

TD-0006168 MLTS Circuit Breaker Replacement Business Case

TD-0006168 MLTS Circuit Breaker Replacement Business Case (BC)



Portfolio Business Line:	Work Category:	Work Code / Name:
Choose an item. Trans: 100%	Replacement	2002 TCAPEX Station rebuilds
Project Start date:	Commissioning Readiness Date:	Project Completion Date:
24/02/2021	31/12/2027	31/03/2028
Business case purpose and overview		
This business case seeks approval to invest \$36.5 M CAPEX at Moorabool Terminal Station (MLTS). The investment includes replacing identified 500 kV and 220 kV assets, including 18 circuit breakers, 20 sets of three phase isolators and 56 instrument transformers by December 2027. The assets identified for replacement have been assessed to be in poor condition and present a material risk of asset failure. Asset failure has the potential to impact electricity supply reliability, generation cost, safety, environment, collateral equipment damage and emergency replacement costs. The estimated project cost is ~\$3.4 M higher than the Capex forecast included in the current TRR for the MLTS project. The cost increase is due to increased labour, material and plant cost. The timing of the project also differs to the TRR proposal. Project expenditure from April 2027 will form part of the next TRR period (2027-2031). The additional Capex required will be included in the 2027-2031 TRR proposal. The regulatory investment test – transmission (RIT-T) for this project is well progressed with the publication of the Project Assessment Draft Report (PADR) on 18 August 2022. No non-network options have been identified as feasible alternatives to the proposed asset replacement project. The RIT-T will be concluded before the end of the year. Network support payments of up to \$16.9 M may be required for planned 500 kV circuit outages. The cost for network support will be treated as a cost pass through with no financial impact on the business. Approval for network support cost will be requested should a network support agreement be required for this project. Planned network outages have been minimised as far as possible in developing the scope of work. Essential outages to allow the selected assets to be replaced is estimated to incur STPIS penalties of about \$2.5 M. Approval is also sought for \$1.3 M relating to existing assets (mostly 220 kV current transformers) to be written off as they are not suitable for spares and will be replaced with dead tank circuit breakers that have internal current transformers.		
Why is this project required? What's the value that this business will deliver?		
MLTS is an important terminal station as it is part of the main transmission backbone connecting major loads such as the APD smelter and renewable generation such as the Macarthur Wind Farm. It is also part of the transmission interconnector with South Australia. Most of the primary assets were installed in the early 1980's and are approaching the end of their useful life, with some 500 kV and 220 kV switchgear in poor (C4) or very poor (C5) condition. An asset failure at MLTS will constrain renewable generation off and result in increased generation cost and may also impact supply security.		
Is this project part of the 5-year Reg Reset submission?	☒ Yes / ☐ No If Yes please select: ☐ EDPR / ☒ TRR / ☐ GAAR Reg Reset Category: Tx - Replacement Other Reset Amount: \$30.4 M (excluding IDC and management reserve)	
Is this forecast in the current FY Plan?	☒ Yes / ☐ No	
Incremental change in Opex	No change is expected in Opex	

Project Expenditure Forecast (FY)

Project Expenditure for approval (nominal)	First 5 years					Lifecycle Total
	2023	2024	2025	2026	2027	
Direct Capital expenditure	0.4	2.7	7.5	8.1	6.8	29.5
Overheads	0.0	0.2	0.5	0.6	0.5	2.0
Capitalised Finance Charges	0.0	0.1	0.3	0.2	0.3	1.0
Project Delivery Budget (SAP Capex budget)	0.4	3.0	8.4	8.9	7.6	32.6
Management Reserve	0.3	0.3	0.3	0.3	0.3	2.6
Total CAPEX for Approval (incl risk, CFCs & OHs)	0.7	3.3	8.7	9.2	7.9	35.2
Operating Expenditure for approval (Project Opex)	-	-	-	-	-	-
Written down value of assets retired/sold	-	-	1.3	-	-	1.3
Total Estimated expenditure for approval (nominal)	0.7	3.3	10.0	9.2	7.9	36.5

BUSINESS USE ONLY

30/10/2025

1 of 11

UNCONTROLLED WHEN PRINTED

TD-0006168 MLTS Circuit Breaker Replacement Business Case

Analysis of investment options

Analysis of investment options (\$m - Present Value)	Capex	Opex	Total Financial Costs	Potential Costs	Other Economic Costs & (Benefits)	Total PV Cost	PV Cost Ratio (compared to BAU)
BAU	-	-	-	-	148.2	148.2	1.00
Option 1	29.0	-	29.0	-	14.2	43.3	0.29
Option 2	29.0	-	29.0	-	21.1	50.1	0.34

Options considered	- Business as Usual - Option 1 (Recommended): Integrated Replacement - Option 2: Staged Replacement with 220kV switchgear deferred		
Preferred option	Option 1 has the highest net benefits of all options and for all scenarios and sensitivity studies. It presents a robust investment decision to reduce the asset failure risk at MLTS.		
Key benefit	Total value		Overview
	Avoided market impact cost of more than \$4 M pa from the first year of the investment.		The project will not deliver a material reduction in business operating and maintenance cost.
Non-Financial benefit	Reduction in market impact cost and reactive asset replacement cost.		
Key implementation/ delivery risks	- Availability of planned outages impacting project delivery - Human error incident that impacts the transmission system		
Project Sponsor	Project Initiator & Dept.	Prepared by:	Date BC submitted:
[C.I.C], GM Network Strategy and Planning	[C.I.C], Transmission Network Planning	[C.I.C], Transmission Network Planning	18/08/2022

Business Case e-sign-off

Project # / Title / Version	TD-0006168 – MLTS Circuit Breaker Replacement			
Name	Title	Signature	Date Approved	Comments
ENDORSEMENTS				
[C.I.C]	GM Network Strategy and Planning, Project Sponsor	Via NEC	30/08/22	
[C.I.C]	GM Finance Networks and Digital	Via NEC	30/08/22	
DoA APPROVALS				
[C.I.C]	EGM Networks and Digital	Via IC	02/09/22	
[C.I.C]	CFO/IC Chair	Via Docusign	02/09/22	
[C.I.C]	Chief Executive Officer	Via Docusign	02/09/22	

TD-0006168 MLTS Circuit Breaker Replacement Business Case

TABLE OF CONTENTS

1. PROJECT BACKGROUND	4
1.1 ASSET CONDITION	5
1.2 RATIONALE	5
2. PROJECT SCOPE	6
2.1 IN SCOPE	6
2.2 DEPENDENCIES	6
3. KEY BENEFIT AND ASSUMPTIONS	7
4. FINANCIALS	8
4.1 OPEX BREAKDOWN	8
4.2 CAPEX BREAKDOWN	8
5. SCHEDULE	8
5.1 KEY PROJECT SCHEDULE AND MILESTONES	8
6. RISK IDENTIFICATION	9
7. SUSTAINABILITY	9
8. CORPORATE ACCOUNTING CONSIDERATIONS	10
8.1 ASSET RETIREMENTS	10
8.2 CONTRIBUTED (GIFTED) ASSETS	10
8.3 ASSETS TO BE CREATED	10
9. CHECKLIST	10
APPENDIX A ATTACHMENTS	11

TD-0006168 MLTS Circuit Breaker Replacement Business Case

1. PROJECT BACKGROUND

MLTS is owned and operated by AusNet and is located near Geelong. It is part of the main 500 kV transmission network, which provides major transmission network services in Victoria. The 500 kV transmission backbone runs from east to west across the state and connects generation in the Latrobe Valley and western parts of Victoria with the major load centers located in Melbourne. It also forms an interconnector with South Australia at Heywood Terminal Station (HYTS) as shown below.



Figure 1 - 500 kV Transmission Network Backbone

MLTS serves as a 500 kV switching station with 500/220 kV transformation that ties the 500 kV transmission network backbone with the 220 kV transmission network near Geelong as shown in Figure 2. MLTS has two 1000 MVA 500/220 kV transformers. The ongoing need for MLTS is both demonstrated in AEMO's Integrated System Plan (ISP) and the Victorian Annual Planning Report (VAPR).

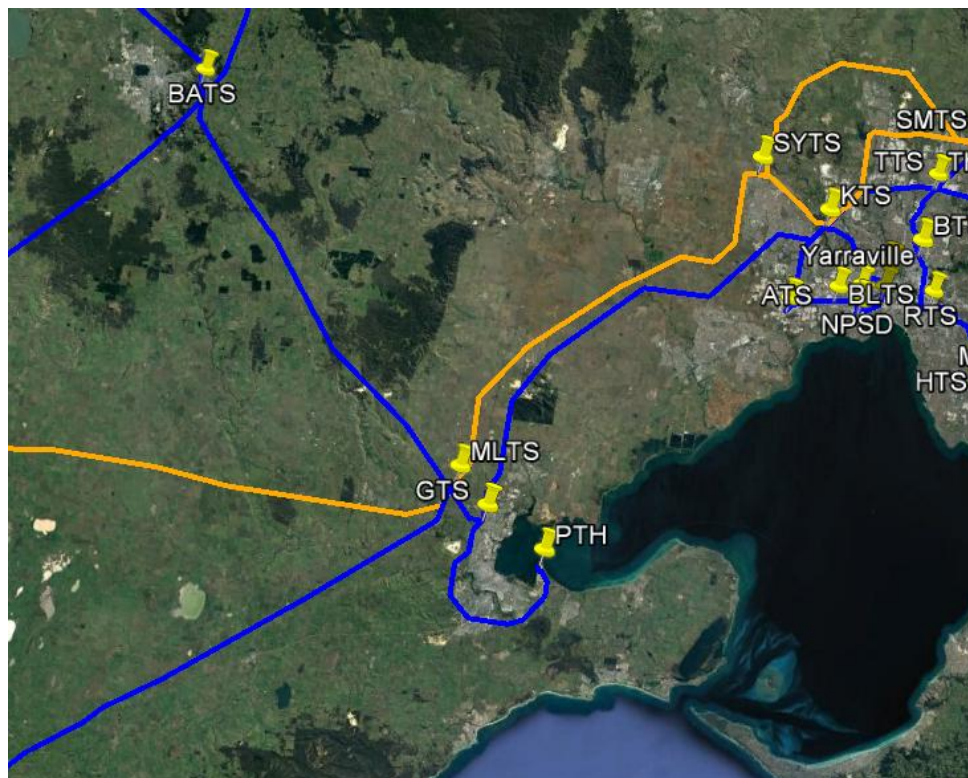


Figure 2 - Transmission network connected at MLTS

TD-0006168 MLTS Circuit Breaker Replacement Business Case

1.1 Asset Condition

Several primary (circuit breakers and instrument transformers) and secondary (protection and control) assets at MLTS are in poor (C4) or very poor (C5) condition as expected of assets that have been in service for many years. Table 1 provides a summary of the condition of the relevant major assets at MLTS.

Asset class	Condition scores				
	C1	C2	C3	C4	C5
500 kV circuit breakers	1	0	0	0	8
220 kV circuit breakers	3	2	1	3	7
500 kV and 220 kV Current transformers	3	31	12	24	5
500 kV and 220 kV Voltage transformers	7	0	1	13	14

Table 1 - Summary of major equipment condition scores

Eight of the nine 500 kV circuit breakers are in very poor condition and are approaching their end of serviceable life. With a condition score of C5, these circuit breakers present challenges due to duty-related deterioration. Common problems are flange corrosion, SF6 leakage and hydraulic mechanism seal deterioration. Spares are limited and large component parts are not replaceable. Manufacturer support for these assets is also limited and refurbishment is not a viable economic option.

Ten of the sixteen 220 kV circuit breakers are in poor condition and are approaching their end of serviceable life. With condition scores of C4 and C5, these circuit breakers present challenges due to duty-related deterioration. Spares are limited and large component parts are not replaceable. Manufacturer support for these assets is limited and refurbishment is thus not a viable economic option.

Several instrument transformers at MLTS (56 in total) are in poor or very poor condition. The management of safety risks from potential explosive failures of instrument transformers is costly due to the need for regular oil sampling and partial discharge condition monitoring. Refurbishment is not a viable economic option for these assets.

This project also includes replacement of a number of 220 kV current transformers that were installed in 2007 to manage an identified safety risk at the time. The units will be replaced with dead tank circuit breakers that have integrated current transformers consistent with our asset management policy. These 220 kV current transformers are exhibiting accelerated ageing through excessive internal thermal activity and have not achieved the expected service life. The units are not deemed suitable to be retained as spares or re-deployed and decommissioning is recommended. The asset write down value for these assets is expected to be \$1.2M at the time of retirement.

Sixteen sets of 500 kV three phase isolators and four sets of 220 kV three phase isolators have been found to be in poor condition with minimal spares. These isolators will be replaced at the same as the circuit breakers given their condition and the opportunity to utilize the planned outage for the circuit breaker replacement given the challenges to obtained network outages. Network support payments may also be required in some instances for planned outages and have to be considered in the asset renewal decision.

1.2 Rationale

The poor condition of some of the assets at the terminal station increases the likelihood of asset failures. Such failures would result in prolonged outages impacting users of the transmission network. Investment to selectively replace all assets that are in poor or very poor condition is economically justified and will address the following identified asset failure risks at MLTS:

- Market impact risk as result of non-optimal generation dispatch when low-cost renewable generation

TD-0006168 MLTS Circuit Breaker Replacement Business Case

have to be constrained due to unplanned circuit outages at MLTS

- Safety risk for assets that could fail explosively
- Environmental risk
- Financial risk when emergency replacements or reactive repairs are needed
- Collateral damage risk for asset that could fail explosively

Timely investment in asset replacements at MLTS will ensure that AusNet will be able to maintain reliable transmission network services at MLTS and mitigate safety and environmental risks as required by the NER and Electricity Safety Act 1998¹.

2. PROJECT SCOPE

2.1 In Scope

Item No.	In Scope
IS-1	Replace 500 kV and 220 kV switchgear and protection relays with condition scores of C4 and C5 as described in scope of work.

2.2 Dependencies

Item No.	Project Dependency Details and Description
D-1	A major station replacement project to replace the 500 kV GIS at SYTS is underway and opportunities to coordinate planned outages should be implemented in the project staging and design.

¹ Victorian State Government, Victorian Legislation and Parliamentary Documents, "*Energy Safe Act 1998*"

TD-0006168 MLTS Circuit Breaker Replacement Business Case

3. KEY BENEFIT AND ASSUMPTIONS

Incentives and Customer: These are projects which are justified using external incentive schemes such as STPIS, F-Factor, CSIS, DMIS, etc

- Example: Improvements to reliability. A program of replacing fuses to prevent candling fuses and improve F-factor performance

Efficiency: These are projects where the expenditure will result in efficiency gains

- Example: Replacing a transformer to avoid additional maintenance costs incurred in the future

Safety Risk and Compliance: These are projects aimed at managing safety risk or compliance issues

- Example: ESV Commitments, environment and safety

Savings to existing cost base: These are reductions to the existing cost base (**not avoided costs**)

- Example: Relocating an overhead feeder section with high vegetation maintenance costs to reduce **current** vegetation opex

Option	Benefit Detail	Key Benefit Category	Key Benefit Value (\$)	Key Benefit Assumptions (Baseline and Measurement)	Benefit Start to Full Realisation Date
Option 1	Is there a direct bottom line budget impact? ☐ Yes / ☒ No Cost Centre: CPX: \$ OPX: \$	Safety, Risk & Compliance	Not material and has not been monetised	The project will reduce the likelihood of asset failure risks, including for assets that could fail explosively and thus present a safety risk. The avoided safety risk has not been quantified in direct financial savings for the business and is not considered to be material based on the low probability of occurrence.	Benefit start 31/12/27 Full Realisation 31/12/27
Option 1	Is there a direct bottom line budget impact? ☐ Yes / ☒ No Cost Centre: CPX: \$ OPX: \$	Incentives & Customer	The avoided market impact risk is around \$4 M pa and presents the economic benefits that could be achieved by the project	Asset failures at MLTS could impact the availability of the 500 kV and 220 kV circuits connected at MLTS and result in non-optimal dispatch of generation. This will result in increased generation cost, which can be avoided by asset replacement to improve the reliability of the terminal station.	Benefit start 31/12/27 Full Realisation 31/12/27

TD-0006168 MLTS Circuit Breaker Replacement Business Case

4. FINANCIALS

4.1 Opex Breakdown

Opex excl Project implementation (nominal)	First 5 years					Lifecycle Total
	2023	2024	2025	2026	2027	
BAU Total Opex	-	-	-	-	-	-
Incremental Opex Costs - Option 1	-	-	-	-	-	-
Opex Savings - Option 1	-	-	-	-	-	-
Net Budget impact (split by division below)	-	-	-	-	-	-
New Cost profile	-	-	-	-	-	-

4.2 Capex Breakdown

Capex Breakdown (incl mngt reserve - nominal)	First 5 years					Lifecycle Total
	2023	2024	2025	2026	2027	
Design	-	1.1	0.6	-	-	1.6
Internal Labour	0.4	0.3	0.4	0.3	0.3	1.9
Materials	-	1.3	4.1	4.2	2.9	12.5
Plant & Equipment	-	-	0.1	0.5	0.5	1.5
Contracts	-	-	2.3	3.1	3.2	11.9
Meter Costs	-	-	-	-	-	-
Other	-	-	-	-	-	-
Management Reserve (incl Risk)	0.3	0.3	0.3	0.3	0.3	2.6
Total Capex	0.7	3.0	7.8	8.4	7.1	32.1

5. SCHEDULE

5.1 Key Project Schedule and Milestones

Key Milestone and Deliverables (Waterfall)	Planned Completion Date
Approval of Stage Gate 2	24/02/2021
Approval of Business Case	29/08/2022
Approval of RIT ☐ N/A	31/12/2022
Construction Commencement	1/02/2024
Commissioning Readiness Complete	31/12/2027
Project Completion - Stage Gate 6 Approval	31/03/2028

TD-0006168 MLTS Circuit Breaker Replacement Business Case

6. RISK IDENTIFICATION

Risk Description	Potential unmitigated Risk consequence	Mitigations	Potential mitigated risk consequence	Likelihood of Impact
Availability of planned outages impacting project delivery	Delays to project delivery may occur if planned outages are not possible or deferred.	Planned outages have been minimised as far as possible for the planned scope. AusNet will apply for network support cost to be treated as a pass through.	Delays to project delivery may still occur if planned outages are not possible or deferred. Network support cost will be passed through.	Medium

7. SUSTAINABILITY

List the changes to sustainability this project will deliver in the table below.

Sustainability Consideration	Impact from this project	Comments
Greenhouse gas emissions ☒ N/A	☐ Increase ☐ Neutral ☐ Decrease	<<For an increase or decrease, please state which emissions are impacted, and by how much (if known). <i>E.g. The pipeline replacement program is expected to decrease AusNet scope 1 emissions from fugitive gas, estimated reduction of x%. More information can be found on Emission Management (sharepoint.com)>></i>
Waste ☒ N/A	☐ Waste reduction strategies to be implemented	<<Please describe your waste reduction strategies e.g. how waste will be diverted from landfill and/or if recycled content can be sourced>>
Social procurement ☒ N/A	☐ Purchases from social enterprises ² ☐ Purchases from Aboriginal and Torres Strait Islander-owned businesses ³ ☐ Purchases from Australian Disability Enterprises ⁴ ☐ Purchases from local suppliers ⁵	<<Please describe any opportunities to purchase from social enterprises, Aboriginal and/or Torres Strait Islander businesses, Australian Disability Enterprises and/or local businesses. If required, please contact Procurement for more information>>
Community ☒ N/A	☐ Community consultation required ☐ Community benefits actions	<<Please describe your approach to keeping local communities informed of the project, if required. Describe any associated actions to positively impact the local communities>>

<<If required, please contact michelle.bishop@ausnetservices.com.au for assistance with this table>>

² See The Loop for access to potential supplier lists from [social enterprises](#) on the "Suppliers" tab [How to purchase \(sharepoint.com\)](#).

³ See The Loop for access to potential supplier lists from [Aboriginal and Torres Strait Islander businesses](#) on the "Suppliers" tab [How to purchase \(sharepoint.com\)](#).

⁴ Australian Disability Enterprises [ADE](#)

⁵ Local suppliers, as defined by the State government for the purchase. See [Local Jobs First - Glossary](#) for Victorian Government definition of "local"

TD-0006168 MLTS Circuit Breaker Replacement Business Case

8. CORPORATE ACCOUNTING CONSIDERATIONS

Note: OPEX owner assumes responsibility for any write off costs should the project be cancelled.

Capex profit centre	13260
Propex profit centre	N/A
Opex (BAU) owner & cost centre	[C.I.C] 12060
Transmission Regulatory Key	Prescribed Shared (PS)

8.1 Asset Retirements

The total asset write down amount is \$1.3 M. It includes protection and instrument transformers as per the fixed assets report attached. These assets are in poor condition and not suitable for spares.

Finance introduced a service life review process to allow for changes to be made to an asset's financial life and to apply accelerate depreciation over a shorter timeframe once it has been confirmed that an asset is not going to reach its expected life. This may be due to planned replacements, technology improvements, or site / industry decisions such as site closures. Assets adjusted this way will depreciate to zero by the project end date, resulting in a favourable financial outcome compared with not making the adjustment.

8.2 Contributed (Gifted) Assets

N/A

8.3 Assets to be created

This project will replace the existing assets in a like-for-like manner with details provided in the attached scope of work document. The table below provides a high-level breakdown of the cost of the replacement assets.

Description of Asset	Quantity	Estimated Cost (total)	Expected Asset Life
500 kV circuit breakers	8	\$21.1 million	45 years
220 kV circuit breakers	10	\$15.4 million	45 years
Totals		\$36.5 million	

9. CHECKLIST

For transmission network projects, is there a market impact in the delivery of the project?	☐ N/A / ☒ Yes / ☐ No The STPIS cost to deliver the project is estimated at \$2.5 M.
Has a Value Engineering Workshop been conducted?	☐ N/A / ☐ Yes / ☒ No << If yes, what are the savings? \$X >>
For the purposes of RIT, have you considered all credible options including non-network options?	☐ N/A / ☒ Yes / ☐ No

TD-0006168 MLTS Circuit Breaker Replacement Business Case**Appendix A ATTACHMENTS**

Document Title	Attachment (Embedded document)
Scope of Works / Initiative Brief *	 Direct Cost Summary - TD-00061
Financial Model with NPV*	 MLTS NPV Model V3.xlsm
Detailed Cost Estimate and Benefit Assumptions*	 MLTS Economic Model Rev7July2022
Write Down Value (WDV) details	 fixed asset report TD-0006168 MLTS CI
Gifted Assets details	N/A

Attach files as objects, or upload to ppm and advise here. Asterisk (*) are mandatory documents