TransGrid

Category Analysis RIN Response - Basis of Preparation

■ 31 OCTOBER 2015

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1. Introduction

On 7 March 2014, the Australian Energy Regulator (AER) issued TransGrid with a *Regulatory Information Notice Under Division 4 of Part 3 of the National Electricity (New South Wales) Law* (the 'Revenue Reset RIN'), requiring the business to prepare and submit certain information to support the AER's regulatory responsibilities. This Basis of Preparation document has been prepared to support the audited information package that is due to be submitted to the AER by 31 October 2015. The audited information package is comprised of:

1. The populated worksheets provided as Appendix A to the RIN;
2. The Basis of Preparation for each variable covered in the RIN worksheets;
3. Confidentiality Claims on any information included in the RIN worksheets;
4. Audit Report
5. Verification of the information by way of a Statutory Declaration in the form provided as Appendix B to the RIN.

2. Compliance with the Revenue Reset RIN Requirements

The Revenue Reset RIN outlines the requirements for the Basis of Preparation as follows:

3. BASIS OF PREPARATION

3.1 TransGrid must explain, the basis upon which TransGrid prepared information to populate the input cells (basis of preparation), for all information in the following regulatory templates 2.1 Expenditure Summary' to '2.11 Provisions', and '2.13 Insurance & Self-insurance' and '2.15 Step changes, and '4.1 Asset Age Profile' to '4.3 MD & utilisation-spatial', and '5.1(a) ECFM' and '5.1(b) EBSS', '5.2. STPIS' and '6.4. Shared assets'.

3.2 The basis of preparation must be a separate document (or documents) that TransGrid submits with its completed regulatory templates.

3.3 The basis of preparation must follow a logical structure that enables auditors, assurance practitioners and the AER to clearly understand how TransGrid has complied with the requirements of this Notice.

3.4 At a minimum, the basis of preparation must:

(a) demonstrate how the information provided is consistent with the requirements of the Notice;

(b) explain the source from which TransGrid obtained the information provided;

(c) explain the methodology TransGrid used to provide the required information, including any assumptions TransGrid made; and

(d) explain circumstances where TransGrid cannot provide input for a variable using actual information, and therefore must provide estimated information:

(i) why an estimate was required, including why it was not possible for TransGrid to use actual information;

(ii) the basis for the estimate, including the approach used, assumptions made and reasons why the estimate is TransGrid's best estimate, given the information sought in the Notice.

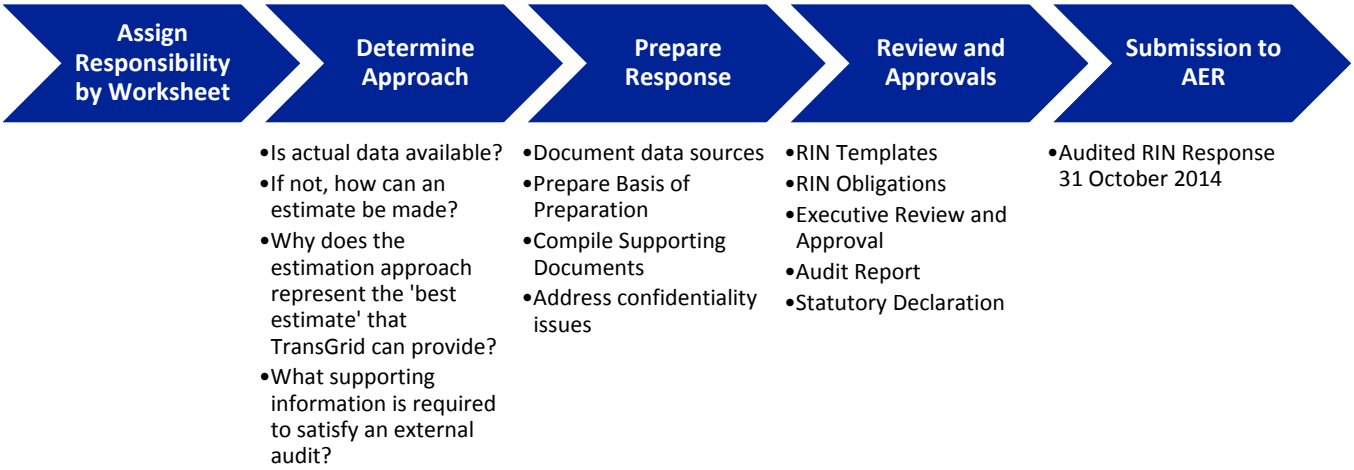
3.5 TransGrid may provide additional detail beyond the minimum requirements if TransGrid considers it may assist a user to gain an understanding of the information presented in the regulatory templates.

3.6 When reporting an audit opinion or making an attestation report on the regulatory templates presented by TransGrid, an auditor or assurance practitioner shall opine or attest by reference to TransGrid's basis of preparation.

This document has been structured to respond to the requirements in a clear and transparent manner.

3. Preparation Process

TransGrid's high level process for preparing its response to the RIN is outlined below.



3.1 Document Control

The RIN Templates, Basis of Preparation, RIN Responses and supporting documents are located on TransGrid's file servers. These documents will be retained to support the preparation of the annual information required in future years.

3.2 Governance

The information required under the RIN has been prepared by the responsible personnel within TransGrid and reviewed by their Group Manager prior to the consolidation into TransGrid's draft submission package. The draft submission package has then submitted to KPMG audit and subject to an external audit during September and October 2015. The final RIN package will be provided by 31 October 2015, inclusive of the Final Audit Report and signed Statutory Declaration.

4. Principles of Preparation

TransGrid's response to the Revenue Reset RIN has been prepared in accordance with the AER's *Principles and Requirements* document, provided as Appendix E to the Revenue Reset RIN.

In accordance with the AER's instructions TransGrid has provided actual information using 'records used in the normal course of business' wherever this is possible. In cases where TransGrid has been unable to provide actual information, the variables have been estimated as follows:

- In the first instance, where actual information exists, but the presentation is contingent of a judgement or assumption, TransGrid has used actual information to prepare the variable and stated the judgement or assumption that has been made.
- Where actual information exists, but the information is incomplete over the time period or by the categories required by the RIN, TransGrid has used the actual information as far as practicable and stated the methodology used to estimate the remaining data.

- Where no actual information is recorded for the variable in the normal course of business, TransGrid has stated the methodology that it has used to estimate the variable required by the AER, including the assumptions made and the data sources used.

By following these principles of preparation, TransGrid considers that where estimates have been provided, these represent the best estimate available for each variable, noting that considerable uncertainty remains with respect to the AER's specific purpose(s) for the information.

TransGrid has prepared the schedules in compliance with the requirements of Accounting Standard AASB 108 Accounting Policies, Changes in Accounting Estimates and Errors and in compliance with the recognition, measurement and classification requirements of other relevant Accounting Standards. To the extent determined appropriate, the RIN schedules have been prepared in compliance with the disclosure requirements of the relevant Accounting Standards. TransGrid also notes that there has been a change to AASB 119 Employee Benefits which has impacted the expense recognised in relation to Defined Benefits.

5. Information Sources

Due to the combination of financial and non-financial data requested by the AER, including a number of items that are not routinely reported, TransGrid has drawn data from a large number of information sources that are used across its business. In most cases it has been necessary to undertake additional analysis to derive the specific information that is required in the RIN response.

The key systems and information sources that have been relied on are summarised in the table below, and are referred to, in the detailed basis of preparation tables in section 7.

Information Source	Brief Description	Supports
AEMO National Electricity Forecasting Report (NEFR)	Annual forecasting report produced by AEMO	5.3 MD - Network Level
Aerial Laser Survey (ALS)	Refer to LiDAR	2.7 Vegetation Management
Distribution Network Service Provider (DNSP) Forecasts	Forecasts provided to TransGrid from Distribution Network Service Providers (e.g. Ausgrid, Essential Energy, Endeavour Energy)	5.4 MD & Utilisation - Spatial
Economic Benchmarking RIN Data Templates	The Data Templates submitted to the AER in response to the Economic Benchmarking RIN	2.8 Maintenance, 5.2 Asset Age Profile
Ellipse	TransGrid's ERM system, including asset, business and financial reporting	2.2 Repex, 2.3 Augex, 2.5 Connections, 2.7 Vegetation Management, 2.8 Maintenance, 2.10 Overheads, 2.11 Labour , 2.12 Input Tables, 5.2 Asset Age Profile
Finance Data Cube (Ellipse)	Refers to the process of querying TransGrid's financial information from the Ellipse ERM system	
Fleet Database	Fleet is a TransGrid approved application to manage TransGrid's fleet of mobile plant and motor vehicles. The system reports on purchase details, running costs, vehicle usage & FBT attributed to individual motor vehicles and mobile plant. It has direct interfaces to Ellipse to ensure data content is consistent	2.6 Non-network
Invoices Received	Contractor invoices received for vegetation management works have been used to estimate the variables requested in Template 2.6	2.7 Vegetation Management
IT Configuration Management System	Service Desk Plus (to 2013) integrated asset management solution which provides an accurate inventory of all hardware, software assets in TransGrid. BMC Remedy IT Service Management (Asset Management Console) was been introduced in late 2013 to replace	2.6 Non-network

Information Source	Brief Description	Supports
	Service Desk Plus.	
LiDAR	Light Detection and Ranging data sourced from aerial surveys that is used to measure vegetation clearances from TransGrid's transmission line assets.	2.7 Vegetation Management
NS&O Equipment Databases	Databases maintained by the Network Services and Operations group	2.8 Maintenance, 5.2 Asset Age Profile
Operating Manuals	Record the ratings of each circuit on the TransGrid network	2.2 Repex, 2.3 Augex, 2.5 Connections, 5.4 MD & Utilisation - Spatial
Oracle	TransGrid's finance system prior to the transition to Ellipse. Historical data has been retrieved from Oracle records to support the disaggregation into the categories required by the templates	2.8 Maintenance, 2.11 Labour
Opex Model	TransGrid's opex forecasting model that is used for the preparation of the regulatory proposal	2.8 Maintenance
Project planning & project management documents	Various individual documents used for planning, approval and delivery purposes. This record more detailed project specific information that is not recorded in TransGrid's other systems at a project level.	2.3 Augex, 2.5 Connections, 2.8 Maintenance, 5.2 Asset Age Profile
QAPR	Quarterly Asset Performance Report, an internal report on outages that is generated each quarter from the THEOS System	2.2 Repex, 2.8 Maintenance
System Operating Diagrams	High Voltage Operating Diagrams detail in plan view, single line format, the high voltage equipment, operational nomenclature and electrical connections for substations, switching stations and power station switchyards	2.2 Repex, 5.2 Asset Age Profile
TAMIS	NSW Transmission System and TransGrid Asset Management Information System (TAMIS) is the Geographical Information System (GIS) used by TransGrid to manage its spatial asset data.	2.2 Repex, 2.7 Vegetation Management, 2.8 Maintenance, 5.2 Asset Age Profile
THEOS	TransGrid's outage recording/reporting system	2.2 Repex, 2.7 Vegetation Management
TransGrid Regulatory Accounts	TransGrid's annual regulatory accounts which are prepared and submitted in accordance with the AER's requirements	2.1 Expenditure Summary, 2.2 Repex, 2.3 Augex Project Data, 2.5 Connections, 2.6 Non-network, 2.7 Vegetation Management, 2.8 Maintenance, 2.10 Overheads, 2.11 Labour, 2.12 Input Tables
TransGrid Electrical Data Book	A central record of electrical asset data regarding TransGrid's network that is published on the TransGrid Intranet (The Wire).	2.7 Vegetation Management, 2.8 Maintenance, 5.2 Asset Age Profile, 5.4 MD & Utilisation – Spatial
TransGrid 30 Year Asset Management Plan (2009-2039)	A long term asset management plan prepared for the TransGrid network.	5.2 Asset Age Profile
TUOS System	Transmission Use of System (TUOS) charges are TransGrid's primary source of revenue. The TUOS System is the billing system that underpins TransGrid's invoicing and records the information from the various metering installations deployed across TransGrid's network.	4.1 MD - Network Level, 5.4 MD & Utilisation - Spatial
TransGrid Manuals & Policies	Used for the operation and maintenance of TransGrids assets, these outline equipment information, standard practices and maintenance requirements.	2.7 Vegetation Management, 2.8 Maintenance
Workforce Profile Report	Annual submission of the workforce profile to the NSW government	2.11 Labour

6. Confidentiality Claims

TransGrid has identified the following issues where measures need to be taken to protect confidential information. This is summarised below:

Document affected	Issue	TransGrid Resolution
Worksheet 2.2 Repex	• Ability to determine TransGrid's unit rates for procurement of equipment	Information is available to consumers at an aggregate level
Worksheet 2.3 Augex	• Ability to determine TransGrid's unit rates for procurement of equipment. • Ability to determine TransGrid's supplier costs, labour costs and property costs for particular projects	Information is available to consumers at an aggregate level
Worksheet 5.4 MD and utilisation-spatial	• Disaggregated information for 330kV and 220kV customers will allow individual customers to be identified.	These figures have been aggregated into the figure reported for TOPED0112 'To Directly Connected End Users' in accordance with the AER's instructions for the Economic benchmarking RIN

7. Detailed Basis of Preparation

The following sections outline the Basis for Preparation for each line item in the RIN Templates.

7.1 Contents Worksheet

The Contents Worksheet does not require any input by TransGrid.

7.2 Worksheet 1.0 Business & Other Details

Worksheet 1.0 Business & Other Details requires general business address and contact information.

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7.3 Worksheet 2.1 Expenditure Summary

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Prescribed transmission services capex (as incurred) Replacement Expenditure	The total expenditure for regulated replacement capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For repex, we have included: • Major Proj-Presc Secuirty Comp • Major Proj-Presc Replacement Asset renewal strategies	TransGrid financial records reported from Ellipse and Business Reporting and 2014-15 Regulatory Accounts. Supporting information reported here in RIN 2.1 is in line with that in RIN 2.12 Input Tables.	N	N/A	N/A
Prescribed transmission services capex (as incurred) Connections	The total expenditure for regulated connection capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For connections, we have included: Major Proj-Pres Connections	TransGrid financial records reported from Ellipse and Business Reporting and 2014-15 Regulatory Accounts. Supporting information and list of projects are in line with RIN 2.5 Connections and RIN 2.12 input tables.	N	N/A	N/A
Prescribed transmission services capex (as incurred) Augmentation Expenditure	The total expenditure for regulated augmentation capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For Augmentation, we have included: • Major Proj-Presc Aug-Main Grid • Major Proj-Pres Aug-Sub Sys Major Proj-Pres Strat Property	TransGrid financial records reported from Ellipse and Business Reporting and 2014-15 Regulatory Accounts. Supporting information reported here in RIN 2.1 is in line with that in RIN 2.3 Augex – Table 2.3.3, as well as RIN 2.12 Input Tables.	N	N/A	N/A
Prescribed transmission services capex (as incurred) Non-Network	The total expenditure for regulated non network capital projects, exclusive of capitalised overheads and reported on an 'as incurred' basis. Grouping is based on Portfolio groupings in Ellipse. For non-network, we have included: • Presc – Other (idemand) • Support –Facilities	TransGrid financial records reported from Ellipse and Business Reporting and 2014-15 Regulatory Accounts. Supporting information reported here in RIN 2.1 is in line with that in RIN 2.6 Non Network, as well as RIN 2.12 Input Tables.	N	N/A	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	• Support – IT • Support - Motor Vehicles Support - Plant & Equipment				
Prescribed transmission services capex (as incurred) Capitalised Network Overheads	The network support costs allocated to capital projects.	TransGrid financial records reported from Ellipse and Business Reporting. Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	Y	Support costs allocated to capital projects are separately shown in the Finance cube. These support costs are then categorised into Network or Corporate Overheads based on the RC that incurred the costs.	
Prescribed transmission services capex (as incurred) Capitalised Corporate Overheads	The corporate support costs allocated to capital projects.	TransGrid financial records reported from Ellipse and Business Reporting. Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	Y	Support costs allocated to capital projects are separately shown in the Finance cube. These support costs are then categorised into Network or Corporate Overheads based on the RC that incurred the costs.	
Prescribed transmission services capex (as incurred) Balancing Item	The value required to reconcile to TransGrid's Regulatory Accounts	Balancing item relate to prescribed NCIPAP and iDemand projects which do not fall under the catergories noted above. Amount and treatment of NCIPAP projects is consistent with NCIPAP projects reported in historical capex schedule in the Regulatory Account.	N/A	N/A	N/A
Prescribed transmission services opex by category Vegetation Management	The Vegetation Management Expenditure reported in RIN 2.7	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures reconcile to the and 2014-15 Regulatory Accounts, as follows; • Land & Easement opex amount in Opex model (Regulatory Accounts DISAGG Inc and DISAGG Opex) Information reported here in RIN 2.1 is in line with that in RIN 2.7 Vegetation.	N	N/A	N/A
Prescribed transmission services opex by category Maintenance	The Maintenance Expenditure reported in RIN 2.8	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures reconcile to the and 2014-15 Regulatory Accounts, as follows; • Total maintence opex less land & easement in the Opex model (Regulatory Accounts DISAGG Inc and DISAGG Opex) Information reported here in RIN 2.1 is in line with that in RIN 2.8 Maintenance.	N	N/A	N/A.
Prescribed transmission services opex by category Non-Network	The Non-Network operating expenditure reported in RIN 2.6	TransGrid financial records reported from Ellipse and Business Reporting and 2014-15 Regulatory Accounts. TransGrid includes the non network opex in network / corporate overheads, hence the amount here is zero.	N	N/A	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Prescribed transmission services opex by category Network Overheads	The opex component of the total network overheads reported in RIN 2.10	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures reconcile to the and 2014-15 Regulatory Accounts (opex model and Accounts DISAGG Inc and DISAGG Opex supporting workpaper). Total network overheads= the sum of the following • Total maintenance support & asset management • Total operations • Total Grid Planning Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	N	N/A	N/A
Prescribed transmission services opex by category Corporate Overheads	The opex component of the total corporate Overheads reported in RIN 2.10	TransGrid financial records reported from Ellipse and Business Reporting. RIN 2.1 Expenditure Summary figures reconcile to the and 2014-15 Regulatory Accounts (opex model and Accounts DISAGG Inc and DISAGG Opex supporting workpaper). Total corporate overheads= the sum of the following • Taxes & insurance • Property management • Corporate & Regulatory management • Business management • Self-insurance Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.	N	N/A	N/A
Prescribed transmission services opex by category Balancing Item	The value required to reconcile to TransGrid's Regulatory Accounts	N/A – Nil Balancing item	N/A	N/A	N/A

Overall notes:

Capital Expenditures
Capital expenditures for 2014-15 are obtained from TransGrid financial system, and reporting through the Finance cube. The Finance cube shows capital expenditure by projects and by cost category and expense element.
Each project has been categorised as Augmentation / Connection / Replacement / Non Network (Support) based on the Portfolio Grouping and reference to the 2014-15 Regulatory Accounts.

Operating Expenditures
Operating expenditures for 2014-15 are obtained from TransGrid financial system, and reporting through the Finance cube. The Finance cube shows operating expenditure by RC, AC and expense element.
The amount for each combination of RC-AC-ELEMENT has been classified into the categories as per the submission in Regulatory Accounts.

Approved by (Acting Group Manager): Nancy Yeung, Manager Corporate & Management Accounting

7.4 Worksheet 2.2 Repex

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Replacement Expenditure	Expenditure associated with projects deemed as being Asset Replacement or Security & Compliance. This does not include replacements associated with operating, which is typically on an urgent basis. Expenditures are reported on project close / as commissioned basis, in $Nominal.	For Major Projects which completed in 2014/15, financial data originates from Ellipse. For programs financial data originates from the Finance Data Cube with Portfolio Grouping as Asset Renewal Strategies.	Y. TransGrid does not collect or estimate project costs at the level of detail required, particularly for major projects.	Material projects ending in 2014/15 have been allocated based on a combination of the construction contract schedule items, cost breakdowns for internal labour, standard costing and pro-rated. Costs for asset replacement strategy projects are directly attributable to a number of catagories.	• Any expenditure from the contracts that is not directly attributable to an item or grouping of items has been prorated across the attributable items. • Standard estimate splits from our estimating database are used is some instances to obtain the required level of details as the contract schedules do not record the required information. • Additional items have been added to allow for directly comparable scopes for costing for the asset replacement strategy works and the major project replacements.
Asset Replacements	Units of asset replaced associated with Replacement Expenditure projects as defined above. This may include assets that have been replaced for security and compliance purposes.	Manual counts from • Project definition document • Other project specific documents • Equipment tracing information Calculated counts from sub-project numbers where the relationship between asset counts and projects is known. SSA – Calculated counts based upon the standard estimate used for the Asset Strategy	Y TransGrid does not specifically associate assets with projects in the equipment register. SSA – Yes.	Manual counts from • Project scoping document • Other project specific documents • Equipment tracing information Calculated counts from sub-project numbers where the relationship between asset counts and projects is known. SSA – Calculated counts based upon the standard estimate used for the Asset Strategy	Cases not considered • Where a number of assets is replaced with a different number of assets, the newer number is used, unless any can be specifically associated with augmentation • Where asset replacement is achieved by another asset type, replacement units are based on the replacement asset type. For example a transmission line is effectively replaced with a number of substation reactive plant projects • Dead Tank CB construction also incorporates other asset types. Where a Dead Tank CB is used to replace a conventional CB, no allowance has been made for the decommissioning of other assets made redundant by the type of CB installed.
Transmission Tower Asset Failures	The failure of any entire transmission structure, subcategorised by voltage and single/multiple circuit. Failure of an asset is defined as when the asset causes an unplanned outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2014 Electrical Data Book (RINB-2-2-02) has been used to determine the voltage and whether the transmission asset is single or multiple circuit	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
Transmission Tower Support Structure Failures	The failure of any individual component of a transmission structure (e.g. insulators, cross-arms)	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset	N Tthe values provided	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	but not the entire structure, subcategorised by voltage and single/multiple circuit. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2012 Electrical Data Book (RINB-2-2-02) has been used to determine the voltage and whether the transmission asset is single or multiple circuit.	are actual data.	Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	
Conductor Failures	The failure of any conductor on a transmission line, subcategorised by voltage and rating. Overhead earth-wires have been classified into the 'Other' category. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2014 Electrical Data Book (RINB-2-2-02) has been used to determine the voltage. The TransGrid Operating Manuals, i.e. documents RINB-2-2-03, RINB-2-2-04, RINB-2-2-05 & RINB-2-2-06, have been used to source the conductor rating	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year..	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
Transmission Cable Failures	The failure of any transmission cable, subcategorised by voltage and insulation type. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2014 Electrical Data Book (RINB-2-2-	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
		02) contains voltage and insulation information.		column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year	
Substation Switchbay Failures	The failure of any components within a substation switchbay, subcategorised by voltage and the following equipment types: CB, Disconnector, Earth Switch, VT, CT, GIS Module, and Other. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category.	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
Substation Power Transformer Failures	The failure of power transformers subcategorised by voltage and MVA rating. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2014 Electrical Data Book (RINB-2-2-02) has been used to determine the transformer voltages and ratings.	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Substation Reactive Plant Failures	The failure of reactive plant subcategorised by voltage and the following reactive plant types: SVCs, Capacitors, Oil Filled Reactors, and Other. Note that failures of capacitors or reactors within an SVC are classified as SVC failures. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category. The TransGrid December 2014 Electrical Data Book (RINB-2-2-02) has been used to determine the reactive plant voltages.	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
SCADA, Network Control and Protection System Failures	The failure of all SCADA, Network Control and Protection equipment subcategorised by the following types: Protection Assets, Control Assets, Communications Assets and Metering Assets. Note that this category does not include the Material Failures of SCADA as reported in the previous Economic RIN to the AER. Failure of an asset is defined as when the asset causes a fault outage of non transient nature, or otherwise enters into a state of unfit for use (condition based asset replacements not included). Failures due to external causes (e.g. thunderstorms) have been excluded.	Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database stored on TransGrid's shared drive (with secure access for only Asset Performance & Systems staff), which in turn is populated from the outage records in THEOS (the business database application used by Network Operations staff to record outage data). An extract of this data has been provided in the RINB-2-2-01 spreadsheet, in the 'NPR Outages List Linked Table' worksheet. The 'Category Analysis RIN' worksheet uses this table to count up the number of asset failures for each category.	N The values provided are actual data.	Every outage record in the 'QAPR Comment on Outage' table within the THEOS PC Stats Access database contains a 'RIN Category' field which is populated with the applicable RIN asset group and category combination (as defined in the AER RIN template) for that outage. This 'RIN Category' field is represented by column AW in the 'NPR Outages List Linked Table' worksheet within RINB-2-2-01. Each numerical value in this column corresponds to a unique RIN asset group and category combination. For each asset group and category combination, the frequency of the corresponding numerical value is counted and reported across the relevant financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by Network Operations staff in THEOS, as per standard procedure.
Total MVAr By SVC	The combined nominal maximum reactive power rating for all SVCs in service at the end of the financial year. This is capacitive for TransGrid SVCs. The total nominal maximum reactive output of SVCs replaced in the year..	Small number of SVCs manually counted. Ratings from the Electrical Data Book No SVC replacements were made in the period	N	Manual Count	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Total MVARs by Capacitors	The combined nominal reactive power rating for all capacitors in service at the end of the financial year. The combined nominal reactive power rating for all capacitors	Capacitors identified using asset count data prepared for schedule 5.2. Rating information is cross checked using Operating Diagrams. Manual review of operating diagrams for the small number of projects identified	N	Manual Count	
Total MVArs by Oil Filled reactors	The combined nominal reactive power rating for all oil filled SHUNT reactors in service at the end f the financial year The combined nominal reactive power rating for all oil filled SHUNT reactors replaced in the year	Reactors identified using asset count data prepared for schedule 5.2. Rating information is cross checked using Operating Diagrams. No reactor replacements in the current year period	N	Manual Count	Series reactors are excluded as they do not provide voltage support for the network.
Lines					
Transmission Lines Repex Asset Replacement Expenditure by Asset Category ($000s)	Replacement capital expenditure on Transmission Line Structures due to the line being unable to efficiently maintain its service performance requirement. Replacement capital expenditure on Transmission Line Support Structures due to the line being unable to efficiently maintain its service performance requirement. Replacement capital expenditure on Transmission Line Conductors due to the line being unable to efficiently maintain its service performance requirement.	TransGrid's Enterprise Resource Management system - Ellipse. Construction contracts	Y TransGrid does not collect or estimate project costs at the level of detail required, particularly for major projects.	Material projects ending in 2014/15 have been allocated based on a combination of the construction contract schedule items, cost breakdowns for internal labour, standard costing and pro-rated. Costs for asset replacement strategy projects are directly attributable to a number of catagories.	Refer to Table 1 under Notes.
Transmission Lines Repex Additional Repex Expenditure by Asset Category ($000s)	These are additional categories to the ones provided in Repex Template. Including: Capital expenditure on Transmission Line Structures to allow them to meet regulatory requirements (ground clearances). Capital expenditure works dismantling works associated with transmission line rearrangements. Capital expenditure works to assist with the dismantling and rearrangement of distributor connections due to substation replacement projects.	TransGrid's Enterprise Resource Management system - Ellipse. Construction Contracts	Y	Material projects ending in 2014/15 have been allocated based on a combination of the construction contract schedule items, cost breakdowns for internal labour, standard costing and pro-rated. Costs for asset replacement strategy projects are directly attributable to a number of catagories.	Structures that have been modified by the replacement of a single pole of a multiple pole structure have not been classed as replacements and are included in other. E.G. single pole added to increase the height of a single phase for ground clearances.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Transmission Line Repex Asset Replacements (Units)	No of Transmission Line Structures replaced due to the line being unable to efficiently maintain its service performance requirement or due to line rearrangements for substation replacement projects. No of Transmission Line Support Structures replaced due to the line being unable to efficiently maintain its service performance requirement or due to line rearrangements for substation replacement projects.. No of Transmission Line conductors replaced due to the line being unable to efficiently maintain its service performance requirement or due to line rearrangements for substation replacement projects..	TransGrid's Enterprise Resource Management system - Ellipse. Detailed design information	N	The structure counts were obtained from the detailed design information for the completed projects	Refer to Table 1 under Notes
Transmission Line Repex Other Repex Expenditure (units)	Due to the variable nature of the included works no count has been determined as appropriate.	Project specific documentation including drawings and contracts	N/A	N/A	N/A
Transmission Line Repex Asset Failures	The failure of an asset to perform its function not caused by external events outside beyond its designed capacity.	THEOS Outage management and recording system Asset Performance Failure Investigations	N	Every failure of transmission line assets have been investigated and the cause identified. Some investigations lead to official formal reports, others are reviewed and reported on email.	Where a failure investigation identified that a failure occurred due to weather events beyond the structure's designed capability, this is not recorded as an asset failure.
Transmission Lines Repex Selected Asset Characteristics Conductor Length Material Type Asset Volumes Currently In Commission	The type of conductor installed on TransGrid's transmission network identified by route length (KM)	Electrical Data Book TransGrid Asset Management Information System (TAMIS)	N	Calculations are based on total length of conductors. From the data records in the transmission line data book the total circuit km of conductor have been added up.	Calculations are based on total circuit length of conductor. Where a circuit has a split phase configuration, it is counted twice. This calculation has only been performed on phase conductors not earthwires.
Transmission Lines Repex Selected Asset Characteristics Conductor Length Material Type Asset Replacements	The type of conductor replaced or installed for line rearrngements for substation replacement projects on by route length (KM).	N/A	N	The values were calculated from detailed design drawings.	Line rearrangements for other project requirements is not counted as replacement expenditure, eg for line deviations. Earthwire replacement and reuse of conductors have not been included.
Other Replacement Expenditure	The 'Other Replacement Expenditure' category represents additional replacement capital expenditure	Ellipse	Y	These represent additional categories of costs that are replacement in nature but cannot	The Telecommunications Network Expenditure is calculated based on telecommunications projects that could not be broken down into meaningful consistent units.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	projects that cannot be categorised as a discrete number of asset replacements. This includes: - Telecommunications Networks (where there is no clear 'unit' for population of the Repex Sheet), - Security and Compliance Projects (these are largely 'replacement' in nature); and, - 'Other Replacement Expenditure' (which comprises the residual of the replacement capex and includes the items that have not specifically be allocated to an individual asset type e.g. civils, structures, buildings)			be accounted for elsewhere in the RIN templates.	'

Notes:

Table 1

The following types of projects are identified as REPEX as Asset Replacements:

Category	Project Type	Description
Structure Replacements	Wood Pole Replacement	Complete replacement of wood pole transmission line structures (Not on a defect basis).
Structure and Conductor Replacements	Transmission Line Rearrangements	Replacements associated with line rearrangements and connections for substation replacements or to allow them to meet regulatory requirements (ground clearances).

Approved by (Group Manager): Lance Wee, Manager/Asset Performance

7.5 Worksheet 2.3 Augex Project Data

Data variable &TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Augmentation Project	Major projects relating to augementation of the networkin order to improve the quality of the network and to meet regulatory obligations.	TransGrid financial records reported from Ellipse and Business Reporting based on portfolio groupings. Portfolio groupings 'Major Pro-Presc Aug-Main Grid', 'Major Pro-Presc Aug – Sub Grid' and 'Major Pro-Presc Strategic Property' are included. Only projects commissioned in FY14-15 and total project spend greater than $5m are reported separately as per AER guidelines. Total project costs are reported on real $ basis as drawn from Ellipse ($Nominal) and has been inflated to $Dec-14 using the same CPI modifiers consistent with TransGrid's CPI conversion methodology as published on The Wire.	N	Projects are extracted from Ellipse Finance cube. Reference is made to the Portfolio Grouping in Ellipse and other relevant sources to determine the project category for reporting in RIN.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Substation and Project Summary Information	As per AER interpretation	Project planning documents	N	Values captured from project documents	No assumptions were made as data was extracted straight from project plans
Plant & Equipment Volume	As per AER interpretation	Project planning documents	N	Values captured from project documents	No assumptions were made as data was extracted straight from project plans
Plant & Equipment Expenditure	Procurement costs of the plant / equipment.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the transformer, switchgear, reactive plant and other plant & equipment costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Installation Labour Volume	The number of hours allocated to labour expenditure	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project which includes the internal labour hours costed to the project.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Installation Labour Expenditure	TransGrid labour costs directly charged to the work orders of the Augmentation projects	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the labour costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Expenditure – Civil Works	Costs allocated to civil works including buildings, earthworks, drainage, landscaping, roads and fencing.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the civil works costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Expenditure – Other Direct	Direct costs charged to the Augmentation projects other than plant & equipment procurement,	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification	N	Detailed project transaction report is run for each project, and expenditures for each project are	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.

Data variable &TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	labour and civil works.	in Ellipse.		analysed to obtain other direct costs.	
Years Incurred	The period the augementation project took place.	Project documentation	N	Information from relevant project documentation.	
Related Party Contract Margin	As per AER interpretation	N/A	--	TransGrid does not have related party contracts.	
Related Party Contract Total	As per AER interpretation	N/A	--	TransGrid does not have related party contracts.	
Non Related Party Contracts	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain other direct costs.	Categorisation of costs is based on expense element classification in Ellipse and plant and equipment costs reallocated as appropriate.
Land Purchases Expenditure	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtainland purchase costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Easement Expenditure	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain easement costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Line and Project Summary – Project Type	The type of augmentation work completed on the transmission line.	Project planning documents / Project Cable schedules.	N	Values captured from project documents and cableschedules	No assumptions were made as data was extracted straight from project plans and schedules
Line and Project Summary – Route Line Length Added	The additional route length added to the TransGrid's network due to this augmentation project.	Project planning documents / Project Cable schedules.	N	Values captured from project documents and cableschedules	No assumptions were made as data was extracted straight from project plans and schedules
Towers/poles (including structures, and civil works) Configuration	The structure configuration resulting from this augmentation project.	Not applicable – only Augex was an underground cable project.	N		
Towers/poles (including structures, and civil works) Towers/Poles Added	The number of structures added to TransGrid's network due to this augmentation project.	Not applicable – only Augex was an underground cable project.	N		

Data variable &TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Towers/poles (including structures, and civil works) Towers/Poles Upgraded	The number of structures upgraded in TransGrid's network due to this augmentation project.	Not applicable – only Augex was an underground cable project.	N		
MVA Rating – Pre – Lines and Cables	The normal ratings for the underground cable prior to the augmentation being undertaken with the season used based upon the maximum demand time for that year (Spring Day in 2014/15).		N		
MVA Rating – Post – Lines and Cables	The normal ratings for the underground cable after the augmentation is undertaken with the season used based upon the maximum demand time for that year (Spring Day in 2014/15).	Grid operating manuals: OM 304 RATINGS OF MAIN GRID CIRCUITS	N	Values captured from TransGrid operating manuals	The new circuit was a dual circuit cable. The rating provided was the rating for BOTH circuits.
Emergency Rating- Pre – Lines and Cables	The contingency ratings for the underground cable prior to the augmentation being undertaken with the season used based upon the maximum demand time for that year (Spring Day in 2014/15).	Not applicable for this RIN only Augex was a new underground cable, so no "Pre" data	N		
Emergency Rating – Post – Lines and Cables	The contingency ratings for the underground cable after the augmentation is undertaken with the season used based upon the maximum demand time for that year (Spring Day in 2014/15).	Grid operating manuals: OM 304 RATINGS OF MAIN GRID CIRCUITS	N	Values captured from TransGrid operating manuals	This one Line Augex project was a dual circuit cable. The N-1 rating was the rating of the two cables when one is out of service. As there is less heating this number is greater than half of the normal rating.
Circuit KM Added	The additional circuit length added to TransGrid's network due to this augmentation project.	Project planning documents / Project Cable schedules.	N	Values captured from project documents and cable schedules	No assumptions were made as data was extracted straight from project plans and schedules
Expenditure – Lines and Cables	Lines and cables expenditure	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the lines and cable costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting..
Expenditure – Other Plant	Other plant costs related to Lines and Cables	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the other plant costs.	Categorisation of costs is based on expense element classification in Ellipse.
Installation Labour Volume	The number of hours allocated to labour expenditure	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the hours of	Categorisation of costs is based on expense element classification in Ellipse.

Data variable &TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				labour charged to the project.	
Installation Labour Expenditure	TransGrid labour costs directly charged to the work orders of the Augmentation projects	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the labour costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Expenditure – Civil Works	Other civil costs related to Lines and Cables	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the civil works costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting.
Expenditure – Other Direct	Materials are the raw materials, standard parts, specialised parts and sub-assemblies required to assemble or manufacture a network/non-network asset or to provide a network/non-network service.	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain other direct costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Years Incurred	The period the augementation project took place	Project documentation	N	Information from relevant project documentation.	
Related Party Contract Margin	As per AER interpretation	N/A	--	TransGrid does not have related party contracts.	
Related Party Contract Total	As per AER interpretation	N/A	--	TransGrid does not have related party contracts.	
Non Related Party Contracts	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain other direct costs.	Categorisation of costs is based on expense element classification in Ellipse and lines and cables costs reallocated as appropriate..
Land Purchases – Lines and Cables	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtainland purchase costs.	Categorisation of costs is based on expense element classification in Ellipse.
Easements - Lines and Cables	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. Categorisation of costs is based on expense element classification in Ellipse.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain easement costs.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting

Data variable &TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Expenditure, Substations, Lines and Other Assets	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. 2014/15 Regulatory Accounts / Categorisation of costs is based on expense element classification in Ellipse.	N	The total augmentation capex for 2014/15 is obtained from Finance cube, and in line with RIN 2.1 and Regulatory Accounts.	No assumptions were made as data was extracted straight from Ellipse and Business Reporting

Approved by (Acting Group Manager): Nancy Yeung, Manager Corporate & Management Accounting (financial data)

Approved by (Group Manager): Lance Wee, Manager/Asset Performance (non-financial data)

7.6 Worksheet 2.5 Connections

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Connection Project	Capital projects relating to new assets, secondary system changes or communications augmentations in response to requests from regulated customers, including other Network Service Providers. Total project costs are reported for connection projects commissioned in FY14/15.	Connection projects are extracted from TransGrid's financial records (using Ellipse Finance cube) based on Portfolio Grouping of "Major Proj-Pres Connection". Connection projects are reconciled to 2014-15 Regulatory Accounts and RAB	N	Not applicable	This is not applicable; project are directly extracted from the Finance cube.
Direct Materials Costs	Raw materials, standard parts, specialised parts and sub-assemblies required in the execution of Connection projects. Total project direct materials costs in nominal dollars.	Direct material costs are extracted using the Finance cube, information is further drilled down to Cost Category for each Connection project. Cost category "Materials" and "Equipment" are added together to obtain the Direct Materials Costs.	N	Not applicable	Overhead (support cost allocated) is excluded from the amounts reported as per AER requirements.
Direct Labour Costs	Labour costs directly charged to the work orders of the Connection projects. Total project direct labour costs in nominal dollars.	Direct material costs are extracted using the Finance cube, information is further drilled down to Cost Category for each Connection project. Cost category "Labour" is used to obtain the Direct Labour Costs.	N	Not applicable	Overhead (support cost allocated) is excluded from the amounts reported as per AER requirements.
Connection Rating (MVA)	Normal cyclic rating	Operating manuals or project initiation documents (such as Project Approval Documents (PAD), Needs Statements).	Y	Information obtained from the operating manuals or project documents.	For existing installations, either the rating specified in the PAD or the lowest normal rating (for the seasons or months for which ratings were given in an Operating Manual) was used. For future installations, the rating of other installations at that location which are likely to be similar to that to be provided in the future were used.
Connection Voltage (kV)	Nominal voltage	Operating manuals or project initiation documents (such as Project Approval Documents (PAD), Needs Statements).	Y	Information obtained from the operating manuals or project documents.	
Underground / Overhead	Whether the Connection project is underground or overhead	Project documentation including Project Approval Documents (PADs), Need Statements.	Y	Information obtained from project documents.	
Year Connection Project Completed	Financial year end date that the project is complete and the asset is in service.	TransGrid financial records reported from Ellipse and Business Reporting. Project documentation	N	"Actual Finish Date" is obtained from Finance Cube Report, in conjunction with Project Close Out Report, Project Management Report and Ellipse Project Information, which is signed off by Manager/Portfolio Management.	

Approved by (Acting Group ManagerNancy Yeung, Manager Corporate & Management Accounting (all except connection rating, connection voltage, underground/overhead)

Approved by (Group Manager): Lance Wee, Manager/Asset Performance (Connection rating, connection voltage, underground/overhead)

7.7 Worksheet 2.6 Non-network

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Service Subcategory - IT & Communications - Capex	Capital expenditure on Non-Network IT by 'Client Device / Recurrent / Non-Recurrent' categories. Expenditures are reported on project close / as commissioned basis, in $Nominal.	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from Ellipse Finance Data Cube. Figures are actual balances and exclude capitalised support cost (element 400). Each project was classified to the recurrent, non-recurrent or client device categories.	N	N/A	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Service Subcategory IT & Communications - Opex	Operational expenditure on Non-Network IT by 'Client Device / Recurrent / Non-Recurrent' categories.	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from Ellipse Finance Data Cube and agreed to Regulatory accounts / opex model. Figures are actual balances. Nature of the expenditures were reviewed and classified to the recurrent, non-recurrent or client device categories and totalled. The calculation includes Opex for all work orders/accounts for the IT& Communications subcategory for TransGrid as a whole (both the IT group and other Business Units).	N	N/A	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Annual Descriptor Metrics – IT & Communications Expenditure (Employee Numbers)	Total Number of TransGrid Employees	Based on staff actuals / Work force profile data	Y	Historical data was extracted from workforce profile data and employee headcount data	Historical data is actuals. . As requested by the AER, only employees engaged in prescribed Transmission services work are to be reported. Calculation – exclude employees in the Business Revenue and Growth (BR&G) Business unit Data supplied by HR.
Annual Descriptor Metrics – IT & Communications Expenditure (User Numbers)	Total Number of Users (Employees + Contractors)	IT Configuration Management System	Y	User count is based on historical data from the IT configuration management system. Unique users of workstations excluding those users in BR&G.Users without a TransGrid issued device (e.g. remote contractors) are not included.	User count is based on historical actuals
Annual Descriptor Metrics – IT & Communications Expenditure (Number of Devices)	Total Number of Devices	IT Configuration Management System	Y	Based on historical records. The data is sought through exporting the Configuration Management Database (CMDB) to excel as a snapshot in time then filtering the data to "in use and in store" (laptop, computer, tablets, smartphones). Devices allocated to BR&G have been excluded as per rationale above.	

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Asset Category (Motor Vehicles)	Stand alone Elevated Work Platforms are defined as Light Elevated Work Platforms Mobile plant items such as trailers, excavators, mowers, tractors, forklifts etc. are defined as a Heavy Commercial Vehicle.	Data was obtained from the TransGrid Fleet database for active vehicles as at the 30/06/15. Includes replaced vehicles that were active or on short term loan.100% Private use contract officer vehicles have been excluded. Lifting appliances and other mounted plant items have been excluded from all metrics, however included in capital costs for heavy vehicles	N	N/A	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Asset Reporting Category (Motor Vehicles - Capex)	Motor Vehicle Capex by vehicle type Due to the nature of the asset class, as incurred is considered the same as as commissioned.	TransGrid's Regulatory Accounts and TransGrid Fleet Database. Capital expenditure for FY2014/15 was obtained from the Regulatory Accounts for 'Mobile Plant' (5739) and 'Motor Vehicles' (5777) categories. 'Motor Vehicles' include the subcategories Cars and Light Commercials, and 'Mobile Plant' includes subcategories EWP's and Heavy Vehicle.	N	N/A	No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Asset Reporting Category (Motor Vehicles - Opex)	Motor Vehicle Opex by vehicle type	TransGrid's Regulatory Accounts and TransGrid Fleet Database for the period Jul-14 to Jun-15. OPEX costs are based on actual costs incurred in financial year2014/15. Data was obtained from account codes 585 and 756 with expense codes 266 (Fuel), 269 (Tyres), 270 (Spare Parts) and 439 (Maintenance). Transaction data was extracted from the fleet database to enable the actual costs from TransGrid Accounts to be proportioned by Asset Category. Depreciation and insurance costs are excluded from the operating costs on the basis that these operating costs are accounted for elsewhere in the RIN templates.	N	N/A	• No assumptions were made as data was extracted straight from Ellipse and Business Reporting
Average Kilometres Travelled	Average Kilometres travelled by vehicle type	TransGrid Fleet Database	N	Average kilometres for vehicle types from TransGrid Fleet Database during 2014/15	Annual kilometres are based on vehicles fitted with an odometer and for that reason trailers and other plant are excluded
Number Purchased	Total number of vehicles purchased	TransGrid Fleet Database	N	Number of vehicle purchases by vehicle type recorded in TransGrid Fleet Database.	100% private use vehicles are excluded.
Number in Fleet	Total number of vehicles in the fleet by vehicle type	TransGrid Fleet Database	N	Total vehicles by vehicle type recorded in TransGrid Fleet Database.	100% private use vehicles are excluded. Vehicles that have been removed from the TransGrid Fleet but pending sale have been removed.
Proportion of total fleet allocated to regulatory expenditure (%)	Proportion of the fleet (by vehicle type) that are allocated to regulatory expenditure	Fleet expenditure is obtained from TransGrid Fleet Database. 100% private use vehicles are excluded. All fleet considered as regulatory expenditure.	No	N/A	No assumptions were made as data was extracted straight from Ellipse and Business Reporting

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Service Subcategory - Buildings & Property - Capex	Building and Property capital expenditure classified as non-network in TransGrid's regulatory accounting statements. Prepared on project close / as commissioned basis.	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from the Finance Data Cube	N	N/A	No assumptions were made
Service Subcategory - Buildings & Property - Opex	Building and Property operating expenditure classified as non-network in TransGrid's regulatory accounting statements.	TransGrid financial records reported from Ellipse and Business Reporting. TransGrid includes other non network opex as overheads (as in RIN 2.1 Expenditure Sumamry), hence the amount here is zero.	N	N/A	No assumptions were made
Service Subcategory -Other - Capex	Miscellaneous Plant and Office Machines reported as 'Other' non-network capex in TransGrid's regulatory accounting statements. iDemand projects are included. Due to the nature of the asset class, as incurred is considered the same as as commissioned.	TransGrid financial records reported from Ellipse and Business Reporting. Information was extracted from the Finance Data Cube.	N	N/A	No assumptions were made
Service Subcategory -Other-Opex	Other non network operating expenditures	TransGrid financial records reported from Ellipse and Business Reporting. TransGrid inclides other non network opex as as overheads (as in RIN 2.1 Expenditure Sumamry), hence the amount here is zero.	N	N/A	No assumptions were made

Approved by (Acting Group Manager): Stuart Barber, Chief Informatino Officer (Information Technology)

Approved by (Group Manager): Sunny Bhasin, Manager Training Logistics and Property (Motor Vehicles)

Approved by (Acting Group Manager): Nancy Yeung, Manager Corporate & Management Accounting (Financial)

7.8 Worksheet 2.7 Vegetation Management

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Route Line Length Within Zone (KM)	The length of line routes. Where a line is a double circuit or split phase line, that section of the route is only counted once.	TransGrid Asset Management Information System (TAMIS)	N	Span lengths for all circuits were extracted from TAMIS. Route length was averaged from the two spans attached to dual circuit structures and added to single circuit spans	Only a single vegetation zone is used, as TransGrid's network is not subject to different systems or regulations for different areas of the state. No underground cable route length is included.
Total number of maintenance spans	Where the contractor has claimed and been paid for maintenance work in a span it is counted as a maintenance span.	The data is sourced from the vegetation maintenance contractors who prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance.	N	A count of spans where payment has been claimed by the contractors. The data is calculated from invoices where the vegetation maintenance contractors have claimed against contract rates for work carried out on each span.	Where TransGrid staff have trimmed a tree or trees during a line inspection, this information has not been recorded, so these spans are not counted as maintenance spans.
Total Length of Maintenance Spans (KM)	The total length of the spans counted as Maintenance Spans	Span lengths are sourced from TransGrid's TAMIS database.	N	A sum of span lengths for each span counted as a Maintenance Span	The whole span length is counted for each Maintenance Span. TransGrid does not directly record the length of the areas that were maintained in the spans.
Average number of trees per maintenance span (0's)	Average number of trees per maintenance span is the number of trees maintained in that span, as trees not maintained are not counted.	The number of trees can generally be calculated using the contractor invoices, as the tree cutting rates are based upon hectare rates and hourly rates. The data is sourced from the vegetation maintenance contractors who prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance.	Y The contractor invoices are based upon contract rates by either hectare or hourly rates. Work amounts for hectare rate work are agreed with the contractor before work based upon vegetation densities in an agreed format. These vegetation densities are used to determine a coverage percentage and an estimate of a number of trees to be maintained based upon canopy size. Hourly rate work has been estimated to be able to maintain certain numbers of trees per hour using the various types of maintenance.	Hourly rate total hours are converted to trees using a trees per hour figure for the various maintenance activities. Hectare rate total hectares maintained are converted to trees by a vegetation coverage density percentage multiplied by a number of trees per hectare at 100% coverage based on crown size suitable for the type of maintenance. A review of a sample of the calculated count of trees was carried out by the TransGrid easement officers to determine suitability of the calculations. Some spans identified too many trees, some too few, but in an overall sense, the calculations are deemed suitable. Due to the majority of managed vegetation being regrowth, it can be quite dense, and lead to very large numbers of trees.	For hectare rates, the following vegetation crown densities apply: • Scattered is <5% coverage, use 3% • Light is 5-15% coverage, use 10% • Medium is 15-25% coverage, use 20% • Heavy (or high) is >25% coverage, use 40% as an average • Slashing is taken to be 40% coverage as slashing can only be used where trunks are less than 75mm thick at the cutting level. Vegetation crown sizes are estimated as the following: • Hectare Hand Clearing – 4 m^2 crown – 2500 trees/hectare @100% coverage • Hectare Mulching – 2 m^2 crown – 5000 trees/hectare @100% coverage • Hectare Slashing or Spraying – 2 m^2 crown – 5,000 trees/hectare @100% coverage For hourly rates, the following progress is estimated: • Hand clearing – 10 trees per hour • Hand clearing > 18° Slope – 5 trees per hour • 'Drive Through' – 10 trees per hour - Where a contractor goes with the inspector and trees are removed at the time • Spraying – 15 trees per hour, or 30 trees per hour with a spray truck • Slashing – 500 trees per hour • Pruning by climbing – 1 tree per hour • Pruning by EWP – 2 trees per hour • Tritter/Excavator – 70 trees per hour

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
					• Small Mulcher – 20 trees per hour • Medium Mulcher – 75 trees per hour • Large Mulcher – 100 trees per hour • Mechanical Pruning (Jaraff, etc) – 50 trees per hour
Length of Vegetation Corridors (KM)	The length of land upon which vegetation is maintained not including grassland/farmland and gullies where vegetation is not maintained.	NSW Transmission System and TransGrid Asset Management Information System (TAMIS) Vegetation, groundand conductor survey data identified from Aerial Laser Surveys LiDAR	Y TransGrid does not directly record vegetation types on easements or spans where no vegetation management is required. The figure is based upon the same proportional calculation as previous RIN years. The length is rounded to the nearest 100km.	TransGrid's LiDAR data provides laser survey points on vegetation greater than 1m in height. This has been used to identify "vegetated zones" on transmission line easements. This data is loaded against TransGrid's easements in the TAMIS GIS application and the total length is calculated. Gullies are removed from the vegetated length through a rough approximation of conductor sag along a transmission line. This is documented in the calculation spreadsheet.	It is assumed that a Gully is an area where the span length is larger than 300m and the approximate ground height is lower than approximate conductor sag + 10m. It is assumed that a "vegetated zone" is any area which has atleast 1 vegetation survey point within $1m^2$ A proportion of the network that is a "Vegetation Corridor" is calculated from LiDAR data available as at October 2014. As a result, it is extrapolated to the remainder of the line route length. As future LiDAR data is available, the accuracy of the estimation will improve.
Average Width of Vegetation Corridors (Metres)	The average width of land along which vegetation is maintained.	NSW Transmission System and TransGrid Asset Management Information System (TAMIS)	Y TransGrid does not directly record vegetation corridor widths for every section of lines.	The standard easement width for the line voltage is multiplied by the length of vegetation corridor above per span, then the sum of these areas is divided by the total length of vegetation corridors.	It is assumed that combined easements which occur generally in the vicinity of substations does not materially affect the average width of vegetation corridors and has not been considered in the calculation. The widths are calculated from the spans that have LiDAR data as at October 2014 as per the length of vegetation corridors above.
Average Frequency of Cutting Cycle (Years)	The straight average of the vegetation maintenance period for each transmission line for the appropriate year. No weighting for line length was used.	Transmission Line Maintenance Plan contains the maintenance frequency tables	Y	The vegetation maintenance cycle in years was listed for each circuit, then the average was taken. All lines were included in all years, not just those with Vegetation Maintenance Spans.	Where lines cross regional boundaries, the maintenance frequency for the region with the longer portion of the line was chosen. Line length was not taken into account, a 'simple' average was taken, as per the instructions: " The average vegetation Maintenance Span Cycle can be calculated based on a simple average of all the Maintenance Span Cycles"
Tree Trimming ($000's) Vegetation Corridor Clearance ($000's)	Expenditure that occurs in the management of individual trees. Expenditure that occurs in the clearing of areas of the easement not individual trees.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data Easement Contractor Invoices The data used to disaggregate the total is sourced from Materials and expenses recorded against vegetation management work orders in Ellipse.	Y The total reported in TransGrid's Regulatory Accounts and Ellipse has been used, with the split between subcategories estimated from an analysis of contractor invoices.	To calculate the split between the categories required by the worksheet, the total 'Land & Easement Maintenance' item reported in the Regulatory Accounts has been disaggregated based on analysis of the work orders. Standard Jobs on the work order have been used to identify the categorisation (inspection, other or maintenance). The total Routine and Non-Routine Materials and Expense for easement maintenance work is the Contractor costs for	Where the TransGrid line inspector has identified and consequently trimmed/removed one or more trees during a line inspection, it is not a significant tree trimming cost. The proportion of work classified as tree trimming is 1.34 times that of the vegetation corridor clearance.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				managing easement vegetation. The vegetation maintenance contractors prepare an invoice input spreadsheet as part of their invoices submitted for vegetation maintenance. This has been used to calculate the split between Tree trimming and Vegetation corridor clearance for all vegetation management expenses recorded in the TransGrid system. The proportion of the split of dollars is calculated from the proportion of work carried out on individual trees (generally hand clearing) or on an area of trees (generally machine clearing).	
Inspections ($000's)	Expenditure solely for the inspections for vegetation management.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data	N	All costs recorded against vegetation inspection work orders.	These inspection jobs include a small portion of contractor liaison costs as some inspection jobs are completed in conjunction with the contractor.
Audits ($000's)	Expenditure solely for the purpose of auditing vegetation management.	TransGrid does not record the proportion of its costs on Inspection or Audit from the Contractor Liaison expenditure	N/A	Auditing on contractor work occurs at the same time as supervision of the contractor on site and so TransGrid does not record expenditure on audits of vegetation separately. Costs will be included in contractor liason expenditure	N/A
Contractor Liason Expenditure ($000's)	Expenditure that occurred during the management of external contractors for vegetation management	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' Ellipse Financial Data Ellipse Work Order Data Ellipse Standard Job Data The data used to disaggregate the total is sourced from Labour recorded against vegetation management work orders in Ellipse.	Y The total labour cost reported in TransGrid's Regulatory Accounts and Ellipse has been used.	Any labour and expenditure costs recorded by TransGrid staff against vegetation maintenance work orders. Includes costs of auditing contractor work which occurs at the same time as the supervision of the contractor on site.	This does not include any contractor liaison costs incurred during inspection work.
Other vegetation management expenditure ($000's)	Other vegetation management expenditure which has not been captured by the previous fields. Aerial Laser Survey costs for the TransGrid network. Access Track maintenance costs for the TransGrid network.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' and Ellipse reports Costs recorded against Aerial Laser Survey and Access Track Maintenance work orders.	N This is the total cost allocated to Access Track Maintenance and the Routine LiDAR scan of the network	Any labour and expenditure costs recorded by TransGrid staff against aerial laser survey work orders and access track maintenance.	All vegetation maintenance expenditure outside the Routine LiDAR scanning and access track maintenance has been captured in the other fields.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Number of fire starts caused by vegetation grow-ins (NSP responsibility) (0'S)	Fires caused by electrical faults due to growth of vegetation within TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of fire starts caused by vegetation blow-ins and fall-ins (NSP responsibility) (0'S)	Fires caused by electrical faults due to vegetation within TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of outages caused by vegetation grow-ins (NSP responsibility) (0'S)	Outages caused by electrical faults due to growth of vegetation within TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of outages caused by vegetation blow-ins and fall-ins (NSP responsibility) (0'S)	Outages caused by electrical faults due to vegetation within TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of fire starts caused by vegetation grow ins (OTHER PARTY RESPONSIBILITY) (0'S)	Fires caused by electrical faults due to growth of vegetation outside of TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of fire starts caused by vegetation blow-ins and fall-ins (OTHER PARTY RESPONSIBILITY) (0'S)	Fires caused by electrical faults due to vegetation outside of TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.
Number of outages caused by vegetation grow-ins (OTHER PARTY RESPONSIBILITY) (0'S)	Outages caused by electrical faults due to growth of vegetation outside of TransGrid's vegetation management corridor.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Number of outages caused by vegetation blow-ins and fall-ins (OTHER PARTY RESPONSIBILITY) (0'S)	Outages caused by electrical faults due to vegetation outside of TransGrid's vegetation management corridor falling or blowing into the transmission line.	THEOS - TransGrid's Outage Management System.	N Every fault of the TransGrid's transmission line is investigated and reported on.	All outages recorded against category "TREE" in THEOS have been extracted. From follow up reports it is identified whether the fault was due to grow-in, fall-in or blow-in.	No assumptions are necessary as each fault was investigated.

Approved by (Group Manager): Lance Wee, Manager/Asset Performance

7.9 Worksheet 2.8 Maintenance

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Transmission Lines Maintenance Asset Quantity at year end 2014-15	The number of transmission structures (including steel towers, wood poles, concrete poles and steel poles) on TransGrid's network. The number of transmission support structures on TransGrid's network. The route length of conductors on TransGrid's transmission network. The route length of transmission cables on TransGrid's network.	TransGrid Asset Management Information System (TAMIS)	N	Structure counts werer totalled from TAMIS reports Span lengths for all circuits were extracted from TAMIS. Route length was averaged from the two spans attached to dual circuit structures and added to single circuit spans Cable route lengths were calculated from Cable Schedules and drawings	There are no support structures on TransGrid's network that are recorded or maintained separately to the structures.
Substation Equipment & property maintenance - Asset Quantity Switchbays	Total number of in-service switchbays within TransGrid's substation TransGrid has interpreted this data requirement to be similar to that used for worksheet 5.2 – ie: as a requirement to identify the population age profile of the switchbays installed as at the end of the financial year.	Ellipse TRB 601 REPORT; Extract Tracing information	Y	Sum of all in-service Ellipse bays shown as in service as at the end of the specified financial year. 'Non-real' Ellipse bays created for the purpose of the data model are excluded.	Switchbays in negotiated (third party) substations are excluded
Substation Equipment & property maintenance - Asset Quantity Power transformers	Total number of in-service transformers within TransGrid's substation	Ellipse TRB 601 REPORT; Extract Tracing information	Y	Sum of all in-service transformers commissioned prior to the end of the specified financial year	As explained in the BoP – Transformer Capacity parts 6.1.5 and 6.1.6
Substation Equipment & property maintenance - Asset Quantity Substation - Property	All prescribed substations under TransGrid's ownership	Refer to attached Excel file 'Substation List'; Quantity of TransGrid's owned substations has been created by an update of the previously submitted list. This can be verified from the schedule of operating diagrams	N	Sum of all in-service substations prior to the end of the specified financial year	N/A
SCADA & Control maintenance – Asset Quantity	The Number of Control IEDs on the Network	Information Supplied in Historical Quarterly Asset Performance Reports (QAPR) SystemsRenewal, Maintenance and Disposal Strategy – Substation Automation Systems Ellipse Tracing Information	Y Data was available from RIN13/14 Audit and augmented by works carried out in Financial Year 14/15.	Balance of New Assets Installed this financial year added to count for previous year.	It is assumed that movements in Asset numbers were due to new construction, capital replacement work, decommissioning or defect replacement
Protection Systems Maintenance – Asset Quantity	The Number of Major Protection Relays on the Network	Information Supplied in Historical Quarterly Asset Performance Reports (QAPR)Renewal, Maintenance and Disposal Strategy – Substation Automation Systems	Y Data was available from RIN13/14 Audit and augmented by works carried out in Financial Year 14/15.	Balance of New Assets Installed this financial year added to count for previous year.	It is assumed that movements in Asset numbers were due to new construction, capital replacement work, decommissioning or defect replacement

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Telecommunication Systems – Asset Quantity	The Number of Terminal Equipment, MUXs, Base Stations and Power Supplies on the Network	Information Supplied in Historical Quarterly Asset Performance Reports (QAPR)Renewal, Maintenance and Disposal Strategy – Telecommunications Terminal Equipment Ellipse Tracing Information	Y Data was available from RIN13/14 Audit and augmented by works carried out in Financial Year 14/15..	Balance of New Assets Installed this financial year added to count for previous year.	It is assumed that movements in Asset numbers were due to new construction, capital replacement work, decommissioning or defect replacement
Metering Systems – Asset Quantity	The number of Meters on the System	Information Supplied in Historical Quarterly Asset Performance Reports (QAPR)Renewal, Maintenance and Disposal Strategy – Substation Automation Systems	Y Data was available from RIN13/14 Audit and augmented by works carried out in Financial Year 14/15..	Balance of New Assets Installed this financial year added to count for previous year.	It is assumed that movements in Asset numbers were due to new construction, capital replacement work, decommissioning or defect replacement
Transmission Lines Maintenance Asset Quantity Inspected /Maintained 2014-15	The number of transmission structures (including steel towers, wood poles, concrete poles and steel poles) on TransGrid's network. The route length of conductors on TransGrid's transmission network. The route length of transmission cables on TransGrid's network.	BR199 - Routine Maintenance Achievement reports (from The Wire)	Y Inspection jobs are recorded against a standard job that identifies structures in discrete quantities for maintenance purposes (20, 60, 100, 150 and 200 structures for climbing inspections and 25, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 700 for ground inspections). These quantities are used to estimate the number of structures inspected in each standard job.	Maintenance Scheduled Tasks are setup each year according to TransGrid's Transmission Line Maintenance Policy these will create appropriate work orders each year. The work orders for routine maintenance for each work group in each financial year can be viewed in the BR199 Routine Maintenance Achievement report. The number of structures is the sum of the standard job structure quantity if the work order was a ground inspection.	TransGrid conducts aerial inspections of every structure annually with the exception of the far west 220kV network which is inspected by air once every two years.. For the purpose of this RIN structure inspections are only counted for ground inspections (same as previous). Inspections on conductors include thermovision scans and OHEW corrosion. There were no thermovision scans completed in FY2015. 100% of the underground cable network is inspected yearly, so the quantity inspected is equivalent to the total amount of UG cable assets.
Substation – Property Asset Quantity Inspected Maintained	Number of substation Properties inspected in each year	Ellipse Work Order Data	Y	The figure reported for ASSET QUANTITY - INSPECTED/ MAINTAINED has been capped at the total number of Substation Properties.	TransGrid notes that for some assets, such as substation property, different types of maintenance are conducted several times per year under different work orders. Where this has occurred, TransGrid only counted the asset as having been maintained once.
Other Asset Classification - Asset Quantity Inspected Maintained	Number of Completed Inspection and Routine Maintenance Work Orders	Ellipse Work Order Data	Y	Work Orders are categorised into the Equipment classification using the standard job. Only work orders with a completion code and date in the required financial years are calculated.	Work orders may address a range of equipment, for example, a substation inspection would also include an inspection of each Substation switchbay and transformer. In this instance, the work order would be reported against the substation classification, as this is the level at which the work is recorded.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Transmission Lines Maintenance Average Age of Asset Group 2014-15	The average age of transmission structures on TransGrid's network. The average age of conductors on TransGrid's transmission network. The average age of transmission cables on TransGrid's network.	TransGrid Asset Management Information System (TAMIS)	Y The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well recorded.	The age of each structure is calculated, then the sum of these is divided by the number of structures. For conductors and cables, the average age is calculated on a per kilometre basis.	Generally, maintenance replacements of a wood pole in a two pole structure are not included in the age of the structure. Where a new structure is known to have been installed, it is included. . For cables and conductors, average age per kilometre is assumed as the requested value by the AER.
Substation Equipment & property maintenance - Average Age Switchbays	Average age of in service switchbays	Ellipse TRB 601 REPORT; Extract Tracing information	Y	Sum of total in service years of all switchbays divided by total number of switchbays which are commissioned prior to the end of the specified financial year	Assumed: 1.Commission dates for all switchbays recorded in Ellipse are accurate; 2. Age of the switchbay does not change regardless of whether any HV plants within the switchbay has been replaced
Substation Equipment & property maintenance - Average Age Power transformers	Average age of in service transformer	The Excel file '2015TransFormerWorkSheet' This spreadsheet has also been used to provide Economic Benchmarking RIN data.	Y	For consistency, the Excel file '2015TransFormerWorkSheet' used previously for Economic Benchmarking RIN, was reused for Substation Power Transformers.	As explained in the BoP – Transformer Capacity parts 6.1.5 and 6.1.6
Substation Equipment & property maintenance - Average Age Substation - Property	All prescribed substations under TransGrid's ownership. Substation Age based on Initial Commissioning Date	Refer to attached Excel file 'Substation List'; Quantity of TransGrid's owned substations has been created by an update of the previously submitted list. This can be verified from the schedule of operating diagram	Y	Sum of all in-service substations prior to the end of the specified financial year	Based on definition. Definition does not consider significant augmentation or replacement
SCADA & Control maintenance – Average Age	The average of all Control IEDs in service based on available replacement date.	Ellipse Equipment Register Data	Y	Age extrapolated from replacement date data recorded against each asset as of July 2014.	Known Population of Systems with estimated Age Data have been included in the calculation.
Protection Systems Maintenance – Average Age	The average of all main protection relays in service based on available installation date.	Network Asset Condition Assessment – Substation Automation Systems – Protection All Regions Relays – Database maintained by NS&O	Y	Age extrapolated from installed date as of July 2014	Known Population of Systems with estimated Age Data have been included in the calculation.
Telecommunication Systems – Average Age	The average of all telecoms Terminal equipment in service	Based on Asset Manager estimate and known asset quantities.	Y	Data is not available. Therefore a high level estmimate was made based on the quantity of units and the estimated average age for telecommunications assets types.	The average age for each telecommunications asset type was estimated and reported for all years.
Metering Systems – Average Age	The average of all market meters in service based on available installation date.	Metering Devices Age Profile – Database maintained by NS&O	Y Age extrapolated from installed date as of September 2010, supplemented with information from Meter Inventory Report as of July 2014.	Age extrapolated from installed date as of September 2010, supplemented with information from Meter Inventory Report as of July 2014.	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Transmission Lines Maintenance Inspection Cycle	The average frequency of inspection on transmission structures in TransGrid's network. The average frequency of inspection on conductors in TransGrid's network. The average frequency of inspection on cables in TransGrid's network.	The Transmission Line Maintenance Plan contains the inspection frequency tables for transmission line structures and conductors. The Underground Cable Assets Maintenance Plan contains the inspection frequency tables for cables and associated infrastructure.	Y Where lines cross regional maintenance boundaries, there may be a variation in the designated inspection frequency as the general situation of the line changes. The frequency chosen for these lines was the frequency for the longer line section. The impact of these few lines on the overall average is minimal.	The inspection cycle in years was listed for each circuit, then the average was taken. When a line has more than one inspection type the most expensive was selected.	Only routine inspections are considered. It is assumed that the following inspections are the most expensive inspection types: Steel Towers – Ground Inspection Wood Poles – Ground Inspection Non-Wood Poles – Ground Inspection Conductors - Thermovision Inspection Cables – Inspection was assumed as the route patrol.
Transmission Lines Maintenance Maintenance Cycle	The average frequency of maintenance on transmission structures in TransGrid's network. The average frequency of maintenance on conductors in TransGrid's network. The average frequency of maintenance on cables in TransGrid's network.	The Transmission Line Maintenance Plan contains the maintenance frequency tables for transmission line structures and conductors. The Underground Cable Assets Maintenance Plan contains the maintenance frequency tables for cables and associated infrastructure.	Y As not all transmission structures receive maintenance (e.g. grillage or UGI) they are not included in the average calculation.	The inspection cycle in years was listed for each circuit, and then the average was taken. When a line has more than one inspection type the most expensive was selected. Lines which have no routine maintenance (no wood poles and no grillage foundations) do not contribute to the average maintenance cycle calculation. Alarm and accuracy tests are used for Cable maintenance period as they are the most expensive maintenance type.	Only routine maintenance is considered. For Transmission Lines there are only routine maintenance conducted on: - Wood Poles (UGIs) - Steel Towers (Grillage Foundations) There is no maintenance activity carried out on transmission line conductors - Cables (Alarms and Accuracy tests)
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Switchbays		MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.2 Six Monthly Substation Inspections MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 8.4 Service Interval for Circuit Breaker & Section 2.6 Ancillary Equipment	Y	As per maintenance policy	-
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Power transformers		MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.2 Six Monthly Substation Inspections MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.2 Six Monthly Substation Inspections	Y	As per maintenance policy	-
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Substation - Property		MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS Section 7.1.1 Minor Substation Inspections MAINTENANCE PLAN – SUBSTATION ASSETS MAINTENANCE PLAN – SUBSTATION ASSETS – reference to Fire Protection Manual Operations and Maintenance	Y	As per maintenance policy	-

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
SCADA & Control maintenance – Inspection and Maintenance Cycles	Average time in years for a single Control Asset to be inspected/maintained.	Inspection Maintenance performed. D2013/14723 SSA Asset Management - Plan - Maintenance - Routine and Non-routine - Control Systems	Y	Maintenance for Control Systems is by defect only. No regular inspections occur. The number of maintenance tasks versus the asset population has been used to estimate maintenance periods.	The methodology assumes an even spread of defects amoungst the population. No regular inspection cycle for control equipment.
Protection Systems Maintenance – Inspection and Maintenance Cycles	Average time in years for a single Protection Asset to be inspected/maintained.	D2013/14605 SSA Asset Management - Plan - Maintenance - Routine and Non-routine - Protection	Y	The relay population broken down by percentage was measured against the maintenance frequency as stated in the Maintenance Plan to establish a single figure for Maintenance frequency.	No regular inspection cycle for protection equipment.
Telecommunication Systems – Inspection and Maintenance Cycles	Average time in years for a single Telecoms Asset to be inspected/maintained.	D2013/14715 SSA Asset Management - Plan - Maintenance - Routine and Non-routine - Telecommunications	Y	Inspection figures averaged per site basis in Appendices B & C of the Maintenance Plan. Figures for Maintenance taken directly from the plan	Maintenance figures not scaled for population of telecoms equipment.
Metering Systems – Inspection and Maintenance Cycles	Average time in years for a single Metering Asset to be inspected/maintained.	D2013/14722 SSA Asset Management - Plan - Maintenance - Routine and Non-routine - Metering	Y	Figures come directly from Maintenance Plan	-
Routine Maintenance Direct Costs	Labour and Expense costs on routine maintenance of equipment consistent with the definitions used in the Opex model	TransgGrid's Regulatory Accounts Ellipse Financial Data. Ellipse Work Order Data Ellipse Standard Job Data Opex model configuration	Y	To calculate the split between the categories required by the worksheet, the total 'Maintenance' category reported in the Regulatory Accounts has been disaggregated based on analysis of the work orders. Labour, materials and expenditure costs recorded by TransGrid staff against routine maintenance and inspection work orders. Standard Jobs on the work order have been used to identify the asset classification. Where the asset classification cannot be determined from the standard job, the individual work orders have been classified. Costs not directly associated with a work order have been allocated on a percentage split basis across the classifications.	It is assumed that Inspection costs are included under Routine Maintenance Direct Costs. Standard Job table is used to define the classifications Insulator and fittings have been included as part of routine maintenance on structure costs. Property costs at radio repeater communications sites have been included under telecommunications systems Reconciliation with Opex Model is a complex process

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Non-Routine Maintenance Direct Costs	Labour and Expense costs on defect and MOPS maintenance of equipment consistent with the definitions used in the Opex model	TransgGrid's Regulatory Accounts Ellipse Financial Data. Ellipse Work Order Data Ellipse Standard Job Data Opex model configuration	Y	To calculate the split between the categories required by the worksheet, the total 'Maintenance' category reported in the Regulatory Accounts has been disaggregated based on analysis of the work orders. Labour, materials and expenditure costs recorded by TransGrid staff against non-routine maintenance work orders. Standard Jobs on the work order have been used to identify the asset classification. Where the asset classification cannot be determined from the standard job, the individual work orders have been classified. Costs not directly associated with a work order have been allocated on a percentage solit basis across the classifications.	Major operating projects (MOPS) have been included as part of Defect expenses. Standard Job table is used to define the classifications Insulator and fittings have been included as part of defect maintenance on structure costs. Property costs at radio repeater communications sites have been included under telecommunications systems Reconciliation with Opex Model is a complex process

Approved by (Group Manager): Lance Wee, Manager/Asset Performance

7.10 Worksheet 2.10 Overheads

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 2.10.1 Network Overheads Expenditure Overhead amounts for Prescribed Services	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The prescribed opex component of overheads in RIN 2.10 equals the following figures in the 2014-15 Regulatory Accounts: • Prescribed opex component of overheads (RIN) equals Network Operations plus Other Controllable Costs plus Self Insurance (DISAGG Inc and DISAGG Opex) Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Overhead costs allocated and capitalised are added back to determine the total	N	N/A	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
		overhead costs. Maintenance Support and Asset Management Support costs have been allocated based on nature of cost incurred, primarily with reference to the Responsibility Centres.			
Table 2.10.1 Network Overhead expenditure Overhead amounts for Negotiated Services	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The negotiated opex component of overheads in RIN 2.10 equals the negotiated overhead compenent of Other Controllable Costs in the 2014-15 Regulatory Accounts (DISAGG Inc and DISAGG Opex). The negotiated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	N	N/A	N/A
Table 2.10.1 Network Overhead expenditure Overhead amounts for Unregulated Services	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The Unregulated opex component of overheads in RIN 2.10 equals the Unregulated overhead compenent of Other Controllable Costs in the 2014-15 Regulatory Accounts (DISAGG Inc and DISAGG Opex). The unregulated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	N	N/A	N/A
Table 2.10.2 Corporate Overheads expenditure	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The prescribed opex component of corporate overheads in RIN 2.10 equals the Other Controllable Costs and Self Insurance Costs in the 2014-15 Regulatory Accounts (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Capitalised Corporate overheads are obtained by account extract filtered by AC.	N	N/A	N/A
Table 2.10.2 Corporate Overheads expenditure Overhead amounts for Negotiated Services	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The negotiated services opex component of Corporate Overhead in RIN 2.10 equals the negotiated overhead component of Other Controllable Costs in the 2014-15 Regulatory Accounts (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Capitalised Corporate overheads are obtained by account extract filtered by AC.	N	N/A	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Table 2.10.2 Corporate Overheads expenditure Overhead amounts for Unregulated Services	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The unregulated services opex component of Corporate Overhead in RIN 2.10 equals the unregulated overhead component of Other Controllable Costs in the 2014-15 Regulatory Accounts (DISAGG Inc and DISAGG Opex). Using TransGrid financial records, on which the Regulatory accounts are based, the schedule is prepared. Capitalised Corporate overheads are obtained by account extract filtered by AC.	N	N/A	N/A

Note to Overheads

Overhead expenditures incurred that are attributable to capital works but not directly recorded against individual capital projects are capitalised.

Examples of these overhead costs include review of design standards, management of overall capital program (not directly charged to individual capital project), formulating environmental, property and power system procurement policy and procedures. Typically these costs are incurred in the Network Planning and Performance business unit and Capital Program Delivery business unit. These costs are re-allocated to the capital projects through the Support Cost Allocation process.

Approved by (Acting Group Manager): Nancy Yeung, Manager Corporate & Management Accounting

7.11 Worksheet 2.11 Labour

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Labour Classification Levels	As per AER instruction of AER Regulatory Information Notice.	Position Data recorded in Ellipse	Y	Labour data was extracted from Ellipse	Assumptions were made to classify labour into AER categories. Details are provided in the note below.
ASL	As per AER instruction of AER Regulatory Information Notice.	Workforce Profile Report annual submission for 2014-15	N	ASL data is obtained from the Workforce Profile Reports	In accordance with the Workforce Profile Report Data Specification. Total Hours Paid for the year times by 7. Then divide by standard work hours per week for a full time job times by the number of days in the reference period.
Average Productive Work Hours	As per AER instruction of AER Regulatory Information Notice.	Workforce Profile Report annual submission for 2014-2015	Y	(Total Hours Paid + Overtime Hours) - Total Leave Taken	Total Hours Paid includes paid leave and excludes workers paid by third party, unpaid leave, overtime, allowances, additional hours worked under flex-time. Overtime Hours is the number of hours of paid overtime worked by the employee during the reference period Total Leave Taken refers to the sum of leave taken by the employee including annual, paid sick leave, unpaid sick leave, carers leave, long service leave, maternity leave, paternity leave, family and community services leave and unpaid leave. Adjusted by % of costs allocated to training
				The above information is adjusted by percentage of training labour costs over total labour costs.	

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Stand Down occurrences	As per AER instruction of AER Regulatory Information Notice.	Ellipse work codes	Y	An SQL query was run on the Work Code F1 from Ellipse 8 go live (April 2013) on the MSF891 file.	
Ordinary Time Hourly Rate	As per AER instruction of AER Regulatory Information Notice.	Calculated using the Base Annual Salary from the Workforce Profile Report Workforce Profile Report annual submission for 2014-2015	Y	Total ordinary earnings for each category divided by corresponding ordinary hours	Total ordinary earnings for each category divided by corresponding ordinary hours Adjusted by % of costs allocated to training
Overtime Hourly Rate	As per AER instruction of AER Regulatory Information Notice.	Calculated using the Overtime Hours and Total Overtime Earnings from the Workforce Profile Report Workforce Profile Report annual submission for 2014-2015	Y	The Overtime Hourly Rate was calculated by dividing the Total Overtime Earnings by the Overtime Hours.	Overtime Hours is the number of hours of paid overtime worked by the employee during the reference period Total Overtime Earnings – is the total earnings of all paid overtime during the reference period
Expenditure Categories	As per AER instruction of AER Regulatory Information Notice.	Oracle & Ellipse financial systems	Y	Each Responsibility Centre has been mapped to an expenditure category	Network asset capex was included as network overhead (does not meet the definition of direct network labour) and capex on support assets has been classified as corporate overheads.
Total Labour Costs	As per AER instruction of AER Regulatory Information Notice.	TransGrid financial records reported from Ellipse and Business Reporting. The opex labour component agrees to the labour component in the 2014-15 Regulatory Accounts net of support costs. Total labour costs were extracted from financial records, based on total expenditures, in line with information for RIN 2.1 Expenditure Summary and Reconciliation, 2.10 Overheads and 2.12 Input Tables. Please also refer to the BoP of these RINs.	N	N/A	N/A

Note to Labour Classification Levels

To align TransGrid's staff classifications to the required AER template classifications the following assumptions were made:

- Executive: Positions at an EGM/GM level
- Senior Manager: Positions that have 'Reporting level' as a Group Manager
- Manager: Positions that have 'Reporting Level' as Branch Manager, Team Leader or Business Manager – unless Field Services Team LeadersProfessional: Positions that are not team leaders or managers but are SP28 or higher or IEAs or SCOs
- Semi Professional: Positions that are SP16-SP27 and that are not administrative or business support positions.
- Support Staff: Positions that are admin/support roles SP12-SP20
- Interns, Junior Staff and Apprentices - Graduates, MD scholars, Industrial Work Experience and Trainee Engineering Officers
- Apprentices – Electrical and Lineworker Apprentices
- Skilled Electrical Worker - Positions in FS that require electrical/trans line apprenticeship to have been completed
- Skilled Non Electrical Workers - Positions that specify a trade other than electrical/trans line apprenticeship completed
- Unskilled Workers - Positions that have a staff classification in Ellipse as Power Worker

Note on Definition of Overheads'

TransGrid notes that the AER's definition of 'Overheads' and 'Direct' labour that is required for the population of this template differs to that used in the normal course of business. In particular TransGrid highlights that a significant proportion of labour costs described as 'Network Overheads' relates directly to project work that would ultimately be capitalised.

Note on Definition of AER Levels

AER levels were determined by both the Business Unit the employee belonged to and by their AER Category as follows:

Corporate Overheads Internal Labour Costs:
Consists of the following business units/categories:

- Business Growth & Revenue
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff
- People, Strategy & Stakeholders
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff
- Finance & Support Services
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff
- Executive
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff
-

Network Overheads Internal Labour Costs:
Consists of the following business units/categories:

- Field Services
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff
- Project Services
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager
  - Support staff
- Asset Management
  - Executive manager
  - Intern, Junior Staff, Apprentice

- Manager
- Professional
- Semi professional
- Senior manager
- Support staff

Total Direct Network Labour:

Consists of the following business units/categories:

- Field Services
  - Executive manager
  - Intern, Junior Staff, Apprentice
  - Manager
  - Professional
  - Semi professional
  - Senior manager

Support sta

Approved by (Acting Group Manager): Nancy Yeung, Manager Corporate & Management Accounting (financial data – Total Labour column)

Approved by (Group Manager): Robyn Smith, Manager/People and Culture (non-financial data)

7.12 Worksheet 2.12 Input Tables

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
General	Refer to overall principles under notes	-	-	-	-
Vegetation Management	As per AER instruction	GL Account Extract and using TransGrid financial records, which are the basis for 2014-15 Regulatory Accounts. Regulatory accounts: ▪ 2014-15 – Vegetation Management plus Routine Maintenance plus Non Routine Maintenance (RIN 2.12) equals Network Maintenance (Regulatory Accounts DISAGG Inc and Dissag Oopex) RIN 2.7 Vegetation Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Vegetation management is "Land & Easement " in the Regulatory Opex category. The reported amount is split into the subcategories in RIN 2.7	N	N/A	N/A
Routine Maintenance	As per AER instruction	GL Account Extract and using TransGrid financial records, which are the basis for 2014-15 Regulatory Accounts. Regulatory accounts: ▪ 2014-15 – Vegetation Management plus Routine Maintenance plus Non Routine Maintenance (RIN 2.12) equals Network Maintenance (Regulatory Accounts DISAGG Inc and Dissag Oopex) RIN 2.8 Maintenance Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Routine maintenance is "Routine- Lines & Cables, Substations, Communications, Secondary Systems" in the Regulatory Opex category. The reported amount is split into the subcategories in RIN 2.8	N	N/A	N/A
Non-routine Maintenance	As per AER instruction	GL Account Extract and using TransGrid financial records, which are the basis for 2014-15 Regulatory Accounts Regulatory accounts: ▪ 2014-15 – Vegetation Management plus Routine Maintenance plus Non Routine Maintenance (RIN 2.12) equals Network Maintenance (Regulatory Accounts DISAGG Inc and Dissag Oopex) RIN 2.8 Maintenance Costs for Direct Materials / Direct Labour / Contract Cost / Other	N		

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
		Costs are split based on Cost Category and / or Expense Element. Non-routine maintenance "Defects and Major Operating Projects - Lines, Substations, Communications, Secondary Systems" in the Regulatory Opex category. The reported amount is split into the subcategories in RIN 2.8			
Overheads	As per AER instruction	GL Account Extract which are the basis for 2014-15 Regulatory Accounts. Regulatory accounts: • 2014-15 - Prescribed opex component of overheads (RIN) equals Network Operations plus Other Controllable Costs plus Self Insurance (DISAGG Inc and DISAGG Opex) RIN 2.10 Overheads Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element. Overhead costs are as per the overhead categories in the Regulatory Opex, with capitalised overhead added back.	N	N/A	N/A
Augmentation	As per AER instruction	Extract 2014-15 financial data from Finance Cube, which are the basis for 2014-15 Regulatory Accounts. RIN 2.3 Augex Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	N	N/A Element.	N/A
Connections	As per AER instruction	Extract 2014-15 financial data from Finance Cube, which are the basis for 2014-15 Regulatory Accounts. RIN 2.5 Connections Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	N	N/A	N/A
Replacement	As per AER instruction	Extract 2014-15 financial data from Finance Cube, which are the basis for 2014-15 Regulatory Accounts. RIN 2.2 Replacements Costs for Direct Materials / Direct Labour / Contract Cost / Other	N	N/A	N/A

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
		Costs are split based on Cost Category and / or Expense Element.			
Non-network	As per AER instruction	Extract 2014-15 financial data from Finance Cube, which are the basis for 2014-15 Regulatory Accounts. RIN 2.6 Non Network Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	N		

Notes

Overall principle

Finance Cube is the primary source of data, and information submitted to AER previously.

Approved By (Acting Group Manager): Nancy Yeung, Manager Corporate & Management Accounting

7.13 Worksheet 5.2 Asset Age Profile

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Asset Age Profile Transmission Towers by Highest Operating Voltage; Circuit Configuration Installed Assets - Quantity currently in commission by year	Quantity of transmission structures in service as at 30/6/15 categorised by construction date.	TAMIS	Y The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well recorded.	TransGrid's TAMIS system records the construction date of all structures on the TransGrid system, This data was extracted and categorised according to voltage and circuit configuration.	Some minor project data is not included. Construction years for older lines generally comes from dates of easement plan registrations, line schedule or route plan dates. TAMIS records the construction date of structures. In some cases accurate construction dates may not be available due to small defect replacements not being tracked accurately Data is stored as "build year". Dates are stored on a calendar year basis, not financial year. For the purposes of this RIN it was assumed build year was equal to the commissioning financial year. The age profile is based on operating voltage. For example, if a structure is built for 330kV operation but only carrying line(s) operating at 132kV, it will be categorised as a 132kV structure. Note: There will be mismatch between section 2.2 as those structures as listed by project close out. The structures themselves are sometimes installed in previous financial years. Non regulated projects (such as customer connections) are not included in section 2.2 but can add to the structure count.
Asset Age Profile Transmission Tower Support Structures by Highest Operating Voltage; Circuit Configuration	Quantity of transmission tower support structures as at 30/6/15 categorised by construction date	N/A	N	TransGrid do not separate asset data for support structures from towers themselves	There have been some past projects to replace wooden cross arms separate to wood poles, and some insulator replacement projects, however these are not significant in the scheme of separation of these from the tower structures themselves.
Asset Age Profile Conductors by Highest Operating Voltage; Maximum Continuous Rating Installed Assets - Quantity currently in commission by year	Length of transmission conductors in service as at 30/6/15 categorised by construction date.	TAMIS	Y The age of structures and conductors is estimated based on various sources, mainly for the older lines where construction data is not well recorded.	This data has been extracted and categorised according to the voltage and rating (Spring Day Rating). The same rating table for EB RIN was used. Where it was noted that a circuit was constrained by terminal equipment the rating of the line component was checked manually and appropriately categorised.	The age profile has been calculated using circuit lengths not route length. Also segments of Transmission Lines that are built as split phase will have the length of that segment counted twice (as it has double the amount of conductor). Dates are stored on a calendar year basis, not financial year. For the purposes of this RIN it was assumed build year was equal to the commissioning financial year. No account has been made for any sections of conductors replaced for defects or failures. The age profile is based on operating voltage. For example, if a line is built for 330kV operation but only operating at 132kV, it will be categorised as a 132kV line. Whilst the ratings have been corrected removing terminal constraints, where a line uses multiple types of conductors the most constraining rating was assumed for the whole length.
Asset Age Profile Transmission Cables by Highest Operating Voltage; Insulation Type Installed Assets - Quantity currently in commission by year	Length of transmission cables in service as at 30/6/14 categorised by construction date.	Electrical Data Book Project Records (EDMS)	N	TransGrid's Electrical Database (published as the Electrical Data Book) records the commissioning date of segments of transmission cable circuits. For high voltage cables within substations, the length of the cables has been estimated from project drawings.	For small cable sections exact lengths may not have been recorded and have been estimated from available project data. The age profile is based on operating voltage. For example, if a cable is built for 330kV operation but only operating at 132kV, it will be categorised as a 132kV cable. Small lengths of high voltage cables <=66kV which may exist around / within high voltage substations have not been considered.
Asset Age Profile Transmission Towers by Highest Operating Voltage; Circuit Configuration Economic Life [Years] Mean and	Average and Standard Deviation of Economic Life of each asset type	TransGrid's 30 Year Asset Management Plan	Y Averages are based on number of items in the population rather than by length	For each structure, an analysis is made whether it is a coastal or inland structure, then the nominal Economic Life for that type of structure and location is averaged by voltage. The standard	

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Standard Deviation Asset Age Profile Conductors by Highest Operating Voltage; Maximum Continuous Rating Economic Life [Years] Mean and Standard Deviation Asset Age Profile Transmission Cables by Highest Operating Voltage; Insulation Type Economic Life [Years] Mean and Standard Deviation			of conductor	deviation of this mean is taken, rather than a comparison of replacement life with the economic life. Replacement life is not recorded specifically for each wood pole replaced, so this data is not available. There is only a single type of 220kV line, and a single economic life for cables, so there is no standard deviation for these assets	
[A] GENERAL	Only those assets that were categorised 'IS' (acronym for 'In Service') were included. Scrapped, spare units not installed and non-prescribed assets were excluded for this review. TransGrid has interpreted the requirement for "INSTALLED ASSETS -> QUANTITY CURRENTLY IN COMMISSION BY YEAR" as a requirement to identify the numbers of equipment items installed in each year, from the population of equipment current in commission. This will allow a population profile to be established.	*Last Financial Year's RIN submission* *Ellipse Database :* Component Register Summary Report TRB601 Equipment Register, Tracing Data, *TransGrid System Drawings:* High Voltage Operating Diagrams (HVOD's) and WMS Scoping Diagrams.	N This variable was calculated based on compiled data from Ellipse TRB 601 report. It was cross checked (spot checks) using HVOD's and WMS Scoping diagrams.	In preparation for the complilation of RIN data an Ellipse report was run at the end of June to obtain a 'snapshot' of equipment data at that time. Population profiles were based on these reports. Transformer population data was obtained separately for the Economic RIN and this information was re-used. Spot checks were done to correct a small number of errors. This included correction of voltage data based on HV operating diagrams GIS equipment rows were identified for separate reporting and were counted manually.	Date extracted from Ellipse database was correct. Tracing information were correct HVOD's and WMS scoping diagrams were correct. Only their latest versions were used as required.
[B]SUBSTATION SWITCHBAYS {Air Insulated Circuit Breaker}	All CBs other than GIS CBs were included under this category.	As for [A] above	N As for [A] above	As for [A] above..	As for [A] above
[B]SUBSTATION SWITCHBAYS {Air Insulated Isolators/Earth Switch}	As for [A] above	As for [A] above	N As for [A] above	As for [A] above.	As for [A] above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
[B]SUBSTATION SWITCHBAYS {Current Transformers}	As for [A] above	As for [A] above	N As for [A] above	As for [A] above.	As for [A] above
[B]SUBSTATION SWITCHBAYS {GIS Module}	The term 'module' in GIS module was interpreted as a bay that typically comprised a circuit breaker, isolator(s), earth switch(es), CT(s) and a VT in GIS switchboard. A module was assumed to be identical to an outage group as shown in WMS scoping diagrams.	*TransGrid System Drawings:* High Voltage Operating Diagrams (HVOD's) and WMS Scoping Diagrams.	N	As there are very few substations with GIS, the process was predominantly manual. Most recent version of the HVOD's were printed and each bay was manually identified. GIS at Rookwoood subs was added in this update.	HVOD's and WMS scoping diagrams were correct. Only their latest versions were used as required.
[C] SUBSTATION POWER TRANSFORMERS	As for [A] above	The Excel file '2015TransFormerWorkSheet'	N This spreadsheet has also been used to provide Economic Benchmarking RIN data.	For consistency, the Excel file '2015TransFormerWorkSheet' used previously for Economic Benchmarking RIN, was reused for Substation Power Transformers.	As explained in the BoP – Transformer Capacity parts 6.1.5 and 6.1.6
[D] SUBSTATION REACTIVE PLANT {Capacitors}	Assets used to provide voltage support were included under this Asset Group. Tertiary Earthing Capacitors (TEC) used for protection purposes were excluded.	As for [A] above	N As for [A] above	As for [A] above	As for [A] above
[D] SUBSTATION REACTIVE PLANT {Reactors}	Fault current limiting reactors on feeders, and on transformer neutrals were excluded. Two major oil filled series reactors at Sydney South Substation have been included.	As for [A] above	N As for [A] above	As for [A] above. Furthermore, three additional rows under Asset Category/Reactors were added. These were: 1]< = 33 kV; AIR INSULATED REACTORS, 2) >66kV & <= 132kV Air Insulated Reactors; 3] > 66 kV & < = 132 kV ; GAS FILLED REACTORS TransGrid has air cored shunt reactors connected to the tertiary windings of 500kV power transformers; series air cored reactors connected to a few 132kV feeders, and in series with transformers at	As for [A] above

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				Rookwood substation; and SF6 filled shunt reactors at Haymarket Substation. All of these reactors are composed of single phase units and each unit is counted separately.	
Protection Systems	The Number of Major Protection Relays on the Network	Data reported in the 12/13 Economic RIN to the AER, augmented with FY14/15 Protection Relay database maintained by Field Services/Maintenance	Y	A significant population of relay assets have estimated ages. These were estimated by either extrapolating the installation year from alternative sources such as construction drawings, utilising the substation commissioning date for the asset age or spreading the population evenly amongst the years where the relay is known to have been installed.	Where only a year was recorded for installation date – it is assumed this date to be the end of that calendar year (31st December) for translation to financial year.
Control Systems	The Number of Control IEDs on the Network	Equipment Register in Ellipse	Y	A significant population of system assets have estimated ages. These were estimated by either extrapolating the installation year from alternative sources such as drawings, or spreading the population evenly amongst the years where the relay is known to have been installed.	Where only a year was recorded for installation date – it is assumed this date to be the beginning of the calendar year for translation to financial year.
Telecommunication Systems	The Number of Terminal Equipment, MUXs, Base Stations and Power Supplies (Battery Systems) on the Network	Network Renewal, Maintenance & Disposal Strategy and Objectives document for Telecommunications Terminal Equipment Augmented with data reported in the 12/13 Economic RIN to the AER.	Y	Quantities were taken from the Network Renewal, Maintenance & Disposal Strategy and Objectives document for Telecommunications Terminal Equipment document for each telecommunications system asset type. These numbers were augmented by Battery Systems data extracted from Ellipse Equipment Register.	Quantities reported for Asset Management planning purposes
Metering Systems	The number of Meters on the System	Metering Database maintained by Field Services/Maintenance and Output of Metering Inventory Report	Y	Data utilised from the MAP Inventory Database.	The inventory does not track replacements due to defect so these have not been recorded.
Economic Life – Mean Substation Categories	Expected Service Life of the asset	Substations Asset Renewal and Maintenance Strategy	Y	The value is taken from the Substations Asset Renewal and Maintenance Strategy	Based on assumptions for serviceable life based on organisational experience

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Economic Life – Mean – Protection Systems	Expected Service Life of each system	Network Renewal, Maintenance & Disposal Strategy and Objectives – Substation Automation Systems	Y	Expected age for the systems adjusted for the different generation of systems and their prevalence on the Network	Based on assumptions for serviceable life based on organisational experience
Economic Life – Mean - Control Systems - Telecommunication Systems - Metering Systems	Expected Service Life of each system	Network Renewal, Maintenance & Disposal Strategy and Objectives – Automation Systems Network Renewal, Maintenance & Disposal Strategy and Objectives – Metering Systems Network Renewal, Maintenance & Disposal Strategy and Objectives – Telecommunications Terminal Equipment	Y	The value is obtained from Network Renewal, Maintenance & Disposal Strategy .	Based on assumptions for serviceable life based on organisational experience
Economic Life – Standard Deviation Substation categories Protection Systems Control Systems Telecommunications Systems Metering Systems	As per AER instruction	TransGrid does not collect this data	Y	The value has not been calculated	Trangrid has no analysis of this variable and has assumed a value of zero
Economic Life – asset category	As per AER instruction	TranGrid has not provided asset sub-categories in Table 4.1.1	N/A	N/A	N/A

Approved By (Group Manager): Lance Wee, Manager/Asset Performance

7.14 Worksheet 5.3 MD – Network Level

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Raw Network Coincident MD	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS	N However, the data are on an "as delivered by TG's network" basis.	Maximum demand calculations involve spreadsheets which calculate rolling half hour average demands, then extract the maximum rolling half hour demand over the relevant period and adjusting to the required unit of measurement. Where reactive power data are available, the spreadsheets also calculate the reactive power loads at the time of the maximum demands	A 'bulk supply point' has been taken to be a 'connection point'. Reported to three significant figures
Date MD Occurred	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS	N	Date of Maximum Demand for the relevant Financial year	No assumptions. Based on actual data.
Half hour time period MD Occurred	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS	N	This pertains to half hour ended time period within which the MD occurred	No assumptions. Based on actual data.
Winter/Summer Peaking	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS	N	Determined whether the MD occurred in the months of winter or summer.	No assumptions. Based on actual data.
Embedded Generation	Generation connected to a network (such as distributors' networks) supplied from a particular bulk supply point. The load supplied from TG's network excludes load supplied directly from other sources such as generators embedded within distribution networks. Under this RIN, TransGrid is required to provide data "as delivered by its network". Consequently, embedded generation does not contribute to the load supplied from TransGrid's network.	TUOS	N	Data are required to be reported on and "as delivered by TransGrid's network basis". Loads supplied by embedded generation are not supplied by TransGrid's network. Consequently, the figures provided by TransGrid have no component of load supplied from embedded generation.	-
Weather Corrected (10% POE) network coincident MD	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS, AEMO NEFR 2015	Y These are based on AEMO's weather and day-type correction models The approach adopted in	TransGrid does not produce weather corrected maximum demands for its transmission system. However, TransGrid has access to historical actual	It is assumed that the weather and day-type corrected historical series derived from AEMO weather and day-type correction models can be used to approximate weather and day-type corrected actuals for TransGrid's boundary. These are reported to three significant figures.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
			estimating this parameter is the best available in the circumstances. The data are based on NEM metering and information from AEMO's NSW region forecasting process, both of which TransGrid uses in its normal course of business. They are also materially dependent on the assumption that there is a consistent relationship between the native maximum demand of the NSW region of the NEM and the gross maximum demand supplied by TransGrid's network. As such they are neither Actual Information nor Estimated Information (as defined by the AER). However, as AEMO's forecasting models will vary from year to year (as they are updated) and the outputs from that process will also vary from year to year, these data have been taken to be Estimated Information.	10% and 50% POE (weather corrected) data for summer and winter maximum demands from the 2015 AEMO model for the NSW region of the NEM. TransGrid has worked out summer and winter relationships between AEMO's actual network maximum demands for the NSW region and TransGrid's actual maximum demands on its network. These relationships have been used to estimate 10% and 50% POE historical maximum demand for TransGrid's network.	
Weather Corrected (50% POE) network coincident MD	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS, AEMO NEFR 2015	Y As for Weather Corrected (10% POE) network coincident MD	As above	As above

Approved by (Group Manager): Nalin Pahalawaththa, Manager, Power System Analysis

7.15 Worksheet 5.4 MD & Utilisation – Spatial

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
Connection point rating	It is important to note that the capacity of transmission systems can be limited by a range of factors including thermal ratings, voltage stability, transient stability and small signal (oscillatory) stability. These factors can be influenced by the magnitude and distribution of loads and generation across the network. They can also vary with time of day (day/night) and between seasons. Consequently it is neither practical nor sensible to assign a single rating to a particular BSP. Other than to complete RINs, this information has not been generated in the past as it has limited use and relevance to the organisation.	Operating diagrams and operating manuals.	N The figures are based on information in TransGrid's operating manuals and operating diagrams, which are used in the normal course of TransGrid's business. They are also materially dependent on assumptions about how the capacity of a particular part of TransGrid's network is best described as a single figure. As such, the figures are neither Actual Information nor Estimated Information (as defined by the AER). However, as they are based on information from operating manuals and operating diagrams, they have been taken to be Actual Information.		The rating has been taken to be: • Where the bulk supply point is a "lower" voltage busbar of a substation, the summated nameplate ratings of the transformers supplying that busbar; • Where the bulk supply point is the high voltage busbar of a substation, a tee connection or a switching station, the summated normal summer day rating(s) of either the customer's or TransGrid's transmission line(s) connected at that point or the summated nameplate ratings of transformer(s) supplied via the customer's line(s).
Raw adjusted MD (MW)	Consistent with the Economic Benchmarking RIN, this variable has been taken to be the maximum load delivered at the bulk supply point, averaged over a half hour period. It is important to note that: • For most bulk supply points, the maximum demand can occur in either summer or winter; • It is the nature of transmission networks to be interconnected (that is, to have more than one "path" between nodes) and to	TUOS, DNSP	N The figures are based on metered data which are used in the normal course of TransGrid's business. Where adjustments are made, judgement may be required about the magnitude of those adjustments. As such, some of the figures are neither Actual Information	Maximum demand calculations involve spreadsheets which calculate rolling half hour average demands, then calculate the maximum rolling half hour demand over the relevant period and adjusting to the required unit of measurement. Where reactive power data are available, the spreadsheets also calculate the reactive power loads at the time of the maximum demands.	Refer to Note to 'Raw adjusted MD (MW)'

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	connect generation sources at several different locations. This means that loadings on a particular part of a network, such as a bulk supply point, can depend on the geographical distribution of loads on the network, the generation pattern at the time and the network configuration (particularly the location of open points and which lines, cables or transformers, if any, are out of service). In some cases it is impossible to adjust the raw maximum demand to "undo" the impact of these factors. Where it is possible to adjust for temporary switching or temporary changes in major customer loads, adjustments have been made. Where it is not possible to make meaningful adjustments, no adjustments have been made. • For some bulk supply points power can (sometimes) concurrently be delivered on some lines and received on others. For these locations, the maximum demands provided are not necessarily net loads.		nor Estimated Information (as defined by the AER). However, as adjustments are only required at some bulk supply points and those adjustments may not affect the maximum demand, they have been taken to be Actual Information.		
Raw adjusted MD (MVA)	Metered reactive loading data are not available at all bulk supply points. Where they are available, data have been used to calculate the actual MVA loading at the time of the relevant maximum MW loading. Where no reactive power data are available the MVA demand has been based on the system power factor.	TUOS, DNSP	N The figures are based on metered data which are used in the normal course of TransGrid's business. Where MVAr data are not available, they depend on the assumptions made about the power factor. As such, some of the figures are neither Actual Information nor Estimated	MVA = sqrt(MW squared + MVAr squared)	Where MW and MVAr data are available they have been used to calculate the MVA loadings. Where MVAr data are not available, the MVA loadings have been based on the system power factor

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
			Information (as defined by the AER). However, as MVAr data are available for approximately two thirds of bulk supply points the figures have been taken to be Actual Information.		
Date MD occurred	This variable has been taken to be the day on which the relevant maximum demand (in MW) occurred.	TUOS, DNSP	N	Date of Maximum Demand for the relevant Financial year	No assumptions. This is based on actual data
Half hour time period MD occurred	This variable has been taken to be the half hour period during which the relevant maximum demand (in MW) occurred. This is the half hour period ending at the nominated time.	TUOS, DNSP	N	This pertains to Half hour ended time period within which MD occurred	No assumptions. This is based on actual data
Winter/Summer peaking	This variable has been taken to be the "season" (as defined by the AER) in which the actual maximum demand (in MW) occurred.	TUOS, DNSP	N	Determined whether the MD occurred in the months of winter or summer.	No assumptions. This is based on actual data
Adjustments embedded generation	Generation connected to a network (such as distributors' networks) supplied from a particular bulk supply point. The load supplied from TG's network excludes load supplied directly from other sources such as generators embedded within distribution networks. Under this RIN, TransGrid is required to provide data "as delivered by its network". Consequently, embedded generation does not contribute to load supplied from TransGrid's network.	N/A	N/A	Data are required to be reported on and "as delivered by TransGrid's network basis". Loads supplied by embedded generation are not supplied by TransGrid's network. Consequently, the figures provided by TransGrid have no component of load supplied from embedded generation.	-
Weather corrected Coincident MD 10% PoE (MW)	There are some locations for which it is not sensible and/or possible to produce meaningful corrected maximum demands. Loads can vary for a variety of reasons. Many are sensitive to	N/A	Y The figures are based on metered data which are used in the normal course of TransGrid's	AEMO produces weather corrected actuals of 50% PoE and 10% PoE maximum demands for "connection points" (which generally correspond to bulk supply points or aggregations of bulk	-

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
	weather (usually temperature) and/or day-types (weekends, public holidays, etc). Provided that there are no other significant load "drivers" and sufficient weather data are available, it is usually possible to develop reasonable[1] models to adjust actual maximum demands to (approximately) what they would have been under different conditions (that is to estimate 50% PoE and 10% PoE seasonal maximum demands). However, some loads vary for more complex reasons. For example, pumping loads (for crop irrigation) can depend on the availability of water (dam levels, watercourse flow rates, etc) and the need for supplementary water (recent rainfall, soil moisture, etc). For these loads it is usually extremely difficult to develop "correction" models and to determine what constitutes 50% PoE and 10% PoE conditions. A similar effect occurs where intermittent embedded generation (such as wind farms or run of river hydro generation) modifies the load at a bulk supply point.		business. They are also dependent on assumptions used in the "correction" models such as the formulation of load "descriptors" and the number of seasons of data included. As such, the figures are neither Actual Information nor Estimated Information (as defined by the AER). However, as the "correction" models will vary from year (having either completely new data for single season models or some new data for multi-season models) the figures have been taken to be Estimated Information.	supply points). As part of that process AEMO provides historical actual maximum demands as well as its estimates of historical 50% PoE demands and historical 10% PoE demands. Ratios of AEMO's corrected figures to AEMO's actual figures are calculated. Those ratios are then applied to TransGrid's actual; figures to provide an estimate of the corrected figures. This is done separatately for summer and winter as well as coincident and non-coincident demands. Where AEMO figures are for aggregations of bulk supply points, the ratios (for the aggregation) have been used for each of the bulk supply points which were aggregated. AEMO figures are not available for some locations. For those locations, ratios of unity have been used. Most of these are for industrial loads where the loads are unlikely to be particularly sensitive to weather or day-types. At other bulk supply points corrections are not possible as the loads are heavily dependent on: • the configuration of the underlying network (the location of open points); or • the output of embedded generation; or • inter-regional flows.	

[1] TransGrid's experience is that "corrections" to actual maximum demands are imprecise. Broadly, for its bulk supply points, the 95% confidence interval of the estimated "corrected" maximum demands is up to ±10% of the estimated value.

Data variable & TransGrid's interpretation		Data sources, locations and 'owners'	Estimation or actual information, calculations and assumptions		
Variable reference & AER description	TransGrid's interpretation of data variable	Data sources	Is this variable 'Estimated Information' as per AER definition? (Y/N)	How the values for this variable are calculated	Assumptions made to allow calculation / estimation of the variable
				At two other locations (Wallerawang 66 kV and the Khancoban supply from Murray), there was no better information available.	
Weather corrected MD 10% PoE (MVA)	As for 'Weather corrected MD 10% PoE (MW)'	TUOS, AEMO Connection Point forecasts 2015	Y As for 'Weather corrected MD 10% PoE (MW)'.	Where both MW and MVAr data are available, MVA were calculated based on those data. Where MVAr data are not available, the "system average" power factor (of 0.98) has been used.	-
Weather corrected Coincident MD 50% PoE (MW)	As for 'Weather corrected MD 10% PoE (MW)' quantities).	TUOS, AEMO Connection Point forecasts 2015	Y As for 'Weather corrected MD 10% PoE (MW)'	As for 'Weather corrected MD 10% PoE (MW)'	
Weather corrected MD 50% PoE (MVA)	As for 'Weather corrected MD 10% PoE (MVA)' .	As for 'Weather corrected MD 10% PoE (MVA)'	Y As for 'Weather corrected MD 10% PoE (MVA)'	As for 'Weather corrected MD 10% PoE (MVA)'	

Note to 'Raw adjusted MD (MW)'

BSPs where adjustments were not possible due to the complex nature of the network:

Tuggerah 132 kV

Vales Point 132 kV

Munmorah 132 kV

Beaconsfield 132 kV

Haymarket 132 kV

Sydney North 132 kV

Sydney South 132 kV

Rookwood Road 132 kV

Newcastle 132 kV

Waratah West 132 kV

Tomago 132 kV

Regentville 132 kV

Wallerawang 132 kV

Albury 132 kV

Finley 132kV

Sydney West 132kV

Holroyd 132 kV

Lismore (the 132kV busbar of TransGrid's 330/132 kV substation).

Yass 132 kV

Other Observations:

- Lismore 330 kV includes flows on Direct Link.
- Yass 132 kV is a back up supply for the Essential Energy load normally supplied from Marulan. It's the normal connection for Gunning and Cullerin wind farms.
- Finley 132 kV: Connection to Albury via Mulwala and Corowa (via Essential Energy's 132 kV network).

Approved by (Group Manager): Nalin Pahalawaththa, Manager, Power System Analysis