Investment Evaluation Summary (IES)

Project Details:

Project Name:	Replace Zone Equipment - Batteries at Zone Substation
Project ID:	00400
Thread:	Protection and Control
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	B
Work Category Code:	REUPC
Work Category Description:	Replace Urban Zone Sub - Protection
Preferred Option Description:	Option 1 (preferred): Capital-based replacement of zone substation battery bank. Advantages: costs in completing this work are sustainable. Disadvantages: requires disposal of old battery bank.
Preferred Option Estimate (Nominal Dollars):	$206,450

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Unit ($)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume	1	1	1	1	1	1	1	1	1	1
Estimate ($)										
Total ($)	$20,645	$20,645	$20,645	$20,645	$20,645	$20,645	$20,645	$20,645	$20,645	$20,645

Governance:

Project Initiator:	Tim Sutton	**Date:**	11/03/2015
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	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Protection%20and%20Control/REUZO%20Replace%20Battery%20at%20Zone%20Substation.docx
NPV	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Protection%20and%20Control/NPV%20REUZO.xlsm

Section 1 (Gated Investment Step 1)

1. Background

TasNetworks (TN) has 12, 33/11 kV zone substations in its network. The modern batteries used within zone substations are relatively reliable with regards to asset life, so TN has moved to a program of replacing the zone substation batteries at ten-year intervals with no annual discharge testing. Any potential savings in life extension by annual discharge testing of the batteries to determine their condition were less than the cost of the discharge testing and battery maintenance.

1.1 Investment Need

TN has determined that zone substation CAPEX-based battery replacement is a less costly investment than OPEX based battery maintenance and therefore requires funding to renew these assets over the forthcoming regulatory period.

Figure 1: Zone substation battery bank

1.2 Customer Needs or Impact

TasNetworks continues to undertake a 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
- Increase 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, restoration of faults/emergencies and supply reliability.

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

2. Project Objectives

To undertake specified CAPEX-based replacement of zone substation battery banks at 10-year intervals.

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.
- 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
- 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
- Sustainable cost reduction – efficient operating and capital expenditure

4. Current Risk Evaluation

Do nothing is not an acceptable option to TN's risk appetite. The level of risk identified is such that a treatment plan is required to reduce the risks to a tolerable level, in line with TasNetworks' Risk Management Framework.

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	Outage effects on customer	Possible	Major	High
Environment and Community	Environmental damage	Unlikely	Minor	Low
Financial	Penalties resulting from reliability events following zone substation protection failure	Possible	Moderate	Medium
Network Performance	Damage to plant and equipment with no DC	Possible	Major	High
Regulatory Compliance	Penalties resulting from reliability events in the high density urban areas	Possible	Moderate	Medium
Reputation	Outage effects on customer	Possible	Moderate	Medium
Safety and People	Damage to personnel and/or the general public	Possible	Major	High

Section 1 Approvals (Gated Investment Step 1)

Project Initiator:	Tim Sutton	**Date:**	11/03/2015
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 zone substation battery banks at 10-year intervals.

5.1 Scope

Replace zone substation batteries according to install date, and perform acceptance test on each bank.

5.2 Expected outcomes and benefits

Reliable DC back-up supply to zone substation protection systems, for least cost to customer.

5.3 Regulatory Test

Not applicable.

6. Options Analysis

6.1 Option Summary

Option description	
Option 0	Do nothing.
Option 1 (preferred)	Option 1 (preferred): Capital-based replacement of zone substation battery bank. Advantages: costs in completing this work are sustainable. Disadvantages: requires disposal of old battery bank.
Option 2	Option 2: Revert to OPEX-based inspections and testing. Use OPEX funding to perform annual discharge testing and perform regular checks. Replace individual cells if required. Advantages: maximises the life of the battery bank. Disadvantages: battery bank may fail in service meaning no back up DC supply is available for the protection systems.

6.2 Summary of Drivers

Option	
Option 0	Ensure a reliable DC supply to the protection - does not address risk. Minimum cost to the customer - does not address.

Option 1 (preferred)	Ensure a reliable DC supply to the protection - addresses risk. Minimum cost to the customer - addresses.
Option 2	Ensure a reliable DC supply to the protection - partially addresses risk. Minimum cost to the customer - does not address.

6.3 Summary of Costs

Option	Total Cost ($)
Option 0	$0
Option 1 (preferred)	$206,450
Option 2	$211,790

6.4 Summary of Risk

This section outlines an overall residual asset risk level, for each of the options.

Option	Risk Assessment
Option 0	Medium
Option 1 (preferred)	Low
Option 2	Medium

6.5 Economic analysis

Option	Description	NPV
Option 0	Do nothing.	$0
Option 1 (preferred)	Option 1 (preferred): Capital-based replacement of zone substation battery bank. Advantages: costs in completing this work are sustainable. Disadvantages: requires disposal of old battery bank.	-$146,108
Option 2	Option 2: Revert to OPEX-based inspections and testing. Use OPEX funding to perform annual discharge testing and perform regular checks. Replace individual cells if required. Advantages: maximises the life of the battery bank. Disadvantages: battery bank may fail in service meaning no back up DC supply is available for the protection systems.	-$149,887

6.5.1 Quantitative Risk Analysis

Not applicable.

6.5.2 Benchmarking

Similar strategies have been adopted by mainland utilities for their regulatory submissions.

6.5.3 Expert findings

Not applicable.

6.5.4 Assumptions

- All costs are in 2014/15 dollars; and
- NPV includes OPEX to account for OPEX/CAPEX tradeoff.

Section 2 Approvals (Gated Investment Step 2)

Project Initiator:	Tim Sutton	**Date:**	11/03/2015
Project Manager:		**Date:**	

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