Investment Evaluation Summary (IES)

Project Details:

Project Name:	Replace secondary protection transformers at zone substations
Project ID:	00656
Thread:	Zone Substations
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	A
Work Category Code:	REUZO
Work Category Description:	Replace Urban/CBD Zones Other
Preferred Option Description:	Replacement of secondary protection transformers
Preferred Option Estimate (Nominal Dollars):	$950,000

	19/20	22/23	23/24	25/26
Unit ($)	N/A	N/A	N/A	N/A
Volume	2	1	1	1
Estimate ($)				
Total ($)	$360,000	$180,000	$230,000	$180,000

Governance:

Project Initiator:	Michael Healy	**Date:**	26/03/2015
Thread Approved:	David Ellis	**Date:**	02/11/2015
Project Approver:	David Ellis	**Date:**	02/11/2015

Document Details:

Version Number:	1

Related Documents:

Description	URL
IES REUZO replace secondary protection transformers at zone substations	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Zone%20Substations/DRAFT%20IES%20REUZO%20Replace%20secondary%20protection%20transformers%20at%20zone%20substations.docx

Section 1 (Gated Investment Step 1)

1. Background

The main supply points for the greater Hobart are the zone substations. These substations are supplied at 33kV and step the supply voltage down to 11kV. They range in capacity from 20MVA to 90MVA and on average they each supply approximately 5000 customer, both residential and commercial.

1.1 Investment Need

The secondary protection transformers are a critical component of the substation for monitoring operating conditions and for detecting and detecting faults. If a failure of a secondary transformer occurred it would result in mal-operation of the protection system. This situation could result in either result significant loss of customer supply or catastrophic damage to the substation.

At five of the zone substations partial upgrades of the protection systems have been previously undertaken, but the secondary transformers were serviceable condition and so they were not replaced at this time. Historically these devices have been failing on the network at servive age of 50 to 55 years.

The plan is to replace these secondary transformers prior to an in servce failure occurring. The scheduled replacement is as follows:

Zone Substation	Year commissioned	Replacement Year
Derwent Park	1964	2019/2020
Geilston Bay	1964	2019/2020
New Town	1969	2022/2023
Sandy Bay	1969	2023/2024
Bellerive	1971	2025/2026

1.2 Customer Needs or Impact

TasNetworks continues to undertake consumer engagement as part of business as usual and through the voice of the customer program. This engagement seeks in depth feedback on specific issues relating to:

- How it prices impact on its services;
- Current and future consumer energy use;
- Outage experiences (frequency and duration) and expectations;
- Communication expectations;
- STPIS expectations (reliability standards and incentive payments); and
- Increasing understanding of the electricity industry and TasNetworks;

Consumers have identified safety, restoration of faults/emergencies and supply reliability as the highest performing services offered by TasNetworks.

Consumers also identified that into the future they believe that affordability, green, communicative, innovative, efficient and reliable services must be provided by TasNetworks.

This project specifically addresses the requirements of consumers in the areas of safety and affordability.

1.3 Regulatory Considerations

This project is required to achieve the following capital and operational expenditure objectives as described by the National Electricity Rules section 6.5.7(a).

(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) The 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.

2. Project Objectives

The objective of this project is to replace the power transformers at zone substaions to ensure the security of supply is maintained for the site for long term.

3. Strategic Alignment

3.1 Business Objectives

Strategic and operational performance objectives relevant to this project are derived from TasNetworks 2014 Corporate Plan, approved by the board in 2014. This project is relevant to the following areas of the corporate plan:

- We understand our customers by making them central to all we do;
- We enable our people to deliver value; and
- We care for our assets, delivering safe and reliable networks services while transforming our business.

3.2 Business Initiatives

The business initiatives that relate to this project are as follows:

- Safety of our people and the community, while reliably providing network services, is fundamental to the TasNetworks business and remains our immediate priority; and
- We care for our assets to ensure they deliver safe and reliable network services

The strategic key performance indicators that will be impacted through undertaking this project are as follows:

- Price for customers – lowest sustainable prices;
- Zero harm – significant and reportable incidents; and
- Sustainable cost reduction – efficient operating and capital expenditure

4. Current Risk Evaluation

If TasNetworks does not replace there is a risk that a failure could occur resulting in a significant disruption to all customers supplied from these substaions. Under fault conditions protection systems may not operate correctly resulting in a signifcant public safety risk.

The assessment of risk was undertaken using TasNetworks' Risk Management Framework.

The level of risk identified was such that a treatment plan is required to reduce the risk down to a manageable level.

4.1 5x5 Risk Matrix

TasNetworks business risks are analysed utilising the 5x5 corporate risk matrix, as outlined in TasNetworks Risk Management Framework.

Relevant strategic business risk factors that apply are follows:

Risk Category	Risk	Likelihood	Consequence	Risk Rating
Customer	Loss of supply	Possible	Moderate	Medium
Network Performance	Partial disconnection of network	Possible	Minor	Low
Reputation	Damage to reputation from supply disruptions	Possible	Minor	Low
Safety and People	Personal injury or death to member of the public	Unlikely	Severe	High

Section 1 Approvals (Gated Investment Step 1)

Project Initiator:	Michael Healy	**Date:**	26/03/2015
Line Manager:		**Date:**	
Manager (Network Projects) or Group/Business Manager (Non-network projects):		**Date:**	
[Send this signed and endorsed summary to the Capital Works Program Coordinator.]			

Actions			
CWP Project Manager commenced initiation:		**Assigned CW Project Manager:**	
PI notified project initiation commenced:		**Actioned by:**	

Section 2 (Gated Investment Step 2)

5. Preferred Option:

The preferred option is to replace the secondary protection transformers at:

- Derwent Park Zone Substation;
- Geilston Bay Zone Substation;
- New Town Zone Substation;
- Sandy Bay Zone Substation; and
- Bellerive Zone Substation.

5.1 Scope

The scope would consist of:

- Replacement of secondary protection transformers i.e. current transformers and voltage transformers; and
- Commissioning of the protection system

at the following zones:

- Derwent Park
- Geilston Bay
- New Town
- Sandy Bay
- Bellerive

Zone Substation	Year commissioned	Replacement Year
Derwent Park	1964	2019/2020
Geilston Bay	1964	2019/2020
New Town	1969	2022/2023
Sandy Bay	1969	2023/2024
Bellerive	1971	2025/2026

5.2 Expected outcomes and benefits

Delivery of the program would achieve the following benefits:

- The public safety risk from a not clearing a fault on eth network would be greatly reduced; and
- the network reliability for the areas supplied by these substations would be maintained of the long term.

5.3 Regulatory Test

Not applicable

6. Options Analysis

6.1 Option Summary

Option description	
Option 0	Do nothing
Option 1 (preferred)	Replacement of secondary protection transformers

6.2 Summary of Drivers

Option	
Option 0	• Potential for significant power disruption • Potential for significant network disruption • Risk to reputation from asset failures resulting in large power disruption • Potential for harm under fault if protection system not operational

Option 1 (preferred)	• Greatly reduces the likelihood of customer impact from asset failures • Greatly reduces the risk of network disruption from asset failures • Greatly reduces the risk to reputation from a failure occurring that causes significant network disruption. • Greatly reduces the likelihood of an event occurring that has the potential to cause harm.

6.3 Summary of Costs

Option	Total Cost ($)
Option 0	$0
Option 1 (preferred)	$950,000

6.4 Summary of Risk

Option 0: Do Nothing

Customer supply risk remains at 'Medium', with safety risk remaining at 'High'.

Option 1: Replacement of both power transformers [Preferred Option]

Both customer supply risk and safety risk reduced to 'Low'.

6.5 Economic analysis

Option	Description	NPV
Option 0	Do nothing	$0
Option 1 (preferred)	Replacement of secondary protection transformers	$0

6.5.1 Quantitative Risk Analysis

Not applicable

6.5.2 Benchmarking

Maintaining network reliability for the electrical distribution network and minimising public safety risk is also considered a high priority for other DNSP's around Australia.

6.5.3 Expert findings

Nil

6.5.4 Assumptions

Nil

Section 2 Approvals (Gated Investment Step 2)

Project Initiator:	Michael Healy	**Date:**	26/03/2015
Project Manager:		**Date:**	

Actions			
Submitted for CIRT review:		**Actioned by:**	
CIRT outcome:			