Investment Evaluation Summary (IES)

Project Details:

Project Name:	Generator controls for grid connect customer generation
Project ID:	00944
Thread:	Non Network Solutions
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	C
Work Category Code:	NNCMC
Work Category Description:	Non Network Optimisation Constraint Management Capex
Preferred Option Description:	In this option generator controls are installed when the plant is constructed some years in advance of the controls being requried
Preferred Option Estimate (Nominal Dollars):	$112,500

	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 ($)	$22,500	$22,500	$22,500	$22,500	$22,500	$22,500	$22,500	$22,500	$22,500	$22,500

Governance:

Project Initiator:	Andrew Fraser	**Date:**	08/04/2015
Thread Approved:	Andrew Fraser	**Date:**	19/10/2015
Project Approver:	Stephen Jarvis	**Date:**	19/10/2015

Document Details:

Version Number:	1

Related Documents:

Description	URL
NPV sheet	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Non-Networks%20Solutions/Demand%20Mgmt%20Plan/Generator%20control%20NPV.xlsm
Economic Analysis	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Non-Networks%20Solutions/Demand%20Mgmt%20Plan/Generator%20controls%20economic%20analysis.docx

Section 1 (Gated Investment Step 1)

1. Background

There are many customers in Tasmania which have backup generation of significant size installed. These generators are usually not capable of grid infeed. They can only supply the customers' plant islanded from the grid.

The recent commercial and industrial demand survey revealed that there are around 22 (out of 102) large customers (over 4000 MWh annual usage) with backup generation in Tasmania. This indicates that around 22% of customers this size have backup generation.

These generators can be a valuable source of network support in in cases where there is not enough network capacity.

It is generally cheaper to install grid connect controls to a generator when it is built rather than later. This IES aims to determine how many generators are installed each year which may be useful in the future for network support. it also aims ot determine if it is economically viable install the controls when the plant is built instead of at the time the generation is required.

1.1 Investment Need

Embedded generation can be a valuable alternative to traditional network solutions. TasNetworks' existing fleet of mobile generators has served this function successfully for several years. Customer generation could provide this backup at a fraction of the cost.

1.2 Customer Needs or Impact

The primary customers affected directly by this project will be those where the generator controls are installed. This IES only covers the work required to install the controls, not the network support agreement that uses them. This would be justified separately when the agreement is to be enacted.

The cost impact on other customers is expected to be minimal. Generator controls would only be installed if it were cheaper than installing them later and the customer has indicated that they are not opposed to entering into a network support agreement at some point in the future.

1.3 Regulatory Considerations

This project assists in meeting the following capital expenditure objectives[1]:

- Meet or manage the expected demand for standard control services;
- comply with all applicable regulatory obligations or requirements associated with the provision of standard control services;
- maintain the quality, reliability and security of supply of standard control services; and

maintain the reliability and security of the distribution system through the supply of standard control services

The most expensive credible option is less than $5m and therefore does not require a regulatory investment test.

---

[1] National electricity rules 6.5.7(a) version 71

2. Project Objectives

The objective of this project is to meet or manage the demand for standard control services in the most economically efficient manner

3. Strategic Alignment

3.1 Business Objectives

Strategic and operational performance objectives relevant to this project are derived from TasNetworks 2015 Corporate Plan, approved by the board in 2015. This project is relevant to the following areas of the corporate plan.

- Customers: We understand our customers by making them central to all we do
  - Installing controls in customer plant will require working with customers closely to provide effective solutions. Additionally it demonstrates our commitment to customer led solutions to network problems.
- Our Business: We care for our assets, delivering safe and reliable network services while transforming our business
  - These generator controls allow existing reliability to be maintained without building new assets; and
  - These generator controls allow us to meet expected future network demand without building new assets.

3.2 Business Initiatives

The business initiatives that relate to this project are as follows:

- Our Customers: Framework for predictable and sustainable pricing
  - Submit Distribution determination proposal to the AER in January 2016.
- Looking after our assets
  - Review of seven worst performing distribution feeders – feeding into action plan

- Sustainable cost reduction – efficient operating and capital expenditure
  - Preinstalling controls is more economically efficient than post install and thus results in lower costs to customers.
  - Meeting demand growth in the lowest cost manner.

4. Current Risk Evaluation

Moderate safety risk to people due to the introduction of generator control scheme.

Moderate risk to plant equipment being damaged due to generator control scheme malfuction.

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

Environment and Community	Community backlash if industry is damaged	Rare	Minor	Low
Financial	Support agreement fails. Higher GSL/STPIS payments	Possible	Minor	Low
Financial	Controls are installed when not required - TasNetworks receives no value form this investment	Possible	Negligible	Low
Network Performance	Localised interruption of supply to customers caused by generator failure to operate	Possible	Minor	Low
Regulatory Compliance	Failure of generator leads to breach of compliance obligations	Unlikely	Minor	Low
Reputation	Damage of TasNetworks reputation due to issues with installed plant or agreement	Unlikely	Minor	Low
Reputation	Installed equipment damages customer plant	Unlikely	Moderate	Medium
Reputation	Contractual issues with customer	Possible	Minor	Low
Safety and People	Grid infeed from customer plant causes fatality or injury	Rare	Major	Medium

Section 1 Approvals (Gated Investment Step 1)

Project Initiator:	Andrew Fraser	**Date:**	08/04/2015
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 install grid-connect capability on selected backup generators as they are installed on the network. This capability would not be used immediately but is installed some time in advance of the network limitation.

There is a significant cost advantage to installing generator controls when the plant is built:

- Panels are configured correctly for the equipment;
- All controls are specified as capable of grid connect rather than specified later; and
- There is no disruption to the generator availability.

This can vary the cost by a factor of 3 or more.

5.1 Scope

The scope of this project is to install grid connect controls on backup generators. These controls are installed up to 10 years in advance of the date the network support agreement is to be enacted when the plant is new.

5.2 Expected outcomes and benefits

The expected outcome of this project is that embedded generation is made available for network support where it is required. The primary benefits are the cost savings in preinstalling controls when the plant is installed rather than later retrofitting.

Success is measured by validation (i.e. how many controls that were installed were used). This is necessarily a trailing indicator, but is unavoidable due to the nature of the project.

5.3 Regulatory Test

No credible option is greater than $5 million therefore a regulatory investmetnt est is not required.

6. Options Analysis

At this stage the size and location of backup generation to be installed in the next revenue period is unknown. This makes traditional option analysis difficult. Instead this analysis is done in stages:

- First it will determine approximately how many backup generators are installed per year in Tasmania;
- Then it will determine how many of these could reasonably be expected to be in parts of the network where constraints are predicted;
- Then it will determine if embedded generation is the preferred option in some problem domain; and
- Then it will determine under which if any circumstances generator controls can be installed early.

This options analysis is performed in a seperate document (reference 1). The results are presented in this IES.

6.1 Option Summary

Option description	
Option 0	Do nothing
Option 1	In this option generator controls are retrofitted when the network support is required.
Option 2 (preferred)	In this option generator controls are installed when the plant is constructed some years in advance of the controls being requried

6.2 Summary of Drivers

Option	
Option 0	In this option embedded generation is not used and controls are not installed. Can be less economically favourable than using embedded generation
Option 1	In this option generator controls are retrofitted when the network support is required. The base case for using generation. More expensive than preinstalling
Option 2 (preferred)	In this option generator controls are preinstalled some years ahead of then being required. Can be more economically favourable than post installing controls if the generation is required in the near enough future.

6.3 Summary of Costs

Option	Total Cost ($)
Option 0	$0
Option 1	$337,500
Option 2 (preferred)	$112,500

6.4 Summary of Risk

Safety assesments such as HazOps that identify possible issues will be carried out early in the project to reduce the safety risk to people.

TasNetowrks will undertake adequate engineering review of the generator control scheme for each scheme installed.

6.5 Economic analysis

Option	Description	NPV
Option 0	Do nothing	$0

Option 1	In this option generator controls are retrofitted when the network support is required.	$0
Option 2 (preferred)	In this option generator controls are installed when the plant is constructed some years in advance of the controls being requried	$103,700

6.5.1 Quantitative Risk Analysis

The primary risk preinstalling generator controls is that they are not required. The investment decision requires the appropriate risk weighting. This is particularly true if the requirement is far enough in the future that the need is uncertain. Basic application guidelines are in

6.5.2 Benchmarking

6.5.3 Expert findings

6.5.4 Assumptions

Weighted average cost of capital is 3.8%

Section 2 Approvals (Gated Investment Step 2)

Project Initiator:	Andrew Fraser	**Date:**	08/04/2015
Project Manager:		**Date:**	

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