

Primavera Risk Analysis for P3 and Suretrak users

Primavera Risk Analysis for P3 and Suretrak

This document is an extract from the Primavera Risk Analysis help file version 8.7 SP5.


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1	P3 and Suretrak Risk Tutorial	

1.1 P3 Risk Tutorial


1.1.1 Primavera P3 Risk Tutorial

This tutorial takes you through the steps of opening an example P3 project, running a risk analysis and updating the results to the P3 project.

 To use Primavera Risk Analysis with Suretrak first save the Suretrak project in the concentric .P3 format or the Project Groups format.

Tutorial contents:

1. The P3 project
2. Opening P3 project in Primavera Risk Analysis
3. Running risk analysis
4. The risk results
5. Updating the results to P3
6. Viewing the results in P3

 If you are reading this in the on-line help you may want to print out this tutorial - see **Printing Help Topics and Chapters (Section 13)**

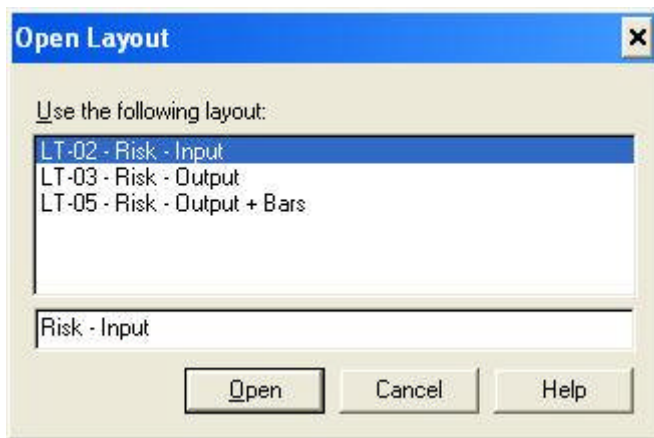
1.2 P3 Risk Tutorial - 1. The P3 project


This tutorial uses a P3 example project that is installed with Primavera Risk Analysis.

If you do not have P3 installed you can move straight to **2. Opening the P3 project in Primavera Risk Analysis (Section 1.3)**

Open the P3 sample project in P3

- Start up P3.
- *File | Open*
- Locate the sample project RSK3 project that is installed with Primavera Risk Analysis and click *Open*. File usually installed in folder C:\Program Files\Oracle\Primavera Risk Analysis\Samples
- *View | Layout | Open*.



- Select "Risk - Input" layout and click *Open*.
-  The "Risk - Input" layout may have been the layout already displayed.

Activity Description	Rem Dur	Orig Dur	Min Dur	Likely Dur	Max Dur	Prob Branch	% Chance Exists	Duration Correlate	Cost Min	Cost Likely	Max Cost	Cost Type	J
Start	0	0							0	0	0		
Erect Scaffold	15	15	10	15	22			SCAF	10,000	11,000	14,000		
Drain off system	8	8	6	8	16				1,000	1,100	1,400		
Chimney rebuild	8	8	6	8	13				4,500	6,000	8,700		
Demolish 50%	15	15	14	15	25				2,000	2,500	3,500		
Drill out ties, etc	16	16	12	16	27				500	600	800		
Cut-off & re-roof	8	8	6	8	14				400	500	650		
Re-wire	7	7	6	7	13				15,000	17,000	24,000		
Re-build 50% of	24	24	20	24	32			BLD	2,300	2,500	3,000		
Test electrics	16	16	10	16	24	NODE			450	500	575		
Electrics FAIL	16	16	12	16	22	20			13,000	15,000	19,000		
Electrics PASS	8	8	6	8	14	80			500	600	700		
Re-build 50% of	26	26	20	26	33			BLD	4,400	4,500	4,900		
Strip off roof cl	8	8	6	8	15				900	1,000	1,250		
Boundary wall	12	12	10	12	17				2,300	2,500	2,700		
Dry rot	2	2	2	2	3		10		15,000	18,000	24,000		
Roof struct. w	12	12	10	12	15				1,500	2,000	2,750		
Recover roof	18	18	15	18	25				9,000	10,000	14,000		
Joinery	7	7	6	7	8				1,500	1,700	2,200		
Plaster	8	8	7	8	10				1,000	1,100	1,400		
Plumbing, etc	6	6	6	6	8				3,500	4,000	6,000		
Dismantle scaf	9	9	6	9	15			SCAF	850	900	950		
Exterior works	7	7	6	7	8				2,300	2,400	2,560		
Inspect, snag,	8	8	3	8	15				950	1,140	1,300		
Finish	0	0							0	0	0		
Site Security	120*	120*							175	200	250	R	


Columns with Activity Codes and Custom Data items have been set up to store the risk input data. These will be mapped into the risk fields when the project is opened in Primavera Risk Analysis.

1.3 P3 Risk Tutorial - 2. Opening the P3 project in Primavera Risk Analysis

Open the Primavera RSK3DIR.P3 in Primavera Risk Analysis

- Start Primavera Risk Analysis.
- *Help | Open Samples...*
- Locate and select the sample file "RSK3DIR.P3". Click *Open*.
- Set up the mappings for the *Task Duration* tab and set up as follows:

Import P3 Risk data

 Pertmaster can model uncertainty based on the activity codes in the Primavera plan. The method used is similar to the methods used with Primavera Monte-Carlo.

Tasks Resources and Costs Probabilistic

Task Duration Uncertainty

Optimistic	OPTD - Optimistic
Most likely	MOST - Most Likely
Pessimistic	PESS - Pessimistic
Duration	<nothing>

Duration Correlation Group

Activity	CORR - Correlation
----------	--------------------

Workspace template

Currently selected - P3.wkspc Select Workspace...


☒ Organize project by WBS

☒ Remember these settings

OK Cancel

- Click on the *Resources and Costs* tab and set up as follows:

Import P3 Risk data

 Pertmaster can model uncertainty based on the activity codes in the Primavera plan. The method used is similar to the methods used with Primavera Monte-Carlo.

Tasks **Resources and Costs** Probabilistic

☐ Import all the Primavera resources and assignments
 (The task cost will be linked to the task duration)

☒ Create triangle cost distribution:

CMIN - Min Cost --> Task, Minimum Cost
 CML - Most Likely Cost --> Task, Most Likely Cost
 CMAX - Max Cost --> Task, Maximum Cost

Treat the above values as daily rates where:

CTYP - Cost Type is set to 'R'

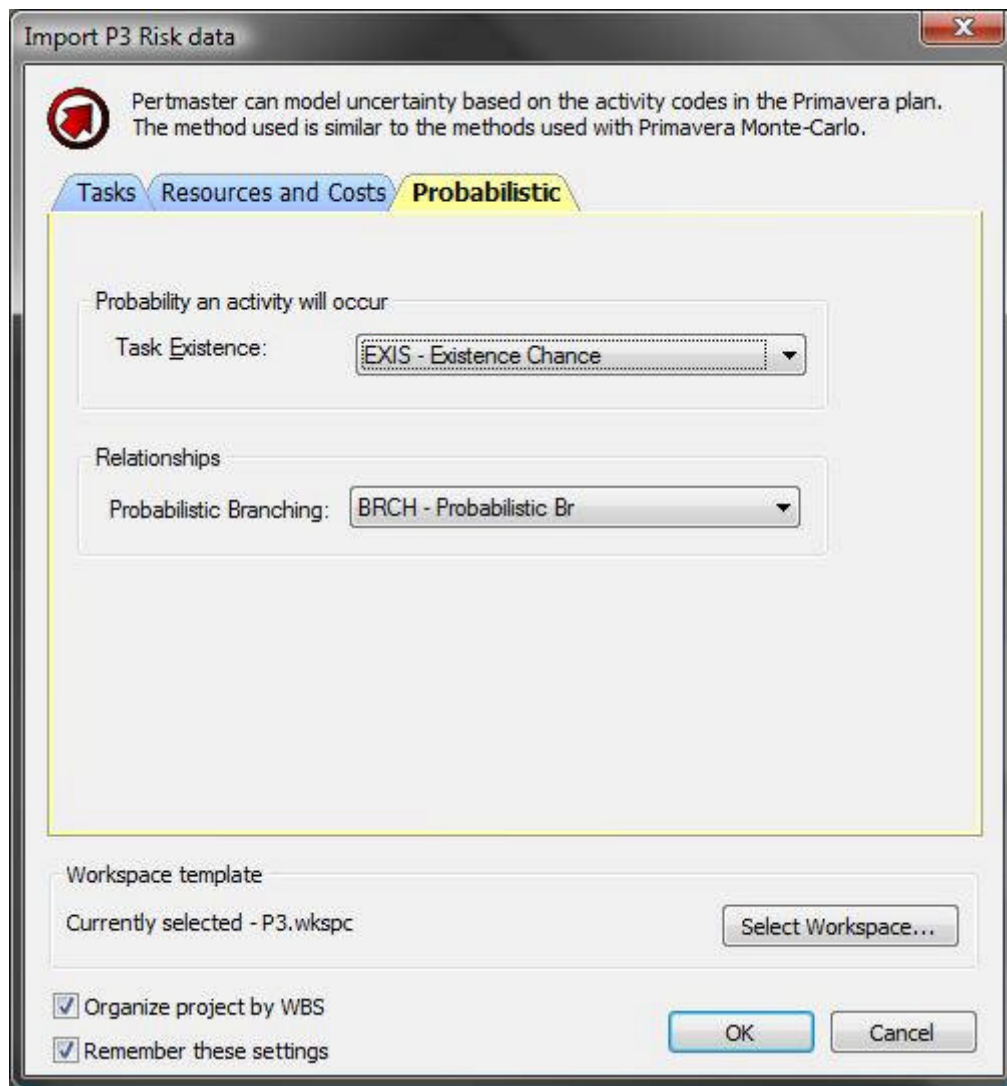
Workspace template

Currently selected - P3.wkspc Select Workspace...

☒ Organize project by WBS
☒ Remember these settings

OK Cancel

- Click on the *Probabilistic* tab and set up as follows:



- Click **OK** to continue the import.
- After the P3 project is opened the *Save As* dialog appears. Save as the default name selected by Primavera Risk Analysis (i.e. "RSK3").
- Click on the *Risk Inputs* sheet to view the imported uncertainty.

Notes

- The *Import Check* sheet displays *Start Check* and *Finish Check* columns that display any differences between the P3 and Primavera Risk Analysis schedule. Check the columns for any differences - there maybe differences of a day for milestones or zero duration activities - these will not affect the results.
- On the *Import Check* sheet the grey bars display the *Start Check* and *Finish Check* graphically. The grey bars are the P3 schedule and the bars above them are the Primavera Risk Analysis schedule.


Viewing risk inputs

- To view all the risk inputs for the project - *Risk | Risk Summary*
- To view individual risk data from the main screen, click on a task and choose the *Risk and Uncertainty* tab in the *Task Details*.

1.4 P3 Risk Tutorial - 3. Running risk analysis

After opening the P3 project in Primavera Risk Analysis a risk analysis can be run.

Run the Risk analysis

- Risk | Run Risk Analysis or click 
- Click *Options...* to display all options.
- Change the options in the *Risk Analysis Options* dialog to those shown below:

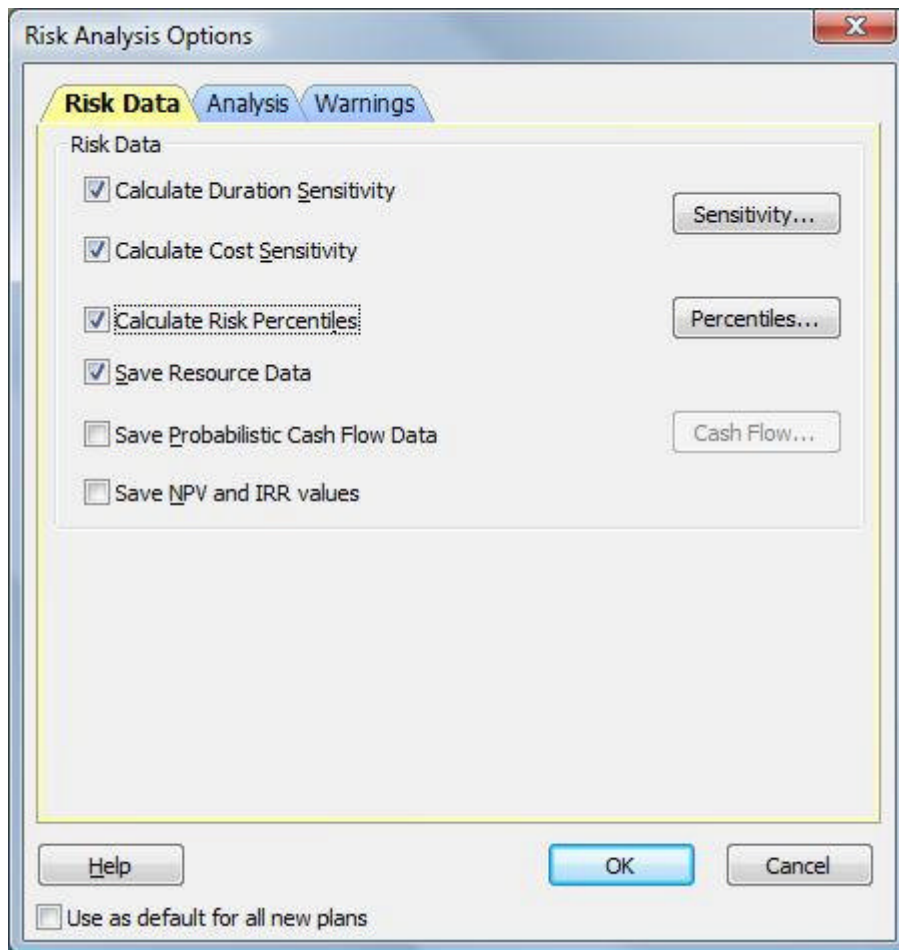


Figure: Risk analysis options dialog

- In the *Analysis Options* dialog click on the *Percentiles...* button that is next to *Calculate Risk Percentiles*.

Selected percentiles can be copied to user task fields.

- Set up the values as shown below (they may already be set up like this):

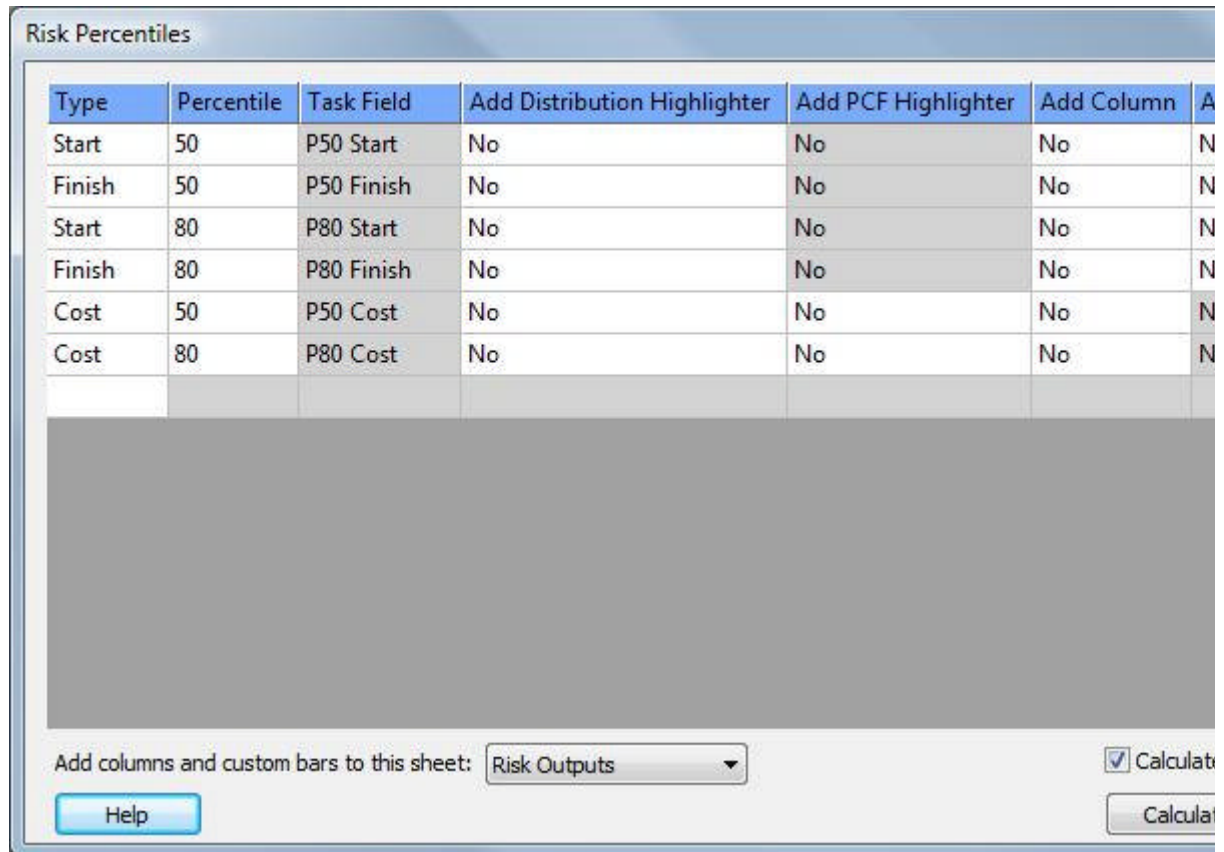
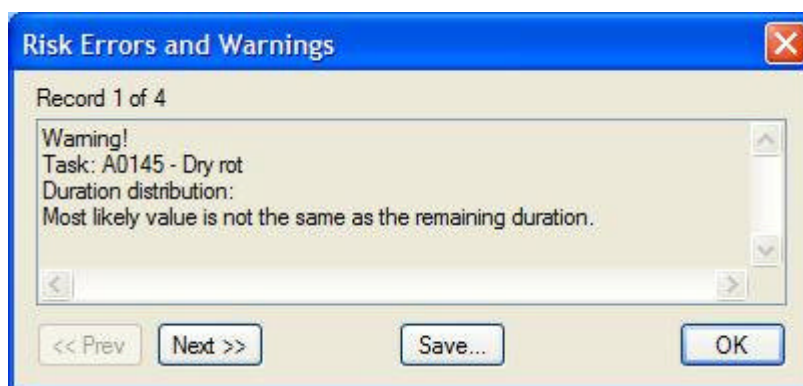


Figure: Setting up task percentiles to calculate the P50 and P80 dates and costs.

- Click *OK* to close the *Risk Percentiles* dialog.
- Click *OK* to close the *Risk Analysis Options* dialog.
- Click the *Analyze* button.
- A warning dialog is displayed with warnings. This tells us that the duration for '0100 - Electrics fail' is outside the range of the distribution. This is correct as we are modeling the probabilistic activities with a zero duration in the Primavera plan. The same applies for the '0145 - Dry Rot' activity. Modeling probabilistic activities with a zero duration ensures that their durations do not affect the project's deterministic finish.



- Click *OK* to close the *Risk Errors and Warnings* dialog.
- Click on *Step* button to step through individual iterations. The step through allows you to check to see if the analysis is proceeding as expected. In particular you can watch probabilistic activities appear and disappear from the schedule, e.g. '0100 - Electrics fail' and '0110 - Electrics pass'. Notice as you step through how the project cost changes and activities move on and off the critical path.

As you step through each iteration you can scroll around and format the Gantt Chart area.

- Use the *Complete* button to run analysis without re-drawing after each iteration.



Using *Step* and *Go* require Primavera Risk Analysis to redraw after each iteration - this can significantly increase the time taken to complete the risk analysis. Once you are happy that the risk analysis is proceeding as expected, use the *Complete* button and it will be a lot faster.

1.5 P3 Risk Tutorial - 4. The risk results

After the risk analysis has been run the *Distribution Graph* is displayed.

The Distribution Graph can be used to display distributions for Finish Dates, Start Dates, Durations, Total Float, Resources or Costs for any of the tasks in the plan or for the entire plan.

The name of the selected distribution is displayed in the graph title.

The chance of completing the project on time

- Select *Finish Date* tab.
- On the right hand side under *Highlighters* read the *Deterministic* probability (4%)
- On right hand side read the 80% date (23 Aug)

The chance of completing a selected task on time

The distribution for an individual task can also be displayed.

- Select '0160 - Recover roof' from the task tree on the left of the Distribution Graph.
- On the right hand side under *Highlighters* read the *Deterministic* probability (3%)
- On right hand side read the 80% date (28 Jul)

The chance of completing the project in budget

First we need to change back to the Entire Plan.

- Select '<Entire Plan>' from the task tree on the left of the Distribution Graph.

Now display the Cost distribution.

- Select *Cost* tab: Read the *Deterministic Cost* probability (less than 1%)
- On right hand side read the 80% cost (118,125)

Return to the Gantt Chart

- Close the Distribution Graph. You may be asked to save at this point.

Displaying risk outputs in the Gantt Chart

Outputs such as the Criticality Index and Duration Sensitivity can be displayed in the Gantt Chart.

- Click on the *Risk Outputs* sheet.



Figure: Risk results displayed in the Gantt Chart columns

- The risk outputs can be read from the columns:

Criticality Index shows how often an activity was on the critical path during the analysis - activities with a high criticality index are more likely to cause a delay to the project.

Duration Sensitivity shows the amount of correlation between an activities duration and the project duration - activities with a high duration sensitivity are also more likely to cause a delay to the project.

Cost Sensitivity shows the amount of correlation between an activities cost and the project cost - activities with a high cost sensitivity are also more likely to increase the project cost.

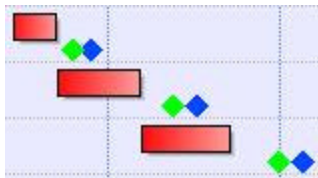
Task Existed shows how often an activity existed during the analysis - this applies to probabilistic activities.

Viewing P50 and P80 dates graphically

The P50 and P80 dates have been stored in the task user fields P50 Start, P50 Finish, P80 Start and P80 Finish.

The task user fields can be displayed using custom task bars. To save time we will retrieve some predefined views that already have the custom task bars set up for us.

- If open, close the *Distribution Graph* dialog.
- View | View | Insert View.
- Check the *Insert View as New Sheet* check box.
- Choose 'Gantt Chart: P50 - P80 Markers'
- Click OK



You should now be able to see the markers that display the P50 and P80 risk schedule.



Use *Format | Custom Task Bars* to view custom task bar set up.

- The *Create Task Percentiles* option must have been checked and set up in the *Risk Analysis Options* before running the risk analysis. If this option is not checked then the user dates are not populated and therefore no bars or markers can be drawn.

Viewing Tornado Graph

The Tornado Graph can display the Duration Sensitivity, Cost Sensitivity, Criticality Index, Duration Cruciality, and Schedule Sensitivity Index graphically. Activities with the highest Duration Sensitivity and Cost Sensitivity are the activities most likely to cause the project to be delayed or go over budget.

Display the Tornado Graph.

- *Reports* | *Tornado Graph*
- Click on the *Duration Sensitivity* tab (if not already selected).

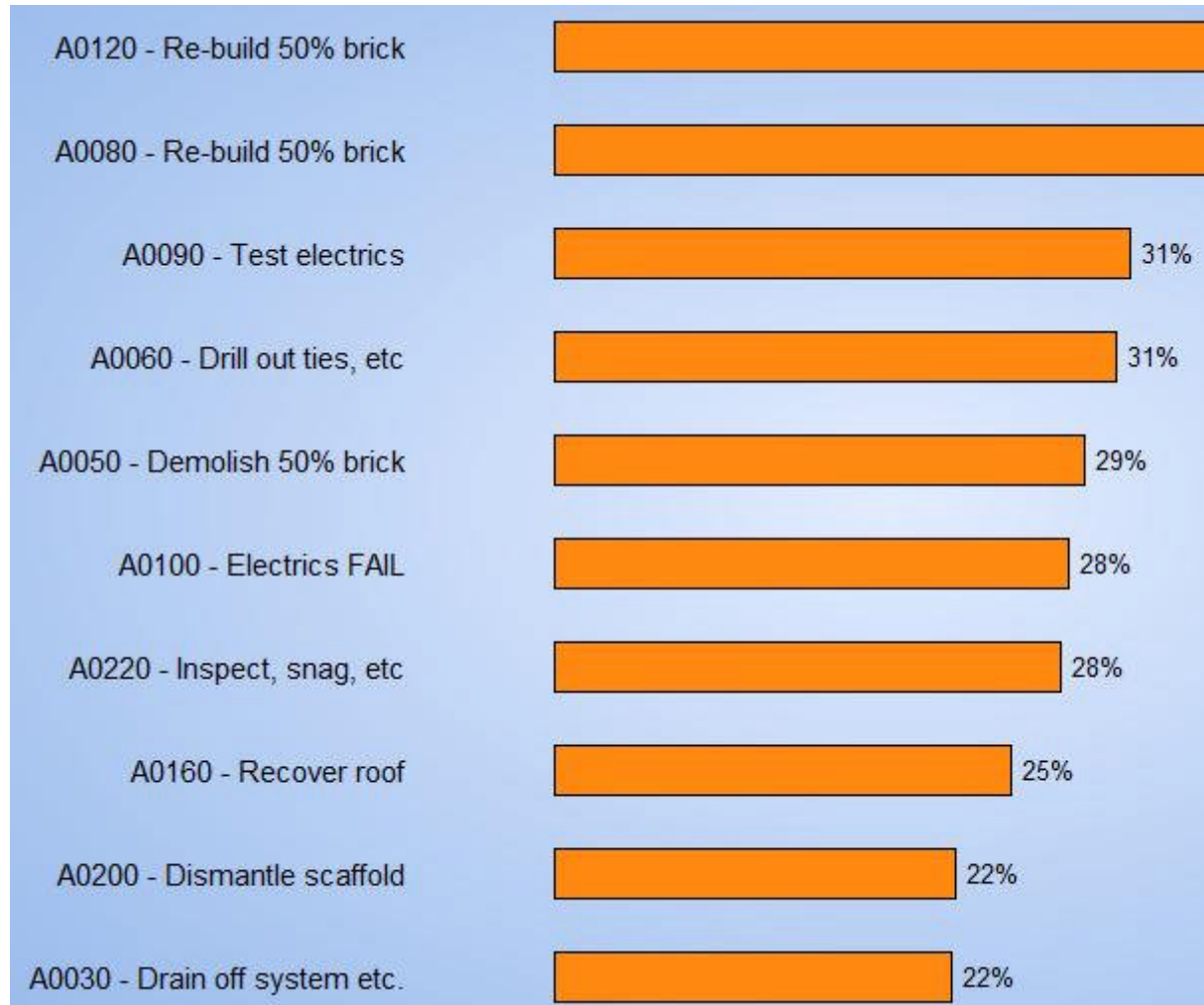


Figure: Tornado Graph displaying tasks most likely to affect the project completion

Click on the other tabs to display other metrics, for example *Cost Sensitivity*.

💡 Double-click on a bar in the Tornado Graph to go to that task in the Gantt Chart.

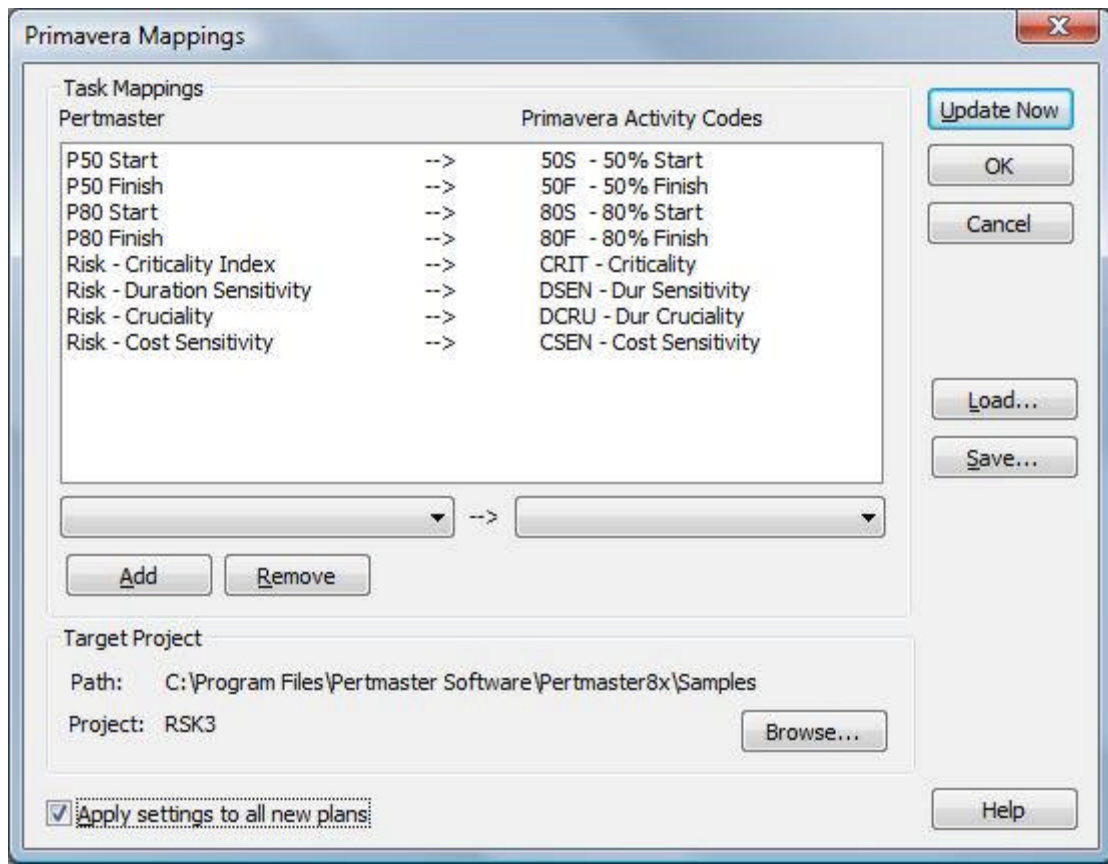
1.6 P3 Risk Tutorial - 5. Updating the results to P3

The risk analysis results in Primavera Risk Analysis can be updated in the P3 project. The P3 Activity Codes and Custom Data Items are used to store these results. We can also update risk inputs such as the minimum and maximum durations. This allows any changes that were made to these values while in Primavera Risk Analysis to be updated in the P3 project.

Update the risk results to P3

- Go to *File* | *Primavera* | *Update Primavera P3 Project...*

- Click the *Load...* button and choose 'P3Mappings'.
- Click *OK*.



- If any of the mappings are missing then use the *Add* and *Remove* buttons to add the mappings shown above.
 - Click *Update Now*.
 - Enter your P3 user name. If you do not know your log on name then open a project in P3 and press the F5 key to display the *Current Users* dialog.
- 💡 To prevent having to log on every time you can add an entry to the PrimaveraRiskAnalysis.ini file that is located in the Primavera Risk Analysis installation folder. Add the following entry:
P3UserName=NAME
(where NAME is your log on name).
- Click *OK*. The results are updated automatically in the P3 project.

1.7 P3 Risk Tutorial - 6. Viewing the results in P3

After the risk analysis results have been updated in the P3 project they can be viewed in the P3 project. Example layouts are saved in the sample P3 project.

💡 Layouts in the sample P3 project can be transferred to other P3 projects using the *View | Layout | Transfer* command.

Opening the Risk Output layout

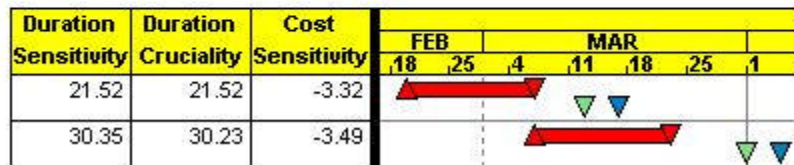
- Run Primavera P3.
- *View | Layout | Open*.
- Select the layout 'Risk - Output' and click *Open*.

🔧 My fields such as '50% Finish' are blank in P3 - Why?

The previous update step may have failed without reporting the failure. If the fields are blank in P3

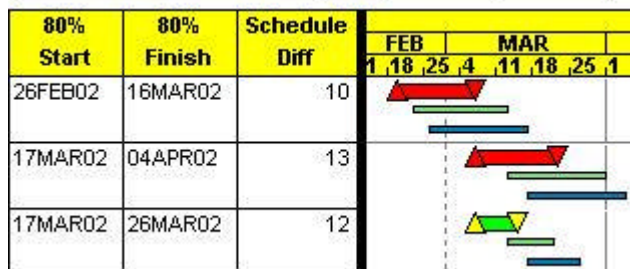
then the update can be run manually - see **Updating P3 file manually running PRMBatch (Section 10)**.

Activity Description	Orig Dur	50% Finish	80% Finish	Schedule Diff	Criticality Index
Demolish 50% brick	15	12MAR02	16MAR02	10	100.00
Drill out ties, etc	16	31MAR02	04APR02	13	99.60



- View | Layout | Open.
- Select the layout 'Risk - Outputs + Bars' and click Open.

Activity Description	Orig Dur	50% Start	50% Finish
Demolish 50% brick	15	23FEB02	12MAR02
Drill out ties, etc	16	13MAR02	31MAR02
Cut-off & re-route electric	8	13MAR02	21MAR02



2 P3 - Opening and Updating Primavera P3 files

A project can be saved in Primavera P3 and SureTrak as a series of .P3 files (sometimes referred to as *concentric* or *project group*) or a PRX file (sometimes referred to as a backup). These files can be read in by Primavera Risk Analysis. If you have a Primavera P6 plan in the .PRX see **Opening .PRX files (Section 6)**





1. Save/Export the project from Primavera, P3 or SureTrak in the concentric .P3 format or the project group format.

P3 - Plans are normally saved in the .P3 format so this is very straightforward.

SureTrak - You will need to save in the P3 format. In SureTrak open plan and then export/save as P3 format.

See Primavera P6 product documentation for further details on saving/exporting in the P3 format.

2. Before importing to Primavera Risk Analysis it is recommended that the project is scheduled in P3 using F9 shortcut or *Tools | Schedule* command. This will ensure that the project is up to date with the latest schedule information. This is not essential as Primavera Risk Analysis does not need to use this information, but it allows the schedule dates in the .P3 file to be compared with the Primavera Risk Analysis dates.
3. Start up Primavera Risk Analysis.



4. *File | Primavera | Open Primavera P3 Project...*
5. Locate the required .P3 file and click *Open*.
6. You may have used the *Activity Codes* or *Custom Data Items* in your project to record details on some or all of the following risk details: Optimistic, Most Likely and Pessimistic durations, Duration Distribution, Probabilistic branching and Correlation. If your project Activity codes contain some or all of these details then the Import P3 Risk data dialog that is displayed allows you to import this data into Primavera Risk Analysis, the import will then setup equivalent risk data in Primavera Risk Analysis.
 -  If you do not specify a *Duration Distribution* Primavera Risk Analysis assumes a Triangle distribution.
7. Primavera Risk Analysis will display a dialog that shows you what is happening as the files are read in. Any warnings are displayed at the end. If your plan contains thousands of tasks please be patient as it may take a minute or two to import.
8. After opening a Primavera P6 project Primavera Risk Analysis loads the selected workspace (default is *Primavera.wkspc*). This workspace contains a sheet called *Import Check* that compares the start and finish dates in the P3 project with those in the Primavera Risk Analysis schedule.
 -  If Primavera Risk Analysis cannot locate the selected workspace the default workspace *default.wkspc* in the Primavera Risk Analysis application folder is used.
 -  If you did not schedule your project before you imported then the early start and finish dates may not match in the columns shown in the Import Check sheet.
9. The import is then complete.
 -  The P3 project is organized by the WBS as a default. See **Organizing Tasks (on-line documentation)** for details on organizing the project by Activity Code.

Step 2 - Run the risk analysis

1. If you have not mapped the risk data from the P3 project then enter the appropriate risk data for tasks. You can use Quick Risk to quickly enter duration distributions for selected parts or all of the project (*Risk | Duration Quick Risk*).
2. Run the risk analysis and create risk details such as P50 and P80 dates, Criticality Index and Sensitivity for the project tasks.


Step 3 - Update risk analysis results in the Primavera P6 database

The results of the risk analysis can be updated in the Primavera P6 database. For example P10 and P90 dates can be updated in the Custom Data Items in the Primavera P6 database. You can also use the update to store the minimum, maximum and most likely durations in the Primavera Activity Codes - this way after the risk analysis has been run and the Primavera P6 database updated, all the risk data is stored in Primavera P6 database and there is no requirement to keep the Primavera Risk Analysis program.

1. *File | Primavera | Update Primavera P3 Project...*
2. Set up the required mappings.
 -  You must first have created Activity Codes or Custom Data Items in the P3 project to receive the updates.
3. Click *Update Now* and the chosen fields are updated in the Primavera P6 Database.
 -  When the Primavera Risk Analysis command: *File | Primavera | Update Primavera P3 Project* command is used, Primavera Risk Analysis automatically invokes Primavera's PRMBATCH.exe program to update the P3 project. See **P3 - Manually running PRMBatch (Section 10)** if the *Update Primavera P3* command appears to not work.

3 P3 - .P3 files read in by Primavera Risk Analysis

When a Primavera P6 plan is saved as the .P3 file format only some of the .P3 files created are read by Primavera Risk Analysis.


-  Primavera Risk Analysis will attempt to read in a .P3 plan even if some files are missing. A warning is given that the expected file could not be found. This can be useful in some situations, for example the xxxxRLB.p3 and xxxxRES.p3 files can be removed so the imported plan contains no resources.


As Primavera Risk Analysis reads in the P3 project it displays the files in the *Reading P3 files* dialog. Each file contains data that Primavera Risk Analysis uses to create the project schedule.

The files read in by Primavera Risk Analysis are as follows:

XXXXDIR.P3

Plan data such as start date and set up for the calendars and calendar templates.

 The XXXX represents the four character P3 project code. In the example program opened previously this would be "DEM1".

 If files are missing an error is displayed in the Reading P3 files dialog. Primavera Risk Analysis will however still try to create the project. For example if the XXXXREL.p3 file is missing the project will be read in but there will be no relationships between the tasks.

XXXXHOL.P3

Set the work / no work period for the calendars.

XXXXRLB.P3

Creates resources: Name, Description (unit of measure).

All resources created with a normal loading, this means that as the task durations increases the resource requirement increases.

XXXXACT.P3

Below are the main activity details that are read by Primavera Risk Analysis:

P3 Remaining duration -> Remaining Duration

P3 Original duration -> Original Duration

P3 Actual Start -> Actual Start

P3 Actual Finish -> Actual Finish

P3 Start Milestones -> created as a start milestone

P3 Finish Milestones -> created as a finish milestone

P3 Hammocks -> created as a hammock

P3 flags -> created as milestones

P3 All other activity types -> created as normal tasks

P3 Activity type -> P3 Task Type

P3 Constraints -> Primavera Risk Analysis Constraints

P3 Planned Start -> Baseline Start

P3 Planned Finish -> Baseline Finish

The following items are not used to schedule the project. They allow the Primavera P6 schedule to be compared with the Primavera Risk Analysis schedule. The dates are used in the Start Check and Finish Check columns displayed in the *Import Check* sheet after a .P3 project is imported.

P3 Early Start -> Imported Early Start

P3 Early Finish -> Imported Early Finish

P3 Late Start -> Imported Late Start

P3 Late Finish -> Imported Late Finish

XXXXLOG.P3

P3 Activity notes -> Task Notes 1

XXXXWBS.P3

P3 WBS -> WBS

XXXXRES.P3

Resource assignments:

P3 budget -> budget

P3 amount -> actual

P3 forecast quantity -> amount

all other values ignored.

XXXXREL.P3


Builds relationships between tasks. All link types (fs, ff, ss, sf) and lags (positive and negative) are supported.

XXXXTTL.P3

Activity Codes -> Task User Fields

XXXXITM.P3

Custom Data Items -> Task User Fields

 Primavera Risk Analysis cannot read in any format options that have been set-up in the P3 project. For example, bar colors, columns, sort order.

4 P3 - Primavera Workspace

After all the data has been read from the .P3 files Primavera Risk Analysis creates a schedule and displays it as a Gantt Chart. It also formats the Gantt Chart by automatically applying the selected workspace. The workspace selected by default is *P3.wkspc*.



You can modify the *P3.wkspc* if you wish, see **Saving workspaces, sheets and views (on-line documentation)**. If you modify the file you will need to remove read only flag on the existing *P3.wkspc* file so it can be overwritten.

Import Check sheet - Start and finish check columns

The *P3.wkspc* has start and finish check columns in the *Import Check* Sheet. These allow the schedule dates for the P3 project to be compared with those created by Primavera Risk Analysis. As P3 and Primavera Risk Analysis use different scheduling engines it is prudent to check that there are no important differences between the two.

During the import the P3 early start and early finish dates are copied into Imported Early and Late Dates task user fields.

The columns called "Start Check" and "Finish Check" perform a simple calculation that displays any difference between the P3 dates and the Primavera Risk Analysis schedule.

The Start Check and Finish Check are calculated columns with the following formulae:

Start Check column:

PS - @USERFIELD("Imported Early Start")

Where PS is the Primavera Risk Analysis start date and the Imported Early Start is the P3 Early Start date.

Finish Check column

PF - @USERFIELD("Imported Early Finish")

Where PF is the Primavera Risk Analysis finish date and the Imported Early Finish is the P3 Early Finish date.

Custom bars


The Custom bars in Primavera Risk Analysis are used to draw the P3 deterministic schedule as a grey bar under the Primavera Risk Analysis schedule. This provides a graphical comparison between the two deterministic schedules.


To view custom bars in Primavera Risk Analysis: *Format | Custom Task Bars*.

Organization / Sort

As a default Primavera Risk Analysis Organizes the project by WBS and sorts the tasks by task ID.

After the import the tasks can be re-organized using *Plan | Organize*. See **Organizing Tasks (on-line documentation)** for further details.

 Primavera Risk Analysis cannot organize by P3 fields such as *Early Start*. However you can sort on most of these fields after the P3 project has been opened in Primavera Risk Analysis.


 When organizing by WBS Primavera Risk Analysis never displays empty work breakdown levels.


5 P3 - Suggested Mappings

Primavera Risk Analysis reads and updates risk data from P3 project files. The suggested Activity Codes and Custom Data Items for storing risk inputs and outputs are detailed below.

Activity Risk INPUTS

When a P3 project is opened to perform a risk analysis Primavera Risk Analysis reads in the risk data from the P3 Activity Codes and Custom Data Items (CDI's). The fields that are used in the default P3 risk input columns are detailed below.


 These are only suggested default mappings. You do not have to map all the suggested fields.

 It is important that the Activity Code Descriptions in the original P3 project are not left blank and that they are unique. If they are left blank or not unique it can cause Activity Codes to not be listed when the project is being imported into Primavera Risk Analysis.

P3 activity field		Mapped to risk input field in Primavera Risk Analysis
OPTD - Activity Code	-->	Minimum Duration
		Most Likely Duration
MOST - Activity Code	-->	If MOST not entered for an Activity Primavera Risk Analysis uses the Activity Remaining Duration.
PESS - Activity Code	-->	Maximum Duration
DIST - Activity Code	-->	Duration Distribution
CORR - Activity Code	-->	Duration Correlation
BRCH - Activity Code	-->	Probabilistic Branching
EXIS - Activity Code	-->	Task Existence
CMIN - Custom Data Item	-->	Minimum Cost
CML - Custom Data Item	-->	Most Likely Cost
CMAx - Custom Data Item	-->	Maximum Cost
CTYP - Activity Code	-->	Selects Spread or Normal (per day/hour) cost

Activity Risk Outputs

After a risk analysis has been performed in Primavera Risk Analysis the results can be updated to the P3 project.

 The fields must first be set up in the P3 project before the risk results can be updated.

Primavera Risk Analysis risk result		Mapped in P3 to
P50 Start date	-->	RWS - Custom Data Item
P80 Finish date	-->	RWF - Custom Data Item
Risk Mean Start date	-->	RMS - Custom Data Item
Risk Mean Finish date	-->	RMF - Custom Data Item
Criticality Index	-->	CRIT - Activity Code
Duration Sensitivity	-->	DSEN - Activity Code
Duration Cruciality	-->	DCRU - Activity Code
Cost Sensitivity	-->	CSEN - Activity Code

6 P3 - Opening Primavera P6 .PRX files

Compressed .PRX files

A PRX file is a set of .p3 files compressed into a single file. PRX files can be used to backup or move around .p3 projects. Before Primavera Risk Analysis can read a PRX file it is necessary to restore the compressed file.

Restoring .PRX file

- Rename the file .EXE. E.g. PROJ.PRX rename to PROJ.EXE
- Double-click on the renamed file to run it.
- In the *Self Extracting Project* dialog select a folder to extract the .P3 files to.
- Click *Extract*.

._B3 files

If a PRX file extracts as a set of files with extensions "._B3" and ".P3X" rather than ".P3" then the PRX file is a Project Group that consists of one or more Member Projects.


To copy a member project from a project group

- In P3 - *Choose Tools* | *Project Utilities* | *Copy*.
- Select the original single project from the Projects list box.
- Type the name of the single project in the *Project Group* field.
- Click *Browse* to select a project from a different folder.
- Enter a project name and a two-character ID for the first project.
- Click *OK*.

Repeat these steps for each project you want to create. When you finish creating projects, delete the original activities at the project group level. The member projects can then be opened in Primavera Risk Analysis.

7 P3 - Opening a P3 file planned in hours


If you have a P3 project that has been planned in hours Primavera Risk Analysis will recognize this.

 If your project was created in Suretrak you can switch to hours or days in SureTrak using the *Tools* | *Options* | *Project* | *Display Style* and choose *Hours* or *Days*.

When a project from P3 or Suretrak is in hours Primavera Risk Analysis automatically sets the Working Time to 24 sub-units per day (i.e. one for each hour of the day).

When entering duration values into the P3 project for the OPTD, MOST and PESS values use the following formats:

36 36 days
 36H 36 hours
 1D12H 1 day 12 hours
 1:12 1 day 12 hours

 Decimal points should not be used in duration values.

8 P3 - Repairing and fixing P3 files

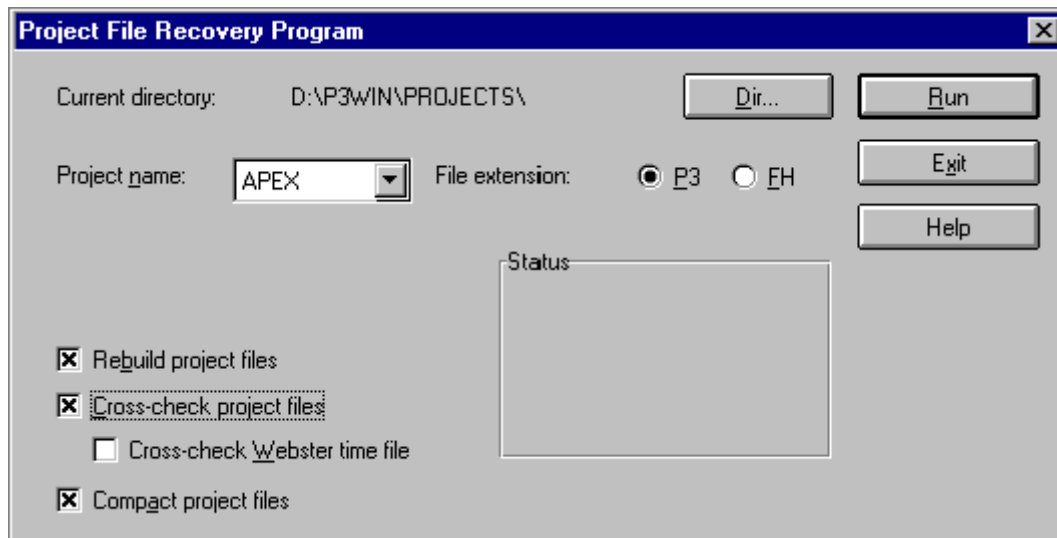
It is possible for the P3 database files (.p3) to become corrupted and this can have a number of consequences such as:

- File will not open in P3
- File will not open in Primavera Risk Analysis
- File opens in Primavera Risk Analysis or P3 but there are errors.

There is an application that is installed with the P3 software that can be used and may help fix problems associated with a corrupted P3 file.

To run the P3 project file recovery program

- Run the program: C:\P3WIN\P3PROGS\PFXW.EXE
- Double-click the PFXW icon to run the Project File Recovery Program.



- If the path shown in the *Current directory* field is not the one that contains your projects, use the Dir... button to change the current directory.
- Choose a *File extension*, P3 or FH, according to the type of project files you want to process.
- In the Project name box, click and select the name of the project whose files you want processed.
- Select *Rebuild project files*, *Cross-check project files* and *Compact project files*. If using Webster, select to Cross-check Webster time file.
- Click *Run* to begin recovery processing. The Status box in the lower half of the dialog indicates the name of the file currently being processed.
- If the program detects a .BAD file or a .FIX file, you are prompted to confirm that it can be overwritten: choose Yes, No, or Cancel.
- When recovery processing is complete, a message dialog box is displayed, advising you that processing was successfully completed or that an error was detected. Click *OK* in the message dialog box; the Status box displays the message, "Processing completed"

The Compact project files option compresses the database and can be run after deleting or removing large amounts of data from a project.

9 P3 - Global Change

The global change can be used to remove or update risk inputs in the P3 project.

The examples below show some useful global changes:

Copy Remaining Duration to Most Likely

This copies the deterministic activity remaining duration to the most likely duration for just normal activities (milestones etc. are ignored).

- STYP refers to the type of activity (e.g. normal, milestone). 0 represents a normal activity.
- The Activity Codes must have been created in P3 first.

GL-01 RSK2 - Global Change

Title:

Change Selection

Selection criteria: ☒ Any ☐ All

Specifications:

	Data Item	Criteria	Data Item/Value	Operation	Data Item/Value
If:	STYP	EQ	0		
or					
or					
or					
Then:	MOST	EQ	RD		
Else:					

Quick Risk

This copies the remaining duration to the most likely and creates values for the Optimistic (minimum) and Pessimistic (maximum) durations based on a chosen percentage – in this example –20% and +30%. Only applied to normal activities (milestones etc. are ignored).

GL-02 RSK2 - Global Change

Title:

Change Selection

Selection criteria: ☒ Any ☐ All

Specifications:

	Data Item	Criteria	Data Item/Value	Operation	Data Item/Value
If:	STYP	EQ	0		
or					
or					
or					
Then:	MOST	EQ	RD		
	OPTD	EQ	MOST	*	0.8
	PESS	EQ	MOST	*	1.3
Else:					

Remove Risk Inputs

This global change removes any entries in the Activity Codes for the optimistic, most likely and pessimistic duration. This is useful for clearing existing values.

GL-10 RSK2 - Global Change

Title: Remove Inputs - Risk Durations

Change Selection

Selection criteria: ☒ Any ☐ All

Specifications:

	Data Item	Criteria	Data Item/Value	Operation	Data Item/Value
If:					
or					
or					
or					
Then:	OPTD	EQ	""		
	MOST	EQ	""		
	PESS	EQ	""		
Else:					

Transfer... OK Cancel Help

10 P3 - Updating P3 file manually running PRMBatch

When the Primavera Risk Analysis command: *File | Primavera | Update Primavera P3 Project* command is used, Primavera Risk Analysis automatically invokes Primavera's PRMBATCH.exe program to update the P3 project.

If for some reason the *Update Primavera P3* command does not update the P3 project you can operate the PRMBATCH program manually.

1. First try to run the update using the Update Primavera P3 command. You must always perform this step even if it fails as it creates the batch file needed for manually running the update.
2. Close down P3 as it does not allow the PRMBATCH to be run if open.
3. Run the PRMBATCH.exe program. It is installed with Primavera and located under the C:\P3WIN\P3PROGS folder.

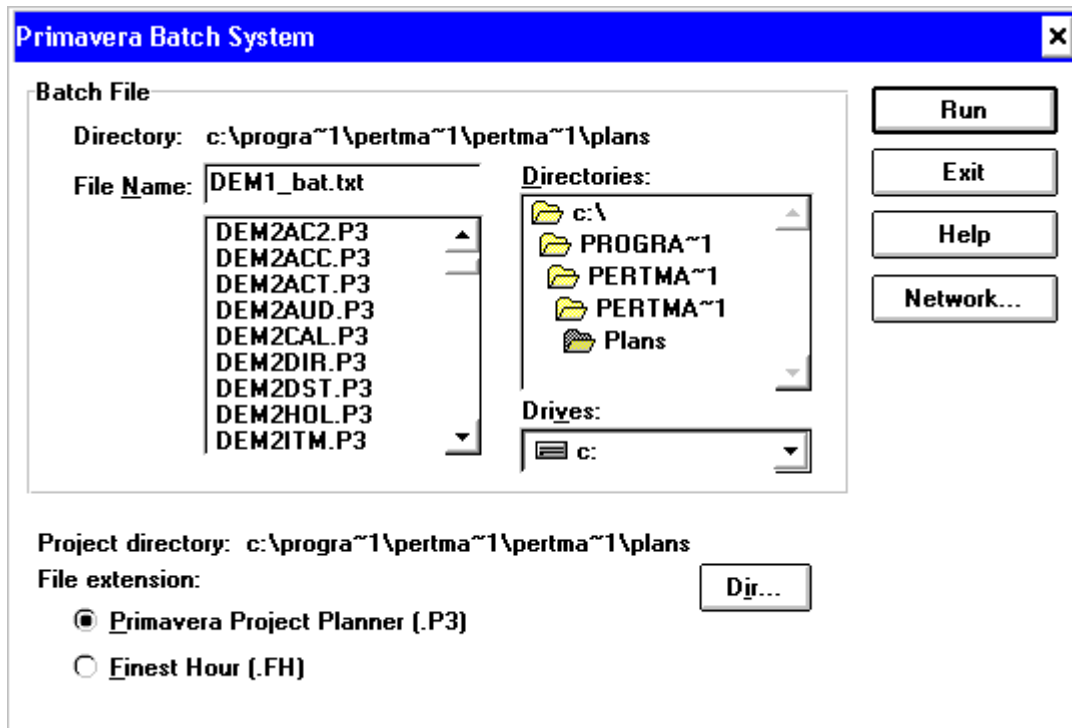


Figure: PRMBATCH application can be used to update a P3 project manually from a batch file

1. Locate the batch file called XXXX_bat.txt (where XXXX is the four letter project code, e.g. DEM1). It is created in the same folder as the P3 project.
2. Click *Run* and the P3 project will be updated using the batch file.
3. You can check the P3 report file to confirm that PRMBATCH ran correctly. It is a text file and is located ...\\p3win\\p3out\\p3.out

The Project directory needs to be set to the location of the project you are updating. Use the *Dir&* button to change this directory if required (see figure above).

The file P330batch.pdf contains further documentation on updating P3 projects using PRMBatch.exe. It is located on the P3 installation CD.

11 P6/P3/Suretrak - Primavera Risk Analysis differences

After importing a Primavera P6 schedule any differences between the Primavera Risk Analysis and Primavera P6 schedule dates can be examined using the *Start Check* and *Finish Check* columns located on the *Import Check* sheet.

Differences can occur if the project is not scheduled in Primavera P6 before importing into Primavera Risk Analysis - **Opening an unscheduled plan (Section 12)**

11.1 Activities

Zero duration activities

Zero duration activities may show a difference on the finish date. This occurs because zero duration tasks in Primavera Risk Analysis report the finish date as one day before the start whereas zero duration tasks in Primavera P6 report the finish and start as the same date.

Level of Effort activity

These tasks are imported as hammocks in Primavera Risk Analysis.

P3 hammocks

Hammocks in P3 are imported into Primavera Risk Analysis. P3 ignores any FS links to and from hammocks, whereas Primavera Risk Analysis schedules the hammock to stretch to the start or finish of the task the hammock is linked to or from with the FS link.

P5, P6 WBS Summary Activity

Primavera Risk Analysis' equivalent activity type to the Primavera P6 WBS summary activity is a Primavera Risk Analysis Summary task. Any resource assignments on WBS Summary activities are transferred to summary tasks in the following ways depending on which option is selected during the import:


1. Organize by WBS selected: Primavera Risk Analysis will create a summary task structure to represent the Primavera P6 WBS. The resources on Primavera P6 WBS summary activities are transferred to the relevant summary task. In this case the WBS activity ID will not appear in the Primavera Risk Analysis task list because the summary activity will use an ID based on the Primavera P6 WBS structure.
2. Do NOT organize by WBS: Primavera Risk Analysis will create a summary task for each Primavera P6 WBS activity and assign the resources directly to it. Tasks that are in the same WBS in Primavera P6 will be demoted under the summary task in Primavera Risk Analysis. In this case the WBS activity ID will appear in the Primavera Risk Analysis task list.

Links to Primavera P6 WBS Summary activities are not imported as they are ignored and not used in Primavera P6.

Unsupported Activity Types

Primavera Risk Analysis imports but does not fully support the following Primavera P6 activity types:

- Meeting activities
- Start and Finish flags
- Independent activities
- Topics (Suretrak files only)
- WBS activities not supported for P3 import.

 Start and Finish flags are imported as milestones. All other unsupported activities are imported into Primavera Risk Analysis as normal tasks.

11.2 Activity ID's

Spaces at the start of an activity ID are removed when imported into Primavera Risk Analysis.

Spaces cannot be used at start of name to distinguish between activities. For example " 10" and "10" would be ok in Primavera P6 but would be treated as "10" and "10" by Primavera Risk Analysis.

11.3 Primavera P6 - Minutes, Hours and Days

When opening a Primavera P6 project you have a choice of importing to the nearest day, hour or quarter hour as defined by the Planning Unit. If durations or calendar nonworking / working time are entered more precisely in Primavera P6 then Primavera Risk Analysis will round to the nearest day, hour or quarter hour depending on the Planning Unit selected during the import.

If any of the Primavera P6 durations have to be rounded during import a message box is displayed asking if you wish to view the log file that details the differences. E.g.

Loading tasks

WARNING: A0010 Duration changed from 78.63 days to 79.00 days

WARNING: A0020 Duration changed from 203.50 days to 204.00 days

WARNING: A0030 Duration changed from 334.50 days to 335.00 days

Primavera P6

11.4 - Hours per day

In Primavera P6 the hours per day setting is used to convert durations in minutes to durations in days.

When Primavera Risk Analysis connects to the Primavera P6 database the user selects Day as the Planning Unit it is necessary to choose a suitable hours per day value as this is used to convert the Primavera P6 durations and nonworking time stored in minutes to durations and nonworking time in days.

When opening XER files the "hours per day" setting is not recorded in the XER file. The hours per day is set to 8 as the default and can be changed during the XER import.

11.5 Calendars

Make nearest workday a holiday

Primavera Risk Analysis **does not** support the option to *make the nearest workday a holiday*.

Repeating Holidays

Primavera Risk Analysis supports repeating holidays.

Working time that finishes the next day

If you have a non-working period in P3 that starts at say 07:00 and ends at 02:59 (i.e. the next day) Primavera Risk Analysis interprets this as non-working from 07:00 to 23:59 but does NOT make the next 3 hours of the next day non-working.

11.6 Links

The three main link types (finish to start, start to start, finish to finish) are supported. Lags (positive and negative) are supported by Primavera Risk Analysis. Primavera Risk Analysis also reads in Start to finish links but it is recommended that the Start to Finish link type is not used as there can be schedule differences between Primavera Risk Analysis and Primavera P6.



After opening a Primavera P6 project in Primavera Risk Analysis you can use the *Reports | Schedule Check Report...* to identify any Start to Finish links.

11.7 Lags on links

Positive and negative lags are supported by Primavera Risk Analysis. The calendars used by lags are detailed below.

Calendars used on lags

During an import the calendars used on lag durations are set up by Primavera Risk Analysis automatically to match those used by P3 (i.e. the preceding task calendar for all link types) and Primavera P6 (i.e. the calendar set up in the Primavera P6 schedule options). To change the calendar used by Primavera Risk Analysis on lag durations use *Plan | Plan Options | Scheduling* tab.

11.8 Resources and Costs

Resource and cost import

Primavera P6: XER import always imports all individual resource assignments, roles and expenses.

Primavera P6: API import can import none, all or just the cost of the resources split into Labor, Non-Labor, Materials and Expenses.

Varying resource Price / Unit over time

Primavera Risk Analysis only imports one Price / Unit value for each resource.

Primavera P6: When a resource with a varying Price / Unit is imported into Primavera Risk Analysis the Price / Unit with the latest date is used.

Primavera P6 XER: When a resource with a varying Price / Unit is imported into Primavera Risk Analysis the Price / Unit with the maximum value is used.

11.9 Primavera P6 - Scheduling Options

Primavera Risk Analysis has some but not all of the Primavera P6 scheduling options.

Primavera P6 scheduling options can be viewed and set in Primavera P6 using - *Tools | Schedule | Options | Advanced* button.

Ignore relationships to and from other projects

Primavera Risk Analysis does not read in this option.

If a single Primavera P6 project is opened in Primavera Risk Analysis you will receive a warning of any links to other projects. A constraint will be applied to simulate the effect of the missing link.

If the projects that have a link between them are both opened in Primavera Risk Analysis the link is created.

See **Opening multiple projects (Primavera P6) ('Primavera P6 - Opening multiple projects' in the on-line documentation)**

Make open-ended activities critical

See notes on P3 scheduling options below.

Use Expected Finish Dates

Primavera Risk Analysis does not read in this option. Does not affect schedule.

Schedule automatically when a change affects dates

Primavera Risk Analysis does not read in this option. Primavera Risk Analysis default is to schedule automatically.

It is recommended that before a Primavera P6 project is opened in Primavera Risk Analysis it is scheduled. If a project is opened that has not been scheduled then the start and finish check columns will not be reliable.

Level resources during scheduling

Primavera Risk Analysis does not read in this option. To resource level a schedule in Primavera Risk Analysis use *Plan | Level Resources*. To resource level after each risk iteration: *Risk | Risk Analysis Options | Analysis | Resource level after each iteration*.

 This requires that the project in Primavera Risk Analysis contains resources with limited supplies.

Recalculate assignment costs after scheduling

Primavera Risk Analysis does not read this option. Primavera Risk Analysis always recalculates resource assignments.

When scheduling progressed activities use:

Retained Logic / Progress Override / Actual Dates

Primavera Risk Analysis supports *Progress override* and *Retained logic*. The *Actual Dates* option is not supported.

Calculate start-to-start lag from: Actual start, Early start

Primavera Risk Analysis supports and reads in this option. This only affects tasks that are scheduled out of sequence when using retained logic.

Define critical activities as

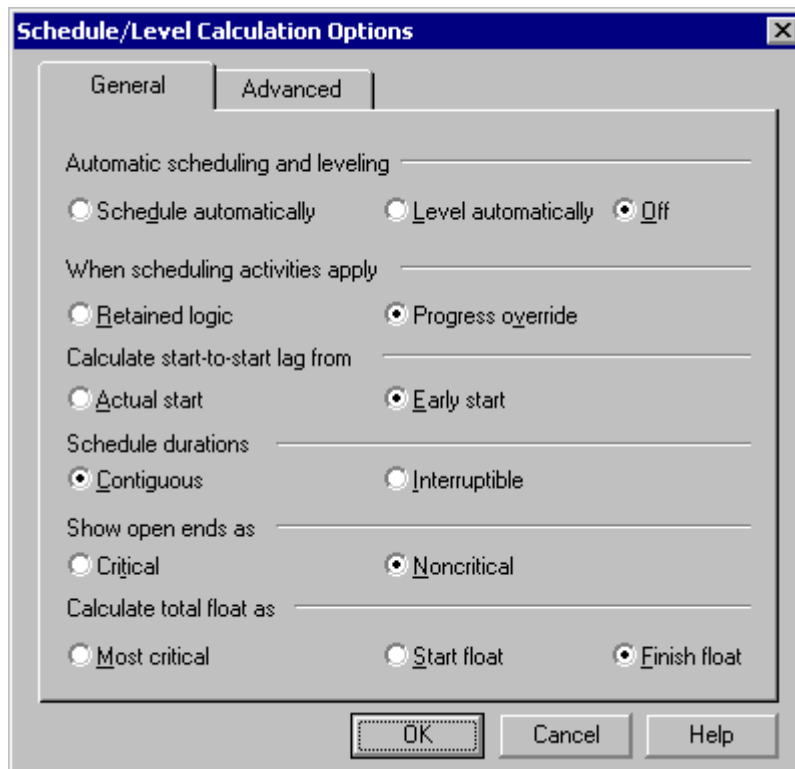
Total Float less than or equal to X days - Primavera Risk Analysis supports this option but it is not read in from Primavera P6 and defaults to 0. To change in Primavera Risk Analysis: *Plan | Plan Options... | Scheduling*

Longest Path - Primavera Risk Analysis supports this option but it is not read in from Primavera P6. To change in Primavera Risk Analysis: *Plan | Plan Options... | Scheduling*

Compute Total Float as - Primavera Risk Analysis always calculates the Total Finish Float as the smallest of Total Start Float and Total Finish float.

Calendar for scheduling Relationship Lag - Primavera Risk Analysis reads this option and sets it in the *Plan | Plan Options... | Scheduling*.

11.10 Primavera P3 - Scheduling Options



11.11

Figure: P3 scheduling option dialog.

Automatic Scheduling and Leveling

Primavera Risk Analysis Project Risk default is to schedule automatically and to only level on request.

When scheduling activities apply: Retained logic, Progress override

Primavera Risk Analysis supports *Progress override* and *Retained logic*. Primavera Risk Analysis reads in this option for P3.

Calculate start-to-start lag from: Actual start, Early start

Primavera Risk Analysis supports and reads in this option. This only affects tasks that are scheduled out of sequence when using retained logic.

Schedule durations: Contiguous, Interruptible

Primavera Risk Analysis models both of these options and automatically changes its scheduling options depending on the method selected in the P3 project.

Primavera Risk Analysis models the P3 Interruptible option with the *Can Stretch* scheduling option: *Plan | Plan Options...* | *Scheduling* tab.

Primavera Risk Analysis Project Risk models P3 Contiguous option with the *Never Stretch*: *Plan | Plan Options...* | *Scheduling* tab.

Primavera Risk Analysis supports a third option *Stretch only if start of task has a successor*. If a task has a successor linked start-to-start and the successor would be delayed if the task was not stretched (i.e. contiguous) then the task is stretched (i.e. interruptible). This option is never selected automatically when importing a P3 project.

Show open ends as: Critical, Noncritical

Primavera Risk Analysis does not automatically support this option. To simulate this option open Primavera P6 project in Primavera Risk Analysis and set the *Always Critical* constraint on for any open-ended activities.

Calculate total float as: Most critical, Start float, Finish float

In Primavera Risk Analysis the default option is to use the "Start Float" to determine whether an activity is critical.

Additionally "Finish float" or "Longest Path" options can be used.

Option can be selected in Primavera Risk Analysis using *Plan | Plan Options...* | *Scheduling*

Constraints

It is recommended that Primavera P6 projects that are being risk analyzed have as few constraints as possible.

Primavera P6 has more constraint types than Primavera Risk Analysis and the Primavera P6 constraints are translated into equivalent Primavera Risk Analysis constraints as shown in the table below:

From P3 to Primavera Risk Analysis

Primary Constraints

Early constraint, Start--> Start On or After

Early constraint, Finish --> Finish On or After

Start on --> Start On

Late constraint, Start --> Start On or Before

Late constraint, Finish --> Finish On or Before

Mandatory, Start --> Must Start On

Mandatory, Finish --> Must Finish On

Expected Finish --> Not imported by Primavera Risk Analysis

Float constraint, Zero total float --> Always Critical set on

Float constraint, Zero free float --> As late as possible

If a task has an Actual Start then Primavera Risk Analysis does not delay the finish of the task whereas P3 does.

Secondary Constraint

Primavera Risk Analysis does not read in the secondary constraint.

From Primavera P6, P7 to Primavera Risk Analysis

Primary Constraints

Start On --> Start On

Start On or Before --> Start On or Before

Start On or After --> Start On or After

Finish On --> Finish On

Finish On or Before --> Finish On or Before

Finish On or After --> Finish On or After

As Late As Possible --> As Late As Possible

Mandatory Start --> Must Start On

Mandatory Finish --> Must Finish On

Secondary Constraint

Primavera Risk Analysis does not read in the secondary constraint.

Expected Finish Dates

P3

An *Expected Finish* date constraint in P3 overrides Finish to Finish links (see figure below).

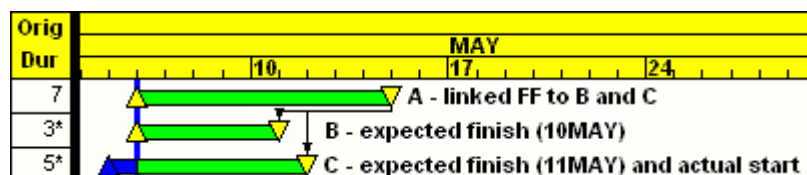


Figure: In the P3 screen shot above the *Expected Finish* dates on tasks B and C are overriding the FF links from their predecessor task A.

In Primavera Risk Analysis *Expected Finish* dates are not supported. If a P3 schedule has an *Expected Finish* that has overridden the FF logic then this can cause differences between the P3 and

Primavera Risk Analysis schedules (see figure below)

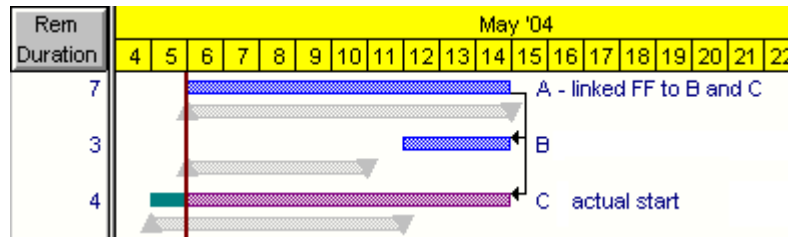


Figure: Primavera Risk Analysis does not implement the *Expected Finish* and the FF links are driving the finish dates of tasks B and C. The grey bars display the equivalent P3 schedule dates that are caused by the application of an *Expected Finish* constraint.

As *Expected Finish* dates can override the logic in P3 it is recommended they are not used in P3 schedules.

Primavera P6 and P7

Primavera P6 and P7 do NOT override FF logic when *Expected Finish* dates have been entered. This is the same as Primavera Risk Analysis.

12 Primavera - Opening plan with unscheduled changes

If a Primavera P6 plan that contains unscheduled changes is opened in Primavera Risk Analysis then the Primavera Early and Late dates read in by Primavera Risk Analysis will be the Start and Finish dates calculated the last time the project was scheduled.

As Primavera Risk Analysis always schedules a Primavera P6 project when it is opened, the unscheduled project is likely to display differences in the *Start Check* and *Finish Check* columns in the Import Check sheet that is displayed on the workspaces Primavera.wkspc and P3.wkspc.

This will not affect the results of the analysis, it will however make it difficult to spot genuine scheduling differences between Primavera Risk Analysis and Primavera P6. It is therefore recommended that any changes in the Primavera P6 project have been scheduled before opening in Primavera Risk Analysis.

- ✎ The Primavera Early and Late dates are mapped to the Primavera Risk Analysis Imported Early Dates and Imported Late Dates user fields.
- ✎ Scheduling a project in Primavera P6 also ensures any changes that have been made to the project are updated to the project database.

Start Check	Finish Check
	2
2	2
2	2

Figure *Start Check* and *Finish Check* columns showing differences when the project was not scheduled in Primavera P6 before importing into Primavera Risk Analysis.

To schedule a project in Primavera

- F9 | *Schedule*

13 PDF Documentation and Printing Help

PDF Documentation

Some of the on-line help (e.g. tutorials) can be found in the *Documentation* folder that is created when the Primavera Risk Analysis software is installed. The documentation is saved in the Adobe PDF format. The default installation folder for the documentation is:

C:\Program Files\Oracle\Primavera Risk Analysis\Documentation

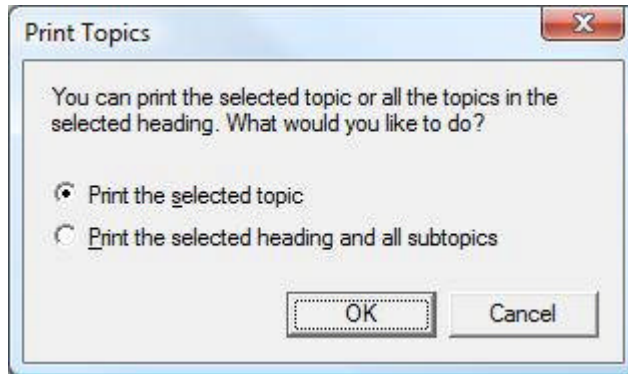
Printing an individual help topic

After printing a help topic, Windows can sometimes freeze the help file. If this occurs, right-click on the Primavera Risk Analysis help application icon in Windows Start menu Taskbar (usually located at the bottom of the screen) and choose *Restore*.

1. Select the required topic.
2. Click on the *Print* button.



3. Choose *Print the selected topic*.



Printing a chapter of the help

After printing a chapter of the help, Windows can sometimes freeze the help file. If this occurs right-click on the Primavera Risk Analysis help application icon in Windows Start menu Taskbar (usually located at the bottom of the screen) and choose *Restore*.

1. Select the required chapter.
2. Click on the *Print* button
3. Choose *Print the selected heading and all the subtopics*.

The example below has the Risk Tutorial - Part 1 selected. Clicking on the *Print* button and selecting *Print the selected heading and all the subtopics* will print out the whole of the 'Risk Tutorial - Part 1'.

