Powerlink Service Target Performance Incentive Scheme Proposal

1 July 2012 to 30 June 2017
Regulatory period

Powerlink Queensland

Proposed Amendments to Service Target Performance Incentive Scheme

1. Submission Overview

The Service Target Performance Incentive Scheme (STPIS)[1] states that a proposal to amend an existing scheme must be submitted 22 months prior to the commencement of the next regulatory control period. In Powerlink's case, proposed amendments to the current scheme are required to be lodged with the AER by 31 August 2010.

Powerlink has drawn on its experience of using the current STPIS to identify some refinements to improve the alignment of the scheme with the targeted outcomes for consumers and the electricity market.

The STPIS consists of two components: the service component and market component. In relation to the service component, Powerlink proposes the following changes:

- Parameter 1 – Transmission Circuit Availability – change the sub-parameters of peak periods, critical and non-critical circuit elements to transmission lines, transformers and reactive plant;
- Parameter 2 – Loss of Supply Event Frequency – change the current thresholds of 0.2 and 1.0 system minutes to 0.15 and 0.75 system minutes respectively; and
- Parameter 3 – Average Outage Duration – change the definition to include an 'interval mean' calculation.

In relation to the market component, the AER approved Powerlink's early implementation of the market impact parameter in June 2010[2]. Powerlink proposes a slight refinement to the definition.

Powerlink is not proposing changes to the maximum revenue increment or decrement.

Powerlink notes that other elements of the STPIS scheme (namely targets, caps, collars, weightings and offsets) are required to be submitted with Powerlink's Revenue Proposal in May 2011.

2. Rules Requirements

Section 2.3 (e) and (f) of the STPIS Guideline states that:

> *e. A proposal by a TNSP to amend this scheme to add or vary a parameter or vary the definition of an existing parameter must:*
>
> *1. demonstrate how the proposed amendment is consistent with the objectives in clause 1.4 of this scheme*
>
> *2. provide information and quantitative data on its performance history of at least the most recent three to five years as measured by its proposed parameter, and*

[1] AER, Final – Electricity transmission network service providers, Service target performance incentive scheme, March 2008

[2] Powerlink commenced under the Market Impact scheme on 18 July 2010.

3. *where this performance history information is not available, provide an appropriate benchmark or methodology to set values for the proposed parameter.*

f. *A proposal by a TNSP to amend this scheme to:*

1. *remove a parameter, or*
2. *vary the maximum revenue increment or decrement that a TNSP may receive under the service component or the market impact component*

must demonstrate how the proposed amendment is consistent with the objectives in clause 1.4 of this scheme.

Clause 1.4 of the STPIS Guideline states that the:

AER objectives for this scheme are that it:

(a) contributes to the achievement of the National Electricity Objective
(b) is consistent with the principles in clause 6A.7.4(b) of the NER
(c) promotes transparency in:
(1) the information provided by a TNSP to the AER, and
(2) the decisions made by the AER
(d) *assists in the setting of efficient capital and operating expenditure allowances in its transmission determinations by balancing the incentive to reduce actual expenditure with the need to maintain and improve reliability for customers and reduce the market impact of transmission congestion.*

The National Electricity Objective states that:

"to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to –

a. *price, quality, safety, reliability, and security of supply of electricity; and*
b. *the reliability, safety and security of the national electricity system."*

Section 6A.7.4 (b) of the National Electricity Rules (Rules) states that:

(b) The principles are that the service target performance incentive scheme should:
(1) provide incentives for each Transmission Network Service Provider to:
(i) provide greater reliability of the transmission system that is owned, controlled or operated by it at all times when Transmission Network Users place greatest value on the reliability of the transmission system; and
(ii) *improve and maintain the reliability of those elements of the transmission system that are most important to determining spot prices;*

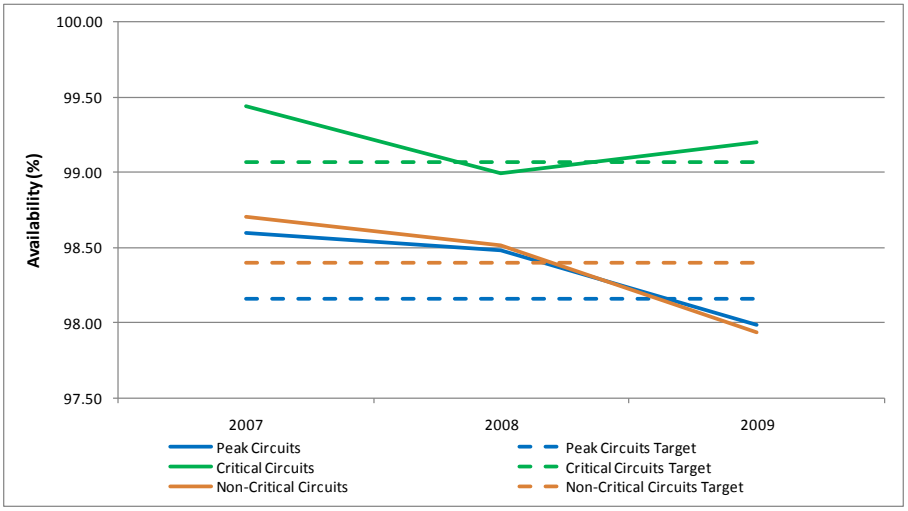
3. Amendments to Powerlink's STPIS

3.1. Parameter 1 : Transmission Circuit Availability

Transmission circuit availability is the percentage of time that each transmission element is available during the year. Powerlink currently has the transmission circuit availability

sub-parameters of critical, non-critical and peak circuits[3]. Powerlink's actual performance (with exclusions) for 2007 (based on half year performance), 2008 and 2009 and revenue neutral targets (for the current regulatory period) are shown in Figure 1 below.

Figure 1 - Powerlink Actual Circuit Availability Performance (2007 to 2009)



Comparing actual performance to the current targets, Powerlink has consistently performed well in each of the three sub-parameters. This performance has been achieved whilst undertaking the largest capital works program in the National Electricity Market (NEM). With the recent implementation of the new market impact parameter, Powerlink proposes to change the sub-parameters of critical, non-critical and peak circuits to three individual availability sub-parameters of transmission lines, transformers and reactive plant (as detailed in Table 1 below).

Table 1 - Powerlink's Existing and Proposed Sub-parameters for Transmission Circuit Availability

Existing Sub-parameters	Proposed Sub-parameters
Peak Circuits	Transmission Lines
Critical Circuits	Transformers
Non-Critical Circuits	Reactive Plant

A shift away from the existing critical, non-critical and peak sub-parameters removes the overlap between the service component and market component, i.e. the peak and critical circuit parameters are designed to focus attention on ensuring the most important circuit elements are available (and in particular) during peak periods where the load is higher and the market value of transmission capacity is likely to be greatest. With the recent introduction of the new market impact parameter, Powerlink is now incentivised to minimise outages of critical elements at all times and thereby minimise the impact on the market.

With the existing sub-parameters, Powerlink is incentivised to take outages of network elements for routine maintenance and construction work in off-peak periods (overnight

[3] Critical Circuits are those with voltages of 275kV and 330kV, non-critical circuits are those with voltages 132kV and below and peak circuits consider all voltages between 7am to 10pm weekdays excluding public holidays.

and weekends, where resource costs are higher and work is made more complex due to lack of natural light). This would not be the most efficient course of action if the outage can be managed during selected times in the peak time zones with no or minimal impacts on users and the market.

Off-peak outages result in more expensive field resources (due to higher labour rates through overtime). Working at night also involves additional requirements, such as lighting, and can be affected by fatigue management considerations to ensure the safety of staff. Consequently, the ability to undertake work at the most appropriate time, irrespective of whether that is peak or off peak time, leads to more efficient use of resources.

Further, the new market impact parameter ensures Powerlink is incentivised to focus on elements that are most valued by the market at any time, not just at peak times, e.g. network elements that need to be managed carefully as they can cause market impacts at many different times of the day. This requires the TNSP to understand which elements of its network impact on the market and manage the availability of those elements at the appropriate times.

Thus, the proposed amended sub-parameters, in conjunction with the market component, change the incentive on Powerlink slightly to take outages for routine maintenance and construction work on critical and non-critical plant at times when there is no or minimal impact on users and the market irrespective of whether this is peak or off peak times.

Powerlink also notes that sub-parameters based on plant categories (as now proposed by Powerlink) form part of the standard definitions[4] in the AER STPIS Guideline. Further, the AER approved the same sub-parameters for TransGrid in its final decision in April 2009[5]. This indicates that the AER considers sub-parameters based on plant categories to be acceptable.

Table 2 provides Powerlink's availability performance history for the transmission lines, transformers and reactive plant sub-parameters for 2006 to 2009. The calculation identifies the aggregate unavailability (in hours) for planned and unplanned outages for each plant type and then divides this by the total number of hours that each plant type could be available. Availability was then calculated by subtracting the unavailability % from 100%.

Table 2 - Powerlink's Historical Transmission Availability Performance from 2006-2009

Sub-Parameter	**Actual Performance (Calender Year)**			
	2006	**2007**	**2008**	**2009**
Transmission Line Availability	98.97	99.38	99.41	97.96
Transformers Availability	98.50	98.67	99.14	98.58
Reactive Plant Availability	96.50	98.07	96.22	97.90

[4] AER, Electricity Transmission Network Service Providers, Service Target Performance Incentive Scheme, Appendix A – page 16.
[5] AER, Final Decision, TransGrid transmission determination 2009–10 to 2013–14, 28 April 2009

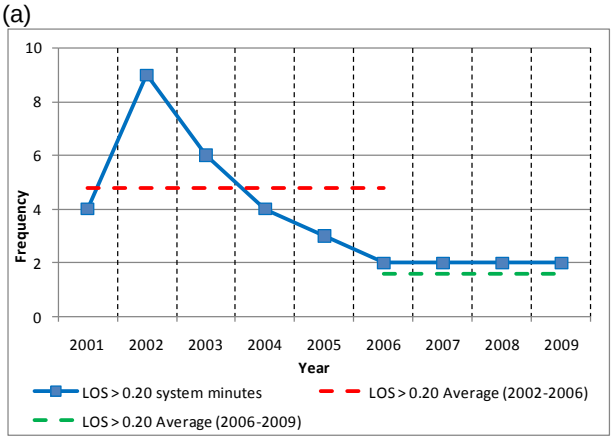
3.2. Parameter 2 : Loss of Supply Event Frequency

Loss of Supply (LOS) Event Frequency relates to the number of events on a transmission network above the AER approved system minute thresholds. The magnitude of the event is dependent on the relative size and duration of the LOS event, e.g. one system minute is equivalent to the loss of the total network maximum demand for one minute. For Parameter 2, Powerlink currently has x (moderate loss) and y (large loss) thresholds of 0.2 and 1.0 system minutes, respectively.

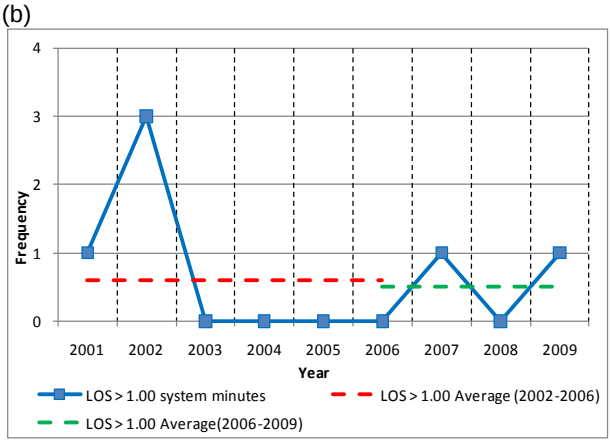
Figure 2 illustrates that Powerlink's LOS performance has improved significantly over the last nine years. This is shown by the green dashed line (average event history from 2006 to 2009) being lower than the red dashed line (average event history from 2002 to 2006).

Figure 2 - Powerlink's Historical Loss of Supply Events for (a) 0.20 and (b) 1.00 system minutes

(a)



(b)



To provide an adequate incentive to TNSPs, LOS thresholds need to reflect the design topology and load composition of the transmission network. Consequently, thresholds need to be reflective of the achievable response times faced by an efficient network operator.

Powerlink owns and operates one of the "longest and skinniest" and geographically diverse high voltage transmission grids in the world. Electricity must be transmitted over long distances to serve regional cities, towns and industrial areas. The long, relatively unmeshed nature of the network results in large loads that are less well connected to generation sources compared to more meshed networks. As a result, when compared to the more meshed networks of other NEM states, Powerlink's network is inherently subject to larger loss of supply (and system minute) events.

Powerlink proposes a change to x and y thresholds of 0.15 and 0.75 system minutes, respectively, as shown in Table 3. These proposed lower thresholds represent a balance between the inherent vulnerability of the long, skinny Powerlink grid to larger loss of supply events than other parts of the NEM, and the improved performance over the last nine years, in order to continue to provide incentives to reduce LOS frequency and duration. Setting the threshold levels at 0.15 and 0.75 system minutes provides a representative number of LOS outages (similar to other TNSP determinations) to set an appropriate target.

Table 3- Powerlink's Existing and Proposed Parameter 2 Thresholds

Existing Threshold	Proposed Thresholds
> 1.0 System Minutes	> 0.75 System Minutes
> 0.2 System Minutes	> 0.15 System Minutes

Large LOS events have greatest impact on customers as a result of the number of customers involved and/or the duration of the event. The 0.75 system minute threshold will continue to incentivise Powerlink to improve its large LOS performance, i.e. reduce the probability of the events that most impact customers. As noted, due to the long and thin nature of Powerlink's network, it is expected and reasonable that the thresholds are higher than other NEM TNSPs with more meshed and less geographically dispersed networks.

In addition to the new thresholds, Powerlink also proposes, based on practical experience, the following refinements to the definition:

1. the period of the interruption starts when a loss of supply event occurs and ends when Powerlink offers supply restoration to the customer; and
2. an interruption >0.75 system minute(s) also registers as a >0.15 system minute(s) event.

The first statement provides greater clarity that Powerlink is only responsible for the duration of a LOS event which is within its control. Powerlink notes that this refinement has been previously approved by the AER for Transend in April 2009[6].

The second statement reinforces the existing process used by Powerlink in its current service standard scheme and does not impact the data collection history. Powerlink notes that this has been previously approved by the AER for ElectraNet in April 2008[7].

Powerlink's current STPIS reporting process aligns with the refinements detailed above and is reflected in the LOS historical data.

Table 4 provides Powerlink's LOS history for 0.15 and 0.75 system minutes for 2006 to 2009 and shows the annual number of loss of supply events greater than the proposed thresholds. Performance has been determined by counting the number of events each year greater than 0.15 and 0.75 system minutes.

Table 4 - Powerlink Historic Loss of Supply Performance 2006 to 2009

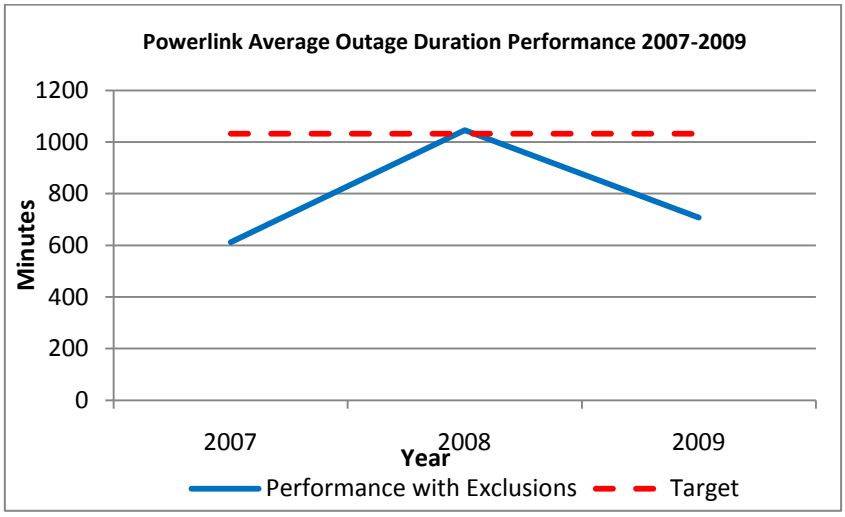
Sub-Parameters	Actual Performance (Calender Year)			
	2006	2007	2008	2009
Loss of Supply > 0.75 system minutes	1	1	0	1
Loss of Supply > 0.15 system minutes	2	4	4	3

[6] AER, Final Decision, Transend Transmission Determination 2009–10 to 2013–14, 28 April 2009
[7] AER, Final Decision, ElectraNet transmission determination 2008–09 to 2012–13, 11 April 2008

3.3. Parameter 3: Average Outage Duration

Currently, Average Outage Duration is defined as the average time taken to restore an unplanned network outage, with the longest outage time for any single event capped at 7 days. As shown in Figure 3, Powerlink's Average Outage Duration performance surpassed the AER targets in 2007 (based on half year performance) and 2009 and was marginally less in 2008. In other words, Powerlink's network sustained an annual average outage duration less than the AER approved targets in 2007 and 2009 and slightly above in 2008.

Figure 3 - Powerlink's Average Outage Duration Performance 2007-2009

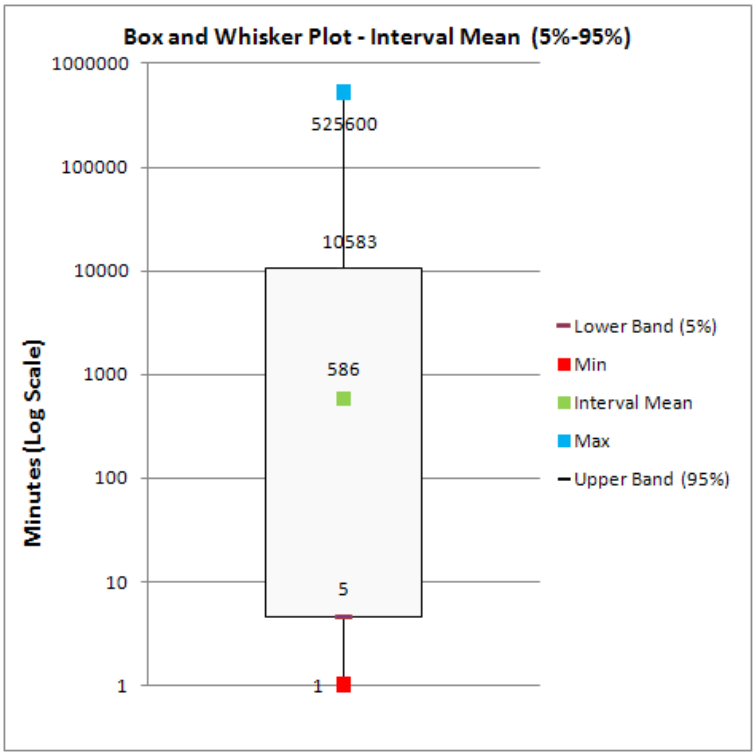


Powerlink proposes to use a similar average outage duration definition, with a refinement to the outage duration data set to include only the outage duration events that fall between the 5th and 95th percentile, to exclude "outliers" from the calculation of the mean. An "interval mean" will then be calculated from the data set.

For the avoidance of doubt, the 5th and 95th percentiles are only being used to define the bands of the data set from which the interval mean is calculated.

Average outage duration events are best presented in a 'box and whisker' plot which utilises specified percentiles to illustrate the dispersion of the data. The box and whisker plot in Figure 4 uses interval bands of the 5th and 95th percentile and Powerlink's average outage duration history from 2006 to 2009. It shows that the bottom 5th percentile refers to average outage duration events between 1 to 5 minutes and the 95th percentile refers to events greater than 10,583 minutes.

Figure 4 - Box and Whisker for 5%-95% Interval Mean for 2006-2009 Performance



A comparison of events greater than the average 95th percentile (i.e. those greater than 10,583 minutes) with Powerlink's existing 7 day cap of 10,080 minutes shows that the proposed definition refinement would include slightly larger events. In other words, the proposed measure would capture events longer than the 7 day cap, i.e. those between 10,080 and 10,583 minutes. Powerlink considers that larger (e.g. the 2nd and 98th percentile) bands would include events that are outside Powerlink's control.

The use of a band between the 5th and 95th percentile removes the shorter duration events (such as auto reclose, and those not requiring onsite crews to remedy the problem) and longer duration events (where the restoration time is typically out of Powerlink's control). For the longer events, additional labour and resources will usually not improve the restoration time of the outage as removal of the affected equipment for offsite repair is generally required. These longer events, which are typically outside the control of an efficient TNSP, should be removed from the average outage duration calculation to overcome the incorrect signal of any one event dominating the calculated performance.

The resultant 90% of outages are events that are usually within Powerlink's control to respond. It follows that targeting Powerlink's incentive at a reduction to these outage events will improve the reliability of the network and help reduce the probability of occurrence of LOS events. This leads to positive outcomes for customers and end users.

Powerlink's 2006 to 2009 interval mean (shown in Figure 4 above) is approximately 586 minutes, which equates to an average response time of approximately ten hours. Ten hours provides an appropriate target to incentivise Powerlink to correctly diagnose the problem, mobilise crews and implement the solution, given the geographical dispersion of Powerlink's network.

Table 5 provides Powerlink's Average Outage Duration interval mean performance for 2006 to 2009. The annual results were calculated by determining annual outage events that were below the 5th percentile and those above the 95th percentile, and excluding them from the data set. An interval mean was then calculated for all remaining events.

Table 5 - Powerlink Interval (5% - 95%) Mean Historic Performance (2006-2009)

Sub-Parameter	**Actual Performance (Calender year)**			
	2006	**2007**	**2008**	**2009**
5%-95% Interval Mean (minutes)	978	421	639	306

3.4. Inclusions and Exclusions

Exclusions (and inclusions) under the STPIS give further clarification to the sub-parameter definitions. For the 2012/13 to 2016/17 regulatory period, Powerlink proposes the following refinements to the existing exclusions:

Refinement:	Addition of the statement "capacitor banks in the off-peak seasonal periods", where the off-peak season is defined from 1 April through to 31 October.
Justification:	During the off-peak season when the grid is lightly loaded, not all capacitor banks are required to support the transmission system. Under the existing STPIS, Powerlink is required to return every capacitor bank to service or be penalised under the circuit availability and average outage duration parameters, regardless of whether the capacitor bank is required at that time. This currently requires Powerlink's resources (field crews and operators) to mobilise to site out of normal hours such as weekends, incurring overtime rates when the level of reactive support required can be readily met by other capacitor banks. The exclusion removes the need for Powerlink to return all capacitor banks to service in the winter period when they are least required. This will lead to efficient outcomes by enabling Powerlink to better plan and schedule restoration work in association with other activities.
Parameters:	Circuit Availability and Average Outage Duration

The adjusted historical performance for the Reactive Plant Availability and Average Outage Duration sub parameters is detailed in Table 6 below. The Transmission Lines and Transformers Availability measures are not impacted by the above exclusion as they do not contain capacitor banks.

Table 6 - Historical Reactive Plant Availability and Interval Mean with Exclusions

Sub-Parameter	**Actual Performance (Calender year)**			
	2006	**2007**	**2008**	**2009**
Reactive Plant Availability	97.34%	98.59%	97.32%	98.41%
5%-95% Interval Mean (minutes)	707	300	498	257

Refinement:	Removal of the third party examples e.g. (five years of history for precedent of 3rd party event)
Justification:	The scope of third party events is very broad. The AER now has 3 years of audited history which have set precedents for future assessment of third party events. To avoid confusion, Powerlink considers it appropriate to remove the examples, and rely on historical precedent and general principles to justify future third party events.
Parameters:	Circuit Availability, Loss of Supply and Average Outage Duration

Refinement:	Under frequency load shedding caused by third party events
Justification:	Powerlink considers that this exclusion clarifies the operation of under frequency load shedding (UFLS) in the STPIS. UFLS occurs when the NEM frequency drops below pre-defined limits, and load is shed automatically to ensure the network remains stable. Powerlink therefore considers that UFLS caused by a third party event is outside Powerlink's control, and as such should be excluded.
Parameters:	Circuit Availability, Loss of Supply and Average Outage Duration

Refinement:	Inclusion of "and reactors" and removal of "and any other primary transmission equipment essential for the successful operation of the transmission system but does not include individual circuit breakers and isolators or secondary systems".
Justification:	Modification of the statement aligns the physical equipment with the proposed sub-parameters of transmission line, transformers and reactive plant. Information for plant categories is supplied as part of the AER's annual service performance review.
Parameters:	Circuit Availability

The full definition, inclusions and exclusions for Powerlink's proposed STPIS parameters (with marked changes from Powerlink's existing scheme) are included in Appendix A.

4. AER Objectives

Any changes or variations to Powerlink's existing STPIS need to satisfy the AER objectives as detailed in Section 2, that is:

- that the changes contribute to the National Electricity Objective (NEO);
- are consistent with 6A.7.4(b) of the Rules, promote transparency in the information provided by a TNSP to the AER and decisions made by the AER; and
- assists in the setting of efficient capital and operating expenditure.

4.1. Contribute to the National Electricity Objective

Powerlink considers that the proposed changes to the STPIS contribute to the NEO by promoting efficient investment in electricity transmission networks.

Powerlink considers that the proposed changes to its existing STPIS scheme are both an efficient and practical approach to meeting the NEO. Efficiency is a concept which requires that the best use be made of available resources to deliver the best possible or most desired outcomes to society as a whole. From the information provided in Section 3, it is clear that Powerlink's resources will be better utilised if, under the:

- Circuit Availability parameter, outages for project and maintenance work were able to be scheduled on network elements at the most appropriate time to minimise impacts on users and the market without penalty;
- Loss of Supply parameter, Powerlink could reduce the duration and frequency of customer outages;
- Average Outage Duration parameter, Powerlink was able to focus on outage events within its control (and that will most positively impact on customer supply); and
- Circuit Availability and Average Outage Duration parameters, Powerlink was not required to immediately return capacitor banks to service when they were not required.

In doing so, Powerlink is able to direct its focus and resources to influencing aspects and parameters which reflect outcomes of significance to customers and stakeholders. Ultimately, this is expected to be in the longer term interests of electricity consumers.

A further important dimension of efficiency is that the market is able to adapt to change over time. Powerlink considers that it is dynamically efficient to amend the scheme in response to: the addition of the market impact parameter, network developments and conditions, capital and operational expenditure requirements as well as customer requirements. Further, a greater appreciation of the impact of specific network events (in different circumstances) and Powerlink's ability to respond to these events has also been considered in proposing the changes above. Powerlink considers such outcomes to be in the long term interests of consumers.

4.2. Consistent with 6A.7.4(b) of the Rules

The STPIS incentivises TNSPs to provide greater reliability of network elements that have greatest value to Transmission Network Users, and are most important to determining spot prices. The Circuit Availability parameter ensures that the entire network is operated with minimum downtime, the Loss of Supply frequency parameter ensures the duration and frequency of customers load loss is kept to a minimum and the Average Outage Duration parameter ensure the integrity and quality of supply of the transmission network is maintained.

Under the proposed changes, Powerlink:

- has the incentive to schedule outages so that work can be undertaken under favourable (i.e. not at night) working conditions, where there is no / minimal market impact;
- will be incentivised to ensure that the duration and frequency of loss of supply events are reduced; and
- can focus on events that it can manage to improve the overall reliability of the system and reduce the probability of a loss of supply event.

Consistent with 6A.7.4(b)(1)(i), this will enhance the incentive on Powerlink to improve the overall availability and reliability of parts of the transmission system that customers place the greatest value.

4.3. Promotes transparency in the information provided by a TNSP to the AER, and decisions made by the AER

As part of the revenue determination every 5 years, Powerlink proposes a service standard scheme to the AER for the upcoming regulatory control period. The AER has the opportunity to review, investigate, modify and approve Powerlink's STPIS parameters, definitions, targets, caps and collars.

In addition, under Section 5.3 of the STPIS Guideline, the AER reviews the service performance information provided by Powerlink on an annual basis. Powerlink has been subject to a full audit review of its service performance information in 2007[8] and 2008. The results of these audit reviews are publically available. Powerlink's 2006 service performance results were reviewed by the AER's consultants as part of Powerlink's 2007/08 to 2011/12 Revenue Proposal, while the 2009 results were comprehensively reviewed by AER staff.

Powerlink also considers that transparency of information is already provided through the current review and audit processes. The AER's full audit reviews have consistently shown that Powerlink's data collection and reporting processes are accurate. In addition, the AER has commended Powerlink for its open and active participation throughout the review process.

The data sets used to calculate historic performance for new sub-parameters, i.e. transmission line, transmission transformer and reactive plant availability, Loss of Supply greater than 0.15 and 0.75 system minutes and the Average Outage Duration interval mean are the same datasets that have been used to calculate the existing sub-parameters. Powerlink therefore considers that the new sub-parameters are transparent and fully auditable by the AER.

Powerlink considers its proposed changes do not detract from any future levels of transparency as all parameters under the STPIS are open to an AER review and audit.

[8] SKM reviewed Powerlink's service performance results from 1 July 2007 to 31 December 2007.

4.4. Assists in the setting of efficient capital and operating expenditure

Under the service component of the STPIS, Powerlink has 1 percent of Maximum Allowable Revenue (MAR) at risk as a possible penalty. As stated in section 1, Powerlink is not intending to change the MAR increment or decrement, i.e. it is proposed to remain at 1 percent.

In Powerlink's current operating environment (for the 2010/11 financial year), 1 percent of MAR equates to approximately 5 percent of total controllable operational expenditure. Any efficient operator faced with a scheme that has 5 percent of its controllable expenditure at risk is significantly incentivised to ensure its performance meets regulatory approved targets.

For the upcoming 2012-2017 regulatory control period, Powerlink is also subject to an Efficiency Benefit Sharing Scheme (EBSS) that provides "a continuous incentive to achieve efficiencies by allowing the TNSP to retain, for a fixed period, the difference (negative or positive) between its actual and forecast operating expenditure"[9].

Powerlink considers the financial impact on operating expenditure (under the STPIS) combined with the EBSS provides a substantial incentive to reduce actual expenditure while maintaining and improving the reliability of the network and reducing the impact of market transmission congestion. This ensures the efficient setting of capital and operating expenditure.

5. Refinement to Market Impact Parameter

5.1. Powerlink's existing parameters and proposed refinement

The AER approved Powerlink's application for the early implementation of the market impact parameter in June 2010[10].

Powerlink proposes to continue to apply the market impact parameter as detailed in the current STPIS, with one refinement to the existing definition. Powerlink proposes to include "where the information described in (1), (2), (3) or (4) indicates that a TNSP together with one or more DNSPs are responsible for a single *network outage constraint*, the TNSP is apportioned an allocation of the number of *dispatch intervals* that reflects the number of NSPs responsible for the *network outage constraint"*.

A scheduled generator[11] embedded into a Distribution Network Service Provider (DNSP) system can impact on the marginal value of the NEM. Consequently, if a TNSP was to take an outage on the transmission system that connected a DNSP (and scheduled generator) to the NEM, the marginal value of the network outage constraint could exceed

[9] AER, Final decision, Electricity transmission network service providers - Efficiency benefit sharing scheme, September 2007, page 2.
[10] Powerlink commenced under the market impact scheme on 18 July 2010.
[11] Under the section 2.2.2 of the Rules, a schedule generator is defined as a "generating unit which has a nameplate rating of 30 MW or greater…."

$10. This would result in Dispatch Interval (DI) counts and a resultant negative impact for the TNSP.

The addition to the definition will encourage Powerlink to look for opportunities, over and above its current processes, where it can align outages on its transmission system with another (connected) DNSP outage. It is proposed that Powerlink would then only receive an equal allocation of the DI events. Powerlink will be further incentivised to seek out opportunities to schedule outages with other NSPs, including DNSPs and help reduce any adverse impacts on participants in the NEM.

The full definition of Powerlink's proposed market impact parameter (with marked changes from the existing scheme) is included in Appendix A.

5.2. Consistency with AER Objectives

5.2.1. Contribute to the National Electricity Objective

Powerlink is only proposing a refinement to the market impact parameter, rather than any material changes. Given this, Powerlink considers that its proposed change contributes to the NEO, and is also consistent with 6A.7.4(b) of the Rules (as detailed in section 5.2.2 below).

Powerlink considers the alignment of TNSP outages with existing NSP outages results in efficient market outcomes by not subjecting the NEM to multiple events that could impact on market participants. The exclusion incentivises a TNSP to continually seek out opportunities that align outages with other NSPs. This results in efficient investment and development of the transmission network for the benefit of all consumers of electricity.

5.2.2. Consistent with 6A.7.4(b) of the Rules

A possible reduction in the DI count will incentivise Powerlink's operations planning to ensure outages, where possible, align with other NSPs outages. This has the impact of improving the availability of the transmission network and reducing the potential impact on market participants.

5.2.3. Promotes transparency in the information provided by a TNSP to the AER and decisions made by the AER

The full details of all network constraints are publicly available through the datasets published by AEMO. The additional exclusion will give the AER access to more specific information on how NSPs work to co-ordinate outages so as to reduce the overall impact of outages on market participants. Powerlink considers that this will assist the decisions made by the AER.

The AER audited Powerlink's DI history for 2005 to 2009 (as part of its application for the early adoption of the market impact parameter). During the 2005 to 2009 period, Powerlink did not encounter a DI event on an outage that was aligned with a network outage of another NSP. Therefore, the definition refinement will not change Powerlink's market impact parameter result approved by the AER.

5.2.4. Assists in the setting of efficient capital and operating expenditure

As detailed in section 4.4, Powerlink considers the efficient setting of capital and operational expenditure is achieved through the STPIS (of which the market impact parameter is a component) and EBSS. Together, the schemes provide incentives to reduce actual expenditure while maintaining and improving the reliability of the network and reducing the impact of market transmission congestion.

6. Appendix A – Service Target Performance Incentive Scheme - Definitions, Exclusions and Inclusions

For convenience, modifications to Powerlink's existing scheme have been marked up with strike-through and blue text.

Parameter 1	Transmission Circuit Availability
Sub-parameters	~~transmission circuit availability (critical circuit elements)~~ ~~transmission circuit availability (non-critical circuit elements)~~ ~~transmission circuit availability (peak periods)~~ transmission line availability transformer availability reactive plant availability
Unit of measure	percentage of total possible hours available
Source of data	TNSP outage reports and system for circuit availability agreed schedule of ~~critical circuits and~~ plant ~~peak period 7:00 am to 10:00 pm weekdays excluding public holidays~~ ~~off-peak all other times~~
Definition/formula	formula: $\frac{\text{No. of hours per annum defined circuits are available x 100}}{\text{Total possible no. of defined circuit hours}}$ definition: the actual circuit hours available for defined ~~(critical/non-critical/peak)~~ transmission circuits divided by the total possible defined circuit hours available ~~a critical circuit element is an element of the 330 kV network, the 275 kV interconnected network that forms the backbone of the transmission system and interconnections to other jurisdictions. All other circuits are non-critical~~ Powerlink should submit a list of circuits annually as part of the AER's compliance review Winter off-peak season is 1 April through to 31 October
Inclusions	'circuits' includes overhead lines, underground cables, power transformers, phase shifting transformers, static var compensators, capacitor banks and reactors~~, and any other primary transmission equipment essential for the successful operation of the transmission system but does not include individual circuit breakers and isolators or secondary systems~~ outages from all causes including planned, forced and emergency events, including extreme events
Exclusions	unregulated transmission assets (e.g. some connection assets) any outages shown to be caused by a fault or other event on a 'third party system' ~~(e.g. intertrip signal, generator outage, customer installation)~~

force majeure events

any outage not affecting Powerlink's primary transmission equipment

faults originating from Powerlink owned equipment that affect primary plant or equipment owned by a distributor, connected customer or a generator

capacitor banks in the winter off-peak period

under frequency load shedding caused by third party events

Parameter 2	Loss of supply event frequency
Sub-parameters	number of events greater than ~~0.20~~ 0.15 system minutes per annum number of events greater than ~~1.0~~ 0.75 system minutes per annum
Unit of measure	number of significant events per annum
Source of data	TNSP outage reporting system
Definition/formula	number of events greater than ~~0.2~~ 0.15 system minutes or ~~1.0~~ 0.75 system minutes where: $\text{System minute} = \frac{\text{Customer outage duration (minutes)} \times \text{load lost (MW)}}{\text{System maximum demand (MW)}}$ definition of system minute: the customer outage duration (in minutes) times the load lost (in megawatts) divided by the highest system maximum demand (in megawatts) that has occurred prior to the time of the event. period of the interruption starts when a loss of supply occurs and ends when Powerlink offers supply restoration to the customer an interruption >0.75 system minute(s) also registers as a >0.15 system minute(s) event
Inclusions	all unplanned outages exceeding the specified impact (that is, ~~0.2~~ 0.15 system minutes and ~~1.0~~ 0.75 system minutes) all parts of the regulated transmission system extreme events
Exclusions	unregulated transmission assets (e.g. some connection assets) any outages shown to be caused by a fault or other event on a 'third party system' ~~(e.g. intertrip signal, generator outage, customer installation)~~ planned outages *force majeure events* under frequency load shedding caused by third party events

Parameter 3	**Average outage duration**
Unit of measure	Minutes
Source of data	TNSP outage reporting system
Definitions	formula: $\frac{\text{Aggregate minutes duration of all included outages } \sout{\text{unplanned outages}}}{\text{Number of included outage events}}$ definition: the cumulative summation of the included outage duration time for the period, divided by the number of included outage events during the period. included outage: an outage duration that falls between the 5th and 95th percentile of all forced outage durations during the period. the start of each outage event is the time of the interruption of the first circuit element. the end of each outage event is the time that the last circuit element was restored to service ~~the impact of each event is capped at seven days~~ Winter off-peak season is 1 April through to 31 October
Inclusions	faults on all parts of the transmission system (connection assets, interconnected system assets) all forced and fault outages whether or not loss of supply occurs
Exclusions	planned outages momentary interruptions (duration of less than one minute) *force majeure events* capacitor banks in the winter off-peak period any outages shown to be caused by a fault or other event on a 'third party system' under frequency load shedding caused by third party events

Market impact parameter

Unit of measure	Number of *dispatch intervals*
Definition	The market impact parameter is the number of *dispatch intervals* where an outage on a TNSP's network results in a *network outage constraint* with a *marginal value* greater than $10/MWh. Where: *dispatch interval* has the meaning set out in the NER. *network outage constraint* is the change to the physical capability of the transmission network following the outage of transmission network equipment from service as identified by and recorded in the *market systems*. the *marginal value* is published in the *market systems* and is an indication of the change, at the margin, in the cost of producing electricity sufficient to meet demand brought about by a particular *network outage constraint*. Where there is more than one *network outage constraint* with a *marginal value* greater than $10/MWh in one *dispatch interval*, the market impact parameter counts the *dispatch interval* for each *network outage constraint* (that is, the same *dispatch interval* may be counted more than once). To measure a TNSP's performance against this market impact parameter, the AER will allocate each network outage constraint to the TNSP responsible for the constraint using: 1. the Market Information on Planned Network Outages, which is published every month by NEMMCO based on information provided by the TNSPs as required under clause 3.7A of the NER, or 2. the Network Outage Schedule, which is published by *NEMMCO* on its website based on information provided by the TNSPs or 3. the description in the constraint set published by *NEMMCO* of why the constraint was invoked or 4. where it is not clear from (1), (2) or (3), the published market management system data or other information provided by *NEMMCO*. Where the information described in (1), (2), (3) or (4) indicates that more than one TNSP is responsible for a single network outage constraint (for example an outage affecting an interconnector), the number of dispatch intervals is apportioned equally between the TNSPs.

	Where the information described in (1), (2), (3) or (4) indicates that a TNSP together with one or more DNSPs are responsible for a single *network outage constraint*, the TNSPs is apportioned an allocation of the number of *dispatch intervals* that reflects the number of NSPs responsible for the *network outage constraint"*.
Exclusions	1. *force majeure events* 2. network constraints that are invoked to manage the reclassification of *non-credible contingency events* to *credible contingency events* as per clause 4.2.3(f) of the NER 3. any outages shown to be caused by a fault or other event on a 'third party system'—e.g. intertrip signal, generator outage, customer installation 4. outages on assets that are not providing *prescribed transmission services* 5. outages for personal safety that are not related to the activity of owning or operating a *transmission network* 6. outages that are only for the purpose of assisting with operational security, for example where a lower voltage parallel circuit is taken out of service to assist with transfers across an interconnector 7. network constraints related to network support services in accordance with clause 5.6.2 of the NER 8. *dispatch intervals* (for a *network outage constraint*) that are affected by: a. manifestly incorrect input to the *dispatch algorithm* (as determined by *NEMMCO* under clause 3.9.2B of the NER) b. a constraint applied by *NEMMCO* that does not accurately reflect or is otherwise inconsistent with the network capability that the TNSP advised *NEMMCO* c. scheduling error d. *mandatory restrictions* under clause 3.12A of the NER e. *NEMMCO* declaring the *spot market* suspended under clause 3.14.3 of the NER, or f. an *administered price cap* under clause 3.14.2 of the NER