January 2026

Powerlink 2027-32 Revenue Proposal

Project Pack

CP.03094 Procurement of Spare Transformer

Project Status: Unapproved

Network Requirement

There are currently 37 regulated 275/132kV power transformers in Powerlink's network, with varying capacities from 200 to 375 MVA and varying nameplate ages from 3 to 41 years. These transformers are critical in enabling power flow between the 275kV backbone network and the 132kV network that provides supply to network customers [1].

Due to the significant increase in transformer lead time and also an increase in the observed failure rate of the 275/132kV transformer fleet between 10-24 years of age, a review of Powerlink's spare transformer strategy has been undertaken. This review considered:

- Size of the fleet;
- Ability to source a transformer from other Australian utilities in an emergency;
- Age profile of the fleet;
- Observed increase in failure rate of this fleet;
- Increased lead times to procure replacement transformers following a failure;
- Consequence of failure when no spare is available; and
- Future uses for spare transformers to manage risks associated with transformer life extension or replacement projects.

The recommendation of this review is that an additional 375MVA 275/132kV transformer is required to adequately mitigate the risk of transformer failures within this fleet. As part of this review Powerlink has calculated that it is now necessary to hold a second spare unit for this transformer fleet based on the observed increase in failure rate for this fleet and when procurement lead-times are three to four years. This will provide a similar level of reliability and availability of transformer capacity as only holding a single spare unit when procurement lead-times were around one year.

Recommended Option

The objective of this project is to procure and install a new 375MVA 275/132kV system spare transformer at Ross substation by December 2027[1].

Cost and Timing

The estimated cost to procure and install the spare transformer at Ross substation is $15.1m ($2025/26) [2].

Target Commissioning Date: December 2029

Documents in CP.03094 Project Pack

Public Documents

1. CP.03094 Procurement of Spare Transformer – Project Scope Report
2. CP.03094 Procurement of Spare Transformer – Concept Estimate

Project Scope Report

CP.03094

Procurement of Spare 275/132kV Transformer

Proposal – Version 2

Document Control

Change Record

Issue Date	Revision	Prepared by	Reviewed by	Approved by	Background
4/10/24	1	[redacted]	[redacted]	[redacted]	
19/9/25	1	[redacted]			Added cleaning of OST

Related Documents

Issue Date	Responsible Person	Objective Document Name
26/08/24	[redacted]	PIF Procurement of additional 275-132kV Transformer (Objective ID: A5614511)

Document Purpose

The purpose of this Project Scope Report is to define the business (functional) requirements that the project is intended to deliver. These functional requirements are subject to Powerlink's design and construction standards and prevailing asset strategies, which will be detailed in documentation produced during the detailed scoping and estimating undertaken by DTS (or OSD), i.e. it is not intended for this document to provide a detailed scope of works that is directly suitable for estimating.

Project Contacts

Project Sponsor	[redacted]
Strategist – HV/Digital Asset Strategies	[redacted]
Planner – Main/Regional Grid	[redacted]
Manager Projects	[redacted]
Project Manager	[redacted]
Design Manager	[redacted]

Project Details

1. Project Need & Objective

There are currently 37 regulated 275/132kV power transformers in Powerlink's network, with varying capacities from 200 to 375 MVA and varying nameplate ages from 2 to 40 years. These transformers are critical in enabling power flow between the 132kV network and the higher capacity 275kV network.

To mitigate the risk of failure of one of these transformers, a spare 375MVA 275/132kV transformer has been installed at Ross substation to ensure a replacement timeframe in the order of 1 to 6 months can be achieved. In the event that this spare transformer was not available, the replacement timeframe would now be in the order of 3 to 4 years due to transformer manufacturing and supply constraints (historically, the lead time for power transformers was in the order of one year). Therefore, an effective spare transformer strategy is essential to ensure load is not put at risk for extended periods.

Due to the significant increase in transformer lead time and also the increased failure rate of the 275/132kV transformer fleet between 10-22 years of age, a review of Powerlink's spare transformer strategy has been undertaken. The recommendation of this review is that an additional 375MVA 275/132kV transformer is required to adequately mitigate the risk of transformer failures within this fleet. For further details, please refer to '275/132kV Power Transformer Spares Review' (A5644763).

The objective of this project is to procure and install a new 375MVA 275/132kV system spare transformer at Ross substation by March 2027.

2. Project Drawing

Figure 1 – Ross Substation – Proposed location for second spare transformer

Proposed location – note this is indicative only – design to update based upon SME input

3. Deliverables

The following deliverables are to be provided in response to this Project Scope Report. The requirement dates for these deliverables will be communicated separately.

This project will follow the single stage approval process. The following deliverables are required to facilitate full project approval:

1. A report (e.g. Project Proposal) detailing the works to be delivered, proposed staging of delivery, resource requirements and confirmation of availability, and outage requirements

2. A class 3 estimate (minimum), based upon published design advices detailing key design elements and MSP RFQ

3. A basis of estimate document and risk table, detailing the key estimating assumptions and delivery risks

4. A detailed project staging and outage plan that includes primary plant, secondary systems and telecoms outages

4. Project Scope

4.1. Original Scope

The following scope presents a functional overview of the desired outcomes of the project. The proposed solution presented in the estimate must be developed with reference to the remaining sections of this Project Scope Report, in particular *Section 6 Special Considerations*.

Briefly, the project consists of procuring and installing a new 375MVA 275/132kV system spare transformer at Ross substation.

4.1.1. Transmission Line Works

Not applicable.

4.1.2. H013 Ross Substation Works

Design, procure, construct, test and commission all infrastructure required for the installation of a second system spare 375MVA 275/132kV transformer with consideration of the following:

- Transformer should have a 415V connection point for auxiliary components and should have the ability to connect the radiator bank to either end for ease of installation when replacing a failed transformer;

- Modify or replace the existing ex-reactor bund and foundation to suit the spare transformer (refer Figure 1);

- Connect the transformer to the existing oil separation tank. Review condition and capacity of the existing oil separation tank and modify as required to ensure

compliance with relevant environmental legislation (note assumption that F8858 line reactor will be decommissioned by end 2027);

- Provide an AC supply to the spare transformer;
- Clean the oil separation tank following completion of construction; and
- Update drawing records, SAP, config files etc accordingly.

4.1.3. Telecoms Works

Not applicable

4.1.4. Easement/Land Acquisition & Permits Works

Not applicable

4.2. Key Scope Assumptions

The following assumptions should be included in the estimating of this scope:

- F8858 Line Reactor will be decommissioned by end 2027.

4.3. Variations to Scope (post project approval)

Not applicable

5. Key Asset Risks

Asset risk management shall be in accordance with the Asset Risk Management Process Guideline (A4870713).

6. Project Timing

6.1. Project Approval Date

The anticipated date by which the project will be approved is March 2025.

6.2. Site Access Date

H013 Ross Substation is an existing Powerlink owned substation and access is available immediately.

6.3. Commissioning Date

The latest date for the commissioning of the new assets included in this scope is 31 March 2027.

7. Special Considerations

- Ross substation is currently impacted by 275kV CT Restricted Access Zones.
- Project to be executed in conjunction with CP.03089 Ross 4 Transformer Replacement. Consideration to be given to coordination of project activities / resourcing to maximise efficiencies.

8. Asset Management Requirements

Equipment shall be in accordance with Powerlink equipment strategies.

Unless otherwise advised Sarah Gilmour will be the Project Sponsor for this project. The Project Sponsor must be included in any discussions with any other areas of Network and Business Development including Asset Strategies & Planning.

9. Asset Ownership

The works detailed in this project will be Powerlink Queensland assets.

10. System Operation Issues

Operational issues that should be considered as part of the scope and estimate include:

- interaction of project outage plan with other outage requirements;
- likely impact of project outages upon grid support arrangements; and
- likely impact of project outages upon the optical fibre network.

11. Options

Not applicable

12. Division of Responsibilities

Not applicable

13. Related Projects

Project No.	Project Description	Planned Comm Date	Comment
Pre-requisite Projects			
Co-requisite Projects			
Other Related Projects			
CP.03089	Ross 4 Transformer Replacement	Dec 2026	Project activities/resources to be coordinated

CP.03094 Procurement of Spare 275/132kV Transformer

Concept Estimate

Table of Contents

1. Executive Summary

There are currently 37 regulated 275/132kV power transformers in Powerlink's network, with varying capacities from 200 to 375 MVA and varying nameplate ages from 2 to 40 years. These transformers are critical in enabling power flow between the 132kV network and the higher capacity 275kV network.

To mitigate the risk of failure of one of these transformers, a spare 375MVA 275/132kV transformer has been installed at Ross substation to ensure a replacement timeframe in the order of 1 to 6 months can be achieved. In the event that this spare transformer was not available, the replacement timeframe would now be in the order of 3 to 4 years due to transformer manufacturing and supply constraints (historically, the lead time for power transformers was in the order of one year). Therefore, an effective spare transformer strategy is essential to ensure load is not put at risk for extended periods.

Due to the significant increase in transformer lead time and also the increased failure rate of the 275/132kV transformer fleet between 10-22 years of age, a review of Powerlink's spare transformer strategy has been undertaken. The recommendation of this review is that an additional 375MVA 275/132kV transformer is required to adequately mitigate the risk of transformer failures within this fleet.

The assessment behind this proposal has established that the project can be delivered by December 2029.

The project will follow the single stage approval process.

1.1 Project Estimate

No escalation costs have been considered in this estimate.

		Total ($)
Estimate Class	5	
Base Estimate – Un-Escalated (2025/2026)		15,146,390
TOTAL		**15,146,390**

1.2 Project Financial Year Cash Flows

No escalation costs have been considered in this estimate.

DTS Cash Flow Table	Un-Escalated Cost ($)
To June 2028	104,686
To June 2029	9,399,978
To June 2030	5,641,726
TOTAL	**15,146,390**

2. Project and Site-Specific Information

2.1 Project Dependencies & Interactions

This project is related to the following projects:

Project No.	Project Description	Planned Commissioning Date	Comment
Dependencies			
	F8858 Line Reactor Decommissioning	Dec 2027	If there is sufficient capacity, the existing oil separation tank connected to the F8858 Line Reactor will be modified and repurposed for the new spare transformer.
Interactions			
Other Related Projects			
CP.03104	Replace 275kV CTs - Northern	Nov 2026	A Restricted Access Zone (RAZ) Works Plan will be required if the RAZ is not revoked by the time access is required.
CP.03089	Ross 4 Transformer Replacement	Dec 2026	Project activities/resources to be coordinated for efficiencies between the projects CP.03089 and CP.03094.

2.2 Site Specific Issues

- H013 Ross Substation is located 18km southwest of the Townsville CBD. It is surrounded by a regional residential suburb near the Ross River Dam.
- The substation consists of one yard of 275kV and 132kV equipment.
- Asbestos containing material (ACM) has been identified at H013 Ross Substation in the underground pipes in the switchyard. Maintaining the ACM in a condition that prevents exposure may be compromised if major refurbishment works are undertaken.
- There are 3 275kV Current Transformers at H013 Ross which have invoked a Restricted Access Zone(s) (RAZ) in the substation. The RAZ does not impact access to the H013 Ross Control Buildings, however access to the 275kV substation yard is restricted. The 275kV CTs are planned to be replaced and commissioned by November 2026 under CP.03104. An appropriate RAZ Works Plan will be required if the RAZ is not revoked by the time of works where access is required.

- The Townsville area is subject to the following average number of days of rain. Consideration was given to this when developing the project schedule.

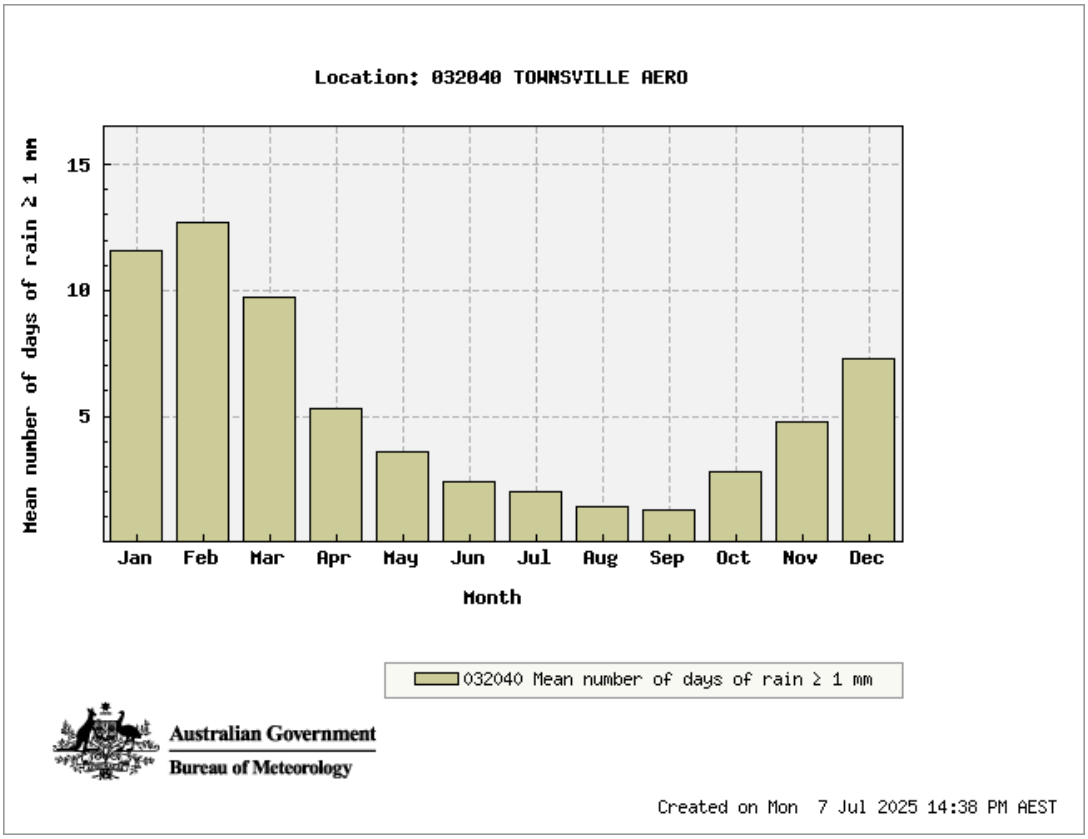

Figure 1 - Number of Days of Rain >1mm Townsville (Source: Bureau of Meteorology 28th June 2025)

3. Project Scope

The following works have been costed for in the estimate.

3.1 Substation Works

H013 Ross Substation

Design, procure, construct, test and commission all infrastructure required for the installation of a second system spare 375MVA 275/132kV transformer with consideration of the following:

- Transformer should have a 415V connection point for auxiliary components and should have the ability to connect the radiator bank to either end for ease of installation when replacing a failed transformer;
- Modify or replace the existing ex-reactor bund and foundation to suit the spare transformer (refer Figure 2);
- Connect the transformer to the existing oil separation tank, if the condition and capacity of the existing oil separation tank is sufficient (note assumption that F8858 line reactor will be decommissioned by end 2027). A new oil separation tank may be required (risk captured in cash flow estimate).
- Provide an AC supply to the spare transformer; and
- Update drawing records, SAP, config files etc accordingly.

Figure 2 - Proposed location for second spare transformer at H013 Ross Substation

Proposed location – note this is indicative only – design to update based upon SME input

3.2 Telecommunication Works

Not applicable.

3.3 Major Scope Assumptions

The following key assumptions were made for this Project Estimate.

- F8858 Line Reactor will be decommissioned by the end of 2027.
- Estimate is based on Powerlink architectures, standards and equipment in place and available at the time of development.
- H013 Ross 275kV Current Transformers will be replaced by November 2026, revoking the Restricted Access Zones, prior to work starting on the site.
- No Restricted Access Zone will be deployed on this site during construction.
- MSP resources will be available to complete the works.
- Procurement of long lead items align with project delivery requirements.
- A bench extension is not required.

The following assumptions have been made with respect to civil design:

- The existing substation platform and yard drainage system drains freely and is fit for purpose.
- The existing internal substation road is fit for purpose.

3.4 Scope Exclusions

- Easement acquisitions work, including permits, approvals, development applications are excluded. All works are within Powerlink-owned land.

- No outages are required.
- No major modification to the earth grid is included in this estimate.
- Removal of rock or unsuitable material, including asbestos and other contaminants.
- No modification and upgrading of the internal roads, lights, fences and gates.
- No modification on the existing transmission lines or HV underground cables is considered in this estimate.
- No allowance has been made for live substation works.

4. Project Execution

4.1 Project Schedule

This project will follow the single stage approval process.

A high-level project schedule has been developed for the project stages:

Milestones	High-Level Timing
Transformer Procurement	October 2024 – June 2029
Request for Class 3 Estimate	April 2027
Class 3 Project Proposal Submission	October 2027
Full Project Approval	December 2027
Project Development Phase 1 & 2	January 2028 – July 2028
ITT Submission (8 Weeks)	August 2028 – October 2028
Execute Delivery (including award of SPA contract)	November 2028
SPA Site Establishment	February 2029
SPA Civil Works and Construction	February 2029 – July 2029
MSP Site Establishment	December 2029
MSP Commissioning	December 2029
Project Commissioning	December 2029

4.2 Network Impacts

Not applicable.

4.3 Resourcing

Resources for the project will be completed by internal design resources with support from external design partners. The construction works will be completed by the following:

- Civil works to modify or replace ex-reactor foundation – SPA
- Transformer assembly and installation – Manufacturer

- Installation of AC supply cable for heaters and lights – MSP

5. Project Asset Classification

Asset Class	Base ($)	Base (%)
Substation Primary Plant	15,126,612	99.9
Substation Secondary Systems	19,777	0.1
TOTAL	**15,146,390**	**100**

Figure 3 - CP.03094 Asset Classification

6. References

Document name and hyperlink	Version	Date
Project Scope Report	1.0	04/10/2024