Investment Evaluation Summary (IES)

Project Details:

Project Name:	Address safety and environmental issues in ground mounted substations - Oil containment
Project ID:	00523
Thread:	Ground Mounted Substations
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	A
Work Category Code:	SIGMS
Work Category Description:	Address Safety and Env Issues in GMS
Preferred Option Description:	Install oil containment
Preferred Option Estimate (Nominal Dollars):	$800,000

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Unit ($)	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000	$20,000
Volume	4	4	4	4	4	4	4	4	4	4
Estimate ($)	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000
Total ($)	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000	$80,000

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	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Ground%20Mounted%20Substations/DRAFT%20SIGMS%20-%20Address%20Safety%20and%20Environmental%20Issues%20in%20Ground%20Mounted%20Substations%20IES.docx

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.

Oil containment issues:

Distribution transformers contain a mineral insulating oil for both electrical insulation of the internal components and cooling.

Australian standard AS 2067, Clause 6.7.11 requires that every high voltage installation containing equipment with more than 500 litres of a liquid dielectric such as transformer oil shall have provision for containing the total volume of any possible leakage and meet the overall objectives of Appendix H of AS 1940, the storage and handling of flammable and combustible liquids (reference 10).

Older installations do not have the same level of oil containment controls as modern installations and accordingly represent a higher level of risk to the environment should an asset fail.

Figure 1 - Unbunded transformer next to waterway

TasNetworks has experienced a small number of oil spill incidents in the recent years, where the oil has not been contained on site due to no oil containment.

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 ensure TasNetworks minimises the environmental risk that oil filled trasformers present to the environment.

Ensure compliance 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.

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 there would be an increase in unbunded oil spills, an increased risk of public or personnel contracting asbestos related illnesses, less effective fire doors and remain unprotected from exposed live front boards that have potential for serious injury or fatality.

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

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	Environmental remediation and follow up work required as a result of an oil spill	Possible	Negligible	Low

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 oil containment for building type substations where transformer replacements are occurring

5.1 Scope

This work is to align with REGTF – Replace ground mounted transformers, where 4 transformers per year are to be replaced.

Oil containment will be required to be installed at these 4 sites.

This work will include creation of sloping floors, the use of grates, sealing cable trenches and anything else required to contain the volume of oil in 1 transformer if a leak occurs

5.2 Expected outcomes and benefits

It is expected that following the implementation of this program, any oil leaks from new transformers as a result of manufacturing defects will be contained on the site

5.3 Regulatory Test

Not applicable

6. Options Analysis

6.1 Option Summary

Option description	
Option 0	Do nothing
Option 1 (preferred)	Install oil containment

6.2 Summary of Drivers

Option	
Option 0	Environmental incidents may occur following an oil leak developing on a transformer
Option 1 (preferred)	This will create no environmental incidents following an oil leak developing on a transformer

6.3 Summary of Costs

Option	Total Cost ($)
Option 0	$0
Option 1 (preferred)	$800,000

6.4 Summary of Risk

Option 0: Do Nothing

Environmental risk will be maintained at its current level. The oil containment infrastructure currently doesn't comply.

Option 1: Install Oil Containment [Preferred Option]

The likelihood of causing an environmental incident is eliminated with the replacement of transformers in substations that do not have adequate oil containment. This will make TasNetworks compliant with Australian standards and best industry practices.

6.5 Economic analysis

Option	Description	NPV
Option 0	Do nothing	$0
Option 1 (preferred)	Install oil containment	$0

6.5.1 Quantitative Risk Analysis

Not applicable

6.5.2 Benchmarking

Other DNSPs also have strategies in place to minimise the environmental impact of their electrical network

6.5.3 Expert findings

Not applicable

6.5.4 Assumptions

No oil bunding exists at the sites where transformers are being replaced

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:			