paul Kim's Units/Time is cut in half, the duration of his resource assignment doubles in response.

Change the Units/Time assigned to a resource.

1. In the *Budgeted Units/Time* column, type <4> and press *Enter* on your keyboard.

? *What is the duration of Paul Kim's resource assignment now?*

2. In the *Budgeted Units/Time* column, type <8> and press *Enter* on your keyboard.

Note that the Original Duration of Paul's resource assignment has returned to 40 days.

Adding a Resource

You will adjust the length of the work day for Paul Kim and add another resource to the activity. By adding another resource, the duration of the resource assignment is cut in half. Before proceeding with the exercise, however, you will need to confirm a setting in User Preferences.

$$\begin{array}{ccccc} \textbf{Duration} & \times & \textbf{Resource Units/Time} & = & \textbf{Units} \\ (\text{recalculated}) & & (\text{fixed}) & & (\text{unchanged}) \end{array}$$

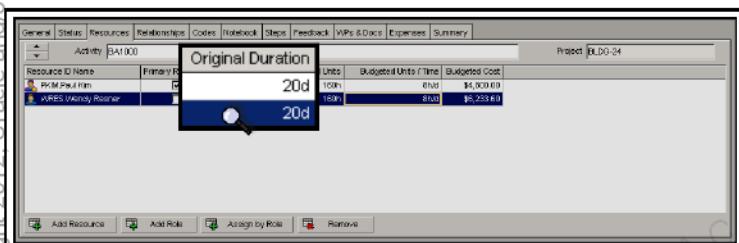


Figure 23-6: Adding another resource causes the Original Duration of each resource assignment to change from 40 days to 20 days.

Add a second resource to an activity.

1. On the Edit menu, click *User Preferences*.
 2. Click the Calculations tab.
 3. In the Resource Assignments section, select *Recalculate the Units, Duration, and Units/Time for existing assignments based on the activity Duration Type* and then close the User Preferences dialog box.
 4. In the Resources tab in Activity Details, click *Add Resource*.
 5. On the Assign Resources dialog Display Options bar, click *Filter By, All Resources*.
 6. Select a resource, *WR – Wendy Resner*; and then click .
 7. Close the Assign Resources dialog box.

? *What are the total Budgeted Units for the activity?*

 8. On the Edit menu, click *User Preferences*.
 9. Click the Calculations tab.
 10. In the Resource Assignments section, select *Preserve the Units, Duration, and Units/Time for existing assignments*; and then close the User Preferences dialog box.

Lesson Review

Key Concepts

- The Duration Type setting determines how duration, units, and units/time are synchronized for activity resource assignments so that the following equation is always true:

$$\text{Duration} \times \text{Resource Units}/\text{Time} = \text{Units}.$$

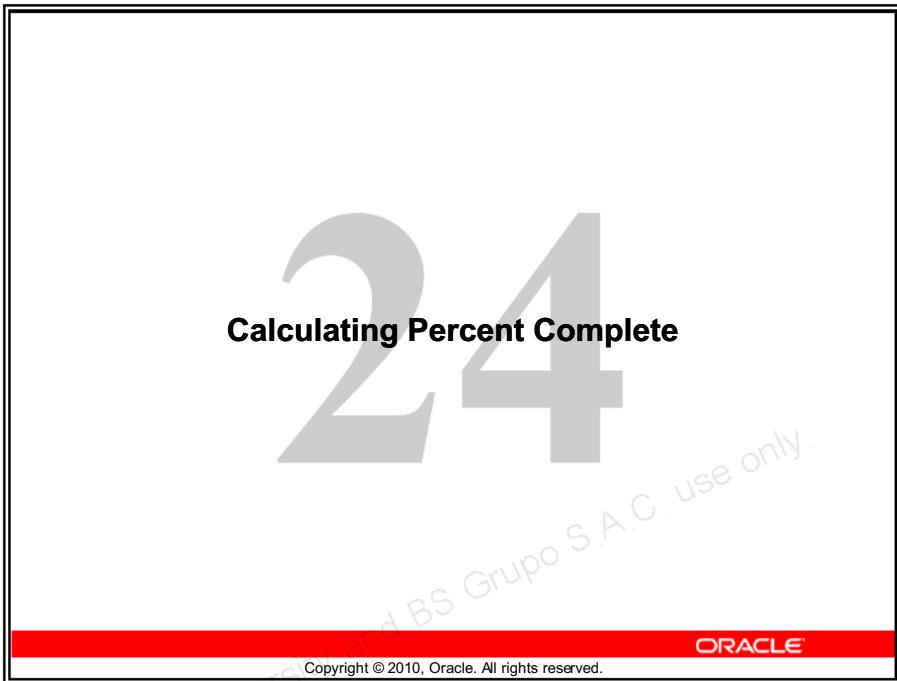
- The default Duration Type setting for all new activities is set at the project level on the Defaults tab in Project Details.
- You can modify the default Duration Type for activities as necessary at the activity level on the General tab in Activity Details.

Review Questions

- Which Duration Type would you choose for an activity if resource availability was fixed at 8h/d?
 - Fixed Units/Time
 - Fixed Units
 - Fixed Duration & Units
 - Fixed Duration and Units/Time
- True or False:** If an activity has a "drop dead date," you should set the Duration Type to Fixed Units.
- True or False:** If the Duration Type of an activity is Fixed Duration & Units, P6 Professional will not recalculate the duration when a change is made to either resource units or units/time.
- Which Duration Type would you choose for an activity with a fixed schedule and budget?
 - Fixed Units/Time
 - Fixed Units
 - Fixed Duration & Units
 - Fixed Duration and Units/Time

Notes





Lesson 24 – Calculating Percent Complete

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	15	30	5	60

Objectives

After completing this lesson, you should be able to:

- Describe the three Percent Complete types.
- Determine which Percent Complete type to use based on how your organization reports progress.
- Explain how activity percentages are calculated based on the Percent Complete type chosen.
- Use weighted steps to calculate Percent Complete.

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Percent Complete

- Used to identify the amount of work completed on an activity.
- Assigned at the project level but may be changed at the activity level.
 - Three types:
 - Duration Percent Complete
 - Units Percent Complete
 - Physical Percent Complete
- Selected type displays as field in Status tab in Activity Details.
 - Determines Activity % Complete, which can be displayed as column in Activity Table.

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Duration Percent Complete

- Use if you record progress based on the number of work days remaining (i.e., Remaining Duration).
- Activity is duration-driven.
- Default type in P6 Professional.
- Calculated as:

$[(\text{Original Duration} - \text{Remaining Duration})/\text{Original Duration}] \times 100$

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Units Percent Complete

- Use if you record progress based on actual work effort accomplished and remaining work effort needed to complete (i.e., Remaining Units).
- Activity is work-effort driven.
Calculated as:

$$\text{(Actual Units/At Completion Units)} \times 100$$

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Physical Percent Complete

- Use if you record progress based on personal judgment.
- Activity is work-product driven.
- Manually entered – not calculated.

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Weighted Steps

- Used to calculate Activity Percent Complete based on the relative weights of completed vs. non-completed steps.
- Weight of a step can be any number from 0 to 999,999.
- Weights are relative based on a total of 100%.

Activity % Complete

Time

Step	Weight	Percent Completed
1	5.0	50%
2	2.0	20%
3	3.0	30%

Activity % Complete

Time

Step	Weight	Percent Completed
1	5.0	50%
2	2.0	20%
3	3.0	30%

Activity % Complete

Time

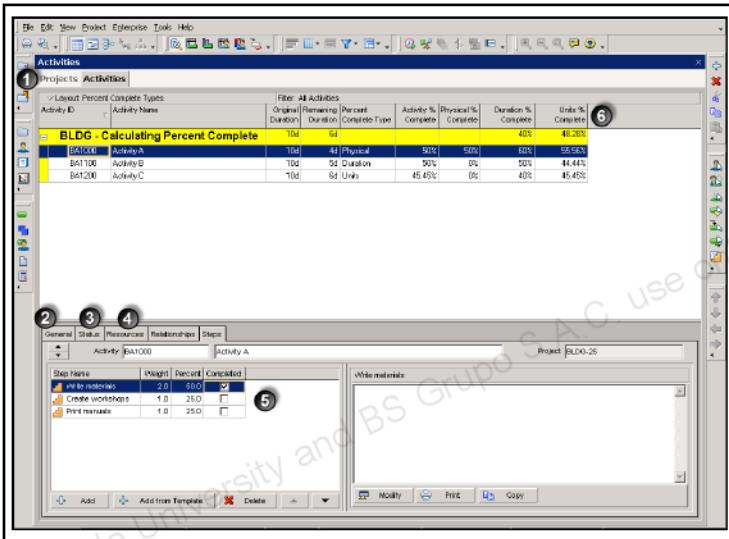
Step	Weight	Percent Completed
1	5.0	50%
2	2.0	20%
3	3.0	30%

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Overview: Calculating Percent Complete

The default percent complete type is set at the project level in the Projects window but can be changed at the activity level in the Activities window. Tabs in Activity Details are used to status Physical Percent Complete and to create weighted steps.



- ① On the Enterprise menu, click *Projects* to access the Projects Window where you can specify the default Percent Complete type on the Defaults tab in Project Details.
- ② Use the General tab in Activity Details to change the percent complete type for an individual activity.
- ③ Use the Status tab in Activity Details to update the Remaining Duration and Physical Percent Complete values for progressed activities.
- ④ Use the Resources tab in Activity Details to update Actual Units and Remaining Units for resources working on progressed activities.
- ⑤ Use the Steps tab in Activity Details to create weighted steps for calculating Physical Percent Complete.
- ⑥ View Percent Complete calculations in columns in the Activity Table.

Practice: Calculating Percent Complete

In this practice you will:

- Set the default percent complete type for a project.
- Change the percent complete type for an individual activity.
- Update activities based on each of the percent complete types.
- Use weighted steps to calculate an activity's percent complete.

Assigning a Percent Complete Type

When a project is created, the default percent complete type for new activities is Duration Percent Complete. This can be changed at the project level so that new activities will be assigned a new default Percent Complete type but existing activities will retain their originally assigned type.

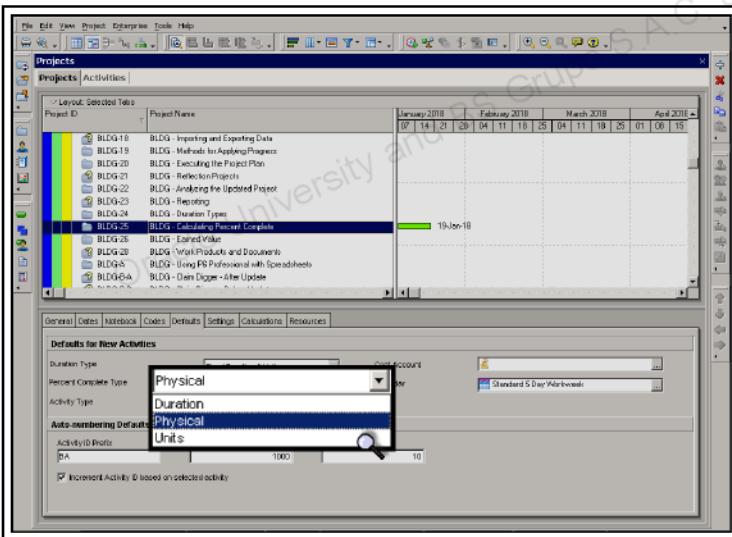


Figure 24-1: Assign a default percent complete type for the project.

❖ Set the default percent complete type for a project.

1. Open a project, *BLDG-24 BLDG – Calculating Percent Complete*.
2. Click the Projects view tab near the top of the screen.
3. On the Layout Options bar, click *Layout, Open*.

4. Select a layout, *Selected Tabs*, and then click *Open*.
5. In the Project Table, select the opened project, *BLDG-24*.
6. In Project Details, click the Defaults tab.
7. In the *Percent Complete Type* list, select *Physical*.

You can also modify the Percent Complete type at the activity level.

The screenshot shows the Oracle Project Management interface. At the top, there's a toolbar with various icons. Below it is a navigation bar with 'Activities' selected. The main area displays a table of activities under the heading 'BLDG - Calculating Percent Complete'. The table has columns for Activity ID, Activity Name, Duration, Remaining Duration, Percent Complete, and three types of percentage completion (Activity % Complete, Physical % Complete, and Duration % Complete). Three activities are listed: BA1000 (Activity A), BA1001 (Activity B), and BA1002 (Activity C). All show 0% completion across all metrics.

A detailed dialog box is open for 'Activity A' (BA1000). It has tabs for General, Status, Resources, Relationships, and Schedules. The General tab is active. Under 'Activity Type', it says 'Task Dependent' and 'Duration Type' is set to 'Fixed Units/Time'. In the 'Percent Complete Type' dropdown, 'Physical' is selected. Below this, there are fields for 'Duration', 'Response', and 'Units'. A magnifying glass icon is positioned over the 'Units' field.

Figure 24-2: Assign a Percent Complete type to an activity.

Change the Percent Complete type of an activity.

1. Click the Activities view tab near the top of the screen.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Percent Complete Types*, and then click *Open*.
4. Select an activity, *BA1000 – Activity A*.
5. Click the General tab.
6. In the *% Complete Type* list, select *Physical*.

Updating Activities Based on Physical Percent Complete

Physical Percent Complete reflects the actual progress on an activity. To update an activity, type the following:

- A value into the *Physical Percent* field.
- A Remaining Duration.
- Each resource's Actual Units.

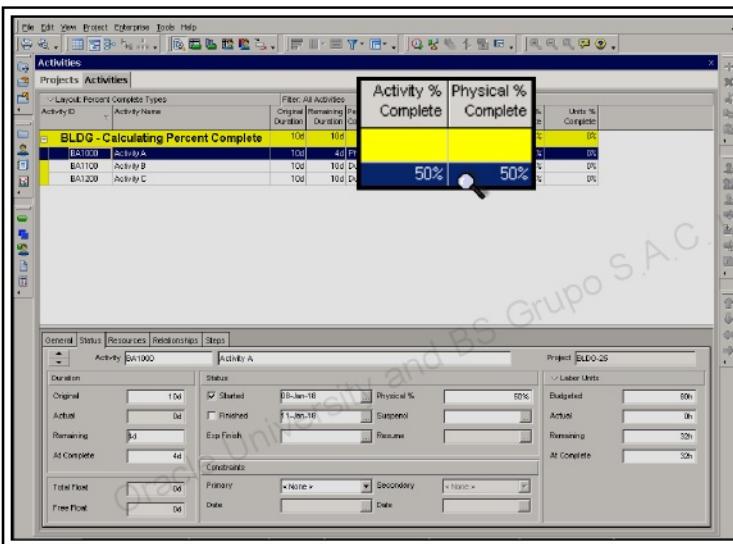


Figure 24-3: The *Activity % Complete* field is being driven by the *Physical % Complete* field.

♂ Enter a Physical Percent Complete value for an activity.

1. In the Activity Table, confirm that *Activity A* is selected.
2. Click the Status tab.
3. Select the *Started* check box.
4. In the *Physical % Complete* field, type <50> and then press *Enter* on your keyboard.

Update the Remaining Duration and Actual Units.

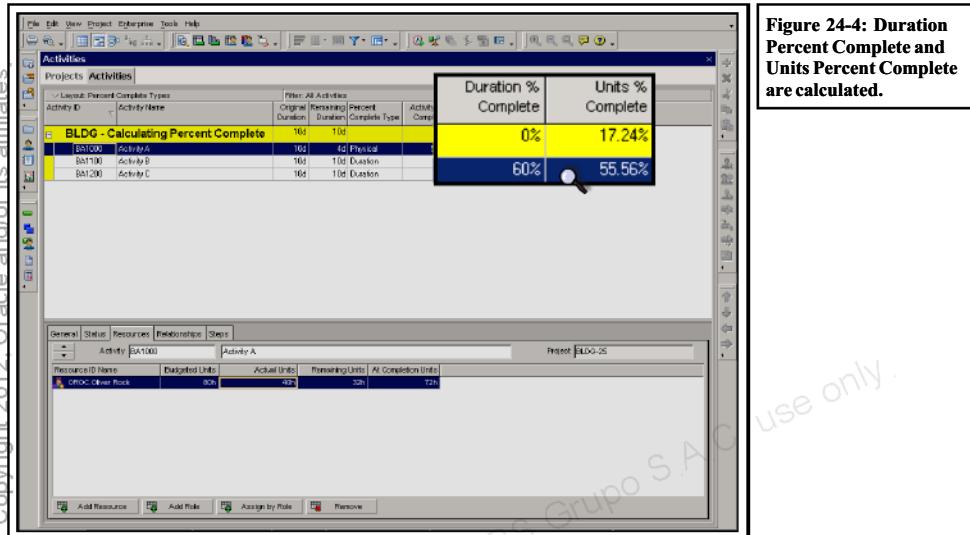


Figure 24-4: Duration Percent Complete and Units Percent Complete are calculated.

Updating Activities Based on Duration Percent Complete

Select the Duration Percent Complete type when progress can most easily be reported in terms of actual days of work remaining. To record progress on an activity, update Remaining Duration and each resource's Actual Units.

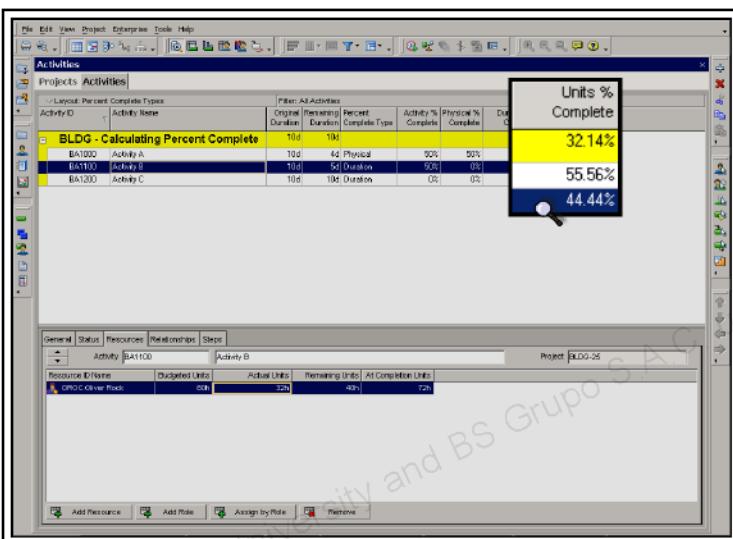


Figure 24-5: Units Percent Complete is calculated.

Update the status of an activity.

1. In the Activity Table, select an activity, *BA1100 – Activity B*.
The activity's percent complete is Duration Percent Complete.
2. In the Status tab in Activity Details, select the *Started* check box.
3. In the *Remaining*(duration) field, type <5> and press *Enter* on your keyboard.
4. Click the Resources tab.
5. In the *Actual Units* field for Oliver Rock, type <32> and press *Enter* on your keyboard.

The resource's Remaining Units equals the activity's Remaining Duration multiplied by its Units/Time.

Updating Activities Based on Units Percent Complete

Use Units Percent Complete to calculate an activity's percent complete from its resources' Actual Units and At Completion units.

To record progress for an activity, update each resource's Actual Units and Remaining Units.

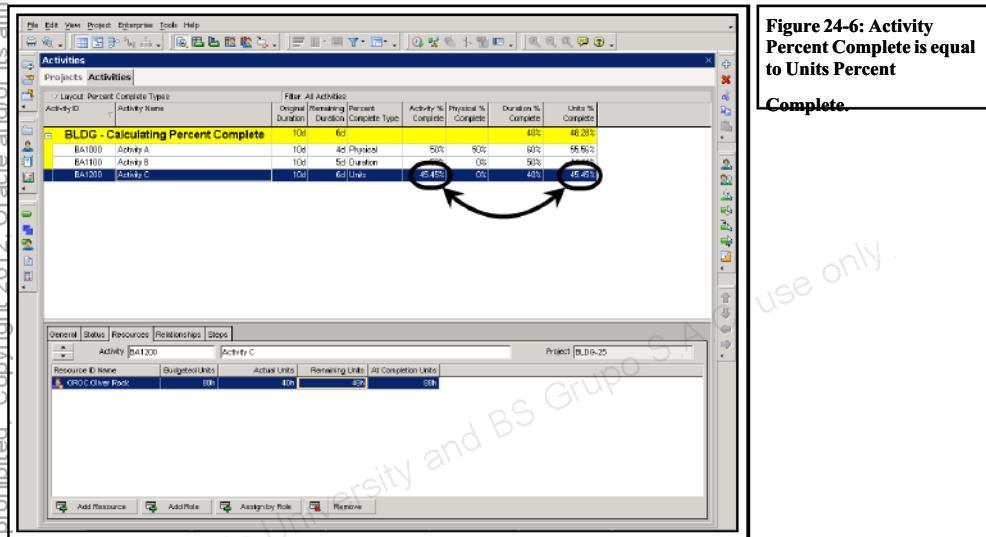


Figure 24-6: Activity Percent Complete is equal to Units Percent Complete.

Modify the Percent Complete type and update an activity.

- In the Activity Table, select an activity, *BA1200 – Activity C*.
- In the General tab in Activity Details, select a % Complete Type, *Units*.
- In the Status tab, select the *Started* check box.
- Click the Resources tab.
- In the *Actual Units* field, type <40> and press *Enter*.
- In the *Remaining Units* field, type <48> and press *Enter*.

Remaining Duration is updated based on the Remaining Units according to the equation: Remaining Duration = Remaining Units / Units per Time.

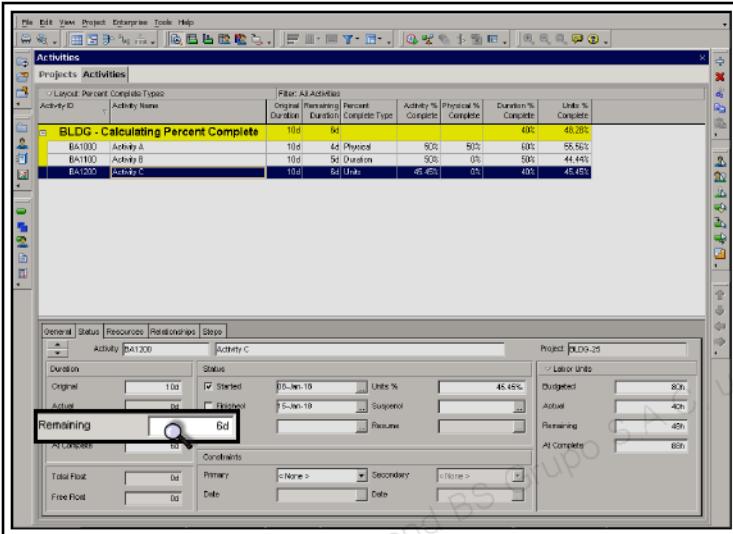


Figure 24-7: The Remaining Duration has been recalculated.

View Remaining Duration on the Status tab.

- Click the Status tab.

? *What is the Remaining Duration for the activity?*

Weighted Steps

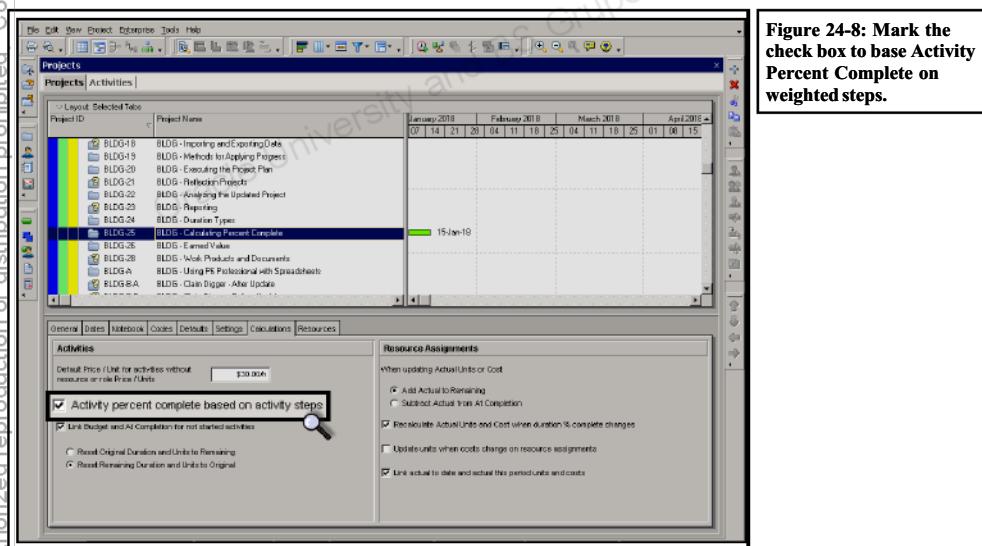
Steps allow you to divide activities into smaller tasks and then to track the completion of those tasks. When you assign weights to the steps, the completion of each specific step drives the completion of the activity as a whole. The following two options must be set to use weighted steps:

- In the Projects window, click the Calculations tab in Project Details. Select the *Activity percent complete based on activity steps* check box.
- In the Activities window, click the General tab in Activity Details. Set the Percent Complete Type to *Physical*.

The use of weighted steps is best suited for large activities which contain several distinct steps and for calculating earned value.

Setting Up Weighted Steps

The first option required for using weighted steps is set at the project level. This setting affects both existing and new activities.



Set the project-level option to use weighted steps.

1. Click the Projects view tab to navigate to the Projects window.

2. In the Project Table, confirm that *BLDG-24* is selected.
3. In the Calculations tab in Project Details, select the *Activity percent complete based on activity steps* check box.
4. When prompted, click *Yes*.

The second option required for weighted steps is set at the activity level.

The screenshot shows the Oracle Project Management interface. The main window displays the 'Activities' view with a table of activities for project 'BLDG-24'. One row is selected, showing 'Activity A' with a duration of 4d and a physical percentage of 50%. Below this, the 'Activity Details' dialog is open for 'Activity A'. In the 'General' tab, under the '% Complete Type' section, 'Physical' is selected. Other tabs like 'Status', 'Resources', and 'Relationships' are visible but inactive.

Figure 24-9: Specify the activity's Percent Complete type.

Confirm the percent complete type for an activity.

1. Click the Activities view tab to return to the Activities window.
2. In the Activity Table, select an activity, *BA1000 – Activity A*.
3. In Activity Details, click the General tab.
4. In the *% Complete Type* list, confirm *Physical*.

Adding Weighted Steps to Activities

You must enter weights for each step. The weights are relative to each other with completion of all the steps equaling 100%.

When weighted steps are used on an activity, the *Physical %* field on the Status tab in Activity Details becomes read-only.

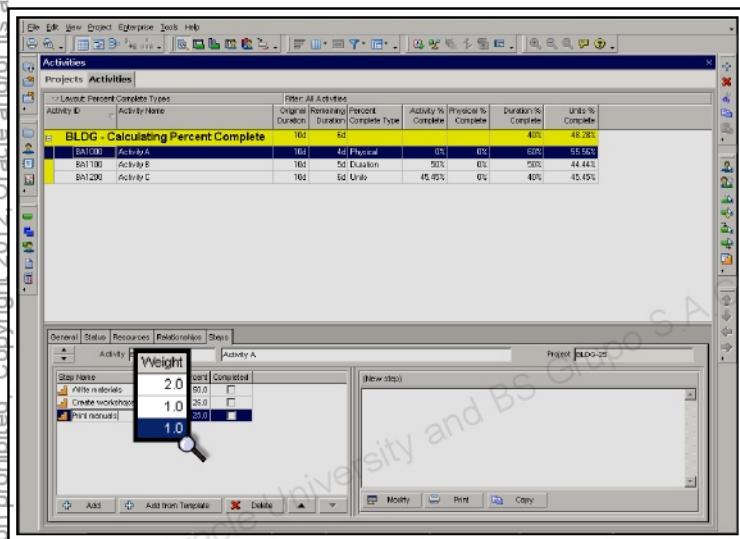


Figure 24-10: Step weights are added.

Add steps and weights to an activity.

1. In Activity Details, click the Steps tab.
2. In the left pane, click *Add*.
3. Click *Yes* when prompted.
4. Add the following steps and weights:
 - a. Step <Write materials>, weight <2.0>.
 - b. Step <Create workshops>, weight <1.0>.
 - c. Step <Print manuals>, weight <1.0>.

Updating Weighted Steps

The Physical Percent Complete is based on the relative weights of the complete steps versus the incomplete steps.

- Physical Percent Complete = Weight of completed step(s) / Sum of all Weights

The *Activity % Complete* and *Physical % Complete* columns are not editable. These columns are automatically calculated based upon the steps completed.

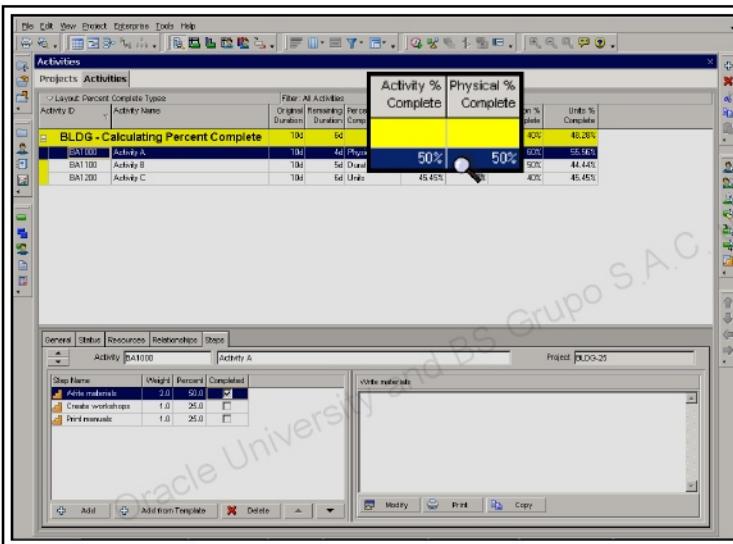


Figure 24-11: Activity Percent Complete and Physical Percent Complete are both calculated to be 50% because the *Write Materials* step was marked completed.

View the Percent Complete calculations for completed steps.

- For the *Write materials* step, select the *Completed* check box.
- In the Activity Table, review the *Activity % Complete* and the *Physical % Complete* columns.

? What are the *Activity % Complete* and the *Physical % Complete* values? Why?

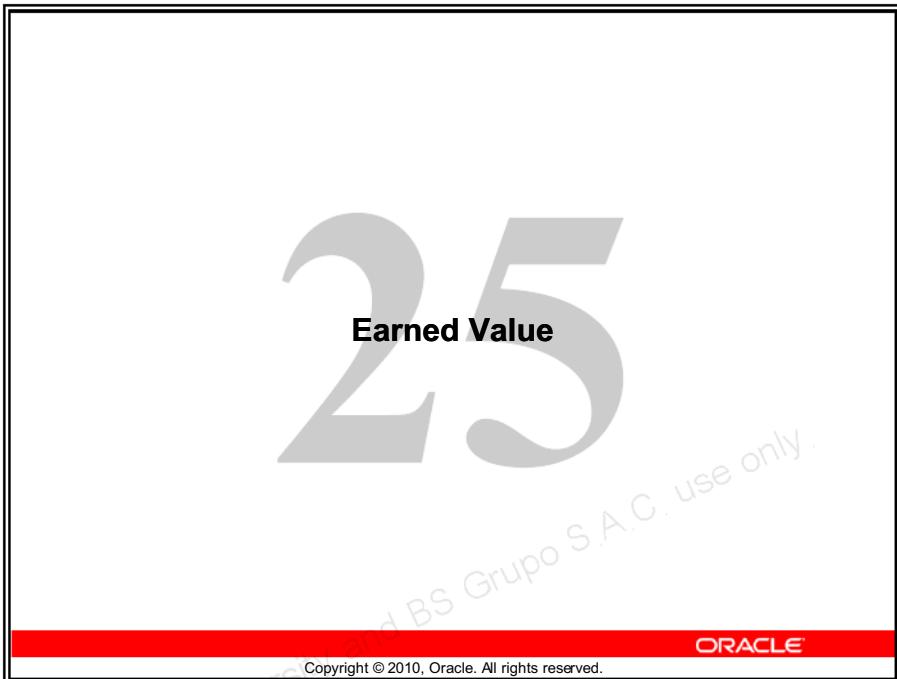
Lesson Review

Key Concepts

- Activity Percent Complete is used to identify the amount of work completed on an activity.
- The Percent Complete type determines how an activity's percent complete is updated.
- Determine which Percent Complete type to use based on how your organization reports progress.
- You can set the default Percent Complete type for all activities at the project level.
- The Percent Complete type can be changed for individual activities at the activity level.

Review Questions

1. Which of the following is not a Percent Complete type?
 - a. Units
 - b. Physical
 - c. Weight
 - d. Duration
2. **True or False:** Units Percent Complete = $(\text{Actual Units} / \text{At Completion Units}) * 100$
3. **True or False:** The Percent Complete type determines how Activity % Complete is calculated.
4. **True or False:** The default percent complete type is Physical.



Lesson 25 – Earned Value

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
30	15	30	5	80

Objectives

After completing this lesson, you should be able to:

- Define earned value.
- Define Performance Percent Complete.
- Review the results of different earned value techniques.
- Recognize the benefits of using earned value analysis.

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Earned Value Analysis

- A technique for measuring project performance.
 - Compares actual costs and schedule progress against planned costs and schedule progress.
- Provides an objective evaluation of project performance at any point in the project schedule.
 - Valid performance measurements across all projects regardless of size, complexity, or budget range.
- Provides an accurate forecast of a project's final cost and finish date.
 - Results can be reliably predicted as early as within the first 15-20% of a project schedule.

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Essential Performance Variables

Earned value calculations are based on three essential performance variables, measured at any point (data date) after the project has started:

- **Planned Value Cost** – The monetary value of the work that should have been accomplished by the data date if the project had proceeded according to the baseline plan.
 - *How much work should have been done?*
- **Earned Value Cost** – The monetary value of the work actually performed by the data date.
 - *How much work was actually done?*
- **Actual Cost** – The actual total cost incurred for the work accomplished by the data date.
 - *How much did the completed work cost?*

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Earned Value Analysis – A Simplified Example

Project Plan:

10-day project to build 10 desks for \$1,000

- \$1,000 total value
- 1 desk per day
- \$100 per desk



10 days



10 desks
(1desk/day)



\$1,000
(\$100/desk)

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Planned Value Cost (PV)

At the end of day 5 of the project:

- How many desks should have been built? **5 desks**
- What is the value of those desks that should have been built? **$5 \times \$100 = \500**



days



desks



\$500

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Earned Value Cost (EV)

At the end of day 5 of the project:

- How many desks have actually been built? **3 desks**
- What is the value of those desks that have been built?

$$3 \times \$100 = \$300$$



days



desks



\$300

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Actual Cost (AC)

At the end of day 5 of the project:

- How much did it cost to build those three desks?
\$600



days



desks



\$600

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Summary of Performance Variables

At the end of day 5 of the project:



Planned Value Cost (PV) = \$500



Earned Value Cost (EV) = \$300



Actual Cost (AC) = \$600

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Schedule Variance (SV)

Schedule Variance is the difference between what was earned and what was planned:

$$\mathbf{EV - PV = Schedule Variance}$$

In our example:

$$\mathbf{\$300 (EV) - \$500 (PV) = - \$200 (SV)}$$

A negative number indicates that the project is behind schedule.

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Cost Variance (CV)

Cost Variance is the difference between what was earned and the actual cost:

$$\mathbf{EV - AC = Cost Variance}$$

In our example:

$$\mathbf{\$300 (EV) - \$600 (AC) = - \$300 (CV)}$$

A negative number indicates that the project is over budget.

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Variance vs. Performance Index

- Schedule and Cost Variances merely indicate how much a project is ahead/behind schedule or over/under budget.
 - A variance of \$300 is significant on a \$1,000 project but considerably less significant on a \$10 million project.
- Schedule and Cost Performance indices each provide a ratio that relates variances to overall project dimensions and accurately gauges performance regardless of project size.
 - Performance indices can be used to forecast final schedule and cost outcomes.

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Schedule Performance Index (SPI)

The Schedule Performance Index is the ratio of what was earned to what was planned:

$$\text{EV/PV} = \text{Schedule Performance Index}$$

In our example:

$$300/500 = .6$$

A number less than 1.0 indicates that the project is behind schedule. For every dollar of physical work this project had planned to accomplish, only \$.60 was actually completed.

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Cost Performance Index (CPI)

The Cost Performance Index is the ratio of what was earned to the actual cost:

$$\text{EV/AC} = \text{Cost Performance Index}$$

In our example:

$$300/600 = .5$$

A number less than 1.0 indicates that the project is over budget. For every project dollar spent, only \$.50 in physical work was accomplished.

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Estimate to Complete (ETC)

Estimate to Complete identifies how much money it will cost to complete a project from the point at which the earned value analysis is performed.

The ETC is calculated using one of two formulas:

- ETC = remaining cost for activity
 - Calculated as Remaining Units X Resource Price/Unit
- ETC = Performance Factor X (Budget at Completion – Earned Value Cost)
 - Where the Performance Factor is calculated depending on the technique selected for the WBS.



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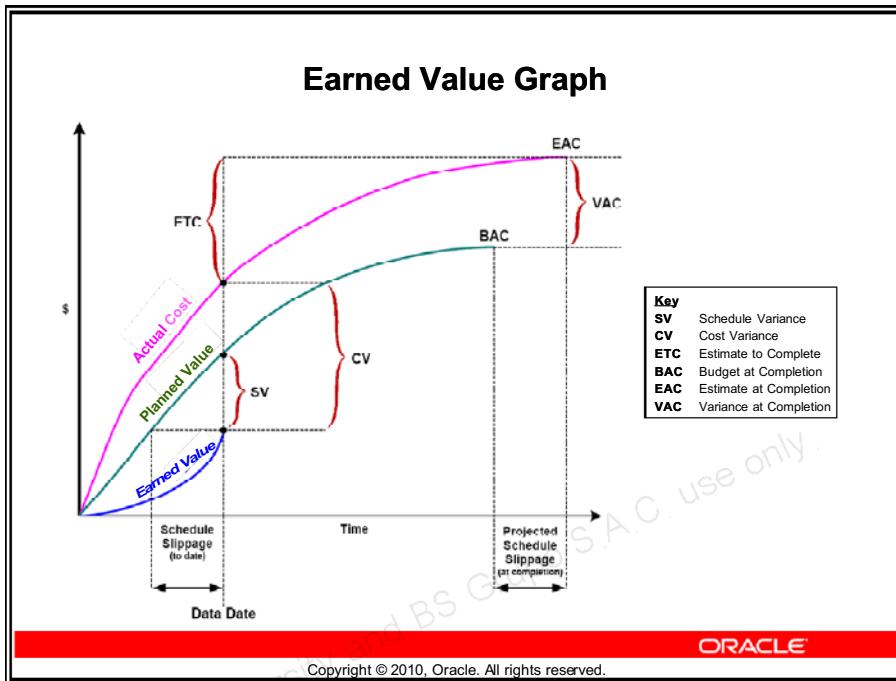
Performance Factor (PF)

The Performance Factor is used to compute Estimate to Complete. The Performance Factor is calculated in one of four ways:

- $\text{PF} \leq 1$ Yields an overly optimistic result.
- $\text{PF} = 1/\text{CPI}$
 - Yields an optimistic/realistic result.
- $\text{PF} = 1/(\text{CPI} \times \text{SPI})$
 - Yields a pessimistic/realistic result.
- $\text{PF} = \text{User Defined}$
 - Yields a variable result depending on the assumptions used to establish the PF.

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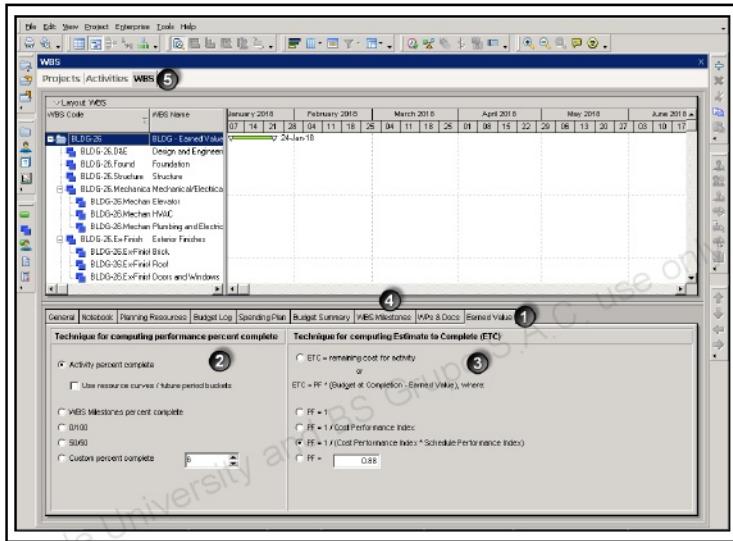


Notes



Overview: Performing an Earned Value Analysis

P6 Professional automates earned value analysis. Earned value settings are selected on tabs in WBS Details in the WBS window, and earned value calculations can be viewed in Activity Table columns in the Activities window.



- ① In WBS Details, click the Earned Value tab to select settings for earned value calculations.
- ② On the Earned Value tab, choose a technique for computing performance percent complete for earned value calculations.
- ③ Choose a technique for computing Estimate to Complete for earned value calculations.
- ④ Click the WBS Milestones tab to create weighted milestones for computing performance percent complete.
- ⑤ Use the view tabs to navigate back and forth between the WBS window and the Activities window.

Practice: Performing an Earned Value Analysis

In this practice you will:

- Update activity progress on the Activity Details Status tab in the Activities window.
- Reschedule the project and view earned value calculations in the columns of the Activity Table.

Earned Value Project Background

The *Building Addition* project contains a single activity, *BA1000*, that spans from 08-Jan-18 to 19-Jan-18. A single resource is assigned to *BA1000* for a total of 80 hours. The price/unit for the resource is \$100 per hour; therefore, the Budgeted At Completion cost for *BA1000* is \$8,000. A baseline has been created. An active project baseline against which to measure actual performance is required for earned value analysis.

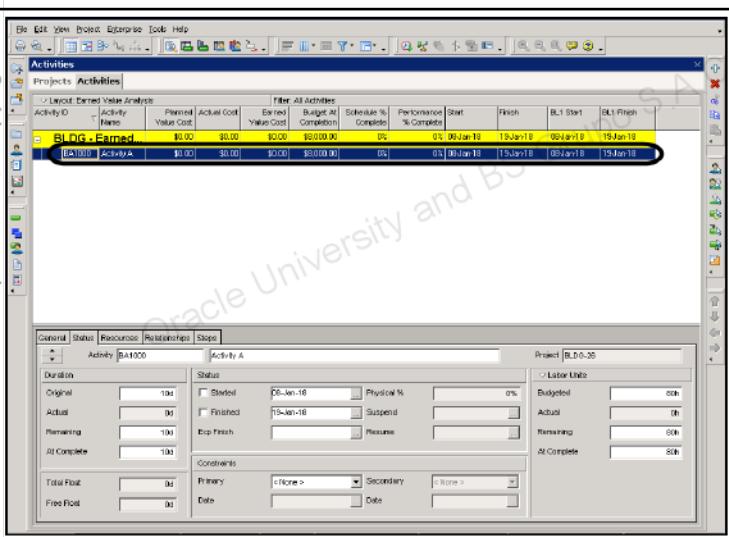


Figure 25-1: The project has one activity, *BA1000*.

Open a project.

1. Open a project, *BLDG-25 BLDG – Earned Value*.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Earned Value Analysis*, and then click *Open*.

Planned Value Cost, Actual Cost, and Earned Value Cost are zero because the activity has not started.

Calculating Planned Value Cost

Planned Value Cost is the cost of the work that should have been accomplished as of the data date, if the project had proceeded according to the baseline plan.

$$\text{Planned Value Cost} = \text{Budget at Completion} \times \text{Schedule \% Complete}$$

An alternative way to define Planned Value Cost: One day of work should have been completed with a single resource at 8 h/d and \$100/h; therefore, 8hr x \$100/h = \$800.

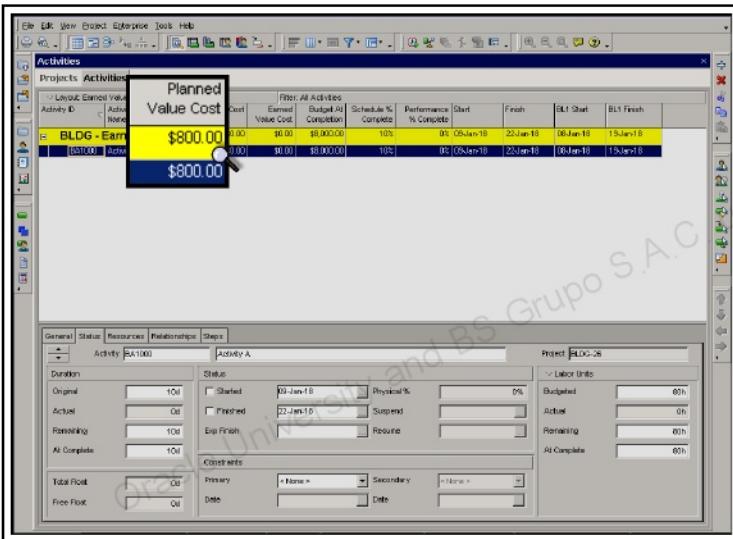


Figure 25-2: Planned Value Cost equals \$800.

⌚ Schedule the project and view Planned Value Cost.

1. On the Tools menu, click *Schedule*.
2. Select a new data date, *09-Jan-18*, and then click *Schedule*.

Calculating Actual Cost

Actual Cost is the actual total cost incurred for the work accomplished as of the data date.

Actual Cost = Actual Labor Cost + Actual Nonlabor Cost + Actual Expense Cost + Actual Material Costs

(Although there are no expenses or nonlabor costs in the present example, Actual Total Cost can be viewed on the Summary tab in Activity Details.)

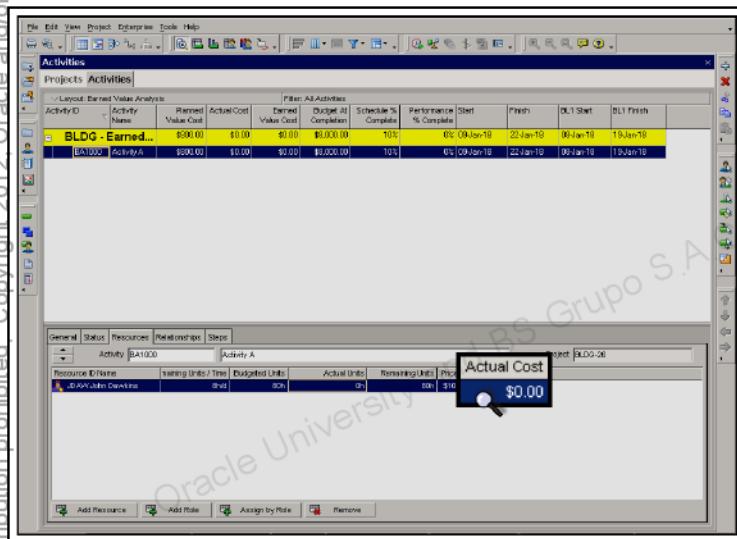


Figure 25-3: View the Actual Cost for labor and nonlabor resources on the Resources tab.

View Actual Cost.

1. In Activity Details, click the Resources tab, and view the Actual Cost for the resource assignment.

Calculating Earned Value Cost

Earned Value Cost is the monetary value of work performed by a resource as of the data date.

$$\text{Earned Value Cost} = \text{Budget at Completion} \times \text{Performance \% Complete}$$

Since 25% of the work has been completed, 25% of the cost should have been incurred: \$2000 (25% of \$8,000).

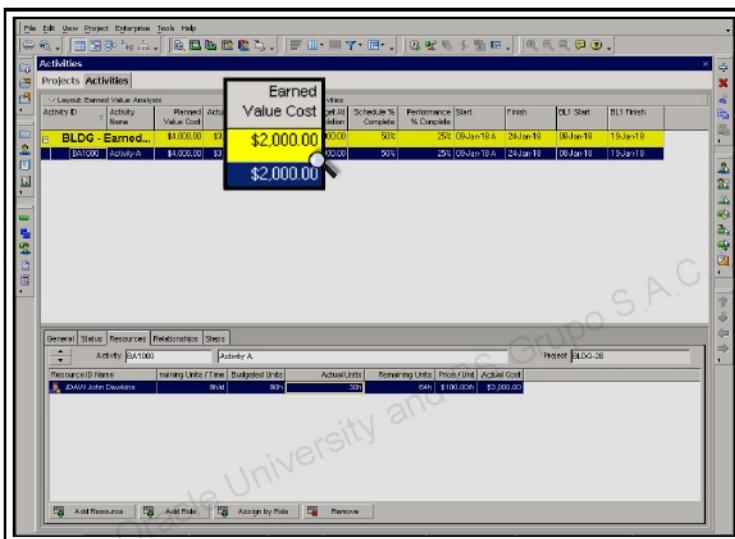


Figure 25-4: Earned Value Cost equals \$2,000.

Update an activity and view the effect on Earned Value Cost.

- In Activity Details, click the Status tab.
- Select the *Started* check box and confirm a Start date, *09-Jan-18*.
- In the *Physical %* field, type **<25>** and in the *Remaining Duration* field, type **<8>**.

Performance Percent Complete is set to 25% because the activity's Percent Complete Type is set to Physical (in the General tab). Physical % has been entered as 25%. Earned Value Cost is calculated as 25% of \$8,000 = \$2,000.

- Click the Resources tab, and in the *Actual Units* field, type **<30>**.
- On the Tools menu, click *Schedule*, select a new data date, *15-Jan-18*, and then click *Schedule*.

Performance % Complete

Accurate and reliable determination of Performance Percent Complete is essential to a meaningful earned value analysis. Performance Percent Complete can be different from the Activity Percent Complete depending on the technique used to compute it. Techniques are set at the WBS level and calculated as:

- **Activity percent complete**—Calculated based on the activity's percent complete type.
- **WBS Milestones percent complete**—Calculated based on the completion of the WBS element's weighted milestones.
- **0/100**—Calculated as 0% after an actual start is assigned, then as 100% after an actual finish is assigned.
- **50/50**—Calculated as 50% after an actual start is assigned, then as 100% after an actual finish is assigned.
- **Custom percent complete**—Calculated as a user-defined percentage after an actual start is assigned, then as 100% after an actual finish is assigned.



Figure 25-5: Settings can be viewed on the Earned Value tab in WBS Details.

View Earned Value settings in the WBS window.

1. On the Project menu, click *WBS*.
2. Select the top level of the WBS, *BLDG-25*.
3. In WBS Details, click the Earned Value tab.

Weighted Milestones

WBS milestones can be used when higher-level task increments comprise a body of activities and you want to control the activities at the WBS level. When you assign weights to the WBS milestones, the completion of each specific milestone is used to calculate the performance percent complete of the WBS.

- Weight of the milestone can be any number between 0 and 999999.
- Performance Percent Complete is calculated based on the relative weights of the completed milestones versus the incomplete milestones.
 - ◆ Performance Percent Complete is applied to all the activities under that WBS element, and then rolled back up to the WBS.
- The following option must be set to use weighted milestones: In the WBS window, click the Earned Value tab in WBS Details. Select the *WBS Milestone percent complete* check box.

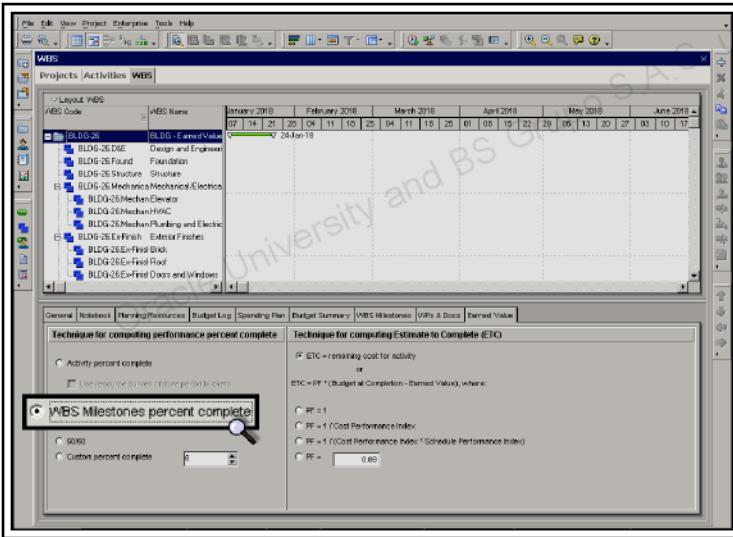


Figure 25-6: Select WBS Milestone percent complete.

Set WBS Milestone percent complete for computing Performance Percent Complete.

1. In the Earned Value tab, select *WBS Milestones percent complete*
2. Click *Yes* when prompted.

Creating Weighted Milestones

In the WBS window, you must enter weights for each milestone. The weights are relative to one another based on 100% completion of all the milestones.

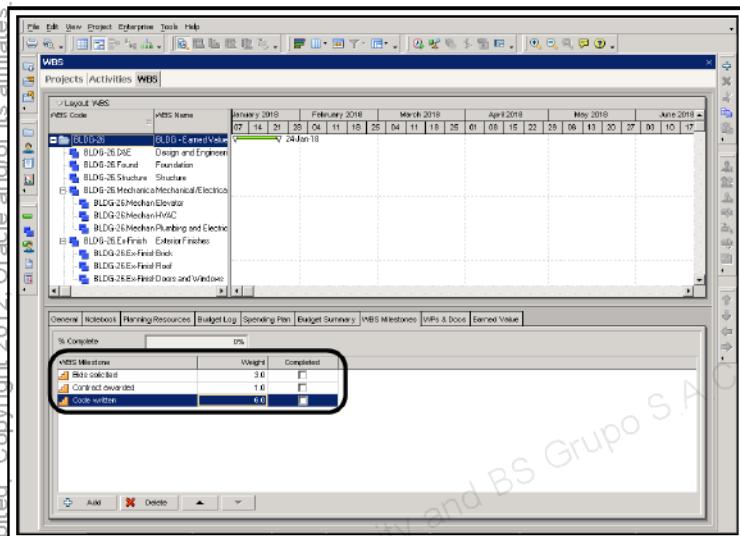


Figure 25-7: Create weighted milestones on the WBS Milestones tab.

Updating Weighted Milestones

The Milestone Percent Complete is based on the relative weights of the completed milestones versus the incomplete milestones.

The Milestone Percent Complete is calculated as: Bids solicited = 30%, Contract awarded = 10.0%, Code written= 60.0%.

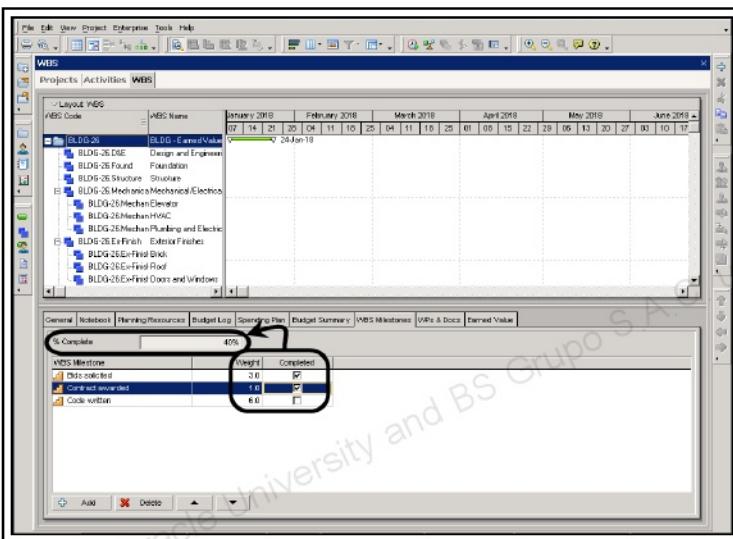


Figure 25-8: The Milestone % Complete is based on the weights of the completed milestones.

Mark WBS milestones complete.

1. Select the *Completed* check box for the first milestone, *Bids solicited*.
2. Select the *Completed* check box for the second milestone, *Contract awarded*.

? *What is the Performance Percent Complete for the activity at this point?*

Effect of Weighted Milestones on Activities

The Performance Percent Complete is set equal to the WBS milestones' Percent Complete.

$$\text{Earned Value} = \text{Budget At Completion} \times \text{Performance Percent Complete}$$

$$(\$3,200.00 = \$8,000.00 \times 40\%)$$

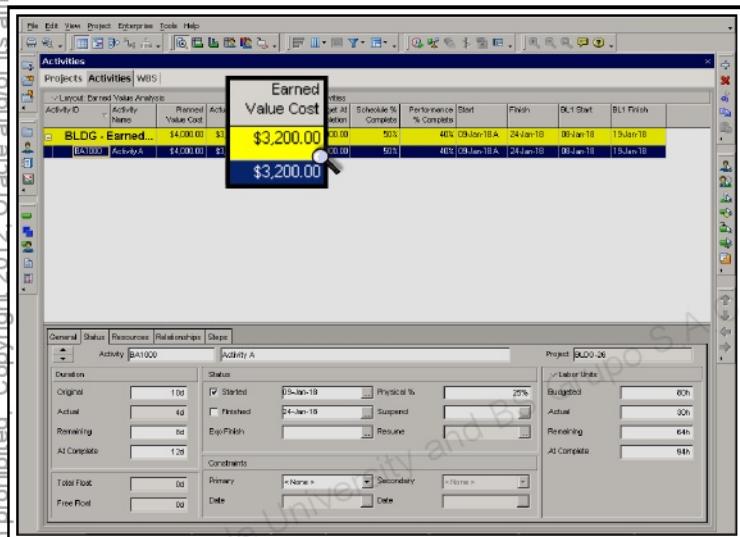


Figure 25-9: Earned Value Cost equals \$3,200.

View the calculations on an activity using weighted milestones.

- Click the Activities view tab to return to the Activities window.

The Performance Percent Complete is now set to 40% because two of the WBS milestones were completed.

The Earned Value Cost is now calculated as 40% of \$8,000 = \$3,200.

50/50

This technique assigns a Performance Percent Complete of 50% to an activity once the activity has been marked started, and 100% complete when the activity is marked completed.

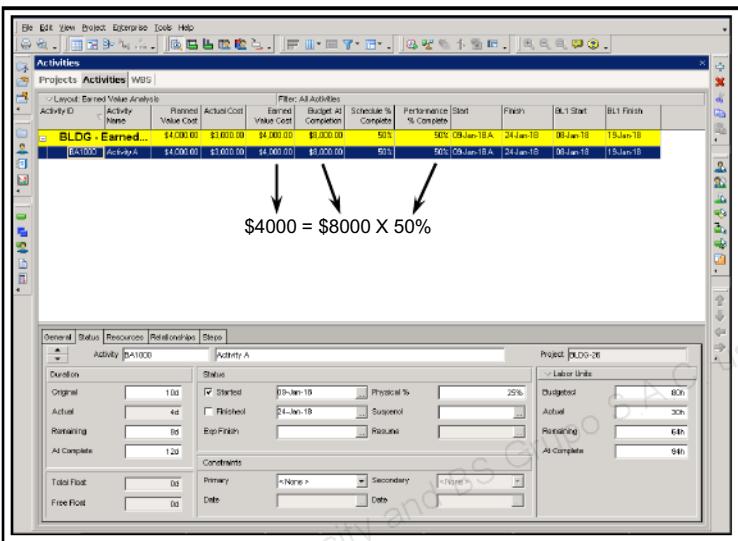


Figure 25-10: A 50/50 cost calculation.

View a 50/50 cost calculation.

1. Click the WBS view tab near the top of the screen to return to the WBS window.
2. In WBS Details, click the Earned Value tab.
3. In the Technique for computing performance percent complete section, select *50/50*.
4. When prompted, click *Yes*.
5. Click the Activities view tab.

Activity Percent Complete

Activity Percent Complete calculates Performance Percent Complete from the activity's Percent Complete type.

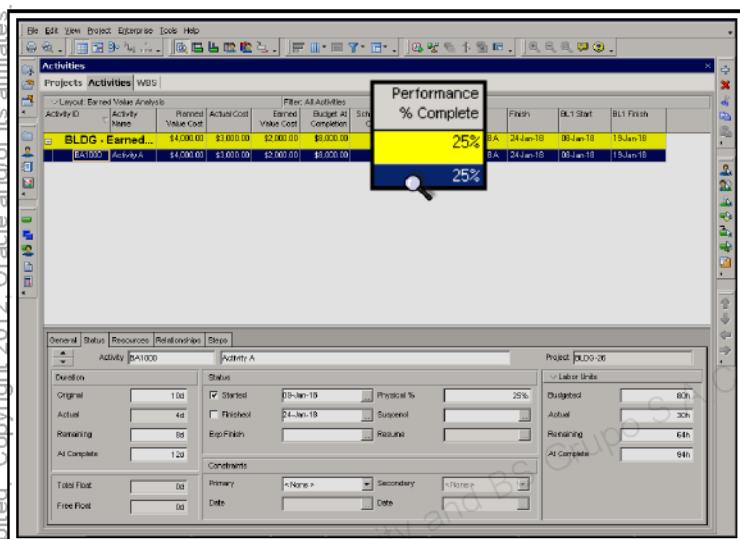


Figure 25-11: An Activity Percent Complete calculation.

View an Activity Percent Complete calculation.

1. Click the WBS view tab.
2. In the Earned Value tab Technique for computing performance percent complete section, select *Activity percent complete*.
3. When prompted, click *Yes*.
4. Click the Activities view tab.

The Performance % Complete is now set to 25% because the activity has an actual start and we are using the Activity % Complete of 25%. Consequently, the Earned Value Cost is now calculated as 25% of \$8,000 = \$2,000.

? *True or False: Selection of the technique for computing performance percent complete can have a significant impact on earned value calculations.*

Conclusions Based on Earned Value

Once you have completed an updating cycle, you can draw conclusions about schedule and cost performance by comparing Planned Value Cost, Earned Value Cost, and Actual Cost.

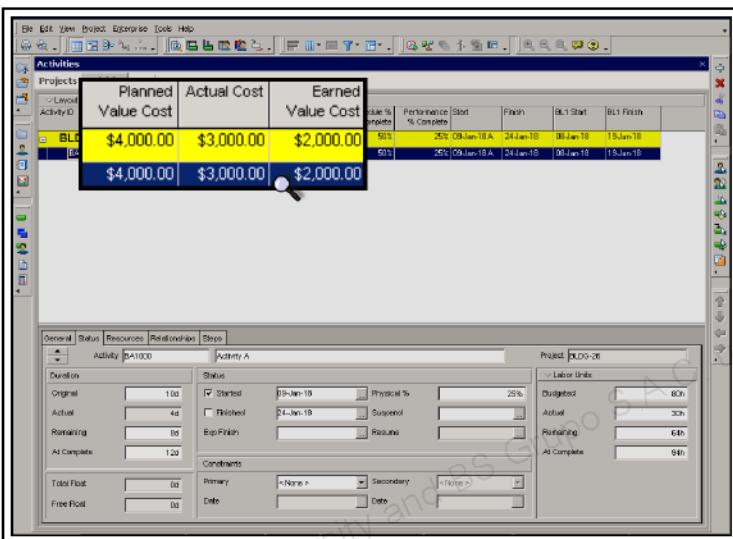


Figure 25-12: View Planned Value Cost, Earned Value Cost, and Actual Cost in the Activity Table.

Cost and Schedule Performance Indices

P6 Professional automatically calculates the Cost Performance Index and Schedule Performance Index.

Cost Performance Index (CPI)

- Relates the physical work accomplished to the dollars spent to accomplish the work.
- CPI = Earned Value Cost / Actual Cost
 - ◆ A value of less than one (1) indicates that actual costs have exceeded the value of the work accomplished.
 - ◆ For every project dollar spent, \$0.67 in physical work was accomplished.

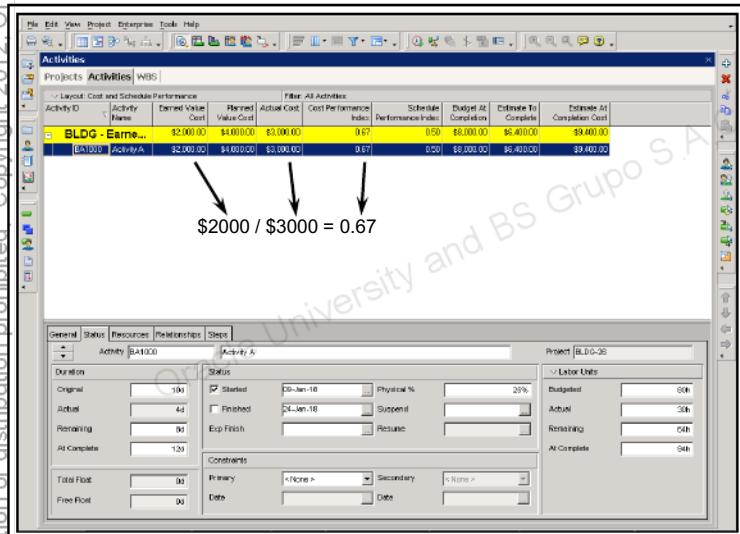


Figure 25-13: A CPI value of less than 1 indicates that costs have exceeded the value of the work performed.

View performance indices.

1. On the Layout Options bar, click *Layout, Open*.
2. Select a layout, *Cost and Schedule Performance* and then click *Open*.

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Schedule Performance Index (SPI)

- Relates the physical work accomplished to the amount of work that was planned.
- SPI = Earned Value Cost / Planned Value Cost
 - ◆ A value of less than one (1) indicates that less work was actually performed than was scheduled.
 - ◆ For every dollar of work planned, only \$.50 was actually completed.

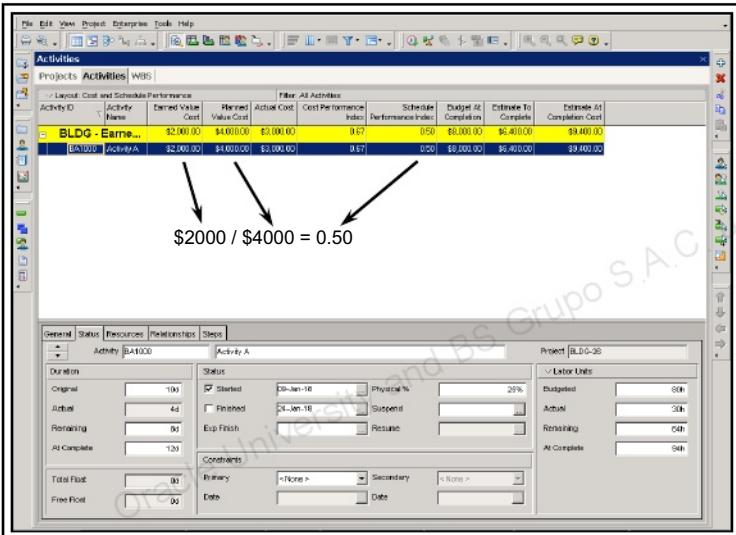


Figure 25-14: SPI relates the physical earned value accomplished against the amount of work that was planned.

Calculating Estimate to Complete

Estimate to Complete identifies how much money you are projecting to spend from now through the end of your project. P6 Professional offers several techniques for calculating ETC. The selected technique is set at the WBS level.

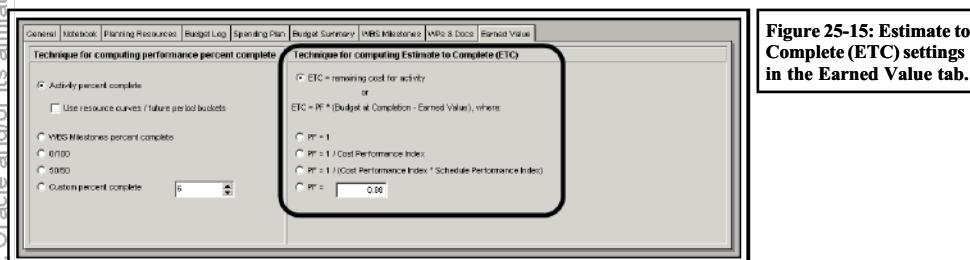


Figure 25-15: Estimate to Complete (ETC) settings in the Earned Value tab.

View the Earned Value tab in WBS Details.

1. Click the WBS view tab.
2. In the Earned Value tab in WBS Details, confirm that *ETC = remaining cost for activity* is selected in the Technique for computing Estimate to Complete (ETC) section.

Using Remaining Cost for Activity to Calculate ETC

Remaining cost for activity is the system default. It calculates ETC based on Remaining Units. However, this calculation does not take into account schedule delays cost overruns. Historical evidence shows that such negative trends do not correct themselves but tend to worsen over time.

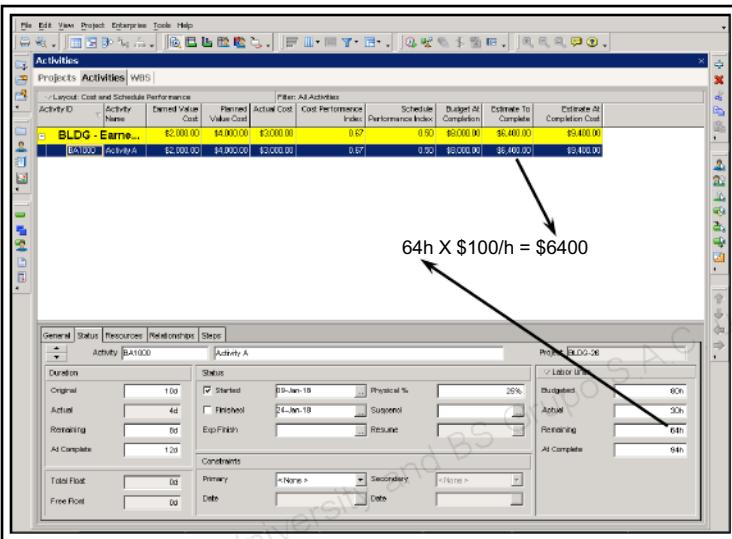


Figure 25-16: Using remaining cost for the activity, the calculated ETC is \$6400.

Using CPI to Calculate ETC

Using CPI to calculate ETC represents a reliable indicator of the "minimum" total required costs. It is viewed as the most optimistic the project will do based on its history.

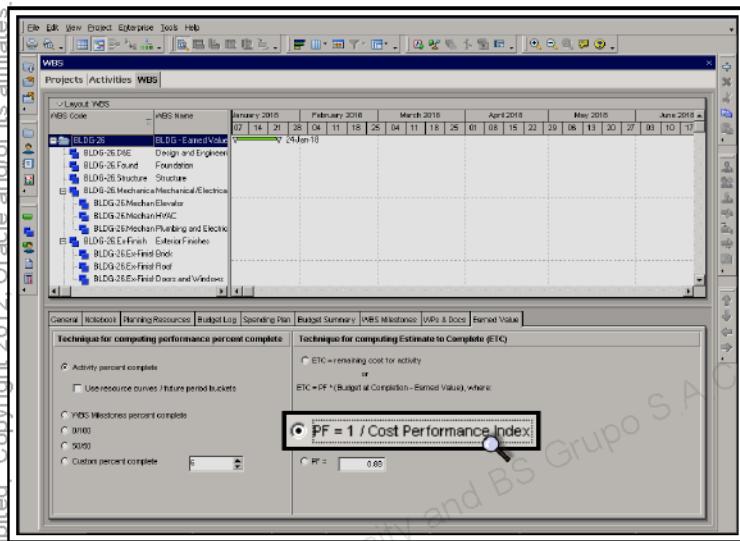


Figure 25-17: Select a new setting for calculating the ETC.

Select a different technique for computing ETC.

1. Click the WBS view tab.
2. In the Technique for computing Estimate to Complete (ETC) section in WBS Details, select $PF = 1 / \text{Cost Performance Index}$.
3. When prompted, click *Yes*.

- ETC = PF X (Budget at Completion - Earned Value Cost)
 - ◆ Where PF = 1/CPI
- (1/CPI) X (Budget at Completion - Earned Value Cost)
- Therefore, ETC = (1/CPI) X (Budget at Completion - Earned Value Cost)

The ETC is \$9,000, meaning that if the project progresses as it has in the past, it will cost \$9,000 to complete the project. The original budget was \$8,000 and when we complete the project it will cost \$12,000 (Actual + ETC).

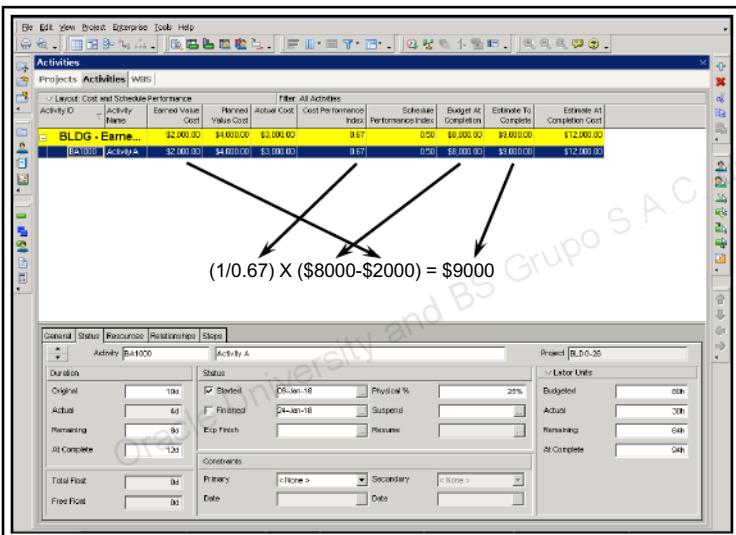


Figure 25-18: Estimate to Complete is \$9,000.

Using CPI and SPI to Calculate ETC

Using CPI and SPI to calculate ETC represents a reliable indicator of the "maximum" total required costs because it incorporates the cost overrun to date with a behind-schedule condition to produce the statistical forecast.

- Viewed as the very worst the project will do based on its history.

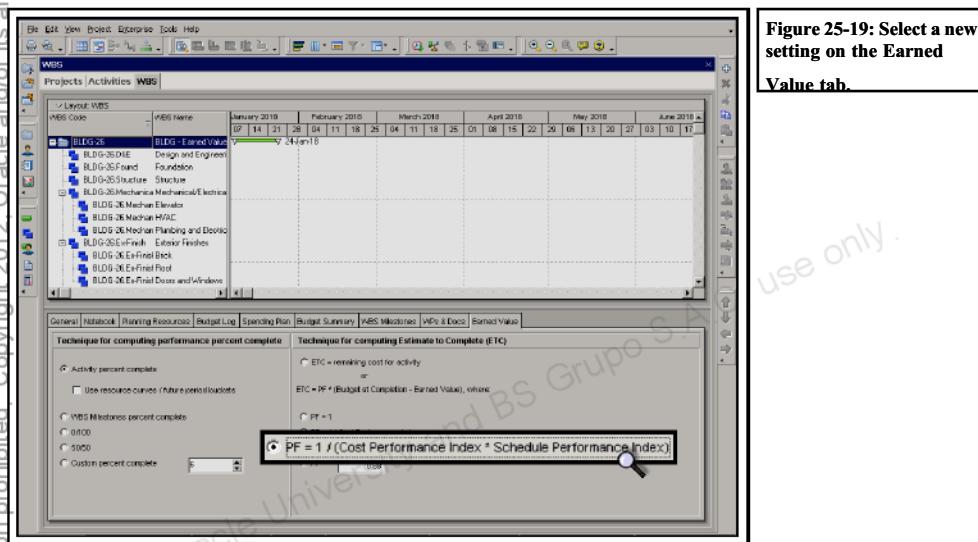


Figure 25-19: Select a new setting on the Earned Value tab.

Select a different technique for computing ETC.

- Click the WBS view tab.
- In the Technique for computing Estimate to Complete (ETC) section in WBS Details, select $PF = 1 / (Cost\ Performance\ Index * Schedule\ Performance\ Index)$.
- When prompted, click *Yes*.

- ETC = PF X (Budget at Completion - Earned Value Cost)
 - ◆ Where PF = 1/(CPI * SPI)
- [1/(CPI X SPI)] X (Budget at Completion - Earned Value Cost)

The ETC is \$18,000. This means that if the project progresses as it has in the past, it will cost \$18,000 to complete the project. The project has already incurred \$3,000 worth of costs, therefore the Estimate at Completion Cost (EAC) is \$21,000. The original budget was \$8,000, creating a Variance at Completion (VAC) of -\$13,000.

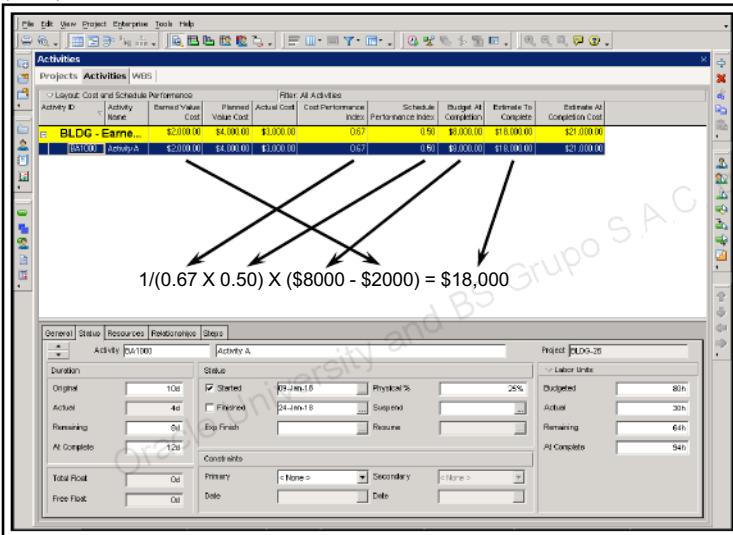


Figure 25-20: Estimate to Complete is \$18,000.

View an ETC calculation.

1. Click the Activities view tab.
2. View the ETC calculation in the Activity Table.

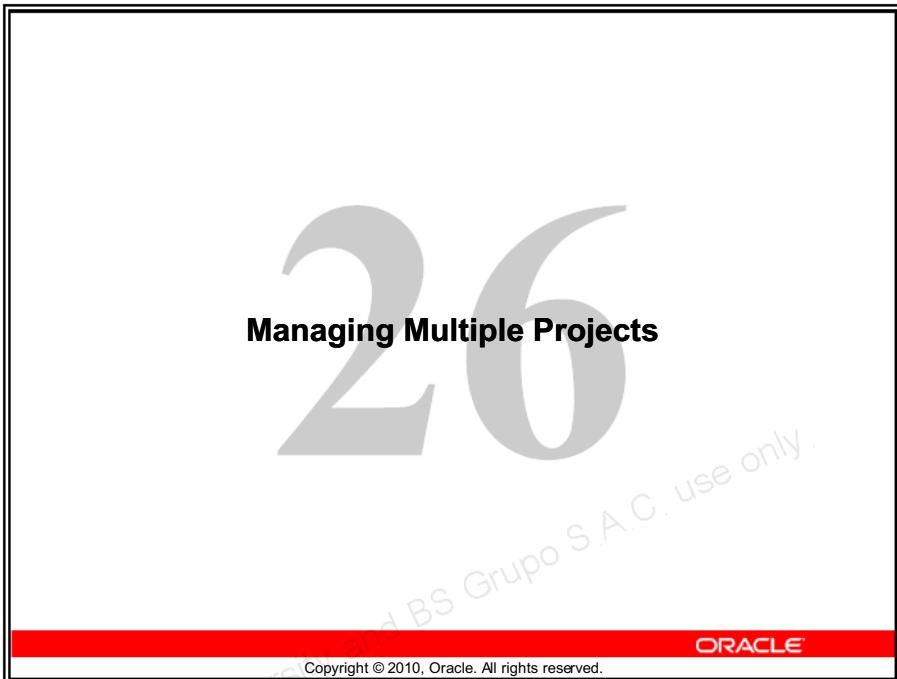
Lesson Review

Key Concepts

- Perform an earned value analysis to compare the budgeted (planned) cost of work to the actual cost.
- Calculate the Planned Value, Earned Value, and Actual Costs to determine how much work should have been completed, how much work was completed, and how much the completed work cost.
- Assign weights to WBS milestones and use the completion of each specific milestone to calculate the performance percent complete of the WBS.

Review Questions

1. What is the cost of the work that should have been accomplished as of the data date, if the project proceeded according to the baseline plan?
 - a. Actual Cost
 - b. Planned Value Cost
 - c. Earned Value Cost
 - d. SPI
2. Which of the following is used to calculate Planned Value Cost?
 - a. Schedule % Complete
 - b. Performance % Complete
 - c. Physical % Complete
 - d. Activity % Complete
3. **True or False:** A CPI value of less than 1 indicates that actual costs have exceeded the value of the work performed.
4. Which of the following relates the physical work accomplished against the amount of work that was planned to be accomplished?
 - a. Earned Value Cost
 - b. CPI
 - c. Actual Cost
 - d. SPI



Lesson 26 – Managing Multiple Projects

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	10	20	5	45

Objectives

After completing this lesson, you should be able to:

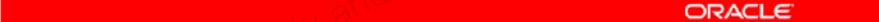
- Filter and apply progress to multiple projects.
- Set the default project for multiple projects.
- Explain how project elements are handled in multi-project mode.

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Benefits of Breaking Large Project Into Smaller, Multiple Projects

- Break into phases or smaller projects while maintaining inter-project relationships.
- Keep sensitive financial information confidential when working with multiple organizations.
- Meet requirements of governments and other sponsors to maintain separate, smaller projects or phases of a larger project.

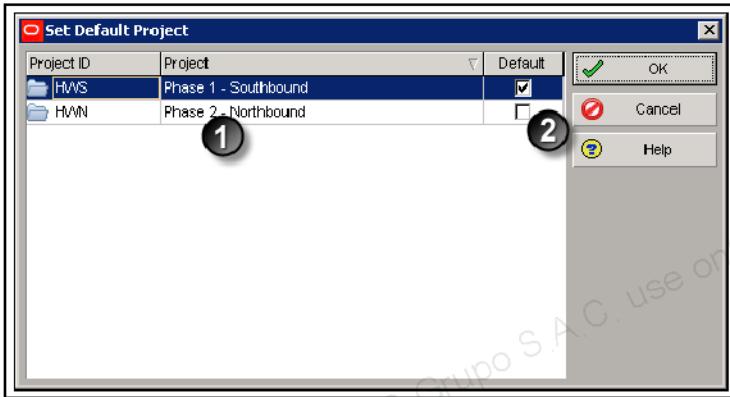


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Overview: Managing Multiple Projects

When multiple projects are open, you can group and filter; schedule all open projects simultaneously; open additional projects that have dependencies to open projects; and manage cross-project relationships. On the Project menu, click *Set Default Project* to display the Set Default Project dialog box.



- ➊ Set Default Project dialog box displays a list of the open projects.
- ➋ Select the *Default* check box to specify the project to use by default when adding new information.

Practice: Managing Multiple Projects

In this practice you will:

- Open multiple projects.
- Filter and apply progress to activities in multiple projects.
- Set the default project for multiple projects.
- Monitor critical activities.

In this lesson, you will monitor the status of a large project. Due to the complexity of the project, each phase is maintained as a separate project with its own schedule.

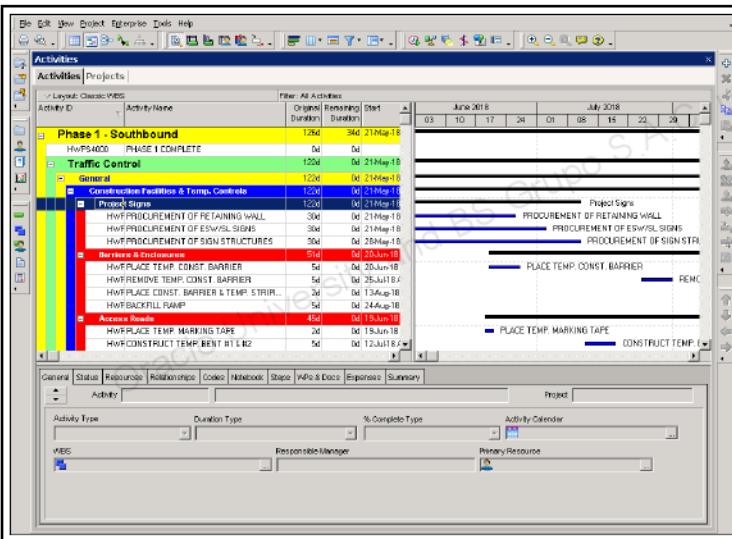


Figure 26-1: View the progress on the first phase of the project.

Open multiple projects.

1. On the File menu, click *Close All* to close all open projects.
2. On the File menu, click *Open*.
3. In the *REVO EPS* element, Ctrl+Click and select the projects, *HWS Phase 1 – Southbound* and *HWN Phase 2 – Northbound*, and then click *Open*.
4. Open a layout, *Classic WBS*

Viewing Multiple Project Activities

When an activity in one project has a relationship to an activity in another project, these projects are dependent on each other. Group by project in the Activities window to view activities associated with each project.

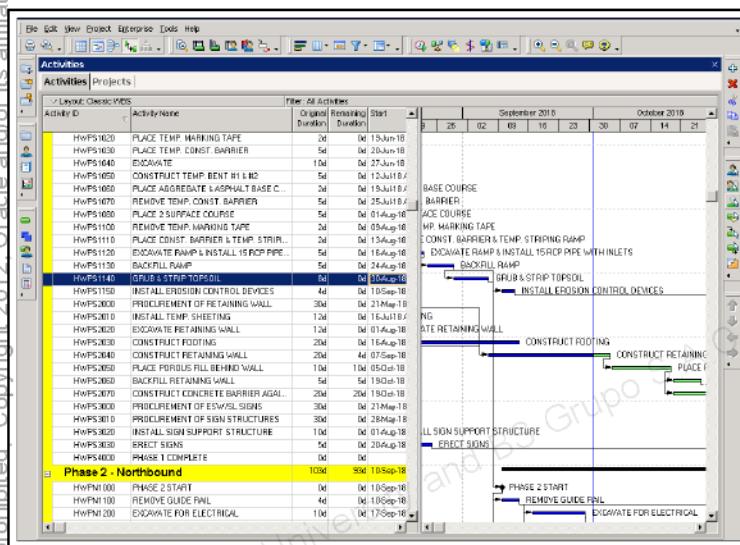


Figure 26-2: The projects are grouped into two WBS bands.

Viewing Activities Assigned to a Resource in Multiple Projects

Filtering activities in open projects enables you to see activity assignment information for multiple projects in one layout. For example, run a filter to see to which projects a resource is assigned.

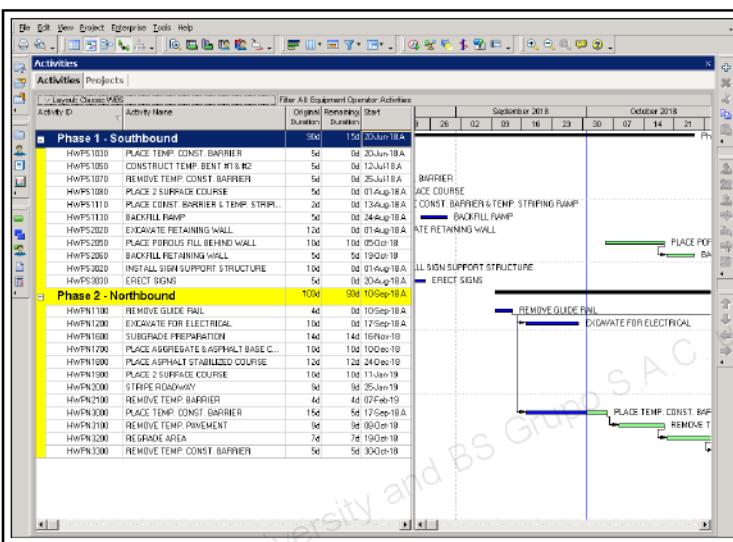


Figure 26-3: A view of activities assigned to the resource, *Equipment Operator*, in the open projects.

>Create and run a filter.

1. On the Layout Options bar, click *Filters*.
2. Click *New*.
3. In the *Filter Name* field, type <**Equipment Operator Activities**>.
4. In the *Parameter* list, select *Resources*.
5. Double-click in the *Is* field, and then select *contains* from the list.
6. Double-click in the *Value* field, and then type <**Equipment Operator**>.
7. Click *OK*.
8. Click *OK*.

View the activities to which the *Equipment Operator* is assigned in both projects.

Applying Progress Across Multiple Projects

Apply progress to activities in multiple projects simultaneously.

Use a filter to quickly see which activities should be updated during a specified period of time.

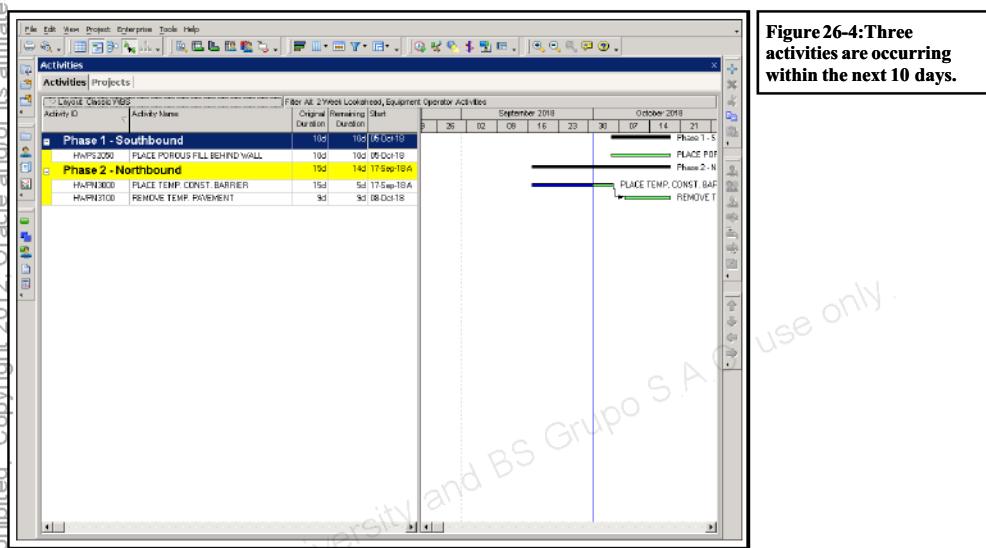


Figure 26-4:Three activities are occurring within the next 10 days.

Next, status activities that have made progress during the period from 1-Oct-18 to 8-Oct-18.

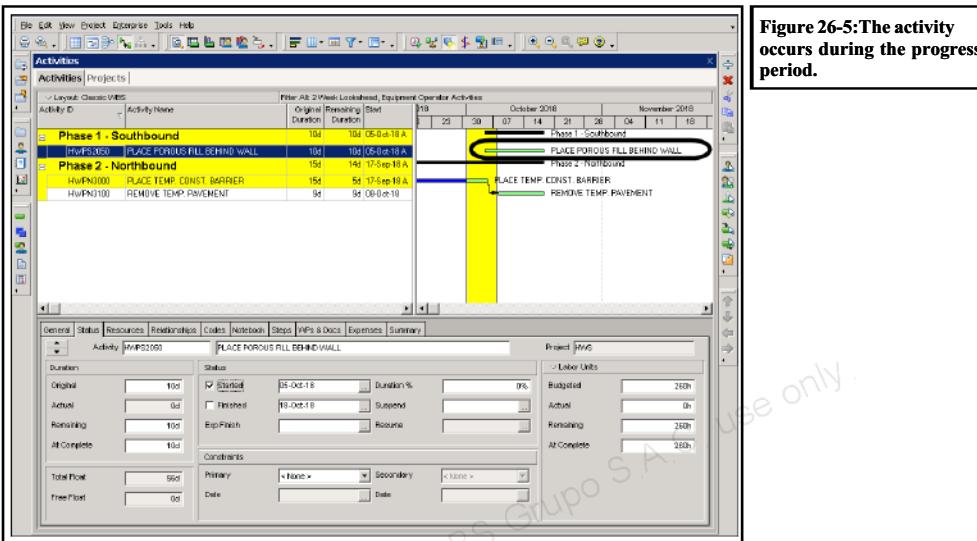


Figure 26-5: The activity occurs during the progress period.

Activity *HWPN3000–Place Temp. Const. Barrier* is making expected progress and will be included in the progress update.

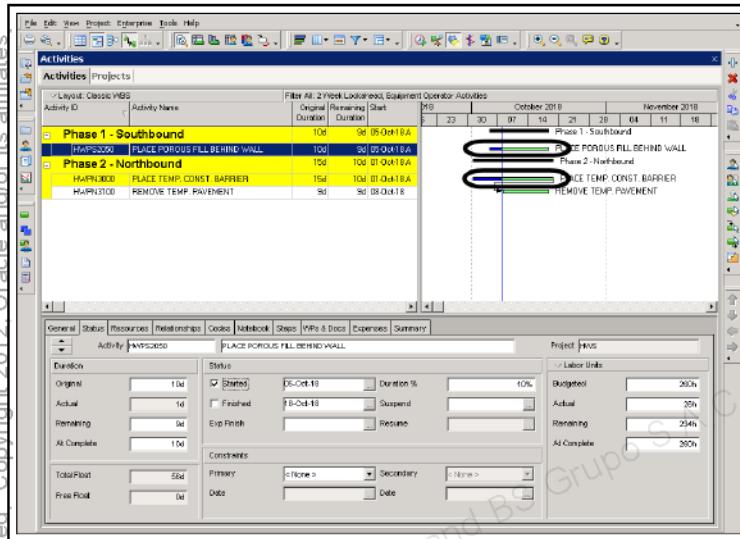


Figure 26-6: The activities are updated.

Run Update Progress for the selected activities.

1. On the Tools menu, click *Update Progress*.
2. Click *Apply*.
3. Click *OK*.

Viewing the Project ID of Predecessors and Successors

On the Relationships tab in Activity Details, you can display the *Project ID* column to see the ID of the project to which a predecessor or successor belongs.

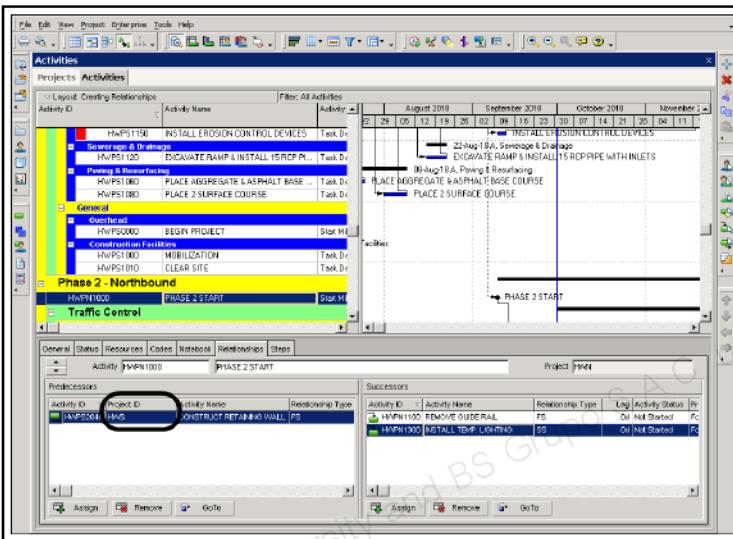


Figure 26-7: The Project ID column in the Relationships tab.

Display the Project ID column.

1. Open a layout, Classic WBS.
2. On the Top Layout toolbar, click to view relationships.
3. Select an activity, *HWPN1000 – PHASE 2 START*.
4. Click the Relationships tab.
5. Right-click in the column area in the Predecessor pane and select *Customize Predecessor Columns*.
6. In the *General*/grouping band, select *Project ID*, and then click .
7. Click *OK*.
8. In the Predecessors pane, confirm the predecessor's Project ID, *HWS*.

This activity has a relationship to an activity in another project.

Scheduling Multiple Projects

When scheduling multiple projects, all open projects are scheduled using each project's current data date.

In the Schedule Options dialog box, you can choose how to handle relationships to activities in a different database. If the *Ignore Relationships to and from other projects* check box is clear, P6 Professional will schedule activity dates based on external relationships to projects that are not in the same database as the project being scheduled. If this check box is selected, these dependencies are not considered when activities are scheduled.

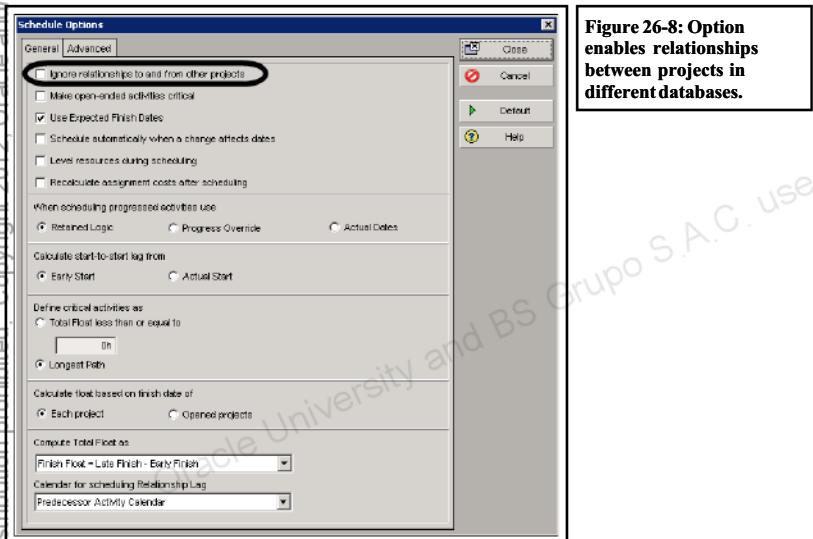


Figure 26-8: Option enables relationships between projects in different databases.

Setting the Default Project

When multiple projects are open, *Set Default Project* enables you to specify which project's settings to use when you add activities, schedule, or level, and which project to use by default when adding new information to the database. For example, if you add a new activity, and the project into which the new activity is added is not provided within the context of the current grouping, the activity is added to the default project.

Select *Project, Set Default Project*, to select the project from among open projects.

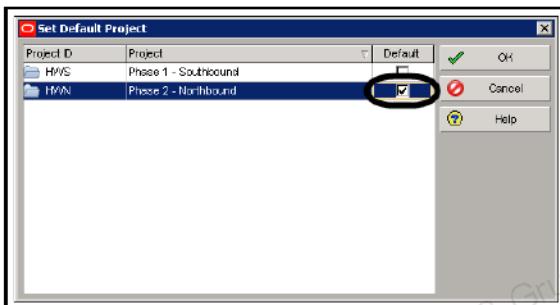


Figure 26-9: Select the default project from a list of open projects.

♂ Set the default project.

1. On the Project menu, click *Set Default Project*.
2. Select the *Default* check box for the *HWN – Phase 2 – Northbound* project, and then click *OK*.

How Project Elements are Handled in Multi-Project Mode

In multi-project mode, all project-owned elements follow a simple rule: the project that owns the element is the only project that may use the element. The list below details how some elements are handled.

- **Project-level activity codes** – All project-level activity codes are included with their respective projects when they are opened in multi-project mode. The activity code types are grouped by project and you can add, edit, or remove project-level activity codes as well as assign them to activities within their respective projects.
- **Project-level reports** – All global reports and all project-specific reports for the open projects are available. Project-owned reports use the project as a filter.
- **Project-level calendars** – All the project-level calendars are included with their corresponding projects when the projects are opened, either alone or in multi-project mode. In multi-project mode, the layout is grouped by project, so you can easily add, edit, or remove project-level calendars as well as assign them to activities within their respective projects.
- **Documents** – Documents are always grouped by project to make it clear that documents from one project may not be moved into the document hierarchy of another project.
- **Activity layouts** – All project-level elements, such as activity codes, are available for columns, grouping, filters, dialogs, etc. Project-level elements are similar to global elements, with the addition of the following guidelines for multi-project mode.
- **Baselines** – No baseline information is saved at the EPS level. If a baseline does not exist for one or more of the open projects, each of those projects uses the current plan as its primary baseline. You can select all open projects in the Baseline dialog box and click Add to add a baseline for all open projects.
- **Publish project Web site** – All the open, detailed (not summarized) projects are published to the same Web site in multi-project mode. When you select which reports to publish, all global reports and project-specific reports for the open projects are available.

Lesson Review

Key Concepts

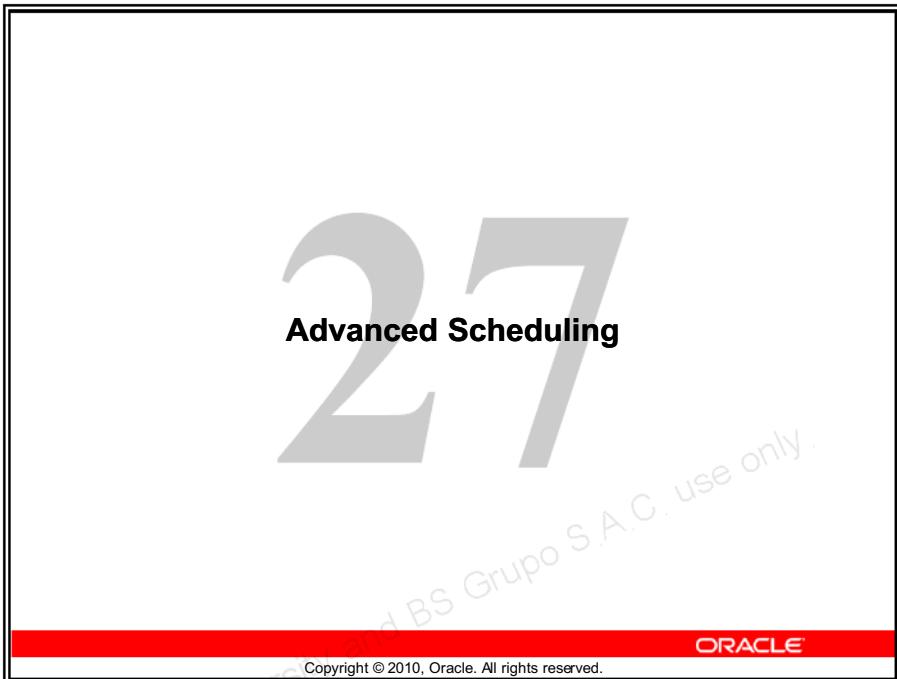
- P6 Professional allows relationships between activities in separate projects. When an activity in one project has a relationship to an activity in another project, these projects are dependent on each other.
- Set the default project to determine which project new information will be added.

Review Questions

1. **True or False:** Only milestones can have relationships between projects.
2. **True or False:** You can schedule all open projects using different data dates.

Notes





Lesson 27 – Advanced Scheduling

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	10	20	5	45

Objectives

After completing this lesson, you should be able to:

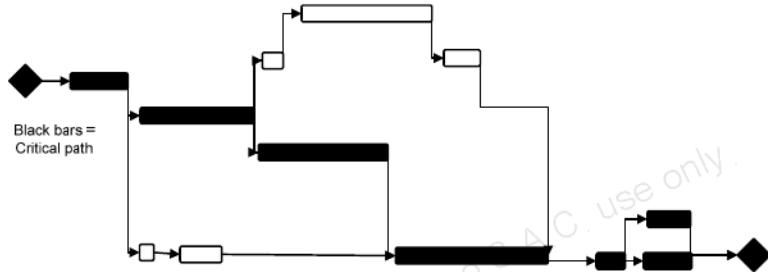
- Calculate multiple float paths when scheduling.
- Explain the difference between scheduling logic options.
- Describe a calendar's effect on lag.

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Critical Path

- Series of activities that determines a project's minimum total duration and completion date.
- Delay of critical activity will delay project finish.
- Defined either by Total Float or longest path in project network.



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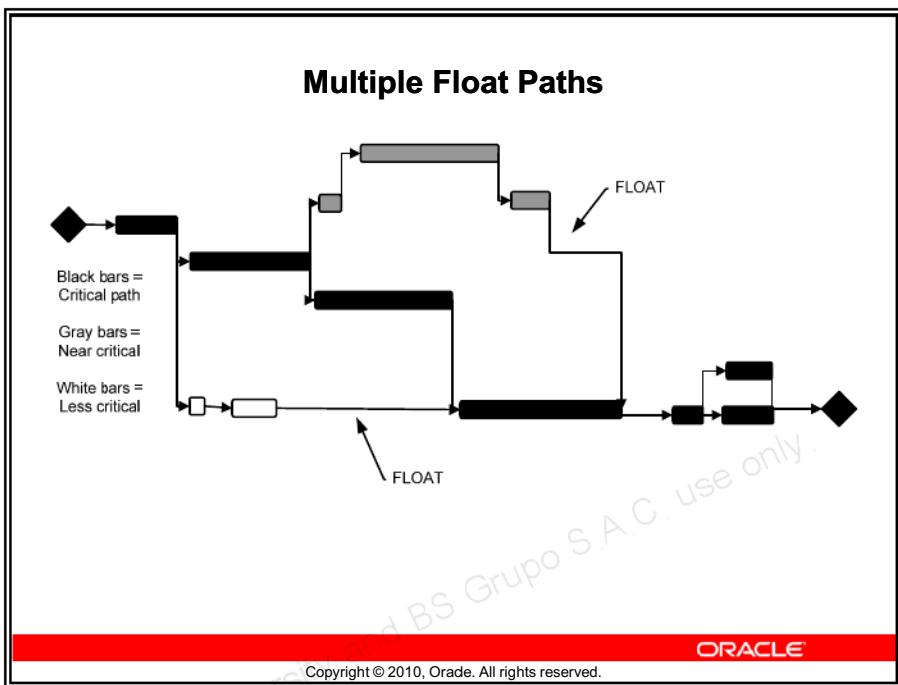
Question

Can activities that are not on the critical path affect project duration?

1. Yes
2. No

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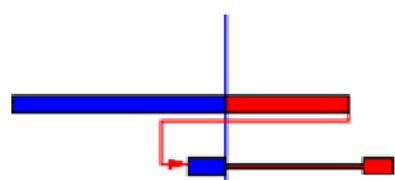
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Scheduling Out-of-Sequence Activities

Retained Logic

Preserves original relationship between activities.



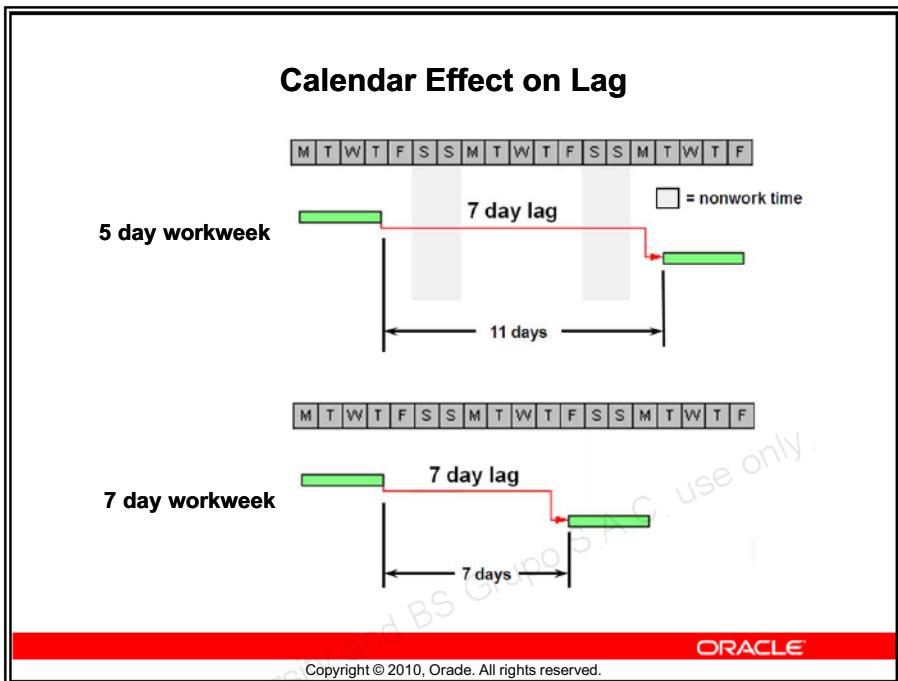
Progress Override

Disregards original relationship between activities.



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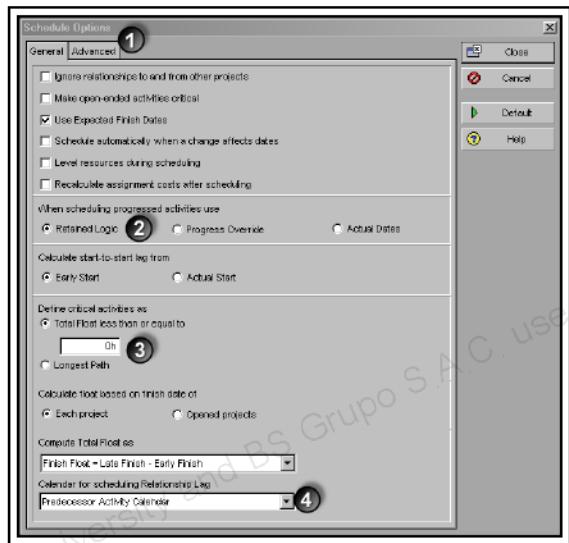


Notes



Overview: Using Advanced Scheduling Options

Click *Options* in the Schedule Options dialog box to access controls for handling a wide range of scheduling concerns and circumstances. The dialog box is divided into two tabs: General and Advanced.



- ① Click the Advanced tab to calculate multiple float paths.
- ② On the General tab, select the appropriate option for scheduling progressed activities.
- ③ Define critical activities by Total Float or by their inclusion on the longest path through the project's activity network.
- ④ Specify which calendar to use for scheduling relationship lag.

Practice: Using Advanced Scheduling Options

In this practice you will:

- Calculate multiple float paths for a project and view them in the Gantt chart and Activity Network.
- Use two methods to schedule activities that have been progressed out of sequence.
- Investigate the effects of different calendars on relationship lag.

Multiple Float Paths

Choose to calculate a specified number of float paths based on Total Float or Free Float. You can also choose the activity on which the float paths will end. You can calculate float paths that affect the entire project schedule or, by choosing an activity or a milestone, calculate float paths for a part of the schedule.

- **Total Float** – Working backward from the activity on which you want the paths to end, the application looks for driving predecessor relationships and determines which predecessor activity has the most critical driving relationship based on the least Total Float. Continuing backward from that activity, P6 Professional repeats this process until an activity is reached that has no predecessor relationship. Then, P6 Professional begins the forward pass from this activity and determines which successor activity has the most critical driving relationship, again based on the least Total Float, and repeats the process until an activity is reached that has no successor relationship. These activities represent the most critical float path. The overall process is repeated to calculate the remaining sub-critical paths. Because Total Float relates to the project as a whole, the Total Float method should be used if you want the multiple float paths to take into account a project's Must Finish By date.
- **Free Float** – Free Float is the amount of time an activity can slip without impacting the early start of its immediate successor. Choose this option to define float paths based on the longest path through the project's activity network. The most critical path will be identical to the critical path that is derived when you choose to define critical activities as Longest Path in the General tab in Project Details. The Free Float method should be used only if you are focusing on potential disruption impacts within the path itself and need not take into account a Must Finish By date.

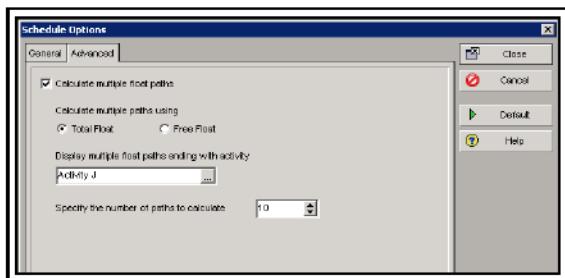


Figure 27-1: Schedule Options
Options enable you to calculate multiple float paths and to target them on a specific activity.

❖ **Set multiple float path scheduling options.**

1. Open a project, *BLDG-27 BLDG – Advanced Scheduling*.
2. Confirm that you are in the Activities window (or click the Activities tab near the top of the screen).
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Advanced Scheduling*, and then click *Open*.
5. On the Tools menu, click *Schedule*(or press *F9*on your keyboard).
6. In the Schedule dialog box, click *Options*, and then in the Scheduling Options dialog box, click the Advanced tab.
7. Select the *Calculate multiple float paths*checkbox.
8. Confirm that *Total Float*is selected.
9. In the *Display multiple float paths ending with activity*field, click *...*and then select *BA1090 - Activity J*.
10. Click

If an activity is not specified, float paths are calculated using the last activity in the project.

11. Click *Close*.

Each float path is ranked from most critical to least critical and stores the value for each activity in the *Float Path* field. For example, if you calculate five float paths, a value of 1 represents the most critical float path; a value of 5 represents the least critical float path.

To view the float paths after you schedule the project, group activities in the Activity Table by *Float Path*.

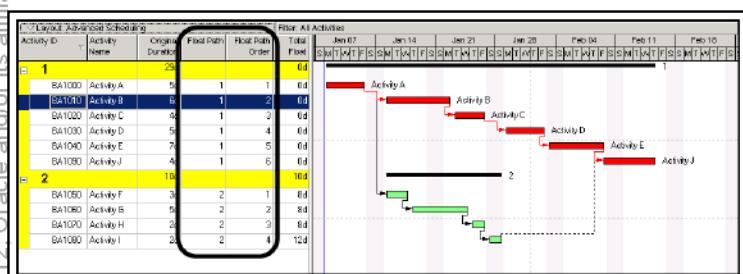


Figure 27-2: Activities grouped by float path. The *Float Path* and *Float Path Order* fields indicate which float path each activity belongs to and its order within the path.

View multiple float paths in the Gantt chart.

1. Click *Schedule*.
2. On the Layout Options bar, click *Group and Sort*.
3. In the Group and Sort dialog box *Group Bylist*, select *Float Path*.
4. Click *OK*.

You can also view the float paths in the Activity Network.

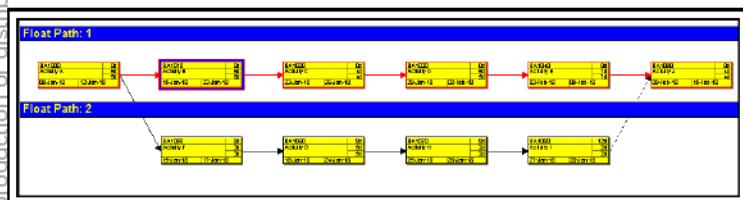


Figure 27-3: The float paths are displayed in the Activity Network.

View multiple float paths in the Activity Network.

1. On the Layout Options bar, click *Show on Top, Activity Network*.
2. On the Layout Options bar, click *Group and Sort*.
3. In the Group and Sort dialog box *Group Bylist*, select *Float Path*, and then click *OK*.

Scheduling Out-of-Sequence Activities

Work on activities may sometimes proceed out of sequence. For example, Task A might have a Finish to Start relationship with Task B, but work begins on Task B before Task A has been completed. Although usually not of serious concern, such instances nevertheless represent changes to the project plan that, unless accounted for, can disrupt activity relationships later in the project.

To prevent potential problems, P6 Professional offers three scheduling options for handling progress on out-of-sequence activities:

- **Retained Logic** — The Remaining Duration of a progressed activity is not calculated until all predecessors are complete.
- **Progress Override** — Network logic is ignored and the activity can progress without delay.
- **Actual Dates** — Backward, forward passes are scheduled using actual dates.

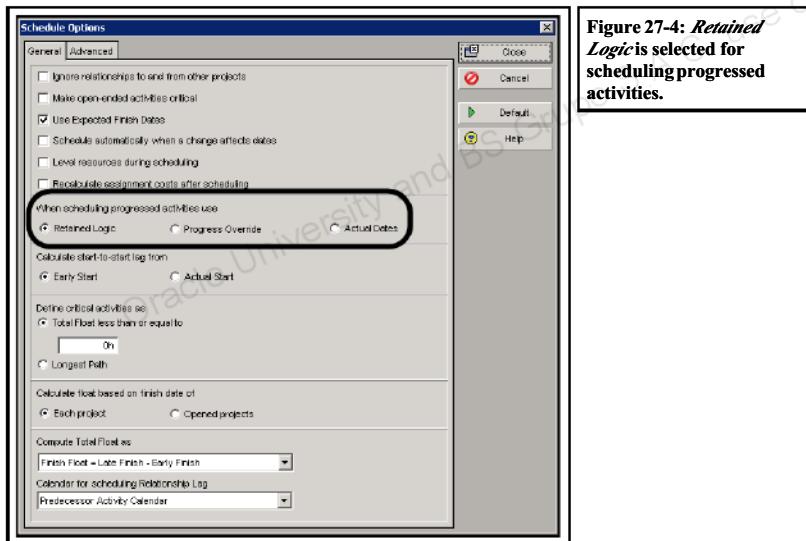


Figure 27-4: Retained Logic is selected for scheduling progressed activities.

Update activities and select Retained Logic for scheduling progressed activities.

1. On the Layout Options bar, click *Show on Top, Gantt Chart*
2. On the Layout Options bar, click *Group and Sort*.
3. In the *Group By* list, select *<None>*, and then click *OK*.

4. In Activity Details, click the Status tab, and update activities as specified in the following table:

Activity #	Update Actions
BA1000, BA1050, BA1060	Select the <i>Started</i> and <i>Finished</i> check boxes.
BA1010	Select the <i>Started</i> check box. In the <i>Remaining Duration</i> field, type <4>.
BA1020	Select the <i>Started</i> check box. In the <i>Remaining Duration</i> field, type <2>.

Using Retained Logic

When scheduling using retained logic, an activity that starts out of sequence cannot complete until its predecessor has finished. The Remaining Duration of the successor activity is scheduled to begin after its predecessor activity is scheduled to finish.

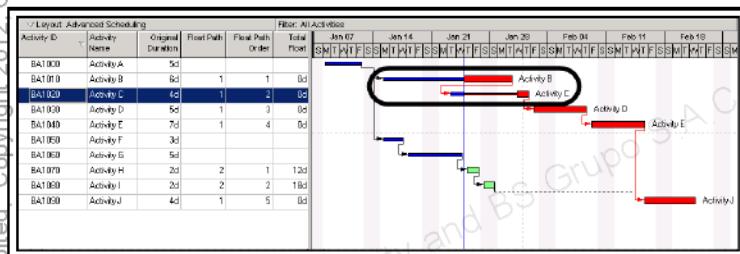


Figure 27-5: After scheduling, the remaining duration for Activity C is delayed until Activity B is completed.

Schedule the activities using the Retained Logic scheduling option.

1. On the Tools menu, click *Schedule*.
2. In the Schedule dialog box, click *Options*.
3. In the *When scheduling progressed activities use* field, confirm *Retained Logic*.
4. Click *Close*.
5. In the *Current Data Date* field, click and select a date, *25-Jan-18*.
6. Click *Schedule*.
7. View the activity bars in the Gantt chart.

Using Progress Override

When scheduling using progress override, P6 Professional ignores the relationship logic and schedules the Remaining Duration of the successor activity from the data date.

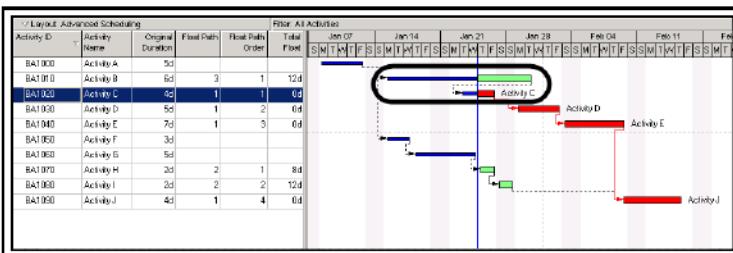


Figure 27-6: Progress Override enables Activity C to finish before Activity B.

Schedule activities using the Progress Override option.

1. On the Tools menu, click *Schedule*.
2. Click *Options*.
3. In the *When scheduling progressed activities us* field, select *Progress Override*.
4. Click *Close*.
5. Click *Schedule*.

Calendar Effect on Lag

Lag is defined as an offset or delay from an activity to a successor. In the General tab in Schedule Options, choose a calendar for P6 Professional to use when calculating lag between activities. The calendar used will affect activity dates and float. Lag is calculated based on one of the following calendars:

- **Predecessor Activity Calendar**— Based on the predecessor’s assigned activity calendar. This is the default calendar.
- **Successor Activity Calendar**— Based on the successor’s assigned activity calendar.
- **24 Hour Calendar**—Based on continuous workperiods.
- **Project Default Calendar**— Based on the calendar selected as Default for New Activities in the Defaults tab in Project Details.

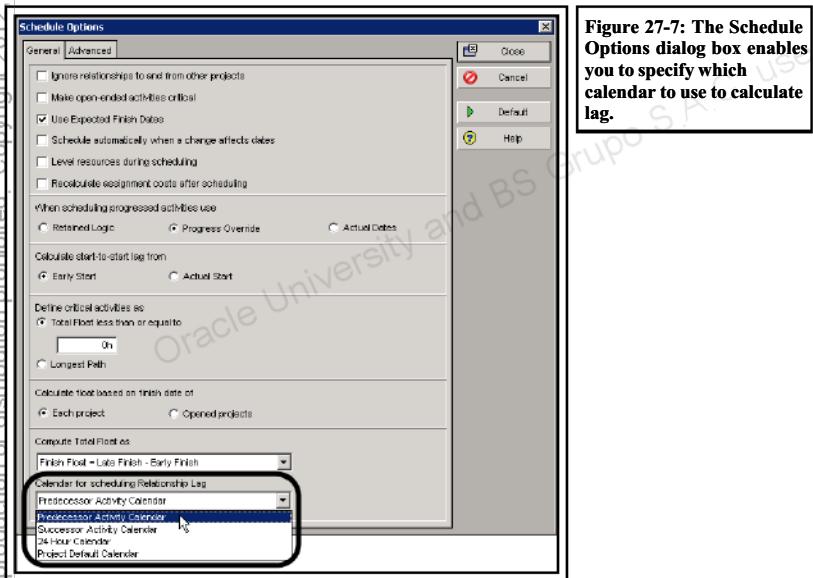


Figure 27-7: The Schedule Options dialog box enables you to specify which calendar to use to calculate lag.

Using the Predecessor Calendar

Assign lag to activities in the Relationships tab in Activity Details.

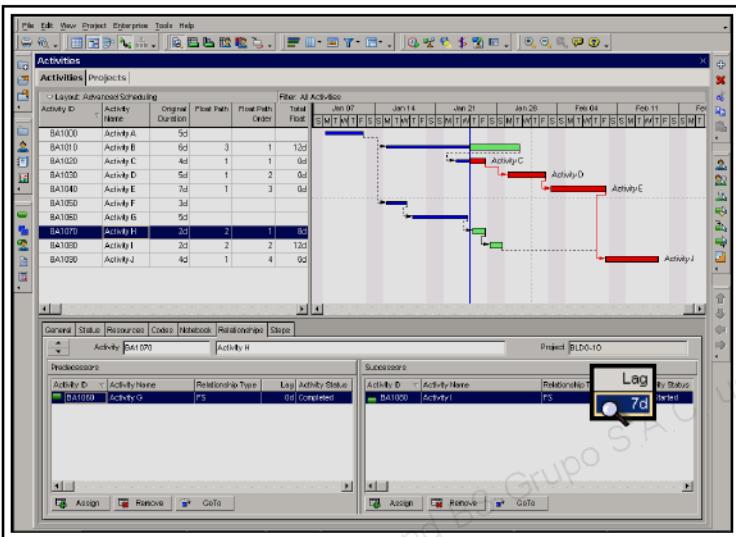


Figure 27-8: Apply lag to a relationship in the *Lag* field.

The early dates and Total Float may change depending on the calendar used to calculate lag.

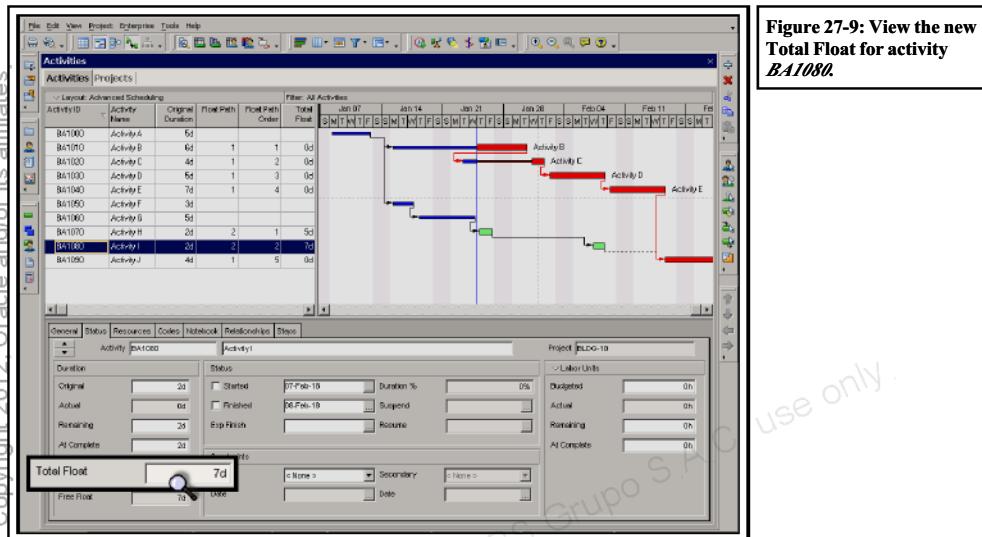


Figure 27-9: View the new Total Float for activity BA1080.

Schedule the project using the Predecessor Activity Calendar to calculate lag.

1. In the Activity Table, select *BA1080 – Activity I*.
2. In Activity Details, click the Status tab.
3. Confirm the early start date, *27-Jan-18*, and the early finish date, *28-Jan-18*.
4. Confirm Total Float, *12d*.
5. On the Tools menu, click *Schedule*, and in the Schedule dialog box, click *Options*.
6. In the *When scheduling progressed activities use* field, select *Retained Logic*.
7. In the *Calendar for Scheduling Relationship Lag* field, confirm *Predecessor Activity Calendar*.
8. Click *Close*, and then click *Schedule*.

? Now, what is the Early Start date for activity *BA1080*?

? What is the Early Finish date?

? What is the Total Float?

Using the Successor Calendar

Now, change from the predecessor's activity calendar to the successor's activity calendar for calculating lag and view the impact on activity *BA1080 - Activity I*.

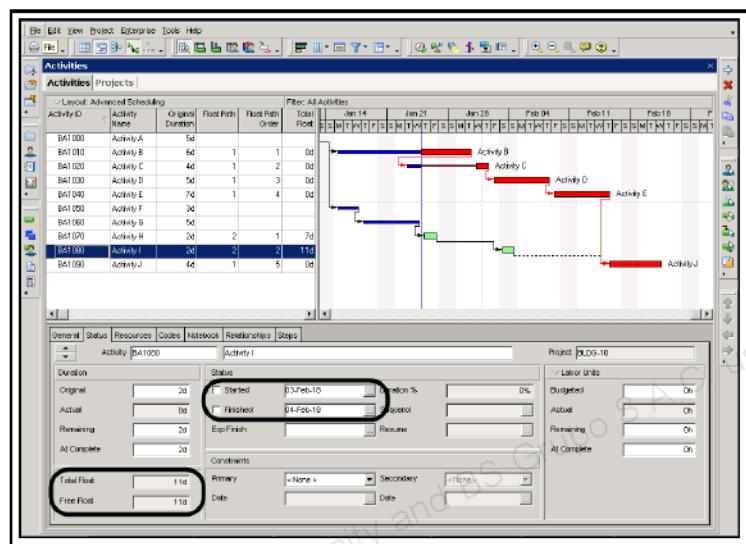


Figure 27-10: Review the new dates and float for activity *BA1080*.

Use the Successor Activity Calendar to calculate lag and view the results.

1. Confirm that *BA1080* is still selected and in Activity Details, and then click the General tab.
2. In the *Activity Calendar* field, confirm *7-8hr Days Workweek*
3. Click the Status tab and confirm the early start date, *7-Feb-18*, and the early finish date, *8-Feb-18*.
4. On the Tools menu, click *Schedule*, and in the Schedule dialog box, click *Options*.
5. In the *Calendar for Scheduling Relationship Lag* field, select *Successor Activity Calendar*
6. Click *Close*, and then click *Schedule*.

? Now, what is the early start date for activity *BA1080*?

? What is the early finish date?

? What is the Total Float?

Lesson Review

Key Concepts

- The Advanced Scheduling Options dialog box enables you to track multiple float paths in a project.
- Scheduling options enable you to choose how to schedule progressed out of sequence activities.
- When scheduling progressed activities, you can choose to ignore out-of-sequence logic by using Progress Override.
- In the Scheduling Options dialog box, you can choose the calendar to use for calculating relationship lag.

Review Questions

1. Why are multiple float paths important?
 - a. They help to define the major phases of a project.
 - b. They indicate which activities will likely take the longest to complete.
 - c. They reveal activities off the critical path that can affect project dates.
 - d. All of the above
2. **True or False:** Float paths that target a specific activity or project phase can be calculated.
3. Which option for scheduling progressed activities most closely preserves the original relationships between project activities?
 - a. Retained Logic
 - b. Progress Override
 - c. Actual Dates
 - d. a or c
4. **True or False:** Lag between two activities may be calculated differently depending on the calendar used.

Notes



SECTION VI

Appendices

Using P6 Professional with Spreadsheets

Claim Digger

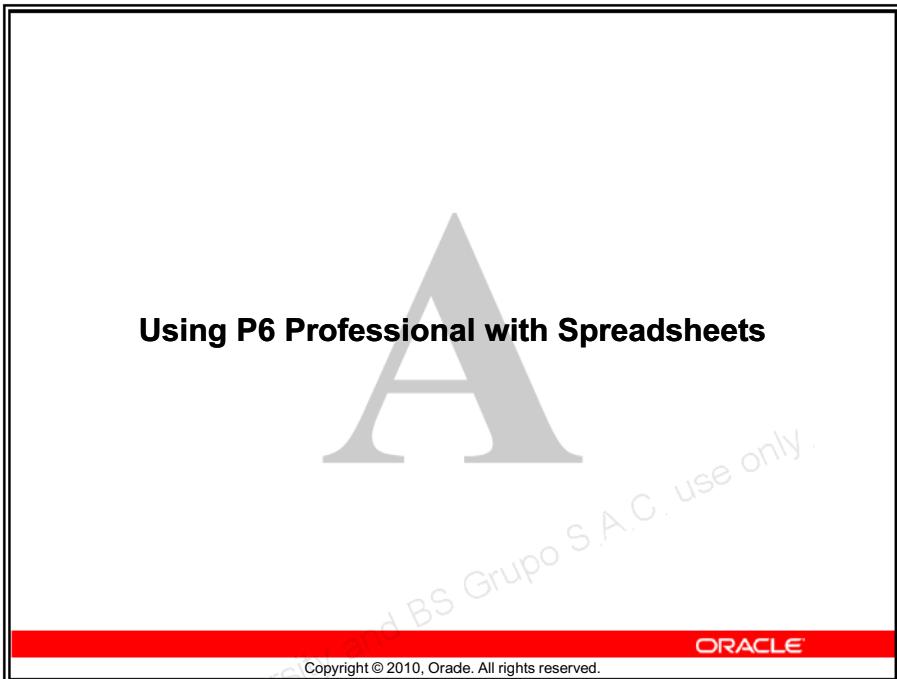
Creating Output

Timescaled Logic Diagrams

Case Study Solutions

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Appendix A – Using P6 Professional with Spreadsheets

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
5	15	20	5	45

Objectives

After completing this lesson, you should be able to:

- Export activity data to a spreadsheet application.
- Modify project information in the spreadsheet application.
- Import project information from the spreadsheet application.
- Importing a new project from the spreadsheet application.

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Exporting to a Spreadsheet Application

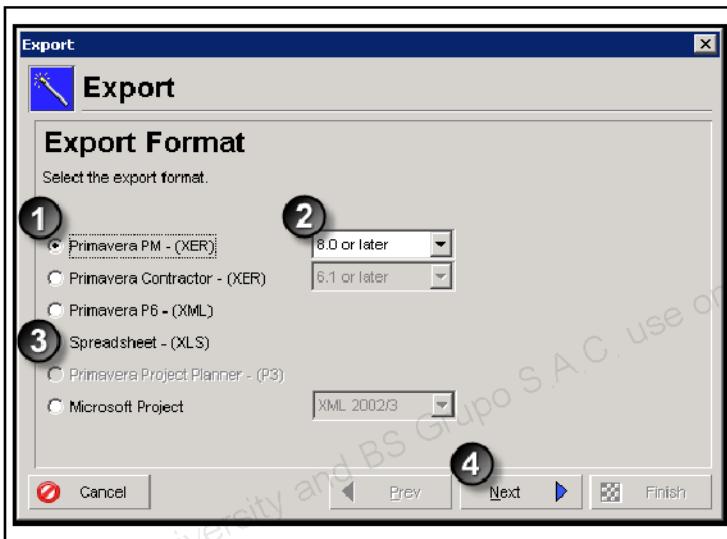
- Import and export information to and from the P6 Professional database using external files and then share this information with other P6 Professional and non-P6 Professional users.
- Edit project information in a spreadsheet format:
 - Activities
 - Activity Relationships
 - Expenses
 - Resources
 - Resource Assignments

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Overview: Exporting Data to a Spreadsheet Application

The Export wizard enables you to choose the format and data you want to export. Export information such as activities, activity relationships, resources, resource assignments, and expenses into a spreadsheet format.



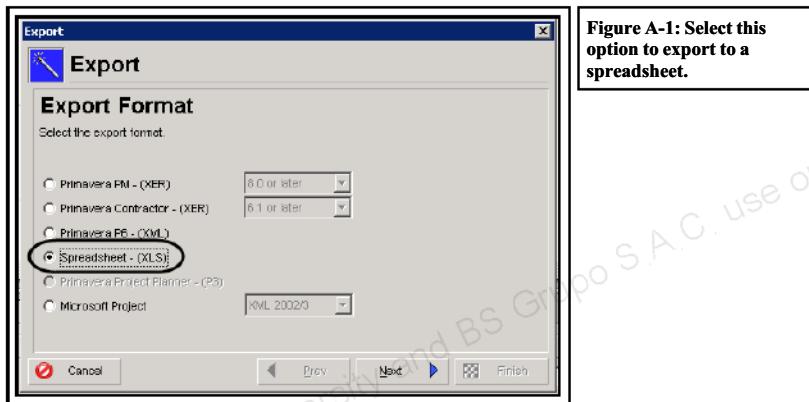
- ① Select from a list of available export format options. Based on the option selected, choose to export a complete project, specific project information, or resource information to a file that you can open in another application.
- ② Select the application version from the list for the selected export format.
- ③ The *Spreadsheet (XLS)* option enables you to export project data to spreadsheet applications.
- ④ Click *Next* to advance through the wizard.

Practice: Exporting Data to a Spreadsheet Application

In this practice you will use the Export wizard to export project data into a spreadsheet format.

The Export Wizard

A project must be open to export its data. In the wizard, you must first select the format in which you want to export data. Select the *Spreadsheet (XLS)* option to export project data to spreadsheet applications.



Export a project using the Export Project wizard.

1. Open a project, *BLDG-A1 BLDG – Using P6 Professional with Spreadsheets*.
2. On the File menu, click *Export*.
3. Select *Spreadsheet - (XLS)* and then click *Next*.

Export Type

Each data type selected is exported to a separate worksheet in the spreadsheet application. The export types available are based on the selected export format.

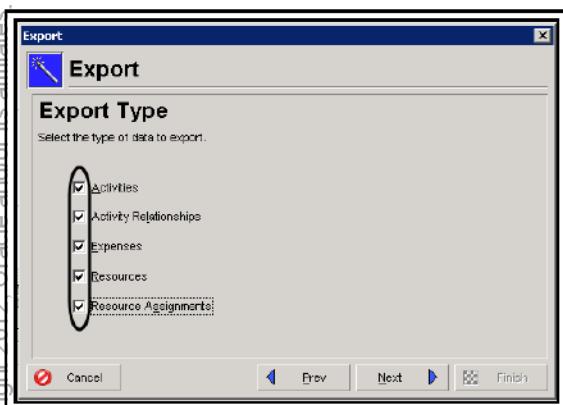


Figure A-2: Select the data types to include in the export file.

Select the types of data to export.

1. Select all export types listed, and then click *Next*.

Select Projects

Select the projects you want to export from a list of currently open projects.

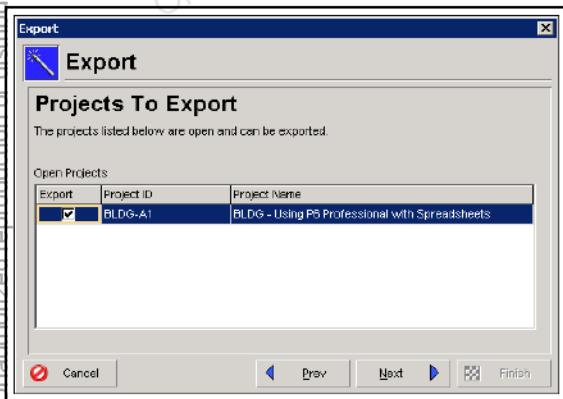


Figure 27-11: Select the check box in the *Export* column to select the project(s) you want to export.

 **Select the project to export.**

1. Select the *Export* check box for *BLDG-A1 BLDG – Using P6 Professional with Spreadsheets*.
2. Click *Next*.

Select Template

Create or modify an existing template that holds specifications for the export file. In the template, select the columns, filters, and sort criteria for each subject area.

The column, filter, and sort criteria only apply to the subject area selected. You can define the criteria for each subject area.

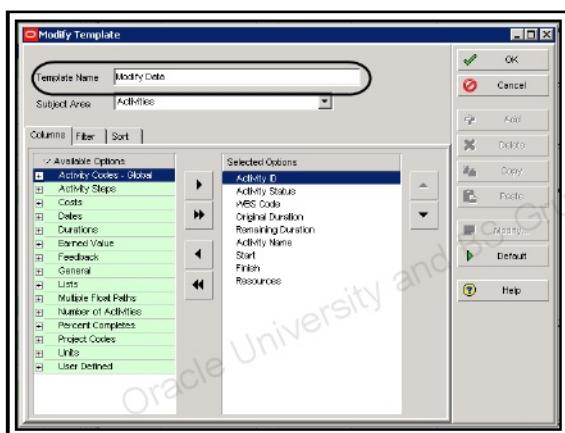


Figure A-3: Type a name for the XLS template.

 **Create a new template.**

1. In the Select Template dialog box, click *Add*.
2. In the *Template Name* field, type <Modify Data>.

Add Columns to the XLS file

The data fields available to add as columns are based on the subject area selected. Each subject area has certain data items that must be included in the export file and cannot be removed from the Selected Options section. Click  to remove non-default data items.

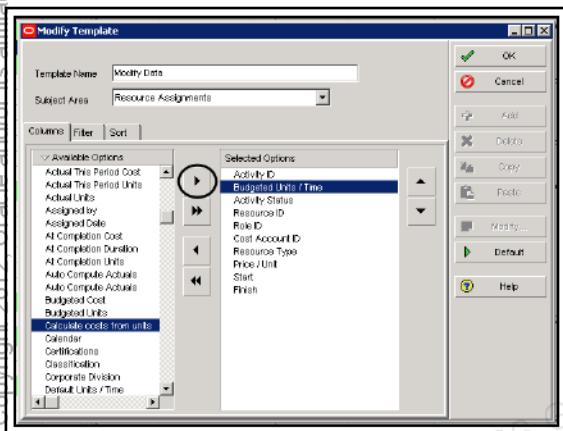


Figure A-4: Click to move the data item to the Selected Options section.

Select the columns to display in the spreadsheet.

1. In the *Subject Area* list, confirm *Activities* is selected.
2. Click the Available Options bar in the Columns tab, and then click *Group and Sort By; List*
3. In the Available Options section, select the *Original Duration* and *Remaining Duration* data items, and click  to move them into the Selected Options section below *Finish*.
4. In the *Subject Area* list, select *Activity Relationships*.
5. Click  to remove non-default data items from the Selected Options section.
6. In the Available Options section, select *Lag*.
7. Click  to move it to the Selected Options section below *Successor*.
8. In the *Subject Area* list, select *Resource Assignments*.
9. Select a data item, *Budgeted Units/Time*, and then click  to move it to the Selected Options section below *Resource Type*.

Assign a Sort Order

In the export template, add sort criteria to apply to the exported data.

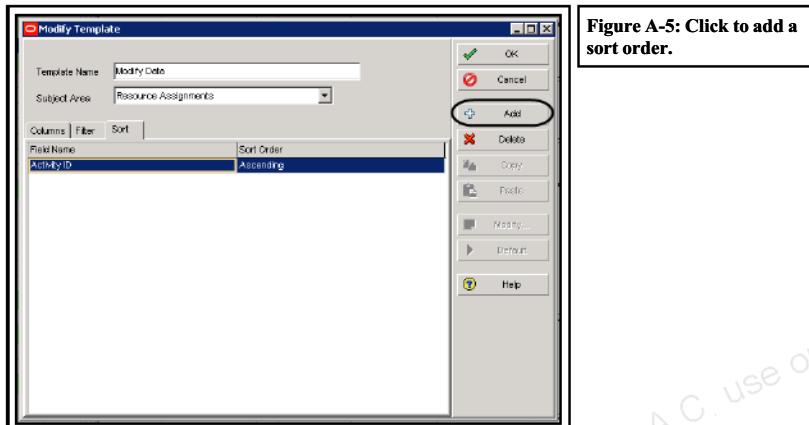


Figure A-5: Click to add a sort order.

Select the XLS File Location

Select a location to which to save the XLS file. The Export wizard will assign the Project ID as the file name, which you can change. If exporting multiple projects, separate spreadsheet application files are created for each project.

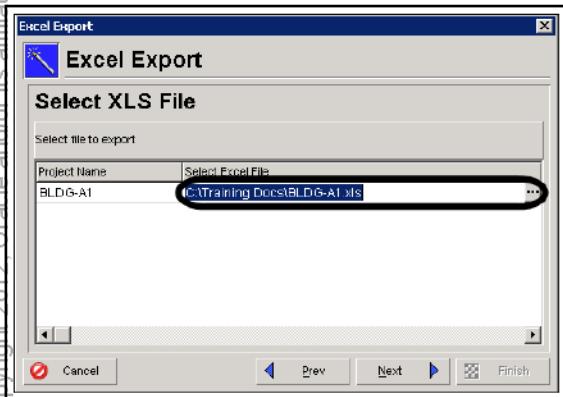


Figure A-6: Double-click to select the location in which to save the XLS file.

>Select the location to save the XLS file.

1. In the *Select Excel File* field, double-click and browse to the location to save the XLS file, *C:\Training Docs*.
2. In the *File Name* field, verify *BLDG-A1.xls*.
3. Click *Open*.
4. Click *Next*.

Summary

The summary information includes the directory in which the export file was saved and the subject areas that were exported in the file.

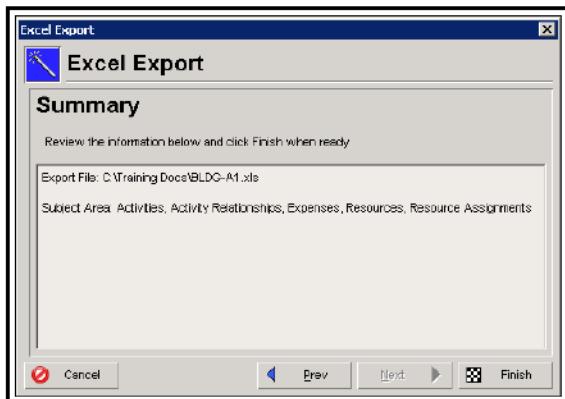


Figure A-7: Summary information is listed for the export file.

Export the project.

1. Review the summary information for the export file.
2. Click *Finish*.
3. Click *OK* to confirm that the export was successful.

Overview: Modifying and Importing Project Data

After you export an XLS file from P6 Professional, you can modify the data in a spreadsheet application. In the exported XLS file, each subject area is exported to a separate worksheet within the XLS file.

A1	B	C	D	E	F	G	H	I	J	K
task_code	codestatus_code	wbs_id	remain_dtarget_task_name	Original_Activity_Name	start_date	end_date	resource_list	delete_record_flag		
1	Activity ID	Activity Status WBS Code		Remaining Original Activity Name						
2	BA-ADM1	Not Started	Bldg 30	208	208	Project Administration	1/6/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Tim Harris	d
3	BA-010	Not Started	Bldg 30 DSE	10	10	Design Building Additio	1/6/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Koenig Designers	
4	BA-010	Not Started	Bldg 30 DSE	12	12	Design Building Additio	1/6/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Koenig Designers	
5	BA-029	Not Started	Bldg 30 DSE	5	5	Review and Approve D	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Paul Kim	d
6	BA-039	Not Started	Bldg 30 DSE	3	3	Assemble Technical D	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Paul Kim	
7	BA-049	Not Started	Bldg 30 DSE	10	10	Review Technical D	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Paul Kim	
8	BA-049	Not Started	Bldg 30 DSE	11	11	Install Door and Window	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Finishes Carpenter	
9	BA-049	Not Started	Bldg 30 DSE	12	12	Install Exterior Doors on	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Finishes Carpenter	d
10	BA-010	Not Started	Bldg 30 Ex-Finish	2	2	Install Exterior Doors on	1/6/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Finishes Carpenter	
11	BA-010	Not Started	Bldg 30 Ex-Finish	10	10	Output to External Driv	1/6/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Finishes Carpenter	
12	BA-099	Not Started	Bldg 30 Ex-Finish	10	10	Insulation and Bulkup P	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Poulter	
13	BA-010	Not Started	Bldg 30 Ex-Finish	5	5	Assemble Brick Sample	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Koenig Designers	
14	BA-010	Not Started	Bldg 30 Ex-Finish	10	10	Review and Approve B	1/5/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock, Paul Kim	
15	BA-020	Not Started	Bldg 30 Ex-Finish	3	3	Prepare and Select Br	2/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
16	BA-030	Not Started	Bldg 30 Ex-Finish	3	3	Review Bricks for	2/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
17	BA-040	Not Started	Bldg 30 Ex-Finish	1	1	Deliver Bricks for Brick	2/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
18	BA-050	Not Started	Bldg 30 Ex-Finish	50	50	Deliver Bricks	3/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
19	BA-060	Not Started	Bldg 30 Ex-Finish	0	0	Close-in Phase Begins	1/2/2018 8:00:00 AM			
20	BA-070	Not Started	Bldg 30 Ex-Finish	7	7	Brick Exterior Walls	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Mason	
21	BA-010	Not Started	Bldg 30 Mechanic	0	0	Rough-in Phase Begins	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM		
22	BA-010	Not Started	Bldg 30 Mechanic	15	15	Get Mechanical and Ele	1/4/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Operating Engineer	
23	BA-010	Not Started	Bldg 30 Mechanic	1	1	Get Mechanical and Ele	1/4/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Plumber, Vapor Installer	
24	BA-010	Not Started	Bldg 30 Mechanic	2	2	Install Heater, Coo	1/4/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Plumber, Vapor Installer	
25	BA-010	Not Started	Bldg 30 Mechanic	1	1	Rough-In Plumbing Pipe	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Plumber	
26	BA-010	Not Started	Bldg 30 Mechanic	15	15	Install Wiring and Cables	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Electrician	
27	BA-010	Not Started	Bldg 30 Mechanic	3	3	Connect Equipment	1/3/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Plumber, Electrician	
28	BA-010	Not Started	Bldg 30 Mechanic	3	3	Prepare and Select Br	2/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
29	BA-010	Not Started	Bldg 30 Mechanic	2	2	Review Brick Thread Pv	2/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
30	BA-010	Not Started	Bldg 30 Mechanic	1	1	Assemble Brick Haul	2/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Oliver Rock	
31	BA-010	Not Started	Bldg 30 Mechanic	0	0	Fabricate and Deliver H	2/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Area Corp	
32	BA-010	Not Started	Bldg 30 Mechanic	10	10	Install HVAC Ducts	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Heating Ventilation & AC Technician	
33	BA-010	Not Started	Bldg 30 Mechanic	2	2	Insulate Ducts	1/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Heating Ventilation & AC Technician	
34	BA-010	Not Started	Bldg 30 Mechanic	5	5	Set Head Pump	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Operating Engineer	
35	BA-010	Not Started	Bldg 30 Mechanic	3	3	Relocate HVAC Chiller	1/2/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Heating Ventilation & AC Technician	
36	BA-010	Not Started	Bldg 30 Mechanic	1	1	Startup and Test HVAC	1/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM	Operating Engineer	
37	BA-010	Not Started	Bldg 30 Mechanic	0	0	Rough-in Complete	1/1/2018 8:00:00 AM	1/23/2018 5:00:00 PM		

- In the spreadsheet, the first row column headers identify the database field name that was exported. To import data successfully, do not change the values in these cells.
- The second row consists of P6 Professional field names that correspond to each database field name. These cells are editable.
- Each tab consists of related information based on the exported subject area.
- Type a 'D' or 'd' in the *Delete This Row* column to delete an activity.

Practice: Modifying and Importing Project Data

In this practice you will:

- Open and update an exported project file in a spreadsheet application.
 - Import the updated spreadsheet into the P6 Professional project.

Updating Data in a Spreadsheet Application

Each subject area has the following worksheet name:

- **Activities**—TASK
 - **Activity Relationships**—TASKPRED
 - **Expenses**—PROJCOST
 - **Resources**—RSRC
 - **Resource Assignment**—TASKRSRC

Figure A-8: The exported file opened in the spreadsheet application.

 Open the exported spreadsheet file in OpenOffice Calc and view data.

1. To launch the OpenOffice Calc spreadsheet application, click *Start, Programs, OpenOffice.org 3.2, OpenOffice.org Calc* (**Do not** launch MS Excel to view the spreadsheet.)
 2. Browse to *C:\Training Docs* and open the *BLDG-A1.xls* file.
 3. Confirm the **TASK** worksheet tab is selected. Expand the columns as necessary to view data.
 4. Click each worksheet tab to view its data.

The following guidelines can assist you in importing project data successfully:

- When updating project data in a spreadsheet application, such as units, costs, durations, and percent complete fields, import one updated field at a time. Data integrity may be compromised if you attempt to update multiple fields simultaneously via import into P6 Professional.
- In the spreadsheet application, to delete a row of data, type a '*D*' or '*d*' in the *Delete This Row* column.
- Add dictionary items to P6 Professional before assigning these items to activities in the spreadsheet application. If you assign a new value to an activity or resource that does not exist in P6 Professional, then Import will not add it to the dictionary. This applies to resources, roles, activity codes and values, calendars, cost accounts, WBS, and resource codes and values.
- An activity row in the spreadsheet application must include an Activity ID to import successfully.
- Update each subject area in its own sheet.
- Do not change the language set in P6 Professional (*Tools, Set Language*). For example, if the text in the export file is in English, the updates you import should be in English.
- Export the *Activity Type* column in P6 Professional to assign to new activities. P6 Professional will assign the default activity type (*Project Details, Defaults tab*) to a new activity if a type is not specified.
- Right-click in the Activities window and select *Export to Excel* to quickly export the columns displayed in the current layout.
- Use the USERDATA tab in the Spreadsheet application spreadsheet as a reference for the user preference settings (*Edit, User Preferences*) in P6 Professional. Do not edit this information. This information is used to redirect the information back into the proper project in P6 Professional when the import is processed.

You will use the spreadsheet to update Original Duration for an activity.

	A	B	C	D	E	F	G
1	task_code/status_code	wbs_id	target_dtm_hr_cnt	remain_dtm_task_name		start_date	
2	Activity ID	Activity Status	WBS Code	Original Duration(d)	Pending Activity Name	(*Start	
3	BA1020	Not Started	BLDG-A-DSE	208	208	1/29/2018 8:00:00 AM	
4	BA1020	Not Started	BLDG-A-DSE	10	10	Build Admin Kiosk	1/29/2018 8:00:00 AM
5	BA1020	Not Started	BLDG-A-DSE	72	72	Design Building Addition	1/29/2018 8:00:00 AM
6	BA1020	Not Started	BLDG-A-DSE	113	113	Review and Approve Designs	1/29/2018 8:00:00 AM
7	BA1020	Not Started	BLDG-A-DSE	2	2	Assemble Technical Docs for Heat Pumps	1/29/2018 8:00:00 AM
8	BA1020	Not Started	BLDG-A-DSE	10	10	Review Technical Data on Heat Pumps	1/30/2018 8:00:00 AM
9	BA5100	Not Started	BLDG-A-Ex-Finish Wdn	1	1	Install Door and Window Frames	6/25/2018 8:00:00 AM
10	BA5100	Not Started	BLDG-A-Ex-Finish Wdn	2	2	Instal Exterior Doors and Windows	6/25/2018 8:00:00 AM
11	BA5110	Not Started	BLDG-A-Ex-Finish Wdn	6	10	Building Enclosed	
12	BA5110	Not Started	BLDG-A-Ex-Finish Wdn	10	10	Interior Wall and Ceiling Plastering	7/2/2018 8:00:00 AM
13	BA5100	Not Started	BLDG-A-Ex-Finish Brick	3	3	Assemble Brick Samples	1/22/2018 8:00:00 AM
14	BA5110	Not Started	BLDG-A-Ex-Finish Brick	10	10	Review and Approve Brick Samples	1/25/2018 8:00:00 AM
15	BA5120	Not Started	BLDG-A-Ex-Finish Brick	3	3	Prepare and Solot Bids for Brick Exterior	2/21/2018 8:00:00 AM
16	BA5130	Not Started	BLDG-A-Ex-Finish Brick	3	3	Review Bids for Brick	2/26/2018 8:00:00 AM
17	BA5140	Not Started	BLDG-A-Ex-Finish Brick	1	1	Award Contractor for Brick	3/1/2018 8:00:00 AM

Figure A-9: Change the Original Duration for activity BA1020.

Importing from a Spreadsheet Application into P6 Professional

After updating project data in the spreadsheet application, import the data into P6 Professional.

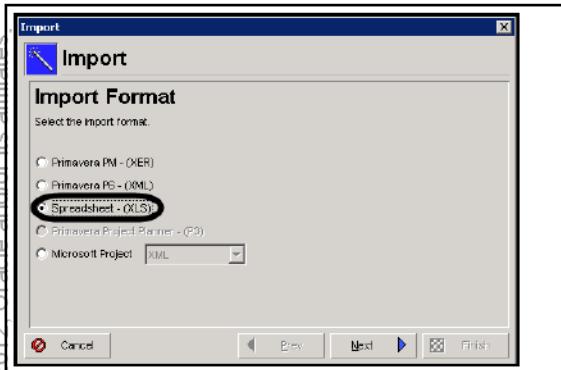


Figure A-10: Select the format of the file you want to import.

Import the XLS file into P6 Professional.

1. On the File menu in P6 Professional, click *Import*.
2. Select the import format, *Spreadsheet - XLS*, and then click *Next*.

Next, select the file you want to import into P6 Professional.



Figure A-11: Click to select the location of the import file.

Select the spreadsheet application file to import into P6 Professional.

1. In the *Select file to import* field, click (...) and browse to *C:\Training Docs\BLDG-A1.xls*.
2. Click *Open*, and then click *Next*.

Select the import types for the subject areas you want to update in P6 Professional. The import types available to select are based on the types that exist in the XLS file you are going to import.



Figure A-12: Select the import types that contain updated data.

☛ Select the data to import into the project.

1. Select two import types, *Activities* and *Resource Assignments*, and then click *Next*.

Next, select the project into which you want to import updated project data.

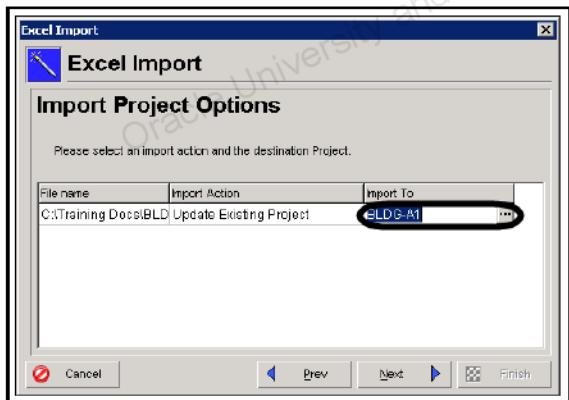


Figure A-13: Double-click to select the project into which you want to import data.

☛ Choose how to import updated data.

1. Double-click in the *Import To* field.
2. Select a project, *BLDG-A1*.

3. Click 
4. Click *Next*, and then click *Finish*.
5. Click *OK*.

Reviewing Import Updates in P6 Professional

After you import the project data, view the updated information in P6 Professional.

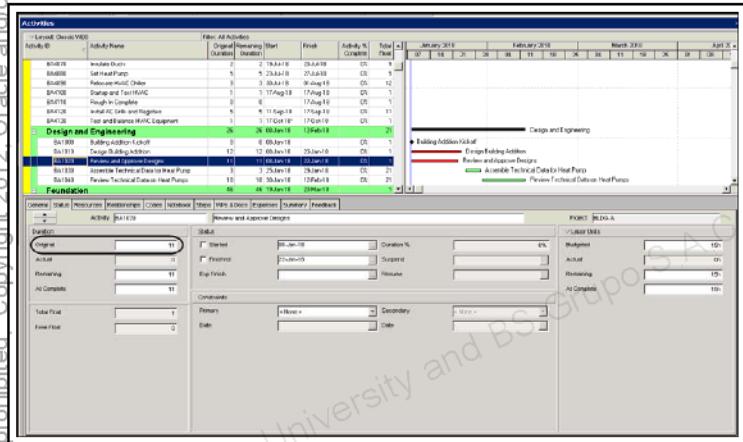


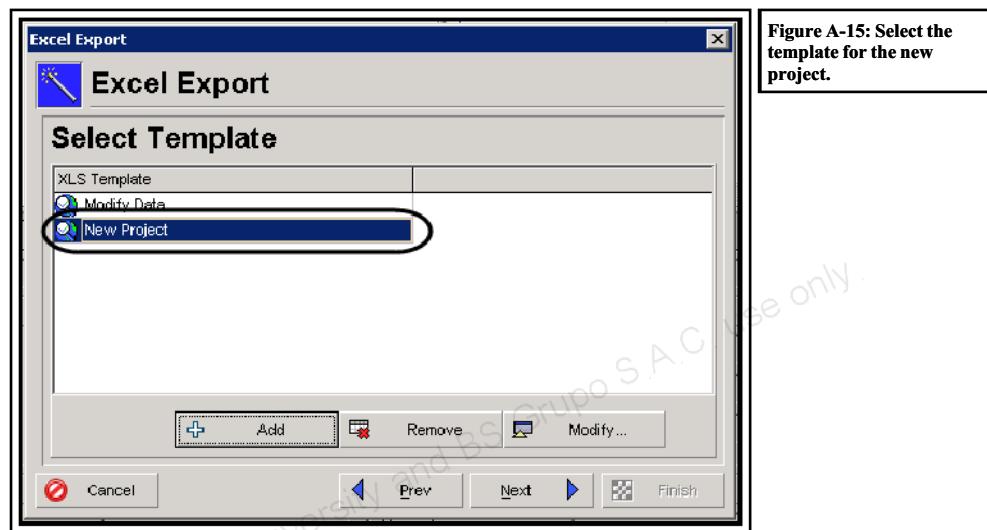
Figure A-14: The new Original Duration for the activity.

Review the Original Duration.

1. Confirm you are in the Activities window. (Or on the Project menu, click *Activities*.)
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Classic WBS* and then click *Open*.
4. Select an activity, *BA1020- Review and Approve Designs*.
5. In Activity Details, click the Status tab.
6. Review the new Original Duration for the activity.

Adding New Schedule Data via a Spreadsheet Application

Add a new project schedule in P6 Professional using a spreadsheet application. To ensure that the data imports into P6 Professional correctly, export a blank XLS file from P6 Professional and populate it with your spreadsheet data in the spreadsheet application.



Export a blank project.

1. Open a project, *BLDG-NEW BLDG-Importing a New Project* (located in the *EXTRA-Con EPS* node).
2. On the File menu, click *Export*.
3. Select the export format, *Spreadsheet - (XLS)*.
4. Click *Next*.
5. Select the data types, *Activities* and *Activity Relationships*.
6. Click *Next*.
7. Select the *Export* check box for *Bldg-NEW*.
8. Click *Next*.
9. Click *Add*.

10. In the *Template Name* field, type <New Project>, and then click *OK*.

11. Click *Next*.

12. Click *Next*.

13. Click *Finish*, and then click *OK*.

14. Close the project, *Bldg-NEW*.

If you export a project with no activities, the worksheets in the XLS file will only contain the column headers and database field names.

A1	Task_code	C	D	E	F	G	H	I	J	K	L	M
1	task_code	Status_code	wbs_id	task_name	start_date	end_date	resource_id					
2	ActivityID	Activity_Status	WBS Code	Activity Name	(<input type="checkbox"/> Start)	(<input type="checkbox"/> Finish)	(<input type="checkbox"/> Resources)	Delete record flag				
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

Figure A-16: The file created using the Export Wizard.

 **View the blank XLS file created from the new project.**

1. Using the OpenOffice spreadsheet application, open the file, *Bldg-NEW.xls*, in C:/Training Docs.
2. Adjust the column widths in the spreadsheet application file.
3. Save and close the file, *Bldg-NEW.xls*.

You will import data from the spreadsheet for the new project. To minimize data entry, a spreadsheet has been created for you.

task_code							
A	B	C	D	E	F	G	H
task_code	status_code	wbs_id	task_name	target_dmn_hr_cnt	delete_record_flag		
2 AD1000			Activity A	10			
4 AD1010			Activity B	5			
5 AD1020			Activity C	8			
6 AD1030			Activity D	7			
7 AD1040			Activity E	10			
8 AD1050			Activity F	15			
9 AD1060			Activity G	9			
10 AD1070			Activity H	5			
11 AD1080			Activity I	1			
12							
13							
14							
15							
16							
17							

Figure A-17: Transferred activity data in the TASK worksheet.

 **View a new spreadsheet that contains data for the new project.**

1. Using the OpenOffice spreadsheet application, open the file, *New Project.xls*, in C:/Training Docs.
2. Click the TASK tab.
3. Review the project data in the worksheet.
4. Click the TASKPRED tab and review the data.
5. Exit the spreadsheet application.

Importing New Project Data into P6 Professional

Import the XLS file into the P6 Professional project.

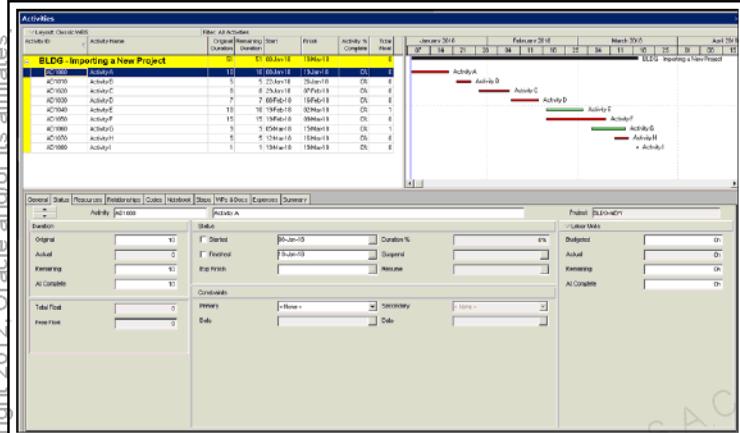


Figure A-18: The new schedule is imported into the project.

View the new activities in P6 Professional.

1. In P6 Professional, open a project, *Bldg-NEW*.
2. On the File menu, click *Import*.
3. Select an import format, *Spreadsheet - (XLS)*.
4. Click *Next*.
5. Browse to *C:\Training Docs\New Project.xls* and then click *Open*.
6. Click *Next*.
7. Select the import types, *Activities* and *Activity Relationships*.
8. Click *Next*.
9. Double-click in the *Import To* field and select a project, *Bldg-NEW*, and then click to assign.
10. Click *Next*.
11. Click *Finish*, and then click *OK*.
12. On the Tools menu, click *Schedule*, and then click *Schedule*.

Lesson Review

Key Concepts

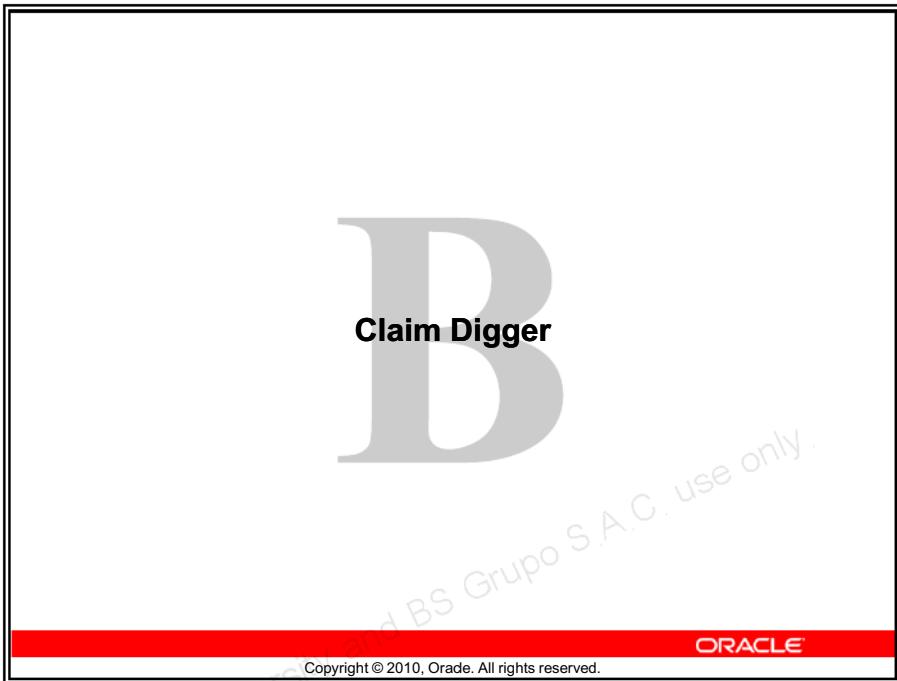
- The import option *Spreadsheet-(XLS)* enables you to transfer project information into other spreadsheet applications, such as Oracle Open Office.
- Each data type or subject area is exported to a separate worksheet within the export file.

Review Questions

1. **True or False:** The USERDATA worksheet contains the settings from the User Preferences in P6 Professional.
2. Type a _____ to delete a row of data from the spreadsheet.
3. **True or False:** An activity row in the spreadsheet application must include an Activity ID to import successfully.

Notes





Appendix B – Claim Digger

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
5	5	15	5	30

Objectives

After completing this lesson, you should be able to:

- Describe how Claim Digger compares project plans.
- Create a comparison report in Claim Digger.



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Claim Digger

Claim Digger is a utility that compares two project plans – a revised plan and a base plan – and creates a report on the differences between the plans:

- Items added
- Items deleted
- Changed values

Depending on the industry selected during installation, the application may be called Schedule Comparison.

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Notes



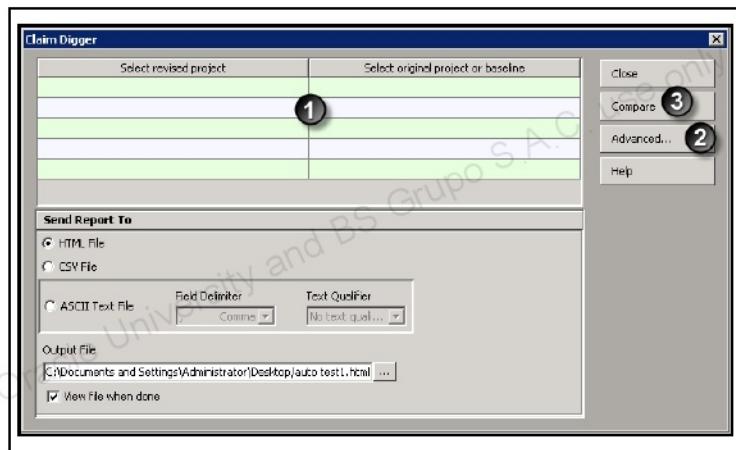
Overview: Using Claim Digger

Claim Digger is valuable for project managers, general contractors, and construction managers who need to track changes on large, complex, fast-moving projects.

Key Claim Digger functionality:

- Reports can be created in HTML, CSV, or text format.
- Select the revised project and base project to be used for comparison.
- Comparison options can be turned on/off based on your needs

Access Claim Digger through the Tools menu in P6 Professional.



- ① Use the Claim Digger dialog box to specify a revised project plan and its corresponding base project plan to compare.
- ② Click *Advanced* to select comparison options before comparing the two project plans.
- ③ Click *Compare* to run Claim Digger.

Practice: Using Claim Digger

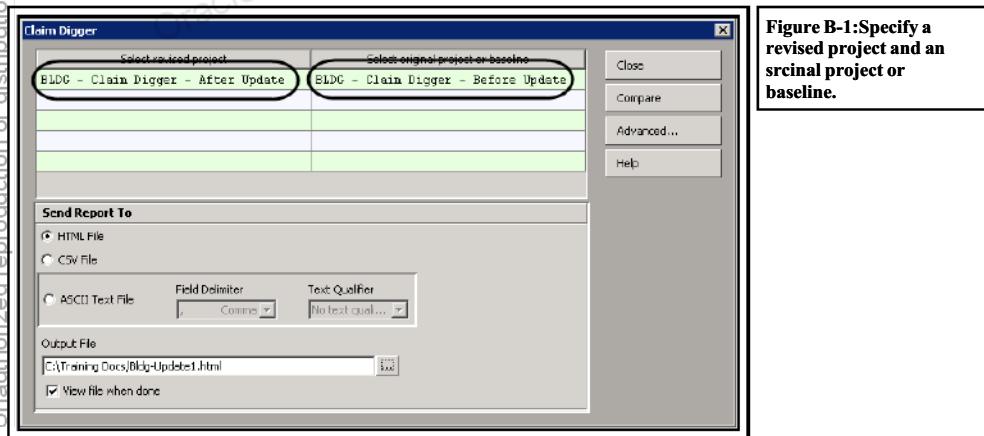
In this practice you will:

- Launch Claim Digger.
- Select a revised project plan and a base project plan to compare.
- Review comparison options.
- Generate and review a Claim Digger report.

Configuring Projects and Output Options

After Claim Digger is launched, the main application window appears. Several configuration and output decisions are required:

- Specify the projects to be used as the revised project and the base project.
- Select a report format:
 - ◆ HTML file
 - ◆ CSV file
 - ◆ ASCII text file
- Specify the output file destination.
- Specify report launch setting (automatic launch after creation).



• Launch Claim Digger and select the revised and scinal projects.

1. On the File menu, click *Close All*.
2. When prompted, click *Yes*.
3. On the Tools menu, click *Claim Digger*.
4. Click on the first row of the *Select revised project* column
5. Click  to select the revised project.
6. Expand *Construction Projects, Eastern Division*, and *Building East*.
7. Select *BLDG-B1-BLDG – Claim Digger-Before Update*, and then click *OK*.
8. Click in the first row of the *Select scinal project or baseline* column.
9. Click  to select the scinal project or baseline.
10. Expand *Construction Projects, Eastern Division*, and *Building East*.
11. Select *BLDG-B2-BLDG – Claim Digger-After Update*, and then click *OK*.
12. In the *Send Report To* field, confirm that *HTML File* is selected.
13. In the *Output File* field, click  and browse to *C:\Training Docs*.
14. Type a file name, <**Bldg - Update1**>, and then click *Save*.
15. Select the *View file when done* check box.

Choosing Comparison Options

Click *Advanced* in the main application window to select comparison options.

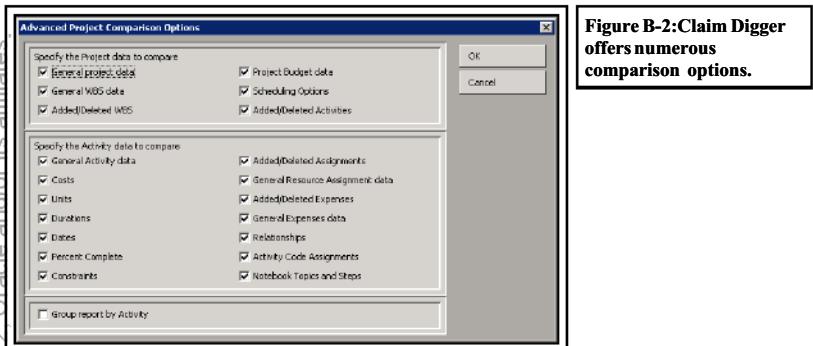


Figure B-2:Claim Digger offers numerous comparison options.

View the comparison options.

1. Click *Advanced*.
2. After viewing the advanced options, click *Cancel*.

You will now run the report.

3. Click *Compare*, and then click *OK*.

Reviewing the Report

If the *View file when done* check box is selected, the report is displayed after it is created.

Each section of the report details:

- Added/deleted values.
 - Old values/new values for values that have been changed.

Figure B-3:A sample Claim Digger report.

Review the HTML output report.

1. Review the output report.
 2. Close the report.
 3. Click *Close* on the Primavera Claim Digger dialog box.

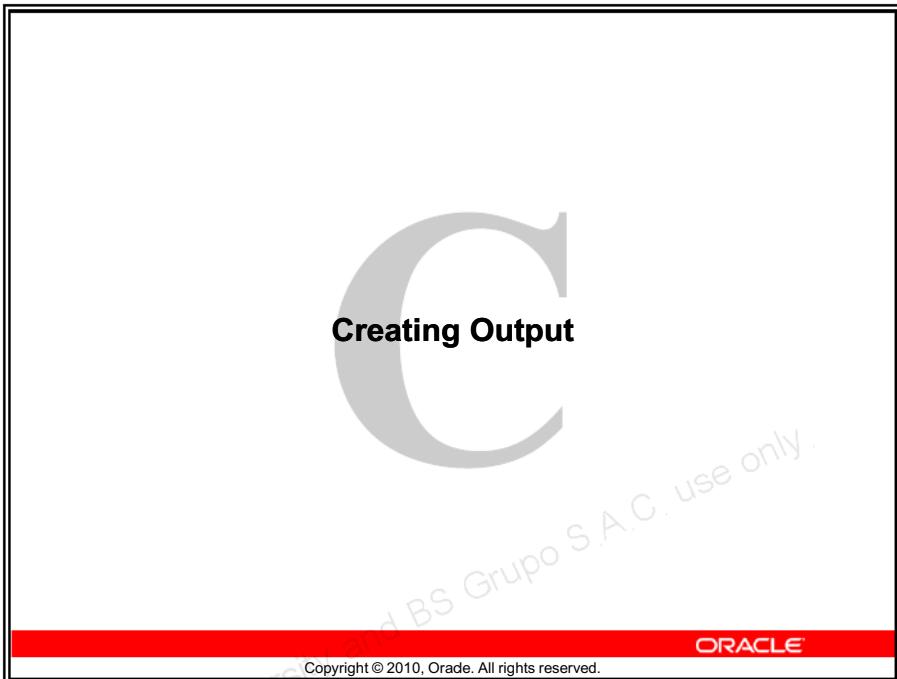
Lesson Review

Key Concepts

- Claim Digger is a utility that compares two versions of a project and creates a report on the differences.
- Customize Claim Digger to compare the data items you select in the Advanced Project Comparison Options.

Review Questions

1. Which menu is used to launch Claim Digger?
 - a. File
 - b. View
 - c. Project
 - d. Tools
2. **True or False:** Claim Digger creates a report on the differences between project plans, but does not include data that has been deleted.



Appendix C – Creating Output

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
5	10	20	5	40

Objectives

After completing this lesson, you should be able to:

- Customize the appearance of headers and footers.
- Insert and format the curtain and text attachment tools.
- Format the appearance of the data date.



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Output Controls

P6 Professional offers functionality to enhance onscreen display and printed material:

- Formatting layouts for print
 - Headers, footers
 - Graphics
- Gantt chart
 - Curtain tool
 - Text tool
 - Customized data date line

The page features a prominent red horizontal bar at the bottom, spanning most of the width of the content area. The word "ORACLE" is printed in white capital letters on this bar.

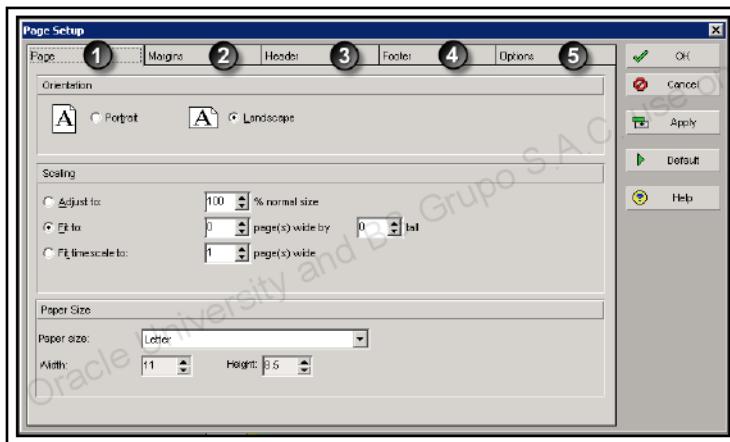
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Overview: Creating Output

P6 Professional provides a range of capabilities and controls for creating and customizing printed output based on project layouts.

- On the File menu, click *Print Preview* to access printing format controls and to preview results of formatting options.
- On the View menu, click *Attachments* to format curtain and text attachments and insert them into layouts. Click *Bar Chart Options* to access controls for formatting the Gantt chart.
- The Page Setup dialog box enables you to specify the format settings for the displayed layout or report.



- ① Use the Page tab to specify the page orientation, scaling, and paper size.
- ② The Margins tab enables you to set page margins.
- ③ The Header tab enables you to create a header with multiple sections that you can customize with project information.
- ④ The Footer tab enables you to create a footer with multiple sections that you can customize with project information.
- ⑤ The Options tab enables you to specify date range, content, and pagination options. The available options on this tab vary according to the current view displayed when you select Page Setup.

Practice: Creating Output

In this practice you will:

- Format a header and footer for printing a layout and view them using *Print Preview*.
- View Print Setup controls.
- Format and apply a curtain attachment to the Gantt chart in a layout.
- Format and insert a text attachment to the Gantt chart.
- Format the data date in the Gantt chart.

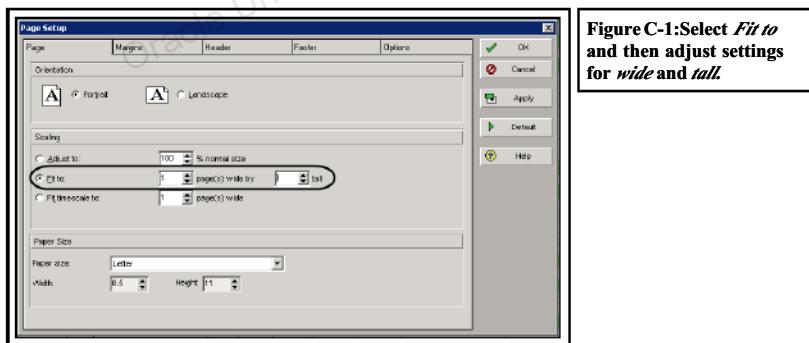
Printing Layouts and Page Setup

Page Setup is used to determine how information is organized when printing a layout. Access Page Setup by clicking *Page Setup* on the File menu or click the Page Setup icon  in Print Preview. The options you select in the Page Setup dialog is saved as part of that layout.

The *Apply* button allows you to see the results of your selections without closing the Page Setup dialog box. This button is active only when Page Setup is accessed from Print Preview.

Page Tab

The Page tab specifies the page orientation, scaling, and paper size for the layout or report displayed.



Format a layout to print on one page.

1. Open a project, *BLDG-C BLDG – Creating Output*. Confirm that you are in the Activities window. (Or on the Project menu, click *Activities*.)
2. On the Layout Options bar, click *Layout, Open*.

3. Select a layout, *Creating Output* and then click *Open*.
4. On the File menu, click *Print Preview*.
5. Click to launch Page Setup.
6. Select an orientation, *Portrait*.
7. In the Scaling section, select *Fit to* and change the scaling to *1 page wide by 1 tall*
8. Click *Apply*:

Margins Tab

On the Margins tab, you can set page margins for the displayed layout or report. The Top, Left, Bottom and Right sections set the distance between the edge of the paper and the edge of the printed layout or report text.

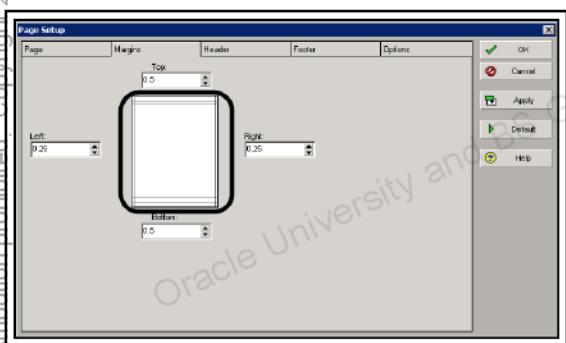


Figure C-2:The sample window shows how margins will appear.

Adjust page margins.

1. In the Page Setup dialog box, click the Margins tab.
2. Set the Left and Right margins both to 0.25.

Header Tab

Headers and footers can be customized. Place headers and footers on the first page, last page, all pages, or no pages. Break headers and footers into as many as five sections. Manually change the width of each section.

Display the following information in headers and footers:

- Gantt chart legend
- Text
- Logos
- Revision box

Select *None* to show a blank section.

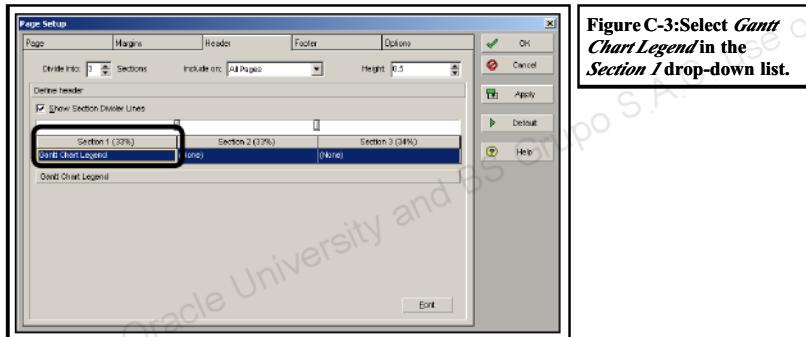


Figure C-3:Select *Gantt Chart Legend* in the *Section 1* drop-down list.

Task 3 Add three sections to the header and then view the changes.

1. Click the Header tab.
2. In the *Divide Into Sections* field, confirm *3*.
3. In the *Include on* list, confirm *All Pages*.
4. In the *Height* field, select *0.5* inches.
5. Click in the *Section 1* field, and then select *Gantt Chart Legend* in the list.

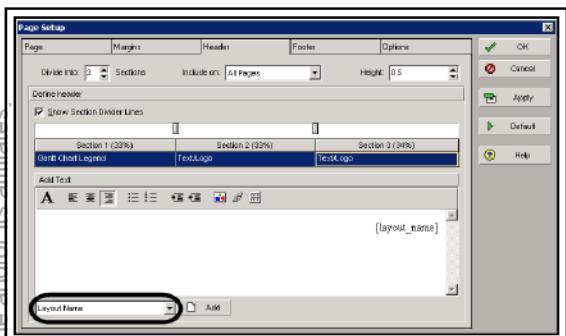


Figure C-4:Specify text fields in the Add Text section.

6. In the *Section 2* list, select *Text/Logo*.
7. In the list at the bottom of the Add Text section, select *Date*, and then click *Add*.
8. Click to center the *Date* field in Section 2.
9. In the *Section 3* list, select *Text/Logo*.
10. In the list at the bottom of the Add Text section, select *Layout Name*, and then click *Add*.
11. Click to right-align the *Layout Name* field in Section 3.

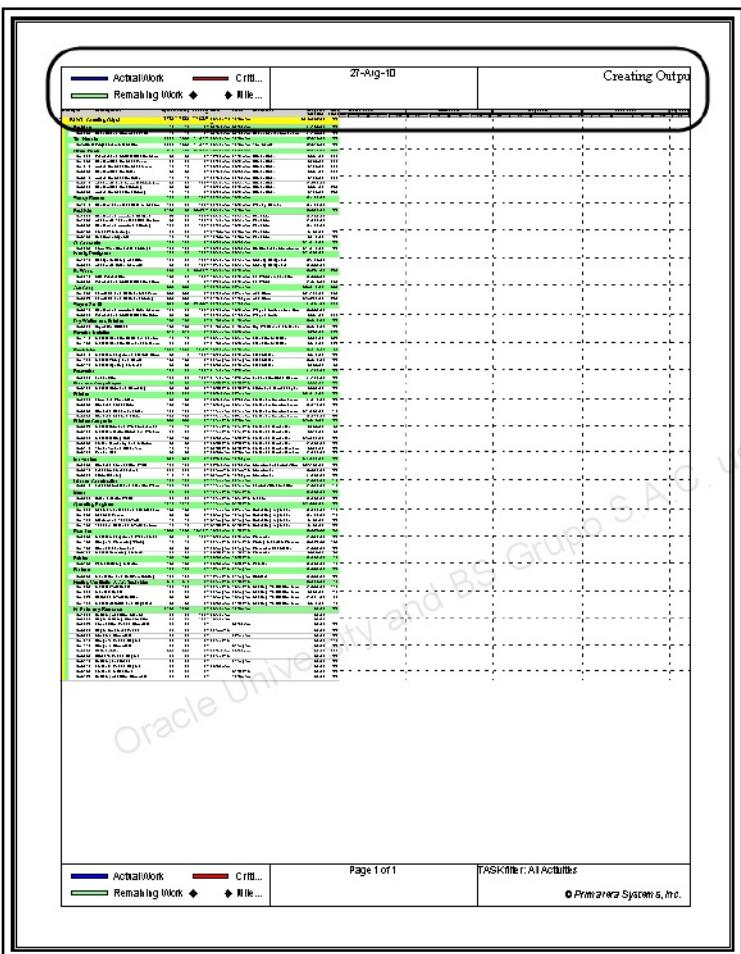


Figure C-5: Three sections have been inserted into the header.

Footer Tab

Use the Footer tab to create a custom footer for the displayed layout or report. To save the information added to a header or footer, the layout must be saved.

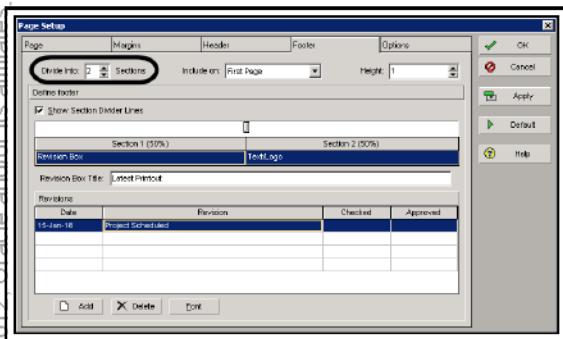


Figure C-6: Divide the footer into two sections.

Insert a Revision Box and a logo into the footer and then view the changes.

1. In the Page Setup dialog box, click the Footer tab.
2. In the *Divide Into Sections* field, select 2.
3. In the *Include on* list, select *First Page*.
4. In the *Height* field, select 1 inch.
5. In the *Section 1* list, select *Revision Box*.
6. In *Revision Box Title* field, type <Latest Printout>.
7. In the Revisions window, click in the *Date* field, and then click and select a date, 15-Jan-18.
8. Double-click in the *Revision* field and type <Project Scheduled>.

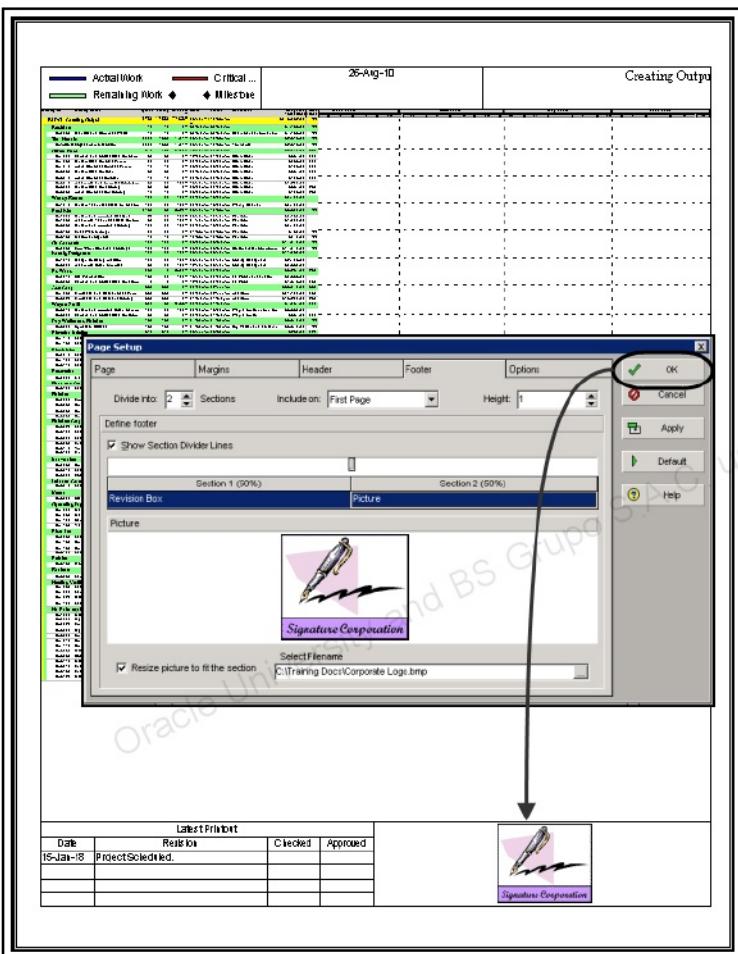


Figure C-7: The logo is displayed in the footer.

Options Tab

Use the Options tab to specify date range, content, and pagination options when you print window data or layouts. The available options on this tab vary according to the view displayed when you select the Page Setup option.



Figure C-8: Clear the *All Columns* checkbox.

Set output timescale dates.

1. In Print Preview, click .
2. Click the Options tab.
3. In the Timescale Start field, click and select PS-Earliest Project Start.
4. In the Timescale Finish field, select Custom Date.
5. Select a date, 31-May-18, and then click Select.
6. In the Print section, clear the All Columns check box.
7. Click OK.

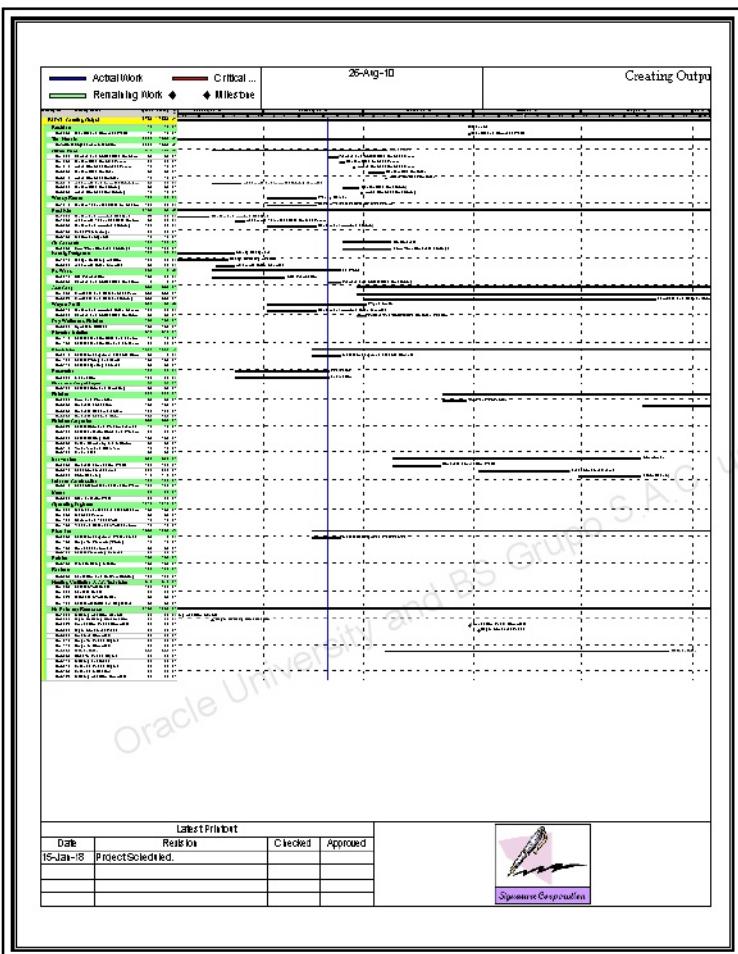


Figure C-9: Print Preview shows the Activity Table, Gantt chart, and grid lines as specified in the Page Setup dialog box.

Print Setup

Print Setup allows you to select the default printer, print size, and page orientation utilizing the printer drivers installed in your computer's Control Panel. Once changes are made in Print Setup, you can view the changes immediately in Print Preview.

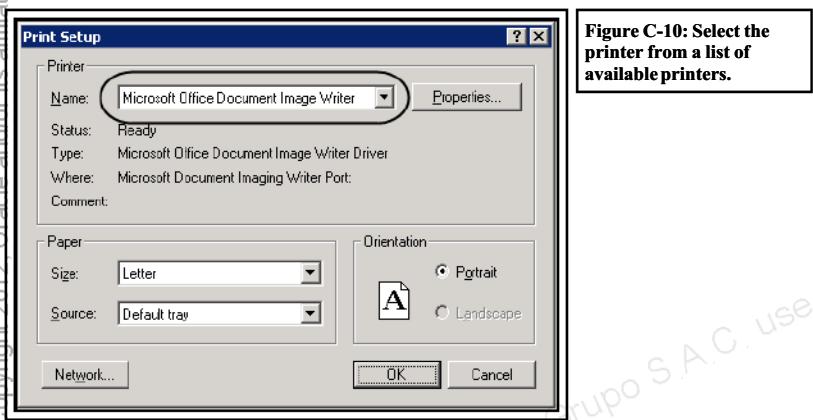


Figure C-10: Select the printer from a list of available printers.

View available printers.

1. On the File menu, click *Print Setup*.
2. Click the *Name* list to view available printers.
You will not print at this time.
3. Click *Cancel*.

Attachment Tools

Attachment tools enable you to insert text and add a shaded curtain to the bar area of the Gantt chart. Multiple curtains can be displayed.

Curtain Tool

Use the Curtain Attachment dialog box to highlight a specific time period in the Gantt chart. Multiple curtains can be displayed.

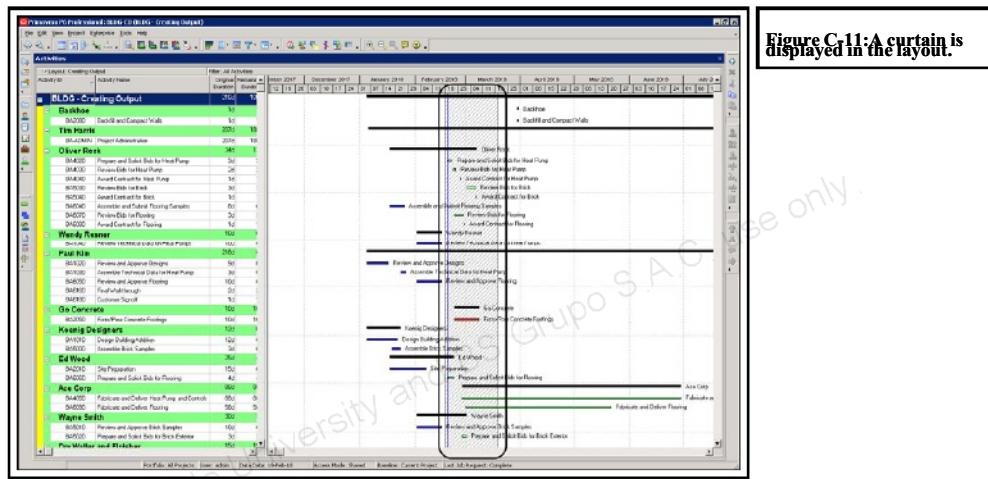


Figure C-11: A curtain is displayed in the layout.

Display a curtain in the layout.

1. On the Layout Options bar, click *Show on Bottom, No Bottom Layout*.
2. On the View menu, click *Attachments, Curtain, Add Curtain*.
3. Confirm the *Display curtain attachment* check box is selected.
4. In the *Start Datefield*, select *18-Feb-18*.
5. In the *Finish Datefield*, select *20-Mar-18*.
6. Click *OK* to view the curtain.

Text Tool

Use the Text Tool to create formatted text and insert it in a layout. Inserted text can be associated with an individual activity and can be customized by adjusting the font and style.

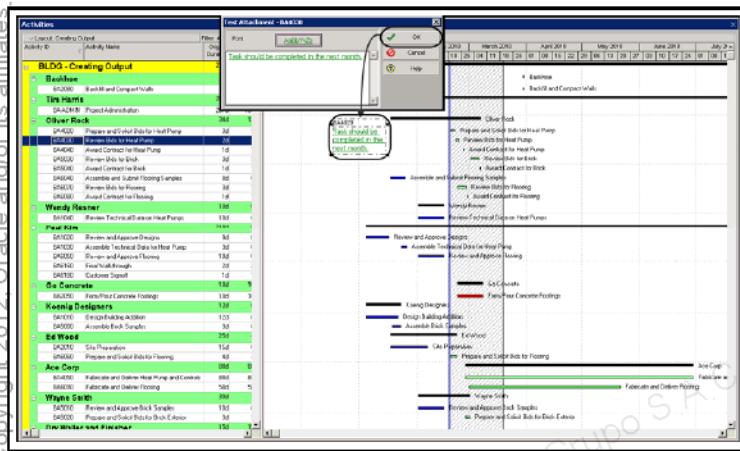


Figure C-12:Text associated with activity **B4020** has been inserted in the Gantt chart

Insert a text attachment and view the activity associated with the text.

1. Right click in the Gantt chart area next to an activity, **B4020**(in the *Oliver Rock* grouping band), and select *Attachments*, *Text*.
2. Type **<Task should be completed in the next month.>**
3. Click **AaBbYyZz** and in the Font dialog box, select the *Underline* checkbox.
4. In the *Colorlist*, select *Green*.
5. Click **OK** to exit the Font dialog box and again to exit the Text Attachment dialog box.
6. Click on the text, *Task should be completed in the next month* to view the Activity ID associated with the inserted text.

Customizing Data Date Style

The data date style, size, and color can be changed from the Bar Chart Options dialog box.

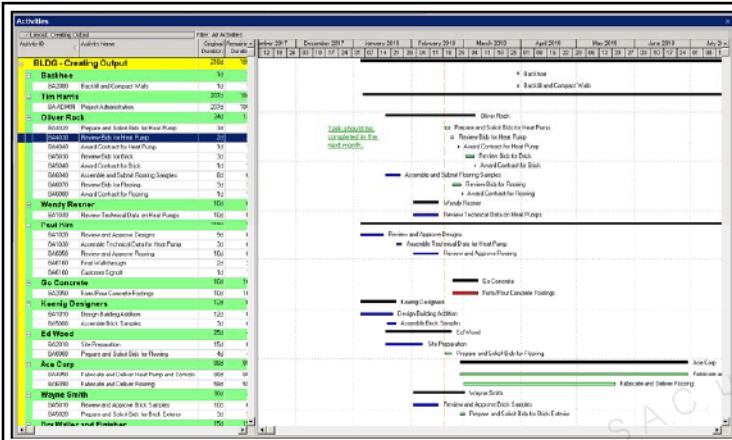


Figure C-13: The data date is now displayed as an orange dashed line.

Change the color and style of the data date line.

1. On the View menu, click *Attachments, Curtain, Hide All*.
2. On the Layout Options bar, click *Bar Chart Options*.
3. Click the Data Date tab.
4. In the *Style* list, select the Dashed style (second option down on the list).
5. Click the color button, and then select a shade of orange.
6. Click *OK* to exit the Color dialog box and again to exit the Bar Chart Options dialog box.

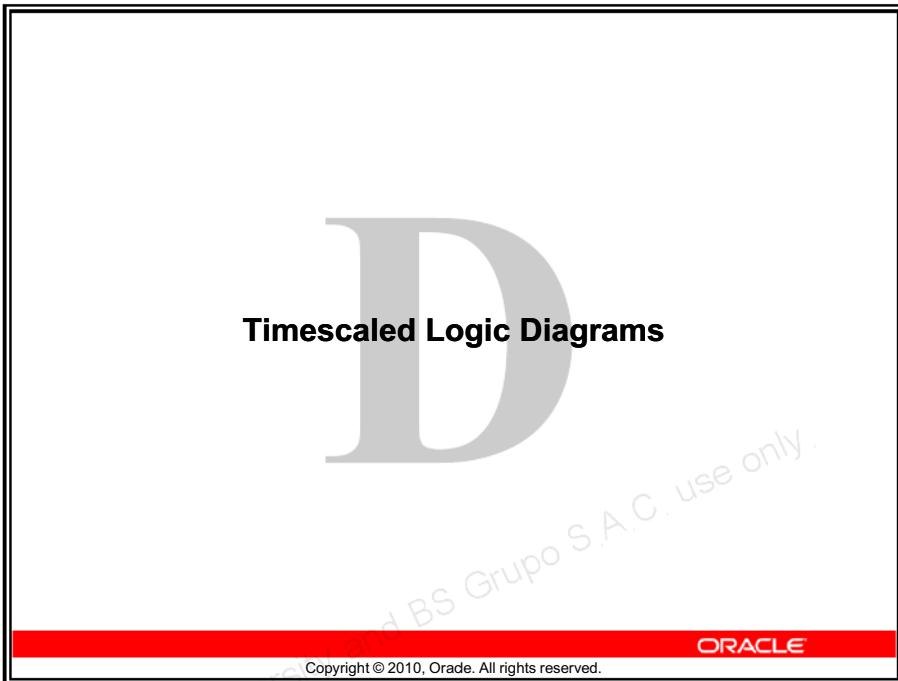
Lesson Review

Key Concepts

- Page Setup is used to specify how information is organized when printing a layout.
- Tabs within Page Setup – Page, Margins, Header, Footer, Options – help you customize the appearance of the printed document.
- Several options are available to enhance the display within the application:
 - ◆ Use the Curtain Attachment dialog box to highlight a specific time period in a Gantt chart.
 - ◆ Use the Text Tool to create formatted text and insert it in a layout.

Review Questions

1. **True or False:** You can insert a maximum of five sections in the header.
2. **True or False:** You must be in Print Preview to apply the changes made to a layout in Print Setup.
3. What is a vertical shaded area in the bar chart called?
 - a. Text box
 - b. Curtain
 - c. Symbol
 - d. Thumbtack
4. **True or False:** The data date is always represented by the color blue.



Appendix D – Timescaled Logic Diagrams

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
5	5	15	5	30

Objectives

After completing this lesson, you should be able to:

- Describe what a timescaled logic diagram is.
- Explain the value of timescaled logic diagrams.
- Create a timescaled logic diagram.

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Timescaled Logic Diagrams

A timescaled logic diagram is a bar chart (similar to a Gantt chart) that shows the logical relationships among project activities during a particular time period.

- Capabilities enable you to:
 - Specify the time period.
 - Group and sort activities in the diagram.
 - Control appearance of activity bars, bar labels, relationship lines, and other diagram elements in the final printout.
- Useful for:
 - Isolating small sections of a project in order to better understand the chains of activities that drive the project's schedule.
 - Compressing and printing an entire project on a single page for reports and other communications.

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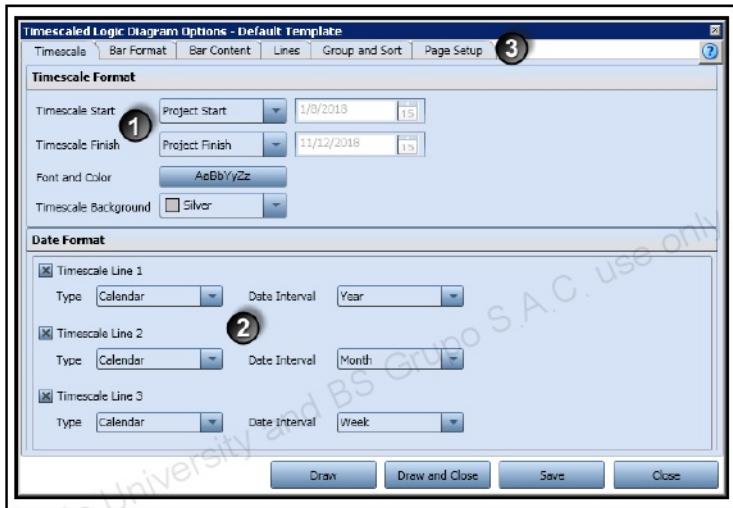
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Notes



Overview: Creating a Timescaled Logic Diagram

Click *Timescaled Logic Diagram* on the Tools menu to access timescaled logic diagram templates and associated options for specifying the timescale and for controlling the appearance of activity bars, bar labels, relationship lines, and other elements in a timescaled logic diagram.



- ① Use options in the Timescale Format section of the Timescale tab to specify the time period displayed in a timescaled logic diagram.
- ② Use options in the Date Format section of the Timescale tab to specify how the timescale will appear in a timescaled logic diagram.
- ③ Use other tabs in the Timescaled Logic Diagram Options dialog box to control how activity bars, bar labels, relationship lines, and other elements appear in a timescaled logic diagram.

Practice: Creating a Timescaled Logic Diagram

In this practice you will create a timescaled logic diagram.

Timescaled Logic Diagrams

A timescaled logic diagram is a bar chart (similar to a Gantt chart) that shows the logical relationships among project activities during a particular time period. Capabilities enable you to specify the start and finish dates of the time period, to group and sort activities in the diagram, and to closely control the appearance of activity bars, bar labels, and relationship lines in the final printout.

Timescaled logic diagrams are useful for isolating small sections of the project in order to better understand the chains of activities that drive a project schedule. They are also useful for compressing and printing an entire project on a single page for reporting and other project communication purposes.

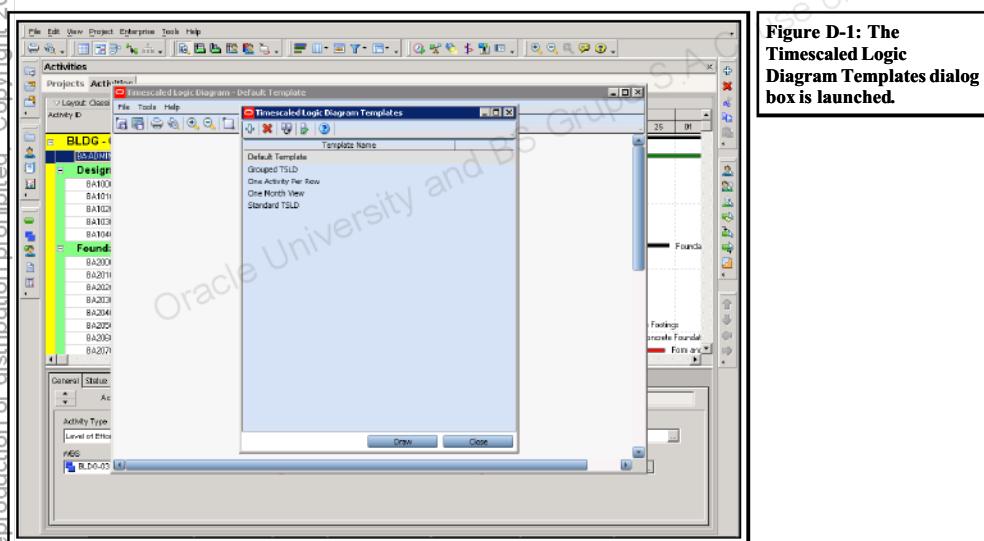


Figure D-1: The Timescaled Logic Diagram Templates dialog box is launched.

Launch the Timescaled Logic Diagram Templates dialog box.

1. Open a project, *BLDG-D BLDG – Timescaled Logic Diagrams*, and confirm that you are in the Activities window.
2. On the Tools menu, click *Timescaled Logic Diagram* to launch the Timescaled Logic Diagram Templates dialog box.

Choosing a Template

Timescaled logic diagrams use templates to record, maintain, and apply the numerous option settings that control a diagram's final appearance. Templates reduce errors and make configuring timescaled logic diagrams faster, more convenient, and easier to reproduce.

The Timescaled Logic Diagram Templates dialog box includes several templates from which to choose. It also provides icons for making changes to the templates available:

-  Add a new template.
-  Delete the selected template.
-  Duplicate the selected template.
-  Edit the selected template.

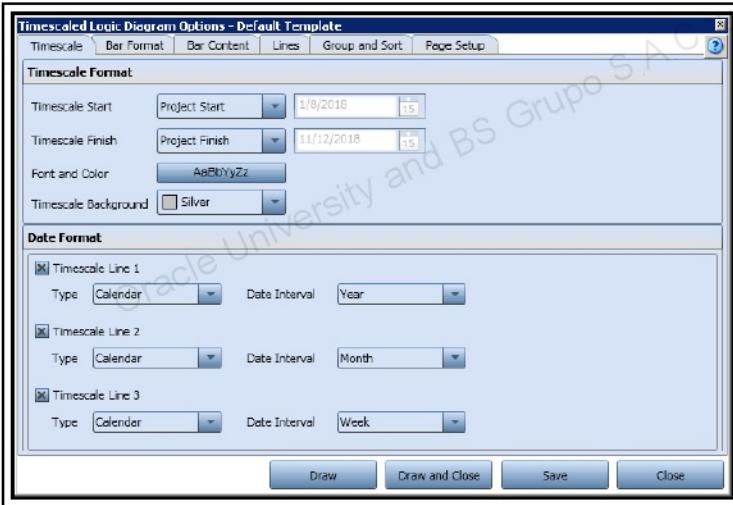


Figure D-2: Option selections for the Default Template are displayed and can be edited in the Timescaled Logic Diagram Options dialog box.

>Select and edit a timescaled logic diagram template.

1. In the Timescaled Logic Diagram Templates dialog box, select a template, *Default Template*.
2. Click  (*Edit Template*).

Specifying the Timescale

The default template uses a project's Start and Finish dates to specify the timescale. However, you can specify a shorter time period within the project's overall schedule and then zoom in on that period for a close look at the activities and relationships occurring therein.

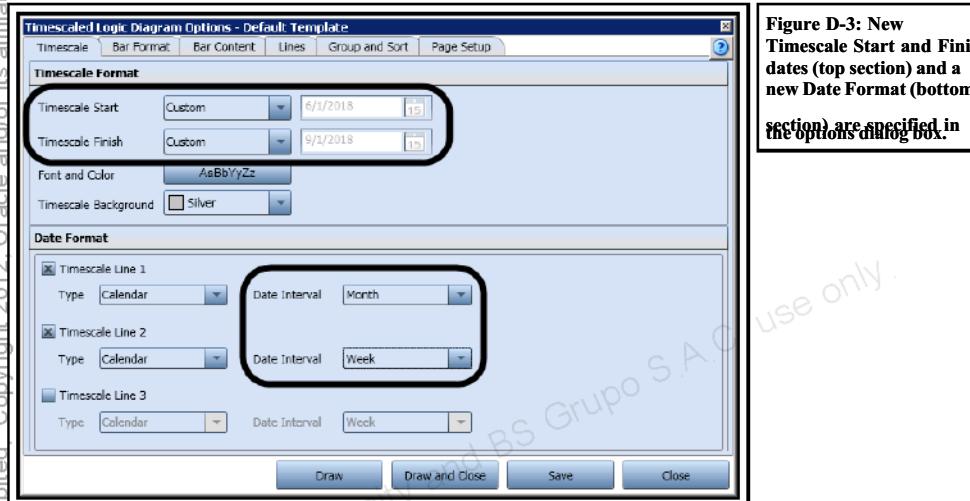


Figure D-3: New Timescale Start and Finish dates (top section) and a new Date Format (bottom section) are specified in the options dialog box.

Specify a timescale.

1. In the Timescaled Logic Diagram Options dialog box, confirm that the Timescale tab is selected.
2. In the *Timescale Start* field, click and select *Custom* from the list.
3. In the date field to the right, click and select a date, *01-Jun-18*.
4. In the *Timescale Finish* field, click and select *Custom* from the list.
5. In the date field to the right, click and select a date, *01-Sep-18*.
6. In the Timescale Line 1 *Date Interval* field, select *Month*.
7. In the Timescale Line 2 *Date Interval* field, select *Week*.
8. Clear the *Timescale Line 3* check box.

Other Timescale Logic Diagram Options

In addition to specifying the timescale, you can customize activity bar positions, colors, and labels; choose the color and style of data date and relationship lines; and group and sort the activity bars displayed in a timescaled logic diagram. Changes to option settings can then be saved as a new template for use with future diagrams.

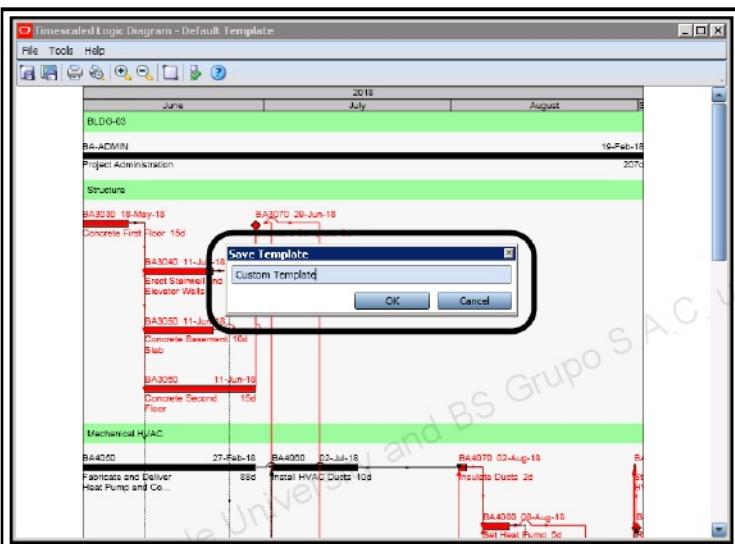


Figure D-4: The timescaled logic diagram is displayed, and a new *Custom Template* is being saved.

- ☛ **Select additional customization options and draw a timescaled logic diagram.**
1. Click the Bar Format tab.
 2. In the *Show schedule for* field, confirm *Early Dates*, and in the *Method* field, confirm *Standard*.
 3. Click the Bar Content tab.
 4. In the Bar Labels section, select the *TopRight* check box, and then click and select *Early Start* from the list.
 5. Select the *BottomRight* check box, and then click and select *Original Duration* from the list.
 6. Click the Lines tab.
 7. In the Relationship Lines section, confirm that *Draw Relationships* and *All Relationships* are both selected.

8. Click the Group and Sort tab.
9. In the Group By section, select the first check box and confirm *WBS Path*.
10. Click *Draw and Close*.
11. Click *Close*.
12. After viewing the timescaled logic diagram, on the File menu, click *Save Template*.
13. In the Save Template dialog box, type a name for the template, <**Custom Template**>, and click *OK*.
14. On the File menu, click *Exit*.
15. When asked if you want to save changes, click *No*.

Lesson Review

Key Concepts

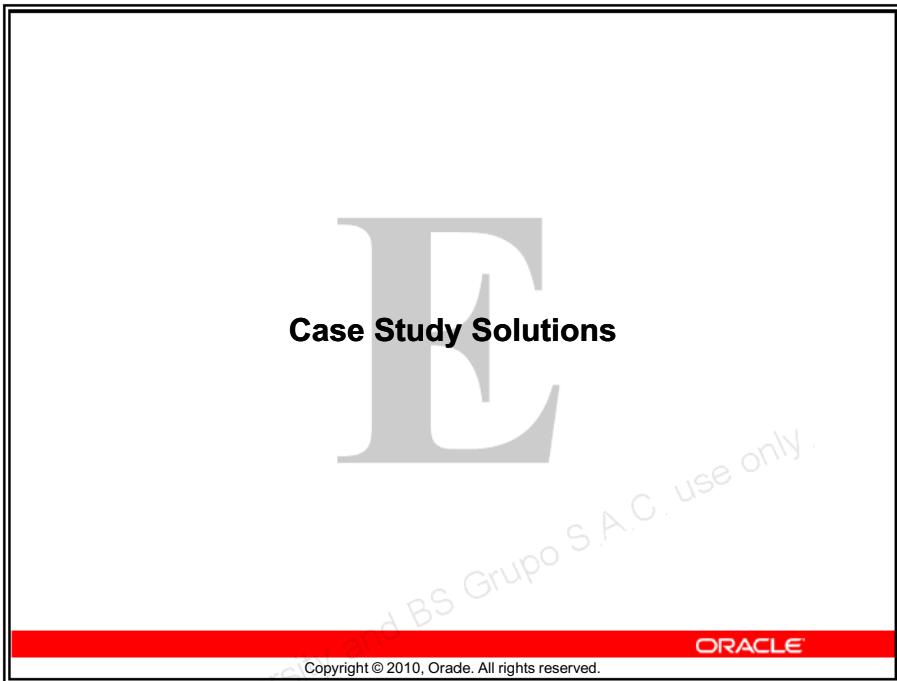
- A timescaled logic diagram is a bar chart (similar to a Gantt chart) that shows the logical relationships among project activities during a particular time period.
- Timescaled logic diagram capabilities enable you to specify the start and finish dates of the time period, to group and sort activities in the diagram, and to closely control the appearance of activity bars, bar labels, and relationship lines in the final printout.
- Timescaled logic diagrams are useful for isolating small sections of the project in order to better understand the chains of activities that drive a project schedule.
- Timescaled logic diagrams are also useful for compressing and printing an entire project on a single page for reports and other project communications.

Review Questions

1. **True or False:** Timescaled logic diagrams enable users to isolate and closely examine sections of the Gantt chart for a better understanding of the activities and relationships that drive a project schedule.
2. **True or False:** The command for creating a timescaled logic diagram is located on the Project menu.

Notes

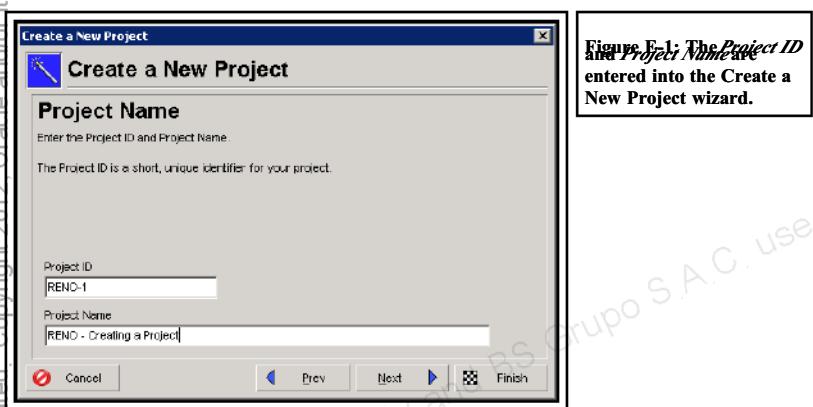




Appendix E – Case Study Solutions

Case Study 1: Solutions

The following is presented as a guide to completing Case Study 1. Due to the flexibility of P6 Professional, there is often more than one way to accomplish any particular task, and you are encouraged to experiment and adopt methods that are comfortable for you. Compare your approach – and your results – to the text and screenshots below.



1. To create a new project, first close any open projects and then use the Create a New Project wizard as follows:
 - a. On the File menu, click *Close All* to close all open projects.
 - b. On the File menu, click *New* to launch the wizard.
 - c. Enter the information from Objective 1 into the appropriate wizard screens.

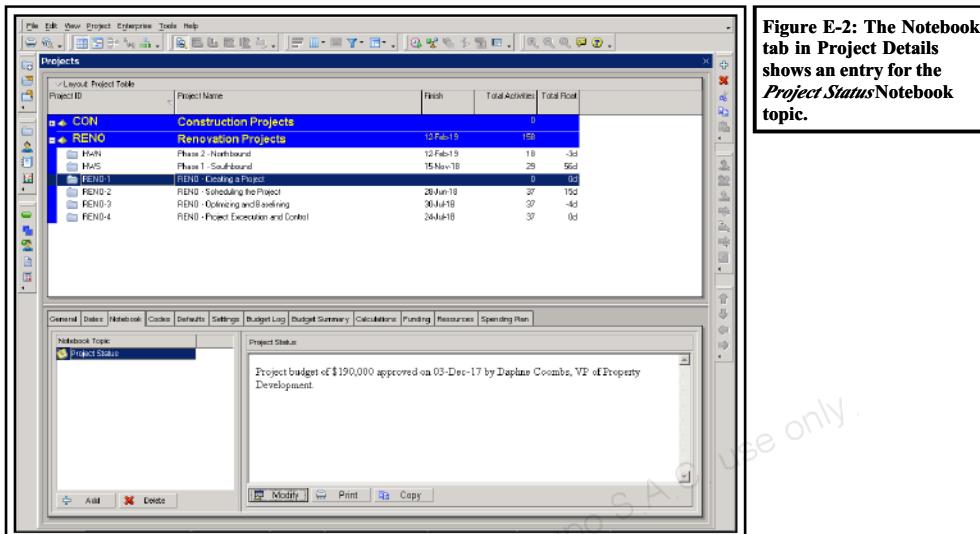


Figure E-2: The Notebook tab in Project Details shows an entry for the *Project Status Notebook* topic.

2. After creating the project, enter a Notebook topic in Project Details:
 - a. Confirm that you are in the Projects window.
 - b. In the Project Table, select the newly created project, *RENO 1 – Creating a Project*.
 - c. In Project Details, click the Notebook tab and add a Notebook topic, *Project Status*. Then, type an entry, such as **<Project budget of \$190,000 approved on 03-Dec-17 by Daphne Coombs, VP of Property Development.>**

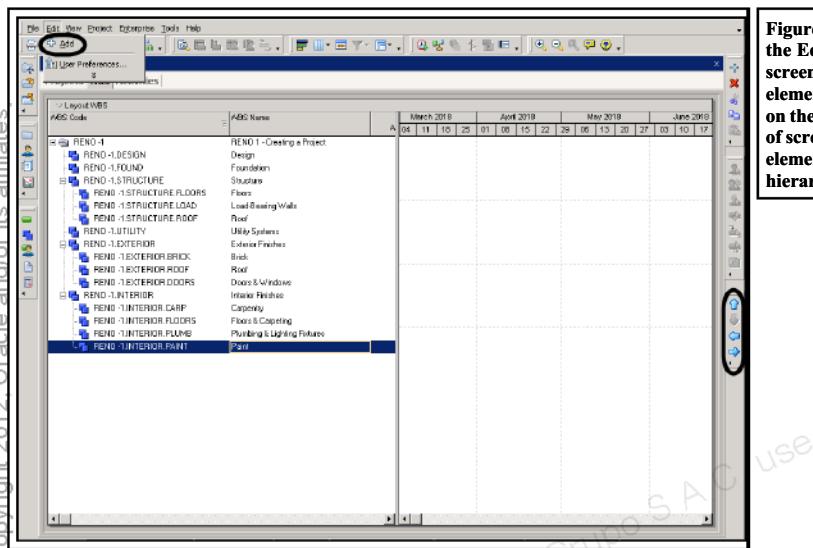
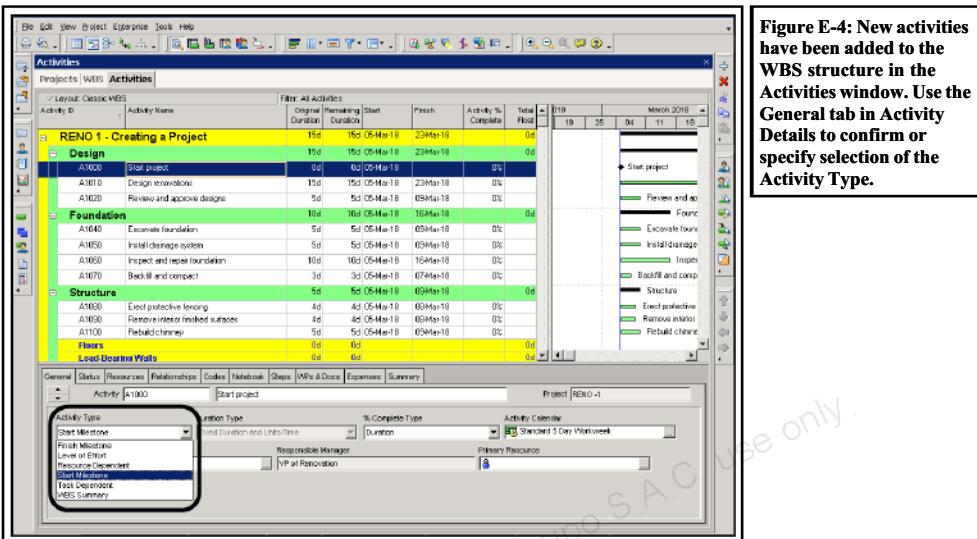


Figure E-3: Click *Add* on the *Edit* menu (top of screen) to add WBS elements. Use the arrows on the Move toolbar (right of screen) to arrange the elements in the WBS hierarchy.

3. To create a WBS structure, use the WBS window.

- a. On the Project menu, click *WBS*. The project (and highest level of the WBS), *RENO-1*, is already displayed.
- b. On the Edit menu, click *Add* to add new WBS elements, and use the arrows on the Move toolbar to arrange the WBS elements as in the screenshot above.



4. To add activities, use the Activities window.

- On the Project menu, click *Activities*.
- Open a layout, *Classic WBS*, if it is not already open. You should see the WBS hierarchy bands ready for activities to be added. If the WBS bands are not displayed, it is because they do not yet contain any activities. If that is the case, on the Layout Options bar, click *Group and Sort* and in the Group By Options section of the Group and Sort dialog box, clear the *Hide if empty* check box.
- On the Edit menu, click *Add* to add new activities. Remember that activities are entered below the item selected in the Activity Table. Confirm the Activity ID as each new activity is added (and make any necessary changes) in the Activity Table *Activity ID* column. Enter the name of each new activity and its Original Duration directly into the appropriate Activity Table columns. *Task Dependent* is the default Activity Type for new activities. Use the *Activity Type* field on the General tab in Activity Details to confirm *Task Dependent* for each new activity (and to select *Start Milestone* for activity *A1000*).

Case Study 2: Solutions

Compare your approach and answers to the text and screenshots below for the solutions to Case Study 2.

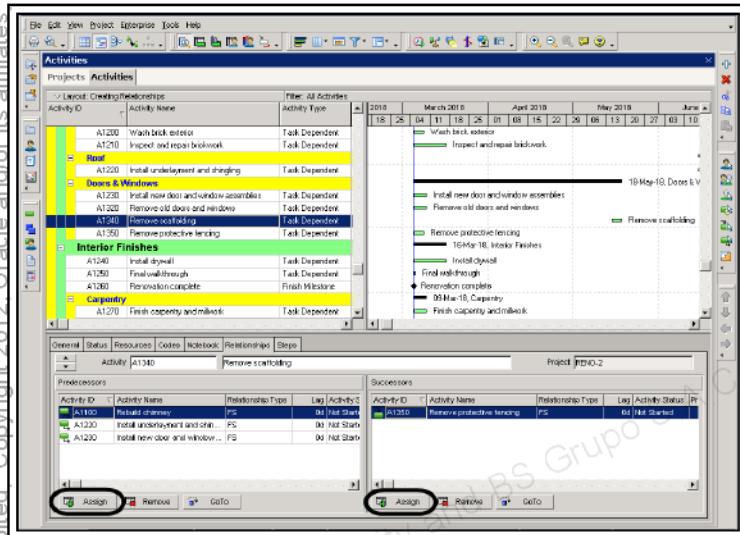


Figure E-5: Use the *Assign* buttons on the Relationships tab in Activity Details to create relationships with the activity selected in the Activity Table.

- To create relationships, use the Relationships tab in Activity Details. In the Activities window after opening the project and layout, click the Relationships tab in Activity Details. Then, select activities in the Activity Table and use the *Assign* buttons in the Predecessors and Successors windows on the Relationships tab to create relationships as specified in Case Study 2, Objective 1.
 - To schedule the project: On the Tools menu, click *Schedule*, confirm the data date, *05-Mar-18*, and click *Schedule*. To check the scheduled Finish date, click the *Projects* tab near the top of the screen and then click the Dates tab in Project Details. The scheduled Finish date is *30-Jul-18*.

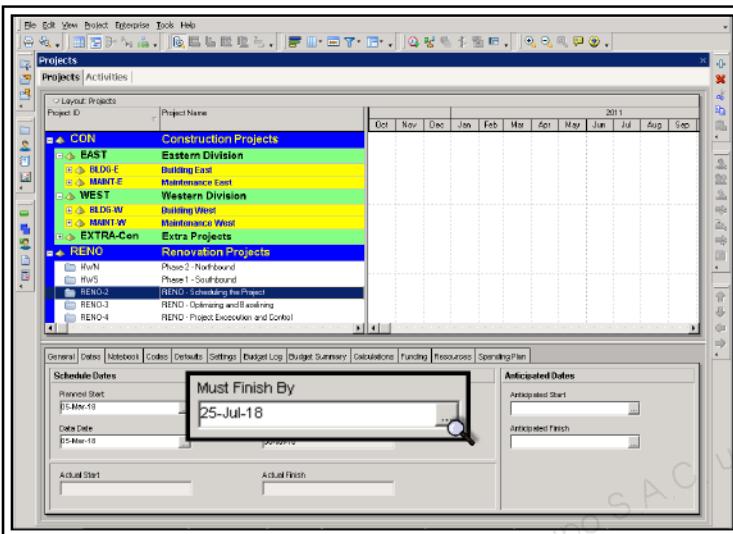


Figure E-6: A Must Finish By constraint has been assigned to the project.

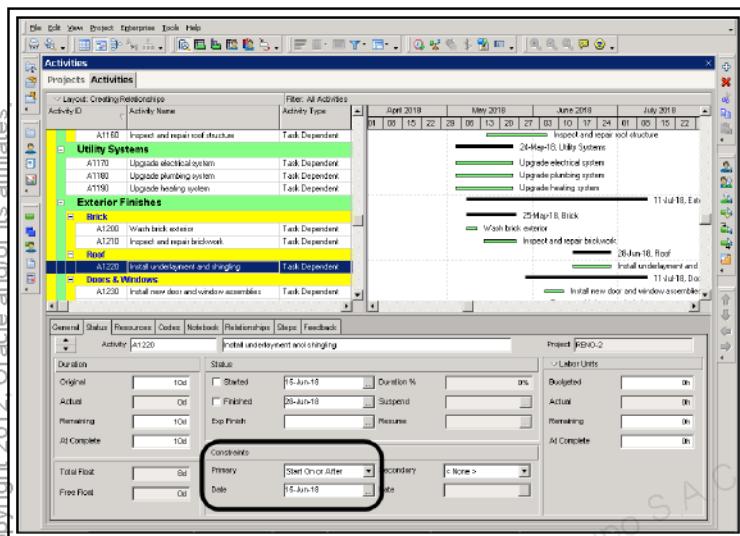


Figure E-7: A primary constraint, *Start On or After*, has been assigned to activity *A1220*.

3. To assign a Start On or After constraint to activity *A1220*, click the Activities tab to navigate back to the Activities window, and select activity *A1220* in the Activity Table. In Activity Details, click the Status tab. In the Constraints section, select *Start On or After* in the Primary field, and then in the Datefield, click to select the date.
4. After rescheduling the project, click the Projects tab near the top of the screen to navigate to the Projects window. On the Dates tab in Project Details, confirm that the Finish date remains 30-Jul-18. Although the constraint delayed the start of activity *A1220*, it did not affect the project's Finish date because *A1220* had sufficient float. The constraint reduced the float on activity *A1220* from 15 days to 8 days.

Case Study 3: Solutions

Compare your answers for Case Study 3 to the text and screenshots below. The numbering below reflects the numbering of the objectives in the case study.

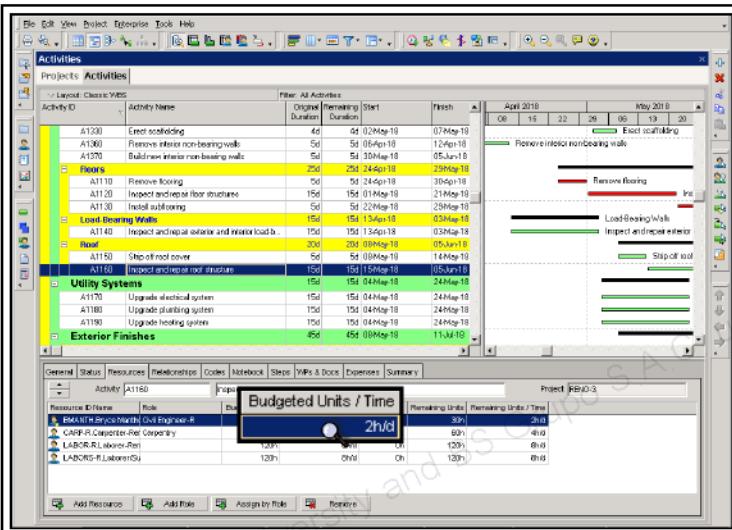


Figure E-8: After adding resource Bryce Manthorne to activity A1160, it is necessary to change his **Budgeted Units/Time**.

2. To assign resources to project activities, use the Resources tab in Activity Details.
 - a. After making the specified Resource assignments, change the Units/Time for Bryce Manthorne and for the Inspector-Renovation directly in the *Budgeted Units/Time* column on the Resources tab.

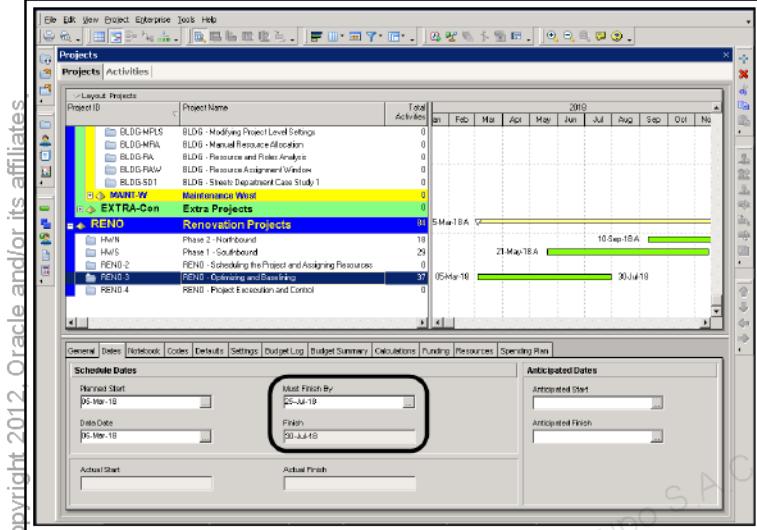


Figure E-9: Scheduled Finish date and Must Finish By date are both displayed on the Dates tab in Project Details.

4. The scheduled Finish date and the Must Finish By date can both be viewed on the Dates tab in Project Details.
 - a. Scheduled Finish date = 30-Jul-18
 - b. Must Finish By date = 25-Jul-18
 - c. The project is behind schedule. Adding a *Total Float* column to the project layout indicates that the project is four days behind schedule. (*Total Float* = -4d).
5. When trying to shorten a project, focus on critical activities. Option 2 is the only choice involving critical activities and is therefore the only choice capable of reducing overall project duration. In the Activities window, select activity *A1090* in the Activity Table and then click the Relationships tab in Activity Details. In the Successors window, for activity *A1110*, change the lag from 7 to 3 days.
6. After rescheduling, the project will finish on time (scheduled Finish = 24-Jul-18, Total Float = 0d).

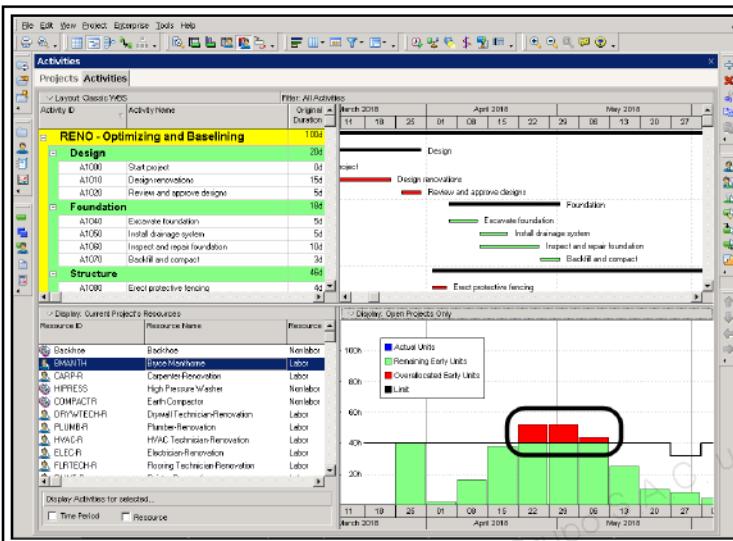


Figure E-10: Red bars indicate that Bryce Manthorne is overallocated.

7. To use the Resource Usage Profile, on the Layout Options bar in the Activities window, click *Show on Bottom, Resource Usage Profile*. Click the Resource Usage Profile left pane Display Options bar and filter by the current project's resources. Click the right pane Display Options bar and click *Show All Projects* to remove the check mark and show resource allocations for the currently open project only.
- Go down the list of resources in the profile's left pane while viewing the graph in the right pane. Bryce Manthorne is overallocated.
 - To see which activities are affected, select the Time Period check box at the bottom of the Resource Usage Profile left pane. Click each of the histogram bars that shows overallocated units (red) and view the activities causing overallocation during that week in the Activity Table in the top left quadrant of the screen.

The graph shows overallocation during three weeks:

Week of April 22: A1060, A1070, **A1120**, A1140

Week of April 29: A1070, **A1120**, A1140

Week of May 6: A1100, **A1120**

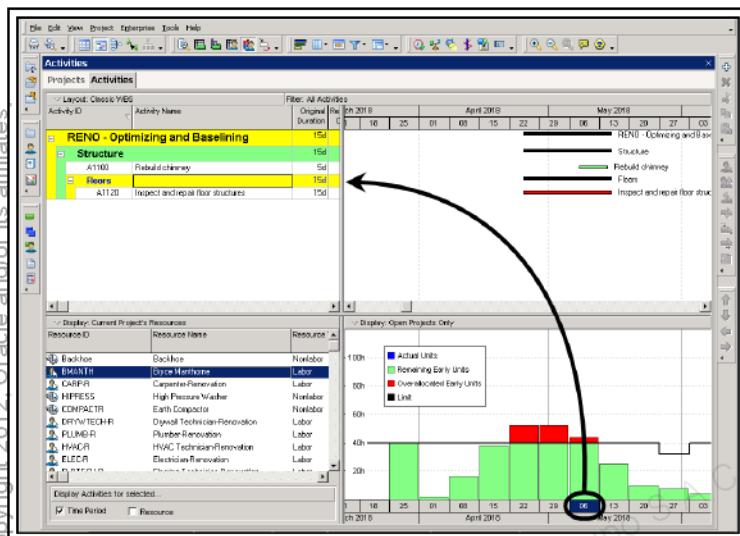


Figure E-11: Activities *A1100* and *A1120* are causing overallocation during the week of 06-May-18. Activity *A1120* is involved during every period of overallocation.

- c. One activity, *A1120*, is involved during every week of overallocation. Replacing Bryce Manthorne with Joe Couto on that activity resolves all overallocation:
 - In the Activity Table, select *A1120*.
 - In the Resource Usage Profile left pane, clear the *Time Period* check mark.
 - On the Edit menu, click *Assign, Resources by Role*.
 - In the Assign Resources by Role dialog box, filter by *All Resources*, select and remove Bryce Manthorne, and select and assign Joe Couto.

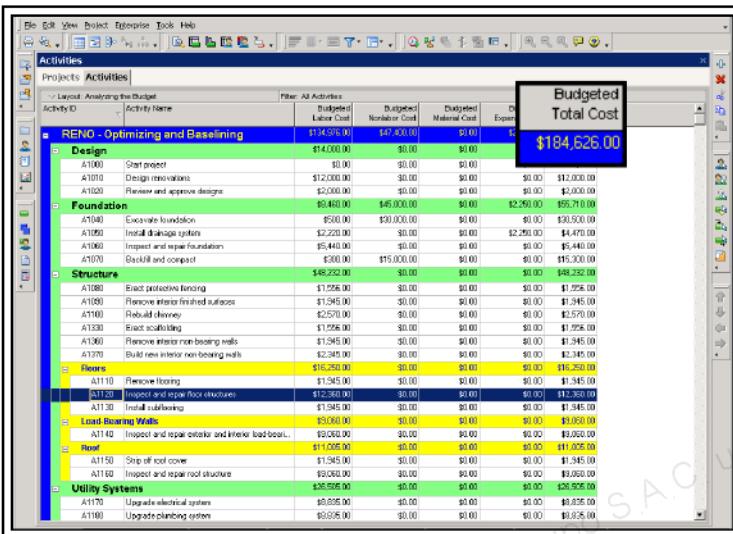


Figure E-12: Budgeted Total Cost on the Analyzing the Budget layout shows that the project is within budget.

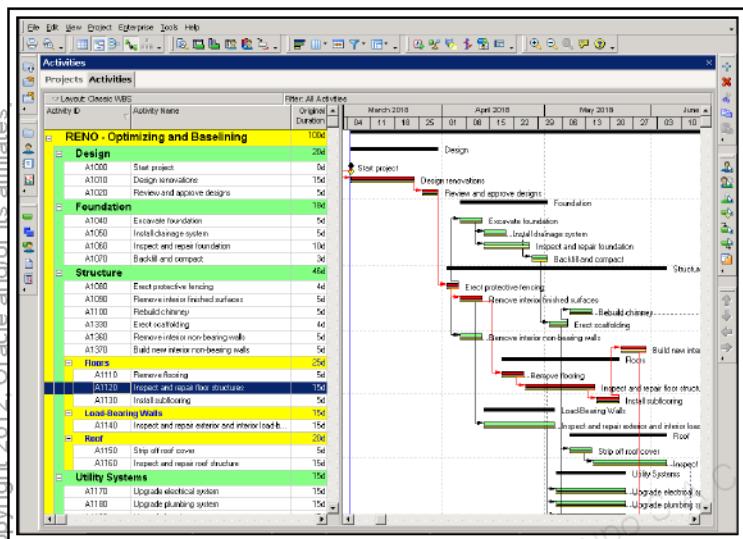


Figure E-13: Baseline bars are displayed in the Gantt chart.

9. On the Project menu, click *Maintain Baselines* to create a baseline.
 - a. Click *Add*, confirm *Save a copy of the current project as a new baseline*, type a baseline name, and select *Initial Plan* as the baseline type. On the Project menu, click *Assign Baselines* to assign the new baseline to the project schedule. In the Assign Baselines dialog box, select the newly created baseline in the *Project Baseline* and the User Baselines *Primary* field and then click *OK*.
 - b. To display the primary baseline in the Gantt chart, reopen the *Classic WBS* layout. On the Layout Options bar, click *Bars*, select the *Primary Baseline* and *Baseline Milestone* check boxes, and then click *OK*.
 - c. To export the project plan, on the File menu, click *Export* and follow the prompts in the Export wizard to export it to C:\Training Docs in XML format (the export will be a Zip file).

Case Study 4: Solutions

Compare your answers for Case Study 4 to the screenshots and text below. Numbering reflects numbering of the objectives in Case Study 4.

2. After updating activities in the April 23 to April 30 period and rescheduling, the project is still on schedule (Total Float = 0d).

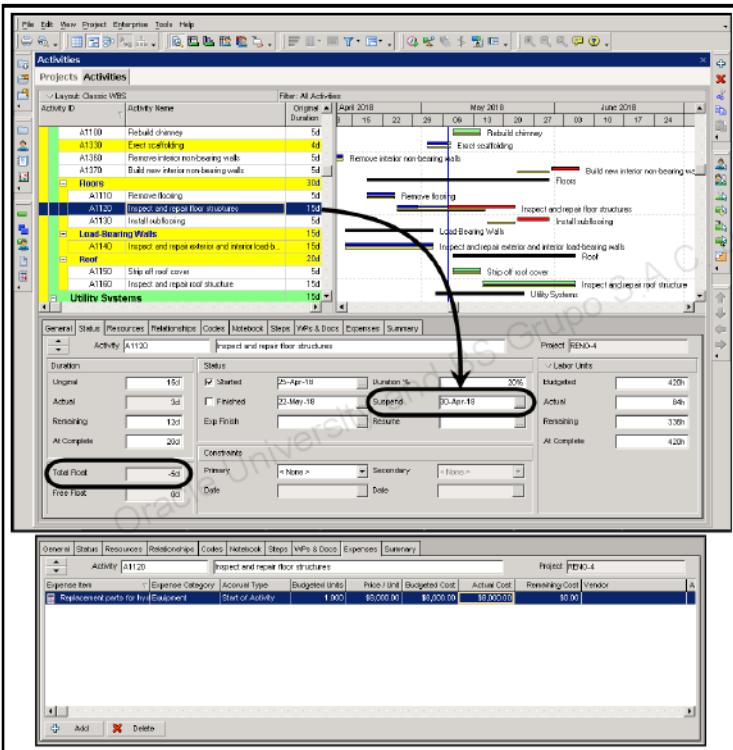


Figure E-14: Activity A1120 has been suspended on the Status tab, and an expense for the activity has been added on the Expenses tab. After rescheduling, Total Float for the activity (as well as all other critical activities) is -5d indicating that the project is now behind schedule.

3. After updating activities in the April 30 to May 7 period and rescheduling, the project has fallen behind schedule by 5 days (Total Float = -5d). You determine can whether the project is on schedule by checking the Total Float of any critical activity on the Status tab. If Total Float is less than zero, the project is behind schedule. Also, notice in the Gantt chart that the baseline bars are no longer aligned with the red critical activity bars.

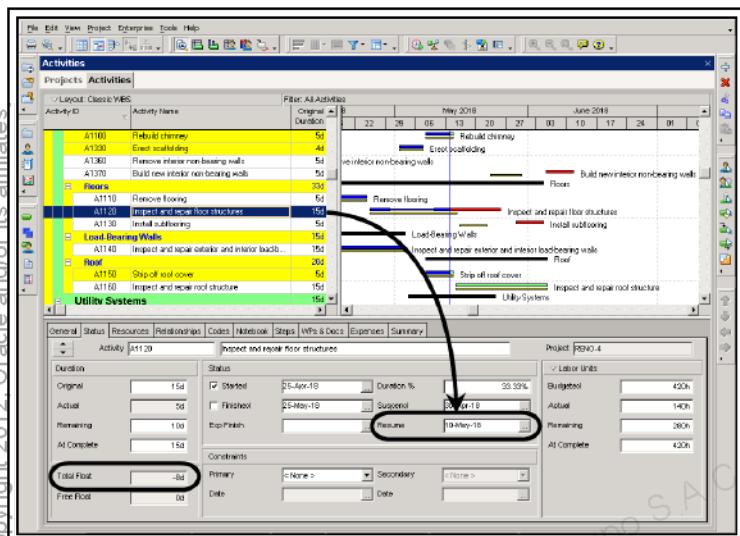


Figure E-15: Work has resumed on activity A1120. After rescheduling, the activity (as well as other critical activities and the project itself) is 8 days behind schedule (Total Float = -8d).

- After updating activities in the May 7 to May 14 period and rescheduling, the project has fallen behind schedule by 8 days (Total Float = -8d).

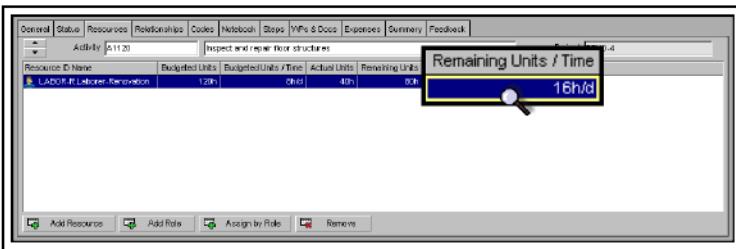


Figure E-16: Resources tab for *A1120* with Actual and Remaining Units updated to reflect the new Remaining Duration. Note the *Remaining Units/Time* for the resource.

5. After doubling resources on activity *A1120* and rescheduling, the project is now 3 days behind schedule (Total Float = -3d).

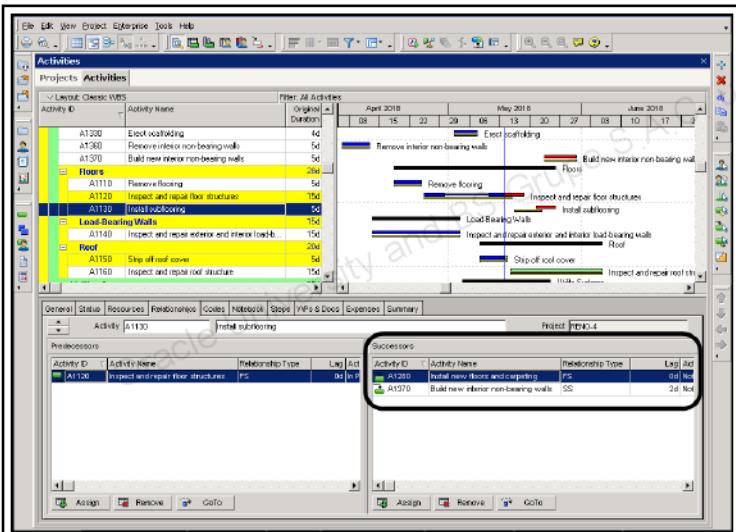


Figure E-17: The relationship between activity *A1130* and its successor, *A1370*, has been changed, and a new relationship with a new successor, *A1280*, has been added.

6. After changing the relationships between activity *A1130* and its successors and then rescheduling the project, the project is fully back on schedule (Total Float = 0d).
7. The project is back on schedule, and the Resource Usage Profile indicates that there are no overallocated resources.

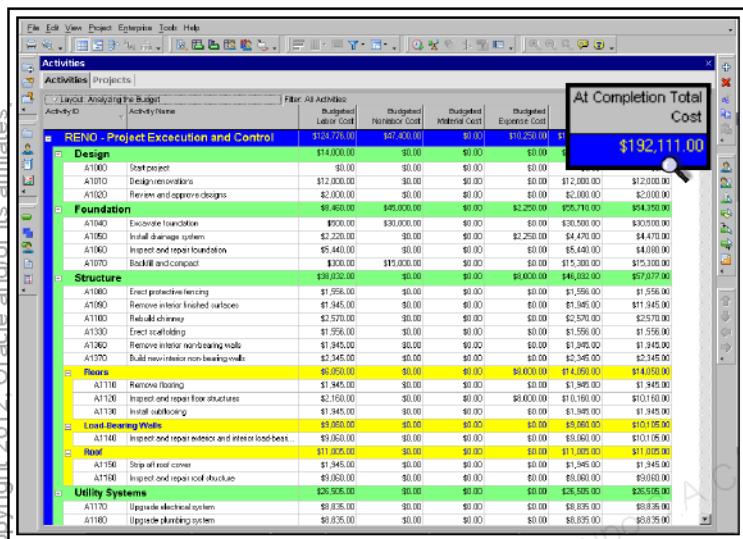


Figure E-18: At Completion Total Cost shows that the project is over its Original Budget of \$190,000.

- After updating and re-optimizing the project plan, the project is no longer within its Original Budget of \$190,000. Due to project expenses and changes to resource assignments, the At Completion Total Cost for the project is now \$192,111.

