

Investment Evaluation Summary (IES)



Project Details:

Project Name:	Refurbish Single Phase Regulators
Project ID:	00520
Thread:	HV Regulators
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	B
Work Category Code:	REURG
Work Category Description:	Replace Regulator Ground Mtd Single Phase
Preferred Option Description:	<p>Option 1: Refurbish Regulators</p> <p>Perform routine mechanical maintenance on single phase (Cooper) HV regulators at a rate of every 15 years, or 100,000 taps, whichever occurs first, as well as refurbish units when they are identified as poor condition.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • Less unplanned failures • Maintain system performance <p>Disadvantages:</p> <ul style="list-style-type: none"> • CAPEX required <p>This is the lowest cost option to reduce the business risks to manageable level and ensure regulatory obligations are met.</p>
Preferred Option Estimate (Nominal Dollars):	\$450,000

	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25	25/26	26/27
Unit (\$)	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000
Volume	3	3	3	3	3	3	3	3	3	3
Estimate (\$)	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000
Total (\$)	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000	\$45,000

Governance:

Project Initiator:	James Goodger	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
Refurbish Single Phase Regulators - IES	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/High%20Voltage%20Regulators/DRAFT%20IES%20REURG%20Replace%20Regulator%20Single%20Phase%20(Cooper)%20-%20Faults%20-%20Issues%20-%20End%20of%20Life.docx

Section 1 (Gated Investment Step 1)

1. Background

High voltage (HV) regulators are installed at various locations along high voltage feeders to maintain voltage levels within the distribution network to industry acceptable standards.

HV regulators are generally located on rural 11 kV and 22 kV feeders according to the load and length of these feeders, with several installed in rural zone substations to provide on load tapping.

HV regulators can be split into two groups:

- Single phase units - usually pole mounted in an open-delta configuration (two tanks), but may also be ground mounted; and
- Three phase units - typically older units that are ground mounted within a fenced enclosure.

There are forty two high voltage regulator sites on the network that use single phase regulators.

1.1 Investment Need

The HV regulators require routine maintenance to maximise their operational life. After a period of approximately 15 years a complete refurbishment of the units is required.

If the units were not refurbished their condition would continue to deteriorate until failure occurred. This would result in loss of supply to customers for an extended period until the unit was repaired or replaced.

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.

1.3 Regulatory Considerations

This project is required to achieve the following capital expenditure objectives as described by the National Electricity Rules section 6.5.7(a) and 6.5.6(a). 6.5.7 (a) Forecast capital expenditure

- (1) meet or manage the expected demand for standard control services over that period;
- (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

Refurbish and perform routine mechanical maintenance on single phase (Cooper) HV regulators.

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
- We will transform our business with a focus on:
 - the customer, and a strong commitment to delivering services they value
 - an appropriate approach to the management and allocation of risk
 - a well run, efficient business, that delivers sustainable returns to the Tasmanian community and is resilient to future challenges.

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

- Customer engagement and service – customer net promoter score
- Price for customers – lowest sustainable prices
- Network service performance – meet network planning standards
- Sustainable cost reduction – efficient operating and capital expenditure

4. Current Risk Evaluation

If TasNetworks does not implement a refurbishment plan for the Coopers single phase high voltage regulators then premature asset failure and reactive replacement will be required.

The oil containment tanks have been known to rust to an un-repairable state in less than six years. The loss of oil would result in an environmental incident, which depending on the site location could also result in a risk to public safety.

If no action is taken there will be an increase in regulator failures which will cause supply and power quality issues for customers.

The business risk associated with these assets has been evaluated by using the TasNetworks risk 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	Regulator failure or equivalent asset issue would result in loss of supply to customers.	Possible	Moderate	Medium
Network Performance	Regulator failure or equivalent asset issue may result in significant customer disruption, in terms of voltage compliance, downstream of the regulator.	Possible	Moderate	Medium

Section 1 Approvals (Gated Investment Step 1)

Project Initiator:	James Goodger	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:

Preferred option is to perform routine mechanical maintenance on single phase (Cooper) HV regulators at a rate of every 15 years, or 100,000 taps, whichever occurs first.

5.1 Scope

Work to be undertaken:

- Repair to the tanks of a suitable X 2 single phase regulators by providing protective coating of epoxy paints as referred in DM # 30110824.
- Relocate Tap Changer Motor drive Capacitor from inside of the tank to outside in control cubicle, if required (mainly for older units).
- Replace Tap Position indicator.
- Replace damaged tap changer contacts and repair any other minor defects
- Remove the pole mounted single phase regulators and replace with the refurbished single phase regulators.

5.2 Expected outcomes and benefits

Routine mechanical maintenance is required to ensure continued safe and reliable operation of the asset. NOTE: Maintenance is capitalised as it involves significant internal component replacement and tank maintenance, extending the life of the asset.

5.3 Regulatory Test

Not applicable.

6. Options Analysis

6.1 Option Summary

Option description	
Option 0	<p>Option 0: Do Nothing The regulators would not be refurbished and the rust issue will prematurely end the life of the Coopers HV regulators.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • Lowest cost <p>Disadvantages:</p> <ul style="list-style-type: none"> • Supply issues downstream from failures • Voltage drops downstream from failures • Noncompliance with regulatory obligations • Increase in OPEX • Premature Failure <p>Does not address risks previously identified in Section 4</p>
Option 1 (preferred)	<p>Option 1: Refurbish Regulators</p> <p>Perform routine mechanical maintenance on single phase (Cooper) HV regulators at a rate of every 15 years, or 100,000 taps, whichever occurs first, as well as refurbish units when they are identified as poor condition.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • Less unplanned failures • Maintain system performance <p>Disadvantages:</p> <ul style="list-style-type: none"> • CAPEX required <p>This is the lowest cost option to reduce the business risks to manageable level and ensure regulatory obligations are met.</p>

6.2 Summary of Drivers

Option	
Option 0	Non-preferred - may result in asset failure causing significant voltage and security issues on the affected feeder.
Option 1 (preferred)	Ensure safe and reliable operation of the asset

6.3 Summary of Costs

Option	Total Cost (\$)
Option 0	\$0

Option 1 (preferred)	\$450,000
----------------------	-----------

6.4 Summary of Risk

Option 0: Do Nothing

The risk to a reduction in both network performance and reliability occurring remains at medium

Option 1: Continue to refurbish the high voltage regulators [Preferred Option]

The routine refurbishment of the single phase high voltage regulators will maintain the network performance and reliability at its current levels.

6.5 Economic analysis

Option	Description	NPV
Option 0	<p>Option 0: Do Nothing The regulators would not be refurbished and the rust issue will prematurely end the life of the Coopers HV regulators.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • Lowest cost <p>Disadvantages:</p> <ul style="list-style-type: none"> • Supply issues downstream from failures • Voltage drops downstream from failures • Noncompliance with regulatory obligations • Increase in OPEX • Premature Failure <p>Does not address risks previously identified in Section 4</p>	\$0
Option 1 (preferred)	<p>Option 1: Refurbish Regulators</p> <p>Perform routine mechanical maintenance on single phase (Cooper) HV regulators at a rate of every 15 years, or 100,000 taps, whichever occurs first, as well as refurbish units when they are identified as poor condition.</p> <p>Advantages:</p> <ul style="list-style-type: none"> • Less unplanned failures • Maintain system performance <p>Disadvantages:</p> <ul style="list-style-type: none"> • CAPEX required <p>This is the lowest cost option to reduce the business risks to manageable level and ensure regulatory obligations are met.</p>	\$0

6.5.1 Quantitative Risk Analysis

Not applicable.

6.5.2 Benchmarking

Routine maintenance and refurbishment is an activity that is also undertaken by other Australian utilities.

6.5.3 Expert findings

Not applicable.

6.5.4 Assumptions

Not applicable.

Section 2 Approvals (Gated Investment Step 2)

Project Initiator:	James Goodger	Date:	20/03/2015
Project Manager:		Date:	

Actions

Submitted for CIRT review:		Actioned by:	
CIRT outcome:			