Asset Management Plan

Service Performance

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Authorisations

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Review cycle	1 Year	

Responsibilities

This document is the responsibility of the Asset Performance Team, Tasmanian Networks Pty Ltd, ABN 24 167 357 299 (hereafter referred to as "TasNetworks").

Please contact the Asset Performance Team Leader with any queries or suggestions.

- Implementation All TasNetworks staff and contractors.
- Compliance All group managers.

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Record of revisions

Section number	Details
	New Document

Table of Contents

1 Purpose

The purpose of this document is to describe:

- TasNetworks' service performance management strategy for 2015 to 2020;
- influencing factors on the service performance management strategy;
- key business processes that influence service performance outcomes and the associated systems that support these processes;
- current service performance levels; and
- initiatives to address poor service performance.

2 Scope

This document covers all aspects of the transmission, distribution and telecommunications network that have a customer service or network performance outcome.

Phone call service performance (within the distribution AER STPIS) is out of scope as management of this activity is not the responsibility of the SAM group.

3 Strategic Alignment and Objectives

This asset management plan has been developed to align with both TasNetworks' Asset Management Policy and Strategic Objectives.

It is part of a suite of documentation that supports the achievement of TasNetworks strategic performance objectives and, in turn, its mission. This asset management plan is not bound to a specific asset class and identifies the issues and strategies relating to whole of network service performance and the activities that can to be undertaken to address the identified issues at varying levels of the system.

Figure 1 represents TasNetworks documents that support the asset management framework. The diagram highlights the existence of, and interdependence between, the Plan, Do, Check, Act components of good asset management practice.

As a prudent network service provider, TasNetworks manages the network by balancing cost, risk and performance to deliver reliable levels of service and performance to its customers. Network service and performance is a primary aspect of TasNetworks' customer service and must meet the requirements of customers and the Tasmanian community, while also meeting the needs of TasNetworks.

TasNetworks' service performance objectives are detailed in Table 1 below.

Table 1: Strategic alignment

Document	Objective
Asset Management Policy	"Manage our assets to meet the strategic goals, measures and initiatives outlined in the Corporate Plan"
	"Continually adapt, benchmark and improve asset management strategies and practices…"
	"Develop and continually improve asset management processes and systems to optimise asset management efficiencies and decision making processes"
	"Maintain a complete and accurate register and documentation system of all our assets"
Corporate Plan	"No net penalties, as measured by STPIS"
Business Plan	"Network service performance maintained"
	"Review and plan developed to address seven worst performing distribution feeders"
Strategic Asset Management Plan	"Service performance will be maintained at **current overall network service levels**, whilst service to poorly performing reliability communities will be improved to meet regulatory requirements"
SAM Team Plan	"Maintain network performance at corporate targets"
	"Establish and report on performance targets for network assets"
	"Develop and implement an asset incident investigation process"

TasNetworks has defined 'current overall network service levels' as the five year historical average ending 2012-13.

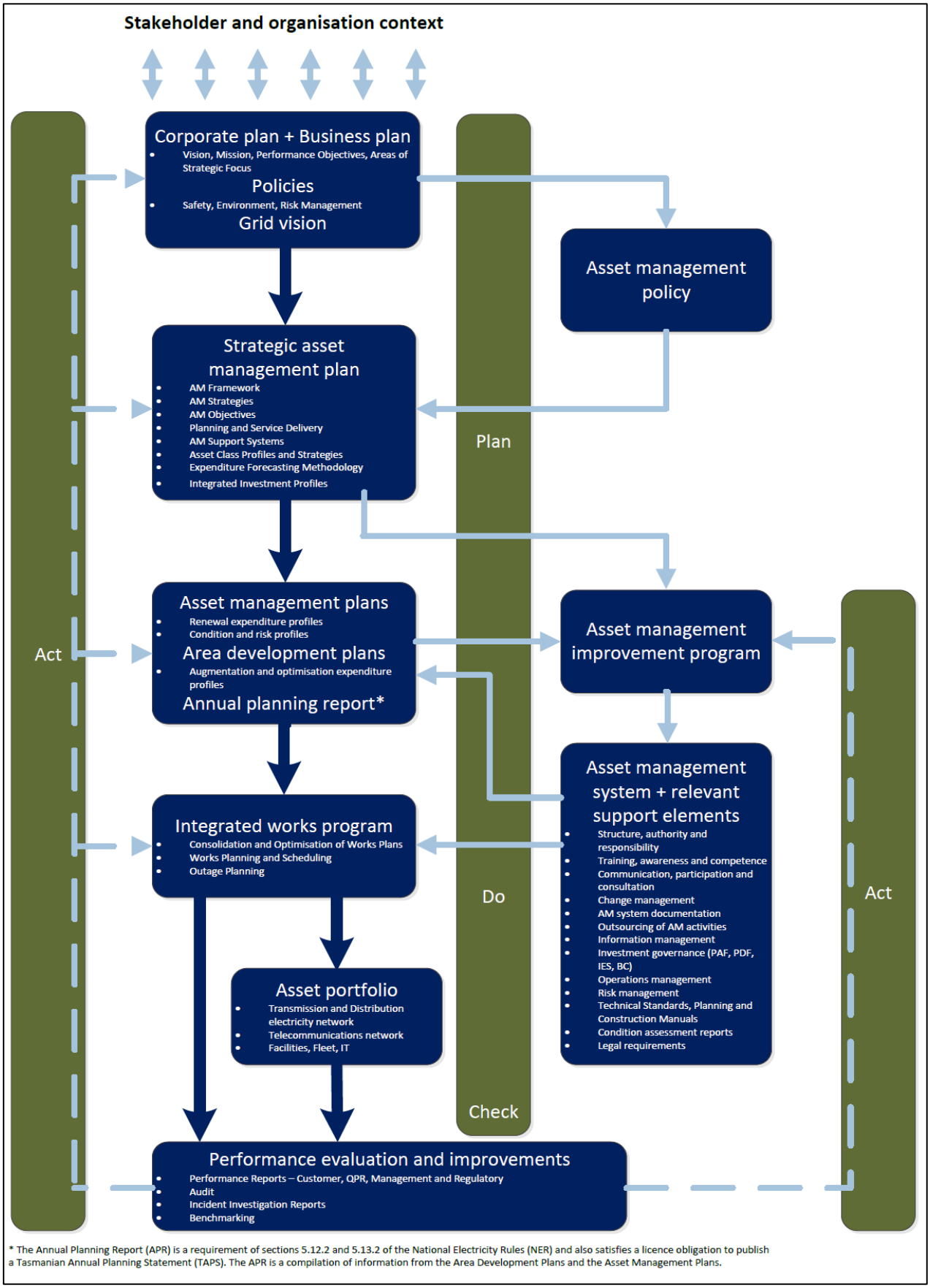
In alignment with TasNetworks' broader business objectives, this service performance objective will be achieved while:

- providing lowest sustainable prices and maximising value to our customers;
- managing TasNetworks' risk profile to main a safe and secure electricity supply;
- complying with regulatory, code and legislative responsibilities;
- sustainably and efficiently managing the network both now and in the future with respect to cost effectiveness and service; and
- responding to consumer input and feedback.

This strategy does not preclude TasNetworks from enhancing network reliability where system, community or feeder performance is either deteriorating or consistently inadequate. Investment in service performance improvement strategies is to be managed within TasNetworks regulated investment allowances.

This asset management plan describes the management frameworks, strategies and programs developed to maintain service performance with the aim of achieving these objectives.

Figure 1 – TasNetworks Asset Management Documentation Framework



4 TasNetworks' operating environment

TasNetworks must consider the current internal and external environments within which the business operates when setting strategies to achieve the best balance of cost, risk and performance that meet the requirements of shareholders, customers, and the business. A number of key considerations are described in more detail below.

4.1 Internal

The internal operating environment includes those aspects of service performance over which TasNetworks has significant influence.

4.1.1 Benchmarked performance

As a prudent asset manager that is actively seeking to achieve sustainable pricing, it is incumbent on TasNetworks to continuously strive to identify and implement operational efficiencies, without adversely impacting on the corporate risk profile.

To assist in this process, TasNetworks regularly benchmarks the cost and performance of its operational activities against other network service providers both nationally and internationally, identifying where TasNetworks is performing well, and where further improvement may be possible. Benchmarking activities include items such as the:

- AER's annual regulatory information notices for distribution and transmission networks;
- biennial International Transmission Operations and Maintenance Study (ITOMS); and,
- ESAA's annual network sector survey.

4.1.2 Asset condition

Network assets are at various stages in their asset life cycles. Varying methods of condition monitoring are applied to different asset classes throughout their lives to minimise the risk of service failure and to ensure that assets are renewed within appropriate timeframes, with consideration always given to prudent deferral of capital investment.

To maximise asset life while minimising whole of lifecycle cost, TasNetworks is committed to continuous improvement of its asset condition monitoring activities.

4.1.3 Culture

The delivery of TasNetworks' service performance management strategy is highly dependent on TasNetworks personnel approaching their daily activities within a cultural framework that is focused on providing lowest sustainable prices and maximising value to our customers, while managing TasNetworks' risk profile to maintain a safe and secure electricity supply.

To ensure this cultural framework is maintained, TasNetworks will engage employees through TasNetworks' culture development programs and through a cycle of continuous feedback and improvement regarding network service performance. The outcomes of this program will continue to feed into the service performance management strategy.

4.1.4 Pricing

To ensure TasNetworks delivers value to its customers at the lowest sustainable price, no expenditure above the regulated allowance will be incurred for reliability projects. Operating efficiencies and the prudent deferral of capital investment will be actively pursued across all aspects of reliability performance to deliver value to our customers.

4.2 External

The external operating environment includes those aspects of service performance that are predominantly imposed on TasNetworks by external bodies and over which TasNetworks has less influence.

4.2.1 Compliance

To maintain baseline levels of safety and security, TasNetworks is subject to a number of legislative and contractual compliance requirements. An assessment of the risk associated with these requirements is undertaken, with controls prioritised and applied to its business processes to deliver a safe and reliable network for TasNetworks' customers, contractors and internal workforce.

Ensuring ongoing compliance will always be a critical consideration in the establishment of future reliability management strategies.

4.2.2 Customers

Customer consultation completed by TasNetworks in 2014 revealed critical information regarding customer expectations relating to reliability. Key survey findings included:

- 90 per cent of customers believe that the number of outages they currently experience is acceptable (frequency); and,
- 94 per cent of customers stated that the acceptable duration for outages is between one and five hours.
- the following ranking of the various aspects of service provision by TasNetworks:
    - safe supply of electricity;
    - reliability of supply;
    - restoration of faults and emergencies; and
    - cost.

Additional customer consultations conducted as part of TasNetworks' recent transmission determination found that the majority of customers are:

- unwilling to pay more for increased reliability;
- unwilling to pay less for a lower level of reliability.

Therefore it is incumbent on TasNetworks to identify service performance management initiatives that deliver the required service performance outcomes while ensuring expenditure remains within regulated investment allowances and while.

In achieving this, there are expectations from customers and the Tasmanian public that TasNetworks will:

- maintain the safety of the public, contractors and TasNetworks employees;
- be environmentally responsible;
- respond to network incidents; and
- provide a secure network.

To further understand and respond to customer value drivers, TasNetworks will continue to engage customers on an ongoing basis through the 'Voice of the Customer' program. The outcomes of this program will continue to feed into the service performance management strategy.

4.2.3 Regulation

External regulation is an important mechanism by which network service providers are incentivised to ensure customer reliability, and other aspects of customer service, are considered within the business' investment and operational decision making framework.

4.2.3.1 Australian Energy Regulator (AER)

At a national level the AER assesses network expenditure to ensure network service providers are prudently and efficiently managing their network. To ensure cost and risk outcomes are not achieved at the expense of service performance the AER applies service target performance incentive schemes (STPIS) at the distribution and transmission levels.

There are financial incentives and penalties associated with each STPIS and these are generally expressed as a percentage of allowable revenue. The incentives and penalties can result in customers paying more, or less, for their electricity service. To minimise the impact on customer pricing TasNetworks can choose to forego additional revenue that they may achieve in a performance period, as occurred in 2013-14.

4.2.3.2 Office of the Tasmanian Economic Regulator (OTTER)

At a state level, OTTER assesses service performance through an annual performance reporting process and an incident reporting process (applied when incidents occur).

There are no financial incentives or penalties associated with OTTER performance targets.

4.2.3.3 Summary of external reporting obligations

Table 2 provides a summary of reporting obligations for the AER and OTTER. When comparing, it should be noted that while the name and intent of a number of performance measures are the same, the underlying definitions will differ. These definitions are described in more detail in documentation available from the AER website, or from the Zone (R151088).

Table 2: AER and OTTER reporting obligations

	Measure	AER	OTTER
Transmission	Loss of supply events	✓	✓
	Outage duration	✓	✓
	Circuit outage rate	✓	
	Market impact	✓	
	Network capability	✓	
	Proper operation of equipment	✓	
	Plant availability		✓

	Connection site reliability and availability		✓
Distribution	Frequency of unplanned outages (SAIFI)	✓	✓
	Duration of unplanned outages (SAIDI)	✓	✓
	Phone call service	✓	
	Guaranteed service level payments (GSLs)		✓

5 What is service performance?

5.1 Service performance granularity

TasNetworks strives to maintain existing network service performance levels whilst prudently and efficiently managing our assets to meet our customer expectations.

Service performance will vary across an electricity network, depending on many factors such as geography, weather conditions, existing network interconnectivity, vegetation density and customer criticality. To ensure that service performance management activities use best endeavours to address customer requirements, TasNetworks measures service performance at various levels across the:

- transmission network:
    - total network (system);
    - circuit; and,
    - connection site.
- distribution network:
    - total network (system);
    - planning area;
    - reliability community;
    - feeder; and
    - customer.

TasNetworks also assigns varying levels of criticality to its distribution customer base, to ensure that the security of electricity supply is commensurate with the criticality of the individual customer (eg. customers reliant on life support systems) or connected load.

Categories used by TasNetworks (as prescribed by the AER and OTTER) include:

- critical infrastructure;
- high density commercial;
- urban and regional centres;
- higher density rural; and
- lower density rural.

5.2 How do we measure service performance?

The effectiveness of TasNetworks' service performance management plan is measured through its ability to achieve the corporate objective of "No net penalties, as measured by STPIS".

To break this down to a more practical level, TasNetworks measures its performance against agreed targets as set by the AER and OTTER.

The following section summarises the performance measures prescribed by the AER and OTTER, and the types of positive customer outcomes that are incentivised through the application of targets against these measures.

Further detail and definitions regarding these measures can be found in documentation available from the AER website, or from the Zone (R151088).

5.2.1 Supply reliability (transmission and distribution)

Supply reliability measures the impact of outages on customers with respect to outage frequency and outage duration. Outages are classified as planned or unplanned. The distribution outage management system allows for additional classification of unplanned outages into unplanned, third party and transmission related.

Outage frequency reflects the effectiveness of TasNetworks' asset management strategies in the prevention of outages. It is measured using the number of loss of supply (LOS) events and average circuit outage rate for the transmission network, and a system average interruption frequency index (SAIFI) for the distribution network.

Outage duration reflects the responsiveness of TasNetworks field operations at responding to unplanned or forced outage events. It is measured using average unplanned outage duration for the transmission network, and a system average interruption duration index (SAIDI) for the distribution network.

Supply reliability performance is a component of the AER's distribution and transmission service target performance incentive schemes (STPIS).

5.2.2 Plant availability (transmission)

Plant availability is a transmission network measure of the time that plant is in service, or available for service. Plant may be unavailable for service due to planned, forced or fault outages.

TasNetworks monitors the availability of its transmission system assets in three circuit categories:

- transmission line circuits;
- transformer circuits; and,
- capacitor bank circuits.

TasNetworks also monitors the availability of supply and demand connection points as part of its reporting requirements to customers and regulators. Connection point availability data is published in the annual Performance and Information Report to OTTER.

5.2.3 Supply security (transmission)

Supply security is a measure of the diversity built into transmission network.

Supply and demand connection points are categorised as firm or non-firm. A firm connection point is one that has sufficient plant diversity and capacity to enable continuity of supply following the loss of a network element. Conversely, a non-firm connection point may lose supply following the loss of a network element.

Customers value firm connection points because it is more likely that supply will be maintained when a transmission outage occurs. From the perspective of network design, it is important to balance the benefits of a secure supply against the additional costs associated with plant diversity.

TasNetworks determines the level of security of a firm connection point by monitoring plant outages. The instances where a firm connection point becomes non-firm due to a plant outage are reported as regulatory requirements.

The numbers of firm and non-firm connection points are shown in Table 3.

Table 3: TasNetworks' firm and non-firm connection sites in 2014-15

Connection point type	Firm	Non-firm
Distribution customers	29	14
Directly connected customers	5	9

5.2.4 Supply quality (transmission and distribution)

TasNetworks' customers require a high quality electricity supply to ensure that their electrical equipment and appliances:

- operate as designed and can be used to full capability;
- operate continuously when required, with minimal risk of interruption; and
- are at minimal risk of damage when connected to TasNetworks' distribution or transmission system.

To meet these requirements it is necessary to maintain the supply from the system to a standard set by the National Electricity Rules, with the following electrical quantities maintained within set limits:

- frequency;
- power frequency voltage magnitude;
- voltage fluctuations;
- harmonic or notching distortion of voltage; and
- voltage balance.

Power quality meters are installed at various points in the transmission network to collect information on power quality information such as frequency and voltage fluctuations. Power quality performance is assessed against the technical requirements stated in Schedule 5.1a and 5.1 of NER on a monthly basis.

TasNetworks' measure of supply quality performance is the number of validated customer complaints regarding supply quality. Typically following a customer complaint, TasNetworks will undertake a detailed analysis using specialised measuring equipment over a reasonable period. Should TasNetworks' measurements show that there is an issue (eg. supply quality does not meet

NER obligations), the complaint will be taken as validated. TasNetworks then addresses the supply quality issue.

5.2.5 Market impact component (transmission)

The market impact component (MIC) of the transmission STPIS was introduced in 2014. The MIC parameter measures the effect of congestion caused by a transmission circuit outage on the electricity market. The MIC parameter has been introduced to improve market operation, by providing incentives for TNSPs to minimise the number of transmission circuit outages that have significant impact on electricity prices. The MIC is part of a strategy by the AER to improve the value provided by existing capital assets.

The MIC parameter is the number of *dispatch inter*vals where an outage on a TNSP's network results in a *network outage constraint* with a *marginal val*ue greater than $10/MWh.

Transmission congestion occurs when the transmission network has insufficient capacity to support the optimal generator dispatch based upon generator bids. Generators are then dispatched out of merit order to maintain transmission operation within the required limits. These limits (or constraints) may be thermal (the transmission line cannot carry a larger quantity of power without exceeding temperature limits), related to system stability, or related to maintaining voltage stability.

5.2.6 Network capability component (transmission)

The Network Capability Component (NCC) was introduced to the transmission STPIS in December 2012. The NCC improves transmission capability by incentivising NSPs to relieve transmission constraints through the commitment of limited operational and capital expenditure to:

- improve the capability of those elements of the transmission system most important to determining spot prices; or
- improve the capability of the transmission system at times when transmission network users place greatest value on the reliability of the transmission system.

6 What are our targets and how are we performing?

6.1 Overall performance objective

As described above, TasNetworks uses the measures prescribed by the AER and OTTER in ascertaining the effectiveness of its service performance management plan and associated strategies, with an overall outcome of "No net penalties, as measured by STPIS".

To provide greater focus within the business, TasNetworks has assigned target performance outcomes at a number of different levels within the transmission and distribution STPISs. These targets are summarised in Table 4.

Table 4: TasNetworks' overall STPIS scheme performance targets

	Performance Category	Performance Target
Transmission	AER STPIS – Service Component	25% of maximum possible bonus
	AER STPIS - Market Impact Component	25% of maximum possible bonus
	AER STPIS - Network Capability Component	100% of program implemented
	OTTER Performance	100% compliance with target
Distribution	AER STPIS[1]	20% of maximum possible bonus
	OTTER Performance	100% compliance with target

To achieve the corporate objective of "No net penalties, as measured by STPIS" it would be easy for TasNetworks to assign a more conservative performance target for each of performance categories listed above (eg. 0% of maximum possible bonus).

However, considering that the business has a choice whether to forego or bank (in the case of distribution performance) additional revenue received under the STPIS, a positive target is deemed to provide greater incentive for TasNetworks to actively strive to achieve more effective customer service performance outcomes, under the proviso that this does not come at either increased cost or risk to the business.

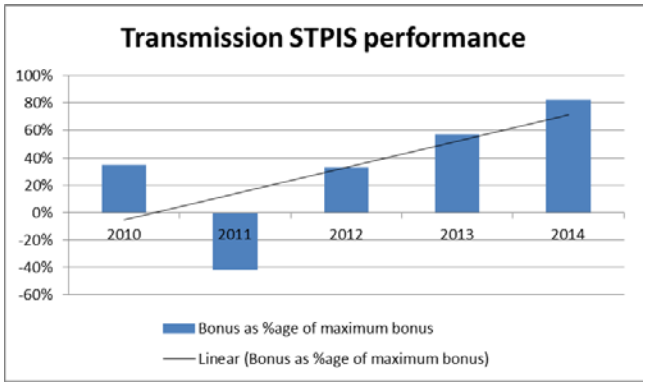
[1] Excluding Phone Call and GSL performance measures

6.2 Transmission system performance

6.2.1 Overall transmission STPIS performance

TasNetworks' historical performance against the transmission STPIS is shown in Figure 2.

Figure 2 – TasNetworks' historical transmission STPIS performance

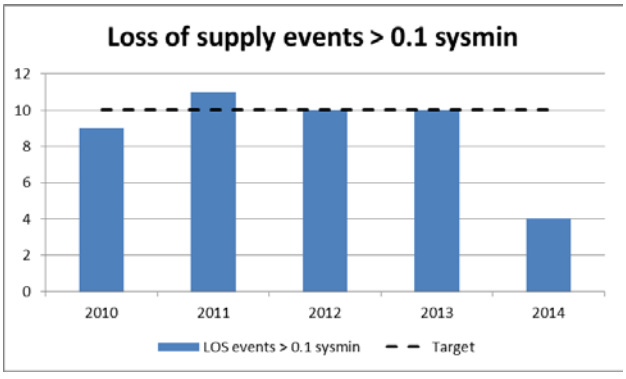


Performance Assessment: **Good**

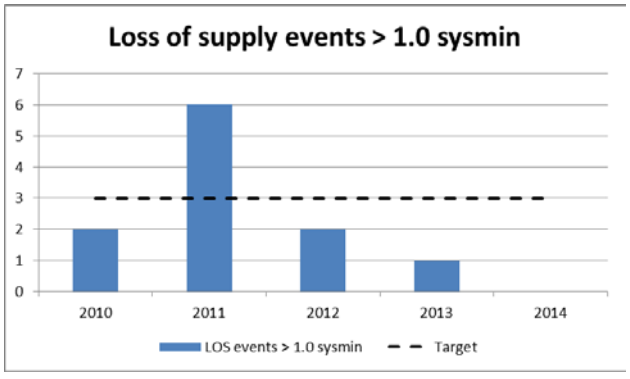
6.2.2 STPIS service component

6.2.2.1 Loss of supply events

Performance Measure		Target	% MAR Penalty	% MAR Reward
Supply reliability – outage frequency	Frequency of loss of supply events > 0.1 system minutes	≤ 10 events	0.15	0.15
	Frequency of loss of supply events > 1.0 system minute	≤ 2 events	0.15	0.15



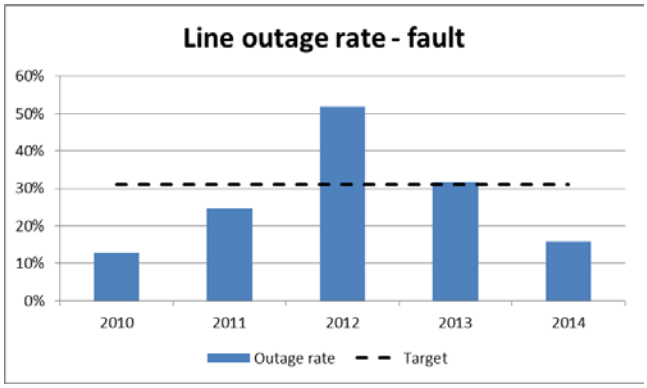
Performance Assessment: **Good**



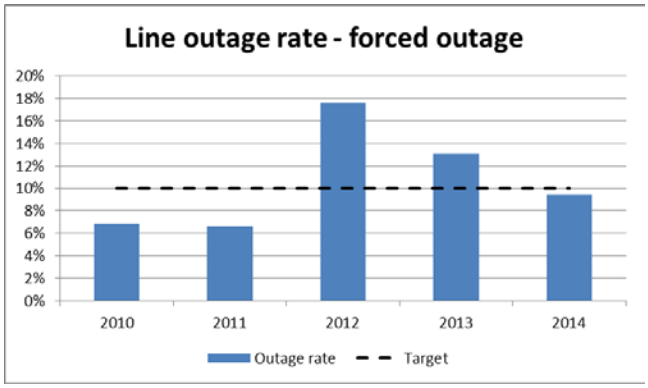
Performance Assessment: **Good**

6.2.2.2 Average circuit outage rate

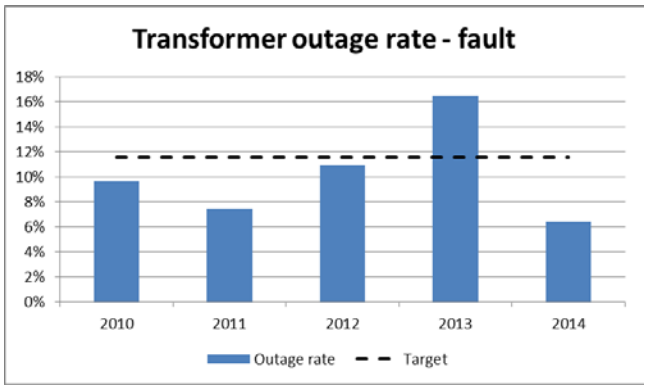
Performance Measure		Target	% MAR Penalty	% MAR Reward
Average circuit outage rate	lines outage rate – fault	≤ 31.2%	0.2	0.2
	transformers outage rate – fault	≤ 11.6%	0.2	0.2
	reactive plant outage rate – fault	≤ 3.3%	0.1	0.1
	lines outage rate - forced outage	≤ 10.0%	0.0	0.0
	transformer outage rate - forced outage	≤ 2.8%	0.0	0.0
	reactive plant outage rate - forced outage	≤ 14.0%	0.0	0.0



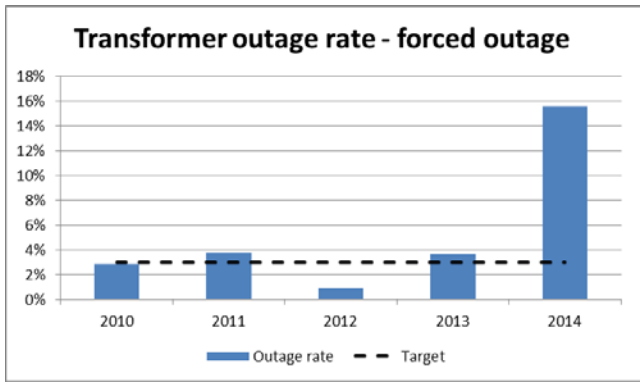
Performance Assessment: **Good**



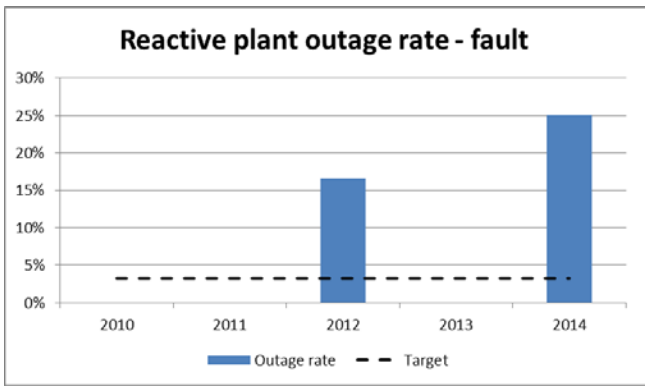
Performance Assessment: **Average**



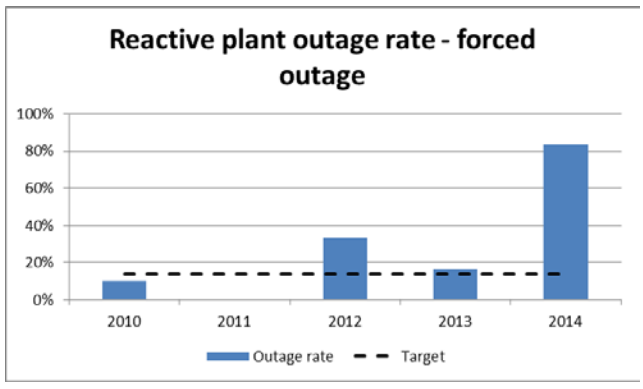
Performance Assessment: **Good**



Performance Assessment: **Poor**



Performance Assessment: **Poor**

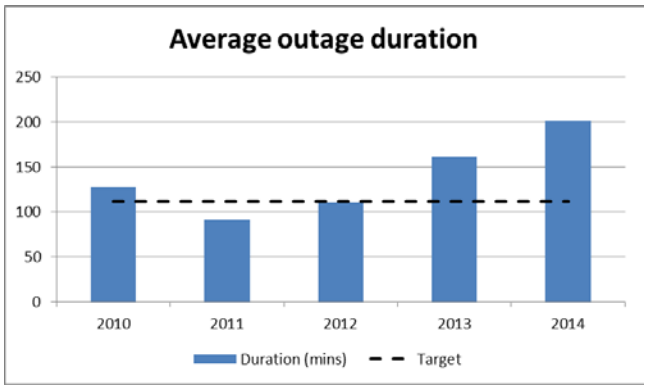


Performance Assessment: **Poor**

RA1	'Transformer outage rate - forced outage' - Review 2015 and 2014 performance for improvement opportunities.
RA2	'Reactive plant outage rate' – Refer performance data to Asset Strategies team for investigation.

6.2.2.3 Average outage duration

Performance Measure	Target	% MAR Penalty	% MAR Reward
Average outage duration	≤ 112 minutes	0.2	0.2

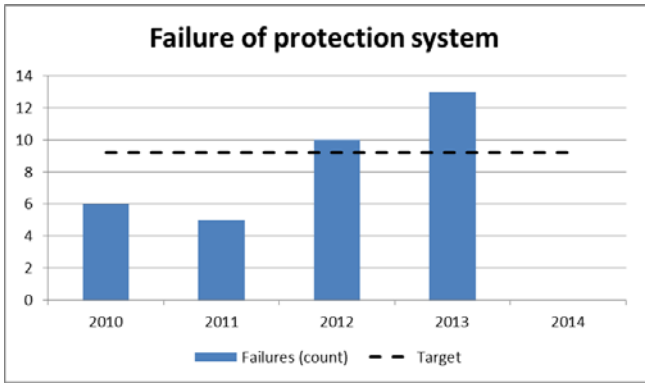


Performance Assessment: **Poor**

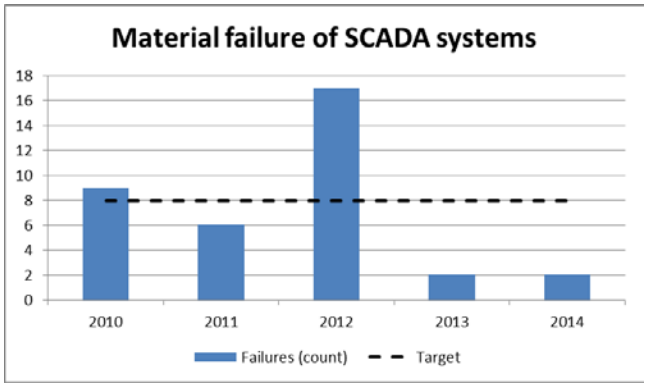
RA3	'Average outage duration' - Review 2015 and 2014 performance for improvement opportunities.

6.2.2.4 Proper operation of equipment

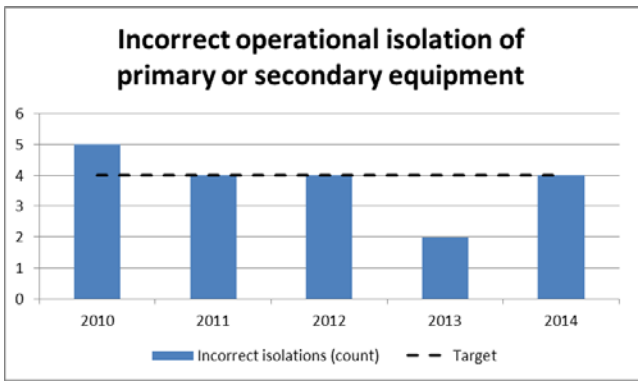
Performance Measure		Target	% MAR Penalty	% MAR Reward
Proper operation of equipment	Failure of protection system	≤ 9.2 events	0.0	0.0
	Material failure of the Supervisory Control and Data Acquisition (SCADA) system	≤ 8 events	0.0	0.0
	Incorrect operational isolation of primary or secondary equipment	≤ 4 events	0.0	0.0



Performance Assessment: **Good**



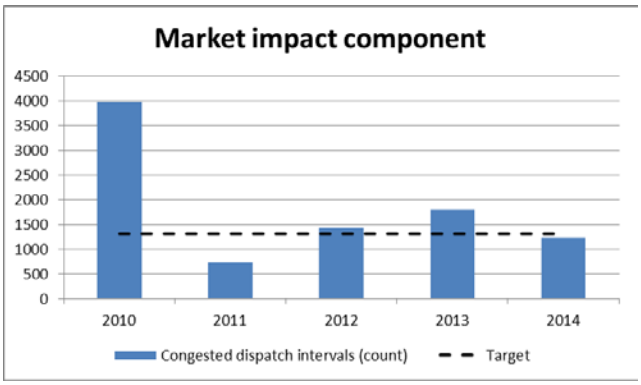
Performance Assessment: **Good**



Performance Assessment: **Good**

6.2.3 STPIS market impact component

Performance Measure	Target	% MAR Penalty	% MAR Reward
MIC	≤ 1,318 dispatch intervals	0.0	2.0



Performance Assessment: **Average**

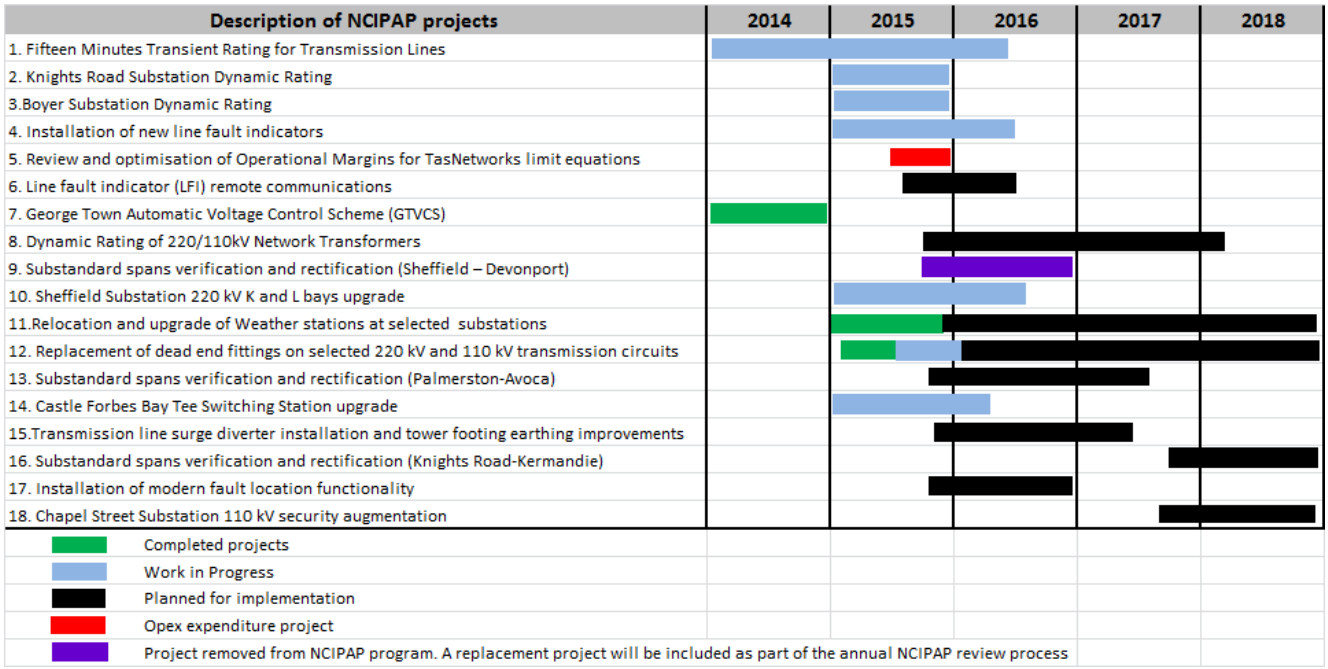
6.2.4 STPIS network capability component

Performance Measure	Target	% MAR Penalty	% MAR Reward
NCIPAP	100% of program implemented	0.0[2]	1.5

As shown in Figure 3, the five year NCIPAP program is currently on track for completion by December 2018.

[2] In the fifth regulatory year, the % MAR penalty is increased to -2.0%, subject to the delivery of the NCIPAP projects planned for delivery.

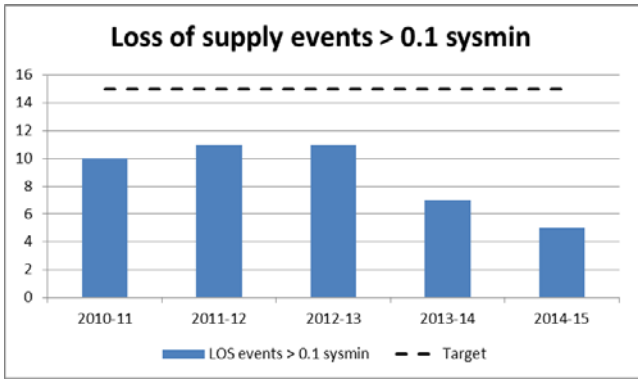
Figure 3 – NCIPAP implementation schedule



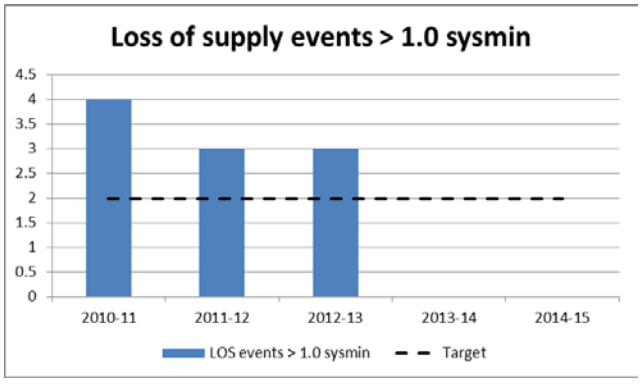
6.2.5 OTTER performance

6.2.5.1 Loss of supply events

Performance Measure		Target
Supply reliability – outage frequency	Frequency of loss of supply events > 0.1 system minutes	≤ 15 events
	Frequency of loss of supply events > 1.0 system minute	≤ 2 events



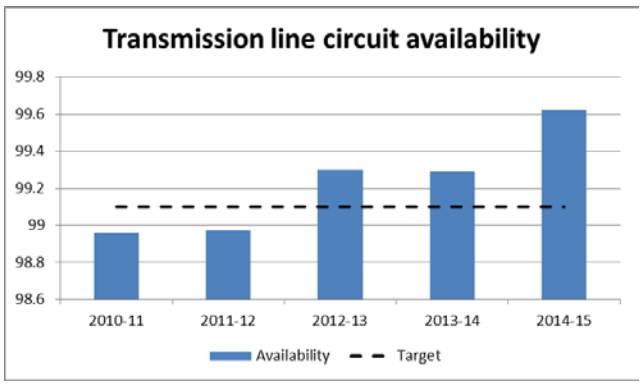
Performance Assessment: **Good**



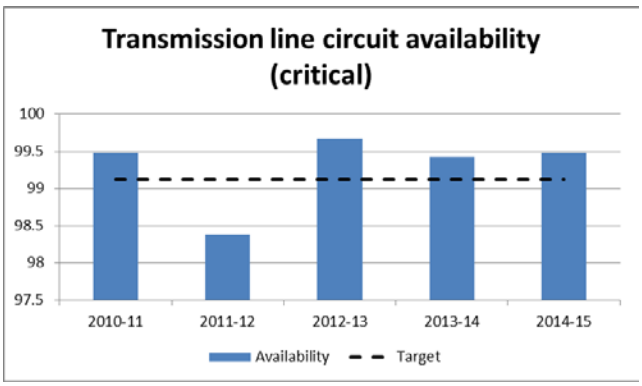
Performance Assessment: **Good**

6.2.5.2 Circuit availability

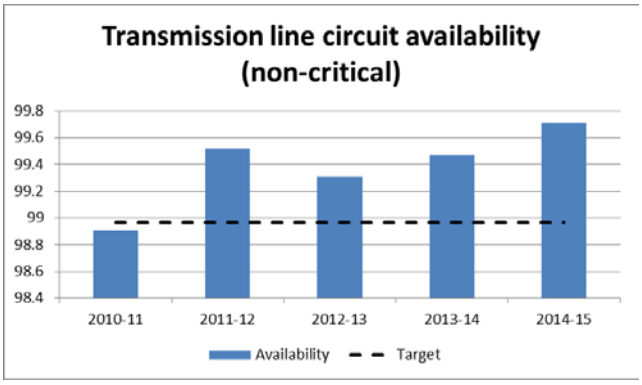
Performance Measure		Target
Circuit availability	Transmission line circuit availability	99.10%
	Transmission line circuit availability (critical)	99.13%
	Transmission line circuit availability (non-critical)	98.97%
	Capacitor circuit availability	99.00%



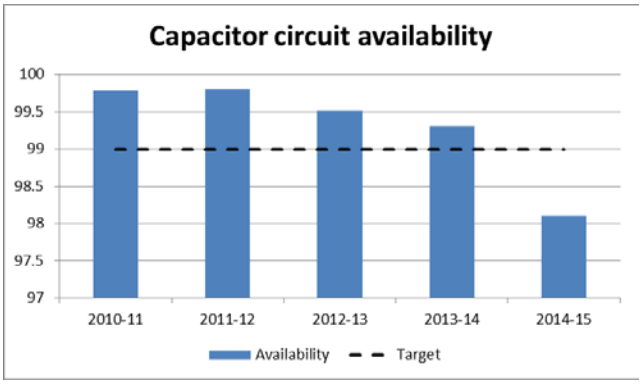
Performance Assessment: **Good**



Performance Assessment: **Good**



Performance Assessment: **Good**

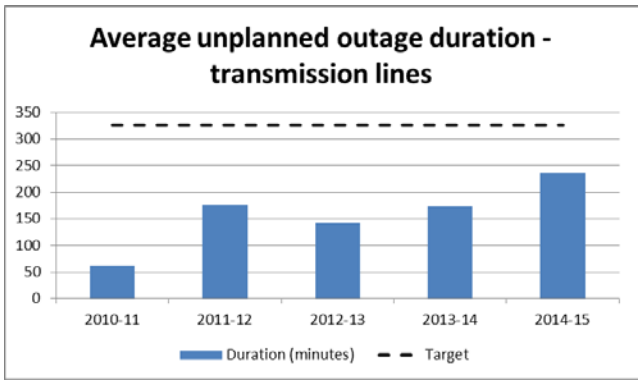


Performance Assessment: **Poor**

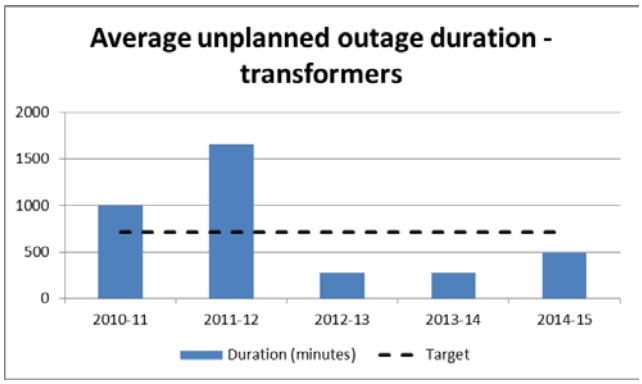
RA4	'Capacitor circuit availability' - Refer performance data to Asset Strategies team for investigation.

6.2.5.3 Average outage duration

Performance Measure		Target
Average unplanned outage duration	Average unplanned outage duration – transmission lines	327 minutes
	Average unplanned outage duration – transformers	712 minutes



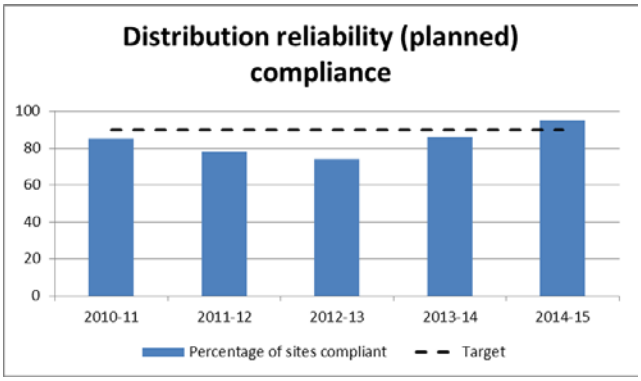
Performance Assessment: **Good**



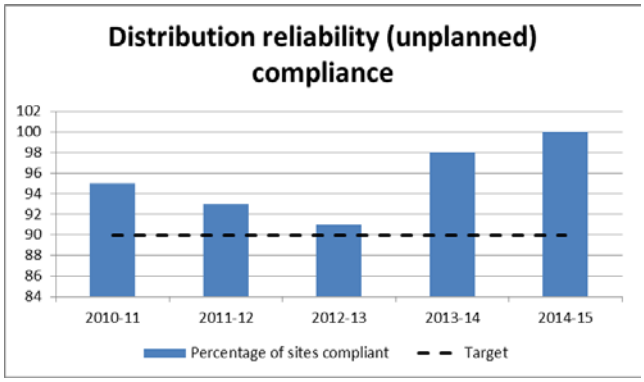
Performance Assessment: **Good**

6.2.5.4 Connection point compliance

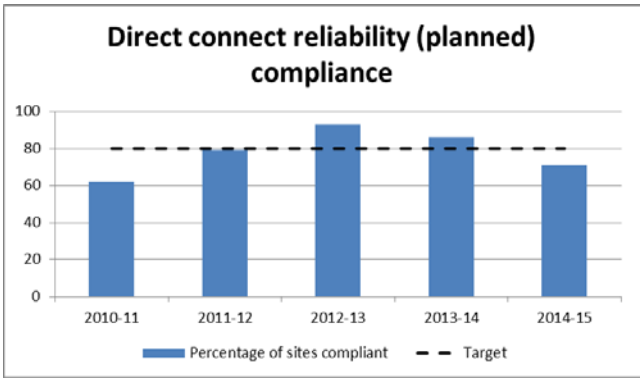
Performance Measure		Target
Connection point compliance	Distribution reliability (planned) compliance	90%
	Distribution reliability (unplanned) compliance	90%
	Direct connect reliability (planned) compliance	80%
	Direct connect reliability (unplanned) compliance	80%



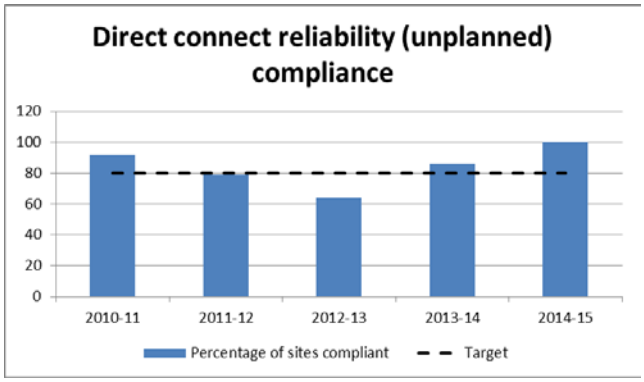
Performance Assessment: **Average**



Performance Assessment: **Good**



Performance Assessment: **Average**



Performance Assessment: **Good**

6.3 Distribution system performance

6.3.1 Introduction

TasNetworks outage management system classifies outages into four types:

- unplanned outages;
- planned outages;
- transmission outages; and
- third party outages.

Unplanned and planned outages are the outage types that TasNetworks can primarily influence through their service performance management activities.

Distribution service performance is reported in different ways, depending on the needs of the audience, with the key differences generally pertaining to the inclusion or exclusion of planned, unplanned, third party, transmission and 'Major Event Day'[3] outages. Table 5 presents a summary of these differences.

TasNetworks currently calculates supply reliability performance using the connected transformer capacity of the network (kVA). As part of regulatory reporting requirements, TasNetworks is also required to calculate supply reliability performance using the number of connected customers on the network (customer installations) but is not currently measured using this metric. TasNetworks will shift from kVA to customer based reporting in July 2017.

[3] A major event day (MED) is when the number of system minutes caused by outages exceeds an annually calculated threshold, indicating abnormal conditions have significantly affected the reliability of the system and may be outside the control of the DNSP. TasNetworks uses the IEEE 2.5 Beta Methodology for calculating its annual MED threshold.

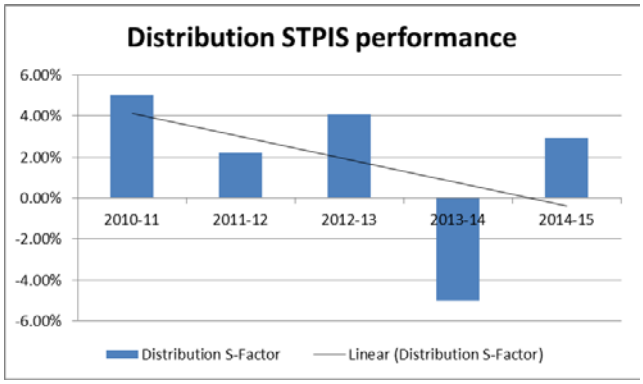
Table 5: Summary of regulatory and internal reporting criteria

Customer	Frequency	System				Inclusions	Exclusions	Reliability Unit	
		System	Reliability Areas (5)	Reliability Community (101)	Feeders			Customers	Load
OTTER	Quarterly	✓	✓	✓		Planned and unplanned outages	Third party and transmission outages	✓	✓
OTTER	Annually	✓	✓	✓		Planned and unplanned outages	Third party and transmission outages	✓	✓
AER	Annually	✓	✓		✓	Unplanned and third party outages	Major event days, planned outages, customer installation faults, house fires, bush fires	✓	✓
TasNetworks	Monthly	✓	✓			Unplanned and third party outages	Major event days, planned outages, customer installation faults, house fires, bush fires		✓
TasNetworks	Quarterly	✓				Planned and unplanned outages	Third party and transmission outages		✓

6.3.2 Overall distribution STPIS performance

TasNetworks' historical performance against the distribution STPIS is shown in Figure 4.

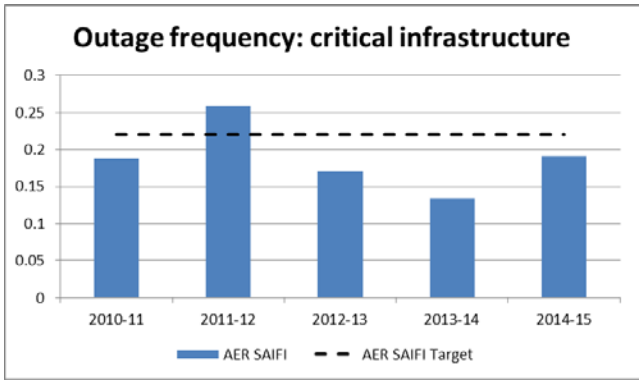
Figure 4 – TasNetworks' historical distribution STPIS performance



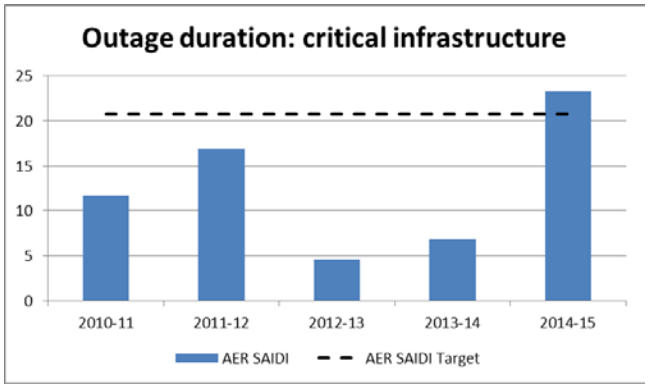
Performance Assessment: **Good**

6.3.3 STPIS reliability of supply

Performance Measure[4]		**Target**
Reliability of supply (SAIFI)	Critical infrastructure	≤ 0.22 events
	High density commercial	≤ 0.49 events
	Urban and regional centres	≤ 1.04 events
	High density rural	≤ 2.79 events
	Low density rural	≤ 3.20 events
Reliability of supply (SAIDI)	Critical infrastructure	≤ 20.79 mins
	High density commercial	≤ 38.34 mins
	Urban and regional centres	≤ 82.75 mins
	High density rural	≤ 259.48 mins
	Low density rural	≤ 333.16 mins

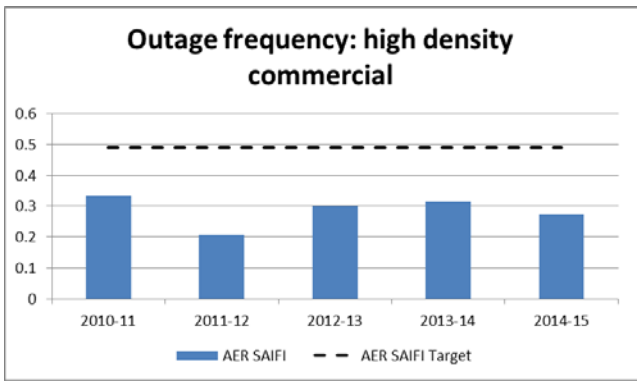


Performance Assessment: **Good**

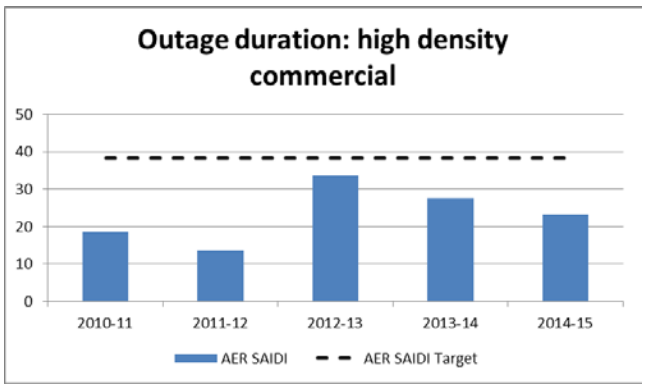


Performance Assessment: **Average**

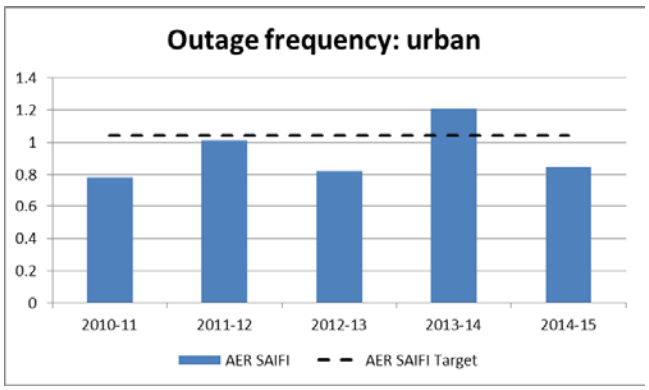
[4] Includes unplanned and third party outages but excludes MEDs and outages due to bushfires, house fires, customer installation faults and total fire ban day patrols.



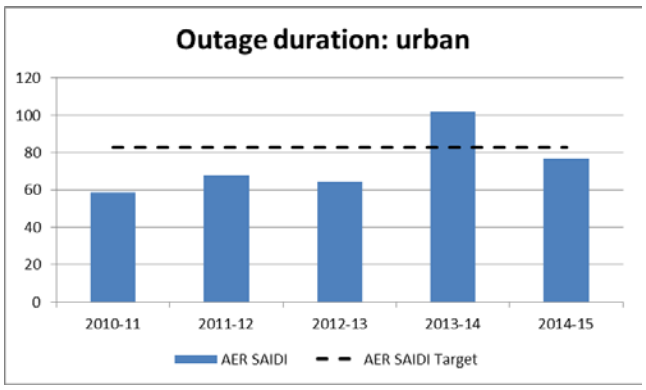
Performance Assessment: **Good**



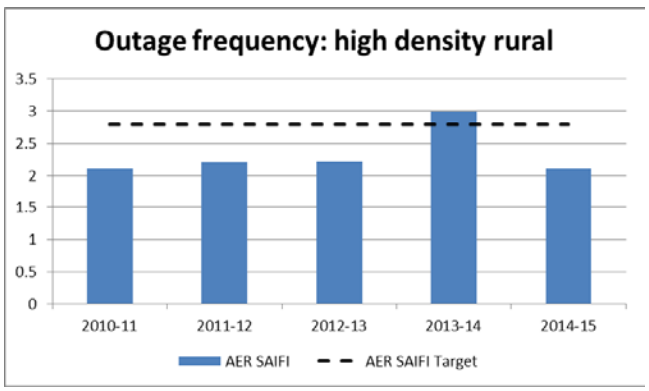
Performance Assessment: **Good**



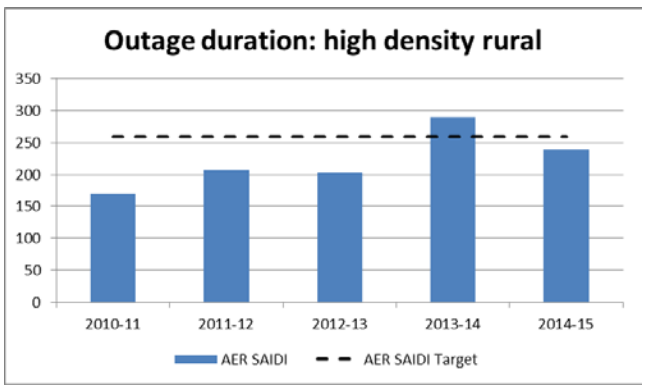
Performance Assessment: **Good**



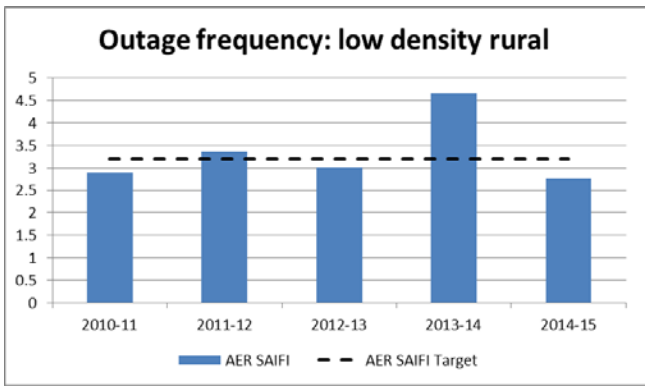
Performance Assessment: **Average**



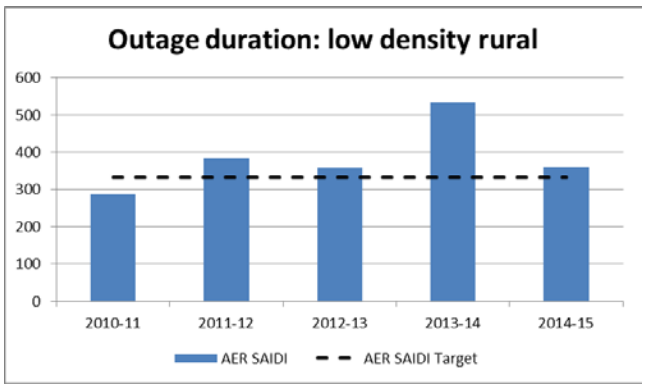
Performance Assessment: **Good**



Performance Assessment: **Average**



Performance Assessment: **Average**



Performance Assessment: **Poor**

RA5	'STPIS outage duration: low density rural' - Review historical performance for improvement opportunities.
RA6	'Overall distribution STPIS' - There is a slight long term deterioration in outage frequency and duration for a number of categories. While not an immediate concern this requires ongoing monitoring.

6.3.4 STPIS customer service

Performance Measure		Target
Customer Service	Call service performance	73.6%

Call service performance measures the annual percentage of calls to the fault centre that enter the queue for an operator and are answered within 30 seconds. These values exclude major event days and outages due to bushfires, house fires, customer installation faults and total fire ban day patrols.

6.3.5 OTTER guaranteed service levels

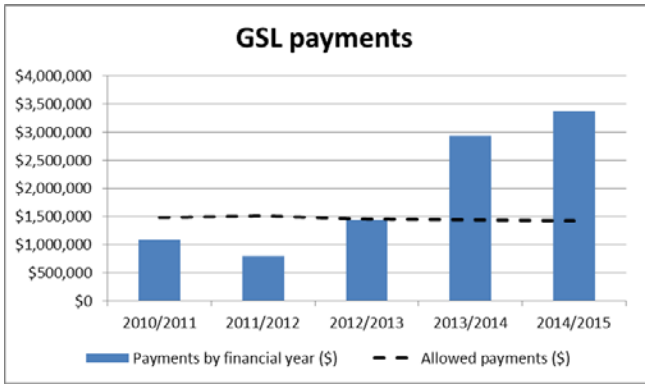
Performance Measure	Target
Guaranteed service levels	-

TasNetworks makes one-off payments to customers to acknowledge service performance outside of guaranteed service levels. Payments to distribution customers are made to compensate for:

- supply reliability and restoration;
- less than 4 business days' notice of a planned interruption;
- not leaving a customer's property in the condition that it was found when staff require access to a property; and
- greater than seven days to repair a street lighting outage in a customer's street when the customer is the first to report the outage.

TasNetworks' GSL performance is the outcome of many varied and diverse processes and activities undertaken across the business by numerous teams. For this reason, at this point in time TasNetworks has not specified a target GSL performance level, but instead is relying on the success of other service performance initiatives to have a resultant impact on the number of GSL payments incurred.

It should be noted that there is a regulatory allowance for GSLs payments, with the magnitude of the allowance determined by historic performance.



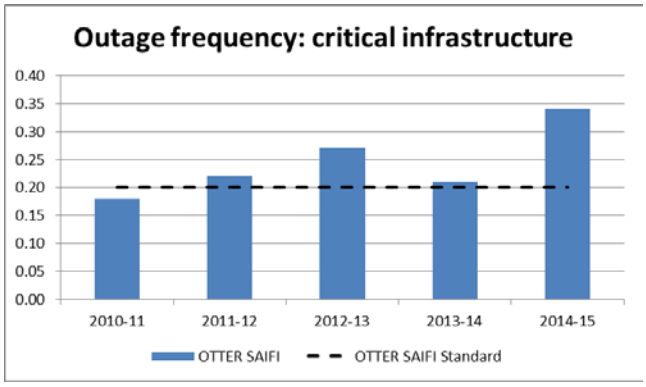
Performance Assessment: **Poor**

RA7	'STPIS GSL Payments' – Ensure consideration is given to minimising GSL payments when developing performance improvement initiatives.

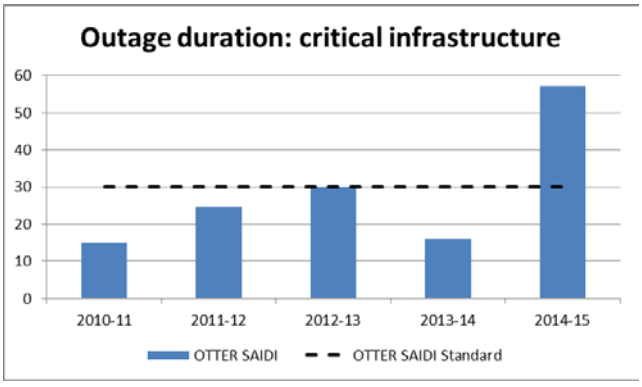
6.3.6 OTTER reliability of supply (category level)

The TEC defines frequency and duration performance targets for 5 reliability categories. TasNetworks is required to report on performance at the category level to OTTER on a quarterly and annual basis.

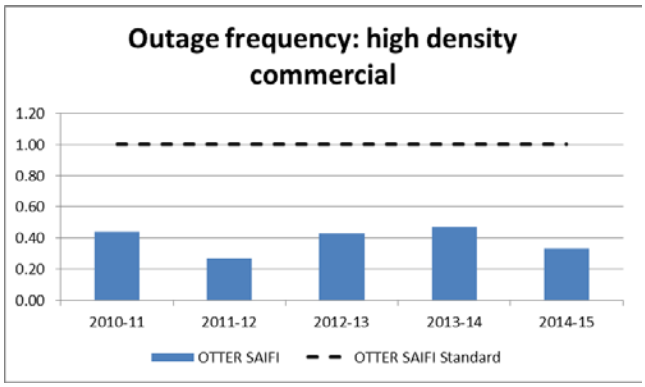
Performance Measure		Target (OTTER)
Supply reliability – outage frequency	Critical infrastructure	≤ 0.2 events
	High density commercial	≤ 1 event
	Urban and regional centres	≤ 2 events
	High density rural	≤ 4 events
	Low density rural	≤ 6 events
Supply reliability – outage duration	Critical infrastructure	≤ 30 mins
	High density commercial	≤ 60 mins
	Urban and regional centres	≤ 120 mins
	High density rural	≤ 480 mins
	Low density rural	≤ 600 mins



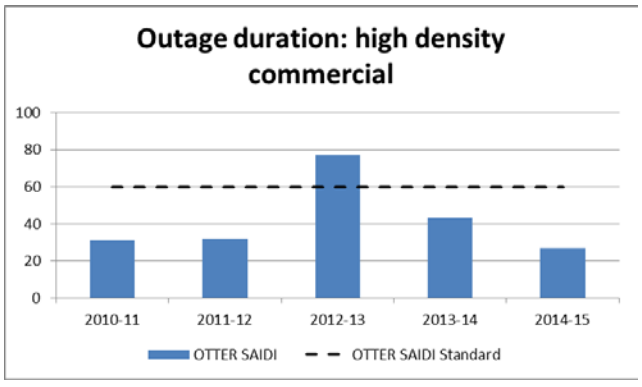
Performance Assessment: **Poor**



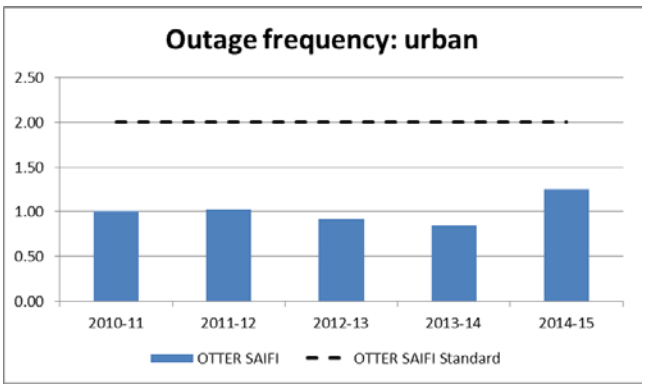
Performance Assessment: **Poor**



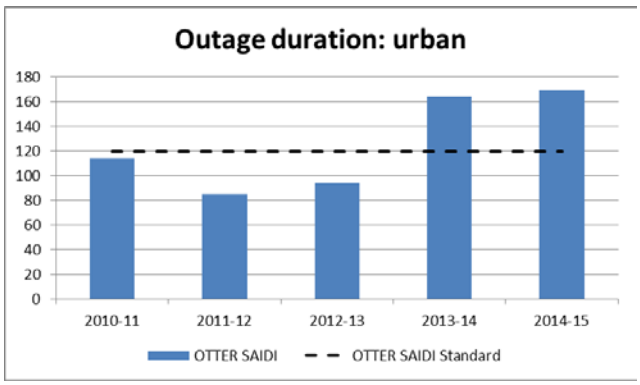
Performance Assessment: **Good**



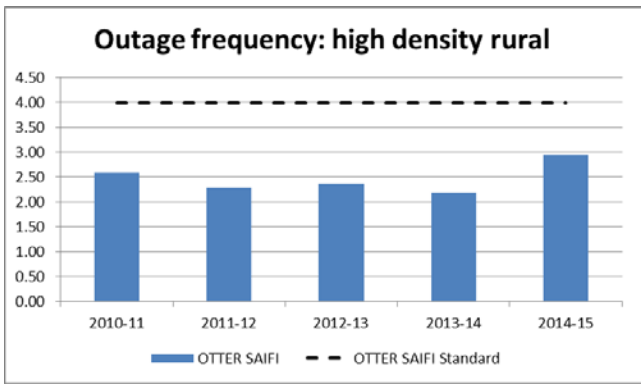
Performance Assessment: **Good**



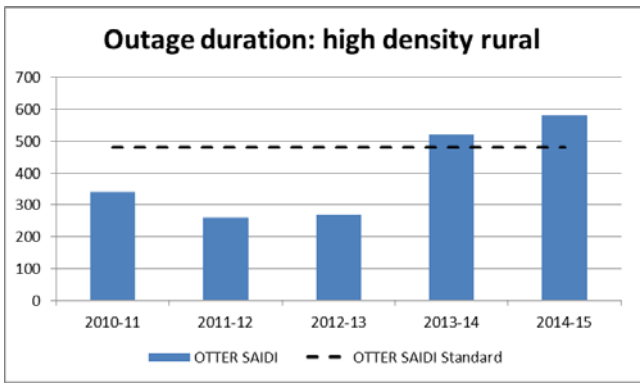
Performance Assessment: **Good**



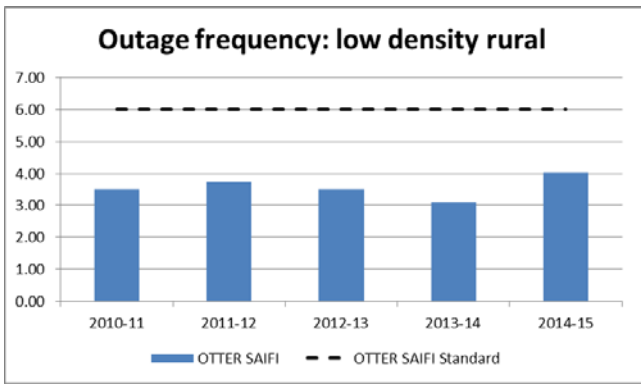
Performance Assessment: **Poor**



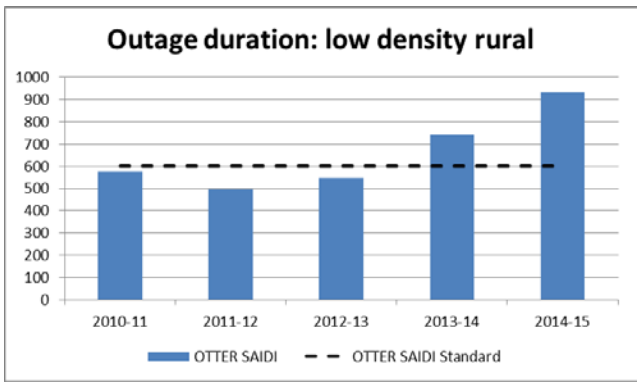
Performance Assessment: **Good**



Performance Assessment: **Poor**



Performance Assessment: **Good**



Performance Assessment: **Poor**

RA8	'OTTER (category) outage duration, multiple categories' – Plan and implement a service performance improvement framework.
RA9	'OTTER (category) outage frequency: critical infrastructure' – Review historical performance to identify improvement opportunities.

6.3.7 OTTER reliability of supply (community level)

Performance Measure		Target (OTTER)
Supply reliability – outage frequency	Critical infrastructure	≤ 0.2 events
	High density commercial	≤ 2 events
	Urban and regional centres	≤ 4 events
	High density rural	≤ 6 events
	Low density rural	≤ 8 events
Supply reliability – outage duration	Critical infrastructure	≤ 30 mins
	High density commercial	≤ 120 mins
	Urban and regional centres	≤ 240 mins
	High density rural	≤ 600 mins
	Low density rural	≤ 720 mins

The TEC defines frequency and duration performance targets for 101 reliability communities. TasNetworks is required to report the performance of these communities to the OTTER on a quarterly and annual basis.

Analysis of the last five years of performance for the reliability communities reveals that:

- TasNetworks is delivering either good or excellent service performance to 62 communities;
- 39 communities are performing worse than target and, without intervention, are forecast to continue to exceed the TEC community reliability standards;
- there is a direct correlation between poor performing communities and poor performing feeders; and,
- outage frequency performance is generally reasonable, however outage duration (SAIDI) is of concern.

Of those 39 communities where performance is poor, extensive analysis has found that seven communities are experiencing a disproportionally poor level of service performance. The analysis also found that an improvement in service performance of seven distribution feeders supplying these communities would result in a significant improvement in service performance not only at the community level, but at a reliability category and system level as well. Significant improvements in STPIS outcomes and GSL performance were also forecast. These communities and feeders are presented in the table below.

Table 6: Seven poor performing communities

Classification	Community	Connected kVA	SAIFI Target	SAIFI	SAIDI Target	SAIDI
Low Density Rural	Railton Rural	93,016	8	2.65	720	845
Low Density Rural	Cressy - Blessington Rural	77,205	8	4.77	720	2112
Low Density Rural	North East Rural	54,451	8	5.29	720	1658
Low Density Rural	Burnie Rural	38,125	8	4.7	720	1178
Low Density Rural	Channel Rural	36,788	8	4.05	720	1505
Low Density Rural	Tamar East Rural	38,146	8	2.62	720	1224
High Density Rural	Meander Valley Rural	34,959	6	4.36	600	1186

RA10	Develop a plan to improve the service performance of the seven worst performing communities and associated

	feeders. This plan should be flexible enough to apply to other poor performing communities and feeders in the future.

6.3.8 TasNetworks performance as reported internally

Performance Measure		Target[5]
Supply reliability – outage frequency	Normalised SAIFI	1.90 interruptions
Supply reliability – outage duration	Normalised SAIDI	231 minutes

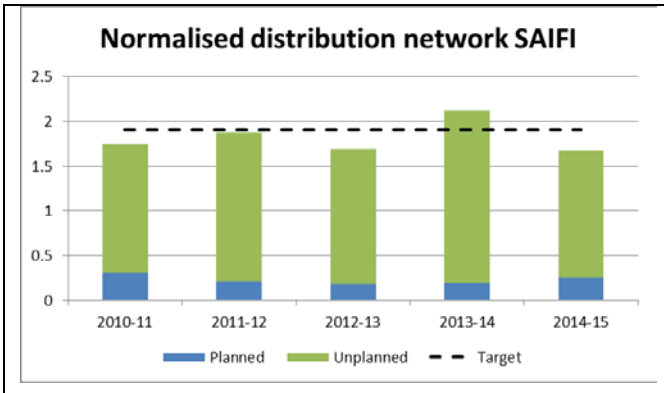
There are pros and cons associated with the different reporting methodologies utilised by the AER and OTTER.

AER reporting excludes planned outages and therefore is not sufficiently reflective of customer service performance. It also includes some fault types that are outside TasNetworks' control, such as house fires and faults initiated within a customer's installation.

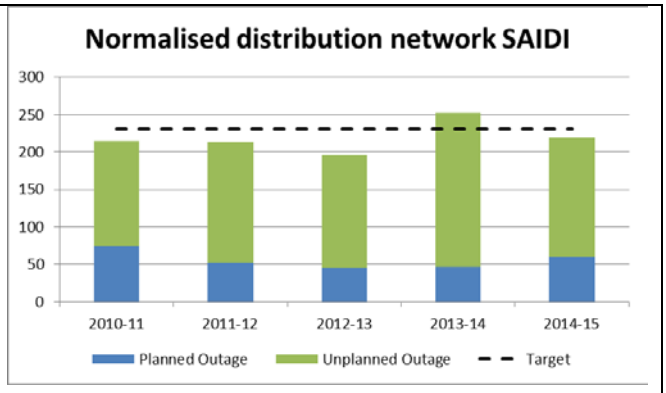
While OTTER reporting does include planned outages, and excludes those fault outages over which TasNetworks has no control, it is very granular and does not provide reporting at the system level.

For this reason TasNetworks has created internal service performance indicators for outage frequency and duration that follow the OTTER approach, but with the underlying performance rolled up to a system level.

Despite no material increases to SAIFI and SAIDI, there is a decreasing trend in the number and duration of planned interruptions on the network, with a converse increase in the number and duration of unplanned interruptions.



Performance Assessment: Average



Performance Assessment: Average

For these outages, the top ten outage causes over the last five years are summarised in Table 7.

[5] KPIs were set using historical performance information (2009-10 to 2013-14)

Table 7: Top 10 outage causes

Rank	SAIFI causes	% SAIFI contribution	SAIDI causes	% SAIDI contribution
1	Can't Find a Cause	24%	Planned Outage for System Work	20%
2	Planned Outage for System Work	11%	Fire	11%
3	Vegetation Outside Clearance	10%	Vegetation Outside Clearance	11%
4	Transmission Fault	8%	Can't Find a Cause	11%
5	Human Interference	6%	Human Interference	5%
6	Birds	5%	Lightning	5%
7	Lightning	5%	Transmission Fault	5%
8	Pole	4%	Pole	5%
9	Connection Failure	4%	Birds	3%
10	Wind	3%	Cable - Underground	3%

Planned outages, outages due to 'vegetation outside clearance', and outages with unknown causes contribute to over 40 per cent of system SAIFI and SAIDI. Reducing the frequency of any of these outage types will result in a material improvement in system SAIFI and SAIDI.

RA11	'Cause and type analysis' - Develop a plan to reduce the number of unplanned outages of type 'Can't Find a Cause'.
RA12	'Cause and type analysis' - Develop a plan to reduce the frequency or duration of planned outages, without adversely impacting on unplanned outages.
RA13	'Cause and type analysis' - Develop a plan to reduce the frequency or duration of unplanned outages caused by 'Vegetation Outside Clearance'.

TasNetworks has yet to establish formal KPIs for measuring asset performance, however, asset performance failure and outage cause trends are monitored to identify poor performance. Analysis of the last five years of asset related outage causes reveals deteriorating performance for the following asset classes:

- high voltage switchgear;
- underground cables; and
- pole fires; and
- clashing overhead conductors.

RA14	'Cause and type analysis' - Develop a suite of service performance KPIs for major asset classes or asset classes demonstrating a deterioration in performance.
RA15	'Cause and type analysis' - Develop a plan to improve service performance for poor performing assets.

7 Management Plan

7.1 Influencing service performance

The desired outcomes of an effective service performance management strategy are:

- reduced outage frequency due to prevention;
- minimised impact on customers; and,
- timely restoration of supply.

Service performance can be influenced through:

- network planning and design;
- asset management strategies;
- operational management of planned and unplanned outages; and,
- service performance education and awareness.

7.1.1 Network planning and design

Network planning is the process of identifying potential changes to the electricity network due to changing customer demands or changing risk profiles, and developing the network to meet existing and future customer requirements. The key objectives of network planning are to ensure adequate:

- network capacity and design – the rating, selection and configuration of equipment in the network,
- security of supply – the interconnectivity and redundancy of the network; and
- quality of supply – how suitable the supply is with respect to factors such as steady state voltage, voltage sag and swell, harmonics, flicker, distortion, unbalance and power factor.

It is in the design and planning phase that TasNetworks has its biggest opportunity to influence long term service performance levels, by preventing outages from occurring in the first place, or by building diversity and resilience into the network. TasNetworks reduces the frequency of outages by ensuring appropriate network design standards and equipment selection. For example, the mitigation of environmental related outages by installing bird flappers on overhead lines near waterways to prevent bird contact with lines.

Network interconnectivity and diversity are critical to minimising the impact of outages on customers and reducing restoration times. The strategic placement of protection devices, such as reclosers and sectionalisers, and operable switches, such as load and air break switches, minimises the initial customer impact of unplanned outages and enables swifter fault isolation and greater configurability of the network in the restoration of supply.

Poor service performance levels may indicate that greater network connectivity is required or the protection is inappropriate. This can be addressed through installation/removal of protection and switch assets, protection coordination reviews and network augmentations and extensions, with the solution based on network constraint analysis, load forecasting and recommendations from Network Operations and field personnel involved with outage restoration processes. Where

network solutions are not viable, non-network solutions such as mobile generation may be explored.

TasNetworks also utilises intelligent network devices with automation capability to automatically isolate faults within certain sections of the network and automatically reconfigure the network to restore supply. There are approximately 30 of these “Loop Automation” schemes currently active in TasNetworks distribution network with potential future sites under investigation.

Timely access to current service performance levels is critical for appropriate network planning and design to identify performance issues and customers at risk. An initiative is underway to improve the timeliness and accessibility of service performance information across the business for various business requirements.

Typical projects implemented by TasNetworks in the past that have had a positive impact on service performance levels include:

- increased security through the introduction of ‘breaker and a half’ substation designs; and
- increased diversity through design enhancements to the northwest, northeast and southern regions of Tasmania.

7.1.2 Asset management strategies

After an asset has been placed into service there are numerous avenues by which service performance can continue to be influenced in a strategic manner. A number of key processes are summarised below, with detail captured within TasNetworks asset management plans.

7.1.2.1 Asset replacement

The replacement of assets that are approaching end of life is an essential part of TasNetworks approach to maintaining adequate levels of service performance. TasNetworks continues to rely on asset condition as its primary driver for asset replacements and is focused on building clear linkages between asset condition and risk exposure.

Typical projects implemented by TasNetworks in the past that have had a positive impact on service performance levels include:

- improved performance, reduced risk of obsolescence and associated risk of inadequate spares holdings through circuit breaker replacement programs;
- improved service performance as a result of the replacement of outdoor switchgear in poor condition;
- reduced impact of unplanned outages due to conductor breakage as a result of the 7-strand copper replacement program;
- improved service performance through transformer replacement programs for transformers approaching end of life, as determined through DGA and other condition monitoring activities;
- increasing the resilience of the network through tree hazard removal programs; and,
- increased flexibility and reduced cost resulting from the development of a clear and rationalised spares strategy.

7.1.2.2 Maintenance regimes

TasNetworks undertakes routine and non-routine inspection and monitoring on various network assets to assess their condition and ability to provide the required functions, as asset age alone is not sufficient justification for asset management decisions. Appropriate inspection and monitoring programs lead to lower numbers of in service failures, reduced customer complaints and an improved customer service experience.

The frequency and complexity of inspection and monitoring programs depends on the criticality of that asset in the operation of the network and the associated risks that failure or unavailability of that asset poses. Asset inspections tend to be routine and on a fixed cycle, with non-routine inspections initiated as required, whereas power quality monitoring is triggered by customer complaints.

Performance monitoring of information captured through inspection process can identify emerging trends in the network and measure the effectiveness of inspection and monitoring programs.

Typical maintenance regimes implemented or modified by TasNetworks in the past that have had a positive impact on service performance levels include:

- improved risk quantification and assessment through transformer condition monitoring;
- introduction of thermal inspection and other techniques to improve TasNetworks' ability to identify and respond to asset risks;
- increased reliance on protection relay self-diagnosis capabilities to reduce the cost of maintenance regimes; and,
- reduced operational expenditure, balanced against risk, through the extension of asset maintenance periods (eg circuit breakers and disconnectors).

7.1.2.3 Defect management

Defects are mostly identified through routine and non-routine inspection and monitoring programs. They are rectified based on:

- the criticality of that asset in the operation of the network;
- associated risks that failure or unavailability of that asset poses; and
- the likelihood of that defect causing a catastrophic failure of the asset.

Defect analysis and those that result in failures can lead to a better understanding of failure mechanisms for asset classes and help to identify emerging trends in the network to be targeted for asset inspections or a change in asset strategy.

7.1.2.4 Incident investigations

TasNetworks undertakes investigations of all safety, environment, and transmission system incidents that occur on property or assets owned, managed or under the responsibility of TasNetworks. This process is currently documented in TasNetworks' Incident Management Procedure (R94015).

Under the OTTER "Guideline on Incident Reporting for the Tasmanian Electricity Supply Industry", transmission and distribution incidents that meet certain criteria set by OTTER are investigated

and reported to OTTER within the prescribed timeframes. The completion of remedial actions arising from incident investigations can result in:

- increased workplace safety;
- improved environmental management practices;
- increased performance of the Tasmanian electricity network;
- Improved compliance with Regulatory requirements;
- cost benefits resulting from improvements to asset management strategies;
- process enhancements;
- improved equipment design standards; and/or
- opportunities for closer contractor relations.

7.1.2.5 Asset management Information

Asset management information is the foundation on which TasNetworks' network management strategies and plans are developed. This includes information pertaining to:

- Asset data (including condition);
- Operational and capital expenditure;
- Asset risk;
- Asset performance;
- External benchmarking data for comparative purposes.

TasNetworks has inherited three asset registers with diverse asset management information quantity and quality across the asset classes. These three registers will be consolidated into one system as part of TasNetworks integrated business system initiative, with significant consideration also given to improvements in cost capture and risk management. This will not only meet our needs as a prudent asset manager, but will also facilitate effective RIN and revenue determination reporting.

7.1.3 Operational management of planned and unplanned outages

7.1.3.1 Planned outage management

As planned outages are one of the highest contributors to service performance, preventative maintenance and prudent asset replacement activities need to be carefully planned and scheduled to minimise the impact on customers and their service performance levels. Utilisation of live line techniques and deployment of mobile generators are considered where practical.

7.1.3.2 Unplanned outage management

While a resilient network will reduce the likelihood of unplanned outages, the reality is that assets deteriorate and ultimately fail in service, with storm events often contributing to premature failure. It is through effective operational practices, both in and between the network control room and the field, that TasNetworks utilises its final opportunity to influence service performance.

Therefore, it is critical that operational staff have an understanding of the way in which their activities can provide positive service performance outcomes, and that they have the necessary information, skills and systems available to them to make informed decisions in real time.

There are many opportunities available, including:

- intelligent and effective utilisation of mobile generators;
- utilisation of fault indicators to inform field staff and reduce fault restoration times; and
- increasing the number of field devices with remote communication capabilities to speed up fault restoration activities and to provide more accurate information to control room staff (eg fault indicators).

7.1.4 Service performance education and awareness

As described within 'ISO 55000:2014 - Asset management - Overview, principles and terminology', effective asset management requires a balance between cost, risk and performance outcomes in the achievement of corporate objectives.

To manage service performance it is critical that TasNetworks staff understand what constitutes good, average or poor service performance, and how they are able to influence service performance through their daily activities.

7.2 Service performance improvement

Throughout this document, a suite of remedial actions for service performance improvement have been identified. These actions form the basis of TasNetworks' future service performance improvement activities.

Table 8 presents a consolidated view of these actions. The management strategy to be adopted for each action is also presented.

Specific = Action will be taken by the AP Team to address this specific action with the support of other staff as required.

SPIF **=** This action will be addressed through the Service Performance Improvement Framework (SPIF), described in more detail in section 7.2.1.

E2E **=** This action will be addressed through the E2E process review project.

While accountability for these activities will reside with the Asset Performance team, the responsibility may sit elsewhere within the business.

Table 8: Summary of remedial action for service performance improvement

ID	Remedial Action	Management Strategy
RA1	'Transformer outage rate - forced outage' - Review 2015 and 2014 performance for improvement opportunities.	Specific
RA2	'Reactive plant outage rate' – Refer performance data to Asset Strategies team for investigation.	Specific
RA3	'Average outage duration' - Review 2015 and 2014 performance for improvement opportunities.	Specific
RA4	'Capacitor circuit availability' - Refer performance data to Asset Strategies team for investigation.	Specific
RA5	'STPIS outage duration: low density rural' - Review historical performance for improvement	SPIF

	opportunities.	
RA6	'Overall distribution STPIS' - There is a slight long term deterioration in outage frequency and duration for a number of categories. While not an immediate concern this requires ongoing monitoring.	SPIF
RA7	'STPIS GSL Payments' – Ensure consideration is given to minimising GSL payments when developing performance improvement initiatives.	SPIF
RA8	'OTTER (category) outage duration, multiple categories' – Plan and implement a service performance improvement framework.	SPIF
RA9	'OTTER (category) outage frequency: critical infrastructure' – Review historical performance to identify improvement opportunities.	SPIF
RA10	Develop a plan to improve the service performance of the seven worst performing communities and associated feeders. This plan should be flexible enough to apply to other poor performing communities and feeders in the future.	SPIF
RA11	'Cause and type analysis' - Develop a plan to reduce the number of unplanned outages of type 'Can't Find a Cause'.	SPIF
RA12	'Cause and type analysis' - Develop a plan to reduce the frequency or duration of planned outages, without adversely impacting on unplanned outages.	SPIF
RA13	'Cause and type analysis' - Develop a plan to reduce the frequency or duration of unplanned outages caused by 'Vegetation Outside Clearance'.	SPIF
RA14	'Cause and type analysis' - Develop a suite of service performance KPIs for major asset classes or asset classes demonstrating a deterioration in performance.	E2E – Theme 3
RA15	'Cause and type analysis' - Develop a plan to improve service performance for poor performing assets.	SPIF

7.2.1 Service Performance Improvement Framework (SPIF)

As discussed in earlier sections, OTTER reporting shows that service performance is non-compliant and deteriorating for many communities, with initial focus necessary for the seven worst communities/feeders.

At the same time, stakeholder consultation has identified six aspects of TasNetworks' service performance that are currently managed in an ad hoc and ineffective manner:

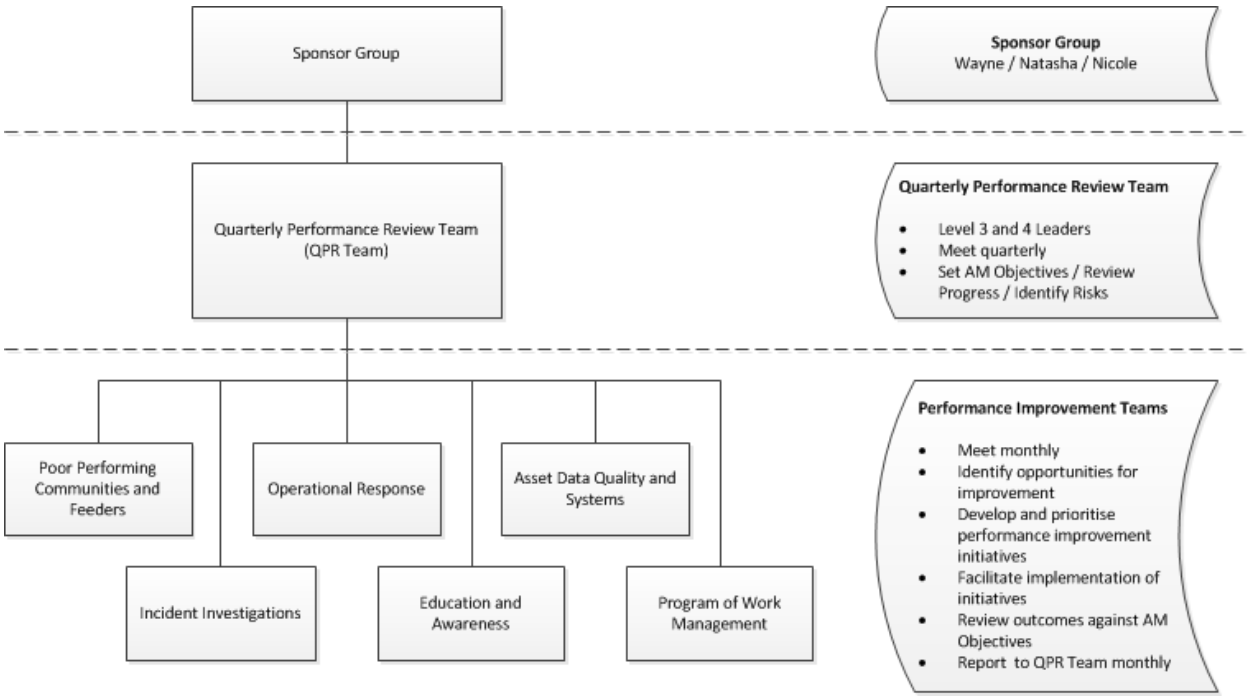
- poor performing communities
- operational response
- program of work management
- asset information quality
- incident investigations
- performance education and awareness

To address these deficiencies and improve the service performance outcomes of its asset management activities, the Asset Performance Team is in the process of establishing the TasNetworks Service Performance Improvement Framework (SPIF).

For each of the six focus areas described above, a Performance Improvement team is being created to:

- establish quantifiable performance objectives;
- identify issues that contribute to, and opportunities for the improvement of service performance;
- develop and prioritise initiatives to address the identified opportunities;
- facilitate the implementation of service performance improvement initiatives through existing programs of work or process improvement; and
- review the outcomes of implemented initiatives to demonstrate success against performance objectives.

To achieve this, the following project structure is being adopted.



Appendix A provides more detail regarding the objectives and stakeholders for each of the Performance Improvement teams.

The SPIF will become the means by which TasNetworks manages its service performance obligations to its customers in a routine manner.

Any initiatives for service performance improvement identified within the SPIF that require investment will be funded through existing programs of work.

Appendix A – SPIF Performance Improvement Teams

	Theme	Objective	Key stakeholders
1	**Poor performing communities and feeders**	Identify, prioritise and implement performance improvement initiatives targeted at poorly performing communities across Tasmania.	SAM – Asset Performance SAM – Asset Strategies SAM – Network Planning WS&D – Programing and Planning and/or Works Planner WS&D – Design and Estimation WS&D – Asset Area Managers WS&D – Vegetation Management WS&D – Field Operations
2	**Operational response**	Identify, prioritise and implement performance and cost improvement initiatives targeted at the processes and tools utilised within and between the control room and field environments.	SAM – Asset Performance CE&NO – Network Operations WS&D – Field Operations WS&D – Asset Area Managers
3	**Program of work management**	Currently out of scope of the SPIF. We will work with the E2E process to ensure needs are addressed. However, by necessity some aspects of PoW management will need to be considered under 'Poor performing communities and feeders' .	E2E Theme Owner
4	**Asset data quality and systems**	Ensure asset, performance, risk and cost information, and associated benchmarking and other reporting systems are of sufficient quality and/or effectiveness to support effective asset management decision making.	SAM – Asset Performance SAM – NIS F&BS – Financial Analysis and Reporting Other teams as required.
5	**Incident investigations framework**	Minimise the likelihood of asset incident reoccurrence or impact, and ensure continuous asset management improvement, through a clear and well understood asset incident investigation framework.	SAM – Asset Performance SAM – Asset Strategies SAM – Metering Strategies WS&D – Engineering and Design WS&D – Health, Safety and Environment
6	**Education and awareness**	Raise the awareness of the business regarding service performance risks and opportunities, ensuring that consideration and priority is given to poor performing communities in our asset management decision making.	SAM – Asset Performance Other teams as required.