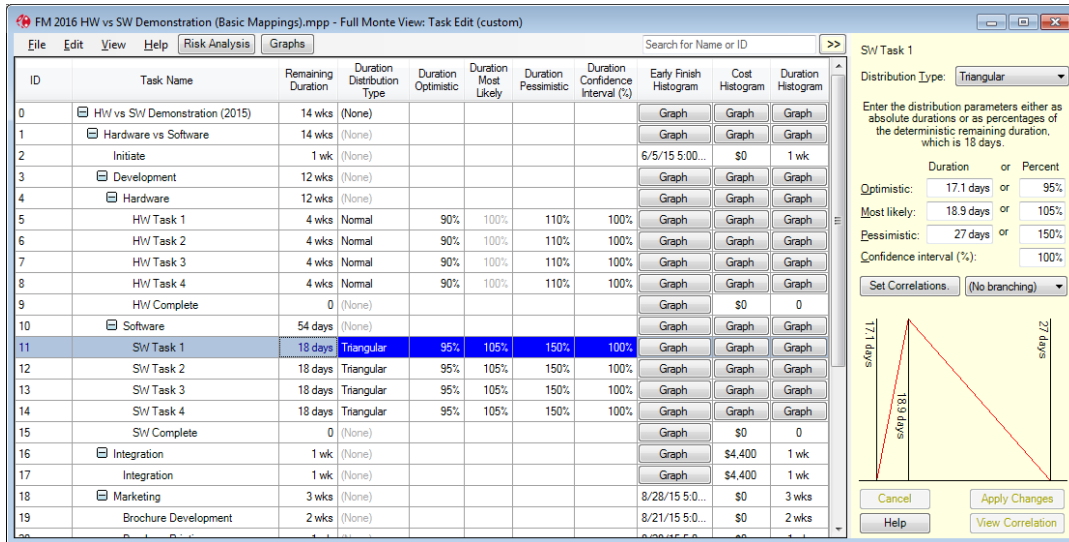


## Full Monte 2016 for Microsoft Project

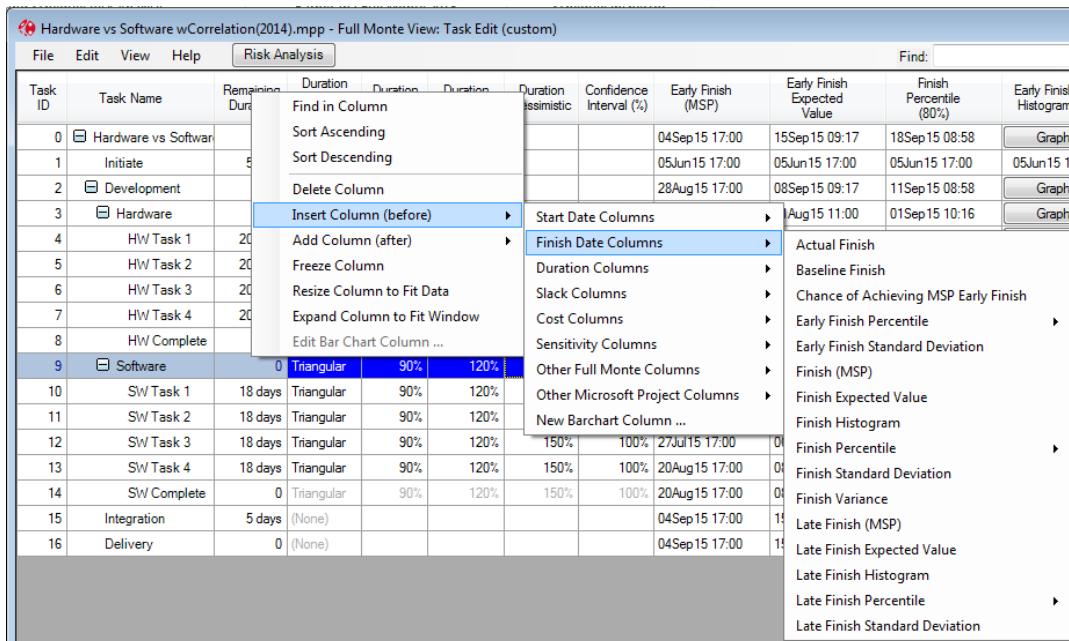
### Interface

Full Monte 2016 features a new spreadsheet style interface that supports a hierarchical approach to assigning uncertainty data.



The content of the spreadsheet view is user configurable and can include data columns from Microsoft Project and Full Monte, buttons for graphical reports, and Gantt charts.

To simplify the insertion of data columns, the field picker now groups available columns by data type.

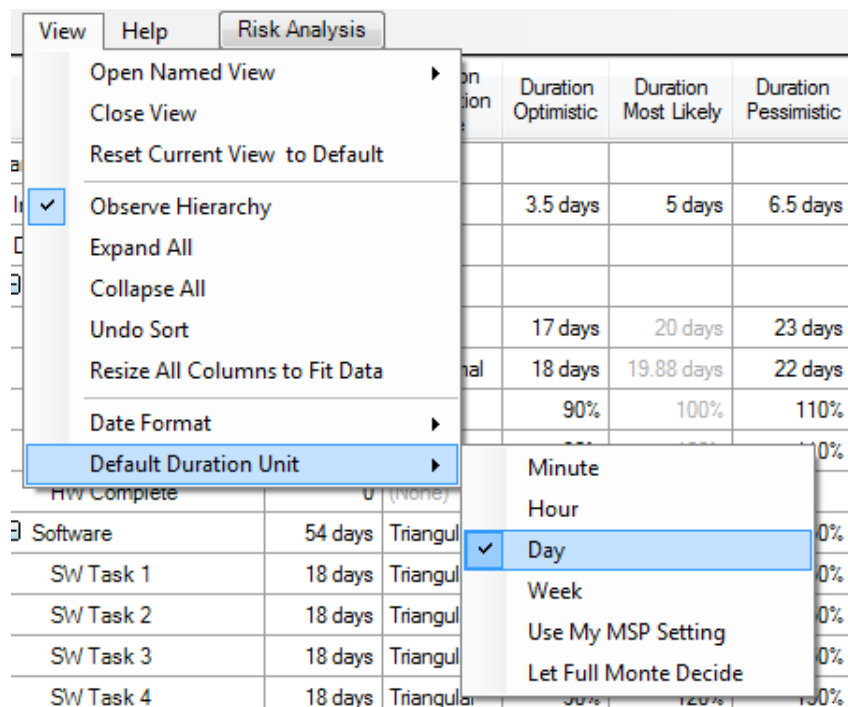


In the following example, the Hardware summary task (ID 3) was assigned a Normal distribution and this has been inherited by all the Hardware subtasks. The user can override the inherited value at any level.

2	[-] Development	60 days	(None)					28Au
3	[-] Hardware	60 days	Normal	90%	100%	110%	100%	28Au
4	HW Task 1	20 days	Normal	90%	100%	110%	100%	03Jul
5	HW Task 2	20 days	Normal	90%	100%	110%	100%	31Jul
6	HW Task 3	20 days	Normal	90%	100%	110%	100%	31Jul
7	HW Task 4	20 days	Normal	90%	100%	110%	100%	28Au
8	HW Complete	0	Normal	90%	100%	110%	100%	28Au
9	[-] Software	54 days	(None)					20Au
10	SW Task 1	18 days	(None)					01Jul

In Graph button columns, the constant value is now displayed (rather than a blank cell) if no distribution information exists for the cell.

The user can now select the default units for entering/displaying durations from the View menu.



Specific units can be selected along with the current setting in Microsoft Project. The user can also let Full Monte automatically choose an appropriate unit for each cell (as with Full Monte 2.1).

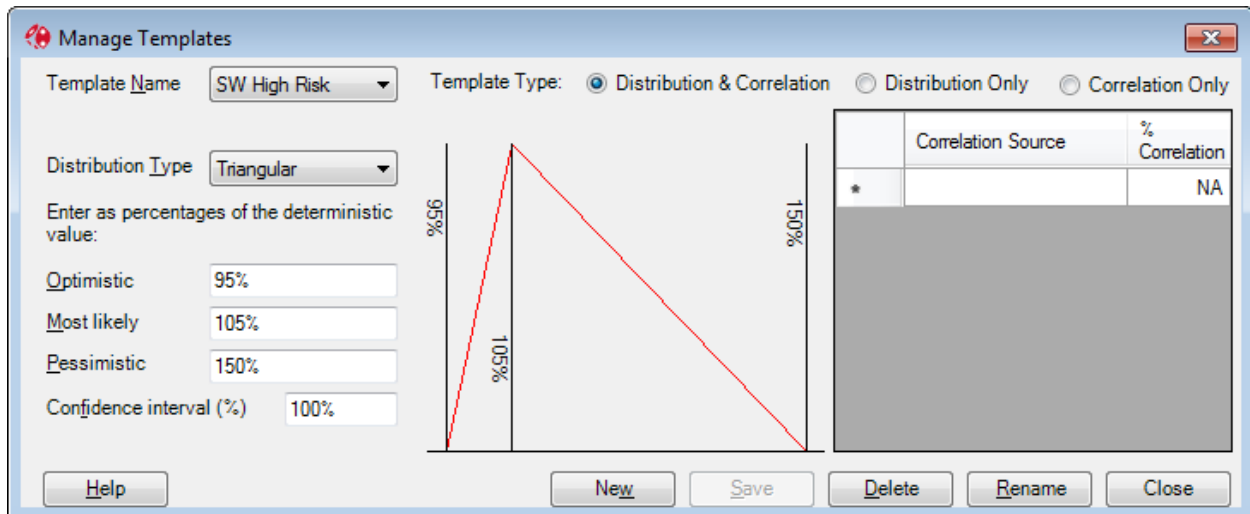
The 'Copy to Clipboard' option now only copies valid data rows from views.

## Templates

Templates can be defined with specific sets of uncertainty information. This allows organizations to model risk matrices/groups/bands and simplify the assignment of uncertainty information to tasks.

Templates are defined and maintained under Edit, Manage Templates.

This following template has been defined for “SW High Risk” work and specifies a Triangular distribution with optimistic/pessimistic values of 95/150 percent, 100% confidence and no correlation.



Templates can be utilized in two ways:

- Assigned directly to one or more selected tasks
- Assigned based on the contents of a custom text field

### Template Assignment to selected tasks

The user can select one or more tasks in the spreadsheet view using standard conventions like Click, Shift+Click, Ctrl+Click or Ctrl+A.

Right Click on any selected row and the context menu “Apply Template →” will be displayed. Use the mouse to select an appropriate template. The uncertainty data from the chosen template will be applied to all selected tasks.

3	Hardware	60 days	Normal	90%
4	HW Task 1	20 days	Normal	90%
5	HW Task 2	20 days	Normal	90%
6	HW Task 4			
7	HW Complete			
8	Software			
9	SW Task 1			
10	SW Task 2			
11	SW Task 3			
12	SW Task 4			
13	SW Complete			
14	Integration			
15	Delivery			

Context menu options:

- Apply Template
- DEFAULT
- HW HIGH RISK
- HW LOW RISK
- HW MEDIUM RISK
- INHERITED
- NONE
- SW HIGH RISK
- SW LOW RISK
- SW MEDIUM RISK
- From Text Field

## Template Assignment based on custom Text field

As well as applying templates to selected tasks by choosing a specific name from the provided list, the user can select 'From Text Field' and then choose an available custom text field that contains the name of the template to be assigned to each task. Custom text fields with lookup values are supported.

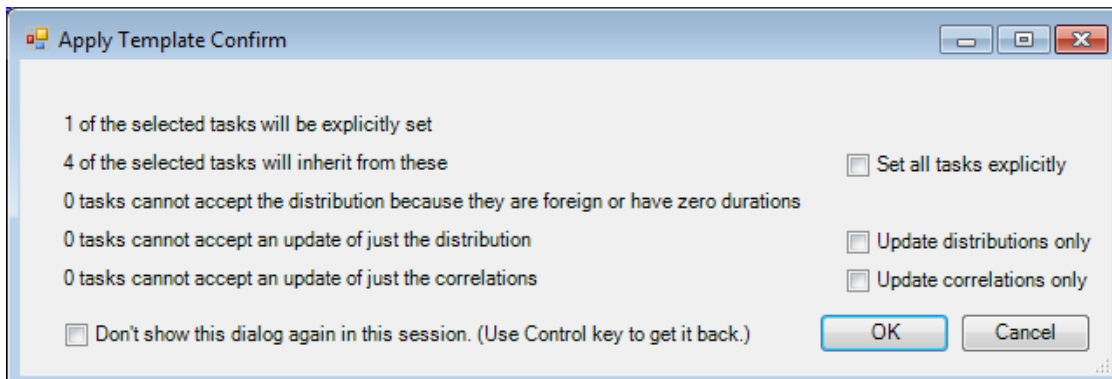
The following screenshot shows a custom column (named Distribution Template) in Microsoft Project that has pre-defined values matching template names.

Task Name	Distribution Template	Duration	Start	Finish
Initiate	None	5 days	6/1/15 8:00 AM	6/5/15 5:00 PM
Development		60 days	6/8/15 8:00 AM	8/28/15 5:00 PM
Hardware		60 days	6/8/15 8:00 AM	8/28/15 5:00 PM
HW Task 1	HW Low Risk	20 days	6/8/15 8:00 AM	7/3/15 5:00 PM
HW Task 2	HW Low Risk	20 days	7/6/15 8:00 AM	7/31/15 5:00 PM
HW Task 3	HW Low Risk	20 days	7/6/15 8:00 AM	7/31/15 5:00 PM
HW Task 4	HW Low Risk	20 days	8/3/15 8:00 AM	8/28/15 5:00 PM
HW Complete		0 days	8/28/15 5:00 PM	8/28/15 5:00 PM
Software		54 days	6/8/15 8:00 AM	8/20/15 5:00 PM
SW Task 1	SW High Risk	18 days	6/8/15 8:00 AM	7/1/15 5:00 PM
SW Task 2				7/27/15 5:00 PM
SW Task 3				7/27/15 5:00 PM
SW Task 4				7/20/15 5:00 PM
SW Complete				7/20/15 5:00 PM
Integration				7/4/15 5:00 PM
Delivery		0 days	7/4/15 5:00 PM	7/4/15 5:00 PM

If the selected custom text field has no name associated with it, it will be renamed "Distribution Template".

Full Monte will validate to ensure the contents of the selected custom field contains data matching valid template names (although it is case insensitive). If the field on any task contains data that does not match an existing template name, the process is aborted and the user informed. Any tasks with blank values in the selected field will be ignored and no changes will be made to task uncertainty data for those tasks.

The following confirmation dialog is shown before the templates are applied



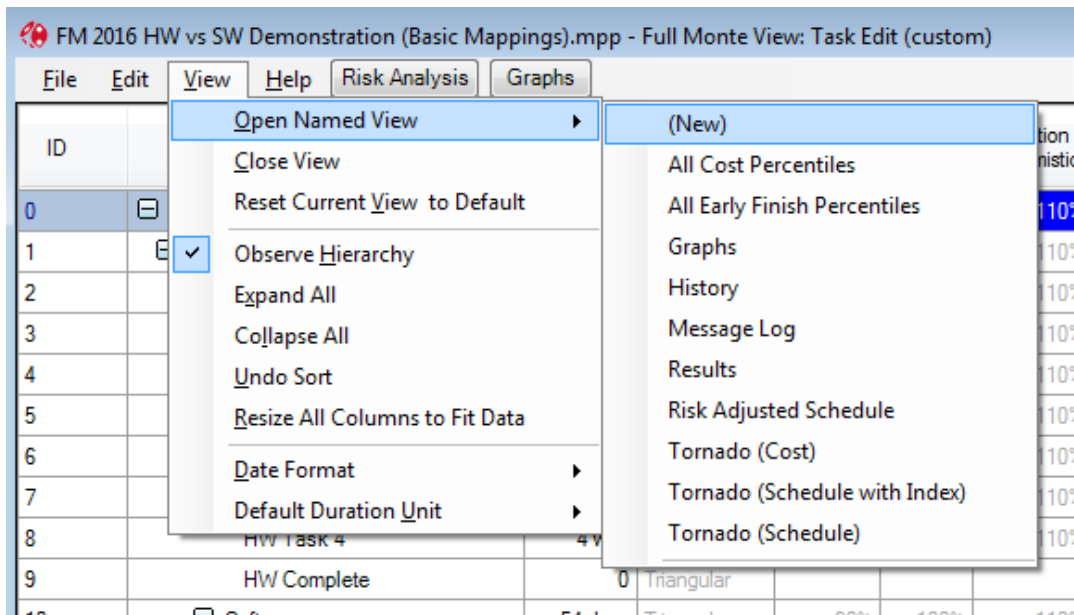
The dialogs contains informational messages regarding how many tasks will be affected and also allows the user to choose whether distributions and/or correlations should be set. There is also an option to suppress the dialog during the remainder of a Full Monte session (it will always be displayed on first use in a new session). The user can also force the dialog to be displayed by holding down the Control (Ctrl) key when selecting the template to apply.

Full Monte will detect where the same template is being applied to both a summary task and its sub-tasks and will only apply the template to the summary task while setting the sub-tasks to 'inherit' unless the option to 'Set all tasks explicitly' is selected..

## Views

Views, formerly known as 'Reports' in earlier versions of Full Monte, are accessible from the View menu.

A basic set of views is pre-defined but the user can create custom views to meet their requirements.



### Split Tornado (Schedule) / Split Tornado (Cost) Reports

Showing the results of sensitivity analysis using split color bars was available in Full Monte 2.1.14197.1 or later by renaming the regular Tornado view however these are now available as standard views in Full Monte 2016. The point where the color changes is the project or deliverable expected finish date.

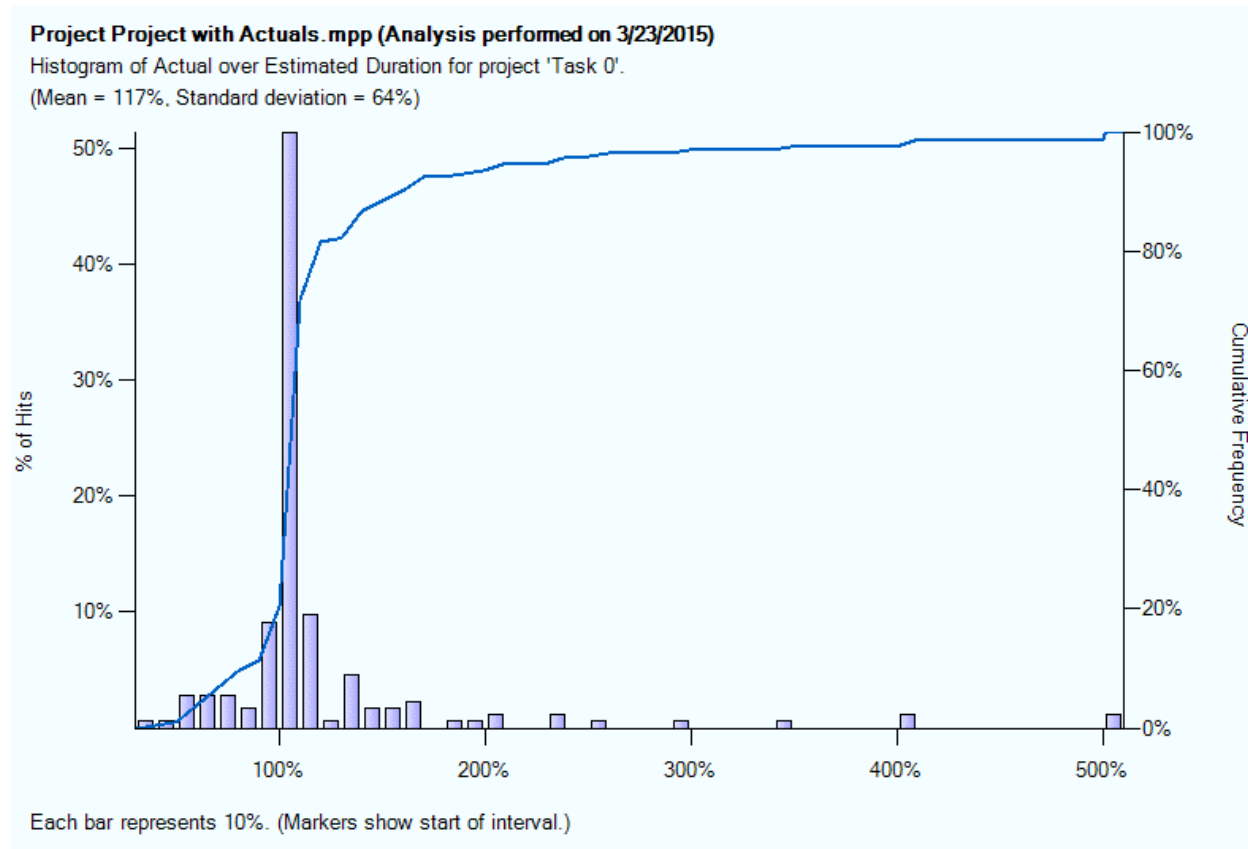
ID	Task Name	Remaining Duration	Percent Critical	Percent Critical (Sensitivity)	Sensitivity Index	Sensitivity Index		Optimistic Finish of Project	Pessimistic Finish of Project	2015			Early Finish Histogram
						50.0				Sep 06	13	20	
14	SW Task 4	18 days	84%	84%	55%			9/9/15 10:14AM	9/21/15 11:59...				Graph
11	SW Task 1	18 days	84%	84%	55%			9/9/15 10:14AM	9/21/15 11:59...				Graph
13	SW Task 3	18 days	42%	42%	28%			9/10/15 3:13PM	9/18/15 1:49PM				Graph
12	SW Task 2	18 days	42%	42%	28%			9/10/15 3:18PM	9/18/15 1:39PM				Graph
5	HW Task 1	4 wks	16%	16%	3%			9/11/15 11:38AM	9/14/15 3:19PM				Graph
8	HW Task 4	4 wks	16%	16%	3%			9/11/15 11:38AM	9/14/15 3:19PM				Graph
6	HW Task 2	4 wks	8%	8%	2%			9/11/15 11:50AM	9/14/15 1:21PM				Graph
7	HW Task 3	4 wks	8%	8%	2%			9/11/15 11:50AM	9/14/15 1:19PM				Graph

## History Report

The History report performs an analysis of Actual over Estimated durations for complete tasks. This is useful for validating the choice of future optimistic/pessimistic duration values. Graphical representations of the historical data for child tasks are available for summary levels.

Task Name	Percent Complete (MSP)	Baseline Duration	Actual Duration	Actual over Estimated Duration
<input type="checkbox"/> Task 0	68%	0	76.96 wks	<input type="button" value="Graph"/>
<input type="checkbox"/> Task 1	68%	108 wks	76.96 wks	<input type="button" value="Graph"/>
<input type="checkbox"/> Task 419	64%	101.8 wks	65.41 wks	<input type="button" value="Graph"/>
Task 434	100%	6.6 wks	19.4 wks	293%
Task 433	100%	9 wks	21.4 wks	237%
Task 431	100%	38.2 wks	37.4 wks	97%
Task 429	100%	38.2 wks	37.4 wks	97%
Task 427	100%	66.4 wks	26.6 wks	40%

For summary levels the Graph button produces a histogram showing the results for child tasks.



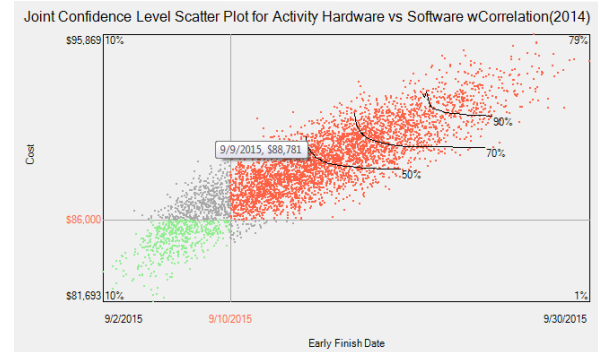
## Joint Confidence Level (JCL) Report

The Joint Confidence Level (JCL) scatterplot shows the percentage of simulation results where both the cost and schedule results for the analysis are within target cost and time parameters.

The National Aeronautics and Space Administration (NASA) requires this report to be produced at Key Decision Point (KDP)-C for all projects over \$250 million.

Each point on the chart represents the cost and schedule information for a single iteration of the simulation. Full Monte automatically performs 5001 simulations to produce the chart.

In the following example we can see just 10% of results fell within the target cost of \$86,000 and finishing before 9/10/15 although the cost could increase to around \$88,000 while still achieving the 9/10/15 schedule target (the hover text is for a point in the upper left quadrant).



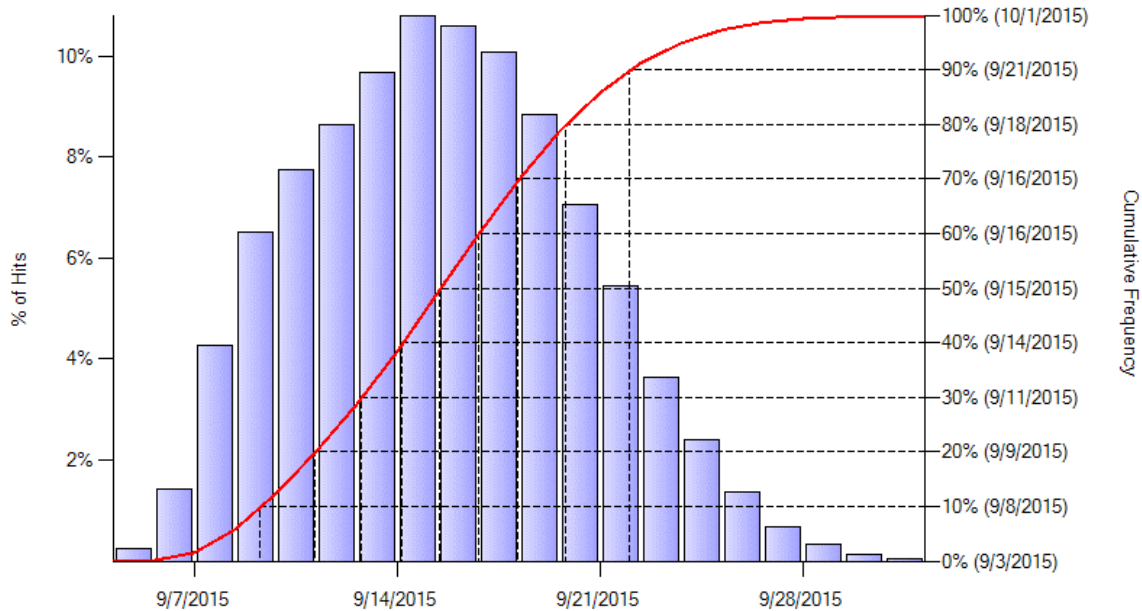
## Histogram Reports

The histogram chart has been significantly enhanced both in terms of content and configuration.

### Project Hardware vs Software wCorrelation(2014).mpp (100000 simulations performed on 3/10/2015)

Histogram of Early Finish for project 'Hardware vs Software wCorrelation(2014)'.

Mean = 9/15/2015:9:15 AM, Standard deviation = 27.3 hours, Deterministic value = 9/4/2015:5:00 PM (2%).



Each bar represents 1 day. (Markers show start of interval.)

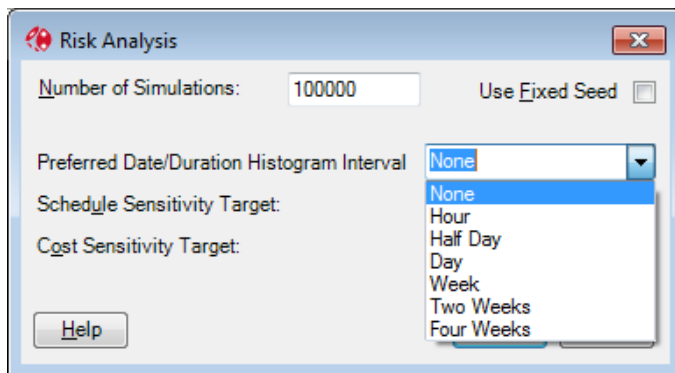
## Histogram Content Enhancements

- Y-Axis legends
- Deterministic value and chance of achievement in title block

## Histogram Configuration Enhancements

- X-Axis can now exclude non-work time
- The preferred interval of the X-Axis markers can now be specified
- S-Curve can now be smoothed with Cubic Spline Interpolation

The preferred X-Axis interval is specified when performing risk analysis.

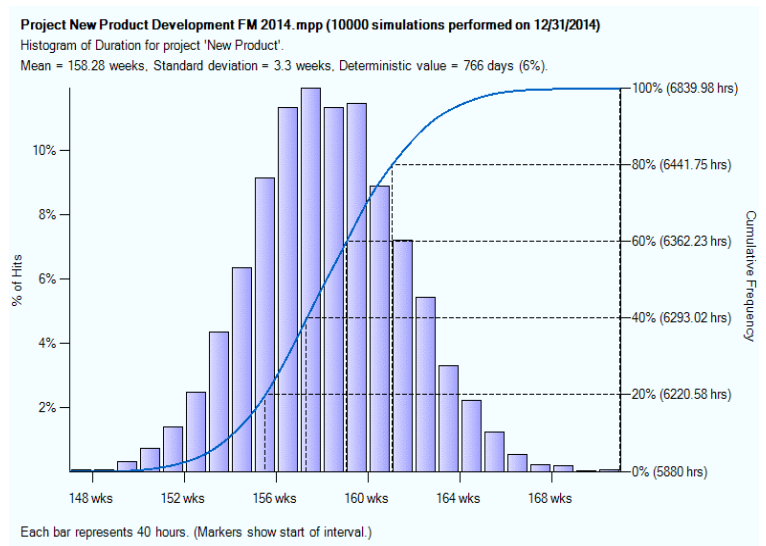


The specified preferred interval may not be honored for a specific task if the range of values cannot be sensibly displayed using the selected time unit. For example, if the range of finish dates for a specific task spans several months, then a preference of an hourly interval will not be applied to that specific task and a more suitable scaling interval (Days, Weeks etc.) will be used.

## Duration Histogram

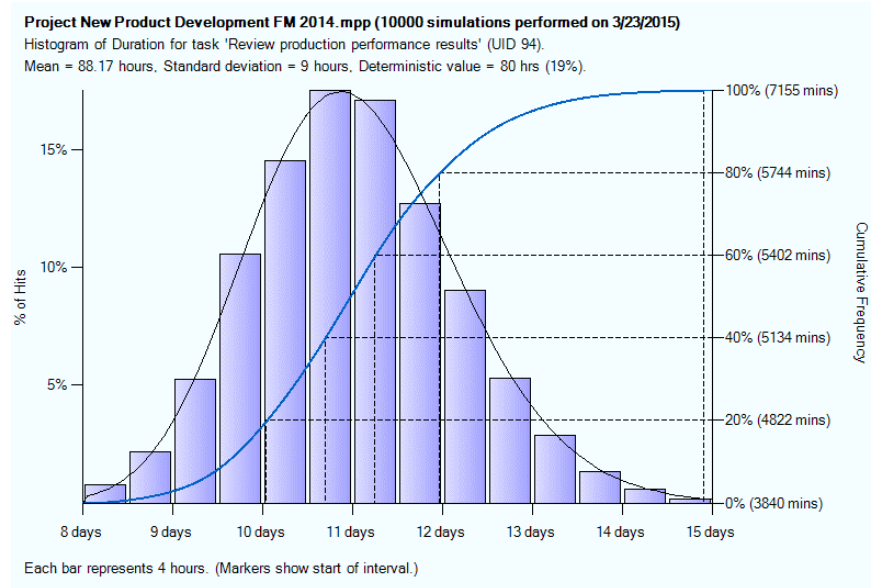
A new duration chart type has been introduced. This allows the user to view the range of possible durations for projects, subprojects or tasks.

An example of the range of durations for a project.





When the duration histogram is produced for a single task, the user specified distribution curve is overlaid on the graph for reference purposes.



## Resource Rate Uncertainty

In Full Monte 2.1, cost uncertainty was calculated based on the sampled duration for each task on each iteration of the simulation. With Full Monte 2016 it is also now possible to model resource rate uncertainty as well. Choose Edit, Edit Resources to open the Resource Edit Dialog

Resource ID	Cost Rate(s)	Cost Rate Distribution Type	Cost Rate Optimistic	Cost Rate Most Likely	Cost Rate Pessimistic	Confidence Interval (%)
<input type="checkbox"/> All Resources		(None)				
Widget T1	\$1,500.00	Normal	90%	100%	110%	100%
Widget T2	\$2,300.00	(None)				
HW Eng	\$50.00/h	Triangular	100%	100%	110%	100%
SW Eng	\$60.00/h	(None)				
PM	\$80.00/h	(None)				

In this example we are modelling a  $\pm 10\%$  range for Widget T1 and up to a 10% increase in the hourly rate for Hardware Engineers.

## Calculations

### Expected/Mean Values

Mean or Expected date values are now calculated taking into account calendars. This prevents mean values occurring in non-working periods.

## Sensitivity

The basis for sensitivity information (as estimated during the Risk Analysis process or based on a Full Analysis for a specific task) is now available in reports. The user also now has control over the number of simulations performed when performing the full analysis for a specific task.

The full analysis option for sensitivity is now available in any custom views that contain sensitivity tornado charts.

The estimated sensitivity values have been improved both for cost and schedule especially where correlations are applied.

## Field Mapping

Full Monte stores configuration and user entered data in Microsoft Project custom fields. Some fields are mandatory (Full Monte will not work without them) while others are optional.

With Full Monte 2.1, only data stored in custom fields was available for reporting so even if data was not technically mandatory (Full Monte could be used without it), if it was not mapped then it could not be referenced in reports.

One final issue with Full Monte 2.1 was that some Full Monte results could not be mapped at all; for example percentile values.

Table 1 compares the standard (default) custom fields utilized by Full Monte 2.1 and Full Monte 2016 for Microsoft project.

Full Monte Data	Project Custom Field	
	FM 2.1	FM 2016
Cost Expected Value	Cost1	
Cost Standard Deviation	Cost2	
Cost Sensitivity Optimistic	Cost3	
Cost Sensitivity Pessimistic	Cost4	
Merge Point Delay	Duration1	
Total Slack Standard Deviation	Duration10	
Early Start Standard Deviation	Duration3	
Early Finish Standard Deviation	Duration4	
Late Start Standard Deviation	Duration5	
Late Finish Standard Deviation	Duration6	
Free Slack Expected Value	Duration7	
Free Slack Standard Deviation	Duration8	
Total Slack Expected Value	Duration9	
Early Finish Expected Value	Finish1	
Late Finish Expected Value	Finish2	
Optimistic Project Finish (sensitivity)	Finish3	
Pessimistic Project Finish (sensitivity)	Finish4	
Cost Sensitivity Attributable Variance	Number10	

Percent Active (branching)	Number6	
Percent Critical	Number7	
Sensitivity Index	Number8	
Sensitivity Attributable Variance	Number9	
Early Start Expected Value	Start1	
Late Start Expected Value	Start2	
Full Monte Input Data	Text1	Text1
Early Start Histogram	Text11	
Early Finish Histogram	Text12	Text7
Late Start Histogram	Text13	Text11
Late Finish Histogram	Text14	Text10
Free Slack Histogram	Text15	Text9
Total Slack Histogram	Text16	Text13
Cost Histogram	Text17	Text4
Analysis Log Messages	Text18	Text3
Full Monte Results		Text2
Duration Histogram		Text5
Finish Histogram		Text8
Start Histogram		Text12

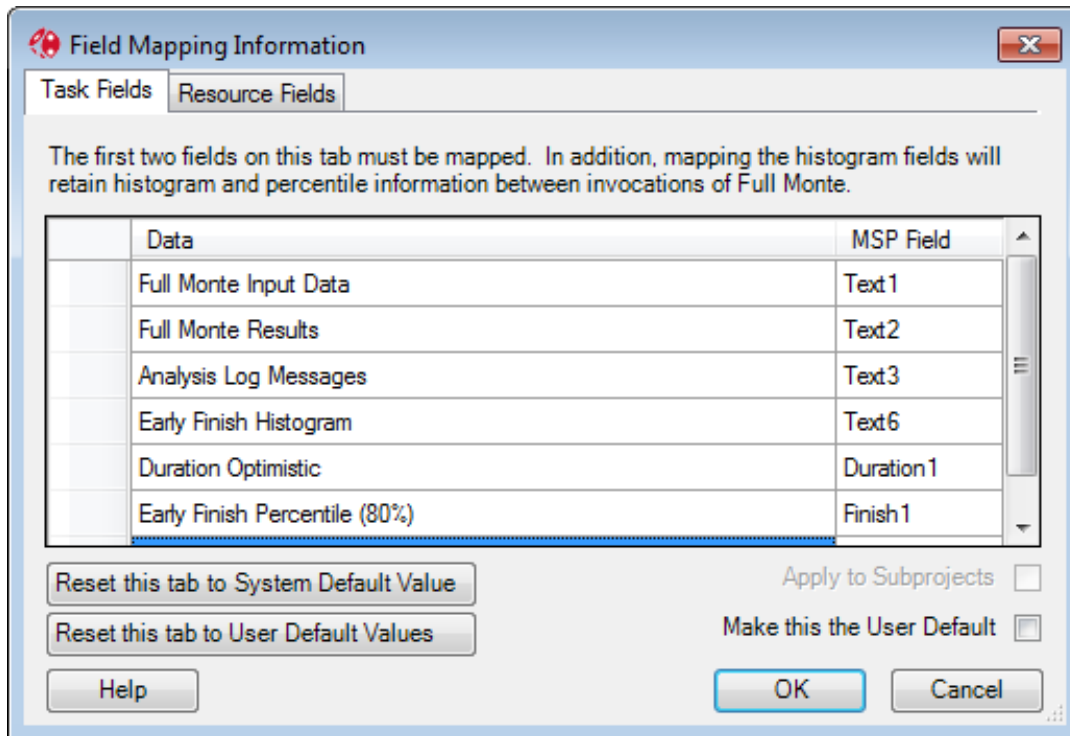
Table 1

With Full Monte 2016 for Microsoft Project, all data that was previously stored in Cost, Duration, Number, Start and Finish custom fields has now been consolidated into a single Text field (Full Monte Results). This dramatically reduces the total number of custom fields required for Full Monte data.

Furthermore, the user can choose to modify the default mappings to just two mandatory fields (Full Monte Input Data and Full Monte Results).

**Note:** If histogram data is not mapped to custom fields then histogram and percentile data will not persist between sessions and a Risk Analysis must be performed to re-create the data before histogram and percentile data will be available for viewing/reporting in a new session. Barbecana recommends that histogram data for important fields like 'Early Finish' is mapped to a custom field so that it persists between sessions.

As well as the mandatory and suggested mapped fields, the user can also add mappings for any other Full Monte data they wish to be available in a Microsoft Project custom field. This includes uncertainty and percentile data.



The field mapping dialog has been enhanced to allow users to easily revert to the Full Monte system default mappings, their own private default mappings, or to maintain a project specific mapping.

In order to support resource rate uncertainty the dialog has tabs for both Tasks and Resources.

### External subprojects

Full Monte 2016 no longer requires that linked projects share the same field mappings. This greatly simplifies performing a schedule risk analysis on an IMS comprising schedules from different sources.

### Data conversion from Full Monte 2.1

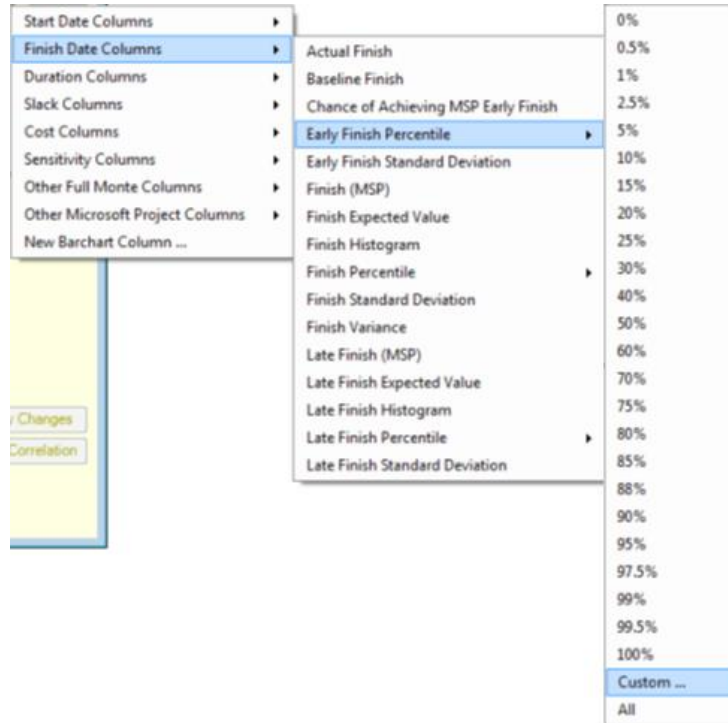
When a project with existing Full Monte 2.1 uncertainty information is opened in Full Monte 2016, the existing data will be automatically converted to the Full Monte 2016 format. Once converted the data will no longer be accessible to Full Monte 2.1.

## Documentation

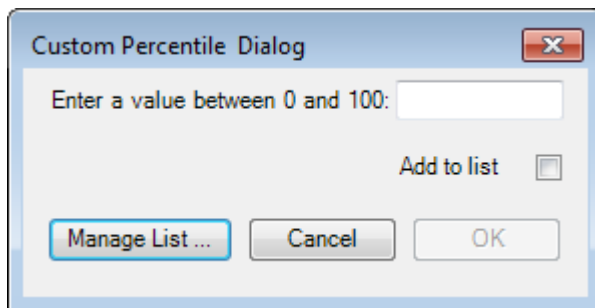
For Full Monte 2016, the documentation has been re-written and split into two manuals. These are an Installation Guide and a user Guide. The installation guide now includes more detail and a trouble shooting section.

## Percentile Values

Two new options have been added for Percentiles; Custom... and All.



Selecting Custom... allows the user to add specific percentiles values to those available for inclusion in reports and mapping to Microsoft Project custom fields.



The user can select 'Add to List' to permanently add the new percentile value to Full Monte pick lists.

The 'All' option will insert all defined percentile values into columns in the report. This is especially useful when creating a report to export data to Excel.