DRAFT DECISION
ElectraNet transmission determination
2018 to 2023

Attachment 11 − Service target performance incentive scheme

October 2017

AUSTRALIAN ENERGY REGULATOR

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Note

This attachment forms part of the AER's draft decision on ElectraNet's transmission determination for 2018–23. It should be read with all other parts of the draft decision.

The draft decision includes the following documents:

Overview

Attachment 1 – Maximum allowed revenue

Attachment 2 – Regulatory asset base

Attachment 3 – Rate of return

Attachment 4 – Value of imputation credits

Attachment 5 – Regulatory depreciation

Attachment 6 – Capital expenditure

Attachment 7 – Operating expenditure

Attachment 8 – Corporate income tax

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Shortened forms

Shortened form	Extended form
AARR	aggregate annual revenue requirement
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
capex	capital expenditure
CESS	capital expenditure sharing scheme
EBSS	efficiency benefit sharing scheme
ERP	equity risk premium
FCAS	Frequency Control Ancillary Service
MAR	maximum allowed revenue
NEL	national electricity law
NEM	national electricity market
NEO	national electricity objective
NER	national electricity rules
NSP	network service provider
NCIPAP	Network Capability Incentive Projects Action Plan
opex	operating expenditure
RIN	regulatory information notice
STPIS	service target performance incentive scheme
TNSP	transmission network service provider

11 Service target performance incentive scheme

The service target performance incentive scheme (STPIS) provides a financial incentive to transmission network services providers (TNSPs) to maintain and improve service performance. The current version of the STPIS, version 5, includes three components: a service component, market impact component and a network capability component.[1]

The Service Component provides a reward/penalty of +/- 1.25 per cent of MAR to improve network reliability, by focussing on unplanned outages. The Service component is designed to encourage TNSPs to seek to reduce the number of unplanned network outages and to promptly restore the network in the event of unplanned outages that result in supply interruptions. This component is also designed to indicate potential reliability issues.

The market impact component (MIC) provides an incentive to TNSPs to minimise the impact of transmission outages that can affect wholesale market outcomes. The MIC measures performance against the market impact parameter which is the number of dispatch intervals (DIs) where an outage on the TNSP's network results in a network outage constraint with a marginal value greater than $10/MWh.[2] TNSPs receive a reward or penalty of up to 1 per cent of MAR for the relevant calendar year. Under clause 4.2(a) of version 5 of the STPIS, a TNSP must submit seven calendar years of data. The target is set in the revenue determination based on the median five of the seven years of historical performance.

The network capability component is designed to encourage TNSPs to develop projects (up to a total of 1 per cent of the proposed MAR per year) in return for a pro-rata incentive payment of up to 1.5 per cent of MAR, depending on the successful completion of proposed projects. This component encourages TNSPs to examine their networks to identify suitable low cost one-off operational and capital expenditure projects that improve the capability of the transmission network at times when it is most needed.

11.1 Draft decision

We will apply all components of version 5 of the STPIS to ElectraNet for the 2017/18–22/23 regulatory control period as detailed below.

Our draft decision is based on the 2010–2016 audited data. For the final decision, we require ElectraNet to submit its 2017 data under version 5 of the STPIS with its revised revenue proposal.

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1 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 2.2(a)(1–3).

2 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, Appendix C.

Table 11-1 Draft decision — Caps, floors and targets for 2017/18–2022/23

Sub Parameter	Best fit	Floor	Target	CAP
Unplanned outage circuit event rate:				
Transmission line outage - fault	Triangular (KS preferred)	8.7	27.0	38.1
Transformer outage – fault	Weibull	18.0	31.0	43.0
Reactive plant – fault	Loglogistic	13.3	27.7	43.8
Transmission line outage – forced outage	Pearson5	7.7	11.4	16.6
Transformer outage – forced outage	Triangular (KS preferred)	5.5	15.5	23.8
Reactive plant – forced outage	LogLogistic	7.8	17.5	29.5
Loss of supply event frequency (number of events):				
> (x) system minutes	Poisson	1	4.2	8
> (y) system minutes	Poisson	0	2.4	5
Average outage duration (minutes):	Pearson5	106	161	235
Proper operation of equipment (number of events):				
Failure of protection system	Poisson	15.00	22.60	31.00
Material failure of SCADA	Poisson (preferred Akaike information criterion)	0.00	1.2	3.00
Incorrect operational isolation of primary or secondary equipment	Poisson	4.00	7.8	13.00

Source: AER analysis.

Table 11-2 Draft decision —MIC parameter values for 2017/18–2022/23

Parameter values - MIC	Indicative (2010–2016
2010	1,790
2011	1,362
2012	4,255
2013	2,465
2014	96
2015	10,629
2016	11,591
Target (draft decision, place holder)	4,100
Cap for unplanned outages	703
Dollar per dispatch interval	$719 per DI
	($ real 2017-18)

Source: AER analysis.

Table 11-3 Draft decision — 11.1 Network capability component for 2017/18–2022/23 ($ nominal)

ElectraNet proposed project priority ranking	Project	Description	Improvement target	Opex	Capex	Total
1	Tailem Bend – Mobilong 132 kV Tailem Bend – Tungkillo 275 kV Tailem Bend – Cherry Gardens 275 kV South East – Tailem Bend #1 275 kV South East – Tailem Bend #2 275 kV	Apply dynamic ratings to the circuits that make up the Heywood interconnector in South Australia to better account for favourable weather conditions.	See appendix A		100,000	100,000

2	Davenport – Belalie – Mokota – Robertstown 275 kV Davenport – Mt Lock - Canowie – Robertstown 275 kV	Remove and replace plant that are rated lower than the design capability of the conductors	See appendix A		1,300,000	1,300,000
3	Robertstown 275/132 kV transformers	Install DR-E3 transformer management relays and the bushing monitoring add-on to the two 275/132 kV transformers at Robertstown	See appendix A		500,000	500,000
4	State-wide	To review the existing AULimit search program to support other power system analysis software packages currently available in the market such as Power Factory, its limit search criteria, appropriate programing language and any improvement that potentially be achieved in improving the accuracy of the limit derivation methodology.	See appendix A	100,000	200,000	300,000
5	South East 275 kV substation	Install an additional 100 Mar capacitor at South East substation	See appendix A		3,600,000	3,600,000
6	Templers - Waterloo 132 kV	Install Smart Wires Powerline Guardian SD4-1200 and 3 Guardian 390-800 devices on Waterloo - Templers 132 kV.	See appendix A		5,900,000	5,900,000

7	Tungkillo 275 kV	Tie in Tailem Bend to Cherry Gardens 275 kV at Tungkillo.	See appendix A	5,300,000	5,300,000
Total					17,000,000

Source: AER analysis.

11.2 ElectraNet's revenue proposal

ElectraNet's revenue proposal sought to apply version 5 of the STPIS as follows:

- the service component parameter targets are set equal to average historic performance and the caps and floors are set at the 5th and 95th percentiles of historic performance[3]
- the Market Impact Component (MIC) performance data from 2010–16 is included to enable calculation of the parameter values set out in clause 4.2 (b) (1)–(3), being the annual performance target, the unplanned outage event limit and the dollar per dispatch interval incentive[4]
- the Network Capability Incentive Parameter Action Plan (NCIPAP) proposes seven priority projects to improve network capability. The total proposed cost of the NCIPAP is approximately $17 million, which may lead to an incentive reward up to 50 per cent of the cost. This would amount to about $6.6 million, over the 2017/18–2022/23 regulatory control period if the relevant conditions are met.[5]

11.3 AER's assessment approach

A revenue determination for a TNSP is to specify, amongst other things, the annual building block revenue requirement for each regulatory year of the regulatory control period.[6] In turn, the annual building block revenue requirement must be determined using a building blocks approach, under which one of the building blocks is the revenue increments or decrements (if any) for that year arising from the application of any STPIS (and other schemes).[7] We have assessed ElectraNet's revenue proposal against the requirements of the STPIS version 5.

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3 ElectraNet, *Revenue proposal: Attachment 11 Service Target Performance Incentive Scheme*, 28 March 2017, p. 12.

4 ElectraNet, *Revenue proposal: Attachment 11 Service Target Performance Incentive Scheme*, 28 March 2017, p. 12.

5 ElectraNet, *Revenue proposal: Attachment 11 Service Target Performance Incentive Scheme*, 28 March 2017, p. 14; AER, *Final – Service Target Performance Incentive Scheme, October 2015,* cll 5.2 and 5.3.

6 NER, cl. 6A.4.2(a)(2).

7 NER, cll. 6A.5.4(a)(5), 6A.5.4(b)(5) and 6A.7.4.

11.3.1 Service component

We assessed whether ElectraNet's proposed performance targets, caps and floors comply with the STPIS requirements for:[8]

- average circuit outage rate, with six sub parameters[9]
- loss of supply event frequency, with two loss of supply event sub-parameters[10]
- average outage duration
- proper operation of equipment, with three sub-parameters.[11]

We must accept ElectraNet's proposed parameter values if they comply with the requirements of specified in clause 3.2 of the STPIS.[12] However, we may reject them if we form the opinion that they are inconsistent with the objectives of the STPIS.[13] We measure actual performance for the 'average circuit outage rate' and 'average outage duration' parameters on a two calendar year rolling average in accordance with appendix E of the STPIS.

We assessed ElectraNet's service component proposal against the requirements of the STPIS — that is, whether:

- ElectraNet's data recording systems and processes produce accurate and reliable data and consistently recorded based on the parameter definitions under version 5 of the STPIS[14]
- the proposed performance targets were equal to the average of the most recent five years of performance data[15]
- any adjustments to the proposed targets made under clause 3.2(j) of version 5 of the STPIS are warranted and reasonable[16]
- ElectraNet applied a sound methodology, with reference to the performance targets, to calculate the proposed caps and floors[17]
- any adjustment to a performance target was applied to the cap and floor of that parameter.[18]

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8 AER, *Final – Service Target Performance Incentive Scheme, October 2015,* clause 3.2.

9 Six parameters include Line event rate–fault, Reactive plant event rate – fault, Lines event rate – forced, Transformer event rate –forced and Reactive plant event rate – forced.

10 They are the number of events greater than 0.05 system minutes per annum and the number of events greater than 0.2 system minutes per annum.

11 They are failure of protection system, material failure of SCADA system and incorrect operational isolation of primary or secondary equipment.

12 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. *3.2(a).*

13 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2*(l)*.

14 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl*.* 3.2(d) *& (f)*.

15 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(*f*).

16 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(*j*).

17 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(e).

18 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(e).

We assessed the probability distributions applied by ElectraNet to calculate caps and floors to determine whether a sound methodology was used.

11.3.2 Market Impact Component

We assessed ElectraNet's market impact component proposal against the requirements of the STPIS — that is, whether:

- data used to calculate the market impact parameter is accurate and reliable, and consistently recorded based on the parameter definition in Appendix C[19]
- the proposed performance target was calculated in accordance with the requirements of clause 4.2(f) in version 5 of the STPIS
- the proposed unplanned outage event limit has been calculated in accordance with the requirements of clause 4.2(h) in version 5 of the STPIS
- the proposed dollar per dispatch interval has been calculated in accordance with clause 4.2(j) in version 5 of the STPIS.

Where ElectraNet's proposed values for the market impact parameter do not comply with the requirements of the STPIS or are otherwise inconsistent with the objectives of the scheme we will reject the proposed values and provide substitute performance targets that comply with the STPIS.[20]

11.3.3 Network capability component

We assessed ElectraNet's network capability component against the STPIS requirements to take into account:[21]

1. the likely effect of the priority project improvement on wholesale market outcomes, including inter-regional outcomes
2. the likely effect of the priority project improvement in ensuring that the transmission network can meet demand at an injection point without major network augmentation or replacement
3. whether the priority project improvement is appropriate, taking into account the forecast changes in demand at a relevant injection point
4. the benefits to consumers resulting from the priority project improvement
5. the extent to which a TNSP would be incentivised or required to undertake such a project under the NER or any other applicable regulatory obligations
6. the time taken for a project to have a net positive benefit

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19 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 4.2(c).

20 AER, *Final – Service Target* Performance Incentive Scheme, October 2015, cll 4.2(d) & (e).

21 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

7. any relevant information contained in the TNSP's most recent annual planning report
8. whether the average total expenditure of all the TNSP's priority projects in each regulatory year is not greater than 1 per cent of the TNSP's annual average maximum allowed revenue.

11.3.4 Interrelationships

The STPIS takes into account any other incentives provided for in the NER that TNSPs have to minimise capital or operating expenditure.[22] One objective of the STPIS is to encourage efficient expenditure 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.[23]

The STPIS interacts with the Capital Expenditure Sharing Scheme (CESS) and the opex Expenditure Benefit Sharing Scheme (EBSS). The STPIS allows us to adjust the performance targets of the service component for the expected effects on the TNSP's performance from any increases or decreases in the volume of capital works planned during the regulatory control period.[24] In conjunction with CESS and EBSS, the STPIS will ensure that:

- any additional investments to improve service quality are based on prudent economic decisions
- reductions in capex and opex are achieved efficiently, rather than at the expense of service levels to network users.

11.4 Reasons for draft decision

We will apply version 5 of the STPIS to ElectraNet in the next regulatory control period.

Our draft decision is based on the 2010–2016 audited data. For the final decision, we require ElectraNet to submit its 2017 data under version 5 of the STPIS with its revised revenue proposal.

11.4.1 Service component

Performance targets must equal the TNSP's average performance history over the past five years unless they are subject to adjustment under clause 3.2(i) or (j) of the STPIS.[25] We generally approve performance targets that are the arithmetic mean of the past five years' performance data.

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22 NER, cl. 6A.7.4(b)(5).

23 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 1.4(b)(3)

24 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(j).

25 AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2.

We accept ElectraNet's performance targets for the next regulatory control period as these are consistent with the methodology outlined in version 5 of the STPIS.[26]

11.4.2 Caps and floors

Proposed caps and floors must be calculated with reference to the proposed performance targets using a sound methodology.[27] In the past, we have generally accepted approaches that use five years of performance data to determine a statistical distribution that best fits the data. We applied the caps and floors set at two standard deviations either side of the mean (if using a normal distribution), or at the 5th and 95th percentiles (if using a distribution other than the normal distribution).

The distribution selected to calculate the caps and floors for a particular parameter must be conceptually sound. Our principles for selecting a distribution to calculate caps and floors are as follows:

- the chosen distribution should reflect any inherent skewness of the performance data
- the distribution should not imply that impossible values are reasonably likely. For example, the distribution for an average circuit outage rate sub-parameter should not imply that values below zero per cent are reasonably likely
- discrete distributions should be used to represent discrete data. For example, a discrete distribution such as the Poisson distribution should be used when calculating caps and floors for loss of supply sub-parameters. Continuous distributions should not be used.

Historically, we have applied the Kolmogorov-Smirnov (K-S) fit (distance) statistic in our regulatory determinations to calculate the caps and floors. We do not consider the Anderson-Darling (A-D) approach to be a sound methodology for calculating caps and floors. We determine that we will apply the Kolmogorov-Smirnov (K-S) fit statistic to the selection of best-fit distribution to calculate ElectraNet's Services' caps and floors. This is consistent with our historical approach to calculating the caps and floors. The K-S statistic is based on the maximum difference between the sample distribution and the test distribution. As a refinement, the A-D statistic gives more weight to the tails of the distribution than the K-S test does. We consider the K-S fit statistic is to be preferred due to its simplicity, especially when there is no evidence to suggest the A-D fit statistic is more appropriate in this particular case. Further, with only five data points being available, we consider that placing more weight across the tail end (to the right)[28] by using the A-D statistical fit is an unsound methodology.[29]

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[26] ElectraNet, *Revenue proposal: Attachment 11 Service Target Performance Incentive Scheme*, 28 March 2017, p. 12.

[27] AER, *Final – Service Target Performance Incentive Scheme,* October 2015, cl. 3.2(e).

[28] WSP Parsons Brinckerhoff, *ELECTRANET Fitting probability distribution curves to reliability data 2015/16*, February 2017, p. 5.

[29] AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 3.2(e).

Furthermore, ElectraNet's approach on skewness of the distribution appears to be inconsistent. For the parameter “Transmission line outage – fault”, ElectraNet chose a distribution that has the same skew direction as the input data. Whereas, "Transformer outage – forced outage”, ElectraNet chose a distribution that does not have the same direction of skew as the underlying data. For the parameter “Material failure of SCADA", ElectraNet has proposed the Geometric distribution, which had the second lowest Akaike information criterion but provided no reason for doing so. We are not aware of a conceptual reason to prefer the Geometric distribution given this parameter is counting the arrival rate of relatively rare events. Consequently, we consider the Poisson distribution is appropriate because it is the distribution with the lowest Akaike information criterion.

Table 11-1 sets out the caps and floors derived from our approach as discussed above.

11.5 Market impact component

The performance target to apply from April 2018, based on the average performance of the median five years from 2010–16, is at Table 11-2.

Performance target

The performance target is calculated in accordance with clause 4.2(f) of version 5 of the STPIS by:

- calculating the raw performance target which is equal to its average annual performance history against the market impact parameter for the median five out of seven preceding calendar years
- calculating 17 per cent of the raw performance target
- adjusting the annual performance history of ElectraNet's for the seven preceding calendar years by limiting the impact of market impact parameter counts associated with unplanned outages to 17 per cent of the raw performance target
- using the adjusted performance history to calculate the performance target, which is the average adjusted annual performance history of the median five out of seven preceding calendar years

In accordance with this methodology, ElectraNet proposed:

1. A raw performance target (M) of 4910.8 DIs

2. An unplanned outage event limit of (17% of M) of 834.8 DIs and

3. An adjusted performance count of 4910.8.

We do not accept ElectraNet's proposed performance target for the market impact parameter, for the following reasons:

Within its calculation of the 2018–23 raw performance target (M), ElectraNet had included 10 309 counts for the Frequent Control Ancillary Service (FCAS) constraints

(F_S+LREG_0035 and F_S+RREG_0035). These DIs are set out in Table 11-5. We have excluded these DIs from the basis of the 2018–23 raw performance target (M) as a Force Majeure Exclusion, for reasons set out later. Accordingly, we have re-calculated ElectraNet's 'unplanned outage event limit' and adjusted performance count.

Our draft decision, therefore, is to substitute the proposed value of 4910.8 dispatch intervals with 4100 dispatch intervals as per Table 11-4.

Table 11-4 Draft decision —MIC parameter values for 2017/18–2022/23

Year	ElectraNet proposal			AER			Adjusted	
	Planned	Unplanned	Total	Planned	Unplanned	Raw Total	Unplanned	Adj Total
2010	1,611	179	1,790	1,611	179	1,790	179	1,790
2011	1,319	43	1,362	1,319	43	1,362	43	1,362
2012	4,078	177	4,255	4,078	177	4,255	177	4,255
2013	2,362	103	2,465	2,362	103	2,465	103	2,465
2014	87	9	96	87	9	96	9	96
2015	17,237	871	18,108	9,926	871	10,797	703	10,629
2016	13,862	820	14,682	10,888	806	11,694	703	11,591
Raw Target			4,911			4,134		
Unplanned outage event limit			835			703		
Revised Target								4,100

Note (a) The value of the performance target (T) for the market impact parameter is set in the revenue determination and is based on the TNSP's average performance over the most recent seven calendar years, excluding the maximum and the minimum performance measure.

Treatment of FCAS constraints arising from AEMO operational changes

AEMO's approach to managing system security in South Australia (SA) during outages on the Heywood interconnector changed in 2015. Now, AEMO requires 35 MW of regulation FCAS to be sourced locally whenever a single contingency could result in SA becoming an island as a result of a separation event. That is, the new policy requires that the regulation FCAS constraints (F_S+LREG_0035 and F_S+RREG_0035) will be invoked for all circumstances where a single contingency would island SA.

Under the STPIS (version 5) the AER has the discretion to exclude the impact of force majeure events from the performance measure.[30] A force majeure event is any event,

[30] AER, *Final – Service Target Performance Incentive Scheme*, October 2015, Appendix C.

act or circumstances, or combination of event, acts and circumstances which is beyond the reasonable control of the TNSP.[31] For the present purpose of applying the MIC, we have excluded DIs arising from AEMO's new policy under the force majeure clause on the basis that ElectraNet must comply with the new requirement and there is no evidence at this point in time to indicate that ElectraNet is in a position to control the impact of those requirements upon its performance.

TNSP's are bound by the directions of AEMO as the market operator. AEMO's new policy appears to have been implemented to address a system security situation that was previously unforeseen. This is consistent with AEMO's statutory functions "to maintain and improve system security".[32] Whilst AEMO's policy could materially impact a ElectraNet's performance in the long term, we consider that in the short term, it is likely that ElectraNet will not be able to prevent or reduce the impact of the this policy change by adopting better practices.

We recognise that ElectraNet may be concerned that the new operating conditions would not be accounted for in the target for 2018–23, because the target will be based on its performance prior to AEMO's change in FCAS policy. Hence, ElectraNet has included 2998 DIs (in 2016) and 7311 DIs (in 2015) for the Frequent Control Ancillary Service (FCAS) constraints (F_S+LREG_0035 and F_S+RREG_0035) in its 2018–23 performance target calculation.[33] However, we consider that it is appropriate to exclude these DIs because, at this stage, they are of a kind that is beyond ElectraNet's reasonable control. Accordingly, we have removed these DIs from the calculation of the performance target for 2018–23.

Table 11-5 FCAS 35MW requirement that ElectraNet had included in its 2018–23 raw performance target

Constraint ID	2015	2016	Total
F_S+LREG_0035	3698	1499^	5197
F_S+RREG_0035	3613	1499^	5112
Total	7311	2998	10 309

^ ElectraNet shared some of these with AusNet Services as a coordinated outage, so it applied a weighting of 0.5 to 582.5DIs for each constraint.

That said, we will continue to review the ability of ElectraNet to mitigate the impact of the FCAS operational changes (F_S+LREG_0035 and F_S+RREG_0035) in the annual compliance process and may further reassess the setting of ElectraNet's targets at the end of the 2018–23 regulatory control period. Hence, we may establish

31 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, Appendix G.

32 Section 49(1) of the National Electricity Law.

33 Because of the averaging method, the 2015 data is not included in the median 5 years used to calculate the 2018–23 target.

an appropriate target based on the new policy for the 2023 –28 regulatory control period.

We also consider that, if AEMO does change its Power System management policy during 2018–23, then we will review the case for exclusion against the force majeure factors during the annual compliance process. Our consideration will include the degree to which ElectraNet could foresee and mitigate the impact. We also expect that ElectraNet will be able to develop strategies to respond to the new FCAS policy over the forthcoming regulatory period.

Setting unplanned outage limit

Regarding the setting of the unplanned outage limit, we confirm that the unplanned outage event limit is an annual cap that is to be applied to the annual total DIs attributable to unplanned outages in each year of the forthcoming period.

ElectraNet had proposed a limit of 835 DIs. Because we excluded the F_S+LREG_0035 and F_S+RREG_0035 constraints from the raw data, the unplanned outage limit is reduced to 703 DIs and the adjusted Revised Target becomes 4100 DIs.

11.6 Network capability component

11.6.1.1 Revenue forecasts for priority projects

ElectraNet's regulatory proposal and building block included revenue forecasts for the Network Capability Incentive Component. ElectraNet stated that for transparency purposes it felt it appropriate to ensure that all reasonably likely costs to customers in the forthcoming regulatory period be represented in its overall revenue and pricing outlook for presentation purposes.[34]

We do not agree with ElectraNet's proposed approach. We consider that the building block model only includes approved building block revenue. However, NCIPAP incentive payments or clawbacks for an approved plan under the STIPIS are subject to annual approval by the AER at the end of the regulatory period, and become part of the approved MAR at that time for the relevant regulatory year. As such, it is not accurate to recognise projects and payments for projects that have not occurred or been approved in the building block.

ElectraNet can disclose the NCIPAP payments for transparency purposes, as it see fit once the annual STPIS outcomes has been approved.

11.6.1.2 System Security Expenditure

The submission from the Consumer Challenge Panel sub panel 9 (CCP) recommended a review of the Network Capability Projects to account for the South

[34] ElectraNet, *AER information request #009 - STPIS - ElectraNet's NCIPAP revenue forecast*, 8 August 2017, p. 5.

Australian Energy Transformation Regulatory Investment Test for Transmission (RIT-T). Further, the CCP considered the existing assumptions of market benefits drawn from the 2012 Heywood Interconnector upgrade RIT-T should be tested for relevance; noting that there have been significant changes in market conditions since that time.[35]

We note that following the Heywood interconnector upgrade, the interconnector is capable of transmitting 650 MW in either direction. However, the transmission network constraints in SA prevent ElectraNet and/or AEMO from fully utilising the interconnector's available capacity. ElectraNet's NCIPAP projects are intended to address the constraints to improve market access to low cost generation.

The recent announcement of the South Australian Energy Transformation, if implemented, would improve energy security and price outcomes in South Australia. However, we expect that those anticipated changes would have immaterial impact on the benefits of ElectraNet's proposed NCIPAP projects. Those proposed NCIPAP projects are intended to increase the intra-regional power transfer capacity, and consequently the interregional power transfer capacity. We consider that, while the new SA Government energy transformation policies may allow South Australia to rely less on the Heywood interconnector under some operational conditions, South Australia would still need the full Heywood interconnector capacity for import and export at times.

Where, South Australia's generation output exceeds its demand, the excessive output would need to be exported to other states. The export capacity is currently limited by South Australia's transmission network's intraregional transfer capacity. The proposed projects are aimed at increasing the intraregional transfer capacity so that the full interconnector capacity of Heywood can be accessed by South Australian generators.

11.6.1.3 Priority projects

We accept ElectraNet's NCIPAP with a total expenditure of $17 million ($ real 2017/18). The average total expenditure of the priority projects outlined in each regulatory year is not greater than 1 per cent of ElectraNet's average annual maximum allowed revenue as required by clause 5.2(b)(vi) of the STPIS. These projects were also endorsed by the Australian Energy Market Operator in its role of reviewing ElectraNet's NCIPAP.[36]

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[35] Consumer Challenge Panel Sub Panel 9, *Submission to the Australian Energy Regulator (AER) Response to proposals from ElectraNet for a revenue reset for the 2018-23 regulatory period*, 12 July 2017, pp. 32–33.

[36] AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, pp. 1–3.

South East – Tungkillo 275 kV dynamic line ratings

This project would apply dynamic line ratings on the lines in the Heywood interconnector corridor, resulting in moderate increase of interconnector capacity under favourable weather conditions. The estimated cost is $0.1 million.[37]

ElectraNet will install weather stations along the Heywood interconnector transmission corridor to collect and feed live weather data (temperature, wind speed and direction, solar radiation data) into its SCADA system, and implement algorithms to determine real-time dynamic ratings.[38]

ElectraNet's estimated the annual benefit of $0.8 million resulting from increases in the line ratings. We accept this view because this project is likely to produce positive impacts on South Australian spot prices and provide net benefits to South Australian consumers.

AEMO agreed with ElectraNet on its assessment of project need, improvement targets, likely material benefits, and ranking of this priority project.[39]

Consequently, we approve this priority project as it facilitates improvements in the capability of transmission asset.[40]

Removal of plant limits on Robertstown to Davenport lines

This project will remove and replace plant rated lower than the design capability of the conductors the Robertstown to Davenport lines—where existing plant ratings have constrained the full use of line capacities. This work would increase the intra-regional transfer capacity with an estimated cost is $1.3 million.[41]

ElectraNet estimated the annual benefit of $6.2 million resulting from improved access to low cost generation.[42] We accept this view because the project is likely to generate a positive net outcome in a relatively short period.

AEMO agreed with ElectraNet on its assessment of project need, improvement targets, likely material benefits, and ranking of this priority project.[43]

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37 ElectraNet, *Revenue Proposal 2019 -2023, Attachment 11 - Appendix A Network Capability Incentive Parameter Action Plan*, 28 March 2017, pp. 12–14.

38 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

39 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

40 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

41 ElectraNet, *Revenue Proposal 2019 -2023, Attachment 11 - Appendix A Network Capability Incentive Parameter Action Plan*, 28 March 2017, pp. 15–17.

42 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

43 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

Consequently, we approve this priority project as it facilitates improvements in the capability of transmission asset.[44]

Transformer management relay uprating program

This project will install DR-E3 transformer management relays and condition monitoring equipment to the two 275/132 kV transformers at Robertstown, with an estimated cost of $0.5 million.[45]

ElectraNet estimated the annual benefit of $0.24 million resulting from the increase in export capacity through Murray link interconnector. This is likely to benefit both South Australian low cost generators (e.g. wind farms) and other TNSPs in the interconnected regions.[46]

AEMO agreed with ElectraNet on its assessment of project need, improvement targets, likely material benefits, and ranking of this priority project.[47]

We consider the estimated costs to be low for the anticipated benefits and the project is likely to deliver net wholesale market benefit. Consequently, we approve this priority project as it facilitates improvements in the capability of transmission asset.[48]

Constraint formulation improvement investigation

This project to review existing network limit search program (AULimit) to support other power system analysis software packages and improve the accuracy of the limit derivation methodology. The project cost will be $0.2 million in capex and $0.1 million in opex.[49]

ElectraNet estimated the annual benefit of the project to be $0.3 million and should improve the accuracy of ElectraNet's limit calculation methodology to enable lower constraint equation margins, and therefore increases transfer limits by 10MW.[50]

AEMO agreed with ElectraNet on its assessment of project need, improvement targets, likely material benefits, and ranking of this priority project.[51]

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44 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

45 ElectraNet, *Revenue Proposal 2019 -2023, Attachment 11 - Appendix A Network Capability Incentive Parameter Action Plan*, 28 March 2017, pp. 17–19.

46 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

47 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

48 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

49 ElectraNet, *Revenue Proposal 2019 -2023, Attachment 11 - Appendix A Network Capability Incentive Parameter Action Plan*, 28 March 2017, pp. 17–19.

50 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

51 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

We approve this project as it is likely to deliver a net benefit in term of reducing network constraints, hence better access to low cost generations. [52]

South East 275 kV capacitor bank

This project is to install an additional 100MVAr capacitor bank at an estimated cost of $3.5 million.[53]

ElectraNet submitted that the additional reactive support is to address voltage and transient stability limits along the Heywood interconnector transmission corridor. ElectraNet also submits that this should support increased power flow to achieve the 650MW Heywood interconnector limit with an estimated annual benefit of $1 million.[54]

We consider that it would be appropriate for ElectraNet, as the transmission service provider, to address the voltage support/reactive shortage through its capital expenditure program. We also note that ElectraNet has obligations under clause 4.3.4 of the NER in relation to system security. AEMO supports ElectraNet's assessment of the project need, improvement targets, likely material benefits and the ranking of this priority project.[55]

We approve this project under the NCIPAP as it is likely to deliver a net benefit in term of reducing network constraints, hence better access to low cost generations. [56]

Smart Wires PowerLine Guardian trial

This project would install a proprietary product from Smart Wires to reduce line impedance, which in turn should increase line capacity.

Smart Wires products are design to regulate power line flows. It is use to increase network transfer capacity and avoid network constraint binding. For example, in transmission networks, there are situations where the load on one power line reaches operational limit and imposes a power transfer constraint while other lines operating in parallel are underutilised. In these situations, Smart Wire devices may be used to transfer load from the fully loaded power line to other underutilised lines, avoiding a pending network constraint.

We consider that if this trial were successful, it would present a potentially low cost solution for TNSPs to manage network constraints, and avoid or defer major capital expenditure that would otherwise be required to address the constraint. We consider that this trial has a potential to reduce capital expenditure in the long term.

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52 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

53 ElectraNet, *Revenue Proposal 2019 -2023, Attachment 11 - Appendix A Network Capability Incentive Parameter Action Plan*, 28 March 2017, pp. 21–23.

54 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 3.

55 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 2.

56 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

We also note that AEMO agreed with ElectraNet on its assessment of project need, improvement targets, likely material benefits, and the ranking of this priority project.[57]

Hence, we accept this priority project because, despite some level of uncertainty that it will meet the STPIS requirement to facilitate improvements in the capability of transmission assets, this has significant cost saving potential for all users. [58]

Tailem Bend to Cherry Gardens tie in

This project would populate one additional diameter at Tungkillo by tying in the Tailem Bend - Cherry Gardens 275 kV line with an estimated cost of $5.3 million.[59]

ElectraNet claimed that this work would improve voltage angle and voltage stability at Tungkillo, and as a result, increase Heywood Interconnector capacity utilisation by 10 MW. It estimated the annual benefit in a range of $0.2 to $0.5 million.[60]

We consider that the proposed tie in is likely to increase import and export capability across the Heywood interconnector and is likely to deliver a market benefit based on improved access to low cost generation. Consequently, we approve this priority project as it facilitates improvements in the capability of transmission asset. [61]

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57 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 3.

58 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

59 AEMO, *AEMO review of ElectraNet's Network Capability Incentive Parameter Action Plan (NCIPAP) for 1 July 2018 to 30 June 2023*, March 2017, p. 3.

60 ElectraNet, *Revenue Proposal 2019 -2023, Attachment 11 - Appendix A Network Capability Incentive Parameter Action Plan*, 28 March 2017, pp. 25–26.

61 AER, *Final – Service Target Performance Incentive Scheme*, October 2015, cl. 5.2(l).

A Network Capability priority projects targets

Project ranking allocated by ElectraNet	Transmission Circuit / Injection Point	Target Improvement	
		Target limit (Winter rating - MVA)	
Priority Project 1 – South East – Tungkillo 275 kV dynamic line ratings	Tailem Bend – Mobilong 132 kV	207	
	Tailem Bend – Tungkillo 275 kV	684	
	Tailem Bend – Cherry Gardens 275 kV	675	
	South East – Tailem Bend #1 275 kV	766	
	South East – Tailem Bend #2 275 kV	766	
		Summer rating (MVA)	Winter rating (MVA)
Priority Project 2 – Removal of plant limits on Robertstown to Davenport lines	Davenport – Robertstown 275 kV	162	246
	Davenport – Mt Lock 275 kV	115	200
	Mt Lock - Canowie 275 kV	115	200
	Canowie – Robertstown 275 kV	162	246
		Rating (MVA)	
Priority Project 3 – Transformer management relay uprating program	Robertstown 275/132 kV #1 208 Robertstown 275/132 kV #2	208	
Priority Project 4 – Constraint formulation improvement investigation	State-wide	Transient and voltage stability limits	
Priority Project 5 – South East 275 kV capacitor bank	South East 275 kV substation	V^^S_NIL_MAXG + 30 MW V::S_NIL_MAXG + 30 MW V^^S_NIL_TBSE + 30 MW V::S_NIL_TBSE + 30 MW	

Priority Project 6 –Smart Wires PowerLine Guardian trial	Templers – Waterloo 132 kV Robertstown – Tungkillo 275 kV Robertstown – Para 275 kV	S>>NIL_BRTW_WTTP + 17 MW S>>NIL_BRTX_WTTP + 17 MW S>>NIL_BWMP_WTTP + 17 MW S>>NIL_RBTU_WTTP + 17 MW
Priority Project 7 – Tailem Bend to Cherry Gardens tie in	Tungkillo 275 kV	V^^S_NIL_MAXG + 10 MW V::S_NIL_MAXG + 10 MW V^^S_NIL_TBSE + 10 MW V::S_NIL_TBSE + 10 MW