ActewAGL Distribution 2014/15 Transmission Pricing Methodology

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Overview

To cater for increasing demand for electricity in the ACT and the south-eastern region of NSW, the high voltage transmission system that services this area has been augmented. TransGrid established a second 330/132 kV substation at Williamsdale in February 2012, providing a high capacity supply on the south eastern extremity of the ACT, to supplement the existing Canberra 330/132 kV substation to the north of the ACT.

The resulting supply arrangement makes use of the capability of both TransGrid's and ActewAGL's networks, in order to minimise overall costs. Significant portions of ActewAGL's 132 kV network in the ACT perform a transmission function, by operating in parallel with and providing support to TransGrid's 330 kV network. These ActewAGL assets are termed *dual function assets* and constitute a material proportion of ActewAGL's asset base.

As a consequence of this development, the Australian Energy Regulator (AER) has determined that transmission pricing arrangements will apply to ActewAGL's *dual function assets*, from 1 July 2014.

This document sets out the methodology that ActewAGL has developed for its transmission pricing and is a requirement of the National Electricity Rules (the Rules).

1 Introduction

ActewAGL provides both *distribution services* within the ACT and transmission services to south eastern region of NSW. This document outlines ActewAGL's proposed transmission *pricing methodology*.

This *pricing methodology* directly reflects the *pricing principles* for *prescribed transmission services* set out in clause 6A.23 of the Rules. The standardised approach described in this document has been developed to conform with the steps and sequence set out in the National Electricity Rules (the Rules).

This *pricing methodology* is proposed to apply from 1 July 2014 to 30 June 2019.

This document is separate to the *pricing proposal* that ActewAGL must submit to the AER for distribution pricing, under Chapter 6.18 of the Rules.

1.1 Interpretation

In this proposed transmission *pricing methodology,* italicised terms have the meaning given to them in the Australian Energy Regulator's (AER) *transmission pricing methodology guidelines* or in the Rules[1,2].

1.2 Prescribed transmission services

ActewAGL's proposed transmission *pricing methodology* relates to the provision of *prescribed transmission services*. These services are provided by *dual function assets*, which operate in parallel, and provide support to TransGrid's higher voltage transmission network. The services provided by these ActewAGL assets include:

- Shared transmission services provided to *Network Service Provide* (*prescribed TUoS services*);
- Connection services provided to connect ActewAGL's *distribution* network to the *transmission* network (*prescribed exit services*); and
- Services required under the Rules or in accordance with jurisdictional electricity legislation that are necessary to ensure the integrity of the *transmission network*, including through the maintenance of power system security and assisting in the planning of the power system (*prescribed common transmission services*).

This proposed transmission *pricing methodology* does not relate to the provision of negotiated transmission services (deemed as *negotiated distribution services* under clause 6.24.2(c) of the Rules) that may be provided by ActewAGL.

1 AER, *Final Electricity Transmission Network Service Providers Pricing methodology guidelines*, October 2007.

2 AEMC, *National Electricity Rules Version 60*, as at 1 January 2014.

1.3 Rules requirements

Clause 6A.24.1(b) of the Rules states that the transmission *pricing methodology* is a methodology, formula, process or approach that when applied by a TNSP:

(1) allocates the *aggregate annual revenue requirement* (*AARR*) for *prescribed transmission services* to:

  (i) the categories of *prescribed transmission services* for that provider; and

  (ii) *transmission network connection points* of *Transmission Network Users*; and

(2) determines the structure of the prices that a *Transmission Network Service Provider* may charge for each of the *categories of prescribed transmission services* for that provider.

The Rules also require that the transmission *pricing methodology* satisfy principles and guidelines established by the Rules. In particular, clause 6A.10.1(e) of the Rules requires that the proposed transmission *pricing methodology* must:

(1) give effect to and be consistent with the *Pricing principles for prescribed transmission services* (that is to say, the principles set out in rule 6A.23); and

(2) comply with the requirements of, and contain or be accompanied by such information as is required by, the *transmission pricing methodology guidelines* made for that purpose under rule 6A.25.

In 2007, the AER issued Pricing methodology guidelines pursuant to clause 6A.25 of the Rules[3].

2 Transmission Pricing Methodology Guideline requirements

2.1 Co-ordinating *Network Service Provide*

In accordance with clause 6A.29.1 of the Rules, TransGrid is the *Co-ordinating Network Service Provide* for NSW. As at June 2014, for the purposes of transmission pricing there are five TNSPs covering NSW and the ACT region of the National Electricity Market. ActewAGL is required to annually provide TransGrid with a revised model of ActewAGL's transmission network, with the approved *AARR* for its transmission system already allocated in accordance with this transmission *pricing proposal*. ActewAGL is also required to provide any other information reasonably required by TransGrid to ensure the proper calculation of transmission prices in New South Wales. The calculation of the *postage stamp* rates which form part of transmission prices referred to in the AER Guidelines at 2.1(h); are calculated by the coordinating TNSP, TransGrid.

Note that there are currently no prudent discounts to ActewAGL customers referred to in the AER Guidelines at 2.1(k).

[3] AER, *Final Electricity Transmission Network Service Providers Pricing methodology guidelines*, October 2007.

2.2 Summary of this Proposal

The AER's *transmission pricing methodology guidelines* are issued pursuant to the Rules. They specify:

- The information that is to accompany a proposed transmission *pricing methodology*,
- Permitted pricing structures for the recovery of the locational component of *prescribed TUoS services*;
- Permitted *postage stamp* pricing structures for *prescribed common transmission services* and the recovery of the adjusted non-locational component of *prescribed TUoS services*;
- The types of transmission system assets that are *directly attributable* to each category of *prescribed transmission services*; and
- Those parts of a proposed transmission *pricing methodology*, or the information accompanying it that will not be publicly disclosed without the consent of the TNSP.

ActewAGL is an *appointing provider* of transmission services in NSW. As a consequence, the scope of this transmission *pricing methodology* is limited to:

• Calculation of the *Annual Aggregate Revenue Requirement* for each *regulatory year* of the *regulatory control period*;	section 3.2
• Proposing a methodology to determine whether assets fall in to the categories of exit, entry, shared or common service;	section 3.3 and Appendix 1
• Detail of how the priority ordering approach of clause 6A.23.2(d) of the Rules has been implemented, including three worked examples;	Appendix 1
• Allocating the *AARR* to exit, entry, shared and common service asset classes using an attributable cost share method, to determine an *Annual Service Revenue Requirement* (*ASRR*) for each asset class;	section 3.4
• Allocating the *ASRR* of each asset class to the specific assets within that asset class;	section 3.5
• Describing how asset costs which are associated with *prescribed entry services* and *prescribed exit services* at a *connection point*, which may be attributable to multiple *Transmission Network Users*, will be allocated; and	section 3.5.4
• Billing arrangements for direct connected *Transmission Customers*;	section 4
• Management of *prudential requirements* and prudent discounts for new or existing connections to the ActewAGL transmission network;	section 6
• Detail of how ActewAGL intends to monitor and develop records of its compliance with its approved transmission *pricing methodology*, the *pricing principles for prescribed transmission services* (clause 6A.23) and part J of the Rules.	section 7

Elements of *pricing methodology* required by the AER guidelines and National Electricity Rules that are carried out by TransGrid on behalf of ActewAGL are:

- Any adjustments required to be made to the locational component of the *ASRR* as required in the Rules[4].
- Any adjustments required to be made to the pre-adjusted non-locational component of the *ASRR* as required in the Rules[5].
- Allocation of the locational component of *prescribed TUoS services* to transmission *connection point*s.
- Establishing the structure and price for common service, general, and locational charges at each of ActewAGL's transmission *connection points*[6].

3 Proposed transmission pricing methodology

3.1 Arrangements applicable to ActewAGL for the 2014-19 *regulatory control period*

Clause 11.55 of the Rules provides for transitional arrangements to apply in relation to the economic regulations of *distribution services* in NSW and the ACT for the 2014-19 *regulatory control period*. Under these arrangements, the AER will make two determinations, for:

- A *transitional regulatory control period* from 1 July 2014 to 30 June 2015; and
- A *subsequent regulatory control period*, from 1 July 2015 to 30 June 2019.

In the Stage 1 Framework and Approach paper, the AER has determined under clause 6.25(b) of the Rules that ActewAGL's *dual function assets* will become subject to the Rules provisions on transmission pricing during *the interim regulatory control period* and the *subsequent regulatory control period*[7].

Clause 6.26 of the Rules establishes that the transmission pricing arrangements in Part J of Chapter 6A apply to ActewAGL's *dual function assets*. Clause 6A.24.2 requires ActewAGL to publish a *pricing methodology* for its *dual function assets*.

3.2 Calculating the Aggregate Annual Revenue Requirement

ActewAGL owns both distribution assets and *dual function assets*, which provide *transmission standard control services*.

4 Rules, clause 6A.23(c)(1).

5 Rules, clause 6A.23(c)(2).

6 That is, ActewAGL transmission connection points that supply ActewAGL's distribution network, not to be confused with TransGrid connection points that supply ActewAGL's distribution network.

7 AER, *Stage 1 Framework and approach paper - ActewAGL: Transitional regulatory control period 1 July 2014 to 30 June 2015 and Subsequent regulatory control period 1 July 2015 to 30 June 2019*, March 2013, p. 42.

The portion of the *aggregate annual revenue requirement* relevant to *transmission standard control services* is established by the AER under clause 6.26(b)(1). To arrive at the *AARR* for *transmission standard control service* for the purposes of Part J of Chapter 6A, the *maximum allowed revenue* is adjusted in accordance with:

(1) Rules clause 6.6 (relating to adjustments after the making of a *building block determination*);

(2) Rules clause 6.13 (relating to revocation of a determination); and

(3) Subtracting the operating and maintenance costs expected to be incurred in the provision of *prescribed common transmission services*, in accordance with clause 6A.22.1.

For the purposes of determining the *AARR* for transmission pricing, ActewAGL has complied with these requirements. ActewAGL has derived the costs referred to in (3) above from budget projections, including:

- Network switching and operations;
- Administration and management of the business;
- Network planning and development; and
- General overheads.

3.3 Categorising exit, entry, shared and common service assets

ActewAGL's *AARR* for *prescribed transmission services* is recovered from transmission charges for the following categories of transmission service:

- *Prescribed exit services*, which include assets that are fully dedicated to serving a *Transmission Customer* or group of *Transmission Customers* at a single *connection point* and: (a) are deemed prescribed by virtue of the operation of clause 11.6.11 of the Rules; or (b) are provided to *Network Service Provider* at the boundary of the prescribed transmission network;
- Prescribed transmission use of system (TUoS) services which include assets that are shared to a greater or lesser extent by all users across the transmission system and are not *prescribed common transmission services*, *prescribed entry services* or *prescribed exit services*; and
- *Prescribed common transmission services*, which are services that benefit all *Transmission Customers* and cannot be reasonably allocated on a locational basis.

At this time, ActewAGL does not have any assets providing *prescribed entry services* to a generator. However, this proposal outlines ActewAGL's proposed methodology with respect to the allocation of these services in anticipation that such a service may be required. *Prescribed entry services* include those assets that are fully dedicated to serving a Generator or group of Generators at a single *connection point*.

The first step in calculating *prescribed transmission service* prices is to classify each asset utilised in the provision of *prescribed transmission services* into one of the above categories of service. The delineation between the assets that provide *prescribed entry services*, *prescribed exit services*, *prescribed TUoS services* and *prescribed common transmission services* is set out in clause 2.4 of the AER transmission *pricing methodology* guidelines.

The cost allocation process assigns the optimised replacement cost (ORC)[8] of all prescribed assets to either *prescribed common transmission services* (assets that benefit all *Transmission Customers*) or individual network branches (transmission lines and transformers). Each branch is then defined as entry, exit or shared network. This process of cost allocation is explained in more detail in Appendix 1.

3.4 Calculation of the *Annual Service Revenue Requirement* for each category of service

The second step in calculating prescribed transmission service prices is calculation of the attributable cost share for each category of service, in accordance with clause 6A.22.3 of the Rules. The attributable cost share is the ratio of:

- The costs of the transmission system assets *directly attributable* to the provision of that category of *prescribed transmission services* (as determined in 3.3); to
- The total costs of all the TNSP's transmission system assets *directly attributable* to the provision of *prescribed transmission services* (as determined in 3.3).

For example, assume the ORCs of prescribed services assets have been allocated to the applicable categories of *prescribed transmission services* as shown in Table 1

Table 1: Costs allocated to categories of *prescribed transmission services*

Category	ORC $'000
Exit service	250,000
Entry service	0
TUoS service	181,000
Common Service	205,000
Total	636,000

The attributable cost shares are calculated as:

$$\text{Attributable Cost Share}_{EXIT} = ORC_{EXIT} / ORC_{TOTAL}$$

$$= \$250{,}000 / \$636{,}000$$

$$= 0.39$$

[8] Consistent with clause 6A.22.3(b) of the Rules.

The attributable cost shares of the other categories calculated in the same manner, as shown in Table 2.

Table 2: Attributable Cost Shares

Category	ORC $'000	Attributable Cost Share
Exit service	347,000	0.39
Entry service	0	-
TUoS service	278,000	0.28
Common Service	11,000	0.31
Total	636,000	1.00

The third step in calculating prescribed transmission service prices is to allocate the *AARR* to each category of prescribed transmission service in accordance with the attributable cost share for each such category of services.

This allocation results in the annual service revenue requirement (*ASRR*) for that category of services.

Assuming an *AARR* of $30 M and applying the attributable cost shares determined above the *ASRR* for each category of prescribed services is calculated as:

$$ASRR_{EXIT} = AARR \text{ x Attributable Cost Share}_{EXIT}$$

$$= \$30{,}000{,}000 \text{ x } 0.39$$

$$= \$11{,}600{,}000$$

The *ASRR*s of the other categories are calculated in the same manner, as shown in Table 3.

Table 3: Annual Service Revenue Requirements

Category	Attributable Cost Share	Annual Service Revenue Requirement (*ASRR*) $'000
Exit Service	0.39	11,600
Entry Service	-	-
TUoS Service	0.28	8,400
Common Service	0.31	9,500
Total	1.00	30,000

3.5 Allocation of the *ASRR* to specific assets and transmission network *connection points*

The fourth step in calculating prescribed transmission service prices is to allocate the *ASRR* for *prescribed entry services*, *prescribed exit services* and *prescribed TUoS services* to each *transmission network connection point* in accordance with the principles of clause 6A.23.3 of the Rules.

3.5.1 Prescribed entry services

ActewAGL does not currently have any prescribed entry services. This hypothetical example indicates how the cost allocation for these services would ne treated. The whole of the *ASRR* for *prescribed entry services* is allocated to *transmission network connection points* in accordance with the attributable *connection point* cost share for *prescribed entry services* that are provided by the TNSP at that *connection point*.

The attributable *connection point* cost share for *prescribed entry services* is the ratio of the costs of the transmission system assets *directly attributable* to the provision of *prescribed entry services* at that *transmission network connection point* to the total costs of all the TNSP's transmission system assets *directly attributable* to the provision of *prescribed entry services*.

For example, consider two hypothetical generators, Gen 1 and Gen 2, that receive *prescribed entry services* and the cost allocation methodology had allocated the ORCs of assets (in $'000) *directly attributable* to entry services to them as follows:

$$\text{Attributable } \textit{Connection point} \text{ Cost Share}_{\text{GEN AI}} = \text{ORC}_{\text{GEN AI}} / \text{ORC}_{\text{ENTRY}}$$

$$= \$1{,}000 / \$3{,}000$$

$$= 0.333$$

The attributable *connection point* cost shares of the other generator is calculated in the same manner as shown in Table 5.

Table 4: *Prescribed entry services* ORCs

Entry	ORC $'000
Gen 1	1,000
Gen 2	2,000
Total ORC of prescribed entry assets	3,000

Table 5: Attributable *connection point* cost shares

Entry	ORC $'000	Attributable connection point cost share
Gen 1	1,000	0.333
Gen 2	2,000	0.667
Total	3,000	1.000

The *ASRR* of $100,000 allocated to the Gen AI *transmission network connection point* is calculated as follows:

$$\textit{ASRR}_{\text{GEN AI}} = \textit{ASRR}_{\text{ENTRY}} \text{ x Attributable } \textit{connection point} \text{ cost share}_{\text{GEN AI}}$$

$$= \$100.000\text{x } 0.333$$

$$= \$33{,}333$$

The *ASRR* of the other generator *connection point* is calculated in the same manner.

Table 6: *Connection point ASRR*s (Entry)

Entry	ORC	Attributable connection point cost share	Connection point *ASRR*
Gen 1	1,000	0.333	33,333
Gen 2	2,000	0.667	66,667
Total	3,000	1.000	100,000

The *ASRR* related to the entry assets for each generator is recovered via a daily fixed charge. For example Gen Al will be charged a daily rate of:

Gen 1 Fixed Charge = $33,333/365 days[9]

= $91.32/day for the relevant financial year

No other charges will be applied to generators, as the Rules specify that the transmission network is allocated to loads, rather than generation. Common services and TUoS services are therefore allocated to loads.

3.5.2 Prescribed exit services

The whole of the *ASRR* for *prescribed exit services* is allocated to *transmission network connection points* in accordance with the attributable *connection point* cost share for *prescribed exit services* that are provided by the TNSP at that *connection point*.

The attributable *connection point* cost share for *prescribed exit services* is the ratio of the costs of the transmission system assets *directly attributable* to the provision of *prescribed exit services* at that *transmission network connection point* to the total costs of all the transmission system assets *directly attributable* to the provision of *prescribed exit services*.

The *ASRR*s of the prescribed exit *connection point*s are calculated in the same manner as for the entry *connection point*s, with a total *ASRR* of $9 M.

Table 7: *Connection point ASRR*s (Exit)

Exit	ORC $'000	Attributable connection point cost share	*Connection point ASRR* $'000
Load A	10,000	0.333	3,000
Load B	15,000	0.500	4,500
Load C	5,000	0.167	1,500
Total	30,000	1.000	9,000

[9] 366 days is used for this calculation in a leap year.

The *ASRR* related to the exit assets for each load is recovered via a daily fixed charge. For example Load A will be charged a daily rate of:

Load A Fixed Charge = $3,000,000/365 days[9]

= $818.18 per day for the relevant financial year.

Locational charges, TUoS general charges and common service charges will also apply to Load A, and are calculated by TransGrid as the Co-ordinating TNSP appointed by ActewAGL.

3.5.3 Prescribed Transmission Use of System (TUoS) services

The prescribed TUoS (shared network) services *ASRR* is recovered from:

- *Prescribed TUoS services* (locational component); and
- *Prescribed TUoS services* (the adjusted non-locational component).

Clause 6A.23.3(c)(1) of the Rules requires that:

> "a share of the *ASRR* (the locational component) is to be adjusted by subtracting the estimated *auction amounts* expected to be distributed to the TNSP under clause 3.18.4 from the *connection points* for each relevant *directional interconnector* and this adjusted share is to be allocated as between such *connection points* on the basis of the estimated proportionate use of the relevant *transmission system* assets by each of those customers, and the *CRNP methodology* and *modified CRNP methodology* represent two permitted means of estimating proportionate use".

In NSW, TransGrid as the co-ordinating TNSP and ensures compliance with this requirement, since ActewAGL is not a direct recipient of auction amounts. TransGrid makes relevant adjustments to account for auction amounts in its *pricing methodology*, consistent with clause 6A.23.3(c)(1). Please refer to TransGrid's transmission *pricing methodology* with respect to compliance with this clause.

Allocation of the locational component of *prescribed TUoS services* is carried out by TransGrid using the *CRNP methodology*, which assigns a proportion of shared network costs to individual customer *connection point*s. TransGrid does this using the TPRICE *Cost Reflective Network Pricing* software used by most TNSPs in the NEM. Details of this calculation can be found in TransGrid's *transmission pricing proposal*.

The *CRNP methodology* requires three sets of input data:

- An electrical (load flow) model of the network;
- A cost model of the network (the results of the cost allocation process described in Appendix 1); and
- An appropriate set of load/generation patterns.

The remainder of the *ASRR* (the pre-adjusted non-locational component) is to be adjusted:

- By subtracting the amount (if any) referred to in clause 6A.23.3(e) of the Rules;
- By subtracting or adding any remaining settlements residue (not being settlements residue referred to in the determination of the locational component but including the portion of settlements residue due to intra-regional loss factors) which is expected to be distributed or

recovered (as the case may be) to or from the TNSP in accordance with clause 3.6.5(a) of the Rules;

- For any over-recovery amount or under-recovery amount from previous years;
- For any amount arising as a result of the application of clause 6A.23.4(h) and (i) of the Rules; and
- For any amount arising as a result of the application of prudent discounts in accordance with clause 6A.26.1(d)-(g) of the Rules.

These adjustments are carried out by TransGrid as the Co-ordinating TNSP in NSW. ActewAGL provides advice to TransGrid of any expected under-recovery or over-recovery amount from previous years to be used by TransGrid in setting prices each year.

3.5.4 Costs that could be allocated to more than one category of service

ActewAGL allocates substation costs that are *directly attributable* to entry, exit, common and TUoS services and then allocates the residual costs, known as substation local costs, to entry, exit and TUoS services on the basis of the number of pricing branches (transmission lines and transformers) connected to that substation.

Clause 6A.23.2(d) of the Rules has a priority ordering concept for the allocation of those costs which could be attributable to more than one category of *prescribed transmission services*.

The substation local costs are allocated to the various prescribed services in accordance with the provisions of clause 6A.23.2(d) of the Rules having regard to the stand alone costs associated with the provision of *prescribed TUoS services* and *prescribed common transmission services* with the remainder being allocated to prescribed entry and *prescribed exit services*.

Details of ActewAGL's application of priority ordering can be found in Appendix 1.

3.6 Provision for relaxation of TUoS locational side constraints

The implementation of clause 6A.23.4(g) of the Rules allows for the relaxation of the 2% side constraint for material changes in *connection point* load or renegotiation of connection agreements, subject to AER approval.

In the event that a *Transmission Customer* requests a material increase in demand at an existing *connection point*, ActewAGL, together with TransGrid, as the Co-ordinating TNSP in NSW, will seek approval from the AER to set the prescribed TUoS - locational price as intended by clause 6A.23.4(g) of the Rules.

3.7 Transmission prices and charges

Calculation of prices for all *prescribed transmission services* in NSW is carried out by TransGrid as the Co-ordinating TNSP in NSW. Please refer to TransGrid's *pricing methodology* for the calculation of prices for ActewAGL's transmission network. TransGrid receives ActewAGL's transmission models with all assets allocated to the relevant asset classes and a portion of the *AARR* allocated to give the *ASRR* for each class. Assets within each asset class have already been allocated a portion of the *ASRR* for that class in accordance with this *pricing methodology*.

3.8 Contract demand charge

ActewAGL is able to nominate locations on its transmission network where an excess demand charge is to apply. ActewAGL would nominate to TransGrid the particular locations of ActewAGL's transmission connection points (a *connection point* direct to TransGrid or one that connects ActewAGL's distribution network to its transmission network) where excess demand charging is to apply. ActewAGL would proposes an agreed maximum demand for this *connection point*, and if ActewAGL's maximum demand exceeded the contract agreed maximum demand level at any time during the financial year then an Excess Demand Charge would apply.

ActewAGL has not nominated any locations on the transmission network where an excess demand charge would apply but may do so during the 2014-19 *regulatory control period*.

3.9 Setting of TUoS locational prices between annual price publications

In the event that ActewAGL requires a TUoS locational price at a new *connection point* or at a connection where the load has changed significantly after prescribed TUoS service locational prices have been determined and published, an interim price, not subject to the side constraints of clause 6A.23.4(f) of the Rules, will be determined by TransGrid as the co-ordinating TNSP in NSW. This will be calculated using the prevailing pricing models with demands estimated in a manner consistent with clause 2.2(f) of the transmission *pricing methodology* guidelines.

A price subject to the side constraints of clause 6A.23.4(f) of the Rules will be determined and published at the next annual price determination.

4 Billing arrangements

4.1 Billing for prescribed transmission services

Consistent with the clause 6A.27.1 of the Rules, ActewAGL will calculate the transmission service charges payable by *Transmission Network Users* connected to the ActewAGL transmission network, in accordance with the transmission service prices published under clause 6A.24.2 as calculated by TransGrid. The prices calculated by TransGrid that are relevant to the ActewAGL transmission network are published on the ActewAGL website.

Where charges are determined for *prescribed transmission services* from metering data, these charges will be based on kW or kWh obtained from the metering data managed by AEMO.

ActewAGL will issue bills to *Transmission Network Users* for *prescribed transmission services* which satisfy or exceed the minimum information requirements specified in clause 27.2 of the Rules on a monthly basis or as agreed between the parties.

Consistent with clause 6A.27.3 of the Rules, a *Transmission Network User* must pay charges for *prescribed transmission services* properly charged to it and billed in accordance with the transmission *pricing methodology* of the relevant *Transmission Network Service Provider* by the date specified on the bill.

4.2 Payments between Transmission *Network Service Providers*

Consistent with clause 6A.27.4 of the Rules, TransGrid is the *Co-ordinating Network Service Provider* in NSW and the ACT under 6A.29.1 of the Rules and will pay to each other relevant *Transmission Network Service Provider* the revenue which is estimated to be collected during the following year by the first provider as charges for *prescribed transmission services* for the use of transmission systems owned by those other *Transmission Network Service Provider*.

Such payments will be determined by TransGrid, as the *Co-ordinating Network Service Provider* for the region.

Financial transfers payable under clause 6A.27.4 of the Rules will be paid in equal monthly instalments or as documented in revenue collection agreements negotiated between the parties.

5 *Prudential requirements*

5.1 *Prudential requirements* for prescribed transmission services

Consistent with clause 6A.28.1 of the Rules, ActewAGL may require a *Transmission Network User* to establish *prudential requirements* for either or both connection services and transmission use of system services. These *prudential requirements* may take the form of, but need not be limited to, capital contributions, pre-payments or financial guarantees.

The requirements for such *prudential requirements* will be negotiated between the parties and specified in the applicable connection agreement.

5.2 Capital contribution or prepayment for a specific asset

Consistent with clause 6A.28.2 of the Rules, where ActewAGL is required to construct or acquire specific assets to provide prescribed connection services or *prescribed TUoS services* to a *Transmission Network User*, ActewAGL may require that user to make a capital contribution or prepayment for all or part of the cost of the new assets installed.

In the event that a capital contribution is required, any contribution made will be taken into account in the determination of prescribed transmission service prices applicable to that user by way of a proportionate reduction in the ORC of the asset(s) used for the allocation of prescribed charges or as negotiated between the parties.

In the event that a prepayment is required any prepayment made will be taken into account in the determination of prescribed transmission service prices applicable to that user in a manner to be negotiated between the parties.

The treatment of such a capital contribution or prepayment for the purposes of a revenue determination will be in accordance with the relevant provisions of the Rules.

ActewAGL may require a bank guarantee from a *Transmission Customer*, to cover the financial year of a transmission investment made by ActewAGL for the customer. Bank guarantees will only be relevant in cases where such investments relate to the construction of prescribed transmission assets. Such guarantees will be made in agreement with the customer and hold funds as security for

ActewAGL in the event that the customer does not provide a satisfactory income stream through payment for TUoS charges over an agreed period of time.

6 Prudent discounts

ActewAGL is required to provide information to TransGrid in relation to prudent discounts relating to ActewAGL's *Transmission Customers*. TransGrid would adjust, in accordance with rule 6A.26.1(d)-(g), the non-locational component of the *ASRR* for *prescribed TUoS services* for the amount of any anticipated under-recovery arising from prudent discounts applied.

ActewAGL currently has no prudent discount arrangements with any *Transmission Customers*.

7 Monitoring and compliance

As a regulated business ActewAGL is required to maintain compliance monitoring and reporting systems to demonstrate compliance with its Distribution Licence, Revenue Determination, the National Electricity Rules and other statutory obligations.

In order to monitor and maintain records of its compliance with its approved transmission *pricing methodology*, the *pricing principles for prescribed transmission services*, and part J of the Rules ActewAGL proposes to:

- Maintain the specific obligations arising from part J of the Rules in its compliance management system;
- Maintain electronic records of the annual calculation of prescribed transmission prices and supporting information; and
- Periodically subject its transmission pricing models and processes to functional audit by suitably qualified persons.

8 Additional information requirements

ActewAGL does not consider transitional arrangements necessary as a result of the implementation of this proposed transmission *pricing methodology*. ActewAGL does not have any relevant derogations in accordance with chapter 9 of the Rules, nor are there any applicable transitional arrangements arising from chapter 11 of the Rules relevant to this proposed transmission *pricing methodology*.

9 Confidential elements of pricing methodology

This *pricing methodology* is not considered confidential by ActewAGL.

Appendix 1: Details of cost allocation process

A detailed cost allocation process is used to assign the optimised replacement cost (ORC) of all prescribed service assets to either common service (assets that benefit all *Transmission Customers*), network branches (transmission lines or transformers) and prescribed entry or *prescribed exit services* in a manner consistent with Section 2.4 of the AER's transmission *pricing methodology* guidelines.

The cost allocation process is summarised as follows.

Step 1: Initial Asset Cost Allocation

Assets and their ORCs are assigned to one of the following primary asset categories:

- Transmission lines;
- Transformers;
- Circuit breakers;
- Common service assets (communications, reactive support, office buildings etc.); and substation local assets (ancillary equipment, civil work, and establishment).

The following plant items are not separately identified in ORC values and are incorporated into the ORC of the associated primary items above:

- Bus work;
- Secondary systems including protection and instrument transformers.

Step 2: Allocation to Classes of Service

Assets are allocated to the classes of prescribed service in accordance with the provisions of Section 2.4 of the transmission *pricing methodology* guidelines. In the case of a circuit breaker, each has its replacement cost divided evenly between the branches to which it is *directly attributable*. Any circuit breaker that is not *directly attributable* to any branch together with substation local costs identified in Step 1 become subject to the priority ordering process.

In the case of a connection asset attributable to multiple network users, such as a transformer, serving multiple *Transmission Customers* at a *connection point* (which may provide prescribed entry and/or *prescribed exit services*) the cost of the shared connection asset will be allocated between the network users in accordance with a demand related allocation or as negotiated between the connected parties.

Step 3: Priority Ordering

In the case of those costs which would be attributable to more than one category of *prescribed transmission services*, specifically the substation local assets identified in Step 1 and those circuit breakers identified as substation local costs in Step 2, costs will be allocated in accordance with the provisions of clause 6A.23.2(d) of the Rules having regard to the stand alone costs associated with the provision of *prescribed TUoS services* and *prescribed common transmission services* with the remainder being allocated to prescribed entry and *prescribed exit services*. The implementation of the priority ordering process is detailed below.

9.1.1 Priority Ordering Methodology

Rules Requirement

Clause 6A.23.2(d) of the Rules requires that:

> Where, as a result of the application of the attributable cost share, a portion of the *AARR* would be attributable to more than one category of *prescribed transmission services*, that attributable cost share is to be adjusted and applied such that any costs of a transmission system asset that would otherwise be attributed to the provision of more than one category of *prescribed transmission services*, is allocated as follows:
>
> 1. to the provision of *prescribed TUoS services*, but only to the extent of the stand-alone amount for that category of *prescribed transmission services*;
>
> 2. if any portion of the costs of a transmission system asset is not allocated to *prescribed TUoS services*, under subparagraph (1), that portion is to be allocated to *prescribed common transmission services*, but only to the extent of the stand-alone amount for that category of *prescribed transmission services*;
>
> 3. if any portion of the costs of a transmission system asset is not attributed to *prescribed transmission services* under subparagraphs (1) and (2), that portion is to be attributed to *prescribed entry services* and *prescribed exit services*.

Stand-alone amount is defined as:

> For a category of *prescribed transmission services*, the costs of a transmission system asset that would have been incurred had that transmission system asset been developed, exclusively to provide that category of *prescribed transmission services*.

AEMC Rule determination

In its rule determination the AEMC provided the following guidance on the application of the priority ordering approach for the allocation of costs which can be attributed to more than one type of service[10]:

> "The Commission has maintained a priority ordering approach for the allocation of expenses or costs which can be attributed to more than one type of service. The cascading principle adopted by the Commission is based on the premise that users are seen to be the 'cause' of transmission investment. Therefore, costs should be first allocated to prescribed transmission use of system services on a stand-alone basis and then to *prescribed common transmission services*. Where a service/cost cannot justifiably be attributed to TUoS or common services it should be allocated to entry and exit services."

In developing this methodology, ActewAGL has had regard for the following example in the rule determination'[11]:

[10] Rule Determination for National Electricity Amendment (Pricing of *Prescribed transmission services*) Rule 2006, p5.

[11] Ibid p. 37.

Consider a substation costing $30 M that was developed:

- partly in order to provide *Prescribed TUoS services*;
- partly in order to provide *Prescribed common transmission services*; and
- partly in order to provide *prescribed exit services*.

Then assume that had the substation been developed solely to provide *prescribed TUoS services*, it could have been much smaller and would have cost only $10 M. Had the substation been developed solely in order to provide *prescribed common transmission services*, it would have cost $5 M. Finally, had the substation been developed solely in order to provide *prescribed exit services*, it would have cost $20 M.

The application of the principle would then lead to the $30 M cost of the substation being attributed to Prescribed Transmission Service categories as follows:

- $10 M to the *prescribed TUoS services ASRR*;
- $5 M to the prescribed common services *ASRR*; and
- The remaining $15 M to the prescribed exit service *ASRR*.

Objective and General Approach

The proposed allocation methodology relies on the assumption that substation infrastructure and establishment costs are proportionate to the number of high voltage circuit breakers in the substation.

Based on this assumption, the appropriate allocator for substation infrastructure and establishment costs for a stand-alone arrangement is the ratio of the number of high voltage circuit breakers in the stand-alone arrangement to the number of high voltage circuit breakers in the whole substation.

Step 1: Branch Identification

Identify the branches, being the lines, transformers, major reactive devices and exits/entries in the substation which provide prescribed TUoS, *prescribed common transmission services* and exit or entry services, in the substation.

Step 2: Allocation of Circuit Breakers to Branches

For each high voltage circuit breaker in the substation identify the branches directly connected to it. Any circuit breaker that does not directly connect to a branch is excluded from allocation and all costs associated with it are added to the substation infrastructure and establishment cost.

Count the total number of circuit breakers directly connected to branches.

As a general rule, Distribution *Network Service Provide* (DNSPs) are classified as a prescribed exit service while Generators are classified as a prescribed entry service. Negotiated services are not part of the regulated asset base and fall outside the priority ordering process detailed in clause 6A.23.2(d) of the Rules.

Step 3.1: Stand-alone arrangements for Prescribed TUoS

With reference to the number of lines providing *prescribed TUoS services* determine the number of circuit breakers required to provide TUoS services of an equivalent standard on a stand-alone basis. The stand-alone configuration is the simplest substation configuration (in the absence of development) had it been developed to provide a prescribed TUoS service. This may be done by way of a look up of typical stand-alone configurations.

Step 3.2: Stand-alone arrangements for Prescribed common transmission services

With reference to the number of lines providing *prescribed TUoS services* and the devices providing prescribed common service determine the number of circuit breakers required to provide *prescribed common transmission services* of an equivalent standard on a stand-alone basis. The stand-alone configuration is the simplest substation configuration (in the absence of development) had it been developed to provide a prescribed common service. This may be done by way of a look up of typical stand-alone configurations.

Step 4: Allocation of substation infrastructure and establishment costs

Step 4.1: Allocation of Prescribed TUoS

Allocate a portion of substation infrastructure and establishment costs to prescribed TUoS according to the ratio of the high voltage circuit breakers identified in Step 3.1 to the total number of high voltage circuit breakers connected to branches in the substation identified in Step 2.

Step 4.2 Calculate the Unallocated Substation Infrastructure Costs after TUoS Allocation

Calculate the Unallocated substation infrastructure cost by subtracting the amount calculated in Step 4.1 from the total substation infrastructure amount.

Step 4.3 Allocation of Prescribed Common Service

Allocate a portion of the substation infrastructure and establishment costs to prescribed common service based on to the ratio of the high voltage circuit breakers providing *prescribed common transmission services* identified in Step 3.2 to the total number of high voltage circuit breakers connected to branches in the substation. If the common service portion of substation infrastructure is greater than the Unallocated costs, then the Unallocated portion only is attributed to prescribed common service. In this instance, nothing will be attributed to prescribed entry and *prescribed exit services*.

Step 4.4 Calculate the Unallocated Substation Infrastructure Costs after Common Service Allocation

Calculate the Unallocated substation infrastructure cost by subtracting the amount calculated in Step 4.3 from the amount calculated in Step 4.2.

Step 4.5 Allocation of Prescribed Entry and Exit Service

Allocate the remaining substation infrastructure and establishment costs (calculated in Step 4.4) to each branch providing prescribed exit or entry services based on the ratio of the high voltage circuit breakers providing the entry or exit service to the branch to the total number of high voltage circuit breakers providing entry or exit services or in accordance with the TNSP's cost allocation methodology as appropriate.

Step 4.6 Allocation of Assets that provide both Entry and Exit Services

Clause 2.1(d)(3) of the AER guidelines states that a TNSP must provide:

> Details of how the *AARR* will be allocated to derive the *ASRR* for each category of prescribed transmission service, including:
>
> (3) how asset costs which may be attributable to both *prescribed entry services* and *prescribed exit services* will be allocated.

ActewAGL proposes that where assets can be defined as both entry and exit services, that the allocation of the remainder of costs (after completing allocation to TUoS and common service) to be allocated on a simple proportion of circuit breakers that immediately connect those customers, for each service against the total number of circuit breakers of entry and exit services combined.

Consider the worked example in Appendix 1. Suppose that next to the negotiated service, a generator is connected to the busbar via a single circuit breaker and next to that yet another DNSP exit load connected via a single circuit breaker. In that case, there are now two circuit breakers for DNSP exit loads, and one circuit breaker for generator entry service. In that case, two thirds of the remaining entry/exit service cost will be charged to the exit service and one third to the entry service.

This cost allocation will apply unless negotiated service arrangements apply between the parties, in which case the cost allocation in the particular circumstances will be negotiated between the parties

Step 4.7 Allocation of Exit Assets a *Connection point* with Multiple *Transmission Customers*

Clause 2.1(e)(1)C of the guidelines states that a TNSP must provide:

> Details of how the *ASRR* for each category of prescribed transmission service will be allocated to each transmission *connection point*, including:
>
> (1) how the attributable *connection point* cost share for both *prescribed entry services* and *prescribed exit services* will be calculated in accordance with clause 6A.22.4 of the National Electricity Rules, including:
>
> c) how asset costs allocated to *prescribed entry services* and *prescribed exit services* at a *connection point*, which may be attributable to multiple *Transmission Network Users*, will be allocated;

Where exit or entry assets are shared between several customers, whether load and/or generation, that the allocation of the remainder of costs (after completing allocation to TUoS and common service) to be allocated on a simple proportion of the circuit breakers that immediately connect that customer to the exit/entry point against the total number of the same circuit breakers. This is the same method as that outlined above at Step 4.6.

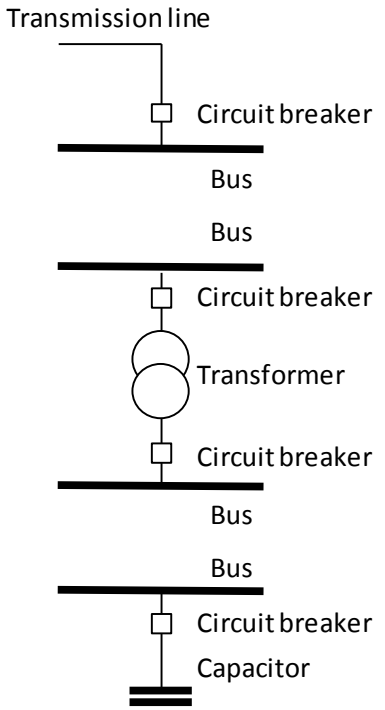
Notes

- Costs are only allocated in Step 4 until fully allocated.
- Consistent with clause 6A.23(d)(3) of the Rules it is possible that no costs will be attributed to entry and exit services.

- New and existing negotiated service assets are excluded from the analysis as any incremental establishment costs associated with them are taken to be included in the negotiated services charges on a causation basis.
- The assessment of standalone arrangements only needs to be conducted once per substation except where changes to the configuration of the substation occur.

Definition - Branches

As illustrated by the diagrams below a "Branch" is a collection of assets (e.g. lines, circuit breakers, capacitors, buses and transformers) that provide a transmission service.



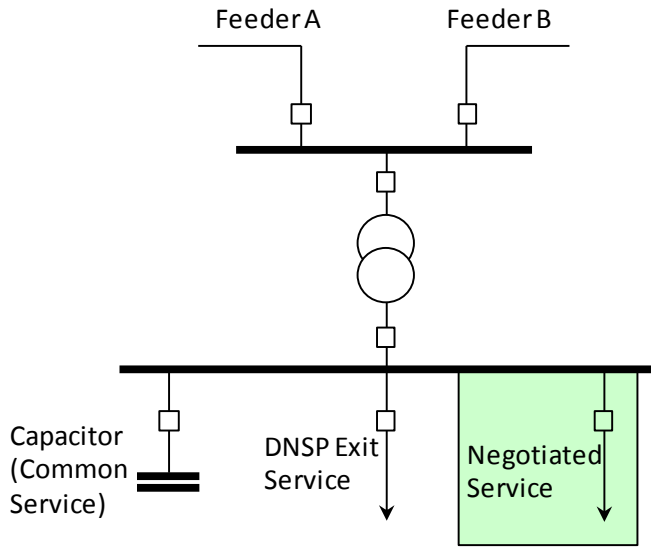
Branch with Transmission Line, Busbar and Circuit Breaker

Branch with Transformer, Circuit Breaker and two Busbars

Branch with Capacitor, Circuit Breaker and Busbar

Worked Example 1: Substation costs priority ordering

Consider the substation below with an ORC value of, say, $12 M. Of this, $3 M is for the existing negotiated service, which does not form part of the regulated asset base and is not governed by 6A.23.2(d). Therefore, the negotiated service does not exist for the purposes of priority ordering, and the total infrastructure cost is $9 M for allocation purposes.

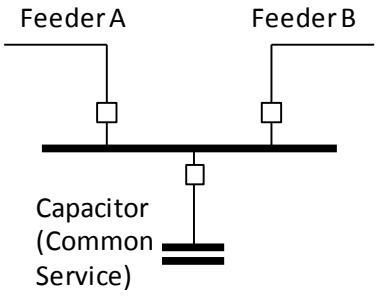


Step 1: The branches are Feeder A, Feeder B, DNSP Exit, Tie Transformer and Capacitor, the negotiated service branch is not considered as discussed above.

Step 2: The total number of circuit breakers directly connected to branches is 6 again excluding the negotiated service).

Step 3.1: The stand-alone arrangement for the provision of *prescribed TUoS services* to an equivalent standard is shown below and consists of 2 circuit breakers.

Step 3.2: The stand-alone arrangement for the provision of *prescribed common transmission services* to an equivalent standard is shown below and consists of 3 circuit breakers.



Step 4: Total infrastructure cost is $9 M, excluding the negotiated service as discussed.

Costs are allocated to prescribed TUoS in the ratio of the circuit breakers in the stand-alone arrangement to the total circuit breakers.

Infrastructure Cost Allocated to TUoS = (2/6) x $9m = $3m Unallocated = $9m - $3m = $6m

Costs are allocated to prescribed common service in the ratio of the circuit breakers in the stand-alone arrangement to the total circuit breakers.

Infrastructure Cost allocated to Common Service: (3/6) x $9m = $4.5m Unallocated = $6m - $4.5m = $1.5m

Remainder of Unallocated (calculated above) to be allocated to prescribed entry and *prescribed exit services*.

Infrastructure Cost allocated to Exit = $1.5m

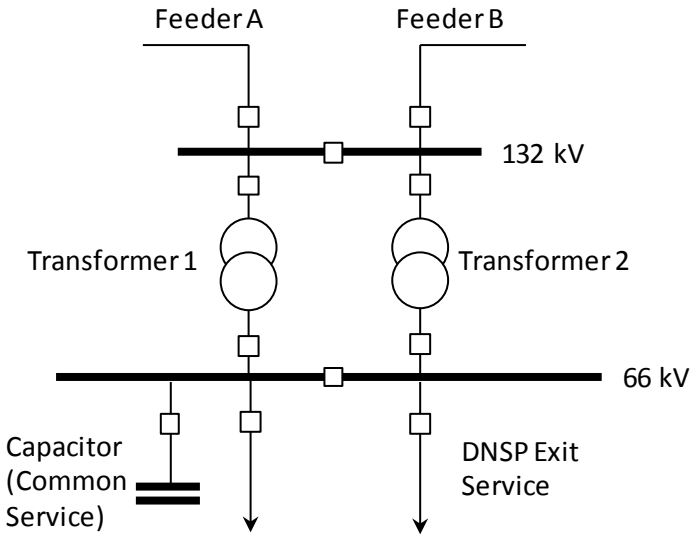
This example is shown in Table 8.

Table 8: Priority ordering for Example 1

Asset Class	Breakers	Allocation	Unallocated
Substation Infrastructure Costs		$9 M	$9 M
Total Breakers	6		
TUoS Stand Alone Breakers	2		
1. Share to TUoS	=2/6	= 2/6 x $9 M = $3 M	$6 M
Common Service Stand Alone Breakers	3		
2. Share to Common Service	=3/6	= 3/6 x $9 M = $4.5 M	$1.5 M
3. Share to Entry and Exit Services		= $1.5 M	0

Worked Example 2: Subtransmission substation cost priority ordering

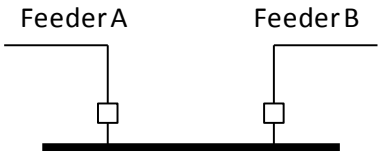
Consider the substation below, where the secondary voltage is 66 kV (and therefore capable of providing support to the higher voltage transmission network.



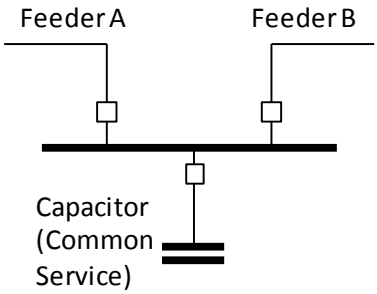
Step 1: The branches are Feeder A, Feeder B, DNSP Exit (2), Transformer 1, Transformer 2 and Capacitor.

Step 2: The total number of circuit breakers directly connected to branches is 9. The bus section breakers are not directly connected to any of the branches and are therefore ignored for the purposes of priority ordering.

Step 3.1: The stand-alone arrangement for the provision of *prescribed TUoS services* to an equivalent standard is shown below and consists of 2 circuit breakers. Note the bus section breaker is ignored since it is not connected to any of the branches



Step 3.2: The stand-alone arrangement for the provision of *prescribed common transmission services* to an equivalent standard is shown below and consists of 3 circuit breakers.



Step 4: Assume the total infrastructure cost is $20 M.

Costs are allocated to prescribed TUoS in the ratio of the circuit breakers in the stand-alone arrangement to the total circuit breakers.

Infrastructure Cost Allocated to TUoS = (2/9) x $20 M = $4.44 M Unallocated = $20 M - $4.44 M = $15.55 M

Costs are allocated to prescribed common service in the ratio of the circuit breakers in the stand-alone arrangement to the total circuit breakers.

Infrastructure Cost allocated to Common Service: (3/9) x $20 M = $6.67 M Unallocated = $15.55 M - $6.67 M = $8.89 M

Remainder of Unallocated (calculated above) to be allocated to prescribed entry and *prescribed exit services*.

Infrastructure Cost allocated to Exit = $8.89 M

This allocation is shown in Table 9.

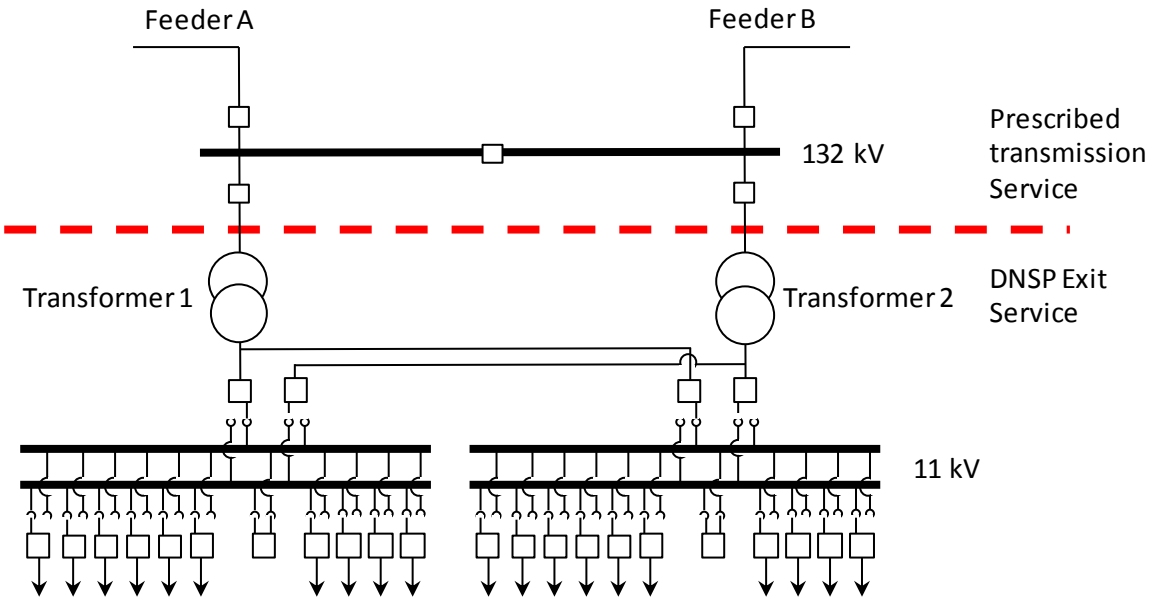
Table 9: Priority ordering for Example 2

Asset Class	Breakers	Allocation	Unallocated
Substation Infrastructure Costs		$20 M	$20 M
Total Breakers	9		
TUoS Stand Alone Breakers	2		
1. Share to TUoS	=2/9	= 2/9 x $20 M = $4.44 M	$15.55 M
Common Service Stand Alone Breakers	3		
2. Share to Common Service	=3/9	= 3/9 x $20 M = $6.67 M	$8.89 M
3. Share to Entry and Exit Services		= $8.89 M	0

Worked Example 3: Zone substation cost priority ordering

Consider the zone substation below, where the secondary voltage is 11 kV (and therefore not capable of providing support to the higher voltage transmission network). The substation is considered to comprise two sections:

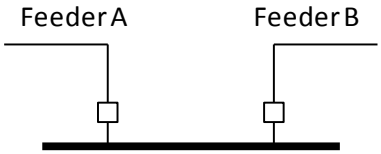
- The 132 kV section, which provides transmission support; and
- the transformers and 11 kV busbar, which supply the distribution system and provide a DNSP exit service.



Step 1: The branches are Feeder A, Feeder B and DNSP Exit (Transformer 1and Transformer 2).

Step 2: The total number of circuit breakers directly connected to branches is 4. The 132 kV bus section breaker is not directly connected to any of the branches and is therefore ignored for the purposes of priority ordering.

Step 3.1: The stand-alone arrangement for the provision of *prescribed TUoS services* to an equivalent standard is shown below and consists of 2 circuit breakers. Note the bus section breaker is ignored since it is not connected to any of the branches



Step 3.2: There is no equipment providing common service at this location.

Step 4: Assume the total infrastructure cost is $30 M, of which $6 M is associated with the assets that provide transmission services and $24 M associated with the distribution exit services (the 132/11 kV transformers and 11kV equipment).

Costs are allocated to prescribed TUoS in the ratio of the circuit breakers in the stand-alone arrangement to the total circuit breakers.

Infrastructure Cost Allocated to TUoS = (2/4) x $6 M = $3.0 M Unallocated = $6 M - $3 M = $3 M.

There are no costs allocated to prescribed common service.

Remainder of Unallocated (calculated above) to be allocated to prescribed entry and prescribed exit services.

Infrastructure Cost allocated to Exit = $3 M + $24 M (see above) = $27 M.

This allocation is shown in Table 10.

Table 10: Priority ordering for Example 3

Asset Class	Breakers	Allocation	Unallocated
Substation Infrastructure Costs		$6 M	$24 M
Total Breakers	4		
TUoS Stand Alone Breakers	2		
1. Share to TUoS	=2/4	= 2/4 x $6 M = $3 M	$27 M
Common Service Stand Alone Breakers	0		
2. Share to Common Service	0	0	$27 M
3. Share to Entry and Exit Services		= $27 M	0