Calculation of Service Standards

2008/09 – 2013/14

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Contact

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1 Introduction

This paper covers the methodology used to estimate the new targets for the Australian Energy Regulator (AER) service standards scheme over the next regulatory period.

2 Background

The AER has advised that the outage incentive scheme will continue in the next reset period and that they would like the scheme to include transmission outages for customer and third party related works on the shared network. Their aim is to have SP AusNet reporting on a consistent basis with the other TNSP's.

3 Targets Measured in Scheme

These targets measure performance across a wide number of targets. These targets are categorised in to three groups, which are;

Availability Measures

- Total Circuit Availability,
- Peak Critical Availability,
- Peak Non Critical Availability,
- Intermediate Critical Availability, and
- Intermediate Non Critical Availability.

Loss of Supply Event Index

- >0.05 min per annum, and
- >0.3 min per annum.

Average Outage Duration

- Lines, and
- Transformers.

4 Historical Performance 2002 to 2006

Actual performance outcomes over the past five years are outlined in Table 1. These performance outcomes include outages caused through SP AusNet's CAPITAL and OPEX works along with forced and fault outages.

Table 1 - Performance incentive scheme – Historical Performance without Customer Augmentation Outages.

	Measure	Actual Performance					
		2002	2003	2004	2005	2006	Average
Without Customer Augmentation	**Circuit availability:**						
	Total	99.191	99.323	99.269	99.341	99.257	99.276
	Peak Critical	99.085	99.787	99.974	99.945	99.878	99.734
	Peak Non-critical elements	99.107	99.841	99.571	99.857	99.787	99.633
	Intermediate Critical	98.515	99.479	99.804	99.745	99.556	99.42
	Intermediate Non-critical elements	99.487	99.338	99.394	98.21	98.765	99.039
	Loss of supply events:						
	>0.05 system minutes	NA	3	2	5	5	3.75
	>0.3 system minutes	NA	0	0	2	3	1.25
	Average outage duration:						
	Lines	6.136	9.978	2.73	7.542	33.379	11.953
	Transformers	7.498	7.659	4.862	6.644	7.692	6.871

5 Method Used To Derive Targets

5.1 Availability Measures

The target 'Availability Measures' are determined by the duration of outages on transmission elements. These outages are categorised by the cause of the outage as follows;

- Forced and Fault,
- SP AusNet Maintenance,
- SP AusNet CAPEX, and
- Customer / Third party Works.

Forced and Fault

Forced and fault outages are determined using the historical averages of 2002 to 2006. The averaged forced and fault outage duration has been divided into peak and intermediate periods based on the duration of each period i.e. a random failure pattern.

SP AusNet OPEX

Planned and routine maintenance as well as asset work outages are determined using the historical averages of 2002 to 2006. The division of peak, intermediate, critical and non-critical hours have also been determined through historical performance. No adjustments to the historical averages have been made to reflect the increased asset works program, in accordance with the AER Guidelines (AER - Draft Proposed Service Target Performance Incentive Scheme, January 2007)

SP AusNet CAPEX

Circuit availability was calculated using the proposed list of capital works over the 2008 to 2013 reset period. For each project identified on this list an outage plan was developed. From this outage plan the outage duration for each effected transmission element was calculated.

Each project was assessed so that works causing multiple outages on the same transmission element were combined, reducing the overall outage. In special cases (where the equipment can be rebuilt in a new location) the outage duration was calculated based on installation time rather than the time needed to replace the element in situ, hence reducing the outage time.

Critical and Non-Critical

The definition of critical and non-critical equipment has been rolled forward from the existing scheme. Critical and Non-Critical outage durations are allocated based on the forecast outages on these network elements.

Timing of Peak, Intermediate and Off-Peak

The timing of peak, intermediate and off-peak hours have been rolled forward from the existing scheme. Forecast peak, intermediate and off-peak outage hours are allocated through historical averages over the 2002 to 2006 period.

Table 2 Performance incentive scheme – Timing of Peak, Intermediate and Off-peak hours.

Period Designation	Inclusive Calendar Period	Calendar Period Exclusions
Period 1 – Peak	Mid-November – Mid-March (inclusive) Weekdays (Mon. – Fri.) Between 1100-2000hrs (Eastern Summer Time)	Weekend days (Sat. / Sun.) Public Holidays From the last weekday before Christmas Day to the first weekday after New Year's Day (inclusive)
Period 2 – Intermediate	1 June – 31 August (inclusive) Weekdays (Mon. – Fri.) Between 0700-2200 hours	Weekend days (Sat. / Sun.)
Period 3 – Off Peak	All other times	

5.2 Loss of Supply Event Index

The target 'Loss of Supply Event Index' measures the frequency of events that directly impacts on customers. The proposed targets are calculated using the historical average from 2003 to 2006, adjusted for the increase in the CAPEX program. This adjustment is justified, as there is a direct relationship between the amount of work performed on the network and interruptions to supply.

The increased CAPEX program over the 2008 - 2013 period will decrease the circuit availability due to outages needed for construction and connection of the identified works program. The increased outages on the network will reduce the redundancy of the system and therefore an increase in loss of supply events may also occur.

5.3 Average Outage Duration

The target 'Average Outage Duration' measures the average amount of time it takes to return a piece of plant to service after a fault. The proposed targets have been set using the historical data from 2002 to 2006.

Proposed Outage Duration Cap

A proposed one-week (168 hours) cap on individual events ensures that one event cannot dominate the measured performance, therefore destroying the incentive properties of the measure.

5.4 Proposed Targets without Customer Augmentation

The existing performance targets, average historical performance outcomes and the proposed targets as calculated using the methodology listed above are outlined in Table 3. The proposed targets include Forced and Fault, SP AusNet CAPEX and SP AusNet OPEX outages, as well as taking into account the proposed fault duration cap. As the Forced and Fault and the SP AusNet OPEX targets are based on the historical average the 'shift' from the historical values is only attributable to the increase in CAPEX related outages.

Table 3: Performance incentive scheme – Proposed Targets without Customer Augmentation Outages

	Measure	2003/08 Target	Historical 2002/06 Outcome	Proposed Targets Without Customer Augmentation	Adjustment from Historical
Without Customer Augmentation	**Circuit availability:**				
	Total	99.2	99.276	98.859	-0.417
	Peak Critical	99.9	99.734	99.55	-0.184
	Peak Non-critical elements	99.85	99.633	99.445	-0.188
	Intermediate Critical	99.85	99.42	98.811	-0.609
	Intermediate Non-critical elements	99.75	99.039	98.695	-0.344
	Loss of supply events:				
	>0.05 system minutes	2	3.75	4	0.25
	>0.3 system minutes	1	1.25	2	0.75
	Average outage duration:				
	Lines	10	6.589*	7	0.411
	Transformers	10	6.871	7	0.129

* Adjusted for proposed outage duration cap

Note: Numbers in Tables may not add to total due to rounding

6 Customer Augmentation

The AER has advised that they would like the scheme to include transmission outages for customer related works. To fulfil this request the following method was used to predict the outages.

Augmentation CAPEX outages have been forecast based on the *VENCorp Annual Planning Report* (2006) and the distribution companies *Transmission Connection Planning Report* (2006). Circuit availability was calculated using outage plans developed to complete these projects.

Some additional outages allowances have been made for tower relocations, as these are not reported in these documents, and for generator connections, as these are not planned out to 2013. Both these allowances have been calculated based on the historical and forecast frequency of tower relocations and generator connections.

6.1 Proposed New Exclusions

Fault Level Mitigation Works

It is posed to exclude fault level mitigation works as Vencorp has not formulated a strategy to deal with this issue and the solution chosen can have significantly different outage requirements. It is also proposed to exclude fault level mitigation works associated with new customer connections for the same reason.

Line Up Rating

Line up rating where replacement of line conductors is required have a significant affect on circuit availability and as there is none forecast for the next reset period it is proposed to exclude outages for this work if a line up rating is requested by a customer.

Interconnector Upgrades

Interconnector upgrades are generally very large projects with substantial outage requirements. No projects of this nature are specifically forecast by VENCorp so it is proposed to exclude this work category rather than attempt to make a provision

Switchyard Busbar Up rating

Works required to up rate a busbar rating for fault level or normal current are to be excluded as the outage requirements for this work may be significant depending on the station configuration. As there is no definite forecast works it is proposed to exclude this work category rather than attempt to make a provision.

6.2 Proposed Targets with Customer Augmentation

The output of the proposed performance targets is shown in table four below. The measures (both historical and proposed) include customer augmentation and the proposed exclusions.

Table 4 Performance incentive scheme – Proposed Targets with Customer Augmentation Outages

	Measure	2002/06 Historical Performance With Customer Augmentation	2008/13 Forecast Outages Proposed Targets	Adjustment from Historical
With Customer Augmentation	**Circuit availability:**			
	Total	99.111	**98.682**	-0.429
	Peak Critical	99.619	**99.283**	-0.336
	Peak Non-critical elements	99.43	**99.355**	-0.075
	Intermediate Critical	99.076	**98.494**	-0.582
	Intermediate Non-critical elements	98.749	**98.618**	-0.131
	Loss of supply events:			
	>0.05 system minutes	3.75	**4**	0.25
	>0.3 system minutes	1.25	**2**	0.75
	Average outage duration:			
	Lines	6.589*	**7**	0.411
	Transformers	6.871	**7**	0.129

* Adjusted for proposed outage duration cap

Note: Numbers in Tables may not add to total due to rounding

A comparison of the proposed performance targets with and without customer augmentation is shown in table five below.

Table 5 Performance incentive scheme – Proposed Targets with and without Customer Augmentation Outages

	Measure	Proposed Targets 2008/13 Using Forecast Outages		Adjustment
		Without Customer Augmentation	With Customer Augmentation	
With / Without Customer Augmentation	**Circuit availability:**			
	Total	98.859	**98.682**	-0.177
	Peak Critical	99.55	**99.283**	-0.267
	Peak Non-critical elements	99.445	**99.355**	-0.09
	Intermediate Critical	98.811	**98.494**	-0.317
	Intermediate Non-critical elements	98.695	**98.618**	-0.077
	Loss of supply events:			
	>0.05 system minutes	4	**4**	0
	>0.3 system minutes	2	**2**	0
	Average outage duration:			
	Lines	7	**7**	0
	Transformers	7	**7**	0

* Adjusted for proposed outage duration cap

Note: Numbers in Tables may not add to total due to rounding

7 Caps and Collars

Caps are placed above the target by an amount equal to one standard deviation from the historical average, while collars are placed below the target by an amount equal to two standard deviations from the historical average. The asymmetry reflects the fact that performance is already high and therefore improvements are more difficult to achieve than performance reductions.

8 Proposed Targets

The output of the proposed performance targets with collars and caps are shown in table six below.

Table 6: Performance incentive scheme – Proposed Targets with Collars and Caps

	Measure	Historical	Using Forecast Outages		
		With customer works	Collar	Target Proposed Targets	Cap
With Customer Works	**Circuit availability:**				
	Total	99.111	98.378	**98.682**	98.835
	Peak Critical	99.619	98.513	**99.283**	99.668
	Peak Non-critical elements	99.43	98.871	**99.355**	99.597
	Intermediate Critical	99.076	97.108	**98.494**	99.188
	Intermediate Non-critical elements	98.749	97.247	**98.618**	99.303
	Loss of supply events:				
	>0.05 system minutes	3.75	7	**4**	2
	>0.3 system minutes	1.25	4	**2**	1
	Average outage duration:				
	Lines	6.589*	12	**7**	4
	Transformers	6.871	10	**7**	6

* Adjusted for proposed outage duration cap

Note: Numbers in Tables may not add to total due to rounding