Response to the AER Explanatory Statement on Powerlink's proposed Service Target Performance Incentive Scheme

1 July 2012 to 30 June 2017
Regulatory period

Shortened forms

AER	Australian Energy Regulator
DNSP	Distribution Network Service Provider
LOS	Loss of Supply
MITC	Market Impact of Transmission Congestion
MW	Megawatt
MWh	Megawatt-hour
NEM	National Electricity Market
NEO	National Electricity Objective
Rules	National Electricity Rules
Scheme	Service Target Performance Incentive Scheme
TNSP	Transmission Network Service Provider

Powerlink Queensland

Response to the AER Explanatory Statement on Powerlink's proposed Service Target Performance Incentive Scheme

1. Submission Overview

In accordance with Section 2.3(d) of the Scheme Guideline[1], Powerlink submitted a proposal to the AER on 31 August 2010 to refine the Scheme applicable to Powerlink in the 2013 to 2017 regulatory period. The AER released an Explanatory Statement on 3 December 2010 in response to Powerlink's proposed refinements. This document provides Powerlink's response to the Explanatory Statement.

Table 1 below outlines Powerlink's original proposed refinements to the Scheme, the AER's proposed Scheme, Powerlink's further comments and reference to additional supporting information.

In summary, Powerlink has accepted the AER's position in relation to 10 of the 12 items under consideration. Powerlink is unable to accept the AER's position in relation to 2 of the 12 items, and believes that the AER should re-consider its position on those 2 items.

In particular, Powerlink urges the AER to consider the geographically-sparse Queensland grid rather than pursuing a "one-size-fits –all" approach.

The remainder of the document provides a more detailed response to the AER's Explanatory Statement.

[1] AER, Electricity transmission network service providers – Service Target Performance Incentive Scheme, March 2008, page 4

Table 1 - Quick Reference Guide

Item	Powerlink August Submission	AER Explanatory Statement	Powerlink Response to the Explanatory Statement	Recommended AER Response
Transmission Circuit Availability – sub parameter amendment	Changes to the sub-parameters of peak periods, critical and non-critical circuit elements to transmission lines, transformers and reactive plant.	AER accepted with proviso Powerlink include a 'peak' sub-parameter. AER considers that the MITC parameter does not adequately cover all customers.	Powerlink has provided an additional peak sub-parameter. Section 2.1.	Approve on the basis that it adequately covers the peak periods that have most value to customers and are important to setting the wholesale pool price.
Transmission Circuit Availability – sub-parameter amendment	Changes of 'Circuit' in the availability definition to align with the physical equipment with the proposed sub-parameters of transmission line, transformers and reactive plant.	AER accepted most of the proposed changes but rejected one aspect to align the definition with TransGrid.	Powerlink accepts the AER's proposal. Section 2.2	No further action.
Loss of Supply	The addition of "the period of the interruption starts when a loss of supply event occurs and ends when Powerlink offers supply restoration to the customer" to the definition for the LOS parameter.	AER considered this appropriate on the basis that it has been previously approved for all other NEM TNSPs.	Section 3.2	No further action.
Loss of Supply	The addition of "an interruption > y system minute(s) also registers as a > x system minute(s) event" to the definition for the LOS parameter.	AER considered this appropriate on the basis that it has been previously approved for all other NEM TNSPs.	Section 3.3	No further action.
Loss of Supply	Changes to the moderate (X) and large (y) LOS thresholds from 1.0 to 0.75 and 0.2 to 0.15 system minutes respectively.	AER rejected Powerlink's proposed thresholds and replaced with 0.30 and 0.05 system minutes respectively.	Powerlink does not agree with the proposed severe reductions, and provides further information as to why higher thresholds are needed	Review the additional information in the context of the geographically-sparse Queensland grid (rather than pursuing a one-size-fits-all

Item	Powerlink August Submission	AER Explanatory Statement	Powerlink Response to the Explanatory Statement	Recommended AER Response
			for the geographically-sparse Queensland grid. Powerlink's large and moderate LOS thresholds should be reinstated to 0.75 and 0.15 system minutes. Section 3.1	approach), and set the thresholds to Powerlink's proposed levels. Thresholds need to be set in context, and to provide an incentive to improve performance.
Average Outage Duration – definitional amendment	An interval mean based on the average of events from the 5th to 95th percentile.	AER rejected on the basis that the statistical approach will remove events that it deemed controllable. It also noted that the targets would 'move around' and only firm as the year progresses.	Whilst there are benefits in the Scheme originally proposed, Powerlink accepts the AER proposal to retain the existing Scheme. Section 4.1	No further action.
Average Outage Duration – definitional amendment	Addition of third party exclusions in the outage duration definition.	AER agreed a third party exclusion was appropriate but the example list of exclusions should also be included	Powerlink accepts the AER's proposal noting the example list in not exhaustive. Section 4.2	No further action.
Market Impact of Transmission Congestion – exclusion amendment	Change to the MITC definition to allow the equal apportioning when a TNSP coordinates outages with a DNSP.	AER rejected on the basis that it could offer an incentive to collude with a DNSP to take outages at times that are not beneficial to the NEM.	Powerlink does not agree with the AER, and provides further information as to how the definitional change will reduce outages, and thus benefit the NEM. Section 5.1	Approve the changes to the MITC definition on the basis that it will benefit the NEM by reducing the potential number of outages.
Other Exclusion Amendments	Proposed the removal of third party events examples, "e.g. Intertrip signal, generator outage, customer installation" for the availability and loss of supply parameter exclusions on the basis that sufficient examples	AER rejected on the basis that no valid reason for removing the example has been made and that it is attempting to maintain consistency between TNSPs within the Scheme's Appendix	Powerlink accepts the AER's proposal noting the example list in not exhaustive. Section 6.1	No further action.

Item	Powerlink August Submission	AER Explanatory Statement	Powerlink Response to the Explanatory Statement	Recommended AER Response
	now exist within the precedent of past Scheme audits.	B exclusions.		
Other Exclusion Amendments	Exclusion of the capacitor banks in off-peak months (April to October) for the Availability and Average Outage Duration parameters.	AER accepted on the basis of information provided by Powerlink that shows a significant reduction in capacitor bank utilisation between April to October.	Section 6.3	No further action.
Other Exclusion Amendments	Proposed the addition of 'Under Frequency Load Shedding caused by third party events' as an exclusion for all Scheme sub-parameters.	AER rejected on the basis that the existing third party arrangement would capture a UFLS caused by a Generator's equipment.	Powerlink accepts the AER's proposal given the clarity provided in the Explanatory Statement. Section 6.2	No further action.
AER Proposed Amendments	-	AER proposed a number of amendments to parameter definitions to address legacy text and provide consistency in wording across TNSPs	Powerlink accepts the AER's proposed amendments. Section 7.0	No further action.

2. Transmission Circuit Availability – Sub-Parameter Amendment

The Transmission Circuit Availability parameter is designed to provide an incentive to TNSPs to ensure that the transmission network is energised and able to transport electricity. As the AER rightly identifies in its Explanatory Statement, the transmission circuit availability parameter is a lead indicator of reliability[2], i.e. network availability ultimately impacts network reliability.

In its August 2010 submission[3], Powerlink proposed changes to the sub-parameters of peak periods, critical and non-critical circuit elements to transmission lines, transformers and reactive plant. Powerlink considers that a shift away from the existing sub-parameters removes the overlap between the service component and market component of the Scheme. That is, with the introduction of the new MITC parameter[4], Powerlink is incentivised to minimise outages of critical elements at all times in order to minimise the impact of outages on the market. The new sub-parameters also enabled Powerlink to undertake work at the most appropriate times, irrespective of whether that is peak or off-peak.

The AER considers that the MITC parameter does not accurately capture the true impact of transmission unavailability, noting that it only captures the effects of transmission outages on the dispatch of generators (and scheduled loads); it does not capture the impact on ordinary customers or unscheduled generators and loads[5]. The AER concluded that an outage on a transmission line which only affects customers could have a very substantial customer impact, but that impact would not be picked up in the market impact parameter and that some form of 'peak' availability sub-parameter should remain.

In its Explanatory Statement, the AER accepted Powerlink's proposal to adopt individual plant sub-parameters of transmission lines, transformers and reactive plant. However, for the reasons discussed above, the AER has requested that Powerlink include an appropriate 'peak' availability sub-parameter.

To assist the AER with its requirement for an additional 'peak' sub-parameter, Powerlink provides the following information.

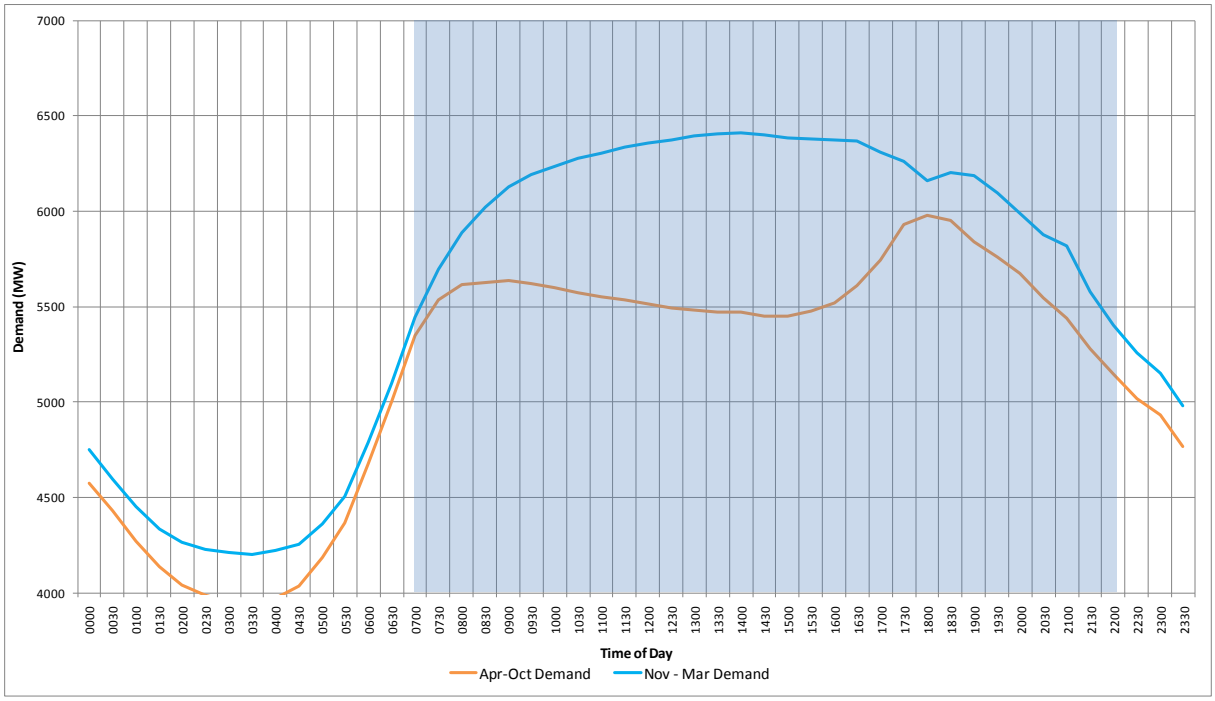
2.1. Peak Transmission Availability - Sub-Parameters

As suggested by the AER[6], Powerlink agrees that demand in the Queensland transmission network can be fairly constant across traditional 'peak' periods. Figure 1 shows the Queensland daily demand profile for November to March and April to October periods. The data has been averaged from June 2007 to June 2010. The information supports the AER's statement and demonstrates that Powerlink's peak system load starts around 07:00 in the morning and continues through to 22:00 in the evening during the summer months. The chart clearly shows that demand is flatter and higher during the November to March period when compared to the April to October period. It also illustrates the period when

[2] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 4.
[3] Powerlink, Powerlink Service Target Performance Incentive Scheme Proposal, August 31 2010, Page 3
[4] Powerlink commenced under the Market Impact scheme on 18 July 2010.
[5] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 8.
[6] Ibid, page 8.

transmission network users place greatest value on the reliability of Powerlink's transmission system is the summer months between 07:00 and 22:00.

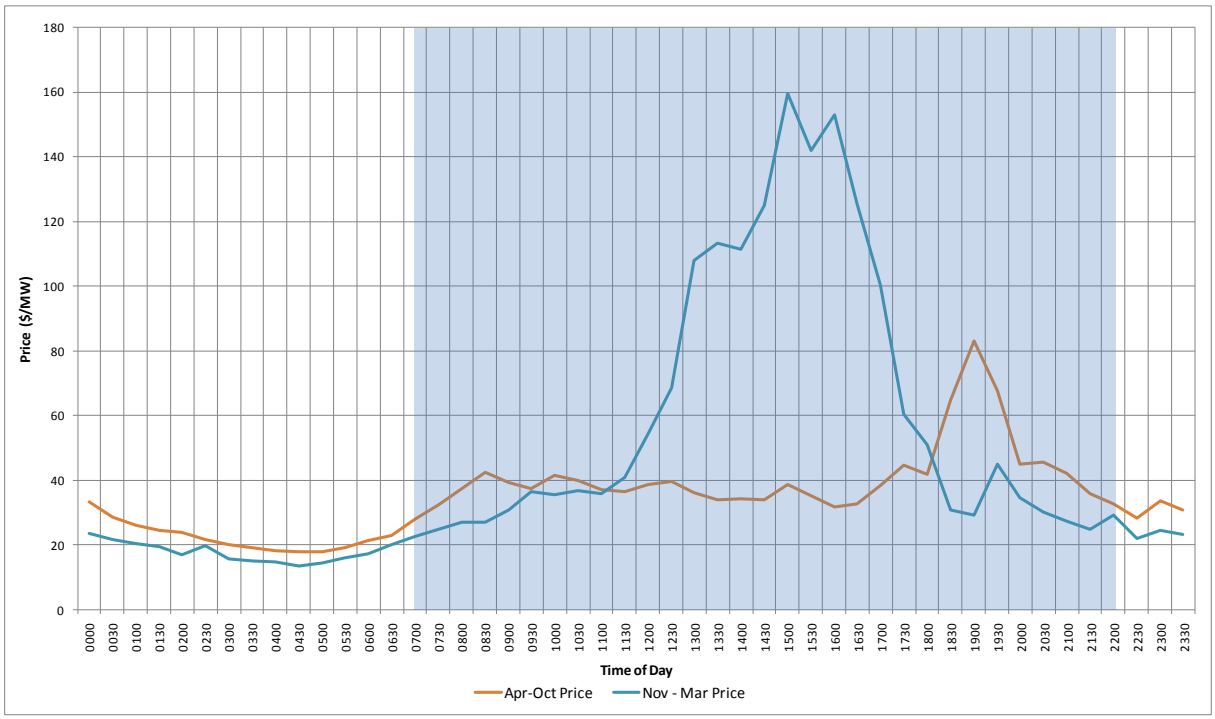
Figure 1 - Queensland Average Demand (MW) (from 2007-2010) Profiles



Source: Powerlink Metering Information

Similarly, Figure 2 shows the Queensland wholesale electricity price for the November to March and April to October periods. The data has been averaged from June 2007 to June 2010. The chart shows that Queensland's electricity price typically peaks from 12:00 noon through to 18:00 in the early evening. As a result, in Queensland, this is the period when the reliability of transmission system elements has most potential impact on spot prices.

Figure 2 - Queensland Average ($/MWh) (from 2007 to 2010) Profiles



Source: AEMO NEM Data

The AER suggested that Powerlink may elect to retain the proposed sub-parameters (transmission lines/transformers/reactive plant), but further divide those parameters into peak/off-peak sub-components[7]. However, Powerlink has concerns that this would result in three additional transmission circuit availability sub-parameters and have the impact of diluting the financial incentive of each parameter, as well as increasing the administrative burden and reporting complexity of the Scheme. To minimise these impacts, Powerlink considers that a reasonable alternative is to include a single peak transmission circuit availability measure.

To address the AER's concerns, Powerlink proposes Transmission Circuit Availability (Peak Periods) as an additional transmission circuit availability sub-parameter. Transmission Circuit includes the individual plant of transmission lines, transformers and reactive plant, which is consistent with the definition in Powerlink's existing scheme. "Peak Periods" refers to the months from November through to March, with a time period from 07:00 in the morning to 22:00 in the evening. It is further proposed that weekends and public holidays are not included in the sub-parameter.

The "Peak Period" months have been proposed on the basis that they exclude the "off-peak" months of April to October (accepted by the AER for the exclusion of capacitor banks). The proposed time interval (as detailed in blue in Figures 1 and 2 above), and the exclusion of weekends and public holidays is the same as the peak time period for Powerlink's existing

[7] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 8

Scheme. These time periods also reflect the historical peak demand and price period that have the most impact on reliability and will also capture the impact on ordinary customers[8].

To demonstrate the robustness of Powerlink's proposed additional availability measure and to assist the AER's assessment, Powerlink has provided its historic performance using the proposed availability sub-parameter. Table 2 provides Powerlink's availability performance history for the additional Transmission Circuit Availability (Peak Periods) sub-parameter for 2006 to 2009. This calculation is based on the information previously submitted to the AER in the August 2010 submission. The calculation identifies the aggregate unavailability (in hours) for planned and unplanned outages and divides this by the total number of available hours. Availability was then calculated by subtracting the unavailability % from 100%.

Table 2 - Powerlink's Historical Circuits Peak Performance from 2006-2009

Sub-Parameter	Actual Performance (Calender Year)			
	2006	2007	2008	2009
Transmission Circuit Availability (Peak Periods)	98.68	98.85	98.69	98.45

Parameter Weightings

Powerlink notes that the AER has made statements in its Explanatory Statement regarding the weighting of transmission availability and loss of supply parameters[9]. Section 3.3 of the Scheme Guideline[10] requires parameter weightings be addressed in Powerlink's May 2011 Revenue Proposal.

2.2. Circuit Definition

Powerlink notes the AER's acceptance of Powerlink's proposal to include reactors in the 'circuits' definition, given the proposed new circuit availability parameters. However, the AER did not consider it appropriate to remove the reference to the other equipment, preferring consistency with the TransGrid 'circuits' definition.

Powerlink does not agree that a definition should be justified simply on the basis that it already applies to another TNSP. However, Powerlink does accept that as technology evolves, there may be new types of plant added to the network which should be included in the definition of a circuit. On balance, Powerlink accepts the AER's proposed definitional amendment for circuit inclusions.

3. Loss of Supply - Threshold Amendment

The loss of supply event frequency parameter provides incentive for a TNSP to reduce the number of events where supply is lost to the customer. The system minute measurement takes into account the duration (in minutes) and size (in MW) of the event.

[8] Ibid, page 8
[9] Ibid, page 9
[10] AER, Electricity transmission network service providers – Service Target Performance Incentive Scheme, March 2008, page 6

3.1. x and y System Minute Thresholds

In its Explanatory Statement, the AER rejected Powerlink's proposed large (y) and moderate (x) LOS thresholds of 0.75 and 0.15 system minutes ,which already incorporated significant reductions to 1.0 and 0.2 system minutes thresholds in Powerlink's current scheme. The AER proposes severe reductions to 0.30 and 0.05 system minutes, respectively. Consistent with its August 2010 submission, Powerlink does not agree with the AER's proposal to severely reduce the x and y thresholds. Powerlink does not disagree with the AER that meaningful incentives should apply. However, Powerlink believes that the AER needs to consider meaningful incentives for Powerlink in the context of the geographically-sparse Queensland grid, rather than pursuing a one-size-fits-all approach.

To provide that meaningful incentive, thresholds need to be set greater than the size of the majority of LOS events for the Queensland grid. If the thresholds are set too low, the incentive is reduced as, in theory, there is no incentive under the Scheme to respond once the y threshold has been exceeded. Further, higher thresholds are not easier to achieve given the target, caps and collars for each threshold are based on actual historical performance. Hence, the incentive exists for any threshold level to improve on historical performance (when within the TNSP's control). Powerlink totally rejects the AER's suggestion that severely reducing the threshold will result in certain events which could previously be ignored by Powerlink now being taken into account[11] . This assertion is fundamentally flawed and unsubstantiated. No loss of supply event is ever ignored by Powerlink, given its reliability and other obligations and the potential impacts on customers. The key objective of the Scheme is that the thresholds must be set high enough to provide a meaningful incentive for most of the LOS events. It is also fundamental to the LOS scheme parameters to include the low frequency but large events, as these are the ones that have a particularly high impact on customers. To set thresholds too low and ignore these events is contrary to the NEO and section of 6A.7.4(b) of the Rules.

The AER stated that there is no information to suggest that Powerlink's thresholds cannot be set in line with the thresholds used by other TNSPs except for its argument of having a long and skinny network.[12] To reinforce its original proposal for LOS thresholds of 0.75 and 0.15 system minutes, Powerlink has provided further information relating to its network characteristics, load composition and operating requirements. This will assist and clarify the AER's understanding of the 'real world' practicalities of operating Powerlink's specific geographically-sparse network. Powerlink considers that regard to the information below will lead to meaningful incentives. A one size fits all approach to the Scheme for TNSPs is not appropriate and should not be adopted.

Powerlink's Network Characteristics

As detailed in the circuit availability section above, Powerlink accepts the AER's requirement for a "peak" transmission circuit availability parameter. The AER's decision to deviate from TransGrid's decision[13] (where peak sub-parameters was not required) was based on its

[11] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 12.
[12] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 12.
[13] AER, Final decision: Electricity transmission network service providers – Service target performance incentive scheme (incorporating incentives based on the market impact of transmission congestion) March 2008, page 9.

assessment of individual network characteristics, i.e. TransGrid's meshed network compared to Powerlink's "long and stringy" network, and differences in demand profile between the regions.

Given this close alignment with the x and y parameters compared to TransGrid, it appears that limited consideration of the differences in network characteristics was given to determining an appropriate x and y thresholds when compared to the transmission circuit availability sub-parameter. Further, alignment is not a sufficient basis to propose similar thresholds across the NEM. It appears that the AER has not applied evidentiary standards to its own analysis, and simply based Powerlink's proposed thresholds on likely target measures rather than first separately considering the thresholds in context.

As identified in Powerlink's proposal and the AER's Explanatory Statement, Powerlink owns and operates one of the "longest and skinniest" and geographically sparse high voltage transmission grids in the world.

The majority of the Queensland transmission network, when compared to the New South Wales and Victorian networks, is adjacent to the coast with minimal network intra-connection. Electricity must be transmitted over long distances to serve a series of sizeable regional cities, towns and large industrial loads. The long, relatively unmeshed nature of the network results in large loads that are less well connected to generation sources compared with the more meshed networks of the southern states. Queensland's electricity transmission network configuration and remote loads are unique compared to other TNSPs in the NEM.

The loss of larger, less well connected loads will result in comparatively higher system minute events for Queensland when compared other NEM TNSPs. Therefore, in order to set an appropriate incentive to manage these loss of supply events, the large and moderate thresholds should be higher than other NEM TNSPs. The AER noted in its Explanatory Statement that "Powerlink's higher thresholds can be partly justified on the grounds that it has a long and skinny network."[14] However, the AER did not justify the extent to which Powerlink thresholds should be higher.

Powerlink had previously commissioned an independent University of Queensland report entitled "Investigations into the Reliability of Meshed versus Extended Transmission Systems" which assesses the impact of radial and meshed network topology on system reliability. The report explores the underlying concepts and techniques for assessing the reliability of electricity networks and recommends indices that measure the extent to which a network is "meshed" or "radial". Building on these concepts, a simplified network is used to demonstrate the impact on "radial" and "meshed" network topologies. The report also compares the Queensland and Victorian high voltage transmission networks configurations to determine what the potential reliability and loss of supply impacts might be.

The report concludes that the Queensland electricity transmission network, when compared to the Victorian electricity transmission network[15], has a severity index (akin to the LOS threshold) of at least 2.5 times higher than the Victorian network. This means that as a result

[14] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 9.
[15] Saha, T., Thapar, A., Investigations into the Reliability of Meshed versus Extended Transmission Systems, University of Queensland, 2005, page 36.

of the different network configurations, the magnitudes of Powerlink's LOS events are likely, over time, to be at least 2.5 times greater than Victoria. The report is included in Appendix B.

The current Victorian LOS x and y thresholds are 0.30 and 0.05 system minutes. Applying a 2.5 'severity index' ratio results in x and y thresholds of 0.75 and 0.125 system minutes respectively. These thresholds are very similar to those proposed by Powerlink, and provide further evidence to demonstrate the need for Powerlink, given its particular network topology and geography, to have higher LOS thresholds than other NEM TNSPs.

Load Composition

Powerlink's 2010 Annual Planning Report indicates that state wide electricity growth is expected to increase by 4.2% per annum on average for the next ten years. This growth is driven partly by "the developing electricity requirements in the Surat Basin area arising primarily from the proposed liquefied natural gas (LNG) upstream processing facilities, coal mining and related load growth in the service towns"[16].

Historically, Powerlink has had a number of directly connected customers, and growth has been driven by consistent increases from distribution supply points. However, developments in the Surat Basin will require Powerlink to connect numerous additional direct connect customers, with loads greater than 100MW.

Powerlink expects to facilitate connection to approximately twice the number of direct connect customers with loads greater than 100MW from the start of the next regulatory period (2012/13), compared with the start of the current regulatory period (2007/08). Other additional loads are also committed to be connected during Powerlink's next regulatory period. This new 'lumpy' load growth is unprecedented, and far outweighs the traditional smooth growth observed at distribution connection points. Further, these new developments are again forecast to be in the geographically remote areas of Powerlink's network.

Powerlink considers that the AER's proposed severe reduction in thresholds removes the financial incentive to respond to these existing and new large loads. The lower thresholds would effectively reduce the time Powerlink has to respond to a large loss of supply event before the threshold is exceeded. If the response time is not practically achievable, the event is outside Powerlink's control and the incentive for Powerlink to respond to the event is removed. The reduced "large" LOS threshold effectively discriminates against larger loads and removes the incentive for Powerlink to further develop processes to respond to these events. For these practical and logical reasons, Powerlink considers that the severely reduced thresholds do not provide appropriate incentives and are contrary to the NEO and Section 6A.7.4 of the Rules.

Operating Requirements

The operation of Powerlink's network is subject to a number of statutory and regulatory requirements set out in the Rules, various legislation and Codes including the National Electricity Network Safety Code (produced by the Electricity Supply Association of Australia). The Electricity Networks Association (ENA) publishes Guidelines that support the objectives of the National Electricity Network Safety Code.

[16] Powerlink, Powerlink Annual Planning Report 2009/10, page 24

The guideline "ENA NENS 07-2006: National Guideline for Manual Reclosing of High Voltage Apparatus Following a Fault Operation" sets out the minimum industry standards for the safe manual reclosing of high voltage electrical apparatus following a network fault.

The Guideline states that "before attempting an initial manual reclose, the Network Operator shall wait a minimum of fifteen minutes (to allow the receipt of information regarding any incident to the Control Centre), and consider sectionalising the feeder and re-energising, section by section."[17]Powerlink has auto-reclose installed on all critical feeders where possible (given constraints on generator feeders). The automatic reclose of transmission lines helps minimise the impact of transitory faults on the network.

However, if a fault fails to clear and the feeder is not automatically returned to service under the ENA Guideline, Powerlink is required to wait 15 minutes (in the absence of other information) before attempting to manually reclose the circuit breaker to restore supply. As a result in these cases the feeder will be out of service for a period greater than 15 minutes. Analysis of Powerlink's LOS for the period 2006 to 2009 shows that 65% of all LOS events occurred on feeders that had Auto Reclose installed and half of these events (32.5% of total LOS events) had durations equal or greater than 15 minutes indicating that manual reclose was required.

Based on its 2006 to 2009 LOS history, Powerlink has determined that the average loss of supply event is 34 MW. The system minute impact of the manual reclose guideline can be calculated by applying the 15 minute duration to the average loss of supply value. This results in a system minute calculation of 0.06 system minutes[18]. This means that a significant number of LOS events which exceeded the AER's proposed threshold of 0.05 system minutes would be outside the control of Powerlink. . This is counter to the Scheme's objectives in that Powerlink must be able to influence the outcome or no incentive exists. Powerlink's proposed threshold of 0.15 system minutes ensures that more of these events are within Powerlink's control, and an incentive exists to improve performance.

Proposed x and y system minute thresholds

In light of the evidence above, Powerlink considers that appropriate LOS thresholds for its network are 0.75 and 0.15 system minutes. These thresholds take account of Powerlink's 'real world' network characteristics, future load characteristics, operating requirements and provide appropriate incentives to improve performance. These thresholds are already significantly reduced from the existing thresholds of 1.0 and 0.2 system minutes. This reduction takes into account Powerlink's improved performance over the last five years, while also considering the counter-acting impact of the large additional remote loads associated with future network development expected to be undertaken during the next regulatory period.

3.2. Period of the Interruption

Powerlink notes that the AER considers it appropriate to make explicit that a loss of supply event ends when a TNSP offers supply restoration to the customer.

[17] Electricity Network Association, "ENA NENS 07-2006: National Guideline for Manual Reclosing of High Voltage Apparatus Following a Fault Operation", Section 6.3
[18] 34MW x 15 minutes ÷ 9000 MW = 0.057 system minutes

3.3. Events Greater than y System Minutes Registering as Greater than x System Minutes

Powerlink notes that the AER considers it appropriate to make explicit that the events greater than y system minutes also register as an x system minute event.

4. Average Outage Duration - Definitional Amendment

In its Explanatory Statement, the AER rejects Powerlink's proposed refinement to use a statistical approach (i.e. an interval mean) on the basis that entire events would be excluded from the calculation. Powerlink has a number of concerns with the AER's assessment of the interval mean approach.

4.1. Interval Mean Parameter

Powerlink disagrees with the AER's statement that the measure would create a perverse incentive for a TNSP to not return a line to service for an outage that nears the threshold, so as to have that event excluded from the calculation of the interval mean[19]. Powerlink considers this to be a theoretical and unsubstantiated claim, which does not have regard to the real world management and operation of a transmission network.

The AER's assertion is also contrary to good electricity industry practice. As stated previously, consistent with its reliability and other obligations and good electricity practice, Powerlink will continue to ensure that customer supply is restored quickly and safely. Further, Powerlink's Customer Connection Agreements require the transmission service to be reconnected as soon as reasonably possible. Powerlink's improved LOS performance[20] over the last ten years is evidence to this commitment and culture. Further, the overall Scheme is structured such that it would penalise such behaviour under the transmission circuit availability parameter and also increase the likelihood of a LOS event. Whilst a theoretical case can be made that a perverse incentive may arise, the AER has not substantiated its claim nor demonstrated why it considers a demonstrably efficient TNSP such as Powerlink would ever operate in such a manner.

In addition, Powerlink notes that rather than relying on a broad statistical approach, the AER has a preference for specifically identifying uncontrollable events[21]. Given the size of the Powerlink network and its exposure to the harsh Queensland environment, a large number of forced outages are experienced on an annual basis. For information, those events do not usually result in a loss of supply and plant is typically returned to service with minimal or no impact on customers. To analyse each forced outage and explicitly include or exclude it from the average outage duration measure is a time consuming exercise, and not necessarily an efficient use of resources.

The AER also raised concerns that the interval thresholds would move around as they were based on percentiles in a distribution that will only take shape as the year progresses[22]. Powerlink agrees with the AER that performance measures with uncertain targets are more

[19] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 15.
[20] The Average Outage Parameter is a lead indicator of LOS performance.

[21] Ibid, page 16
[22] Ibid, page 16

difficult for the TNSP to manage. Whilst there are benefits in the Average Outage Duration Scheme proposed by Powerlink, Powerlink accepts the AER's proposal to retain the existing arrangements.

4.2. Exclusion for Outages Caused by Third party Systems

The AER agreed with Powerlink's August proposal that an exclusion for outages caused by third party systems was appropriate. In addition the AER proposed to use the same wording for exclusions as for the other two parameters.

Powerlink's accepts the AER's proposed wording noting that the example list, is by definition, not exhaustive.

5. Market Impact of Transmission Congestion - Exclusion Amendment

In its Explanatory Statement, the AER rejects Powerlink's proposed change to Appendix C: Market Impact performance component – performance incentive scheme parameter.

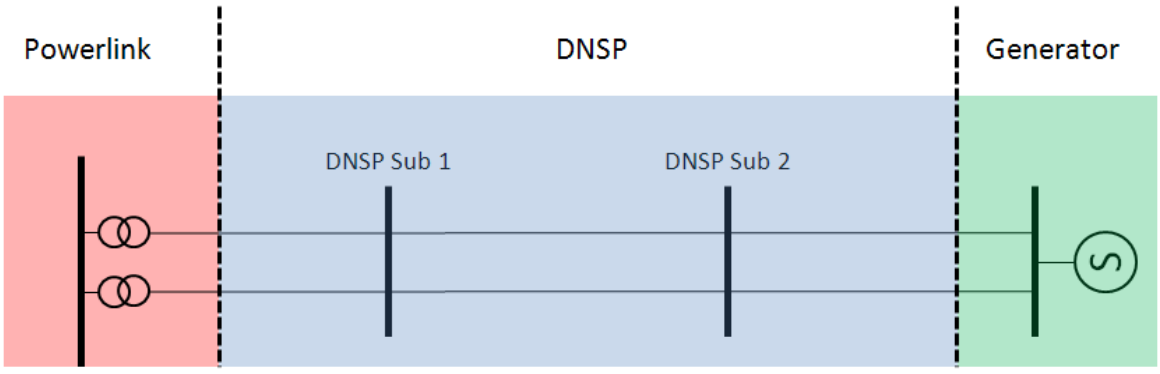
Powerlink proposed the inclusion of an additional statement where the information described in (1), (2), (3) or (4) indicates that a TNSP together with one or more DNSPs are responsible for a single network outage constraint, the TNSP is apportioned an allocation of the number of dispatch intervals that reflects the number of NSPs responsible for the network outage constraint.

Powerlink takes this opportunity to provide the AER with further information to support its proposal.

5.1. Exclusion Amendment

In the Queensland electricity network, a typical embedded scheduled generator connects radially through the DNSP's network to Powerlink's transmission substation (as shown in Figure 3 below).

Figure 3 - Embedded Generator Connection back to Powerlink's Substation



Due to the nature of the generator connection, an outage to the transmission or distribution network could result in a difference in the shadow pool price of greater than $10/MWh. Consequently, if Powerlink were to take an outage at its substation (shown in red in Figure 3)

that affects the connection of the generator, it could incur a dispatch interval count and impact the market.

To minimise the impact to the market, there should be an incentive for Powerlink to seek out opportunities where outages to its substation can be co-ordinated with outages to the DNSP's network. This is akin to the AER stated definition that permits TNSPs to equally share dispatch intervals.

Powerlink understands that an MITC incentive scheme does not currently apply for DNSPs. However, an outage taken by the DNSP on its network (shown in blue in Figure 3) has the same potential to impact the market as an outage at Powerlink's substation.

The AER suggests that if the proposed amendment was allowed, Powerlink would be able to effectively "collude" with DNSPs and operate in a manner that would be to the detriment of the NEM[23]. Powerlink strongly refutes the AER's suggestion that it would operate in a manner contrary to the NEO and good electricity industry practice.

An efficient DNSP or TNSP would not take a network outage unless work (be it maintenance or capital replacement/augmentation) is required on the system. The key reason is that unnecessary outages will impact circuit availability and put the network at unnecessary risk.

If Powerlink's proposed change is not included, there is no incentive for Powerlink to coordinate outages such as these with the relevant DNSP and opportunities to reduce market impacts may be forgone. However, if the proposed changes are accepted Powerlink will be incentivised to take outages at the same time as the DNSP. Consequently, the total number of outages and resultant impact on the market will not increase, and has the potential to decrease, benefiting the market and customers.

It is therefore recommended that the AER include the amendment the definition of the Market Impact Performance Component in Appendix C:

> "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"

6. Other Exclusion Amendments

Powerlink proposed three additional changes to the parameter definitions.

6.1. Third Party Events

The AER did not agree with altering the definition of a third party event, and proposed the existing definition be retained. Powerlink maintains the third party event exclusions allowed in past AER decisions provides robust guidance. However as per Section 4.2 Powerlink accepts the AER's proposed wording noting the for example list is not exhaustive.

[23] AER, Explanatory statement - Proposed amendment Electricity transmission network service providers - Service target performance incentive scheme, page 17.

6.2. Under Frequency Load Shedding caused by Third Party Events

The AER did not consider it appropriate to explicitly identify under frequency load shedding caused by third party events as an exclusion, given that such an event would be captured by the current third party event exclusion.

Powerlink accepts the AER's proposed wording given the confirmation in the Explanatory Statement that under frequency load shedding caused by a third party event would be excluded, and is covered by the more generic third party event exclusion.

6.3. Capacitor Banks in Off-Peak Seasonal Periods

Following the provision of the additional capacitor bank utilisation data, Powerlink notes the AER's acceptance of its proposal to exclude capacitor banks from the availability and average outage duration parameters during off-peak seasonal periods.

7. AER Proposed Amendments

Powerlink accepts the AER's additional minor amendments to the Powerlink parameter definitions to address legacy text, and provide consistency in wording across TNSPs (where appropriate).

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

For convenience, enhancements to the AER's proposed Scheme definitions outlined in the Explanatory Statement have been marked up with strike-through and blue text (see attached).

9. Appendix B – University of Queensland Report "Investigations into the Reliability of Meshed versus Extended Transmission Systems"

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 from 1 November through to 31 March 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 330kV 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 ~~critical~~ circuits~~/system components~~ 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 NOTE: under section 3.5 of the AER's Information Guidelines, the TNSP must provide a list to the AER each year of the events that the TNSP considers should be excluded from performance results, including reasons and how the event meets the relevant exclusion definition

Parameter 2	**Loss of supply event frequency**
Sub-parameters	frequency of events where loss of supply exceeds x system minutes frequency of events where loss of supply exceeds y system minutes
Unit of measure	number of significant events per annum.
Source of data	TNSP outage reporting system
Definition/formula	number of events greater than x system minutes or y 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 >y system minutes also registers as a >x system minutes event x = ~~0.05~~ 0.15 y = ~~0.2~~ 0.75
Inclusions	all unplanned outages exceeding the specified impact (that is, x system minutes and y 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* NOTE: under section 3.5 of the AER's Information Guidelines, the TNSP must provide a list to the AER each year of the events that the TNSP considers should be excluded from performance results, including reasons and how the event meets the relevant exclusion definition

Parameter 3	**Average outage duration**
Unit of measure	Minutes
Source of data	TNSP outage reporting system
Definition/formula	formula: $\frac{\text{Aggregate minutes duration of all unplanned outages}}{\text{Number of events}}$ definition: the cumulative summation of the outage duration time for the period, divided by the number of outage events 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—e.g. intertrip signal, generator outage, customer installation NOTE: under section 3.5 of the AER's Information Guidelines, the TNSP must provide a list to the AER each year of the events that the TNSP considers should be excluded from performance results, including reasons and how the event meets the relevant exclusion definition