# **Risk of Events To Objectives with Controls**

#### **Overview**

This page displays a similar grid as with the Risk of Events To Objectives (without controls), but with added columns for results when Controls are in effect.

The Likelihoods, Impacts, and Risks of the events To Objective "**Public Relations**" without and with controls are displayed below:

MANAGE MODELS	IDE	NTIFY/STR		IOOD OF	EVENTS	IMPACT OF EVEN	NTS	RISKS			CONTRO	LS	CONTROLLE	ED RISKS
Risk with Controls Registers											C Reloa	ad 🜑 On-line	🔓 Lock 🖸 Sn	apshots 🔒
	Ŧ	-	Loss Exceedance.	🝸	Filter Eve	ents Simulated Resul	lts 🔄 Timestar	mp Show M	lonetary Value	s 🛓			<b>\$</b> 1	Preferences
Risk of Events (with Controls)														
o Overall			· · · · · · · · · · · · · · · · · · ·		·	isk to Objective (W								
<ul> <li>From Sources</li> </ul>		Selecte	d controls: 13 Cost O	f Selecter	d Controls	\$98,200 (unfunded: \$51	1,604,000) <b>T</b> e	otal Cost Of All	Controls: \$5	1,702,200	How Se	elected: Optim	ized with budget	of \$100,000
O To Objectives		🔽 Sea	arch	:	Drag a colu	mn header here to group by	that column		0	G	Searc	:h		
<ul> <li>Likelihood of Events (with Cont.</li> <li>Prom Sources</li> </ul>		Objecti	ive Name						All F	Participar	ts			
<ul> <li>Impact of Events (with Controls)</li> </ul>		Obie	ectives	1.1	Color	Event Name		W.O. Contr	ols			With Control	s	
<ul> <li>On Objectives</li> </ul>	, 	y Di	ublic Relations				Likelihood	Impact	Risk		elihood	Impact	Risk	
<ul> <li>Loss Exceedance Curve (with</li> </ul>				1	•	Late Train Running	35.48%	36.14%	12.82%		8.81%	36.14%	3.18%	
Loss Exceedance Curve (with     Overall     From Sources			Loss of Company Reput	ati 3	•	Line Closure	27.22%	55.05%	14.99%		6.44%	55.05%	3.55%	
			Customer/Business Diss	at 4	•	Failed Integration with Future Monitoring	15.55%	35.56%	5.53%		10.11%	35.56%	3.59%	
<ul> <li>To Objectives</li> </ul>		🔪 👘 Fi	nancial			System Network								
Bow-Tie Diagrams (with Contr		)	Loss of Customers	5	•	Intelligent Event Monitoring Network	18.55%	16.73%	3.10%		4.05%	16.73%	0.68%	
o Overall	0		Financial Loss			Shut Down								
<ul> <li>From Sources</li> </ul>			Financial Liability Due to	A 6	•	Major Train Work Accident	17:64%	25.83%	4.56%		1.41%	6.46%	0.09%	
<ul> <li>To Objectives</li> </ul>		Re	eliability, Availability, Mair	nta 7	•	Minor Train Work Accident	14.67%	0.00%	0.00%		1.35%	0.00%	0.00%	
Risk Map (with Controls)			Loss of Maintenance Eff	ici a		Major Train Public	17.69%	61.87%	10.94%		1.44%	1.44%	0.02%	
Overall     From Sources			Disruption/Damage to Se	en -	-	Accident								
• To Objectives			Repair to Service Line Ir	nfra										
Sensitivity Analysis		Pe	erformance											
O Risk ∆ Sources			Temporary Line Closure											
<ul> <li>O Risk ∆ Objectives</li> <li>O Risk ∆ Objectives (Perform</li> </ul>			Loss of Reliability and N	eti		Total Risk	:		51.9	4%			11.11%	

The combined results for "**All Participants**" are displayed by default. The W.O. (without ) Controls and With Controls are displayed below the "All Participants" column heading.

					All Pa	articipants		
I. †	Color	Event Name		W.O. Contro	ols		With Contro	ls
			Likelihood	Impact	Risk	Likelihood	Impact	Risk
1	•	Late Train Running	35.48%	36.14%	12.82%	8.81%	36.14%	3.18%
3	•	Line Closure	27.22%	55.05%	14.99%	6.44%	55.05%	3.55%
4	•	Failed Integration with Future Monitoring System Network	<b>15</b> .55%	35.56%	5.53%	10.11%	35.56%	3.59%
5	•	Intelligent Event Monitoring Network Shut Down	18.55%	16.73%	3.10%	4.05%	16.73%	0.68%
6	•	Major Train Work Accident	17. <mark>6</mark> 4%	25.83%	4.56%	1.41%	6.46%	0.09%
7	•	Minor Train Work Accident	<mark>14</mark> .67%	0.00%	0.00%	1.35%	0.00%	0.00%
8	•	Major Train Public Accident	<mark>17.</mark> 69%	61.87%	10.94%	1.44%	1.44%	0.02%
		Total Risk	:		51.94	%		11.11%

An Objective is selected from the Objectives Hierarchy at the left.

bjective Name						All Par	ticipants			
Objectives	1	Co	Event Name		W.O. Contro	ols		With Control	s	
				Likelihood	Impact	Risk	Likelihood	Impact	F	Risk
<ul> <li>Public Relations</li> </ul>	1	0	Late Train Running	35.48%	36.14%	12.82%	8.81%	36.14%		3.18%
Loss of Company Reputation	3	•	Line Closure	27.22%	55.05%	14.99%	6.44%	55.05%		3.55%
Customer/Business Dissatisfaction w	4	•	Failed Integration with Future Monitoring System	15.55%	35.56%	5.53%	10.11%	35,56%		3.59%
Financial		-	Network							
Loss of Customers	5	•	Intelligent Event Monitoring Network Shut Down	18.55%	16.73%	3.10%	4.05%	16.73%		0.689
Financial Loss	6	•	Major Train Work Accident	17.64%	25.83%	4.56%	1.41%	6.46%		0.099
Financial Liability Due to Accident	7	•	Minor Train Work Accident	14.67%	0.00%	0.00%	1.35%	0.00%		0.00%
	8	0	Major Train Public Accident	17.69%	61.87%	10.94%	1.44%	1.44%		0.02%
Reliability, Availability, Maintainability										
Loss of Maintenance Efficiency										
Disruption/Damage to Service Line Ir										
Repair to Service Line Infrastructure			2							
Performance										

You can also select the top node "Objectives" which will show the same results as with the Overall Risk Results page.

The Events on the grid may vary depending on the contributions of the events given the selected objective.

### Select Participants and Groups

By default, the results shown are for the "All Participants" group.

By selecting from the Participants and Groups" icon, you can display the results for other participants or groups.

Chief Engineering Officer       ceo@gwu.edu       Yes         Chief Executive Officer       che@gwu.edu       Yes         Chief Risk Officer       cro@gwu.edu       Yes         Denis Risman       denisrisman@gwu.edu       Yes         Devin Nagy       devinnagy@gwu.edu       Yes         Grace       grace@eci.com       Yes         IT Supervisor       its@gwu.edu       Yes	arch	:					•	Group name	¢	Has data? 💧	Select all users with
Chief Engineering Officer       ceo@gwu.edu       Yes         Chief Executive Officer       che@gwu.edu       Yes         Chief Risk Officer       cro@gwu.edu       Yes         Denis Risman       denisrisman@gwu.edu       Yes         Devin Nagy       devinnagy@gwu.edu       Yes         Grace       grace@eci.com       Yes         IT Supervisor       its@gwu.edu       Yes	$\Rightarrow$	Participant Name 🔷	Email Address	🔶 Has	data? 💧 🔶						data
Chief Executive Officer       che@gwu.edu       Yes         Chief Risk Officer       cro@gwu.edu       Yes         Denis Risman       denisrisman@gwu.edu       Yes         Devin Nagy       devinnagy@gwu.edu       Yes         Grace       grace@eci.com       Yes         IT Supervisor       its@gwu.edu       Yes		Brian Quigley	quigleybf@gwu.edu		Yes	<b>A</b>		All Participants		Yes	
Chief Executive Officer       che@gwu.edu       Yes         Chief Risk Officer       cro@gwu.edu       Yes         Denis Risman       denisrisman@gwu.edu       Yes         Devin Nagy       devinnagy@gwu.edu       Yes         Grace       grace@eci.com       Yes         IT Supervisor       is@gwu.edu       Yes		Chief Engineering Officer	ceo@gwu.edu		Yes					Yes	
Chief Risk Officer     cro@gwu.edu     Yes       Denis Risman     denisrisman@gwu.edu     Yes       Devin Nagy     devinnagy@gwu.edu     Yes       Grace     grace@eci.com     Yes       IT Supervisor     its@gwu.edu     Yes		Chief Executive Officer	che@gwu.edu		Yes		0				
Devin Nagy     devinnagy@gwu.edu     Yes       Grace     grace@eci.com       IT Supervisor     its@gwu.edu     Yes		Chief Risk Officer	cro@gwu.edu		Yes			Engineering		Yes	
Grace     grace@eci.com       IT Supervisor     its@gwu.edu     Yes		Denis Risman	denisrisman@gwu.edu		Yes						
IT Supervisor its@gwu.edu Yes		Devin Nagy	devinnagy@gwu.edu		Yes						
		Grace	grace@eci.com								
		IT Supervisor	its@gwu.edu		Yes						
James@eci.com		James	james@eci.com								
John Doe j.doe@eci.com		John Doe	j.doe@eci.com								
Michael Mankowski mmankowski@owu edu Ves		Michael Mankowski				•					
Select all I Deselect all			Si	elect all I F	eselect all						

#### After selecting participants and groups to display, click OK.

Objective News						All Par	ticipants					Chief Engi	neering Officer		
Objective Name	1.1	Color	Event Name		W.O. Contro	ls		With Control	S		W.O. Contro	S		With Control	s
				Likelihood	Impact	Risk	Likelihood	Impact	Risk	Likelihood	Impact	Risk	Likelihood	Impact	Risk
Objectives	1	•	Late Train Running	35.48%	36.14%	12.82%	8.81%	36.14%	3.18%	12.40%	41.35%	5.13%	4.19%	41.35%	1.73
<ul> <li>Public Relations</li> </ul>	3	•	Line Closure	27.22%	55.05%	14.99%	6.44%	55.05%	3.55%	9.14%	51.15%	4.68%	3.16%	51.15%	1.61
Loss of Company Re	4	•	Failed Integration with Future Monitoring	15.55%	35.56%	5.53%	10.11%	35.56%	3.59%	11.10%	36.30%	4.03%	8.76%	36.30%	3.18
Customer/Business			System Network												
Financial	5	•	Intelligent Event Monitoring Network	18.55%	16.73%	3.10%	4.05%	16.73%	0.68%	3.93%	18.00%	0.71%	2.82%	18.00%	0.51
Loss of Customers			Shut Down	-											
Financial Loss	6	•	Major Train Work Accident	17.64%	25.83%	4.56%	1.41%	6.46%	0.09%	7.74%	27.80%	2.15%	0.84%	6.95%	0.06
Financial Liability Du	7	•	Minor Train Work Accident	14.67%	0.00%	0.00%	1.35%	0.00%	0.00%	1.29%	0.00%	0.00%	0.32%	0.00%	0.00
Reliability, Availability, I	8	•	Major Train Public Accident	17.69%	61.87%	10.94%	1.44%	1.44%	0.02%	8.26%	56.05%	4.63%	1.37%	1.34%	0.02
Loss of Maintenance			/ codon	L							-		-		
Disruption/Damage t			Total Risk			51,94%			11.119	%		21.32	%		7

### Open Bow-tie diagram from Grid

Clicking the Event Name will open a modal that displays the bow-tie diagram for the selected event.

From the Bow-tie diagram, you analyze the **likelihoods** (left) and **impacts** (right) of the selected **event** (center) To **Objerctives** with **controls**. Click "Bow-tie Diagram From Objectives" for more details.

MANAGE MODELS IDE	TIFY/	STRUCT	URE LIKELIHOOD OF EVEN	TS IMPA	CT OF EVENTS	3	RISKS		CONTROLS	CONTROLLED RISKS
Risk with Controls Register	ers									CReload On-line CSnapsh
Loss Exceedance	<b>T</b> Filt	er Events	Simulated Results Times	tamp Show N	Monetary Value:	s 差				🌣 Preference
Li	kelih	ood. Ir	npact, and Risk to Objecti	ve (With Co	ntrols) for l	ntelligent Ev	vent Londo	n Underara	und Monito	orina
		ected Cor	• • •			st Of All Controls				timized with budget of \$100,000
Search	Dr	rag a colu	mn header here to group by that columr	1		0	Searc	h		
bjective Name						All Part	ticipants			
Objectives	L.Ť	Color	Event Name		W.O. Contro	ols		With Controls		
<ul> <li>Public Relations</li> </ul>				Likelihood	Impact	Risk	Likelihood	Impact	Risk	
	1	•	Late Train Running	35.48%	36.14%	12.82%	8.81%	36.14%	3.18%	
Loss of Company Reputation	3	۲	Line Closure Failed Integration with Future	27.22%	55.05%	14.99%	6.44%	55.05%	3.55%	
Customer/Business Dissatisfa	4	•	Monitoring System Network	15.55%	35.56%	5.53%	10.11%	35.56%	3.59%	
Financial	5		Intelligent Event Monitoring Network Shut Down	18.55%	16.73%	3.10%	4.05%	16.73%	0.68%	
Loss of Customers	6	•	Maior Train Work Accident	17.64%	25.83%	4.56%	1.41%	6.46%	0.09%	
Financial Loss	7	•	Minor Train Work Accident	14.67%	0.00%	0.00%	1.35%	0.00%	0.00%	
Financial Liability Due to Acci	8	•	Major Train Public Accident	17.69%	61.87%	10.94%	1.44%	1.44%	0.02%	
Reliability, Availability, Maintaina										
Loss of Maintenance Efficien										
Disruption/Damage to Service							N			
Repair to Service Line Infrast							G			
Performance										
Temporary Line Closure										
Loss of Reliability and Netwo										
LOSS OF Reliability and NetWo			Total Ris	sk:		51.94%	6		11.11%	

### Export Grid into excel or image format

There to group by that column	Searc	ch 5
ent Name		All Participa
	Likelihood	Impact
te Train Running	35.48%	15.87%
radation of Intelligent Monitoring System Physical Assets	11.17%	32.43%
You can export the grid into a .xlsx file by clicking		
You can also export the results page into an image file (.png) by clicking		
Show or Hide columns		
You can show/hide columns both for:		

- the main results grid at the right, and
- the hierarchy tree at the left

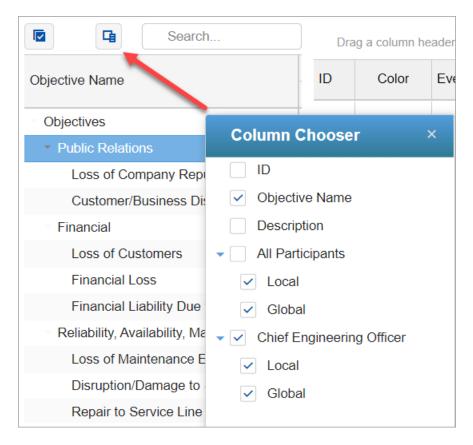
For the main results grid, click the column chooser at the top of the grid:

		Sear	rch
rticipa	ints	🔶 Chi	ef Enginee
ct	Risk	Likelihood	Impact
5.9%	Column Cl	hooser	×
2.4%	V ID		
	<ul> <li>Color</li> </ul>		
	<ul> <li>Event Na</li> </ul>	ame	
	<ul> <li>Descripti</li> </ul>	on	
	Simulatio	on Group	
	Event His	story	
	Risk Owr	ner	
	<ul> <li>All Partic</li> </ul>	ipants	
	<ul> <li>Likeliho</li> </ul>	bod	
	<ul> <li>Impact</li> </ul>		
	✓ Risk		
	<ul> <li>Chief English</li> </ul>	gineering Offic	er
	✓ Likeliho	bod	
	<ul> <li>Impact</li> </ul>		
	✓ Risk		

Simply check/uncheck the column(s) you want to show/hide.

The events attributes can also be displayed on the grid, from above the "Event History" and "Risk Owner" are events attributes.

For the Sources Hierarchy, click also the column choose on its top:



Here you can select:

- ID Source ID
- Objective Name
- Description source's description or information document
- Local and Global local or global likelihoods of the sources based on the selected participant/group judgments

#### Sort by Column

Clicking the column header can sort the grid in ascending or descending order by that header.

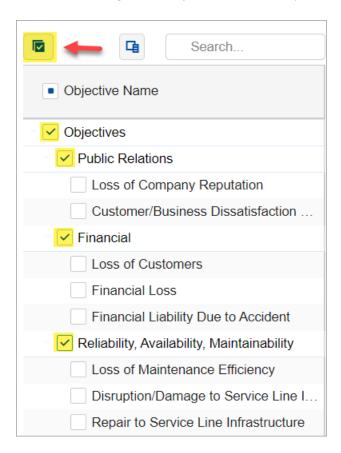
ID	Color	Event Name	Description		All Participar	nts
ID ID	Color	Event Name	Description	Likelihood	Impact	Risk
[01]	•	Late Train Running	Train is late when its time on the track between the two points is different than the time scheduled in the operational plan.	35.5%	15.9%	5.6%
[02]	•	Degradation of Intelligent Monitoring System Physical Assets	This is degradation of signals, cables, and sensors.	11.2%	32.4%	3.6%
[05]	۲	Line Closure	No train traffic allowed	27.2%	22.5%	6.1%
[06]	٠	Failed Integration with Future Monitoring System Network		15.6%	6.2%	1.0%
[07]	•	Intelligent Event Monitoring Network Shut Down		18.6%	26.9%	5.0%
[08]	0	Major Train Work Accident	Death occurs	17.6%	43.6%	7.7%
[09]	•	Minor Train Work Accident	Injury occurs	1 <mark>4.7%</mark>	6.8%	1.0%
[10]	0	Major Train Public Accident	Death occurs	17.7%	49.7%	8.8%

You can reset the sorting by pressing the Ctrl key on your keyboard and clicking again the column header where the sorting is currently active.

#### Select Multiple Source Nodes

Instead of showing results only from one WRT Objective, you can also select multiple source nodes at once.

To enable multi-select, click the multi-select icon at the top of the Objectives Hierarchy. By doing so, you will see checkboxes to the right of the objective names where you can select the WRT objective nodes you want to see the results.



A new column, WRT Objective, will be displayed on the main results grid to indicate the WRT nodes for each event.

ID	Color	Event Name	Description		All Participar	nts	
ID	COIOI	Event Name	Description	Likelihood	Impact	Risk	WRT Objective
[01]	•	Late Train Running	Train is late when its time on the track between the two points is different than the time scheduled in the operational plan.	35.48%	15.87%	<b>5</b> .63%	Objectives
[02]	•	Degradation of Intelligent Monitoring System Physical Assets	This is degradation of signals, cables, and sensors.	11.17%	32.43%	3.62%	Objectives
[05]	•	Line Closure	No train traffic allowed	27.22%	22.54%	6.13%	Objectives
[06]	•	Failed Integration with Future Monitoring System Network		<mark>15</mark> .55%	6.25%	0.97%	Objectives
[07]	•	Intelligent Event Monitoring Network Shut Down		18.55%	26.94%	5.00%	Objectives
[08]	•	Major Train Work Accident	Death occurs	17.64%	43.63%	7.69%	Objectives
[09]	•	Minor Train Work Accident	Injury occurs	<mark>14</mark> .67%	6.77%	0.99%	Objectives
[10]	0	Major Train Public Accident	Death occurs	17. <mark>69%</mark>	49.70%	8.79%	Objectives
[01]	•	Late Train Running	Train is late when its time on the track between the two points is different than the time scheduled in the operational plan.	35.48%	25.64%	9.10%	Financial
[02]	•	Degradation of Intelligent Monitoring System Physical Assets	This is degradation of signals, cables, and sensors.	11.17%	5.64%	0.63%	Financial

From above, we can see the likelihoods, impacts, and risks of the events WRT the Overall Sources (top-node), Human Factor, and Environmental.

You can also group the grid by WRT source for better display, this is done by dragging the WRT column header to the top left of the grid:

<ul> <li>Objective Name</li> </ul>	ID	Color	Event Name		All Participa	nts	WRT Objective
		COIOI	Event Name	Likelihood	Impact	Risk	WRI Objective
✓ Objectives	[01]	0	Late Train Running	35.48%	15.87%	5.63%	Objectives
<ul> <li>Public Relations</li> </ul>			Degradation of Intelligent				
Loss of Company Reputation	[02]	•	Monitoring System Physical Assets	11.17%	32.43%	3.62%	Objectives
Customer/Business Dissatisfaction	[05]	0	Line Closure	27.22%	22.54%	6.13%	Objectives
✓ Financial	[06]	•	Failed Integration with Future Monitoring System Network	15.55%	6.25%	0.97%	Objectives
Loss of Customers	[07]	•	Intelligent Event Monitoring Network Shut Down	18.55%	26.94%	5.00%	Objectives
Financial Loss	[08]	•	Major Train Work Accident	17.64%	43.63%	7.69%	Objectives
Financial Liability Due to Accident	[09]	•	Minor Train Work Accident	14.67%	6.77%	0.99%	Objectives
<ul> <li>Reliability, Availability, Maintainability</li> </ul>	[10]		Major Train Public Accident	17.69%	49.70%	8.79%	Objectives
	[01]	0	Late Train Running	35.48%	36.14%	12.82%	Public Relations
Loss of Maintenance Efficiency	[05]	0	Line Closure	27.22%	55.05%	14.99%	Public Relation
Disruption/Damage to Service Line I	[06]	•	Failed Integration with Future Monitoring System Network	15.55%	35.56%	5.53%	Public Relation
Repair to Service Line Infrastructure Performance	[07]	•	Intelligent Event Monitoring Network Shut Down	18.55%	16.73%	3.10%	Public Relation
	[08]	۲	Major Train Work Accident	17.64%	25.83%	4.56%	Public Relation
Temporary Line Closure	[09]	•	Minor Train Work Accident	14.67%	0.00%	0.00%	Public Relation
Loss of Reliability and Network Effici	[10]	0	Major Train Public Accident	17. <mark>69%</mark>	61.87%	10.94%	Public Relation
Loss of Wider Monitoring System Pr	[01]	0	Late Train Running	35.48%	25.64%	9.10%	Financial
Loss of Train Service	[02]	•	Degradation of Intelligent Monitoring System Physical Assets	11.17%	5.64%	0.63%	Financial

## Show Monetary Values

Simulated vs Computed Event Likelihoods, Impacts, and Risks (Flaw of Averages)

Preferences