

Arrisca Analyser FlexProfessional™

Software Version 4

User Guide - Excel version

About Arrisca Version 4 : FlexProfessional™

Thank you for purchasing FlexPro™ from Pre-emptive Analytics or one of our resellers. We value your business as a new FlexPro™ customer.

FlexPro™ can be used for quality assurance and control (verification and validation) and to deliver an improved understanding of the mechanics of the data.

FlexPro™ is not an add-in but a discreet piece of software that dynamically interacts with Microsoft Excel® to enhance the capability of the user.

FlexPro™ is especially useful for getting to grips with spreadsheets which have been built by others. It will quickly and transparently enable the user to understand the mechanical data relationships in the workbook and identify the key input elements - known as Drivers - that affect the outcomes of the model.

Software Structure.

We hope you find FlexPro™ useful and easy to operate.

We are eager to hear your feedback - either positive or critical - and ideas.

Contact information is provided in the Support section of this document.

We wish you an enjoyable and productive experience.

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Indicates there is important note



Indicates there is a tip or guidance to save you effort or to provide Business “services” to support your organisation.

1 Getting Started

1.1 Installation Guide and System Requirements

Arrisca Version Ver 4.0: FlexProfessional™ is provided on an installation CD. If you have access to network installation, please contact your network administrator for installation instructions.

System requirements

Operating System: Microsoft Windows 7.

Microsoft Excel®: Office 2010 and 2013.

FlexProfessional™ requires about 100MB of free hard disk space. There are no other specific hardware requirements.

Installation

Insert the installation CD in your CD drive.

Run file [CD]:\Setup.exe

Follow the on screen instructions.

The Licence key code can be found in licence agreement supplied with the CD or via email.

Microsoft .Net© may need be installed to ensure full functionality

You must restart your PC after installation to complete the process.

The installer places an application icon onto the desktop which you will see after installation. This icon is used to start the application and load the workbook.



The software includes “factory set” terminology that relates to a ISO 15-288 organisation such as the MoD, it also has pre-set ‘risk category’s’ for risk identification/classification, you are advised to check your organisation procedures and policy’s to ensure that the terminology is appropriate.

All of the pre-settings can be ‘User’ adjusted to meet your requirements see section 9



Enabling the extended run-macro function within Excel.

To enable the run-macro function during FlexProfessional™ sensitivity analysis you must alter an Excel security related setting in the Excel application as follows:

MS Office 10

1. Open Excel
2. From the File tab select Options>Developer (this will open a new Excel Tab)
3. From The Developer Tab select Macro Security> “Trust access to the VBA Project object Model”
4. Click OK
5. From file tab select Options>Trust Centre.
6. From Trust Centre options select Macro Settings> “Enable all macros”
7. Press OK and close Excel

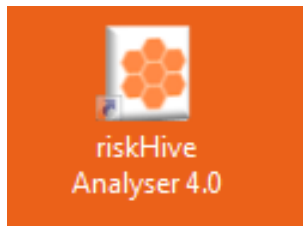
The setting will be effective next time Excel is opened.

You will be able to control Excel macros during FlexPro sensitivity analysis.
Refer to the ‘Select Macros’ section of this manual for details.

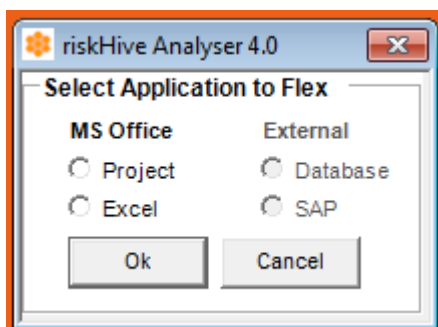
1.2 Launching the application

The application is launched from an icon on the desktop.

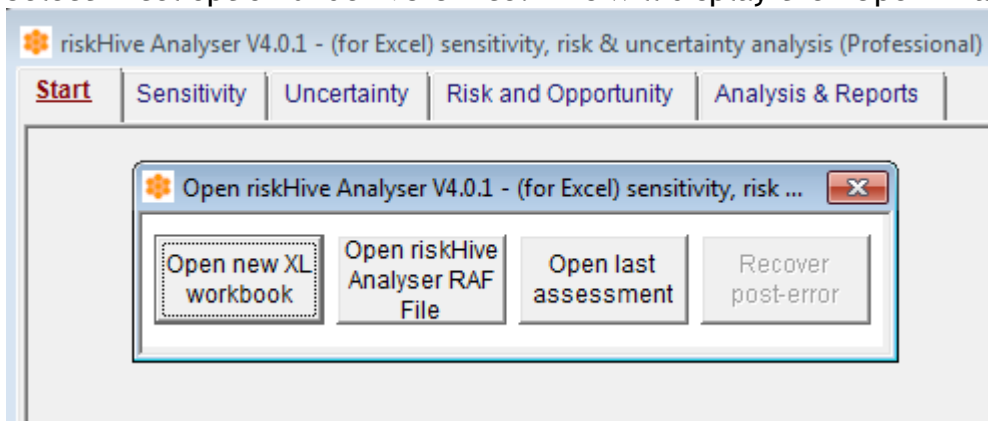
1. Double Click on the application icon on the desktop.



2. The "Select Application to Flex" start screen will be displayed.



3. Select Excel option under MS Office. This will display the "Open Analyser" box

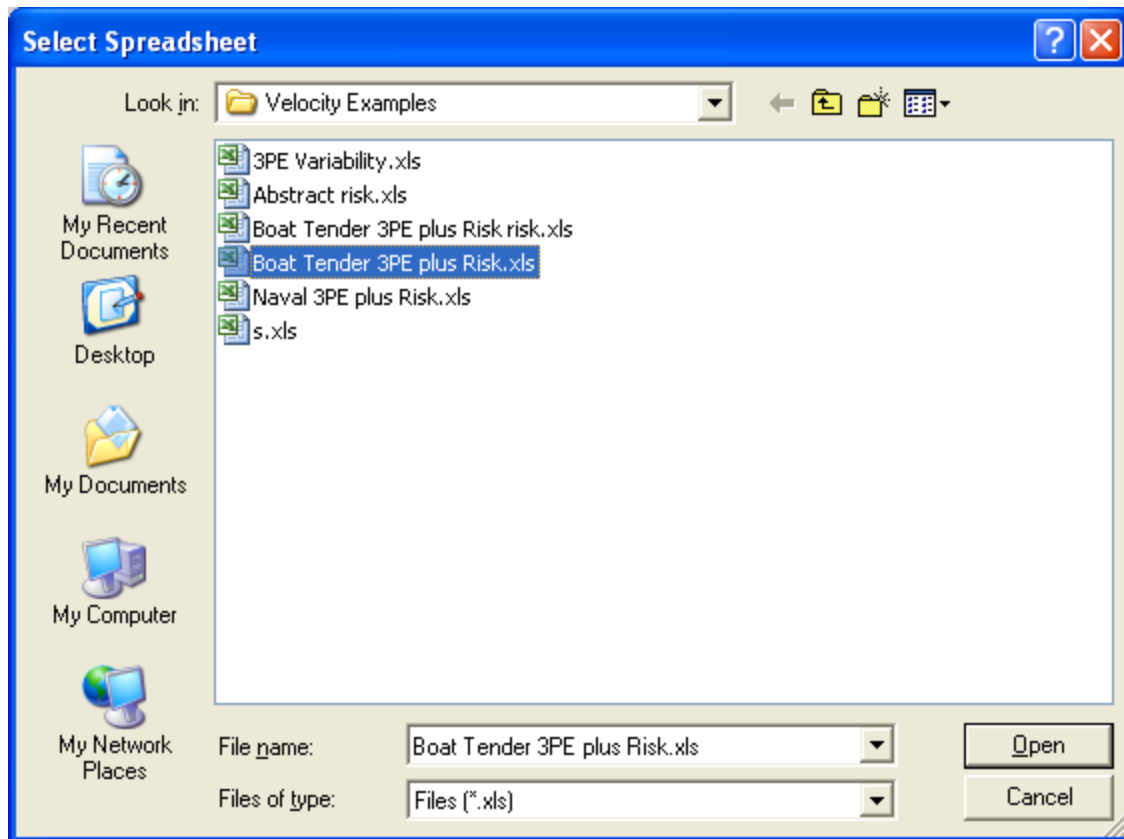


4. Select the option you require:
 - **Open new XL workbook** - Browse for a workbook to perform an analysis
 - **Open Arrisca RAF file** - Load a previous analysis as a complete package
 - **Open last assessment** - Return to the last activity-state of the application
 - **Recover post-error** - for use in case of an undesired application failure

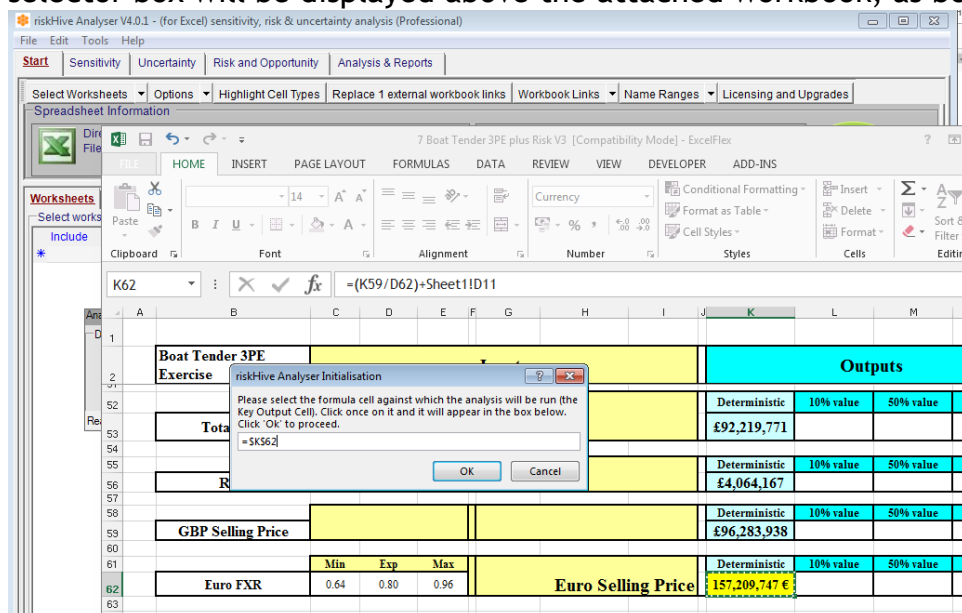
2 Application Launch and Navigation Excel option

2.1.1 Open new XL workbook

1. Click once on the **Open new XL workbook** button.
The Select Spreadsheet dialog box will be displayed:



2. Select the workbook you wish to analyse and click **Open**.
The workbook will automatically open and the FlexProfessional Initialisation cell-selector box will be displayed above the attached workbook, as below:



3. Select the worksheet and cell you wish to analyse the inputs and risks against. The cell reference will appear in the Initialisation box.
Hint: This must be a calculation or formula. It's usually the final value.
This cell is known as the **Key Output Cell (KOC)** in the FlexPro application.
4. Click OK and the application will load and display the **Driver Analysis Tab**.



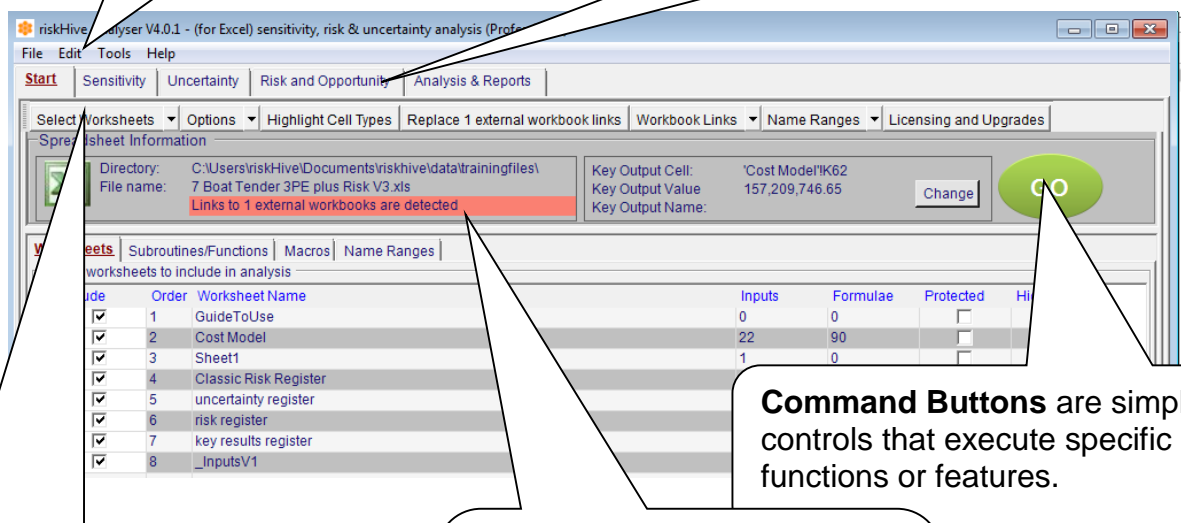
You are now ready to perform Sensitivity, Uncertainty and Risk & Opportunity analysis to UK Treasury Green Book compliant standards.

2.2 Application Navigation

The FlexPro application is controlled using an intuitive combination of View Panes, Menus, Function Tabs, Feature Bars and Control Buttons.

Main Menu contains high level commands and access to parameters and settings that apply globally to the application.

Function Tabs provide easy instant access to the major functional areas of the application. Function Tabs feature context-sensitive menus and Feature Bars.



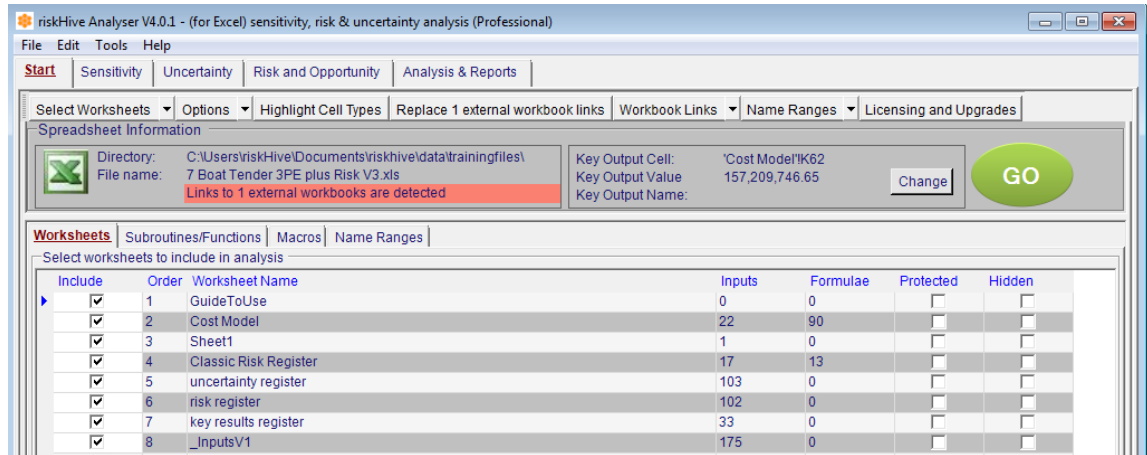
Feature Bars contain Function-specific commands that allow the user to interact with the application. All Feature Bar controls, text, commands and layouts are user-configurable.

View Panels are dynamic panes that contain lists and control windows. Both the main application window and **all panels are resizable** and have a 'size-memory'.

Command Buttons are simple controls that execute specific functions or features.

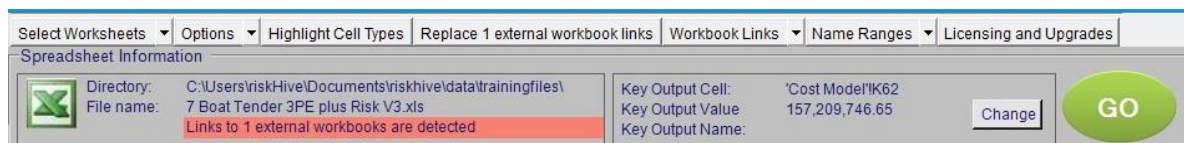
3 Start Control function tab

The Start Analysis Function Tab displays and manages controls related to the driver analysis itself. It can be accessed at any time from its Function Tab.



3.1 Feature Bar - Analysis Control

The Feature Bar contains function-specific controls and information pertaining to the attached workbook and Driver Analysis Control:

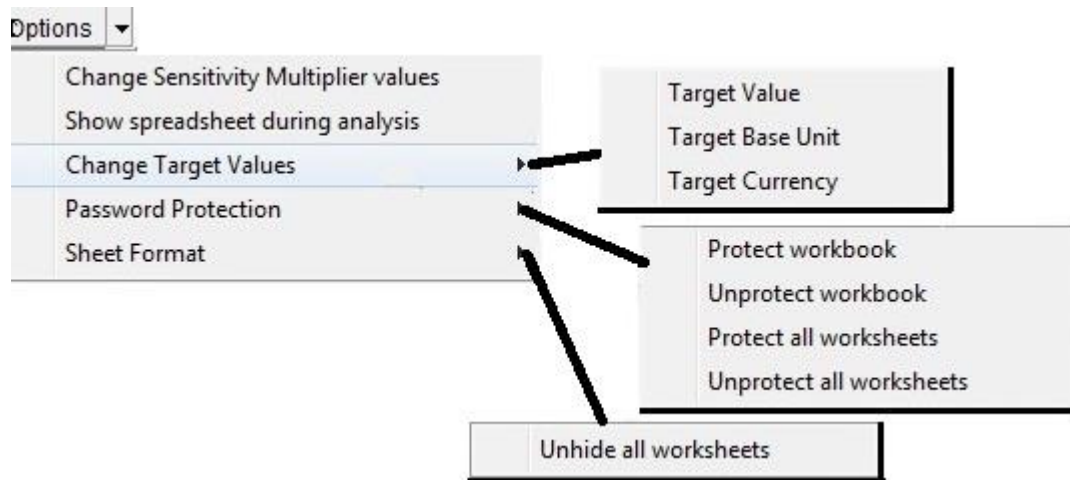


3.1.1 Select worksheets command

This command allows you to change what is included in the main panel selection:

- All Worksheets
- Key worksheet only (only the worksheet that contains the Key Output Cell)
- > zero inputs (all worksheets that have at least one viable input cell)

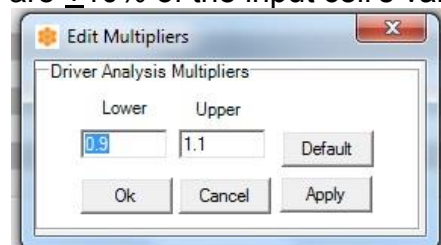
3.1.2 Options command



This command allows you to select Driver Analysis utility options:

3.1.2.1 Change Analysis Multipliers

Allows you to modify the upper and lower multiplier limits that are used during the sensitivity analysis itself. This will display a pop-up window that will allow you to enter new flex values for use in analysis. The default values are $\pm 10\%$ of the input cell's value.



The actual effect of each input, or Driver, is calculated from the Cumulative Effect of both the increase and reduction in the value of the input during analysis.

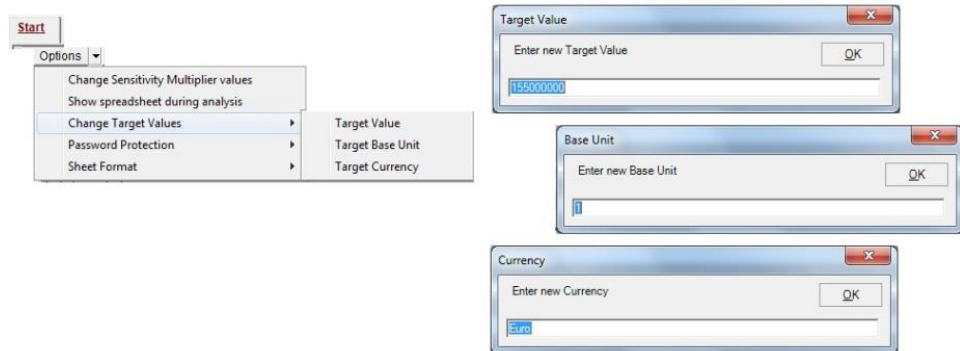
3.1.2.2 Show spreadsheet during analysis

Select this option to display the workbook during the Driver Analysis so you can see the data being flexed.

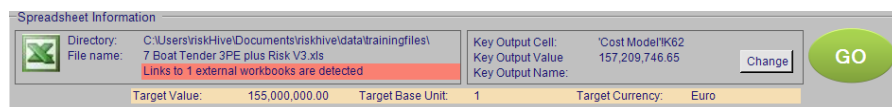


The workbook is normally hidden during the Driver Analysis – visibility of the workbook slows the analysis down considerably.

3.1.2.3 Change Target Values command-



Provides the facility to present additional bars on the S-curve reports to represent the desired outcome, which may be different from the deterministic or other confidence-related values To ensure that the graphic outputs reflect requirements, the target Value (Absolute), Base value(Divisor format) and currency can be changed via popup menus.



New Targets are displayed in the Spreadsheet Information Panel; it may be necessary to drag panel open to see results.

3.1.2.4 Password protection

FlexPro cannot flex protected or read-only worksheets or areas. You must either deselect the worksheet from the list of included worksheets or unprotect it. If you have selected a protected or read-only worksheet for analysis, you will get the following pop-up message on clicking the Start button and you must either deselect or unprotect the worksheet to continue with analysis:

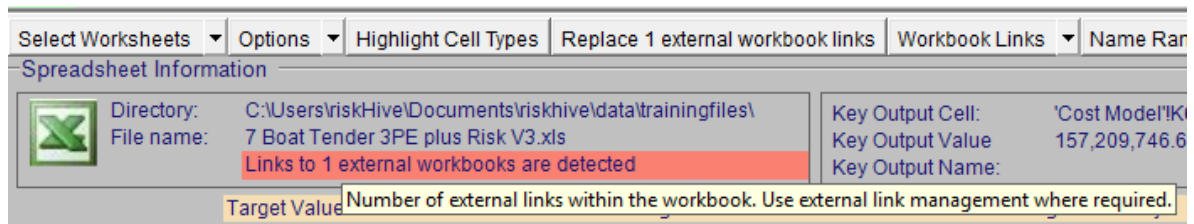


3.1.3 Highlight Cells Types

This provides the option the highlight the Excel worksheet with either the constants or formulas thereby aiding the audit and verification of the Spreadsheet.

3.1.4 Replace external workbook(s) links

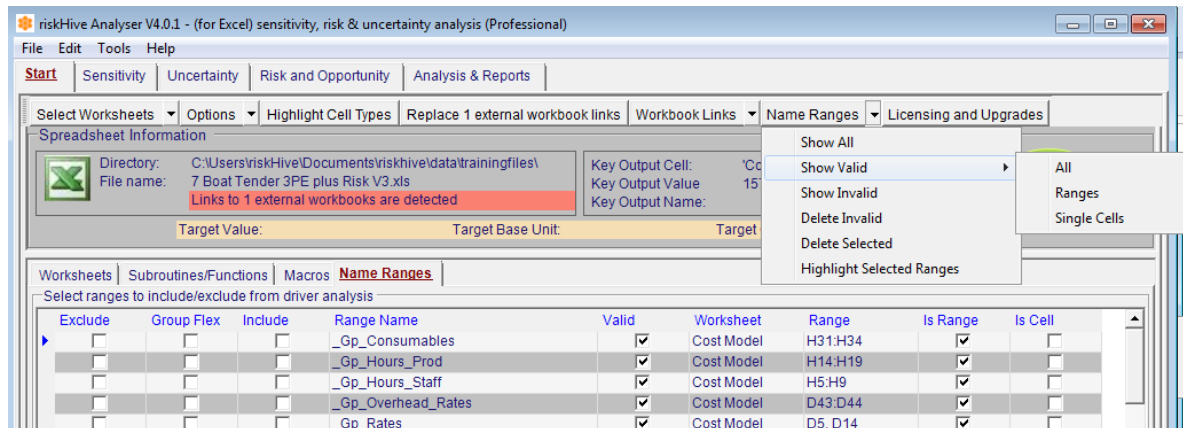
External Link management - allows you to replace links to external workbooks with the value of the link. The linked cells are highlighted and a comment is added to the cell with its original linked location for auditability. If they are not incorporated they will not be included in the sensitivity analysis. Look for **Red warning in spreadsheet information panel** and use **Replace 'n' external workbook links** tab to collect data.



3.1.5 Workbook Links

All reference to any workbook link can displayed in the primary excel sheet or can copied the MS clipboard from where they can be incorporated in any documentation.

3.1.6 Name Ranges



This allows you to select what rows containing ‘named ranges’ are displayed in the worksheet display panel.

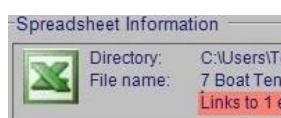


: Ensure that the ‘Name Ranges’ option in the display panel is selected before using the ‘Name ranges’ features.

3.1.7 Licensing and Upgrades

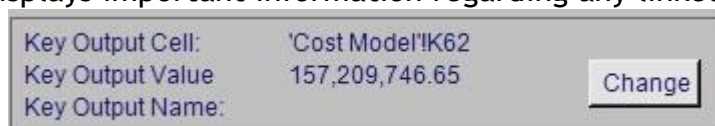
This will link to our web site that explains the capability of each version of our software and how to upgrade the product that will meet your needs.

3.1.8 Spreadsheet Information Panel



This panel displays summary information relating to the workbook that FlexPro is currently attached to and will analyse. This includes the directory location and the file name of the workbook as non-editable fields.

Also displays important information regarding any linked workbook.



The location, value and name (should it have one) of the **Key Output Cell** are also displayed. This is a very important field as the inputs will be measured by their effect on this cell during analysis. The Change button allows you to modify the selected cell.



*: The **Key Output Cell** must be a formula or calculation, not an input constant. Any changes via the “Change” button will not take effect until a analyse is run*

3.1.9 Start Driver Analysis



This prominent button starts the Driver Analysis function.

To start the Driver analysis:

1. Click once on the green **Start Driver Analysis** button. The Excel workbook is hidden from view and a progress indicator is displayed to inform the user of analysis status.
2. During analysis the button changes to a red **Stop** button.
3. When the analysis is complete the **Sensitivity Function Tab** is displayed.



Warning- If the workbook uses formula linked to “Dates” in a date format, the sensitivity output will be bias towards those dates, change date cells to a formula format to overcome any issues.



Warning- spreadsheets should fully verified to ensure that pure inputs (constants) have not been entered as a formula cell (eg = 123) as the Arrisca tool will not include them in a sensitivity analysis.



The sensitivity analysis will produce results based on the deterministic inputs and all the elements that make up a risk impact e.g. probability, Min. ML & Max values

Start- worksheet view panel

Depending on the Display options selected (Section 3.1.1), the main view panel allows you to select or deselect the worksheets, macros or functions you do and do not want to include or run in the Driver Sensitivity analysis.

Worksheets						
Subroutines/Functions Macros Name Ranges						
Select worksheets to include in analysis						
Include	Order	Worksheet Name	Inputs	Formulae	Protected	Hidden
<input checked="" type="checkbox"/>	1	GuideToUse	0	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	2	Cost Model	22	90	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	3	Sheet1	1	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	4	Classic Risk Register	17	13	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	5	uncertainty register	103	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	6	risk register	102	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	7	key results register	33	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	8	_InputsV1	175	0	<input type="checkbox"/>	<input type="checkbox"/>
*						

453 Inputs 103 Formulae are selected for analysis.

Each worksheet in the workbook is summarised by a row in the panel. Information about the number of inputs and formulae is provided alongside each worksheet name along with an indication of its read-only or protected status. At the bottom of the window the sum total of all selected inputs is displayed. By default, all worksheets are selected. Use the checkboxes to select or deselect specific worksheet types for analysis or use the **Include** command on the Feature Bar as described in Section 3.1.2.

The cell summary panel at the base of the Driver Analysis Function Tab shows the total number of Inputs and Formulae that are contained in the selection.



You cannot deselect the worksheet that contains the Key Output Cell.



Deselect sheets you know to be reports, graphs, outputs or tables that don't contribute to the final value. The selection window displays guide information regarding the number of potential inputs and formulae in each sheet. In general, the fewer sheets that are selected, the faster the analysis will be completed.

3.2 Subroutine/Functions

The Subroutines/functions panel allows you to view any additional coded functions that exist in the workbook. You cannot run these from FlexPro because of their use of programming arguments that may need to be passed to or from other code areas and makes them unreliable to run as macros, so we list them instead.

If you want to use a Subroutines/functions, remove or replace its coded arguments in Visual Basic, save it and it will appear as a macro in the Macro list on reload.

3.3 Start- Macro view panel

The Macros panel allows you to select or deselect any macros that exist in the workbook that you may want to run during the execution of sensitivity analysis.



Each available macro in the workbook is summarised by a line in the panel.

By default, no macros are selected.

Use the checkboxes to select or deselect each macro for analysis.

You may define the order in which the macros are run by manually selecting and editing the Execute Order field. Select the Execute Order field for the desired macro, type the new order number and press the Enter key on your keyboard.



You can sort by Run, Execute Order or Name columns by clicking on the blue field column titles.



All macros need to be reviewed to ensure there are no embedded factors that may affect the outcome of the model.



Running macros can significantly increase the time taken to run analysis.

3.4 Name Ranges

Worksheets Subroutines/Functions Macros Name Ranges									
Select ranges to include/exclude from driver analysis									
Exclude	Group Flex	Include	Range Name	Valid	Worksheet	Range	Is Range	Is Cell	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Consumables	<input checked="" type="checkbox"/>	Cost Model	H31:H34	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Hours_Prod	<input checked="" type="checkbox"/>	Cost Model	H14:H19	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Hours_Staff	<input checked="" type="checkbox"/>	Cost Model	H5:H9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Overhead_Rates	<input checked="" type="checkbox"/>	Cost Model	D43:D44	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Rates	<input checked="" type="checkbox"/>	Cost Model	D5, D14	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Risk_Impacts	<input checked="" type="checkbox"/>	Classic Risk Regis	D3:F7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_Gp_Risk_Probs	<input checked="" type="checkbox"/>	Classic Risk Regis	C3:C7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cost Model!_TMTOCR1C1	<input type="checkbox"/>	Cost Model!#REF!		<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Converted_Price_Ship1	<input type="checkbox"/>	Cost Model!#REF!		<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Converted_Price_Ship2	<input type="checkbox"/>	Cost Model!#REF!		<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Converted_Price_Total	<input type="checkbox"/>	Cost Model!#REF!		<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Correlation	<input checked="" type="checkbox"/>	uncertainty regis	A24:D28	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Cost_Ship1	<input checked="" type="checkbox"/>	Cost Model	K47	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cost_Ship2	<input type="checkbox"/>	Cost Model!#REF!		<input type="checkbox"/>	<input type="checkbox"/>	

By default all named ranges within the spreadsheet are displayed invalid ranges are automatically excluded and highlighted in red. To select what is displayed use the 'name ranges' feature tab see 3.1.6

4 Sensitivity function tab

The **Sensitivity** panel displays the results of the Driver Analysis and allows you to manipulate and monitor the inputs that were identified as Drivers. This is the primary interactive screen for Driver display, management and flexing.

View Panels are dynamic panes that contain lists and control windows. Both the main application window and all panels are resizable and have a 'size-memory'.

no.	Rank	Name of Worksheet	Input Value	Format	Outcome Effect	Effect@Min 0.9	Effect@Max 1.1	% Change	N	
1	1	Cost Model	0.8	0.00	-24314125.73	13372769.15	-10941356.58	-0	0.1	
2	2	Prod_Lab1 Cost Model	D14	23.06	£#.#0.0	13582357.35	-6791178.68	6791178.68	-0	23
3	3	OHead_Pt Cost Model	D43	1.24	0.0%	7518304.96	-3759402.48	3759402.48	-0	1.1
4	4	Sheet1	D11	36854824.30	#.#0	7370964.86	-3685482.43	3685482.43	-0	36
5	5	SC_Ship1 Cost Model	H38	18516026.23	£#.#0.0	4862295.03	-2481147.52	2481147.52	-0	18
6	6	Hrs_Ship1 Cost Model	H17	303184.36	#.#0	4197096.13	-2098548.06	2098548.06	-0	30
7	7	Staff_Lab1 Cost Model	D5	21.85	£#.#0.0	3454673.12	-1727336.56	1727336.56	-0	21
8	8	Hrs_Ship1 Cost Model	H15	209926.87	#.#0	2906097.28	-1453048.64	1453048.64	-0	20
9	9	Hrs_Ship1 Cost Model	H16	207711.64	#.#0	2875430.96	-1437715.48	1437715.48	-0	20
10	10	Ohead_St Cost Model	D44	2.24	0.0%	2388415.99	-1194207.99	1194207.99	-0	2.1
11	11	Hrs_Ship1 Cost Model	H14	150298.58	#.#0	2080640.26	-1040320.13	1040320.13	-0	15
12	12	Hrs_Ship1 Cost Model	H5	85202.79	#.#0	1616534.85	-808267.43	808267.43	-0	85
13	13	Profit_Rat Cost Model	D50	0.07	0.00%	1548466.31	-774233.15	774233.15	-0	0.1
14	14	Classic Risk Regi	C3	75	General	906250	-453125	453125	-0	75
15	15	Hrs_Ship1 Cost Model	H6	44240.44	#.#0	1839364.66	-419682.33	419682.33	-0	44
16	16	Hrs_Ship1 Cost Model	H19	58081.34	#.#0	804042.02	-402021.01	402021.01	-0	58

Input Control Panel enables selected drivers to be flexed

Watch Panel by default the target cell selected for the analyse is

Driver Details Panels enables comments be added and classify the item with corporate terms



Many of the functions described in this section of the manual can be accessed by a "right" click on the mouse see 4.2.2.

4.1 Feature Bar - Sensitivity

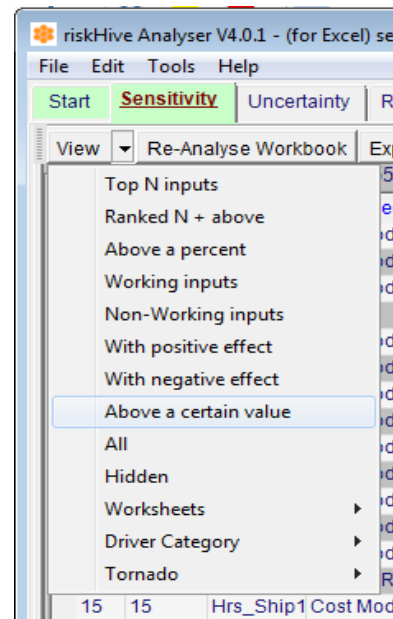
The Feature Bar contains function-specific controls and information pertaining to the **Sensitivity** results of the Driver Analysis:

4.1.1 View command

This command allows you to change which Drivers are displayed in the main Sensitivity Drivers panel:

Options:

- Top 'N' inputs
- Above a Percentage
- Working inputs
- Non- working inputs
- With Positive effect
- With Negative effect
- Above a certain value
- All
- Hidden
- Worksheets
 - Filter
 - Remove Filter
- Driver category
 - Filter
 - Remove Filter
 - TornadoRelative-100% of the width represents the biggest driver value
 - Absolute- the bars occupy n % of the column width by % effect
- Tornado
 - Relative
 - Absolute



: The ability to display elements in their order of importance is key to the **Assurance and Due Diligence** function within an Organisation.

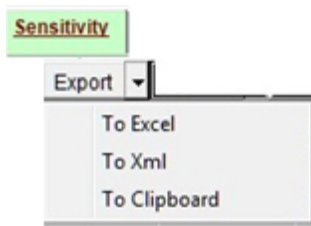


: Listing “Non-working inputs” and “hidden” elements provide support to the workbook **Verification** process of an Organisation.

4.1.2 Re-Analyse workbook command

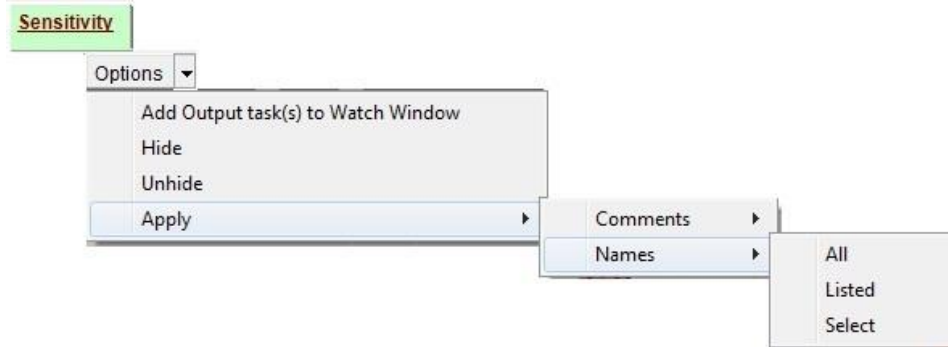
This command will re-run analytical analysis and transfer the result to workbook.

4.1.3 Export Command



This allows the sensitivity analyse to be exported to the desired MS tool

4.1.4 Options command



As default the watch panel contains the “target cell”, additional cells can be added via the ‘**Add Output cell(s) to watch window**’ command.

The **Hide** command enable single or multiple driver rows to be removed from the viewing pane; their effect on the sensitivity analyse is not affected.

To bring hidden rows into view select the **View** tab, **Hidden** option, chose the rows then either select **Unhide** from the **Options** tab or right click the mouse and select “unhide” from the “Driver Actions” option

The **Apply** command allows you to decide where **comments** and or **Names** that are entered in the **Drivers Details Panel** are displayed after they are **Saved** via the Driver Details panel

Options:

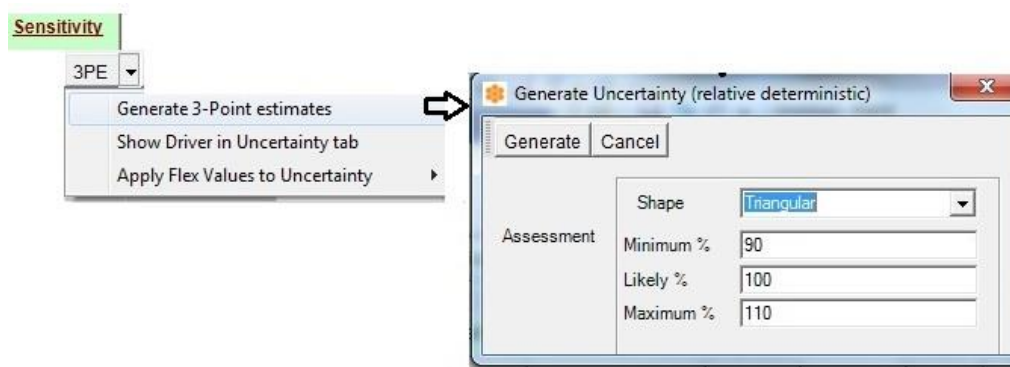
- All Change every row
- Listed Change listed rows
- Select Change selected rows

4.1.5 3 PE (Point Estimating)

4.1.5.1 Generate 3 Point Estimate

This command will allow you adjust the driver set by generating 3 point estimates, results can be viewed in the Uncertainty section.

Method: select rows to adjusted, select **3PE Generate 3 Point Estimate**, chose **distribution** shape and required values for **Min**, **Most Likey** & **Max**, press **Generate** button.



4.1.5.2 Show Driver in Uncertainty Tab command

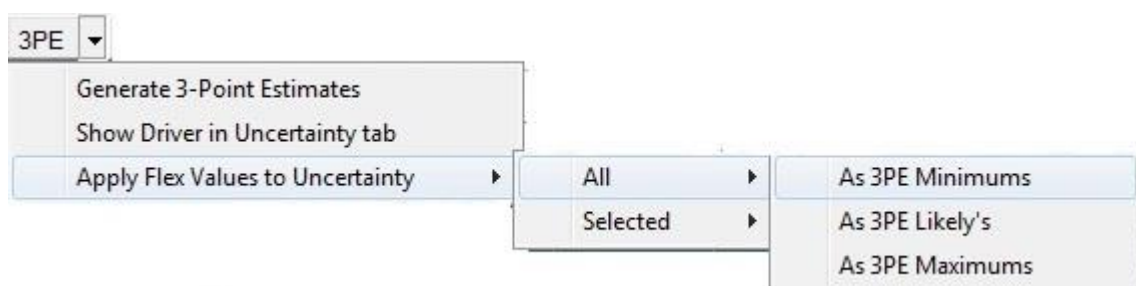
This command allows you transfer selected drivers to the **Uncertainty Register** such that they may have Uncertainty Assessments made on them.

To transfer cells to the Uncertainty Register:

1. Select the Drivers you want to transfer to the Uncertainty Register
2. Click on the **3 PE** tab > select **Show Drivers in Uncertainty Tab** command.
3. A confirmation message is displayed. Click **OK** to finish operation.

The selected cells are displayed in the **Uncertainty Drivers List** on the **Uncertainty Function Tab**. Their shapes are highlighted in red to indicate no assessment has yet been made.

4.1.5.3 Generating Uncertainty Inputs



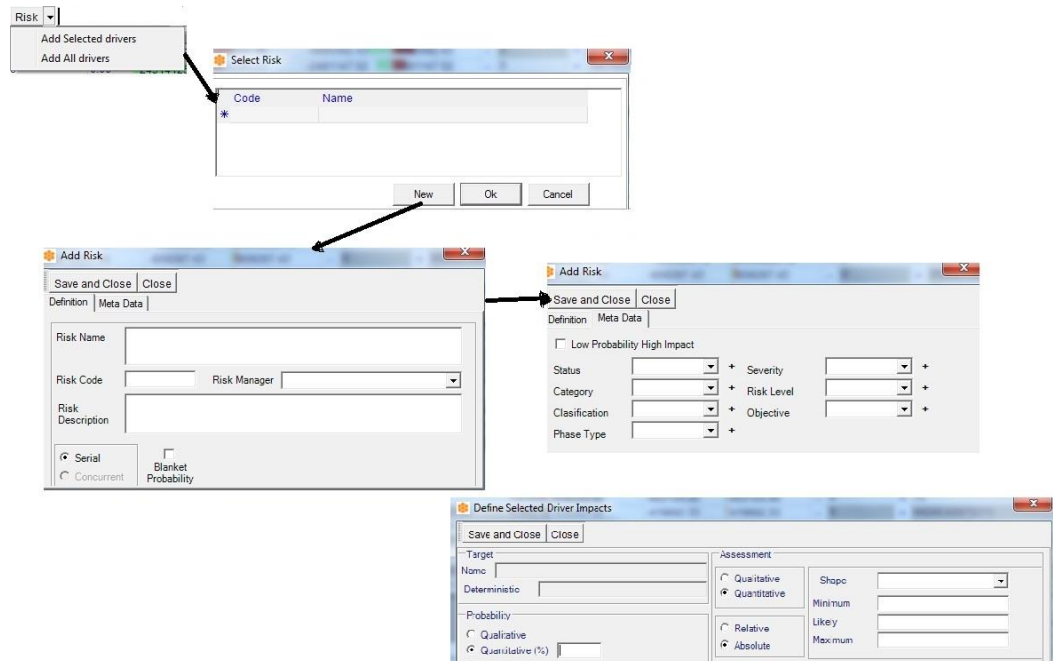
Uncertainty may be added by recording the manipulation of the Sensitivity Drivers on the **Sensitivity 3 PE** Function Tab.

To add Uncertainty from manipulation of the Sensitivity Drivers:

1. Select the **Drivers** (cells displayed) to be flexed and added to the Uncertainty List
2. Set **Likely** values **THIS MUST BE DONE FIRST**
 - i. Use either the **Input Control Slider** or the **+ or - Flex Buttons** to manipulate the selected drivers to a desired state which represents a set of **Likely** Uncertainty values
 - ii. Select **3PE > ALL or Selected> Apply Flex values to Uncertainty select As 3PE Likely**
 - iii. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete.
 - iv. The Driver cells have been added to the Uncertainty Drivers List on the Uncertainty Function Tab with a Constant shape of the value set by the flex manipulation
3. Set **Minimum** values:
 - i. Use either the **Input Control Slider** or the **+ or - Flex Buttons** to manipulate the selected drivers to a desired state which represents a set of **Minimum** Uncertainty values
 - ii. Select **3PE > ALL or Selected> Apply Flex values to Uncertainty > select As 3PE Minimum**
 - iii. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete.
 - iv. The Minimum values have been added to the parameters on the Uncertainty Drivers List on the Uncertainty Function Tab. The shape is now indeterminate and is highlighted in red.
4. Set **Maximum** values:
 - i. Use either the **Input Flex Control Slider** or the **+ or - Flex Buttons** to manipulate the selected drivers to a desired state which represents a set of **Maximum** Uncertainty values
 - ii. Select **3PE > ALL or Selected> Apply Flex values to Uncertainty > select As 3PE Maximum**
 - iii. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete.
 - iv. The Maximum values have been added to the parameters on the Uncertainty Drivers List on the Uncertainty Function Tab. The shape is now Triangular and the assessment is complete.

4.1.6 Risk

This command enables either the inclusion of pre-defined risks or the ability to create new risks, both risk details and metadata can be captured, the metadata elements can be user defined allowing user selection from a dropdown menu. Once the risk detail is saved via the **save and close** button, you will be prompted to select the drivers that are affected by the risk.



Add to selected drivers method:

1. Select **Driver(s)** using **crtl** for multiple choice **select Risk>Add to selected drivers** from the sensitivity function tab.
2. A popup “**Select Risk**” menu will appear either selected a listed risk or press **New**.
3. If **New** was selected a Popup form appears, this is in two parts:
 - a. **Definition** - You are required to **name** and **describe** the risk and state the **Risk Code** and **Risk manager**. If **Blanket Probability** is chosen you must input a **probability factor**.
 - b. **Meta Data** - will require you to fill the relative metadata via dropdown menus. These dropdown menus can be update by the user to reflect your Organisations policy see 9.1.2.8 for details.
4. Press **Save and Close** a new popup form will appear that requires you to **Define selected Driver Impacts**
5. The affected driver is displayed in “target” area of the popup form.
6. Set **Probability**:
 - a. Select either of the **Qualitative** or **Quantitative** options in probability sub panel.
 - i. **Qualitative**: Select the desired **Probability Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative**: Type in the desired **Probability** value (an integer between 0 and 100) in the field that appears to the right of the option.

- iii.
- 7. Set **Impact** (*the impact of the risk not to be confused with the uncertainty estimate*):
 - a. Select either of the **Qualitative** or **Quantitative** options in the Assessment sun panel.
 - i. **Qualitative:**
 - 1. Select either **Relative** or **Absolute** levels;
 - 2. the desired **Impact Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative:**
 - 1. Select the desired **Shape** from the drop-down list that appears to the right of the option;
 - iii. Type in the desired Impact Values (min, likely, max, etc) in the fields that appear underneath the shape drop-down.
- 8. Click **Save** a popup message will appear to give progress press **OK**.

Add to All

- 1. Select **Risk>Add to ALL** from the sensitivity function tab.
- 2. A popup “**Select Risk**” menu will appear either selected a listed risk or press **New**.
- 3. If New was selected a Popup form appears, this is in two parts:
 - a. **Definition** - You are required to **name** and **describe** the risk and state the **Risk Code** and **Risk manager**. If **Blanket Probability** is chosen you must input a **probability factor**.
 - b. **Meta Data** - will require you to fill the relative metadata via dropdown menus. These dropdown menus can be update by the user to reflect your Organisations policy see 9.1.2.8 for details.
- 4. Press **Save and Close** a new popup form will appear that requires you to **Define selected Driver Impacts**
- 5. The affected driver is displayed as **blank as all drivers are affected** in the “target” area of the popup form.
- 6. Set **Probability**:
 - a. Select either of the **Qualitative** or **Quantitative** options in probability sub panel.
 - i. **Qualitative:** Select the desired **Probability Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative:** Type in the desired **Probability** value (an integer between 0 and 100) in the field that appears to the right of the option.
- 7. Set **Impact** (*the impact of the risk not to be confused with the uncertainty estimate*):
 - a. Select either of the **Qualitative** or **Quantitative** options in the Assessment sun panel.
 - i. **Qualitative:**
 - 1. Select either **Relative** or **Absolute** levels, see note below;
 - 2. the desired **Impact Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative:**
 - 1. Select the desired **Shape** from the drop-down list that appears to the right of the option;

- iii. Type in the desired Impact Values (min, likely, max, etc) in the fields that appear underneath the shape drop-down.
8. Click **Save** a popup message will appear to give progress press **OK**.



- ***Relative** will produce values for min. most likely and max (3PE) based on the deterministic value used in the model.*
- ***Absolute** option will add the deterministic value to the pre-determined 3 PE defined by “User”. This option is best suited to “Design to cost” modelling when detailed risk impact information is limited.*



***Blanket Probability** will take precedence over individual risk settings if two or more risks have an impact on a selected cell*

.

4.1.7 Highlight Driver Cells command

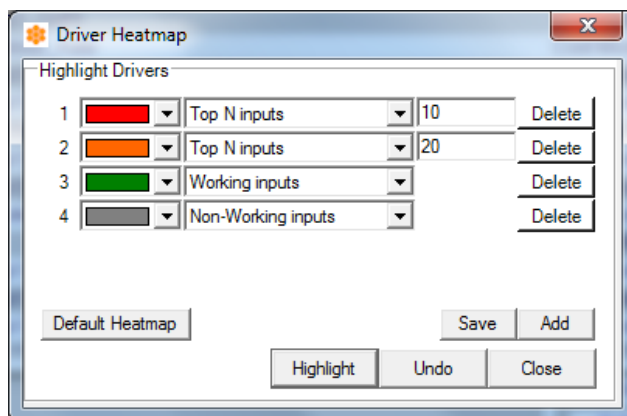
The application provides functionality for marking the input drivers displayed on the Sensitivity Drivers panel. It does this by using Excel to highlight cells.



4.1.7.1 To highlight the input driver cells currently displayed in the Sensitivity Drivers panel:

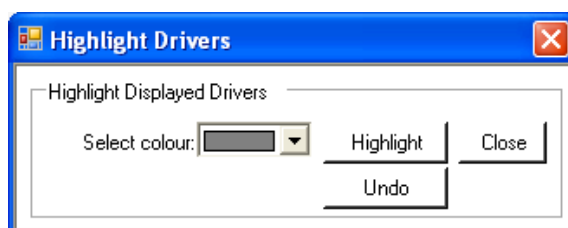
4.1.7.1.1 Heatmap

1. Select “by heatmap”
2. Select from popup menu the combination required for the display
3. Press **Highlight**
4. Press **Undo** to remove any highlighting
5. The **save** option will remember your chosen combination of colours and ‘n’ inputs.
6. **Close** option shuts heatmap.



4.1.7.1.2 Current Selection

1. Select for display the Driver cells you want to highlight
2. Click once on the **Highlight Driver Cells** command.
The Highlight Drivers dialogue box will be displayed;



3. Select the required highlight colour from the drop down colour selector and then click the **Highlight** button once. A message will confirm the action. Click **Undo** to remove the last highlight action.



: To create a Driver ‘heatmap’ based on significance, define and display sets of Drivers using the Drivers to Display control and different highlighting colours.



When using the heatmap function for spreadsheet verification i.e. to check for “non-working” inputs on sub totals within the spreadsheet it is necessary to set the display options so that only “non-working” inputs will be highlighted.



It should be noted that where an input cell value is used in many formulas it will not show up as non-working cell if missed from say a sub total elsewhere in the spreadsheet.



Input cells that have a value of zero will be classified as Non-Working

4.1.8 Reset all drivers command

This command allows you reset any changes that have been made to Driver cells.

To reset Driver cells to their original (deterministic Excel) values:

1. Click once on the **Reset all drivers** command.
2. All Drivers will be returned to their original values.



Comments and Names cannot be reset

4.2 Sensitivity Drivers panel

The Drivers Panel displays the results of the analysis in tabular format.

Drivers (20) Top 20 inputs (of 463)												
no.	Rank	Name of Input Worksheet	Location	Input Value	Format	Outcome Effect	Effect@Min 0.9	Effect@Max 1.1	% Change	New Value	Category	Comments
1	1	Cost Model	D62	0.8	0.00	-24314125.73	-13372766.15	-10941356.58	0	0.8		
2	2	Prod_Lab1 Cost Model	D14	23.06		-13582357.35	-6791178.68	-6751176.68	0	23.06		
3	3	OHead_Pr Cost Model	D43	1.24		-7518304.96	-3759402.48	-3759402.48	0	1.24		
4	4	SC_Ship1 Cost Model	D11	36854824.30		-7370964.86	-3685482.43	-3685482.43	0	36854824.30		
5	5	Staff_Lab1 Cost Model	H38	18516026.23	##0.00	-4962295.03	-2481147.52	-2481147.52	0	18516026.23		
6	6	Hrs_Ship1 Cost Model	H17	303184.36	##0.00	-1927096.12	-2098548.06	-2098548.06	0	303184.36		
7	7	Staff_Lab1 Cost Model	H17	21.85	##0.00	-1727336.56	-1727336.56	-1727336.56	0	21.85		
8	8	Hrs_Ship1 Cost Model	H17	209926.87	##0.00	-1453048.64	-1453048.64	-1453048.64	0	209926.87		
9	9	Hrs_Ship1 Cost Model	H17	207711.64	##0.00	-1437715.48	-1437715.48	-1437715.48	0	207711.64		
10	10	OHead_St Cost Model	D44	2.24	0.00	-2388415.99	-1194207.99	-1194207.99	0	2.24		
11	11	Ship1 Cost Model	H14	58	##0.00	-1080640.26	-1080640.26	-1080640.26	0	58		
12	12	Ship1 Cost Model	H5	9	##0.00	-1616534.85	-806643.43	-806643.43	0	9		
13	13	Rat1 Cost Model	D50	0.00%		-1548466.31	-774233.15	-774233.15	0	0.00%		
14	14	Classic Risk Regit C3		75	General	1906250.00	-453125.00	453125.00	0	75		
15	15	Hrs_Ship1 Cost Model	H6	44240.44	##0.00	-1139264.66	-446522.22	-446522.22	0	44240.44		

4.2.1 Columns

The columns are used to summarise the analysis results and subsequent flexing. To sort the data by a column in descending order click on the column title bar text. A second click on the column title bar text will sort in ascending order.

4.2.2 Analysis Results columns

These columns are used to display deterministic (original) workbook input data and the results of the sensitivity analysis once completed.

A. No.

Displays the unique line number of the driver list.

B. Rank

Displays the Driver ranking sorted by decreasing effect. The most influential Driver is ranked number 1. All drivers below this have less effect for a given amount of flex than this driver.

C. Name of input cell

If the cell has a name in Excel it will be displayed here. If the cell does not have a name you can type a name into this field and then apply the name to the Excel workbook by clicking the **Apply Names** Feature Bar command.

Tip: This is a quick way of naming the significant Driver input cells.

D. Worksheet

Displays the Excel workbook location of the Driver input cell.

E. Cell

Displays the Excel worksheet location of the Driver input cell.

F. Input cell value

Displays the input cell value from the Excel workbook without format

G. Format

Displays the format of the Driver input cell, includes custom formats.

H. Effect @ 'n'%

Displays the amount the **Key Output Cell** is affected by the sensitivity analysis at the settings defined in the Analysis Multipliers control. The column heading displays the cumulative sensitivity value used in analysis.



The length of the coloured slider in this column indicates the impact on key output cell



: If the analysis was executed at the default of $\pm 10\%$ then the column heading will read 'Effect @ 10%'.

I. Effect at 90 and 110% / Tornado Bars

Displays the effect of the cell at the given flex value as a percentage of the Key Output Cell value. i.e. If the KOC value is 1000 and the 'Sensitivity @ 10%' is 100 (from the previous column) then the Effect% will be 10. The background displays a graphical representation of the effect of the Drivers list on the Key Output Cell. The tornado bar is coloured to indicate polarity of effect:

- a. Red = Direct: KOC value increases as Driver cell value increases.
- b. Green = Inverse: KOC value decreases as Driver cell value increases.

The scale view of the Tornado bars can be changed from Relative to Absolute by using the **Tornado** command on the Feature Bar.

4.2.3 Flex Control columns

These columns are used to dynamically flex and manipulate the workbook input data and display the flexed data values. During manipulation the Excel workbook is manipulated and is updated with the flexed input values so you can see the effects of the manipulation on the workbook. These changes are not automatically saved but this can be done by using the **Save as** menu item in Excel

J. - (minus character) increment control

This control is used to reduce the Driver input value by 1% increments. Click on the minus character to reduce the input cell value by 1% per click. The control is coloured to indicate the polarity of the resulting effect on the Key Output Cell as follows:

- a. Red = KOC value increased as a result of the input cell decrease (denoting an inverse relationship).
- b. Green = The KOC value decreased as a result of the input cell decrease (denoting a direct relationship).

K. Delta

Displays the percentage delta value in percentage terms of the Driver input cell if manipulated. If the cell has not been manipulated the field displays zero value.

L. + (plus character) increment control

This control is used to increase the Driver input value by 1% increments. Click on the plus character to increase the input cell value by 1% per click. The control is colourised to indicate the polarity of the resulting effect on the Key Output Cell as follows:

- a. Red = KOC value decreased as a result of the input cell increase (denoting an inverse relationship).
- b. Green = The KOC value increased as a result of the input cell increase (denoting a direct relationship).

M. Flexed value

Displays the new (flexed) value of the Driver input cell if manipulated. If the cell has not been manipulated the field displays the original cell value.



: If you want to set the Driver input value to a specific value rather than use the plus / minus incremental controls you can select this field and type in the desired value. Press the Enter key on your keyboard to update the value.

4.2.4 Information Columns

N. Category

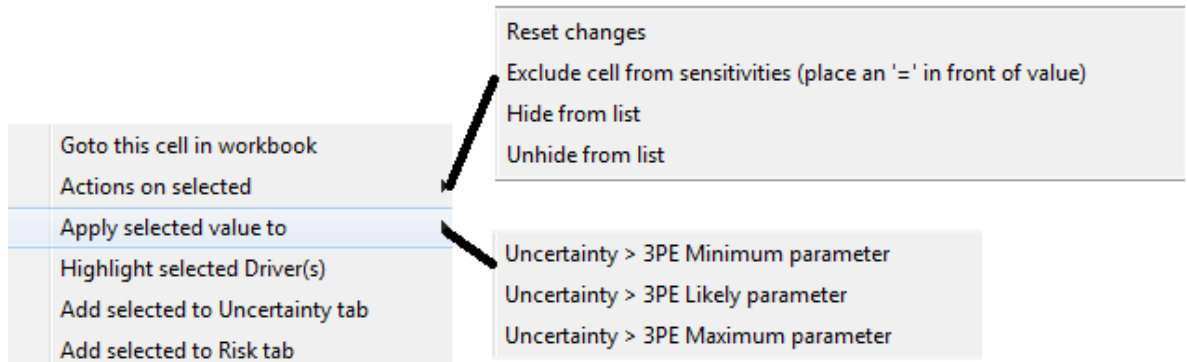
Displays the assigned identification; this should align with your organisations process or policy on identifying risk and uncertainty.

O. Comments

Displays the user input comments

4.2.5 Sensitivity Driver panel contextual menu (right-click)

Select the row from sensitivity display panel, there are a number of options available by making a right click menu, as shown below:



4.2.5.1 Goto this cell in workbook

- Goto this cell in workbook - selects and focuses target cell



: This is a quick way of finding the Driver inputs in the Excel workbook.

4.2.5.2 Driver Actions sub menu

The following options are available:

- **Reset** - returns this cell to its original Excel values comments and names added are not affected.
- **Exclude cell from sensitivities** - inserts an '=' sign as a prefix to cell
- **Hide** - hides cell from Drivers list
- **Unhide** restores hidden rows

4.2.5.3 Apply Selected menu

This command transfers the current cell value to the Uncertainty assessment, full flex instruction are detailed in 4.1.7.; options are available:

- **Minimum** - applies **New Value** to Uncertainty minimum value
- **Likely** - applies **New Value** to Uncertainty likely value
- **Maximum** - applies **New Value** to Uncertainty maximum value

4.2.5.4 Highlight menu

This command highlights in the Excel sheet the current cell only in the colour you select.



4.2.5.5 Add 'cost cell' to Uncertainty

This command provides a short method that bypasses the 3 PE tab covered in 4.1.6 that is it enables you to transfers the current cell to the Uncertainty Drivers list.

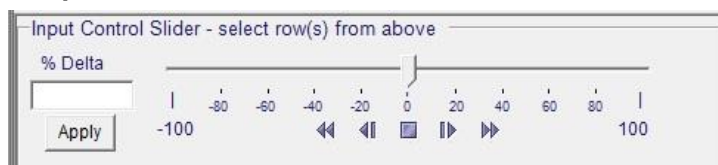
4.2.5.6 Add 'cost cell' to Risk

This command provides a shortcut method that bypasses the Risk feature covered in 4.1.8 that is it enables you to transfers the current cell to the Uncertainty Drivers list.

4.3 Driver Details panel

The Driver Details panel allows you to edit or enter the Name and Comments. Click Save after editing the fields. Either field may be inserted into the Excel cell's comments field by using the Feature Bar commands previously described.

4.4 Input Control Slider Panel



This panel allows you to flex multiple rows so that the change the “Key Output Cell” (KOC) can be calculated.

Use the ‘shift’ or ‘Ctrl’ keys to select multiple Drivers on the Sensitivity Drivers panel and then drag the Flex Control Slider to manipulate the inputs as a group. The inputs will be manipulated by the same percentage of their original values. The resulting effect on the KOC is displayed in the **Watch Output Cells** panel. Subsequent groups of inputs may then be selected and flexed to build-up a scenario.

For example, a group of durations may be selected and manipulated using the slider to simulate an overall increase in the time required to perform tasks. Once this effect has been applied, a group of rates or overheads may be adjusted downward to reflect the changes possible as a result of more hours and the overall effect will be displayed in the **Watch Output Cells** panel.

:



: The workbook will be dynamically updated with the flexed input data. You can save your scenarios either by saving the workbook as a different filename or by over-writing the original workbook.



: The application has already made a backup of the original workbook in the source folder with a time and date extension that can be kept or deleted on close.



: This function is extremely useful when conducting real time negotiations and demonstrating to Management the effects of changes.

The slider control allows the flexure of multiple Driver inputs simultaneously. Watch Output Cells

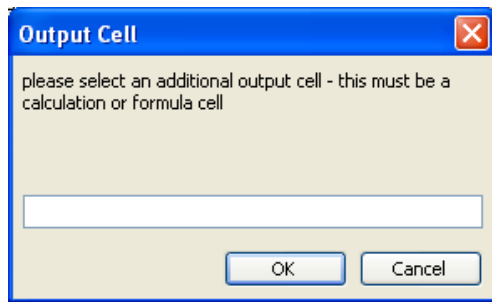
The Watch Output Cells panel allows the monitoring of multiple workbook outputs simultaneously as the Driver Inputs are manipulated. Initially, only the **Key Output Cell** is loaded as the first entry to this control and can be identified by the title of the output response window (for example [key output cell = 'abc']). As the inputs are manipulated and the KOC is affected the background colour will change to Red or Green as the KOC increases or decreases in value respectively.

Watch Output Cells: target 'Cost Model'!K62, delta 597,104 [\$€-1]					
Output Cell	Name	Original Value	New Value	Change	% Change
'Cost Model'!K62		157,209,747 [\$€-1]	157,806,851 [597,104 [\$€-1]	0.38
'Cost Model'!H10	Hrs_Ship1_Staff	143,618 Hrs	143,618 Hrs	0 Hrs	0
'Cost Model'!H20	Hrs_Ship1_Prod	981,145 Hrs	981,145 Hrs	0 Hrs	0
*					

Add Output cell(s) to watch
 Remove 'Cost Model'!H10Hrs_Ship1_Staff from watch list
 Show 'Cost Model'!H10Hrs_Ship1_Staff in Key Results

To add further outputs to the list, right-click on the Output response window and the Output response contextual menu options will appear.

Click on the **'Add Output cell(s) to watch'** option and the following dialog box will open.



Select the cell you want to watch in Excel and click OK. The output will be added to the list. You can repeat the process to select multiple outputs for display in the list.

As the inputs are manipulated you can see the individual output values changing in the watch-window.

To remove entries from the watch-window right click on the required cell and select **“Remove ‘sheet cell ref’ from watch list”** on the Output response menu.

The **Show ‘sheet cell ref’ in key results** command will add the cell to key results in the Excel sheet.

5 Uncertainty function tab

Uncertainty can be described as:

‘A cause of volatility in outcome - excluding risk and opportunity factors’

Uncertainty can be used to express and quantify:

- Lack of knowledge regarding input data.
- Known boundaries of estimation error.
- Poor provenance or immaturity of data quality.

It can be difficult to gauge (or get anyone to commit to) a single-point estimate. People are generally more comfortable with a range of input and this is the aspect that Uncertainty facilitates.

- In theory, the number of data points for Uncertainty is unlimited and could be described by continuous distribution with up to 101 points.
- Most commonly, variable estimates have two or three points, ranging between Minimum, Expected and Maximum values.
- Whilst we must take care not to mandate three data points in all cases the common term for the Uncertainty assessment process is Three-Point Estimation

Three-Point Estimation is a quantitative analysis technique that assigns numerical values to define a range of possible out-turns so that ‘Risk Analysis’ may be carried out to better inform decisions. In forecasting terms, a Three-Point Estimate is an estimate of the range of possible out-turns from a Minimum to a Maximum; with the Expected out-turn located between these two extremes.

3PEs (generally) consist of three values and an associated distribution;

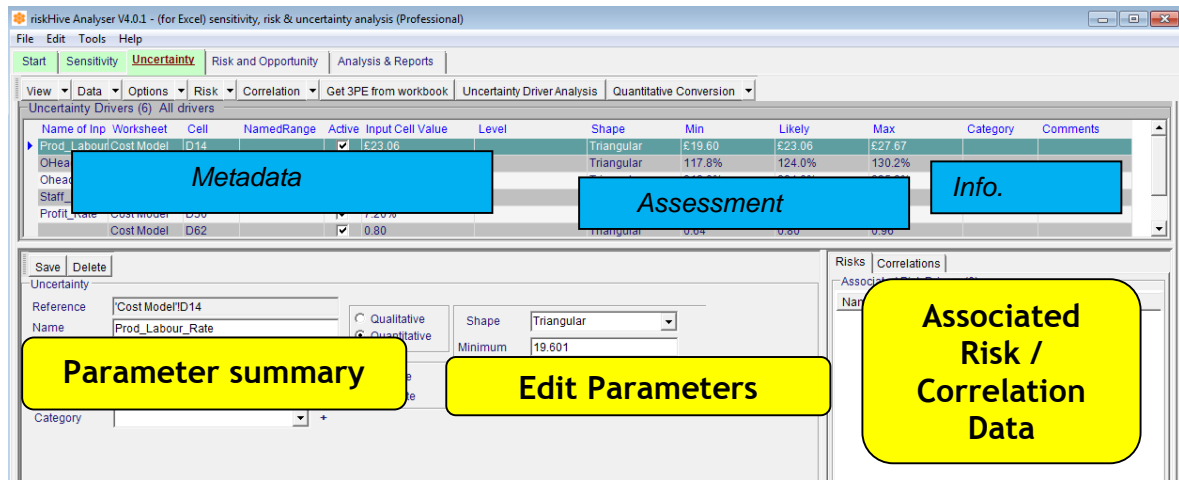
- Minimum possible value
- Expected Out-turn Value
- Maximum possible value
- Distribution Type (Shape)

It is a methodology for describing the valuation and limits of Uncertainty that surround forecasts in a format suitable for subsequent Monte Carlo analysis.

Three point estimates (3PE) have become the current standard for both variability assessment parameters because;

- The Customer now requires them in certain sectors,
- They provide an significant additional level of granularity to input data whilst imposing minimum overhead on the costing process,
- They engage an additional thought process which has the effect of making the estimate more robust, easier to audit and validate.

To access fields and controls related to uncertainty click once on the Uncertainty Function Tab.



The main window on the Uncertainty tab displays a summary of the Uncertainty parameters beneath the Features Bar with its Uncertainty-related controls. Each row in the list of Uncertainty Drivers pertains to one input cell in the attached Excel workbook and summarises the applied Uncertainty assessment.

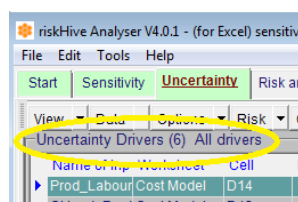
Each column contains a parameter pertaining specifically to the cell selected. The Uncertainty Drivers list may be sorted by any column alphanumerically ascending or descending by clicking on the column header description title.

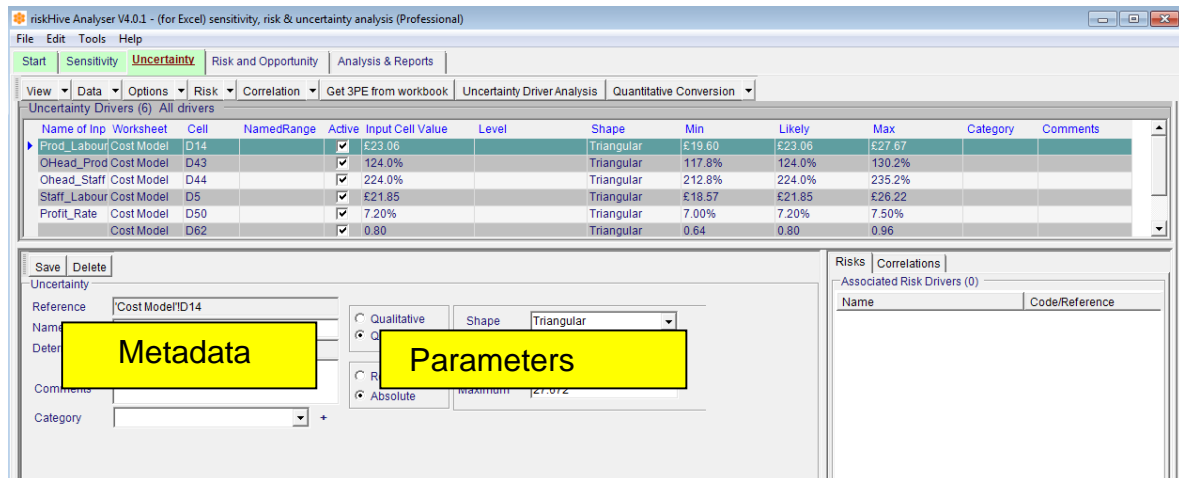
Column headings are:

- Metadata:
 - Name of Input Cell: If there is a cell name in Excel
 - Worksheet: Location of the Cell in the Workbook
 - Cell: Location of the Cell in the Worksheet
 - Input Cell Value: Single-point (constant) value from Excel
- Assessment Parameters:
 - Level: Qualitative level assessment (H, M, L, etc.)
 - Shape: Quantitative distribution type (Uniform, Triangular, etc)
 - Min: Quantitative lowest possible value for 3PE
 - Likely: Quantitative most likely value for 3PE
 - Max: Quantitative highest possible value for 3PE
- Comments: Text field for capturing notes and assumptions re. cell



: The total number of Uncertainty Driver cells is displayed above the summary pane underneath the Feature Bar:



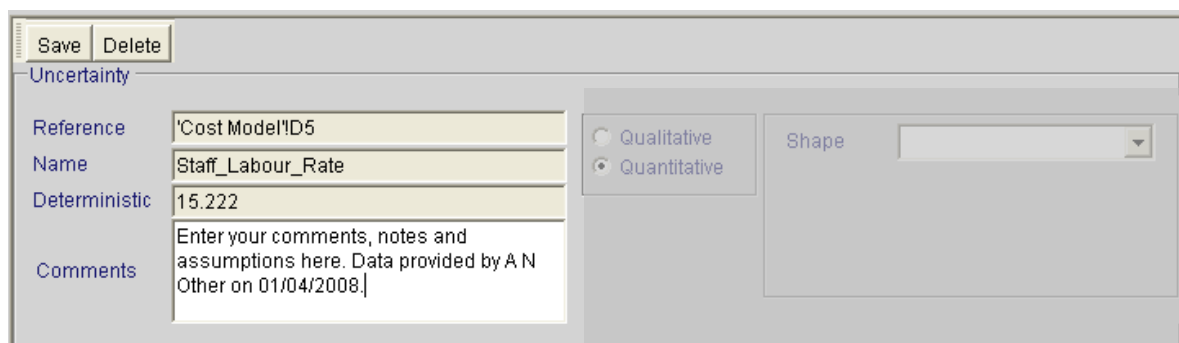


5.1.1 View or edit Uncertainty assessment parameters

The following Edit instructions apply irrespective of the method used to add or import the Uncertainty Drivers to the list. To access a cell's uncertainty parameters click once on the row containing the cell you wish to view or edit. The Uncertainty parameters will be displayed in the lower left pane of the Uncertainty Function Tab.

5.1.1.1 View Uncertainty Metadata

Metadata pertaining to the cell is displayed to the left side of the Uncertainty parameters pane. The only metadata that may be edited by the user is the **Comments** field. This is a text field with a character limit of 1024. Once the **Comments** field is populated or updated click **Save** to commit changes.



Comments saved here will also be visible in the Comments field in the Uncertainty Drivers summary list, in the Comments field on the Sensitivity Function Tab and may also be inserted as a comment into the attached workbook on the relevant cell as a record external to the application.

5.1.1.2 Apply or edit QUALitative Assessment Parameters

The application provides a unique ability to assign Uncertainty by applying a qualitative level to the cell. Qualitative assessment parameters are described in detail in **Section 8**. When the qualitative level is applied to the target cell the quantitative parameters, such as a three-point estimate, are automatically and dynamically calculated relative to the cell's value.

To apply a qualitative Uncertainty assessment to a single cell:

1. Select the cell row to which you wish to apply the assessment level
2. In the Uncertainty parameter pane, select the **Qualitative** button
3. In the type selector box, select **Relative** levels
4. Select the level you wish to apply from the **level** drop-down box
5. Click **Save**. The assessment is applied and the Level is displayed in the main Uncertainty Drivers list.



The information (circled in yellow) shown below the qualitative selection is an illustration of the factors that describe the distribution that will be applied the deterministic value, it does not use those numbers for any other purpose.

To apply a qualitative level to **multiple cells** at the same time:

1. Hold down the Ctrl key and click once on each row you want to select
2. Repeat the qualitative level selection process above and click **Save**.
3. The assessment level is applied to each of the selected cells and the Level is displayed for each selected cell in the main Uncertainty Drivers list.

Name of Input Cell	Worksheet	Cell	NamedRange	Active	Input Cell Value	Level	Shape	Min	Likely	Max	Category	Comments
Uncertainty	C6			<input checked="" type="checkbox"/>	300	Mu Medium Increase						



**Qualitative
Level
Assessment
Summaries**

: The calculation of Uncertainty Driver Mean Impact (See section 5.9) is not possible for cells that have a qualitative assessment applied.

5.1.1.3 Apply or edit QUANTitative Assessment Parameters

Quantitative Uncertainty assessments may be made using several standard input distributions that are listed and described fully in **Section 8**.

To apply a quantitative Uncertainty assessment to a single cell:

1. Select the cell row to which you wish to apply the assessment level
2. In the Uncertainty parameter pane, select the **Quantitative** button
3. Select the distribution **Shape** you wish to apply from the **Shape** drop-down
4. Type in the Minimum, Likely and Maximum values you wish to apply (the
5. Click **Save**. The assessment is applied and the parameters are displayed in the main Uncertainty Drivers list.

The screenshot shows the 'Uncertainty' pane. On the left, there are input fields for 'Reference' (Cost Model!H5), 'Name' (Hrs_Ship1_PM), 'Deterministic' (85202.7920509193), and a 'Comments' text area. On the right, there are two radio buttons: 'Qualitative' and 'Quantitative' (which is selected). Next to them is a 'Shape' dropdown menu set to 'Triangular'. Below this are three input fields: 'Minimum' (50000), 'Likely' (85000), and 'Maximum' (100000). At the top left of the pane are 'Save' and 'Delete' buttons.

To apply quantitative parameters to **multiple cells** at the same time:

1. Hold down the Ctrl key and click once on each row you want to select
2. Repeat the qualitative level selection process above and click **Save**.
3. The assessment parameters are applied to each of the selected cells and are displayed for each selected cell in the main Uncertainty Drivers list.

Name of Input Cell	Worksheet	Cell	NamedRange	Active	Input Cell Value	Level	Shape	Min	Likely	Max	Category	Comments
Prod_Labour_Rate	Cost Model	D14		✓	£23.06		Triangular	£19.60	£23.06	£27.67		
Overhead_Prod	Cost Model	D43		✓	124.0%		Triangular	117.8%	124.0%	130.2%		
Overhead_Staff	Cost Model	D44		✓	224.0%		Triangular	212.8%	224.0%	235.2%		
Staff_Labour_Rate	Cost Model	D5		✓	£21.85		Triangular	£18.57		£26.22		
Profit_Rate	Cost Model	D50		✓	7.20%		Triangular	7.00%		7.50%		
	Cost Model	D62		✓	0.80		Triangular	0.64		0.96		
Hrs_Ship1_Manf	Cost Model	H14		✓	150,299 Hrs		Triangular	135,269 Hrs		172,843 Hrs		

**Quantitative
Parameter
Assessment
Summaries**

5.2 View function

This command allows you to change which Drivers are displayed in the main Sensitivity Drivers panel:

Options:

- Parameters Formatted - display as per MS Project
- Parameters Sortable- will convert different units to a constant



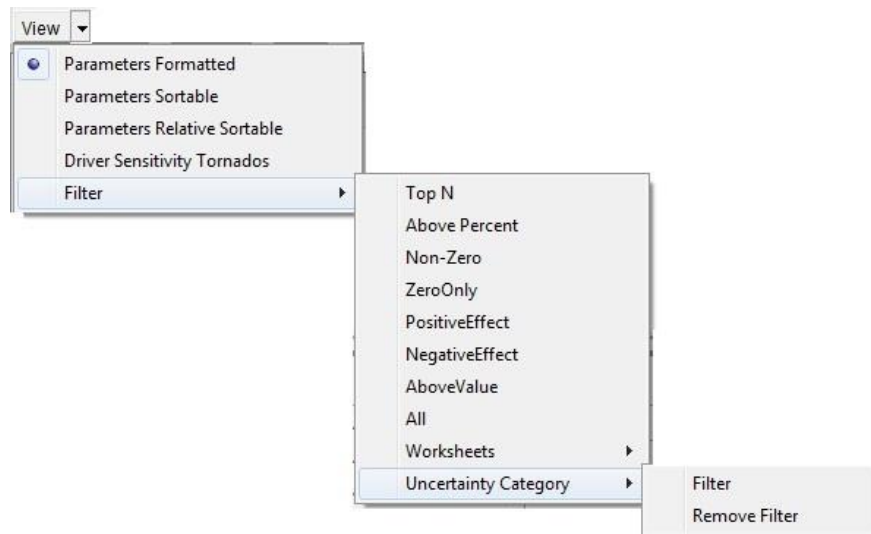
: Use with Caution

- Parameters relative Sortable- will display in Relative terms



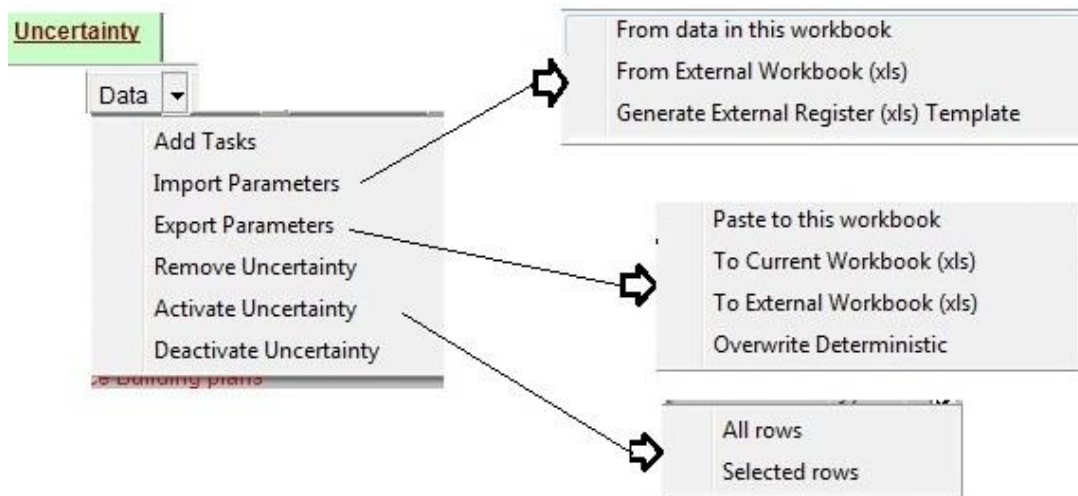
: Use with Caution

- Drivers Sensitivity Tornados
 - Relative
 - Absolute



- Filter
 - Top 'N' inputs
 - Above a Percentage
 - Working inputs
 - Non- working inputs
 - With Positive effect
 - With Negative effect
 - Above a certain value
 - All
 - Worksheets
 - Remove Filter
- Driver category
 - Filter
 - Remove Filter

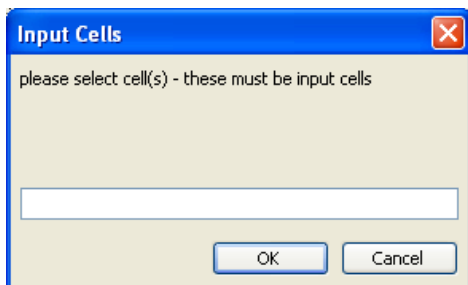
5.3 Data function



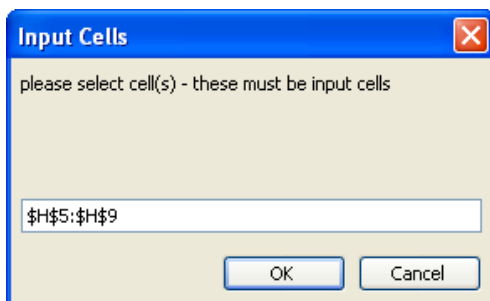
5.3.1 Add Cells selected from Excel

To add uncertainty by manually selecting cells from the attached workbook:

1. Click once on the **Data** tab on the **Uncertainty Feature Bar**
2. Select **Add Cells selected from Excel** from the drop-down list. The cell-selector will be displayed in Excel over the attached workbook:



3. Select the cells to which you want to add uncertainty parameters. The cell locations or ranges will be displayed in the cell-selector window. Click **OK**.



4. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation.
5. The cells are now displayed in the main Uncertainty Drivers pane with their names, locations and deterministic values. Note that the shape column is highlighted in red denoting that although the cell is available for uncertainty

assessment it currently has no parameters assigned to it.

5.3.2 Import parameters

From data in this workbook
 From External Workbook (xls)
 Generate External Register (xls) Template

5.3.2.1 From data in this workbook

5.3.2.1.1 Grab 3PE Uncertainty from columns in worksheet

To grab 3-point estimate uncertainty input data from the attached workbook:

1. Click once on the **Data** control on the **Uncertainty Tab > Feature Bar**
2. Select the **Import parameters > From data in this workbook** option. The input dialog appears:

Which format is your data

☒ Columns

Min	Likely	Max	Shape
1	2	3	B

☐ Rows

Min	Likely
1	2
3	B

☒ By cell selection ☐ By Range selection

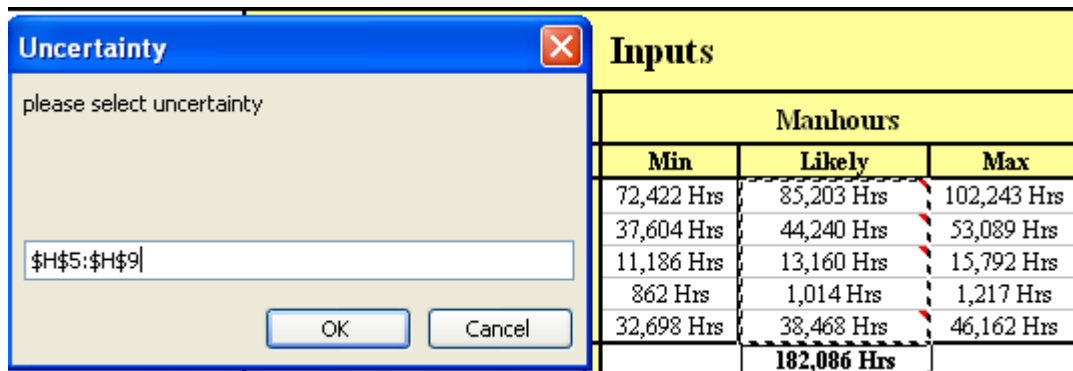
☒ Also include shape
☐ Also add as Key Result
☐ Ignore Zero's
☐ Correlate selected range of cells

Select Cancel

3. Select the **Columns** option. If you have defined the distribution shape by typing its initial to the left of the max value select the **Include Shape** box.
4. Click **Select**. The cell-selector is displayed in the attached workbook.
5. Use the mouse to select only the Likely values in the column.



The application expects the min and max values to be adjacent (either side) so you don't have to select them all, as shown in the graphic below.

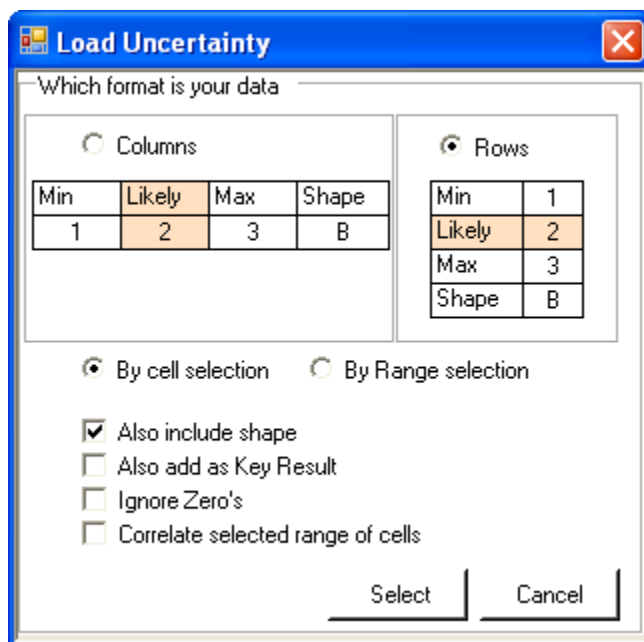


6. Once you have selected the Likely cells click **OK**.
7. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation. The selected cells are added to the Uncertainty list, the 3PE parameters are applied and the new selections are displayed in the main Uncertainty Drivers list.

5.3.2.1.2 Grab 3PE Uncertainty from rows in worksheet

To grab 3-point estimate uncertainty input data from the attached workbook:

1. Click once on the **Data** control on the **Uncertainty Tab > Feature Bar**
2. Select **Import Parameters>From data in this workbook** option. The input dialog appears:



3. Select the **Rows** option. If you have defined the distribution shape by typing its initial to the left of the max value select the **Include Shape** box.
4. Click **Select**. The cell-selector is displayed in the attached workbook.
5. Use the mouse to select only the Likely values in the row.



The application expects the min and max values to be adjacent (above & below) so you don't have to select them all, as shown in the graphic below.

	Year1	Year2	Year3	TotalTtotal
Min	£72,422	£37,604	£11,186	122,075 Hrs
Likely	£85,203	£44,240	£13,160	143,618 Hrs
Max	£102,243	£53,089	£15,792	172,341 Hrs

Uncertainty ✖

please select uncertainty

6. Once you have selected the Likely cells click **OK**.
7. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation. The selected cells are added to the Uncertainty list, the 3PE parameters are applied and the new selections are displayed in the main Uncertainty Drivers list.

5.3.2.2 Input Uncertainty by import from an Uncertainty Register

To import Uncertainty from an external register in an Excel workbook:

2. Ensure the external register is prepared and saved in the following format:

Cell Reference	Name	Level	Minimum	Likely	Maximum	Shape	Whole
'Cost Model'!H6	Hrs_Ship1_Design		50		150	Uniform	FALSE
'Cost Model'!H7	Hrs_Ship1_Proc		50	100	150	Triangular	FALSE
'Cost Model'!H8	Hrs_Ship1_ILS		75	100	125	Beta	FALSE
'Cost Model'!H9	Hrs_Ship1_OpsMan		0.1	50	0	Normal	FALSE
'Cost Model'!H5	Hrs_Ship1_PM	High					

(the cell name is optional but can be used instead of the Cell Reference to allow consistent parameter application where the target cell reference is not consistent between workbooks.

3. Click once on the **Data** control on the **Uncertainty Tab Feature Bar**
4. Select **Import Parameters** then **From external register (.xls)** option.
5. Select the file name and location from the displayed file-browser window
6. Click **Open**.
7. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation. The imported information is added to the Uncertainty list and displayed in the main Uncertainty Drivers list.

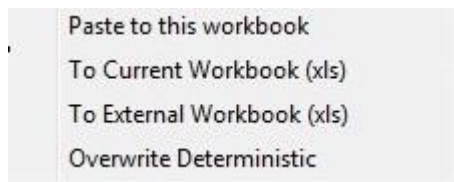
5.3.2.3 Generate an Uncertainty Register import template

The application contains a function to generate for the user a new workbook with a pre-configured risk register import template for easy population.

To generate the risk register import template in new workbook:

1. Click once on the **Data** control on the **Uncertainty Tab Feature Bar**
2. Select **Import Parameters** then **Generate external register (.xls) template** option.
3. A new Excel workbook will be created which contains the pre-configured template layout. Populate the template with uncertainty data and be sure to extend the Excel **Name Range** 'Uncertainty' to include all new line items.

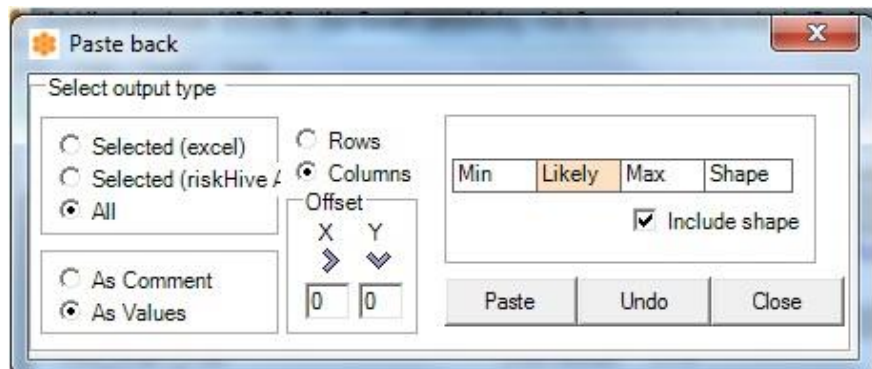
5.3.3 Export parameters



5.3.3.1 Paste to this workbook

This will you add Arrisca values to Excel workbook

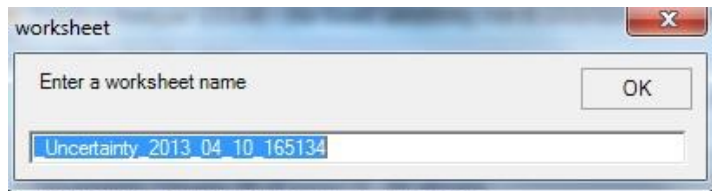
- Select paste to this option
- Fill in popup “paste back” options
- Note addition values can be added as rows or columns with offsets



5.3.3.2 Export to Current Workbook

This allows you to export uncertainties to the current workbook as a new worksheet.

- Select To current workbook from Data> Export Parameters
- A popup option box will allow to change the name of worksheet if required, sheet is pre name by the Arrisca tool , press OK to finish operation.



5.3.3.3 Export To External Workbook as an uncertainty register

To export Uncertainty to an external register in a new Excel workbook:

1. Click once on the **Data** control on the **Uncertainty Tab Feature Bar**
2. Select **Export Parameters** then **To external register (.xls)** option.
3. Select the file name and location in the displayed file-browser window
4. Click **Save**.
5. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation.

The Uncertainty parameters are exported in the following format:

Cell Reference	Name	Level	Minimum	Likely	Maximum	Shape	Whole
'Cost Model'!H6	Hrs_Ship1_Design		50		150	Uniform	FALSE
'Cost Model'!H7	Hrs_Ship1_Proc		50	100	150	Triangular	FALSE
'Cost Model'!H8	Hrs_Ship1_ILS		75	100	125	Beta	FALSE
'Cost Model'!H9	Hrs_Ship1_OpsMan		0.1	50	0	Normal	FALSE
'Cost Model'!H5	Hrs_Ship1_PM	High					

The parameters may be edited, extended or reduced as required in Excel and then re-imported into the application using the **Uncertainty Tab Feature Bar Data > Import Parameters > From external register (.xls)** control described in Section 5.3

5.3.4 Remove Uncertainty

Uncertainty may be removed by one of two methods:

- All
- Selected rows only

To remove **all** uncertainty assessments and clear the Uncertainty Driver list:

1. Click once on the **Data** on the **Uncertainty Tab Feature Bar** then select **Remove uncertainty**
2. Select the **All** option
3. A progress indicator appears and a confirmation message is displayed once the task is finished.

To remove **selected** uncertainty assessments and remove them from the Uncertainty Driver list:

1. Select the rows representing the cells you want to remove from the Uncertainty Drivers list
2. Click once on the **Data** on the **Uncertainty Tab Feature Bar**
3. Select the **Remove uncertainty** then **Selected rows** option
4. A progress indicator appears and a confirmation message is displayed once the task is finished.

5.3.5 Activate Uncertainty

To deactivate uncertainty assessments and clear the Uncertainty Driver list:

4. Click once on the **Data** on the Uncertainty Tab Feature Bar then select **Activate uncertainty**
5. Select the **All** option
6. A progress indicator appears and a confirmation message is displayed once the task is finished. View “**Active**” column to confirm operation.

To remove **selected** uncertainty assessments and remove them from the Uncertainty Driver list:

5. Select the rows representing the cells you want to remove from the Uncertainty Drivers list
6. Click once on the **Data** on the Uncertainty Tab Feature Bar
7. Select the **Activate uncertainty** then **Selected rows** option
8. A progress indicator appears and a confirmation message is displayed once the task is finished. View “**Active**” column to confirm operation.

5.3.6 Deactivate Uncertainty

To deactivate uncertainty assessments and clear the Uncertainty Driver list:

7. Click once on the **Data** on the Uncertainty Tab Feature Bar then select **Deactivate uncertainty**
8. Select the **All** option
9. A progress indicator appears and a confirmation message is displayed once the task is finished. View “**Active**” column to confirm operation.

To remove **selected** uncertainty assessments and remove them from the Uncertainty Driver list:

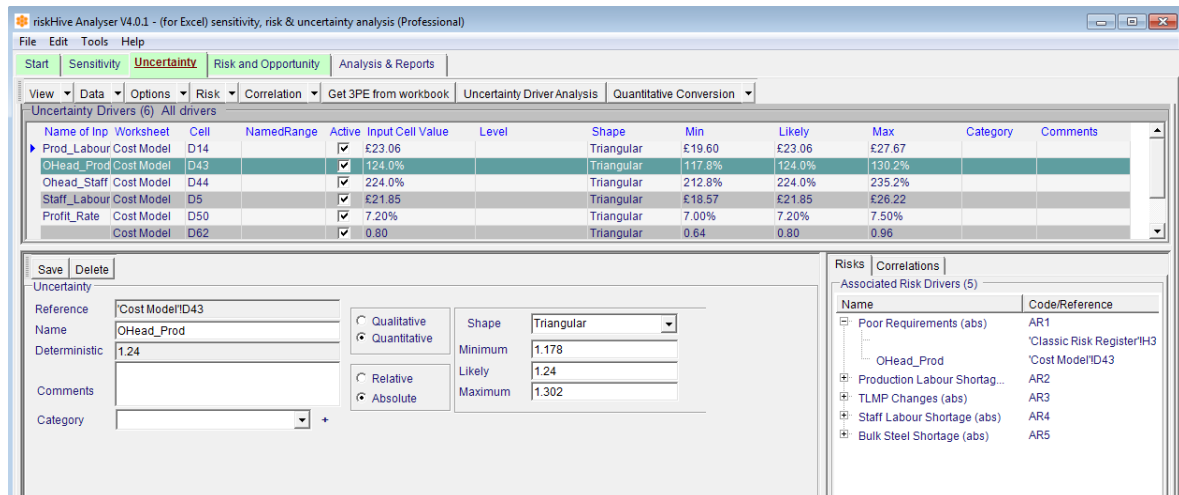
9. Select the rows representing the cells you want to remove from the Uncertainty Drivers list
10. Click once on the **Data** on the Uncertainty Tab Feature Bar
11. Select the **Deactivate uncertainty** then **Selected rows** option
12. A progress indicator appears and a confirmation message is displayed once the task is finished. View “**Active**” column to confirm operation.

5.4 Risk



5.4.1 Show all Risks

By default any risk associated with the cell row highlighted in the Uncertainty window will be displayed in the 'Risks' window in the bottom right of the Uncertainty screen. The 'show all risks command will display all risks associated with any uncertainty row in the small window.



5.4.2 Add selected Uncertainties

The cells highlighted will be added to the risk tab as impacts associated with either an extant or newly created risk.

- Select the row that you wish to add the impact values.
- Click Risk tab then Add Uncertainty.
- A popup “define selected Uncertainty Impacts” will appear
- Complete the **Probability** either as Quantitative percentage value or Qualitative statement.
- Complete **Assessment** with impact values (quantitative) or percentage impact (Relative) . This is impact the risk may have on the selected element not to be confused with the 3PE uncertainty estimate. If you unable to define values, click Qualitative and use statements from the dropdown menu to define impact.
- Press **Save and Close** button

5.4.3 Add All uncertainties

All cells that have uncertainty will be added to the risk tab as impacts associated with either an extant or newly created risk.

- Click Risk tab then **Add ALL Uncertainty**.
- A popup “define selected Uncertainty Impacts” will appear
- Complete the **Probability** either as **Quantitative** percentage value or Qualitative statement.
- Complete **Assessment** with impact values (quantitative) or percentage impact (Relative). This is impact the risk may have on the all the elements not to be confused with the 3PE uncertainty estimate. If you unable to define values, click Qualitative and use statements from the dropdown menu to define impact.
- Press **Save and Close** button

5.5 Correlation

Correlation between any uncertainty inputs can easily be applied from the Uncertainty Drivers List and managed from the Associated Correlations box.



Correlation is the expression of interaction between variables.

- Correlation is used to describe the derivative effect of the variation of nominated 'lead' elements on 'dependent' elements during analysis.
- Correlation can be used to make variables 'follow' or 'repel' each other to a degree specified by what is called the Coefficient of Correlation.
- The relationship between the variables may be described as either Direct or Inverse depending on the nature of effect.

5.5.1 Add correlation to Uncertainty Driver cells

In the Uncertainty Drivers list on the Uncertainty Function Tab:

1. Select the Uncertainty Driver rows you wish to correlate using the Ctrl key
2. Right-click once on one of the selected cells and a menu appears
3. Select the **Add Correlation with uncertainty of 'Cell x'** option

The screenshot shows the riskHive Analyst V3.5.46 interface. The 'Uncertainty Drivers' list on the left contains several rows. A right-click menu is open over the 'Hrs_Ship1_Fab' row, with the option 'Add Correlation with cell 'Cost Model' H17' highlighted. The 'Correlation' dialog box is open, showing 'Cost Model' H17 as the cell to correlate with 'Cost Model' H18. The 'To degree' is set to 100%. The 'Risk & Correlation Panel' on the right shows the 'Associated Correlations (1)' table.

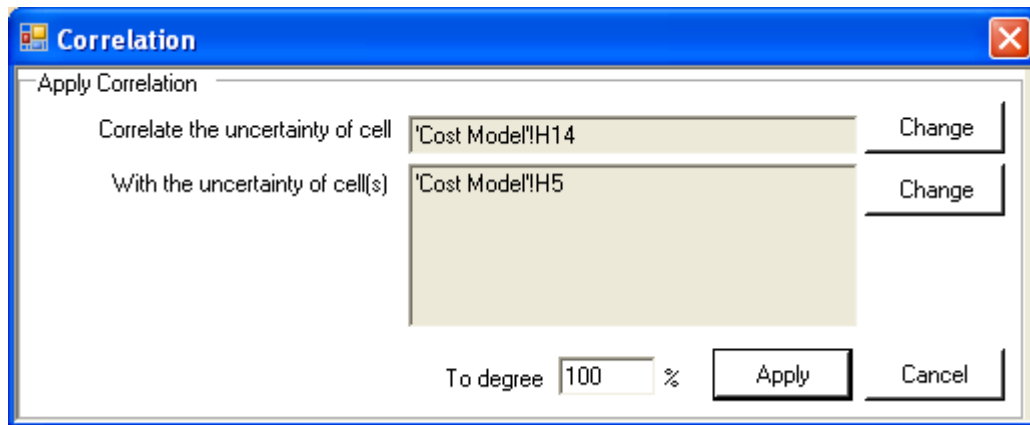
Left	Right	Active	Coefficient
'Cost Model' H17	'Cost Model' H18	<input checked="" type="checkbox"/>	1

Right Click menu

Correlation dialog box

Risk & Correlation Panel

4. The Correlation dialog box will appear. From here you can change either the cells to be correlated or the degree of correlation to be applied.



5. Using the **Change button** select the desired cells and degree of correlation selected, click once on the **Apply** button to commit the correlation to the simulation.

The Associated **Correlations panel** will be populated.

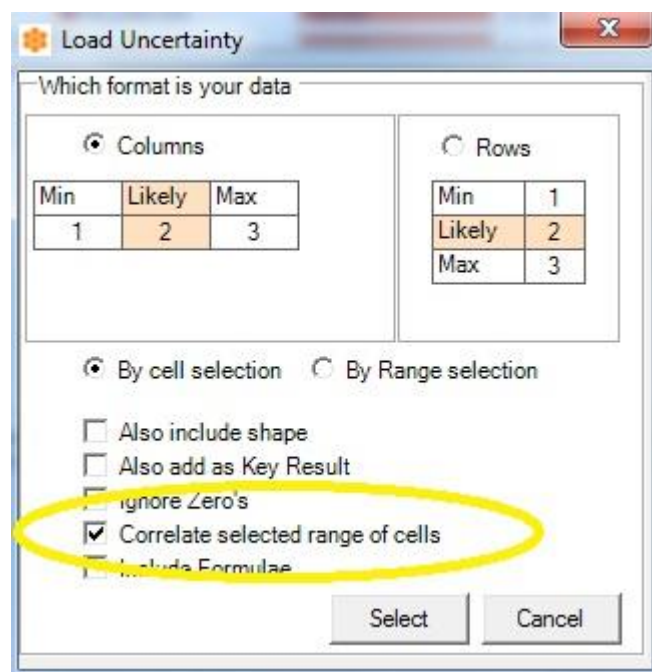


Parameter Inputs:

- Lead variable
- Tracking variable (s)
- Correlation coefficient (value = -100% through +100%)
- Any degree of Direct or Inverse correlation can be specified, with the greatest effects at the -100%/+100% limits.

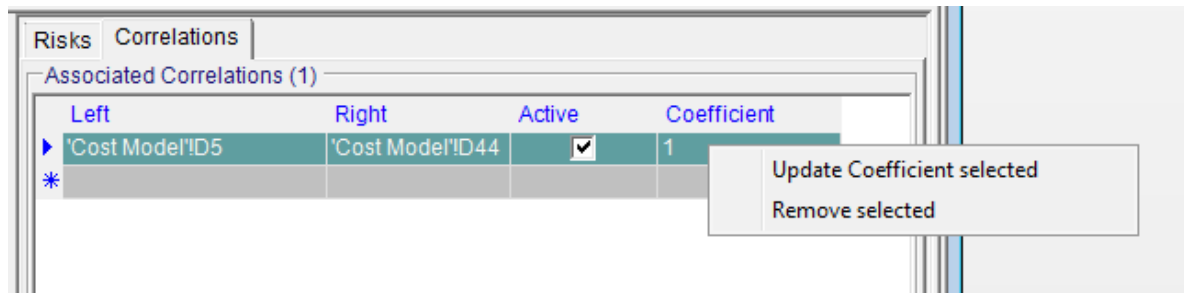
5.5.2 Add correlation when grabbing Uncertainty from workbook

In the **Get 3PE from workbook** function as described in Section 5.2, check the box for Correlate Selected Range of Cells before import.



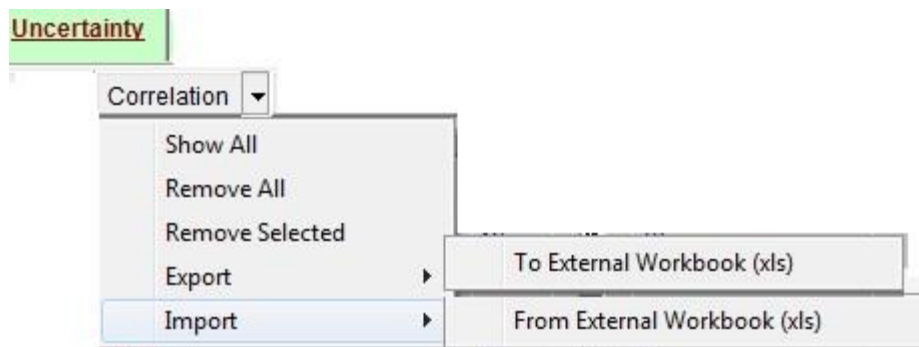
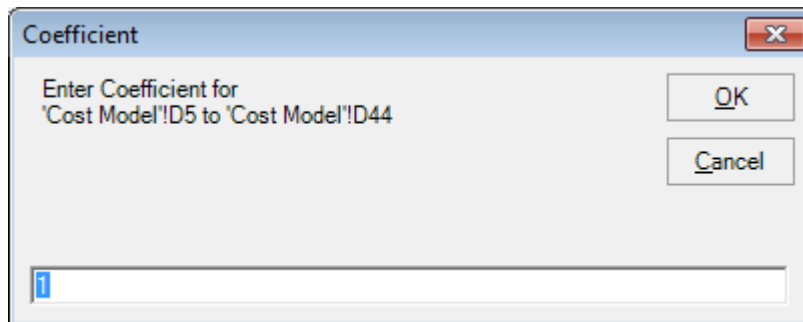
5.5.3 Remove correlation from Uncertainty Drivers

In the **Associated Correlation** window select the correlated items you wish to remove then right click verify action by clicking the **remove selected** popup box



5.5.4 Update Correlation

In the **Associated Correlation** window select the correlated items you wish to change right click verify and verify **update Coefficient selected**. A popup menu will appear displaying details of the correlated items selected, type in new coefficient a value between -1 and +1 (1=100%)



5.5.5 Show All

This function control what is displayed in Risk/Correlation panel (btm. right hand of screen)

- Select **Correlation** from **Uncertainty** function tab
- Select **Show All** to display all the items that are correlated.

5.5.6 Remove All

This function control what is displayed in Risk/Correlation panel (btm. right hand of screen).

- Select **Correlation** from **Uncertainty** function tab
- Select **Remove All** to remove correlated items from display.

5.5.7 Remove Selected

This function removes selected items from view.

- Using **Ctrl** key and **left click** select items to be removed.
- Select **Correlation** from **Uncertainty** function tab
- Select **Remove Selected** to remove correlated items from display.

5.5.8 Export

Will export the correlation data to an Excel workbook

- Select **Correlation** from **Uncertainty** function tab
- Select **Export**, you be ask to **Name** the file then press **Save**, this will create a new workbook in the format shown below. Remember to fill in Excel with metadata and **Save**.

	A	B	C	D	E	F	G
1	FlexPro Excel Correlation						
2							
3	Contract:						
4	Date:						
5							
6	Correlation:						
7	Left Reference	Right Reference	Coefficient	Active		Correlation Matrix:	
8						Sum of Coefficient	Left Reference
9						Right Reference	1
						2	3

5.5.9 Import

Will Import Correlation data from an Excel workbook

- Select **Correlation** from **Uncertainty** function tab
- Select **Import**> select file from Import manager.



: *file must be in the format shown above.*

5.6 Get 3PE from workbook

There are certain common layouts of Uncertainty values in a spreadsheet. The application provides the ability to ‘grab’ this data from the spreadsheet. The two most common layouts are:

- **Columns** - where the minimum & maximum values are in adjacent cells to the left and right of the likely value, laid out as in the following graphic;

Min	Likely	Max
1	2	3

and

- **Rows** - where the minimum & maximum values are in adjacent cells directly above and below the likely value, laid out as in the following graphic;

Min	1
Likely	2
Max	3

The cells may be grabbed either individually, as contiguous or non-contiguous selections or by ranges. The main purpose of this feature is to ‘grab’ large amounts of 3PE input data in one go. It is quite normal to select a range of cells containing many thousands of 3-point estimates to import by a single click.

5.6.1 Grab options for 3PE Uncertainty import from worksheet

As well as grabbing the 3-point estimate cells and parameters from the workbook it is possible to carry out additional functions during the process:

- **Also include shape** - allows specification of distribution to be applied. Simply ensure the initial letter of the distribution is included to the right of for Columns or below for Rows. Common shapes, with parameters, are:
 - C = Constant (Likely)
 - U = Uniform (Min, Max)
 - T = Triangular (Min, Likely, Max)
 - B = Project Beta (Min, Likely, Max)
 - N = Normal (Sigma = Std Deviation, Mu (Mean)) - Use Distribution tool to establish Mu & sigma value see Sect 9.1.3
 - L = Lognormal (Sigma = Std Deviation, , Mu (Mean), deterministic) - Use Distribution tool to establish Mu & sigma value see Sect. 9.1.3
- **Also add as Key Result** - This option adds the Likely cells to the list of Key Results as part of the grab process. This results in statistical data being calculated for all of the likely cells during a Monte Carlo simulation and the subsequent paste-back of the statistical confidence-related values.
- **Ignore zeros** - this option identifies and ignores zero-value likely cells during the grab process, reducing the number of nugatory cells that are imported and displayed in the Uncertainty Drivers and Key Results lists.

5.7 Add Uncertainty by Driver manipulation

Uncertainty may be added by recording the manipulation of the Sensitivity Drivers on the **Sensitivity Function Tab**.

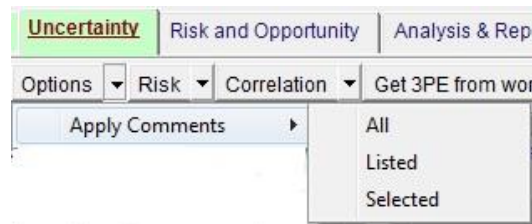
To add Uncertainty from manipulation of the Sensitivity Drivers:

1. Ensure that a **Driver Analysis** (see section 3) has been run in **Start** function.
2. Navigate to the **Sensitivity Function Tab** by clicking once on the tab
3. Select the **Drivers** to be flexed and added to the Uncertainty List
4. Set **Likely** values:
 - i. Use either the **Manual Flex Control Slider** or the **+ or - Flex Buttons** to manipulate the selected drivers to a desired state which represents a set of **Likely** Uncertainty values
 - ii. On the **Feature Bar**, select the **Apply Flex Values** control
 - iii. Select **Selected** and most **Likely**
 - iv. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete.
 - v. The Driver cells have been added to the Uncertainty Drivers List on the Uncertainty Function Tab with a Constant shape of the value set by the flex manipulation
5. Set **Minimum** values:
 - i. Use either the **Manual Flex Control Slider** or the **+ or - Flex Buttons** to manipulate the selected drivers to a desired state which represents a set of **Minimum** Uncertainty values
 - ii. On the **Feature Bar**, select the **Apply Flex Values** control
 - iii. Select **Selected** and **Minimums**
 - iv. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete.
 - v. The Minimum values have been added to the parameters on the Uncertainty Drivers List on the Uncertainty Function Tab. The shape is now indeterminate and is highlighted in red.
6. Set **Maximum** values:
 - i. Use either the **Manual Flex Control Slider** or the **+ or - Flex Buttons** to manipulate the selected drivers to a desired state which represents a set of **Maximum** Uncertainty values
 - ii. On the **Feature Bar**, select the **Apply Flex Values** control
 - iii. Select **Selected** and **Maximums**
 - iv. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete.
 - v. The Maximum values have been added to the parameters on the Uncertainty Drivers List on the Uncertainty Function Tab. The shape is now Triangular and the assessment is complete.

5.7.1 Options

Apply Comments to workbook cells; any comments that have been added and saved to the Uncertainty Driver list may subsequently be inserted into the comments field of the workbook cells.

To apply the comments to the workbook:



1. Ensure you have recorded and saved comments in the Uncertainty Drivers (comment text is visible in the Comments column to the right of the list)
2. Click once on the **Options** control on the Uncertainty Tab Feature Bar
3. Select **Apply Comments** then select either **All**, **Listed** or **Select** option
4. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation. The comments have now been inserted into the relevant cells in the workbook. Any existing comments for each cell have been appended not replaced.

5.8 View the impact of Uncertainty

Name of Worksheet	Cell	NamedRange	Active	Input Cell Value	rank	Outcome Volatility	Cell Volatility%	Likely Offset	Effect@Min	Effect@Max	Category	Comments
Uncertainty	C16	2940	✓	2940	1	1,200.00	40.82	0	-540.00	860.00		
Uncertainty	C9	2304	✓	2304	2	1,080.00	46.68	0	-504.00	576.00		
Uncertainty	C12	1320	✓	1320	3	720.00	54.55	0	-240.00	480.00		
Uncertainty	C13	1680	✓	1680	3	720.00	42.86	0	-240.00	480.00		
Uncertainty	C15	2520	✓	2520	3	720.00	28.57	0	-240.00	480.00		
Uncertainty	C14	1260	✓	1260	7	480.00	36.10	0	-180.00	300.00		
Uncertainty	C7	2160	✓	2160	6	660.00	30.56	0	-180.00	480.00		

To understand the impact the drivers that have associated uncertainty select the **Uncertainty Driver Analysis** feature tab this refresh the viewing panel with new information; the new columns are:

- **Outcome Volatility-** The drivers total possible impact on the grand total i.e. The selected cell chosen as the “Key Output cell”
- **Cell Volatility-** The drivers overall percentage impact.
- **Likely Offset-** The drivers total impact in units of base assessment (units of the target cell in workbook)
- **Effect@Min** The drivers minimum effect in base units
- **Effect@Max** The drivers max effect in base units



: Use **View > Parameters Formatted** to switch viewing panel back to 3PE value view.



There is a known issue regarding **Effect@Max** if the software has gone through several load and reload files cycles the values shown are the same for each row, if this occurs it is necessary to use Tools> clear or in extreme circumstances reboot the computer.

5.9 Quantitative Conversion

Uncertainty

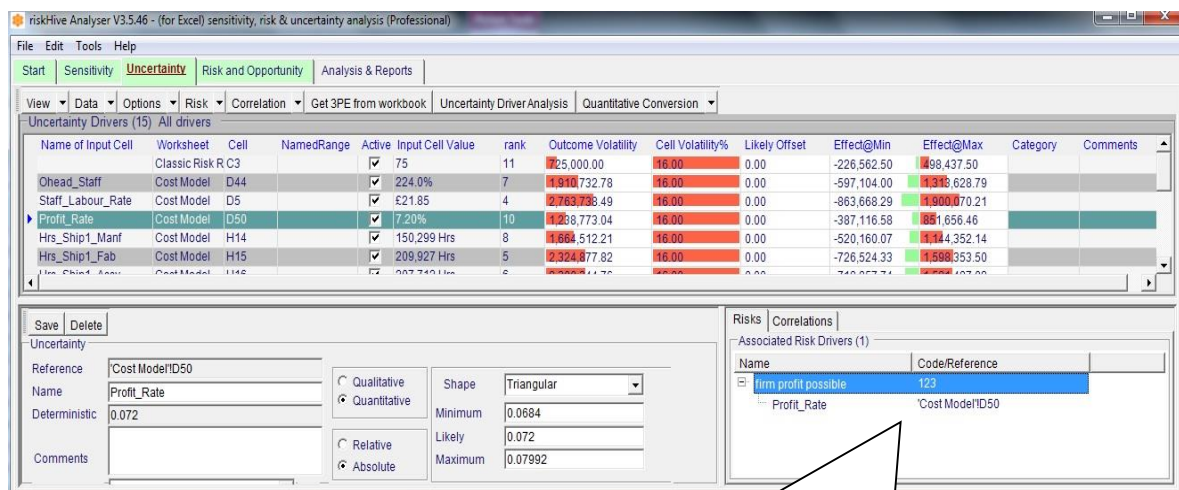


If you have used any form of **Qualitative** assessment it will necessary to covert **Qualitative** to a **Quantitative** value

- Select Quantitative Conversion from the Uncertainty function
- Select All or pre select a row(s) from the viewing panel, use Ctrl+Click to select more than one row.

5.10 Associated Risk Drivers window

Cells that have Uncertainty parameters may also have risk parameters attached. The Associated Risk Drivers window allows the user to see what risk or opportunities may be associated with the cell selected in the main list.

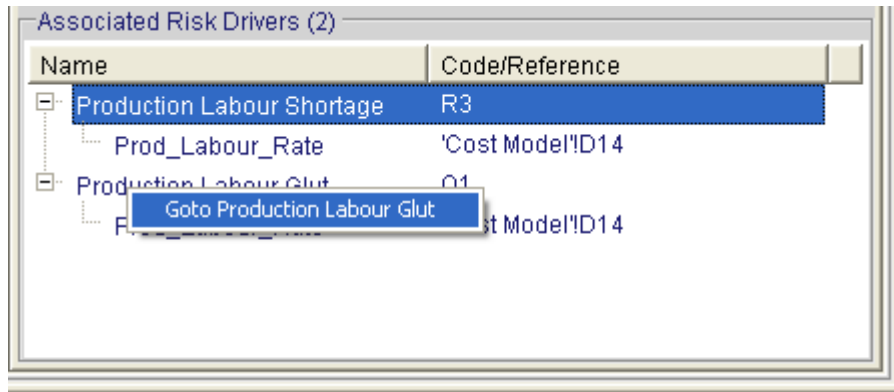


If risk drivers exist for the selected cell, use the + or - controls to expand or collapse the risk driver impact list.

To access the risk drivers associated with the cell:

1. Right-click on the name of the risk in the associated risk drivers pane
2. Select Goto [name of risk driver]

3. The Risk and Opportunity Function Tab is displayed and the associated risk driver is selected and its parameters are displayed.



5.10.1.1 Sensitivity Driver panel contextual menu (right-click)

There are a number of options available by making a right mouse click menu within the driver panel, as shown below:



5.10.1.1.1 Goto this cell in workbook

- Goto this cell in workbook - selects and focuses target cell



: This is a quick way of finding the Driver inputs in the Excel workbook.

5.10.1.1.2 Driver Actions sub menu

The following options are available:

- **Reset** - returns this cell to its original Excel values comments and names added are not affected.
- **Exclude cell from sensitivities** - inserts an '=' sign as a prefix to cell
- **Hide** - hides cell from Drivers list
- **Unhide** restores hidden rows

5.10.1.1.3 Apply sub menu

This command transfers the current cell value to the Uncertainty assessment, full flex instruction are detailed in 4.1.7.; options are available:

- **Minimum** - applies current flex value to Uncertainty minimum value
- **Likely** - applies current flex value to Uncertainty likely value
- **Maximum** - applies current flex value to Uncertainty maximum value

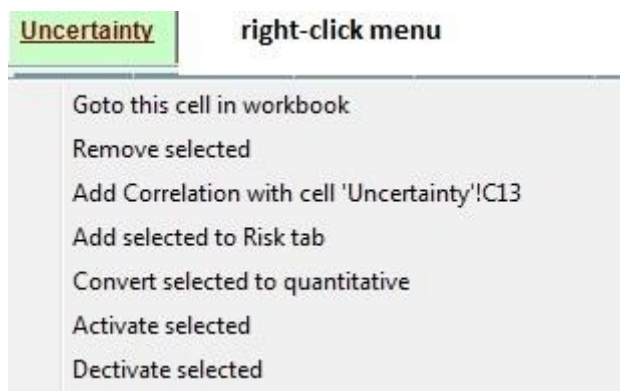
5.10.1.1.4 **Highlight menu**

This command highlights in the Excel sheet the current cell only in the colour you select.



5.10.2 **Uncertainty panel contextual menu (right-click)**

Select the row from uncertainty display panel, there are a number of options available by making a right mouse click menu, as shown below:



5.10.2.1 **Add Goto this cell in workbook**

- Goto this cell in workbook - selects and focuses target cell



: This is a quick way of finding the Driver inputs in the Excel workbook.

5.10.2.2 **Remove Selected**

- Remove rows from uncertainty calculations.

5.10.2.3 **Add Correlation with cell (selected row)**

This command provides a shortcut to correlation method detailed in 5.7.7

Add 'selected cell' to Risk

This command provides a short method that bypasses the Risk feature covered in 4.1.8 that is it enables you to transfers the current cell to the risk Drivers list.

5.10.2.4 **Convert selected to quantitative**

Converts selected row from qualitative (%) to values

5.10.2.5 **Activated selected**

Include row in calculations.

5.10.2.6 **Deactivate selected**

Exclude selected row from calculations

6 Risk and Opportunity function tab

6.1 Risk

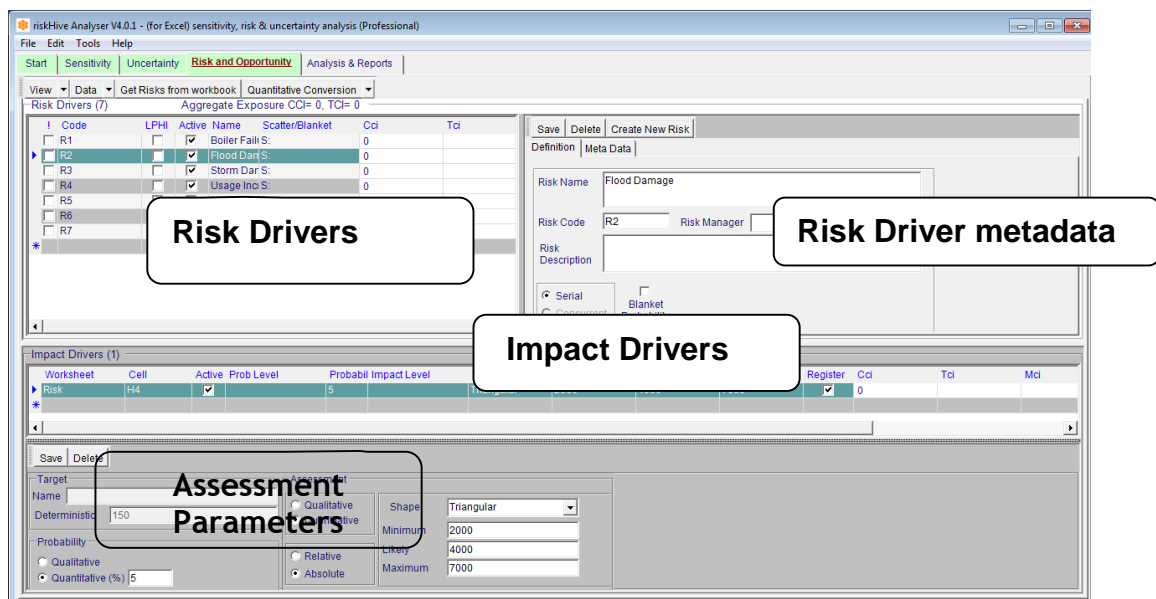
As far as the term Risk is used you may consider the word Opportunity to be exchangeable where the effect of the impact is of the opposite polarity.

The differentiator between Risk (and Opportunity) and Uncertainty is the Probabilistic element - also known as Likelihood.

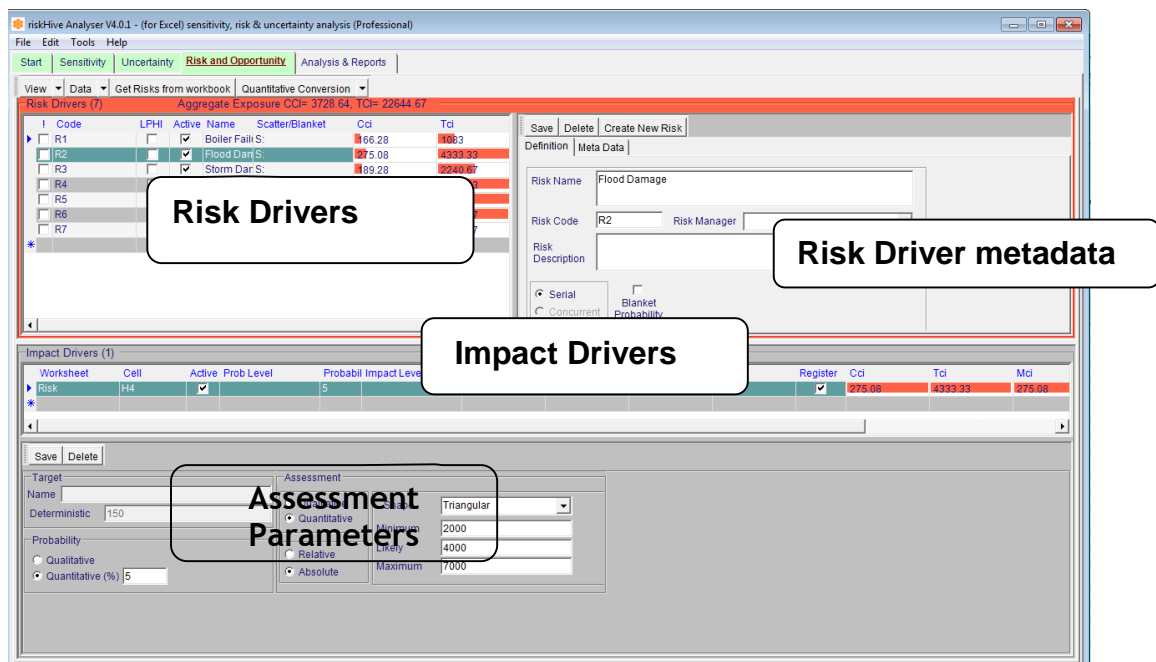
In risk, for there to be a Likelihood of occurrence, recorded as Probability on a scale of 0% - 100%, there must be an associated event or root-cause for the impact to manifest.



Opportunity is utilised by the tool as being a negative “risk” value eg. Min -700, Most Likely -500 and Max -200



Pre Simulation view



Post simulation view

Risk Display

The main window on the Risk and Opportunity tab displays a summary of the Risk Driver parameters beneath the Features Bar with its risk-related controls. Each row in the list of Risk Drivers pertains to one Risk or Opportunity. The total number of risk drivers in the system is shown at the top of the Risk Drivers list in the Risk Driver Summary Bar. The colour of the Risk Driver Bar in post simulation display is indicative of the polarity of effect of the aggregate risk driver list:

- Red - the effect of the drivers is to increase the overall outturn value

- Green - the effect of the drivers is to decrease the overall outturn value



: It is subjective as to whether an increase or decrease in the outcome represents good / bad, red / green, or risk / opportunity - dependent on your perspective - therefore the colours that represent increase and decrease are configurable in Settings and Configuration. See **Section 8** for details.

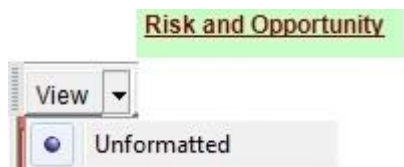
Each row in the Impact Drivers list pertains to an impact that acts on an input cell in the attached Excel workbook.

Each column contains a parameter pertaining specifically to the risk selected. The Risk Drivers list may be sorted by any column alphanumerically ascending or descending by clicking on the column header description title.

Column headings are:

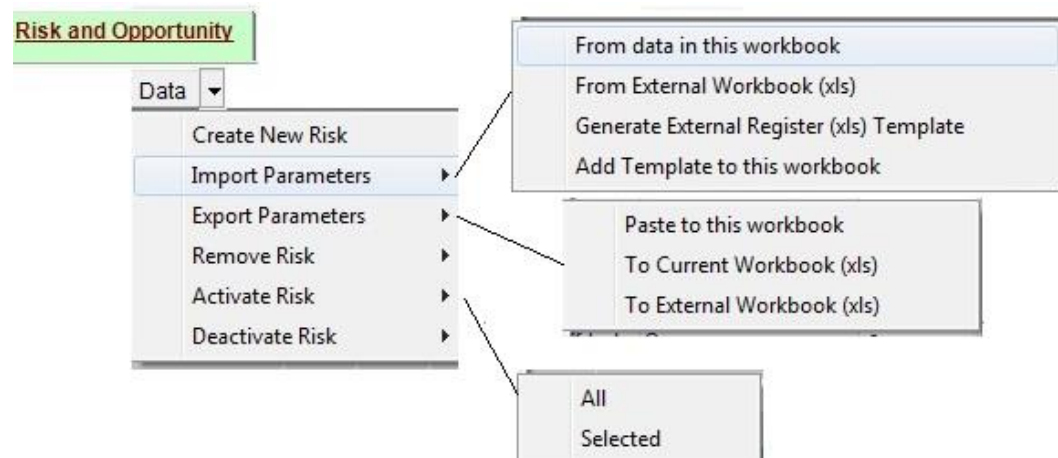
- Risk Driver List:
 - Code: Unique risk identifier (optional)
 - Active: Indicates if the risk is active during simulation
 - Name: The high-level short-name of the risk
 - Scatter / Blanket: Indicates probability dependence
 - CCI: Context Critical Impact - the risk outcome in common units
 - TCI: Total Critical Impact - non-probabilistic risk outcome in common units
- Impact Driver List:
 - Worksheet: Location of the Cell in the Workbook
 - Cell: Location of the Cell in the Worksheet
 - Probability Level: Qualitative Probability Level (if applied - HML)
 - Probability: Quantitative probability (as integer: scale 0-100)
 - Impact Level: Qualitative Impact Level (if applied - HML)
 - Shape: Quantitative distribution type (Uniform, Triangular, etc)
 - Min: Quantitative lowest possible value for 3PE
 - Likely: Quantitative most likely value for 3PE
 - Max: Quantitative highest possible value for 3PE
 - CCI: Context Critical Impact - the risk outcome in common units
 - TCI: Total Critical Impact - non-probabilistic risk outcome in common units
 - MCI: Mean Critical Impact - actual mean impact of risk in units of base assessment (units of the target cell in workbook)

6.2 View



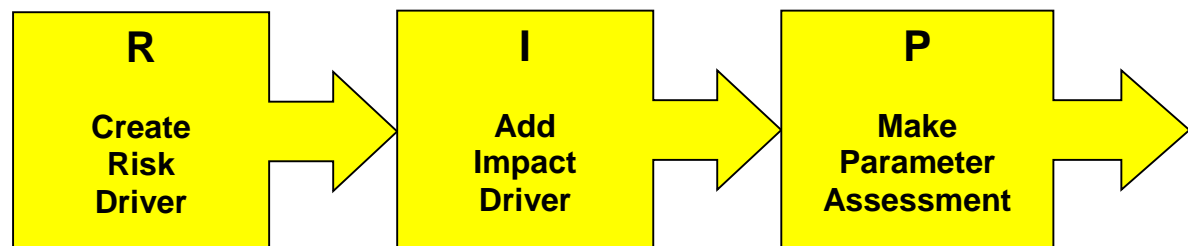
Tool is Factory set at **Unformatted** view only

6.3 Data



6.3.1.1 Create a new risk

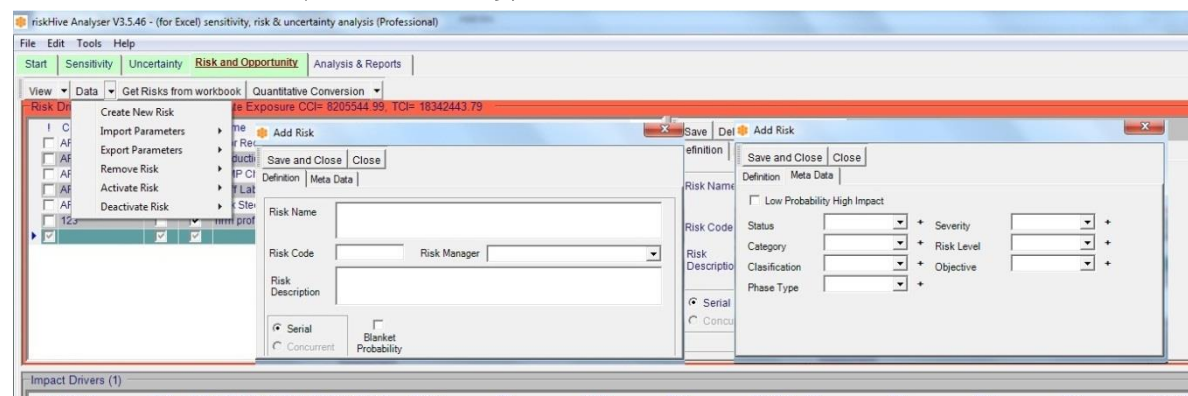
To add a **Risk Driver** by manual entry, follow the following 3-point procedure:



Risk may be added in one of three ways:

- Add by manual entry
- Import from cells in the attached workbook
- Import from a separate Risk Register

6.4 Create New Risk (manual entry)



6.4.1 To add a Risk Driver by manual entry:

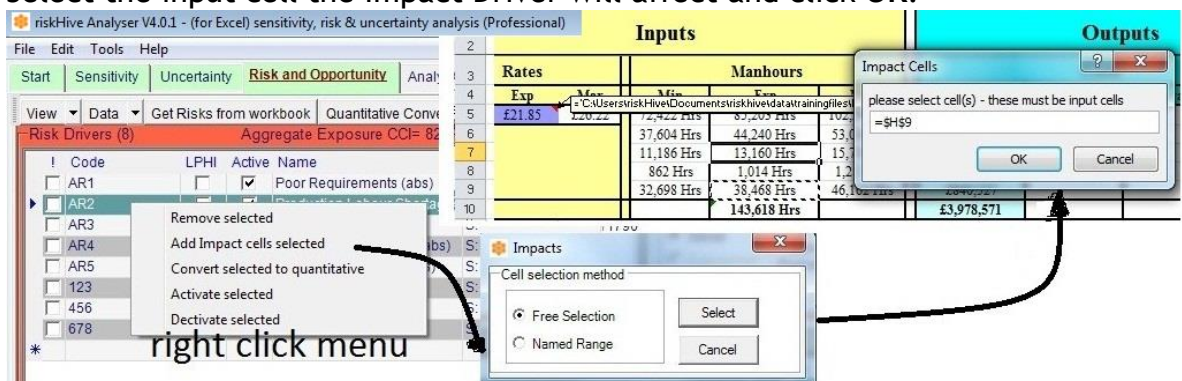
1. Click once on the **Data** control on the **Risk and Opportunity Feature Bar** then select **Create New Risk** . The Risk Add Driver will pop up:
 - a. Type the **Name** of the new risk driver (mandatory),
 - b. Enter the **Risk Code**, if applicable (optional)
 - c. Select the **Risk Manager** (optional)
 - d. Enter a high-level **Description** of the risk (Optional)
2. **Meta Data** - will require you to fill the relative metadata via dropdown menus. These dropdown menus can be update by the user to reflect your Organisations policy see 10.1 for details. Alternatively menu can be change using the “+” alongside the dropdown menu box.
3. Select Metadata from the pop up box Fill in the appropriate level from the dropdown menus
4. Click **Save**. The Risk Driver is displayed in Risk Drivers List on the left and metadata on right.

6.4.2 Add an Impact Driver to a Risk Driver

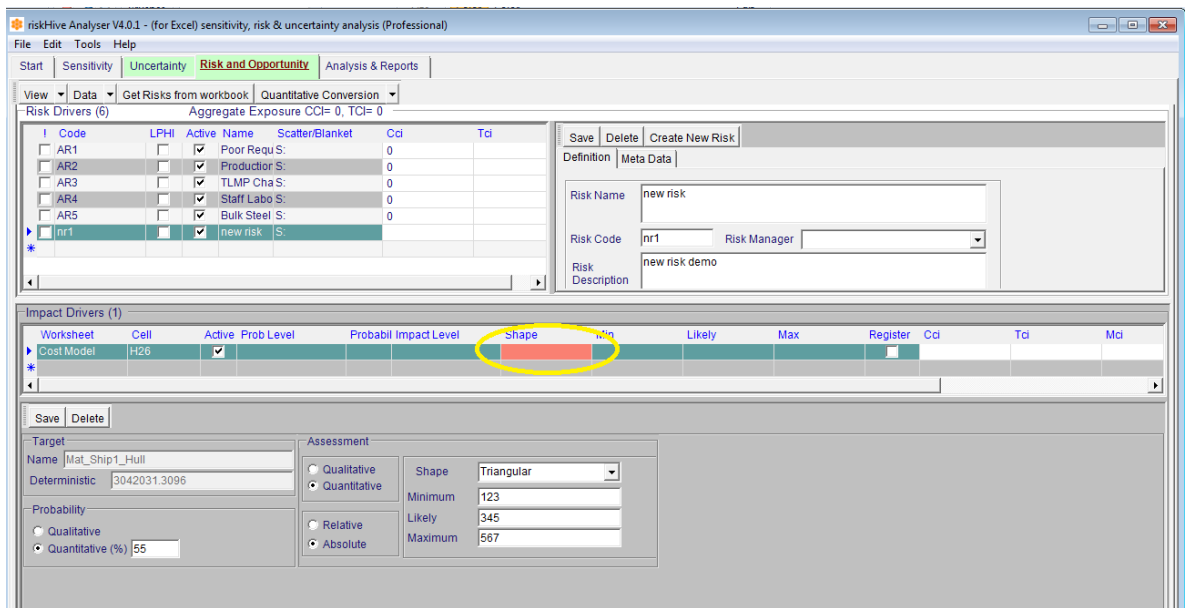
On its own a Risk Driver has no effect on the analysis. It requires the application of at least one **Impact Driver** to describe its effect on the workbook model. Each Risk Driver may have an unlimited amount of Impact Drivers, each affecting a different cell in the attached workbook. In this way it is possible to build-up complex effects of risk and opportunity and yet measure their aggregate effect.

To add an **Impact Driver** by manual entry:

1. In the Risk Drivers list pane select the **Risk Driver** row to which the Impact Driver is to be added by clicking once on the desired row.
2. Right-click once on the selected row and click on the **Add Impact Cells [risk name]** control on the context menu that appears.
3. Switch to Excel - the cell-selector box will appear in the attached workbook.
4. Select the input cell the Impact Driver will affect and click **OK**.



5. A confirmation message is displayed once the Impact is added is finished. Click **OK** to complete the operation. The impact is displayed in the **Impact Drivers List** pane. The Shape column is coloured red denoting an incomplete or incorrect parameter set.



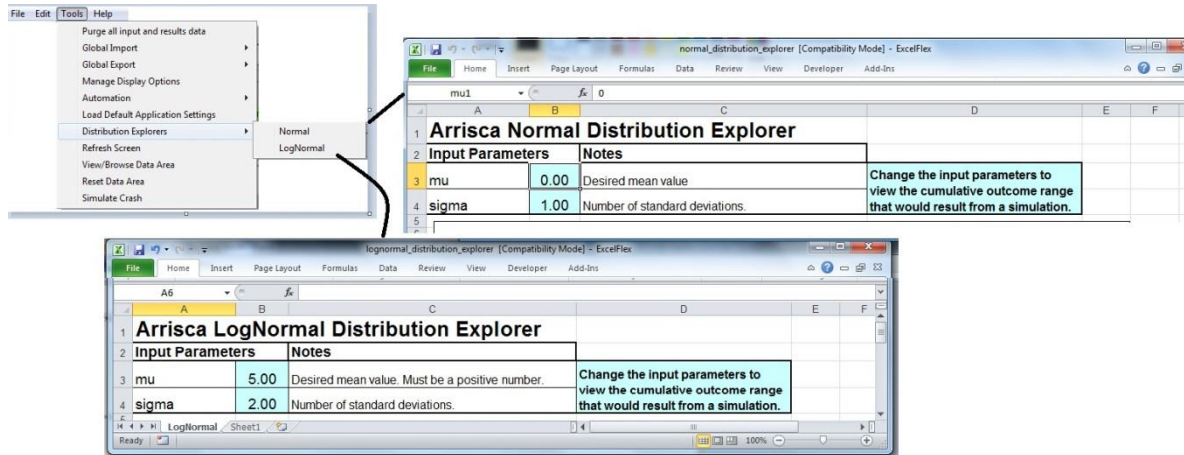
6.4.2.1 Add an Impact Assessment to an Impact Driver

To have an effect on the workbook during analysis an **Impact Driver** needs an **Impact Assessment** to describe its effect on the workbook model. Each **Impact Driver** has one impact assessment that pertains to and is quantified in the units of measurement of the cell to which it applies. e.g. if the cell's units are in \$ then the impact assessment is also in \$; and if the cell's unit is hours then the assessment is also in hours - not \$ or the final currency of the workbook.

To add an assessment to an **Impact Driver** by manual entry:

- In the **Impact Drivers** list pane select the **Impact Driver** row to which the Impact Assessment is to be added by clicking once on the desired row.
- The Impact Assessment Parameters pane at the base of the Risk & Opportunity Function Tab now relates to the selected Impact Driver.
- **Set Probability:**
 - a. Select either of the **Qualitative** or **Quantitative** options in probability sub panel.
 - i. **Qualitative:** Select the desired **Probability Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative:** Type in the desired **Probability** value (an integer between 0 and 100) in the field that appears to the right of the option.
- **Set Impact:**
 - a. Select either of the **Qualitative** or **Quantitative** options in the Assessment sun panel.
 - i. **Qualitative:**
 1. Select either **Relative** or **Absolute** levels;
 2. the desired **Impact Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative:**
 1. Select the desired **Shape** from the drop-down list that appears to the right of the option;
 - iii. Type in the desired Impact Values (min, likely, max, etc) in the fields that appear underneath the shape drop-down.

- Click **Save**. The Impact Driver Assessment parameters are displayed in the Impact Drivers List pane in their respective fields.



: Any blank, inappropriate or illegal field values are highlighted in red.



- Relative** will produce values for min. most likely and max (3PE) based on the deterministic value used in the model.
- Absolute** option will add the deterministic value to the pre-determined 3 PE defined by "User". This option is best suited to "Design to cost" modelling when detailed risk impact information is limited.

6.4.3 Input Risk by import from cells in the attached workbook

There are certain common layouts of Risk values in a spreadsheet.
The application provides the ability to ‘grab’ this data from the spreadsheet.
The most common layouts is:

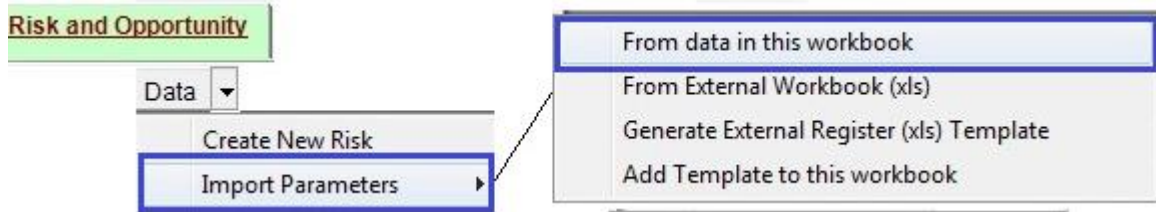
Code	Name	Prob	Minimum	Most likely	Maximum	Shape	Target	Description
AR1	Risk1	75	2,000,000	5,000,000	7,500,000	T	0	Rework required
AR2	Risk2	25	500,000	875,000	1,000,000	T	0	Rate increase
AR3	Risk3	15	600,000	1,000,000	1,250,000	B	0	Cost increase
AR4	Risk4	35	50,000		150,000	U	0	Rate increase
AR5	Risk5	15		400000		C	0	Material price

The risk parameters may be grabbed in one go by selecting the **Names** of risks.
The main purpose of this feature is to ‘grab’ large amounts of risk input data in one go. It is quite normal to select a range of cells containing an entire risk register to import by a single click.

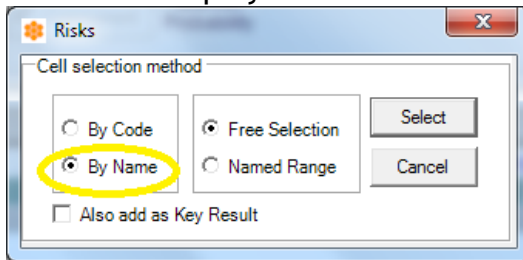


*: The **Target** cells must have a value of zero and if you want to calculate the total risk value you must create a sum total of all the risk target values. This total risk value can be summed with the total of the spreadsheet model to provide a risk-adjusted grand total value. You can select the **Target** cells as **Key Results** to generate individual statistical data or graphs for each risk.*

6.4.4 Import from the attached workbook:



- Click once on the **Data** on the **Risk and Opportunity Feature Bar**
- Select **Import Parameters** then **From data in this workbook** option. The cell-selector is displayed in the attached workbook.



- Use the mouse to **select only the Names** of the risks in a column. The application expects the risk parameters to be laid-out as described above so you don't have to select them all, as shown in the graphic below (the selected cells containing the risk names are highlighted in yellow):

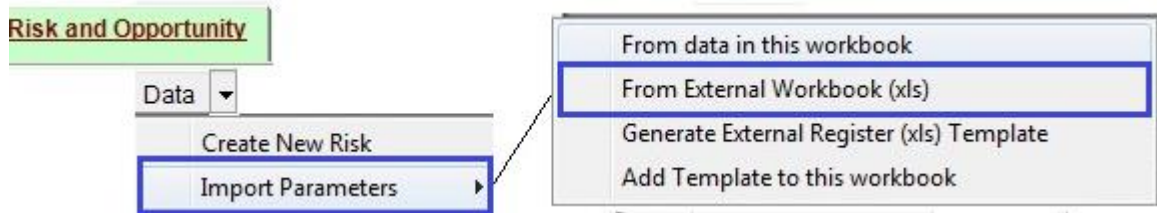
	A	B	C	D	E	F	G	H	I
1	Code	Name	Prob	Minimum	Most likely	Maximum	Shape	Target	Description
2	AR1	Risk1	75	2,000,000	5,000,000	7,500,000	T	0	Rework required
3	AR2	Risk2	25	500,000	875,000	1,000,000	T	0	Rate increase
4	AR3	Risk3	15	600,000	1,000,000	1,250,000	B	0	Cost increase
5	AR4	Risk4	35	50,000		150,000	U	0	Rate increase
6	AR5	Risk5	15		400000		C	0	Material price
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									

- Once you have selected the risk **Names** cells click **OK**.
- A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation. The selected risks are added to the Risk Drivers list.



: If your risk register is not exactly in this layout format you can create a template for the layout and then link the relevant cells to it. The import function can grab formulaic cells as well as 'constant' input cells.

6.4.5 Import from a separate Risk Register



To import risk data from an external risk register in an Excel workbook:

1. Ensure the external register is prepared and saved in the following format shown on the following page. The red box denotes the named range RISKS:
2. Click once on the **Data** control on the **Risk and Opportunity** Features Bar
3. Select **Import parameters** then **From external Workbook (.xls)** option.
4. Select the file name and location from the displayed file-browser window
5. Click **Open**.
6. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation. The imported information is added to the **Risk Drivers** list and displayed in the main list.

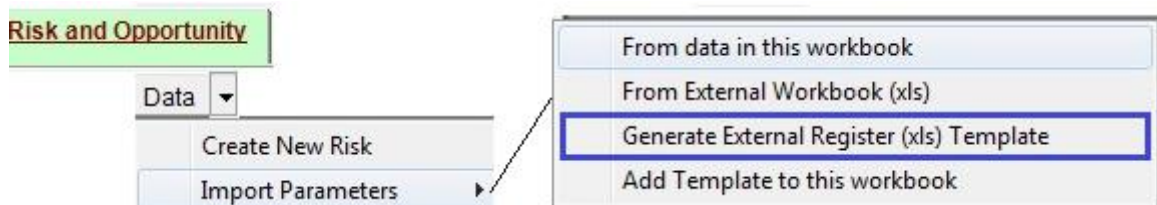
to allow consistent parameter application where the target cell reference is not consistent between workbooks.

Scatter or Blanket - scatter means all impacts of a risk instance are probabilistically independent - blanket means they are probabilistically linked. Use either **Probability Level (Qualitative)** OR **Probability (Quantitative)**- not both.

Use either **Impact Level (Qualitative)** OR **Min, Likely, Max (Quantitative)**- not both.

Serial or concurrent has no effect in Excel workbook modelling.

6.4.6 Generate an External Register import template



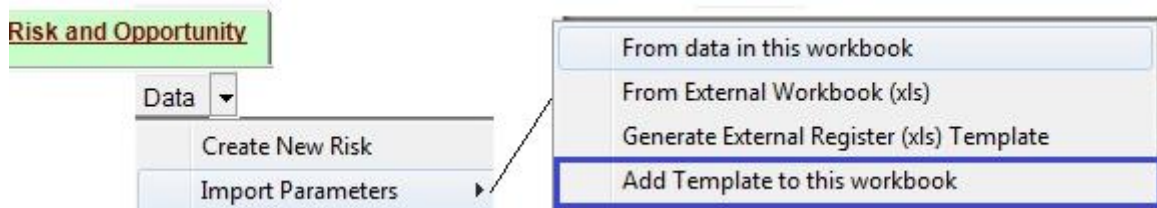
The application contains a function to generate for the user a new workbook with a pre-configured risk register import template for easy population.

To generate the risk register import template in new workbook:

1. Click once on the **Data** control on the **Risk and Opportunity** Feature Bar
2. Select **Import Parameters** then **Generate external register (.xls) template** option.
3. A new Excel workbook will be created which contains the pre-configured template layout. Populate the template with risk register data and be sure to extend the Excel **Name Range 'RISKS'** to include all new line items.

6.4.7

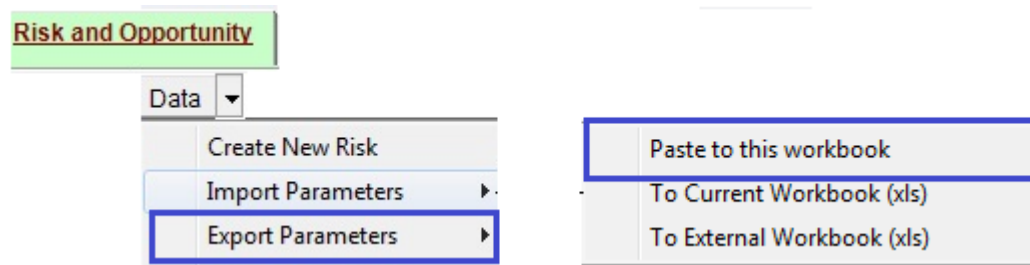
Add Template to this Workbook



1. Click once on the **Data** control on the **Risk and Opportunity** Feature Bar
2. Select **Import Parameters** then **Add template to this workbook** option.
3. A Message box will inform you when complete.

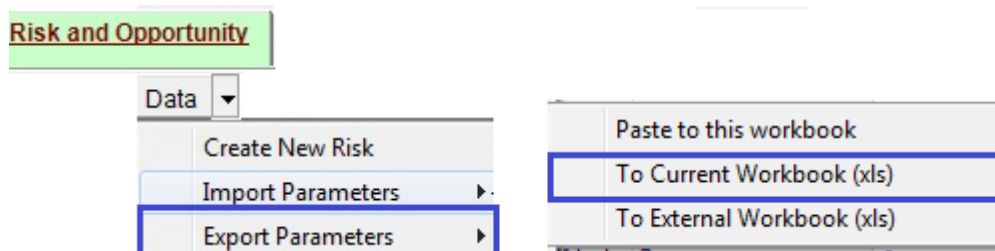
6.5 Export

6.5.1 Paste to this workbook



This command exports the set of risk parameters to the workbook in the format of the embedded risk register from which it was originally imported. This function is intended to help update the register in the Excel workbook if the parameters (e.g. probability or impact data) are modified in the application after import.

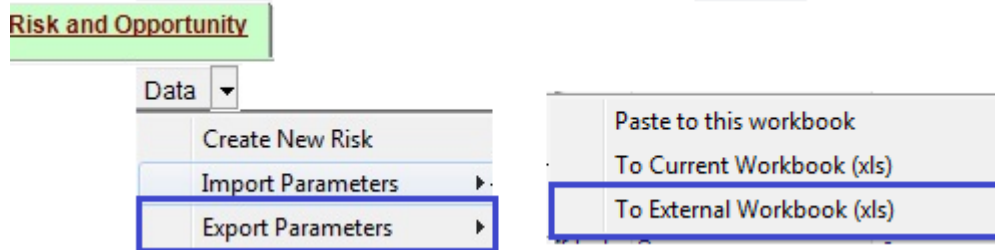
6.5.2 To current workbook



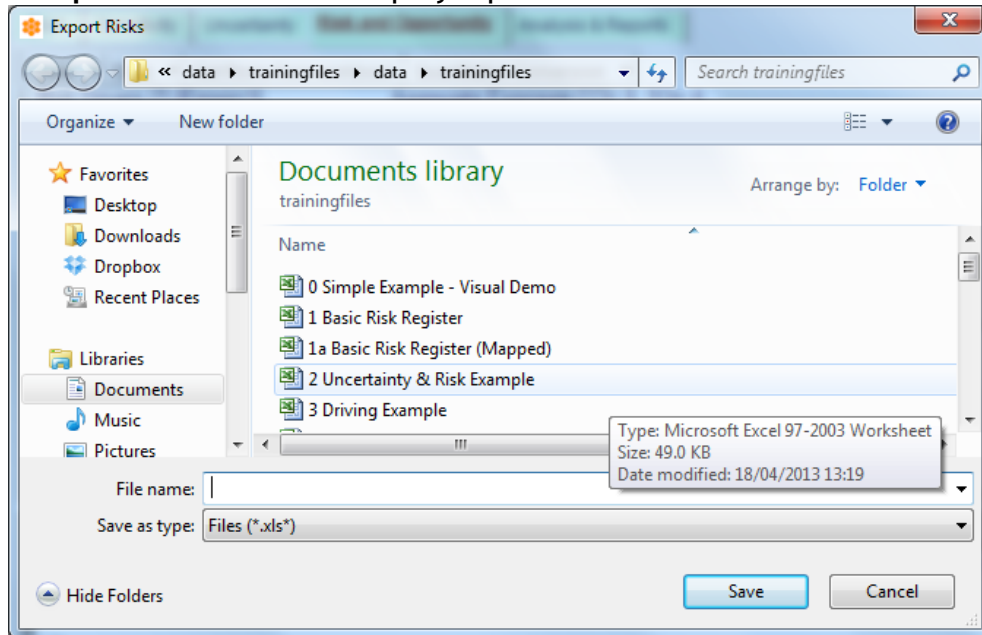
This will create a worksheet in the current workbook

1. Click once on the **Data** control on the **Risk and Opportunity** Feature Bar
2. Select **Export Parameters** then **to Current Workbook**
3. A **file Name** box will display a suggested name for the sheet, you can overwrite if required Press **OK**
4. A message box will inform you when complete.

6.5.3 To External Workbook



1. Click once on the **Data** control on the **Risk and Opportunity** Feature Bar
2. Select **Export Parameters** then to **External Workbook**
3. A **Export Risks** box will display Input Filename Press **Save**



4. A message box will inform you when complete.

Cell Reference	Cell Name	Code	Risk Name	Risk notes	Scatter_or_blanket	Probability Level	Probability	Impact Level	Minimum	Likely	Maximum	Shape	Whole	Serial_or_concurrent	Include_risk	Include_impact	Impact notes
Cost Model\I\H9		R7	TLMP Changes		S	L	L							S	TRUE	TRUE	
Cost Model\I\H10		AR1	Risk 1	Rework required	S		75		2000000	5000000	7500000	Triangular	FALSE	S	TRUE	TRUE	
Cost Model\I\H11		AR2	Risk 2	Rate increase	S		25		500000	875000	1000000	Triangular	FALSE	S	TRUE	TRUE	
Cost Model\I\H12		AR3	Risk 3	Cost increase	S		15		600000	1000000	1250000	Beta	FALSE	S	TRUE	TRUE	
Cost Model\I\H13		AR4	Risk 4	Rate increase	S		35		50000	0	150000	Uniform	FALSE	S	TRUE	TRUE	
Cost Model\I\H14		AR5	Risk 5	Material price	S		15		0	400000	0	Constant	FALSE	S	TRUE	TRUE	
Cost Model\I\H15		O1	Production Labour Glut		S		50		0	-1.153	0	Constant	FALSE	S	TRUE	TRUE	
Cost Model\I\H16		R2	Staff Labour Shortage		S	N			3	4	6	Beta	FALSE	S	TRUE	TRUE	
Cost Model\I\H17		R3	Production Labour Shortage		S		50		0	2.306	0	Constant	FALSE	S	TRUE	TRUE	
Cost Model\I\H18		R4	Minimum Wage Increase		S		25		0.4	1	1.2	Beta	FALSE	S	TRUE	TRUE	
Cost Model\I\H19		R6	Poor Requirement		B		10		0	41376.258	0	Constant	FALSE	S	TRUE	TRUE	
Cost Model\I\H20		R6	Poor Requirement		B		45		50000	0	70000	Uniform	FALSE	S	TRUE	TRUE	
Cost Model\I\H21		R6	Poor Requirement		B		75		0	41070.131	0	Constant	FALSE	S	TRUE	TRUE	
Cost Model\I\H22		R7	TLMP Changes		S	L	L							S	TRUE	TRUE	

Risk Register Template

6.6 Generate a Risk Register import template

The application contains a function to generate for the user a new workbook with a pre-configured risk register import template for easy population.

To generate the risk register import template in new workbook:

1. Click once on the **Data** control on the **Risk and Opportunity Features Bar**
2. Select the **Generate external register (.xls) template** option.
3. A new Excel workbook will be created which contains the pre-configured template layout. Populate the template with risk register data and be sure to extend the Excel **Name Range** 'RISKS' to include all new line items.



(the impact of the risk not to be confused with the uncertainty estimate): Excel templates are also available online at RiskHive.com

6.7 Edit Risk Driver information (metadata)

To access and edit Risk Driver information (metadata):

1. In the **Risk Driver List** pane on the **Risk and Opportunity Tab**, click once on the row of the Risk Driver you wish to edit.
The **Risk Driver Metadata** in the top-right pane will display related data:
2. Edit the **Risk Driver Metadata** as required
3. Click **Save**. Updated Risk Driver is displayed in Risk Drivers List on the left.

6.8 Edit Impact Driver parameters

To access and edit Impact Driver information (metadata and parameters):

1. In the **Impact Driver List** pane on the **Risk and Opportunity Tab**, click once on the row of the Impact Driver you wish to edit.
The **Impact Driver Assessment** in the bottom pane will display related data:
2. Edit the **Impact Driver Metadata** and parameters as required
3. Click **Save**. Updated Impact Driver parameters are displayed in the Impact Drivers List above.

6.9 Export Risk to Excel risk register

To export Risk data to an external register in a new Excel workbook:

1. Click once on the **Data** control on the **Risk and Opportunity Feature Bar**
2. Select the **To external register (.xls)** option.
3. Select the file name and location in the displayed file-browser window
4. Click **Save**.
5. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation.

The Risk data parameters are exported in the format described in **Section 6.3**:

Cell Reference	Name	Level	Minimum	Likely	Maximum	Shape	Whole
'Cost Model'!H6	Hrs_Ship1_Design		50		150	Uniform	FALSE
'Cost Model'!H7	Hrs_Ship1_Proc		50	100	150	Triangular	FALSE
'Cost Model'!H8	Hrs_Ship1_ILS		75	100	125	Beta	FALSE
'Cost Model'!H9	Hrs_Ship1_OpsMan		0.1	50	0	Normal	FALSE
'Cost Model'!H5	Hrs_Ship1_PM	High					

The parameters may be edited, extended or reduced as required in Excel and then re-imported into the application using the **Uncertainty Feature Bar Data > From external register (.xls)** control described in Section 5.3

6.10 Remove Risk Drivers

Risk Drivers may be removed by one of two methods:

- All
- Selected risks only

To remove **all** risk drivers and clear the **Risk Driver** list:

1. Click once on the **Data** feature on the Risk and Opportunity Tab > Feature Bar
2. Select the **Remove Risk** then **All** option
3. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation.

To remove **selected** risk drivers and remove them from the **Risk Driver** list:

1. Select the rows representing the risks you want to remove from the **Risk Driver** list
2. Click once on the **Data** feature on the Risk and Opportunity Tab > Feature Bar
3. Select **Remove Risk** then **Selected** option
4. A progress indicator appears and a confirmation message is displayed once the task is finished. Click **OK** to complete the operation.

6.11 Risk Probability

To correlate the probabilistic parameters of **Impact Drivers** within a **Risk Driver**, use the **Blanket Probability** control in the Risk Driver Metadata pane on the **Risk and Opportunity Tab**

The screenshot shows the 'Risk and Opportunity' tab interface. At the top, there are buttons for 'Save', 'Delete', and 'Create New Risk'. Below these are two tabs: 'Definition' and 'Meta Data'. The 'Meta Data' tab is active, showing a form for a risk driver named 'Poor Requirements (abs)'. The form includes fields for 'Risk Name', 'Risk Code' (AR1), 'Risk Manager' (a dropdown menu), and 'Risk Description'. At the bottom of the form, there are two radio buttons: 'Serial' (selected) and 'Concurrent'. A yellow circle highlights the 'Blanket Probability' checkbox, which is currently unchecked.

To correlate Impact Driver Probabilities:

1. Select the **Risk Driver** for which you want to apply Blanket Probability.
2. Check the **Blanket Probability** box.
3. Set **Blanket Probability** value:
 - a. Select either of the **Qualitative** or **Quantitative** options.
 - i. **Qualitative:** Select the desired **Probability Level** from the drop-down list that appears to the right of the option;
 - ii. **Quantitative:** Type in the desired **Probability** value (an integer between 0 and 100) in the field that appears to the right of the option.
4. Click **Save**. Updated Risk Driver Probability is displayed in the **Risk Drivers** List in the pane to the left. The **Scatter/Blanket** column is updated.

6.12 Analytical Risk Outcome metrics

The application includes various methods of calculation of risk impact as follows:

6.12.1 MCI: Mean Critical Impact Sensitivity Calculation

Mean Critical Impact is the actual value of the mean impact of the Impact Driver from the statistical outcome of the Monte Carlo simulation. Its units are that of the cell to which the Impact assessment applies (units of the target cell in workbook).



: MCI can only be displayed for the individual Impact Drivers - not for the Risk Drivers themselves at the higher level.

6.12.2 CCI: Context Critical Impact Sensitivity Calculation

Context Critical Impact is the outcome of the effect of applying the MCI value of the Impact Driver to the cell to which the Impact assessment applies - i.e. the difference the mean risk impact makes to the final outcome of the workbook.



- CCI can be displayed for both the individual Impact Drivers and for the Risk Drivers themselves at the higher level.
- At the Risk Driver level the value is derived from the combined simultaneous effect of all the related Impact Drivers.
- At the Aggregate Exposure level the value is derived from the combined simultaneous effect of all the related Risk Drivers and Impact Drivers.

6.12.3 TCI: Total Critical Impact Sensitivity Calculation

Total Critical Impact is the outcome of the effect of applying the non-probabilistic mean value of the Impact Driver to the cell to which the Impact assessment applies - i.e. the difference the total risk impact makes to the final outcome of the workbook.



1. TCI can be displayed for both the individual Impact Drivers and for the Risk Drivers themselves at the higher level.
2. At the Risk Driver level the value is derived from the combined simultaneous effect of all the related Impact Drivers.
3. At the Aggregate Exposure level the value is derived from the combined simultaneous effect of all the related Risk Drivers and Impact Drivers.

7 Analysis and Reports function tab

Analysis and Reporting pertains mainly to the stochastic (Monte Carlo) functions of the application. Basic Sensitivity Driver Reports are also contained on this function tab.

Function Tab Layout: pre simulation

7.1 Key Results

Key results are cells in the attached workbook that have been selected for statistical analysis during the process of Monte Carlo Simulation. By default the application will only calculate statistical outcomes for the Key Outcome cell. To generate statistical information for additional cells they must be added to the list of Key Results.

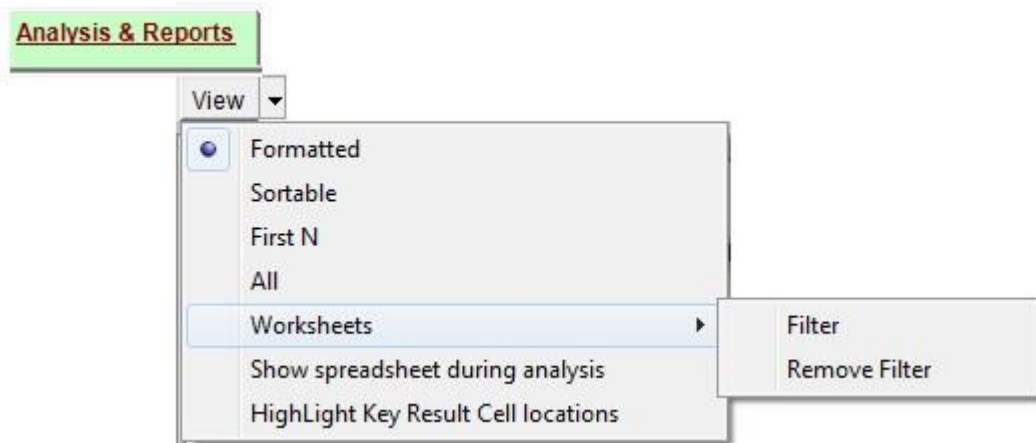


: You must add cells to Key Results before you run a Monte Carlo simulation. Cells added post-simulation will NOT provide statistical outcome information.



If an external register does not exist, use the **Data** control and then **Export Parameter** then select **option**.

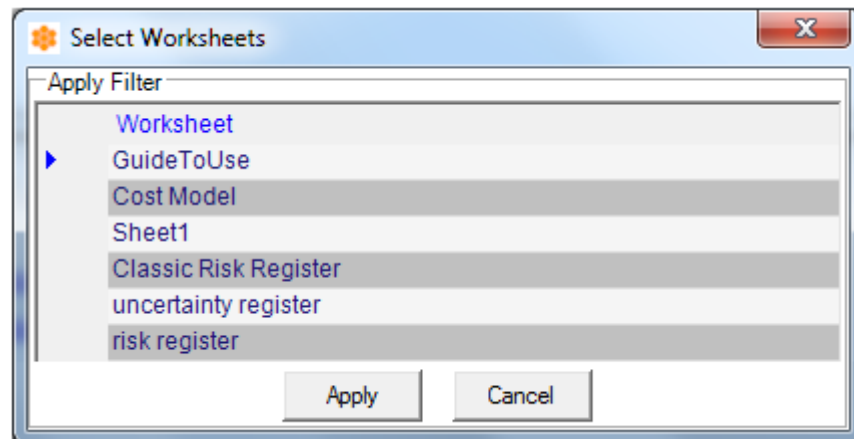
View



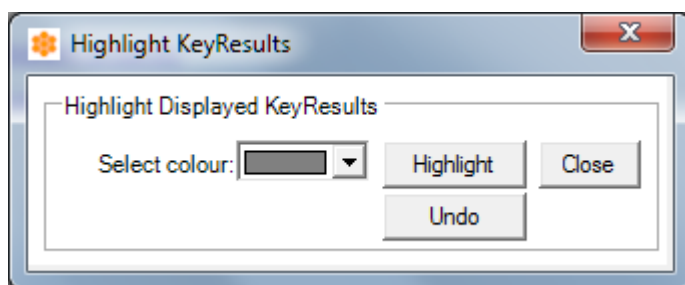
- Formatted - key results by cell order
- Sortable Will change values to pure units. Use with CAUTION
- First N Limit the number of key results displayed
- All Show all key results
- Worksheets
- Filter Display by worksheet selection, using popup menu



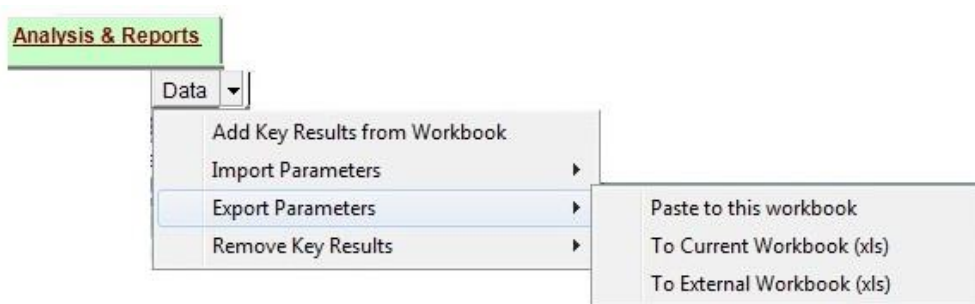
Order is determine by MS database order so some cell's may appear to be out of order)



- Remove filter Removes any selected worksheets
- Show spreadsheet during analysis- Will make changes to the spreadsheet that be can be viewed during the simulation. Caution this will increase the time needed to perform the simulation run.
- Highlight key Results Cell Location- When selected a popup menu



Will enable to choose which colour you would like the key cell to be.

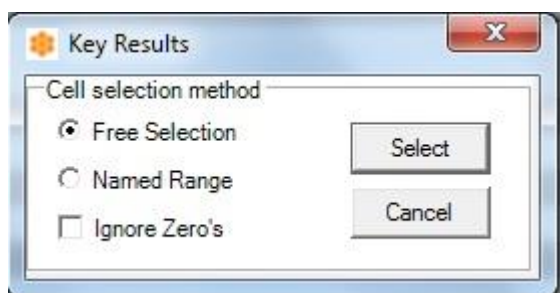


7.1.1 Add Key Results to list

Adding Key Results to the list is done by selecting cells from the attached workbook.

On the Feature Bar click once on the **Add Key Results from Workbook** Button. This can also be reached via the **Data** feature

The Key Results dialog box will open and present selection options:



7.1.1.1 Add all selected cells to the list

1. Select **Free Selection** and click once on the **Select** button. The cell-selector tool will appear and allow you to select cells to be added to the list of Key Results.
2. When you click **OK** ALL cells that are selected will be added to the list of Key Results.
3. A progress indicator appears and a confirmation message is displayed once the task is finished.
4. Click **OK** to complete the operation.



: You may select an individual cell, multiple cells, contiguous groups of cells or non-contiguous cells (using the Ctrl key).

7.1.1.2 Add all Named Range to the list

1. Select Named Range and click once on the **Select** button. The Popup menu will appear and allow you to select ranges (use Ctrl + left click) to be added to the list of Key Results.
2. When you click **Apply** the ranges that are selected will be added to the list of Key Results.
3. A progress indicator appears and a confirmation message is displayed once the task is finished.

7.1.1.3 Ignore Zero-value cells when adding to the list

1. Check the **Ignore Zeros** box before clicking once on the **Select** button to disregard all cells within a selection or range so that only cells with a numeric value are added to the list of Key Results.



: You may reduce the number of nugatory cells added to the Key Results list by checking this option before adding the selected cells. This can help make the subsequent simulation faster and the reports cleaner and less cluttered.

7.1.2 Import Key Results to list

The ability to import a list of cell references from an external excel workbook provides the ability to add desired Key Results negating the need to repeat the selection process where a list of Key Result cell references is known and saved.

To import a list of Key Result cell references to Excel:

1. On the **Feature Bar** click once on the **Data** control
2. Select **Import Parameters**
3. Select **From External Workbook (.xls)**
4. Select **file** from popup dialog screen then **Open**
5. A progress indicator appears and a confirmation message is displayed once the task is finished.
6. Click **OK** to complete the operation

7.1.3 Removing Key Results from list

There are two options for removing Key Results directly from the list:

- All
- Selected

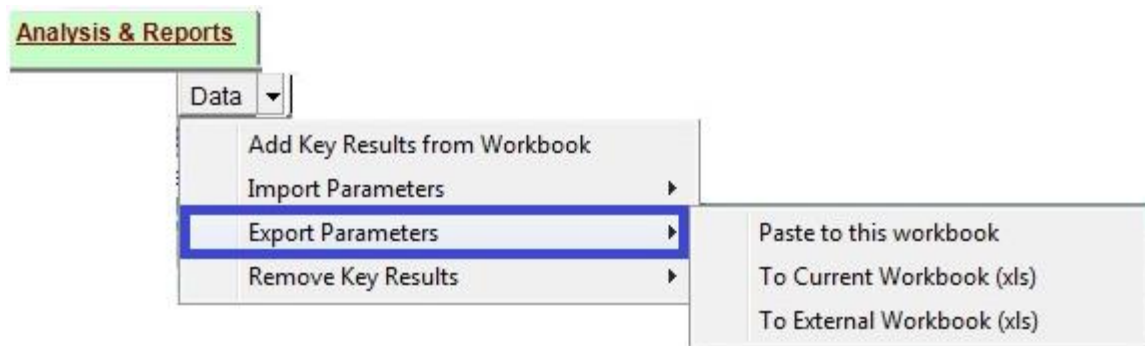
7.1.3.1 To remove all Key Results from the list

1. On the Analysis and Reports Feature Bar, click once on the **Data** control and select **Remove key results** then **All** option from the drop-down list.
2. A progress indicator appears and a confirmation message is displayed once the task is finished.
3. Click **OK** to complete the operation.

7.1.3.2 To remove selected Key Results from the list

1. In the **Key Results** pane, first select the Key Result rows you want to remove from the list by clicking on each one.
2. You can use the shift or Ctrl keys to select ranges or non-contiguous rows.
3. On the Analysis and Reports Feature Bar, click once on the **Data** control select **Remove Key Results** then **Selected** option from the drop-down list.
4. A progress indicator appears and a confirmation message is displayed once the task is finished.
5. Click **OK** to complete the operation.

7.1.4 Export Key Results



Parameters related to Key Results may be exported from the application in two ways:

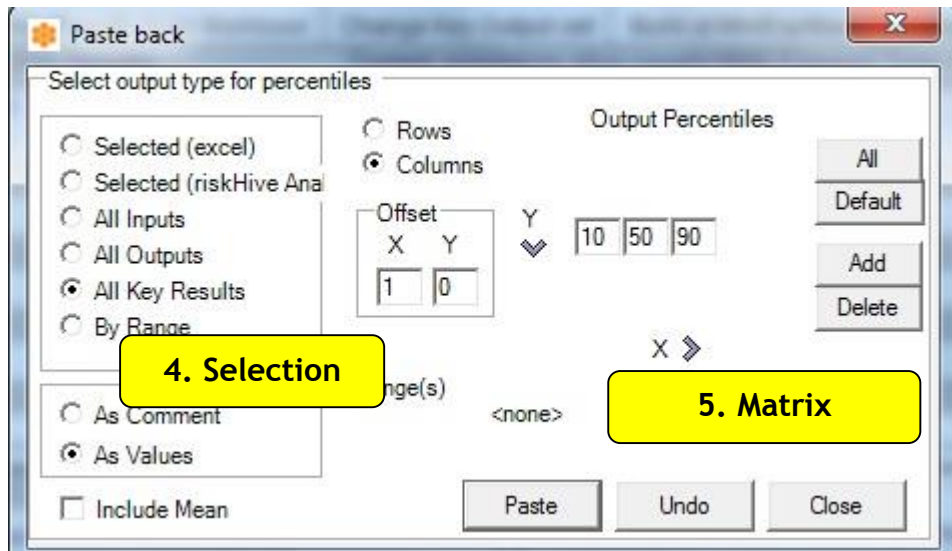
- As a list of Key Result Cells to a separate Excel workbook
- As a data-paste of statistical data values into the attached workbook

7.1.4.1 Export Key Results Statistical Data Values to attached workbook

The ability to export the statistical data values pertaining to Key Results to the attached excel workbook using a paste function provides the ability to populate the data set with the results of a simulation and analysis with minimal effort.

To export the list of Key Result cell references to Excel:

1. On the Feature Bar click once on the **Data** control
2. Select **Export Parameters** then **Paste to this Workbook**
3. The **Paste back** control box is presented, as below:



4. Make your selection from the options of:
 - **Selected (excel)** will paste back all cells you select with the cell-selector
 - **Selected (riskHive analysis)** will paste back to the riskHive analysis sheet
 - **All Inputs** will paste back to all variable input cells (constants)
 - **All Outputs** will paste back to all calculation cells
 - **All Key Results** will paste back to all cells marked as Key Results
 - **By Range**
- And
 - **As Comment** (will add a comment to each cell to be pasted)
 - **As Values** (will paste actual data values in matrix format)
5. If you selected **As Values**, use the **matrix** control to specify where the data should be pasted. The origin is the centre cell of the matrix and this value will be pasted over the existing Key Result cell value. You can use the **X and Y Offset** fields to move the pasted fields away from the origin.
6. A progress indicator appears and a confirmation message is displayed once the task is finished.
7. Click **OK** to complete the operation.



Warning Users will be required check that “Paste back” cells are the same format as the key Output cell, as the tool will only paste numbers and not cell format.

8.



: Example of Paste-back with Offset

Element	Key Result	10% value	50% value	90% value
Total Price	£114,356,157	£89,910,801	£95,528,186	£123,146,520
Risk	£0	£871,449	£4,921,029	£5,818,036
Selling Price	£114,356,157	£94,162,944	£99,660,882	£127,014,411

The Key Results are indicated with the green fill. Statistics for these values were generated during the Monte Carlo simulation.

The 10%, 50% and 90% values for each Key Result were then pasted back into the worksheet adjacent to the deterministic values using the settings below:

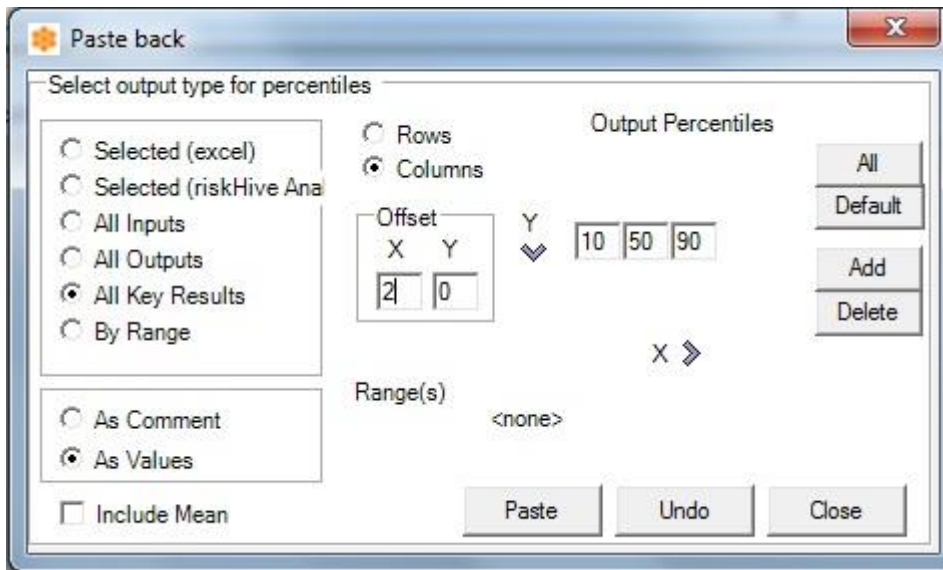


: Paste-back alternate statistical values or layouts

You can paste-back values other than the 10%, 50% and 90% default by selecting All from the paste back menu or over typing with required inputs

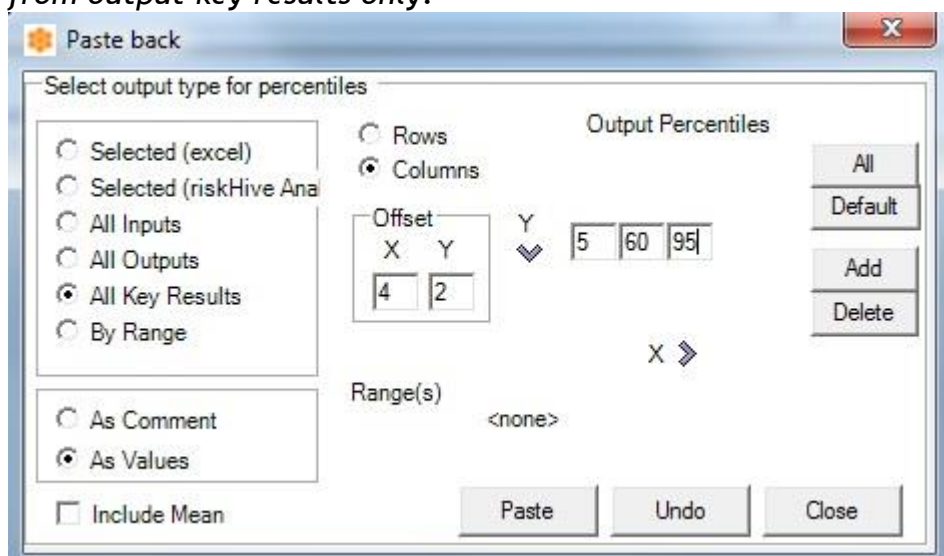
Example 1

Paste back 10%, 50%, 90% values centred on 2 cells to the right of each key result:



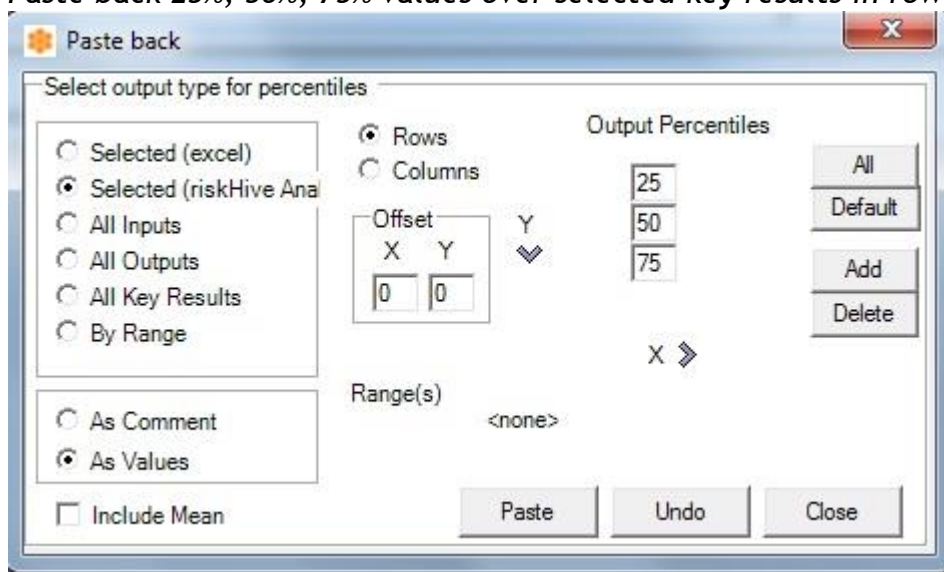
Example 2

Paste back 5%, 60%, 95% values centred on 4 cells to the right and 2 cells down from output key results only:



Example 3

Paste back 25%, 50%, 75% values over selected key results in row format:



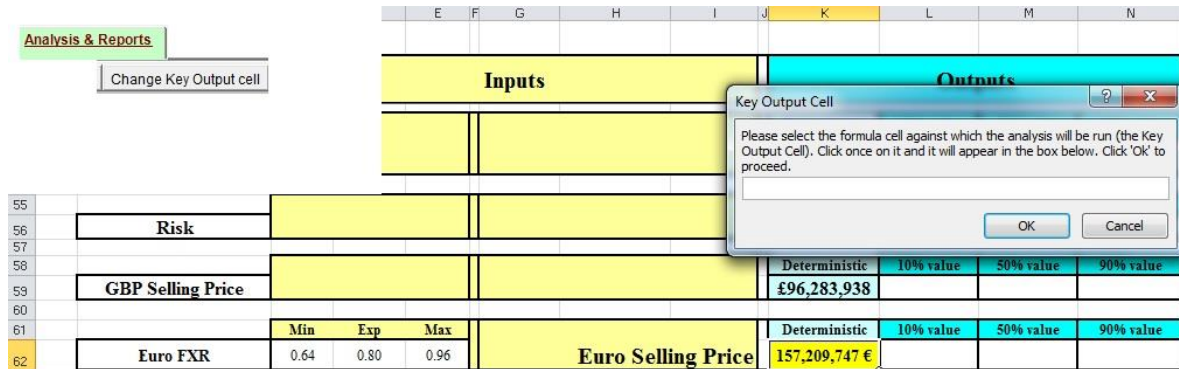
7.1.4.2 Export a List of Key Result Cells to an Excel workbook

The ability to export the list of cell references to an external excel workbook provides the ability to edit, maintain and subsequently import the whole list of selected Key Results, thus negating the need to repeat the selection process.

To export the list of Key Result cell references to Excel:

1. On the Feature Bar click once on the **Data** control
2. Select **Export Parameters** then **To External Workbook (xls)**
3. A progress indicator appears and a confirmation message is displayed once the task is finished.
4. Click **OK** to complete the operation.

7.1.5 Change Key Output Cell



This allows you to change the output cell. This is useful when tracking sub totals.

1. On the Feature bar select **Change Key Output Cell**
2. This will open Excel and prompt you to select a new **Output cell**
3. Message box to confirm action

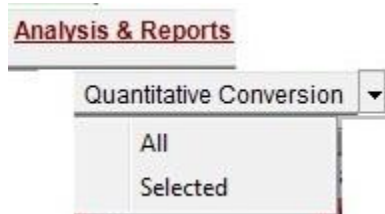
7.1.6 Calculate Theoretical Limits

The MS workbook is constructed using deterministic estimates, this function replaces the deterministic values with the 3 point estimates that fed the Hullograms with data so that the extreme values can be displayed on the graph.



: It is important that this run before hullograms are prepared.

7.1.7 Quantitative Conversion



If you have used any form of **Qualitative** assessment it will necessary to convert **Qualitative** to a **Quantitative** value

- Select **Quantitative Conversion** from the Uncertainty function
- Select **All** or pre select a row(s) from the viewing panel, use Ctrl+Click to select more than one row.

7.2 Simulation

The application enables the user to run a meta modelling technique to simulate the effects of the stochastic variables, risk and uncertainty, on the workbook. The modelling technique used is called Monte Carlo simulation. The results of this simulation can be analysed to generate statistical information regarding the ranges of outturn of the workbook to inform the decision-making process.

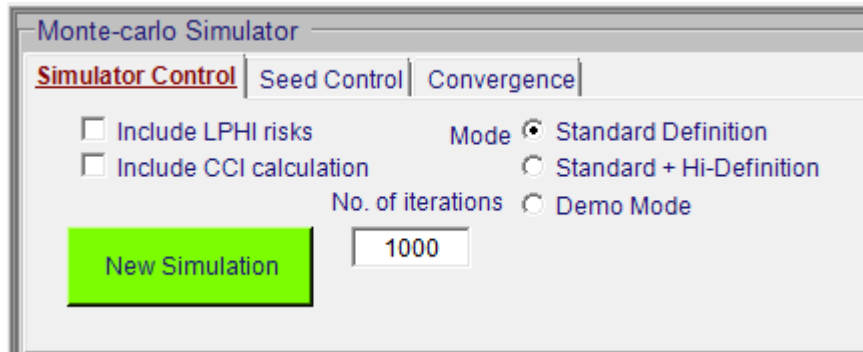
Whilst the simulation itself is a complex computing exercise the controls presented to the user are simple and straightforward. They are located in the bottom left of the Analysis & Reports Function Tab.



: To be able to run a Monte Carlo simulation the model must contain at least one element of either uncertainty or risk or there will be nothing to analyse.

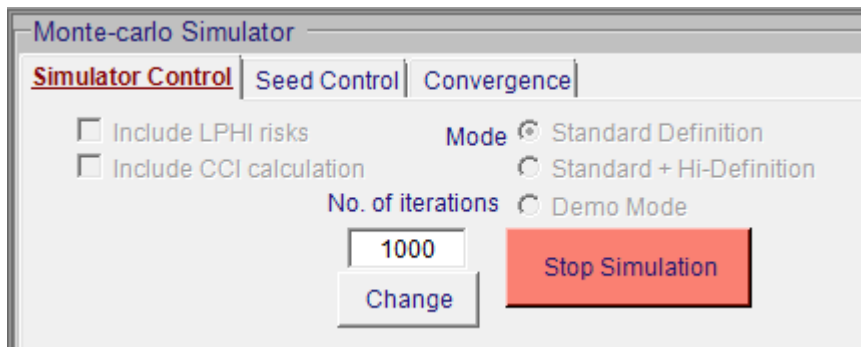
7.2.1 Run a new simulation set

If the system has not yet run a simulation there is only one option available, the **New Simulation** button.

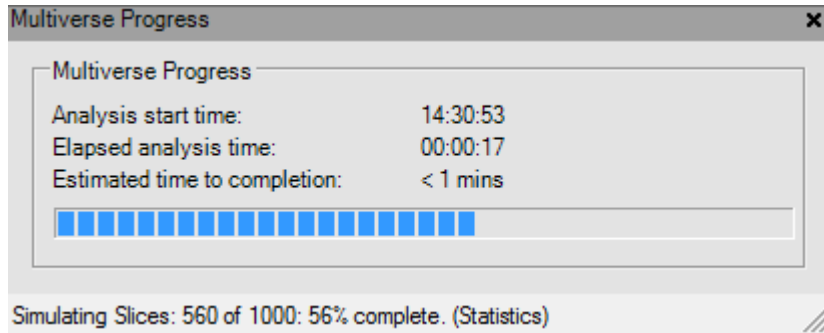


To initiate a Monte Carlo simulation:

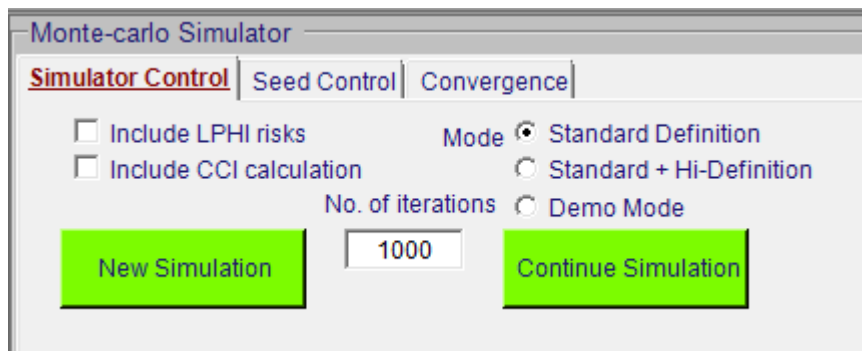
1. Type in the number of simulation iterations required in the **No. of iterations** data entry field to the right of the button.
2. Chose if you require to include or exclude low probability high impact (LPHI) risks
3. Chose **Mode** - **Standard** will produce data suitable for good quality graphical and output data. Whereas **Standard+ Hi Definition** will provide data that will enable high quality graphs to be produced also the data for each simulation is available that records which risk are active and any given point.
4. Chose to include exclude **CCI calculations**.
5. Click once on the green **New Simulation** button.
6. The workbook will be hidden and the simulation will begin.
7. The **Stop Simulation** button is displayed- this will abort the process.



8. During simulation a progress indicator is displayed to track the simulation iterations as they are completed. An estimated time to complete is also displayed along with the current elapsed simulation time.



9. The workbook is redisplayed once the simulation is finished and the statistical outcome values are displayed in the Key Results pane. The simulator controls now display the green **New Simulation** and **Continue Simulation** buttons.



7.2.2 Continue a simulation set

If the system has run a simulation you may want to continue the simulation from where it ended to generate more iteration data and improve the quality of the results. To continue a simulation set:

1. Type in the new number of simulation iterations required in the **No. of iterations** data entry field to the right of the button.
2. Click once on the green **Continue Simulation** button.
3. The workbook will be hidden and the simulation will continue.
4. The simulation will run until either the **Stop Simulation** button is clicked or the new **No. of iterations** limit is reached.

7.2.3 Stop a simulation set

If the system has run a simulation you may want to continue the simulation from

1. Click once on the green **Stop Simulation** button.
2. At the end of the next set of slices the simulation will end.
3. The workbook is redisplayed once the simulation is finished and the statistical outcome values are displayed in the Key Results pane. The simulator controls will now display the green **New Simulation** and **Continue Simulation** buttons again.

7.2.4 SEED option

Monte-carlo Simulator

Simulator Control **Seed Control** Convergence

☒ Random Seed ☐ Fixed Seed

Generate new seed

Seed (upto 6 digits) 29690

Guidance?

The seed option allows you to use either a **Random** number or a **Fix** Seed.



:Use fixed if wish to repeat a simulation that will give identical results each time it is run.

7.2.5 Convergence

Monte-carlo Simulator

Simulator Control Seed Control **Convergence**

☐ Stop on convergence

Stop at 5.0 % error

Check every 200 iterations

Current Percent 0.10

Guidance?

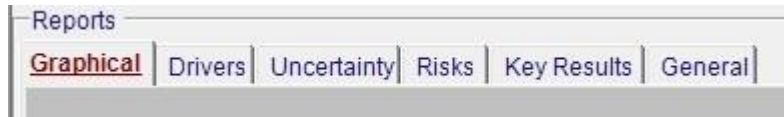
With any statistical simulation technique you reach a point when more simulations runs will not improve the output results, this option allows you set the point at which you consider the simulation should stop.

7.2.6 Stop a simulation set

If the system has run a simulation you may want to continue the simulation from

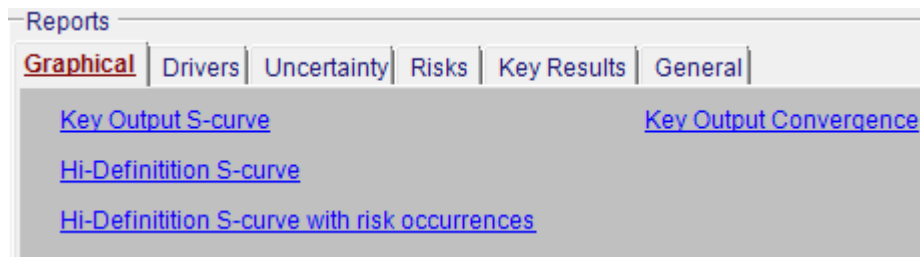
4. Click once on the red **Stop Simulation** button.
5. At the end of the next set of slices the simulation will end.
6. The workbook is redisplayed once the simulation is finished and the statistical outcome values are displayed in the Key Results pane. The simulator controls will now display the green **New Simulation** and **Continue Simulation** buttons again.

7.3 Reports



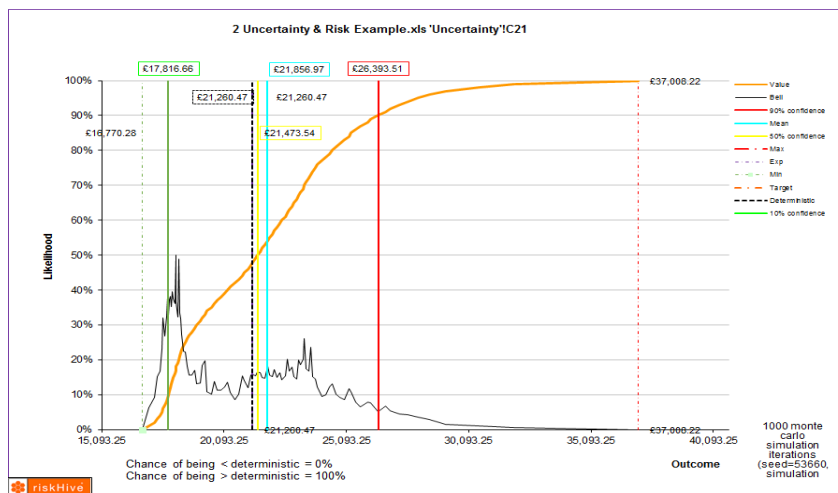
The application features a range of graphical and text-based reports. All reports are produced by exporting data and information to templates that are built in Excel. This enables each user to customise or edit templates and reports to their own specification.

7.3.1 Graphical



Graphical reports such as S curves and frequency distributions may be easily produced (post simulation) for any cell in the workbook that is a Key Result

- Press **Key Output Hullogram (s-curve)** to show the 10%, 50%, 90%, Statistical Mean and Deterministic values over the Total Price Distribution S-curve.
- Press **Key Output Convergence** to show the range of outcomes of the Contract as an S-curve without overlays
- Press **Hi Definition S-curve** for very detail graphical output, similar to Key output graph but with greater detail as it uses 1% steps.



- Press **Hi Definition S-curve with risk occurrences** for very detail graphical output, with data points for each simulation that also records the impact value of each risk at that point

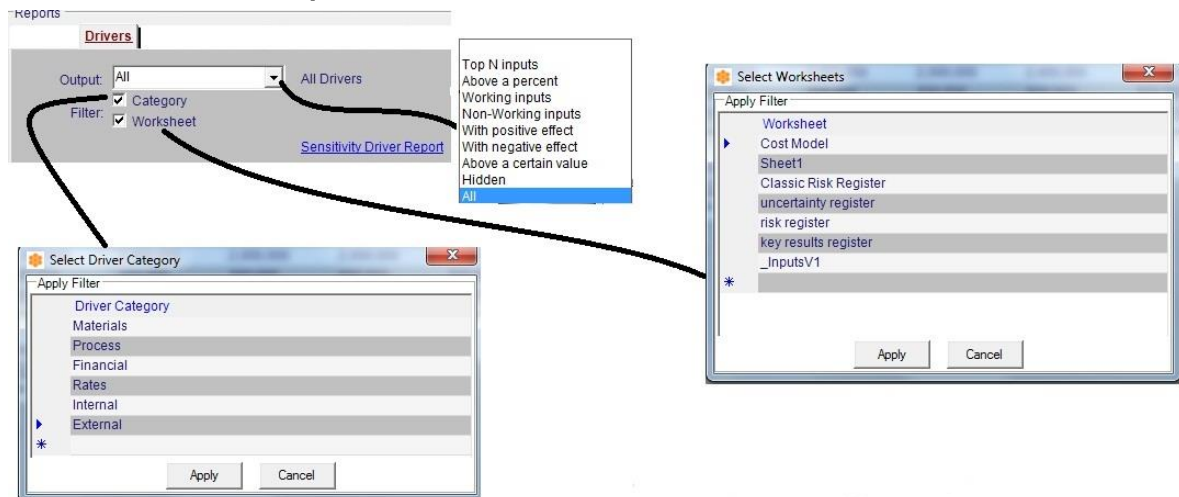
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	FlexPro Simulation	2 Uncertainty & Risk Example.xls 'Uncertainty' C21								Target	Min	Exp	Max	
2		1000 monte carlo simulation iterations (seed=53660, simulation time=00:00:17)								£21,260.47	£16,770.28	£0.00	£37,008.22	
3	Contract:								File					
4	Date:								R6	R1	R5	R4	R7	R3
5									Incomp	Boiler	M&E	Usage	Contra	Flood
6									lete	Info	Failure	Repairs	Disrupt	Dama
7									Risk	Risk	Risk	Risk	ed	ge
8									H8	H3	H7	H6	Risk	Risk
9													H5	H4
10	Simulation:													
11	Order	iteration	Slice	Simulation	Value									
459	26	20	7	2	£20,902.11				1709					
460	434	420	109	2	£20,904.60				1066				2075	
461	196	180	49	4	£20,916.18				939				1792	
462	448	440	112	4	£20,925.27						3889			
463	964	960	241	4	£20,926.62				3254					
464	431	420	108	3	£20,927.31				3233					
465	141	140	36	1	£20,949.01						2526			
466	380	360	95	4	£20,962.07				1637	891				
467	707	700	177	3	£20,971.74					824			1483	
468	81	80	21	1	£20,975.07				2624					
469	967	960	242	3	£20,985.81				2756					
470	965	960	242	1	£20,988.35									
471	414	400	104	2	£21,064.68						3602			
472	971	960	243	3	£21,096.84				3362					3004

Risk occurrence detail report



For sensitive reporting it may be necessary to use the risk occurrence report to check that risk occurrence matches the target probability if there is disparity extra simulations may be necessary to ensure a close match.

7.3.2 Drivers report



The Driver analysis creates a new Excel workbook. The parameters can be finely tune through a series of dropdown and popup menus.

To select what is include for the Category or Worksheet first tick the box on the report screen a popup menu will appear, highlight the items you which wish to include by using **ctrl key** and **left clicking** required row then press **Apply**, your selection will be displayed next to category and worksheet.

Once you have selected which uncertainties are to be used and what worksheets and categories are required press **Sensitivity Driver Report** progress popup screen will inform you of progress with a final message on completion.

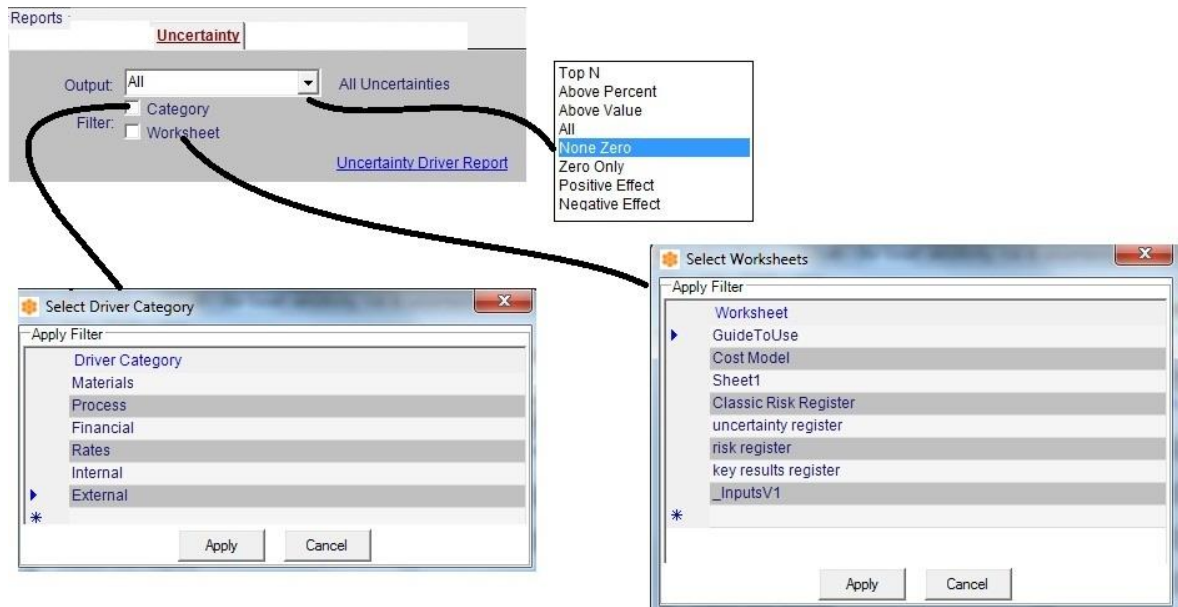


: It is suggested that you rename the Excel file generated to aid audit.



This is useful when you want to include the results of the sensitivity analysis for perusal by others, as a record of validation or as a guide to uncertainty assessment

7.3.3 Uncertainty report



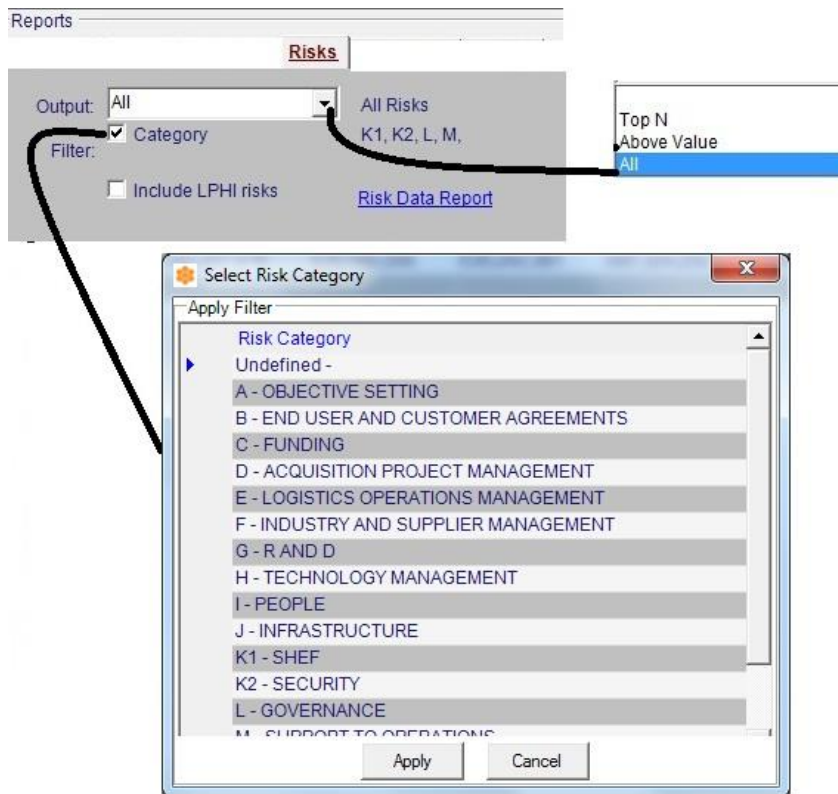
The Uncertainty driver analysis creates a new Excel workbook. The parameters can be finely tune through a series of dropdown and popup menus. To select what is include for the Category or Worksheet first tick the box on the report screen a popup menu will appear, highlight the items you wish to include by using **ctrl key** and **left clicking** required row then press Apply, your selection will be displayed next to category and worksheet

Once you have selected which uncertainties are to be used which worksheets and category are required press **Uncertainty Driver Report** progress popup screen will inform you of progress with a final message on completion



It is suggested that you rename the Excel file generated to aid audit.

7.3.4 Risk Report



The **Risk** report creates a new Excel workbook. The parameters can be finely tune through a series of dropdown and popup menus. To select what is include for the Category first tick the box on the report screen a popup menu will appear, highlight the items you which wish to include by using **ctrl key** and **left clicking** required row then press Apply, your selection will be displayed next to category.

Once you have selected which risks are to be used and what categories are required press **Risk Data Report** progress popup screen will inform you of progress with a final message on completion



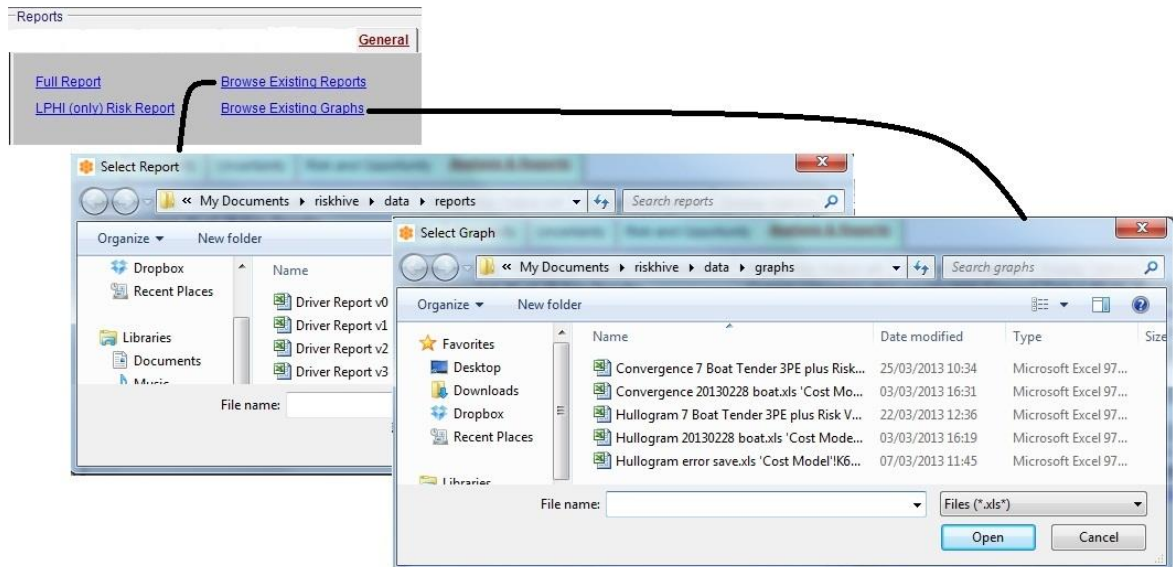
It is suggested that you rename the Excel file generated to aid audit.

7.3.5 Key results



Press **key results report** to produce an Excel workbook that contains all the pre-selected key results

7.3.6 General reports



There are 4 options in the general section:

Full Report

This feature can be used to package and export the primary assessment data and output results to an Excel workbook.

The workbook contains:

- The description of the workbook and its primary attributes
- The complete range of outcomes of the analysis as described by an S-curve in 5% confidence level increments
- The complete graphical outputs
- The complete collection of:
 - sensitivities,
 - uncertainty,
 - risks, opportunities
 - associated Input Parameters and resulting Impact data
 - associated categorisation and classification information
- Risk ownership information

LPHI

This will produce an Excel workbook that lists all the elements that you have selected as low probability High Impact risks.

Browse Existing Reports

Will open an existing Excel report

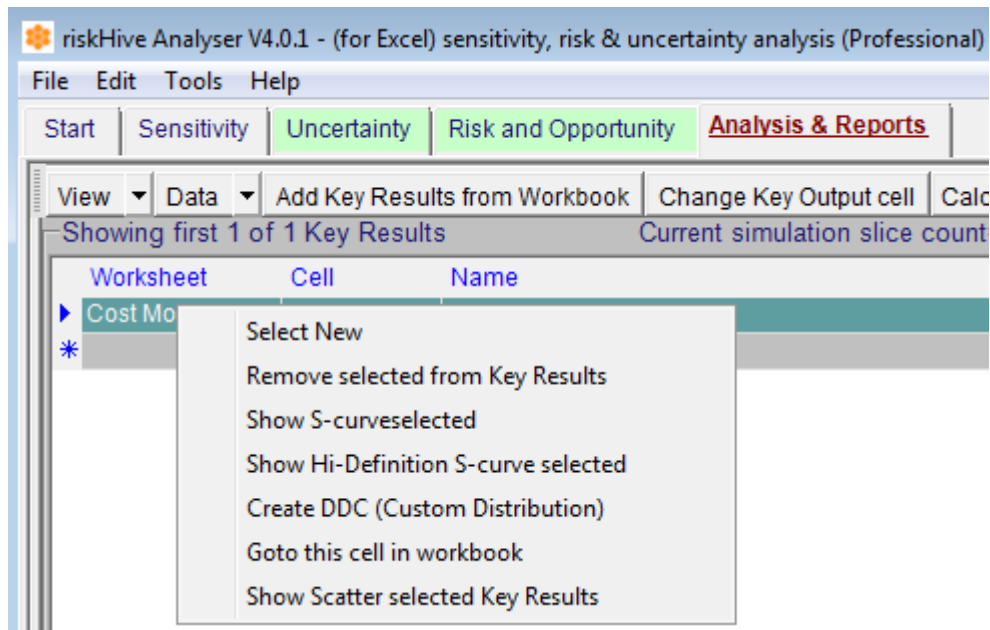
Browse Existing Graphs

Will open an existing Excel workbook with graphical outputs

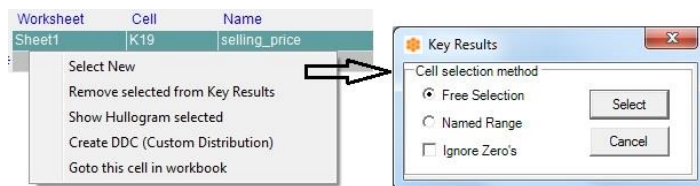


The browse function have been included to save you leaving the Arrisca program to establish what report names have been used.

7.3.7 Analysis & Reports contextual menu (right-click menu)

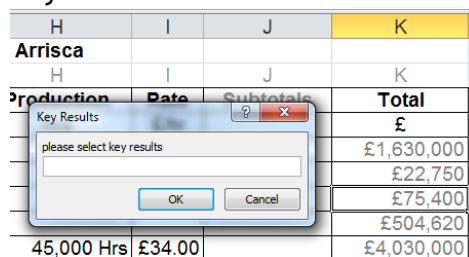


7.3.7.1 Select New (key result)



This enable a new key result to added to list:

- Press Select New then select the cell selection method.
- The Excel workbook will be displayed enabling you to choose the new key result cell.



- Press OK to close.

7.3.7.2 Remove selected from key Results

- Select the row you wish to remove.
- Right click and Select **Remove selected from key results**

7.3.7.3 Show S curve for selected

- Select the Key results you wish to create a Hullogram.
- Right click and select show Hullogram

7.3.7.4 Show Hi Definition S curve selected

- Select the Key results you wish to create a Hullogram.
- Right click and select show Hullogram

7.3.7.5 Create DDC (Custom Distribution)

This function allows you to save an output distribution from analysed key result this can then be used as an input distribution for any other task.

- Select Key result row.
- Right click and select create DDC.
- Name file and press OK.

7.3.7.6 Goto to this cell in worksheet

This function will take you straight to worksheet cell that is linked to the selected key result.

- Select key result row
- Right click and select **Goto to this cell in worksheet**

7.3.7.7 Scatter plot Key selected results



This function utilises the Arrisca Project function so would not normally be used for an Excel model. However, there may a requirement to compare key items in this form, therefore the function is active but will require manual amendment to Excel plot as the default uses time in days as the base comparator not cost.

This function allows two key results to be plot on single graph thus providing a view of what values where in play during the simulation.

- Select the two row to be compared use Left click and **Ctrl** key.
- Select **Scatter plot for two key results**
- Amend Excel plot cell C 44 to Cost and change C47 to number format, change legend to Cost not duration.

8 Input Distributions and Levels

8.1 Quantitative Input Distributions

The application allows the selection and application of certain common input distribution shapes. These are selected using the drop-down boxes adjacent to the input parameter Descriptions for:

- Uncertainty, and for
- Risk Driver Impact

Although the same terminology is used, descriptions of Input Data Parameters vary dependent on whether the shape is being applied as Uncertainty or Risk Impact:

Parameter	Description	
	Uncertainty	Risk Driver Impact
Minimum Value	This is an optimistic estimate of what might happen, assuming that the risks do not materialise and that everything goes about as well as possible.	This is an optimistic estimate of the minimum additional value that the occurrence of a risk impact will have over and above the baseline estimate.
Most Likely Value	This is the estimator's best bet, the sort of estimate that is right more often than any other (i.e. the mode, in statistical language).	This is the best estimate of the additional value that the occurrence of a risk impact will have over and above the baseline estimate.
Maximum Value	This is a pessimistic extreme, assuming that the worst tends to happen, but excluding the very remote - e.g. "Acts of God".	This is a pessimistic estimate of the maximum additional value that the occurrence of a risk impact will have over and above the baseline estimate.

The common shape descriptions available to the user are detailed as follows: (Please refer to Glossary (section 9) for full explanations of terms.

8.1.1 Constant

The Constant shape results in zero variation in the outcome.

When applied to Uncertainty it effectively fixes the cell value at the value that is input in the Likely field, though this may differ from the Deterministic cell value.

When applied to risk the impact will be fixed at the Likely field value.

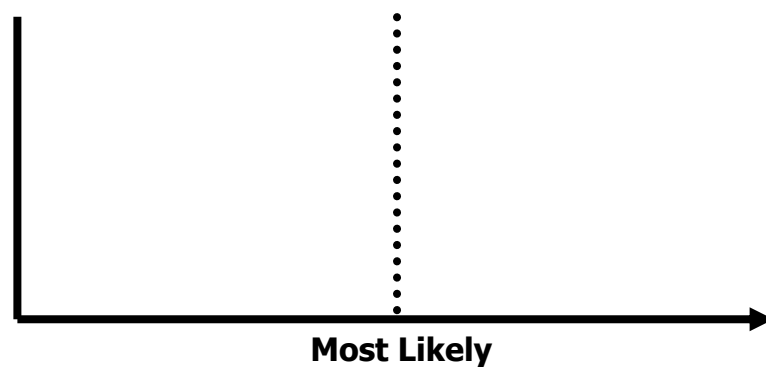
Application:

- Where an alternative single-point estimate is to be used in simulation.

Parameters:

- Most Likely Value

Graphical representation:



8.1.2 Uniform

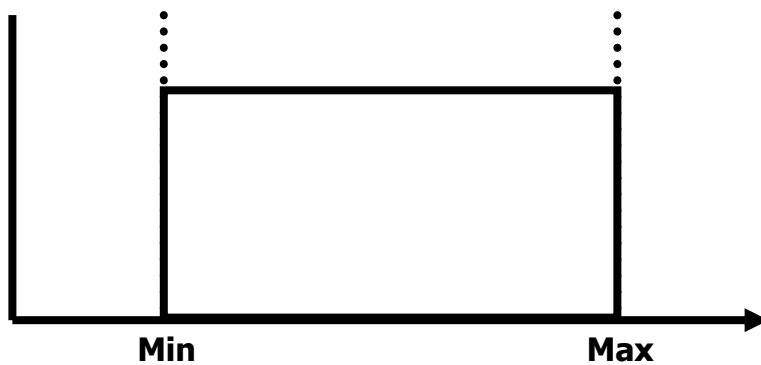
The Uniform shape describes a range of outcomes that has an equal chance of being any of value between two points, the Minimum and Maximum Values.

Applications:

- Very rough modelling where data is absent
- When not much is known about the distribution of an outcome, (say, only its smallest and largest values)

Parameters:

- Minimum Value
- Maximum Value



8.1.3 Triangular

The Triangular shape describes a defined range of outcomes between two points plus a Most Likely value that lies between the Minimum and Maximum Values.

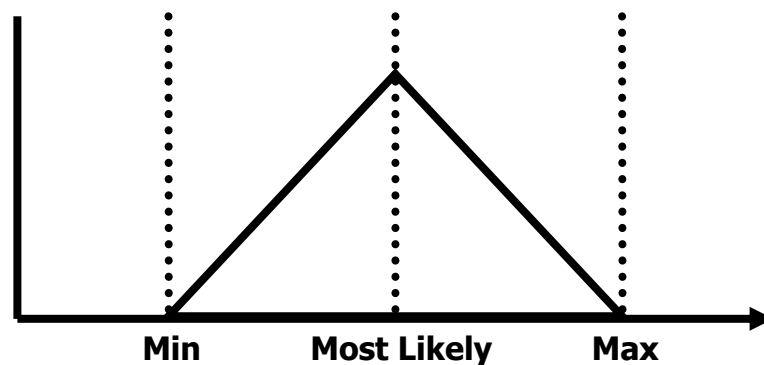
Application:

- 3PE for rough modelling where data is absent
- The Triangular Distribution is typically used as a subjective description of a range for which there is only limited sample data, and especially in cases where the relationship between variables is known but data is scarce. It is based on knowledge of the minimum and maximum and an "inspired guess" as to the modal value.

Parameters:

- Minimum Value
- Most Likely Value
- Maximum Value

Graphical representation:



8.1.3.1 Trianglewhole

Special variant of a normal triangle that will only generate whole numbers use when decimal values will cause issues such as design to cost models where it impossible to have a part component eg. $\frac{1}{2}$ a reinforcing rib in a hull

8.1.4 Beta (PERT)

The Beta is a Triangular shape describing a defined range of outcomes between two points plus a Most Likely value that lies between the Minimum and Maximum Values, but where the outcomes strongly tend toward the Most Likely value.

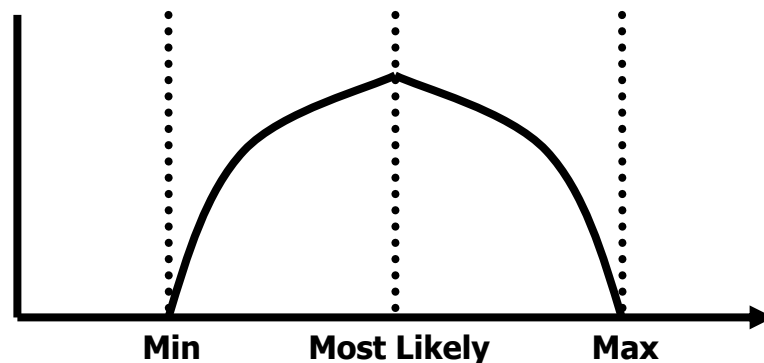
Application:

- 3PE for rough modelling where data is absent but there is some assurance that the Most Likely value is a confident outturn compared to the extents.
- Used for estimates to completion where the Most Likely value is sound.

Parameters:

- Minimum Value
- Most Likely Value
- Maximum Value

Graphical representation:



8.1.4.1 BetaWhole

Special variant of a normal Beta that will only generate whole numbers use when decimal values will cause issues such as design to cost models where it impossible to have a part component eg. $\frac{1}{2}$ a reinforcing rib in a hull

8.1.4.2 Normal

It is often called the **bell curve** because the graph of its probability density resembles a bell.

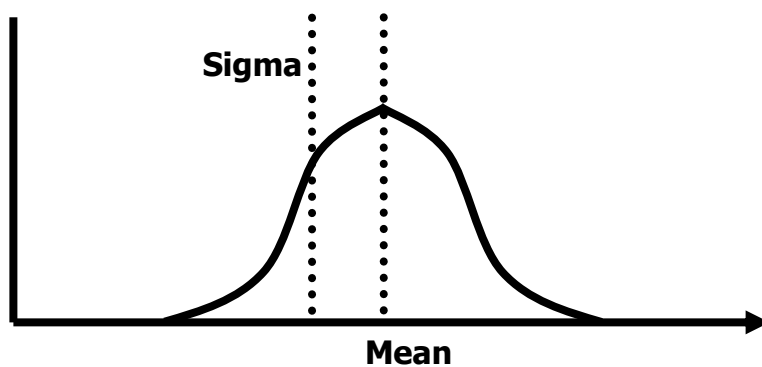
Applications:

- Financial uncertainty
- Populations of physical data
- Biological distributions

Parameters:

- μ (Mean Value)
- σ (Sigma, Standard Deviation Value)

Graphical representation:



8.1.5 Lognormal

The log-normal distribution is the single-tailed probability distribution of any random variable whose logarithm is normally distributed. It cannot generate a negative polarity outcome as the results are always positive

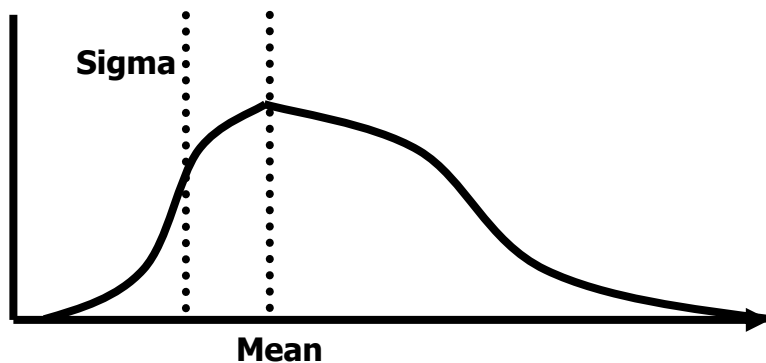
Applications:

- Sizing of requirements or resources
- Populations of geophysical data (such as oil-well reserves)
- Biological distributions

Parameters:

- μ (Mean Value)
- σ (Sigma Standard Deviation Value)
- Determinate

Graphical representation:



..!

8.1.6 Custom Discrete -

Like a die roll, the outcome values are limited to a finite range of definite outcomes with an assigned probability value for each outcome. All outcome probabilities must sum to 1 (unity).

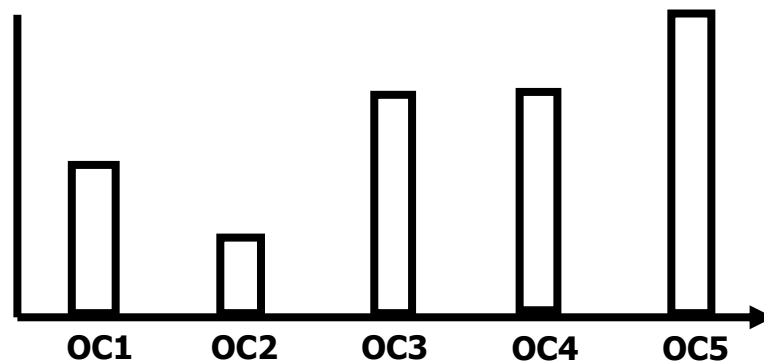
Applications:

- Die-like assessments (1,2,3,4,5 or 6 - each with 16.667% probability).
- Where there is a modal outcome (levies or damages applied).

Parameters:

- Outcome (unlimited)
- Probability of outcome.

Graphical representation:



8.1.7 Custom Continuous-

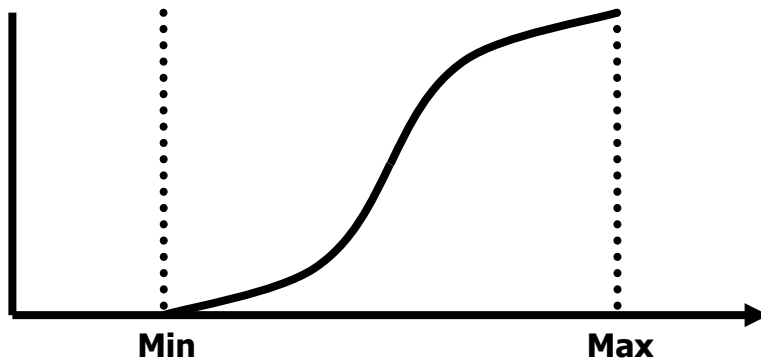
Applications:

- Where up to 101 points describe an input curve - used where there is historical data or where there are specific cost or engineering outcome definitions available for transcription

Parameters:

- 0% to 100% cumulative values in 5% increments (21 point estimate)

Graphical representation:



8.1.8 Data Cartridge -

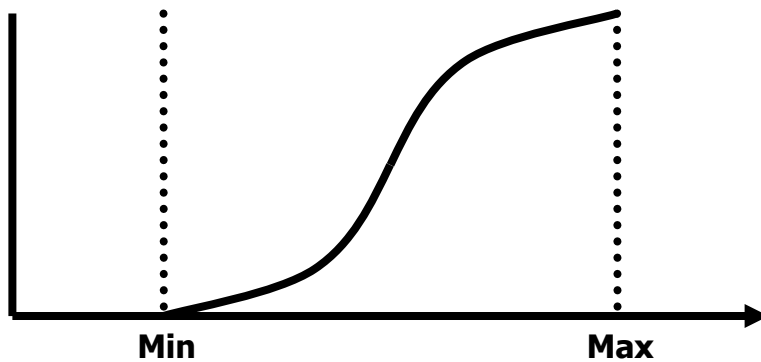
Applications:

- Where the output of a separate simulation and analysis is to be used as an input distribution range for an input cell.

Parameters:

- 0% to 100% cumulative values in 5% increments (21 point estimate)

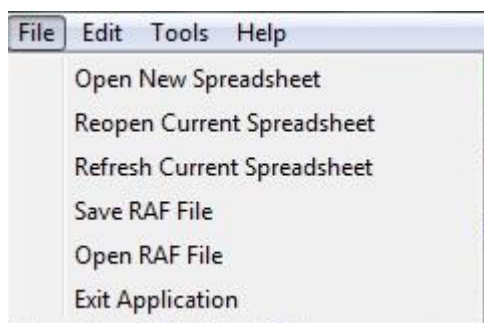
Graphical representation:



9 Application Metadata and Settings

9.1 Main Menu

9.1.1 File



9.1.2 Open New spreadsheet

This option will take you to the specified folder and allow you to open a new spreadsheet.

9.1.3 Reopen Current Spreadsheet

If the workbook that is being analysed gets closed for some reason either intentionally (because the user wants to discard all changes) or by accident this command will automatically reopen the current spreadsheet for you.

9.1.4 Refresh Current Spreadsheet

This command is used to update the Arrisca software with any changes that may have been made to the structure, formulas or constants in the spreadsheet. If the spreadsheet has been modified by the user whilst it has been open with Arrisca the spreadsheet must be first saved and then this command to update Arrisca with the changes.

9.1.5 Save RAF file

This allows you to save both Arrisca inputs/outputs and the Excel sheet in one file.

This file is a compressed archive and contains the following elements:

- A copy of the spreadsheet that is being analysed (that can be redeployed when the archive is reopened on another machine at a later date),
- All user inputs / outputs and associated comments
- Associated risk and uncertainty registers
- All analytical results and reports which can be immediately accessed.

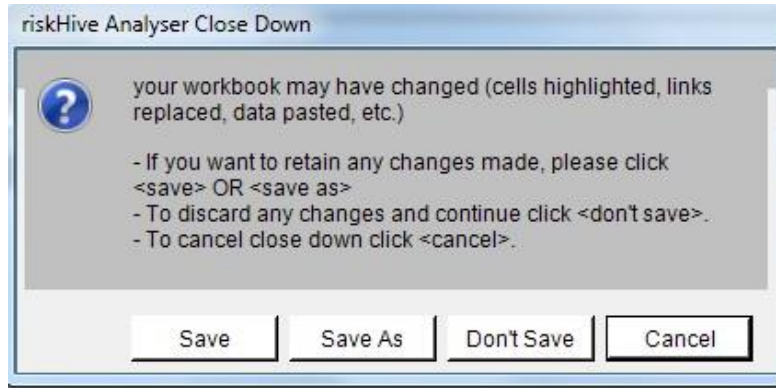


: This provides an excellent method for creating an archive document that as well containing the results of the analysis also contains a frozen copy of the Excel workbook that the analysis was based on.

9.1.6 Open RAF file

Will open a RAF file so that the Arrisca tool is populated and the associated Excel file is opened.

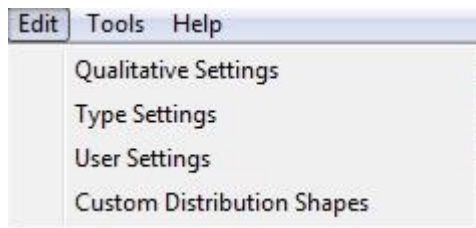
9.1.7 Exit Application



When **Exit** or **Close** application is selected the close down menu is displayed, this gives you the option to:

- Save - save file without renaming
- Save As- save as a new file
- Don't save - any changes are lost
- Cancel - skip shut down

9.1.8 Edit



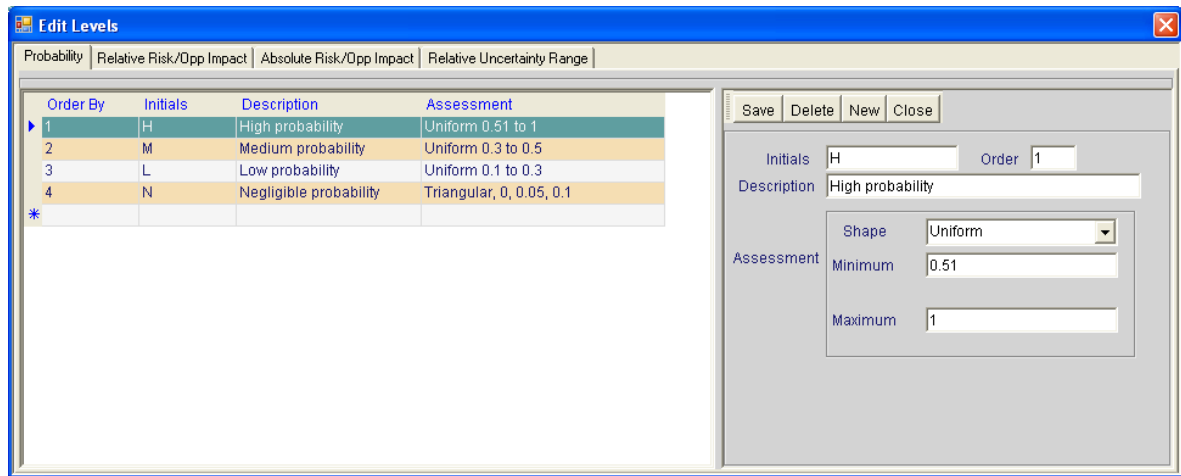
9.1.8.1 Qualitative Settings

The Qualitative assessments that are possible in Arrisca Velocity use Qualitative Assessment Level Definitions to provide parameter sets for analysis.

The Levels are accessed from the Main Menu select **Edit > Qualitative Settings**. This displays the Edit Levels Function Tab as shown below:

The default level definitions are as follows:

9.1.8.2 Probability Levels



Order By	Initials	Description	Assessment
1	H	High probability	Uniform 0.51 to 1
2	M	Medium probability	Uniform 0.3 to 0.5
3	L	Low probability	Uniform 0.1 to 0.3
4	N	Negligible probability	Triangular, 0, 0.05, 0.1
*			

Save Delete New Close

Initials: H Order: 1

Description: High probability

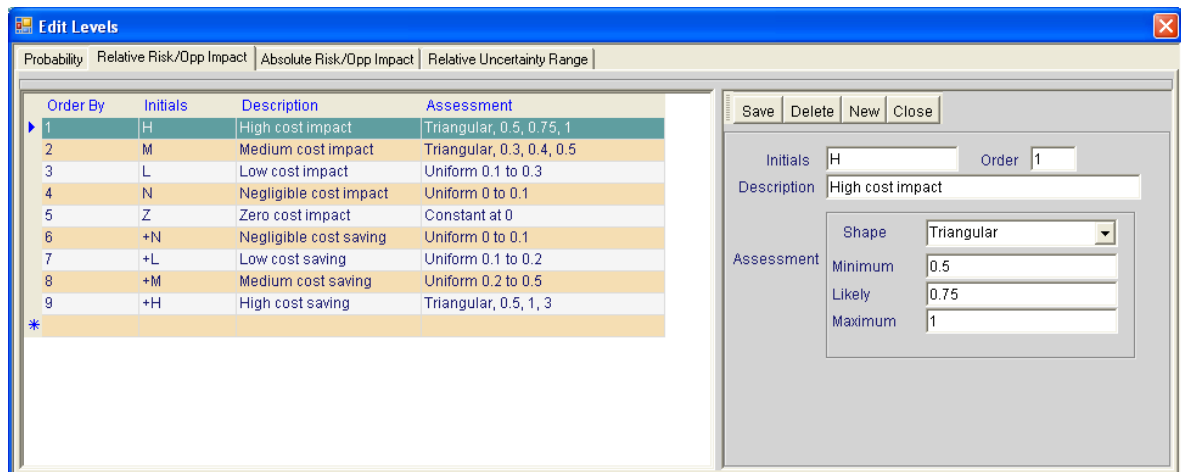
Assessment:

Shape: Uniform

Minimum: 0.51

Maximum: 1

9.1.8.3 Relative Risk/Opp Impact Levels



Order By	Initials	Description	Assessment
1	H	High cost impact	Triangular, 0.5, 0.75, 1
2	M	Medium cost impact	Triangular, 0.3, 0.4, 0.5
3	L	Low cost impact	Uniform 0.1 to 0.3
4	N	Negligible cost impact	Uniform 0 to 0.1
5	Z	Zero cost impact	Constant at 0
6	+N	Negligible cost saving	Uniform 0 to 0.1
7	+L	Low cost saving	Uniform 0.1 to 0.2
8	+M	Medium cost saving	Uniform 0.2 to 0.5
9	+H	High cost saving	Triangular, 0.5, 1, 3
*			

Save Delete New Close

Initials: H Order: 1

Description: High cost impact

Assessment:

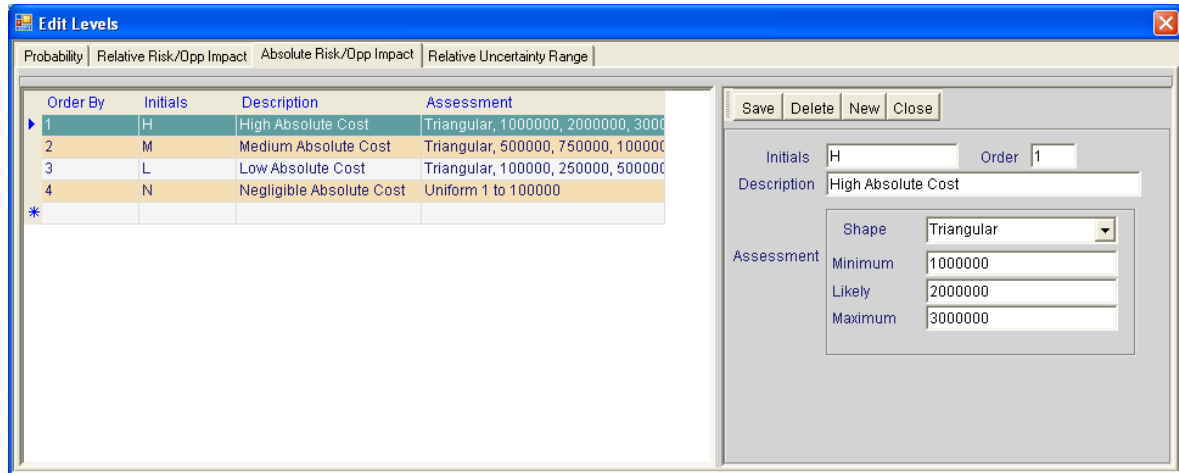
Shape: Triangular

Minimum: 0.5

Likely: 0.75

Maximum: 1

9.1.8.4 Absolute Risk/Opportunity Impact Levels



Order By	Initials	Description	Assessment
1	H	High Absolute Cost	Triangular, 1000000, 2000000, 3000000
2	M	Medium Absolute Cost	Triangular, 500000, 750000, 1000000
3	L	Low Absolute Cost	Triangular, 100000, 250000, 500000
4	N	Negligible Absolute Cost	Uniform 1 to 100000

Save Delete New Close

Initials: H Order: 1

Description: High Absolute Cost

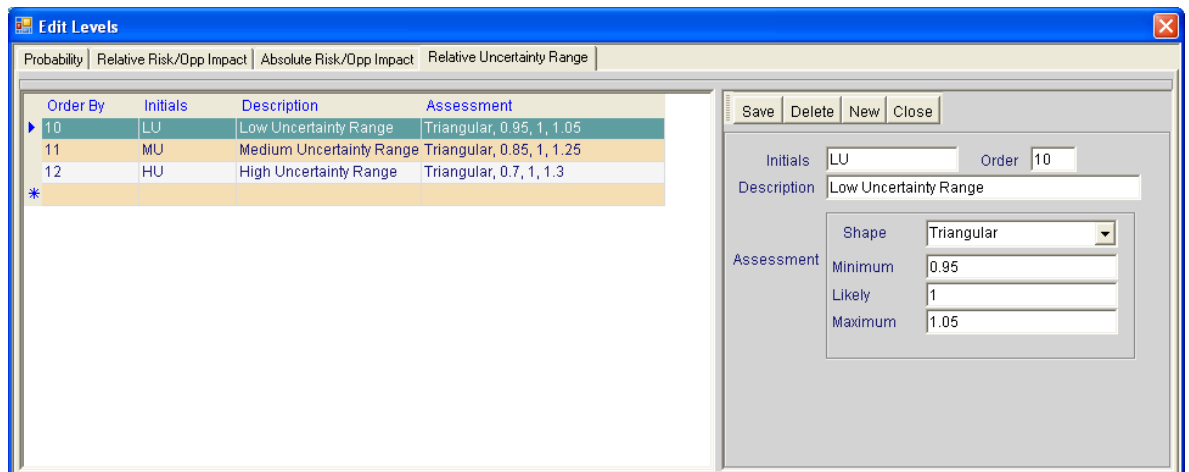
Assessment:

- Shape: Triangular
- Minimum: 1000000
- Likely: 2000000
- Maximum: 3000000



Absolute option will add the deterministic value to the pre-determined 3 PE defined by in this table. This option is best suited to “Design to cost” modelling when detailed risk impact information is limited.

9.1.8.5 Relative Uncertainty Levels



Order By	Initials	Description	Assessment
10	LU	Low Uncertainty Range	Triangular, 0.95, 1, 1.05
11	MU	Medium Uncertainty Range	Triangular, 0.85, 1, 1.25
12	HU	High Uncertainty Range	Triangular, 0.7, 1, 1.3

Save Delete New Close

Initials: LU Order: 10

Description: Low Uncertainty Range

Assessment:

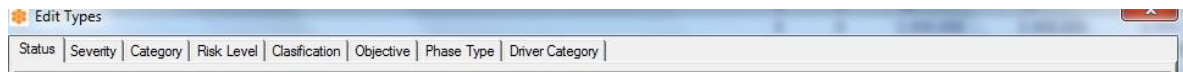
- Shape: Triangular
- Minimum: 0.95
- Likely: 1
- Maximum: 1.05

9.1.8.6 Level management and configuration

All the Edit levels can be changed or added too via the right hand data panel:

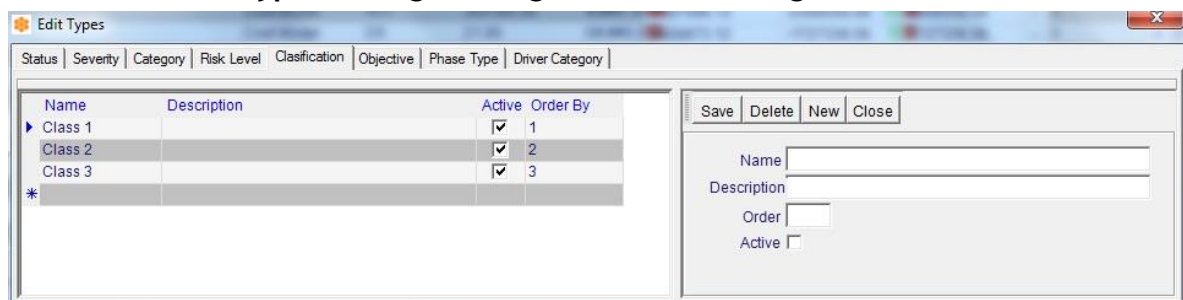
- Changes, select the row you wish amend and update the associated metadata use Save to store data
- New, select **New** input description, then use Assessment to define the impact or probability; **Order by** refers the order the content will be displayed in the dropdown menu

9.1.8.7 Type Settings (Risk and Drivers)



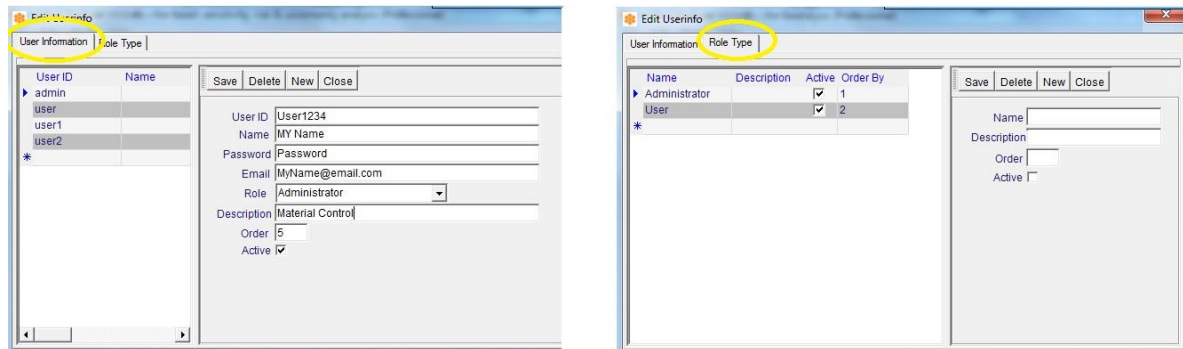
- **Status**- Risk term to describe the life cycle of the risk and will be defined in risk management process
- **Severity-Impact** of the risk; these are defined by your Organisation's risk management process
- **Category (for Risk)**- The part of business that effected by the risk; this defined by risk management process.
- **Risk Level**- The ranking of risks by their effect; the number of risk levels will be defined in risk management process.
- **Classification**- What type of risk is it can it be grouped with other risks e.g. By Cost impact, by Time, etc, these will be defined in risk management plan.
- **Phase Type**- describes when the risk is likely to occur. For an ISO 15 288 company this the CADMID phases.
- **Driver Category**- What part of the Business or process is affected e.g. Wage rates, Material, Testing, etc

9.1.8.8 Type Settings management and configuration



- All **Type settings** can be changed or added too via the right hand data panel:
- Changes, select the row you wish amend and update the associated metadata use **Save** to store data
- New, select **New** input description and associated data and press **Save**. **Order by** refers the order the content will be displayed in the dropdown menu

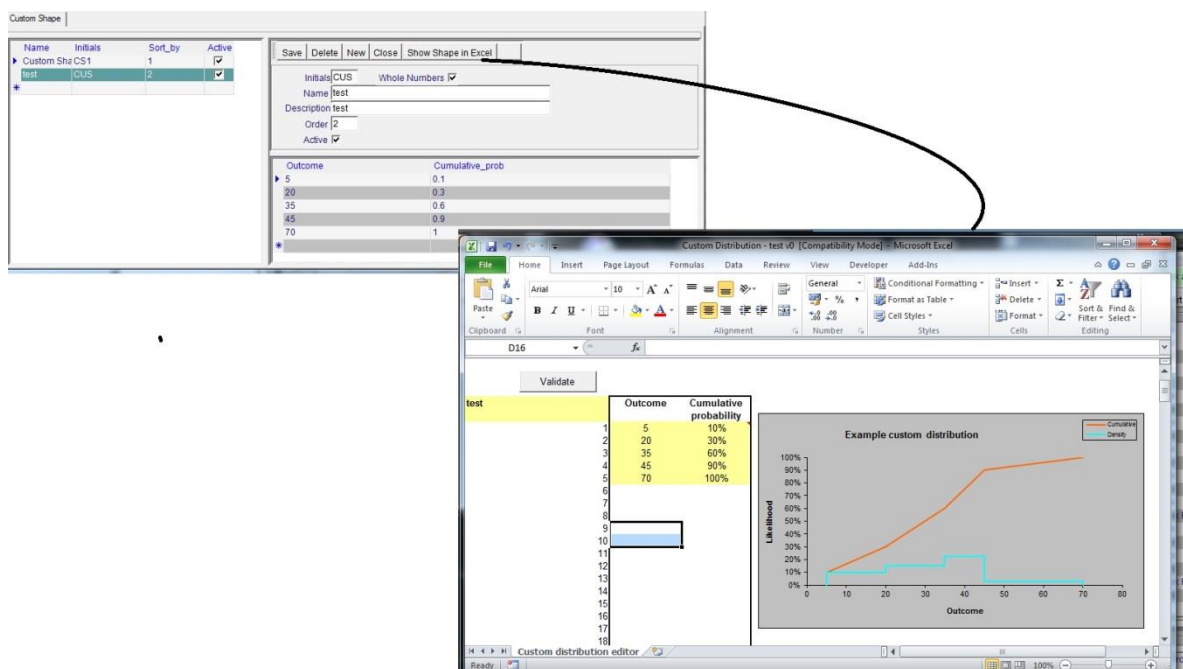
9.1.8.9 User Information



This provides a method of controlling data and providing an audit trail. It will require the risk management plan to define Users limitations.

- **Users** can be changed or added too via the right hand data panel:
- **Changes:** select the row you wish amend and update the associated metadata use **Save** to store data
- **New,** select **New** input details and press **Save**. **Order by** refers the order the content will be displayed in the dropdown menu

9.1.8.10 User-Custom Distributions



This feature allows you to add a custom distribution; this may be data from a previous project that best describes a possible outcome if a risk occurs.

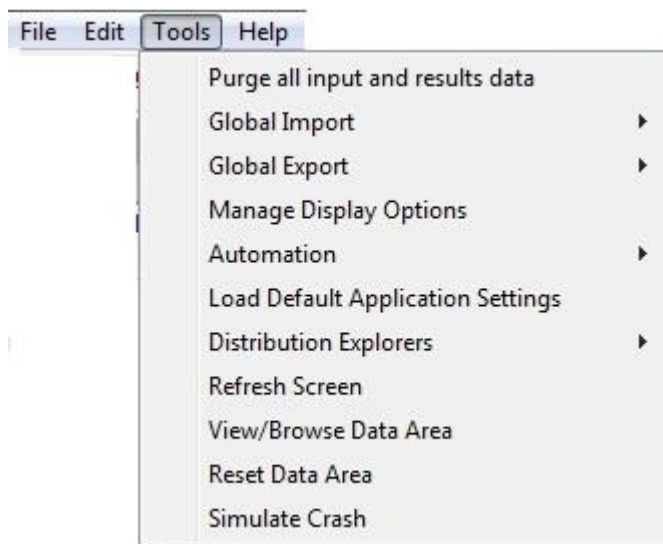
Create distribution

- Select **New** from data input panel, fill in the blank metadata cells **Name**, **Order** (default =1) and **Active** are mandated inputs others are optional.

Distribution data input

- The shape of the distribution is described by an outcome value and the point at it occurs (**Cumulative_Prob**). The **Outcomes** must be a progressive value and the Cumulative probability must also be progressive with a range of 0 to 1. A maximum of 21 data points are allowed; press **Save**.
- Once entered the distribution can viewed in Excel by selecting the **Show Shape in Excel button** (see above).
- Plots can be amended in Excel
 - Change **cumulative prob** or **outcomes**.
 - Press **Validate** button in workbook to check that data conforms.
 - Return to Arrisca and select **Retrieve shape from Excel** button
- Press **Save** to store shape.

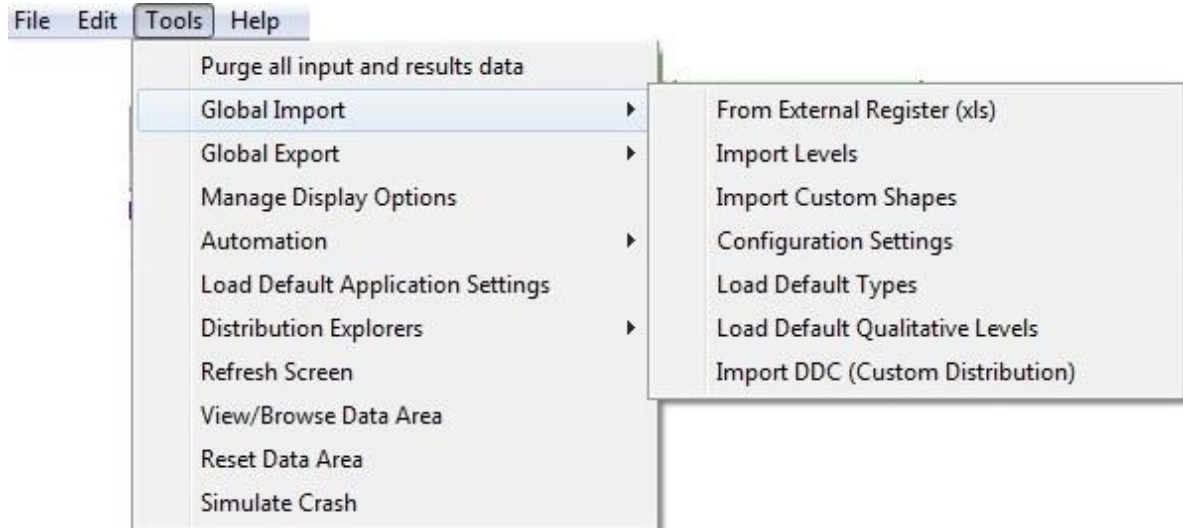
9.1.9 Tools



9.1.9.1 Purge all inputs and results data

After several runs of the software certain internal computer memory devices will need to be reset to eliminate inconsistent results, select this option to clear memory.

9.1.9.2 Global Import



9.1.9.3 From External Register (.xls)

- Enables a saved formatted risk register to be imported and used as a template for a new workbook.

9.1.9.4 Import Levels

- Import risk levels from .xlm file

9.1.9.5 Import Custom Shape

- Import custom shape from Excel workbook

9.1.9.6 Configuration Settings

- To maintain constancy of approach you can import a saved configuration from an earlier task via a .xlm file.

9.1.9.7 Load Default Types

- Reset to “Factory supplied” values

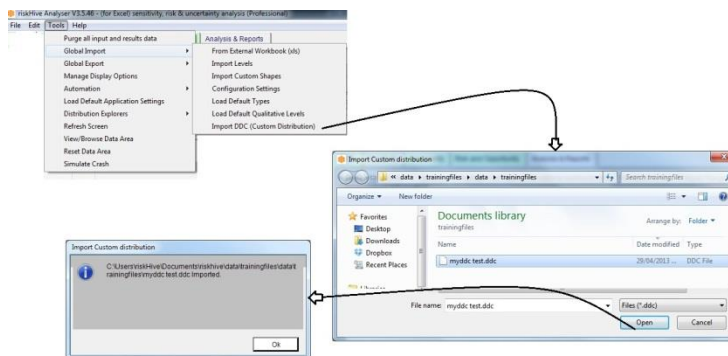
9.1.9.8 Load Default Qualitative Levels

- Reset “Factory Supplied” values

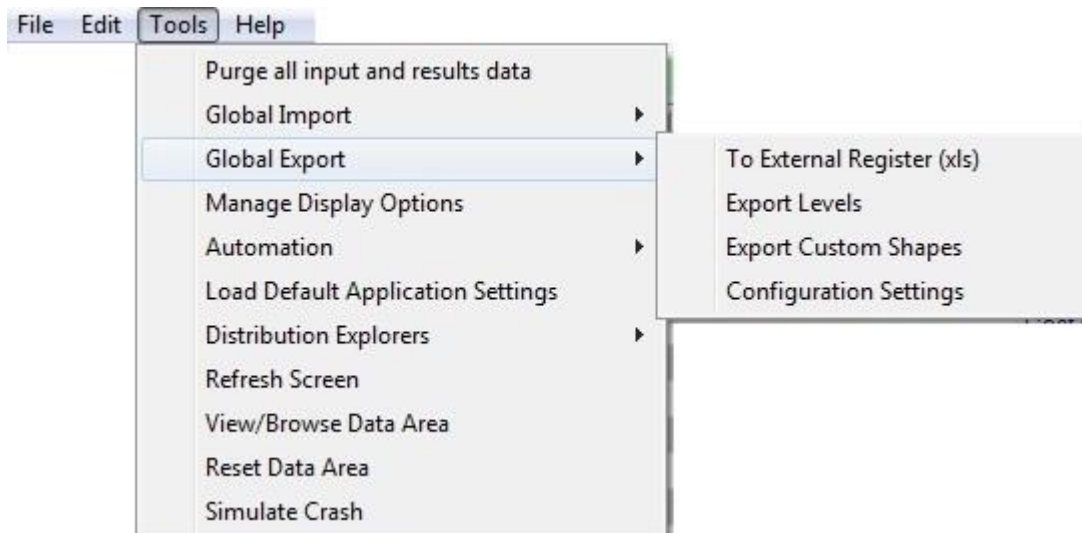
9.1.9.9 Import DDC (custom distribution)

The Arrisca software allows you create DDC file which captures a distribution from a previous analysis and may represent a input distribution for a new analysis

- From the Tools tab on the main menu select Import DDC (Custom Distribution)
- Select the required file from the Import Custom Distribution popup.
- A popup will confirm the file has been imported, Press OK.



9.1.10 Global Export



9.1.10.1 Export to External register (.xls)

9.1.10.2 Export Levels to Excel

- Saving the custom Levels will you to reuse Levels for similar tasks.

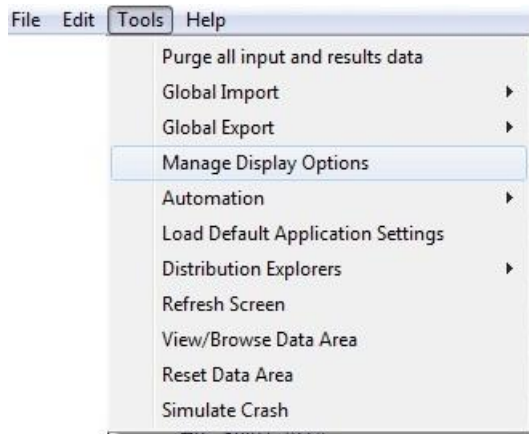
9.1.10.3 Export Custom shape to Excel (.xls)

- Saving Custom Shapes allows reuse for other tasks

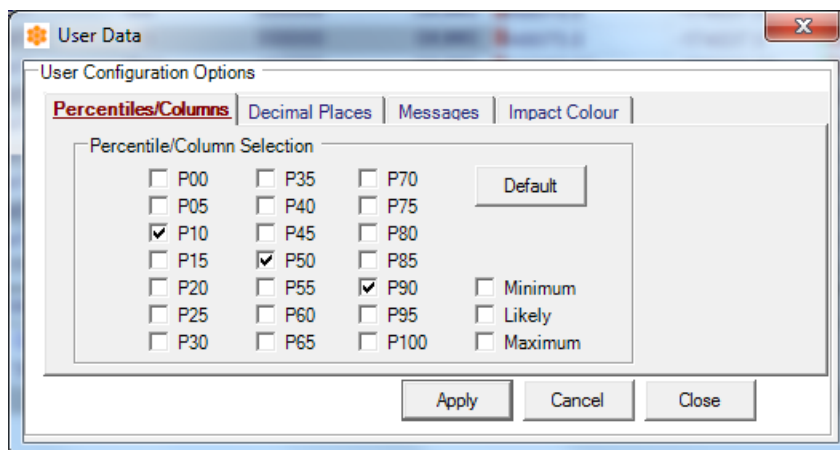
9.1.10.4 Export Configuration Settings

- Saving Configuration settings allows reuse for other tasks

9.1.11 Manage Display Options

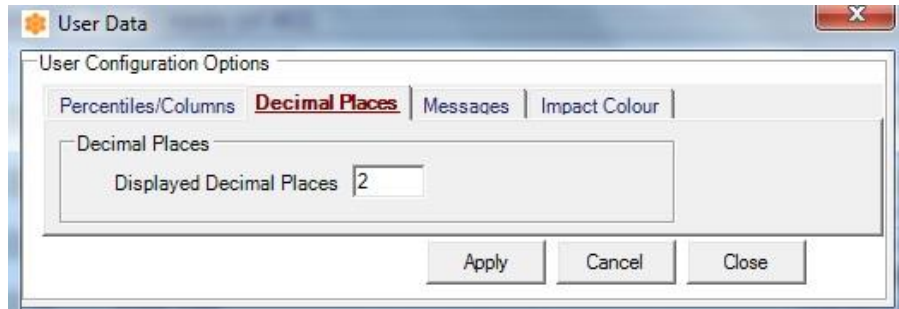


9.1.11.1 Percentiles Columns



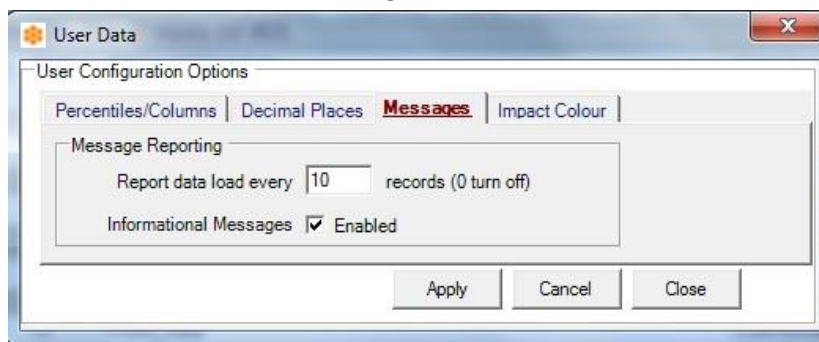
- The Analysis results display can be changed to suit your requirements
- Select the required percentage values and press **Apply** then **Close**.
- By selecting **Default** you can reset to “Factory settings”

9.1.11.2 Decimal Places



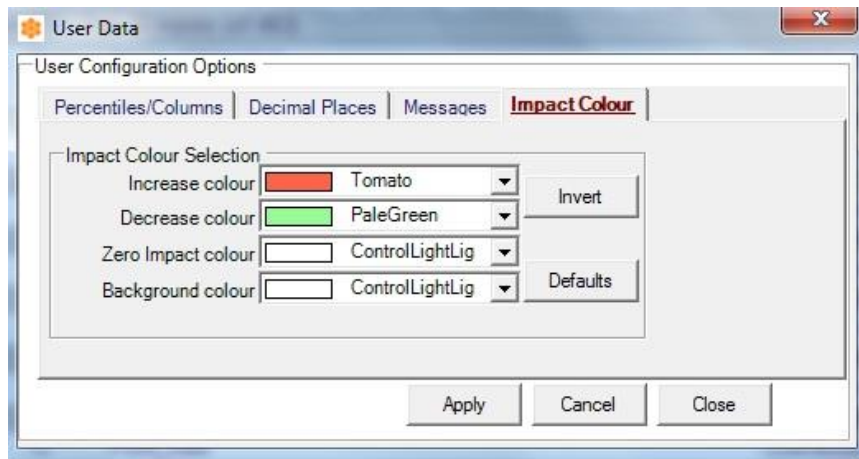
- The decimal places shown in the result displayed can be adjusted to level you require, this is useful when working in £k.
- Input required value and press **Apply** then **Close**.

9.1.11.3 Messages



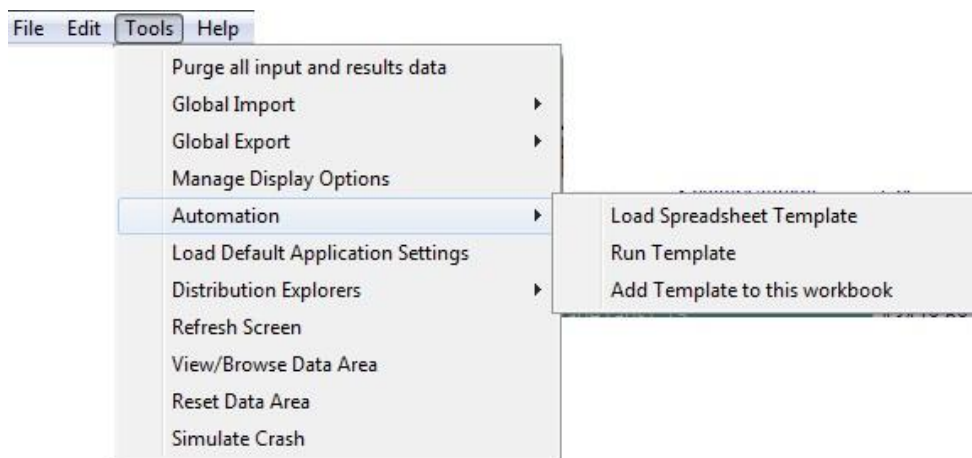
- Messages are useful to track progress or warn you of error, but they do slightly increase process time, these options allow you to change the frequency or turn them off completely.
- Input record refresh rate
- Un-tick box to switch off information messages then press **Apply** and **Close**.

9.1.11.4 Impact Colour



- This options allows you to change the ‘Impact colour’ used .
- Select required colour setting and press **Apply** then **Close**
- The **invert** button will swop the ”increase” and “decrease” selections press **Apply** then **Close**
- **Default** resets to “factory Settings”

9.1.12 Automation



- The Arrisca software can be run automatically by dragging the Excel workbook over the Arrisca Desktop icon. However, for this to function to work the workbook must be constructed in particular format.
- Load spreadsheet Template
- Run Template
- Add Template to this Workbook-

See template layout below.

	A	B	C	D	E	F	G
1							
2	Description of Automation Action	Command	User Input Option	Arguments			
4	Identify Key Output Cell	KeyOutputCell	Y				
5	The Name of the cell that contains the primary output against which you want			TargetCell			
6	Input and Risk Driver Sensitivities to be measured.						
7	Record a log of the automation execution	Logging	Y				
8	Show way-point messages during execution?			Y			
9	Start of location to save automation log			LoggingLocation			
10	External workbook link management	ExternalLinks	Y				
11	Remove external workbook links (Y/N)			Y			
12	User confirmation (Y/N)			Y			
13	Run Macros	Macro	N	Run Every Simulation	Run At Start	Run At End	
14	Name of macros contained in workbook (Macro1,Macro2,...)						
15	Input-Sensitivity Driver Analysis	DriverAnalysis	N				
16	Name of range containing list of worksheets to analyse.			WorksheetListRange			
17	If there is no name entered here then all are processed.			0.9			
18	Lower flex limit (Percentage of cell value i.e. 0.9)			1.1			
19	Upper flex limit (Percentage of cell value i.e. 1.1)			N			
20	Run heatmap schema after processing (Y/N)						
21	Uncertainty (3-point estimate) data import from file	Uncertainty	Y	Range1	Range2	Range3	
22	Range(s) where Uncertainty 3PE exist			Uncertainty1	Uncertainty2		
23	Layout of 3PE (Row or Column)			Column	Column		
24	Get Shape (Pick-up distribution shape for 3PE)			N	N		
25	Ignore Zeros (Don't import any zero-value cells)			Y	Y		
26	Add as a Key Result during import process			N	N		
27	Correlation import range from file	Correlation	Y	Range1	Range2	Range3	
28	Range(s) describing where Correlation values exist			Correlation1			
29	Risk (register) data import from file	Risk	Y	Range1	Range2	Range3	
30	Range(s) where risk register data exists			Risk1	Risk2		
31	Add risk target cell as a Key Result during import process (Y/N)			N	N		
32	Key Result cells import range from file	KeyResults	Y	Range1	Range2	Range3	
33	Range(s) describing where Key Results exist			KeyResult1	KeyResult2	KeyResult3	
34	Add risk target cell as a Key Result during import process (Y/N)			Y	Y	Y	
35	Run Monte Carlo Simulation and Analysis	Simulation	Y				
36	Max. Number of Monte Carlo Simulation sets to run (in multiples of 20)			400			
37	Use fixed Random number seed			Y			
38	Random number seed (6 digit)			65535			
39	Stop on Convergence			N			
40	Convergence limit (%)			1			
41	Convergence slice check (in multiples of 20)			20			
42	Paste-back Monte Carlo results to Key Results in workbook	PasteBack	Y	Range1	Range2		
43	Range(s) describing where Key Results exist (blank = All)			KeyResult1	KeyResult2		
44	Flows or Columns (KR selection orientation)			Column	Column		
45	X/Y Offset (from Key result)			0/0	0/0		
46	Confidence values to paste back (in 5% increments from 0% through 100%)			10/50/90	10/50/90		
47	Generate full report in new Excel workbook	Reports	Y	Name			
48	Report Type (Full)			Full			
49	Generate RAF archive file (includes workbook)	Raf	Y				
50	Append filename with timestamp? (Y/N)			Y			
51	Close Application on Completion	Completion	Y				
52	Save Workbook on Close? (Y/N)			Y			
53	Arrisca Automation Log	Selected Driver Worksheets					

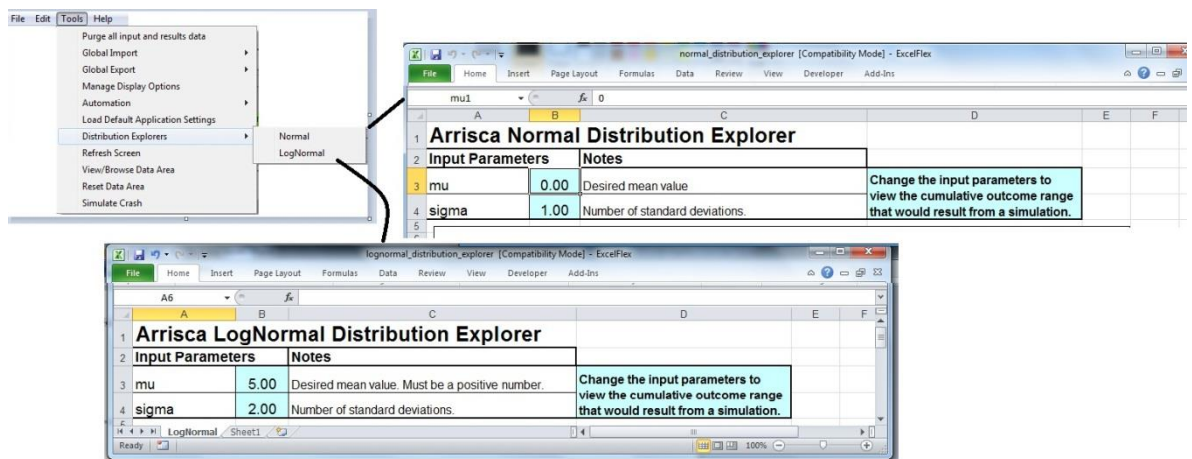


If you have many ranges of “Risks” or “Uncertainties” it is good practice to use named ranges that have a common name start as this will allow global import via the Name\$ function e.g Riskrange1, Riskrange2, et seq these can be imported by using Riskrange\$ in Cell D28 only

9.1.13 Load Default Application Settings

- Select this option to reset all levels, Category’s and Classification’s to “Factory setting”.

9.1.14 Distribution Explorers



- The explorer tool allows you picture the distributions based on a Normal and Log Normal basis.
- Select which option **Normal** or **Log Normal** an Excel workbook will open, there are only 2 inputs required **Desired mean** and number of **Standard Deviations**



: The use of a log normal can have a significant effect in that it concentrates impacts at the lower end of the probability scale but extreme high impacts compared to a normal distribution. It should only be used when there evidence to justify its use.

9.1.15 Refresh Screen

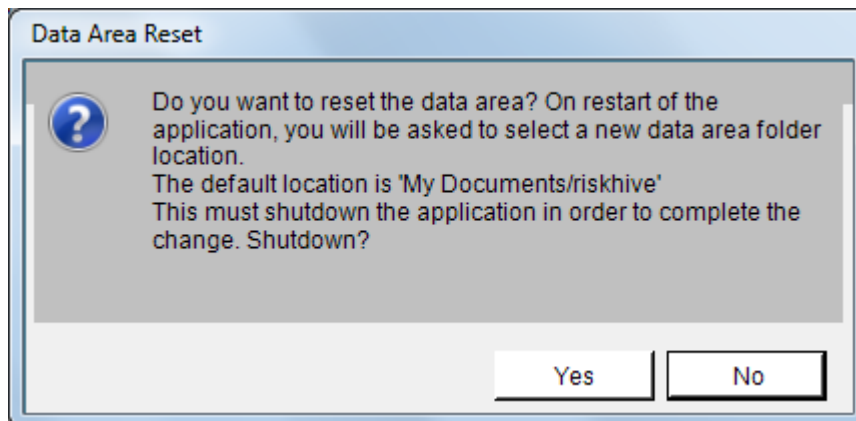
- This is a standard refresh function use when display's get over written with spurious data.

9.1.16 View & Browse Data Area

- This function will start the **Windows Explorer** and take you straight to the folder where you have stored files.

9.1.17 Reset Data Area

- This will reset all data area and restart software.



: Use with caution as Arrisca will shut down and your data may be lost.

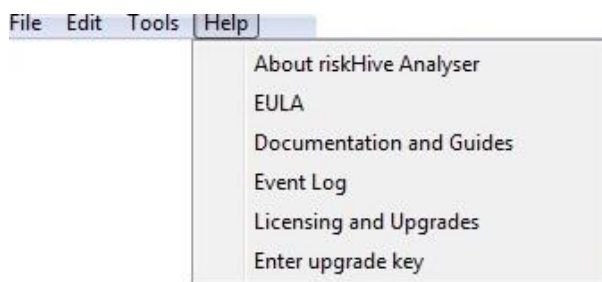
9.1.18 Simulate Crash

- The **simulate crash** function is to provide you with confidence in the Arrisca's capability to capture your inputs as you progress through the risk analyse assessment (sensitivity, uncertainty, etc).



: Use this to demonstrate the Arrisca's tool robustness.

9.2 Help



9.2.1 About riskHive Analyser

- Will display the issue, build state release date and contact information

9.2.2 EULA

- Will display a copy of the software licence agreement.

9.2.3 Documentation and Guides

- Will link you the riskHive Web site where you can access online help files

9.2.4 Event Log

- Will display in MS Note a recorded of all the error logs created for the day.

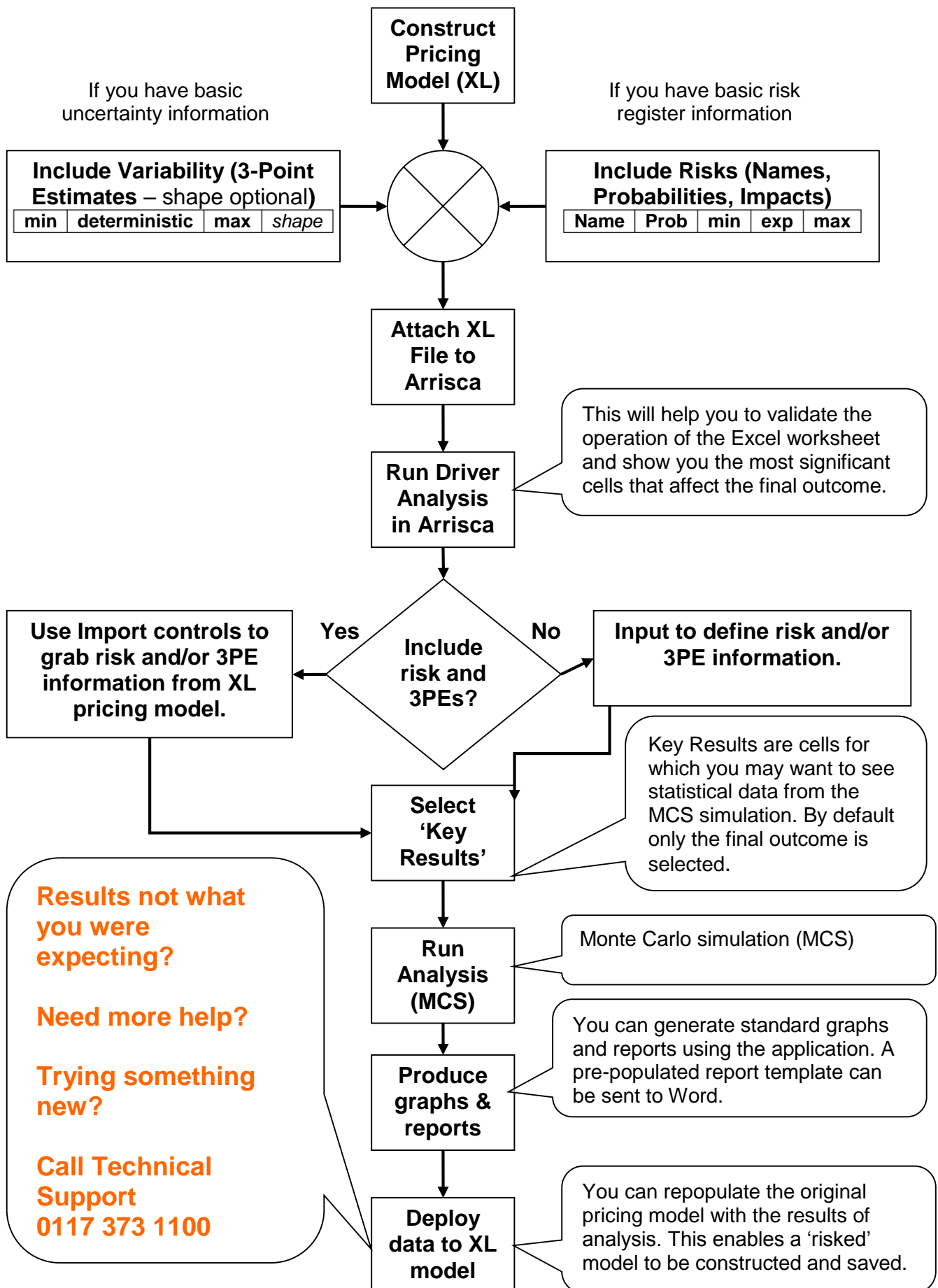
9.2.5 Licensing and upgrades

- Will link you the riskHive Web site where you can obtain information regarding licensing and upgrade keys

9.2.6 Enter upgrade key

- Input new upgrade key code

10 Quick start guide



11 Glossary

Term	Definition
3PE	abr. See Three-point Estimate
Assess Risk	<p>The activity within the Risk Management Process of prioritising identified Risks against agreed criteria. It includes the systematic:</p> <ul style="list-style-type: none"> determination of the likelihood of an event (Probability) assessment of severity of consequences (Impact) <p>assignment of responsibility (Risk Owner)</p>
Analyse Risk	The activity within the Risk Management Process of using a simulation or modelling technique to produce the whole range of possible outcomes from the data collected during the Assess Risk process. See Monte Carlo simulation.
Attached workbook	The Excel workbook to which the Arrisca application is attached and is able to process.
Bell Curve	See Frequency Distribution
Cell-selector tool	The Excel pop-up window that allows the selection of a cell or range of cells for further processing
Central limit theorem	The central limit theorem (CLT) states that the sum of a large number of independent and identically-distributed random variables will be approximately normally distributed (i.e., following a Gaussian distribution, or bell-shaped curve) if the random variables have a finite variance.
Central limit theorem avoidance	Don't use more than about 30 elements of uncertainty with common distribution shapes in any one simulation parameter set, or use probabilistic risk with a likelihood of 100% to separate values.
Confidence Figure (%)	A Confidence Figure is the likelihood of meeting or bettering a specific parameter (time, cost or other). The confidence figure is normally defined as a percentile (%) figure and is derived from quantitative modelling (statistical analysis) using such tools as Monte Carlo Simulation.

	The MOD Approvals process places importance on the likely outcome (time and cost) at the 10%, 50% and 90% Confidence Figures which must not be confused with Three Point estimating.
Confidence Interval	The population of statistical outcomes existing between the 10% and 90% Confidence Figures in which 80% of all the outcomes lie.
Consequence	The effect the occurrence of a Risk has on the planned progress or outcome of a project or programme plan.
Context	The detail regarding the events, circumstances, and interrelationships that may lead to a Risk Event occurring.
Cumulative Frequency Distribution	The integration of the Frequency Distribution. Graphically known as the S-curve due to its shape
Data Cartridge	A self-contained package of Arrisca analysis data and parameters that can be used to transfer information between models and applications using XML.
Distributions: Input: Types	
Driver Analysis	An analytical technique that facilitates the identification and quantification of input sensitivities with respect to an identified outturn calculation
Enterprise Analytics	The technique of consolidating and analysis data from around the Enterprise in an analytically and statistically correct manner to aid decision support
Event	In Risk Management an Event is the occurrence of unplanned/uncertain circumstances which lead to a detrimental impact (positive for opportunities) on planned project progress or outcomes.
Excel	Microsoft's proprietary spreadsheet application
Fallback Plan	A Risk Handling Option that defines alternatives only to be taken up if a Risk occurs or a mitigation plan has failed to have the intended effect or a risk decision point is reached. (See also Mitigation Plan)
Feature Bar	The upper area of the Function Tab which contains the context-specific controls for each screen

Frequency Distribution	Relative frequencies of value intervals can be shown in a frequency distribution - also known as a Bell Curve. The frequency of each value is indicated by points or dots drawn at the midpoints of each value interval. A smooth curve is used to connect the points and, similar to a graph, is plotted on two axes: The horizontal axis from left to right (or x axis) indicates the different possible values of some variable (the outcome of the simulation). The vertical axis from bottom to top (or y axis) measures frequency or how many times a particular value occurs.
Frequency Polygon	Relative frequencies of value intervals can be shown in a frequency polygon. The frequency of each value is indicated by points or dots drawn at the midpoints of each value interval. Those points are then connected by straight lines.
Function Tab	Function Tabs allow easy switching between the primary function areas application and contain the Feature Bars, Controls and List Panels.
Hullogram	<p>The Hullogram is a primary graphical output of the Arrisca application. It is a dataset that is exported to an Excel template which automatically produces graphs and reports based on the following data:</p> <ul style="list-style-type: none"> • Deterministic (single-point target value) • Bell-curve • S-curve • 10% Confidence figure • 50% Confidence figure • 90% Confidence figure • Statistical mean outcome value
Identify Risk	The activity within the Risk Management process to find, list and characterise elements of Risk. NOTE: Elements include Context, Risk Source, Event and Consequence. Opportunities may also be revealed.
Input Distribution	The means of describe the range of input values that will be used in simulation. Usually a shape plus a parameter set. See Distributions
Issue	A significant certain occurrence differentiated from a Risk by virtue of its certainty of occurrence and by the fact that it should be accounted for in Planning & Scheduling activities and not Risk Management.
Key Outcome Cell	The cell in the Excel workbook whose outturn is the focus of the analysis.

Key Result	The name given to a cell which is selected to have statistical results calculation during simulation. Accessible from the Key Results Function Tab.
Manage Risk	The activity within the Risk Management Process of implementing, monitoring, reporting and reviewing Risk Management actions against objectives.
Maximum Value	This is a pessimistic extreme, assuming that the worst tends to happen, but excluding the very remote - e.g. "Acts of God".
Metamodelling	The term used to describe the technique of applying overlays to an existing model to 'shock' or 'flex' it into generating a different range of outturns.
Minimum Value	This is an optimistic estimate of what might happen, assuming that the risks do not materialise and that everything goes about as well as possible.
Mitigation Plan	A Risk Handling Option that sets in place actions to reduce the Probability and/or the Impact of a Risk prior to its occurrence. (See also Fallback Plan)
Monte Carlo Simulation	<p>Monte Carlo methods are a class of computational algorithms that rely on repeated random sampling to compute their results. Monte Carlo methods are widely used when simulating physical and mathematical systems. Because of their reliance on repeated computation and random or pseudo-random numbers, Monte Carlo methods are most suited to calculation by a computer but can be replicated manually. Monte Carlo methods tend to be used when it is infeasible or impossible to compute an exact result with a deterministic algorithm (as in the case of Confidence Figures) There is no single Monte Carlo method; instead, the term describes a large and widely-used class of approaches. However, these approaches tend to follow a particular pattern:</p> <ul style="list-style-type: none"> • Define a domain of possible inputs. • Generate inputs randomly from the domain, • Perform a deterministic computation on them. • Aggregate the results of the individual computations into the final results. <p>The term Monte Carlo method was coined in the 1940s by physicists working on nuclear weapon projects in the Los Alamos National Laboratory. [</p>

Most Likely Value	This is the estimator's best bet, the sort of estimate that is right more often than any other (i.e. the mode, in statistical language).
Opportunity	A Risk with positive Consequences. Combination of the Probability of an Event occurring and its positive Consequences on objectives. (See also Risk)
Optimism Bias	The demonstrated systematic tendency for appraisers to be over-optimistic about key project parameters. The MOD process for addressing Optimism Bias is detailed in JSP507.
Plan	The activity within the Risk Management Process of selection and implementation of Risk Handling Options.
Probability	The likelihood that an event (Risk) will occur usually described as a percentile figure. A probability approaching 100% should be considered as certain event and included in project plans and budgets.
Residual Risk	Risk remaining after Risk Handling Options have been implemented.
Risk	A significant uncertain occurrence, differentiated from an Issue by virtue of its lack of certainty. A Risk is defined by the combination of the Probability of an Event occurring and its Consequences on objectives. NOTE: The term “Risk” is generally used to embrace the possibility of both negative and/or positive consequences. However, “Opportunity” is specifically used to define those Risks with only the possibility of positive consequences. Additional Information: All Risks should be described in a consistent and unambiguous manner. Projects are recommended to adopt a structured method to capture data on identified risks. For an example of good practice in this area download Risk Description Discipline document.
Risk Factor	The factor(s) that govern(s) the probability and/or impact attached to a Risk.
Risk Handling Options	Mitigation action for reducing the Probability and/or Impact of a Risk this includes Treat, Transfer, Tolerate and Terminate, also the provision of Fallback Plans. (For Opportunities handling options are designed to enhance and encourage the likelihood of occurrence and increase the Impact on outcomes.)

Risk Impact	A measure of the severity of a Risk consequence. (Can be positive for Opportunities)
Risk Management	The systematic application of management policies, procedures and practices to the tasks of establishing the context, identifying, analysing, planning and managing Risks in a way that will enable organisations to minimise loss and maximise opportunity in a cost-effective way. NOTE: The Risk Management Process includes the activities of Identify, Analyse, and Plan & Manage.
Risk Management Plan	A description of how Risk is to be managed within a project. It defines Risk Management Roles, Responsibilities, Methodology, Tools and Techniques specific to a project.
Risk Management Strategy	A description of the objectives of Risk Management in relation to the overall objectives and context of a project. It includes interrelationships between Risk Management and other project activities and must demonstrate that Risk Management fits within a project's Through Life Management approach.
Risk Manager (or Risk Process Manager)	The person within a Project with the overall responsibility, accountability and authority for ensuring that the Risk Management Process is deployed and operated effectively.
Risk Owner	The individual with the overall responsibility, accountability and authority for the planning & management of a Risk. NOTE: The Owner of a Risk should be that individual best able to manage the source of the Risk.
Risk Source	The underlying set of circumstances and factors that lead to the existence of a Risk.
S-curve	See Cumulative Frequency distribution
Secondary Risk	A Risk arising solely from the adoption of a Risk Handling Option.
Simulation	See Monte Carlo Simulation
Slice	A single iteration of Monte Carlo sampling
Source	The root cause of a risk occurring described in terms of the risk Event and circumstances leading to it not the consequences of the event occurring.
Terminate (Avoid)	Some risks will only be treatable, or containable to acceptable levels, by terminating or avoiding the activity or activities that give rise to the risk.

Three Point Estimate	<p>A technique that uses three values to characterise an estimate; Minimum through Most Likely to Maximum that are the basic input values for quantitative analysis. The three values needed are defined as follows:</p> <ul style="list-style-type: none"> • Minimum - This is an optimistic estimate of what might happen, assuming that the risks do not materialise and that everything goes about as well as possible. • Most Likely - This is the estimator's best bet, the sort of estimate that is right more often than any other (i.e. the mode, in statistical language). • Maximum - This is a pessimistic extreme, assuming that the worst tends to happen, but excluding the very remote - e.g. "Acts of God".
Tolerate (Accept)	<p>The ability to do anything about some risks may be limited, or the cost of taking any action may be disproportionate to the potential benefit gained. In these cases the response may be toleration.</p>
Transfer	<p>For some risks the best response may be to transfer them. Namely, shift the responsibility or burden of loss to another party through legislation, contract, insurance or other means. This may also occur through Public Private Partnership (PPP) or Customer Supplier Agreement (CSA) re-negotiation activity. Partial transfers are known as risk sharing or risk assignment.</p>
Treat (Reduce)	<p>By far the greater number of risks will belong to this category. The purpose of treatment is not necessarily to obviate the risk, but more likely to contain the risk to an acceptable level. The actions taken to handle risk are instigated by the Risk Owner although their effects may be felt outside of the Risk Owner's organisation.</p>
Uncertainty	<p>A condition where the outcome can only be estimated. NOTE: the term Uncertainties is also specifically used to describe uncertain occurrences that are considered insignificant in terms of impact on objectives.</p>
Workbook	<p>The generic name of the file created and operated by Microsoft's proprietary Excel</p>

	application. Workbooks use the .xls file extension.
Worksheet	The generic name of a tab contained within an Excel workbook.

12 Support

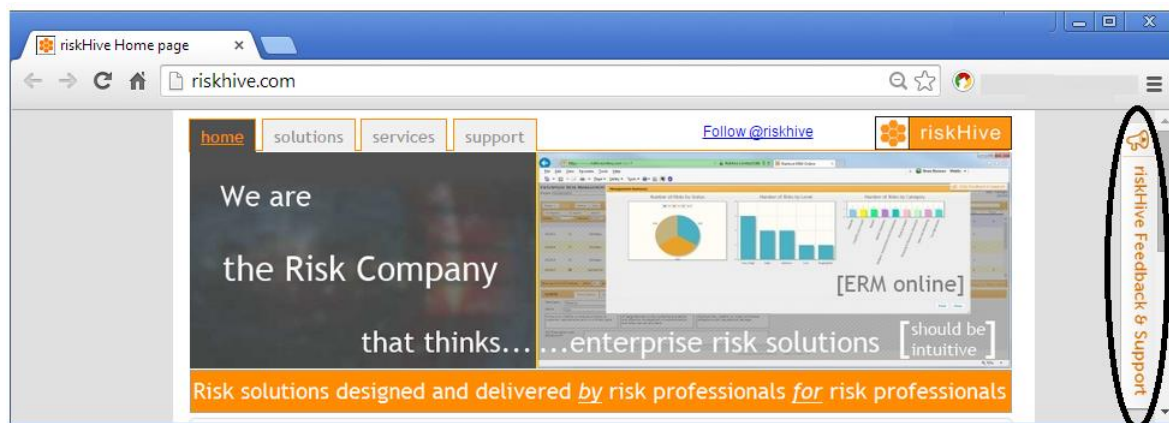
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Support lines are open from 09:00 to 17:30 (GMT) Monday to Friday.

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