Deltek Acumen Risk

Analysis and Reports Series

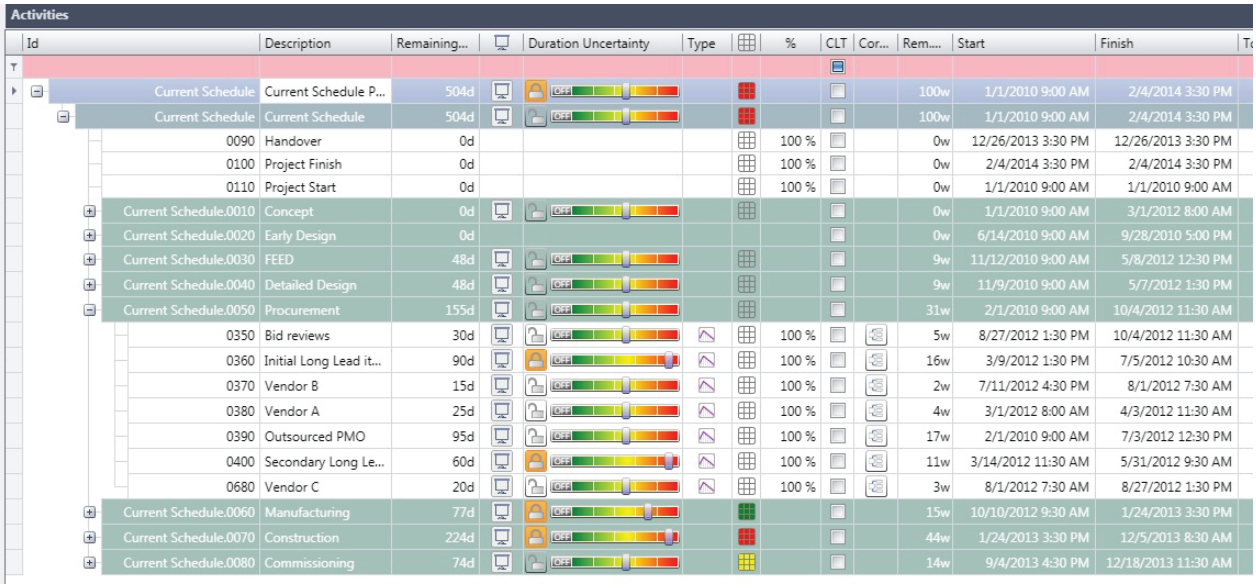
Quick Reference Guide

Click on the topics to go directly to that page.

Acumen Risk 8.2 - Risk Analysis

This infographic highlights the tools and features which can be used to manage Risk Analysis.

Importing Project Data



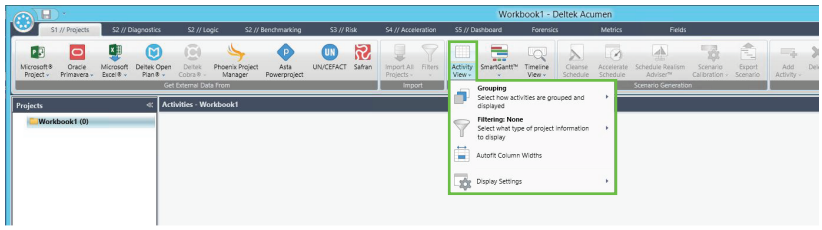
Id	Description	Remaining...	Duration Uncertainty	Type	%	CLT	Cor...	Rem....	Start	Finish
Current Schedule	Current Schedule P...	504d						100w	1/1/2010 9:00 AM	2/4/2014 3:30 PM
Current Schedule	Current Schedule	504d						100w	1/1/2010 9:00 AM	2/4/2014 3:30 PM
0090	Handover	0d			100 %			0w	12/26/2013 3:30 PM	12/26/2013 3:30 PM
0100	Project Finish	0d			100 %			0w	2/4/2014 3:30 PM	2/4/2014 3:30 PM
0110	Project Start	0d			100 %			0w	1/1/2010 9:00 AM	1/1/2010 9:00 AM
Current Schedule.0010	Concept	0d						0w	1/1/2010 9:00 AM	3/1/2012 8:00 AM
Current Schedule.0020	Early Design	0d						0w	6/14/2010 9:00 AM	9/28/2010 5:00 PM
Current Schedule.0030	FEED	48d						9w	11/12/2010 9:00 AM	5/8/2012 12:30 PM
Current Schedule.0040	Detailed Design	48d						9w	11/9/2010 9:00 AM	5/7/2012 1:30 PM
Current Schedule.0050	Procurement	155d						31w	2/1/2010 9:00 AM	10/4/2012 11:30 AM
0350	Bid reviews	30d			100 %			5w	8/27/2012 1:30 PM	10/4/2012 11:30 AM
0360	Initial Long Lead it...	90d			100 %			16w	3/9/2012 1:30 PM	7/5/2012 10:30 AM
0370	Vendor B	15d			100 %			2w	7/11/2012 4:30 PM	8/1/2012 7:30 AM
0380	Vendor A	25d			100 %			4w	3/1/2012 8:00 AM	4/3/2012 11:30 AM
0390	Outsourced PMO	95d			100 %			17w	2/1/2010 9:00 AM	7/3/2012 12:30 PM
0400	Secondary Long Le...	60d			100 %			11w	3/14/2012 11:30 AM	5/31/2012 9:30 AM
0680	Vendor C	20d			100 %			3w	8/1/2012 7:30 AM	8/27/2012 1:30 PM
Current Schedule.0060	Manufacturing	77d						15w	10/10/2012 9:30 AM	1/24/2013 3:30 PM
Current Schedule.0070	Construction	224d						44w	1/24/2013 3:30 PM	12/5/2013 8:30 AM
Current Schedule.0080	Commissioning	74d						14w	9/4/2013 4:30 PM	12/18/2013 11:30 AM

- Project Data can be imported into Acumen Risk which is then displayed in S1//Projects.
- Data analysis can be performed on Projects, Snapshots and Scenarios.
- Within the S3//Risk model, data is Grouped by WBS as default but field grouping can be set up.

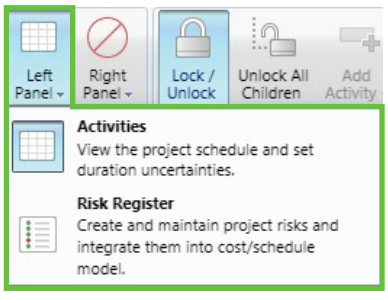
Set up Views

The setup of the **S3//Risk tab** follows the standard Acumen platform set-up. **Sub-views** can be selected through the **left/right panel menu options**. The sub-views have the options to set the left and right panels to different views.

1 **Activities View** - This is the standard view that would be found in Acumen Fuse, Risk and 360.



2 **Left Panel** - Gives the option to view Activities or the Risk Register.



3 **Right Panel** - Provides more options for viewing Risks.

Acumen Risk 8.2 - Risk Analysis

CPM with Risk Analysis

- Risk alters the critical path - lesser activities become important, causing unexpected changes
- Quantifies probability of completing project on time and budget
- Uses estimates for durations and costs (min, most likely, max)
- Takes both **Uncertainty** and **Risk Events** into account
- Numerical Analysis Methodology
  - Monte Carlo or Latin Hypercube
  - All methods subject to schedule logic, constraints, input types

Risk Analysis Process

1. Evaluate and Clean-Up Schedule
2. Assign Uncertainty Estimates for Schedule, Set up
3. Discrete Risk Events for Schedule - Run Worst Case
4. Brainstorm Mitigation - Run Option Analysis
5. Select Mitigation
6. Update Schedule and Cost Estimate
7. Publish P-value Schedule and Cost Estimate

Analyse Components

The validity and reliability of the Risk Analysis results are directly impacted by the quality of the schedule. If the schedule is not good quality, a **schedule check** should be run before any further analysis is conducted.

Schedule

- Constraints
- Missing Logic
- Leads/Lags
- Redundant Logic

Duration Uncertainty

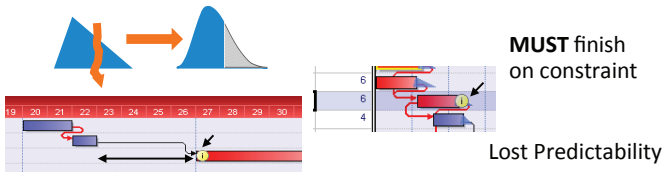
- Normal Variation
- Stop signs or stop lights

Discrete Risk Events

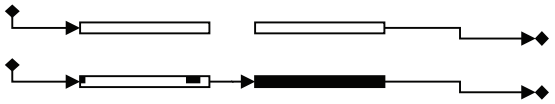
- Individual Event
- Probability
- Consequence/Impact
- Car accident or train crossing

Analyse Schedule Quality

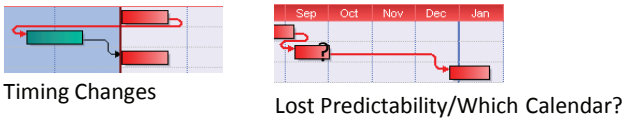
Constraints



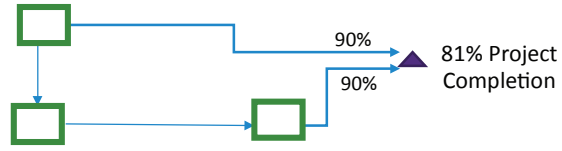
Missing Logic/Open Ends



Lags/Leads (negative lag)



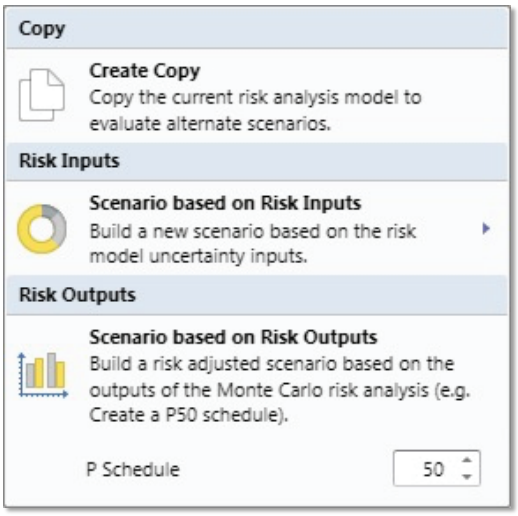
Redundant Logic



Acumen Risk 8.2 - Risk Mitigation

Scenario Creation

Scenario generation is very flexible in Deltek Acumen Risk®. A new scenario can be created to look at varying uncertainty levels for a **specific set of activities**, or **different cost uncertainty levels**, or **different sets of discrete risk events** with the same assumptions on uncertainty.



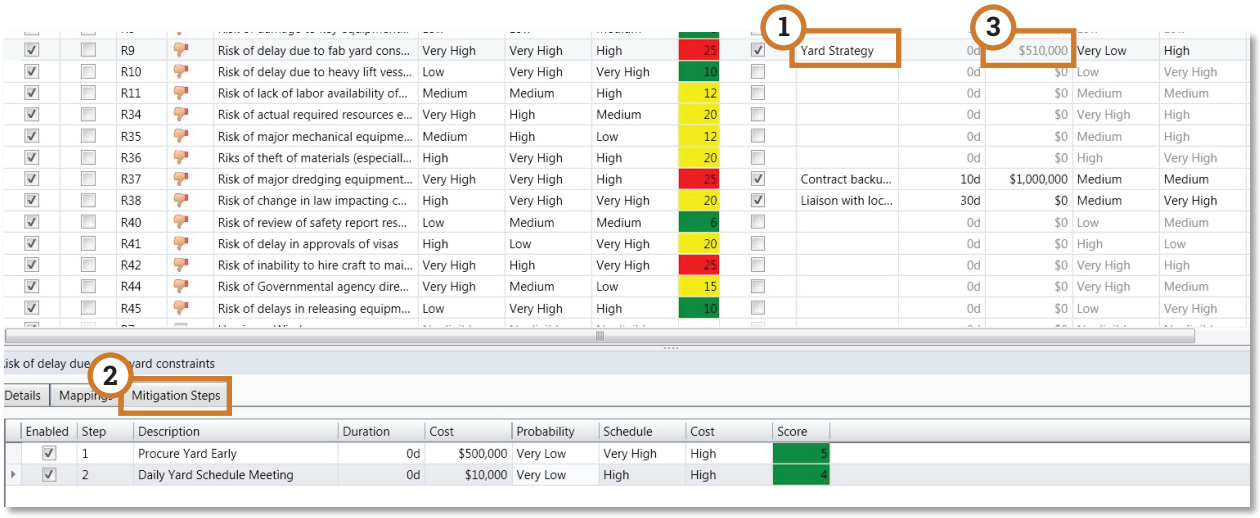
Comparison Situations

- Quantitative Measure of Impact on activities/events
- Knock-On Effect of Sequence
- Impact of Specific Risk Event
- Impact of Mitigation Options

Note: When a scenario is created, it adopts all of the project schedule characteristics, including the base uncertainty, risk register, and mapped risk event(s). The scenario, at the moment of creation, is an exact duplicate of the original schedule risk model.

Mitigation Set Up

Mitigation steps are the activities that are added to a project to reduce the probability and/or impact of a risk event. The best mitigation steps reduce both probability and impact. Typically, a mitigation step only impacts one or the other.



Identify Top Risk Drivers

1. Put Mitigation in Risk Register
2. Single or Steps (Sequential)
3. Single sums up the individual steps

The results of the mitigation analysis can be sent to Risk Comparison to determine if the benefits of the mitigation balance out against the costs and time commitment.

Acumen Risk 8.2 - Cost Risk Analysis Process

Cost Risk Analysis Process

1. Evaluate and Clean-Up Schedule
2. Assign Uncertainty Estimates for Schedule, Set up
3. Discrete Risk Events for Schedule - Run Worst Case
4. Brainstorm Mitigation - Run Option Analysis
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6. Update Schedule and Cost Estimate
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Uncertainty Factor™ Template for Base Cost Uncertainty

The Uncertainty Template is used by both the **Risk Advisor** and the **Uncertainty Factor™ features**. These Templates contain a finite number of levels of uncertainty that define the percentages from which the **minimum**, **most likely**, and **maximum** durations are calculated.

Save/Load Templates

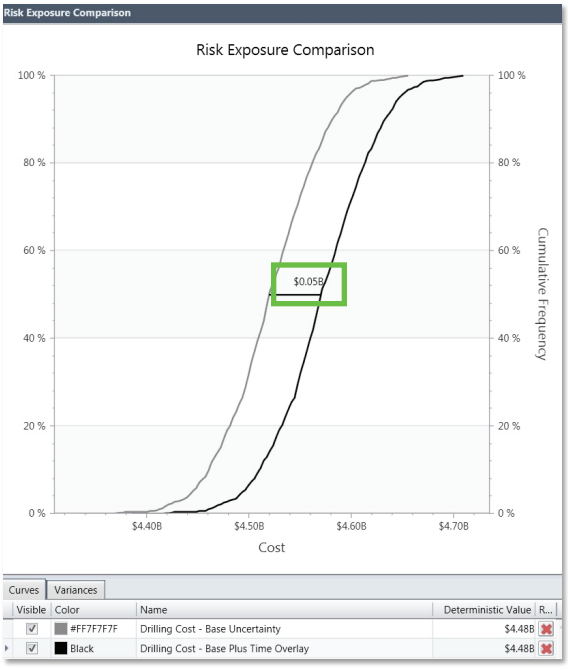
Customize Templates

- Names
- Number of Levels
- Distribution Type
- Values

Advantages:

- Standardizes across project, program, organization
- Percentages apply to daily or hourly schedule durations

Cost of Time Contribution



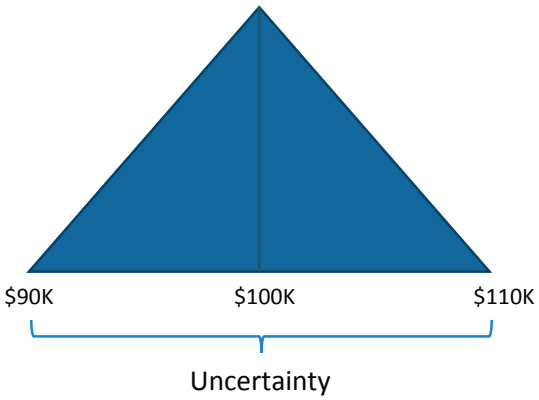
Difference Between Base Uncertainty and Time Overlay

- Difference Between Base Uncertainty and Time Overlay
  To Save the $50,000,000 – go after the Time Not the Price

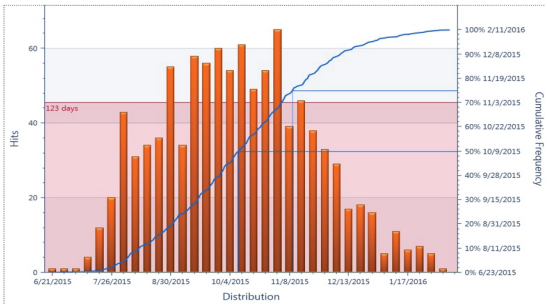
Acumen Risk 8.2 - Cost Risk Analysis Process

Schedule Impact on Cost Risk

Cost Uncertainty Range



Schedule Risk Exposure
Deterministic: 300d



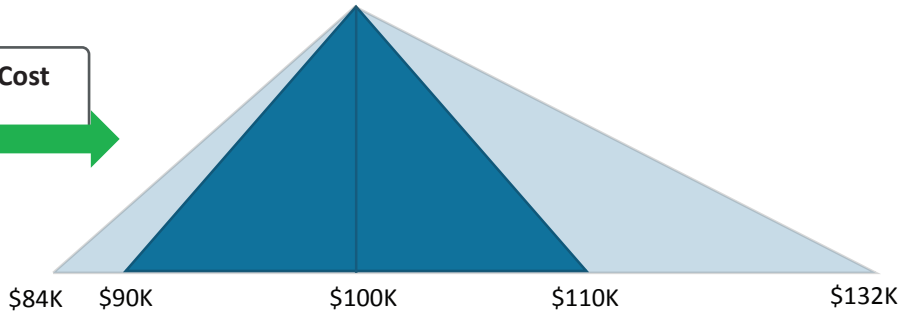
P0 = 280d P100 = 360d

Calculate Multipliers

Min Side Multiplier	Max Side Multiplier
P0 ÷ Deterministic	P100 ÷ Deterministic
280 ÷ 300 = 93%	360 ÷ 300 = 120%

Time Overlay on Cost Uncertainty Distribution

Apply Multipliers to Cost Uncertainty Range

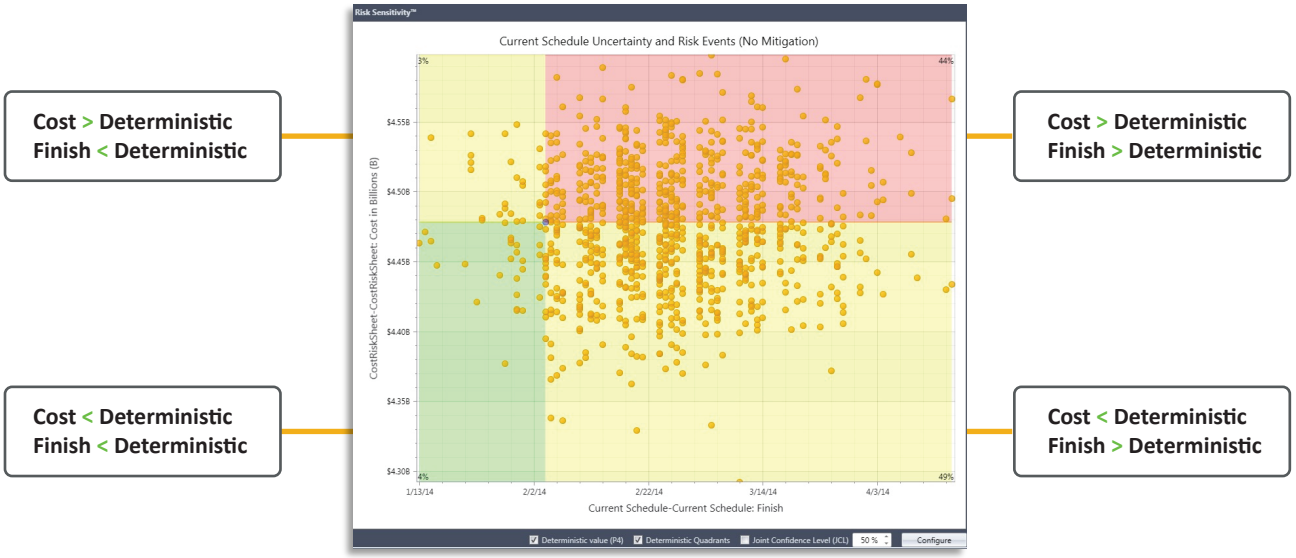


Uncertainty Range Adjusted

Acumen Risk 8.2 - Risk Analysis Outputs

Risk Sensitivity

Risk Sensitivity chart shows the relationship and **Joint Confidence Level (JCL)** between activities and/or costs in a scatter chart format. The Risk Sensitivity chart is viewed by selecting it from the Right Panel pull-down. The chart displays quadrants that show where cost and/or finish date were less than or greater than their deterministic values. The axes can be individually defined and are typically set for a cost vs. finish date analysis.

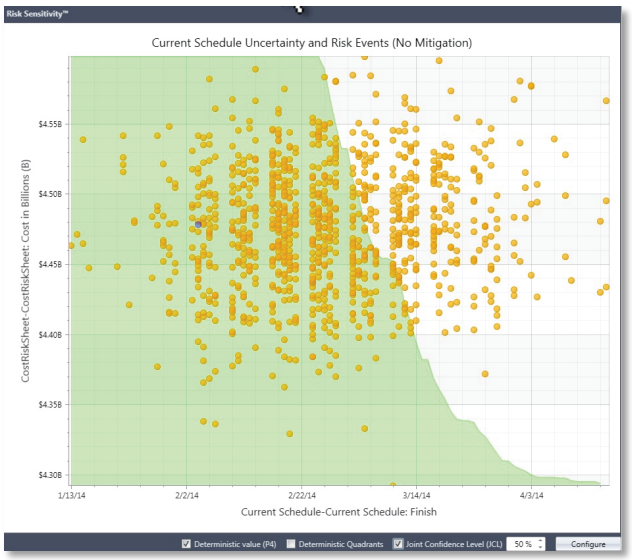


Risk Sensitivity (Scatter Chart)

- Activity Finish vs. Cost
- Definable Axes

Joint Confidence

Joint Schedule/Cost Analysis is accessed by first running the Risk Sensitivity and then putting a check in the Joint Confidence box at the bottom of the analysis screen. The level of Joint Confidence is also selected through the pull-down box on the same analysis screen.



Joint Confidence Level (JCL)

- Meet **BOTH** Schedule and Cost Criteria

Acumen Risk 8.2 - Risk Analysis Outputs

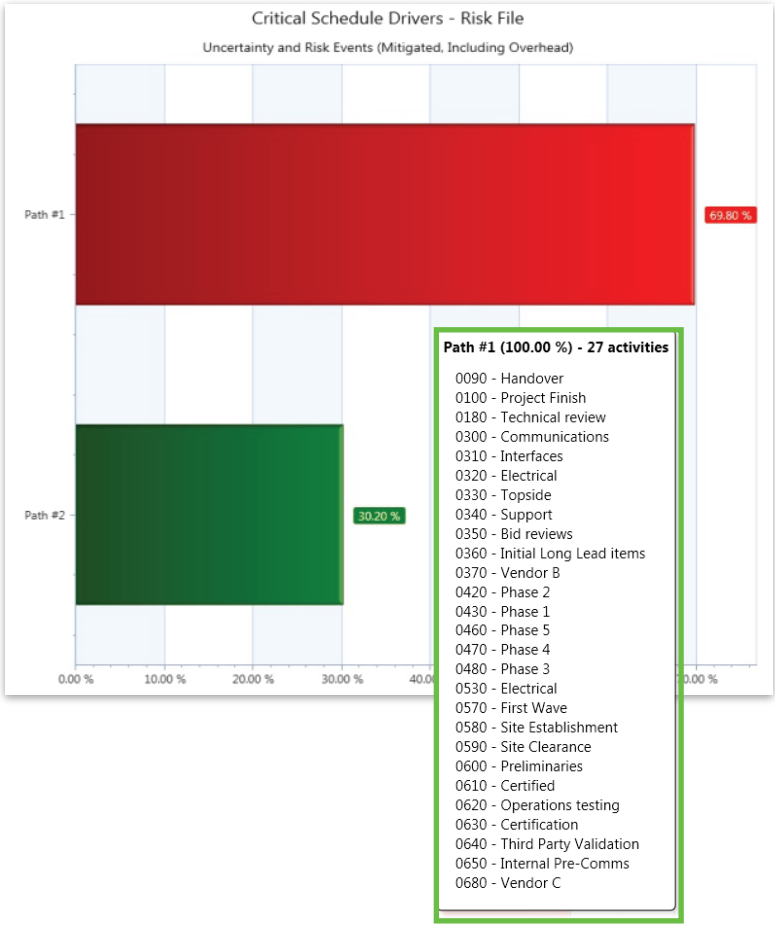
Critical Schedule Drivers

Each Iteration:

- Calculates a new critical path
- Keeps track of activities on/off the critical path

Displays the Common Critical Paths

- Hover and display list of activities
- Create a SmartGantt™ filter
- Apply filter in S1//Projects Tab and Risk Tab

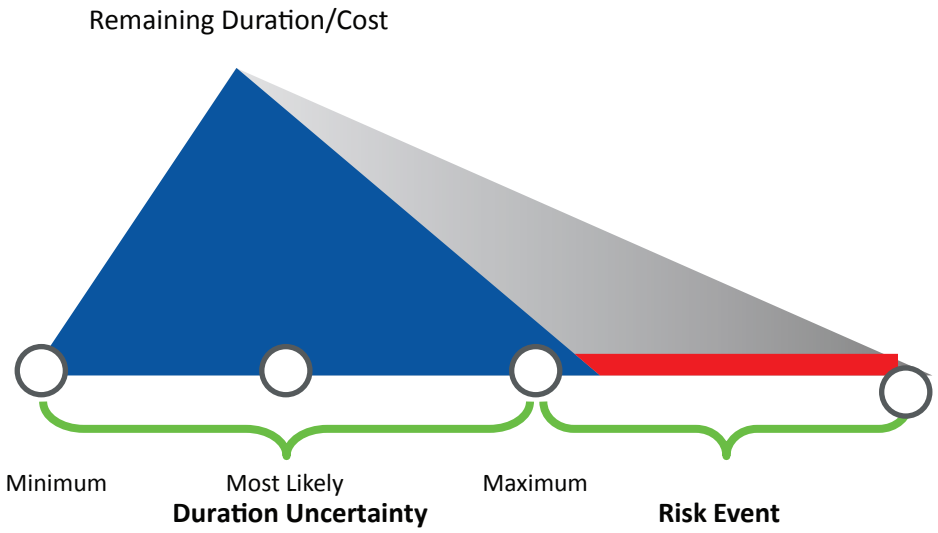


Acumen Risk 8.2 - Risk Modelling

This infographic provides a high level overview to Risk Modelling.

What is Risk Modelling?

Risk Modelling shows the relationship between **Estimate Uncertainty** and **Risk Events**. Risk Events are often included in Uncertainty Estimates and by identifying what they are, we can manage Risk Events within the Risk Register which allows for a more refined Estimate Uncertainty.



Uncertainty + Risk Events = Total Risk Exposure

Terminology

Deterministic Finish Date or Deterministic Cost

Finish Date from the planning program or Total Cost from the cost estimate.

P-Value

Probability that the project will be finished by a selected date or earlier or selected cost or less.

Duration / Cost Uncertainty

Range of values that describes the minimum and maximum amount of duration or cost for an individual activity. Normal variability or wobble including, **personnel uncertainty, estimating uncertainty, activity scope uncertainty, past performance uncertainty, etc**.

Discrete Risk Event

These are individual risk events with a probability of happening and a consequence of additional time and/or money including, **adding/removing key personnel, scope addition, material delivered late, bad weather, decision delay, etc**.

Mitigation

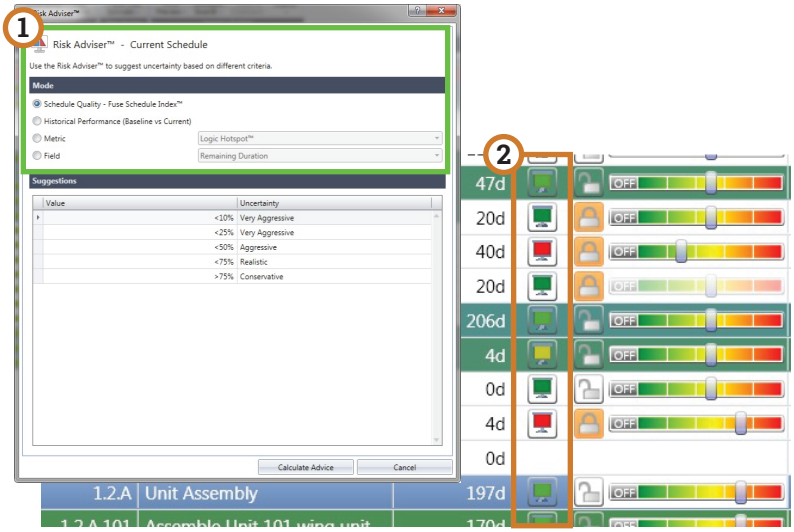
Potential new work that reduces either the probability of a risk event happening **OR** lessens the consequences if it does happen.

Acumen Risk 8.2 - Risk Advisor

Risk Advisor™

The Risk Advisor™ makes uncertainty template suggestions based on **Schedule Quality, Historical Performance (Baseline vs. Current), an individual metric, or an individual field**. For each selection an uncertainty template is defined and then applied based on the mode selected and the criteria established.

Provides External Input Based on a Metric or a Field



1 Set Up Advice

- Schedule quality per activity
- Historical Pperformance
- Metric Field (Standard or Custom)
- Field (User or Code Field)
- **MUST** be a numeric value

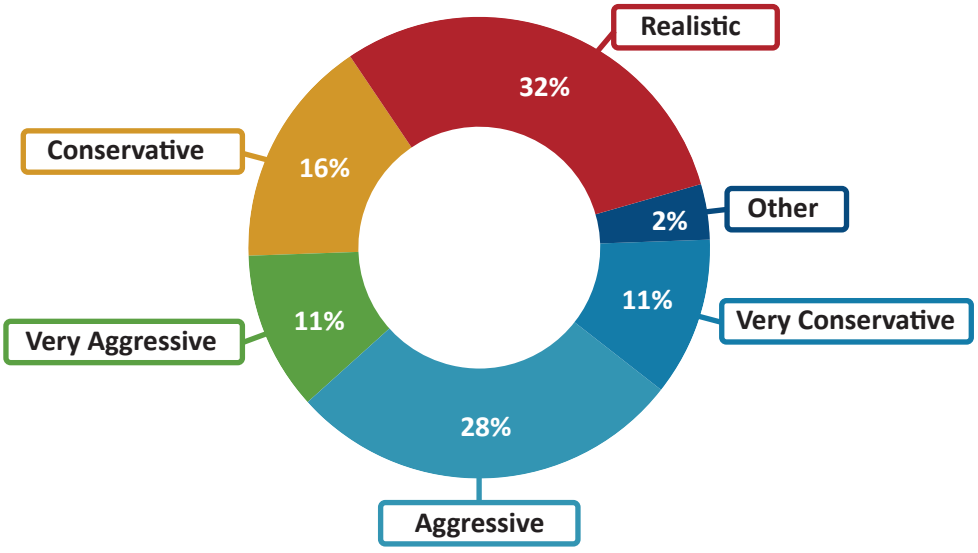
2 Apply Advice

- Summary or individual
- Shows colors on screen
- Matches advisor level to template

Viewing Uncertainty Profile

The Uncertainty distribution chart includes only activities that have a status of **not-complete**. So, activities with a remaining duration of zero have **No Risk** assigned and are not shown in the distribution.

Doughnut Chart



Display What Activity(s) are Selected on Left

Other = Manual Entry

Dynamically Updates as Sliders Change

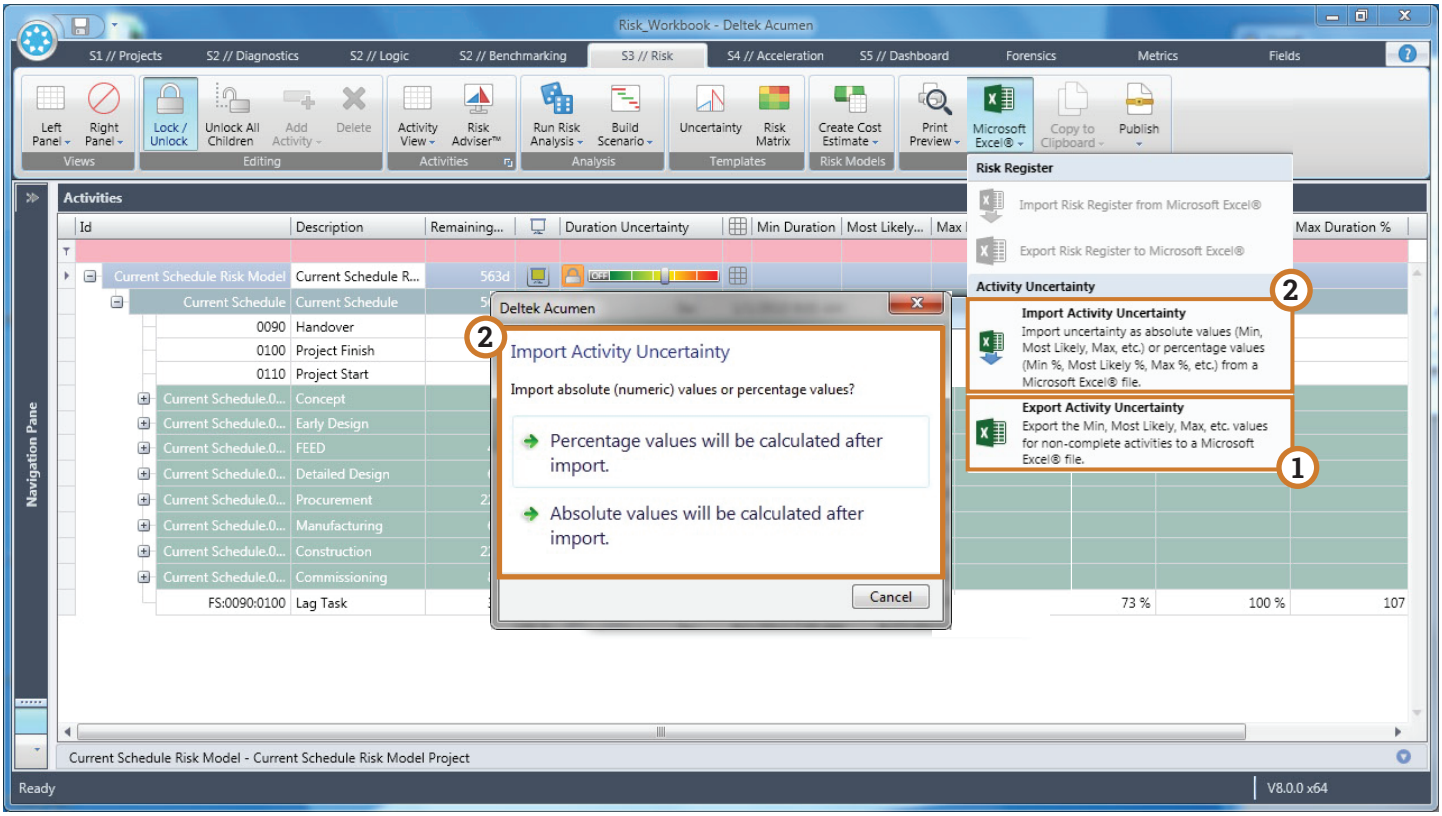
No Risk Category = Milestones or Completed Activities (Remaining Duration = 0)

Acumen Risk 8.2 - Risk Advisor

Export/Import Values

Save and Re-apply to Next Risk Model

- Schedule Name and Activity IDs **MUST** be the same



1. **Export to MS Excel**

2. **Import from MS Excel**

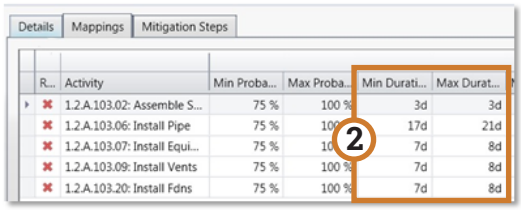
   - **Absolute numbers** - Percentages are calculated
   - **Percentages** - Numbers are calculated

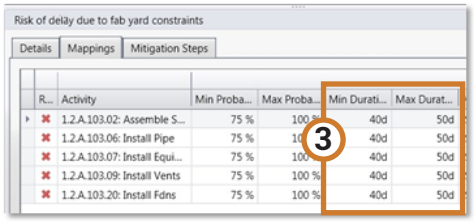
Acumen Risk 8.2 - Risk Mapping

Risk Event Impacts

Multiple Risk Events to a Single Activity

Risk ID	Description	Probability	Impact
0001	Hurricane	25%	(2) 10 days
0002	Labor Strike	50%	(1) 50%





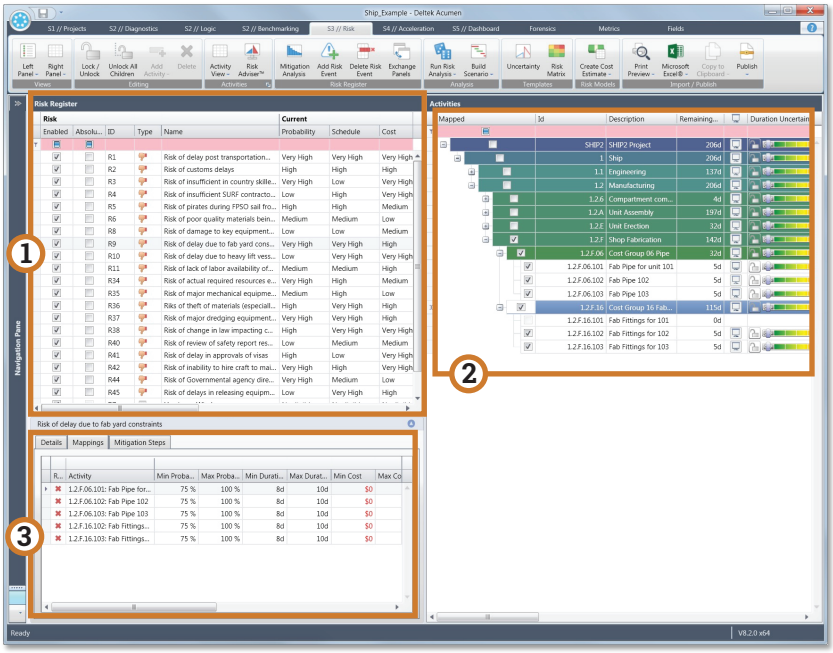
1 **Percentages** – Each activity receives a % of the remaining duration/cost

2 **Pro-Rated Number** – Each activity receives its portion of impact depending upon its portion of remaining duration/cost

3 **Absolute Number** – Each activity receives the full impact

Mapping Risk Events

Risk events **must** be mapped to activities/cost elements in order to be included in the risk model. Mapping can be done **several different ways**. If the risk register is fully populated, then the mapping is a process of assigning the risk events to the correct activity or activities. If the risk register is empty, then a risk event can be **both** entered into the register and assigned simultaneously.



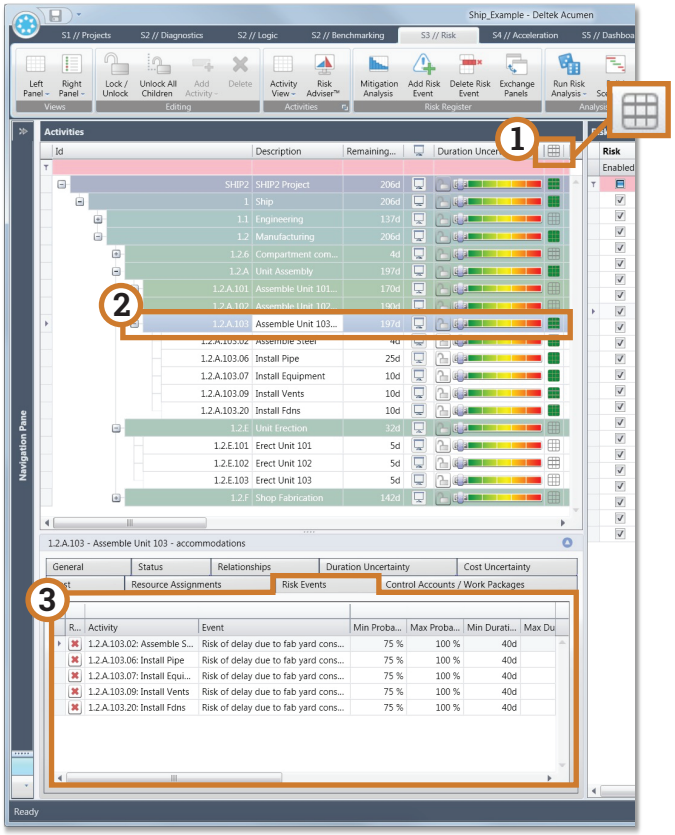
1 Individual Activity or Summary Activity - Children get **Absolute** or **Pro-Rated Amount of Risk**

2 Manual Mapping – Map from Risk Events to Activity(s)

3 View Mappings – Mappings Tab

Acumen Risk 8.2 - Risk Mapping

Automatic Mapping



1 **Waffle/Grid Icon** – Adds a Risk Event and Maps

2 **Individual Activity** or **Summary Activity** - Children get Absolute or Pro-Rated Amount of Risk

- Automatic Mapping – Map from Activity(s) to Risk Events

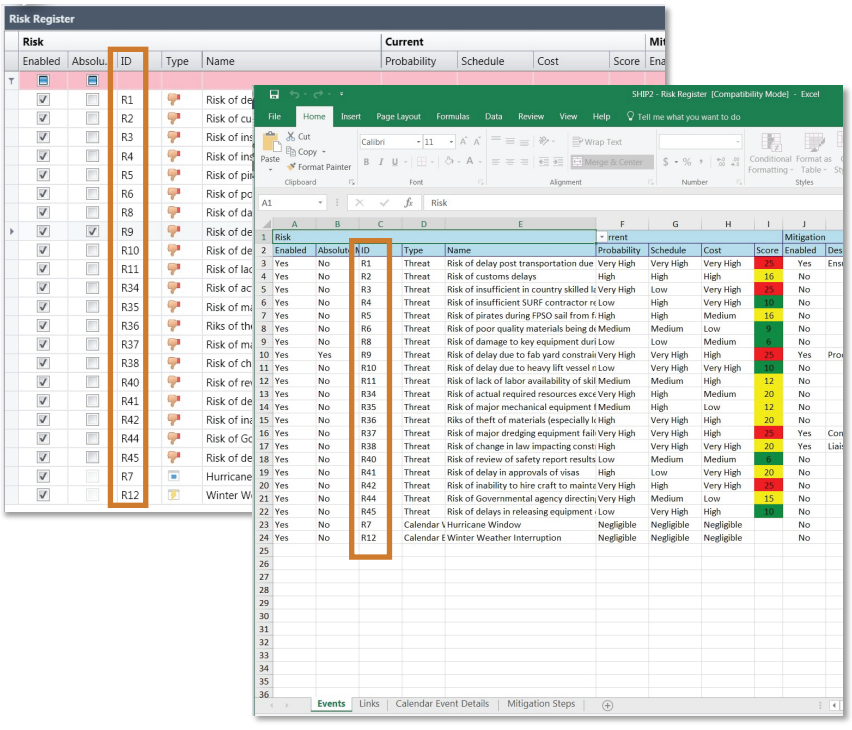
3 View Mappings – **Risk Event Tab**

- Good view for project team

Import/Export

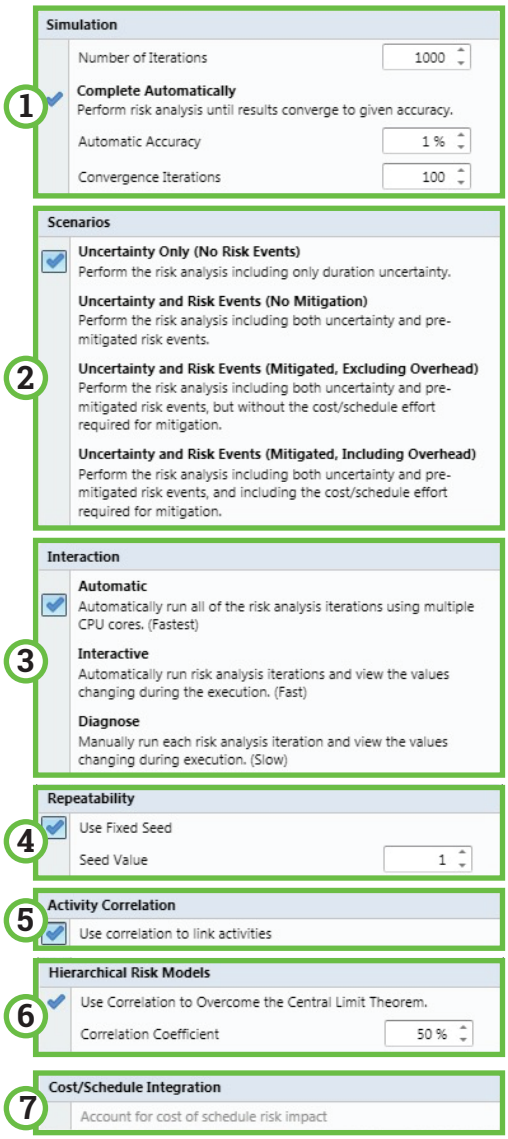
Risks can be **edited/added/removed** in the MS Excel file, independent of Deltek Acumen Risk®. Then can be imported back into the Deltek Acumen Risk® Risk Register by selecting Import Risk Register from the same pull-down menu as the Export.

- Each schedule has its own **Risk Register**
- Export to MS Excel
- Import from MS Excel
- **Risk Events** automatically map if the activity ID and Risk ID are the same



Acumen Risk 8.2 - Risk Analysis Exposure

Risk Analysis Exposure Options



1 Simulation

- Accounts for all reasonable combinations
- Follows the CPM Schedule Logic
- Run iteration until results don't vary significantly
- Sets number of iterations

2 Scenarios

- Combination of Uncertainy, Risk Events, Mitigation, Overhead

3 Interaction

- Accuracy, Interactive, Diagnose

4 Repeatability

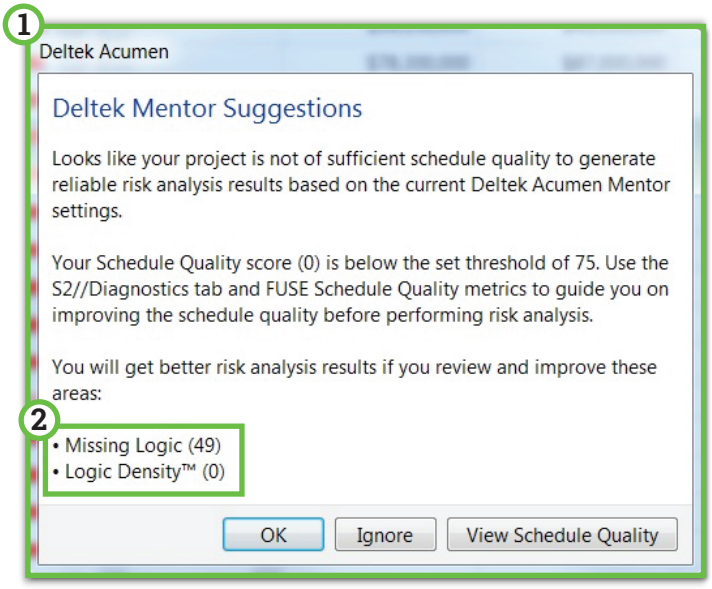
5 Activity Correlation

6 Hierarchical Risk Models

- Overall Correlation
- Less than 3 levels below uncertainty assignment

7 Cost/Schedule Integration

Risk Mentor

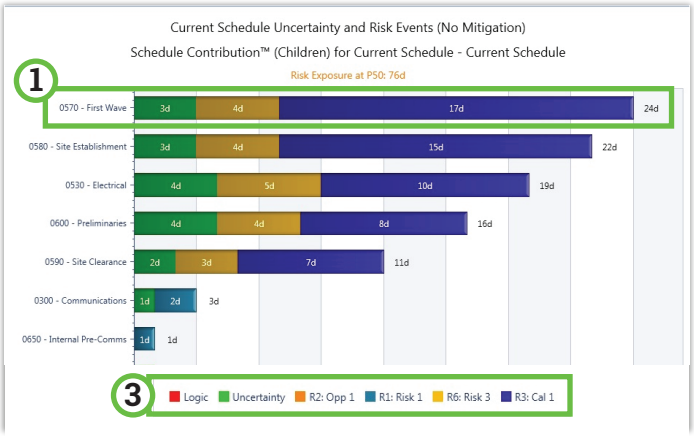


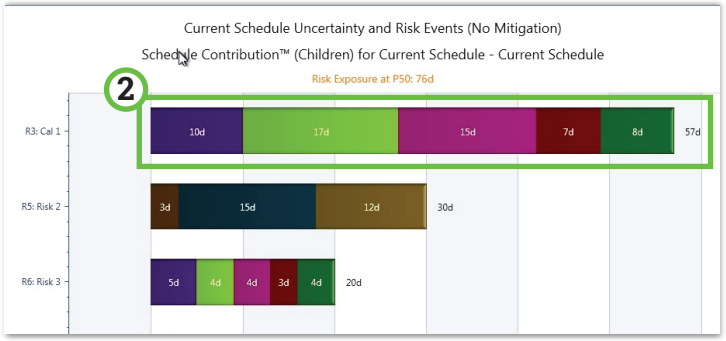
1 Checks schedule quality score

2 If below 75, gives message and what metric is the issue

Acumen Risk 8.2 - Risk Analysis Exposure

Risk Drivers

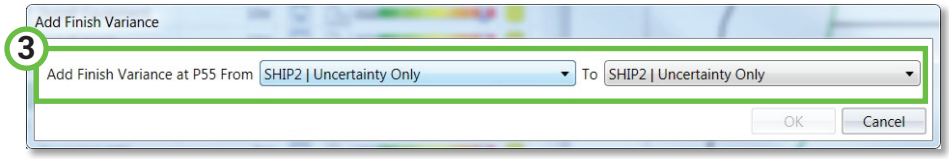


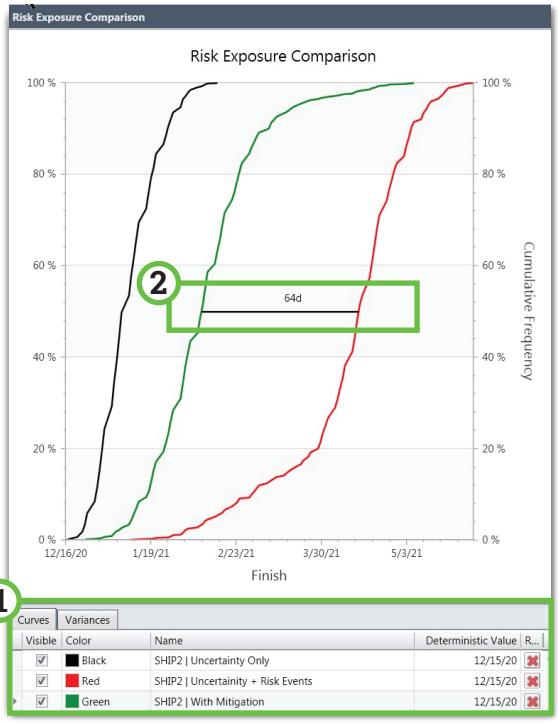


Types	Traditional Reporting	Risk Contribution
1 Most Vulnerable Activities 2 Top Risk Event Drivers	• Criticality • Correlation Statistic • Both can be misleading	• Select P-Value • Schedule or Cost Contribution 3 Differentiates sources - Logic, Uncertainty, Risk Events

Comparison and Chart Customization

The Risk Comparison chart can be customized for the **data curves (colors, labels, date unit) and variances**. If there are only two curves on the chart then the variance is automatically added. If there are more than two curves on the chart, then two must be selected for the variance to be shown.





1 For Each Curve

- Visible
- Colors
- Lables

2 Variances
Automatically set if only 2 curves

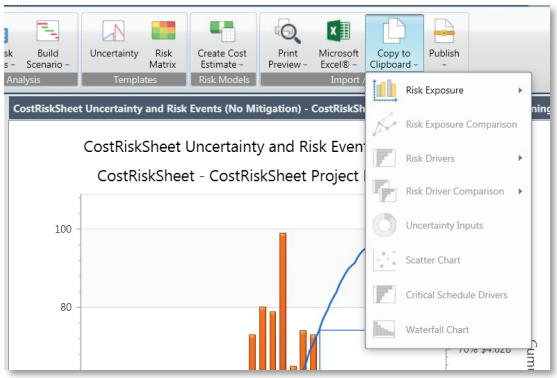
3 Select desired curves if > 2 curves

Acumen Risk 8.2 - Risk Analysis Reports

Schedule or Cost Analysis

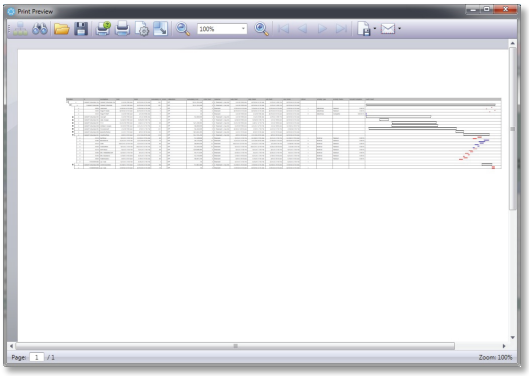
Risk Sensitivity chart shows the relationship and joint confidence level (JCL) between activities and/or costs in a scatter chart format. The Risk Sensitivity chart is viewed by selecting it from the right panel pull-down.

Images



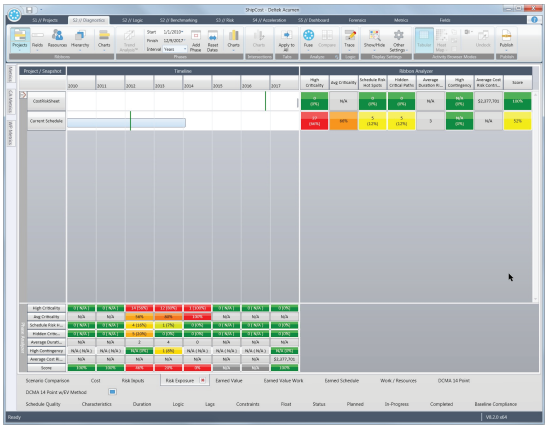
- All analysis images can be copy/pasted to the clipboard

Activities/Gantt Chart



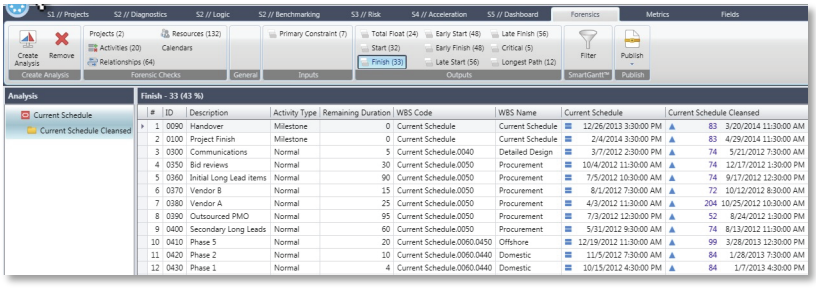
- Print Preview
- Export

S2//Diagnostics



- Risk Inputs
- Risk Exposure

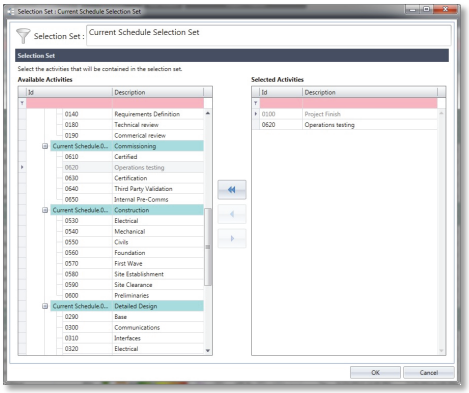
Images

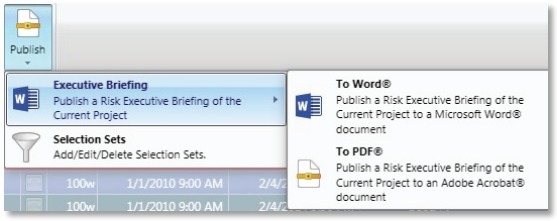


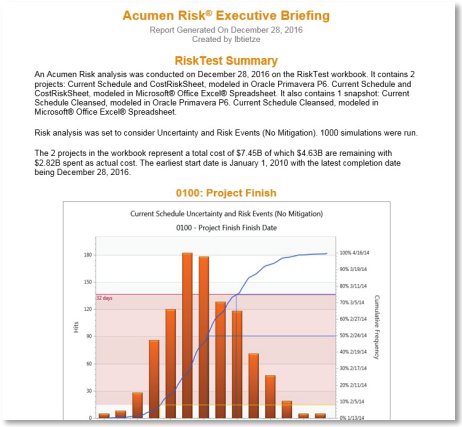
- Remaining duration between initial schedule and risk adjusted schedule

Acumen Risk 8.2 - Risk Analysis Reports

Risk Executive Briefing







Selection Sets

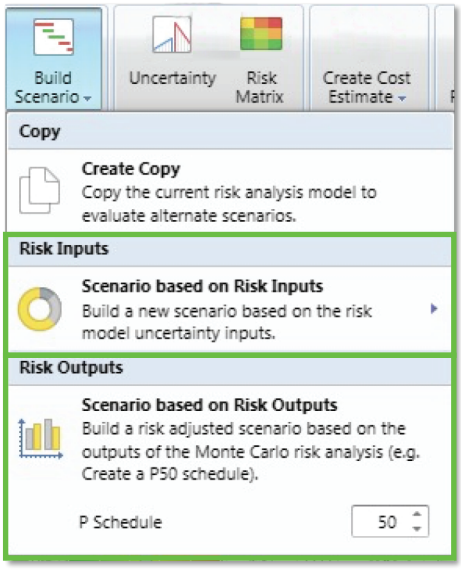
- Set of Specific Activities

Executive Briefing

- Summary Text
- Risk Exposure Image
- Risk Contribution Image

Risk Adjusted Schedule

Once the schedule has been analyzed for risk, a new scenario can be created based on the **risk inputs** or **risk outputs**. This is very useful when a schedule needs to be re-calibrated based on the project team's uncertainty rankings or a deterministic schedule (that includes all of the risk impact) needs to be created for a customer. Deltek Acumen Risk® can automatically create the risk-adjusted schedule using either the **risk inputs** or **risk outputs**.



Based on Uncertainty Inputs

- PERT Method = [Max+(MostLikely*4)+Min]/6
- Median Method = Value that Separates the Min from the Max

Based on Risk Analysis Outputs

- Select P-Value
- Assembles CPM Based on P-Value Durations

Exportable to:

- P6 – XER
- MS – MPP or XML
- Deltek – OpenPlan (publish updates)
- UN/CEFACT – schedule schema