MODEL OVERVIEW AND PROCESS GUIDE

CPUE Risk Quantification Model

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1 Overview

1.1 The Model

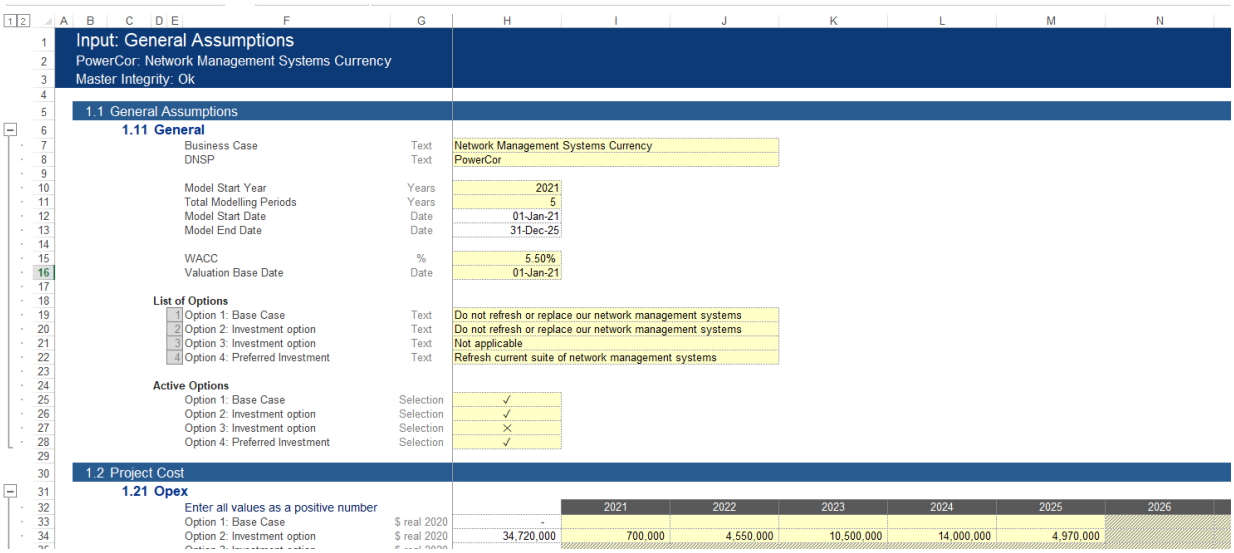
1.1.1 Model Overview

This model has been developed to provide CP-PAL-UE with a tool to assess multiple strategic options within its IT infrastructure and the risk impact on its IT and business environment. The outputs summarise the capital expenditure and cost of risk for each strategic option.

The purpose of this document is to provide the users of the CP-PAL-UE risk quantification model with an understanding of the model structure and guidance on how to populate the model.

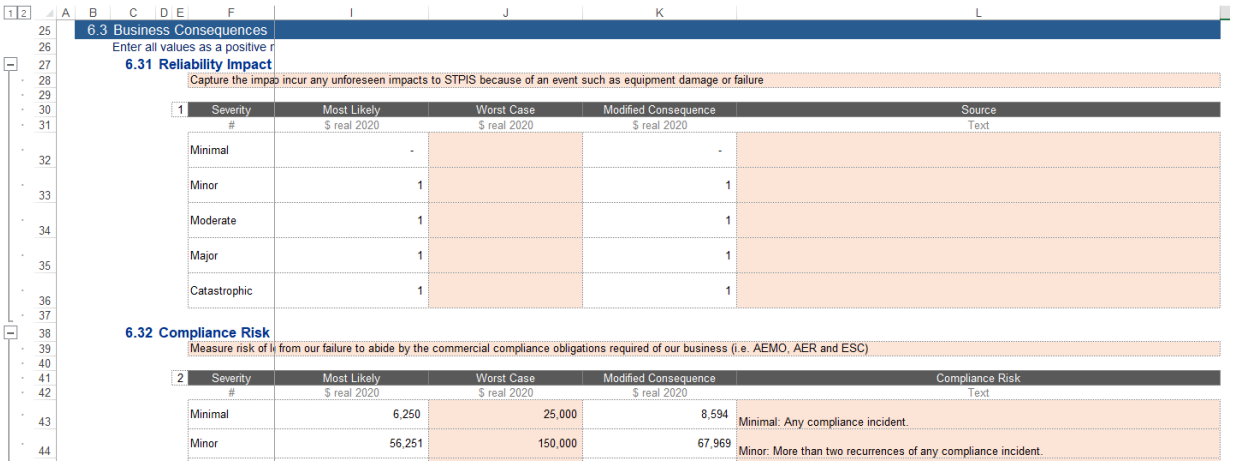
1.1.2 The Formatting

The model uses specific formatting to help guide the user. The yellow input cells (shown below) are to be populated by the business case user.



1	Input: General Assumptions											
2	PowerCor: Network Management Systems Currency											
3	Master Integrity: Ok											
5	1.1 General Assumptions											
6	1.11 General											
7	Business Case	Text	Network Management Systems Currency									
8	DNSP	Text	PowerCor									
10	Model Start Year	Years	2021									
11	Total Modelling Periods	Years	5									
12	Model Start Date	Date	01-Jan-21									
13	Model End Date	Date	31-Dec-25									
15	WACC	%	5.50%									
16	Valuation Base Date	Date	01-Jan-21									
18	List of Options											
19	1 Option 1: Base Case	Text	Do not refresh or replace our network management systems									
20	2 Option 2: Investment option	Text	Do not refresh or replace our network management systems									
21	3 Option 3: Investment option	Text	Not applicable									
22	4 Option 4: Preferred Investment	Text	Refresh current suite of network management systems									
24	Active Options											
25	Option 1: Base Case	Selection	✓									
26	Option 2: Investment option	Selection	✓									
27	Option 3: Investment option	Selection	✕									
28	Option 4: Preferred Investment	Selection	✓									
30	1.2 Project Cost											
31	1.21 Opex											
32	Enter all values as a positive number			2021	2022	2023	2024	2025	2026			
33	Option 1: Base Case	$ real 2020	-									
34	Option 2: Investment option	$ real 2020	34,720,000	700,000	4,550,000	10,500,000	14,000,000	4,970,000				

The orange input cells (shown below) are to be populated by the corporate team and will be applied across all business cases. The corporate inputs can be found in the BusMat sheet and the General sheet.



25	6.3 Business Consequences				
26	Enter all values as a positive r				
27	6.31 Reliability Impact				
28	Capture the impa incur any unforeseen impacts to STPIS because of an event such as equipment damage or failure				
30	1 Severity	Most Likely	Worst Case	Modified Consequence	Source
31	#	$ real 2020	$ real 2020	$ real 2020	Text
32	Minimal	-		-	
33	Minor	1		1	
34	Moderate	1		1	
35	Major	1		1	
36	Catastrophic	1		1	
38	6.32 Compliance Risk				
39	Measure risk of l from our failure to abide by the commercial compliance obligations required of our business (i.e. AEMO, AER and ESC)				
41	2 Severity	Most Likely	Worst Case	Modified Consequence	Compliance Risk
42	#	$ real 2020	$ real 2020	$ real 2020	Text
43	Minimal	6,250	25,000	8,594	Minimal: Any compliance incident.
44	Minor	56,251	150,000	67,969	Minor: More than two recurrences of any compliance incident.

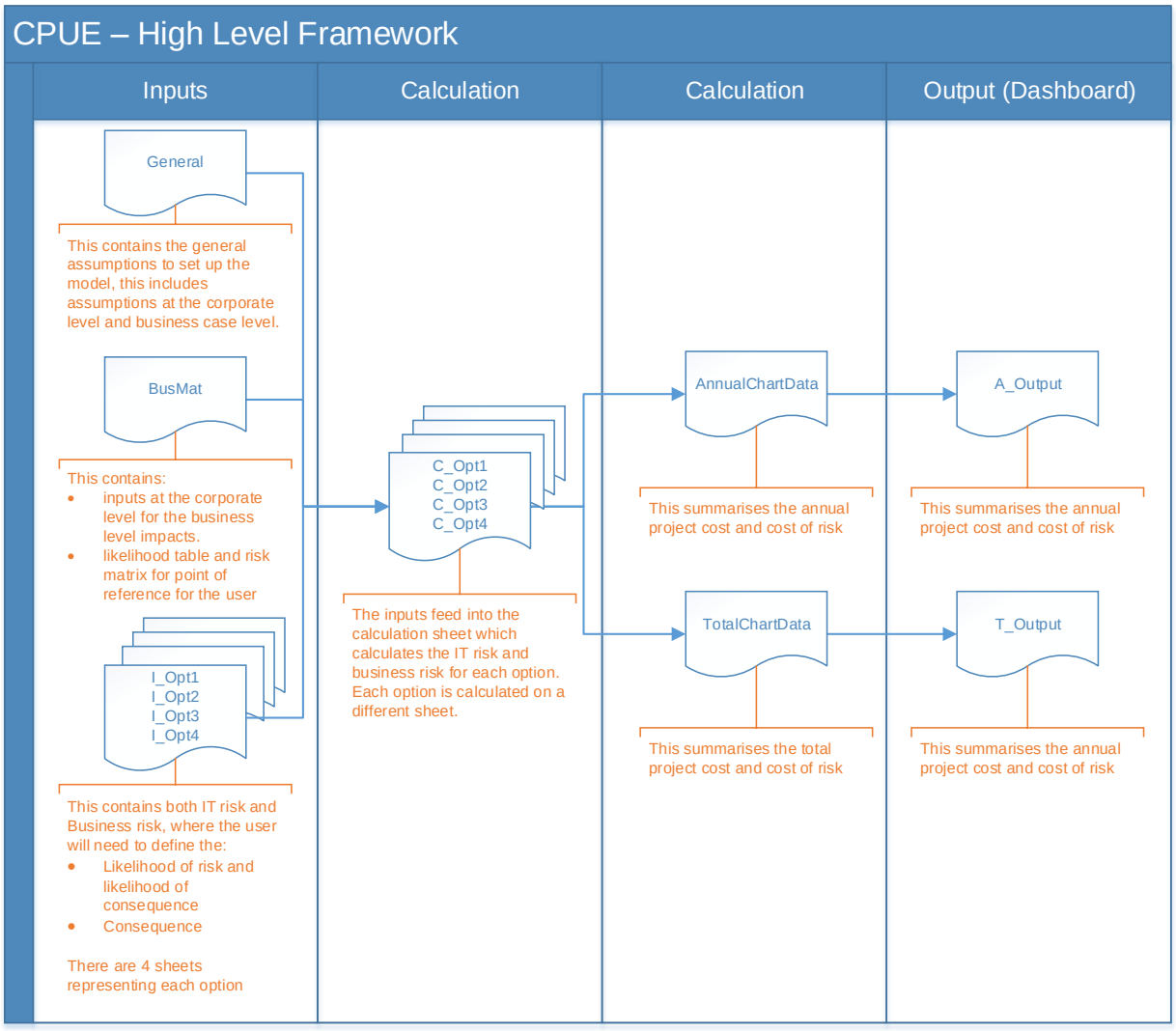
All input sheets have an added layer of security of sheet protection which allows the user to enter data however does not allow the user to change the structure of the sheet. Please **avoid** copying and pasting cells because this will also copy the formatting across. All other cells are **not** input cells, please **do not** change these cells. For more information on the conventions surrounding the other formatting styles please refer to the *Model Convention* section on the *Cover* tab of the model.

2 Model Structure

2.1 Overview

There will be a separate model for each business case and Distributed Network Supply Provider (DNSP). The model contains four strategic options and the user will need to populate the assumptions of the project cost and cost of risk for each option.

The model is structured into inputs, calculations and outputs which can be identified through the formatting of each tab, please refer to the *Model Convention* section on the Cover tab. See diagram below for the model flow.



2.1.1 General

The General sheet is where the business case user and corporate user is required to enter the general modelling assumptions to set up the model.

The corporate user inputs will be clearly defined by the orange formatting and includes entering the likelihood range of the number of occurrences per year for each rating and entering the reference list for IT impacts and business impacts.

The business case user inputs will be clearly defined by the yellow formatting and includes entering the project cost assumptions for each option and entering the names of the different IT systems for each option.

2.1.2 I_Opt1, I_Opt2, I_Opt3, I_Opt4

There is a separate input sheet for each option where the business case user is required to populate the inputs for both IT risk and business risk.

2.1.3 BusMat

The BusMat sheet contains the corporate level inputs for the business consequences. The corporate user is required to populate the consequences for each severity level, i.e. minimal, minor, moderate, major and catastrophic.

This sheet also contains the likelihood table and risk matrix to help the user populate the risk assumptions. It is only used as an information guide and does not impact the model calculations.

2.1.4 C_Opt1, C_Opt2, C_Opt3, C_Opt4

There is a separate calculation sheet for each option which calculates both IT risk and business risk.

2.1.5 TotalChartData

This sheet summarises the calculations that will feed into the T_Output sheet.

2.1.6 AnnualChartData

This sheet summarises the calculations that will feed into the A_Output sheet.

2.1.7 ReportDataRef

This sheet contains a log to assist the user to track any differences between the calculated numbers in the model and the numbers applied in the business cases. The user will have the ability to provide a description to outline the reason for the difference.

2.1.8 L

This sheet contains a list of the name ranges for this model. Please be aware that changes to name ranges can change certain functionalities of the model, therefore it is recommended that no changes are made to this sheet.

2.1.9 Check

This sheet contains a summary of all the checks within the model.

2.1.10 T_Output

The dashboard provides a view of the total project cost, IT risk and business risk for each option. It also provides the user the ability to view the IT risk and business risk for a selected IT system.

2.1.11 A_Output

The dashboard provides an annualised view of the project cost, IT risk and business risk for each option. It also provides the user the ability to view the IT risk and business risk for a selected IT system.

3 Model Process

3.1 General

The General sheet contains the following headers (see below) and sets up the model for each option.

Input: General Assumptions
United Energy: SAP
Master Integrity: Ok

1.1 General Assumptions
- **1.11 General**

1.2 Project Cost
- **1.21 Capex**
- **1.22 Opex**

1.3 General Cost of Risk Assumptions
- **1.31 Likelihood**
- **1.32 Consequence**
- **1.33 Reference List**

3.1.1 General Assumptions

Section 1.11 in the model contains the corporate level general assumptions (shown below) including the following:

- Model start year and total modelling periods
- Likelihood: the business case user will need to enter in a range of the number of occurrences per year for each rating, i.e. once a month, year, every two years, every five years, every ten years.

$$\text{Likelihood of once every two years} = \frac{1}{2}$$

$$\text{Likelihood of once every five years} = \frac{1}{5}$$

- Consequence hourly rate: this drives the consequence calculation employee utilisation and rectification cost for IT risk.
- Reference List: this section sets up the IT impacts and business impacts that flows through in the model.
- List of IT impacts: the business case user can enter up to 6 IT impacts
- List of business impacts: the business case user can enter up to 8 business impacts

1.3 General Cost of Risk Assumptions

1.31 Likelihood

Likelihood Per Event

			Bound	Likelihood	
			Years	#	
1	Monthly	Misc.	0.08	12.00	Risk occurs once per month
2	Annual	Misc.	1.00	1.00	Risk occurs once per year
3	Every 2 years	Misc.	2.00	0.50	Risk occurs once every 2 years
4	Every 5 years	Misc.	5.00	0.20	Risk occurs once every 5 years
5	Every 10 years	Misc.	10.00	0.10	Risk occurs once every 10 years

1.32 Consequence

Hourly Rate

Users	$ real 2021	69
Users hourly rate	$ real 2021	138
Discount for user time impacted	%	50%
IT Specialist	$ real 2021	129

1.33 Reference List

List of IT Systems

			Option 1	Option 2	Option 3	Option 4
1	IT system 1	Text	SAP	SAP	Non-SAP solution	SAP
2	IT system 2	Text				
3	IT system 3	Text				
4	IT system 4	Text				
5	IT system 5	Text				

List of IT Impacts

1	Outage
2	Suitability
3	System Sustainability
4	
5	
6	

List of Business Impacts

1	Reliability Impact
2	Compliance Risk
3	Customer Experience Risk
4	Safety Risk
5	Bushfire Risk
6	Financial Loss
7	
8	

3.1.2 Project Assumptions

Section 1.2 in the model contains the business case general assumptions (shown below) including the following:

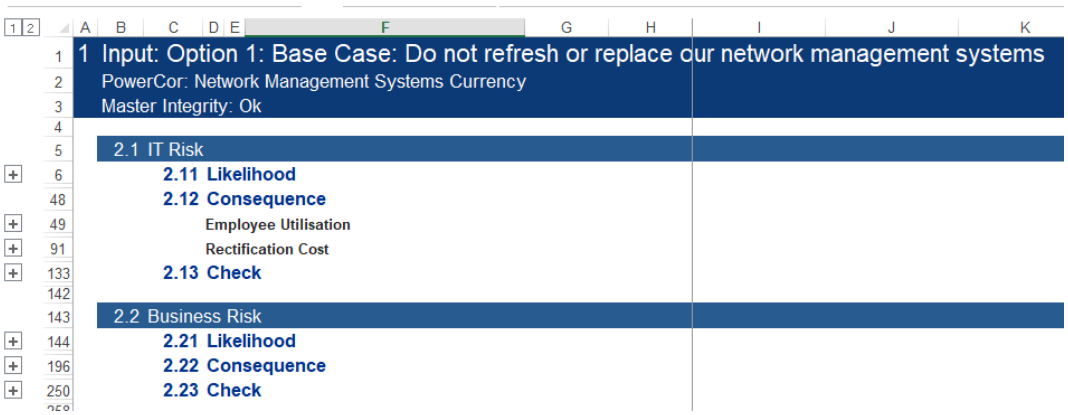
- Business case and DNSP: this is for information purposes and does not drive any model calculations.
- List of Options and Active Options: provides an overview of the four different options including the ability for the business case user to switch an option on and off.
- Project Cost: this contains the breakdown by capex and opex for each option against a 10 year timeline. The inputs do not need to be entered when the:
  - period is greater than the total modelling periods (General!H8)
  - Option is switched off (General!H58:H61)
- List of IT systems: the business case user has the ability to enter up to 5 IT systems for each option

3.2 I_Opt1, I_Opt2, I_Opt3, I_Opt4

Each sheet contains the same structure and has following headers (see below). This is where the business case user enters the likelihood and consequence of each IT system for:

- IT risk
- Business risk

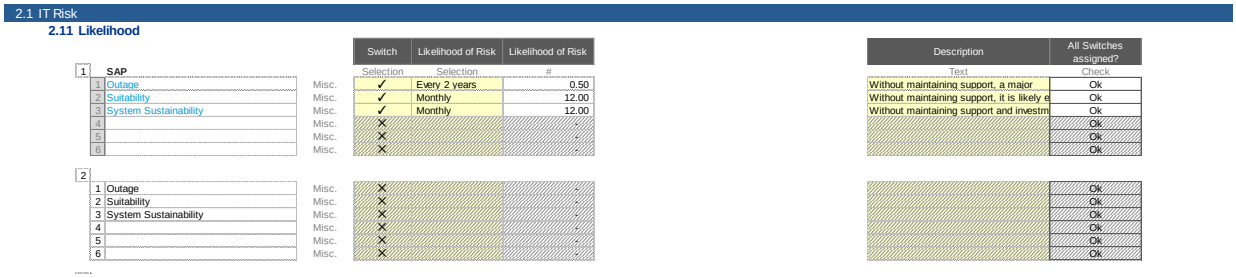
There are checks contained in the worksheets to ensure the inputs have been sufficiently populated.



3.2.1 IT Risk

For I_Opt1, Section 2.1 in the model contains the IT risk assumptions of likelihood (Section 2.11 in the model) and consequence (Section 2.12 in the model). The business case user will need to assign a switch for each IT system and IT impact breakdown, where the list of IT systems and IT impact is defined in General!E80:K84 and General!E29:F34. Furthermore, the input cells will be greyed out for switches that are deactivated.

The business case user will be able to select from a dropdown list the likelihood of risk and likelihood of consequence (shown below), where the likelihood represents the number of occurrences per year and the dropdown list is based on the inputs entered in General!E16:L20.



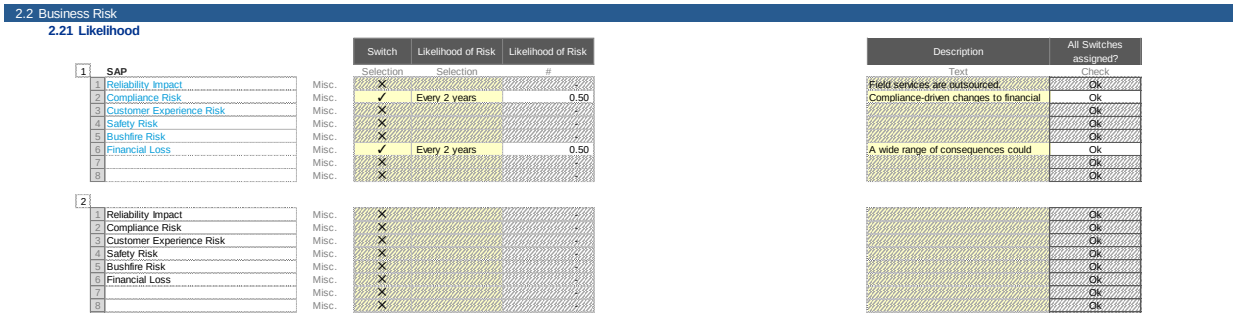
For I_Opt1, Section 2.12 in the model, the business case user will need to enter the employee utilisation and rectification cost assumptions for the active switches (shown below). Input cells will be greyed out for switches that are deactivated.

The same structure applies for I_Opt2, I_Opt3, and I_Opt4.

3.2.2 Business Risk

For I_Opt1, Section 2.2 in the model contains the Business risk assumptions of likelihood (Section 2.21 in the model) and consequence (Section 2.22 in the model). Similar to IT Risk, the business case user will need to assign a switch for each IT system and business risk breakdown, where the list of IT systems and business impact is defined in General!E80:K84 and General!E37:F44. Furthermore, the input cells will be greyed out for switches that are deactivated.

The business case user will be able to select from a dropdown list the likelihood of risk and likelihood of consequence (shown below), where the likelihood represents the number of occurrences per year and the dropdown list is based on the inputs entered in General!E16:L20.



In Section 2.22 in the model, there are 2 options available to calculate the business consequence (shown below):

1. Corporate consequence: the business case user can select from a dropdown the severity of the consequence, where the dropdown list is based on the inputs entered in the BusMat sheet
2. Project consequence: the business case user can enter an amount for the best case, most likely and worst case. To assess and quantify the cost consequence of potential risks, the Johnson modification of the Pearson-Tukey formula (see below), recommended by Risk Engineering Society (RES) Contingency Guideline 2016 was used. It should be noted that the accuracy and reliability of the method should be regularly reviewed and improved with support of actual data. In assessing the best case, most likely and worst case ranges, a number of factors including subject matter expert views, estimating judgment, previous experience, historical data, risk appetite and the organisation's previous performance should be also considered.

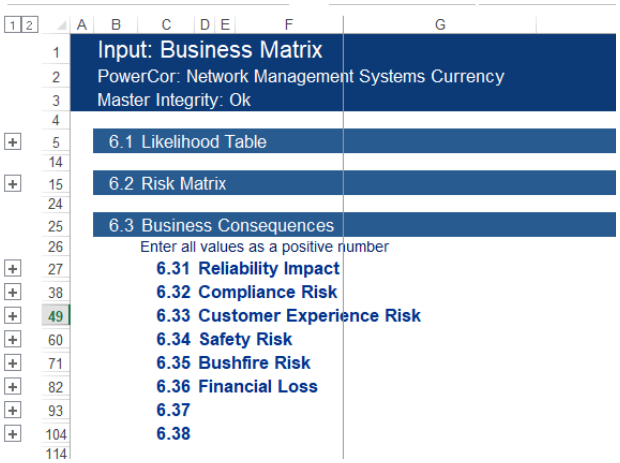
$$Johnson\ modification\ of\ the\ Pearson - Tukey = \frac{3 \times Best\ Case + 10 \times Most\ Likely + 3 \times Worst\ Case}{16}$$

When both corporate consequence and project consequence are entered in the model, the model will prioritise and apply the project consequence above the corporate consequence.

The same structure applies for I_Opt2, I_Opt3, and I_Opt4.

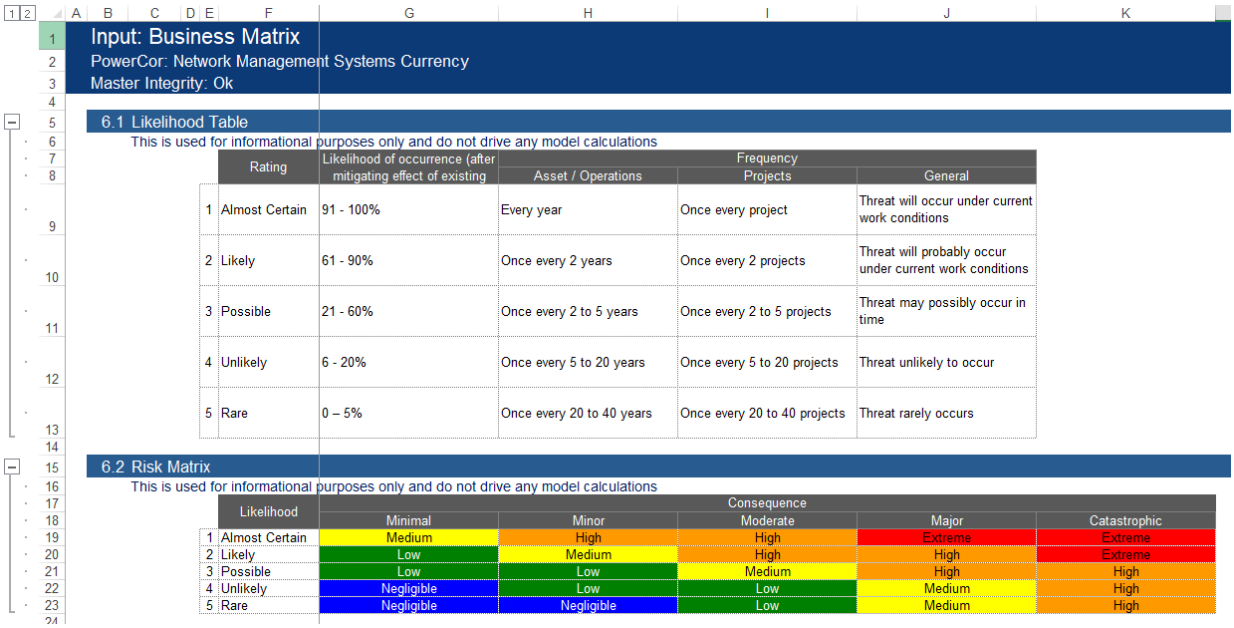
3.3 BusMat

This sheet contains the following headers (see below), and will be populated by corporate users.



3.3.1 Likelihood Table and Risk Matrix

Section 6.1 and 6.2 in the model provides information on the likelihood and risk, and does not drive any calculations.



Input: Business Matrix
PowerCor: Network Management Systems Currency
Master Integrity: Ok

6.1 Likelihood Table

This is used for informational purposes only and do not drive any model calculations

	Rating	Likelihood of occurrence (after mitigating effect of existing	Frequency		
			Asset / Operations	Projects	General
1	Almost Certain	91 - 100%	Every year	Once every project	Threat will occur under current work conditions
2	Likely	61 - 90%	Once every 2 years	Once every 2 projects	Threat will probably occur under current work conditions
3	Possible	21 - 60%	Once every 2 to 5 years	Once every 2 to 5 projects	Threat may possibly occur in time
4	Unlikely	6 - 20%	Once every 5 to 20 years	Once every 5 to 20 projects	Threat unlikely to occur
5	Rare	0 – 5%	Once every 20 to 40 years	Once every 20 to 40 projects	Threat rarely occurs

6.2 Risk Matrix

This is used for informational purposes only and do not drive any model calculations

	Likelihood	Consequence				
		Minimal	Minor	Moderate	Major	Catastrophic
1	Almost Certain	Medium	High	High	Extreme	Extreme
2	Likely	Low	Medium	High	High	Extreme
3	Possible	Low	Low	Medium	High	High
4	Unlikely	Negligible	Low	Low	Medium	High
5	Rare	Negligible	Negligible	Low	Medium	High

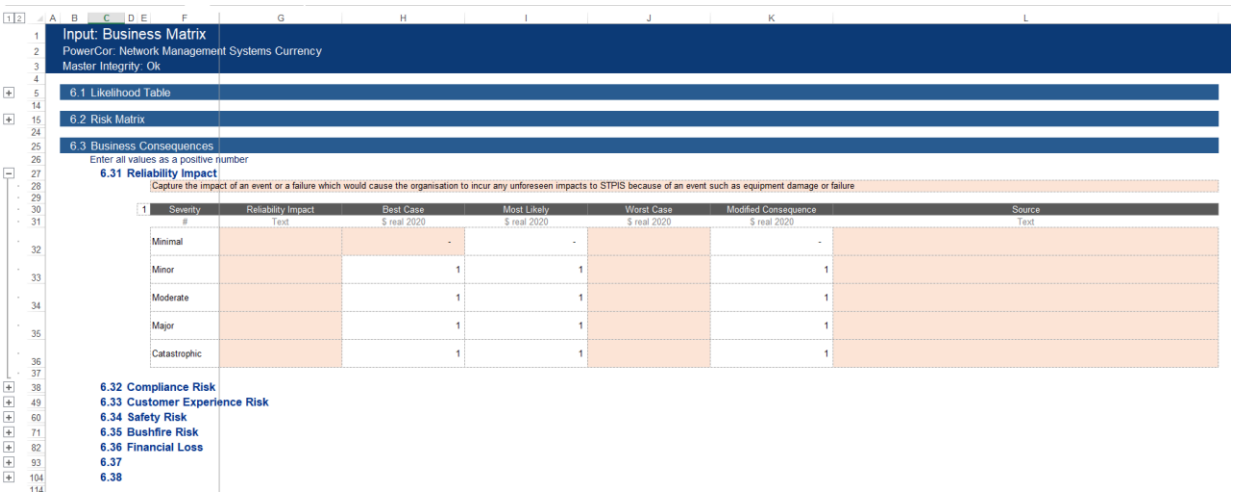
3.3.2 Business Consequences

Section 6.3 in the model contains the inputs for the corporate level business consequences of each business impact, where the list of business impacts is defined in General!E37:F44. For each business impact, the corporate user will need to enter the worst case amount for each level of severity, source of information and any additional description.

Modified consequence

Three of the more commonly used probability distributions for assessing inherent risks are Triangular, Normal, Pert and Lognormal (or their Alt format) distributions. For the purpose of CP-PAL-UE cost risk model, the 'Triangular Distribution' with three-point estimates has been used. As per RES Contingency Guideline, many risk analysts prefer to use the Alt format of Triangular and Pert distributions to address overestimation of the best-case numbers and underestimation of the worst-case estimates, while a multiplier factor of 2 to 4 for worst case scenario is quite common. A multiplier factor of 3 has been used within CP-PAL-UE model. It should be noted that the accuracy and reliability of these assumptions including type of distribution and its range of boundaries should be also regularly reviewed and improved with support of actual data.

The modified consequence is based on the Johnson modification of the Pearson-Tukey formula.


Input: Business Matrix
PowerCor: Network Management Systems Currency
Master Integrity: Ok

6.1 Likelihood Table

6.2 Risk Matrix

6.3 Business Consequences

Enter all values as a positive number

6.31 Reliability Impact

Capture the impact of an event or a failure which would cause the organisation to incur any unforeseen impacts to STPIS because of an event such as equipment damage or failure

1	Severity	Reliability Impact	Best Case	Most Likely	Worst Case	Modified Consequence	Source
	#	Text	$ real 2020	$ real 2020	$ real 2020	$ real 2020	Text
	Minimal		-	-		-	
	Minor		1	1		1	
	Moderate		1	1		1	
	Major		1	1		1	
	Catastrophic		1	1		1	

6.32 Compliance Risk
6.33 Customer Experience Risk
6.34 Safety Risk
6.35 Bushfire Risk
6.36 Financial Loss
6.37
6.38