Planning Report Newmerella (NLA) Zone Substation

AMS – Electricity Distribution Network

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1 Executive Summary

AusNet Services is a regulated Victorian Distribution Network Service Provider (DNSP) that supplies electrical distribution services to more than 745,000 customers. Our electricity distribution network covers eastern rural Victoria and the fringe of the northern and eastern Melbourne metropolitan area.

As expected by our customers and required by the various regulatory instruments that that we operate under, AusNet Services aims to maintain service levels at the lowest possible cost to our customers. To achieve this, we develop forward looking plans that aim to maximise the present value of economic benefit to all those who produce, consume and transport electricity in the National Electricity Market (NEM).

This report presents our forward looking investment plans to manage the existing and emerging service level constraints in the Newmerella (NLA) Zone Substation supply area to ensure that we maintain service levels to our customers over the short and long term. The report outlines how we quantify service risk, identifies and assesses the costs and benefits of potential options to mitigate the identified risks, and provides forward looking plans outlining the optimal service risk mitigation solutions, and timing of those solutions, to maintain service levels.

1.1 Identified Need

Newmerella (NLA) commenced operation as a 66/22kV transformation station in 1970. The two 5MVA transformers were installed in 1970, but were manufactured in 1949. The 22kV switchyard consists of three ACRs and a cap bank CB that were also installed in 1970. The 66kV switchyard has had some modifications since the site was established, such as new 66kV CBs in 1986 and 2015.

The physical and electrical condition of these assets has deteriorated and they are now presenting an increasing failure risk.

The station 66kV bus is unswitched, hence faults on the 66kV transformer bus or either one of the transformers will result in a complete loss of supply to all 3717 customers at NLA.

Faults on circuit breaker B will impact an additional 1395 customers at Cann River (CNR) Zone Substation, which has a radial 66kV supply from NLA.

The key service constraints at NLA are:

- Security of supply risk presented by the switching of the two transformers and CNR in a single group,
- Security of supply risks presented by the increased likelihood of asset failure due to the deteriorating condition of the assets;
- Health and safety risks presented by a possible explosive failure of bushings on a number of the assets;
- Plant collateral damage risks presented by a possible explosive failure of a number of the assets;
- Environmental risks associated with insulating oil spill or fire;
- Reactive replacement risks presented by the increasing likelihood of asset failure due to the deteriorating condition of the assets; and
- Health and safety risks presented by asbestos containing cement sheets or electrical switch boards in the control building, store room and toilet.

1.2 Proposed Preferred Option

The options analysis identifies that the preferred option, being the one that maximises the net economic benefit to all those that produce, consume and transport electricity in the NEM, is to:

- Replace the transformers and 22kV switchgear by summer 2025/26, at an estimated capital cost of [C.I.C] (Real $2018).

Applying a discount rate of 6.44% per annum, this proposed preferred option has a net economic benefit of [C.I.C], relative to the Do Nothing Different option, over the forty-five-year assessment period.

1.3 Next Steps

This planning report outlines the service level risk mitigation investment that AusNet Services has assessed as prudent, efficient and providing the optimal balance of supply reliability and cost.

While this report outlines AusNet Services' plans for maintaining service levels, and serves to support AusNet Services' revenue request for the 2022-26 EDPR period, the proposed investment is subject to the regulatory investment test for distribution (RIT-D).

As such, the proposed investment will be confirmed via the formal RIT-D process, which includes publication of three reports at the various RIT-D stages, and includes a formal consultation process where interested parties can make submissions that help identify the optimal solution.

2 Introduction

2.1 Purpose

This planning report outlines asset condition, asset failure risks and network development plans relevant to NLA for the period from 2022-26.

It provides an analysis of viable options to address the identified risks and maintain the efficient delivery of electrical energy from NLA consistent with the National Electricity Rules (NER) and stakeholder's requirements.

It also summarizes the scope, delivery schedule and expenditures associated with the most economical solution to emerging constraints.

2.2 Scope

The scope of this planning report is limited to the equipment within Newmerella (NLA) Zone Substation.

It excludes sub-transmission and distribution feeders entering and exiting the zone substation.

2.3 Asset Management Objectives

As stated in *AMS 01-01 Asset Management System Overview*, the high-level asset management objectives are:

- Comply with legal and contractual obligations;
- Maintain safety;
- Be future ready;
- Maintain network performance at the lowest sustainable cost; and
- Meet customer needs.

As stated in *AMS 20-01 Electricity Distribution Network Asset Management Strategy*, the electricity distribution network objectives are:

- Improve efficiency of network investments
- Maintain long-term network reliability
- Implement REFCLs within prescribed timeframes
- Reduce risks in highest bushfire risk areas
- Achieve top quartile operational efficiency
- Prepare for changing network usage.

3 Background

3.1 Substation Description

Newmerella (NLA) is located approximately 370km east of Melbourne (VicRoads map reference 85 H-5) and is the main source of supply for Newmerella, Orbost, Bemm River, Lake Tyers and surrounding areas.

NLA is located at an elevation of 40m above sea level. NLA has a summer average maximum temperature of 25°C and a winter average minimum temperature of 6°C. Extreme temperatures reach 45.7°C in summer and -0.5°C in winter.

The mean rain fall varies from 51mm to 101mm per month within a year.

NLA supplies 3,717 customers in total. The load at NLA includes town and rural based residential, with some town based commercial, industrial and farming.

The location of NLA within the AusNet Services distribution network is shown in Figure 1.

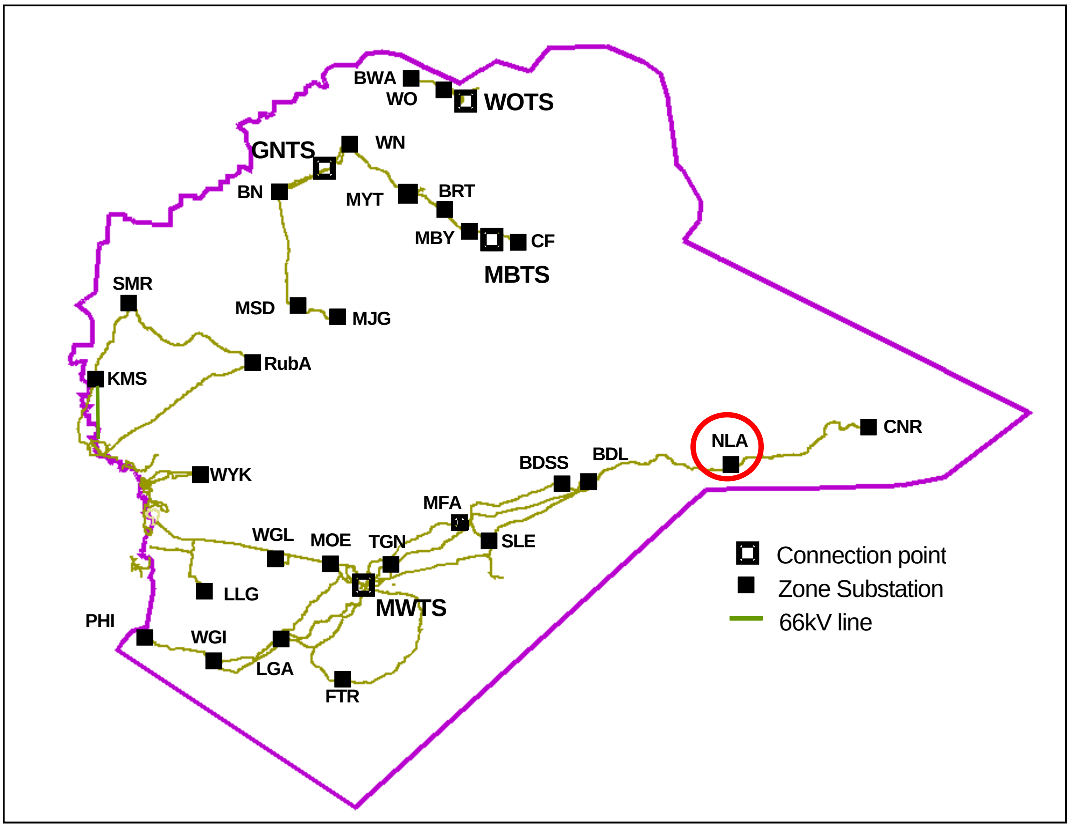

Figure 1: NLA location within AusNet Services network

NLA is supplied via a 66kV circuit that runs from Bairnsdale Zone Substation (BDL). The configuration of primary electrical circuits within NLA is as shown in the following single line diagram Figure 2.

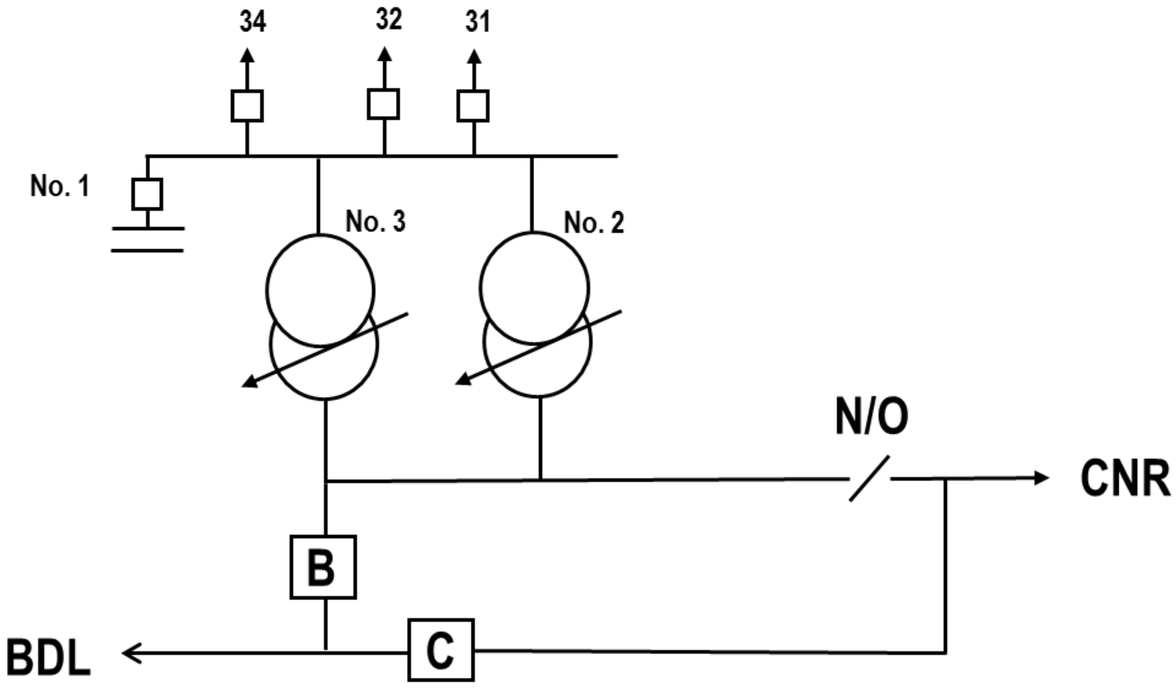

Figure 2: Single Line Diagram of NLA

3.2 Customer Composition

NLA has three 22kV feeders supplying AusNet Services' customers. Table 1 provides detail of the 22kV supply feeders.

Table 1: NLA feeder information

Feeder	Feeder Length (km)	Feeder description	Number of Customers	Number and type of customers
NLA31	210	Summer peaking, long rural feeder	924	75% residential 8% commercial 2% industrial 15% farming
NLA32	79	Summer peaking, short rural feeder	1,464	80% residential 12% commercial 2% industrial 6% farming
NLA34	138	Winter peaking, short rural feeder	1,329	86% residential 7% commercial 1% industrial 6% farming.

The 22kV feeders interconnect with 22Kv feeders from Bairnsdale and Cann River zone substations, but the substantial distance to these station means that only 3.2MVA of load is able to be transferred to these stations via 22kV feeders.

3.3 Zone Substation Equipment

3.3.1 Primary Equipment

NLA includes an air insulated 66kV switchyard with four busbars configured as a 66kV ring, but only two 66kV circuit breakers switching one line from Bairnsdale (BDL) Zone Substation.

There is a normally open (N/O) isolator on the Cann River (CNR) Zone Substation side of the transformer bus to prevent transformer faults from tripping the radial supply to CNR. There are two air insulated outdoor 22kV busbars supplying three 22kV feeders and one 1.5MVAr capacitor bank.

The 66kV circuits are switched by one minimum oil 66kV circuit breaker ‘C’ installed in 1986 and one dead tank 66kV circuit breaker ‘B’ installed in 2015.

The 22kV automatic circuit reclosers (ACR) acting as feeder circuit breakers were manufactured in 1966. The capacitor bank circuit breaker is a bulk oil circuit breaker manufactured in 1969.

Transformation comprises two 5MVA 66/22kV transformers that are switched as a single group. The No.2 and No.3 transformers were manufactured in 1949.

3.3.2 Secondary Equipment

The 66kV CNR line has X and Y distance protection using modern numerical relays.

The 66kV BDL line is protected by distance protection at BDL. No protection is provided at NLA as this is a radial line from BDL.

66kV circuit breaker “C” has an auto reclose scheme using Group 1427 relays.

Auto reclose function is not provided for 66kV CB “B”.

Circuit breaker failure functions are not provided for 66kV CBs “B” and “C”. Remote backup is provided by distance protection at BDL against failure of these circuit breakers.

The 22kV feeder circuit breakers have overcurrent, earth fault and sensitive earth fault protection using modern numerical relays.

The 22kV capacitor bank protection has neutral balance and capacitor control device functions using modern numerical relays.

The transformers are only protected by gas relays. Current driven protection schemes (such as differential, overcurrent, earth fault and restrictive earth fault protection) are not provided.

The 22kV voltage regulating function is provided by modern numerical relays.

66kV bus protection has earth fault overcurrent and distance interlocked phase overcurrent protection using early generation of digital relays.

Modern numerical relay is used for 22kV backup earth leakage protection.

3.4 Asset Condition

AMS 10-13 Condition Monitoring describes AusNet Services’ strategy and approach to monitoring the condition of assets.

Asset condition is measured with reference to an asset health index on a scale of C1 to C5. Table 2 provides a description of the asset condition scores.

Table 2: Asset condition Score and Remaining Service Potential

Condition Score	Condition	Condition Description
C1	Very Good	Initial service condition
C2	Good	Deterioration has minimal impact on asset performance. Minimal short term asset failure risk.
C3	Average	Functionally sound showing some wear with minor failures, but asset still functions safely at adequate level of service.
C4	Poor	Advanced deterioration – plant and components function but require a high level of maintenance to remain operational.
C5	Very Poor	Extreme deterioration approaching end of life with failure imminent.

The condition of the key assets at NLA is discussed in the Asset Health Reports for the key asset classes such as power transformers, instrument transformers and switchgear with information on asset condition rankings, recommended risk mitigation options and replacement timeframes. A summary of the condition is provided in Table 3 and discussed in the following sections.

Table 3: NLA Asset Condition Summary

Asset Type	Number of Assets				
	C1	C2	C3	C4	C5
66kV Circuit Breakers	1		1		
66kV Current Transformers	3				
66kV Voltage Transformers				6	
66/22kV Power Transformers				2	
22kV Circuit Breakers				3	1
22kV Current Transformers				3	
22kV Voltage Transformers				1	

3.5 Zone Substation Supply Capacity

NLA is a winter peaking station and the peak electrical demand reached 8.5MVA in winter 2018. The recorded peak demand during the summer of 2017/18 was 7.3MVA.

The demand growth at NLA is forecast to be flat.

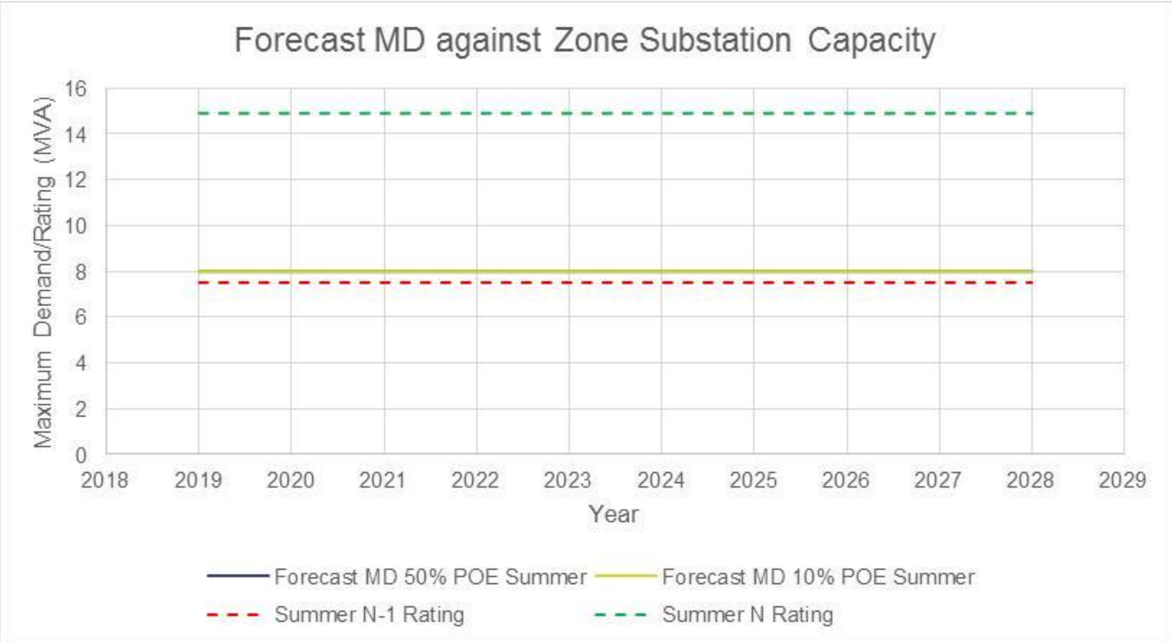

Figure 3: NLA Forecast Maximum Demand against Zone Substation Capacity

3.6 Load Duration Curves

The zone substation load duration curves that feed into the risk-cost assessment model are derived from historical actual demands between:

- 1 October 2016 and 31 March 2017 for the summer 50% probability of exceedance (POE) curves;
- 1 April 2017 and 30 September 2017 for the winter 50% POE curves;
- 1 October 2013 and 31 March 2014 for the summer 10% POE curves; and
- 1 April 2017 and 30 September 2017 for the winter 10% POE curves.

The historical hourly demands are separated by season and unitised based on the recorded maximum demand within that season (summer and winter) and time period, which allows the load duration curve to be scaled according to the seasonal forecast maximum demand for each year of the assessment period.

The 50% POE unitised load duration for NLA zone substation is presented in Figure 4, and the 10% POE unitised load duration for NLA zone substation is presented in Figure 5.

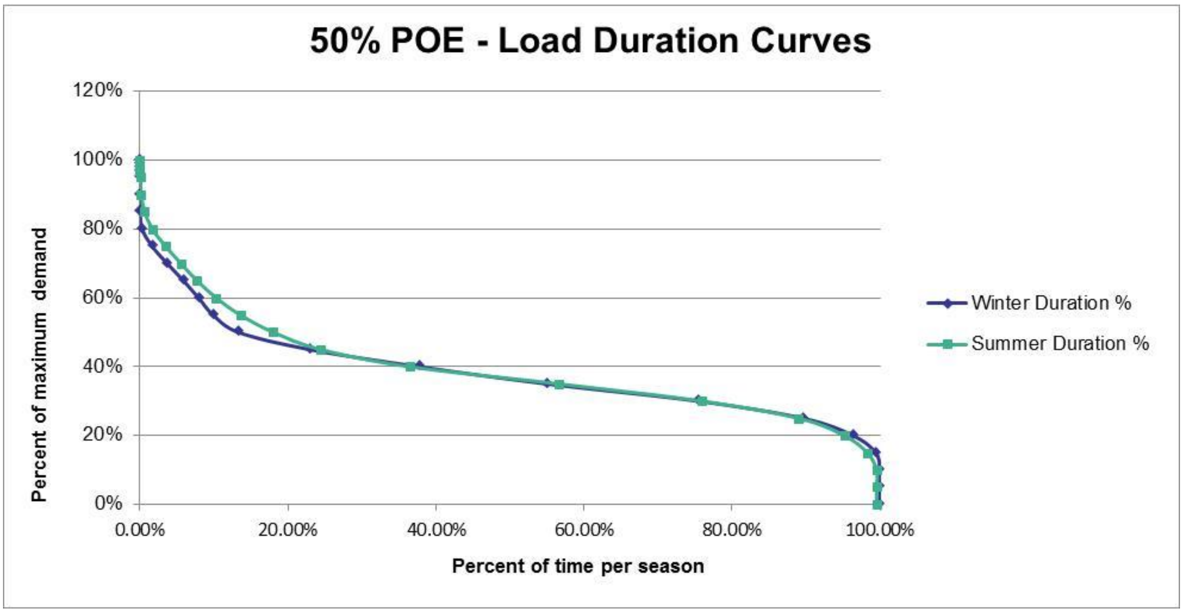

Figure 4: NLA 50% Load Duration Curves

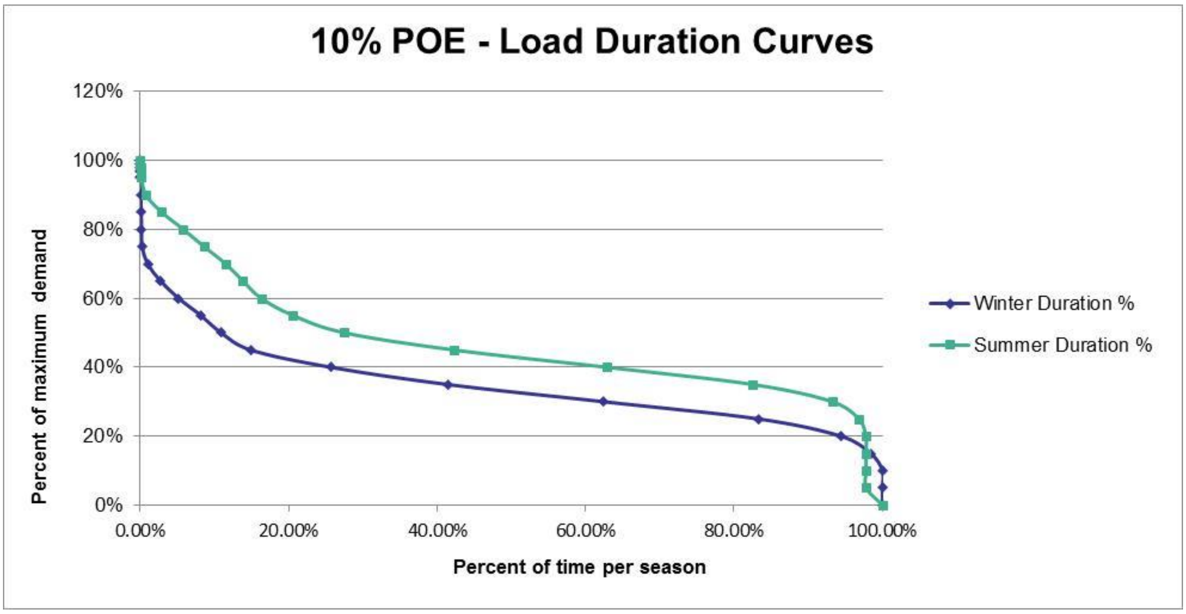

Figure 5: NLA 10% POE Load Duration Curves

3.7 Feeder Circuit Supply Capacity

There is currently no requirement for additional feeders at NLA due to the low load growth in the area.

3.8 Load Transfer Capability

The Distribution Annual Planning Report (DAPR) provides the load transfer capability (in MW) of the feeder interconnections between NLA and its neighbouring zone substations.

This is then forecast forward in line with the forecast demand growth to give the forecast load transfer capability in Table 4.

Table 4: NLA Load Transfer Capability

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Load Transfer Capability (MW)	3.2	3.2	3.1	3.1	3.1	3.0	3.0	3.0	2.9	2.9

4 Other Issues

4.1 Regulatory Obligations

This planning report acknowledges AusNet Services obligations as a Distribution Network Service Provider under the National Electricity Rules with particular emphasis on:

Clause 6.5.7 of the National Electricity Rules requires AusNet Services to only propose capital expenditure required in order to achieve each of the following:

(1) meet or manage the expected demand for standard control services over that period;

(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;

(3) to the extent that there is no applicable regulatory obligation or requirement in relation to:

(i) quality, reliability or security of supply of standard control services; or

(ii) the reliability or security of the distribution system through the supply of standard control services

to the relevant extent:

(iii) maintain the quality, reliability and security of supply of standard control services, and

(iv) maintain the reliability and security of the distribution system through the supply of standard control services; and

(4) maintain the safety of the distribution system through the supply of standard control services.

Section 98(a) of the Electricity Safety Act requires AusNet Services to:

design, construct, operate, maintain and decommission its supply network to minimise as far as practicable –

(a) the hazards and risks to the safety of any person arising from the supply network; and

(b) the hazards and risks of damage to the property of any person arising from the supply network; and

(c) the bushfire danger arising from the supply network.

The Electricity Safety act defines ‘practicable’ to mean having regard to –

(a) severity of the hazard or risk in question; and

(b) state of knowledge about the hazard or risk and any ways of removing or mitigating the hazard or risk; and

(c) availability and suitability of ways to remove or mitigate the hazard or risk; and

(d) cost of removing or mitigating the hazard or risk.

Clause 3.1 of the Electricity Distribution Code requires AusNet Services to:

(b) develop and implement plans for the acquisition, creation, maintenance, operation, refurbishment, repair and disposal of its distribution system assets and plans for the establishment and augmentation of transmission connections:

(i) to comply with the laws and other performance obligations which apply to the provision of distribution services including those contained in this Code;

(ii) *to minimise the risks associated with the failure or reduced performance of assets; and*

(iii) *in a way which minimises costs to customers taking into account distribution losses.*

4.2 Station Configuration Supply Risk

The configuration of NLA means that failure of a major piece of equipment (power transformers, circuit breakers, current transformers and voltage transformers) will result in an immediate loss of all supplies from NLA zone substation until the failed equipment can be switched out, isolated and the station supplies restored.

This would be for an estimated duration of two hours, which is the typical time it takes operators to travel to site and manually re-configure circuits to isolate the failed equipment and sequentially restore supply to as many customers as possible.

Table 5 lists the estimated bus outage consequence factors for each major type of equipment based on the substation layout.

Table 5: NLA Bus Outage Consequence Factors

Equipment	Estimated Bus Outage Consequence
Transformer	100%
22kV circuit breaker	100%
66kV circuit breaker	100%
22kV current transformer	100%
66kV current transformer	100%
22kV voltage transformer	100%
66kV voltage transformer	50%

5 Identified Need

Newmerella (NLA) commenced operation as a 66/22kV transformation station in 1970. The two 5MVA transformers were installed in 1970, but were manufactured in 1949. The 22kV switchyard consists of three ACRs and a capacitor bank circuit breaker that were also installed in 1970. The 66kV switchyard has undergone some modifications since the site was established, such as new 66kV circuit breakers in 1986 and 2015.

The physical and electrical condition of some assets has deteriorated and they are now presenting an increasing failure risk.

The station 66kV bus is unswitched, hence faults on the 66kV transformer bus or either one of the transformers will result in a complete loss of supply to all (approximately 3700) customers at NLA.

Faults on circuit breaker ‘B’ will impact an additional approximately 1400 customers at Cann River (CNR) Zone Substation, which has a radial 66kV supply from NLA.

The key service constraints at NLA are:

- Security of supply risk presented by the switching of the two transformers and CNR Zone Substation in a single switching zone group;
- Security of supply risks presented by the increased likelihood of asset failure due to the deteriorating condition of the assets;
- Health and safety risks presented by a possible explosive failure of bushings on a number of the assets;
- Plant collateral damage risks presented by a possible explosive failure of a number of the assets;
- Environmental risks associated with insulating oil spill or fire;
- Reactive replacement risks presented by the increasing likelihood of asset failure due to the deteriorating condition of the assets; and
- Health and safety risks presented by asbestos containing cement sheets or electrical switch boards in the control building, store room and toilet.

6 Risk and Options Analysis

6.1 Risk-Cost Model Overview

AusNet Services' risk-cost model quantifies the benefits of potential investment options by comparing the service level risk of the Do Nothing (Counterfactual) option with the reduced service level risk assuming the credible option is place.

The investment cost to implement the credible option is then subtracted from the monetised benefit to compare credible options and identify the option that maximises the net economic benefit (the proposed preferred option).

The areas of service level risk costs, and risk cost reduction benefits, that AusNet Services considers include:

- Supply risk;
- Safety risk;
- Collateral damage risk;
- Reactive replacement risk;
- Environment risk;
- Operations and maintenance costs; and
- Losses.

Further details on the model can be found in AusNet Services' Risk-Cost Assessment Model Methodology paper.

6.2 Options to Address Risks

The following options have been identified to address the risk at NLA:

1. Do Nothing
2. Retire one transformer
3. Retire one transformer and sure up supply capacity via network support
4. Network support to defer retirement and replacement
5. Replace 22kV switchgear
6. Replace transformers
7. Replace transformers and 22kV switchgear
8. Replace with fully switched substation

An economic cost-benefit assessment is used to assess and rank the economic efficiency of each option.

The following sections provide a brief summary of each of these options.

6.2.1 Option 1: Do Nothing

The Do Nothing Different (counterfactual) option assumes that AusNet Services would not undertake any investment, outside of the normal operational and maintenance processes.

Under this option, increasing supply risk would be managed by increased levels of involuntary load reduction.

Increased non-supply risks, such as those associated with safety, collateral damage, reactive replacement and environmental impacts, would be accepted as unmanaged rising risk costs.

The Do Nothing Different (counterfactual) option establishes the base level of risk, and provides a basis for comparing potential options.

Since this option assumes no investment outside of the normal operational and maintenance processes, this is a zero investment cost option.

6.2.2 Option 2: Retire transformer

This options whether the current installed capacity of the substation is still required to tests meet customer demand and whether equipment could be retired rather than replaced.

The capital cost for this option is [C.I.C], for associated decommissiong works.

6.2.3 Option 3: Retire transformer and sure up supply capacity via network support

This option tests whether the current installed capacity of the substation is still required to meet customer demand and whether equipment could be retired and network support used rather than replacing poor condition assets.

The capital cost for this option is [C.I.C], for associated decommissiong works and setup of a 5MW network support agreement.

In addition to the capital cost, there is ongoing operational costs associated with this option that represent the network support availability and activation costs, and which vary year-by-year based on the network support expected under this option, as outlined in Table 7.

Table 6: Network support services annualised costs ($ million)

2021	2022	2023	2024	2025
C.I.C				

Option 4: Network support to defer retirement and replacement

This options tests whether network support can be used to defer the replacement of poor condition assets. This option addresses the supply risks associated with poor condition assets, but does not address the safety, environmental or collateral damage risks as the assets remain in service.

The capital cost of this option is [C.I.C], for associated decommissiong works and setup of a 5MW network support agreement.

In addition to the capital cost, there is ongoing operational costs associated with this option that represent the network support availability and activation costs, and which vary year-by-year based on the network support expected under this option, as outlined in Table 7.

Table 7: Network support services annualised costs ($ million)

2021	2022	2023	2024	2025
C.I.C				

6.2.4 Option 4: Replace 22kV switchgear

Stage 1 of the NLA rebuild replaces the existing outdoor 22kV ACRs and capacitor bank circuit breaker with a new indoor 22kV switchboard. Stage 2 of this asset renewal proposal includes the replacement of both transformers and the provision of a new Neutral Earthing Resistor. Under this option only the 22kV outdoor CB and ACRs will be replaced with a new 22kV indoor switchboard.

This option allows for the deferral of the transformer replacement.

This option has a capital cost of [C.I.C].

6.2.5 Option 5: Replace transformers

Stage 1 of the NLA rebuild replaces the existing transformers with new 15/20MVA units. It also includes a new Neutral Earthing Resistor to manage the increased fault levels associated with the new transformers.

Stage 2 of this asset renewal proposal includes the replacement of 22kV ACRs and capacitor bank circuit breaker. This is scheduled for completion around seven years after Stage 1.

This option allows deferral of the 22kV CB and ACR replacements.

This option has a capital cost of [C.I.C].

6.2.6 Option 6: Replace transformers and 22kV switchgear

Under this option the deteriorated No.2 and No.3 transformers will be replaced with new 15/20MVA units. The outdoor 22kV capacitor bank CB and feeder ACRs will be replaced with new outdoor 22kV switchgear. A new Neutral Earthing Resistor will also be installed.

This option has a capital cost of [C.I.C].

6.2.7 Option 7: Replace with fully switched zone substation

Under this option the deteriorated No.2 and No.3 transformers will be replaced with new 15/20MVA units. The outdoor 22kV capacitor bank CB and feeder ACRs will be replaced with a new indoor 22kV switchboard. A new Neutral Earthing Resistor will also be installed.

Two new 66kV circuit breakers will be installed to form a fully switched bus to further improve reliability.

This option has a capital cost of [C.I.C].

6.3 Risk-Cost Model Results

6.3.1 Existing Service Level Risk

Figure 6 shows the existing service level risk. The risk costs are dominated by supply risk and non- supply risks (safety, environment, collateral damage and reactive replacement). The escalation in the risk costs over time is driven by deterioration in the condition of the assets.

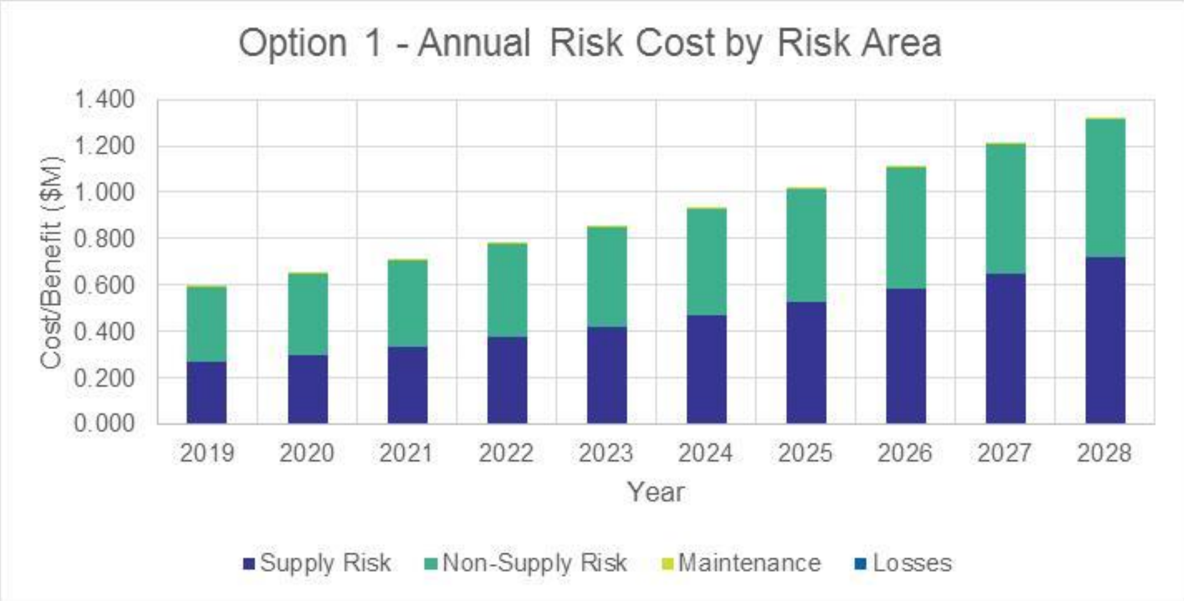

Figure 6: Do Nothing Different – Service Level Risk Cost

6.4 Economic Cost-Benefit Analysis

The economic analysis allows comparison of the economic cost and benefits of each option to rank the options and to determine the economic timing of the preferred option.

It quantifies the capital, operation and maintenance costs along with service level risk reduction benefits for each option.

Table 8 lists the annualised net economic benefit of each option for each year, with the option that maximises this benefit highlighted.

Table 8: Annualised net economic benefit ($M)

	2020	2021	2022	2023	2024	2025	2026	2027	2028
Option 1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Option 2	C.I.C								
Option 3									
Option 4									
Option 5									
Option 6									
Option 7									
Option 8									

This indicates that Option 1 is the most economic option prior to 2026, with Option 7 becoming the most economic option by summer 2025/26.

6.4.1 Sensitivity Analysis

Table 9 presents the net present value of net economic benefits under a variety of sensitivities. The net economic benefit assessment takes account of each option's total capital, operating and maintenance costs, compared to the reduction in service level risk cost that option is expected to deliver.

The robustness of the economic assessment is tested for the following sensitivities:

- Asset failure rates, varied at ±50% of the base failure rate;
- Maximum demand forecasts, varied to ±5% of the base forecast;
- Value of customer reliability (VCR), varied to ±25% of the base VCR;
- Proposed option costs, varied to ±15% of the base option cost;
- Value of statistical life (VoSL) of [C.I.C], varied from a [C.I.C], low case, to a [C.I.C], high case; and
- Discount rate of 6.44%, varied to ±2% per annum of the base discount rate.

The preferred option under each sensitivity is highlighted, and the option that maximises net benefits under the majority of sensitivities is considered the proposed preferred option.

Table 9: NPV of Net Economic Benefit Analysis

<table>
<tr><th>Scenario</th><th>Option 1</th><th>Option 2</th><th>Option 3</th><th>Option 4</th><th>Option 5</th><th>Option 6</th><th>Option 7</th><th>Option 8</th></tr>
<tr><td>Base Case</td><td>$0.00</td><td rowspan="13" colspan="7">C.I.C</td></tr>
<tr><td>High Asset Failure Rate</td><td>$0.00</td></tr>
<tr><td>Low Asset Failure Rate</td><td>$0.00</td></tr>
<tr><td>High Demand</td><td>$0.00</td></tr>
<tr><td>Low Demand</td><td>$0.00</td></tr>
<tr><td>High VCR</td><td>$0.00</td></tr>
<tr><td>Low VCR</td><td>$0.00</td></tr>
<tr><td>High Option Cost</td><td>$0.00</td></tr>
<tr><td>Low Option Cost</td><td>$0.00</td></tr>
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<tr><td>Low VoSL</td><td>$0.00</td></tr>
<tr><td>High Discount Rate</td><td>$0.00</td></tr>
<tr><td>Low Discount Rate</td><td>$0.00</td></tr>
</table>

The sensitivity analysis indicates the preferred option is Option 7, as it has the highest net benefit under the majority of sensitivities tested.

6.5 Optimal Economic Timing of Preferred Option

The annual benefit of implementing a credible alternative option to the Do Nothing Different (counterfactual) is the difference between total service level risk cost with a credible option in place, and the total service level risk cost of the Do Nothing Different option.

The optimal economic timing of the proposed option is the point in time when the annual benefit of implementing the proposed option outweighs the annualised cost to implement that option.

The optimal economic timing to implement the proposed preferred option is by summer 2025/26, as presented in Figure 7.

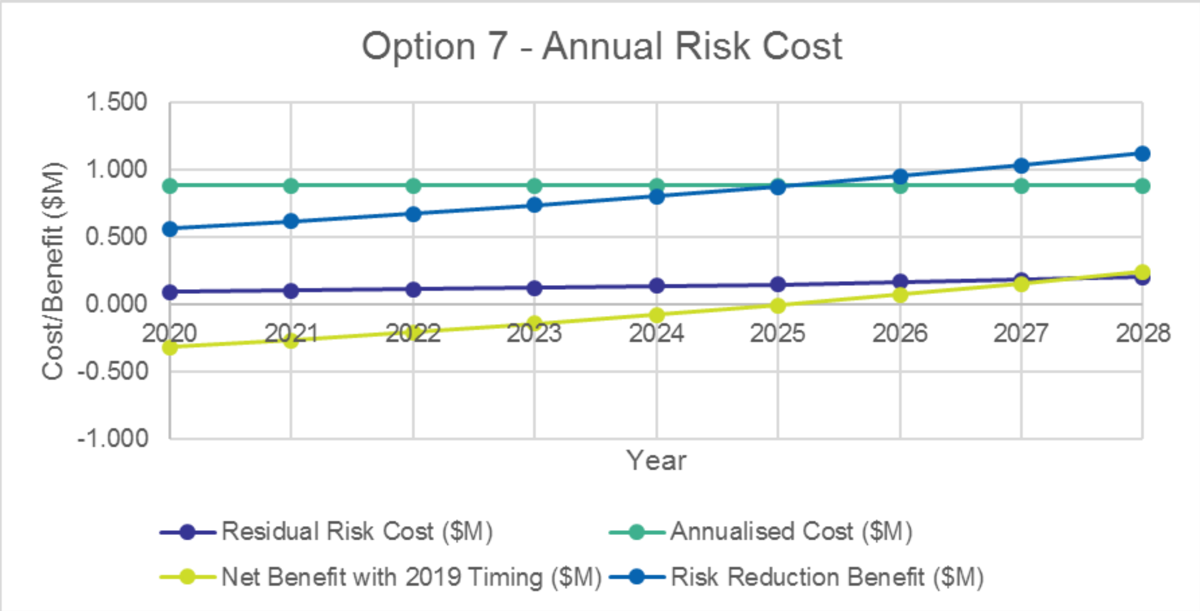

Figure 7: Economic timing of the proposed preferred option

7 Conclusion and Next Steps

The assessment outlined in this report shows that the service level risk to customers supplied from Newmerella (NLA) Zone Substation is not forecast to grow to unacceptable levels within the 2022-26 EDPR period.

7.1 Proposed Preferred Option

The options analysis identifies that the preferred option, being the one that maximises the net economic benefit to all those that produce, consume and transport electricity in the NEM, is to:

- Replace the transformers and 22kV switchgear by 2026, at an estimated capital cost of [C.I.C], (Real $2018).

Applying a discount rate of 6.44% per annum, this proposed preferred option has a net economic benefit of [C.I.C], relative to the Do Nothing Different option, over the forty-five-year assessment period.

7.2 Next Steps

This planning report outlines the service level risk mitigation investment that AusNet Services has assessed as prudent, efficient and providing the optimal balance of supply reliability and cost.

While this report outlines AusNet Services' plans for maintaining service levels, and serves to support AusNet Services' revenue request for the 2022-26 EDPR period, the proposed investment is subject to the regulatory investment test for distribution (RIT-D).

As such, the proposed investment will be confirmed via the formal RIT-D process, which includes publication of three reports at the various RIT-D stages, and includes a formal consultation process where interested parties can make submissions that help identify the optimal solution.