

## Primavera Risk Analysis for Primavera Project Manager

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### **Primavera Risk Analysis for Primavera**

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

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## 1.1 Overview

Primavera Risk Analysis can read in project data from a P3 project file, XER files, a P6 EPPM database and a P6 Professional database. It is also possible to connect via **Web Services ('Using Web Services to connect' in the on-line documentation)** using v8.0 and 8.1.

The primary purpose of this interface is to enable Primavera P6 users to risk analyze their projects using Primavera Risk Analysis's risk tools.

## 1.2 Opening Primavera P6 Projects

Primavera Risk Analysis can read Primavera P6 projects using the following methods:

### Direct connection to Primavera P6 Project Database

A direct connection to your Primavera P6 Project Database can be set up with the **Primavera Connection Wizard (Section 2.1)**.

Primavera Risk Analysis will then allow users to log onto the Primavera P6 Project Database giving them access to their Primavera P6 projects.

**See Opening a Primavera project from database (Section 5.1)**

### XER files

XER files can be created from the Primavera P6 desktop client using the *File | Export* command.

Having created an XER file it can be read directly by Primavera Risk Analysis using the *File | Primavera | Open Primavera XER file*.

There is no need to have any Primavera P6 software installed. You can open a .xer file that has been sent to you.


### Disadvantages of XER compared with the "Direct connection" shown above

- Always imports project resources individually as there is no option to import as only costs summarized as Labor, Non-Labor, Material and Expense.
- Cannot be used to update the Primavera P6 database.

**See Opening a Primavera XER project file (Section 5.2)**

### Reading P3 files (.P3 or .PRX)

Use this method when reading files created in the P3 format.

 .PRX files are simply compressed .P3 and need to be extracted before they can be read by Primavera Risk Analysis.

**See Opening Primavera P3 files ('P3 - Opening and Updating Primavera P3 files' in the on-line documentation)**

### MPP files

Primavera P6 can create MPP files. This format is not recommended as it is designed to support projects created and saved in MS Project. The format is limited in the way that Primavera P6 can store data.

## 2 Setting up a connection to Primavera project database

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### 2.1 Primavera P6 - Primavera Connection Wizard

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The Primavera Connection Wizard will help you set up the connection between Primavera Risk Analysis and a Primavera P6 project database.

#### Security

All Primavera Risk Analysis connections to a Primavera P6 project database use Primavera's security. This allows users to login with their Primavera user name and password giving the user access to only the projects they have permission to view.

 If this is the first time you are connecting to a Primavera P6 Database using the API or you receive an error while trying to connect using the API, please perform the steps detailed in **Opening Primavera Risk Analysis From Primavera P6 Professional (on-line documentation)**.

This will perform the necessary API connection steps for integration between Primavera P6 and Primavera Risk Analysis.

 Oracle recommends using a Secured Socket Layer (SSL) connection where available.

#### Using Connection Wizard to connect to Primavera P6 EPPM database

1. Use *File | Close* to close any open plans.
2. *File | Primavera | Connection Wizard*.
3. Select the version of Primavera P6 you are working with.
4. Complete the Connection Wizard (see below for connection options).



#### P6 v6 (API) and P6 v7 (API)


There are two methods of connecting to the P6 v6 (API) and P6 v7 (API) project database:

1. **Native connection (Section 2.2)** (recommended)
2. **Using the Primavera Integration API to connect (Section 2.3)**



#### ***Auto Synchronize Primavera User Fields***

The user defined fields in Primavera P6 can be used to store project risk data. When you log onto a Primavera P6 database Primavera Risk Analysis will automatically search for any new user defined fields that may have been added since the last time Primavera Risk Analysis connected. Turn this option off if you do not wish Primavera Risk Analysis to check for new fields each time a user logs onto a Primavera P6 database.

 If this option is off and no user fields have been previously synchronized, then a message box asking if you wish to synchronize user fields is displayed.

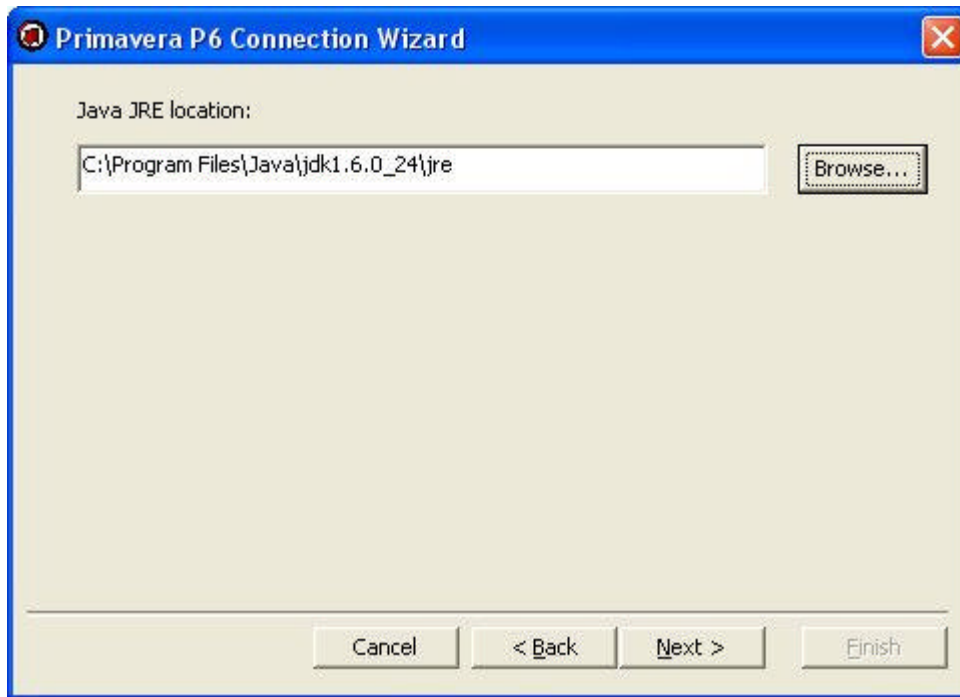
#### **P6 EPPM database R8 and R8.1 or higher (Web Services)**

To connect to these versions you will need to have **Web Services ('Using Web Services to connect' in the on-line documentation)** installed.

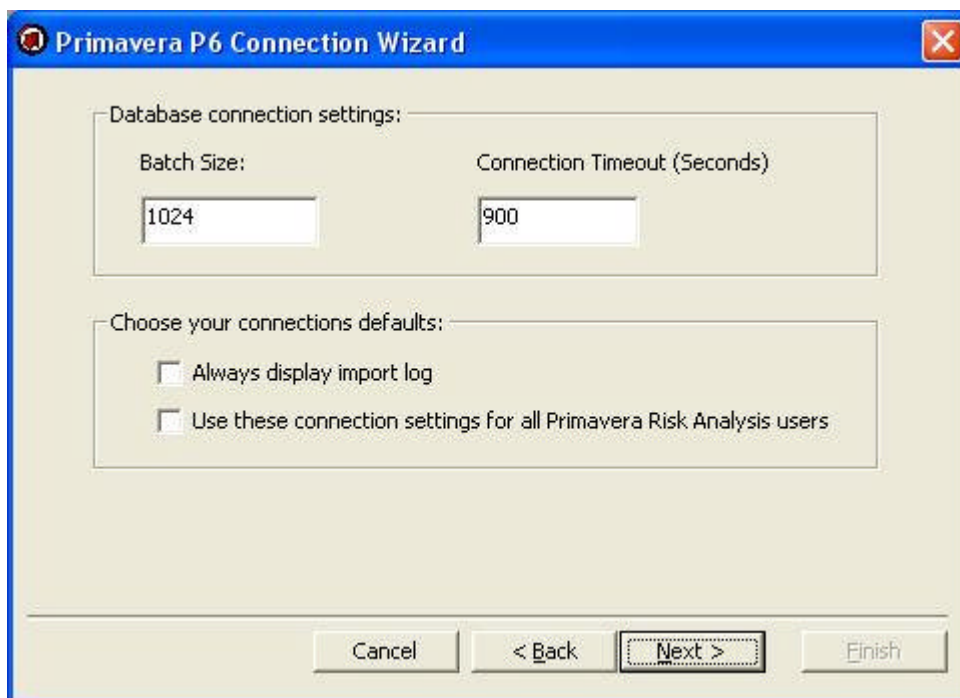
#### **P6 Professional database R8.1 or higher (API)**

The API used to connect to P6 Professional R8.1 or higher is installed with the P6 Professional product.

To connect to this version select P6 Professional database R8.1 or higher (API) and then enter your valid JRE path.



#### Additional Database Connection settings



**Batch Size:** For API and Native connections. This option does not normally need to be adjusted. Primavera recommend a batch size of 1024 for Primavera v6.0 and v7.0.

**Connection Timeout:** For API and Native connections. Increase this value if you are experiencing "Server Busy" messages during the import. Primavera P6 reports the server as being busy if this timeout setting is exceeded during an import, e.g. the network connection is slow, the project contains a lot of data.

**Always display import log:** A log of the import will always be displayed even if there are no errors.

**Use these connection settings for all Primavera Risk Analysis users:** This will populate the PrimaveraRiskAnalysis.ini file in the Primavera Risk Analysis installation folder with the Primavera connection settings. Primavera Risk Analysis will always use these settings when they are available rather than the user's own registry settings.

## 2.2 Primavera P6 - Using Native connection with Primavera P6 v6.x and v7.x

Primavera Risk Analysis can connect securely to a Primavera v6.x and v7.x project database without the installation of any other components.


### Requirements


- Primavera 6.x or 7.x installed using Oracle or SQL / MSDE installation.

### Setting up Native Connection

1. Install Primavera 6.x or 7.x if not installed.
2. Install Primavera Risk Analysis software.
3. Run Primavera.
4. Open any Primavera P6 project.

In Primavera P6 run the menu command: *Tools | Primavera Risk Analysis*.

 This command will be grayed out if there is no project open.

 Running this command creates a connection file (BREBootstrap.XML) that allows Primavera Risk Analysis to connect to the Primavera P6 project database. The location of the BREBootstrap.xml file created can be found using *Help | Support Files | Show Application Data Folder* in Primavera Risk Analysis.

Your Primavera P6 projects can now be opened in Primavera Risk Analysis from Primavera P6 or from within Primavera Risk Analysis.

### Changing database connection

If you have Primavera P6 set up to connect to more than one database the following method can be used to ensure Primavera Risk Analysis connects to the required database.

1. Run Primavera P6 and logon to the database you wish Primavera Risk Analysis to connect to.
2. Open any project.
3. *Tools | Primavera Risk Analysis*. Running this command will set up a connection to the current database and Primavera Risk Analysis will then use this.

### Some Trouble shooting ideas for the native database connection

1. Check that the BREBootstrap.xml file exists in the application data folder displayed. Use *Help | Support Files | Show Application Data Folder*. If no file exists trying running the steps under "Setting up Native Connection".
2. Install and check that the Primavera "Claim Digger" application runs - this application uses the same connection method. If Claim Digger does not work then re-installing the Primavera P6 client can sometimes fix the Primavera Risk Analysis connection problem.
3. Sometimes the "BREBootstrap.xml" file created by Primavera P6 during the steps under "Setting up Native Connection" does not provide a valid connection. Rename the existing "BREBootstrap.xml" file and copy in the "BREBootstrap.xml" located under the default folder "C:\Program Files\Common Files\Primavera Common\Java". Retest the connection. This file may not be here if Claim Digger has not been installed.

## 2.3 Primavera - Using the Primavera Integration API to connect

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The Primavera Integration API contains components that allow Primavera Risk Analysis to access your Primavera P6 project database.

The API method can be used when connecting to the following Primavera applications:

- P6 v6
- P6 v7
- P6 Professional database R8.1 or higher

### Requirements

- Primavera P6 installed using Oracle or SQL / MSDE installation. The Interbase installation is not

supported.

- Primavera Integration API installed.

### Step 1 - Install the Primavera Integration API

The Primavera Integration API should be installed. It is shipped with Primavera P6 software on the Primavera Integration API CD.

The Primavera Integration API can be installed on a server or locally on your PC.

If you need assistance installing the Primavera Integration API your Administrator or Primavera representative should be able to assist you.

### Step 2 - Set up Primavera Risk Analysis to use API

**IMPORTANT** It is essential that Primavera Integration API is correctly installed and operational.

1. Check the Primavera Integration API is able to connect and read projects from your Primavera P6 database using one of the Demo installed with the Primavera Integration API. If this is not successful then it is likely Primavera Risk Analysis will not be able to connect and you will need to contact your administrator or Primavera representative for help on installing and connecting the Primavera Integration API.
2. Run the Primavera Risk Analysis software.
3. Use File | Close to close any open plans.
4. *File | Primavera | Connection Wizard.*
5. Step through wizard and select P6 v6 (API), P6 v7 (API) or P6 Professional database R8.1 or higher (API)
6. Click *Next >*
7. Choose the Primavera Integration API option.
8. If you need to use the Remote please see details below for additional settings.
9. Browse and find the *Primavera Integration API location.*
10. Browse and find the *Java JRE location.*  
The folder you need to browse and select should contain the following additional folders and file:  
...\\bin\\client\\jvm.dll  
**For example:** "\\Program Files\\Primavera\\Claim Digger\\\_jvm" or "\\Program Files\\Java\\j2re1.4.2"
11. Complete the Wizard. You should now be able to connect to the Primavera P6 project database:  
*File | Primavera | Open Primavera P6 Project*

### ADVANCED - Remote connection

#### Server:

Enter the name or IP address of the Java Application Server.

#### RMI-port:

Enter the port number where the Primavera API RMI (Remote Method Invocation) service is running (e.g. 9099).

#### Mode:

This implements one of the Java API modes used to transmit data to and from the Primavera P6 database. Primavera Risk Analysis tells the Java API which mode is required and the Java API implements it. Choose one of the following modes:


*Standard* - The default mode.

*Compression* - The data is compressed before transmitting which should mean less data is transmitted.

*Encrypted* - The data is encrypted before being transmitted.

*HTTP* - Information is sent using HTTP tunneling, this allows the RMI service to operate across a specified port number and is designed for use across firewalls.

*HTTPS* - As HTTP but the information is sent using Secure Socket Layers.

 Both HTTP and HTTPS may require some additional configuration of the application server (Tomcat or Weblogic) and must be enabled from the Primavera API Configuration Tool.



**HTTP(S) Port:**

Only enabled when either HTTP or HTTPS modes are selected, this is the port number the application server is configured to listen for HTTP or HTTPS requests.

**Batch Size:**

Usually does not need changing. For remote connections if the time taken to display a large EPS is great then increasing this value to 1024 may help.

**Connection Timeout (Seconds):**

This option allows the amount of time Primavera Risk Analysis tries to connect to Primavera P6 to be increased. This should only be increased if connections to the Primavera P6 database are timing out even though the connection is correctly configured. Usually only required for large Primavera P6 database implementations.

If the connection is timing out the following "Server Busy" message is displayed:

"This action cannot be completed because the other program is busy. Choose 'Switch To' to activate the busy program and correct the problem".

**Changing database connection**

Primavera Risk Analysis will display connections to the same databases as the Primavera Integration API.

**ADVANCED - Registry settings**

Registry settings are created by the Connection Wizard that are then used by Primavera Risk Analysis to connect to the Primavera P6 project database.

They are located under:

[HKEY\_CURRENT\_USER\Software\ORACLE\Primavera Risk Analysis\Primavera]

## 3 Primavera Risk Tutorial (reading XER file)

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### 3.1 Primavera Risk Tutorial (reading an XER file)

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**3.1.1 Primavera Risk Tutorial using XER file**

Using an XER file to risk analyze a Primavera P6 project only requires Primavera Risk Analysis and needs no additional software installation or setup.

**Tutorial contents:**

This tutorial takes you through the steps of opening an example Primavera XER project and running a risk analysis.

1. Opening the Primavera XER project in Primavera Risk Analysis
2. Running risk analysis
3. The risk results

 If you are reading this in the on-line help you may want to print out this tutorial or use the PDF booklet installed in the Primavera Risk Analysis Documentation folder - see **Printing Help Topics and Chapters (Section 6.3)**


### 3.2 Primavera XER Risk Tutorial - 1. Opening the Primavera XER file in Primavera Risk Analysis

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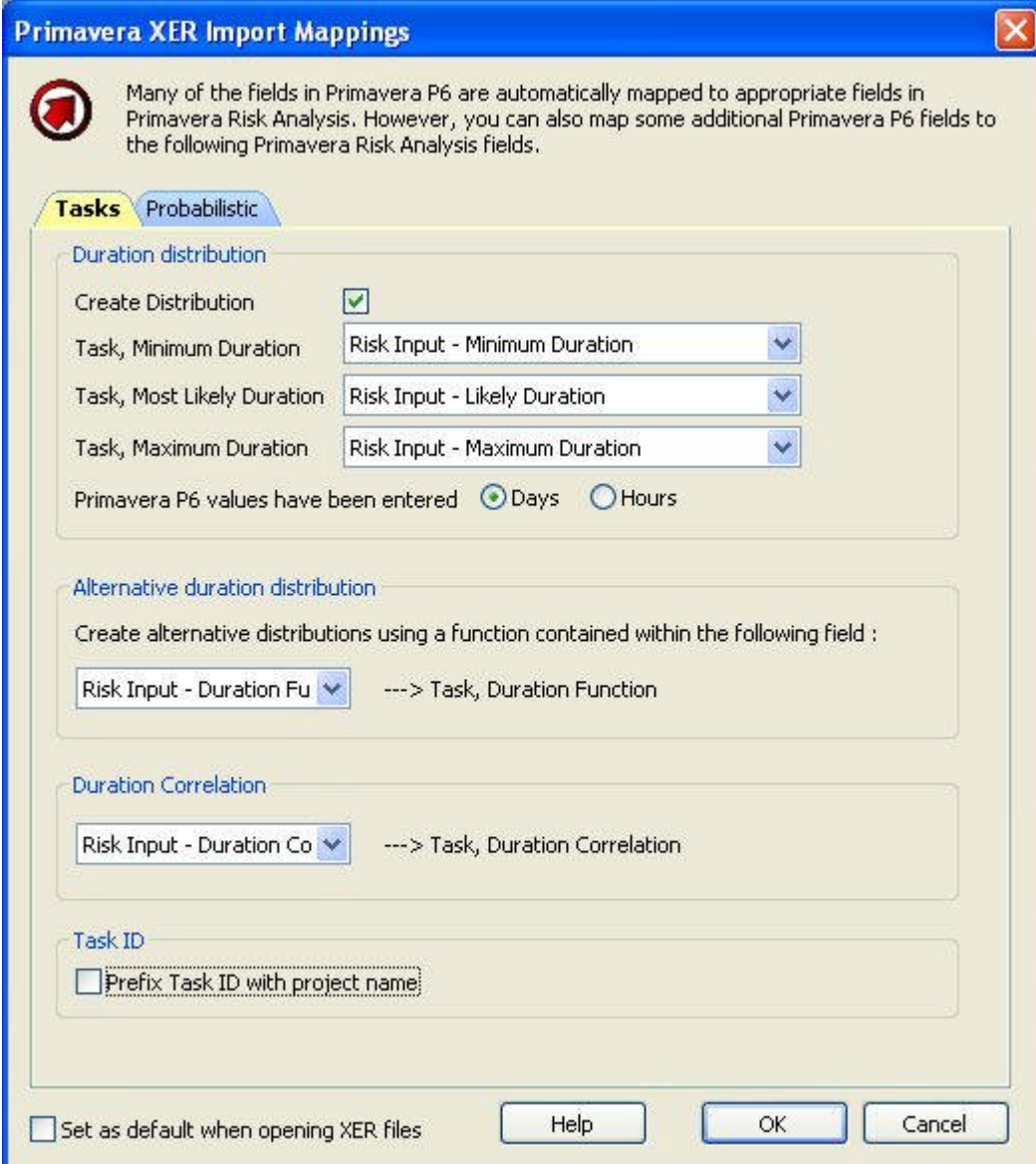
**Open the XER house project in Primavera Risk Analysis**

- Start up Primavera Risk Analysis.

- *Help | Open Samples...*
- Find 'TutorialPrimaveraWithRiskData.xer' and click *Open*.

 XER files can contain more than one project. This XER has only one project called "HOUSE".

- In *Primavera XER Import Options* dialog select *Day*. Ensure the *One day equals* setting is '8' hours - the tutorial plan has calendars with 8 working hours per day.
- Check the *Organize by the project WBS structure*.
- Click *OK*.
- The sample XER file has risk data stored in some of the activity user defined fields. To use this risk data set up the mappings as follows:



**Primavera XER Import Mappings**

Many of the fields in Primavera P6 are automatically mapped to appropriate fields in Primavera Risk Analysis. However, you can also map some additional Primavera P6 fields to the following Primavera Risk Analysis fields.

**Tasks** Probabilistic

**Duration distribution**

Create Distribution ☒

Task, Minimum Duration Risk Input - Minimum Duration

Task, Most Likely Duration Risk Input - Likely Duration

Task, Maximum Duration Risk Input - Maximum Duration

Primavera P6 values have been entered ☒ Days ☐ Hours

**Alternative duration distribution**

Create alternative distributions using a function contained within the following field :

Risk Input - Duration Fu ---> Task, Duration Function

**Duration Correlation**

Risk Input - Duration Co ---> Task, Duration Correlation


**Task ID**

☐ Prefix Task ID with project name

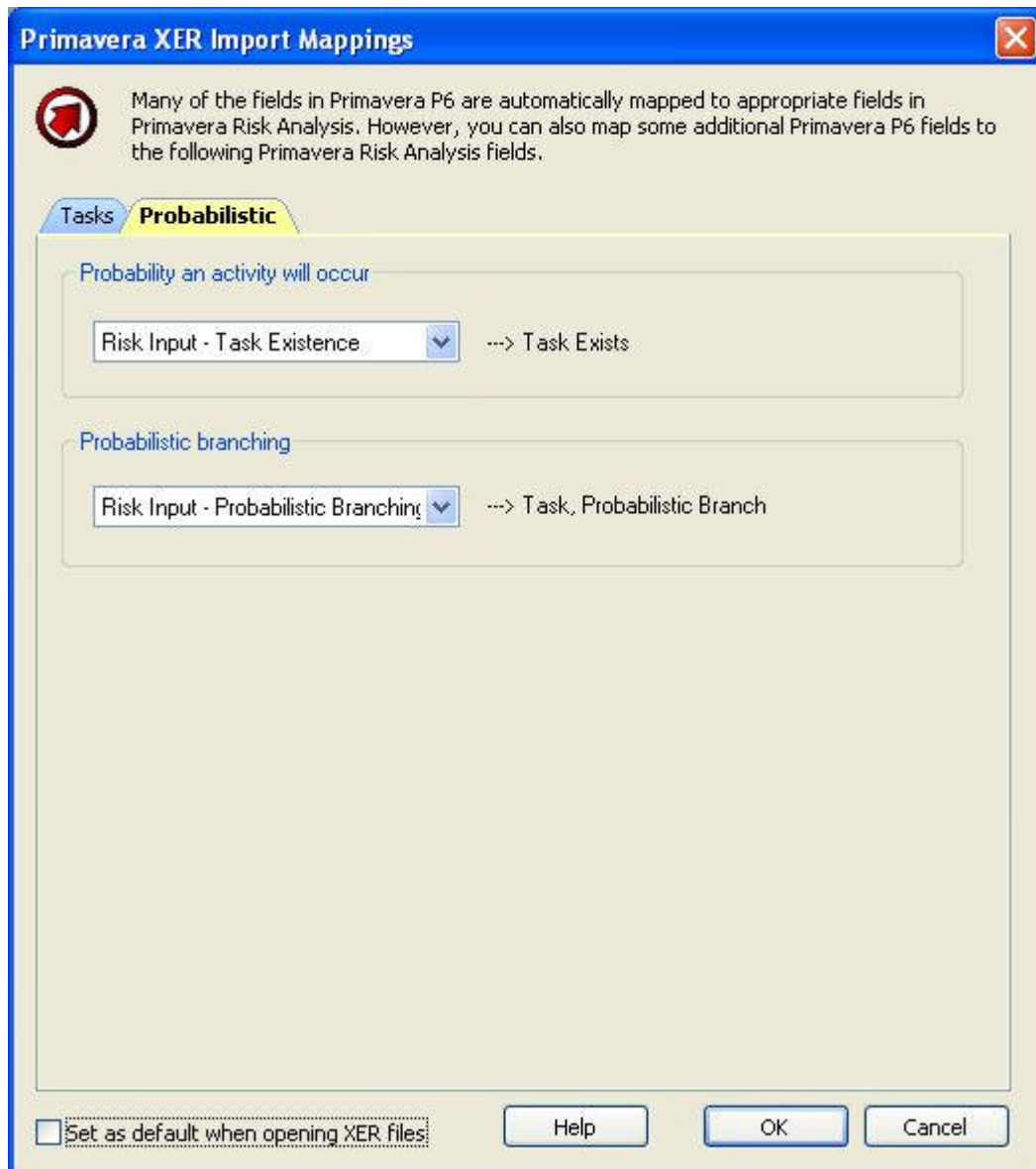
☐ Set as default when opening XER files

Help OK Cancel

**Figure:** Mapping Primavera fields to Primavera Risk Analysis.


 The XER file will only contain details of user fields that have values assigned. Primavera Risk Analysis can only import the user fields that are in the XER file. Therefore if user fields are not available it is likely that they do not contain any values and were therefore not exported as part of the XER file.

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




**Figure:** Mapping Primavera fields to Primavera Risk Analysis.

- Click **OK** to import the project.
- After the Primavera P6 project is opened the **Save As** dialog appears. Click **Save** to use the default name and location selected by Primavera Risk Analysis or change it if you wish.

 If the organize by WBS option was checked during import you may need to expand the top level activity to view the detail. Double-click on the plus sign at the far left hand of the activity row to display all the activities:

ID	Description
+ HOUSE	Pertmaster Tutorial (with risk ...

**Figure:** Use task button to expand a summary task.

- Click on the **Risk Inputs** sheet to view the imported uncertainty.
-  Click on a task to align it if you cannot see the task bars on the Gantt Chart

## Notes

- The **Import Check** sheet displays **Start Check** and **Finish Check** columns that display any differences between the Primavera P6 and Primavera Risk Analysis schedule. Check the columns for any differences - there may be 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 Primavera P6 schedule and the bars above them are the Primavera Risk Analysis schedule.


#### Viewing risk and uncertainty inputs

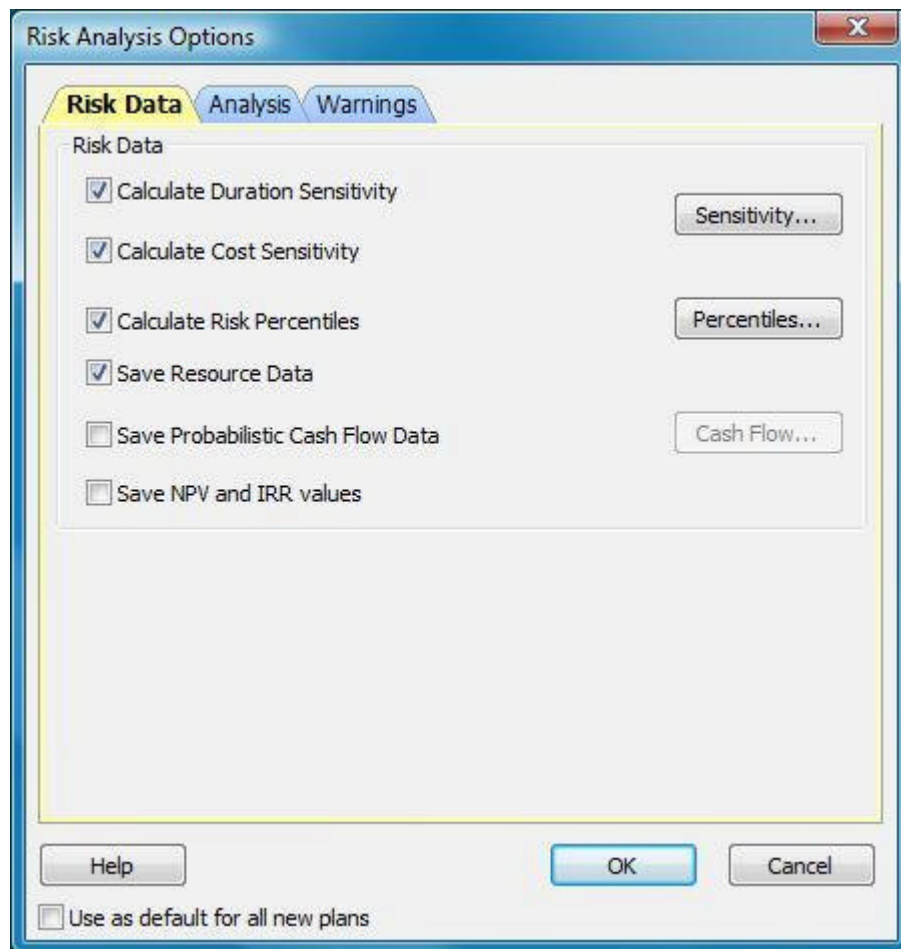
- To view all the risk and uncertainty inputs for the project - *Risk | Risk Summary*.
- Click *OK* to close *Risk Summary* dialog.
- To view individual risk and uncertainty data - Click on a task and choose the *Risk and Uncertainty* tab in the *Task Details*.

### 3.3 Primavera XER Risk Tutorial - 2. Running risk analysis

After opening the Primavera P6 project in Primavera Risk Analysis a risk analysis can be run.

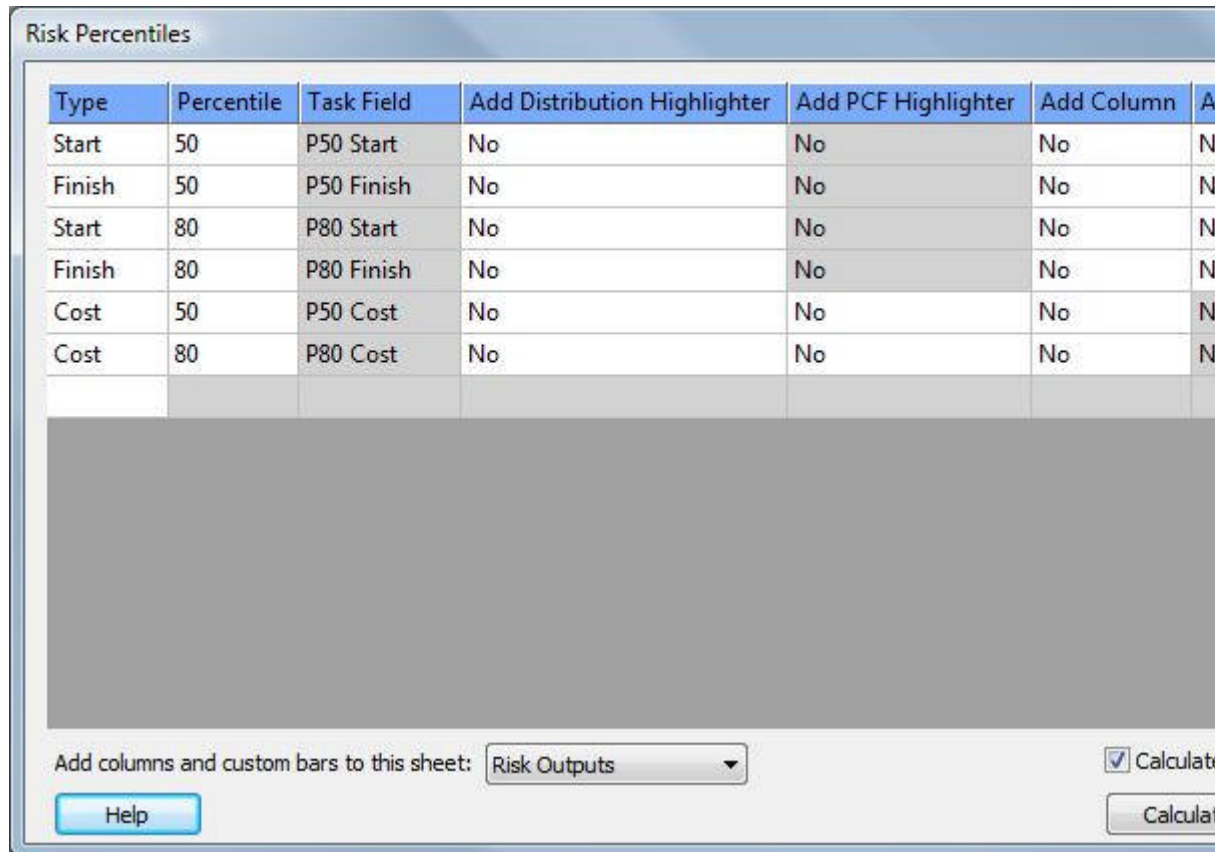
#### Run the Risk analysis

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



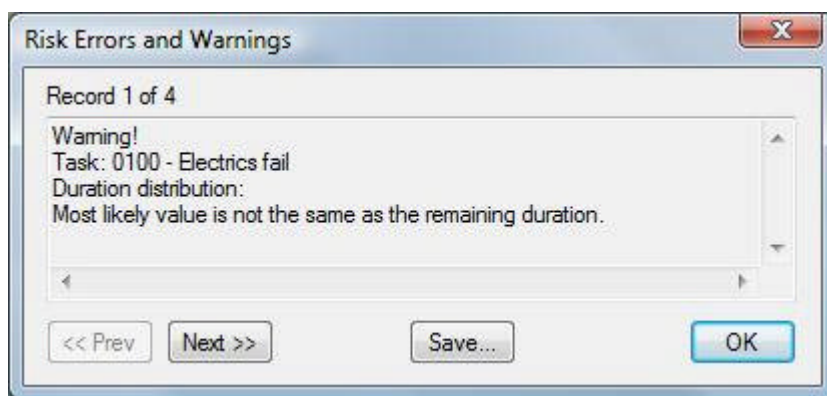
**Figure:** Risk analysis options dialog

- In the *Risk Analysis Options* dialog click on the *Percentiles...* button.
- Set up the values as shown below (they may already be set up like this):



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

- Click *OK* to close the *Task 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 P6 plan. The same applies for the '0140 - Dry Rot' activity. Modeling probabilistic activities with a zero duration ensures that their durations do not affect the project's deterministic finish.



**Figure:** Warnings dialog displayed when risk analysis is run.

- 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 '0090 - 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.

### 3.4 Primavera XER Risk Tutorial - 3. 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 (19%)
- On right hand side read the 80% date (5 Jul)

#### 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* (19%)
- On right hand side read the 80% date (21 May)

#### Return to the Gantt Chart

- Close the Distribution Graph.

#### 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 to display results 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.

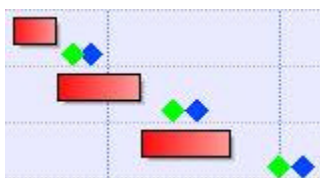
**Task Existed** shows how often an activity existed during the analysis - this applies to probabilistic activities.

#### 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 bars or markers that display the P50 and P80 risk schedule.

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

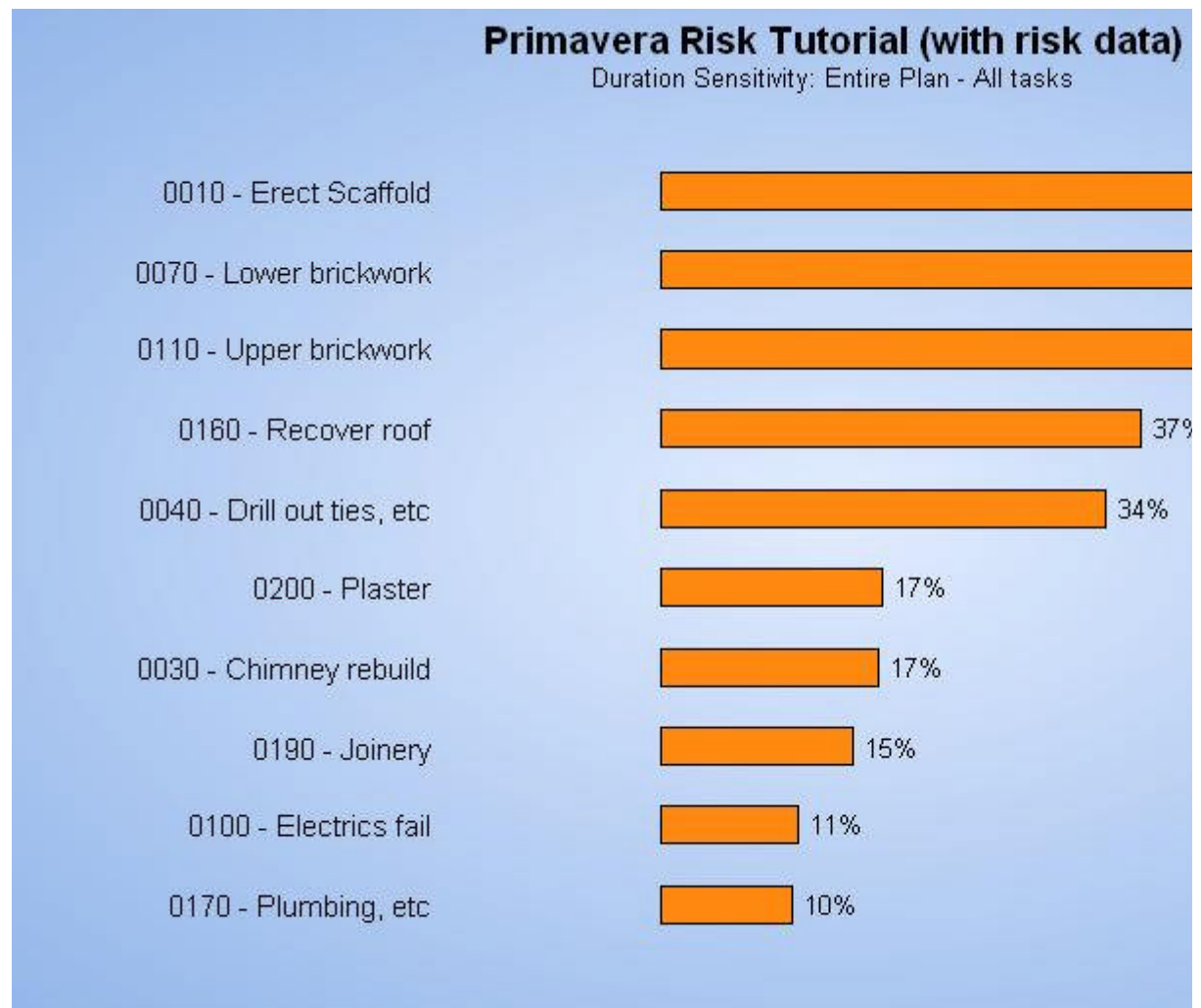
☑ The *Create Task Percentiles* option must have been checked and set up in the *Risk Analysis Options* dialog before running the risk analysis. If this option is not checked then the user dates are not populated and therefore no bars or markers can be drawn.

### 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.

## 4.1 Primavera Risk Tutorial (reading from the project database)

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### 4.1.1 Primavera Risk Tutorial (reading from the project database)

This tutorial demonstrates how Primavera Risk Analysis works with a connection to the Primavera P6 project database.


You will require a working Primavera P6 installation with the connection set up to Primavera Risk Analysis. See **Primavera Connection Wizard (Section 2.1)**.

If you do not have Primavera P6 installed and connected to Primavera Risk Analysis you can alternatively follow the Primavera Risk tutorial that uses the XER file - this tutorial only needs a working Primavera Risk Analysis installation: **Primavera Risk Tutorial (reading an XER file) (Section 3.1)**

#### Tutorial contents:

This tutorial takes you through the steps of opening an example Primavera P6 project, running a risk analysis and updating the results to the Primavera P6 project database.

1. Importing the tutorial project into Primavera P6
2. Opening Primavera P6 project in Primavera Risk Analysis
3. Running risk analysis
4. The risk results
5. Updating the results to Primavera P6
6. Viewing the results in Primavera

 If you are reading this in the on-line help you may want to print out this tutorial or use the PDF booklet installed in the Primavera Risk Analysis Documentation folder - see **Printing Help Topics and Chapters (Section 6.3)**

## 4.2 Primavera Risk Tutorial - 1. Importing the example Primavera P6 project

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Before you can run this tutorial you must import the Primavera P6 sample project into the Primavera P6 project database.

#### Import the Primavera P6 sample project

- Start up Primavera.
- *File | Import | Next | Next*
- At *File Name* browse to the file 'TutorialPrimaveraWithRiskData.xer' that is installed with Primavera Risk Analysis and click *Open*.  
File usually installed in folder C:\Program Files\Oracle\Primavera Risk Analysis\Samples
- Click *Next*.
- Click under *Import To* and select a suitable location for the project in the existing EPS.
- *Next | Next | Finish | OK*.
- *Project | Activities*.

#### Create Schedule Risk Layout

In order to make the input of schedule risk data simple in Primavera P6 we recommend creating a view.

- Add the columns in the figure below.



You can add Columns by right-clicking on a column header and choosing 'Columns...' - you will also find the columns below under the 'User Defined' section of the Columns editor.




Layout: Risk Input - Schedule				Filter: All Activities		
Activity ID	Activity Name	Remaining Duration	Risk Input - Minimum Duration	Risk Input - Likely Duration	Risk Input - Maximum Duration	Risk Input - Duration Func
Pertmaster Tutorial (...)		98d	201	266	373	
0010	Erect Scaffold	15d	11	15	30	

**Figure:** Columns for the Primavera Risk Input - Schedule layout.

- View | Layout | Save Layout As...
- In Layout name: Type "Risk Input - Schedule".
- Click Save.

### Entering Schedule Risk

- You will notice that the risk data has already been entered. See below for explanation.

 The Remaining Durations column will only be the same as those shown below if the *Hours/Day* setting in Primavera is set to 8. This option can be edited in the *User Preferences* dialog (*Edit | User Preferences | Time Units* tab) or the *Admin Preferences* dialog (*Admin | Admin Preferences | Time Periods* tab).

Layout: Risk Input - Schedule				Filter: All Activities		
Activity ID	Activity Name	Remaining Duration	Risk Input - Minimum Duration	Risk Input - Likely Duration	Risk Input - Maximum Duration	Risk Input - Duration Func
Pertmaster Tutorial (with ri...		98d	201	266	373	
0010	Erect Scaffold	15d	11	15	30	
0020	Drain off system etc.	8d	6	8	12	
0030	Chimney rebuild	8d	6	8	12	
0040	Drill out ties, etc	16d	12	16	23	
0050	Cut-off & re-route electric	8d	6	8	12	
0060	Re-wire	7d	5	7	10	
0070	Lower brickwork	24d	18	24	35	
0080	Test electrics	16d	12	16	23	
0090	Electrics pass	3d	3	3	5	
0100	Electrics fail	0d	10	12	15	
0110	Upper brickwork	16d	13	16	23	
0120	Strip off roof cover	8d	6	8	12	
0130	Boundary wall, etc	12d	9	12	17	
0140	Dry rot	6 0d	2	4	10	
0150	Roof struct. work	12d	9	12	17	
0160	Recover roof	27d	20	27	35	
0170	Plumbing, etc	44d	40	44	49	
0180	Dismantle scaffold	12d	7	12	16	
0190	Joinery	14d	6	14	17	
0200	Plaster	20d	0	0	0	
0210	Finish	0d	0	0	0	
0220	Site Security	121d	0	0	0	

**Figure:** Schedule risk data entered in Primavera's user fields.

### Schedule Risk Input Details

With reference to the screen shot above:

1. These are three point estimates for the activity durations. When the *Likely Duration* value is left empty Primavera Risk Analysis will automatically use the activity remaining duration. Primavera Risk Analysis creates a triangular distribution from the 3 points.

2. If you want to use another distribution use the *Duration Function* column (e.g. 'Plaster' uses a uniform distribution). Do not enter any values into the *Min*, *Likely* and *Max Duration* columns.
3. After 'Test Electrics' there are two possible outcomes: 'Electrics pass' or 'Electrics fail'. We can use *Probabilistic Branching* to model this. The risk input data entered '0090[80];0100[20]' tells Primavera Risk Analysis that 20% of the time activity '0090' will occur and the other 80% of the time activity '0100' will occur.
4. The duration uncertainty of one activity can be correlated with the duration uncertainty of another activity. The risk input data entered in the *Duration Correlation* column against the activity 'Upper brickwork' indicates that its duration uncertainty is 95% correlated to the duration uncertainty on activity '0070' (e.g. If the first 'Lower brickwork' takes a long time it is likely that the next one will too.)
5. We are not planning to find 'Dry Rot' in the roof but we believe there is a 10% chance of it existing. We are using *% Chance Exists* to model this.
6. The duration of 'Dry Rot' has been set to zero - this prevents it from affecting the project finish date and cost. In this case a *Likely Dur* must be entered otherwise a value of 0 will be used.

### Create Cost Risk Layout

We will repeat the above steps and create a cost data input view.

- Add the columns in the figure below.

Layout: Risk Input - Cost				Filter: All Activities			
Activity ID	Activity Name	Remaining Labor Cost	Remaining Nonlabor Cost	Remaining Expense Cost	Remaining Total Cost	Risk Input - Expense Minimum	Expense Maximum
0010	Erect Scaffold	£2,850	£0	£0	£2,850		

**Figure:** Columns for the Primavera Risk Input - Cost layout.

- View | Layout | Save As...
- In Layout name: Type "Risk Input - Cost".

### Entering Cost Risk

- All the data is already entered in the sample project. See number items below for explanation.

Layout: Risk Input - Cost Filter: All Activities

Activity ID	Activity Name	Remaining Labor Cost	Remaining Nonlabor Cost	Remaining Expense Cost	Remaining Total Cost	Risk
<b>PERTMASTER TUTORIAL (with risk...)</b>		£81,640	£0	£1,000	£82,640	
0010	Erect Scaffold	£2,880	£0	£0	£2,880	
0020	Drain off system etc.	£1,216	£0	£0	£1,216	
0030	Chimney rebuild	£2,688	1	£0	£2,688	
0040	Drill out ties, etc	£4,864	£0	£0	£4,864	
0050	Cut-off & re-route electric	£1,600	£0	£0	£1,600	
0060	Re-wire	£1,400	£0	£0	£1,400	
0070	Lower brickwork	£8,064	£0	£0	£8,064	
0080	Test electrics	£3,200	£0	£0	£3,200	
0090	Electrics pass	£600	£0	£0	£600	
0100	Electrics fail	£0	£0	£0	£0	
0110	Upper brickwork	£5,376	£0	£0	£5,376	
0120	Strip off roof cover	£1,984	£0	£0	£1,984	
0130	Boundary wall, etc	£1,824	£0	£0	£1,824	
0140	Dry rot	£0	2	£0	£0	
0150	Roof struct. work	£2,976	£0	£0	£2,976	
0160	Recover roof	£6,696	£0	£0	£6,696	
0170	Plumbing, etc	£11,968	£0	£0	£11,968	
0180	Dismantle scaffold	£2,304	£0	£1,000	£3,304	
0190	Joinery	£3,472	£0	£0	£3,472	
0200	Plaster	£3,040	£0	£0	£3,040	
0210	Finish	£0	£0	£0	£0	
0220	Site Security	£15,488	£0	£0	£15,488	

**Figure:** Cost risk data entered in Primavera's user fields.

### Cost Risk Input Details

With reference to the screen shot above:

1. The remaining Labor cost is being calculated from the Labor resources assigned to each activity. When the project is opened in Primavera Risk Analysis the Labor costs can be mapped as Duration Dependent - changes in the activity duration will then affect the cost proportionally.
2. The 'Dry Rot' and 'Electrics fail' task have zero costs as well as a zero duration.
3. This activity has an expense assigned. When the project is opened in Primavera Risk Analysis the Expense costs can be mapped as Duration Independent - changes in the activity duration do not affect the cost. To add uncertainty a Minimum and Maximum Expense can be entered and mapped when the project is opened in Primavera Risk Analysis. Material resources can be assigned in a similar way.


## 4.3 Primavera Risk Tutorial - 2. Opening a Primavera P6 project in Primavera Risk Analysis

### Open the Primavera HOUSE project in Primavera Risk Analysis


Now all the risk data is in the Primavera P6 project we can use Primavera Risk Analysis to open the project and perform a risk analysis.

There are two methods of opening a Primavera P6 project in Primavera Risk Analysis:

1. Start Primavera Risk Analysis then use: *File | Primavera | Open Primavera P6 Project...*
- or
2. Open project in Primavera P6 and then use: *Tools | Primavera Risk Analysis...*

 Method 1 is required for connections to P6 R8.

The steps below use the first option.

- Start Primavera Risk Analysis.
- Click on  or use *File | Primavera | Open Primavera P6 Project...*



If you receive an error regarding an incomplete connection, open Primavera Project Management and choose '*Primavera Risk Analysis*' from the *Tools* menu to complete the connection. Use the settings below to define your import mappings.

Don't forget to check the '*Use as default for new projects*' check box before hitting *OK*!

- Log on to the Primavera P6 project database (e.g. admin, admin).
- In the EPS (Enterprise Project Structure) locate the previously imported project and select it: "HOUSE - Primavera Risk Tutorial (with risk data)".

 Primavera Risk Analysis uses the Primavera security so you will only have access to the projects you have access to when logging directly into Primavera.

- Click *OK* and the *Primavera Enterprise Import Settings* dialog will be displayed.
- On the *General* tab select *Day*. Ensure the *One day equals* setting is '8' hours - the tutorial plan has calendars with 8 working hours per day.
- Check the option *Import the WBS Structure* if it is not already checked.
- Click on the *Tasks* tab.
- Set up the mappings as shown below:

**Primavera P6 Import Settings**

Many of the fields in Primavera P6 are automatically mapped to appropriate fields in Primavera Risk Analysis. However, you can also map additional Primavera P6 fields to the following Primavera Risk Analysis risk fields.

**General** **Tasks** Probabilistic Resources and Costs

**Duration distribution**

Create Distribution ☒

Task, Minimum Duration Risk Input - Minimum Duration

Task, Most Likely Duration Risk Input - Likely Duration

Task, Maximum Duration Risk Input - Maximum Duration

Primavera values have been entered in: ☒ Days ☐ Hours

**Alternative duration distribution**

Create alternative distributions using a function contained within the following field:

Risk Input - Duration Fu ---> Task, Duration Function

**Duration Correlation**

Risk Input - Duration Co ---> Task, Duration Correlation

**Task ID**

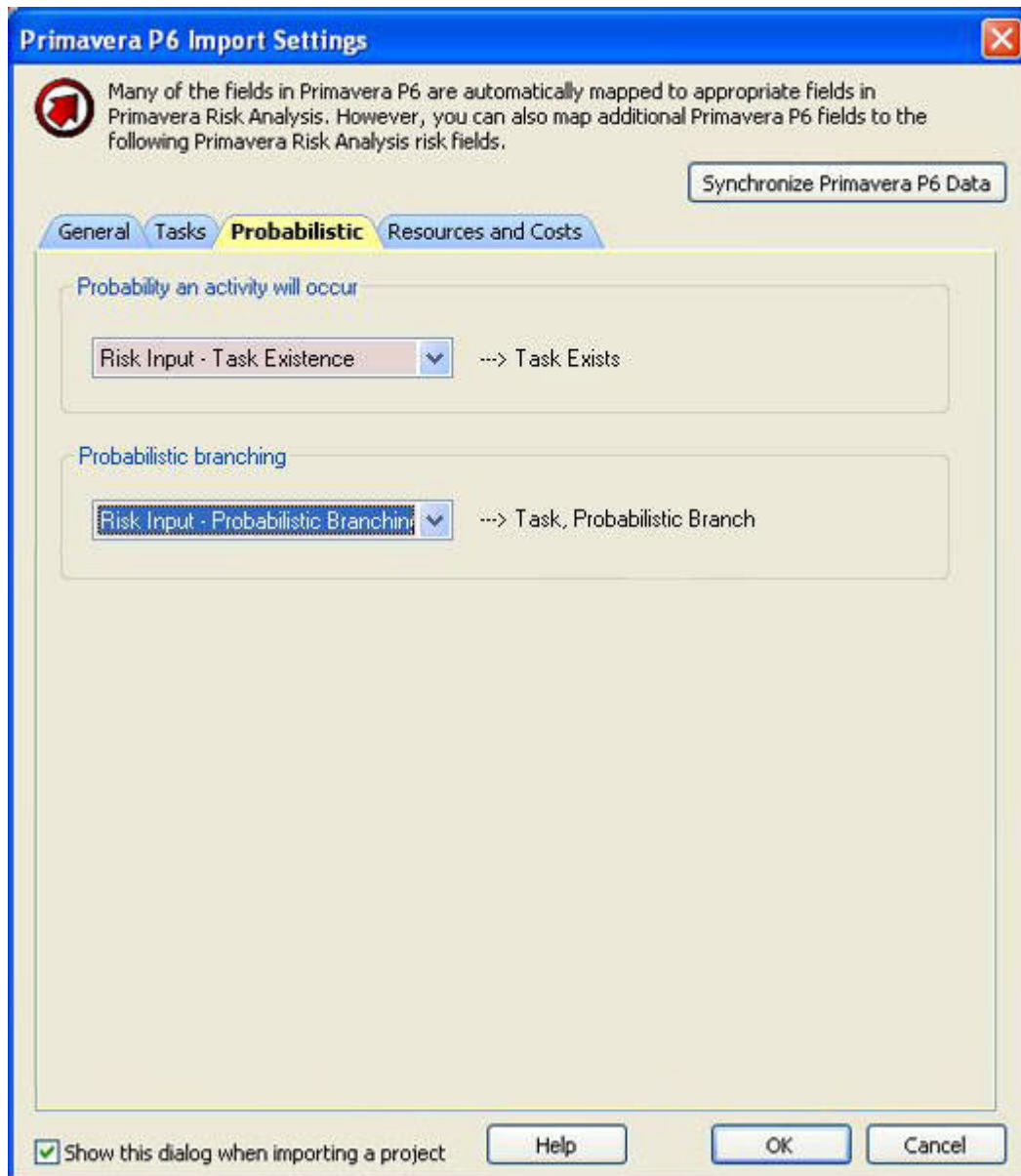
☐ Prefix Task ID with project name

☒ Show this dialog when importing a project

**Figure:** Mapping Primavera fields to Primavera Risk Analysis.

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





**Figure:** Mapping Primavera fields to Primavera Risk Analysis.

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

**Primavera Import Settings**

Many of the fields in Primavera are automatically mapped to appropriate fields in Primavera Risk Analysis. However, you can also map additional Primavera fields to the following Primavera Risk Analysis risk fields.

General Tasks Probabilistic **Resources and Costs** Activity Codes User Defined Fields

☐ Do not import any Resources or Costs  
☐ Import Roles, Resources, Assignments and Activity Expense Costs  
☒ Import Activity Costs summarized as Labor, Non-Labor, Materials and Expenses as below

**Labor Costs**

Duration Dependent ☒ Create ☐  
 Minimum  
 Duration Independent ☐ Most Likely  
 Use Primavera Duration Type ☐ Maximum

**Non-Labor Costs**

Duration Dependent ☒ Create ☐  
 Minimum  
 Duration Independent ☐ Most Likely  
 Use Primavera Duration Type ☐ Maximum

**Material Costs**

Duration Dependent ☐ Create ☐  
 Minimum  
 Duration Independent ☒ Most Likely  
 Use Primavera Duration Type ☐ Maximum

**Expenses**

Duration Dependent ☐ Create ☒  
 Minimum  
 Duration Independent ☒ Most Likely  
 Use Primavera Duration Type ☐ Maximum

Create alternative distributions from a function in

☐ Use as default for new projects

**Figure:** Mapping Primavera fields to Primavera Risk Analysis.

- Check the 'Use as default for new projects' check box.
- Click OK.
- After the Primavera P6 project is opened the *Save As* dialog appears. Save as the default name selected by Primavera Risk Analysis or choose another name and location.

If the organize by WBS option was selected you may need to expand the top level activity to view the detail. Double-click on the plus sign at the far left hand of the activity row to display all the activities:

ID	Description
+ HOUSE	Pertmaster Tutorial (with risk ...

**Figure:** Use task button to expand a summary task

- Click on the *Risk Inputs* sheet to view the imported uncertainty.

## Notes

- The *Import Check* sheet contains *Start Check* and *Finish Check* columns that display any differences between the Primavera P6 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 Primavera P6 schedule and the bars above them are the Primavera Risk Analysis schedule.


#### Viewing risk inputs

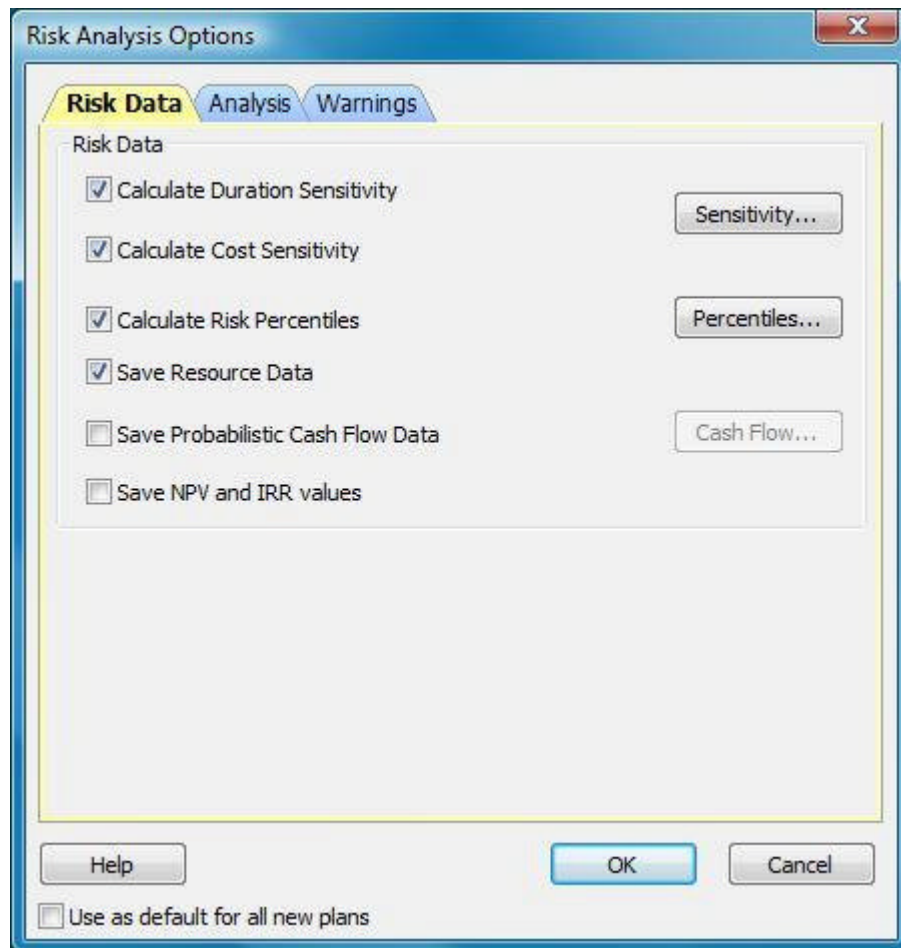
- To view all the risk inputs for the project - *Risk | Risk Summary*.
- To view individual risk data - Click on a task and choose the *Risk and Uncertainty* tab in the *Task Details*.

## 4.4 Primavera Risk Tutorial - 3. Running risk analysis

After opening the Primavera P6 project in Primavera Risk Analysis a risk analysis can be run.

#### Run the Risk analysis

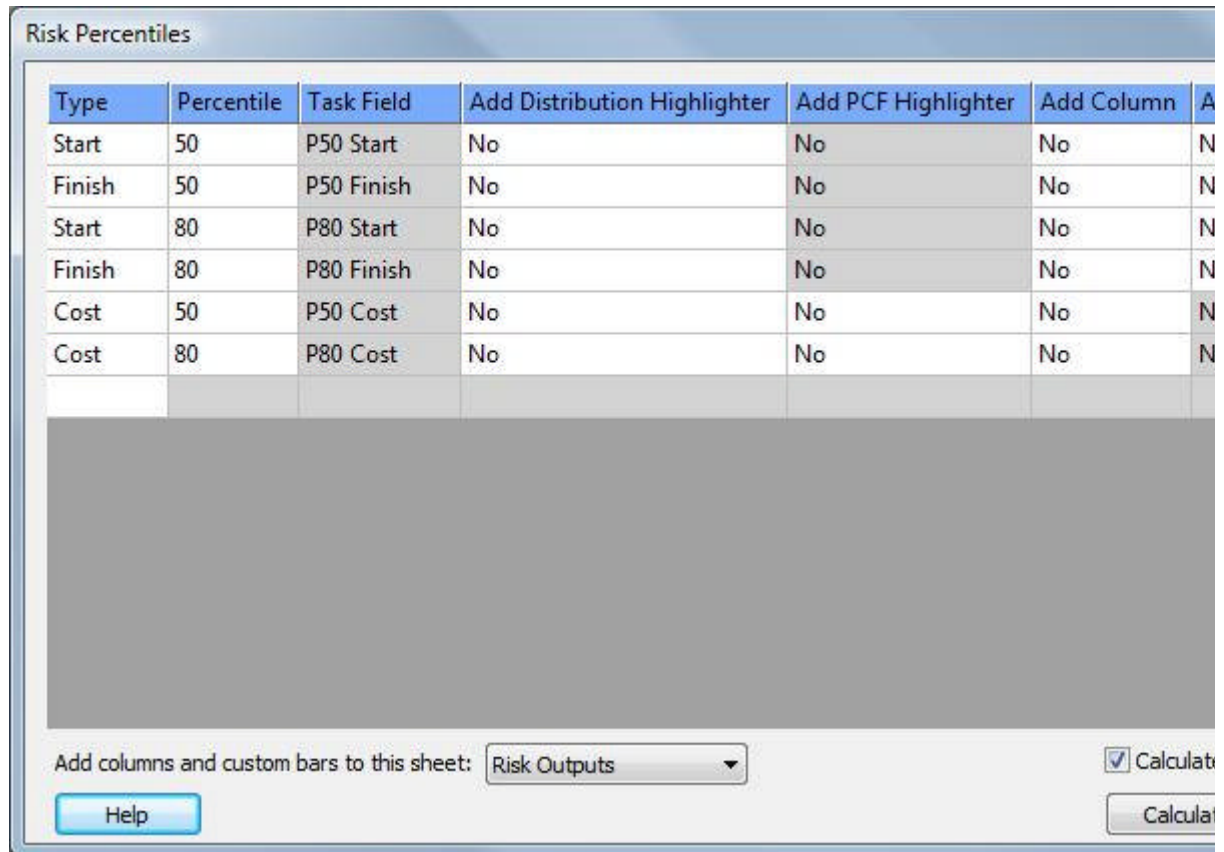
- *Risk | Run Risk Analysis* or click 
- Click *Options...* to display the *Risk Analysis Options* dialog.
- Change the options to those shown below:



**Figure:** Risk analysis options dialog.

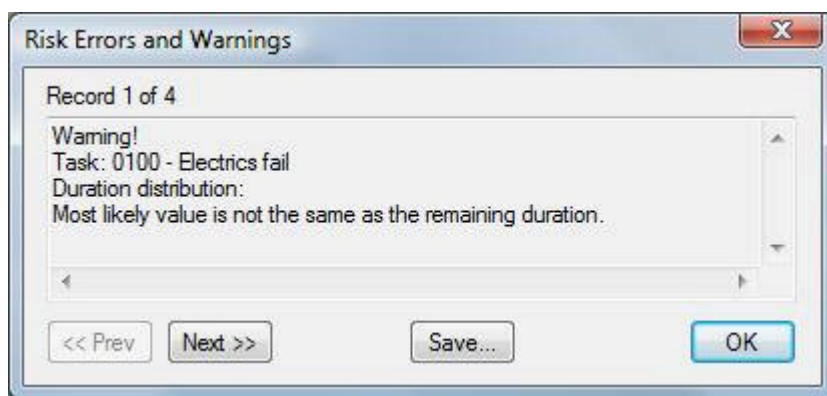
- In the *Risk Analysis Options* dialog click on the *Percentiles...* button.
- Set up the values as shown below (they may already be set up like this):





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

- Click *OK* to close the *Task 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 P6 plan. The same applies for the '0140 - Dry Rot' activity. Modeling probabilistic activities with a zero duration ensures that their durations do not affect the project's deterministic finish.



**Figure:** Warnings dialog displayed when risk analysis is run

- 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 '0090 - 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.

## 4.5 Primavera 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 (18%)
- On right hand side read the 80% date (5 Jul)

### 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 (19%)
- On right hand side read the 80% date (18 May)

### 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 (27%)
- On right hand side read the 80% cost (88,647)

### Return to the Gantt Chart

- Close the Distribution Graph.

### 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.

ID	Description	Rem Duration	02Mar '02Apr '02		P80 Start	P80 Finish	P50 Start	P50 Finish
0060	Re-wire	7	4	1	16/Mar/02	23/Mar/02	12/Mar/02	18/Mar/02
0070	Lower brickwork	24			25/Mar/02	20/Apr/02	20/Mar/02	14/Apr/02
0080	Test electrics	16			21/Apr/02	07/May/02	15/Apr/02	01/May/02
0090	Electrics pass	3			08/May/02	10/May/02	02/May/02	04/May/02

Criticality Index	Duration Sensitivity	Mean Duration	Task Existed	Std Dev Dur	P50 Cost	P80 Cost	Cost Sensitivity	Std Dev Cost	Mean Cost
0%	6%	7	100%	1	£1,400	£1,800	0%	275	1,467
71%	53%	26	100%	4	£8,250	£9,570	0%	1,289	8,470
10%	3%	17	100%	3	£3,400	£3,800	0%	528	3,400
4%	-16%	4	80%	1	£600	£800	0%	149	734

**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.

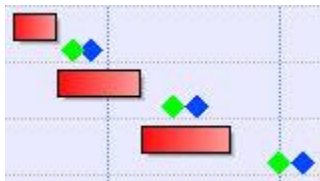
**Task Existed** shows how often an activity existed during the analysis - this applies to probabilistic activities.

### 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 bars or markers that display the P50 and P80 risk schedule.

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

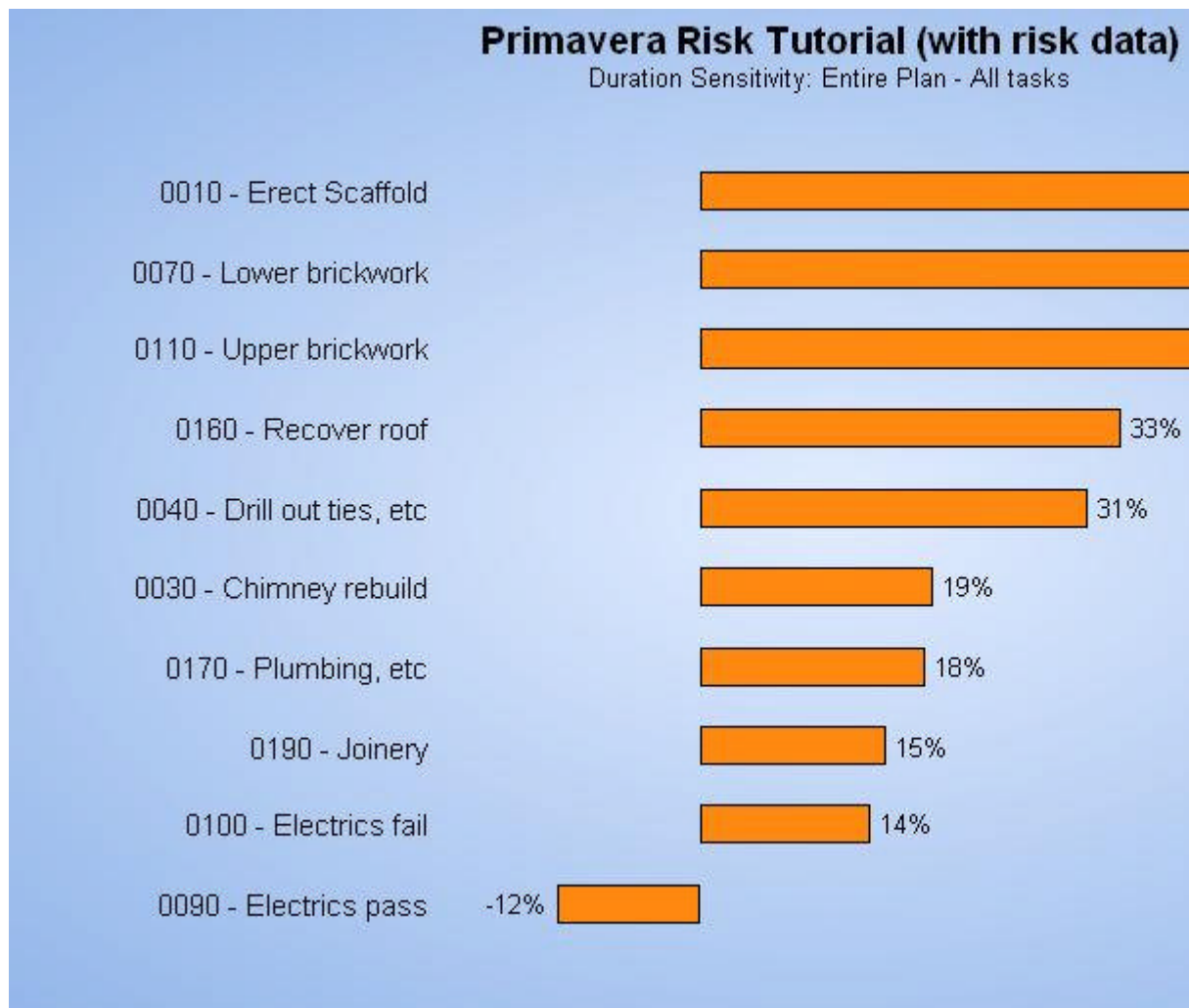
📌 The *Create Task Percentiles* option must have been checked and set up in the *Risk Analysis Options* dialog before running the risk analysis. If this option is not checked then the user dates are not populated and therefore no bars or markers can be drawn.

### 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.

## 4.6 Primavera Risk Tutorial - 5. Updating the results to Primavera

The results of the risk analysis in Primavera Risk Analysis can be updated to the Primavera P6 project. The Primavera user fields are used to store these results. The risk results can be updated in Primavera P6 at the Activity level and the Project level.

🔧 It is also possible to 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 Primavera P6 project.

### Update the risk results to Primavera

- Updates can sometimes partially fail if the project being updated is open in Primavera. Close the tutorial project in Primavera P6 if it is open.
- Click on  or *File | Primavera | Update Primavera P6 Project...*
- Set up the mappings shown below:

Primavera Risk Analysis field		Primavera P6 field
P50 Start	-->	Risk - P50 Start
P50 Finish	-->	Risk - P50 Finish
P80 Start	-->	Risk - P80 Start
P80 Finish	-->	Risk - P80 Finish
Risk Output - Criticality Index	-->	Risk - Criticality Index
Risk Output - Duration Sensitivity	-->	Risk - Duration Sensitivity
Risk Output - Cruciality	-->	Risk - Duration Cruciality
Risk Output - Cost Sensitivity	-->	Risk - Cost Sensitivity

Risk Output - Cost Sensitivity	-->	Risk - Cost Sensitivity
--------------------------------	-----	-------------------------

Add Remove

---

### Project Mappings

Plan Finish Date (050%)	-->	user_end_date1
Plan Finish Date (080%)	-->	user_end_date2
Plan Cost (050%)	-->	user_cost14
Plan Cost (080%)	-->	user_cost15
Plan Finish Date Probability	-->	user_number10

Plan Finish Date Probability	-->	user_number10
------------------------------	-----	---------------

Add Remove

☒ Apply settings to all new plans

Help

**Figure:** Setting up the risk values for mapping into Primavera.

- Click *Update Now*.
- In the warning dialog choose *Yes* and the values from Primavera Risk Analysis will be copied into the Primavera project user fields.
- Log on if requested (e.g. admin, admin).
- The results are updated to the Primavera P6 project.

#### 4.7 Primavera Risk Tutorial - 6. Viewing the results in Primavera

After the risk analysis results have been updated in the Primavera P6 project they can be viewed in the Primavera P6 project desktop client.

## Creating the 'Risk Outputs' layout

Create a new layout called 'Risk Outputs' by doing the following:

- Open Primavera P6 desktop client and log in (e.g. admin, admin).
- If the project is not visible click on the *Activities* icon.
- Add the columns in the figure below:

Activity ID	Activity Name	Risk - Criticality Index	Risk - Duration Sensitivity	Risk - Duration Cruciality	Risk - Cost Sensitivity
-------------	---------------	--------------------------	-----------------------------	----------------------------	-------------------------



- View | Layout | Save As...
- In Layout name: Type "Risk Outputs".

### Creating the 'Risk Outputs – Dates' layout

Create a new layout called 'Risk Output – Dates' by doing the following:

- Add the columns in the figure below.

Activity ID	Activity Name	Risk - P50 Start	Risk - P50 Finish	Risk - P80 Start	Risk - P80 Finish
-------------	---------------	------------------	-------------------	------------------	-------------------

- Right click in the Gantt chart and choose "Bars...".
- Add the two top rows shown in the figure below.
- Change the Row values to 2 and 3 so bars are not drawn on top of each other.

Display	Name	Timescale	User Start Date	User Finish Date	Filter	Preview
<input checked="" type="checkbox"/>	P50 bar	User Dates	Risk - P50 Start	Risk - P50 Finish	All Activities	
<input checked="" type="checkbox"/>	P80 bar	User Dates	Risk - P80 Start	P80 Finish	All Activities	
<input checked="" type="checkbox"/>	Remaining Level	Remain Bar			Level of Effort	
<input checked="" type="checkbox"/>	Actual Level of E	Actual Bar			Level of Effort	
<input type="checkbox"/>	Primary Baseline	Primary Baseline E			Normal	
<input type="checkbox"/>	Second Baseline	Secondary Baseline			Normal	
<input type="checkbox"/>	Third Baseline	Tertiary Baseline			Normal	
<input checked="" type="checkbox"/>	Actual Work	Actual Bar			Normal	

Bar Style		Bar Settings		Bar Labels	
Shape					
Color					
Pattern					
Row	2				

- View | Layout | Save As...
- In Layout name: Type "Risk Output – Dates"

The updated risk results should now be displayed. Colored bars display the P50 and P80 finish dates.



**Figure:** Bars under the deterministic schedule display the P50 and P80 risk schedule.

### Viewing Project Level risk results

The project level columns in Primavera P6 can be used to display the project level risk analysis results that have been updated from Primavera Risk Analysis.

In Primavera:

- *Enterprise | Projects*

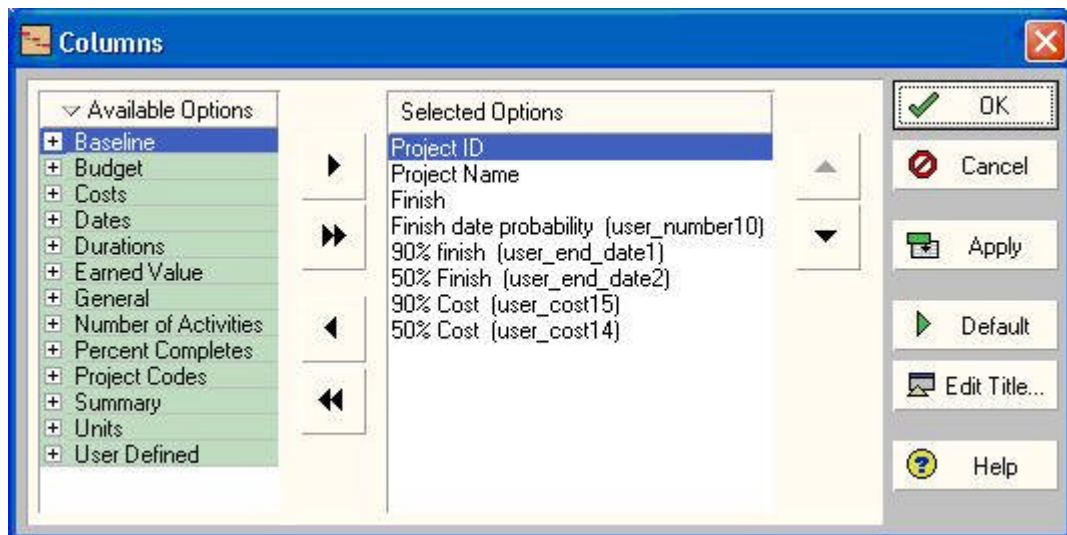
### Retrieving a column layout

- *View | Layout | Open*
- Click *Import* button.
- Select the .plf file 'Risk - Project Level Results.plf' from the *Others* folder under the Primavera Risk Analysis installation. This usually installed in folder C:\Program Files\Oracle\Primavera Risk Analysis\Others
- Click *Open*
- Select *All Users* in the 'Available to' drop down and click *Save*.
- Click *Apply* and then close the dialog.

### Setting up columns manually

If you do not have a column layout as detailed above the columns can be set up manually.

- *View | Columns | Customize*.
- Add the User Defined columns below (use *Edit Column* button to change titles):



**Figure:** Primavera P6 dialog for customising project columns.

- Click *OK* when complete.

After manually setting up the columns or retrieving a layout the columns will display values in a similar way to the example shown below:

Project ID	Project Name	Finish	Finish date probability	90% finish	50% Finish	90% Cost	50% Cost
P1	House pr	06-May-02					
HOUSE	House Build	06-May-02	10.10	20-May-02	12-May-02	£23,300.46	£20,635.99

**Figure:** Project level risk results updated to project user fields.

## 5 Primavera Enterprise

### 5.1 Primavera P6 - Opening a project from a Primavera P6 project database

#### Step 1 - Setting up connection to Primavera P6 database

Use the **Primavera Connection Wizard (Section 2.1)** to set up a connection to the Primavera P6

database.


If a connection cannot be made to the Primavera P6 database then Primavera Risk Analysis can import a Primavera P6 XER file.


## Step 2 - Read in project

1. Create a project in Primavera P6. If you are planning to run a risk analysis you can use the Primavera P6 user fields to store risk information such as minimum, most likely and maximum task durations. This data will be read in by Primavera Risk Analysis and can be used in the risk analysis.
2. *File | Primavera | Open Primavera P6 Project...*
3. Log onto the Primavera P6 database using your user name and password.
4. Primavera Risk Analysis will connect to the Primavera P6 database and read in a list of Projects.
5. Choose whether to display projects organized by EPS or Portfolio.
6. Choose the required Project.
7. Click *OK*.
8. Choose to read the project in to the nearest day or nearest hour or quarter hour.
9. If you have set up risk inputs in the Primavera P6 project user fields (e.g. minimum, most likely and maximum durations) then map these to the appropriate Primavera Risk Analysis fields.


 If user fields exist in the Primavera P6 database but are not visible in the drop down list then try synchronizing the with the database See topic **Primavera - Input Mappings (Section 5.3)**.

10. Primavera Risk Analysis displays a dialog that shows you what is happening as the files are read in. Any warnings are displayed at the end.
11. 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 Primavera P6 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.

12. The import is then complete.

 The Primavera P6 project will be organized by WBS (if selected during import). See **Organizing Tasks (on-line documentation)** for details on organizing the project by Activity Code.

## Opening from Primavera P6

A Primavera P6 v6 or v7 project can also be opened directly in Primavera P6 using the menu command *Tools | Risk Analysis (Primavera Risk Analysis v8)*.

 Opening a Primavera P6 v8 project requires a connection using **Web Services ('Using Web Services to connect' in the on-line documentation)**.

This menu command option is added to Primavera P6 automatically when Primavera Risk Analysis is run. If you wish to prevent Primavera Risk Analysis adding the menu command then add an entry to the PrimaveraRiskAnalysis.ini file as follows:

```
[Primavera]
AddToToolsMenu=FALSE
```

## Step 3 - Run the risk analysis

1. If you have not mapped the risk data from the Primavera P6 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 4 - Update risk analysis results in the Primavera P6 database

The results and inputs of the risk analysis can be seamlessly updated to the Primavera P6 database. For



example Minimum, Most Likely, Maximum durations and the P90 dates or Criticality Index can be updated to user fields in the Primavera P6 database.

1. *File | Primavera | Update Primavera P6 Project...*
2. Use *Remove* and *Add* buttons to change the field mappings.

 You cannot edit an existing mapping, you must delete it and add a new one.

3. Click *Update Now* and the chosen fields are updated in the Primavera P6 Database.

## 5.2 Primavera P6 - Opening a Primavera P6 XER project file


---

### Step 1 - Export project as XER


1. Open a project in Primavera.
2. In Primavera: *File | Export*
3. Select XER format and complete the export wizard. See Primavera P6 documentation for full details on exporting projects using the XER format.


### Step 2 - Import XER file in Primavera Risk Analysis

1. Start Primavera Risk Analysis.
2. In Primavera Risk Analysis: *File | Primavera | Open Primavera XER file.*
3. Locate the XER file you wish to import and click *Open*.
4. If risk inputs were set up in the Primavera P6 project user fields (e.g. minimum, most likely and maximum durations) then map these to the appropriate Primavera Risk Analysis fields.


 In Primavera P6 if a user defined field is created but no activities are assigned a value, then an exported XER file will contain no reference to that user defined field. Primavera Risk Analysis can only list user defined fields that are in the XER file. If a user defined field is not in the drop down lists then it is likely that either the field does not exist in the database or no activities have been assigned a value in the project when the XER file was created.

5. Primavera Risk Analysis displays a dialog that shows you the XER file being read. Any warnings are displayed at the end.
6. 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 Primavera P6 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.

7. The import is then complete.

 The Primavera P6 project will be organized by WBS (if the option was selected during import). See **Organizing Tasks (on-line documentation)** for details on organizing the project by Activity Code.

### Step 3 - Run the risk analysis

1. If you have not mapped the risk data from the Primavera P6 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.

## 5.3 Primavera - Input Mappings

---

The user fields in the Primavera P6 database can be used to store risk inputs such as minimum, most likely and maximum durations. These can be mapped to Primavera Risk Analysis when the Primavera P6 project is opened.

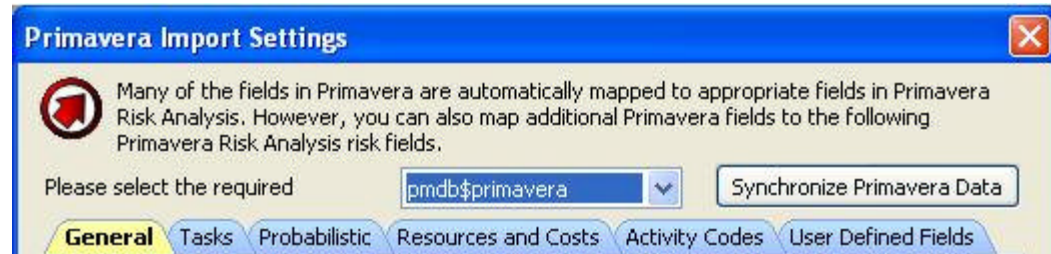
The suggested risk input mappings are shown below.

### Setting up default import mappings

The default mappings can be set-up when a project is imported by selecting the *Use as a default for new projects option*.

This will set up the default mappings for the database that was logged onto.

Alternatively by using the *File | Primavera | Edit Default Import Mappings* (All open plans must be closed using *File | Close* before this menu command can be accessed).



**Figure:** Primavera P6 default import settings dialog.

### Synchronize Primavera P6 Data

Use this button to update Primavera Risk Analysis with any new user fields or activity codes that have been added to the Primavera P6 database.

### Tasks tab

**Primavera P6 Import Settings**

Many of the fields in Primavera P6 are automatically mapped to appropriate fields in Primavera Risk Analysis. However, you can also map additional Primavera P6 fields to the following Primavera Risk Analysis risk fields.

**General** **Tasks** Probabilistic Resources and Costs

**Duration distribution**

Create Distribution ☒

Task, Minimum Duration Risk Input - Minimum Duration

Task, Most Likely Duration Risk Input - Likely Duration

Task, Maximum Duration Risk Input - Maximum Duration

Primavera values have been entered in: ☒ Days ☐ Hours

**Alternative duration distribution**

Create alternative distributions using a function contained within the following field:

Risk Input - Duration Fu ---> Task, Duration Function

**Duration Correlation**

Risk Input - Duration Co ---> Task, Duration Correlation

**Task ID**

☐ Prefix Task ID with project name

☒ Show this dialog when importing a project

**Figure:** Mapping fields from Primavera.

### Duration Distribution

If the *Create Distribution* option is checked then a triangular distribution is created using the selected Primavera P6 fields.

- ✎ If the Minimum and Maximum values are zero then no distribution is created.
- ✎ If an invalid distribution is created (e.g. the minimum is greater than the maximum) a warning is displayed when the risk analysis is run in Primavera Risk Analysis.

### Alternative duration distribution

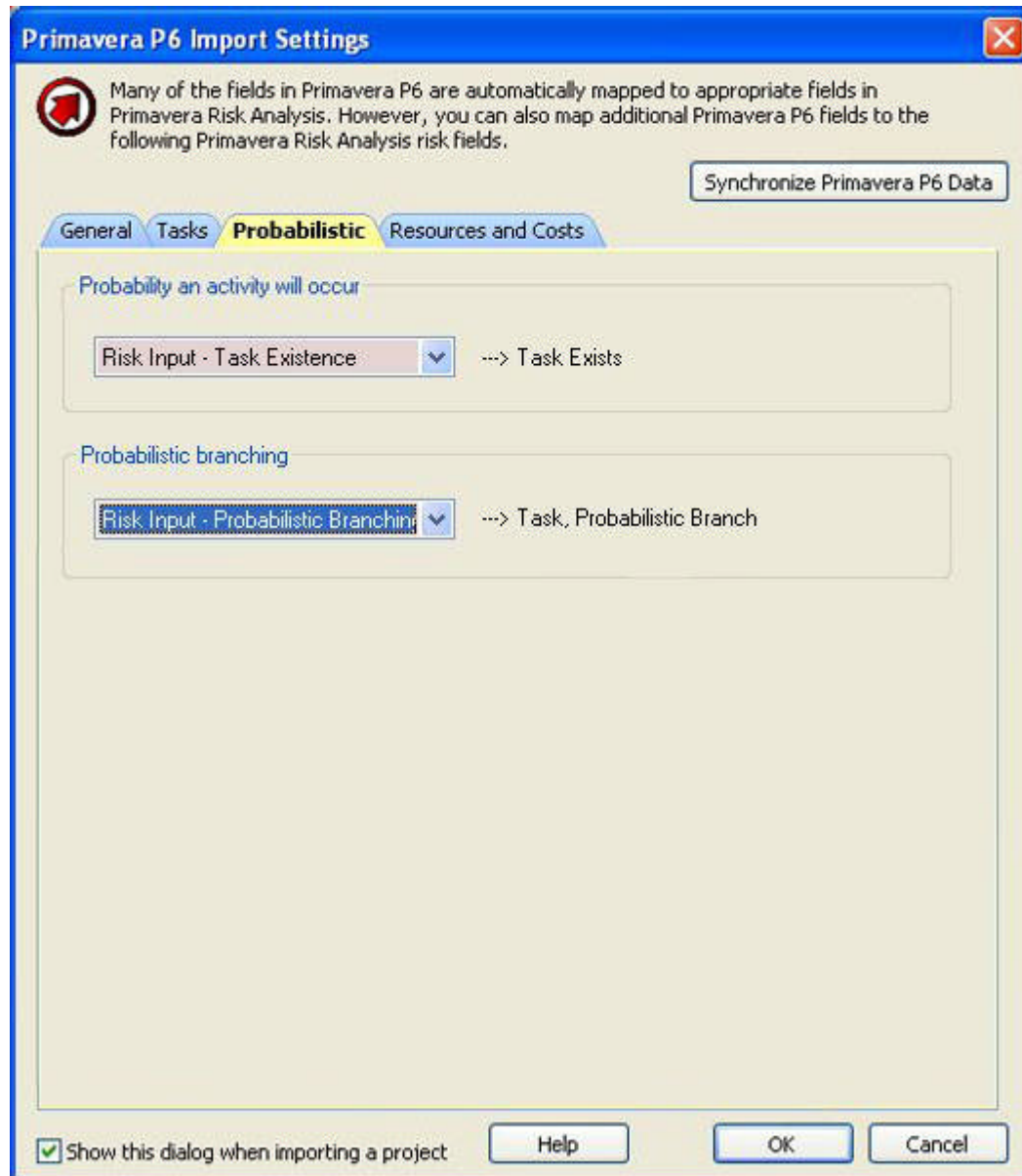
Use this option to create a duration distribution using a function. For example entering: Uniform (20;30) would create a uniform distribution with a minimum of 20 and a maximum of 30.

- ✎ Abbreviations can be used for the distributions e.g. u = uniform, t = triangle.

### Duration Correlation

Duration distributions can be correlated. Use this mapping to correlate duration distributions. For example entering: 0070[95] against an activity would correlate its duration distribution by 95% with the duration distribution of activity "0070".

- ✎ Assign the same activity ID to correlate more than one distribution.

**Probabilistic tab**

**Figure:** Mapping fields from Primavera.

**Probability an activity will occur**

Use this option to map a value to the Task Existence probability. The value is a percentage and should be between 0.01 and 100.

**Probabilistic Branching**

Use the option to define probabilistic branches.

To define a probabilistic branch use the following format:

0090[80];0100[20]

During the risk analysis the above example will branch to Activity "0090" 80% of the time and to "0100" 20% of the time. This branching detail must be assigned to the activity that has the branching activities as successors.

**Resources and Costs tab**

**Primavera Import Settings**

Many of the fields in Primavera are automatically mapped to appropriate fields in Primavera Risk Analysis. However, you can also map additional Primavera fields to the following Primavera Risk Analysis risk fields.

**General** | **Tasks** | **Probabilistic** | **Resources and Costs** | **Activity Codes** | **User Defined Fields**

☐ Do not import any Resources or Costs

☐ Import Roles, Resources, Assignments and Activity Expense Costs

☒ Import Activity Costs summarized as Labor, Non-Labor, Materials and Expenses as below

**Labor Costs**

	Duration Dependent	Duration Independent	Use Primavera Duration Type	Create	
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Minimum	<input type="text"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Most Likely	<input type="text"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Maximum	<input type="text"/>

**Non-Labor Costs**

	Duration Dependent	Duration Independent	Use Primavera Duration Type	Create	
	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	Minimum	<input type="text"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Most Likely	<input type="text"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Maximum	<input type="text"/>

**Material Costs**

	Duration Dependent	Duration Independent	Use Primavera Duration Type	Create	
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Minimum	<input type="text"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Most Likely	<input type="text"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Maximum	<input type="text"/>

**Expenses**

	Duration Dependent	Duration Independent	Use Primavera Duration Type	Create	
	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	Minimum	<input checked="" type="checkbox"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Most Likely	<input type="checkbox"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Maximum	<input type="checkbox"/>

Create alternative distributions from a function in

☐ Use as default for new projects

Help OK Cancel

**Figure:** Mapping fields from Primavera.

#### **Do not import any Primavera P6 resources or costs**

No resources or costs will be imported from the Primavera P6 project.

#### **Import Roles, Resources, Assignments and Activity Expense Costs**

This option will import all project resources and assignments. All resource assignments will be duration independent. In addition expenses and materials will also be imported and assigned as a resource.

#### **Import Activity Costs summarized as Labor, Non-Labor, Materials and Expenses as below:**

The remaining Labor, Non-Labor, Material and Expense costs will be assigned to each activity.

These assignments are made using resources in Primavera Risk Analysis.

The costs can be either duration dependent or duration independent (see below).


#### **Duration Dependent**

Selected costs vary proportionally with activity duration. Labor and Non Labor Costs are usually Duration Dependent, i.e. the longer it takes to complete an activity the more it will people (Labor) and equipment (Non Labor) are required . If an activity has a duration uncertainty then any duration dependent component of the activity cost will also have uncertainty.




**Duration Independent**

Selected costs are independent of the activity duration. Variations in the activity duration do not affect the activity cost. Material and Expenses are usually Duration Independent, e.g. the number of bricks required is a fixed quantity independent of the activity duration.

 Using both duration dependent and duration independent costs on a single activity can be useful as some activity costs are related to the duration (e.g. labor) and some are not (e.g. materials)

**Create distribution check boxes**

This allows a triangular distribution to be assigned to an activity cost. This option is generally used for Duration Independent costs, for example uncertainty can be added to the expense cost of an activity.

 If *Create Distribution* is selected for a *Duration Dependent* cost then the cost of an activity is calculated from the uncertainty in the daily cost plus the uncertainty in the duration.

**Create alternative distributions from a function in field**

Use this option to create a resource distribution using a distribution function.

To create a distribution it is necessary to define the resource and the distribution to be used.

For example LAB[u(1;2)] would assign the resource LAB with a uniform distribution.

 Abbreviations can be used for the distributions e.g. u = uniform, t = triangle.

**Activity Codes tab**

Use this tab to select the Primavera P6 activity codes that are imported.

**Activity Codes tab**

Use this tab to select the Primavera P6 user defined fields that are imported.

## 5.4 Primavera P6 - Output Mappings

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After a risk analysis has been performed in Primavera Risk Analysis the results can be updated to Primavera. The fields that are used in the default Primavera P6 and Primavera Risk Analysis risk output columns are detailed below (divided into Project and Activity level).

It is recommended that new user fields are set up for the purpose of storing the risk input and output data.

**Suggested Activity fields for Risk Inputs**

<b>Primavera Risk Analysis field</b>		<b>New user field in Primavera P6</b>
Minimum Duration	<--	Risk Input - Minimum Duration
Likely Duration	<--	Risk Input - Likely Duration
Maximum Duration	<--	Risk Input - Maximum Duration
Duration Function	<--	Risk Input - Duration Function
Duration Correlation	<--	Risk Input - Duration Correlation
Probabilistic Branch	<--	Risk Input - Probabilistic Branch
Task Existence	<--	Risk Input - Task Existence
Resource Functions	<--	Risk Input - Resource Functions
Set up in import mapping and a distribution is created	<--	Risk Input - Minimum Expense
Set up in import mapping and a distribution is created	<--	Risk Input - Likely Expense
Set up in import mapping and a distribution is created	<--	Risk Input - Maximum Expense

This can be replicated for Labor, NonLabor and Materials

#### Suggested Activity fields for Risk Outputs

Primavera Risk Analysis field		New user field in Primavera P6
P80 Start date	-->	Risk - P80 Start Date
P80 Finish date	-->	Risk - P80 Finish Date
P50 Start date	-->	Risk - P50 Start Date
P50 Finish date	-->	Risk - P50 Finish Date
Risk Mean Start date	-->	Risk - Mean Start Date
Risk Mean Finish date	-->	Risk - Mean Finish Date
Criticality Index	-->	Risk - Criticality Index
Duration Sensitivity	-->	Risk - Duration Sensitivity
Duration Cruciality	-->	Risk - Duration Cruciality
Cost Sensitivity	-->	Risk - Cost Sensitivity

#### Suggested Project fields for Risk Outputs

Primavera Risk Analysis risk result		Mapped to project field in Primavera P6
Selected percentile for project cost Project	-->	User Cost 14 and Project User Cost 15
Selected percentile for project finish Project	-->	User End Date 1 and Project User End Date 2
Chance of meeting Project finish date	-->	Project User Number 10
Chance of meeting latest baseline date in Project	-->	Project User Number 9
Chance of meeting Project cost	-->	Project User Number 8
Chance of meeting Project budget cost	-->	Project User Number 7

## 5.5 Primavera P6 - Grouping of activities

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### Grouping by WBS

During the Primavera P6 import the option to *Import the WBS Structure* can be selected. Primavera Risk Analysis will then structure the imported project using the WBS.

### Grouping by Activity Codes

During the Primavera P6 import *Activity Codes* and *User Defined Fields* can be selected and imported into Primavera Risk Analysis.

The project can then be organized by any of the imported Activity Codes or Task User Fields see **Organizing Tasks (on-line documentation)**.

## 5.6 Primavera P6 - Opening multiple projects

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When opening a project in Primavera Risk Analysis from the Enterprise Project Structure (EPS) you can select to open more than one project. Primavera Risk Analysis then builds a project that contains all of the projects and includes any links between these projects. When opening an XER file that contains multiple projects either an individual project or all the projects can be imported.

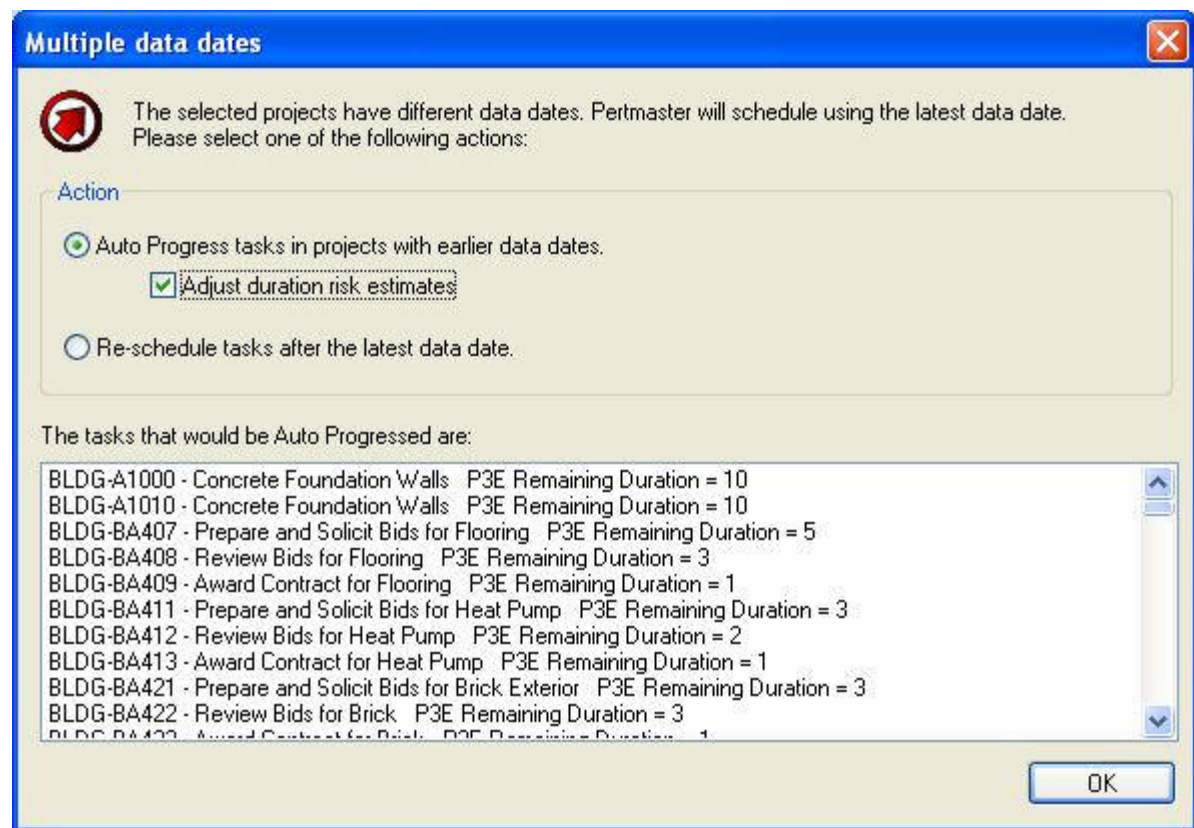
### Different Data Dates

It is recommended that before opening more than one Primavera P6 project in Primavera Risk Analysis the project Data Dates are aligned for each project in Primavera.

If multiple projects with different Data Dates are opened in Primavera Risk Analysis then the latest Data Date is always used and there are two options displayed during the import:

1. Assume no progress on projects with earlier data dates and schedule all in complete activities to start after the latest Data Date.
2. Assume the projects with earlier data dates have progressed according to plan up to the latest Data Date.

These options are automatically displayed when the Primavera P6 project is opened in Primavera Risk Analysis as shown below.



### Links between projects

If a single Primavera P6 project with links to other projects is opened in Primavera Risk Analysis a warning is displayed for each link during the import. The links are then ignored.

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

💡 To ignore links to other projects in Primavera P6 use *Tools | Schedule | Advanced* button | *Ignore relationships to and from other projects*.

## 5.7 Primavera P6 - Currencies

### Primavera Base and Viewing Currency

Primavera Risk Analysis always reads in the activity remaining costs in the *Base Currency* as set up in Primavera P6 under *Admin | Currencies*.

The *Viewing Currency* in Primavera P6 (as set up in under *Edit | User Preferences | Currency*) is ignored by Primavera Risk Analysis.

When the *Base Currency* in Primavera P6 is different from the *Viewing Currency* the values are always stored in the Primavera P6 database as the *Base Currency*. For example if the *Base Currency* is US



dollars and the *Viewing Currency* is GB Pounds with an exchange rate of 1.5, then a value of \$1000 displayed on the screen is converted by Primavera P6 and stored in the Primavera P6 database as a value of \$1500.

When the Primavera P6 project was opened in Primavera Risk Analysis the value of 1500 would be used.

Therefore if you enter minimum and maximum activity costs in Primavera P6 they must be in the base currency.

The reason it is necessary to enter values in the base currency is because the values are entered into the user defined fields and Primavera P6 does not know that they are in fact a currency value that requires converting.

#### **Currency Symbol displayed in Primavera Risk Analysis.**

After a Primavera P6 project is opened in Primavera Risk Analysis the default Primavera Risk Analysis currency symbol is displayed. To change the currency symbol use *Plan | Plan Options* dialog and choose the *Currency* tab.

If you wish to always use the same currency symbol then use the *Use as default for all new plans* after entering the required symbol.

## 6 Additional Reference

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### 6.1 P6/P3/Suretrak - Primavera Risk Analysis differences

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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 6.2)**

#### **6.1.1 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.

#### 6.1.2 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.

#### 6.1.3 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

#### 6.1.4 - 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.

#### 6.1.5 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.

#### 6.1.6 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.

### 6.1.7 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.

### 6.1.8 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.

### 6.1.9 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) (Section 5.6)**

#### 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**

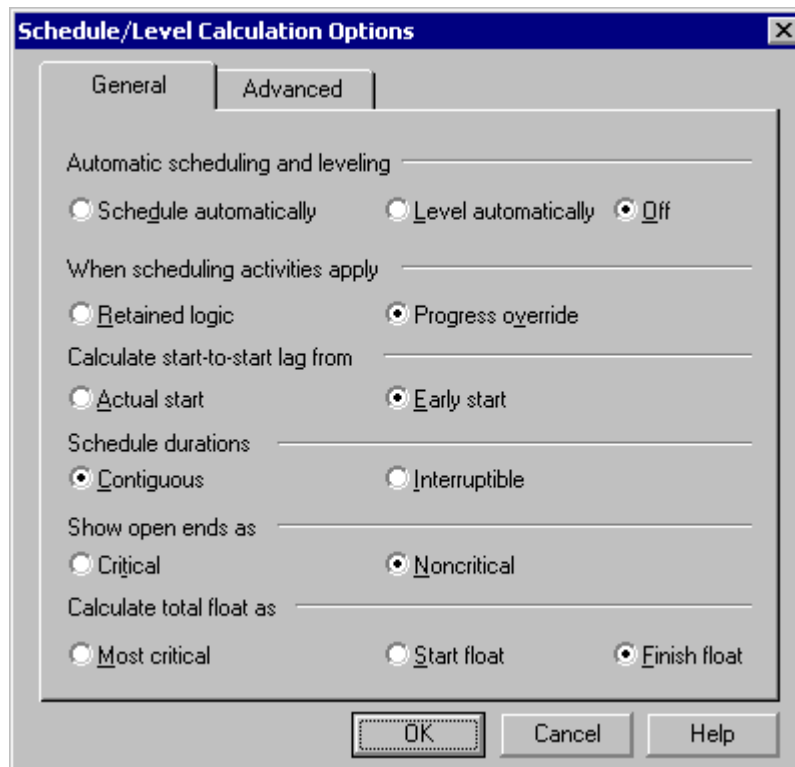
**Total Float less than or equal to X days** - Primavera Risk Analysis supports this option but it is not read in from Primavera P6 and defaults to 0. To change in Primavera Risk Analysis: *Plan | Plan Options...* | *Scheduling*

**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*.

### 6.1.10 Primavera P3 - Scheduling Options



6.1.11

**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

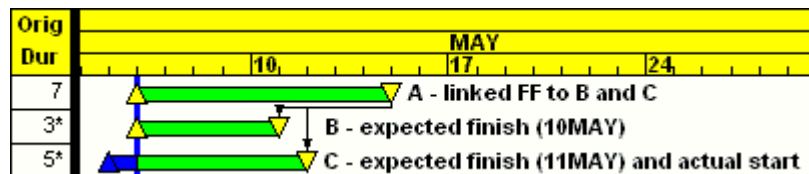
### Secondary Constraint

Primavera Risk Analysis does not read in the secondary constraint.

### Expected Finish Dates

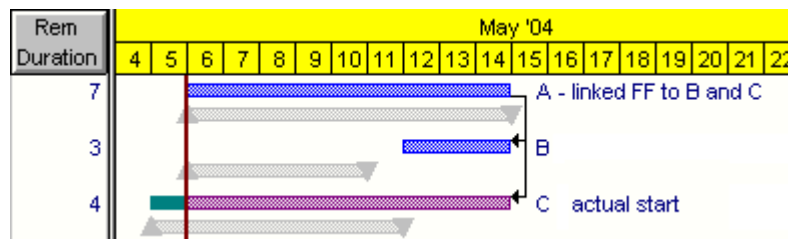
#### P3

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. They 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.

## 6.2 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.

- As 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

## 6.3 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

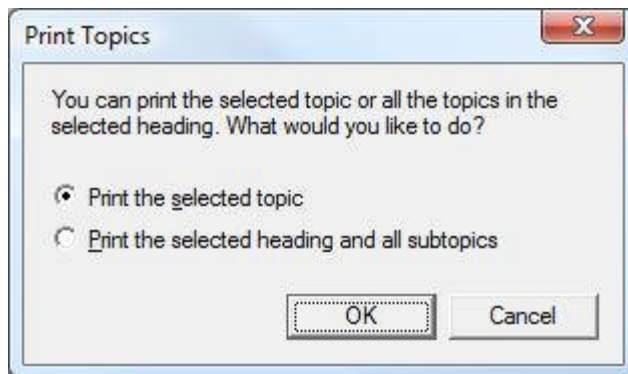
### Printing an individual help topic

- 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'.

