2018-22
POWERLINK QUEENSLAND REVENUE PROPOSAL

Regulatory Information Notice

Powerlink Queensland
Basis of Preparation

Delivering better value

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Glossary of Terms

AEMO	Australian Energy Market Operator
AFW	Application for Work
ABS	Australian Bureau of Statistics
CA RIN	Annual Category Analysis Regulatory Information Notice
CPI	Consumer Price Index
EA	Enterprise Agreement
EBSS	Efficiency Benefit Sharing Scheme
DAE	Deloitte Access Economics
MIC	Market Impact Component of the STPIS
NCC	Network Capability Component of the STPIS
NOS	Network Outage Scheduler (AEMO system)
PTRM	Post Tax Revenue Model
RBA	Reserve Bank of Australia
Reset RIN	2018-22 Revenue Proposal Regulatory Information Notice
SC	Service Component of the STPIS
SCADA	Supervisory Control and Data Acquisition
STPIS	Service Target Performance Incentive Scheme

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Overarching Comments

For clarification, Powerlink has adopted the following general approaches in a number of tables across its 2018-2022 Revenue Proposal Regulatory Information Notice (Reset RIN) templates. Where relevant, these have generally been identified in the Basis of Preparation (BoP) for the specific sheet and/or table.

In accordance with the Reset RIN requirements this BoP only relates to historical data.

Regulatory Financial Statements

Where applicable, all costs have been reconciled to Powerlink's historic Regulatory Financial Statements.

Actual and Estimated Data

Where the preparation of data met the AER's definition of actual information, this data has been identified as actual.

All data which did not meet the AER's definition of actual information has been identified as estimated. This includes information whose presentation *is materially dependent* on historical accounting or other business records and *is contingent* on judgments, assumptions, allocation methodologies or other adjustments for the purposes of responding to the Reset RIN.

Where data has been estimated, Powerlink considers these to reasonably reflect efficient and prudent costs based on realistic estimates of forecast demand and cost inputs.

Conversion to 2016/17 Real values

The Reset RIN requires all dollar values to be presented in 2016/17 real dollars values. Powerlink has applied the following methodology to convert to 2016/17 real dollars to all the relevant templates other than template 7.5 EBSS, to which it has applied the AER's amended approach (refer section 7.5 EBSS).

Powerlink has used the indices published by the Australian Bureau of Statistics (ABS) for the Consumer Price Index of the weighted average of eight capital cities for March quarters. The ABS rebased the indices to September 2012. Powerlink utilised the rebased indices for converting to June 17 dollars.

Forecast CPI has been calculated by taking the geometric average of the Reserve Bank of Australia's (RBA's) short term inflation forecasts and the mid-point of the RBA's inflation target band.

Replacement Templates and Additional Information within Reset RIN Templates

After issuing the Reset RIN, the AER provided updated templates to correct identified errors. The AER also agreed that Powerlink was not required to complete all or part of certain templates. These variations are detailed in Table 1 below.

Table 1 Amended Reset RIN Templates Requirements

Template Name	Replacement Template	Amendment
2.2 Repex	Not applicable	The AER confirmed that Powerlink is not required to provide a forecast of Asset Failures in this template.
2.16 Opex Summary	Not applicable	The AER confirmed that Powerlink is not required to complete this template as a revealed cost base year approach is being applied to forecast operating expenditure.
3.3 Assets (RAB)	3.3 Assets (RAB) Revised	Additional lines for the RAB True Up and Removal of RAB assets was not catered for in the original template.
7.5 EBSS	7.5 EBSS Revised	Change in methodology by the AER.
7.9 STPIS	7.9 STPIS Revised	Template contained formulae errors and locked cells.

Powerlink has included an additional template "2.1 Balancing Item" in accordance with Appendix E section 2 of the Reset RIN.

Historic Data Templates

For clarification, the relevant Reset RIN templates which contain historic data include the following:

- Sheet 2.11 – Labour;
- Sheet 2.14 – Forecast Price Changes;
- Sheet 7.4 – Shared Assets;
- Sheet 7.5 – Efficiency Benefit Sharing Scheme; and
- Sheet 7.9 – Service Target Performance Incentive Scheme.

Sheet: 2.11 Labour

Table: 2.11.3.1 Labour/Non-Labour Expenditure Split

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 4) of the Reset RIN.

Source

The data has been sourced from Powerlink's historic CA RIN templates 2.12.

Methodology and assumptions

Powerlink adopted the following methodology in preparing the historical information for Table 2.11.3.1.

General

Why estimates are required

Powerlink's systems do not record the financial information at the level required by the Reset RIN and so Powerlink has employed the following methodology to estimate the information required under the Reset RIN.

How the estimate has been produced

To determine the split between in-house labour expenditure, labour expenditure outsourced to unrelated parties, controllable non-labour expenditure and uncontrollable non-labour expenditure, Powerlink has considered the nature of the expenditure recognised against cost elements and then grouped them by nature into one of the four categories required by the Reset RIN.

Process to Unburden Corporate Overheads from Costs

The historic CA RIN[1] requires that all capex and opex costs reported in the CA RIN templates 2.2 – 2.10 exclude (or unburden) allocated overheads. Powerlink allocates overheads using its AER approved Cost Allocation Methodology as published on Powerlink's website.

Corporate Overhead

A portion of Powerlink's corporate overhead expenditure has been included in employee activity rates and allocated on a *Labour Time Charged* basis. The resultant charge appears as a single cost element in the reported results. Once charged to an activity, the individual cost components cannot be separately identified in Powerlink's financial systems.

[1] Category Analysis RIN, definition of direct costs, p. 57.

To comply with the requirements of the Reset RIN Powerlink derived an indicative corporate overhead rate which enabled the unburdening (or exclusion) of the corporate overhead from the employee activity rate when applied to the *Labour Time Charged* to activities. To derive the indicative rate Powerlink:

1. Identified the value of corporate overhead expenditure that was allocated to the labour activity charge in the RIN reporting year.
2. This value was then divided by the total costs allocated to activities on a *Labour Time Charged* basis.
3. The resulting percentage (the Burdened Percentage) represents an annual weighted average corporate overhead charged to activities on a *Labour Time Charged* basis.

To unburden the corporate overheads the derived Burdened Percentage was applied to total expenditure via the *Labour Time Charged* method to each activity (both operational and capital).

Procurement Overhead

Costs associated with Powerlink's procurement function were separately identified and allocated as an on-cost to external purchases for goods and services. In accordance with the requirements of the CA RIN[2] Powerlink removed these costs using a pro-rata rate adjustment to the non-labour cost components costed to each activity (both operational and capital activities).

In-house labour expenditure

Labour data has been sourced from the financial reporting systems. For clarification, Powerlink has included labour costs that are consistent with the AER's Reset RIN definitions.

Labour expenditure outsourced to related parties

Queensland Electricity Transmission Corporation Limited (Powerlink) is subject to common control as a Queensland Government owned Corporation. However, the Queensland Government and State of Queensland controlled entities are not considered related parties for the purposes of the Reset RIN due to the specific exclusion of government departments in the definition of *related party* on pages 62-63 of the Reset RIN.

Labour expenditure outsourced to unrelated parties

Data has been sourced from the financial reporting systems. For clarification, Powerlink has included expenditure that is consistent with the AER's Reset RIN definitions.

Controllable non-labour expenditure

Controllable non-labour data has been sourced from the financial reporting systems. For clarification, Powerlink has included only direct costs that are consistent with the AER's Reset RIN definitions.

[2] Category Analysis RIN, pp. 39-40.

Uncontrollable non-labour expenditure

Powerlink have identified uncontrollable non-labour expenditure as insurance premiums, self-insurance, AEMC levy and debt management costs.

Table: 2.11.3.2 Labour Capex

RIN requirements

This section has been completed in accordance with Appendix E (sections 1, 3 and 4) of the Reset RIN.

Source

The Capital Expenditure recorded for historic purposes has been sourced from the Category Analysis RINs template 2.12 Input Table previously submitted by Powerlink and Powerlink's Financial Systems.

The Capital Expenditure recorded for historic purposes has been sourced from the Category Analysis RINs template 2.12 Input Table previously submitted by Powerlink. The capital expenditure reported in these RINs reflects the incurred capital expenditure for projects capitalised in the reporting year. Incurred cost for projects not capitalised (work in progress balances) are not reported in template 2.12 in the reporting year and are reflected in the balancing item reported in Template 2.1.

As Powerlink has used a hybrid capital expenditure forecasting approach for the 2018-22 regulatory period which is not based on specific bottom up projects, Powerlink has not been able to apply the approach used to populate the historic RINs for Reset RIN purposes. Instead, Powerlink has included reportable capex on an as incurred basis in the Reset RIN and this has resulted in a higher portion of forecast capital expenditure reported in template 2.11 and 2.12 offset by a lower reported balancing item in Template 2.1 of the Reset RIN compared to historic trends.

Methodology and assumptions

Powerlink's systems do not record the financial information at the level required by the Reset RIN and so Powerlink has employed the following methodology to estimate the information required under the Reset RIN.

How the estimate has been produced

To determine the split between in-house labour expenditure, labour expenditure outsourced to unrelated parties, controllable non-labour expenditure and uncontrollable non-labour expenditure, Powerlink has considered the nature of the expenditure recognised against cost elements and then grouped them by nature into one of the four categories required by the RIN.

Process to Unburden Corporate Overheads from Costs

Expenditure estimates were derived using the methodology to unburden corporate overheads (including procurement overheads) from the cost data using the processes described in relation to Table 2.11.3.1 of the Basis of Preparation.

In-house labour expenditure

Labour data has been sourced from the financial reporting systems. For clarification, Powerlink has included labour costs that are consistent with the AER's Reset RIN definitions.

Labour expenditure outsourced to related parties

Queensland Electricity Transmission Corporation Limited (Powerlink) is subject to common control as a Queensland Government owned Corporation. However, the Queensland Government and State of Queensland controlled entities are not considered related parties for the purposes of the Reset RIN due to the specific exclusion of government departments in the definition of *related party* on pages 62-63 of the Reset RIN.

Labour expenditure outsourced to unrelated parties

Data has been sourced from the financial reporting systems. For clarification, Powerlink has included expenditure that is consistent with the AER's Reset RIN definitions.

Controllable non-labour expenditure

Controllable non-labour data has been sourced from the financial reporting systems. For clarification, Powerlink has included only direct costs that are consistent with the AER's Reset RIN definitions.

Uncontrollable non-labour expenditure

Powerlink have not identified any uncontrollable non-labour capital expenditure.

Sheet: 2.14 Forecast Price Change

Table: 2.14.1 Forecast labour and materials price change

RIN Requirements

This section has been completed in accordance with Appendix E (sections 1 and 3) of the Reset RIN.

The AER requires Powerlink to provide the following historical information in template 2.14.1.

Historical price changes for the period 2012/13 to 2014/15 relating to:

- Material price changes
- Labour price changes
- "Other" price changes
- Changes in CPI

Price changes are to be recorded in percentage year on year real terms.

Source

Table 2 provides a summary of where data was sourced to populate the historic data for template 2.14. Powerlink considers this data to be estimated.

Table 2: Summary of Historic Data Source

Materials (Copper, Aluminium, Steel, Oil and Construction Costs) price changes	Jacobs independent expert opinion.
Internal labour	Powerlink's 2011 and 2015 Enterprise Agreements; Annual Contract Remuneration approvals
External labour	BIS Shrapnel independent expert opinion[3]

Methodology and Assumptions

Various methodologies were applied and assumptions made in deriving Powerlink's cost escalation rates. The following Table 3 provides a summary.

[3] BIS Shrapnel report provided as Appendix 7.02 to Powerlink's 2018-22 Revenue Proposal.

Table 3: Methodologies applied for Cost Escalation - Historic

Materials (Copper, Aluminium, Steel, Oil and Construction Costs) price changes	Jacobs provided independent expert advice on estimated material price changes for the period 2012/13 to 2014/15. These values have been directly entered into table 2.14.
Internal labour	The internal labour category includes: i. Staff covered by Powerlink's 2011 and 2015 Enterprise Agreements (EAs); ii. Staff on contracts and not remunerated in accordance with the EAs. Powerlink applied the following approach to obtain the required information: i. To determine labour costs for staff covered by the EAs, Powerlink used the rate increases as defined in its 2011 and 2015 EAs. ii. To determine labour costs for staff not remunerated in accordance with the 2011 and 2015 EAs, Powerlink used the salary increases approved for non-EA staff in each year. iii. A weighted average was applied to the annual labour cost increases for EA and non-EA personnel. The weightings were based on the percentage of employees in the EA and non-EA category for each year.
External labour	BIS Shrapnel provided independent expert advice on estimated price changes for the period 2012/13 to 2014/15 using construction wage price indexes for Queensland.

Why estimates are required

Powerlink's financial systems do not record actual material and labour price movements at the level required by the Reset RIN.

How the estimate has been produced

For materials and external labour independent expert opinion was sought to produce the estimates.

The Powerlink enterprise agreement and annual contract remuneration approvals were applied to estimate the historical internal labour rate changes as described in Table 3.

Sheet: 7.4 Shared Assets

Table: 7.4.1 Total unregulated revenue earned with shared assets

RIN Requirements

This Section has been completed in accordance with Schedule 1 Section 16.1 of the Reset RIN.

Source

Shared assets data has been sourced from Powerlink's Enterprise Resource Planning system, SAP.

The historic data provided in template 7.4 (for financial years 2007/08 to 2014/15) is considered to be actual data, ie. for oil testing, property rentals and tower access.

Methodology and Assumptions

All data was prepared from transactions recorded in SAP in relation to relevant cost centres.

For each financial year, Powerlink collated non-regulated revenues and operating expenses for the relevant cost centres. The data reported in template 7.4 reflects non-regulated revenues net of expenses.

The assets used to provide these prescribed and non-regulated services were allocated only to the regulated asset base.

7.5 Efficiency Benefit Sharing Scheme

Table: 7.5.1.1 Opex allowance applicable to EBSS (EBSS Target)

RIN Requirements

This Section has been completed in accordance with Schedule 1 Section 14 of the Reset RIN.

Source

Table 7.5.1.1 has been populated with information sourced from Powerlink's 2012/13 – 2016/17 Transmission Determination and Post Tax Revenue Model (PTRM).

Information used to formulate the demand adjustment calculation (refer Demand Adjustment section below) has been obtained from Powerlink's Transmission Annual Planning Report 2015 and Powerlink's 2018– 22 Revenue Proposal.

Methodology and Assumptions

This input data has been escalated to June 2017 values in order to calculate the net carryover amount for the 2018-2022 regulatory period. This has been achieved by using indices published by the Australian Bureau of Statistics (ABS) for the Consumer Price Index of the weighted average of eight capital cities for June quarters.

Forecast CPI has been calculated by taking the geometric average of the Reserve Bank of Australia's (RBA's) short term inflation forecasts and the mid-point of the RBA's inflation target band.

Demand Adjustment

The Opex allowance for EBSS purposes aligns with the Powerlink's Transmission Determination for the current regulatory period. The Opex allowance has been adjusted in accordance with the conditions set by the AER in its determination, as detailed below:

> *To calculate EBSS carryover amounts, the AER will adjust total forecast opex using the method proposed by Powerlink in appendix Q to its revised revenue proposal if:*
>
> - *actual demand growth is less that the summer low economic growth 50 per cent probability of exceedance demand forecasts from its Annual Planning Report 2011 Update and actual total asset value is less than forecast, or*
> - *actual demand growth is greater than the summer high economic growth 50 per cent probability of exceedance demand forecasts from its Annual Planning Report 2011 Update and actual total asset value is greater than forecast.* [4]

[4] Powerlink Transmission Determination 2012/13 to 2016/17 Final Determination – Efficiency Benefit Sharing Scheme, p. 251, section 11.1.

In determining the demand growth adjustment required Powerlink has used the actual demand growth (native corrected to 50% PoE) reported in Powerlink's Transmission Annual Planning Report 2015, page 31, Tables 2.7 and 2.8 (refer to Appendix 5.03 of Powerlink's 2018-2022 Revenue Proposal). Table 4 below illustrates the forecast and actual demand information between the Annual Planning Report 2011 Update and Powerlink's 2015 TAPR

Table 4 – Demand Growth Comparison

	2012/13	2013/14	2014/15	2015/16
Annual Planning Report 2011 Update				
• 50% PoE Low Economic growth Fcst	9,186	9,689	10,072	10,566
• 50% PoE High Economic growth Fcst	9,539	10,314	10,973	11,777
Transmission Annual Planning Report 2015				
• Table 2.7 50% PoE Historic summer maximum demand (MW)	7,952	7,731	8,084	-
• Table 2.8 Forecast summer transmission delivered demand (MW)				
○ 50% PoE Low growth outlook	-	-	-	8,113
○ 50% PoE High growth outlook	-	-	-	8,331

As detailed above Powerlink's demand growth has been below the Low Economic Growth forecast contained in the Annual Planning Report 2011 Update for the years 2012-13 to 2014-15 and is estimated to continue to be below for 2015-16.

Powerlink's total asset value for the current regulatory period is detailed in Table 5 below.

Table 5 – Total Asset Value Comparison

RAB Balance	2012/13 Actual	2013/14 Actual	2014/15 Actual	2015/16 Fcst
2013 – 2017 Final Determination Fcst	7,096	7,641	8,002	8,406
2018 – 2022 Revenue Proposal (RFM)	6,847	7,148	7,152	7,217
Greater/(Less) than 2013 – 2017 Forecast	(248)	(493)	(850)	(1,189)

As both conditions under the demand adjustment element of the EBSS have been met, for every year of the current regulatory period, Powerlink is required to adjust its controllable Opex allowance for EBSS purposes in every year of the current regulatory period. To determine the adjusted Opex allowance Powerlink applied the actual capital expenditure outcomes to its 2013 – 2017 Opex Model as submitted with its 2013 – 2017 Revenue Determination.

Note – while the Basis of Preparation relates to historic data (up to 2014/15 inclusive), for the purposes of calculating the net EBSS carryover for the current 2013-17 regulatory period, it was necessary to populate all years in the template.

Table: 7.5.1.2 Actual and estimate opex applicable to EBSS

RIN Requirements

This Section has been completed in accordance with Schedule 1 Section 14 of the Reset RIN.

Table 7.5.1.2 has been populated with actual data for financial years from 2009-10 through to 2014-15and populated with proposed values for 2015/16.

Source

Data contained within this table relating to the current regulatory period are actual results and has been sourced from Powerlink's published Regulatory Financial Statements, for the years 2012/13 to 2014/15 inclusive.

Forecast data for the 2015/16 has been sourced from Powerlink's 2018-22 Revenue Proposal.

Data for the years prior to the current regulatory period has been sourced from Powerlink's 2012/13 – 2016/17 Final Determination (April 2012).

Methodology and Assumptions

The data in these tables has been escalated to June 2017 values in order to calculate the carryover amount for the 2018-22 regulatory period. This has been achieved by using indices published by the Australian Bureau of Statistics (ABS) for the Consumer Price Index of the weighted average of eight capital cities for June quarters.

Forecast CPI has been calculated by taking the geometric average of the Reserve Bank of Australia's (RBA's) short term inflation forecasts and the mid-point of the RBA's inflation target band.

The Approved Excludable Costs detailed in Table 7.5.1.2 are in line with the allowable exclusions contained in Powerlink's 20113–17 Transmission Determination (April 2012) and its 2018-22 Revenue Proposal, section 4.7.

Note – while the Basis of Preparation relates to historic data (up to 2014/15 inclusive), for the purposes of calculating the net EBSS carryover for the current 2013-17 regulatory period, it was necessary to populate all years in the template.

7.9 Service target performance incentive scheme (STPIS)

Table: 7.9.1 Historical performance and proposed floor, caps and targets for the service component of the STPIS

Parameter: **Unplanned circuit outage event rate**

Variables: ***Transmission line outage - fault***

Transformer outage – fault

Reactive plant – fault

Transmission line outage – forced outage

Transformer outage – forced outage

Reactive plant – forced outage

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.1 of the Reset RIN. Clause 15.1 (a) states that:

> For the service component of the scheme, provide:
>
> the values that Powerlink proposes are to be attributed to the performance incentive scheme parameters for the purposes of the application to Powerlink of the version 5 STPIS[5] in the attached regulatory template 7.9.

Table 7.9.1 has been populated with actual data for calendar years from 2011 through to 2015 and populated with proposed values for floors, targets and caps.

For clarification, data reported in Table 7.9.1 on the service component of STPIS, relates to calendar years 2011 through to 2015, consistent with the AER's STPIS reporting periods[6].

Source

For performance actuals, information has been sourced from Powerlink's internal network operating systems. Powerlink collects, records and maintains defined transmission circuit outage data and transmission circuit counts, consistent with the AER's STPIS.

Actual data for calendar years 2011 to 2015 has been used to determine fault outage and forced outage rates.

Powerlink's historic transmission element outage data has been used as the source for the number of events per annum.

[5] *Final Electricity Transmission Network Service Provider, STPIS Version 5 (*corrected), AER, October 2015.
[6] Ibid, p. 4.

Methodology and assumptions

The unplanned circuit outage event rate data is based on a calendar year measurement period, for consistency with the AER's STPIS reporting years.

The methodology applied is as follows:

- The AER requires that transmission element outage records exclude any outages of elements as per the STPIS Unplanned element outage event rate parameter definition exclusions[7].
- Powerlink has assessed each element outage record against the AER's STPIS V5 criteria for a "fault outage" or "forced outage" using the following approach:
  - A "Fault Outage" is:
    - Any element outage that occurs as a result of unexpected automatic operation of switching devices. That is, the element outage did not occur as a result of intentional manual operation of switching devices.
  - A "Forced Outage" is:
    - Any element outage that occurs as a result of intentional manual operation of switching devices based on the requirement to undertake urgent and unplanned corrective activity where less than 24 hours' notice was given to affected customers and/or AEMO. The notification time is determined by:
      - Time between "Actual Element Outage Start Time" and time advised to affected customers identified by Powerlink's "Application for Work (AFW)[8] Created Time", including
      - Time between "Actual Element Outage Start Time" and time advised to AEMO identified as "AEMO NOS Submit Time[9]",
- The total number of elements for each reporting year was determined by averaging the number of elements as at 1 January and 31 December of each reporting year.
- The actual number of *fault* outages per annum and the actual number of element counts were used to calculate the *fault* outage rate for each of the element transmission types – lines, transformers and reactive plant.
- The actual number of *forced* outages per annum and the actual number of element counts were used to calculate the *forced* outage rate for each of the element transmission types – lines, transformers and reactive plant.

Data Correction

Data errors were identified and corrected in the classification of the source data for:

- reactive plant – fault data for the 2011 calendar year; and
- reactive plant – forced data for the 2012 calendar year calculations.

The revised figures are provided below and in the template.

[7] Ibid, p. 27. Note – for clarity, given that the AER's STPIS references to 'circuits' actually comprise various 'elements' (eg. lines, transformers and reactive plant), Powerlink has referred to these as 'elements' in this document.
[8] An Application for Work (AFW) is an internal Powerlink document which is created for all planned works associated with Powerlink plant and equipment.
[9] In AEMO's NOS system, Powerlink submits a notification of outage and the submitted time is automatically logged.

Reactive plant – fault	2011	2012	2013	2014	2015*
Previous	35.82%	39.13%	23.66%	29.08%	-
Revised	35.07%	39.13%	23.66%	29.08%	22.30%

Reactive plant – forced	2011	2012	2013	2014	2015*
Previous	18.66%	22.46%	28.67%	31.91%	-
Revised	18.66%	21.74%	28.67%	31.91%	20.14%

*While not a data correction, for completeness the values for the 2015 calendar year are also provided.

Parameter: **Loss of Supply Event Frequency**

Variables: ***> (x) system minutes***

> (y) system minutes

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.1 of the Reset RIN. Clause 15.1 (a) states that:

> For the service component of the scheme, provide:
>
> the values that Powerlink proposes are to be attributed to the performance incentive scheme parameters for the purposes of the application to Powerlink of the version 5 STPIS[10] in the attached regulatory template 7.9.

Table 7.9.1 has been populated with actual data for calendar years from 2011 through to 2015 and populated with proposed values for floors, targets and caps.

For clarification, data reported in Table 7.9.1 on the service component of STPIS, relates to calendar years 2011 through to 2015, consistent with the AER's STPIS reporting periods[11].

Source

For performance actuals, information has been sourced from Powerlink's internal network operating systems. Powerlink collects, records and maintains defined transmission circuit outage data, consistent with the AER's STPIS. The information provided in response to the Reset RIN has been prepared using the actual dataset upon which Powerlink's annual STPIS report from calendar years 2011 to 2015 was based.

[10] *Final Electricity Transmission Network Service Provider, STPIS Version 5 (*corrected), AER, October 2015.
[11] Ibid, p. 4.

Powerlink's historic transmission loss of supply outage data has been used as the source for the number of loss of supply events per annum.

The loss of supply event records have been used as the source for the megawatt hours (MWh) unsupplied for the loss of supply event and event counts.

Methodology and assumptions

The methodology applied is as follows:

- The AER requires that loss of supply event records exclude any outages of circuits as per the STPIS Loss of supply event frequency parameter definition exclusions[12].
- Each loss of supply event record contains a "System Minutes Lost" value. If the value of "System Minutes Lost" of any loss of supply event exceeds the "x system minute" and/or "y system minute" thresholds, then a count of "1" is added to each applicable threshold, indicating one count for the applicable reportable loss of supply event threshold. Powerlink's historic loss of supply event "Number of Events" data were used to count the number of reportable events for each loss of supply event frequency threshold category that is required by the Reset RIN template.
- The Version 5 STPIS loss of supply event frequency thresholds that AER set for Powerlink are as follows:

  (x) system minutes = 0.05 system minutes

  (y) system minutes = 0.40 system minutes

Parameter: Average Outage Duration

Variable: Average outage duration

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.1 of the Reset RIN. Clause 15.1 (a) states that:

> For the service component of the scheme, provide:
>
> the values that Powerlink proposes are to be attributed to the performance incentive scheme parameters for the purposes of the application to Powerlink of the version 5 STPIS[13] in the attached regulatory template 7.9.

Table 7.9.1 has been populated with actual data for calendar years from 2011 through to 2015 and populated with proposed values for floors, targets and caps.

For clarification, data reported in Table 7.9.1 on the service component of STPIS, relates to calendar years 2011 through to 2015, consistent with the AER's STPIS reporting periods[14].

[12] Ibid, p. 29.
[13] Ibid.
[14] Ibid, p. 4.

Source

For performance actuals, information has been sourced from Powerlink's internal network operating systems. Powerlink collects, records and maintains defined transmission circuit outage data, consistent with the AER's STPIS. The information provided in response to the Reset RIN has been prepared using the actual dataset upon which Powerlink's annual STPIS report from calendar years 2011 to 2015 was based.

Powerlink's historic transmission loss of supply event records have been used as the source for the loss of supply event duration and the number of loss of supply events per annum.

Methodology and assumptions

The methodology applied is as follows:

- Powerlink's loss of supply event records exclude any outages of elements as per the AER's STPIS Average outage duration parameter definition exclusions[15].
- The loss of supply event data contains "Supply Outage Duration in minutes" data and the longest duration record for each event was used to sum all reportable loss of supply outage event duration times annually. This record was also used to count the number of all reportable loss of supply outage events annually.
- The annual average outage duration was calculated by dividing the cumulative summation of the loss of supply event duration time for the period by the number of loss of supply events.

Data Correction

Data errors were identified and corrected in the classification of the source data for the average outage duration calculation. The revised figures are provided below and in the template.

Average outage duration	2011	2012	2013	2014	2015*
Previous	80.73	25.52	53.99	102.51	-
Revised	86.77	26.09	5.62	115.97	236.23

*While not a data correction, for completeness the value for the 2015 calendar year is also provided.

[15] Ibid, p. 30.

Parameter: **Proper Operation of equipment**

Variable: ***Failure of Protection System***

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.1 of the Reset RIN. Clause 15.1 (a) states that:

> For the service component of the scheme, provide:
>
> the values that Powerlink proposes are to be attributed to the performance incentive scheme parameters for the purposes of the application to Powerlink of the version 5 STPIS[16] in the attached regulatory template 7.9.

Table 7.9.1 has been populated with actual data for calendar years from 2011 through to 2015.

Source

Information has been sourced from Powerlink's internal network operations systems. Powerlink analyses the performance of protection and control systems as part of its analysis of unplanned outage events. The performance of the protection and control systems is recorded with the associated unplanned outage event data.

The unplanned outage event records provided in response to the unplanned circuit outage event rate parameter for Table 7.9.1 were used as the source for the protection and control system failure event counts.

Methodology and assumptions

The methodology applied for the failure of protection and control system data is as follows:

- Any recorded failure/s of a protection or control system in an unplanned outage event record associated with assets that are not providing prescribed transmission services were excluded as per the STPIS Proper operation of equipment parameter definition exclusions[17].
- Any recorded failure/s of a protection or control system in an unplanned outage event record associated with a force majeure event were excluded as per the STPIS Proper operation of equipment parameter definition exclusions[17].
- As part of Powerlink's unplanned outage event analysis and recording process, the operation of systems providing a protection or control function to high voltage plant and equipment is analysed and recorded. This protection and control system operation analysis data was used to identify the protection and control system failure event counts in accordance with the following definition in the AER's Version 5 STPIS:

[16] Ibid.
[17] Ibid, p. 33.

- … 'protection system failure events' are those events where the relevant protection equipment or control equipment does not operate for a fault event as designed or where the relevant equipment operates when there is no relevant fault event.[18]

- The unplanned outage event records were used to identify the counts of the number of protection and control system failures for each event.
- Any failure of primary equipment such as circuit breakers to respond to signals sent by protection or control equipment was not counted as a protection system failure event, as per the Failure of protection system parameter exclusions[19].
- The annual number of protection system failure events was calculated by summing the number of protection and control system failure events for that year identified for reportable unplanned outage events.

Variable: Material Failure of the Supervisory Control and Data Acquisition (SCADA) System

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.1 of the Reset RIN. Clause 15.1 (a) states that:

> For the service component of the scheme, provide:
>
> the values that Powerlink proposes are to be attributed to the performance incentive scheme parameters for the purposes of the application to Powerlink of the version 5 STPIS[20] in the attached regulatory template 7.9.

Table 7.9.1 has been populated with actual data for calendar years from 2011 through to 2015.

Source

Powerlink receives the SCADA Minutes Lost report from AEMO on a monthly basis. The number of SCADA failure event counts from the AEMO report has been used as the source for the SCADA system failure event counts.

Methodology and assumptions

Powerlink populated the cells for the 2011 to 2015 calendar years with data directly from AEMO's SCADA Minutes Lost report.

[18] Ibid, p. 32.
[19] Ibid, p. 33.
[20] Ibid.

Variable: Incorrect Operational Isolation of Primary or Secondary Equipment Data

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.1 of the Reset RIN. Clause 15.1 (a) states that:

> For the service component of the scheme, provide:
>
> the values that Powerlink proposes are to be attributed to the performance incentive scheme parameters for the purposes of the application to Powerlink of the version 5 STPIS[21] in the attached regulatory template 7.9.

Table 7.9.1 has been populated with actual data for calendar years from 2011 through to 2015.

Source

Data has been sourced from Powerlink's internal network operating systems associated with recording the incidence of incorrect operational isolation. The records include:

- The occurrence of incorrect operational isolation resulting in an unplanned outage of the transmission network; and
- The occurrence of incorrect operational isolation that did *not* result in an unplanned outage of the transmission network.

Methodology and assumptions

The methodology applied for the incorrect operational isolation of primary or secondary equipment data is as follows:

- Powerlink assessed each incorrect operational isolation incident record against the AER's definition below:

  > … 'incorrect operational isolation events' are those events where primary or secondary equipment was not been properly isolated during scheduled or emergency maintenance, irrespective of whether an outage occurred as a result[22].

- Where incorrect operational isolation occurred during primary or secondary isolation sequences, the associated record was included in the count for the number of events.
- The number of incorrect operational isolation events was summated for each year.

[21] Ibid.
[22] Ibid, p. 32.

Data Correction

Further detailed data checking of the historic values identified a formula error in how the incorrect operational isolation was counted for the 2012 and 2013 calendar years. The revised figures are provided below and in the template.

Incorrect operational isolation of primary or secondary equipment	2011	2012	2013	2014	2015*
Previous	11	25	12	10	-
Revised	11	20	9	10	8

*While not a data correction, for completeness the value for the 2015 calendar year is also provided.

Table: 7.9.4 Market impact component
Appendix G MIC Data Template

RIN requirements

This sub-section has been completed in accordance with Schedule 1 Section 15.2 of the Reset RIN. Clause 15.2 states that:

> For the market impact component of the scheme, provide performance data in accordance with appendix C of Version 5[23] of the STPIS for the most recent seven calendar years: 2009 to 2015.

Table 7.9.4 and Market Impact Component (MIC) data template have been populated with actual data for calendar years from 2009 through to 2015.

For clarification, data reported in Table 7.9.4 and the MIC data template on the market impact component of STPIS, relates to calendar years 2009 through to 2015, consistent with the AER's STPIS reporting periods[24].

Source

For performance actuals, historic network constraint equation records have been sourced from AEMO's Market Management System (MMS).

The historic network constraint equation records have been used as the source for the MIC data.

Methodology and assumptions

The methodology applied is as follows:

- The AER requires that MIC performance records exclude any events as per the STPIS MIC definition exclusions[25] and the AER MIC guidance document[26].
- The historic network constraint equation records from AEMO were reviewed in conjunction with AEMO's Network Outage Scheduler (NOS), Market Notices published by AEMO and Powerlink's internal network operating systems.
- This dataset was assessed against the STPIS MIC exclusion criteria and a planned and unplanned outage type was allocated to each record to prepare the market impact parameter values that are required by the Reset RIN template and the MIC template.

[23] Ibid.
[24] Ibid, p. 4.
[25] Ibid, Appendix C, pp. 36-38.
[26] *STPIS Version 5 - MIC guidance*, AER, 30 0ctober 2015.