

Category Analysis RIN Response - Basis of Preparation

■ 31 OCTOBER 2014

Table of Contents

1.	Introduction	3
2.	Compliance with the Revenue Reset RIN Requirements.....	3
3.	Preparation Process	4
3.1	Document Control.....	4
3.2	Governance	4
4.	Principles of Preparation	4
5.	Information Sources	5
6.	Confidentiality Claims	7
7.	Detailed Basis of Preparation	7
7.1	Contents Worksheet	7
7.2	Worksheet 1.0 Business & Other Details	7
7.3	Worksheet 2.1 Expenditure Summary	8
7.4	Worksheet 2.2 Repex	10
7.5	Worksheet 2.3 Augex Project Data	17
7.6	Worksheet 2.5 Connections.....	22
7.7	Worksheet 2.6 Non-network	24
7.8	Worksheet 2.7 Vegetation Management	27
7.9	Worksheet 2.8 Maintenance	32
7.10	Worksheet 2.10 Overheads	38
7.11	Worksheet 2.11 Labour	40
7.12	Worksheet 2.12 Input Tables.....	44
7.13	Worksheet 5.2 Asset Age Profile	47
7.14	Worksheet 5.3 MD – Network Level	54
7.15	Worksheet 5.4 MD & Utilisation – Spatial	56

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 2014. 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.*

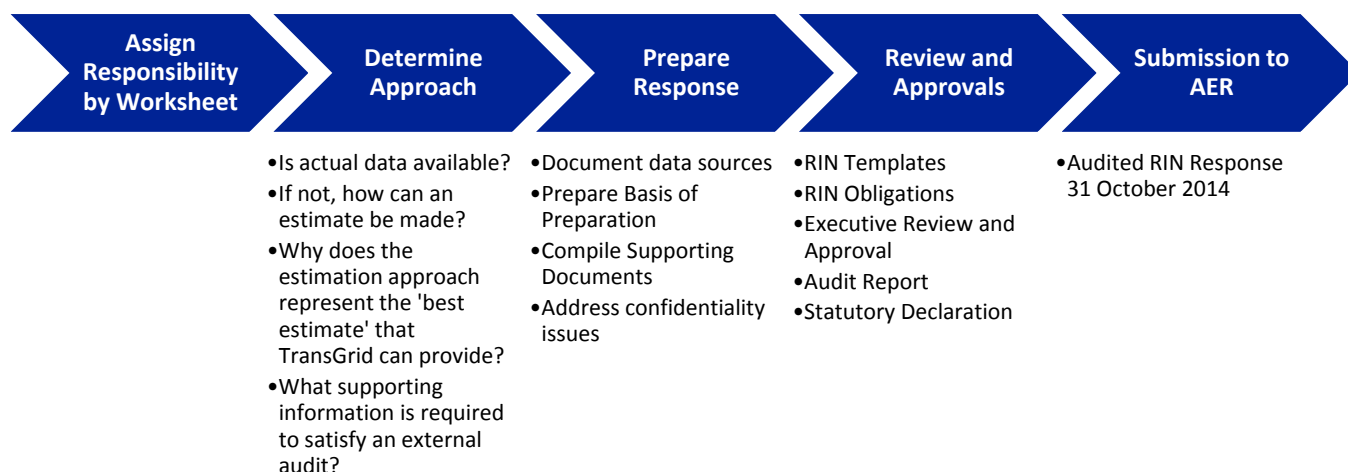
3.5 *TransGrid may provide additional detail beyond the minimum requirements if TransGrid considers it may assist a user to gain an understanding of the information presented in the regulatory templates.*

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 2014. The final RIN package will be provided by 31 October 2014, 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
Capital Accumulation Model (CAM)	TransGrid's Capex forecasting model that is used for the preparation of the regulatory proposal	2.2 Repex, 2.12 Input Tables
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 introduced in late 2013 to replace Service Desk Plus.	2.6 Non-network
LiDAR	Light Detection and Ranging data sourced from aerial surveys that is	2.7 Vegetation Management

Category Analysis RIN Response - Basis of Preparation

31 OCTOBER 2014



Information Source	Brief Description	Supports
	used to measure vegetation clearances from TransGrid's transmission line assets.	
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	<ul style="list-style-type: none">Ability to determine TransGrid's unit rates for procurement of equipment	Information is available to consumers at an aggregate level
Worksheet 2.3 Augex	<ul style="list-style-type: none">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	<ul style="list-style-type: none">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.

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.	TransGrid financial records reported from Ellipse and Business Reporting and 2013-14 Regulatory Accounts	N	Please refer to the notes for capital expenditures below.	Please note the total replacement capital expenditure reported in RIN 2.2 Repex has been prepared using \$real 'as-commissioned' project costs, it is not readily reconcilable to the replacement expenditure reported here, which is on 'as incurred' basis. A reconciliation has been included in the unlocked worksheet. Also, information reported here in RIN 2.1 is in line with that in RIN 2.12 Input Tables.
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.	TransGrid financial records reported from Ellipse and Business Reporting and 2013-14 Regulatory Accounts	N	Please refer to the notes for capital expenditures below.	To align with the historical reporting, connections expenditure has been included as augmentation in the Regulatory Accounts. In RIN, these projects are separated out as required. Information and list of projects are in line with RIN 2.5 Connections.
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.	TransGrid financial records reported from Ellipse and Business Reporting and 2013-14 Regulatory Accounts	N	Please refer to the notes for capital expenditures below.	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.
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.	TransGrid financial records reported from Ellipse and Business Reporting and 2013-14 Regulatory Accounts	N	Please refer to the notes for capital expenditures below.	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.
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.	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.	Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.
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.	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.	Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.
Prescribed transmission services capex (as incurred) Balancing Item	The value required to reconcile to TransGrid's Regulatory Accounts	N/A – Nil Balancing item	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 and 2013-14 Regulatory Accounts	N	Please refer to the notes for operating expenditures below and also RIN 2.7 and its supporting BoP.	Information reported here in RIN 2.1 is in line with that in RIN 2.7 Vegetation.
Prescribed transmission services opex by category Maintenance	The Maintenance Expenditure reported in RIN 2.8	TransGrid financial records reported from Ellipse and Business Reporting and 2013-14 Regulatory Accounts	N	Please refer to the notes for operating expenditures below and also RIN 2.8 and its supporting BoP.	Information reported here in RIN 2.1 is in line with that in RIN 2.8 Maintenance.

RIN Basis of Preparation

OCTOBER 2014



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 Non-Network	The Non-Network operating expenditure reported in RIN 2.6	TransGrid financial records reported from Ellipse and Business Reporting and 2013-14 Regulatory Accounts	N	TransGrid includes the non network opex in network / corporate overheads, hence the amount here is zero.	
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 and 2013-14 Regulatory Accounts	N	The Total Network Overheads reported as opex in TransGrid's Regulatory Accounts	Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.
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 and 2013-14 Regulatory Accounts	N	The Total Corporate Overheads reported as opex in TransGrid's Regulatory Accounts	Information reported here in RIN 2.1 is in line with that in RIN 2.10 Overhead.
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 2013-14 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 2013-14 Regulatory Accounts.

Operating Expenditures

Operating expenditures for 2013-14 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 (Group Manager): David Van Beek, 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.	For Major Projects which completed in 2013/14, Financial data has originated from Ellipse. For programs financial data originates from the Finance cube classified as Asset Renewal Strategies and escalated to 2013/14 dollars	Yes. TransGrid does not collect or estimate project costs at the level of detail required, particularly for major projects.	Material projects ending in 2013/14 have been pro-rated to categories based on key cost drivers for the project.	Standard estimates are used where available, and specific estimates based on budget or actuals are used elsewhere.
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 <ul style="list-style-type: none">Project definition documentOther project specific documentsEquipment tracing information Calculated counts from sub-project numbers where the relationship between asset counts and projects is known.	Yes. TransGrid does not specifically associate assets with projects in the equipment register.	Manual counts from <ul style="list-style-type: none">Project definition documentOther project specific documentsEquipment tracing information Calculated counts from sub-project numbers where the relationship between asset counts and projects is known.	Cases not considered <ul style="list-style-type: none">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 augmentationWhere 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 projectsDead 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, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the ‘Outages’ worksheet. 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.	No, the values provided are actual data.	Every entry in the ‘Outages’ worksheet of the calculation spreadsheet RINB-2-2-01, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.
Transmission Tower Support Structure Failures	The failure of any individual component of a transmission structure (e.g. insulators, cross-arms) 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.	Data have been obtained from the ‘QAPR Comment on Outage’ table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the ‘Outages’ worksheet. 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.	No, the values provided are actual data.	Every entry in the ‘Outages’ worksheet of the calculation spreadsheet RINB-2-2-01, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.
Conductor Failures	The failure of any conductor on a transmission line, subcategorised by voltage and rating. Overhead earth-	Data have been obtained from the ‘QAPR Comment on Outage’ table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business	No, the values provided are actual data.	Every entry in the ‘Outages’ worksheet of the calculation spreadsheet RINB-2-2-01, which	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.



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
	<p>wires have been classified into the 'Other' category.</p> <p>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).</p> <p>Failures due to external causes (e.g. thunderstorms) have been excluded.</p>	<p>database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the 'Outages' worksheet.</p> <p>The TransGrid December 2012 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.</p>		<p>corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.</p>	
Transmission Cable Failures	<p>The failure of any transmission cable, subcategorised by voltage and insulation type.</p> <p>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).</p> <p>Failures due to external causes (e.g. thunderstorms) have been excluded.</p>	<p>Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the 'Outages' worksheet.</p> <p>The TransGrid December 2012 Electrical Data Book (RINB-2-2-04) contains voltage and insulation information.</p>	No, the values provided are actual data.	<p>Every entry in the 'Outages' worksheet of the calculation spreadsheet RINB-2-2-01, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.</p>	<p>It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.</p>
Substation Switchbay Failures	<p>The failure of any components within a substation switchbay, subcategorised by voltage and the following equipment types: CB, Disconnecter, Earth Switch, VT, CT, GIS Module, and Other.</p> <p>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.</p>	<p>Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the 'Outages' worksheet.</p>	No, the values provided are actual data.	<p>Every entry in the 'Outages' worksheet of the calculation spreadsheet RINB-2-2-01, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.</p>	<p>It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.</p>
Substation Power Transformer Failures	<p>The failure of power transformers subcategorised by voltage and MVA rating.</p> <p>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.</p>	<p>Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the 'Outages' worksheet.</p> <p>The TransGrid December 2012 Electrical Data Book (RINB-2-2-02) has been used to determine the transformer voltages and ratings.</p>	No, the values provided are actual data.	<p>Every entry in the 'Outages' worksheet of the calculation spreadsheet RINB-2-2-01, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported</p>	<p>It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.</p>



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
				across each financial year.	
Substation Reactive Plant Failures	<p>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.</p> <p>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.</p>	<p>Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the 'Outages' worksheet.</p> <p>The TransGrid December 2012 Electrical Data Book (RINB-2-2-02) has been used to determine the reactive plant voltages.</p>	No, the values provided are actual data.	Every entry in the 'Outages 08' and 'Outages 09-14' worksheets of the calculation spreadsheet RINB-2-2-03, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.
SCADA, Network Control and Protection System Failures	<p>The failure of all SCADA, Network Control and Protection equipment subcategorised by the following types: Protection Assets, Control Assets, Communications Assets and Metering Assets.</p> <p>Note that this category does not include the Material Failures of SCADA as reported in the previous Economic RIN to the AER.</p> <p>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.</p>	<p>Data have been obtained from the 'QAPR Comment on Outage' table from within the THEOS PC Stats Access database, which in turn is populated from the outage records in THEOS (the business database application used by System Operations staff to record outage data). These data have been entered into the calculation spreadsheet RINB-2-2-01, into the 'Outages' worksheet.</p>	No, the values provided are actual data.	Every entry in the 'Outages' worksheet of the calculation spreadsheet RINB-2-2-01, which corresponds to an unplanned outage, has been checked to determine whether or not it corresponds to an asset failure. If so, a code is entered for that outage corresponding to relevant asset group and category. Then for each asset group and category, the frequency of that code is counted and reported across each financial year.	It is assumed that every asset failure that has occurred has caused an unplanned outage that is recorded by System Operations staff in THEOS.
Total MVar By SVC	The combined nominal reactive power rating for all SVC replaced in the year	No SVC replacements were made in the period	No	Manual Count	N/A
Total MVARs by Capacitors	The combined nominal reactive power rating for all capacitors replaced in the year	No Capacitor replacements were made in the period	No	Manual Count	N/A
Total MVARs by Oil Filled reactors	The combined nominal reactive power rating for all oil filled SHUNT reactors replaced in the year	Manual review of operating diagrams for the small number of projects identified	No	Manual Count	Series reactors are excluded as they do not provide voltage support for the network.
Lines					



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 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.	Yes	Expenditure has been taken from Ellipse and allocated to categories based on key cost drivers.	The following types of projects are identified as REPEX as Asset Replacements: <table><tr><td>Category</td><td>Project Type</td><td>Description</td></tr><tr><td>Structure Replacements</td><td>Wood Pole Replacement</td><td>Complete replacement of wood pole transmission line structures. (Not on a defect basis)</td></tr></table>	Category	Project Type	Description	Structure Replacements	Wood Pole Replacement	Complete replacement of wood pole transmission line structures. (Not on a defect basis)
Category	Project Type	Description									
Structure Replacements	Wood Pole Replacement	Complete replacement of wood pole transmission line structures. (Not on a defect basis)									
Transmission Lines Repex Additional Repex Expenditure by Asset Category (\$000s)	These are additional categories to the ones provided in Repex Template. Including: Life Extension capital expenditure on Transmission Line Structures resulting in a material extension to the asset life. Life Extension capital expenditure on Transmission Line cables resulting in a material extension to the asset life. Life Extension capital expenditure on Transmission Line cable tunnels resulting in a material extension to the asset life. Capital expenditure on Transmission Line Structures to allow them to meet regulatory requirements (ground clearances and aerial marker requirements).	TransGrid's Enterprise Resource Management system - Ellipse. The Transmission Line Asset Management Strategy - GM AS L5 001. The Underground Cables Asset Management Strategy – GM AS S5 002	Yes	Material projects ending in 2013/14 have been pro-rated to categories based on key cost drivers for the project.	Refer to Table 2 under Notes.						
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. No of Transmission Line Support Structures replaced due to the line being unable to efficiently maintain its service performance requirement. No of Transmission Line conductors replaced due to the line being unable to efficiently maintain its service performance requirement.	TransGrid's Enterprise Resource Management system - Ellipse. TAMIS	Yes For wood pole replacements the total number of structures changed is known from project records	The changed structures are recorded against the structure age records. This list is filtered for the two lines that have had structures replaced in 2014 (967 and 94B), providing a structure count	The following types of projects are identified as REPEX for asset replacements: <table><tr><td>Category</td><td>Project Type</td><td>Description</td></tr><tr><td>Structure Replacements</td><td>Wood Pole Replacement</td><td>Complete replacement of wood pole transmission line structures. (Not on a defect basis)</td></tr></table>	Category	Project Type	Description	Structure Replacements	Wood Pole Replacement	Complete replacement of wood pole transmission line structures. (Not on a defect basis)
Category	Project Type	Description									
Structure Replacements	Wood Pole Replacement	Complete replacement of wood pole transmission line structures. (Not on a defect basis)									



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 Other Repex Expenditure (units)	Number of Transmission Line structures with life extension capital expenditure resulting in a material extension to the asset life. Length of Transmission Line Cables with Life Extension capital expenditure resulting in a material extension to the asset life. Length of transmission line cable tunnels with Life Extension capital expenditure resulting in a material extension to the asset life. Number of Transmission Line Spans modified to allow the transmission line to meet its regulatory requirements. Number of marker balls installed to allow the transmission line to meet its regulatory requirements.	TransGrid's Enterprise Resource Management system - Ellipse.The Transmission Line Asset Management Strategy - GM AS L5 001. The Underground Cables Asset Management Strategy – GM AS S5 002 TAMIS	Yes Past tower life extension has been based on advice from network and distributed according to expenditure. Aerial marker balls are based on the total number of marker balls installed and distributed according to expenditure. All future repex units have been identified from planning documents and split based on expenditure breakdowns in the CAM model.	For each project identified with REPEX expenditure the number of structures changed / length of cable was identified from TAMIS or project records.	Refer to Table 4 under Notes.
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	No	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)	No	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 on TransGrid's transmission network identified by route length (KM) against the original conductor (not the new conductor).	N/A	No	No conductor was replaced on the network in 2013/14 due to condition	Line rearrangements for other project requirements is not counted as replacement expenditure, eg for line deviations
Other Replacement Expenditure	The 'Other Replacement Expenditure' category represents additional replacement capital expenditure projects that cannot be categorised as a discrete number of asset	Ellipse	Yes	These represent additional categories of costs that are replacement in nature but cannot be accounted for elsewhere in the RIN templates.	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
	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)				

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 Rebuild	Complete replacement of wood pole transmission line structures and conductors (Not on a defect basis).
Support Structure Replacements	Insulator Replacement	Replacement of insulators on existing transmission line (Classified as transmission line support structure).

Table 2

The following types of projects are identified as REPEX for other Repex Expenditure:

Category	Project Type	Description
Asset Life Extension	Tower Life Extension	Life extension of steel tower structures to prevent corrosion (Classified as transmission structure replacement).
	Cable Backfill Remediation	Life extension of cable through remediation of backfill to allow cable to operate closer to its design thermal limits.
	Tunnel Life Extension	Life extension of tunnel to correct installation issues and allow continued operation.
Modification to Meet Regulatory Requirements	Aerial Marker Balls	Addition of marker balls to transmission line earthwires to meet regulatory requirements (Classified as transmission line support structure replacement).
	Low Span Remediation	Work on a transmission line so it can meet regulatory requirements for ground clearance. This can involve a variety of different work methods. The rectification of clearance on one span is taken as a single structure

replacement.

Table 3

The following types of projects are identified as REPEX for 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 Rebuild	Complete replacement of wood pole transmission line structures and conductors (Not on a defect basis).
Support Structure Replacements	Insulator Replacement	Replacement of insulators on existing transmission line (Classified as transmission line support structure).

Table 4

The following types of projects are identified as REPEX Asset Life Extension:

	Project Type	Description
Asset Life Extension	Tower Life Extension	Life extension of steel tower structures to prevent corrosion (Classified as transmission structure replacement).
	Cable Backfill Remediation	Life extension of cable through remediation of backfill to allow cable to operate closer to its design thermal limits.
	Tunnel Life Extension	Life extension of tunnel to correct installation issues and allow continued operation.
Modification to Meet Regulatory Requirements	Aerial Marker Balls	Addition of marker balls to transmission line earthwires to meet regulatory requirements (Classified as transmission line support structure replacement)
	Low Span Remediation	Work on a transmission line so it can meet regulatory requirements for ground clearance. This can involve a variety of different work methods. The rectification of clearance on one span is taken as a single structure replacement.

Approved by (Group Manager): Garrie Chubb, 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	As per AER interpretation, and includes work relating to improving the quality of the network and to meet regulatory obligations.	TransGrid financial records reported from Ellipse and Business Reporting.	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.	Only projects that completed in 2013-14 are to be reported separately.
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.	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.	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 which includes the internal labour hours costed to the project.	Categorisation of labour volume is based on the expense element classification in Ellipse.
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.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the labour costs.	Categorisation of costs is based on expense element classification in Ellipse.
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.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the civil works costs.	Categorisation of costs is based on expense element classification in Ellipse.
Expenditure – Other Direct	Direct costs charged to the Augmentation projects other than plant & equipment procurement, labour and civil works.	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.
Years Incurred	As per AER interpretation	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.	

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
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.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain land purchase costs.	Categorisation of costs is based on expense element classification in Ellipse.
Easement Expenditure	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 easement costs.	Categorisation of costs is based on expense element classification in Ellipse.
Line and Project Summary – Project Type	The type of augmentation work completed on the transmission line.	Project planning documents / Project Line schedules.	No	Values captured from project documents and schedules	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 Line schedules.	No	Values captured from project documents and schedules	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.	Project planning documents / Project Line schedules.	No	Values captured from project documents and schedules	No assumptions were made as data was extracted straight from project plans and schedules
Towers/poles (including structures, and civil works) Towers/Poles Added	The number of structures added to TransGrid's network due to this augmentation project.	Project planning documents / Project Line schedules.	No	Values captured from project documents and schedules	No assumptions were made as data was extracted straight from project plans and schedules
Towers/poles (including structures, and civil works) Towers/Poles Upgraded	The number of structures upgraded in TransGrid's network due to this augmentation project.	Project planning documents / Project Line schedules.	No	Values captured from project documents and schedules	No assumptions were made as data was extracted straight from project plans and schedules
MVA Rating – Pre – Lines and Cables	The normal ratings for the transmission line prior to the augmentation being undertaken with the season used based upon the maximum demand time for that year (Summer Day in 2013/14).	Grid operating manuals: OM 304 RATINGS OF MAIN GRID CIRCUITS OM 305 RATINGS OF SUBSYSTEM CIRCUITS IN NORTHERN REGION OM307 RATINGS OF SUBSYSTEM CIRCUITS IN SOUTHERN REGION M 306 RATINGS OF SUBSYSTEM CIRCUITS IN CENTRAL REGION	No	Values captured from TransGrid operating manuals	For the pre ratings it was necessary to obtain superseded data from previous versions of the grid operating manuals from System Operations.

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
MVA Rating – Post – Lines and Cables	The normal ratings for the transmission line after the augmentation is undertaken with the season used based upon the maximum demand time for that year (Summer Day in 2013/14).	Grid operating manuals: OM 304 RATINGS OF MAIN GRID CIRCUITS OM 305 RATINGS OF SUBSYSTEM CIRCUITS IN NORTHERN REGION OM307 RATINGS OF SUBSYSTEM CIRCUITS IN SOUTHERN REGION M 306 RATINGS OF SUBSYSTEM CIRCUITS IN CENTRAL REGION	No	Values captured from TransGrid operating manuals	For the pre ratings it was necessary to obtain superseded data from previous versions of the grid operating manuals from System Operations.
Emergency Rating- Pre – Lines and Cables	The contingency ratings for the transmission line prior to the augmentation being undertaken with the season used based upon the maximum demand time for that year (Summer Day in 2013/14).	Grid operating manuals: OM 304 RATINGS OF MAIN GRID CIRCUITS OM 305 RATINGS OF SUBSYSTEM CIRCUITS IN NORTHERN REGION OM307 RATINGS OF SUBSYSTEM CIRCUITS IN SOUTHERN REGION M 306 RATINGS OF SUBSYSTEM CIRCUITS IN CENTRAL REGION	Yes	For some new lines final line ratings (LRA) have not been issued (which considers circuits, droppers, equipment etc). An estimate based off just the circuit rating has been used.	For lines which have not been updated in the current Grid Operating manuals an estimate using only the circuit rating (from similar lines or as advised by planning) was used. For multiple circuit lines of the same voltage the ratings have been added together.
Emergency Rating – Post – Lines and Cables	The contingency ratings for the transmission line after the augmentation is undertaken with the season used based upon the maximum demand time for that year (Summer Day in 2013/14).	Grid operating manuals: OM 304 RATINGS OF MAIN GRID CIRCUITS OM 305 RATINGS OF SUBSYSTEM CIRCUITS IN NORTHERN REGION OM307 RATINGS OF SUBSYSTEM CIRCUITS IN SOUTHERN REGION M 306 RATINGS OF SUBSYSTEM CIRCUITS IN CENTRAL REGION	Yes	For some new lines final line ratings (LRA) have not been issued (which considers circuits, droppers, equipment etc). An estimate based off just the circuit rating has been used.	For lines which have not been updated in the current Grid Operating manuals an estimate using only the circuit rating (from similar lines or as advised by planning) was used. For multiple circuit lines of the same voltage the ratings have been added together.
Circuit KM Added	The additional circuit length added to the TransGrid's network due to this augmentation project.	Project planning documents / Project Line schedules.	No	Values captured from project documents and 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.	Categorisation of costs is based on expense element classification in Ellipse..
Expenditure – Other Plant	Other plant 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 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 labour charged to the project.	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
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.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain the labour costs.	Categorisation of costs is based on expense element classification in Ellipse.
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.	Categorisation of costs is based on expense element classification in Ellipse.
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.	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.
Years Incurred	As per AER interpretation	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 obtain land 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.	N	Detailed project transaction report is run for each project, and expenditures for each project are analysed to obtain easement costs.	Categorisation of costs is based on expense element classification in Ellipse.
Expenditure, Substations, Lines and Other Assets	As per AER interpretation	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	N	The total augmentation capex for 2013-14 is obtained from Finance cube, and in line with RIN 2.1 and Regulatory Accounts.	

RIN Basis of Preparation

OCTOBER 2014



Approved by (Group Manager): David Van Beek, Manager Corporate & Management Accounting (financial data)

Approved by (Group Manager): Garrie Chubb, 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.	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	N	Projects categorised with Portfolio Grouping of "Major Proj-Pres Connection" are extracted from Ellipse Finance cube.	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.	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	N	From 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.	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.	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	N	From 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.	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.	Project Tracking Report, a report extracting information from Ellipse Project documentation	N	Information obtained from the "In Service Date" from the Project Tracking Report (PTR). The Project Tracking Report has expected In Service Date for projects yet to complete. For projects with Work Breakdown Structure established before implementation of Ellipse 8, the "In Service Date" is not captured in the PTR, then reference is made to other project documentation such as Project Close Out Report.	

Approved by (Group Manager): David Van Beek, Manager Corporate & Management Accounting (all except connection rating, connection voltage, underground/overhead)

RIN Basis of Preparation

OCTOBER 2014



Approved by (Group Manager): Garrie Chubb, 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
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.	TransGrid Fleet Database	No	Data was obtained from the TransGrid Fleet database for active vehicles as at the 30/06/14.	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
Asset Reporting Category (Motor Vehicles - Capex)	Motor Vehicle Capex by vehicle type	TransGrid's Regulatory Accounts TransGrid Fleet Database	Yes	Capital expenditure for 2013 to 2014 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.	
Asset Reporting Category (Motor Vehicles - Opex)	Motor Vehicle Opex by vehicle type	TransGrid Fleet Database for the period Jul-13 to Jun-14.	Yes	OPEX costs are based on actual costs incurred in financial year from 2013 to 2014.	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. Data from the fleet database data has been allocated based on fleet number, whereas Ellipse dat has been allocated as per below: <ul style="list-style-type: none">• Registration Costs for new vehicles has been allocated to light commercial vehicles• Bronto data has been allocated to EWP Heavy• Other EWP data has been allocated to EWP Light;• Toyota Fleet Management dat has been excluded as this has been included in the fleet database data; and• Remaining data has been allocated to Heavy Commercial Vehicles.
Average Kilometres Travelled	Average Kilometres travelled by vehicle type	TransGrid Fleet Database	Yes	Average kilometres for vehicle types from TransGrid Fleet Database during 2013/14	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	Yes	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	Yes	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	TransGrid Fleet Database	Yes	Fleet expenditure is obtained from TransGrid Fleet Database	100% private use vehicles are excluded.

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' and 'Non-Recurrent' Subcategories	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	Yes	Figures are actual balances Information was extracted from the Finance Data Cube. Please also refer to the notes for capital expenditure in RIN 2.1 Expenditure Summary. Each project was classified to the recurrent, non-recurrent or client device categories.	
Service Subcategory IT & Communications - Opex	Operational expenditure on Non-Network IT by 'Client Device', 'Recurrent' and 'Non-Recurrent' Subcategories	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	Yes	Figures are actual balances Information was extracted from the Finance Data Cube. Please also refer to the notes for operating expenditure in RIN 2.1 Expenditure Summary. Each RC-AC-Expense Element was classified to the recurrent, non-recurrent or client device categories and totalled	
Annual Descriptor Metrics – IT & Communications Expenditure (Employee Numbers)	Total Number of TransGrid Employees	Based on staff actuals / Work force profile data	Yes	Historical data was extracted from workforce profile data and employee headcount data	Historical data is actuals.
Annual Descriptor Metrics – IT & Communications Expenditure (User Numbers)	Total Number of Users (Employees + Contractors)	IT Configuration Management System	Yes	User count is based on historical data from the IT configuration management system.	User count is based on historical actuals
Annual Descriptor Metrics – IT & Communications Expenditure (Number of Devices)	Total Number of Devices	IT Configuration Management System	Yes	Based on historical records and expected ICT solutions in line with the ICT Strategy. The data is sought through exporting the database to excel as a snapshot in time then filtering the data to "in service" and by useable devices (laptop, computer and hand held device)	
Service Subcategory - Buildings & Property - Capex	Building and Property capital expenditure classified as non-network in TransGrid's regulatory accounting statements.	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	No	Information was extracted from the Finance Data Cube.	No assumptions were made
Service Subcategory - Buildings & Property - Opex	Building and Property operating expenditure classified as non-network in TransGrid's regulatory accounting	TransGrid financial records reported from Ellipse and Business Reporting.	No	TransGrid includes other non network opex as overheads (as in RIN 2.1 Expenditure Summary),	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
	statements.	2013-14 Regulatory Accounts		hence the amount here is zero.	
Service Subcategory -Other - Capex	Miscellaneous Plant and Office Machines reported as 'Other' non-network capex in TransGrid's regulatory accounting statements.	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	No	Information was extracted from the Finance Data Cube.	No assumptions were made
Service Subcategory -Other- Opex	Other non network operating expenditures	TransGrid financial records reported from Ellipse and Business Reporting. 2013-14 Regulatory Accounts	No	TransGrid includes other non network opex as overheads (as in RIN 2.1 Expenditure Summary), hence the amount here is zero.	N/A

Approved by (Group Manager): Kersha Levi, Manager Logistics (Fleet)

Approved by (Group Manager): Stephanie Jensen, Business Manager (Information Technology)

Approved by (Group Manager): David Van Beek, 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 line, that section of the route is only counted once.	Electrical Data Book TransGrid Asset Management Information System (TAMIS)	Yes Some manual adjustments were made to the data extracted from TAMIS and the Electrical Data Book to account for slight changes to the network not recorded in these sources as at 30/6/14.	All line information relevant to TransGrid was downloaded from Electrical Data Books and put into Excel. This was used to determine the date on which all lines were energised. Available Line data was sourced from TransGrid's Asset Management Information System (TAMIS) and compared to Electrical data Books. Totals of line route lengths were calculated from source spreadsheets, including the manual adjustments to match project records and site knowledge.	No assumptions were made in calculations as the asset is static
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. Where the TransGrid line inspector has trimmed/removed a couple of trees as part of the inspection and not recorded them, it is not 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.	Yes TransGrid has not directly collected the total number of spans maintained in 2013-14.	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.	Yes TransGrid does not directly record the length of the areas that were maintained in the spans maintained during 2008-2013.	A sum of span lengths for each span counted as a Maintenance Span	The whole span length is counted for each Maintenance Span
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.	Yes. 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.	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.	For hectare rates, the following vegetation crown densities apply: <ul style="list-style-type: none"> 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:

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
			<p>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.</p> <p>Hourly rate work has been estimated to be able to maintain certain numbers of trees per hour using the various types of maintenance.</p>		<ul style="list-style-type: none">Hectare Hand Clearing – 4 m² crown – 2500 trees/hectare @100% coverageHectare Mulching – 2 m² crown – 5000 trees/hectare @100% coverageHectare Slashing or Spraying – 2 m² crown – 5,000 trees/hectare @100% coverage <p>For hourly rates, the following progress is estimated:</p> <ul style="list-style-type: none">Hand clearing – 20 trees per hourHand 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 timeSpraying – 15 trees per hour, or 30 trees per hour with a spray truckSlashing – 500 trees per hourPruning by climbing – 1 tree per hourPruning by EWP – 2 trees per hourTritter/Excavator – 70 trees per hourSmall Mulcher – 30 trees per hourMedium Mulcher – 150 trees per hourLarge Mulcher – 150 trees per hourMechanical 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.	<p>NSW Transmission System and TransGrid Asset Management Information System (TAMIS)</p> <p>Vegetation, groundand conductor survey data identified from Aerial Laser Surveys LiDAR</p>	<p>Yes</p> <p>TransGrid does not directly record vegetation types on easements or spans where no vegetation management is required.</p>	<p>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.</p> <p>This data is loaded against TransGrid's easements in the TAMIS GIS application and the total length is calculated.</p> <p>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.</p>	<p>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.</p> <p>It is assumed that a "vegetated zone" is any area which has atleast 1 vegetation survey point within 1m²</p>
Average Width of Vegetation Corridors (Metres)	The average width of land along which vegetation is maintained.	<p>Electrical Data Book</p> <p>NSW Transmission System and TransGrid Asset Management Information System (TAMIS)</p>	<p>Yes</p> <p>TransGrid does not directly recorded vegetation corridor widths for every section of lines.</p>	The average width of vegetation corridors is calculated as the total area of TransGrid's standard easement widths for each voltage level divided by the total route line length	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.
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 Plancontains the maintenance frequency tables	<p>Yes.</p> <p>Some lines or line sections are not specifically listed in the GM AS L5 002 or GM AS L1 001 documents</p>	<p>The vegetation maintenance cycle in years was listed for each circuit, then the average was taken.</p> <p>All lines were included in all years, not just those with</p>	<p>Where lines cross regional boundaries, the maintenance frequency for the region with the longer portion of the line was chosen.</p> <p>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"</p>



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
			due to recent rearrangements and policy documents not being updated. These sections will not make a significant material change to the overall average figures, and an estimated maintenance frequency was used based upon knowledge of the vegetation situations and other lines in the areas. Where lines cross regional maintenance boundaries, there may be a variation in the designated vegetation maintenance frequency as the general topography 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.	Vegetation Maintenance Spans.	
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' and Ellipse reports The total Routine and Non-Routine Materials and Expense is the Contractor costs for 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.	Yes 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 estimate the split between the categories required by the worksheet, the total 'Land & Easement Maintenance' item reported in the Regulatory Accounts has been split between tree trimming and corridor clearance. 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).	Where the TransGrid line inspector has trimmed/removed a couple of trees as part of a inspection it is not a significant tree trimming cost. The proportion of work classified as tree trimming is 2.03 times that of the vegetation corridor clearance. This figure comes from the June 2014 Source Data Easements.xlsx spreadsheet.
Inspections (\$000's)	Expenditure solely for the inspections for vegetation management.	TransGrid does not record the proportion of its costs on Inspection or Audit from the Contractor Liaison expenditure	N/A	TransGrid does not record expenditure on inspection of vegetation, costs will be included in contractor liason expenditure	N/A
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	TransGrid does not record expenditure on audits of vegetation, costs will be included in contractor liason expenditure	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
Contractor Liason Expenditure (\$000's)	Expenditure that occurred during the management of external contractors for vegetation management	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' and Ellipse reports The data used to disaggregate the total is sourced from Labour and Expenses recorded against vegetation management work orders in Ellipse.	Yes 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. For this period, this will include costs incurred during inspections and audits.	
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.	TransGrid's Regulatory Accounts 'Land & Easement Maintenance' and Ellipse reports Labour and Expenses recorded against Aerial Laser Survey work orders.	No This is the total cost allocated to the Routine LiDAR scan of the network	Any labour and expenditure costs recorded by TransGrid staff against aerial laser survey work orders.	All vegetation maintenance expenditure outside the Routine LiDAR scanning has been captured in the other fields.
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.	No 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.	No 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.	No 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.	No 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.	No Every fault of the TransGrid's	All outages recorded against category "TREE", "Fire" or "Bushfire" in THEOS have been extracted. From follow up reports it is identified whether the fault	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
			transmission line is investigated and reported on.	was due to grow-in, fall-in or blow-in.	
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.	No 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.	No 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 (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.	No 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): Garrie Chubb, 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
<p>Transmission Lines Maintenance</p> <p>Asset Quantity at year end 2013-14</p>	<p>The number of transmission structures (including steel towers, wood poles, concrete poles and steel poles) on TransGrid's network.</p> <p>The number of transmission support structures on TransGrid's network.</p> <p>The route length of conductors on TransGrid's transmission network.</p> <p>The route length of transmission cables on TransGrid's network.</p>	<p>Electrical Data Book</p> <p>TransGrid Asset Management Information System (TAMIS)</p>	<p>Yes</p> <p>Some manual adjustments were made to the data extracted from TAMIS and the Electrical Data Book to account for slight changes to the network not recorded in these sources as at 30/6/14.</p>	<p>Totals of structure counts and line and cable route lengths were calculated from source spreadsheets, including the manual adjustments to match project records and site knowledge.</p>	<p>There are no support structures on TransGrid's network that are recorded or maintained separately to the structures.</p>
<p>Substation Equipment & property maintenance - Asset Quantity</p> <p>Switchbays</p>	<p>Total number of in-service switchbays within TransGrid's substation</p> <p>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.</p>	<p>Ellipse TRB 601 REPORT;</p> <p>Extract Tracing information</p>	<p>Yes</p>	<p>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.</p> <p>Note: Around 70 GIS switch bays in Beaconsfield North and South which were inadvertently excluded from last financial year's count are added to this year's count.</p>	<p>Switchbays in negotiated (third party) substations are excluded</p>
<p>Substation Equipment & property maintenance - Asset Quantity</p> <p>Power transformers</p>	<p>Total number of in-service transformers within TransGrid's substation</p>	<p>Ellipse TRB 601 REPORT;</p> <p>Extract Tracing information</p>	<p>Yes</p>	<p>Sum of all in-service transformers commissioned prior to the end of the specified financial year</p>	<p>As explained in the BoP – Transformer Capacity parts 6.1.5 and 6.1.6</p>
<p>Substation Equipment & property maintenance - Asset Quantity</p> <p>Substation - Property</p>	<p>All prescribed substations under TransGrid's ownership</p>	<p>Refer to attached Excel file 'Substation Age from NMR';</p> <p>Quantity of TransGrid's owned substations are from latest NETWORK MANAGEMENT PLAN 2011-2016 Appendix B – Schedule of Substations and Switching Stations – adjusted for one year of change</p>	<p>Yes</p>	<p>Sum of all in-service substations prior to the end of the specified financial year</p>	<p>N/A</p>
<p>SCADA & Control maintenance – Asset Quantity</p>	<p>The Number of Control IEDs on the Network</p>	<p>Information Supplied in Historical Quarterly Asset Performance Reports (QAPR)</p> <p>Renewal, Maintenance and Disposal Strategy – Substation Automation Systems</p> <p>Ellipse Tracing Information</p>	<p>Yes. Data was available from RIN12/13 Audit and augmented by works carried out in Financial Year 13/14.</p>	<p>Balance of New Assets Installed this financial year added to count for previous year.</p>	<p>It is assumed that movements in Asset numbers were due to new construction, capital replacement work, decommissioning or defect replacement</p>
<p>Protection Systems Maintenance – Asset Quantity</p>	<p>The Number of Major Protection Relays on the Network</p>	<p>Information Supplied in Historical Quarterly Asset Performance Reports (QAPR)</p> <p>Renewal, Maintenance and Disposal Strategy – Substation Automation Systems</p>	<p>Yes. Data was available from RIN12/13 Audit and augmented by works carried out in Financial Year 13/14.</p>	<p>Balance of New Assets Installed this financial year added to count for previous year.</p>	<p>It is assumed that movements in Asset numbers were due to new construction, capital replacement work, decommissioning or defect replacement</p>

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	Yes. Data was available from RIN12/13 Audit and augmented by works carried out in Financial Year 13/14..	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	Yes. Data was available from RIN12/13 Audit and augmented by works carried out in Financial Year 13/14..	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 2013-14	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)	Yes 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. 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. 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	Yes	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	Yes	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 2013-14	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.	Electrical Data Book TransGrid Asset Management Information System (TAMIS)	Yes Some manual adjustments were made to the data extracted from TAMIS and the Electrical Data Book to account for slight changes to the network not recorded in these sources as at 30/6/14.	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.	It is assumed that single structures that have been replaced due to defect or network modifications (e.g. roads) do not significantly affect the average age of structures in the network. 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	Yes	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 '2014TransFormerWorkSheet'	Yes This spreadsheet has also been used to provide Economic Benchmarking RIN data.	For consistency, the Excel file '2014TransFormerWorkSheet' 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 Age from NMR'; Quantity of TransGrid's owned substations are from latest NETWORK MANAGEMENT PLAN 2011-2016 Appendix B – Schedule of Substations and Switching Stations. Adjusted for changes in the 2014 financial year	Yes	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	Yes	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	Yes	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.	Yes	Data is not available. Therefore a high level estimate 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	Yes – 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	<p>The average frequency of inspection on transmission structures in TransGrid's network.</p> <p>The average frequency of inspection on conductors in TransGrid's network.</p> <p>The average frequency of inspection on cables in TransGrid's network.</p>	<p>The Transmission Line Maintenance Plan contains the inspection frequency tables for transmission line structures and conductors.</p> <p>The Underground Cable Assets Maintenance Plan contains the inspection frequency tables for cables and associated infrastructure.</p>	<p>Yes.</p> <p>Some lines or line sections are not specifically listed in the GM AS L1 001 documents due to recent rearrangements and policy documents not being updated. These sections will not make a significant material change to the overall average figures, and an estimated maintenance frequency was used based upon knowledge of the maintenance requirements and other lines in the areas.</p> <p>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.</p>	<p>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.</p>	<p>Only routine inspections are considered.</p> <p>It is assumed that the following inspections are the most expensive inspection types:</p> <p>Steel Towers – Ground Inspection</p> <p>Wood Poles – Ground Inspection</p> <p>Non-Wood Poles – Ground Inspection</p> <p>Conductors - Thermovision Inspection</p> <p>Cables – Inspection was assumed as the route patrol.</p>
Transmission Lines Maintenance Maintenance Cycle	<p>The average frequency of maintenance on transmission structures in TransGrid's network.</p> <p>The average frequency of maintenance on conductors in TransGrid's network.</p> <p>The average frequency of maintenance on cables in TransGrid's network.</p>	<p>The Transmission Line Maintenance Policy GM AS L1 001 contains the maintenance frequency tables for transmission line structures and conductors.</p> <p>The Underground Cable Assets Maintenance PolicyGM AS S1 005contains the maintenance frequency tables for cables and associated infrastructure.</p>	<p>Yes.</p> <p>Some lines or line sections are not specifically listed in the GM AS L1 001 documents due to recent rearrangements and policy documents not being updated.</p> <p>These sections will not make a significant material change to the overall average figures.</p> <p>As not all transmission structures receive maintenance (e.g. grillage or UGI) they are not included in the average calculation.</p>	<p>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.</p> <p>Lines which have no routine maintenance (no wood poles and no grillage foundations) do not contribute to the average maintenance cycle calculation.</p> <p>Alarm and accuracy tests are used for Cable maintenance period as they are the most expensive maintenance type.</p>	<p>Only routine maintenance is considered. For Transmission Lines there are only routine maintenance conducted on:</p> <p>- Wood Poles (UGIs)</p> <p>- Steel Towers (Grillage Foundations)</p> <p>- Cables (Alarms and Accuracy tests)</p>

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 Equipment & property maintenance - Inspection and Maintenance Cycles Switchbays		SUBSTATION MAINTENANCE POLICY Section 2.1.2 Six Monthly Substation Inspections SUBSTATION MAINTENANCE POLICY Section 2.4.3 Service Interval for Circuit Breaker & Section 2.6 Ancillary Equipment	Yes	As per maintenance policy	-
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Power transformers		SUBSTATION MAINTENANCE POLICY Section 2.1.2 Six Monthly Substation Inspections SUBSTATION MAINTENANCE POLICY Section 2.1.2 Six Monthly Substation Inspections	Yes	As per maintenance policy	-
Substation Equipment & property maintenance - Inspection and Maintenance Cycles Substation - Property		SUBSTATION MAINTENANCE POLICY Section 2.1.1 Monthly Substation Inspections SUBSTATION MAINTENANCE POLICY	Yes	As per maintenance policy	-
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	Yes	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 amongst 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	Yes	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	Yes	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	Yes	Figures come directly from Maintenance Plan	-

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
Routine Maintenance Direct Costs	Labour and Expense costs on routine maintenance of equipment consistent with the definitions used in the Opex model	TransGrid's Regulatory Accounts Oracle Financial Data. Ellipse Work Order Data Ellipse Standard Job Data Opex model configuration	Yes	<p>To estimate the split between the categories required by the worksheet, the total 'Maintenance' category reported in the Regulatory Accounts has been disaggregated using a percentage split derived from an analysis of contractor invoices and work orders.</p> <p>Labour, materials and expenditure costs recorded by TransGrid staff against routine maintenance and inspection work orders.</p> <p>Costs not directly associated with a work order have been allocated to work orders using the proportion of the total allocated cost.</p> <p>Standard Jobs on the work order have been used to identify the asset classification</p>	<p>It is assumed that Inspection costs are included under Routine Maintenance Direct Costs.</p> <p>Standard Job table is used to define the classifications</p> <p>Insulator and fittings have been included as part of routine maintenance on structure costs.</p> <p>Reconciliation with Opex Model is a complex process</p>
Non-Routine Maintenance Direct Costs	<p>Labour and Expense costs on defect and MOPS maintenance of equipment consistent with the definitions used in the Opex model</p> <p>Labour and Expense costs on non-routine maintenance of Transmission Conductors</p> <p>Labour and Expense costs on non-routine maintenance of Transmission Cables</p>	TransGrid's Regulatory Accounts Oracle Financial Data. Ellipse Work Order Data Ellipse Standard Job Data Opex model configuration	Yes	<p>To estimate the split between the categories required by the worksheet, the total 'Maintenance' category reported in the Regulatory Accounts has been disaggregated using a percentage split derived from an analysis of contractor invoices and work orders.</p> <p>Labour, materials and expenditure costs recorded by TransGrid staff against non-routine maintenance work orders (as defined by the work order maintenance type field).</p> <p>Costs not directly associated with a work order have been allocated to work orders using the proportion of the total allocated cost.</p> <p>Standard Jobs on the work order have been used to identify the asset classification</p>	<p>Insulator and fittings have been included as part of defect maintenance on structure costs.</p> <p>Major operating projects (MOPS) have been included as part of Defect expenses.</p> <p>Reconciliation with Opex Model is a complex process</p>

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. 2013-14 Regulatory Accounts	N	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 overhead costs.	The overhead costs are then distributed into relevant categories as stated in the RIN. The matching of the RIN categories is included to support the RIN. 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. 2013-14 Regulatory Accounts	N	The negotiated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	The total overhead cost for the year is allocated into the different reporting categories using the same method of allocation as used for prescribed services.
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. 2013-14 Regulatory Accounts	N	The unregulated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	The total overhead cost for the year is allocated into the different reporting categories using the same method of allocation as used for prescribed services.
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. 2013-14 Regulatory Accounts	N	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 overhead costs	The overhead costs are then distributed into relevant categories as stated in the RIN. The matching of the RIN categories is included to support the RIN
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. 2013-14 Regulatory Accounts	N	The negotiated services overhead costs are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	The total overhead cost for the year is allocated into the different reporting categories using the same method of allocation as used for prescribed services.
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. 2013-14 Regulatory Accounts	N	The unregulated services overhead costs for the years are obtained from account extract filtered by AC, which align with the amounts reported in Regulatory accounts.	The total overhead cost for the year is allocated into the different reporting categories using the same method of allocation as used for prescribed services.

Note to Overheads

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

RIN Basis of Preparation

OCTOBER 2014



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 (Group Manager): David Van Beek, 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	Yes	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 2013-14	No	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 2013-2014	Yes	(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	Yes	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 2013-2014	Yes	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 2013-2014	Yes	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	Yes	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. 2013-14 Regulatory Accounts	N	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.	

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
- Professional: 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 NSO that are not team leader/managers and that requires 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:

- People & Corporate Services
 - Executive manager
 - Intern, Junior Staff, Apprentice
 - Manager
 - Professional
 - Semi professional
 - Senior manager
 - Support staff
- Revenue Strategy & Business Diversity
 - Executive manager
 - Intern, Junior Staff, Apprentice
 - Manager
 - Professional
 - Semi professional
 - Senior manager
 - Support staff
- Strategy & Stakeholder Engagement
 - Executive manager
 - Intern, Junior Staff, Apprentice
 - Manager
 - Professional
 - Semi professional
 - Senior manager
 - Support staff
- Finance
 - 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:

- Network Services & Operations
 - Executive manager
 - Intern, Junior Staff, Apprentice
 - Manager
 - Professional
 - Semi professional
 - Senior manager



- Support staff
- Capital Program Delivery
 - Executive manager
 - Intern, Junior Staff, Apprentice
 - Manager
 - Professional
 - Semi professional
 - Senior manager
 - Support staff
- Network Planning & Performance
 - 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:

- Network Services & Operations
 - Apprentice
 - Skilled electrical worker
 - Skilled non electrical worker
 - Unskilled worker

Approved by (Group Manager): David Van Beek, Manager Corporate & Management Accounting (financial data)

Approved by (Group Manager): Monica Lonergan, 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 Regulatory accounts: ▪ 2013-14 RIN 2.7 Vegetation	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. 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
Routine Maintenance	As per AER instruction	GL Account Extract Regulatory accounts: ▪ 2013-14 RIN 2.8 Maintenance	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. 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
Non-routine Maintenance	As per AER instruction	GL Account Extract Regulatory accounts: ▪ 2013-14 RIN 2.8 Maintenance	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. Costs for Direct Materials / Direct Labour / Contract Cost / Other 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 Regulatory accounts: ▪ 2013-14 RIN 2.10 Overheads	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense	Overhead costs are as per the overhead categories in the Regulatory Opex, with capitalised overhead added back.

RIN Basis of Preparation

OCTOBER 2014



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
				Element.	
Augmentation	As per AER instruction	Extract 2013-14 financial data from Finance Cube Regulatory accounts: <ul style="list-style-type: none"> 2013-14 RIN 2.3 Augex	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	The categorisation of projects is primarily based on information submitted to AER in previous years. In the Regulatory Accounts, Augmentation includes connections projects; but for RIN reporting, Connections projects are separately shown.
Connections	As per AER instruction	Extract 2013-14 financial data from Finance Cube Regulatory accounts: <ul style="list-style-type: none"> 2013-14 RIN 2.5 Connections	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	The categorisation of projects is primarily based on information submitted to AER in previous years. In the Regulatory Accounts, Augmentation includes connections projects; but for RIN reporting, Connections projects are separately shown.
Replacement	As per AER instruction	Extract 2013-14 financial data from Finance Cube Regulatory accounts: <ul style="list-style-type: none"> 2013-14 RIN 2.2 Replacements	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts. Costs for Direct Materials / Direct Labour / Contract Cost / Other Costs are split based on Cost Category and / or Expense Element.	The categorisation of projects is primarily based on information submitted to AER in previous years.
Non-network	As per AER instruction	Extract 2013-14 financial data from Finance Cube Regulatory accounts:	N	Using TransGrid financial records, which are the basis for 2013-14 Regulatory Accounts.	



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
		<ul style="list-style-type: none">2013-14 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.	

Notes

Overall principle

Finance Cube is the primary source of data, with reference made also to CAM model, information submitted to AER previously.

Approved By (Group Manager): David Van Beek, 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 30/6/14 categorised by construction date.	TAMIS Some manual manipulation to adjust for tracking of small numbers of replacements	Yes TAMIS records the construction of structures. In some cases accurate construction dates may not be available due to small defect replacements not being tracked accurately. Some manual adjustments were made to the data extracted from TAMIS to account for these changes. 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.	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.
Asset Age Profile Transmission Tower Support Structures by Highest Operating Voltage; Circuit Configuration	Quantity of transmission tower support structures as at 30/6/14 categorised by construction date	N/A	Yes 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	Length of transmission conductors in service as at 30/6/14 categorised by construction date.	Electrical Data Book TAMIS	Yes Construction dates of conductors are generally not available. The databook tracks	TransGrid's Electrical Database (published as the Electrical Data Book) records the commissioning date of segments of transmission circuits. There will be slight	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).

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
currently in commission by year			<p>build dates of transmission circuits which provide a good estimation of the age of transmission conductors.</p> <p>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.</p> <p>No account has been made for any sections of conductors replaced for defects or failures.</p> <p>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.</p>	<p>variances with TAMIS lengths.</p> <p>This data has been extracted and categorised according to the voltage and rating (Winter Night Rating). The same rating table for EB RIN was used but updated for winter ratings. Where it was noted that a circuit was constrained by terminal equipment the rating of the line component was checked manually and appropriately categorised.</p>	
<p>Asset Age Profile Transmission Cables by Highest Operating Voltage; Insulation Type</p> <p>Installed Assets - Quantity currently in commission by year</p>	Length of transmission cables in service as at 30/6/14 categorised by construction date.	Electrical Data Book Project Records (EDMS)	<p>Yes</p> <p>For small cable sections exact lengths may not have been recorded and have been estimated from available project data.</p> <p>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.</p>	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.	Small lengths of high voltage cables which may exist around / within high voltage substations have not been considered.
Asset Age Profile Transmission Towers by Highest Operating	Average and Standard Deviation of Economic Life of	TransGrid's 30 Year Asset Management Plan	<p>Yes</p> <p>Averages are based</p>	For each structure, an analysis is made whether it is a coastal or inland structure,	

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
<p>Voltage; Circuit Configuration Economic Life [Years] Mean and Standard Deviation</p> <p>Asset Age Profile Conductors by Highest Operating Voltage; Maximum Continuous Rating Economic Life [Years] Mean and Standard Deviation</p> <p>Asset Age Profile Transmission Cables by Highest Operating Voltage; Insulation Type Economic Life [Years] Mean and Standard Deviation</p>	each asset type		on number of items in the population rather than by length of conductor	then the nominal Economic Life for that type of structure and location is averaged by voltage. The standard 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	<p>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.</p> <p>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.</p>	<p><i>Last Financial Year's RIN submission</i></p> <p><i>Ellipse Database :</i> Component Register Summary Report TRB601 Equipment Register, Tracing Data,</p> <p><i>TransGrid System Drawings:</i> High Voltage Operating Diagrams (HVOD's) and WMS Scoping Diagrams.</p>	<p>No.</p> <p>This variable was calculated based on compiled data from Ellipse TRB 601 report.</p> <p>It was cross checked (spot checks) using HVOD's and WMS Scoping diagrams.</p>	<p>The last RIN report was used as the basis of the updated report.</p> <p>New, Replacment and Removed equipment was identified from last financial year's tracing information. Newly installed equipment for the 2014 financial year was added to data provided in the last RIN report to the end of the 2012/13 financial year. Removed equipment was subtracted from the last age profile count provided in the last RIN report.</p> <p>Equipment that has been internally transferred from one in service switchbay to another in service switchbay within the network was excluded from the calculation as they do not affect the age profile.</p> <p>Spot checks were done to correct a small number of errors. This included correction of voltage data based on HV operating diagrams</p>	<p>Date extracted from Ellipse database was correct.</p> <p>Tracing information were correct</p> <p>HVOD's and WMS scoping diagrams were correct. Only their latest versions were used as required.</p>

RIN Basis of Preparation

OCTOBER 2014



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
				GIS equipment rows were identified for separate reporting. A small number of additional rows were identified as not within the scope of the review and were excluded.	
[B]SUBSTATION SWITCHBAYS {Air Insulated Circuit Breaker}	All CBs other than GIS CBs were included under this category.	As for [A] above	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	As for [A] above	As for [A] above.	As for [A] above
[B]SUBSTATION SWITCHBAYS {Current Transformers}	As for [A] above	As for [A] above	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.	<i>TransGrid System Drawings:</i> High Voltage Operating Diagrams (HVOD's) and WMS Scoping Diagrams.	No.	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. Together with Haymarket and Beaconsfield West subs, Beaconsfield North, Beaconsfield South were included in the 2103 financial year report. Holroyd has been added in this update. GIS at Rookwood subs was excluded as its date of commissioning falls outside the relevant regulatory period.	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 '2014TransFormerWorkSheet'	No. This spreadsheet has also been used to provide Economic Benchmarking RIN data.	For consistency, the Excel file '2014TransFormerWorkSheet' 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

RIN Basis of Preparation

OCTOBER 2014



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
[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	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	As for [A] above	As for [A] above. Furthermore, two additional rows under Asset Category/Reactors were added. These were: 1] < = 33 kV; AIR INSULATED REACTORS, 2] > 66 kV & < = 132 kV ; GAS FILLED REACTORS TransGrid has air insulated reactors connected to the tertiary windings of 500kV power transformers, and SF6 filled reactors at Haymarket Sub.	As for [A] above
Protection Systems	The Number of Major Protection Relays on the Network	Protection Relay database maintained by NS&O/ Tech Services	Yes	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	Yes	A significant population of system 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.

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	The Number of Terminal Equipment, MUXs, Base Stations and Power Supplies on the Network	Network Renewal, Maintenance & Disposal Strategy and Objectives document for Substation Automation Systems. Augmented for FY13/14 by Equipment Register Data extracted from Ellipse.	Yes	Quantities were taken from the Network Renewal, Maintenance & Disposal Strategy and Objectives document for Substation Automation Systems document for each telecommunications system asset type. These numbers (current for FY12/13) were augmented by works completed in FY13/14 through 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 NS&O/Tech Services and Output of Metering Inventory Report	Yes	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	Network 30 Year Asset Management Plan 2009-2039	Yes	The value is taken from the Network 30 Year Asset Management Plan	Based on assumptions for serviceable life based on organisational experience
Economic Life – Mean – Protection Systems	Expected Service Life of each system	Network Renewal, Maintenance & Disposal Strategy and Objectives – Substation Automation Systems	Yes	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 – Substation Automation Systems	Yes	The value is obtained from Network Renewal, Maintenance & Disposal Strategy and Objectives – Substation Automation Systems.pdf	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	Yes	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

RIN Basis of Preparation

OCTOBER 2014



Approved By (Group Manager): Garrie Chubb, 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	No 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 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, spreadsheets which also calculate the reactive power loads at the time of the maximum demands are also available	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	No	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	No	This pertains to Half hour ended time period within which MD occurred	No assumptions. Based on actual data.
Winter/Summer Peaking	As per AER instruction Page 53/54 of AER Regulatory Information Notice.	TUOS	No	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	No	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 2014	Yes 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 to 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.	10% and 50% POE (weather corrected) data for summer and winter maximum demands from the 2013 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 2014	Yes These are based on AEMO's weather and day-type correction models The approach adopted in estimating this parameter is the best available in the circumstances.	As above	As above

Approved by (Group Manager): Mal Coble, Manager Network Support, Consultation and Pricing

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	<p>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. Consequently it is neither practical nor sensible to assign a rating to a particular BSP.</p> <p>This information has not been generated in the past as it has limited use and relevance to the organisation.</p>	Operating diagrams and operating manuals.	<p>Yes.</p> <p>The figures are materially dependent on how the capacity of a particular part of TransGrid's network is described as a single figure.</p> <p>The approach adopted in estimating this parameter is the best available in the circumstances.</p>		<p>The rating has been taken to be:</p> <ul style="list-style-type: none"> 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 rating(s) of the transmission line(s) connected at that point.
Raw adjusted MD (MW)	<p>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.</p> <p>It is important to note that:</p> <ul style="list-style-type: none"> 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 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). <p>In some cases it is</p>	TUOS, DNSP	Yes	<p>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.</p> <p>Where reactive power data are available, spreadsheets can also calculate the reactive power loads at the time of the maximum demands.</p>	Refer to Note to 'Raw adjusted MD (MW)'

RIN Basis of Preparation

OCTOBER 2014



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
	<p>impossible to adjust the raw maximum demand to "undo" the impact of these factors.</p> <p>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 adjustment has been made.</p> <ul style="list-style-type: none"> For some bulk supply points power can concurrently be delivered on some lines and received on others. For these locations, the maximum demands provided are not necessarily net loads. 				
Raw adjusted MD (MVA)	<p>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.</p> <p>Where no reactive power data are available the MVA demand has been based on the system power factor.</p>	TUOS, DNSP	<p>Yes</p> <p>The approach adopted in estimating this parameter is the best available in the circumstances.</p>	$MVA = \sqrt{MW^2 + MVar^2}$	Where MW and MVar data are available they have been used to calculate the MVA loadings.
Date MD occurred	This variable has been taken to be the day on which the relevant maximum demand (in MW) occurred.	TUOS, DNSP	No	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	No	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	No	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.	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	-

RIN Basis of Preparation

OCTOBER 2014



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
	<p>The load supplied from TG's network excludes load supplied directly from other sources such as generators embedded within distribution networks.</p> <p>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.</p>			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)	<p>There are some supply points for which it is not sensible and/or possible to produce meaningful corrected maximum demands. For example flows on inter-connectors (which depend on, inter alia, generation patterns and the supply/demand balance in adjoining regions), pumped storage loads (which depend, inter alia, on water availability and generally occur at times of lower load), power station auxiliary loads (which can depend on commercial decisions on how a portfolio of generators will be operated, etc). Consequently, corrected maximum demands can only be provided for supply points which serve distribution networks and directly connected customers.</p> <p>It is important to note that the connection point weather corrected actual maximum demands produced by AEMO should be for either native loads or net loads at the bulk supply point, depending on whether any embedded generation can reasonably be relied upon to be operating.</p> <p>For bulk supply points where concurrent receipt and delivery of power (via different lines) is possible, the historical loads are for power delivered (i.e. not net quantities).</p>	N/A	Y The approach adopted in estimating this parameter is the best available in the circumstances.	<p>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 supply points). As part of that process AEMO provides historical actual maximum demands, historical 50% PoE demands and historical 10% PoE demands.</p> <p>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.</p> <p>This is done separately for summer and winter as well as coincident and non-coincident demands.</p>	-
Weather corrected MD 10% PoE (MVA)	As for 'Weather corrected MD 10% PoE (MW)', meaningful corrected maximum demands	N/A	Y The approach adopted in	Where both MW and MVA data are available, MVA were calculated based on those	-

RIN Basis of Preparation

OCTOBER 2014



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
	can only be provided for supply points which serve distribution networks and directly connected customers.		estimating this parameter is the best available in the circumstances.	data. Where MVA _r data are not available, the "system average" power factor (of 0.98) has been used.	
Weather corrected Coincident MD 50% PoE (MW)	<p>There are some supply points for which weather corrected maximum demands are open to interpretation, for example flows on inter-connectors (which depend on, inter alia, generation patterns and the supply/demand balance in adjoining regions), pumped storage loads (which depend, inter alia, on water availability and generally occur at times of lower load), power station auxiliary loads (which can depend on commercial decisions on how a portfolio of generators will be operated, etc). Consequently, corrected maximum demands can only be provided for supply points which serve distribution networks and directly connected customers.</p> <p>It is important to note that the connection point weather corrected actual maximum demands produced by AEMO should be for either native loads or net loads at the bulk supply point, depending on whether any embedded generation can reasonably be relied upon to be operating.</p> <p>For bulk supply points where concurrent receipt and delivery of power (via different lines) is possible, the historical loads are for power delivered (i.e. not net quantities).</p>	DNSP	<p>Yes</p> <p>The approach adopted in estimating this parameter is the best available in the circumstances.</p>	<p>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 supply points). As part of that process AEMO provides historical actual maximum demands, historical 50% PoE demands and historical 10% PoE demands.</p> <p>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.</p> <p>This is done separately for summer and winter as well as coincident and non-coincident demands.</p>	
Weather corrected MD 50% PoE (MVA)	<p>There are some supply points for which weather corrected maximum demands are open to interpretation, as detailed above. Meaningful corrected maximum demands can only be provided for supply points which serve distribution networks and directly connected customers.</p> <p>.</p>	TUOS, DNSP	<p>Y</p> <p>The approach adopted in estimating this parameter is the best available in the circumstances.</p>	<p>Where both MW and MVA_r data are available, MVA were calculated based on those data.</p> <p>Where MVA_r data are not available, the "system average" power factor (of 0.98) has been used.</p>	

Note to ‘Raw adjusted MD (MW)’

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

- Tuggerah 132 kV
- Vales Point 132 kV
- Munmorah 132 kV
- Macksville 132 kV
- Macksville 132 kV
- Raleigh 132 kV
- Muswellbrook 132 kV
- Stroud 132 kV
- Taree 66 kV
- Beaconsfield 132 kV
- Haymarket 132 kV
- Sydney North 132 kV
- Sydney South 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
- Lismore (the 132kV busbar of TransGrid's 330/132 kV substation).

Other Observations:

- Lismore 330 KV includes flows on Direct Link.
- Snowy Adit Load is included in Cooma 66 KV.
- Yass 132 KV is a back up supply of Essential Energy out of Marulan. It's the normal connection for Gunning and Cullerin wind farms.
- Finley 132 KV: Connection to Albury via Mulwala and Corowa.

Approved by (Group Manager): Mal Coble, Manager Network Support, Consultation and Pricing