Investment Evaluation Summary (IES)

Project Details:

Project Name:	Replace Transformer H-structures
Project ID:	00687
Thread:	Overhead
CAPEX/OPEX:	CAPEX
Service Classification:	Standard Control
Scope Type:	D
Work Category Code:	RETXH
Work Category Description:	Replace Transformer 'H'-pole structures
Preferred Option Description:	Replace H-structures based on condition.
Preferred Option Estimate (Nominal Dollars):	$1,200,000

	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 ($)	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000

Governance:

Project Initiator:	Erin Cook	**Date:**	26/03/2015
Thread Approved:	David Ellis	**Date:**	02/11/2015
Project Approver:	David Eccles	**Date:**	30/10/2015

Document Details:

Version Number:	1

Related Documents:

Description	URL
RETXH NPV	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Overhead%20Systems%20and%20Structures/RETXH%20Replace%20Transformer%20H-structures/TasNetworks%20NPV%20RETXH.xlsm

RETXH IES	http://projectzone.tnad.tasnetworks.com.au/business-projects/nis-program/DD17SAM/Deliverables/Overhead%20Systems%20and%20Structures/RETXH%20Replace%20Transformer%20H-structures/RETXH%20Investment%20Evaluation%20Summary%20(IES).docx

Section 1 (Gated Investment Step 1)

1. Background

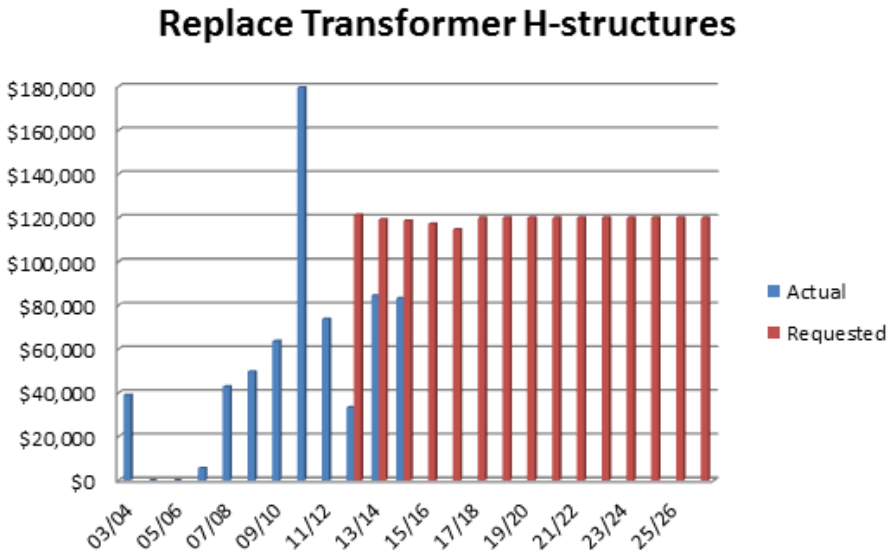
This program covers the replacement of transformers on H-structures due to their condition and a small number of sites overhanging roadways and being vulnerable to being hit by high loads. A separate program is required due to their high removal and redesign costs when compared to a transformer mounted on a single pole. The replacement solution is a single pole substation for smaller loads, or the installation of a ground mounted substation if the load is large.

1.1 Investment Need

The purpose of this program is to replace poor condition existing H-structure and transformer with single pole design. H-structures are generally replaced when one of the supporting poles is condemned (as part of the normal pole inspection program). Sites are prioritised based on condition (identified through asset inspections) and locations for public safety issues.

There are currently 242 H-structures in the system, with 184 of them in urban areas.

The historic costs and requested budget for RETXH are shown in figure 1 below.



1.2 Customer Needs or Impact

TasNetworks continues to undertake 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)
- Increasing 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 and affordability.

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) and 6.5.6(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

The purpose of the program is to replace poor condition existing H-structure and transformer with single pole design.

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 TasNetworks' 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	Disruption to customers resulting from transformer failures in service	Almost Certain	Negligible	Medium
Environment and Community	Transformer H-structure failure causes localised damage to surrounding environment (e.g oil spill into adjacent waterways, etc)	Possible	Minor	Low
Financial	Excessive payouts from reliability incentive schemes (NCEF, GSL, STPIS) resulting from transformer failures in service	Likely	Negligible	Low
Network Performance	Localised interruption to supply	Rare	Major	Medium
Safety and People	Transformer H-structure failure causes risk to members of the public (e.g through falling equipment, leaking oil or pole top fire)	Rare	Major	Medium

Section 1 Approvals (Gated Investment Step 1)

Project Initiator:	Erin Cook	**Date:**	26/03/2015
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 replace poor condition existing H-structure and transformer with single pole design.

5.1 Scope

Replace existing H-structure and transformer with single pole design.

5.2 Expected outcomes and benefits

The expected outcomes of this program are continued safe and reliable running of the network. Replacing transformer H-structures based on their condition presents the lowest life cycle cost while reducing environmental and safety risk as well as reducing fault response and customer outages.

PROGRAM BENEFITS

- Reduced environmental and safety risk
- Reduced fault response
- Reduced customer outages

5.3 Regulatory Test

6. Options Analysis

Option 0: Do Nothing

Do not replace transformer H-structures due to poor condition

Advantages:

- No upfront costs

Disadvantages:

- Does not reduce the likelihood of injury or fatality due to a failing H-structure.
- Does not reduce the likelihood of exposure of the public to energised electrical equipment or being hit by a failed H-structure.

- Does not reduce the likelihood of environmental exposure to oil spill from failing H-structure
- Customers will be exposed to increased unplanned outages.

Option 1: Replace H-structures based on condition

Advantages:

- Costs in completing this work are sustainable
- Minimises the likelihood of exposure of the public to energised electrical equipment or being hit by a failed H-structure.
- Minimises the likelihood of environmental exposure to oil spill from failing H-structure
- Avoids exposing customers to increased unplanned outages.

Disadvantages:

- Cannot completely eliminate the risk of H-structures failing in service

Option 2: Replace H-structures – Total population over 10 years

Advantages:

- Minimises the likelihood of exposure of the public to energised electrical equipment or being hit by a failed H-structure.
- Minimises the likelihood of environmental exposure to oil spill from failing H-structure
- Avoids exposing customers to increased unplanned outages.

Disadvantages:

- The high costs in completing this work are not sustainable

6.1 Option Summary

Option description	
Option 0	Do nothing. Do not replace poor condition transformer H-structures.
Option 1 (preferred)	Replace H-structures based on condition.
Option 2	Replace H-structures – Total population over 10 years

6.2 Summary of Drivers

Option			
Option 0	**Minimise risks to public safety**	**Minimise outage frequency and duration**	**Deliver the most cost effective solution**
	The risks to public safety from H-structure failure are high.	There will be a higher incident of unplanned outages due to H-structure failure.	This option has the lowest upfront costs. Additional costs to the Business are incurred in the form of NECF and STPIS payments. As this option does not address the risk to public safety it is highly likely to involve further costs due to incidents and legal proceedings.
Option 1 (preferred)	**Minimise risks to public safety**	**Minimise outage frequency and duration**	**Deliver the most cost effective solution**
	The risks to public safety from H-structure failure are low, but cannot remove the risk entirely.	There will be a lower incident of unplanned outages due to H-structure failure.	This is the lowest cost option that addresses the risk to public safety.
Option 2	**Minimise risks to public safety**	**Minimise outage frequency and duration**	**Deliver the most cost effective solution**
	The risks to public safety from H-structure failure are low, decreasing with time as they are removed from the Network.	There will be a lower incident of unplanned outages due to H-structure failure.	This option is high cost. The reduction in risk does not justify the high cost of this option.

6.3 Summary of Costs

Option	**Total Cost ($)**

Option 0	$0
Option 1 (preferred)	$1,200,000
Option 2	$13,300,000

6.4 Summary of Risk

The below table shows the residual risk with the preferred option in place. The preferred option reduces the residual risk from the uncontrolled risk rating.

Risk Category	Risk	Likelihood	Consequence	Residual Risk
Financial	Excessive payouts from reliability incentive schemes (NCEF, GSL, STPIS) resulting from transformer failures in service	Unlikely	Negligible	Low
Customer	Disruption to customers resulting from transformer failures in service	Possible	Negligible	Low
Network Performance	Localised interruption to supply	Possible	Minor	Low
Environment and Community	Transformer H-structure failure causes localised damage to surrounding environment (e.g oil spill into adjacent waterways, etc)	Unlikely	Minor	Low
Safety and People	Transformer H-structure failure causes serious injury to members of the public (e.g through falling equipment, leaking oil or pole top fire)	Unlikely	Major	Medium

6.5 Economic analysis

Option	Description	NPV
Option 0	Do nothing. Do not replace poor condition transformer H-structures.	$0
Option 1 (preferred)	Replace H-structures based on condition.	-$496,276
Option 2	Replace H-structures – Total population over 10 years	-$5,504,529

6.5.1 Quantitative Risk Analysis

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6.5.2 Benchmarking

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6.5.3 Expert findings

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6.5.4 Assumptions

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Section 2 Approvals (Gated Investment Step 2)

Project Initiator:	Erin Cook	**Date:**	26/03/2015
Project Manager:		**Date:**	

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