Distribution Category Analysis RIN, 2015-16

Basis of preparation

CONTACT

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Introduction

This Basis of Preparation (BoP) represents part of the response of Tasmanian Networks, ABN 24 167 357 299 (TasNetworks), to the Regulatory Information Notice (RIN) issued in August 2016 by the Australian Energy Regulator (AER), under Division 4 of Part 3 of the National Electricity (Tasmania) Law, for the purposes of collecting information for category analysis.

The information and explanatory material included in this BoP relate to TasNetworks' activities as Tasmania's licensed Distribution Network Service Provider (DNSP) during the 2015-16 Regulatory Year (referred to throughout this document as the current reporting period).

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Definitions and Interpretation

In this document and TasNetworks' response to the RIN, unless otherwise noted:

'**TasNetworks**' refers to Tasmanian Networks Pty Ltd, acting in its capacity as a licensed Distribution Network Service Provider in the Tasmanian jurisdiction of the National Electricity Market.

AER	Australian Energy Regulator
Aurora	Aurora Energy Pty Ltd, acting in its capacity as the licensed DNSP in Tasmania prior to 1 July 2014.
CAM	Cost Allocation Method
DM	TasNetworks' Electronic Document Management System
DNSP	Distribution Network Service Provider
Gentrack	TasNetworks' Meter Data Management System
GTech	TasNetworks' geographic information system
Navision	TasNetworks' financial system
OTTER	Office of the Tasmanian Economic Regulator
POW	Programme of Work
RIN	Regulatory Information Notice
SAIDI	System Average Interruption Duration Index
SAIFI	System Average Interruption Frequency Index
SCS	Standard Control Services
SDW	Spatial Data Warehouse
SOM	TasNetworks' Service Order Management system
TasNetworks	Tasmanian Networks Pty Ltd
WASP	TasNetworks' program-of-work management system (Works, Assets, Solutions and People)

2. Expenditure

Template 2.1 Expenditure Summary & Reconciliation

Table 2.1.1 Standard control services capex
Table 2.1.2 Standard control services opex by category
Table 2.1.3 Alternative control services capex
Table 2.1.4 Alternative control services opex
Table 2.1.5 Dual function assets capex
Table 2.1.6 Dual function assets opex by category

(a) Compliance with the requirements of the RIN

The information provided in *Table 2.1 – Expenditure Summary & Reconciliation* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- total expenditure for capex and opex has been reported on an "as-incurred" basis
- TasNetworks has reconciled total capex and opex with the sum of capex and opex line items in the "balancing item" row of each table in Template 2.1 using a balancing item which has been calculated in line with the instructions set out in paragraph 2.3 of Appendix E to the RIN
- an Excel spread sheet containing the calculation of the balancing items reported in Template 2.1 has been provided
- a reconciliation has been provided between the total capital and operating expenditure reported in Template 2.1 and the capital and operating expenditure recorded in TasNetworks' Annual Reporting RIN and audited Statutory Accounts

(b) Information sources

The summary information reported about standard control services capex in Table 2.1.1 was sourced from tables *2.2 Repex*, *2.3 Augex*, *2.5 Connections data* and *2.10 Overheads capitalised*. The balancing lines include items sourced from the regulatory accounts that have not been included in the above tables.

The information in *Table 2.1.2 Standard control services opex by category* was sourced from templates *2.7 Vegetation*, *2.8 Maintenance*, *2.9 Emergency Response*, *2.6 Non-network data* and *Table 2.10 Overheads capitalised*. The balancing lines include items sourced from the regulatory accounts that have not been included in the above tables. The expenditure reported in *Template 2.6 Non-network* has been included in operating overhead expenditure as well as non-network and, therefore, has been reduced in the balancing items.

The information in *Table 2.1.3 Alternative control services capex* was sourced from templates *4.1 Metering* and *4.2 Public lighting*. The balancing items in Table 2.1.3 include alternative control services capitalised overheads identified during the process of responding to Template 2.10 (but not reported in that template).

The data reported in *Table 2.1.4 Alternative control services opex by category* has been sourced from templates *4.1 Metering*, *4.2 Public Lighting* and *4.3 Fee-based Services*. The balancing items in Table 2.1.4 include alternative control operating overheads identified during the process of responding to template 2.10 (but not reported in that template). Metering expenditure is included as part of overhead expenditure (as per AER instructions) and the balancing items have been reduced to take this into account.

(c) Methodology and assumptions

In relation to Tables 2.1.5 and 2.1.6, TasNetworks has no dual function assets and, therefore, has reported no expenditure in these tables.

Template 2.2 Repex

Table 2.2.1 Replacement Expenditure, Volumes and Asset Failures by Asset Category

(a) Compliance with the requirements of the RIN

The asset replacement and failure volumes reported in Table 2.2.1 are consistent with the requirements of the RIN, in that:

- Where TasNetworks has provided asset sub-categories corresponding to the prescribed asset categories in Table 2.2.1, the asset replacement / asset failure volumes of these sub-categories reconcile with the higher level asset category
- expenditure for each of the sub-categories is determined through prescribed unit rates, determined for each of the sub-categories
- in instances where the asset group categories and the sub-categorisation provisions set out in Table 2.2.1 do not account for an asset on TasNetworks' distribution system, TasNetworks has inserted additional rows below the relevant asset group to account for this and provided a corresponding age profile in regulatory template 5.2
- replacement volumes by asset group are equal to the applicable replacement volumes provided in Table 2.2.2, with the exception of sub transmission assets. Subs transmission asset categories do not fall into any of the asset group metrics specified in Table 2.2.2
- asset replacements reflect the quantity of store data from TasNetworks' financial systems for the current reporting period

TasNetworks has provided the total volume of assets currently in commission and replacement volumes of certain asset groups consistent with the aggregated metrics specified by the AER.

(b) Information sources

Data was obtained from WASP, TasNetworks' financial systems, and data stored in the Spatial Data Warehouse. TasNetworks' outage management system (InService) was also used to source information relating to outages.

(c) Methodology and assumptions

The financial data in Table 2.2.1 has been apportioned across asset categories using financial information for that year and asset replacement volumes.

Determination of Repex work

General

TasNetworks identified the applicable Work Categories used in WASP that best represented Repex activities. Jobs falling into those Work Categories were then analysed within the various works tools, including WASP, InService, TasNetworks' financial systems and WASP Outages.

Poles (replacement / refurbishment / failures)

For pole replacements (i.e. renewals) and refurbishments, sources of data included:

- all completed condition related pole renewals
- pole refurbishments recorded in WASP

The quantity reported for pole renewals and pole refurbishments are based on actual materials allocated through identified Repex work categories in TasNetworks' financial systems. Each piece of material used that correlates to an asset category has been classified as such, enabling the pole replacements arising as a result from other Repex drivers to be identified and counted, for inclusion in the count of replacements.

For pole refurbishments, the staking of wooden poles and the reinstatement of steel / steel and concrete poles has been included. Steel and concrete pole reinstatements have been classified as concrete poles for the purposes of reporting.

TasNetworks records tasks against each pole that requires renewal or refurbishment, and the data provided reflects tasks recorded in WASP, for any work under the Repex work categories.

In the current reporting period, inspection-based wood pole staking total number staked was less than budgeted.

In the current reporting period, inspection-based pole renewals include those severely impacted by bushfire.

Pole Failures

The condition-based replacement of poles is not deemed to constitute an asset failure, based upon the definition provided.

TasNetworks had nine (unassisted) pole failures in the current reporting period.

TasNetworks records pole failures in its risk database, and a tabular record of pole failures is also stored in TasNetworks' document management system.

Pole Top (replacement / failures)

TasNetworks has a capex task defined within WASP for pole top hardware replacement – principally cross-arms. TasNetworks has reported all pole-top hardware replacement tasks completed.

TasNetworks reports outages where pole top hardware has failed and requires replacement in TasNetworks' outage system, this data has been used for the purposes of completing Table 2.2.1.

The outage categories reported as pole-top asset replacement/failures are:

- Cross Arm Bent
- Cross arm Broken
- Pole Top Fire

In the current reporting period, defect replacements have increased for bushfire risk prevention and reliability based on helicopter patrols, and targeted thermal camera inspections. The current reporting period has experienced major drought, windstorms, lightning storms, bushfires and flooding.

Overhead Conductors (replacement / failures)

A summary of stores data has been extracted from TasNetworks' financial systems, and then is linked to the relevant work categories in WASP. As there is no reliable link between asset data and works data, the route length and number of phases involved with each work package cannot be easily attained. For the relevant work packs, the total of the conductor lengths has been used to calculate the length in the Repex table, and the values divided by 3 and converted to km to determine the total km installed.

For these values a distribution across voltages has been undertaken.

For conductor failures, it should be noted that conductors are repaired in the majority of cases, and then programmed for replacement if required as part of a program for replacement (Copper and GI). The types of failures reported are:

- Conductor clashing due to wind long span

- Conductor clashing due to wind slack span
- Conductor - Bare Wire Broken
- Conductor low - Incorrect clearance

The number provided in Table 2.2.1 for overhead conductor failures is equal to the number of failures.

In the current reporting period, defect replacements have increased for bushfire risk prevention and reliability based on helicopter patrols, and targeted thermal camera inspections. The current reporting period has experienced major drought, windstorms, lightning storms, bushfires and flooding.

Underground Cables (replacement / failures)

The approach used for Repex work of underground cables is to use a summary of store data extracted from TasNetworks' financial systems, and then based on material description is allocated to the appropriate RIN category.

For cable failures, it should be noted that cables are repaired in the majority of cases, and then programmed for replacement if required as part of a program for replacement. The failures reported are:

- UG Cable Failure
- UG Joint Failure
- UG Cable Termination Failure(s)

All transformer outages are at LV level, whilst others relate to the voltage of the feeder.

Data provided in Table 2.2.1 for underground cable failures is equal to the number of failures.

Service Lines (replacement / failures)

For service lines, TasNetworks does not have a specific replacement program in place. Instead it has work rules that require the service fitting and service line to be replaced if they meet certain parameters, specifically the type of fitting/service. TasNetworks does not record the details of the arrangement, make or model of service connection assets and is unable to provide a breakdown of service line replacements and/or failures on the basis of actual data.

Transformers (Include ground substations) (replacement / failures)

TasNetworks has a replacement program for transformers, HV and LV switchgear and substations. The data provided in this section is for the work categories relating to those replacement programs.

A summary of stores data has been extracted from TasNetworks' financial systems, and then linked to the relevant RIN categories, based on the asset material description.

In relation to asset failures, TasNetworks' outage management system records failed transformers, ground switchgear and substations. The task reported is:

- Transformer Failure

The feeder voltage is provided for the voltage breakdown.

Switchgear (replacement / failures)

TasNetworks has specific programs for the replacement of ground mounted and overhead switchgear units. For replacement activities the data is sourced from TasNetworks' financial systems, and allocated to the appropriate switchgear type, based on the financial systems description.

Where ground mounted switchgear is replaced and the solution is a complete kiosk substation, although the kiosk also contains a transformer, all the expenditure is accrued on the switchgear replacement REPEX program. This is because the replacement equipment is a singular unit and the expenditure could not be split up and distributed over several REPEX programs.

For failed units, the data is sourced from Inservice, where the outage cause is classified as switchgear and allocated to switchgear type, based on the GIS asset description. This count will include all asset component failures, but does not necessarily attribute the failure to the correct asset group, as this information is not recorded at the time that the unit is replaced. This count does not differentiate between an asset failure that would result in a capex asset replacement or an asset component failure that would result in opex such as replacing a fuse tube. It also does not allow for attribution of failures into the correct RIN asset categories as this information is not recorded at the time that the unit is replaced. Changes to the outage management systems will allow the correct attribution of these units in the next reporting period.

TasNetworks has specific programs for the replacement of defective Air Break Switches, A safety risk mitigation program is ongoing to replace a subpopulation of as- found defective cracked insulator Air Break Switches, These were a priority assessed by a site field inspection condition assessment audit of all Network's air break switches that was completed in the current reporting period. This increased the number of switches to be changed compared to that known in the previous period. Switches failing in service are being replaced as and when, but most are planned for preventative scheduled replacement to minimise risk and outages to customers. For the known air break switches needing to be replaced, the replacement project program timeline is in the years 2015/16 to 2018/19

Public Lighting

Public lighting data has been sourced from stores data for materials recorded in Navision. The data from Navision was assigned to the relevant public lighting categories for faults and replacements. Volumes of faults in table 2.2.1 are not a subset of total replacements in the same table.

SCADA, Network Control

TasNetworks has very small amounts of SCADA units in commission. There is no formal Repex category for replacement work, as the units are relatively new and have no discernible record of Repex activity.

The estimated financial data in Table 2.2.1 has been apportioned across categories using financial information for that year and the volumes of replacements.

(d) Estimated information

Poles (replacement / refurbishment / failures)

For the breakdown of voltages for poles replaced by other drivers for Repex, an estimation of the voltage has been done on a purely ratio basis of other poles. There is no detail available to provide more accurate data.

Pole Top (replacement / failures)

A process of capitalisation of the opex costs for materials against this fault work is undertaken monthly as a way to capitalise the replacement of failed components with new. There is no simple, auditable or consistent method to determine the asset breakdown against the asset class as this is a financial process only. Therefore, other than for recent replacements of pole top assets, there is no count available for the failures which have occurred in each year of the back-cast period.

It is assumed the vast majority of pole top hardware replacements have been captured in the outage management system.

It is assumed the vast majority of pole top hardware is changed at the time the defect is addressed; therefore all outages have been counted. Other assumptions made are that all transformer outages are at a LV level, whilst all others relate to the voltage of the relevant feeder (HV). Finally outages where the voltage is undeterminable will be distributed across 22 kV principally because the vast majority of TasNetworks' pole tops are 22 kV.

Overhead Conductors (replacement / failures)

For overhead conductors, the total conductor used from TasNetworks' stores system has been divided by three to calculate the total kilometres installed, based on the assumption that all installations are three phase.

It is assumed that the majority (≈87.5%) of installations are 22 kV, with a smaller proportion (≈12.0%) being 11 kV conductors and a very small number being LV (≈0.05%). This proportion is based broadly upon voltage distribution across the state where this work would have taken place. From a pole top/construction perspective, however, voltage makes very little difference in terms of the materials used, as the same components are used for both 22 kV and 11 kV voltages.

For conductor failures, it has been assumed that all transformer outages are at LV conductor level; that others relate to voltage of feeder (HV); and conductor replacements with no recorded voltage level involve 22kV conductors, on the basis that the vast majority are 22kV.

Underground Cables (replacement / failures)

For cable / Termination failures, those reported outages where the voltage reported in 'blank', will be distributed across 22kV principally because the vast majority are 22kV.

Service Lines (replacement / failures)

From the failure data, it is assumed that firstly all service fuses and service lines are replaced on failure. The reported task list for service connections failures includes:

- Conductor Failure – Insulated
- Switchgear - Service Fuse Failure

This assumes that all service fuse outages are at Installation level - but not internal to the installation.

Voltage relates to feeder (HV) and is not relevant. Again, 'blank' will be included in the total count.

Residential / Commercial and Industrial split is assumed to be 85/15 approximately, based on the ratio of customer types.

Where an insulated service/service fuse has failed, the vast majority have both items replaced with new. There is no detailed information to support or counter this position other than anecdotal.

TasNetworks has no other services connection types/at other voltages, as they are deemed part of the network, or relate to consumer mains (private).

Transformers (Including ground substations) (replacement / failures)

For transformer failures, the voltage is determined from the material description for the asset in TasNetworks' financial systems.

Switchgear (replacement / failures)

No reliable data is available on which to base the volumes of overhead switchgear failures. Therefore, it has been estimated that 20% of the replacement of overhead switchgear is due to failure (i.e. condition based replacement).

Table 2.2.2 Selected Asset Characteristics

(a) Compliance with the requirements of the RIN

The asset volumes and asset replacements reported in Table 2.2.2 are consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information presented by TasNetworks is based on reliable and objective data sources gathered from records used in the normal course of business
- assets have been categorised as per the asset grouping requirements of the RIN
- asset volumes reflect the assets that were in service as at the end of the current reporting period

- asset replacements reflect the quantity of store data from TasNetworks' financial systems for the current reporting period
- the volumes of assets reported in Table 2.2.2 reported as currently in commission are equal to the volumes of assets reported in Table 5.2.1, if sub transmission assets are excluded. Subs transmission asset categories do not fall into any of the asset group metrics specified in Table 2.2.2
- as required under section 5 of Appendix E of the RIN, specifically paragraph 5.2, TasNetworks has provided explanations of how it has determined any estimates of the total volume of assets currently in commission and replacement volumes of certain asset groups, including the assumptions used

(b) Information sources

Data was obtained from WASP, TasNetworks' financial systems, and data stored in the Spatial Data Warehouse.

(c) Methodology and assumptions

Feeder Classification

Feeders have been classified for the purposes of Table 2.2.2 as per the classification of feeders undertaken for TasNetworks' response to the current Annual Reporting RIN, specifically *Table 3a Feeder Reliability*.

Feeders were classified by applying the AER's feeder categorisation rules of:

- Urban if the maximum demand of the feeder divided by the total length of the feeder is greater than 0.3 MVA/km
- Short Rural if the maximum demand of the feeder divided by the total length of the is less than or equal to 0.3 MVA/km and the total length of the feeder is less than or equal to 200 km
- Long Rural if the maximum demand of the feeder divided by the total length of the feeder is less than or equal to 0.3 MVA/km and the total length of the feeder is greater than 200 km

Feeders for which there was no maximum demand available were manually assessed for classification based on their location and the classification of other feeders connected to the same substation.

TasNetworks does not have any feeders which meet the AER's classification of a CBD feeder.

From the Repex data obtained for Table 2.2.1 the following information has been determined.

Poles (Pole Replacements)

For poles, asset replacement (REPOL) volumes have been previously determined for Table 2.2.1. Those asset volumes have then been split by feeder classification (as per the AER's definitions) based on the feeder associated with each pole. Poles with no recorded feeder attribute have been distributed proportionally across feeder categories.

The AER has made no provision in the RIN template for sub-transmission poles. Therefore the total volume of poles reported in Table 2.2.2 will be less than the total number of poles reported in *Template 5.2 Asset Age Profile*.

The asset volumes currently in commission have been determined through spatial analysis, where feeders were attributed to all poles. Again, poles with no recorded feeder attribute were distributed proportionally across feeder categories.

Overhead Conductors (Conductor Replacements)

Overhead conductor replacement volumes are determined from the values submitted in Table 2.2.1. The asset volumes currently in commission have been provided principally from Template 5.2 Asset Age Profile.

In the case of HV feeders, those asset volumes have then been split by feeder classification (as per the AER's definitions) based on the feeder associated with each conductor. TasNetworks does not record a feeder attribute for LV conductors. Therefore, in the case of low voltage conductors, and any high voltage conductors with no recorded feeder attribute, those conductors have been distributed proportionally across feeder categories based on the classification of high voltage conductors.

This template does not allow for sub-transmission feeders, meaning that high voltage conductor volumes do not reconcile with those reported in Template 5.2.

HV overhead conductors were split by material based on the conductor material recorded in GTech. However, TasNetworks' GIS does not currently record the material of low voltage conductors. Therefore, the split of low voltage conductors between materials was based on an extrapolation of records of low voltage conductor type connected to poles in WASP. The number of low voltage spans was assumed to be the number of poles minus 1. The average span length was then applied to the conductor materials to estimate the total length of low voltage conductors by conductor material. Low voltage spans with no conductor material were proportionally distributed across the low voltage conductor population.

Template 2.2.2 also does not allow for the reporting of copper conductor, so asset volumes will vary between conductor volumes by feeder classification and conductor volumes by material.

Underground Cables (Cable Replacements)

Underground cable replacement volumes are as submitted in Table 2.2.1. The asset volumes currently in commission have been provided principally from Template 5.2 Asset Age Profile.

In the case of high voltage underground cables, those asset volumes have then been split by feeder classification (as per the AER's definitions) based on the feeder associated with each underground cable. TasNetworks does not record a feeder attribute for low voltage underground cables. Therefore, in the case of low voltage cables, and any high voltage underground cables with no recorded feeder attribute, those cables have been distributed proportionally across feeder categories based on the classification of high voltage cables.

This template does not allow for sub-transmission feeders, meaning that high voltage cable volumes do not reconcile with those reported in Template 5.2.

Transformers by MVA (Replaced / Disposed)

Transformer replacement volumes are as submitted in Table 2.2.1. The asset volumes currently in commission have been provided principally from Template 5.2 Asset Age Profile.

TasNetworks does not record the nameplate ratings of transformers on disposal. Therefore, the capacity of transformers disposed of during the current reporting period was estimated on the basis of 10 per cent of the total transformer fleet currently in service, and the transformers replaced during the current reporting period.

Template 2.3 Augex project data

Table 2.3.1 Augex Asset Data - Subtransmission Substations, Switching Stations and Zone Substations

(a) Compliance with the requirements of the RIN

The information provided about Zone Substation Augmentation projects in Table 2.3.1 – Subtransmission substations, Switching stations and Zone substations is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- augmentation projects undertaken by TasNetworks for which Project Close (as defined by the RIN) occurs in the regulatory year have been reported in this table
- augmentation projects which have a cumulative expenditure of greater than $5 million have been individually reported in a row of Table 2.3.1
- no other Zone, subtransmission or switching station augmentation projects experienced Project Close in the regulatory year, so the penultimate row containing non-material project details was reported with $0 for the 'total expenditure' requested
- project expenditure has been reported in the regulatory year nominal dollars

(b) Information sources

The data reported in Table 2.3.1 has been sourced from exports of WASP, TasNetworks' financial systems , schematic diagrams of TasNetworks' substations and project scope documents.

(c) Methodology and assumptions

Zone substation development utilise the work category codes CAZNC, CAZSU, LANDZ and EASEZ. Work programs relating to subtransmission work specifically is extracted from these codes and removed from the zone substation specific data.

This data is examined for jobs exceeding $5 million completed in the regulatory year. No projects were completed in the regulatory year were over $5 million.

Any jobs completed for a total cost less than $5 million are reported as non-material.

Any jobs which do not have a project close date but have costs incurred against them under these work category codes are listed as non-material forecast.

(d) Estimated information

Table 2.3.2 Augex Asset Data - Subtransmission Lines

(a) Compliance with the requirements of the RIN

The information provided about Zone Substation Augmentation projects in *Table 2.3.2 – Augex Asset Data - Subtransmission Lines* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- augmentation projects undertaken by TasNetworks for which Project Close (as defined by the RIN) occurs in the regulatory year have been reported in this table

- no projects completed in the regulatory year had more than $5 million over the life of the project, and so none of the projects were listed as separate rows in Table 2.3.2
- as per the RIN instructions (despite the conflicting cell shading provided in the CA RIN template), 'total expenditure' has been reported in the penultimate row for all non-material projects – entering this value in the available cell in the 'Project Type' column. This total cost is expressed in reported regulatory year nominal dollars

(b) Information sources

The data reported in Table 2.3.1 has been sourced from TasNetworks' Program of Work management system, TasNetworks' financial systems, schematic diagrams of TasNetworks' substations and project scope documents.

(c) Methodology and assumptions

Subtransmission augmentations utilise the work category codes CAZNC, CAZSU, LANDZ and EASEZ. Work programs relating to subtransmission work specifically is extracted from these codes.

This data is examined for jobs exceeding $5 million completed in the regulatory year. No projects were completed in the regulatory year at this value.

Any jobs completed for a total cost less than $5 million are reported as non-material.

(d) Estimated information

No estimates have been used by TasNetworks in completing Table 2.3.2 for the current reporting period.

Table 2.3.3 Augex Data - HV/LV Feeders and Distribution Substations

2.3.3.1 Descriptor Metrics

(a) Compliance with the requirements of the RIN

The information provided about Augex in Table 2.3.3.1 –Descriptor Metrics is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- no information relating to gifted assets has been included
- information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars
- information regarding the circuit line lengths of HV and LV feeders and the number of substations added has been provided on an as incurred basis

(b) Information sources

The data reported in Tables 2.3.3.1 and 2.3.3.2 has been sourced from TasNetworks' financial and Works Management systems.

The numbers of circuit kilometres and distribution transformers added during the reporting period have been obtained from TasNetworks' financial and Works Management systems.

(c) Methodology and assumptions

Data was extracted from the source systems based on specified Work Categories and identified by Overhead and Underground project types

Data was summarised based on High and Low voltage conductor types and Substation types as identified in the Financial Systems data and a translation table provided.

Data was limited by thresholds $500k for High Voltage and $50k for Low Voltage total project spend for completed projects in the last regulatory year by quantities limited to those assets installed in last regulatory year.

2.3.3.2 Cost Metrics

(a) Compliance with the requirements of the RIN

The cost metrics in Table 2.3.3.2 have been compiled with reference to the relevant instructions in the RIN.

(b) Information sources

The cost metrics reported in Table 2.3.3.2 have been sourced from TasNetworks' financial and Works Management systems.

(c) Methodology and assumptions

Expenditure recorded in Table 2.3.3.2 includes all projects undertaken during the regulatory year, not just completed jobs. The assets added or in service as an outcome of projects that were not complete as at 30 June 2015 have not been included in the totals reported in Table 2.3.3.1.

The total cost thresholds applied to delineate between material and non-material high voltage and low voltage feeder augmentation projects are $500k and $50k respectively. The thresholds have been applied against the total cumulative expenditure over the life of the project, inclusive of any indirect costs. Expenditure reported in Table 2.3.3.2, however, excludes overheads.

Table 2.3.4 Augex Data - Total Expenditure

(a) Compliance with the requirements of the RIN

The information provided in *Table 2.3.4 – Augex Data – Total Expenditure* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the augmentation expenditure reported by TasNetworks is based on reliable and objective data sources
- expenditure data in Table 2.3.4 has been reported on an 'as incurred' basis and in nominal dollars
- expenditure relating to land purchases and easements associated with augmentation works on high voltage feeders, low voltage feeders and distribution substations has only been provided in Table 2.3.4
- expenditure recorded in the 'Land and easements' rows of Table 2.3.4 has not been included in the augmentation expenditure reported in relation to the corresponding asset groups in the same table

(b) Information sources

The expenditure data reported in Table 2.3.4 has been sourced from WASP and TasNetworks' financial systems.

(c) Methodology and assumptions

TasNetworks' augmentation expenditure has been extracted from TasNetworks' financial systems by relevant work category, and aggregated to the corresponding asset groups for the purposes of completing Table 2.3.4.

The expenditure reported in Table 2.3.4 in relation to Subtransmission Substations, Switching Stations, Zone Substations and Subtransmission Lines is as incurred, whereas expenditure reported in tables 2.3.1. and 2.3.2 is consistent with requirement to report expenditure on a project close basis.

Template 2.5 Connections

Table 2.5.1 Descriptor Metrics

Expenditure on all types of connection related activities reported in Table 2.5.1 has been allocated to the different classifications and subcategories using the work categories in TasNetworks' accounting system Navision.

Residential Connections

(a) Compliance with the requirements of the RIN

The information provided about connections volumes in *Table 2.5.1 – Descriptor metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- no information relating to gifted assets has been included
- information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars (of the relevant regulatory year)
- information regarding the circuit line lengths of HV and LV feeders and the number of substations added on an as incurred basis

(b) Information sources

Connection volumes

All annual residential connection volumes provided in Table 2.5.1 were sourced from Gentrack.

Underground and overhead connection volumes

The volumes of underground and overhead connections were determined on the basis of information stored in Gentrack, Brave Service Order Management system or Spatial Data Warehouse.

Distribution Substation Installed (MVA added)

Distribution substations MVA added and number installed have been calculated by extracting the transformer size and quantities from the TasNetworks' financial systems quantities that were extracted for residential augmentation HV and LV.

Distribution Substation Installed (0's)

Expenditure data has been sourced from TasNetworks' financial system and reconciled to the Annual Reporting RIN.

Mean days to connect residential customer with LV single phase connection

The mean days taken to connect residential customers requiring a low voltage single phase connection was derived using a combination of service order information originating from TasNetworks' Service Order Management system and performance data captured in the field using the TVD CSC system and stored in TasNetworks' Meter Data Management System.

Volume of GSL breaches for residential customers

The volumes and values of payments made under the customer charter applying in the current reporting period to connections to customers who received a standard of service below that set out in the charter have been derived from records kept in the Charter Payment Tool, which is part of TasNetworks' customer complaint management systems.

Volume of customer complaints relating to connection services

The volume of complaints applying in the current reporting period to connections to customers who made a complaint to TasNetworks have been derived from records kept in the Customer Advocacy Tool, which is TasNetworks' customer complaint management tool.

(c) Methodology and assumptions

Connection volumes

The annual connection volumes for residential, commercial/industrial and embedded generation customers presented in Table 2.5.1 were sourced directly from Gentrack.

Underground and overhead connection volumes

The information captured in Gentrack regarding individual installations includes a field which identifies whether a connection is overhead or underground. This is however currently an incomplete data set.

In the cases of residential, commercial/industrial and embedded generation connections, those connections for which the type of connection has not been recorded have been determined by extracting information from the associated connection Service Order, or failing that, querying the GIS database for the NMIs connection details.

Distribution Substation Installed (MVA added)

For each completed Work Package from WASP, an extract of the transformers by kVA was generated, based upon the record in TasNetworks' financial systems of the stores items used. This data was then summarised using a kVA for the stores item, and then the data was provided for each of the connection subcategories for the current reporting period.

Distribution Substation Installed (0's)

Expenditure has been allocated to the different classifications and subcategories using the work categories in TasNetworks' accounting system Navision. Where the RIN further breaks down the information into more detailed subcategories than TasNetworks' financial systems; volumes relating to these sub categories have been used for allocation purposes.

Mean days to connect residential customer with LV single phase connection

The average time taken to provide residential customers with a low voltage single phase connection has been derived using Brave Service Order Management records of the date on which service orders for connections of this type are received in the field and the corresponding job completion dates. The service orders are generated by SOM and exported into TasNetworks' field tool, which is also used to gather the completion date for each job as part of standard operating procedure.

GSL Breaches/Payments for Residential Customers
Complaint volumes for Residential Customers

(a) Compliance with the requirements of the RIN

The information provided about connection service related GSL breaches and payments in *Table 4.1.2 – Descriptor metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data refers to the voluntary 'GSL' payments and connection complaints made under TasNetworks' Customer Charter to customers who received a standard of service below that set out in the charter in relation to connection services
- the data provided pertains to Customer Charter payments made to residential customers only
- the variables, including any estimated components, are based on reliable and objective data sources

(b) Information sources

The number and value of payments made to customers who received a standard of service below that set out in the customer charter applying to street lighting in the current reporting period have been derived from records kept in the Charter Payment Tool, which is part of TasNetworks' customer complaint management systems.

The volume of complaints relating to street lighting received from customers in the current reporting period has been derived from records kept in the Customer Advocacy Tool, which is TasNetworks' customer complaint management system.

(c) Methodology and assumptions

The data sources which record the customers who have received payments under TasNetworks' customer charter do not consistently contain NMIs, meaning that residential customers that receive payments are not able to be identified with absolute certainty

In order to apportion customer charter payments and street lighting complaints between residential and non-residential customers, a sample of approximately 200 general charter payment recipients for whom NMIs were recorded has been cross-referenced with the network tariff history stored for those NMIs in TasNetworks' distribution billing system in order to identify the primary network tariff (and customer status) applying at the time each payment was made. The findings from this analysis have then been applied to the street lighting-related customer charter payments and complaints made during the current reporting period, with the result that 85 per cent of payments, both by value and number, have been apportioned to residential customers.

(d) Estimated information

Neither the Customer Charter Tool nor the Customer Advocacy Tool include information enabling TasNetworks to readily identify those Customer Charter payments and complaints which are made to or by residential customers.

In the absence of information that enables the systematic and reliable identification of the customer charter payments which were made to residential customers, a sample of payment recipients for which NMIs have been recorded has been cross referenced with network tariff histories stored in the distribution network billing system in order to determine the primary network tariff which applied at the time each charter payment was made. On this basis it is possible to identify residential customers that received a payment. The proportion of residential payment recipients identified in the sample has been applied to the street lighting related customer charter payments made during the current reporting period, in order to determine the extent to which they were made to residential customers.

The same proportion methodology was applied the street lighting complaint volumes.

In order to apportion Customer Charter payments between residential and non-residential customers it has been assumed that the number and value of payments made to residential customers in the sample of charter payments recipients is representative of the charter payments made during the current reporting period , including those payments relating to street lighting services.

This methodology was chosen because it was based on objective data sources and the ratio of residential to non-residential NMIs identified using this technique has been shown to be consistent with that of the wider customer base.

Commercial/Industrial connections

(a) Compliance with the requirements of the RIN

The information provided about Augex in *Table 2.5.1 – Descriptor Metric and 2.5.2 Cost Metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- no information relating to gifted assets has been included
- information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars
- information regarding the circuit line lengths of HV and LV feeders and the number of substations added during the back-cast period has been provided on a project close basis

(b) Information sources

The data reported in Tables 2.3.3.1 and 2.3.3.2 has been sourced from WASP and TasNetworks' financial systems.

The numbers of circuit kilometres and distribution transformers added during the back-cast period have been obtained from TasNetworks' financial and Works Management systems.

(c) Methodology and assumptions

All Projects under the following work categories "SOIRR and SOIRC and SOGSI and SOGSC and SOMPR and SUGSI and SUMPR and SUSCA and SUSUB" and when associated work packs are completed before the beginning of the current reporting period.

To determine the HV and LV Conductor lengths we have extracted from TasNetwork's Works and Assets Management system (WASP) Estimates values for 1 phase (2 wire) or 3 phase (3 wire) unit assemblies, then divided the TasNetworks' financial systems quantity by 1,000 for km and then by a value to allow for single phase or 3 phase lines.

HV and LV projects are defined by Work Category Description and Project Title.

(d) Estimated information

The data reported in Tables 2.5.1 and 2.5.2 has been sourced from WASP and TasNetworks' financial systems.

The numbers of circuit kilometres and distribution transformers added during the back-cast period have been obtained from TasNetworks' financial and Works Management systems.

Subdivision connections

(a) Compliance with the requirements of the RIN

The information provided about Augex in *Table 2.5.1 –Descriptor Metric and 2.5.2 Cost Metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- no information relating to gifted assets has been included
- information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars
- information regarding the circuit line lengths of HV and LV feeders and the number of substations added during the back-cast period has been provided on a project close basis

(b) Information sources

The data reported in Tables 2.5.1 and 2.5.2 has been sourced from TasNetworks' financial and Works Management systems.

The numbers of circuit kilometres and distribution transformers added during the back-cast period have been obtained from TasNetworks' financial and Works Management systems.

(c) Methodology and assumptions

All Projects under the following work categories "SUSBD and SOSDI and SOSDC" and when associated work packs are completed within the current reporting period.

To determine the HV and LV Conductor lengths we have extracted from WASP Estimates values for single phase (2 wires) or three-phase (3 wires) unit assemblies, then divided the TasNetworks' financial systems quantity by 1,000 for km and then by a value to allow for single phase or three-phase lines.

HV and LV Projects defined by HV and LV Conductors in the TasNetworks' financial systems Extract and Estimate data.

All subdivision projects are "LV" with HV and LV conductors installed. Costs have been apportioned between HV and LV conductors installed based on the kms added.

Embedded generation connections

(a) Compliance with the requirements of the RIN

The information provided about Augex in *Table 2.5.1 –Descriptor Metric and 2.5.2 Cost Metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- no information relating to gifted assets has been included
- information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars
- information regarding the circuit line lengths of HV and LV feeders and the number of substations added during the back-cast period has been provided on a project close basis

(b) Information sources

The data reported in Tables 2.5.1 and 2.5.2 has been sourced from TasNetworks' financial and Works Management systems.

The numbers of circuit kilometres and distribution transformers added during the back-cast period have been obtained from TasNetworks' financial and Works Management systems.

(c) Methodology and assumptions

The number of high voltage embedded generator projects have been identified by the relevant TasNetworks' Asset Manager.

HV & LV Augmentation Data – All Connection Sub-Categories

(a) Compliance with the requirements of the RIN

The information provided about augmentation volumes and expenditure relating to connections in *Table 2.5.1 Descriptor Metrics* and *Table 2.5.2 Cost Metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the variables reported by TasNetworks are based on reliable and objective data sources
- no information relating to gifted assets has been included

- information regarding augmentation (capital) expenditure has been reported on an as incurred basis and in nominal dollars
- information regarding the circuit line lengths of HV and LV feeders and the number of substations added during the current reporting period has been provided on a project close basis
- 'km added' refers to the net addition of circuit line length resulting from the augmentation work of complex connections

(b) Information sources

The information regarding augmentation in Table 2.5.1 has been sourced from WASP and the Managing Customer Connections (MACCs) database.

(c) Methodology and assumptions

Augmentation projects were sourced from WASP by extracting work packs that were completed in the current reporting period under the following work categories:

- Residential connections
- Commercial/industrial connections
- Subdivisions

Embedded generation projects were identified in the MACCs database and then cross referenced with the corresponding WASP work packs that were completed within the current reporting period.

The WASP estimates associated with the work packs were used to determine whether the installed circuits were underground, phase (two wire) or three phase (three wire) installations.

The work pack numbers were cross referenced with TasNetworks' financial systems to extract all the materials associated with each job. Each material was then classified as HV or LV using the financial systems description of the materials.

HV and LV circuit lengths added were calculated by taking the TasNetworks' financial systems quantities for conductors and cables (in meters by default), dividing this quantity by 1,000 to convert the lengths to kilometres, and then multiplying by the appropriate number of wires (if required) extracted from the WASP estimates in the previous step.

Table 2.5.2 Cost Metrics by Connection Classification

Expenditure

(a) Compliance with the requirements of the RIN

The expenditure data provided in relation to the provision of connection services in *Table 2.5.2 – Cost metrics by connection classification* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated;
- the expenditure on connections reported by TasNetworks is materially dependent on information recorded in TasNetworks' finance system
- TasNetworks has reported expenditure data as gross amounts, and has not subtracted customer contributions from the connections expenditure data
- TasNetworks has applied the definitions of complex connections in Appendix F of the RIN to provide guidance on the type of work which is to be reported as connection services for the purposes of Table 2.5.2, as opposed to augmentation (reported under Template 2.3)

- Only augmentation expenditure relating to connections provided in response to customer connection requests has been reported in regulatory Template 2.5

(b) Information sources

The costs associated with the provision of connection services have been sourced from TasNetworks' financial systems and reconciled to the Annual Reporting RIN.

(c) Methodology and assumptions

In relation to the provision of connection services, TasNetworks' financial systems does not distinguish between the connection classifications used in Table 2.5.2 (i.e. simple and complex LV or HV connections).

In order to report the costs associated with each type of connection classification stipulated in Table 2.5.2, the total cost of providing connection services in the current reporting period has been apportioned between the classifications in Table 2.5.2 on the basis of unit rates developed specifically for the purposes of weighting the connection volumes reported in Table 2.5.2.

Volumes

(a) Compliance with the requirements of the RIN

The information provided about Residential Complex connections HV in *Table 2.5.2 – Cost Metrics by Connection Classifications* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data reported by TasNetworks is materially dependent on information recorded in reliable and objective records used in the normal course of TasNetworks' business

(b) Information sources

The volumes of Residential complex HV connections; Commercial/Industrial complex HV connections; and Commercial/Industrial complex sub-transmission connections provided by TasNetworks are actual data, gathered from reliable and objective data sources used by TasNetworks during the normal course of business.

(c) Methodology and assumptions

The information provided represents actual data.

Residential – Simple Connection LV

This is the balance after deducting the values for Complex Connections LV and HV below from the total of Residential Underground and Overhead in table 2.5.1

Commercial/Industrial – Simple Connection LV

This is the balance after deducting all values for Complex Connections HV below from the total of Commercial/Industrial Underground and Overhead in table 2.5.1

Embedded Generation – Simple Connection LV

This is the balance after deducting all values for Complex Connections HV below from the total of Embedded Generation Underground and Overhead in table 2.5.1

(d) Estimated information

The connection volumes provided in Table 2.5.2 represent actual data.

Template 2.6 Non-Network Expenditure

Table 2.6.1 Non-Network Expenditure

(a) Compliance with the requirements of the RIN

The information provided in *Table 2.6.1 – Non-Network Expenditure* is consistent with the requirements of the RIN, in that:

- all relevant cells in the template have been populated
- all data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- each category of expenditure has been populated in line with the AER's definitions outlined in the RIN

(b) Information sources

The information in *Table 2.6.1 Non-Network Expenditure* was sourced from TasNetworks' financial systems and TasNetworks' Fleet Management System.

(c) Methodology and assumptions

Client Device Expenditure

Expenditure that relates to a hardware device that accesses services made available by a server. Items included in this category are the costs associated with our IT service provider, plus all capital expenditure associated with the purchase of desktop computers, laptops, tablets etc. This information has been generated from the Annual Reporting RIN.

Recurrent Expenditure

Expenditure included in this category are items that occur on a regular on-going basis and would include the operating labour costs of the IT department, plus all costs associated with landlines, mobile phone charges, software, data communications etc. This information has been generated from the Annual Reporting RIN

Non-Recurrent Expenditure

Expenditure included in this category are items that occur on a non-recurring basis and has been gathered from the Annual Reporting RIN.

Motor Vehicles

All motor vehicles are split into the relevant RIN category per the category number generated from the Fleet Management System. Costs are then allocated on a proportionate basis per the number of vehicles within each category for determining opex expenditure. Capex expenditure is the value of additions within the regulatory year, split into the relevant motor vehicle category

Buildings and Property

Opex and capex expenditure has been sourced from the Annual Reporting RIN.

Other Expenditure

Opex and capex expenditure has been sourced from the Annual Reporting RIN.

(d) Estimated information

No Estimates have been used in the compilation of this table.

Table 2.6.2 Annual Descriptor Metrics - IT & Communications Expenditure

(a) Compliance with the requirements of the RIN

The information provided in Table 2.6.2 IT & Communications expenditure is consistent with the requirements of the RIN, in that:

- all relevant cells in the template have been populated
- all data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- each category of expenditure has been populated in line with the AER's definitions outlined in the RIN

(b) Information sources

The descriptor metrics relating to TasNetworks' IT and Communications expenditure has been sourced from TasNetworks' Human Resources system (Peoplesoft) at the time of the Financial Year End. The numbers provided are as per the TasNetworks' published accounts.

(c) Methodology and assumptions

Employee numbers represent total TasNetworks employee numbers as published in the annual accounts.

(d) Estimated information

No estimates have been used in the compilation of this table.

Table 2.6.3 Annual Descriptor Metrics - Motor Vehicles

(a) Compliance with the requirements of the RIN

The information provided about Motor Vehicles in *Table2.6.3 – Motor Vehicles* is consistent with the requirements of the RIN, in that:

- all relevant cells in the template have been populated
- all data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- each category of expenditure has been populated in line with the AER's definitions outlined in the RIN

(b) Information sources

Information regarding TasNetworks' vehicle fleet has been sourced from TasNetworks' Fleet Management Systems (AusFleet) and TasNetworks' financial systems.

(c) Methodology and assumptions

Kilometres travelled

The opening and closing odometer readings for each vehicle were used to calculate the kilometres travelled in the current reporting period, with the mileages then sorted by category of vehicle and aggregated.

Number purchased

The number of vehicles purchased by TasNetworks during the current reporting period was extracted from AusFleet.

Number in fleet

The number of vehicles in TasNetworks' fleet was derived for each category of vehicle using information taken from TasNetworks' fleet management systems.

Proportion of fleet expenditure

The proportion of fleet expenditure was derived by:

- gathering motor vehicle expenditure for each vehicle from AusFleet
- allocating each motor vehicle to the appropriate category (e.g. Light Commercial, Passenger, Trailer)
- calculating the total expenditure for each category of motor vehicle
- splitting out the cost of each category of vehicle into prescribed and non-prescribed expenditure
- calculating the Regulatory Percentage by dividing prescribed expenditure by total expenditure

(d) Estimated information

No Estimates were used in the compilation of this table.

Template 2.7 Vegetation Management

Vegetation management zones

Under paragraph 12.1 in section 12 of Appendix E to the RIN (Principles and Requirements), TasNetworks is required to nominate one or more vegetation management zone(s) across the geographical area of TasNetworks' distribution network.

TasNetworks has nominated two vegetation management 'zones' in accordance with Appendix E. In doing so, TasNetworks has taken into consideration the areas where bushfire mitigation costs are imposed by legislation, regulation or Ministerial order, as well as areas of the network where other recognised drivers affect the costs of performing vegetation management work.

TasNetworks is required to provide, on separate A4 sheets, maps showing each vegetation management zone and the total network area with the borders of each vegetation management zone. Those maps have been provided as required, and are also reproduced below.

For each vegetation management zone identified, TasNetworks has provided details of any regulations that impose a material cost on performing vegetation management works, including, but not limited to, bushfire mitigation regulations.

Details of the self-imposed standards from TasNetworks' vegetation management program which apply to each nominated vegetation management zone have also been provided as part of this Basis of Preparation document.

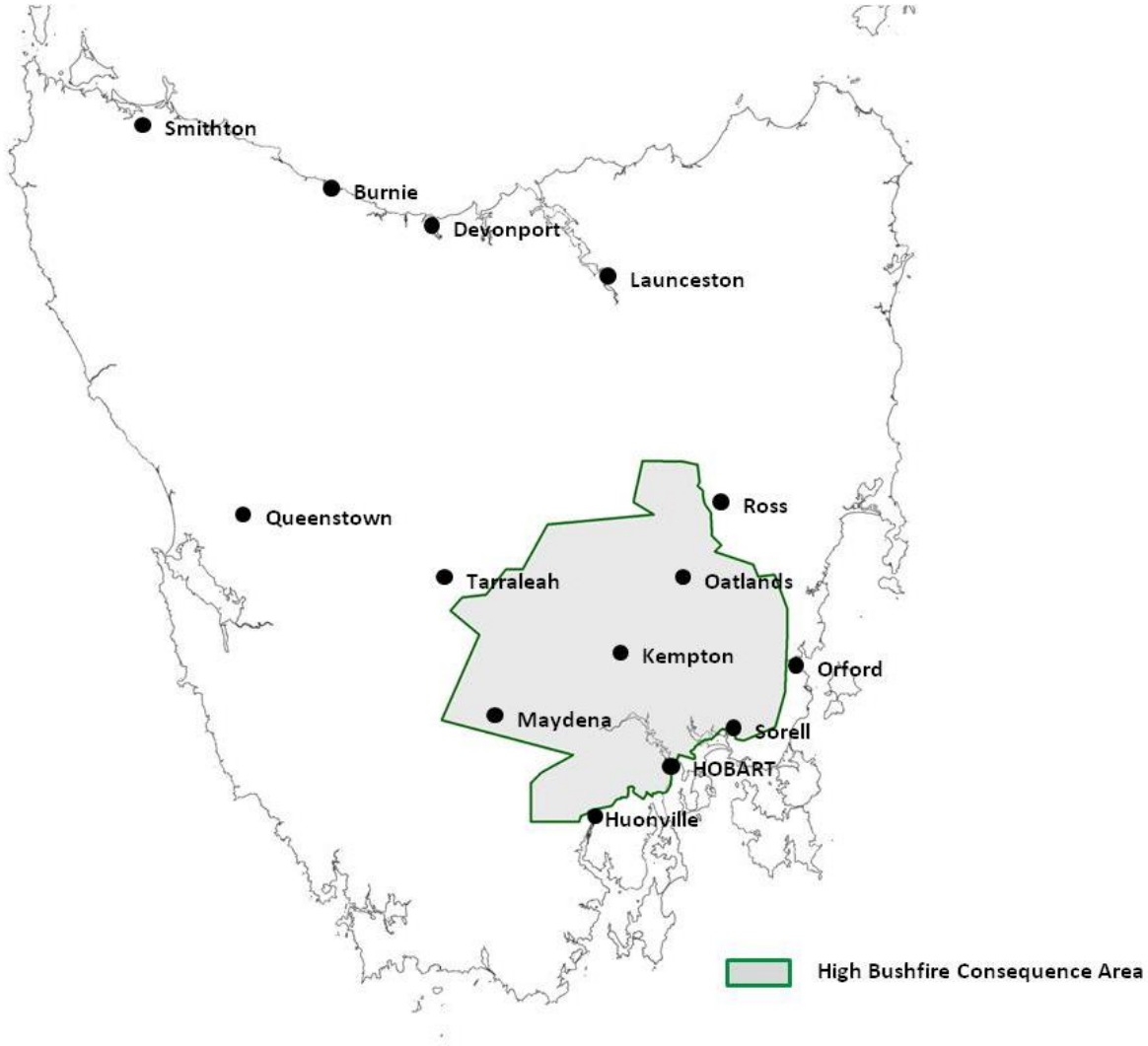
Operationally, TasNetworks' entire network is managed as a single vegetation management zone, which reflects the fact that the entire distribution network is covered by TasNetworks' normal trimming cycle. Within that zone, however, a High Bushfire Consequence Area has been defined to identify the area of TasNetworks' network where bushfire mitigation is a recognised driver of additional vegetation management work.

TasNetworks carries out an annual pre-summer vegetation inspection and cutting program in the High Bushfire Consequence Area to ensure required clearances are achieved prior to the onset of the annual bushfire season.

Tree-trimming costs have been split between zones in the vegetation expenditures table (Table 2.7.2).

The definition of the High Bushfire Consequence Area is flexible, however, and can change between years, in that TasNetworks has the option of extending the area covered by its pre-summer inspection and cutting program if conditions leading into the bushfire season pose sufficient risk to warrant additional work being undertaken. Such risks and additions to the program are developed in consultation with the Tasmania Fire Service and the Bureau of Meteorology.

High Bushfire Consequence Area



Legislation with a material impact on vegetation management work

The following legislation requires TasNetworks to implement programmes relating to vegetation management:

- *Electricity Supply Industry Act 1995* (ESI Act)
- *Electricity Industry Safety and Administration Act 1997* (ESI&A Act)
- The *Tasmanian Electricity Code* (TEC)

TasNetworks' normal trimming cycle across the state are driven by compliance with the ESI Act, the ESI&A Act and Chapter 8A of the TEC. TasNetworks uses the principles and approaches contained within Chapter 8A of the TEC as its basis for managing the vegetation within TasNetworks' statutory easements.

Electricity Supply Industry Act 1995

The ESI Act exists to:

- promote efficiency and competition in the electricity supply industry
- establish and maintain a safe and efficient system of electricity generation, transmission, distribution and supply
- establish and enforce proper standards of safety, security, reliability and quality in the electricity supply industry
- protect the interests of consumers of electricity

The ESI Act covers safety aspects at a fairly high level and is implicit regarding vegetation management risks.

Electricity Industry Safety and Administration Act 1997

The EIS&A Act exists to establish safety standards for electrical articles, to provide for the investigation of accidents in the electricity industry and for related purposes. The ESI&A Act covers:

- Powers of entry and inspection
- Powers to order rectification
- Powers to order disconnection
- Emergency powers relevant to TasNetworks vegetation management activities

Tasmanian Electricity Code (TEC)

The TEC provides, inter alia, a statement of the relevant technical standards of the electricity supply industry, an access regime to facilitate new entry, guidance on price setting methodologies, a means of resolving disputes, and establishes advisory committees to assist the Regulator. There has been on-going development and refinement of the TEC to ensure that it best meets the needs of the Tasmanian electricity supply industry and customers.

Chapter 8A of the TEC includes a framework for the management of vegetation around distribution powerlines. This framework is explicit regarding works requirements and practices in various fire hazard categories.

TasNetworks has the regulatory responsibility to manage trees growing near power lines and mitigate risks associated with trees coming into contact with power lines. The minimum standard to which TasNetworks must achieve is compliance with Chapter 8A of the TEC.

Self-imposed Vegetation Management Standards

Vegetation management works in the High Bushfire Consequence Area include the standard cyclic cuttings undertaken in the rest of the State, as well as a more rigorous annual pre-summer vegetation inspection and cutting programme to ensure required clearances are achieved prior to the onset of each annual bushfire season.

The High Bushfire Consequence Area was developed as part of Aurora Energy's 2012 Bushfire Mitigation Strategy (which has been adopted by TasNetworks), where leading experts from Melbourne University and the Tasmanian Parks and Wildlife Service were engaged (in consultation with the Tasmanian Fire Service) to utilise the industry accepted Phoenix Rapid-fire modelling tool to determine areas of fire loss consequence. This methodology has been utilised by other DNSPs following the findings of the Victorian Bushfire Royal Commission.

The level of exposure to bushfire risk has been determined based on the number of maintenance spans located in the bushfire loss consequence areas.

TasNetworks has the option of extending the area covered by the pre-summer vegetation inspection and cutting programme if conditions leading into the bushfire season pose sufficient risk to warrant additional work being undertaken. Risk and additions to the programme are discussed in liaison with the Tasmania Fire Service and the Bureau of Meteorology.

Table 2.7.1 Descriptor Metrics by Zone

Route Line Length

(a) Compliance with the requirements of the RIN

The route line lengths provided in Table2.7.1 are consistent with the requirements of the RIN, in that:

- all relevant cells in the template have been populated
- all data has been based on reliable and objective data sources which are used in the normal course of TasNetworks' business
- TasNetworks' route line length reflects the length of each span between poles and/or towers
- the length of each span has been considered only once in calculating route line length, regardless of the number of circuits it contains
- the distances between line and cable segments do not reflect vertical components such as sag
- the length of service lines has not been included in the route line length
- TasNetworks' Span Model was developed to comply with the AER's definition of Route Line Length

(b) Information sources

Distribution GIS Span Model.

(c) Methodology and assumptions

TasNetworks' GIS contains a 'span model', a database of pairs of geographic coordinates that correspond to poles with at least one connecting conductor circuit. The total length of all elements in the span model thus gives the horizontal length of all networks spans (changes in height are ignored), with multiple circuits counted only once, in keeping with the AER definition of route line length. This model was developed in 2013, and no updates have been applied since.

Number of Maintenance Spans

(a) Compliance with the requirements of the RIN

The numbers of maintenance spans reported in Table 2.7.1 are consistent with the requirements of the RIN, in that:

- all relevant cells in the template have been populated
- all data has been based on reliable and objective data sources which are used in the normal course of TasNetworks' business
- only spans within TasNetworks' network that were subject to active vegetation management in the current reporting period have been included

The count of **Maintenance Spans,** defined as "A span within TasNetworks' network that is subject to active vegetation management practices...", has been provided where data are available.

(b) Information sources

- Vegetation management system (data populated by ETS)
- Total vegetation expenditure (data provided by vegetation management financial records)

(c) Methodology and assumptions

TasNetworks' primary vegetation management contractor submits the number of spans cleared and trees actioned within each span via electronic data capture and upload to TasNetworks' vegetation management system during the scoping and cutting phase of works.

(d) Estimated information

While TasNetworks' primary vegetation management contractor records the number of spans cleared electronically, other contractors, responsible for approximately 20% of work, do not yet provide the required data directly.

The number of spans maintained where data are available (from the primary contractor) has been divided by expenditure to calculate an average rate (vegetation management productivity) per maintenance span. Expenditure where data is unavailable has been applied at this average rate to estimate the additional number of spans under management.

Due to recent changes in primary contractors, only 75% of primary contractor data was available. This data has been extrapolated to represent 100% with the assumption that the 25% of data unavailable has been actioned at the same progress rates and efficiency as existing data.

Where mechanical clearing techniques have been utilised, an average rate of $4,000 per kilometre has been applied (based upon historical data) to determine kilometres covered. An average span distance of 0.0828km (from known span data within the VMS) has been applied to the total kilometres to determine spans cleared.

The primary vegetation management contractor operates a large and diverse number of teams, through a wide variety of vegetation areas throughout the state. It has been assumed that the average vegetation management productivity of TasNetworks' Primary vegetation management contractor is constant across all contractors. The effects of individual efficiency and progress rates through different areas are thus averaged to determine an overall aggregate rate.

Total Length of Maintenance Spans

(a) Compliance with the requirements of the RIN

The total length of the maintenance spans in each vegetation management zone reported in Table 2.7.1 are consistent with the requirements of the RIN, in that:

- the data provided refers only to maintenance spans where active vegetation management occurred during the current reporting period.

(b) Information sources

- Vegetation management system (Data populated by ETS)
- Distribution span model
- Spatial Data Warehouse

(c) Methodology and assumptions

Each span identified for work can be linked via a specific span ID back to the Spatial Data Warehouse and Distribution Span Model providing the distance of each individual span.

(d) Estimated information

While vegetation pool contractors and mechanical clearing contractors report the number of spans cleared, they do not currently identify the exact spans cleared, meaning that an estimate of the total length of maintenance spans is required.

Data based upon the number and length of spans maintained where data are available has been provided.

Estimates have been derived based upon expenditure where data is unavailable and added to the known data.

It has been assumed that the average vegetation management productivity of TasNetworks' Primary vegetation management contractor is constant across all contractors.

The average span length is considered to be relatively accurate given the large number of spans in each feeder. Vegetation programs for a given year also generally follow a single feeder, mitigating the effects of outlying long or short spans.

Length of Vegetation Corridors

(a) Compliance with the requirements of the RIN

The total length of vegetation management corridors reported in Table 2.7.1 is consistent with the requirements of the RIN, in that the vegetation corridor lengths supplied by TasNetworks do not include portions of the corridor where no managed vegetation exists or where vegetation is not managed.

(b) Information sources

TasVeg spatial vegetation community data, TasNetworks' Spatial Data Warehouse and specialist consultant tree density analysis.

(c) Methodology and assumptions

Vegetation corridor lengths have been estimated using spatial analysis by overlaying TasNetworks' network span model with recognised and modelled vegetation data.

(d) Estimated information

TasNetworks has provided estimated vegetation corridor lengths because actual spatial vegetation corridor records were not kept through the period covered by this submission.

The TasVeg database was used to assign a vegetation "community" to every network span from the Spatial Data Warehouse. A specialist consultant was engaged to analyse these communities and assign appropriate densities for vegetation that may interfere with overhead lines. Any line within a vegetation community (tree density > 0) was considered part of a vegetation corridor.

It has been assumed that the vegetation community data is sufficiently detailed and accurate on the scale of overhead spans.

An objective, state-wide vegetation model is required to make meaningful comparisons and decisions when scheduling and prioritising vegetation work. While more accurate assessments could be made on a local scale, this would likely distort the system-view of vegetation corridors.

2014-15 data has been escalated in proportion to route line length increases to represent 2015-16 data.

Average number of trees per maintenance span

(a) Compliance with the requirements of the RIN

The information about the average number of trees per maintenance span provided in *Table2.7.1 – Descriptor metrics by zone* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been prepared in accordance with the relevant instructions from the AER

(b) Information sources

- Distribution Span Model
- Vegetation Management System (Data populated by ETS)

(c) Methodology and assumptions

TasNetworks' primary vegetation management contractor submits the number of spans cleared and trees actioned within each span via electronic data capture and uploads to TasNetworks' vegetation management system during the scoping and cutting phase of works.

(d) Estimated information

While TasNetworks' primary vegetation management contractor records the numbers of trees cleared per span, other contractors, responsible for approximately 20% of work, do not yet provide the required data directly.

The number of spans maintained (and trees per maintenance span) where data are available has been divided by expenditure to calculate an average rate (vegetation management productivity) per maintenance span. Expenditure where data is unavailable has been applied at this average rate to estimate the additional number of spans under management.

It has been assumed that the average vegetation management productivity of TasNetworks' Primary vegetation management contractor is constant across all contractors.

Where mechanical clearing techniques have been utilised, trees removed are measured by the number of metres squared cleared rather than by numbers of trees. This has resulted in the necessity to convert the number of metres squared cleared into the AER's definition of 'trees'.

Where mechanical clearing techniques have been utilised, an average rate of $4,000 per kilometre has been applied (based upon historical data) to determine kilometres covered. An average span distance of 0.0828km (from known span data within the VMS) has been applied to the total kilometres to determine spans cleared.

Where mechanical clearing techniques have been utilised, a further assumption has been made that the average width of cleared easement is 8 metres. This width is derived from the average total easement width of 12 metres and subtracting 4 metres for allowance for roads and tracks within the easement.

It is assumed (based upon sampling) that 50% of mechanical clearing m^2 are populated with trees greater than 3m in height (as per AER's definition of 'trees').

The primary vegetation management contractor operates a large and diverse number of teams, through a wide variety of vegetation areas throughout the state. The effects of individual efficiency and progress rates through different areas are thus averaged to determine an overall aggregate rate.

Average Frequency of Cutting Cycle

(a) Compliance with the requirements of the RIN

The information has been provided as per the AER's definition of *cutting cycle*.

At the time of gathering data for the RIN, policy on vegetation cycles had not changed, therefore the historical cutting cycle is expected to carry through as the planned cutting cycle.

(b) Information sources

Vegetation management system (Data populated by ETS)

(c) Methodology and assumptions

Feeders within and outside the high bushfire consequence area are scheduled for annual and two-year cutting cycles respectively.

Table 2.7.2 Cost Metrics by Zone

(a) Compliance with the requirements of the RIN

The information provided about vegetation management in 2.7.2 – Expenditure metrics by zone is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the costs associated with vegetation management work have been reported for each of TasNetworks' two nominated vegetation management zones

(b) Information sources

Expenditure data reported in Table 2.7.2 has been sourced from TasNetworks' financial systems , which recognises each vegetation management zone as a separate vegetation management cost centre.

(c) Methodology and assumptions

TasNetworks does not split its vegetation zones into Northern, Central and Southern Regions. Rather, reporting is prepared on two nominated vegetation management zones – zone 1 and zone 2.

Cyclic cutting costs have been apportioned between Tree Trimming and Vegetation Corridor Clearance based on the length of vegetation corridors in each zone as a percentage of the rural route line length recorded for each zone.

TasNetworks' does not identify trees as hazards to be treated differently from any other trees located in the vicinity of power lines. Therefore, the cells in Table 2.7.2 relating to hazard tree cutting have not been disclosed.

Ground clearance works are not recorded separately and the associated costs are included in tree trimming expenditure.

TasNetworks does not record expenditure on inspections of vegetation separately.

TasNetworks does not capture expenditure on audits of vegetation management work separately.

Contractor liaison expenditure has been sourced from TasNetworks' financial systems and reflects the number of FTEs specifically engaged in managing TasNetworks' vegetation management programme, in terms of the associated labour costs, labour on-costs and vehicle costs.

TasNetworks has reported no tree replacement costs because trees near powerlines which are removed as part of vegetation management work are not replaced.

(d) Estimated information

No estimates have been made in preparing Table 2.7.2.

Table 2.7.3 Descriptor Metrics Across All Zones - Unplanned Vegetation Events

(a) Compliance with the requirements of the RIN

The information reported in Table 2.7.3 regarding unplanned vegetation events is consistent with the requirements of the RIN, in that:

- the data has been based on reliable and objective data sources which are used in the normal course of TasNetworks' business
- TasNetworks does not generally categorise vegetation related fire starts as either caused by 'grow-ins' or caused by 'blow-ins or fall-ins'. TasNetworks has made an assumption that 'grow-ins' relate to trees inside the clearance space, whilst 'blow-ins or fall ins' relate to trees outside the clearance space

(b) Information sources

The data regarding fires started by vegetation blow-ins and fall-ins was extracted from TasNetworks' distribution-outage database within WASP.

Template 2.8 Maintenance

Table 2.8.1 Descriptor Metrics for Routine and Non-Routine Maintenance

Service Line Maintenance

(a) Compliance with the requirements of the RIN

The information provided about service line maintenance in Table 2.8.1 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information has been gathered from, or based on, reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

The volume of overhead service wires installed was sourced from GTech.

TasNetworks does not maintain records of installation dates for service wires and so the age data for poles was used to estimate the age of service lines.

(c) Methodology and assumptions

No service wires were inspected during the current reporting period as part of a programme of service line inspection, other than visual inspections undertaken as part of TasNetworks' pole inspection programme. As TasNetworks had no specific inspection cycle for service wires, TasNetworks has reported no activity in relation to the testing of service lines.

(d) Estimated information

TasNetworks does not maintain records of installation dates for service wires and so age data for poles was used to estimate the age of service wires.

Pole top & Overhead Line Maintenance
Pole Inspection and Treatment

(a) Compliance with the requirements of the RIN

The descriptive information provided about pole top and overhead line maintenance (including pole inspection and treatment) in Table 2.8.1 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

The source of the information is GTech.

(c) Methodology and assumptions

Pole Count

The number of poles has been derived by taking a count of the poles recorded in GTech filtered by date installed and grouped by different pole owners in order to exclude privately owned poles from the count. The data was compiled on a calendar year basis due to limitations in installation data which sees only the year of installation recorded rather than the exact day.

The pole count (i.e. number of pole ids) and pole owners were extracted from TasNetworks' Spatial Data Warehouse, as were pole installation dates, with poles and installation dates being matched on the basis of each pole's unique asset identifier.

Pole Inspections

The number of pole inspections conducted during the current reporting period was derived by taking a count of completed work tasks in WASP, filtered by date completed to return only inspections carried out in the current reporting period.

Pole inspections were defined as including only work tasks classified as either *Pole Inspect (DAIS)* (Task Code 1PID) and *Inspect Pole Special Inspections* (Task Code 5OP7) with a status of Closed(c) or Completed (Z).

Average Pole Age

Average pole age has been derived by taking a count of poles from GTech, filtering on date installed and grouping by different pole owners and the year of installation. An extract is taken for each calendar year and the average age is based on the average year of installation - excluding any poles without installation dates.

The average age is calculated on a calendar year basis due to limitations in installation data, with currently only the year of installation being recorded rather than the month of installation or the exact date.

Overhead Asset Inspection

(a) Compliance with the requirements of the RIN

The information provided about overhead asset inspection in Table 2.8.1 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

The source of the information is GTech.

(c) Methodology and assumptions

Conductor and cable line length data was extracted from TasNetworks' GIS.

The line patrolled value was calculated by multiplying the value of conductor length in service by the number of poles inspected divided by the total number of poles.

Network underground cable maintenance by voltage
Network underground cable maintenance by location
Distribution substation equipment and Property maintenance
Zone substation equipment maintenance
Zone substation property maintenance

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- asset in formation has been sourced from asset records via TasNetworks' spatial data warehouse

(b) Information sources

All asset data has been sourced from:

- TasNetworks' spatial data warehouse (array of databases containing live asset records for TasNetworks' network)
- Using "Ground Mounted Substations - Live Asset Records v2 Aug 2015", which is a live link to the spatial data warehouse
- Zone Substation Asset Management Plan
- Distribution Substation Asset management Plan
- Template 2.8.1 Zone sub data
- Program of Work report Subs and UG POW report June 2015

(c) Methodology and assumptions

Cables

Cables lengths and ages are sourced from GTech. Average cables ages is calculated from this data.

Distributions substations

Data sourced using Ground Mounted Substations - Live Asset Records

The number reported for Distribution substation includes only pad mounted and ground mounted distribution transformers. The pole mounted distribution substations are reported under 'other ' in the RIN template.

This document extracts live asset data from the spatial data warehouse. The data extract is for the network as at the beginning of the current reporting period. Where necessary filters can be applied to exclude any changes outside of the relevant regulatory control year.

Assets inspected/maintained

Data has been obtained from both live records and by estimation (Volumes/maintenance frequency).

Average age

By applying filters for the year, the numbers of items can be sourced, and in combination with the age, the average age is calculated (i.e. sum of ages / volume).

Inspection and maintenance cycles

Inspection and maintenance cycles: Frequency sourced from the management plan. Where varying frequencies exist the tasks with the highest cost has been used as the frequency. Historically, as there are several maintenance frequencies for some tasks, a weighted average has been applied.

Zone substations

Volumes recorded in TasNetworks' asset management plan

Maintenance frequencies sourced from TasNetworks' asset management plan

Assets inspected/maintained: Volumes / maintenance frequency

Average age data was calculated using information relative to each Zone substation

Average age of transformer = total age for all transformers / number of items

Average age of switchgear = total age for all switchgear/number of items

Public lighting maintenance

(a) Compliance with the requirements of the RIN

The information provided about public lighting maintenance in Table 2.8.1 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- this information was compiled using the definitions contained in the AER instructions and definitions for the RIN

(b) Information sources

Public lighting quantities have been sourced from TasNetworks' Market Data Management System (GenTrack).

The volumes of public lighting inspection and maintenance activity have been sourced from TasNetworks' financial systems, based on the quantities of materials issued for this work category.

(c) Methodology and assumptions

TasNetworks has limited data relating to the installation date of individual lights. Age data for lights with no install date was estimated using procurement records or by interviewing employees involved historically with the installation of lighting assets.

Inspection and maintenance cycles are both four years for major and minor lights based on the average expected life of lamp and PE cell.

(d) Estimated information

Age data for lights was estimated by applying a flat age profile for each make / model of light over the period each particular light was purchased according to purchasing contract records.

SCADA & Network Control Maintenance
Protection Systems Maintenance

(a) Compliance with the requirements of the RIN

The information provided is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

Wherever possible, asset information has been sourced from live asset records via TasNetworks' spatial data warehouse and, in cases where it has not been possible to do so, that information has been derived from documentary records, such as asset management plans, or estimated based on issued work.

(c) Methodology and assumptions

The definition of "Zone Substation", as per the Regulatory Information Notice issued under section Division 4 of Part 3 of the National Electricity (Tasmania) Law, is defined as follows:

"*A substation on a distribution network that transforms any voltage above 33 kV to levels at or below 33 kV but above 1 kV. As a guide, assets included within a zone substation include all equipment, buildings, structures, civil works and other assets that are located permanently within the substation boundary fence; but excluding the landing spans of incoming or outgoing overhead lines, and excluding incoming or outgoing cables and associated cable terminations (cables includes all power, communications and control cables). "*

Zone substation asset data is not stored in the Spatial Data Warehouse, but the zone substation protection asset database contains the necessary asset information based on the over-arching management plan. Maintenance information can be sourced from the corresponding maintenance contract specification. The most frequent maintenance period has been shown in this report. Zone substations have both protection and SCADA maintenance regimes so appear twice in Table 2.8.1.

Zone substation age profiles are based on the age of the most recent protection upgrade at the station, and so will differ from those of corresponding switchgear.

Terminal substations (with distribution network protection panels in situ) have not been included separately, as they are regarded as part of the corresponding zone substation's protection system.

Recloser, LBSs and sectionaliser devices with remote communications have asset data available in the Spatial Data Warehouse. This data has been reconciled with data pertaining to the Telstra mobile phone accounts which enable remote communications.

Where recloser, LBSs and sectionaliser device installation dates are unavailable in the Spatial Data Warehouse, the "date active" data was used (i.e. the date the equipment was commissioned, as recorded in the geospatial system). As a consequence the asset age derived quantities are not an entirely accurate representation of the actual installation dates.

Reclosers, LBSs and sectionalisers with remote communications undergo five-yearly maintenance on their batteries, which forms part of the protection system. This program was introduced in 2012-13, and as a consequence only a fraction of the asset fleet has been subjected to the maintenance regime (20% of the asset fleet is maintained every year in accordance with the regime).

Distribution substation asset data is stored in the Spatial Data Warehouse. Historically, battery systems (part of the protection systems) have been incrementally upgraded, whilst being transitioned to a four-year capex based battery replacement program (no longer requiring battery maintenance). The remaining systems on the original regime have been maintained at the 6-monthly interval. The exact dates of when the battery systems changed to the new maintenance regime are unknown so it has been assumed that the dates and volumes correspond with the year in which the scope of work was submitted.

Distribution substation protection maintenance tests are also carried out at the same time as the corresponding switchgear maintenance (3, 4, 6 and 8-yearly intervals), and as such have already been covered in the ground-mounted substation reporting section.

SCADA & Network Control devices:

> Includes reclosers, load break switches and sectionalisers, and zone substations (in terms of a complete system per zone substation).

Distribution substations are not included as they do not have SCADA maintenance regimes associated with them.

Protection systems devices:

Includes distribution substations and zone substations (in terms of a complete system per zone substation).

Reclosers, load break switches and sectionalisers are not included as there are no associated protection maintenance regimes associated with them.

2015/16 reporting changes:

Inspection and maintenance frequencies have changed from previous years due to a misrepresentation in the way this is calculated. Previously the maintenance intervals were averaged across the various device types represented. It was determined the best way to represent the maintenance cycle going forward was to use the most frequent maintenance cycle occurring under each category. In both cases this is a monthly interval.

The calculation pertaining to average age is now based on a weighted average of the various device types which make up each protection and SCADA category.

Source data for network control and monitoring field devices was refreshed and updated following the discovery of a number of duplications and the inclusion of a number of devices which do not pertain to this category. This consequently affects data going back to 2008/09.

Calculations pertaining to asset quantity and average age have been updated as minor errors were found. This also affects data going back as far as 2008/09.

(d) Estimated information

Distribution substations which continue to require battery maintenance have been estimated based on when the scope of work was submitted to upgrade the battery systems, as per Section 3.

The following distribution substation volumes were scheduled to have battery systems upgraded:

- 2008-09 – 20 substations
- 2009-10 – 22 substations
- 2010-11 – 29 substations
- 2011-12 – 30 substations
- 2012-13 – 20 substations
- 2013-14 – 20 substations
- 2014-15 – 20 substations
- 2015-16 – 20 substations

In the absence of more accurate data, it has been assumed that the substation battery systems were successfully upgraded in the year in which they were scheduled.

Sub-transmission asset maintenance

(a) Compliance with the requirements of the RIN

TasNetworks had no dual function assets and, therefore reported no descriptor metrics for the maintenance of dual function assets in Tables 2.8.1.

Ground clearance – access tracks

(a) Compliance with the requirements of the RIN

The information provided about the ground clearance of access tracks in Table 2.8.1 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information has been based on reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

TasNetworks' Spatial Data Warehouse and GTech.

TasNetworks' distribution 'Span Model' – a database of pairs of geographic coordinates that correspond to poles with at least one connecting conductor circuit. The Span Model has been derived from spatial conductor data in the Spatial Data Warehouse specifically to meet the AER's definition of Route Line Length.

TasNetworks has a service level agreement with the Tasmanian Department of Primary Industries, Parks, Water and Environment for the Land Titles Office to supply up-to-date GIS transport information sourced from the Land Information System Tasmania (**The LIST**). This includes details of public highways, streets and known private off-road trails.

(c) Methodology and assumptions

The inspection and maintenance cycle for access tracks is the same as the pole inspection cycle (5 yearly) in order to ensure access to assets for inspectors for the purposes of inspecting poles.

The average age of access tracks is assumed to be the same as that of the overhead/pole assets to which they provide access, on the basis that the tracks would have been established around the same time the assets were installed.

Spans only containing LV circuits are not included in the current iteration of the Span Model. TasNetworks' current program of 'active' vegetation management is based on the Span Model and LV-only spans are not actively managed.

(d) Estimated information

TasNetworks does not currently maintain a separate record of access track clearance activity, with ground clearance activities and costs currently being captured under the broader activity of "*Pole top, overhead line & service line maintenance*".

The length of access tracks cleared in the current reporting period has, therefore, been estimated, by dividing the route length of TasNetworks' distribution network which requires non-standard vehicle access (as reported in TasNetworks' response to the Economic Benchmarking RIN for the current reporting period) by the length of the inspection cycle for access track (i.e. five (years)).

The sections of TasNetworks' distribution network requiring non-standard vehicular access has been identified using GTech to identify spans located more than 25 metres from the nearest private off-road trail, public highway or street. Trails explicitly flagged '4WD only' have been excluded as a recognised transport element. After excluding trails explicitly flagged '4WD only', the reported length of the distribution network not within 25m of any transport element is taken to represent the component requiring non-standard vehicular access and, therefore, ground clearance.

Data from the previous reporting period has been escalated in proportion to route line length increases to represent data for the current regulatory period.

Other (Metering transformers)

(a) Compliance with the requirements of the RIN

The information provided in Table 2.8.1 in relation to the maintenance of metering transformers is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

The volume of metering transformers was sourced from Gentrack and asset data obtained from Energex (where Energex provided the Metering Provider role for interval metered NMIs) .

Metering transformer inspection data was sourced from SOM as a count of completed service orders. The ten year maintenance cycle is per the asset management plan for metering transformers and is designed to comply with the requirements of Chapter seven of the National Electricity Rules for metering installations.

Age data was sourced from Gentrack, based on the first recorded connection dates of installations with metering transformers.

(c) Estimated information

Actual install dates for metering transformers is not available. Age data was estimated based on the first connection date of installations with metering transformers. Location of metering transformers was historically identified by a billing multiplier recorded against a meter within the Market Data Management System. This method is no longer accurate as third party metering providers can program multipliers into the meter program, breaking the link between multiplier and metering transformer. This has resulted in decreased volumes of recorded transformers. TasNetworks is establishing an asset database for metering transformers to record this information.

Table 2.8.2 Cost Metrics for Routine and Non-Routine Maintenance

(a) Compliance with the requirements of the RIN

The information provided about maintenance expenditure in Table 2.8.2 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the expenditure on maintenance activities reported by TasNetworks is materially dependent on information recorded in TasNetworks' finance system

(b) Information sources

The expenditure data reported in Table 2.8.2 has been sourced from WASP and TasNetworks' financial systems.

(c) Methodology and assumptions

The routine and non-routine maintenance expenditure reported in Table 2.8.2 has been extracted on the basis of work category codes, which represents the manner in which TasNetworks captures routine and non-routine maintenance expenditure.

The expenditure has been apportioned between asset categories based on asset volumes where applicable.

(d) Estimated information

No estimates were involved in preparing Table 2.8.2.

Template 2.9 Emergency Response

Table 2.9.1 Emergency Response Expenditure

(a) Compliance with the requirements of the RIN

The information provided in Table 2.9.1 – Emergency Response Expenditure is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- emergency response expenditure attributable to major events has been identified using a specific cost code for major events
- emergency response expenditure attributable to major event days has been compiled by identifying the daily operating expenditure incurred on each MED and summing the expenditure for each event

(b) Information sources

The data reported in Table 2.9.1 has been sourced from WASP and TasNetworks' financial systems.

TasNetworks' Regulatory Accounts have been used to reconcile the data sourced from TasNetworks' financial systems and WASP.

The cyclone history on the Bureau of Meteorology website has been used to confirm if any have occurred during the year.

(c) Methodology and assumptions

Major Event Days throughout the period have been identified with reference to MED System Average Interruption Duration Index thresholds calculated using the method prescribed by the AER.

The MEDs identified by TasNetworks during the period do not include any major storm activity, as defined in the RIN, on the basis that TasNetworks distribution network has not been subject to any tropical cyclones of Category 1 or above (as classified by the Australian Bureau of Meteorology).

TasNetworks' emergency response expenditure includes expenditure captured in TasNetworks' financial systems in relation to the following types of emergency response activities:

- Emergency & Unscheduled Power System Response & repairs (**EMRES**)
- Emergency Management - Customer damage to TasNetworks' Asset (**EMDAA**)
- Emergency Response - Major Event (**EMMAJ**)

The emergency response expenditure shown in Table 2.9.1 under (b) includes expenditure incurred in responding to all faults that occur on MEDs. The emergency response expenditure totals shown in Table 2.9.1 under(c) include only the costs relating to emergency responses to major events on major event days (**EMMAJ**). These costs have been taken directly from the network system ledger, meaning that the costs reported for individual days will include capitalised expenditure, but not all overheads and CAM adjustments as they are done on a monthly or end of year basis. The difference between the total EMMAJ category extracted from the network service ledger and what is included in the Annual Reporting RIN has been reconciled.

None of the costs of responding to faults and emergencies reported in Table 2.9.1 include the costs associated with the standing down of field crews, as far as they relate to events involving faults and damaged TasNetworks' assets.

The information contained in Table 2.9.1 has been filtered by work category code and cross referenced against the Major Event Days table. In the interests of accuracy, emergency response expenditure data has been extracted with reference to transaction dates (i.e. 'document dates'), which correspond to MEDs, rather than the posting dates recorded in TasNetworks' finance system.

Template 2.10 Overheads

Table 2.10.1 Network Overheads Expenditure
Table 2.10.2 Corporate Overheads Expenditure

(a) Compliance with the requirements of the RIN

The information provided about Overheads in Template 2.10 is consistent with the requirements of the RIN, in that:

- all relevant input cells have been populated
- all data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- TasNetworks' network operating costs have been disaggregated into the six subcategories set out in paragraph 14.2 of Appendix E, and any network operating costs which are not included in those subcategories but which TasNetworks has previously reported in its Regulatory Accounting Statements have been reported separately
- explanations have been provided for the capitalisation of overhead expenditure

It is noted that there have been no material changes in reported expenditures as a result of changes in TasNetworks' capitalisation policy.

(b) Information sources

The expenditure data in Table 2.10 has been sourced from TasNetworks' financial systems and from TasNetworks' Business Analysis Reporting tool (**BAF**).

(c) Methodology and assumptions

Network Overheads Expenditure – to all services (total costs including capitalised portion)

This information has been derived on the basis of a combination of Network Management and Network Services cost pools. Network Management and Network Services cost pools have been populated from TasNetworks' Annual Reporting RIN.

All field workers' time has been classified as 100 per cent direct costs.

Network operating costs reported under Network Management costs have been allocated between the six subcategories of overhead expenditure set out in Table 2.10.1 based on the type of work performed, and then allocated to the forms of control.

The Network operating costs attributed to Network Services in each year were extracted from TasNetworks' financial system General Ledger Overheads Applied code by work category code, and then allocated to the forms of control. These were then allocated to the six subcategories based on the actual percentage spend of all the overheads departments from the financial system, based on the type of work performed.

Network Overheads Expenditure – to capitalised overheads for only Standard Control Services

This information has been derived from an aggregate of relevant Network Management and Network Services cost pools. The Network Management costs that have been allocated to capital works have been extracted from TasNetworks' financial systems. Network Services costs that have been allocated to capital works (capex jobs only) have also been drawn from TasNetworks' financial systems.

Network operating costs relating to Network Management amounts that have been capitalised were allocated to the six subcategories based on the allocation of departmental overheads. They were then allocated to the forms of control based on actual percentage to only capital jobs and the split of the type of work performed.

Network operating costs relating to Network Services cost recovery against jobs were sourced from TasNetworks' financial system and based on costs that were coded to the General Ledger Overheads Applied code. They were then broken down in each year by work category code to the allocated forms of control as per below. The costs allocated to each form of control were then allocated between the six subcategories in template 2.10 based on the actual percentage spend of all the overheads departments on each type of work performed.

Corporate Overheads Expenditure – to all services (total costs including capitalised portion) and capitalised overheads for Standard Control Services

Corporate Overheads have been populated using the costs allocated in accordance with TasNetworks' Cost Allocation Model which are in line with the Indirect Cost Allocation Model utilised in prior years.

Allocation to forms of control

The allocation of Network Overheads between the different forms of control has been based on two methodologies, both of which are in accordance with TasNetworks' approved CAM:

- Network Management costs have been allocated between the forms of control based on the percentage spend of the total program of work costs driver of forms of control
- Network Services costs have been automatically allocated between forms of control according to the type of work (e.g. work category code), with each type of work allocated directly in TasNetworks' ledger to the relevant form of control

Corporate Overheads Expenditure – to all services (total costs including capitalised portion)

The allocation of Corporate Overheads has been split between Network Management and Network Services on the basis of actual spend, and then allocated to a subcategory. The allocation of expenditure within each subcategory between the forms of control has been undertaken using different methodologies for Network Management and Network Services in accordance with the allocation described in Network Overheads Expenditure.

Corporate Overheads Expenditure – to capitalised overheads for only Standard Control form of control

Corporate overheads expenditure has been calculated on the same basis as the network operating costs relating to Network Services.

Template 2.11 Labour

Table 2.11.1 Cost Metrics per Annum
Table 2.11.2 Extra Descriptor Metrics for Current Year

(a) Compliance with the requirements of the RIN

The labour data reported in Template 2.11 has been prepared in accordance with the RIN specifically paragraphs 4.1-4.8 of Appendix E – Principles and Requirements. On this basis, the information provided in Table 2.11 regarding labour is consistent with the requirements of the RIN, in that:

- only labour costs allocated to the provision of standard control services have been reported
- labour used in the provision of contracts has not been reported
- labour data has been broken down into the Classification Levels in template 2.11 and an explanation of how workers have been grouped into these Classification Levels has been provided
- TasNetworks has not reported separately labour sourced through labour hire contracts
- labour quantities, expenditure, and stand down periods have not been reported across multiple labour tables, except in cases where labour data has been split between corporate and network overheads
- Average Staffing Levels (**ASLs**) for each Classification Level reflect the average paid FTEs for each Classification Level over the course of a given year
- 'Per ASL' values are average values for each Classification Level
- stand down periods have been reported against the relevant classification level in the table containing the relevant labour

Additionally:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

TasNetworks has used the following data sources to populate Template 2.11:

- financial systems
- Payroll System (PeopleSoft)

(c) Methodology and assumptions

Corporate overheads internal labour costs

Average Staffing Levels (ASLs)

Reported total FTE numbers are as at 30th June in the relevant year, as provided in TasNetworks' staffing report.

Employee job titles as per TasNetworks' PeopleSoft (TasNetworks' classification) were categorised into the AER's required classifications as per the RIN instructions.

To determine the ASL per labour classification level, the FTE numbers in each RIN labour category were multiplied by the relevant standard control services percentage. In accordance with TasNetworks' Cost allocation methodology (CAM), in the case of Network Services, the standard control services percentage was based on hours worked across the forms of control. For Network, the allocation percentage was based on total spending across the forms of control.

Allocation to standard control services- forms of control

The allocation of corporate overheads internal labour to standard control services has been based on a percentage spend driver, which is consistent with the CAM.

Total Labour costs

Total labour costs are reflective of the actual corporate labour costs that have been charged to distribution services plus the labour costs associated with the corporate functions (i.e. the finance and regulatory functions).

Productive work hours

The productive work hours for corporate employees (office based staff) has been determined using the available working days per year, adjusted for assumptions developed for budgeting purposes regarding average leave taken on an FTE basis during the year. Office based staff do not complete timesheets to capture actual worked hours, therefore this level of detail is not costed into the finance system. It is assumed that each employee works a standard week, that is, 37.5 hours.

Network Overheads Internal labour costs

Allocation to SCS form of control

As much as possible, labour cost data is directly categorised into the correct form of control. However, in the case of some labour classification types which are not allocated against jobs or activities on the basis of timesheets, labour costs are automatically allocated against standard control services within TasNetworks' finance system. In order to allocate those labour costs more appropriately for the purposes of the RIN, a percentage allocator was developed based on total hours worked across the forms of control, consistent with TasNetworks' CAM. This was applied to the costs and hours reported in relation to Executive Management, Managers, Professional and Semi-Professional employees, Senior Managers, Support Staff and Interns, Junior Staff and Non-field Apprentices.

ASL

Average ASLs for each labour classification type have been determined using actual FTE data, multiplied by the Standard Control Service percentage applicable for that year. The allocator used reflects the proportion of combined opex and capex which relates to standard control services. This is in accordance with the CAM used by TasNetworks for allocating Network Management costs to the forms of control.

Total Labour costs

Total labour costs are reflective of the actual labour costs that have been charged against individual network services and network jobs within TasNetworks' job ledger. The standard control services portion has been derived by multiplying total labour costs by the percentage spend applicable to standard control services.

Productive work hours

Productive work hours for Network employees (office based staff) have been determined using the available working days per each reporting year, adjusted for assumptions (developed for budgeting purposes) regarding the average leave taken during the course of a year. This is because office based staff do not complete timesheets to capture actual worked hours, meaning that this level of data is not costed into the finance system. It is assumed that each employee works a standard week, that is, 37.5 hours.

Network Direct Internal Labour Costs

Allocation to SCS form of control

The allocation of Network internal labour to standard control services has been based on a percentage spend driver for Network Management costs, which is consistent with TasNetworks' CAM.

ASL

The ASL for each labour classification type that has been allocated to standard control services has been determined by multiplying the actual number of FTEs per each classification type by the percentage of actual labour hours worked on standard control services.

Total Labour costs

Allocated to standard control services based on actual labour costs captured against standard control services categories as per costing in TasNetworks' financial system for each year. This has been captured for all FTEs according to their allocated labour classification type.

The direct internal labour costs associated with skilled and non-skilled electrical workers, apprentices and unskilled workers, have been grossed up to include a proportion of the costs associated with unbillable time, with the allocation of those costs to standard control services based on the percentage of total hours worked across each form of control.

Productive work hours

Productive work hours for an average ASL in each of the labour classification levels has been derived from total actual hours costed to standard control services for each of the FTEs allocated to that labour classification type.

Average productive work hours per ASL – Ordinary time

The labour data was categorised into normal time and overtime.

Average productive work hours per ASL – Over time

The labour data was categorised into normal time and overtime.

Average productive work hourly rate – Ordinary time

The average productive normal time hourly rate has been determined by taking actual labour costed to standard control services and dividing that cost by the actual labour hours that have been worked for standard control services.

Average productive work hourly rate – overtime

The average productive overtime hourly rate reflects the average of the hourly overtime rates applied to each labour class of employees.

Stand-down Occurrence Count

Field staff often need to stand-down and when this occurs they include this information in the time which they charge to a job. When entered into TasNetworks' financial systems the jobs used include 'STANDDOWN' in the job description to identify this time. TasNetworks' financial systems jobs were identified and transactions were extracted for these jobs so that occurrences could be counted which was done using a pivot table.

Productive work hours

The costs of Office based staff are not allocated to jobs (or across the forms of control) on the basis of timesheet entries, but are automatically costed by journal entry on a fortnightly basis instead. The labour data to support the journal entry is generated by TasNetworks' payroll system, and is at an aggregated level, e.g. not costed daily. In turn, this means that the actual hours worked for each of these employees cannot be determined on an actual basis and has had to be estimated.

Estimates have, therefore, been provided for the number of productive labour hours that have been worked for Corporate overhead internal labour and Network overhead internal labour sections. These employee groups are office based staff.

In the absence of a record of actual productive hours worked by office based employees, this approach is deemed a reasonable estimate and is consistent with the basis for determining internal budget estimates.

Productive work hours for office-based workers have been determined using the available working days per year, adjusted for assumptions developed for budgeting purposes about the average amount of leave (Annual, sick leave and public holidays) taken per FTE.

Office based corporate employees have been assumed to work a standard week, that is 37.5 hours, this extends for the year, reduced by estimated leave per FTE, as follows:

- average of 20 days annual leave taken per FTE
- average of 6 days sick leave per FTE
- actual Public holidays per annum (10)
- average of 5 additional other days (carers leave and LSL)

Network employees have also been assumed to work a standard week, that is 37.5 hours, this extends for the year, reduced by estimated leave per FTE, as above in addition to:

- average of 4 days leave credit taken

Executive Manager Classification

Executive Managers were all paid via TasNetworks' financial systems. Allocation between the Distribution and Transmission classifications was therefore required to be determined by using TasNetworks' cost allocation methodology (CAM).

Template 2.12 Input tables

(a) Compliance with the requirements of the RIN

The information provided in Table 2.12 is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

The costs reported in Table 2.12 has been drawn from templates 2.2 – 2.9 and 4.1 – 4.3.

The original sources of the cost data were WASP and TasNetworks' financial systems.

(c) Methodology and assumptions

In the main, actual job costs are directly captured in TasNetworks' financial system as labour, materials, contract costs and/or 'other' costs, in line with Template 2.12. However, in cases where unit rates have been used to allocate costs to a job, for the purposes of Table 2.12, the associated expenditure on those jobs has been apportioned between the above cost categories based on the expenditure in each category recorded in the Network Services ledger as a percentage of the total.

4. Alternative Control Services

Template 4.1 Public Lighting

Table 4.1.1 Descriptor Metrics over the current reporting period

(a) Compliance with the requirements of the RIN

The number of public lights reported in *Table 4.1.1 for* the current reporting period is consistent with the requirements of the RIN, in that:

- public lighting volumes and costs have been recorded on an as incurred basis, consistent with the requirements of the RIN
- lighting types have been reported in a manner which is consistent with the RIN definitions of major and minor lighting

(b) Information sources

The population of each public lighting type for the current reporting period was sourced from Gentrack. This system is the master record for public lighting.

(c) Methodology and assumptions

The lighting volumes reported are consistent with the volumes used for the purposes of retailer billing and are consistent with the volumes assumed for the purposes of asset management.

Table 4.1.2 Descriptor Metrics Annually (Expenditure)

(a) Compliance with the requirements of the RIN

The expenditure information provided about Public Lighting in *Table 4.1.2 – Descriptor Metrics Annually* is consistent with the requirements of the RIN, in that:

- costs have been recorded on an as incurred basis, consistent with the requirements of the RIN
- costs have been classified as either:
    - (i) replacement
    - (ii) installation
    - (iii) maintenance expenditure

(b) Information sources

Cost data has been sourced from TasNetworks' financial systems and reconciled to the regulatory accounts.

(c) Methodology and assumptions

Costs have been classified as either:

- replacement
- installation
- maintenance costs

Costs relating to private lights have been excluded through apportioning total costs against the volume of public and private lights as at year end.

Table 4.1.2 Descriptor Metrics Annually (Volume of works)

(a) Compliance with the requirements of the RIN

The volume of public lighting works reported in *Table 4.1.2 – Descriptor Metrics Annually* are consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business
- the information was compiled using the definitions contained in the AER's instructions for the RIN

(b) Information sources

Volumes of public lighting materials for lamps and luminaires installed during the current reporting period were sourced from the TasNetworks' financial systems.

Volumes of dedicated public lighting poles were sourced from GTech.

Public lighting fault data was sourced from SOM.

(c) Methodology and assumptions

Materials are classified into major or minor public lighting categories according to the type of asset. Luminaires up to and including 100 watts are classified as minor lights and over 100 watts are major lights.

When materials are issued from the warehouse they are assigned to a work pack that corresponds to the type of task being performed, e.g. install new light, fault response or replacement.

Table 4.1.2 Descriptor Metrics Annually (Quality of Supply)

Mean Days to Rectify

(a) Compliance with the requirements of the RIN

The mean days taken to rectify or replace public lighting reported in *Table 4.1.2 – Descriptor Metrics Annually* are consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

Data has been sourced from SOM.

(c) Methodology and assumptions

Calculation of the mean days taken to rectify or replace public lighting assets was based on a count of business days between the creation and completion dates recorded for each service order relating to public lighting faults.

Quality of Supply

(a) Compliance with the requirements of the RIN

The information provided about GSL breaches and payments in *Table 4.1.2 – Descriptor metrics annually* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the data describes the voluntary 'GSL' payments made in relation to public lighting under TasNetworks' Customer Charter
- the variables are based on reliable and objective data sources

(b) Information sources

The volumes and values of payments madeto customers who received a standard of service below that set out in the charter in the current reporting period have been derived from records kept in the Charter Payment Tool, which is part of TasNetworks' customer complaint management systems.

Data relating to complaints from customers about public lighting was sourced from a TasNetworks' complaint management system known as the Customer Advocacy Tool (CAT).

Table 4.1.3 Cost Metrics

(a) Compliance with the requirements of the RIN

The information provided about Public Lighting in *Table 4.1.3 – Cost Metrics* is consistent with the requirements of the RIN, in that:

- volumes and costs have been recorded on an as incurred basis, consistent with the requirements of the RIN
- lighting types have been reported in a manner consistent with the RIN definitions of major and minor lighting

(b) Information sources

Cost data has been sourced from TasNetworks' financial system and reconciled to the Annual Reporting RIN.

The volumes of public lighting materials for lamps and luminaries' installed were sourced from the TasNetworks' finance system.

(c) Methodology and assumptions

Materials have been classified into major and minor public light categories according to the type of asset.

When materials are issued from the warehouse they are assigned to a work pack that corresponds to the type of task being performed (e.g. install new light, fault repair or replacement etc).

Public lighting costs are, however, captured for the entire lighting suite, rather than specific to particular lighting types.

To complete Table 4.1.3 asset volumes for light installation, light replacement and light maintenance have been sourced from TasNetworks' financial systems. These volumes, combined with calculated unit rates, have been used as an allocative mechanism to derive average cost by lighting type.

Template 4.2 Metering

Table 4.2.1 Metering Descriptor Metrics

(a) Compliance with the requirements of the RIN

The information provided in Table 4.2.1 – Metering Descriptor Metrics is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the information was compiled using the definitions contained in the AER's instructions and definitions for the RIN
- the data has been gathered from reliable and objective data sources which are used in the normal course of TasNetworks' business

(b) Information sources

Installed meter populations were sourced from Gentrack. This system is the master record for metering assets. The WASP ID field records the type of meter installed according to the following table:

WASP ID	Meter Type
MM1	Direct connect single phase
MM2	Direct connect single phase
MM3	Direct connect single phase
MM4	Direct connect single phase
MM5	Direct connect multi phase
MM6	Direct connect multi phase
MM7	Direct connect multi phase
MM8	Direct connect multi phase
MM9	CT connected
MM10	CT connected
MM11	CT connected
MM12	CT connected

(c) Methodology and assumptions

Volume data from Gentrack is correct as at the date the query is run on the data. The query is run on the first working day of each month and the resultant data is saved so that a total of installed meters at the start of each month is recorded.

Table 4.2.2 Cost Metrics

Expenditure and Volume

(a) Compliance with the requirements of the RIN

The information provided about metering costs in *Table 4.2.2 – Cost Metrics* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the meter reading volumes provided by TasNetworks are actual data
- the data is gathered from records used in the normal course of TasNetworks' business

- TasNetworks has provided expenditure incurred in relation to all non-contestable, regulated metering services

(b) Information sources

The expenditure data in Table 4.2.2 has been sourced from TasNetworks' financial systems.

The Work Category Codes used to extract metering costs from the financial systems capture the costs associated with: Meter Reads (**MDSMR**), Meter Replacement, (**MEREP**) Meter Testing (**AIMET**), Meter Maintenance and Investigations (**ARMER**) and Meter Installations (**MENIN**).

(c) Methodology and assumptions

Actual expenditure (excluding overheads) is as per TasNetworks' financial systems.

The costs of purchasing meters has been determined by applying the unit rate against the volume of meters purchased, which were sourced from Gentrack.

Meter Reads split costing is based on individual job numbers that capture special and scheduled reads on the Network Services side as other labour costs applied after intercompany transfer have apportioned labour and overhead costs based on the actual in Network Services.

TasNetworks does not capture the cost of conducting metering investigations, with metering investigation costs captured under the broader expenditure category of Meter Maintenance and Investigations. In order to provide the requested metering investigation costs, expenditure on meter maintenance has been apportioned between Meter Investigations and Meter Maintenance on the basis of a 20/80 percentage split. The split between meter maintenance and investigations represents an estimate by the relevant Asset Manager that seeks to average the significant variation in investigative effort involved across a wide range of meter maintenance jobs.

(d) Estimated information

TasNetworks does not capture the cost of conducting metering investigations, with metering investigation costs captured under the broader expenditure category of Meter Maintenance and Investigations. In order to provide the requested metering investigation costs, expenditure on meter maintenance has been apportioned between Meter Investigations and Meter Maintenance on the basis of a 20/80 percentage split. The split between meter maintenance and investigations represents an estimate by the relevant Asset Manager that seeks to average the significant variation in investigative effort involved across a wide range of meter maintenance jobs.

The split between meter maintenance and investigations represents an estimate by the relevant Asset Manager that seeks to average the significant variation in investigative effort involved across a wide range of meter maintenance jobs.

Template 4.3 Ancillary Services - Fee Based Services

Table 4.3.1 Cost Metrics for Fee-Based Services

Expenditure

(a) Compliance with the requirements of the RIN

The information provided in *Table 4.3.1 – Cost Metrics for Fee Based Services* about expenditure incurred by TasNetworks in providing fee-based services is consistent with the requirements of the RIN, in that:

- assumption are consistent with the preparation of previous RINs
- all relevant input cells in the template have been populated
- the reported expenditure on the provision of fee-based services is materially dependent on information recorded in TasNetworks' finance system
- Section 15.3 of the RIN requires TasNetworks to provide a description of each fee based service listed in regulatory Template 4.3 that explains the purpose of each service and details the activities which comprise each service. That information is reproduced below

Fee-based Service	Description
Site visit – no appointment	Visit to a customer's premises during normal operational hours where no appointment is required on the regular scheduled day for service delivery.
Site visit – non scheduled visit	Visit to a customer's premises during normal operational hours where the requested date is on a day that is not a regular scheduled day for service delivery.
Site visit – same day premium service	Visit to a customer's premises during normal operational hours where the visit is required on the same day of a retailer's request and the request is received by TasNetworks after 11:00am on that day.
Site visit – after hours	Visit to a customer's premises where the visit is required on the day of a customer's request and the request for the service is organised for a time outside normal operational hours.
Site visit – credit action or site issues	Visit to a customer's premises during normal operational hours due to a credit issue or where the retailer requests the site be de-energised without consultation with the customer.
Site visit – rectification or illegal connection	Visit to a customer's premises during normal operational hours to rectify an installation that has been illegally connected.
Site visit – interval metering	Visit to a customer's premises where interval metering exists.
Tariff alteration – single phase	Visit to a customer's premises during normal operational hours to add or modify a single phase metering circuit.
Tariff alteration – three phase	Visit to a customer's premises during normal operational hours to add or modify a three phase metering circuit.
Adjust time clock	Visit to a customer's premises during normal operational hours to adjust the time period of an existing time clock.

Fee-based Service	Description
Install pulse outputs	Visit to a customer's premises during normal operational hours to install pulse output facility.
Remove meter	Visit to a customer's premises during normal operational hours to remove a metering circuit.
Meter alteration – after hours visit	Visit to a customer's premises outside normal operational hours to undertake a meter alteration at the customer's premises.
Meter alteration – wasted visit	Visit to a customer's premises during normal operational hours to undertake a meter alteration where the alteration could not be completed due to issues at the customer's premises. An after hour's fee will be charged where a visit to a customer's premises after hours to undertake a meter alteration where the alteration could not be completed due to issues at the customer's premises.
Meter test – single phase	Visit to a customer's premises during normal operational hours to test a single phase meter a the customer's request
Meter test – multi phase	Visit to a customer's premises during normal operational hours to test a multi phase meter a the customer's request
Meter test – CT	Visit to a customer's premises during operational hours to test a current transformer (CT) meter at the customer's request.
Meter test – after hours	Visit to a customer's premises, at the request of the retailer, outside normal operational hours to undertake the following services: - meter test - single phase; - meter test- multi phase; and - meter test - CT.
Meter test – wasted visit	Request to cancel a site visit to a customer's premise to perform any of the above services where cancellation request is received within 1 business day of the scheduled date. If this visit was requested after hours the afterhours rates will apply.
Supply abolishment – remove service & meters	Remove meters and service connection at customer's request or building demolition during normal operational hours.
Supply abolishment – after hours	Visit to a customer's premises, at the request of the retailer, outside normal operational hours to abolish supply.
Supply abolishment – wasted visit	Visit to a customer's premises to abolish supply where the service could not be completed due to issues at the customer's premises. An after hours fee will be charged where a visit to abolish supply at the customer's request after hours could not be completed due to issues at the customer's premises.
Tee-up (initial 30 mins)	Electrical Contractor requested tee-up with overhead crew whilst undertaking work at customer's installation during normal operational hours.
Tee-up (additional 15 min block)	Tee-ups are charged at a minimum of 30 minutes plus each additional 15 minute block or part thereof of onsite time.

Fee-based Service	Description
Tee-up – after hours	Electrical Contractor requested tee-up with TasNetworks crew whilst undertaking work at customer's installation after normal operational hours.
Tee-up – no truck – after hours	Electrical Contractor requested tee-up with underground crew whilst undertaking work at customer's installation after normal operational hours.
Tee-up – wasted visit	Electrical Contractor requested tee-up with TasNetworks crew where the works could not be completed due to issues at the customer's premises or where service connections crew were not required on site. An after hours fee will be charged where a visit for a tee-up at the customer's request after hours could not be completed due to issues at the customer's premises.
Truck tee-up	Tee-ups are to be requested on an Electrical Works Request (**EWR**). An attempt to contact the contractor will be made within 2 business days of receiving the EWR from the retailer. Once the tee-up date has been negotiated with the contractor, this date will be known as the 'agreed date'.
Open turret	Open turret or cabinet during normal operational hours for electrical contractor installing or altering customer's mains during normal operational hours.
Data download	Visit to a customer's premises during normal operational hours to download data from a meter.
Alteration to unmetered supply	Visit to a customer's premises to add or remove a load on an existing unmetered supply site during normal operational hours.
Miscellaneous service	Visit to a customer's premises, at the request of the retailer, during normal operational hours to perform a service that is not described elsewhere.
Miscellaneous service – after hours	Visit to a customer's premises, at the request of the retailer, outside of normal operational hours to perform a service that is not described elsewhere.
Miscellaneous service – wasted visit	Visit to a customer's premises during normal business hours for the requested miscellaneous service where the service could not be completed due to issues at the customer's premises. If this visit was requested after hours the afterhours rates will apply.

(b) Information sources

The costs associated with the provision of fee-based services have been sourced from TasNetworks' financial systems and reconciled to the Annual Reporting RIN.

Volume data relating to fee-based services was sourced from SOM based on service orders with an overall status of "complete".

(c) Methodology and assumptions

All costs incurred in the provision of fee-based service are captured against the same cost code in TasNetworks' finance system. For the purpose of Table 4.3.1, total fee-based service costs have been apportioned across fee-based service sub-categories on the basis of Regulated Prices and activity volumes.

Volumes

(a) Compliance with the requirements of the RIN

The information provided about connection volumes in *Table 4.3.1 Fee-Based Services* is consistent with the requirements of the RIN, in that:

- all relevant input cells in the template have been populated
- the connections metrics presented by TasNetworks are based on reliable and objective data sources gathered from records used in the normal course of business

(b) Information sources

Common Fee-Based Services

All annual energisation, de-energisation and re-energisation volumes were sourced from Gentrack.

Miscellaneous Fee-Based Services

All volumes were sourced from SOM based on service orders with an overall status of 'complete'.

(c) Methodology and assumptions

Basic Connection Services are not included in the Fee-Based Services volumes.

Miscellaneous Fee-Based Services

Tariff alterations exclude connection of embedded generation tariff.

The installation of pulse outputs are included in tariff alterations.

Template 4.4 Ancillary Services - Quoted Services

Table 4.4.1 Cost Metrics for Fee-Based Services

Expenditure and Volumes

(a) Compliance with the requirements of the RIN

The information provided about expenditure incurred in providing quoted services in Table 4.4.1 – Cost Metrics for Quoted Services is consistent with the requirements of the RIN, in that:

- TasNetworks has not distinguished between standard or alternative control services when reporting expenditure for quoted services, as per paragraph 15.4
- TasNetworks has not differentiated between capex or opex in relation to the expenditure reported on quoted services, as per paragraph 15.5
- the capture of costs for quoted services provided in Template 4.4 is consistent with the definition of quoted services given in Appendix F of the RIN
- Section 15.1 states that the data provided in relation to quoted services must reconcile to internal planning models used in generating TasNetworks' proposed revenue requirements. The information provided for the current reporting period has been based on actual data and reconciles with the data provided in response to the Annual Regulatory Information Notice for the same year
- Section 15.2 is not applicable to TasNetworks, as quoted services are not listed in TasNetworks' annual tariff proposal
- Section 15.3 requires TasNetworks to provide a description of each quoted service listed in regulatory template 4.4 that explains the purpose of each service and details the activities which comprise each service. That information is provided in the following table:

Service	Purpose	Activities
Relocation/Removal - Poles	To capture expenditure on customer driven pole relocations/removals	Pole relocation and removal in its entirety
Relocation/Removal - Substations	To capture expenditure on customer driven substations relocations/removals	Relocation and removal of substation in entirety or components, eg door way removed or building design mortifications
Relocation/Removal - Transformers	To capture expenditure on customer driven transformers relocations/removals	Transformers removal and relocation in its entirety
Relocation/Removal - Overhead	To capture expenditure on customer driven overhead assets relocations/removals	Relocation or removal of overhead components including; low voltage wire, high voltage wire , service wire, fibre, conductors, switches/fuses
Relocation/Removal - Underground	To capture expenditure on customer driven underground assets relocations/removals	Relocation or removal of underground components including; low voltage cables, high voltage cable, cabinets, turrets
Services of higher standard - Substation	To capture expenditure on customer driven above standard substation works	Modifications to substation for customer needs, including; building design modifications
Services of higher standard - Transformers	To capture expenditure on customer driven above standard transformer works	Modifications to transformer design for customer needs as requested
Services of higher standard - Overhead	To capture expenditure on customer driven above standard overhead asset works	Modifications to overhead asset design for customer needs, including; overhead wires both low voltage and high voltage, service wire, conductors etc
Services of a non standard nature - Connections	To capture expenditure on customer driven service connection and metering works	Disconnects, reconnections, metering upgrades, new mains connections
Services of a non standard nature - Subdivisions	To capture expenditure on customer driven subdivision overhead and underground works	Could encompassed both overhead and components, looks at activities directly related to subdivisions as requested by developers
Services of higher standard - Poles	To capture expenditure on customer driven poles above standard pole works.	Modifications to line designs for customer needs, including the installation of additional poles
Services of a non standard nature - Underground	To capture expenditure on customer driven underground works.	Modifications to cable designs for customer needs including cable size and location

(b) Information sources

Information has been sourced directly from TasNetworks' financial systems and reconciled to the Annual Reporting RIN.

Data has been obtained directly from TasNetworks' financial systems for the direct work costs associated with quoted services work. These costs have then had the overhead component removed and reconciled back to the Opex Allocation Model.

Data was extracted from WASP for all projects relating to quoted services (i.e. Work Level = QUOT). This data details the Service Sub-Category relating to project costs. In instances where the Service Sub-Category field was blank, the project details were manually checked in TasNetworks' financial systems to determine the nature and, therefore, the applicable Service Sub-Category.

Data was also extracted from WASP for the work category CIMIX, which is used to apportion costs to projects that relate to multiple service types.

Information related to corporate overheads and shared services costs were sourced from the Annual Regulatory Information Notice – Opex Allocation Model.

(c) Methodology and assumptions

The source of truth for direct costs was the Annual Regulatory Information Notice – Opex Allocation Model.

Quoted services project data from WASP was summarised into Work Categories and Design Project Types with associated total costs and volumes. Design Project Types have been mapped to a RIN Service Subcategory to enable direct population of Table 4.4.1.

The following assumptions were applied to the data:

- where a Work Category links directly to a type of service, all volumes and costs for that Work Category were applied to that service e.g. the work category QUSCO is 100 per cent allocated to the service "Services of a non standard nature – Connections";
- the Design Project Type was used to classify projects across service types e.g. where 'pole' has been recorded as the project description, it was assumed that the project related to poles; and

When assumptions 1 or 2 could not be applied, information about the service type was manually sourced from WASP, i.e. by referencing customer letters, project notes or directly from the scope.

- in relation to volumes data, a 'one project for one service' relationship was assumed for all service types (i.e. volume = 1 for each project) except for pole relocation and removal.

For the 'Relocation/Removal – Poles' service category, volumes were derived using a $ rate per pole (unit rate) against the cost of the project. The unit rate was built up by a business expert. The volume derived for each project has not been rounded or truncated to arrive at the overall annual total.

5. Network Information

Template 5.2 Asset Age Profile

Table 5.2.1 Asset Age Profile

(a) Compliance with the requirements of the RIN

The information provided about asset age profiles in Table 5.2.1 is consistent with the requirements of the RIN, in that:

- the asset subcategories in Table 5.2.1 correspond with the prescribed asset categories in Table 2.2.1
- the information reflects total volumes of assets currently in commission

(b) Information sources

Data was obtained from TasNetworks' Spatial Data Warehouse. The scripts used to manipulate and report the final data are stored in the ASP_REPORT schema as views, in the Spatial Data Warehouse.

(c) Methodology and assumptions

Asset age profiles are presented on a calendar year basis, due to asset dating limitations before 2010, and that asset age profile data from 2017 will be reported on a financial year basis.

Poles

Since mid-2010, the processes used by TasNetworks to capture pole data have undergone revision. Information about TasNetworks' poles was formerly captured by personnel dedicated exclusively to the gathering of pole data, which resulted in every new pole being captured within 12 months of installation.

With pole data now being captured either through in-field work processes, or by pole inspectors operating under a five year inspection cycle, delays of over 12 months may be experienced in the data capture process. Rules applying to the recording of new poles in TasNetworks' GIS also require that poles can only be added to the database when they have been assigned a Pole Tag ID and their installation has been confirmed. If no confirmation is received from the field of a pole having been erected, a record of the new pole may not be added until the pole is next inspected, which may not occur for another five years under TasNetworks' current inspection regime.

An extract of pole asset data was taken from TasNetworks' spatial data warehouse. Attributes that were extracted included: pole material, pole staking status, voltage, and installation date. Only poles owned by TasNetworks and a small number of poles with unknown or null owners were included. All poles dedicated to public lighting were excluded from this data set.

Poles were then categorised by material and by voltage.

Transformers

TasNetworks has historically captured installation dates for its distribution transformers.

An extract of transformer asset data was taken from TasNetworks' spatial data warehouse. The attributes that were extracted included: asset owner, voltage, transformer size, HV and LV switchgear, phase count, construction type and the year installed.

Transformers were categorised by construction type as either pole mounted, kiosk mounted (including pad-mounted transformers) or ground outdoor/chamber mounted.

Transformers with a recorded phase count of 0, 1 or 2 have been classified as single phase transformers.

Where no information is on record regarding the attributes of a transformer such as voltage and transformer size, those transformers have been distributed across the population of transformers consistent with the age profile of transformers of the same type and similar installation dates.

Public Lighting – Poles/Columns

This section does not cover public lighting luminaires or brackets.

TasNetworks interprets a public lighting pole/column as a pole dedicated to public lighting, owned by TasNetworks, irrespective of whether the Un-Metered Supply (UMS) type is 'public' or 'private'. This is not the same definition that is used for the Economic Benchmarking RIN.

An extract of UMS data was taken from TasNetworks' spatial data warehouse. The query linked UMS that were supported by a pole to a pole tag, which enabled the pole material, installation date and owner of that pole to be retrieved.

Poles were classified as columns if the pole material attribute was 'Steel-Other', otherwise they were classified as poles.

Un-Metered Supplies were classified as major if the wattage of the lamp/luminaire was greater than 100W, otherwise they were classified as minor.

Where no additional information was available, poles with no recorded material, voltage or installation date were distributed proportionally across the population of poles of the same type and installation date.

(d) Estimated information

TasNetworks has not captured installation dates of some asset categories until recently. In these circumstances, estimates of those assets' ages have been made for the purposes of asset age profiling.

Poles

Where there is no voltage and no material information, the poles are distributed across the RIN categories based on the proportion of poles in the RIN categories for which this information is known. Where no voltage information was available, those poles were categorised by voltage in proportion with the breakdown of poles with the same pole material. At this point, all poles in the system have been allocated to a RIN category.

For poles where the age information is not available, the age of these poles are distributed proportionally across the population according to the volumes of poles where age is known, for each RIN category.

The volume of poles for which age information must be estimated is approximately 7per cent of the total population of poles.

Overhead Conductors

TasNetworks' implemented a project to better estimate the age of the HV conductors in the distribution network. A schema was developed in the Spatial Data Warehouse, to store the information of estimated age, through live connections to GIS data. Where possible, the age of conductors are assigned the values of the age of the poles, to which they are connected. Where age data cannot be calculated through this method, these conductors are proportionally assigned the ages of conductor populations whose ages are known.

Underground Cables

TasNetworks does not have reliable historical records of the installation date of HV or LV cables. TasNetworks' implemented a project to better estimate the age of the HV cables in the distribution network.

For HV cables, a spreadsheet was developed that uses GIS connectivity traces to determine the physical asset, to which the cable is connected. The age of the cable is assumed to be equal to the age of the asset, to which it is connected.

For LV cables, TasNetworks' developed a low voltage connectivity model to create a vegetation span model. This model is also used to determine the connectivity of LV cables, where possible, to the transformers to which they are connected. The age of LV cables is approximated as the age of the transformer from which the cable is supplied.

Where ages of these assets are not known, cables are assigned ages proportionally, from the population of cables, whose age is known.

Service Lines

Recorded asset information regarding LV services is limited. TasNetworks currently captures whether a line is located overhead or underground and its voltage, but does not include size, material, type or installed date. While installation dates from TasNetworks' NMI records would be TasNetworks' preferred proxy for the installation date of a service line, this information could not be used for the purposes of this RIN due to issues with installation dates requiring validation. Therefore, the age of the pole to which a service line is connected was deemed an acceptable substitute methodology until NMI installation dates become available.

Geomedia was used to undertake spatial analysis and return the age of the pole and the number of LV services that were close to that pole.

A query of TasNetworks' NMI installation data was used to determine the proportion of residential NMIs, commercial and industrial NMIs.

Services associated with poles for which no installation date (year) was available were distributed proportionally across the rest of the population. The proportions of residential versus commercial/industrial were then applied to the age profile to give values for each type of installation.

LV services are assumed to be the same age as the nearest pole.

LV service numbers are a count of the number of services, not the length of those services.

All services are <= 11 kV and are simple connections.

The proportion of service lines supplying residential customers as opposed to commercial and industrial services is deemed to be the same as indicated by the proportion of NMIs associated with each broad customer category.

This methodology has been used because more accurate information and methodologies were unavailable at the time of submission.

Switchgear

An extract of HV and LV switchgear asset data was taken from TasNetworks' spatial data warehouse, including:

- switchgear installed in substations/switching stations (i.e. ground mounted switchgear)
- overhead switchgear
- a list of zone substations and the number of breakers at each site were extracted (feeder switchgear)

All switchgear was categorised by voltage and type into required categories for the RIN as advised by subject matter experts, and then consolidated into the RIN template.

TasNetworks has added a new asset category for 22kV fuses under the 'Other by' asset group in Template 5.2 as TasNetworks has significant annual expenditure on 22kV fuses and this category was required to align with Template 2.2 REPEX.

Asset information regarding overhead switchgear is limited. It has been assumed that the installation date of switchgear is the same as the transformer/site installation date. Pole installation dates have been used as a proxy for site date for overhead switchgear sites. Any residual volumes were evenly distributed across the population of switchgear of that category.

More accurate information and methodologies were not available at the time of submission.

Public Lighting Luminaires

TasNetworks has limited data relating to the installation date of individual luminaires. Age data for lights with no install date was estimated using procurement records or by interviewing employees involved historically with the installation of lighting assets. The volumes of lights installed in each year was given a flat profile for the period each particular light was purchased by TasNetworks.

Public Lighting Brackets

To identify public lighting brackets, TasNetworks' public lighting pole data was queried to identify all UMSs that are installed on poles that do not have unique pole tags. This count was distributed proportionally across the population of poles of the same type and installation date where no additional information was available.

Public lighting brackets are assumed to be the same age as the pole.

SCADA, Network Control and Protection Systems

The definition of 'Zone Substation', as per the Regulatory Information Notice issued under section Division 4 of Part 3 of the National Electricity (Tasmania) Law, is defined as follows:

"*A substation on a distribution network that transforms any voltage above 33 kV to levels at or below 33 kV but above 1 kV. As a guide, assets included within a zone substation include all equipment, buildings, structures, civil works and other assets that are located permanently within the substation boundary fence; but excluding the landing spans of incoming or outgoing overhead lines, and excluding incoming or outgoing cables and associated cable terminations (cables includes all power, communications and control cables).* "

Asset age profiles are presented on a calendar year basis due to lack of details in TasNetworks' historical asset records.

The information provided is in accordance with the definitions provided in Appendix F of the AER RIN document.

Since 'field device' is taken from the above to mean devices such as relays, Remote Terminal Unit, Program Logic Controllers, Data storage, communication interfaces, and local master stations – the RIN data provided pertains to TasNetworks' zone substation assets only, which are the 33/11 kV substations.

Field device numbers relate to the number of protection and control devices in zone substations which are mostly protection relays. The corresponding device numbers have been sourced from the most recent audit of zone substation secondary equipment, which may be found in the accompanying calculation sheet. This field includes the protection relays located at upstream terminal substations for associated sub-transmission protection.

Communications site infrastructure - in the absence of a definition in Appendix F, communications site infrastructure is assumed to be the same as communications network assets.

Communication network asset volumes are based on one Remote Terminal Unit and one Ethernet switch per zone substation as well as one AVR per transformer and HMI units at the applicable zone substation sites. There are inherently more devices, but exact numbers are currently unknown. Exact volumes are pending the outcome of a zone substation asset audit, which is currently in progress.

Communications linear assets are based on the number of fibre optic links between the zone substation and its upstream substation, which corresponds with the number of transformers at the zone substation i.e. For line differential protection.

Local network wiring assets, due to lack of details in TasNetworks' historical asset records, have been assumed to be the same as the estimated number of field devices.

AFLC is assumed to denote Audio Frequency Load Control assets, of which TasNetworks has none.

No ‘other’ protection assets have been included. This category may be utilised in the next RIN once more recent audit data becomes available.

‘Terminal Station’ is defined by TasNetworks as the upstream substation supplying the associated zone substation. Terminal stations supplying zone substations all have 33 kV sub-transmission links. Accordingly, some distribution protection assets are located within the terminal stations supplying zone substations. The calculation sheet accounts for this using a calculation (estimation) which splits the terminal station assets in accordance with the number of power transformers in each zone substation. These devices are then added to the total device count for each zone substation.

In the absence of a definition in the Regulatory Information Notice, “INSTALLED ASSETS -> QUANTITY CURRENTLY IN COMMISSION BY YEAR” in Table 5.2 of the Regulatory Reporting Statement is taken to mean the total number of assets commissioned in any one year, not the total fleet number in service for any given year.

Economic Life

The economic lives for TasNetworks’ assets are sourced from TasNetworks’ Regulated Asset Base, other than public lighting assets where asset lives have been taken from TasNetworks’ public lighting annuity model.

The standard deviation for the economic life of TasNetworks’ assets has been estimated as the square root of the mean, as discussed on page 51 of the AER’s explanatory statement for the RIN.

Template 5.3 Maximum Demand at Network Level

Table 5.3.1 Raw and Weather Corrected Coincident MD at Network Level

(a) Compliance with the requirements of the RIN

The information provided about the maximum demand at network level in *Table 5.3.1 Raw and weather corrected coincident MD at network level* is consistent with the requirements of the RIN, in that:

- the coincident raw system annual maximum demands are the actual unadjusted summation of actual raw demands for the transmission connection point, at the time when the summation is greatest
- weather correction has also been applied to unadjusted raw demand data to calculate weather corrected 50% POE and 10% POE maximum demands
- the maximum demand data reported in Table 5.3.1 is presented on a regulatory year basis
- all non-scheduled embedded generation data for embedded generators over 0.5MW are included and is the net export to the network at the connection point

(b) Information sources

Raw demand data has been sourced from National Electricity Market metering and eDNA at connection points.

Weather correction is performed using the raw demand data and Bureau of Meteorology weather data for various sites around the state.

(c) Methodology and assumptions

The coincident raw system annual maximum demands are the unadjusted summation of actual raw demands for the transmission connection point, at the time when the summation is greatest.

The weather correction process involves temperature sensitivity analysis at each connection point to determine the demand response to a change in temperature of one degree. The linear variation of daily maximum demand of each season against daily average temperature is taken as demand sensitivity to temperature. The process then determines the relationship between the temperature on the highest demand day and the average long term temperature at the site to determine the relativity to the 50 POE or 10 POE scenarios.

50 and 10 POE temperatures are derived from long term seasonal minimum daily average temperatures.

The difference between the average temperature of the maximum demand day and POE temperature is multiplied by the temperature sensitivity and added to recorded maximum demand to derive temperature corrected maximum demand.

Power factor is calculated as the average of all the half hourly measurementsand applied across the whole year when converting MW to MVA.

Template 5.4 Maximum Demand and Utilisation at Spatial Level

Table 5.4.1 Non-Coincident & Coincident Maximum Demand

(a) Compliance with the requirements of the RIN

The information provided about the non-coincident and coincident maximum demands for the zone substations in *Table 5.4.1 Non-coincident & Coincident Maximum Demand at network level* is consistent with the requirements of the RIN, in that:

- the coincident raw system annual maximum demands are the unadjusted summation of actual raw demands for the transmission connection point, at the time when the summation is greatest
- weather correction has also been applied to raw demand data to calculate weather corrected 50 POE and 10 POE maximum demands
- the maximum demand data reported in Table 5.4.1 is presented on a regulatory year basis
- all non-scheduled embedded generation data for embedded generators over 0.5MW are included and is the net export to the network at the connection point

(b) Information sources

Raw demand data is sourced from National Electricity Market metering and eDNA at connection points.

Weather correction is performed using the raw demand data and Bureau of Meteorology weather data for various sites around the state.

Raw metering data for embedded generators.

(c) Methodology and assumptions

The coincident raw system annual maximum demands are the unadjusted summation of actual raw demands for the transmission connection point, at the time when the summation is greatest.

The weather correction process involves temperature sensitivity analysis at each connection point to determine the demand response to a change in temperature of one degree. Raw unadjusted MD has been used in the weather correction process. The linear variation of daily maximum demand of each season against daily average temperature is taken as demand sensitivity to temperature.

The process then determines the relationship between the temperature on the highest demand day and the average long term temperature at the site to determine the relativity to the 50 POE or 10 POE scenarios. 50 and 10 POE temperatures are derived from long term seasonal minimum daily average temperatures.

The difference between the average temperature of the maximum demand day and POE temperature is multiplied by the temperature sensitivity and added to recorded maximum demand to derive temperature corrected maximum demand.

The substation and transformer MVA ratings provided are based on 'cyclic rating' as required by the RIN. This applies to substation normal and emergency ratings as well as individual transformer ratings. Substation ratings are typically based on nameplate rating from the equipment manufacturer. As TasNetworks does not currently have thermal models of the transformer loading capacity the cyclic ratings provided are a 30% increase of nameplate continuous rating.

Power factor is calculated as the average of all the half hourly measurementsand applied across the whole year when converting MW to MVA.

6. Service & Quality

Template 6.3 Sustained Interruptions to Supply

Table 6.3.1 Sustained interruptions to supply

(a) Compliance with the requirements of the RIN

The information provided about sustained interruptions in Table 6.3.1 is consistent with the requirements of the RIN, in that:

- interruptions have been defined as loss of electricity supply to a customer associated with an outage of any part of the electricity supply network, including generation facilities and transmission networks, of more than 0.5 seconds, including outages affecting a single premises
- the customer interruption starts when recorded by equipment such as SCADA or, where such equipment does not exist, at the time of the first customer call relating to the network outage. An interruption may be planned or unplanned, momentary or sustained. Subsequent interruptions caused by network switching during fault finding are not recorded as additional outages. An interruption ends when supply is restored to the customer
- feeder and Community SAIDI and SAIFI are calculated in accordance with TEC section 8.6.11
- The Major Event Day threshold calculated in accordance with the 2.5ß methodology defined in with TEC section 8.6.11

(b) Information sources

The information in Table 6.3.1 has been sourced from WASP, Asset history data warehouse and Network Operations Control System (NOCS).

(c) Methodology and assumptions

All reliability performance indices (SAIDI and SAIFI) have been calculated using disconnected customers and customer duration at the time of the outage.

A view in ASP_DMART was run on WASP and the Spatial Data Warehouse to extract a base data set of outages, outage assets, customers and distribution transformers for the current regulatory year ("ASP_DMART.OUTAGE_DATA_BASE " query). These tables are saved in the ASP_DMART warehouse for reporting purposes.

Sustained Interruptions by Community

All outages for the current reporting period on mainland Tasmania (i.e. excluding the Bass Strait Islands) have been captured, with the outages' impact measured on the basis of disconnected customers and customer duration as per the RIN requirements.

The data was then cleansed to ensure completeness of customers disconnected and customer durations. All outages were manually inspected to identify issues and information sourced from the asset history data warehouse. Where a customer was connected to a transformer that bordered on two reliability areas, the reliability area of highest customer count was chosen (e.g. urban over high density rural).

TasNetworks' outage categories were then mapped to the AER's categories and applied to the outage data.

An extract of Major Event Days was taken from the current Annual Reporting RIN response and cross referenced with outage data to determine the outages that occurred on major event days. A table on ASP_REPORT is maintained to populate the Major Event Days.

Momentary Interruptions by Community

Momentary interruptions are not recorded for all feeders and TasNetworks is unable to determine the causes of many momentary interruptions.

Momentary interruptions caused by reclosers are automatically captured by TasNetworks' automatic download process for devices where communications are available. Momentary interruptions on circuit breakers are extracted from NOCS on a quarterly basis.

A query was run to extract all momentary outages on TasNetworks' distribution network for the current reporting period with the outage impact measured by disconnected kVA and customers, in line with TasNetworks' STPIS reporting requirements and Category RIN reporting requirements. Disconnected kVA and customers are based on network configuration at the time of running the query, not the configuration at the time of the interruption as the MAIFI calculation relies on TasNetworks' protection zone model, which is refreshed each day and does not store changes.

MAIFI for each reliability classification was calculated by customers interrupted divided by the total number of customers in each reliability area.

All momentary outages have been assumed to be unknown causes and have no duration associated with them as they are less than 1 minute in duration. Template 6.3 does not allow for non-whole numbers as a SAIDI figure, so 0 was entered.

Sustained Interruptions by Feeder

All outages for the current reporting period on mainland Tasmania (i.e. excluding the Bass Strait Islands) were extracted, with the outages' impact measured by disconnected customers and customer duration as per the RIN requirements.

This data was then cleansed to ensure completeness of customers disconnected and customer durations. All outages were manually inspected to identify issues and information sourced from the asset history data warehouse.

TasNetworks' outage categories were then mapped to AER categories and these categories applied to TasNetworks' outage data.

An extract of Major Event Days was taken from the current Annual Reporting RIN then cross referenced with the outage data to determine which outages corresponded with a major event day.

Momentary Interruptions by Feeder

MAIFI by feeders was calculated from number of customers disconnected divided by total customers of that feeder category in worksheet Customers by Feeder Cat (column B).

Events were grouped by day, time, feeder number and feeder classification.

All MAIFIs have been assumed to be of unknown causes and have no duration associated with them as they are less than 1 minute in duration. Template 6.3 does not allow for non-whole numbers as a SAIDI figure, hence a zero value was entered.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