Investment Evaluation Summary (IES)

Project Details:

Project Name:	Address safety and environmental Issues in ground mounted substations - Cover live front boards
Project ID:	00525
Thread:	Ground Mounted Substations
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	D
Work Category Code:	SIGMS
Work Category Description:	Address Safety and Env Issues in GMS
Preferred Option Description:	Cover live front boards with perspex screens
Preferred Option Estimate (Nominal Dollars):	$216,000

	17/18
Unit ($)	$6,000
Volume	36
Estimate ($)	$216,000
Total ($)	$216,000

Governance:

Project Initiator:	Jarad Hughes	**Date:**	20/03/2015
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**

Address Safety and Environmental Issues in Ground Mounted Substations - IES	-

Section 1 (Gated Investment Step 1)

1. Background

TasNetworks own and maintain approximately 1900 ground mounted distribution substations which can be divided into the following types:

1. Building: Indoor equipment enclosed in a permanent building with working space and passageways;
2. Fence: Predominantly outdoor equipment, but may be indoor equipment installed in individual weatherproof housings, within a fenced enclosure;
3. Kiosk: Indoor equipment enclosed in a common weatherproof housing with little or no working space or passageway. Provision is made for individual items to be changed;
4. Padmounted: A complete assembly, which is installed or replaced as a unit on a concrete foundation at ground level; and
5. Vault: Indoor equipment housed in an underground vault with access by a vertical hatchway from a road or footpath.

These assets were installed from the 1950s and the technology and designs used previously vary greatly to those of today's standards. As such a number of these contain safety and environmental issues of which this program aims to address. The issues are as follows:

- Lack of adequate oil containment
- Asbestos containing material
- Fire standards compliance
- Exposed energised equipment (live front boards)

1.1 Investment Need

TasNetworks is required to comply with the Work Health and Safety Act and Regulations 2012, along with the Building Code of Australia, AS 2067 Substation and High Voltage Installations Exceeding 1 kV AC, AS 3000 Electrical Wiring Rules and WorkSafe Tasmania – How to Manage and Control Asbestos in the Workplace Code of Practice.

Exposed energised equipment (live front boards):

A significant number of the older distribution substations have exposed live equipment on the low voltage AC distribution board. The construction of these boards means that live parts are easily accessible and pose a risk to personnel safety. The distribution business began a replacement program in 2007 to remove the 233 live front board sites within the system. An audit was completed in 2012/2013 to quantify the precise number of sites with live front boards and the risk level at each site.

Due to the notable safety risks these boards presented to operational personnel a decision was made in 2012 to accelerate this program. In many instances a more cost effective and timely approach over complete board replacement has been to cover up the live components on the board as seen below.

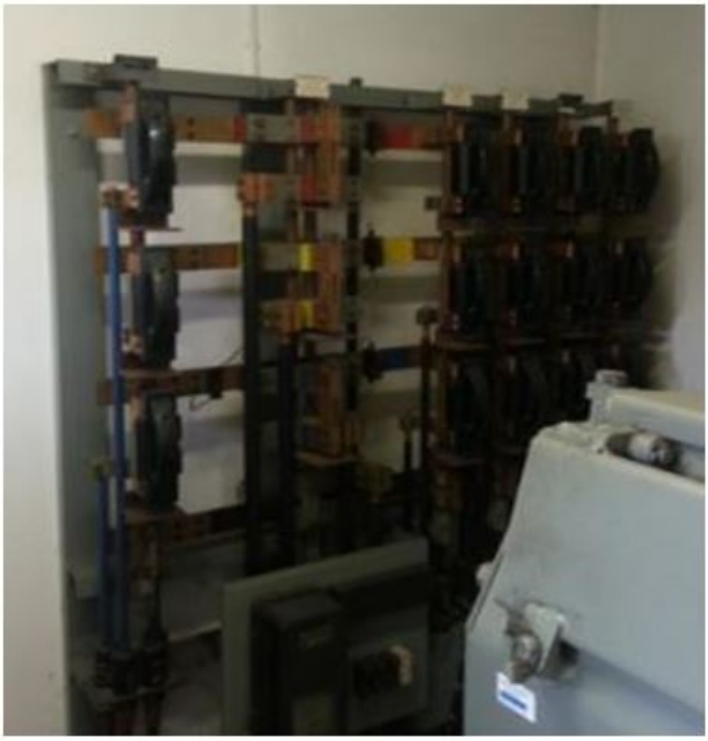

Figure 4 - Exposed live front board inside of a building type substation

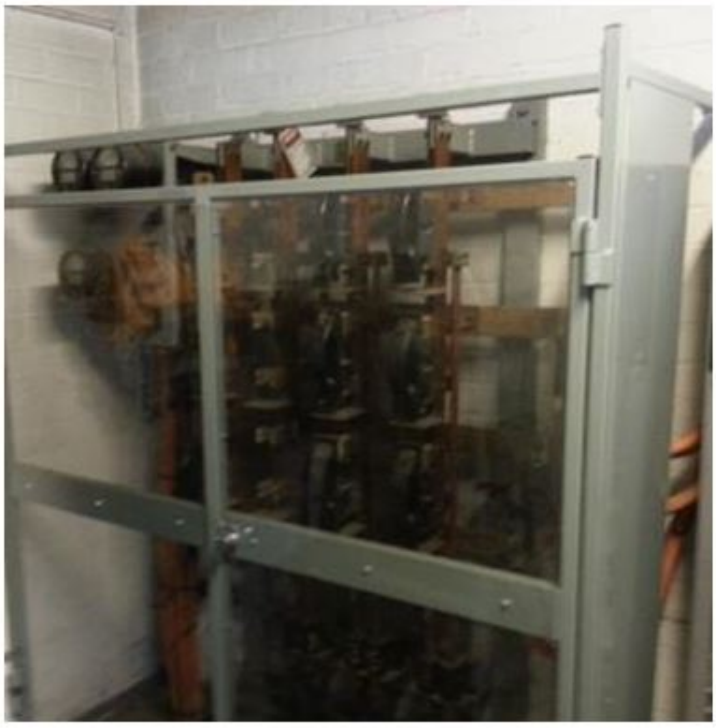

Figure 5 - Live front board covered up with Perspex enclosure

This approach has allowed the rate to be increased significantly from 10 to 40 sites per annum. As of March 2015 there are approximately 111 sites remaining in the system, and TasNetworks plans to have the safety risks address at the sites by the end of 2017/2018.

The accelerated program has resulted in a significant reduction in the risk due to this change in replacement rate. According to TasNetworks' risk framework the consequence remains at severe (fatality) until all sites have been addressed, although the likelihood is significantly reduced.

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)
- 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
- affordability, green, communicative, innovative, efficient and reliable services

Customers will continue to be consulted through routine TasNetworks processes, including the Voice of the customer program, the Annual Planning Review and ongoing regular customer liaison meetings.

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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).

6.5.7 (a) Forecast capital expenditure

(2) comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;

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

2. Project Objectives

To cover live front boards with perspex screens to prevent accidental contact

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:

- Zero harm – significant and reportable incidents

4. Current Risk Evaluation

If TasNetworks where to take a do nothing approach operational personnel would remain unprotected from exposed live front boards with the potential for serious injury or fatality occurring.

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
Safety and People	Death or serious injury to a TasNetworks Operator from contacting energised electrical equipment	Unlikely	Severe	High

Section 1 Approvals (Gated Investment Step 1)

Project Initiator:	Jarad Hughes	**Date:**	20/03/2015
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:

Install perspex screens to cover live front boards

5.1 Scope

Scope of work:

Install perspex screens to cover live front boards

It is expected that at the beginning of the regulatory period (2017/2018), 36 building type substations with uncovered live front boards will remain on the network.

5.2 Expected outcomes and benefits

Following the completion of this work all TasNetworks' building type substations that contain live front boards will be covered by perspex. This will prevent accidental contact with the board that could lead to a serious injury or fatality

5.3 Regulatory Test

Not applicable

6. Options Analysis

6.1 Option Summary

Option description	
Option 0	Do nothing
Option 1 (preferred)	Cover live front boards with perspex screens

6.2 Summary of Drivers

Option	
Option 0	Does not reduce the safety risk of live front boards
Option 1 (preferred)	Adequately addresses risk at a sustainable cost

6.3 Summary of Costs

Option	Total Cost ($)

Option 0	$0
Option 1 (preferred)	$216,000

6.4 Summary of Risk

Option 0: Do Nothing

Keep live front boards uncovered until they are replaced with a modern covered unit.

Advantages:

- Lowest cost solution
- Deferral of CAPEX

Disadvantages

- Does not fix the safety issue
- Does not reach current compliance levels

Does not address risks previously identified in Section 4.

Option 1: Cover Live Front Boards [Preferred Option]

Live front boards will be covered with transparent covers so that personnel cannot accidently come in contact with the live bus work during inspections or maintenance.

Advantages:

- Removes safety threat

Disadvantages:

- Capital expenditure required

This is the lowest cost option to reduce the business risks to manageable.

6.5 Economic analysis

Option	Description	NPV
Option 0	Do nothing	$0
Option 1 (preferred)	Cover live front boards with perspex screens	$0

6.5.1 Quantitative Risk Analysis

Not applicable

6.5.2 Benchmarking

Minimising safety risks to operational personel is strategy of other DNSP's

6.5.3 Expert findings

Not applicable

6.5.4 Assumptions

Nil

Section 2 Approvals (Gated Investment Step 2)

Project Initiator:	Jarad Hughes	**Date:**	20/03/2015
Project Manager:		**Date:**	

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