



# MODEL OVERVIEW AND PROCESS GUIDE

CPUE Risk Quantification Model

# Contents

1	Overview.....	2
1.1	The Model.....	2
1.1.1	Model Overview.....	2
1.1.2	The Formatting.....	2
2	Model Structure.....	3
2.1	Overview.....	3
2.1.1	General.....	3
2.1.2	I_Opt1, I_Opt2, I_Opt3, I_Opt4.....	4
2.1.3	BusMat.....	4
2.1.4	C_Opt1, C_Opt2, C_Opt3, C_Opt4.....	4
2.1.5	TotalChartData.....	4
2.1.6	AnnualChartData.....	4
2.1.7	ReportDataRef.....	4
2.1.8	L.....	4
2.1.9	Check.....	4
2.1.10	T_Output.....	4
2.1.11	A_Output.....	4
3	Model Process.....	5
3.1	General.....	5
3.1.1	Corporate Assumptions.....	5
3.1.2	Project Assumptions.....	6
3.2	I_Opt1, I_Opt2, I_Opt3, I_Opt4.....	6
3.2.1	IT Risk.....	7
3.2.2	Business Risk.....	7
3.3	BusMat.....	8
3.3.1	Likelihood Table and Risk Matrix.....	8
3.3.2	Business Consequences.....	9

# 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.

**Input: General Assumptions**  
 PowerCor: Network Management Systems Currency  
 Master Integrity: Ok

**1.1 General Assumptions**

**1.1.1 General**

Business Case	Text	Network Management Systems Currency
DNSP	Text	PowerCor
Model Start Year	Years	2021
Total Modelling Periods	Years	5
Model Start Date	Date	01-Jan-21
Model End Date	Date	31-Dec-25
WACC	%	5.50%
Valuation Base Date	Date	01-Jan-21

**List of Options**

Option 1: Base Case	Text	Do not refresh or replace our network management systems
Option 2: Investment option	Text	Do not refresh or replace our network management systems
Option 3: Investment option	Text	Not applicable
Option 4: Preferred Investment	Text	Refresh current suite of network management systems

**Active Options**

Option 1: Base Case	Selection	✓
Option 2: Investment option	Selection	✓
Option 3: Investment option	Selection	✗
Option 4: Preferred Investment	Selection	✓

**1.2 Project Cost**

**1.2.1 Opex**

Enter all values as a positive number		2021	2022	2023	2024	2025	2026
Option 1: Base Case	\$ real 2020	-	-	-	-	-	-
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.

**6.3 Business Consequences**  
 Enter all values as a positive number

**6.3.1 Reliability Impact**  
 Capture the impact of any unforeseen impacts to STPIS because of an event such as equipment damage or failure

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

**6.3.2 Compliance Risk**  
 Measure risk of loss from our failure to abide by the commercial compliance obligations required of our business (i.e. AEMO, AER and ESC)

Severity	Most Likely	Worst Case	Modified Consequence	Compliance Risk
#	\$ real 2020	\$ real 2020	\$ real 2020	Text
Minimal	6,250	25,000	8,594	Minimal: Any compliance incident.
Minor	56,251	150,000	67,969	Minor: More than two recurrences of any compliance incident.

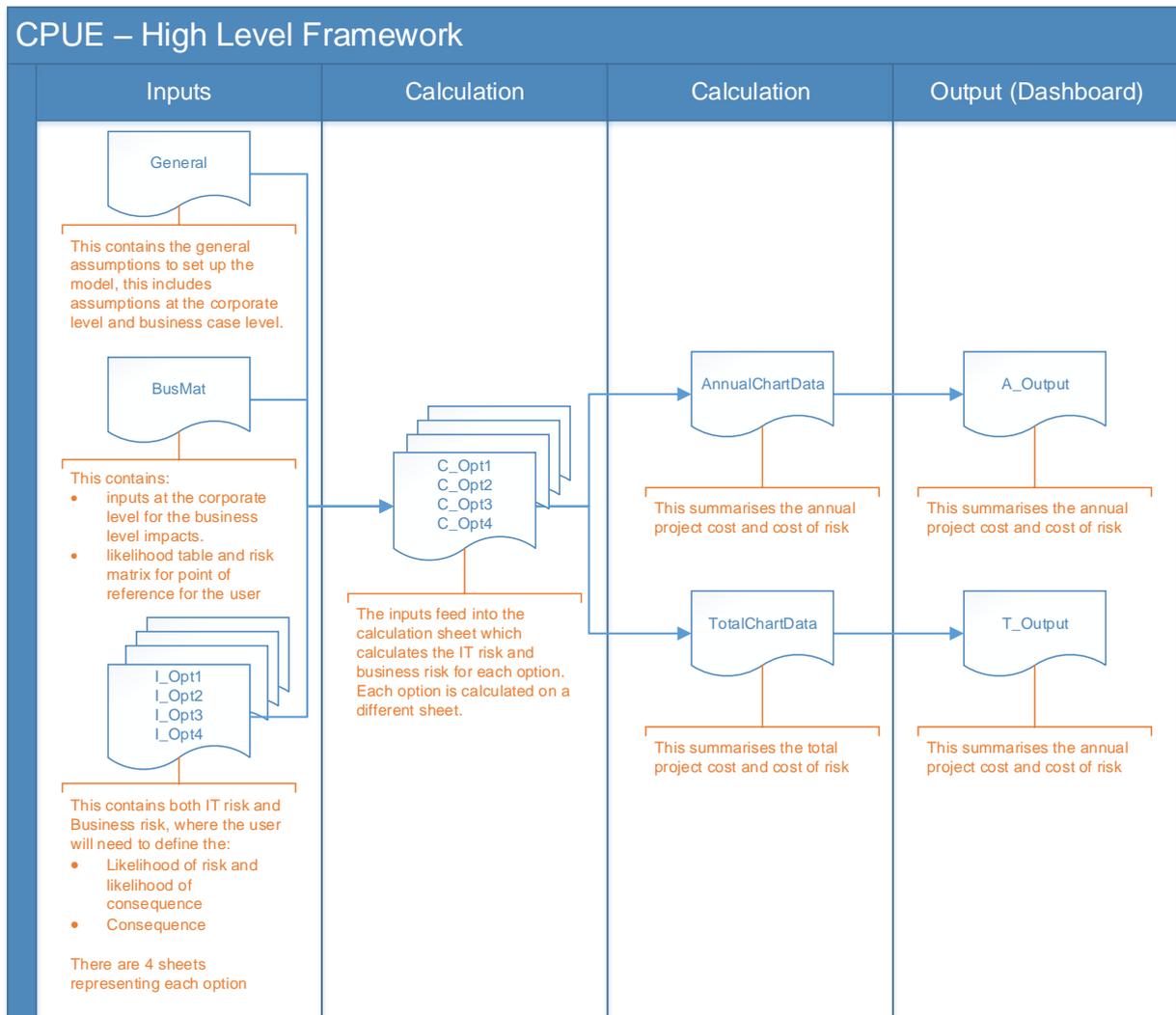
All input sheets have an added layer of security of sheet protection which allows the user to enter data however does not allow the user to change the structure of the sheet. Please **avoid** copying and pasting cells because this will also copy the formatting across. All other cells are **not** input 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

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### 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.

1	1	Input: Option 1: Base Case: Do not refresh or replace our network management systems
2		PowerCor: Network Management Systems Currency
3		Master Integrity: Ok
4		
5		2.1 IT Risk
6		2.11 Likelihood
48		2.12 Consequence
49		Employee Utilisation
91		Rectification Cost
133		2.13 Check
142		
143		2.2 Business Risk
144		2.21 Likelihood
196		2.22 Consequence
250		2.23 Check

### 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.

2.1 IT Risk			
2.11 Likelihood			
1	SAP		
1	Outage	Misc. ✓	Every 2 years 0.50
2	Sustainability	Misc. ✓	Monthly 12.00
3	System Sustainability	Misc. ✓	Monthly 12.00
4		Misc. X	
5		Misc. X	
6		Misc. X	
2			
1	Outage	Misc. X	
2	Sustainability	Misc. X	
3	System Sustainability	Misc. X	
4		Misc. X	
5		Misc. X	
6		Misc. X	

Description	All Switches assigned?
Without maintaining support, a major	Ok
Without maintaining support, it is likely e	Ok
Without maintaining support and investm	Ok
	Ok
	Ok
	Ok

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.

2.2 Business Risk			
2.21 Likelihood			
1	SAP		
1	Reliability Impact	Misc. X	
2	Compliance Risk	Misc. ✓	Every 2 years 0.50
3	Customer Experience Risk	Misc. X	
4	Safety Risk	Misc. X	
5	Bushfire Risk	Misc. X	
6	Financial Loss	Misc. ✓	Every 2 years 0.50
7		Misc. X	
8		Misc. X	
2			
1	Reliability Impact	Misc. X	
2	Compliance Risk	Misc. X	
3	Customer Experience Risk	Misc. X	
4	Safety Risk	Misc. X	
5	Bushfire Risk	Misc. X	
6	Financial Loss	Misc. X	
7		Misc. X	
8		Misc. X	

Description	All Switches assigned?
Field services are outsourced.	Ok
Compliance-driven changes to financial	Ok
	Ok
	Ok
A wide range of consequences could	Ok
	Ok
	Ok

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.

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

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.

1	<b>Input: Business Matrix</b>					
2	PowerCor: Network Management Systems Currency					
3	Master Integrity: Ok					
4						
5	<b>6.1 Likelihood Table</b>					
14						
15	<b>6.2 Risk Matrix</b>					
24						
25	<b>6.3 Business Consequences</b>					
26	Enter all values as a positive number					
27	<b>6.31 Reliability Impact</b>					
38	<b>6.32 Compliance Risk</b>					
49	<b>6.33 Customer Experience Risk</b>					
60	<b>6.34 Safety Risk</b>					
71	<b>6.35 Bushfire Risk</b>					
82	<b>6.36 Financial Loss</b>					
93	<b>6.37</b>					
104	<b>6.38</b>					
114						

#### 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.

1	<b>Input: Business Matrix</b>										
2	PowerCor: Network Management Systems Currency										
3	Master Integrity: Ok										
4											
5	<b>6.1 Likelihood Table</b>										
6	This is used for informational purposes only and do not drive any model calculations										
7		Rating	Likelihood of occurrence (after mitigating effect of existing)	Asset / Operations	Frequency Projects	General					
8		1	Almost Certain	91 - 100%	Every year	Once every project	Threat will occur under current work conditions				
9		2	Likely	61 - 90%	Once every 2 years	Once every 2 projects	Threat will probably occur under current work conditions				
10		3	Possible	21 - 60%	Once every 2 to 5 years	Once every 2 to 5 projects	Threat may possibly occur in time				
11		4	Unlikely	6 - 20%	Once every 5 to 20 years	Once every 5 to 20 projects	Threat unlikely to occur				
12		5	Rare	0 - 5%	Once every 20 to 40 years	Once every 20 to 40 projects	Threat rarely occurs				
13											
14											
15	<b>6.2 Risk Matrix</b>										
16	This is used for informational purposes only and do not drive any model calculations										
17		Likelihood	Minimal	Minor	Moderate	Major	Catastrophic				
18		1	Almost Certain	Medium	High	High	Extreme	Extreme			
19		2	Likely	Low	Medium	High	High	Extreme			
20		3	Possible	Low	Low	Medium	High	High			
21		4	Unlikely	Negligible	Low	Low	Medium	High			
22		5	Rare	Negligible	Negligible	Low	Medium	High			
23											
24											

### 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.

1	Severity	Reliability Impact	Best Case	Most Likely	Worst Case	Modified Consequence	Source
	#	Text	\$ real 2020	\$ real 2020	\$ real 2020	\$ real 2020	Text
32	Minimal		-	-	-	-	
33	Minor		1	1	1	1	
34	Moderate		1	1	1	1	
35	Major		1	1	1	1	
36	Catastrophic		1	1	1	1	