Investment Evaluation Summary (IES)

Project Details:

Project Name:	Replace fault indicators in Overhead Systems
Project ID:	00394
Thread:	Protection and Control
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	B
Work Category Code:	RERPC
Work Category Description:	Replace reclosers - controllers
Preferred Option Description:	Option 3: CAPEX-based replacement using 70% stand alone units 30% remotely monitored units (preferred). Advantages: reasonable balance between all options, addresses risk. Disadvantages: more costly than do nothing approach.
Preferred Option Estimate (Nominal Dollars):	$714,610

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Unit ($)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Volume	23	23	23	23	23	23	23	23	23	23
Estimate ($)										
Total ($)	$71,461	$71,461	$71,461	$71,461	$71,461	$71,461	$71,461	$71,461	$68,973	$68,973

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/RERPC%20Replace%20Fault%20Indicators%20in%20Overhead%20Network.docx
NPV	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Protection%20and%20Control/NPV%20RERPC%20(Fault%20Indicators).xlsm

Section 1 (Gated Investment Step 1)

1. Background

TasNetworks (TN) has an aged fleet of 620 proximity-type overhead line fault indicators (LFI) in its network. These devices produce a sequence of flashing lights following a line fault occurrence, which provides for faster restoration activities post-interruption.

Produced in the early 1990s and with no prior maintenance program, these devices were beginning to fail in service before a 5-year cyclic battery replacement program (OPEX) was introduced in 2012/13. During the forthcoming regulatory period TN considers that this maintenance program alone won't keep the asset fleet in healthy working order chiefly due to age.

As such, a CAPEX-based replacement program is proposed to run in parallel which targets the oldest devices in the fleet, in alignment with the existing maintenance regime.

1.1 Investment Need

With an age profile extending back to the 1990s, TN believes the fleet of overhead fault indicators is in need of replacement. In addition to asset age, equipment obsolescence and a lack of product support are also important factors.

With proximity-type fault indicators no longer available, conductor mounted sensors (three per site) will be required to replace the existing assets. TN recommends installing a small percentage of these sites with additional communications equipment, to facilitate remote monitoring and to further improve fault response capability as required by reliability performance.

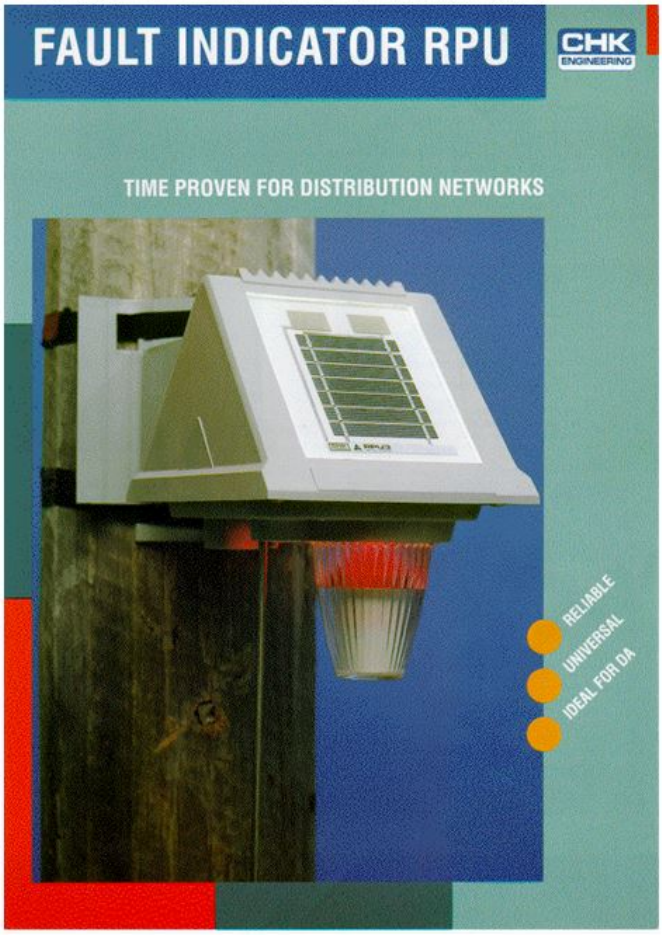

Figure 1: Proximity-type fault indicator

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 overhead fault indicators.

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 above 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	Minor	Low
Environment and Community	Environmental damage	Unlikely	Negligible	Low
Financial	Penalties resulting from reliability events following recloser controller failure	Possible	Minor	Low
Network Performance	Damage to plant and equipment with asset failure	Unlikely	Negligible	Low
Regulatory Compliance	Penalties resulting from reliability events in the critical infrastructure area	Possible	Minor	Low
Reputation	Outage effects on customer	Possible	Minor	Low
Safety and People	Damage to personnel and/or the general public	Possible	Minor	Low

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 scale back to a 75% volume OPEX-based maintenance regime and introduce a 25% CAPEX-based replacement program, to renew the fleet. Of these replacements, 30% is proposed to be remotely monitored and 70% stand-alone.

5.1 Scope

• Replace 25% of the yearly maintenance volume with new conductor-mounted fault indicators (31 per year); and

• Of the 31 devices per year, replace 9 devices (30%) with remote monitoring capability and 22 (70%) as stand-alone.

5.2 Expected outcomes and benefits

A reduction of the time taken to patrol feeders and isolate the faulty line sections. This has significant bearing on our fault response capability and in turn, results in reliability benefits for our customers.

5.3 Regulatory Test

Not applicable.

6. Options Analysis

6.1 Option Summary

Option description	
Option 0	Option 0: Do Nothing – maintain existing maintenance program under AROPC. Advantages: costs in completing this work are least. Disadvantages: does not address risk associated with ageing assets, obsolescence and lack of manufacturer support.
Option 1	Option 1: CAPEX-based replacement using 100% stand alone units. Advantages: costs in completing this work are sustainable. Disadvantages: response times would take longer, reliability performance invariable.
Option 2	Option 2: CAPEX-based replacement using 100% remotely monitored units. Advantages: extensive remote visibility of the network, reliability performance persuadable, addresses risk.

	Disadvantages: cost.
Option 3 (preferred)	Option 3: CAPEX-based replacement using 70% stand alone units 30% remotely monitored units (preferred). Advantages: reasonable balance between all options, addresses risk. Disadvantages: more costly than do nothing approach.

6.2 Summary of Drivers

Option	
Option 0	Ensure a reliable FI device is maintained into the future - does not address risk. Improve fault response efficiencies - does not address. Minimum cost to the customer - addresses.
Option 1	Ensure a reliable FI device is maintained into the future - addresses risk. Improve fault response efficiencies - does not address. Minimum cost to the customer - partially addresses.
Option 2	Ensure a reliable FI device is maintained into the future - addresses risk. Improve fault response efficiencies - addresses. Minimum cost to the customer - does not address.
Option 3 (preferred)	Ensure a reliable FI device is maintained into the future - addresses risk. Improve fault response efficiencies - addresses. Minimum cost to the customer - partially addresses.

6.3 Summary of Costs

Option	Total Cost ($)
Option 0	$0
Option 1	$590,550
Option 2	$1,720,810
Option 3 (preferred)	$714,610

6.4 Summary of Risk

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

Option	Risk Assessment

Option 0	High
Option 1	Medium
Option 2	Low
Option 3 (preferred)	Low

6.5 Economic analysis

Option	Description	NPV
Option 0	Option 0: Do Nothing – maintain existing maintenance program under AROPC. Advantages: costs in completing this work are least. Disadvantages: does not address risk associated with ageing assets, obsolescence and lack of manufacturer support.	$0
Option 1	Option 1: CAPEX-based replacement using 100% stand alone units. Advantages: costs in completing this work are sustainable. Disadvantages: response times would take longer, reliability performance invariable.	-$588,378
Option 2	Option 2: CAPEX-based replacement using 100% remotely monitored units. Advantages: extensive remote visibility of the network, reliability performance persuadable, addresses risk. Disadvantages: cost.	-$1,229,701
Option 3 (preferred)	Option 3: CAPEX-based replacement using 70% stand alone units 30% remotely monitored units (preferred). Advantages: reasonable balance between all options, addresses risk. Disadvantages: more costly than do nothing approach.	-$658,771

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.
- 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:			