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11 March 2011

Our Reference: UE.RE.08.07

Mr Chris Pattas
General Manager
Australian Energy Regulator
PO Box 520
MELBOURNE VIC 3001

Dear Mr Pattas,

Distribution Loss Factors 2011/2012

Clause 3.6.3 of the National Electricity Rules requires Distribution Network Service Providers (DNSPs) to determine distribution loss factors (DLFs) to apply in the next financial year and to then provide these to AEMO for publication. Before submitting the information to AEMO, the DNSP is obliged to obtain the approval of the Australian Energy Regulator (AER) for the distribution loss factors. Accordingly, United Energy Distribution (UED) submits its DLFs for 2011/2012 for approval.

The average DLFs to apply in the financial year 2011/2012 are as follows:

Average DLFs	A	B	C	D	E
Short sub-transmission	1.0051	1.0115	1.0187	1.0410	1.0548
Long sub-transmission	1.0274	1.0338	1.0410	1.0633	1.0771

In order to calculate DLFs for the 2011/2012 financial year, UED has adopted the methodology published by the Essential Services Commission of Victoria in February 2007.

Full details of the forward-looking estimates are included in Attachment 1 together with MSATS codes in Attachment 3.

Clause 3.6.3(b) 2 of the National Electricity Rules sets out requirements for calculating site specific DLFs for certain large customers and embedded generators. The Rules specifically require distributors to calculate a site specific DLF for embedded generating units with actual generation of more than 10MW and end-users with a load of more than 40GWh per annum or demand of greater than 10MW. The site specific DLFs submitted for approval for these customers and generators are as follows:

NMI	Proposed DLF for 2011/2012	Current DLF for 2010/2011
VEEE0PD8AD	1.0124	1.0143
VEEE0TF39Q	1.0142	1.0165
VEEE0BG4Q3	1.0214	1.0240
VEEE0NDNEX	1.0254	1.0246
VEEE08KH3V	1.0091	1.0092
VEEE0C8AW1	1.0050	1.0058
6407649172	1.0114	1.0134

For the 2011/2012 financial year, UED forecasts that the total network energy loss, expressed as a percentage of sales, will be 4.68%, which is 0.05% lower than the actual top-down energy loss of 4.73% calculated for the 2009/2010 financial year. The forecast is based on:

- A reduction in energy sales while there is an increase in maximum demands, indicating that the load profile has become peakier;
- Recent and impending network augmentations; and
- The latest trends in distribution losses, and the results from reconciliation of the 2009/2010 year losses.

Clause 3.6.3h (2) of the National Electricity Rules requires a distributor to perform an *ex post* reconciliation between the total energy losses implied by the forward-looking DLFs for a financial year and the actual energy losses reported for the same period. As at the date of this correspondence, the reconciliation could not be undertaken for 2010/2011 because the necessary metering data was not available for the full financial year. Therefore, a reconciliation calculation was done for 2009/2010 as follows.

$$\sum_{i=1}^{i=N} ME_i \times DLF_i = TAGE = 8{,}478{,}200MWh \quad \ldots(1)$$

$$\sum_{i=1}^{i=N} ME_i + NEL = TNE = 8{,}440{,}950MWh \quad \ldots(2)$$

Where:

ME_i - The Metered Energy flowing out of distribution network connection point *i* over the financial year.[1]

DLF_i - Forward looking Distribution Loss Factor for distribution connection point *i*.

$TAGE$ - Total Adjusted Gross Energy.

NEL - Total Network Energy Loss calculated using a top-down approach (i.e. purchases minus sales).

[1] The National Electricity Rules define metered energy as a positive where flow is towards the transmission connection point, however this definition results in negative values for metered energy supplying customer loads from distribution connection points. To simplify the analysis, United Energy Distribution has defined metered energy out of a distribution connection point as being positive.

TNE - Total Transmission Network Energy flowing into the distribution network.

N - The Number of distribution network connection points.

Equation (1) calculates the total adjusted gross energy (TAGE) flowing out from distribution connection points. It is the metered energy plus implied distribution losses based on the DLFs.

Equation (2) effectively calculates the total energy flowing from transmission connection points into the distribution network (TNE). It is all energy flowing from distribution connection points plus total measured top down energy losses.

The reconciliation process involves comparing the results of equation (1) with equation (2). Attachment 2 shows the results of 2009-2010 DLF reconciliation

In February 2007, the Essential Services Commission published a methodology for the determination of distribution loss factors in accordance with clause 3.6.3(g) of the National Electricity Rules. This methodology is based on an approach developed jointly by the Victorian distribution businesses and is consistent with the methodology used for the calculation of DLFs in previous years. UED has used this methodology for the 2011/2012 DLFs and a copy is enclosed separately (see Attachment 4).

UED has obtained third party advice to the effect that the DLFs calculated for the 2011/2012 financial year were worked out in accordance with the methodology described in Attachment 4. The certification of loss factors is provided as a separate attachment (Attachment 5).

Should you require further information or clarification on the matters discussed in this submission, please contact me on (03) 8540 7818 or alternatively Gabriel Wan, Manager Network Planning and Development on (03) 8544 9615.

Yours sincerely

Andrew Schille
Regulatory Manager

Attachment 1:

Summary of UED Distribution Loss Factors and Supporting Information

2011-2012 DLF Submission to the AER

Company Name	United Energy Distribution

Forecast Energy Procured (MWh) for 2011-2012

Description	Amount (MWh)
Total annual energy obtained from transmission connections at the boundary	8,396,930
Energy obtained from embedded generation	100,770
plus energy obtained from other distributors into the UED network	-106,420
Total Energy Procured per annum	8,391,280

Forecast Energy Supplied (MWh) for 2011-2012

Description	Amount (MWh)
Total annual energy supplied to UED customers	8,016,513
Total Energy Supplied per annum	8,016,513

Forecast Net Metered Energy Supplied (MWh) for 2011-2012

	DLF A	DLF B	DLF C	DLF D	DLF E	Total
Short Sub transmission	36,180	0	986,771	2,316,273	4,359,852	7,699,077
Long Sub transmission	0	0	0	50,729	266,707	317,436

Top-Down Calculated Annual Losses (MWh) for 2011-2012

	DLF A	DLFB	DLF C	DLF D	DLF E	Total
Short Sub transmission	39,549	50,400	56,147	156,085	63,893	374,767
Long Sub transmission	8,693					

Forward-looking average DLF for 2011-2012

	DLF A	DLF B	DLF C	DLF D	DLF E
Short Sub transmission	1.0051	1.0115	1.0187	1.0410	1.0548
Long Sub transmission	1.0274	1.0338	1.0410	1.0633	1.0771

2011-2012 DLF Submission to the AER

Site-specific Distribution Loss Factors (DLFs) for large customers/generators

NMI	Class	DLF
VEEE0PD8AD	C	1.0124
VEEE0TF39Q	C	1.0142
VEEE0BG4Q3	C	1.0214
VEEE0NDNEX	C	1.0254
VEEE08KH3V	C	1.0091
VEEE0C8AW1	A	1.0050
6407649172	C	1.0114

Attachment 2:
2009-2010 DLF Reconciliation

Reconciliation (MWh)

Description	Amount (MWh)
Net energy supplied	8,112,660
Calculated energy losses based on approved DLF	420,867
Actual energy losses	383,618
Reconciliation error	37,249
Reconciliation error (%)	0.46%

Attachment 3:

UED Market Settlement and Transfer Solution (MSATS) DLF codes

Region	MSATS Code	DLF	NMI	Description
VIC	MC05	1.0124	VEEE0PD8AD	Site Specific – load
VIC	MC06	1.0142	VEEE0TF39Q	Site Specific – load
VIC	MC02	1.0214	VEEE0BG4Q3	Site Specific – load
VIC	MC04	1.0254	VEEE0NDNEX	Site Specific – load
VIC	MC01	1.0091	VEEE08KH3V	Site Specific – load
VIC	MC03	1.0050	VEEE0C8AW1	Site Specific – load
VIC	MG01	1.0114	6407649172	Site Specific – generation
VIC	MSAL	1.0274	N/A	Sub transmission line – long line
VIC	MSAS	1.0051	N/A	Sub transmission line – short line
VIC	MHBL	1.0338	N/A	Zone substation – long line
VIC	MHBS	1.0115	N/A	Zone substation – short line
VIC	MHCL	1.0410	N/A	HV feeder line – long line
VIC	MHCS	1.0187	N/A	HV feeder line – short line
VIC	MLDL	1.0633	N/A	LV distribution substation – long line
VIC	MLDS	1.0410	N/A	LV distribution substation – short line
VIC	MLEL	1.0771	N/A	LV line – long line
VIC	MLES	1.0548	N/A	LV line – short line

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GUIDANCE PAPER:

CALCULATION METHODOLOGY FOR DISTRIBUTION LOSS FACTORS (DLFs) FOR THE VICTORIAN JURISDICTION

14 FEBRUARY 2007

An appropriate citation for this paper is:

Essential Services Commission, *Guidance Paper: Calculation methodology for Distribution Loss Factors (DLFs) for the Victorian Jurisdiction*.

Amendment Record

Issue No.	Date	Amendments
Original issue	14 February 2007	

CONTENTS

1 INTRODUCTION

The Essential Services Commission (the Commission) approves Distribution Loss Factors (DLFs) applicable to the Victorian jurisdiction pursuant to clause 3.6.3(i) of the *National Electricity Rules* (the Rules), which states that:

> *…Before providing the distribution loss factors to NEMMCO for publication, the Distribution Network Service Provider must obtain the approval of the relevant Jurisdictional Regulator for the distribution loss factors it has determined for the next financial year.*

The Rules require that Distribution Network Service Providers (distributors) must obtain the Commission's approval of their proposed DLFs for the next financial year, prior to providing the approved DLFs to the National Electricity Market Management Company Limited (NEMMCO) for publication by 1 April of each year. Full details of this clause are contained in Appendix B of this document.

DLFs are used to adjust customers' metered consumption data to allow for energy losses in the electricity distribution network. They are applied to the consumption of second tier customers[1] in the National Electricity Market. The local retailer[2] is responsible for paying for distribution losses that are not allocated to second tier customers.

DLFs are also used to adjust the price paid to an embedded generator[3] to allow for the cost of energy losses in the distribution networks. This provides a price signal to potential embedded generators to encourage them to take network losses into account when making decisions about where to establish new generation.

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[1] A second tier customer is one who does not purchase electricity directly and in its entirety from the retailer who is the local retailer.

[2] A local retailer is the retailer who is responsible under the laws relevant to the participating jurisdiction (in this case Victoria) for the supply of electricity to first tier customers in the supply area of each distribution business.

[3] An embedded generator is a generating unit that is connected to the distribution network.

1.1 What is a DLF?

Energy losses are incurred as power is transported along distribution wires. Losses increase with line length and vary in proportion to the amount of power being transported. Overall losses can vary from year to year due to changes in network utilisation level, network configuration, the shape of the load profile and the level of reactive power support (the power factor).

The method of determining a DLF for a distribution network connection point is specified under clause 3.6.3(h)(3) of the Rules:

> *The distribution loss factor for a distribution network connection point… is determined using a volume weighted average of the average electrical energy loss between the transmission network connection point or virtual transmission node to which it is assigned and each distribution network connection point in the relevant class of distribution network connection points assigned to that transmission network connection point or virtual transmission node for the financial year in which the distribution loss factor is to apply.*

Due to the vast number and diversity of customers connected to electricity networks, it is not practical to measure or accurately calculate the distribution losses caused by each individual customer. The Rules requires that DLFs should be allocated to:

- each embedded generator of actual generation of more than 10 MW — individual site-specific DLFs are to be determined according to the generator's actual location within the network
- each large customer consuming more than 40 GWh per annum or with a peak demand of 10 MW — individual site-specific DLFs are to be determined according to the customer's actual location within the network
- all other customers and embedded generators — network average DLFs are to be allocated according to the type of connection points within the distribution network.

Site-specific DLFs for large embedded generators and customers are to be calculated individually according to the actual network and connection point characteristics.

Network average DLFs are calculated using a model that produces loss factors for different types (classification) of distribution network connection points in the distribution system based on relevant network parameters. Different loss factors are also set for long and short sub-transmission lines.[4]

[4] See section 2.3 for definitions of long and short sub-transmission lines.

1.2 Publication of a formal DLF calculation methodology

The application of DLFs is an important part of the electricity market in terms of customers' and retailers' exposures to electricity use (or cost), and how embedded generators should be rewarded for their outputs. All electricity distributors have been using the same DLF calculation methodology since 2003, which has been accepted by the Commission in its annual DLF approval process. However, this methodology has not been published on the Commission's website as a stand-alone regulatory document.

The publication of the DLF calculation methodology, which is based on the existing methodology used by the distributors, will provide transparency and consistency to the market participants on how DLFs are determined. This will assist the market participants in their planning processes. Further, the formalisation of the DLF calculation methodology will streamline the Commission's DLF approval process each year.

The DLF calculation methodology is intended to provide guidance to the Victorian electricity distributors on how to:

- undertake calculations for the DLFs in accordance with clause 3.6.3 of the Rules
- make submissions to the Commission for approval of the DLFs for the next financial year.

The Commission is aware that currently there are some levels of differences in the DLF calculation methodologies adopted by each jurisdiction. It understands that the reasons for the differences include historical approaches to loss allocation, tariff structures and the network operational information collection methods of the electricity distributors (both within, and across the states and territories). All the underlying issues must be resolved before national consistency can be achieved.

While one of the Commission's objectives under the *Essential Service Commission Act 2001* is to promote consistency in regulation between states and on a national basis, it believes that, taking into consideration the time required for achieving national consistence through resolving the issues identified above, there is clear benefit to the market participants that the existing DLF calculation methodology be formalised at this stage.

1.3 Amendments to the DLF calculation methodology

The Commission may amend this DLF calculation methodology on its own initiative, in response to changes to the Rules, or following a proposal by a distributor, a retailer or other interested persons, if the Commission considers that the amendment would better achieve its objectives under the *Essential Service Commission Act 2001 (Vic)*.

Submissions on amendments to the DLF calculation methodology must be made in writing to the Commission, including details of the proposed amendments and the reasons and/or benefits of the proposed amendments.

All proposed amendments to the DLF calculation methodology will be processed in accordance with the Commission's consultation procedures.

1.4 Structure of this guidance paper

The paper is structured as follows:

- Chapter 1 provides the background information and the reasons for the introduction of the Commission specified DLF calculation methodology.
- Chapter 2 describes the Commission specified DLF calculation methodology.
- Chapter 3 describes the DLF approval process.

2 DLF CALCULATION METHODOLOGY

The sections below provide the procedures of how site-specific and network average DLFs should be calculated.

2.1 Site-specific DLFs for large embedded generators

The requirements for determining DLFs for large embedded generators are specified in clause 3.6.3 or the Rules. Details of these requirements are set out in Appendix B. In particular, clause 3.6.3 (h) states that:

> *The methodology for the determination of distribution loss factors referred to in clause 3.6.3(g) must be developed having regard to the following principles:*
>
> *…*
>
> *(4): The distribution loss factor for a distribution network connection point described in clause 3.6.3(b)(2)(i) [embedded generator of actual generation of more than 10 MW] is determined using the average electrical energy loss between the distribution network connection point and the transmission network connection point to which it is assigned in the financial year in which the distribution loss factor is to apply.*

Where *average electrical energy loss* is defined as:

> *The volume-weighted average of the electrical energy losses incurred in each trading interval over all trading intervals in a defined period of time.*

A consistent approach to the choice of weighting factor is essential to achieve consistency in regulation and to provide a level playing field for competition in embedded generation. In the past, the Commission has approved some site-specific DLFs for embedded generators where losses have been expressed as a percentage of consumer sales, that is:

$$DLF = 1 + Losses/Sales \qquad (1)$$

where 'Sales' is the total energy sold to all customers connected to the connecting network for the embedded generator.

This is consistent with how network average losses are weighted when determining DLFs for small embedded generators and general customer loads, and is appropriate when the volume of sales is very much larger than the generator's output volume. However, a problem arises when the output volume of the generator is larger than the energy consumed by customers in that part of the network between the generator and the transmission connection point. In such circumstances, there is a net export of energy from the generator into the transmission network connection point and the sign of the second term in formula (1) becomes negative. Should sales be less in magnitude than losses, the second term becomes a large negative number and so the DLF could be less than zero. As a DLF represents losses in a network and losses are always present to some extent; it is evident that a DLF must always be a positive number and therefore expressing losses as a percentage of sales in some circumstances is not an appropriate approach.

The Rules require that the losses be volume weighted. Where a generator is directly connected to a transmission connection point, the generator's output volume can be used as the weighting factor. This makes sense as the DLF represents the average losses resulting from the operation of the generator across the various expected operating conditions. Thus, the average loss weighted by generator output volume approximates the average electrical loss for any particular period that the generator is generating.

However, when sales are very much larger than the generator output, using sales (rather than output volume) as the volume weighting factor would provide consistency with the volume weighting factor used for load customers and smaller embedded generators.

The two cases discussed above represent two extremes of a common weighting factor that can be expressed as 'the magnitude of sales less generator output', or in other words, the net energy flow in the connecting network. Thus the DLF would be found from Formula (2).

$$DLF = 1 + Losses / (Magnitude\ of\ sales\ less\ generation) \qquad (2)$$

This volume weighting is consistent with treating a generator as a negative load in network load flow modelling and allows a consistent approach to be adopted and an appropriate DLF to be developed in all likely operating conditions.

In calculating the DLFs for each large embedded generator requiring site-specific DLFs, distributors must follow the following steps:

- Model the operations of the generator based on historical record or other relevant information available.

- Determine the relevant forecast network losses by modelling the distribution network between the generator's connection point and the transmission network connection point for each modelled operating period of the generator.
- Calculate the annual overall DLF utilising a volume weighting factor based on the forecast average electrical energy loss for each modelled operating period of the generator in the financial year in which the DLF is to apply.

2.2 Site-specific DLFs for large customers

The Rules require site-specific loss factors to be derived for large customers with a demand of more than 10 MW or an annual energy consumption of more than 40 GWh. The DLFs for these customers must be based on their locations and connection arrangements.

The energy losses directly associated with a particular customer depend on the point at which the customer is connected to the network. For a customer directly connected to the sub-transmission network, only losses in the sub-transmission lines need to be determined. On the other hand, if a customer is connected to a shared distribution feeder, all the upstream losses need to be fairly allocated between the site-specific customer and all other customers on the feeder.

The following method should be used for determining the DLFs for the next financial year:

(1) Calculate all upstream losses from the site-specific customer's point of supply to the transmission network connection point (being the relevant terminal station).

(2) Determine the total energy sales at each segment of the distribution network upstream from the customer. (see section 2.3 for the details of the classifications of network segments).

(3) Determine the fraction of the total upstream energy sales associated with the site-specific customer. This can be calculated by dividing the energy sales of the customer by the total energy sales at each segment of the distribution network upstream.

> Note: The allocation of losses to site-specific customers based on the proportion of energy sales is consistent with the allocation method for the network average DLF customers and is considered appropriate by the Commission. A demonstration of the reason why allocations based on consumption is considered fair has been included in Appendix A.

(4) Multiply the percentages calculated in (3) by the energy losses calculated in (1) to determine the amount of losses at each segment that are attributable to the site-specific customer. Add these together to get the total distribution network losses attributable to the site-specific customer.

(5) Calculate the site-specific DLF as: 1 + (the total energy losses attributable to the site-specific customer) / (total energy sales to the site-specific customer).

Example: For a large customer supplied from a distribution feeder:

1. The total upstream energy losses (EL) between the customer and the supplying terminal station can be represented as EL_{FEEDER}, $EL_{ZONE\ SUBSTATION}$ and $EL_{SUBTRANSMISSION\ LOOP}$.
2. The total upstream energy sales (ES) can be represented as ES_{FEEDER}, $ES_{ZONE\ SUBSTATION}$ and $ES_{SUBTRANSMISSION\ LOOP}$.
3. Assuming that the site-specific customer energy sales is ES_S, the fraction of feeder sales associated with the site-specific customer is ES_S/ES_{FEEDER}; the fraction of zone substation sales associated with the site-specific customer is $ES_S/ES_{ZONE\ SUBSTATION}$; and the fraction of sub-transmission energy sales associated with the site-specific customer is $ES_S/ES_{SUBTRANSMISSIONLOOP}$.
4. The total site-specific customer losses (EL_S) equals: $(ES_S/ES_{FEEDER}) \times EL_{FEEDER} + (ES_S/ES_{ZONE\ SUBSTATION}) \times EL_{ZONE\ SUBSTATION} + (ES_S/ES_{SUBTRANSMISSIONLOOP}) \times EL_{SUBTRANSMISSION\ LOOP}$.
5. The site-specific DLF is then: $1+EL_S/ES_S$.

2.3 Network Average DLFs for general customers and small embedded generators

Distribution losses should be grouped into five major segments of the distribution network. Customers should pay for the losses based on which of the five segments are used to supply their power.

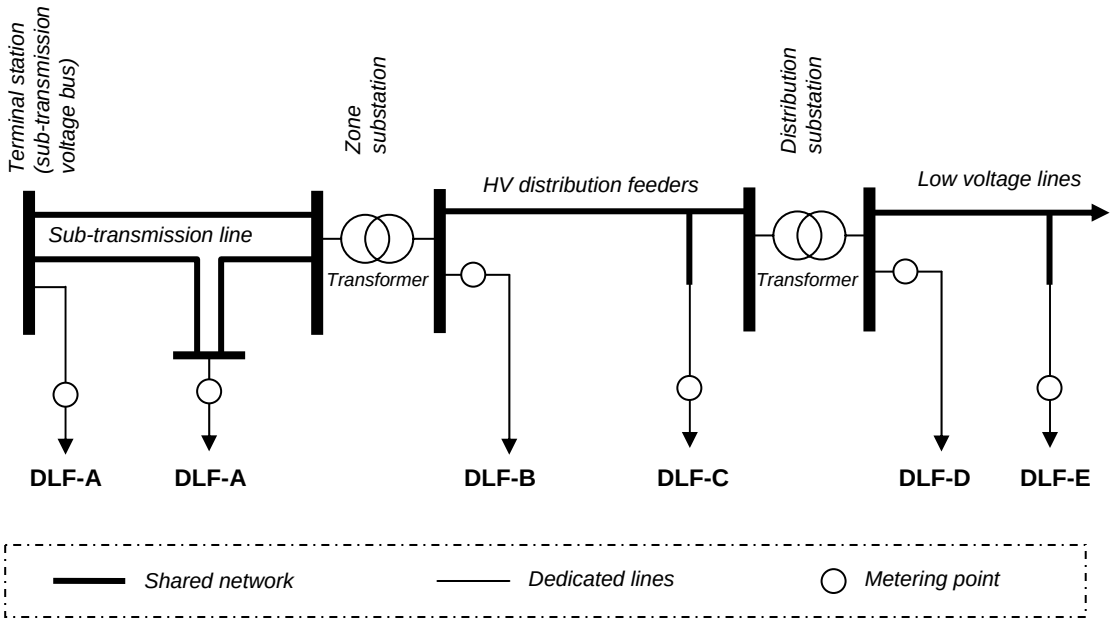
The five network segment categories are:

- Category A: Sub-transmission feeders operating at 66 kV or 22 kV (note: 1 kV = 1000 Volts)
- Category B: Zone substations operating at 22 kV, 11 kV or 6.6 kV
- Category C: High voltage (HV) distribution feeders operating at 22 kV, 11 kV or 6.6 kV
- Category E: Distribution substations operating at 240/415 V
- Category E: Low voltage (LV) feeders operating at 240/415 V.

A customer connected to the low voltage network utilises all upstream assets, causing electrical energy losses in each network segment upstream of its connection point. Customers connected to sub-transmission feeders, however, only cause losses on the sub-transmission network.

Figure 2.1 demonstrates how a customer's point of supply can be categorised under the five network segments.

Figure 2.1: Diagrammatic representation of the types of network connection points



Each customer should be categorised as A through to E depending on the customer's connection point to the network and the location of the metering point. For example, a customer with a dedicated HV feeder from a zone substation will be category C if the meter is at the customer's premises; but would be category B if the meter was installed at the zone substation.

Energy losses can be calculated for each network segment. Once the losses in each segment are determined, the total losses attributable to a customer class can be determined by combining all upstream losses from the customer's point of supply to the terminal station (transmission network connection point) similar to the calculation process of site-specific DLFs. Distribution loss factors are then calculated for each category A to E.

- DLF-A is the distribution loss factor to be applied to a second tier customer or market customer[5] connected to a sub-transmission line (at 66 kV or 22 kV).

[5] Market customers are those customers who purchase their energy directly from the national electricity market.

• DLF-B is the distribution loss factor to be applied to a second tier customer or market customer connected to the lower voltage side of a zone substation at voltages of 22 kV, 11 kV or 6.6 kV.

• DLF-C is the distribution loss factor to be applied to a second tier customer or market customer connected to a distribution line from a zone substation at voltages of 22 kV, 11 kV or 6.6 kV.

• DLF-D is the distribution loss factor to be applied to a second tier customer or market customer connected to the lower voltage terminals of a distribution transformer (at 240/415 V).

• DLF-E is the distribution loss factor to be applied to a second tier customer or market customer connected to a low voltage line at 240/415 V.

Separate DLFs must also be calculated for each of the DLF categories A to E depending on whether the length of the sub-transmission line supplying the customer is 'short' or 'long'. This creates a total of ten DLFs per distributor.

A short sub-transmission line is defined as:

- a radial sub-transmission line where the route length of the line is less than 20 km; or
- a sub-transmission line in a loop where the total route length of all lines in the loop is less than 40 km.

All other long sub-transmission lines are defined as 'long'.

Example:	Assume that a department store is supplied from a distribution substation within its property and that the store is a second tier customer. The store is in an urban area where the sub-transmission network is short and therefore would be classified as 'short D'. Assume DLF-D (short) = 1.0400 as calculated by the distribution company. If this department store consumes 100 MWh of energy in a month (as recorded by the meter), the store's retailer will buy 1.04 x 100 MWh = 104 MWh from the National Electricity Market at the transmission connection point on behalf of the customer. The customer pays for an extra 4 MWh on top of the meter reading because this represents the electrical energy losses on the distribution network.

2.4 Calculation of forward looking DLFs

Clause 3.6.3(i) of the Rules requires that DLFs allocated to customers are based on the 'forward looking' estimate of energy consumption for the next year rather than the actual consumptions and energy losses of the previous year. The estimation of the energy consumption, energy losses and therefore the appropriate DLFs for the next financial year should follow the process below:

(i) Review the historical energy consumption of the entire network (this will inform step (iii) below).

(ii) Review the historical actual overall energy losses of the entire network based on the total energy procured, the total metered energy sales, estimated un-metered energy sales, and allowances for theft and faulty metering equipment (this will inform step (iv) below).

(iii) Predict the total energy consumption for the next financial year.

(iv) Predict the overall energy losses based on historical data, planned changes to network configurations and customer load patterns — this is the 'top-down' approach and provides an accurate prediction of overall network losses.

(v) Compare the predicted top-down overall losses with the calculated 'bottom-up' estimation of total energy losses by multiplying the individually forecasted energy consumption of site-specific customers and the forecasted consumption of all other customers by the theoretical loss factors calculated in accordance with the steps illustrated in sections 2.2 and 2.3.

(vi) Adjust the theoretical DLFs by scaling so that the bottom-up total losses equal the top-down prediction of overall energy losses.

(v) Confirm that the price impact on customers due to changes in DLFs represents no greater than one per cent increase in energy cost.[6] (Note: The Commission may allow for increases in site-specific DLF of more than one per cent for some large customers if the change would better reflect the actual network loss share of the specific customers.)

The Commission considers that:

- The top-down approach will provide a high level of accuracy in predicting the overall losses of the distribution networks. However, this method cannot provide accurate allocation of losses incurred by individual customers.
- The DLFs calculated based on section 2.2 and 2.3 are the results of the best estimates (engineering model) of what the DLFs should be, and have a good level of relativity amongst all customers of a distributor's network.
- Scaling the modelled DLFs to produce an overall loss that is equal to the top-down estimated overall loss would produce a set of appropriate DLFs, because the DLFs derived in this manner would represent the best estimated overall losses and preserve the relativity of individual contributions to the overall distribution losses of all customers.

Therefore, the Commission concludes that the above process for determining the forward looking DLFs should produce a fair and accurate outcome.

[6] As indicated in previous DLF approval papers, the Commission considers that price increase due to change in DLF value of up to one per cent is not unreasonable.

2.5 Reconciliation of Forecast and Actual Losses

The Rules require each distributor to undertake reconciliation between the total energy losses implied by the DLFs for the previous financial year against the actual energy losses for that period. Mathematically the reconciliation process can be expressed as follows:

$$\left[\sum_{i=1}^{i=n} ME_i + Total\ \ actual\ \ distribution\ \ energy\ \ loss\ \right] = \left[\sum_{i=1}^{i=n} ME_i \times DLF_i\right] - \left[\ Reconciliation\ error\ \right]$$

Where:

ME_i = Metered Energy flowing out of a distribution network connection *'i'* over the financial year.

DLF_i = The previously approved DLF for distribution connection point *'i'.*

n = Number of distribution network connection points.

The left hand side of the equation represents all energy flowing out from all customers' distribution connection points plus total measured top down energy losses. It is in effect the total net energy (TNE) flowing from transmission connection points into the distribution network.

The first part of the right hand side of the equation represents the total adjusted gross energy (TAGE) flowing out from distribution connection points. It is the metered energy plus distribution losses recovered through the application of the DLFs.

The reconciliation error is the difference between TNE and TAGE. A positive result means that the actual network losses were higher than the losses recovered through the application of the DLFs. Likewise, a negative result means that actual distribution network energy losses were less than the amount recovered through the application of the DLFs.

The Commission will review the reconciliation errors of each distributor to monitor the accuracy of their forecasting process.

3 APPROVAL PROCESS OF DISTRIBUTORS' PROPOSED DLFs

Distributors must submit to the Commission their proposed DLFs for the next financial year prior to 1 March of each year. The following information must form part of a distributor's submission:

- A declaration that the proposed DLFs have been calculated based on the Commission's DLF calculation methodology.
- The proposed site-specific DLFs for large customers and embedded generators requiring site-specific DLFs, and network average DLFs for all other customers and embedded generators in the format specified in section 3.1.
- A statement of the reconciliation result in terms of over/under allocation of losses from the application of DLFs for the previous financial year in the format specified in section 3.1.
- A statement of the overall losses of the distributor's network as specified in section 3.1.

3.1 Distributors' submissions for approval

Distributors must provide the following information to the Commission.

Site-specific DLFs for large embedded generators

- Each generator's title and National Meter Identifier (NMI)
- DLF for the current financial year
- Proposed DLF for the next financial year
- Percentage change in DLF value
- Information on how the operation of the generator is modelled
- Information on how the relevant network losses are modelled
- Information on how the proposed DLF is calculated including the volume weighting factors adopted.

Note: Due to commercial sensitivity concerns, specific information on the operational information of each generator will not be released by the Commission.

Site-specific DLFs for large customers

- Customers' National Meter Identifiers (NMIs)
- DLF for the current financial year
- Proposed DLF for the next financial year
- Percentage change in energy cost due to the change in DLF value.

Network average DLFs for other customers and embedded generators

- Values of each DLF types (DLF-A , DLF-B, DLF-C, DLF-D and DLF-E, for long and short sub-transmission lines) for the current financial year
- Proposed DLFs for the next financial year
- Percentage change in energy cost due to the change in DLF value for each proposed DLF category
- The extent to which allowance for theft and metering inaccuracy was included in the calculation.

(Note: The Commission undertook a review of the loss levels of other countries in 2000. Based on the findings of the review, the Commission considers that the allowance for theft and metering inaccuracy in Australia is most likely to be between 0.2 and 1.0 per cent.)

Reconciliation of over/under allocation of losses in the previous financial year

Distributors must provide the following information on the 'over or under allocation of network losses' over the previous financial year due to the application of the previously approved DLFs in its network:

- Overall level of losses recovered through the application of DLFs to customers' actual overall consumption in the previous financial year, in MWh
- Actual overall losses as measured by the distributor, in MWh
- Reconciliation error in overall network losses, being the difference between the total losses recovered through the application of the previously approved DLFs and the actual overall losses, in MWh
- Reconciliation error as a percentage of the total energy sales in the distributor's network, with a positive number meaning over-recovery.

Overall level of network losses for the next financial year

- A statement of the forecast overall losses of their networks as a percentage of the forecast overall energy sales for the next financial year.

3.2 The Commission's approval criteria and process

The Commission will assess the information provided by the distributors as specified in section 3.1. Approval will be based on the following considerations:

- For load customers — that the price impact on customers due to changes in DLFs represents no greater than one per cent increase in energy cost. (The Commission may allow for increases in site-specific DLF of more than one per cent for some large customers if the change would better reflect their share of network losses.)
- For embedded generators — that the calculated DLFs are based on sound assumptions about the operations of the generators.
- That distributors have taken into consideration their previous forecast errors in overall loss levels by examining the trend of reconciliation errors over time.
- That the overall levels of network losses of each distributor are reasonable.[7]

The Commission will, after analysis of distributors' submissions, publish a consultation paper for stakeholders and public comments on its website regarding the DLFs proposed by the distributors. The consultation paper will include an analysis of the trends in forecast error levels and the overall levels of network losses of each distributor over time.

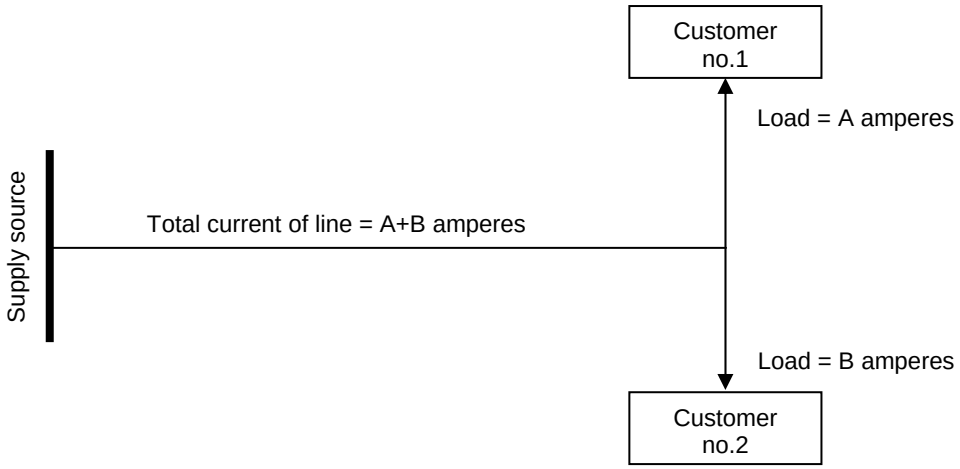
Final approval will take into considerations all comments received by the Commission during the consultation period.

[7] The Commission undertook a review of the loss levels of other countries in 2000. Based on the findings of the review, the Commission considers that the economic levels of losses for Victorian distributors should be in the range of 3 to 5 per cent of sales for urban-based networks and could be as high as 10 per cent of sales for distributors with predominantly rural networks.

APPENDIX A: LOSS ALLOCATION MODEL

Simplified model for the determination of a fair principle for distribution losses allocation to customers

Assuming two customers are connected to a distribution line at the same connection position, and customer no.1 and no.2 have a load current of A and B amperes respectively.



The total loss in the distribution line is $(A+B)^2$ times R, where R = the resistance of the line.

The loss attributable to customer no.1 can be calculated based on a number of allocation principles. As the loss is proportional to the square of the current, the basic levels of loss due to the two customers are A^2R and B^2R respectively. The sum of these two basic losses is less than the actual total loss $(A+B)^2R$. This can be demonstrated by assuming A = 2 amperes and B = 3 amperes. $A^2R + B^2R$ would be 4R + 9R = 13R; but $(A+B)^2R = (2+3)^2R = 25R$.

It appears that allocation based on load current is not appropriate. A more in-depth assessment is therefore necessary.

The lowest level of its share of the total loss attributable to customer no.1 would exist under the assumption that this customer is the first customer who uses the capacity of the line. The loss under this assumption is therefore A^2R.

On the other hand, the highest level its share of the total loss attributable to customer no.1 would be under the assumption that this customer is the last customer who uses the capacity of the line. The loss under this assumption is the marginal loss, i.e. total losses less the losses due to all other customers (in this case customer no.2). This is equal to:

$$(A+B)^2R - B^2R.$$

Note: B^2R being the loss due to customer no.2, if customer no.2 was the sole customer.

Since no one single customer can be considered as the first or last customer who uses the capacity of any distribution line, the fair way of loss allocation is at the mid-level of the two extreme cases above.

The loss that can be considered fairly allocated to customer no.1 is

$$= [A^2R + (A+B)^2R - B^2R] / 2 = A^2R + ABR$$

The portion of the total loss attributable to customer no.1 is its allocated 'fair loss' divided by the total loss of the line,

$$= (A^2R + ABR) / (A+B)^2R = A(A+B)R / (A+B)^2R$$

$$= A / (A+B)$$

= same proportion of the share of current due to customer no.1 of the total line loading.

Therefore it can be concluded that allocation of line losses to customers based on each customer's energy consumption is a fair and reasonable approach.

APPENDIX B: EXTRACT FROM THE NATIONAL ELECTRICITY RULES

Note: The following extract from the National Electricity Rules is based on the version of the Rules published on 14 February 2007. The Rules may change from time to time. The latest version of the Rules can be viewed on the Australian Energy Market Commission's website at www.aemc.gov.au.

3.6.3 Distribution losses

(a) *Distribution losses* are *electrical energy losses* incurred in the conveyance of electricity over a *distribution network*.

(b) *Distribution loss factors*:

(1) notionally describe the *average electrical energy losses* for electricity transmitted on a *distribution network* between a *distribution network connection point* and a *transmission network connection point* or *virtual transmission node* for the financial year in which they apply;

(2) will be either:

(i) a site specific *distribution loss factor* derived in accordance with the methodology determined by the *Jurisdictional Regulator* or the *Distribution Network Service Provider* pursuant to clause 3.6.3(h), for each *distribution network connection point* of the following types:

A. a *connection point* for an *embedded generating unit* with actual *generation* of more than 10MW, based on the most recent data available for a consecutive 12 month period at the time of determining the *distribution loss factor*. Where relevant data is not available for a consecutive 12 month period as a *transmission network connection point* is newly established or has been modified, a *Network Service Provider* may determine whether an *embedded generating unit* has *generation* of more than 10MW, based on its best projection of *generation* in the *financial year* in which the *distribution loss factor* is to apply, taking into account the terms of the relevant *connection agreement*;

B. a *connection point* for an end-user with actual or forecast *load* of more than 40GWh or an electrical demand of more than 10MW, based on the most recent data available for a consecutive 12 month period at the time of determining the *distribution loss factor*. Where relevant data is not available for a consecutive 12 month period as a *transmission network connection point* is newly established or has been modified, a *Network Service Provider* may determine whether an end-user has *load* of more than 40GWh or forecast *peak load* of more than 10MW, based on its best projection of *load* in the *financial*

year in which the *distribution loss factor* is to apply, taking into account the terms of the relevant *connection agreement*;

C. a *connection point* for a *market network service provider*; and

D. a *connection point* between two or more *distribution networks*; OR

(ii) derived, in accordance with the methodology determined by the *Jurisdictional Regulator* or the *Distribution Network Service Provider* pursuant to clause 3.6.3(h), using the volume weighted average of the *average electrical energy loss* between the *transmission network connection point* or *virtual transmission node* to which it is assigned and each *distribution network connection point* in the relevant *voltage class* assigned to that *transmission network connection point* or *virtual transmission node*, for all *connection points* on a *distribution network* not of a type described in clause 3.6.3(b)(2)(i);

(3) are to be used in the settlement process as a notional adjustment to the electrical *energy*, expressed in MWh, flowing at a *distribution network connection point* in a *trading interval* to determine the *adjusted gross energy* amount for that *connection point* in that *trading interval*, in accordance with clause3.15.4.

(c) Each *Distribution Network Service Provider* must assign each *connection point* on its *distribution network*, of a type described in clause 3.6.3(b)(2)(i), to a single *transmission network connection point* taking into account normal *network* configurations and predominant *load* flows.

(a1) **[Deleted]**

(d) Each *Distribution Network Service Provider* must assign each *connection point* on its *distribution network*, not of a type described in clause 3.6.3(b)(2)(i):

(1) where practicable, to a single *transmission network connection point* or otherwise, to a *virtual transmission node*, taking into account normal *network* configurations and predominant *load* flows; and

(2) to a class of *distribution network connection points* based on the location of, *voltage* of and pattern of electrical *energy* flows at the *distribution network connection point*.

(e) So far as practicable, the assignment of *connection points* on the *distribution network* to:

(1) *transmission network connection points* under clause 3.6.3(c); or

(2) *transmission network connection points* or *virtual transmission nodes* and a class of *distribution network connection points* under clause 3.6.3(d),

must be consistent with the geographic boundaries of the *pricing zones* determined in accordance with clause 6.13.2 for use in *distribution service* pricing, and the *voltage* levels incorporated within these *pricing zones*.

(f) The assignment of *connection points* on a *distribution network*:

(1) to a single *transmission network connection point* under clause 3.6.3(c); or

(2) to a *transmission network connection point* or *virtual transmission node* and a class of *distribution network connection points* under clause 3.6.3(d),

is subject to the approval of the relevant *Jurisdictional Regulator* and the *Distribution Network Service Provider* must inform *NEMMCO* of such approved assignments.

(g) *Distribution loss factors* must be determined by a *Distribution Network Service Provider* for all *connection points* on its *distribution network* either individually, for all

connection points assigned to a single *transmission network connection point* under clause 3.6.3(c), or collectively, for all *connection points* assigned to a *transmission network connection point* or a *virtual transmission node* and a particular *distribution network connection point* class under clause 3.6.3(d), in accordance with:

(1) the methodology developed, *published* and maintained by the *Jurisdictional Regulator* for the determination of *distribution loss factors*; or

(2) where the *Jurisdictional Regulator* has not *published* a methodology under sub-paragraph (1) above, the methodology developed, *published* and maintained by the *Distribution Network Service Provider* for the determination of *distribution loss factors*.

(h) The methodology for the determination of *distribution loss factors* referred to in clause 3.6.3(g) must be developed having regard to the following principles:

(1) The aggregate of the *adjusted gross energy* amounts for a *distribution network*, determined in accordance with clause 3.15.4 using the *distribution loss factors* for the *financial year* in which the *distribution loss factors* are to apply should equal, as closely as is reasonably practicable, the sum of:

A. the amount of electrical *energy*, expressed in MWh, flowing at all *connection points* in the *distribution network* in the *financial year* in which the *distribution loss factors* are to apply; and

B. the total *electrical energy losses* incurred on the *distribution network* in the *financial year* in which the *distribution loss factors* are to apply.

(2) The methodology used to determine *distribution loss factors* for a *financial year* should incorporate provisions requiring a *Distribution Network Service Provider* to undertake a reconciliation between the aggregate of the *adjusted gross energy* amounts for its *distribution network* for the previous *financial year* determined in accordance with clause 3.15.4 using the *distribution loss factors* that applied for *connection points* in that *distribution network* in the previous *financial year* and the sum of:

(i) the amount of electrical *energy*, expressed in MWh flowing at all *connection points* in its *distribution network* in the previous *financial year*; and

(ii) the total *electrical energy losses* incurred on its *distribution network* in the previous *financial year*.

(3) The *distribution loss factor* for a *distribution network connection point*, other than those described in clause 3.6.3(b)(2)(i), is determined using a volume weighted average of the *average electrical energy loss* between the *transmission network connection point* or *virtual transmission node* to which it is assigned and each *distribution network connection point* in the relevant class of *distribution network connection points* assigned to that *transmission network connection point* or *virtual transmission node* for the *financial year* in which the *distribution loss factor* is to apply.

(4) The *distribution loss factor* for a *distribution network connection point* described in clause 3.6.3(b)(2)(i) is determined using the *average electrical energy loss* between the *distribution network connection point* and the *transmission network connection point* to which it is assigned in the *financial year* in which the *distribution loss factor* is to apply.

(5) In determining the *average electrical energy losses* referred to in clause 3.6.3(h)(3) and (4) above, the *Distribution Network Service Provider* must use the most recent actual *load* and *generation* data available for a consecutive 12 month period but may adjust this *load* and *generation* data to take into

account projected *load* and / or *generation* growth in the *financial year* in which the *distribution loss factors* are to apply.

(6) In determining *distribution loss factors*, flows in *network elements* that solely or principally provide *market network services* will be treated as invariant, as the methodology is not seeking to calculate the *marginal losses* within such *network elements*.

(i) Each year the *Distribution Network Service Provider* must determine the *distribution loss factors* to apply in the next *financial year* in accordance with clause 3.6.3(g) and provide these to *NEMMCO* for *publication* by 1 April. Before providing the *distribution loss factors* to *NEMMCO* for *publication*, the *Distribution Network Service Provider* must obtain the approval of the relevant *Jurisdictional Regulator* for the *distribution loss factors* it has determined for the next *financial year*.

Certification of the Distribution Loss Factors (DLFs) proposed by the Victorian electricity distributors for the financial year 2011-12

9 March 2011

Victorian Electricity Distribution Businesses

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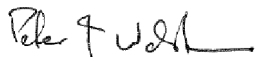
Revision	Details	Date	Amended By
00	Original	09-03-2011	
01	Amended nomenclature	10-03-2011	M Van Doornik
02	Corrected Tables	10-03-2011	M Van Doornik

Author: M. Van Doornik

Reviewer: P. Walshe

Approved by: P. Walshe

Signed: 

Date: 4 March 2011

Distribution: Jemena Electricity Networks (Vic) Ltd, CitiPower Pty, Powercor Australia Ltd, SP AusNet and United Energy Distribution

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Our reference 2159417A

9 March 2011

Certification of the DLFs for the Victorian Distribution Business 2011-12

PB reviewed the proposed DLFs prepared by United Energy Distribution to determine whether they have been prepared in accordance with the requirements of the National Electricity Rules.

Consistent with the reviews undertaken previously by the Essential Services Commission of Victoria, PB has assessed whether the proposed DLFs:

- are based on appropriate data
- accord with the correct methodology, and
- are a fair statement of the applicable loss factors for the DNSP.

The review involved:

- determining the approved calculation methodology that applies and a desk top review of the businesses proposed submission to AER against this methodology
- a meeting with each DNSP to assess data integrity and to clarify any aspects of the DLF calculation.

In our opinion, the proposed DLFs comply with the approved calculation methodology and are consistent with the requirements of clause 3.6.3 of the National Electricity Rules.

Yours sincerely

Peter Walshe
Principal Consultant
Parsons Brinckerhoff Australia Pty Limited

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Appendices

1. Introduction

1.1 Purpose of this report

The Victorian DNSPs – Jemena Electricity Networks Ltd (JEN), CitiPower Pty, Powercor Australia Ltd, SPI Electricity (referred to as SP AusNet) and United Energy Distribution (UED) – are required to submit their proposed distribution loss factors (DLFs) for the financial year 2011-12 to the Australian Energy Regulator (AER) for approval.

The DLFs must be calculated in accordance with a published methodology. In accordance with the National Electricity Rules (NER) 3.6.3(g), the methodology must be either published by the Australian Energy Regulator (AER) or by the Distribution Network Service Provider and adherence to that methodology must be independently certified.

The methodology used by all Victorian businesses is the *Calculation Methodology for Distribution Loss Factors (DLFs) for the Victorian Jurisdiction (14 February 2007)* which was published by the Essential Services Commission (ESC). CitiPower and Powercor have published a new methodology for embedded generators. The new methodology will be applied starting in the 2011-12 financial year.

This report outlines Parsons Brinkerhoff (PB)'s findings from our review of the proposed DLFs.

1.2 Background

DLFs are used to adjust customer's metered electricity consumption data to allow for energy losses in the electricity distribution network.

The National Electricity Rules require that DLFs should be allocated to:

- each embedded generator of actual generation of more than 10MW – individual site-specific DLFs are to be determined according to the generator's actual location within the network
- each large customer consuming more than 40 GWh per annum or with a peak demand of 10MW or more – individual site specific DLFs are to be determined according to the customers' actual location on the network
- all other customers and embedded generators. For this category of customer / generator network average DLFs are to be allocated according to the type of connection points within the distribution network.

The distributors' proposals are summarised in part 2 of this report.

1.3 PB's review methodology

The proposed DLFs must be independently certified that they are based on appropriate data, the correct methodology and that the results are a fair statement of the applicable loss factors for each DNSP.

The Victorian distributors have engaged PB to undertake this independent certification. This report contains PB's analysis of the proposed DLFs.

PB has undertaken a common assessment of all five DNSPs submissions to determine whether the methodology results in a fair statement of applicable loss factors in the Victorian region.

The methodology adopted by PB for this review included:

- determining the approved calculation methodology that applies
- receiving each DNSP's proposed submission to the AER
- a desktop review of the DNSPs proposed submissions against the published methodology
- a telephone discussion or meeting with each DNSP to assess data integrity and to clarify any aspects of the DLF calculation
- assessment of any clarifying information provided.

1.4 Structure of this report

The remainder of this report is structure as follows:

- Part 2 provides the details of the DLFs proposed by the DNSPs for the 2011-12 financial year
- Part 3 provides the details of PB's assessment of the proposed DLFs
- Appendix A provides PB's terms of reference.

2. Proposed DLFs for the 2011-12 financial year

The distributors' proposed DLFs for the financial year 2011-12 are shown in Tables 2.1, 2.2 and 2.3.

2.1 Proposed site-specific DLFs for large customers

The proposed DLFs for large load customers are given in Table 2.1.

Table 2.1 Proposed site-specific DLFs for large load customers for the 2011-12 financial year

Distributor	National Metering Identifier	DLF for 2011-12
CitiPower	VAAA000431	1.0165
	VAAA000673	1.0172
Powercor	VCCCAF0002	1.0007
	VCCCAF0001	1.0063
	VCCCDA0031	1.0010
	VCCCGD0001	1.0009
	VCCCGJ0001	1.0020
	VCCCDA0022	1.0013
	VCCCRD0007	1.0117
	VCCCDA0025	1.0084
	VCCCAB0003	1.0158
	VCCCAD0001	1.0122
	6203764760	1.0087
	VCCCSE0004	1.0538
	VCCCGE0019	1.0085
	VCCCBC0025	1.0353
	VCCCTE0002	1.0565
	VCCCSB0012	1.0542
	6203803617	1.0127
	VCCCBF0010	1.0433
	VCCCLD0024	1.0097
UED	VEEE0PD8AD	1.0124
	VEEE0TF39Q	1.0142
	VEEE0BG4Q3	1.0214
	VEEE0NDNEX	1.0254
	VEEE08KH3V	1.0091
	VEEE0C8AW1	1.0050
	6407649172	1.0114
JEN	VDDD000495	1.0102
	6001280255	1.0057
	VDDD000244	1.0114

	VDDD000134	1.0133
	VDDD000136	1.0029
SP AusNet	VBBB000073	1.0033
	VBBB000161	1.0090
	VBBB000058	1.0213
	VBBB000096	1.0525

2.2 Proposed site-specific DLFs for embedded generators

The proposed DLFs for large embedded generators producing more than 10MW of energy for the 2011-12 financial year are shown in Table 2.2.

Table 2.2 Proposed site-specific DLFs for large embedded generators for the 2011-12 financial year

Distributor	Generator	National Metering Identifier	DLF for 2011-12
CitiPower	none		
Powercor	Challicum Hills Wind Farm	6203661632	0.9820
	Codrington Wind Farm	6203008781	1.0342
	Yambuk Wind Farm	6203690629	1.0342
	Oakland's Hill Wind Farm	See Note 1	0.9086
UED	Clayton Generator	6407649172	1.0114
JEN	Somerton Power Station	6001264751	0.9921
SP AusNet	Alinta No1 Generator at Bairnsdale	6305010110	1.0528
	Alinta No2 Generator at Bairnsdale	6305651897	1.0528
	Toora Wind Farm	630565070	1.0771
	Wonthaggi Wind Farm	6305721689	1.0718
	Esso Longford Generator	VBBB002342	1.0795
	Clover Power Station 1	VMBTWZCLG1	0.9886
	Clover Power Station 2	VMBTWZCLG2	0.9886
	Rubicon Group of Generators	VTTSWZRUBX	1.0343

Note 1: Oakland's Hill Wind Farm will start up in the second half of 2011. The NMI of this generator has not been supplied.

2.3 Proposed network average DLFs for other customers and embedded generators with less than 10MW output

The proposed DLFs for network average customers and embedded generators smaller than 10 MW are given in Table 2.3.

Table 2.3 Proposed network average DLFs for the 2011-12 financial year

Distributor	Distribution Loss factors					
	Type	DLF-A	DLF-B	DLF-C	DLF-D	DLF-E
CitiPower	Short sub-transmission	1.0035	1.0113	1.0160	1.0387	1.0438
	Long sub-transmission	N/A	N/A	N/A	N/A	N/A
Powercor	Short sub-transmission	1.0047	1.0112	1.0360	1.0612	1.0695
	Long sub-transmission	1.0332	1.0397	1.0645	1.0897	1.0980
UED	Short sub-transmission	1.0051	1.0115	1.0187	1.0410	1.0548
	Long sub-transmission	1.0274	1.0338	1.0410	1.0633	1.0771
JEN	Short sub-transmission	1.0056	1.0110	1.0265	1.0389	1.0454
	Long sub-transmission	1.0266	1.0319	1.0474	1.0598	1.0663
SP AusNet	Short sub-transmission	1.0044	1.0122	1.0341	1.0555	1.0632
	Long sub-transmission	1.0390	1.0469	1.0687	1.0902	1.0979

Notes:

- DLF-A is the distribution loss factor to be applied to a second tier customer or market customer connected to a sub-transmission line at 66 kV or 22 kV.
- DLF-B is the distribution loss factor to be applied to a second tier customer or market customer connected to the lower voltage side of a zone substation at 22 kV, 11 kV or 6.6 kV.
- DLF-C is the distribution loss factor to be applied to a second tier customer or market customer connected to a distribution line from a zone substation at voltage of 22 kV, 11 kV or 6.6 kV.
- DLF-D is the distribution loss factor to be applied to a second tier customer or market customer connected to the lower voltage terminals of a distribution transformer at 240/415 V .
- DLF-E is the distribution loss factor to be applied to a second tier customer or market customer connected to a low voltage line at 240/415 V.
- Separate DLFs are also calculated for each DLF category A to E depending on whether the length of the sub-transmission line supplying the customer upstream of the customer's connection point is 'short' or 'long'.

A short sub-transmission line is defined as:

- a radial sub-transmission line where the route length of the line is less than 20 km, or
- a sub-transmission line in a loop where the total route length of all lines in the loop is less than 40 km.

All other sub-transmission lines are defined as 'long sub-transmission'

3. PB's findings

This section sets out PB's analysis and findings.

3.1 Assessment of the proposed DLFs

Consistent with previous assessments of DNSP's proposed DLFs undertaken by the ESC, PB has adopted the following approach when assessing whether the proposed DLFs are a fair statement of the applicable loss factors for each DNSP:

- For load customers — that the price impact on customers due to changes in DLFs represents no greater than a one per cent increase in energy cost. The ESC stated that increases in site-specific DLF of more than one per cent for some large customers may be appropriate if the change would better reflect their share of network losses.
- For embedded generators — that the calculated DLFs are based on sound assumptions about the operations of the generators.
- That distributors have taken into consideration their previous forecast errors in overall loss levels by examining the trend of reconciliation errors over time.
- That the overall levels of network losses of each distributor are reasonable.

In undertaking its review PB had regard to these considerations and also reviewed the following topics:

Calculation methodology

The Rules state that DLFs must be "*derived, in accordance with the methodology determined by the AER or the Distribution Network Service Provider*"[1]. In previous years all of the Victorian DNSPs adopted the methodology developed by the Essential Services Commission of Victoria[2]. As the AER has not established its own methodology, JEN, UED and SP AusNet have adopted the previous calculation methodology for the 2011-12 financial year.

CitiPower and Powercor have also adopted the previous calculation methodology for average demand customers and large site specific customers, but have published a new methodology, addressing section 2.1 of the ESC Methodology, to modify the calculation method used for large embedded generators. The new methodology was reviewed by the AER and published by the distribution businesses in accordance with the NER requirements under clause 3.6.3. CitiPower and Powercor have accepted all other sections of the ESC methodology.

All DNSPs stated that the proposed DLFs have been calculated in accordance with the calculation methodology approved by the ESC in previous years or their published amendments. PB discussed how each DNSP calculates the DLFs with respect to the three category types – large embedded generators, large site specific customers and average

1 National Electricity Rules Clause3.6.3

2 Essential Services commission of Victoria, 14 February 2007, Calculation Methodology for Distribution Loss Factors (DLFs) for the Victorian Jurisdiction

demand customers. PB confirms that each of the DNSPs undertook the appropriate level of calculation for each customer type.

Sales forecasts

PB notes that the Australian Energy Market Operator's (AEMO) forecast sales growth for Victoria in the year 2011-12 (projected in 2010) shows an expected growth of 2.5%[3]. PB undertook an investigation into the load growth forecast by the DNSPs, using the 2010/11 and 2011/12 forecast data, to ensure consistency with the AEMO forecasts. Overall, PB found that the forecast load growth of the DNSPs is consistent with the state wide forecast made by AEMO.

3.2 Price impact on load customers

A high price impact on a local customer may indicate a failure of the DLF calculation methodology to provide an appropriate loss factor. In past reviews the ESC adopted a threshold that price increases should be less than one per cent. PB considers that this threshold is reasonable and has also adopted it.

Table 3.1 and Table 3.2 present the changes in the DLF values for the 2011-12 financial year for large load customers and network average customers from the current (2009-10) financial year respectively, based on the proposed DLFs. The tables show that the impact on all customers of the proposed DLFs for 2011-12 does not result in price increases of greater than one percent.

However, the UED DLF-E category for both Short and Long Sub Transmission lines show price decreases of 1.023% and 1.129% respectively. This change in the UED DLF-E has resulted from a decrease in network losses. The actual losses calculated for financial year 2009/10 were 4.73%, which was significantly reduced compared to the actual losses of 5.64% for 2008/09. As the DLFs for 2010/11 are based on the actual 2008/09 losses and the DLFs for 2011/12 are based on actual 2009/10 losses, the effect of the decrease in losses from 2008/09 to 2009/10 has resulted in a general reduction of the forecast DLFs for 2011/12, most notably for DLF-E by more than 1%.

These changes result in a net decrease in the cost of energy to customers and are therefore acceptable under the ESC methodology.

[3] Australian Energy Market Operator 2010, Electricity Statement of Opportunities, Section 4.6.1

Table 3.1 Changes in proposed DLFs for large load customers

Distributor	National Metering identifier	Current year DLF 2010-11	Proposed DLF 2011-12	Change
CitiPower	VAAA000431	1.0158	1.0165	0.069%
	VAAA000673	1.0181	1.0172	-0.088%
Powercor	VCCCAF0002	1.0008	1.0007	-0.010%
	VCCCAF0001	1.0081	1.0063	-0.179%
	VCCCDA0031	1.0009	1.0010	0.010%
	VCCCGD0001	1.0009	1.0009	0.000%
	VCCCGJ0001	1.0021	1.0020	-0.010%
	VCCCDA0022	1.0013	1.0013	0.000%
	VCCCRD0007	1.0095	1.0117	0.218%
	VCCCDA0025	1.0085	1.0084	-0.010%
	VCCCAB0003	1.0183	1.0158	-0.246%
	VCCCAD0001	1.0107	1.0122	0.148%
	6203764760	1.0084	1.0087	0.030%
	VCCCSE0004	1.0561	1.0538	-0.218%
	VCCCGE0019	1.0093	1.0085	-0.079%
	VCCCBC0025	1.0289	1.0353	0.622%
	VCCCTE0002	1.0568	1.0565	-0.028%
	VCCCSB0012	1.0564	1.0542	-0.208%
	6203803617	See Note 2	1.0127	n/a
	VCCCBF0010	See Note 2	1.0433	n/a
	VCCCLD0024	See Note 2	1.0097	n/a
UED	VEEE0PD8AD	1.0143	1.0124	-0.187%
	VEEE0TF39Q	1.0165	1.0142	-0.226%
	VEEE0BG4Q3	1.0240	1.0214	-0.254%
	VEEE0NDNEX	1.0246	1.0254	0.078%
	VEEE08KH3V	1.0092	1.0091	-0.010%
	VEEE0C8AW1	1.0058	1.0050	-0.080%
	6407649172	1.0134	1.0114	-0.197%
JEN	VDDD000495	1.0085	1.0102	0.169%
	6001280255	1.0056	1.0057	0.010%
	VDDD000244	1.0117	1.0114	-0.030%
	VDDD000134	1.0137	1.0133	-0.039%
	VDDD000136	1.0031	1.0029	-0.020%
SP AusNet	VBBB000073	1.0047	1.0033	-0.139%
	VBBB000161	1.0081	1.0090	0.089%
	VBBB000058	1.0280	1.0213	-0.652%
	VBBB000096	1.0614	1.0525	-0.839%

Note 2: These are new Qualified Customers and therefore do not have DLFs for 2010-11

Table 3.2 Changes in proposed network average DLFs

Distributor	Change in DLF					
	Type	DLF-A	DLF-B	DLF-C	DLF-D	DLF-E
CitiPower	Short sub-transmission	0.021%	-0.005%	-0.065%	-0.112%	-0.129%
	Long sub-transmission					
Powercor	Short sub-transmission	0.090%	0.069%	0.000%	-0.075%	-0.103%
	Long sub-transmission	-0.155%	-0.173%	-0.234%	-0.302%	-0.327%
UED	Short sub-transmission	-0.099%	-0.237%	-0.333%	-0.763%	-1.023%
	Long sub-transmission	-0.233%	-0.366%	-0.459%	-0.876%	-1.129%
JEN	Short sub-transmission	0.020%	0.010%	-0.068%	-0.250%	-0.239%
	Long sub-transmission	0.322%	0.301%	0.220%	0.038%	0.038%
SP AusNet	Short sub-transmission	-0.090%	-0.138%	-0.308%	-0.443%	-0.487%
	Long sub-transmission	0.135%	0.086%	-0.093%	-0.220%	-0.254%

3.3 DLFs for embedded generators

For the 2011-12 financial year, the DNSPs have taken different approaches to the calculation of DLFs for embedded generators. JEN, UED and SP AusNet have retained the methodology published by the ESC in 2007, whereas CitiPower and Powercor have published a new methodology specifically targeting the calculation of DLFs for embedded generators. The following two sections discuss application of the methodologies.

Table 3.3 summarises the proposed DLFs for large embedded generators.

3.3.1 ESC Methodology

JEN, UED and SP AusNet have retained the ESC methodology as their own for calculating the DLFs associated with large embedded generators. The methodology states that the DNSPs must adhere to the following steps:

- model the operations of the generator based on historical record or other relevant information available
- determine the relevant forecast network losses by modelling the distribution network between the generator's connection point and the transmission network connection point and the transmission network connection point for each modelled operating period of the generator

- calculate the annual overall DLF utilising a volume weighted factor based on the forecast average electrical energy loss for each modelled operating period of the generator in the financial year in which the DLF is to apply.

The DLF is then calculated using the following equation:

$$DLF = 1 + \frac{Losses}{Magnitude\ of\ sales\ less\ generation}$$

PB has analysed the information provided by the DNSPs and confirms that in each case these steps have been adhered to.

As a change in DLF may indicate an issue with the underlying methodology, PB assessed the changes and generally found them to be less than 1 per cent. The only exception was for the Rubicon Group of Generators forecast DLF which decreased by 1.14%. The change was due to significantly increased generation combined with a minimal increase in losses[4]. PB therefore concludes that there are no emerging issues with the methodology or assumptions adopted for applying DLFs to large embedded generators.

3.3.2 New methodology for generators

CitiPower and Powercor published a new methodology addressing the calculation of DLFs for large embedded generators, entitled *CitiPower and Powercor Distribution Loss Factor (DLF) Calculation Methodology for Large Embedded Generators November 2010*.

The new methodology calculates the DLF using the difference in the network losses without the generator present and the network losses including the generator, which is then volume weighted by the generators' annual production. The new approach uses the following four steps:

- establish loss characteristics of the distribution network
- calculate distribution losses without embedded generation
- calculate distribution losses with embedded generation
- calculate the DLF using the revised approach, using the equation:

$$DLF = 1 + \frac{Network\ losses\ without\ generator - Network\ losses\ with\ generator}{Annual\ generation\ volume}$$

PB has analysed the proposed DLFs and has noted that the Challicum Hills Wind Farm has a significant change in DLF of -3.051% which has been attributed to the change in calculation methodology. [5]

Although CitiPower has also adopted a new methodology, it currently does not have any embedded generation that meets the 10MW threshold needed for a site specific DLF.

[4] *Refer to the SP AusNet 2011/12 DLF submission for a full explanation.*

[5] *PB understands that Powercor could not apply the previously used calculation methodology to a new generation site as the resulting DLF was not consistent with the actual losses in the network. Hence, a change in methodology to remove the inconsistency seems appropriate. PB notes that it is not required to review the calculation methodology when certifying that DLFs have been prepared in accordance with the published methodology.*

Table 3.3 Proposed DLFs for large embedded generators for the 2011-12 financial year

Distributor	Generator	National Metering Identifier	Proposed DLF for 2011-12	Current DLF 2010-11	Change
CitiPower	none				
Powercor	Challicum Hills Wind Farm	6203661632	0.9820	1.0129	-3.051%
	Codrington Wind Farm	6203008781	1.0342	1.0357	-0.145%
	Yambuk Wind Farm	6203690629	1.0342	1.0357	-0.145%
	Oakland's Hill Wind Farm	See Note 3	0.9086	N/A	N/A
UED	Clayton Generator	6407649172	1.0114	1.0134	-0.197%
JEN	Somerton Power Station	See Note 4	0.9921	0.9864	0.578%
SP AusNet	Alinta No1 Generator at Bairnsdale	6305010110	1.0528	1.0449	0.76%
	Alinta No2 Generator at Bairnsdale	6305651897	1.0528	1.0449	0.76%
	Toora Wind Farm	630565070	1.0771	1.0792	-0.19%
	Wonthaggi Wind Farm	6305721689	1.0718	1.0704	0.13%
	Esso Longford Generator	VBBB002342	1.0795	1.0693	0.95%
	Clover Power Station 1	VMBTWZCLG1	0.9886	0.9874	0.12%
	Clover Power Station 2	VMBTWZCLG2	0.9886	0.9874	0.12%
	Rubicon Group of Generators	VTTSWZRUBX	1.0343	1.0462	-1.14%

Note 3: This is a new generator and does not yet have a NMI or historic DLF data

Note 4: NMI not supplied

3.4 Reconciliation of the previous forecast losses against actual

Clause 3.6.3 (h)(2) of the NER states that DNSPs must reconcile the losses forecast using the DLF methodology in previous years with the actual level of losses which transpired in that year.

In determining the DLFs for the next financial year, the DNSPs advised that they have undertaken reconciliation with the actual losses incurred in the previous financial year (2009-10). The results of the reconciliation process are shown in Table 3.4.

Table 3.4 shows that the magnitude of the DNSPs forecast errors for the previous five financial years have been generally less than 0.8% in terms of total energy distributed and for 2009/10 was less than 0.48%. The level of forecast errors fluctuates both in size and, with the exception of CitiPower, in over and under recovery.

With the exception of SP AusNet, the forecast error as a percentage of sales has increased for the 2009-10 financial year compared to 2008-09 and all DNSPs have had over recovery.

During the review, PB noted the following two minor errors in the submitted information:

1. SP AusNet initially used an incorrect denominator in calculating the percentage error

2. UED initially used an incorrect sign in the equation resulting in a negative rather than positive reconciliation factor.

Both of these errors were corrected and the reports were resubmitted to PB. This report contains the revised values. PB notes that the errors did not alter the values of the calculated DLFs.

PB discussed the reconciliation undertaken with each DNSP and confirmed that appropriate consideration had been given to the reconciliation error and adjustments had been incorporated into the models used to forecast losses for the 2011-12 period if required. PB considers that the DNSPs have demonstrated that they have taken into account the reconciliation required by clause 3.6.3(h)(2) of the NER in calculating the proposed DLFs.

Table 3.4 Reconciliation between actual and losses recovered through the application of DLFs in 2009-10 (shown as a percentage)

Distributor	2009-10				2008-09	2007-08	2006-07	2005-06
	Total level of losses recovered through the application of DLFs MWh	Actual value of losses MWh	Difference Forecast vs. actual losses MWh	Forecast error as a percentage of sales (positive number indicates over-recovery)	Forecast error as a percentage of sales (positive number indicates over-recovery)	Forecast error as a percentage of sales (positive number indicates over-recovery)	Forecast error as a percentage of sales (positive number indicates over-recovery)	Forecast error as a percentage of sales (positive number indicates over-recovery)
CitiPower	258,136	235,533	22,603	0.37	0.35	0.82	0.97	0.61
Powercor	780,818	728,914	51,904	0.48	0.40	0.53	-0.28	0.59
UED	420,867	383,618	37,249	0.46	0.01	-0.27	-0.47	-0.33
JEN	186,634	174,042	12,592	0.28	-0.17	1.14	0.12	0.44
SP AusNet	570,606	541,901	28,705	0.38	0.64	0.79	-0.22	0.09

3.5 Forecast overall losses for the 2011-12 financial year

When it undertook the approval of the DLFs, the ESC considered that the economic levels of losses for Victorian DNSPs should be in the range of 3 to 5 per cent of sales for urban based networks and could be as high as 10 percent of sales for distributors with predominantly rural networks.

PB believes these ranges are useful when examining network losses. PB has examined the forecast loss levels for the DNSPs and concludes that:

- the forecast losses for the urban based DNSPs CitiPower and JEN are within the expected range

- the forecast losses for the DNSPs with rural networks UED, Powercor and SP AusNet are within the expected range.[6]

This analysis is shown in Table 3.5 and shown graphically in Figure 3.1 below.

Table 3.5 Overall loss levels

Distributor	Overall loss as a percentage of total sales							
	2004-05 actual	2005-06 actual	2006-07 actual	2007-08 actual	2008-09 actual	2009-10 actual	2010-11 forecast	2011-12 forecast
CitiPower	4.32	4.29	3.92	3.74	4.11	3.81	4.07	3.97
Powercor	6.73	6.64	7.27	6.22	6.74	6.73	6.88	6.84
UED	4.34	4.66	4.65	5.01	5.64	4.73	5.59	4.68
JEN	4.70	5.05	3.67	4.02	3.92	3.92	3.93	3.78
SP AusNet	7.51	7.87	7.96	6.59	7.44	7.13	7.65	7.35

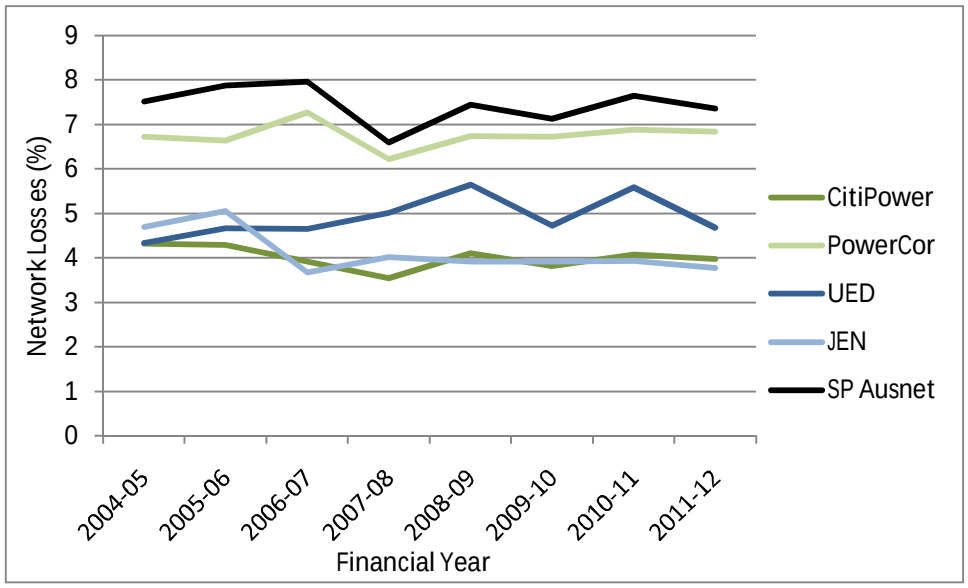

Figure 3.1 Trend of overall loss levels for Victorian DNSPs

3.6 Conclusion

Having assessed the proposed DLFs submitted by the Victorian DNSPs, PB found that:

- JEN, UED and SP AusNet have calculated the DLFs based on the correct methodology; that is the DLF Calculation Methodology published by the ESC.
- CitiPower and Powercor have calculated the DLFs based on the correct methodology; that is the DLF Calculation Methodology published by the ESC for Qualified Customers and network average DLFs and their published methodology *CitiPower and Powercor Distribution Loss Factor (DLF) Calculation Methodology for Large Embedded Generators November 2010* for large embedded generators.

6 PB notes that UED has a predominately urban network with some rural sections. Its forecast losses are appropriately at the lower end of the expected range.

- All Victorian DNSPs have used appropriate data for the calculation of the Distribution Loss Factors.
- The price impact on all load customers due to the proposed DLFs for 2011-12 represents no greater than one per cent increase in energy cost, indicating consistency in application of the DLF calculation methodology.
- The distributors have taken into consideration their previous forecast errors in overall loss levels as verified by the trend of reconciliation errors over time and that the levels of errors are acceptable.
- The overall levels of network losses of each distributor are within acceptable limits.

PB is satisfied that the proposed DLFs meet the requirements of clause 3.6.3 of the National Electricity Rules and are consistent with the published methodologies.

Appendix A

Terms of reference

Amendments to the 2010/11 Terms of Reference

The Terms of Reference (ToR) for the 2011/12 Distribution Loss Factor (DLF) Certification report shall be based on the attached ToR which were agreed to for the 2010/11 DLF certification report.

The following amendments have been applied to make the ToR suitable for 2011/12:

1. The DLF Certification shall be completed for the 2011/12 DLFs.

2. For CitiPower and Powercor, the certification for calculating DLFs for embedded generators shall be according to their published methodology, for Qualified Customers and network average DLFs the certification shall be according to the methodology published by the ESC.

3. The following timetable shall supersede the dates contained within Section 11 of the ToR:

Project task	Completion date
DNSPs provide PB with required information	25 February 2011
Draft certification report issued to DNSPs	4 March 2011
Final certification report issued to DNSPs	9 March 2011

TERMS OF REFERENCE FOR CERTIFICATION OF VICTORIAN DISTRIBUTION BUSINESSES'

DISTRIBUTION LOSS FACTOR 2010/11

Document History

REV	REVISION STATUS	DATE	PREPARED
A	DRAFT	9 Dec 09	Gabriel Wan
B	Final	19 Jan 10	Gabriel Wan

4. Background

Each year, Distribution Network Service Providers (DNSPs) must determine the distribution loss factors (DLFs) to apply for their network in the next financial year in accordance with clause 3.6.3(g) of the National Electricity Rules (NER) and provide these to AEMO for publication by 1 April in that year. The NER requires DLFs to be determined in accordance with a methodology published either by the AER or the DNSP (where the AER has not published a methodology). Before providing the distribution loss factors to AEMO for publication, DNSPs must obtain the approval of the AER for the distribution loss factors it has determined for the next financial year.

5. DLF METHODOLOGY

The AER has not published a calculation methodology for determining DLFs. The AER has also advised that as it will not be publishing a methodology for determining DLFs to apply in 2010-11, DNSPs will continue to determine DLFs in accordance with their own published methodology or, where appropriate, the relevant published methodology operating in their jurisdiction as at 31 December 2007. Methodologies may be amended where necessary to better reflect the principles set out in the NER so long as the revised methodology is published by the DNSP in an accessible form and provided to the AER.

Accordingly, Victorian DNSPs will continue to determine the DLFs in accordance with the methodology published by the Essential Services Commission, Victoria (ESC)[7]. Refer to Appendix 1 for methodology paper.

6. AER APPROVAL OF DLF

The AER has written to the Victorian DNSPs about the approval process for the 2010-11 DLFs. For approval by the AER, the DNSP is to provide to the AER:

- the DLFs in a format fit for publication by AEMO;
- a copy of the methodology (in electronic form) and
- an independent assurance/certification that the DLFs have been calculated by the application of the relevant published methodology.

7. ASSURANCE / CERTIFICATION OF DLF

In previous years, the ESC has certified the DLFs prepared by Victorian DNSPs. However, with the transition from the ESC to the AER of a number of regulatory functions, the ESC is no longer able to perform this service for Victorian DNSPs. In light of this, the AER has advised that it considers that an assurance or certification provided by an auditor or a technical consultant is an acceptable alternative. The AER has also indicated that as with previous year approval process, it does not intend certification to be unduly burdensome but set at a standard sufficient for the certifying party to be confident that the appropriate data has been used, the correct methodology applied and that the results are a fair statement of the applicable loss factors for that firm.

[7] *In 2007 when the ESC was responsible for approving the DLFs prior to publication by NEMMCO, the ESC published a methodology in accordance with the NER and the Victorian DNSPs have been determining DLFs in accordance with this published methodology.*

8. Scope of Work

There are five Distribution Network Service Providers (DNSPs) in Victoria, list below, and all five DNSPs have agreed to jointly engage an auditor/consultant to certify the DLFs.

- Jemena Electricity Networks (Vic) Ltd
- CitiPower Pty
- Powercor Australia
- United Energy Distribution
- SPI Electricity

The auditor/consultant is to review the DLFs proposed by the five DNSPs in accordance with the principles set out above and provide a report to each of the DNSPs certifying whether the DNSP's proposed DLFs have been calculated in accordance with the Calculation Methodology for Distribution Loss Factors (DLFs) for the Victorian Jurisdiction (14 February 2007) published by the ESC, appropriate data has been used and that the results are a fair statement of the applicable loss factors for that firm.

9. Information from VICTORIAN dnsp

Documents provided:

- Guidance Paper: Calculation Methodology for Distribution Loss Factors (DLFs) for the Victorian Jurisdiction (14 February 2007)
- Victorian DNSPs' DLF 2009-10 submission to ESC.
- Review Findings Of The Distribution Loss Factors (DLFs) Proposed By The Victorian Electricity Distributors For The 2009-10 Financial Year
- Victorian DNSPs' proposed DLFs for the 2010-11 financial year.

10. Deliverables

At the completion of its review the auditor/consultant will provide an independent certification report which:

- is of a professional standard capable of being submitted to the AER;
- includes a bibliography outlining all reference sources;
- summarises the expert's experience and qualifications and attach its curriculum vitae;
- identifies any person and their qualifications, who assists you in preparing the report or in carrying out any research or test for the purposes of the report;
- summarises the instructions and attaches these term of reference; and

- (without limiting the points above) carefully and clearly sets out the facts that the auditor/consultant has assumed in putting together his or her report and the basis for those assumptions.

In light of the acceptance by AER of Certification Report prepared by the ESC for the past two years, the Victorian DNSPs are of the view that a report similar to the ESC's report should be acceptable to the AER.

11. Timetable

AER requires DNSPs DLF calculations and independent certification report of these calculations be submitted in electronic form by COB Friday 12 March 2010. Accordingly, the proposed timeline is as follows:

- Friday 26 February 2010 — DNSPs provide auditor/consultant with DLF calculation for certification. The information will be in the same format as those provided to the ESC in previous years.
- Friday 5 March 2010 — Auditor/consultant provides draft certification report to DNSPs.
- Wednesday 10 March 2010 — Auditor/consultant provides final certification report to DNSPs.

Please note that all information submitted to the AER including the certification report will be published on the AER's website unless confidential.