



Network Risk Assessment Guideline

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Revision history

Version	Date	Summary of changes
1.0	6 February 2015	As submitted to the AER as part of the information request AER Ergon 031 (4) for additional information on risk profiles
2.0	3 July 2015	Revisions have been made to: <ul style="list-style-type: none">All position titles in the document to reflect position titles present organisation structure.Table B6 (Reliability Consequence Table) to reflect present network security criteria.

1. PURPOSE AND SCOPE

The objective of the Network Risk Assessment Guideline is to expand upon the Standard for Network Risk Assessment to achieve consistent risk based assessments of the Ergon Energy Network by seeking to:

- explain the process of conducting a Network Risk based assessment, before and after Program of Works projects and programs; and
- ensure consistency of application of the network risk assessment process.

This is to support the overarching principles of effective Risk Management whereby it:

- facilitates continual improvement by being systematic, dynamic and responsive to change;
- explicitly addresses uncertainty;
- ensures significant risks are understood, managed and monitored via a corporate risk profile;
- enables prioritisation of risks on an organisational basis rather than business unit basis;
- enables better asset management and maintenance by more effective allocation and use of resources;
- provides a rigorous basis for decision making leading to pro-active rather than re-active decisions;
- fosters legal and regulatory compliance;
- minimises potential for litigation; and
- protects people's safety.

These guidelines apply to all Network Risk Assessments for projects and programs that are to be considered for inclusion into Ergon Energy's Capital Program.

2. DEFINITIONS, ABBREVIATIONS AND ACRONYMS

10 POE	10% Probability of Exceedance – The peak load forecast with 10% probability of being exceeded (every 1 in 10 years will be exceeded). Based on normal expected growth rates & weather corrected starting loads.
50 POE	50% Probability of Exceedance – The peak load forecast with 50% probability of being exceeded (every 1 in 2 years will be exceeded). Based on normal expected growth rates & weather corrected starting loads.
ALARP	An acronym for “As Low As Reasonably Practicable”, an established principle in risk management (HB 4360:2004).
CAPEX	Capital Expenditure.
Consequence	The outcome or impact of an event or scenario affecting objectives.
ECC	Emergency Cyclic Capacity.
eSAFE	eSafe is a system Ergon Energy has implemented to record, manage, track and report on all safety and environmental risks and hazards.
Event	The occurrence or change of a particular set of circumstances.
Inherent Risk	The initial risk or risk level before any risk treatments or controls are put in place, including operational solutions.
Likelihood	The chance of something happening.
NCC	Normal Cyclic Capacity.

OPEX	Operating Expenditure (includes inspections, maintenance, monitoring).
PoW	Program of Works.
Residual Risk	Risk level calculated after application of all current operational risk treatments or controls (i.e. load shifts for a reliability scenario).
Risk	The effect of uncertainty on objectives. Expressed in terms of a combination of the consequences of an event and the associated likelihood of occurrence.
Risk Assessment	A component of the risk management process, encompassing risk identification, risk analysis, and risk evaluation.
Risk Management	The coordinated activities to direct and control an organisation with regard to risk.
Risk Treatment	Process of selection and implementation of measures to manage the risk with the aim to reduce the consequence and/or likelihood of the particular scenario eventuating.
Scenario	A sequence of events and circumstances which are needed to lead to a chosen consequence.
SME	Subject Matter Expert.
Target Risk	Risk level calculated after application of additional or future risk controls or treatments (i.e. a project which upon completion reduces the level of risk).
WH&S	Workplace Health and Safety.

3. REFERENCES

[STMM002](#) Standard for Network Risk Assessment (Standard)

AS/NZS ISO 31000:2009 Risk Management - Principles and guidelines (Australian Standard)

Network Risk Analysis Tool

Saving Network Risk Assessment Using Ellipse Document Register

4. NETWORK RISK ASSESSMENT

4.1. When Required

A Network Risk Assessment shall be undertaken with respect to the criteria of Network Health & Safety, Environment, Reliability and Capacity when:

- (a) There is a Risk / Limitation / Constraint in the Ergon Energy Distribution Network; and
- (b) A Works Program or Project is proposed; and
- (c) The strategic monetary value of the proposed Program or Project is \$1,000,000 or greater.

In addition, a Network Risk Assessment shall be undertaken for:

- (a) All Projects, regardless of monetary value that are included in and require a variation to the current Annual Plan and any subsequent year when advised as part of the capital plan and budgeting process.
- (b) All Projects that require variation approval from the Network Investment Review Committee (NIRC) if a Network Risk Assessment has not previously been supplied.

Refer to the Asset Governance - Program of Work Governance Group for current possible exclusions.

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If a new Project proposal requires a Network Risk Assessment based on the above criteria, the Project Instigator shall do the initial assessment and create a Project Placeholder via a Works Request.

Immediately prior to the development of each years Capital Works Annual Plan into which this proposed Project will be considered, a review of the Project Instigator's Network Risk Assessment shall be undertaken by a Risk Assessment Team consisting of 4 to 6 staff from different work groups within the Network Optimisation stream.

Figure 1 expands on the process from network project instigation through to the preparations required for a project to be considered for inclusion into the Capital Works Annual Plan.

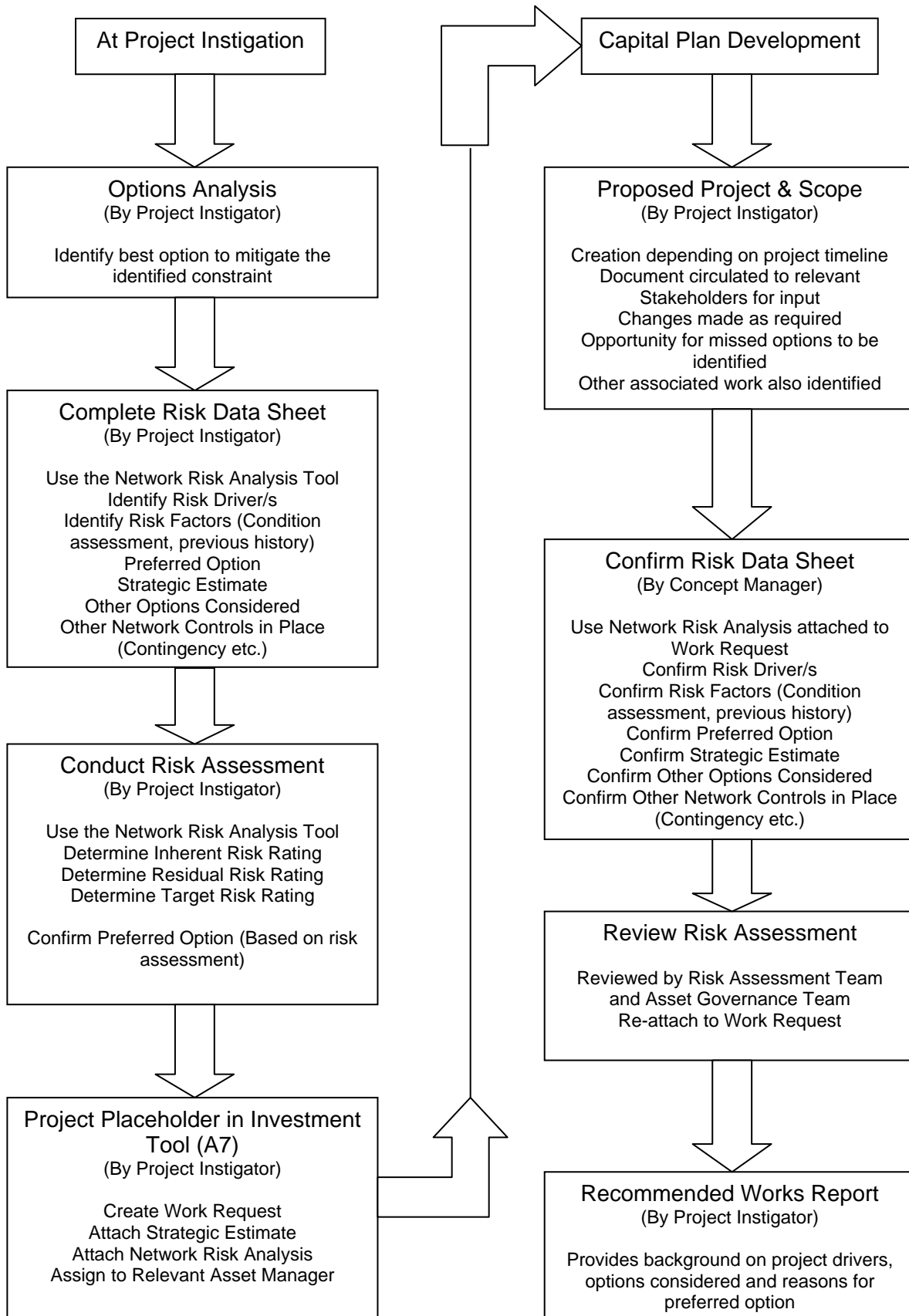


Figure 1 – Network Optimisation Project Instigation and preparation for Capital Plan inclusion

4.2. What must be Produced

Each risk scenario based on a specific risk driver / area of concern or interest based on identified risk factors within the Network Health & Safety, Environment, Reliability and Capacity criteria is to be documented with the following information:

- Scenario of concern including the chosen consequence of interest or concern;
- Risk Data Sheet including risk drivers, risk factors, strategic estimate, other controls in place etc.;
- Assessed likelihood; and
- Risk level calculations and details regarding any new or changed risk treatment measures.

4.3. Data Retention

Risk assessments completed using the Network Risk Analysis Tool and strategic estimate shall be retained and saved with the relevant projects Ellipse Work Request (refer to document Saving Network Risk Assessment Using Ellipse Document Register) and, on completion, notification sent to the Asset Governance - Program of Work Governance Group for review.

For each proposed network project that has a network risk assessment attached, the associated highest residual risk rating score assessed and the year of risk shall be recorded in the A7 database by the Asset Governance - Program of Work Governance Group.

Contents from the Summary sheet of the Network Risk Analysis Tool for all network assessments shall be exported and saved in a common data folder by the Asset Governance - Program of Work Governance Group to allow for the collation and reporting of all Project data.

4.4. What must be Achieved

A network risk assessment outcome/s for the Network Health & Safety, Environment, Reliability and Capacity scenario/s under consideration that can be understood or able to be repeated by others.

4.5. Risk Analysis

4.5.1 Analyse Risks

Refer to Standard for Network Risk Assessment, Section 4.4.

A semi-quantitative risk assessment is required for identified Network Health & Safety, Environment, Reliability, or Capacity scenarios to determine the risk level (For examples see Appendix A – Scenario Mapping).

Semi Quantitative Risk = Consequence x Likelihood.

Qualitative risk assessments may be used, if required, to rank multiple scenarios to ensure additional time and effort is spent on more detailed risk assessments to manage risks of higher importance.

A full Quantitative Risk Assessment (QRA) is possible only if the level of detailed data required is available to calculate the probability of a consequence.

The three risk levels to be considered are the Inherent Risk, Residual Risk and Target Risk.

4.5.2 Choosing Consequence

Refer to Standard for Network Risk Assessment, Section 4.3.

Risk Identification begins by determining a specific risk driver / area of concern or interest based on identified risk factors.

This risk driver / area of concern is the basis for developing a chosen risk scenario that has an agreed consequence at the inherent/ residual risk level.

Using the appropriate Consequence Table (See Appendix B – Network Consequence & Likelihood Tables), consider each of the dimensions for the consequence chosen and determine a numerical score for each. The numerical score (1 to 6) associated with the highest dimension is then identified and that score will be used in subsequent analysis as the consequence (C) score i.e. the highest C score from any relevant dimension column is chosen.

4.5.3 Assessing Likelihood

Refer to Standard for Network Risk Assessment, Section 4.4.6.

When estimating the Likelihood, remember it needs to be the likelihood of the WHOLE scenario (all events) including the end consequence occurring.

Important considerations when determining the likelihood using tables (See Appendix B – Network Consequence & Likelihood Tables) for semi-quantitative risk analysis:

- The column with the most appropriate guidance words that best applies to the scenario under consideration is chosen, and the likelihood (L) score determined from this.
- Different columns of the tables will be useful and relevant to each different identified or described risk scenarios, as the nature of the risk question or scenario could be generic or specific in nature i.e. all transformers of a particular size, or this specific transformer in this specific location.
- The Past History or past frequency of events may influence, but should not solely determine the estimation of the likelihood or frequency of future events being considered. Risk factors or circumstances may be changed with respect to the past.

To address a number of commonly asked questions about estimating the likelihood of certain scenarios, there are some rules or assumptions presented below.

The risk assessment is:

- (a) Assessing any or all of the following - Vegetation caused outages, weather events (including storms), plant or systems failure, external party damage to network.

e.g. Risk factors may include:

- Whether transformer has external bushings or cable box, age or condition of transformer.
- Whether feeder is overhead or underground, condition of the feeder, the type of Construction / Installation, etc.
- Security of supply scenarios, which must include and detail the plant outage events.

- (b) Not assessing the likelihood of 50% POE forecast loads actually eventuating.

Current planning practice does not consider the chance or probability of the load forecast (50% POE) actually eventuating for any given year. The same principle applies in performing the network reliability risk assessment, which is not intended to assess the likelihood of the forecast loads actually eventuating on the network.

- (c) Not assessing the likelihood of plant and resources availability.

Once likelihood has been determined, use the Risk Assessment Consequence and Likelihood Matrix (Figure 2) for semi-quantitative risks to determine the risk score.

$$\text{Semi-Quantitative Risk} = \text{Consequence} \times \text{Likelihood} = C \times L.$$

Risk Analysis 6x6 multiplication $R = C \times L$		Consequence					
		1	2	3	4	5	6
Likelihood	6	6	12	18	24	30	36
	5	5	10	15	20	25	30
	4	4	8	12	16	20	24
	3	3	6	9	12	15	18
	2	2	4	6	8	10	12
	1	1	2	3	4	5	6

Figure 2 - Risk Assessment Consequence and Likelihood Matrix

After each risk analysis, assess which risk factors have the greatest effect on the risk score estimate i.e. to which factors is the risk level most sensitive. Usually some assumptions regarding risk factors are made and need to be tested by seeing how much a small change in each factor can influence the final risk level or score.

By detecting the sensitive risk factors, a better understanding of the certainty and confidence of the risk score can be made. This analysis will also reveal which risk factors will have the highest priority for new risk controls to reduce the risk level the most.

4.5.4 Risk Evaluation

Refer to Standard for Network Risk Assessment, Section 4.5.

The use of the risk score, previously determined, together with the Risk Tolerability scale (Figure 3) for Health & Safety, Environment, Reliability, and Capacity risks provides the ability to evaluate the considered risk, determine if it resides in the intolerable or tolerable range, and if further action is required or may be justified to control or further mitigate the risk.

5. RISK TOLERABILITY

5.1. Network Risk Tolerability

The Risk Tolerability scale (Figure 3) that Ergon Energy has adopted for evaluation of semi-quantitative risk scores relies upon the following key risk principles:

- Exposure to risks identified as intolerable must cease immediately, and the risk clearly communicated to the business.
- For risks identified as intolerable for which exposure is still required and necessary, there is no limit to the resources and effort required to bring it into the tolerable range. There may need to be interim measures put in place to lower the risk while desired works are implemented.
- There is no such thing as “negligible” or “zero” risk, and hence all risks identified should be managed (for very low risks this could be as simple as a periodic review).

- (d) For risks in the tolerable range, the aim is to reduce all network risks to As Low As Reasonably Practicable (The ALARP principle, as represented by the ALARP range in the risk tolerability scale).
- (e) Risk may remain in the ALARP range if it is shown further risk reduction is impracticable or requires action grossly disproportionate in time, trouble and effort to the reduction in risk achieved.
- (f) There is no barrier to allowing a particular risk to rise within the ALARP tolerable range, provided it is demonstrated that is the best outcome for the business, is supported by detailed risk assessments, and has the appropriate level of approval.

The periodic review frequency needs to be calculated and set according to foreseeable frequency of changes of significant risk factors. These frequencies must be recorded and flagged in the appropriate Risk Register.

RISK TOLERABILITY CRITERIA, ACTION & APPROVAL REQUIREMENTS							
RISK SCORE		RISK LEVEL		RISK TOLERABILITY CRITERIA & ACTION REQUIREMENTS			
				POSITION	METHOD	DETAILS	
30	36	Intolerable (stop exposure immediately)					
Tolerable Range	25	29	Very High	ALARP (Risk in this range managed "as low as reasonably practicable")	EGM Network Optimisation	Quarterly Report + One Page Summaries Each project to be supported by the Project Data Sheet, Network Risk Assessment and a one page executive summary (Provided by RAM) EMT report to be provided at discretion of EGM. Corporate risk register to be updated. Periodic Review Required.	
	18	24	High		Network Optimisation Team	Quarterly Report + Project Details Each project to be supported by the Project Data Sheet and Network Risk Assessment. RAM ensures project details available for review by the accountable NOMT manager. Periodic Review Required.	
	11	17	Moderate		Regional Asset Manager	Quarterly Report + Works Request	Each project to be supported by the Project Data Sheet and Network Risk Assessment. Project instigator assigns WR to RAM which includes Project Data Sheet and Network Risk Assessment. Periodic Review Required.
	6	10	Low				
	1	5	Very Low		No Approval Required		

Figure 3 – A Risk Tolerability scale for evaluating Semi-Quantitative risk scores

6. ESCALATION AND REPORTING

6.1. Network Risk Reporting

Regular risk reporting to the appropriate level of management for consideration and approval shall be based on the risk score and the associated action requirements detailed in the Risk Tolerability scale (Figure 3). e.g. Network risks assessed in the Intolerable and Very High level range together with the risk event / driver and relevant project control / investment shall



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be included in a quarterly report to the EGM Network Optimisation instigated by GM Asset Governance via the appropriate reporting channel.

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INTOLERABLE RISK DETAIL REPORT

Investment ID	CPMNN01466	Region	Central	Estimate	\$6,998,844
Investment Description	Gladstone South 11KV Sub - Augment 11KV Substation				
Year Of Risk	2010/11	PIA Date	Jul-10	CPC Date	Mar-12
Risk Category	Capacity				
Assessment Results					
Main Risk Driver	Exceed Line capacity				
Scenario Reviewed	1/ Run Bus open for fault level issue. 2/ 3fdrs on Reg2, approx 12MVA of load on reg 2, which is NCR or 11MVA. Cables are rated at 10MVA				
Risk Factors Considered					
Regulator Condition	Transformers are 38yrs old. Oil samples show no signs of				
11 KV Switchboard Condition	Aged Asset. 1964 vintage.				
	Consequence	Likelihood	Risk Score		
Residual Risk Score	6	6	36		
Target Risk Score	6	1	6		
RA Comments	With replacement of plant the likelihood of failure is reduced				
RAM Comments	This area would be for the RAM to make comment to advise how risk is to be managed				

Figure 4 - One page summary report for the Intolerable and Very High risk level range

7. PERFORM RISK ASSESSMENT

7.1. Network Risk Analysis Tool

Completion of Network Risk Assessments is achieved by utilising the Network Risk Analysis Tool located via the Ergon Energy Asset Governance Project Risk intranet pages.

The Network Risk Analysis Tool has the capability to capture:

- Relevant network data via a 'Data Entry Sheet'
- Attach supporting documentation / photographs
- History details of previous assessments and reviews undertaken for a particular Network Project
- Scenario building for identified risk drivers in the categories of Safety, Environment, Reliability and Capacity
- Inherent, Residual and Target Risk evaluations for each scenario
- A summary of the scenarios highest risk scores and any suggested actions.

7.2. The Network Risk Assessment Method

The network risk assessment method using the Network Risk Analysis Tool is outlined in Figure 5 on the following page.

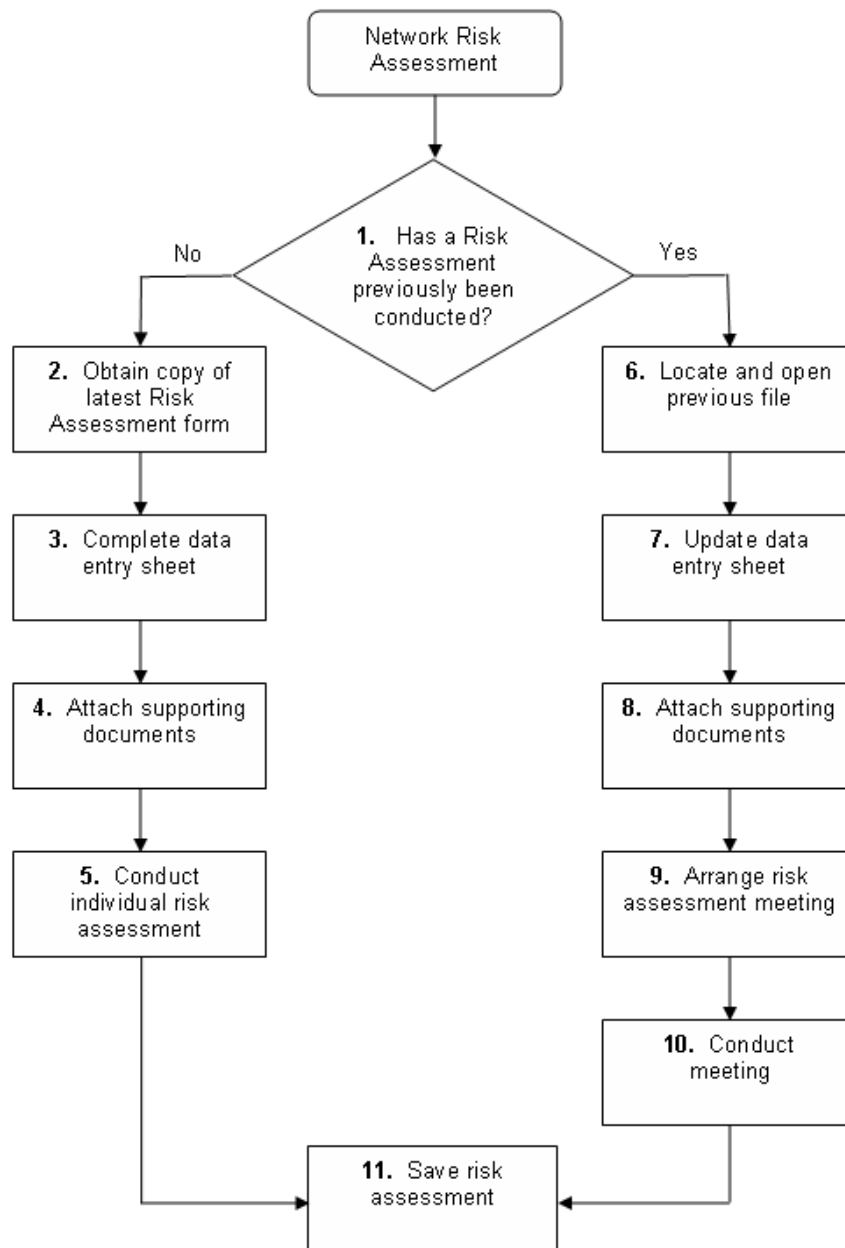


Figure 5 - The Network Risk Assessment Method

The following steps refer to Figure 5 for the Network Risk Assessment Method and are completed by the Risk Assessor using the Network Risk Analysis Tool.

1. Has a risk assessment previously been conducted?

If unsure contact Manager Program Reporting and Risk for advice.

If No, go to '2 Obtain copy of latest risk assessment form'.

If Yes, go to '6 Locate and open previous file'.

2. Obtain copy of latest risk assessment form.

Refer to a document titled "Network Risk Analysis Tool" on the Asset Governance Project Risk intranet site.

3. Complete Data Entry Sheet.

Open Data Entry Sheet and edit data. Complete as much as possible even if outside area of expertise.

It is important to provide as much data as possible to ensure anybody reviewing the risk assessment is aware of all pertinent information.

Data is only needed in the yellow boxes.

Alt & Enter buttons will enable the cursor to move to the next line.

If text is too big for the size of the cell, adjust row/s height to desired size.

To create extra rows, copy rows needed and insert copied rows on next line.

Substation classification can be checked by pressing green check class text.

4. Attach supporting documents.

On Attachments sheet, select relevant data to attach in Column A. These fields can be altered to reflect attachments. Keep cursor on data name to be imported (e.g. name in Column A) and press Import Document button.

To delete object, click once and delete.

To print object, double click to open and print

To change heading select desired cell and overwrite.

5. Conduct Individual Risk Assessment.

On Summary sheet indicate the type of risk assessment being conducted by selecting one of the (green) choices. e.g. Initiator Review. Check data in blue cells and change if incorrect.

All green fields operate as a push button.

Enter your name where indicated and add notes (if any. e.g. any assumptions to be used in assessment).

Add or edit data on Data Entry Sheet during assessment to ensure all data used in the risk assessment will be available during the review process.

On the Safety and Environment sheets, if any Safety and/or Environment issues were raised in the Data Entry Sheet a prompt to explore further will be displayed. If not relevant please make comment on Data Entry Sheet after issue (do not delete issue).

Complete the risk assessment by working through each of the 4 category tabs (Safety, Environment, Reliability and Capacity)

To operate a category tab, if there is a relevant scenario for the project, click on the Yes check box to add a scenario to be assessed. Add any additional notes and indicate what the risk driver is. If the risk driver isn't available in the drop down box place it in the additional notes section.

The risk identified needs to be assessed with regards to the Inherent Risk Rating (no existing operational control measures included), Residual Risk Rating (existing operational control measures included) and Target Risk Rating (with additional new controls or proposed project completed and implemented).

If another risk driver is identified, another scenario can be developed by pressing the green Yes button. The next scenario will open up and the procedure can be repeated.

The highest scoring scenario is used on the Summary sheet.

Ensure that the Year of Risk has been selected from the dropdown box under the results.

Once complete return to Summary Sheet and review results.

Answer any questions that may be indicated and provide feedback in suggested actions field. (e.g., scope to be increased/decreased due to, project needs acceleration/deferring, etc.).

Once risk assessment has been completed press the Complete button.

The next action is: Go to '11 Save Risk Assessment'.

6. Locate and open previous file.

Open Ellipse, locate Works Request and extract copy of previous risk assessment.

If unsure how to do this, refer to a document titled "Saving Network Risk Assessment Using Ellipse Document Register" on the Asset Governance Project Risk intranet site.

7. Update Data Entry Sheet.

Open previous risk assessment and review Data Entry Sheet and edit data (ie add, delete or amend data to reflect latest information available).

It is important to provide as much data as possible to ensure anybody reviewing the risk assessment is aware of all pertinent information.

Data is only needed in the yellow boxes.

Alt & Enter buttons will enable the cursor to move to the next line.

If text is too big for the size of the cell, adjust row/s height to desired size.

To create extra rows, copy rows needed and insert copied rows on next line.

Substation classification can be checked by pressing green Check Class button.

8. Attach supporting documents.

On Attachments sheet, select relevant data to attach in Column A. These fields can be altered to reflect attachments. Keep cursor on data name to be imported (e.g. name in Column A) and press Import Document button.

To delete object, click once and delete.

To print object, double click to open and print.

To change heading select desired cell and overwrite.

9. Arrange Risk Assessment meeting.

Arrange a risk assessment and circulate document to allow participants to become familiar with issues and to provide any additional data.

10. Conduct meeting.

On Summary sheet indicate the type of risk assessment being conducted by selecting one of the (green) choices. e.g. Team Review. Check data in blue cells and change if incorrect.

All green fields operate as a push button.

Enter participants names where indicated and add notes (if any. e.g. any assumptions to be used in assessment)

Add or edit data on Data Entry Sheet during assessment to ensure all data used in risk assessment will be available during the review process.

On the Safety and Environment sheets, if any Safety and/or Environment issues were raised in the Data Entry Sheet a prompt to explore further will be displayed. If not relevant please make comment on Data Entry Sheet after issue (do not delete issue).

Complete the risk assessment by working through each of the 4 category tabs (Safety, Environment, Reliability and Capacity).

Review previous risk assessment from Risk Assessment History sheet to ensure any previous scenarios are reviewed. To review previous risk assessments, press the Unhide Review button and enter the Review Number that you wish to see. Press the Hide Review button and the Review Number you wish to hide to restore to previous view. If needed add additional scenarios to the risk assessment category sheets to complete review of previous scenario. Do not overwrite any historical data.

To operate a category tab, if there is a relevant scenario for the project, click on the Yes check box to add a scenario to be assessed. Add any additional notes and indicate what the risk driver is. If the risk driver isn't available in the drop down box place it in the additional notes section.

The risk identified needs to be assessed / reviewed with regards to the Inherent Risk Rating (no existing operational control measures included), Residual Risk Rating (existing operational control measures included) and Target Risk Rating (with additional new controls or proposed project completed and implemented).

If another risk driver is identified, another scenario can be developed by pressing the green Yes button. The next scenario will open up and the procedure can be repeated.

The highest scoring scenario is used on the Summary sheet.

Ensure that the Year of Risk has been selected from the dropdown box under the results.

Once complete return to Summary sheet and review results.

Answer any questions that may be indicated and provide feedback in suggested actions field. (e.g., scope to be increased/decreased due to, project needs acceleration/deferring, etc).

Once risk assessment has been completed press the Complete button.

11. Save Risk Assessment.

Save document to Ellipse Work Request and, on completion, notification sent to the Asset Governance - Program of Work Governance Group for review.

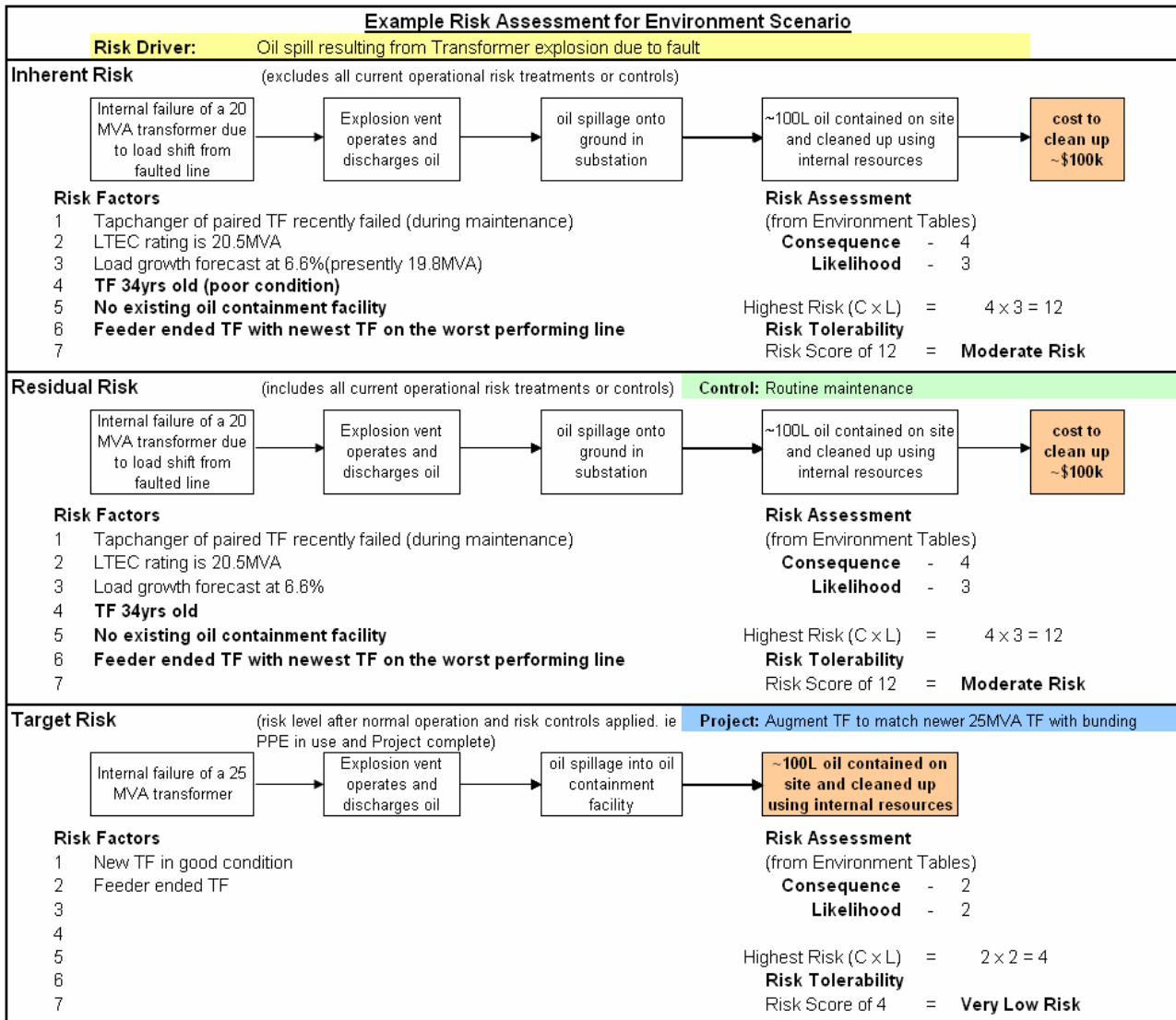
If unsure how to do this, refer to a document titled "Saving Network Risk Assessment Using Ellipse Document Register" on the Asset Governance Project Risk intranet site.

Appendix A - Scenario Mapping

A.1 Example Risk Assessment for Safety Scenario

Example Risk Assessment for Safety Scenario	
Risk Driver: Injury to staff attending faulted distribution line	
Inherent Risk (excludes all current operational risk treatments or controls)	
<pre> graph LR A[Line fault during wet season] --> B[Steep inclines, Slippery access track condition] B --> C[Vehicle roll over on way to fault site] C --> D[Serious injury to multiple staff] </pre> <p>Risk Factors</p> <ol style="list-style-type: none"> Age of line (>45yrs) Access tracks not maintained Line in World heritage rainforest Difficult access during wet season Ongoing outages due to falling bark and branches 	<p>Risk Assessment (from Safety Tables)</p> <p>Consequence - 4</p> <p>Likelihood - 4</p> <p>Highest Risk (C x L) = 4 x 4 = 16</p> <p>Risk Tolerability Risk Score of 16 = Moderate Risk</p>
Residual Risk (includes all current operational risk treatments or controls)	
Control: Maintain access track	
<pre> graph LR A[Line fault during wet season] --> B[Steep inclines, Slippery access track condition] B --> C[Vehicle roll over on way to fault site] C --> D[Serious injury to multiple staff] </pre> <p>Risk Factors</p> <ol style="list-style-type: none"> Age of line (>45yrs) Line in World heritage rainforest Difficult access during wet season Ongoing outages due to falling bark and branches 	<p>Risk Assessment (from Safety Tables)</p> <p>Consequence - 4</p> <p>Likelihood - 3</p> <p>Highest Risk (C x L) = 4 x 3 = 12</p> <p>Risk Tolerability Risk Score of 12 = Moderate Risk</p>
Target Risk (risk level after normal operation and risk controls applied, ie PPE in use and Project complete)	
Project: Re-location of line out of Wet tropics and along roadway	
<pre> graph LR A[Line fault during wet season] --> B[Staff working close to roadway] B --> C[Staff hit by moving vehicle] C --> D[Single Serious injury] </pre> <p>Risk Factors</p> <ol style="list-style-type: none"> Line built beside roadway Staff having to work near/on roadway 	<p>Risk Assessment (from Safety Tables)</p> <p>Consequence - 3</p> <p>Likelihood - 2</p> <p>Highest Risk (C x L) = 3 x 2 = 6</p> <p>Risk Tolerability Risk Score of 6 = Low Risk</p>

A.2 Example Risk Assessment for Environment Scenario



A.3 Example Risk Assessment for Reliability Scenario

Example Risk Assessment for Reliability Scenario		
Risk Driver: Loss of supply due to sub-transmission line fault		
Inherent Risk (excludes all current operational risk treatments or controls)		
Risk Factors 1 Insulator replacement has reduced outages 2 Community outage already expressed in local media 3 Line is 33yrs old and in good condition 4 Customer base - ZS-Res 5 Single 33kV line supplied substation 6 7	Risk Assessment (from Reliability Tables) Consequence - 5 Likelihood - 3 Highest Risk (C x L) = 5 x 3 = 15 Risk Tolerability Risk Score of 15 = Moderate Risk	
Residual Risk (includes all current operational risk treatments or controls) Control: Load transfer and generation availability implemented		
Risk Factors 1 2MVA load transfer via Dist network 2 1.2MVA of mobile generation available 3 Insulator replacement has reduced outages 4 Community outage already expressed in local media 5 Line is 33yrs old and in good condition 6 Customer base - ZS-Res 7 Single 33kV line supplied substation	Risk Assessment (from Reliability Tables) Consequence - 4 Likelihood - 3 Highest Risk (C x L) = 4 x 3 = 12 Risk Tolerability Risk Score of 12 = Moderate Risk	
Target Risk (risk level after normal operation and risk controls applied, ie PPE in use and Project complete) Project: Install a DCCP 66kV feeder energised at 33kV		
Risk Factors 1 2MVA load transfer via Dist network 2 1.2MVA of mobile generation available 3 Community outage already expressed in local media 4 Customer base - ZS-Res 5 Dual circuit suppling load 6 Strategic plan to phase out 33kV and replace with 66kV 7	Risk Assessment (from Reliability Tables) Consequence - 2 Likelihood - 2 Highest Risk (C x L) = 2 x 2 = 4 Risk Tolerability Risk Score of 4 = Very Low Risk	

A.4 Example Risk Assessment for Capacity Scenario

Example Risk Assessment for Capacity Scenario		
Risk Driver: Exceeding feeder capacity		
Inherent Risk (excludes all current operational risk treatments or controls)		
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Summer peak day</div> <div style="display: inline-block; border: 1px solid black; padding: 5px; margin: 0 10px;">→</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">3 Dist fdrs > 110% utilisation for up to 6hrs on weekdays</div> <div style="display: inline-block; border: 1px solid black; padding: 5px; margin: 0 10px;">→</div> <div style="border: 1px solid black; padding: 5px; background-color: #ffcc99; margin-bottom: 10px;">UG exit cable constrained</div> <p>Risk Factors</p> <ol style="list-style-type: none"> 1 Reduced line clearances 2 Large commercial/industrial customer base, expected strong complaints from prolonged outage 3 Load growth of 3.5% 4 NCC of substation exceeded within 3yrs 5 Meshed network, but already constrained 6 Feeder reliability rating is green for all feeders 7 Load exceeding plant rating 	<p>Risk Assessment (from Capacity Tables)</p> <p>Consequence - 8</p> <p>Likelihood - 4</p> <p>Highest Risk (C x L) = 8 x 4 = 24</p> <p>Risk Tolerability Risk Score of 24 = High Risk</p>	
Residual Risk (includes all current operational risk treatments or controls)		
Control: Peak lopping generators installed		
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Summer peak day</div> <div style="display: inline-block; border: 1px solid black; padding: 5px; margin: 0 10px;">→</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">3 Dist fdrs > 90% utilisation for up to 6hrs on weekdays</div> <div style="display: inline-block; border: 1px solid black; padding: 5px; margin: 0 10px;">→</div> <div style="border: 1px solid black; padding: 5px; background-color: #ffcc99; margin-bottom: 10px;">UG exit cable constrained</div> <p>Risk Factors</p> <ol style="list-style-type: none"> 1 Reduced line clearances 2 Large commercial/industrial customer base, expected strong complaints from prolonged outage 3 Load growth of 3.5% 4 NCC of substation exceeded within 3yrs 5 Meshed network, but already constrained 6 Feeder reliability rating is green for all feeders 7 Load exceeding plant rating 8 Load transfer available with peak lopping generators 	<p>Risk Assessment (from Capacity Tables)</p> <p>Consequence - 4</p> <p>Likelihood - 4</p> <p>Highest Risk (C x L) = 4 x 4 = 16</p> <p>Risk Tolerability Risk Score of 16 = Moderate Risk</p>	
Target Risk (risk level after normal operation and risk controls applied, ie PPE in use and Project complete)		
Project: Build a new substation and shift load		
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">Summer peak day</div> <div style="display: inline-block; border: 1px solid black; padding: 5px; margin: 0 10px;">→</div> <div style="border: 1px solid black; padding: 5px; background-color: #ffcc99; margin-bottom: 10px;">Dist fdrs <66 % utilisation</div> <p>Risk Factors</p> <ol style="list-style-type: none"> 1 Feeder reliability rating is green for all feeders 2 Large commercial/industrial customer base, expected strong complaints from prolonged outage 3 Load growth of 3.5% 4 5 6 	<p>Risk Assessment (from Capacity Tables)</p> <p>Consequence - 1</p> <p>Likelihood - 4</p> <p>Highest Risk (C x L) = 1 x 4 = 4</p> <p>Risk Tolerability Risk Score of 4 = Very Low Risk</p>	

Appendix B – Network Consequence and Likelihood Tables

See following pages

Network Risk Assessment Guideline



B.1 Health & Safety Consequence Table

Health & Safety Consequence Table							
Choose the appropriate column(s) with guidance words that apply best to the scenario being considered							
Nature of Harmful Effects							
C Scale	Degree of Personal Harm	Examples of Types of Harm	Degree of Non-Fatal Harmful Effects Incapacity Disability Impairment	Duration of Non-Fatal Harmful Effects Discomfort/ Pain/ Disability/ Impairment	Duration of Business Effects Disabling/ Reduced Productivity/ Alternate work/ Lost time	Treatment Required	Required Administrative/ Regulatory Response
	A	B	C	D	E	F	G
6	Multiple Fatalities/ Incurable Fatal Illnesses						
5	Single Fatality/ Incurable Fatal Illness		Irreversible Total				
4	Multiple Serious Injuries/ Illnesses	Quadriplegia/ complete loss of vision/ hearing/ mobility	Irreversible partial >30%	Permanent/ indefinite/ years	Permanent/ Enduring Approx Months	Hospitalisation - in-patient/ long term/ months extensive rehabilitation	
3	Single Serious Injuries/ Illnesses	Amputation/ paralysis of a limb/ severe burns/ loss of vision/ hearing/ mobility loss	Irreversible partial <30%	Long term/ enduring/ days	Long term/ >1 day <1 week	Hospitalisation - in-patient/ short term/ days some rehabilitation	External Record & Report Required
2	Minor Injury/ Illness	Cuts/ Burns/ Strains/ Sprains	Reversible partial >30%	Short Term/ approx hours	Short term <1 day	Medical/ Outpatient (Doctor)/ limited rehabilitation	
1	Low Level Injury/ Illness	Scratches/ bruises	Reversible partial <30%	Temporary/ approx minutes	Approx minutes	First Aid or less	Internal Record & Report Required

Check this is the latest Process Zone version before use.

Network Risk Assessment Guideline



B.2 Health & Safety Likelihood Table

Health & Safety Likelihood Table						
1. The likelihood of future events is NOT solely determined by the frequency of past events because the circumstances / risk factors could be changed or could be different. 2. Choose the appropriate column(s) with guidance words that apply best to the scenario being considered. 3. Different columns of Guidance Notes will be useful and relevant to different identified / described risk scenarios according to the GENERIC or SPECIFIC nature of the risk question / scenario. 3A. The risk question scenario could refer to a GENERIC job or task or for anonymous ANY individual of a large population / group. eg. What is the L of the chosen C for ANY of our employees falling while climbing ANY of our ladders generally? 3B. The risk question / scenario could refer to a SPECIFIC job or task or for a SPECIFIC person or specific member of a population / group. eg. What is the L of the chosen C for THIS person falling from THIS structure if climbed many times by the same person with the same existing risk factors present? eg. What is the L of the chosen C for THIS person falling during a single climb performed once - here and now - with the existing risk factors - here and now?						
L Scale	Verbal Descriptors		Exposure to Risk Factors	Likelihood Estimate	Likelihood Estimate	Past History
	Defined sequence or scenario is the credible combination of events and risk factors / circumstances required to lead to the chosen Consequence		measured in their effects and exposure time period - job duration or task time or operational time or lifetime	can be expressed as a FREQUENCY per year per climb per hour per KM	can be expressed as a Probability 1 in 100, 0.01, 1% 1E-02	
	A	B	C	D	E	
6	Almost certain to occur	Almost Certain , the defined sequence can and will happen because all risk events / risk factors are almost certain to occur or be present	Extreme Exposure because all risk factors are poorly controlled throughout the whole of the time period	At least daily – or more often ie 300 times per year	At least as often as 1 chance in 10 times or even more often (at least 10% of the times) or up to every time (1:1)	It has been a common / very frequent occurrence in Ergon Energy or the electricity distribution industry
5	Very likely to occur	Very likely that the defined sequence can and will happen because most risk events / risk factors are likely to occur or be present	Very High Exposure because most risk factors are present and are not well controlled during most of the time period	As often as weekly – 50 times per year	Between 1 chance in 10 times and 1 chance in 100 times Between 10% and 1 % of the times	It has been known to have frequently occurred/happened in Ergon Energy or the electricity distribution industry
4	Likely to occur	Likely that the defined sequence can and will happen because many risk events / risk factors are likely to occur or be present	High Exposure because many risk factors are present but are only partly controlled during much of the time period	As often as monthly – 10 times per year	Between 1 chance in 100 times and 1 chance in 1,000 times	Have heard of it happening regularly before in Ergon Energy or the electricity distribution industry
3	Unlikely to occur	Unlikely that the defined sequence can and will happen because many risk events / risk factors are unlikely to occur or be present	Moderate Exposure because many risk factors are not present or are well controlled during many parts of the time period	As infrequently as once per year	Between 1 chance in 1,000 times and 1 chance in 10,000 times	Have heard of it happening occasionally before in Ergon Energy or the electricity distribution industry
2	Very unlikely to occur	Very unlikely that the sequence can and will happen because most risk events / risk factors are very unlikely to occur or be present	Low Exposure because most risk factors are not present or are well controlled during most parts of the time period	As infrequently as once in 10 years	Between 1 chance in 10,000 times and 1 chance in 100,000 times	Rarely heard of it in Ergon Energy or the electricity distribution industry
1	Almost no likelihood of occurring	Almost no likelihood that the sequence can and will happen because almost all risk events / risk factors only occur or would be present in exceptional and rare circumstances	Very Low Exposure because all risk factors are not present or all are well controlled during all of the time period	As infrequently as once in 100 years or even less	As little as 1 chance in 100,000 times or even less	Unheard of in Ergon Energy or the electricity distribution industry

Network Risk Assessment Guideline



B.3 Environment Consequence Table (1 of 2)

Environment Consequence Table (1 of 2)										
Choose the appropriate column(s) with guidance words that apply best to the scenario being considered										
C Scale	Release / Spill of Contaminant / Pollutant Material					Biodiversity (losing)			Biosecurity (preventing)	
	Quantity	Extent	Resources Required	Degree of Toxicity	Degree of Contamination	Nature of Fauna Affected	Nature of Flora effected	Duration of disruption to Ecosystem	Nature of Fauna effects	Nature of Flora effects
	A	B	C	D	E	F	G	H	I	J
6	> 20000 litres	Widespread area of contamination beyond Ergon Energy property / worksite boundary	Emergency situation declaration	Note 1	Irreversible contamination of the environment	Species extinction	Species extinction	Total Loss	Introduction of new exotic species	Introduction of new exotic species
5	> 10000 < 20000 litres	Off-site - Beyond ERGON property / worksite and enters water course	Emergency Services assistance required	Highly toxic	Long-term contamination of the environment	Endangered species effected	Highly sensitive and endangered vegetation harmed	Long-term	Introduce, spread or supply Class 1 pest	Introduce, spread or supply Class 1 pest
4	> 5000 < 10000 litres	Off-site - Beyond Ergon Energy property / worksite but prevented from entering water course	Contained but with outside assistance required	Seriously toxic	Short-term contamination of the environment	Vulnerable species effected	Highly sensitive and of concern vegetation harmed	medium term	Introduce, spread or supply Class 2 pest	Introduce, spread or supply Class 2 pest
3	>1000 <5000 litres	NOT beyond Ergon Energy property / worksite alignment border but threatens to cross boundary	Can be internally managed and internal resources capable of clean-up	Moderately toxic	High level of nuisance	Threatened species effected	Not of concern remnant harmed	Short-term	Introduce, spread or supply Class 3 pest	Introduce, spread or supply Class 3 pest
2	> 200 < 1000 litres	NOT beyond Ergon Energy property / worksite alignment border	Can be internally managed and on-site resources capable of clean-up	Slightly Toxic	Some nuisance	Least concern species harmed	Low sensitivity and vulnerable environment harmed	Note 1	Note 1	Note 1
1	< 200 litres	Very localised-close to activity zone or within spill containment structure/ bunding	Can be internally managed and very little clean up required	Not particularly toxic to ecosystems	Low or no nuisance	Least concern species threatened	Least concern species threatened			

Network Risk Assessment Guideline



B.4 Environment Consequence Table (2 of 2)

Environment Consequence Table (2 of 2)								
Choose the appropriate column(s) with guidance words that apply best to the scenario being considered								
C Scale	Statutory approval required	Regulatory Descriptors	Rectification Remediation / Clean Up Cost	Indigenous Cultural heritage	Non-indigenous Cultural heritage	Carbon Cost	Public Health Effects	Public Relations Impact
	K	L	M	N	O	P	Q	R
6	Activities are conducted without statutory approval/s	Note 1	Unknown and / or on-going cost of clean up and / or management	Destruction of human remains	Note 1	Extreme	Exposure to chronic health effects	Extensive public outrage, call for replacement of Directors and / or Executive management
5	Note 1	Extensive serious environmental harm	< \$5,000,000 and > \$500,000	Disturbing human remains ect	Destruction of registered State heritage place	Very high	Exposure to acute health effects	Public outrage, call for enquiry, substantial negative media campaign. Brand Damage
4		Serious environmental harm	< \$500,000 and > \$50,000	Destruction of artefacts, medicine or scar trees etc	Disturbance of registered State heritage place	High	Short term public health impact	Adverse national media attention (e.g. disruption to large public events).
3		Material environmental harm	< \$50,000 and > \$5,000	Destruction of artefacts, medicine or scar trees etc	Disturbance of a place that may be eligible to be a registered State heritage place	Medium	Minimal public health impact	Adverse regional media attention, Loss of customer trust / action groups formed
2		Lawful environmental harm	< \$5,000 and > \$500	Note 1	Note 1	Low	Some nuisance	Adverse local media attention or other negative external publicity. Multiple customer complaints
1	Activities are conducted with statutory approval/s	Unrelated matters and environmental nuisance (complaint)	< \$500	Lack of consultation with EPA/DNR or indigenous group/s		Very low	Low or no nuisance	Few customer complaints and or external criticism

Note 1. No applicable measure for this dimension.

Network Risk Assessment Guideline



B.5 Environment Likelihood Table

Environment Likelihood Table						
1. The likelihood of future events is NOT solely determined by the frequency of past events because the circumstances / risk factors could be changed or could be different.						
2. Choose the appropriate column(s) with guidance words that apply best to the scenario being considered.						
L Scale	Verbal Descriptors		Exposure to Risk Factors	Likelihood Estimate	Likelihood Estimate	Past History
	Defined sequence or scenario is the credible combination of events and risk factors / circumstances required to lead to the chosen Consequence		measured in their effects and exposure time period - job duration or task time or operational time or lifetime	can be expressed as a FREQUENCY per year per climb per hour per KM	can be expressed as a Probability 1 in 100, 0.01, 1% 1E-02	
	A		B	C	D	E
6	Almost certain to occur	Almost Certain , the defined sequence can and will happen because all risk events / risk factors are almost certain to occur or be present	Extreme Exposure because all risk factors are poorly controlled throughout the whole of the time period	At least daily – or more often ie 300 times per year	At least as often as 1 chance in 10 times or even more often (at least 10% of the times) or up to every time (1:1)	It has been a common / very frequent occurrence in Ergon Energy or the electricity distribution industry
5	Very likely to occur	Very likely that the defined sequence can and will happen because most risk events / risk factors are likely to occur or be present	Very High Exposure because most risk factors are present and are not well controlled during most of the time period	As often as weekly – 50 times per year	Between 1 chance in 10 times and 1 chance in 100 times Between 10% and 1 % of the times	It has been known to have frequently occurred/happened in Ergon Energy or the electricity distribution industry
4	Likely to occur	Likely that the defined sequence can and will happen because many risk events / risk factors are likely to occur or be present	High Exposure because many risk factors are present but are only partly controlled during much of the time period	As often as monthly – 10 times per year	Between 1 chance in 100 times and 1 chance in 1,000 times	Have heard of it happening regularly before in Ergon Energy or the electricity distribution industry
3	Unlikely to occur	Unlikely that the defined sequence can and will happen because many risk events / risk factors are unlikely to occur or be present	Moderate Exposure because many risk factors are not present or are well controlled during many parts of the time period	As infrequently as once per year	Between 1 chance in 1,000 times and 1 chance in 10,000 times	Have heard of it happening occasionally before in Ergon Energy or the electricity distribution industry
2	Very unlikely to occur	Very unlikely that the sequence can and will happen because most risk events / risk factors are very unlikely to occur or be present	Low Exposure because most risk factors are not present or are well controlled during most parts of the time period	As infrequently as once in 10 years	Between 1 chance in 10,000 times and 1 chance in 100,000 times	Rarely heard of it in Ergon Energy or the electricity distribution industry
1	Almost no likelihood of occurring	Almost no likelihood that the sequence can and will happen because almost all risk events / risk factors only occur or would be present in exceptional and rare circumstances	Very Low Exposure because all risk factors are not present or all are well controlled during all of the time period	As infrequently as once in 100 years or even less	As little as 1 chance in 100,000 times or even less	Unheard of in Ergon Energy or the electricity distribution industry

Network Risk Assessment Guideline



B.6 Reliability Consequence Table

Reliability Consequence Table (including Network Security)																	
Choose the appropriate column(s) with guidance words that apply best to the scenario being considered																	
C scale	Interruption (>1 min)				Load at Risk Based on Network Element out of service Per Network Security Criteria							Customer Sensitivity & Impact	Political Sensitivity, Regulatory, Policy, Standards Compliance	Public Relations Impact			
	Ergon Wide SAIDI Minutes for Category - Impact Overall, NOT local	Customer No's	Duration	Repeat Frequency	Regional Centre	Regional Centre	Regional Centre	Regional Centre							Rural / Remote	Rural / Remote	Rural / Remote
	A	B	C	D	E	F	G	H	I	J	K				L	M	N
6	>= 5	> 25000	> 1 month	Note 1	200% Required Criteria	200% Required Criteria	200% Required Criteria	200% Required Criteria	200% Required Criteria	200% Required Criteria	200% Required Criteria	Note 1	Administration appointed / entire or partial loss of operating works or functions	Call for replacement of Directors and/or Executive management, Extensive public outage.			
5	>= 4	12000	> 1 week		150% Required Criteria	150% Required Criteria	150% Required Criteria	150% Required Criteria	150% Required Criteria	150% Required Criteria	150% Required Criteria		150% Required Criteria	Note 1	Call for enquiry, public outage, substantial negative media campaign. Brand damage		
4	>= 3	4000	> 1 day	every day in one week	>20MVA for 1 hour	>15MVA for 6 hours	>5MVA for 12 hours	Outage >24 hours	>15 MVA for 8 hours	>5MVA for 18 hours	Outage >48 hours	Disruption to multiple large scale businesses or essential services (eg. Hospitals, sewage plant, etc.)	Multiple ministerial / cabinet involvement / Compliance issue with Code, Policies or Standards	Adverse national media attention (eg. Disruption to large public events). Loss of public trust.			
3	>= 2	1500	> 12 hours	three times in one week	50% Required Criteria	50% Required Criteria	50% Required Criteria	50% Required Criteria	50% Required Criteria	50% Required Criteria	50% Required Criteria	Disruption to multiple small to medium businesses	Regulator involved / improvement notice issued. Ministerial direction / approval	Adverse local media attention, Loss of customer trust / action groups formed.			
2	>= 1	500	> 3 hours	twice in one month	25% Required Criteria	25% Required Criteria	25% Required Criteria	25% Required Criteria	25% Required Criteria	25% Required Criteria	25% Required Criteria	Disruption to small to medium business	Ergon Energy identified issue and regular notified / enforceable undertaking. Ministerial request. Compliance issue with guidelines	Adverse local media attention or other negative external publicity. Multiple customer complaints			
1	>= 0.1	100	< 3 hours	once only p.a.	10% Required Criteria	10% Required Criteria	10% Required Criteria	10% Required Criteria	10% Required Criteria	10% Required Criteria	10% Required Criteria	Customer inconvenience	Local government concern. Ergon Energy identifies potential for political concern.	Few customer complaints and or external criticism			
Note 1: No applicable measure for this dimension																	

Network Risk Assessment Guideline



B.7 Reliability Likelihood Table

Reliability Likelihood Table					
The likelihood of future events is NOT solely determined by the frequency of past events because circumstances / risk factors could be changed or could be different. Choose the appropriate column(s) with guidance words that apply best to the scenario being considered.					
L Scale	Verbal Descriptors		For a Generic failure of a chosen asset type for a large population of that type e.g. What is the L of the chosen reliability C for generally any RMU failing? Also see Past History	For a Single specific item of asset type e.g. What is the L of the chosen reliability C for this specific RMU failing in way described and leading to the chosen C - here and now - with the existing risk factors - here and now?	Past History For this specific type of failure type for this type of asset leading to the chosen C in the way described
			A	B	C
6	Almost certain to occur	Almost Certain , the defined sequence can and will happen because all risk events / risk factors are almost certain to occur or be present	At least daily – or more often ie 300 times per year	Extreme Exposure because all risk factors are poorly controlled throughout the whole lifetime of the asset item or for the reliability event	It has been a common / very frequent occurrence in Ergon Energy or the electricity distribution industry
5	Very likely to occur	Very likely that the defined sequence can and will happen because most risk events / risk factors are likely to occur or be present	As often as weekly – 50 times per year	Very High Exposure because most risk factors are present and are not well controlled during most of the lifetime of the asset item or for the reliability event	It has been known to have frequently occurred/happened in Ergon Energy or the electricity distribution industry
4	Likely to occur	Likely that the defined sequence can and will happen because many risk events / risk factors are likely to occur or be present	As often as monthly – 10 times per year	High Exposure because many risk factors are present but are only partly controlled during much of the lifetime of the asset item or for the reliability event	Have heard of it happening regularly before in Ergon Energy or the electricity distribution industry
3	Unlikely to occur	Unlikely that the defined sequence can and will happen because many risk events / risk factors are unlikely to occur or be present	As infrequently as once per year	Moderate Exposure because many risk factors are not present or are well controlled during many parts of the lifetime of the asset item or for the reliability event	Have heard of it happening occasionally before in Ergon Energy or the electricity distribution industry
2	Very unlikely to occur	Very unlikely that the sequence can and will happen because most risk events / risk factors are very unlikely to occur or be present	As infrequently as once in 10 years	Low Exposure because most risk factors are not present or are well controlled during most parts of the lifetime of the asset item or for the reliability event	Rarely heard of it in Ergon Energy or the electricity distribution industry
1	Almost no likelihood of occurring	Almost no likelihood that the sequence can and will happen because almost all risk events / risk factors only occur or would be present in exceptional and rare circumstances	As infrequently as once in 100 years or even less	Very Low Exposure because all risk factors are not present or all are well controlled during all of the lifetime of the asset item or for the reliability event	Unheard of in Ergon Energy or the electricity distribution industry

Note 1. Estimation of the overall likelihood for a scenario that contains N-1 or N-2 event needs to include that this event actually occurs as part of the scenario.

Network Risk Assessment Guideline

B.8 Capacity Consequence Table

Capacity Consequence Table											
Choose the appropriate column(s) with guidance words that apply best to the scenario being considered											
Network Overload >IICC under system normal conditions											
C Scale	Bulk Substation or Transmission Feeder	Zone Substation or Sub Transmission Feeder	Distribution feeders			Distribution feeders or plant		Capacity shortfall in MV.A	Capacity Sensitivity & Impact	Political Sensitivity, Compliance to Regulatory, Policy & Standards. (see Note 3)	Public Relations Impact
	> 100% utilisation within x years (see Note 2)	> 100% utilisation within x years (see Note 2)	Voltage for Urban & Short Rural	Voltage for Long Rural	Voltage for SWER	Utilisation Level - Urban feeder & all ZS feeder exits	Utilisation Level - Rural/SWER feeders				
	A	B	C	D	E	F	G	H	I	J	K
6	< 1/2 year	< 1/2 year	No LDC- ≥8.0% voltage drop, LDC ≥11.0% voltage drop	No LDC- ≥9.0% voltage drop, LDC ≥12.0% voltage drop	No LDC- ≥12.0% voltage drop, LDC ≥15.0% voltage drop, Voltage Regulation= 12%	≥100%	≥100%	> 15	Note 1	Administration appointed / entire or partial loss of operating works or functions	Call for replacement of Directors and/or Executive management, Extensive public outage
5	< 1 year	< 1 year	No LDC- ≥6.5% voltage drop, LDC ≥9.5% voltage drop	No LDC- ≥7.5% voltage drop, LDC ≥10.5% voltage drop	No LDC- ≥10.5% voltage drop, LDC ≥13.5% voltage drop, Voltage Regulation- ≥10.5%	≥95%	≥95%	> 10		Note 1	Call for enquiry, public outage, substantial negative media campaign. Brand damage
4	>1 year	>1 year	No LDC- ≥5.0% voltage drop, LDC ≥8.0% voltage drop	No LDC- ≥6.0% voltage drop, LDC ≥9.0% voltage drop	No LDC- ≥9.0% voltage drop, LDC ≥12.0% voltage drop, Voltage Regulation- ≥9.0%	≥85%	≥90%	> 5	Inability to meet agreed target for increased supply to large scale businesses or essential services (eg. Hospitals, sewerage plant, etc)	Multiple ministerial / cabinet involvement / Compliance Issue with Code, Policies or Standards - eg. Failure to provide statutory voltage level requirements	Adverse national media attention (E.g. disruption to large public events). Loss of public trust
3	>2 years	>2 years	No LDC- ≥4.5% voltage drop, LDC ≥7.5% voltage drop	No LDC- ≥5.5% voltage drop, LDC ≥8.5% voltage drop	No LDC- ≥8.5% voltage drop, LDC ≥11.5% voltage drop, Voltage Regulation- ≥8.5%	≥75%	≥90%, within 1 year	> 1	Inability to meet agreed target for increased supply to multiple small to medium businesses.	Regulator involved / improvement notice issued. Ministerial direction / approval	Adverse local media attention, Loss of customer trust / action groups formed
2	>3 years	>3 years	No LDC- ≥4.0% voltage drop, LDC ≥7.0% voltage drop	No LDC- >5.0% voltage drop, LDC >8.0% voltage drop	No LDC- ≥8.0% voltage drop, LDC ≥11.0% voltage drop, Voltage Regulation- ≥8.0%	≥66%	≥90%, within 2 years	< 1	Inability to meet agreed target for increased supply to small to medium businesses.	Ergon Energy identified issue and regulator notified / enforceable undertaking. State MP concern / Ministerial request / concern. Compliance issue with guidelines	Adverse local media attention or other negative external publicity. Multiple customer complaints
1	≥ 4 years	≥ 4 years	No LDC- <4.0% voltage drop, LDC <7.0% voltage drop	No LDC- <5.0% voltage drop, LDC <8.0% voltage drop	No LDC- <8.0% voltage drop, LDC <11.0% voltage drop, Voltage Regulation- <8.0%	<66%	≥90%, within 3 years	Note 1	Customer Inconvenience	Local government concern. Ergon Energy identify potential for political concern	Few customer complaints and or external criticism

Note 1. No applicable measure for this dimension.

Note 2. x years is the time frame until the 100% NCC is forecast to be exceeded for Columns A & B and the indicated % in Columns F & G.

Note 3. Low voltage to be handled under "compliance to regulatory" section in the table above i.e. legislation on service standards.

Network Risk Assessment Guideline



B.9 Capacity Likelihood Table

Capacity Likelihood Table						
The likelihood of future events is NOT solely determined by the frequency of past events because circumstances / risk factors could be changed or could be different. Choose the appropriate column(s) with guidance words that apply best to the scenario being considered.						
L Scale	Verbal Descriptors		For a Generic failure of a chosen asset type for a large population of that type e.g. What is the L of the chosen capacity C for generally any RMU failing? Also see Past History	For a Single specific item of asset type e.g. What is the L of the chosen capacity C for this specific RMU failing in way described and leading to the chosen C - here and now - with the existing risk factors - here and now?	Relevant Load Forecast	Past History
	Defined sequence or scenario is the credible combination of events and risk factors / circumstances required to lead to the chosen Consequence					For this specific type of failure type for this type of asset leading to the chosen C in the way described
	A		B	C	D	E
6	Almost certain to occur	Almost Certain , the defined sequence can and will happen because all risk events / risk factors are almost certain to occur or be present	At least daily – or more often ie 300 times per year	Extreme Exposure because all risk factors are poorly controlled throughout the whole capacity event duration	50% POE	It has been a common / very frequent occurrence in Ergon Energy or the electricity distribution industry
5	Very likely to occur	Very likely that the defined sequence can and will happen because most risk events / risk factors are likely to occur or be present	As often as weekly – 50 times per year	Very High Exposure because most risk factors are present and are not well controlled during most of the capacity event duration	10% POE	It has been known to have frequently occurred/happened in Ergon Energy or the electricity distribution industry
4	Likely to occur	Likely that the defined sequence can and will happen because many risk events / risk factors are likely to occur or be present	As often as monthly – 10 times per year	High Exposure because many risk factors are present but are only partly controlled during much of the capacity event duration	Based on forecast without POE being available	Have heard of it happening regularly before in Ergon Energy or the electricity distribution industry
3	Unlikely to occur	Unlikely that the defined sequence can and will happen because many risk events / risk factors are unlikely to occur or be present	As infrequently as once per year	Moderate Exposure because many risk factors are not present or are well controlled during many parts of the capacity event duration	Note 1	Have heard of it happening occasionally before in Ergon Energy or the electricity distribution industry
2	Very unlikely to occur	Very unlikely that the sequence can and will happen because most risk events / risk factors are very unlikely to occur or be present	As infrequently as once in 10 years	Low Exposure because most risk factors are not present or are well controlled during most parts of the capacity event duration	Note 1	Rarely heard of it in Ergon Energy or the electricity distribution industry
1	Almost no likelihood of occurring	Almost no likelihood that the sequence can and will happen because almost all risk events / risk factors only occur or would be present in exceptional and rare circumstances	As infrequently as once in 100 years or even less	Very Low Exposure because all risk factors are not present or all are well controlled during all of the capacity event duration	Note 1	Unheard of in Ergon Energy or the electricity distribution industry

Note 1. No applicable measure for this dimension.