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Alan Tregilgas
Utilities Commissioner
Utilities Commission
5th Floor, 38 Cavenagh Street
DARWIN NT 0800

Dear Utilities Commissioner

Re: Energy Loss Factors Code – Draft Calculation Methodology

The Corporation, in accordance with c 4 of the *Energy Loss Factors Code*, seeks approval from the Utilities Commission of its attached draft Calculation Methodology for determining Energy Loss Factors for the financial year commencing 1 July 2006 and each year thereafter.

The Corporation believes that its **attached** draft Calculation Methodology:

- was developed in conjunction with the Commission and therefore is capable of being approved without the need for substantial amendment;
- is consistent with both:
 - the principles set out in Schedule 1 of the *Code* (more detail is **attached**); and
 - the matters referred to in s 6(2) of the *Utilities Commission Act*.

Should you have any queries regarding this or any related matters please contact, at first instance, Mr Darren Nelson, Manager of Economic Regulation & Services (Economics), on 8985 8444 and/or at darren.nelson@powerwater.com.au.

Yours sincerely



Bertram Birk
General Manager, Power Networks

// July 2006

Attachment

Specific comments are provided below on how the draft Calculation Methodology is consistent with the principles set out in Schedule 1 of the *Code* and are structured as follows:

- Code;
- Comment(s).

Note that the comments are based on the **attached** independent report by GHD Pty Ltd.

- Code:
 - “involving the estimation of energy losses on a basis that does not assume the associated load is physically supplied with electricity generated from the associated generator”
- Comment(s):
 - In particular, please refer to the 4th, 5th and 7th paragraphs on the 4th page of the GHD report.

- Code:
 - “being forward looking in nature”
- Comment(s):
 - In particular, please refer to the 3rd, 4th, 5th and 6th paragraphs on the 6th page of the GHD report.

- Code:
 - “being capable of approximating actual losses if assumed conditions ultimately were to eventuate during the period of operation of the loss factors”
- Comment(s):
 - In particular, please refer to the 1st paragraph on the 3rd page of the GHD report.

- Code:
 - “not giving rise to any material cumulative under or over estimation of actual energy losses over time”
- Comment(s):
 - In particular, please refer to the 7th and 8th paragraphs on the 4th page of the GHD report.

- Code:

- "being competitively neutral in their effect upon different licensed retailers (and types of retail operations), upon different licensed generators (and types of generation options), and upon different types of end-users of electricity in the Northern Territory"
- Comment(s):
 - In particular, please refer to the 4th and 5th paragraphs on the 3rd page of the GHD report.
- Code:
 - "use information that...is reliable in nature, where information corresponds as closely as is reasonable in the circumstances with actual operations and events"
- Comment(s):
 - In particular, please refer to the 3rd paragraph on the 3rd page of the GHD report.
- Code:
 - "use information that...is capable of independent verification"
- Comment(s):
 - In particular, please refer to the 3rd paragraph on the 3rd page of the GHD report.
- Code:
 - "use information that...is reasonably free from error and bias"
- Comment(s):
 - In particular, please refer to the 3rd paragraph on the 3rd page of the GHD report.
- Code:
 - "be consistent with objects of the Network Access Code and Act"
- Comment(s):
 - In particular, please refer to the 3rd paragraph on the 10th page of the GHD report.
- Code:
 - "conform with applicable good electricity industry practice, applicable general electricity industry practice, and relevant methodologies used among a significant proportion of operators of comparable facilities in the electricity supply industry in Australia"
- Comment(s):
 - In particular, please refer to the 2nd paragraph on the 3rd page of the GHD report.



POWER NETWORKS

Calculation Methodology for Energy Loss Factors

PREPARED BY
Network Planning

June 2006

1 Executive Summary

This report outlines the methodology that the Power and Water Corporation proposes to use for calculating energy loss factors for contestable customers connected to regulated networks in the Northern Territory.

The report is in two parts. The methodology to be used for calculating transfer loss factors for the transmission and sub-transmission network is discussed first. It is proposed that Power and Water will continue to use the alternative methodology originally developed by NEMMCO and used previously by Power and Water with some minor modifications. This methodology was independently assessed by Electric Power Consulting Pty Ltd (EPC) in 2003, on behalf of the Utilities Commissioner. EPC concluded that the methodology was appropriate for use by Power and Water. They also reported that any variations in loss factors so calculated were within the accuracy of the models used for the calculation.

The second part of this report was prepared by GHD Pty. Ltd. and discusses the calculation of distribution loss factors. The GHD report includes a comprehensive review of the methodologies used by other utilities around Australia and shows that the approach proposed for use by Power and Water is in keeping with industry best practice.

Power and Water has developed comprehensive computer models of its distribution network. The proposed methodology utilises these models to calculate demand and energy losses on several sections of the network, and combines these with known energy consumption figures to determine sectional loss factors. These in turn are combined to produce distribution loss factors for a small number of generic network locations.

The transfer and distribution loss factors thus calculated are then combined to calculate a small number of average overall loss factors for contestable customers. These are applied to each customer depending on their location on the network. This sectional approach is adopted almost universally by other utilities.

2 Background

The methodology that is to be used for calculating loss factors is described in Schedule 13 of the Access Code, which itself is the Schedule of the Electricity Networks (Third Party Access) Act. This stipulates that transfer loss factors will be calculated for the transmission network and that entry point or exit point loss factors will be calculated for the distribution network.

Schedule 13 requires the calculation of individual loss factors for every contestable customer, which is very time consuming to achieve. Power and Water has argued that this is an excessive regulatory burden and is not in keeping with best industry practice.

Section 82(2A)(b) of the Access Code allows the regulator to determine alternative approaches to the calculation methodology from time to time. In April 2006 the Utilities Commission released the Energy Loss Factors Code which gives regulatory guidelines for the calculation methodology. The present report details the approach which Power and Water proposes to use in performing these calculations.

3 Calculation Methodology for Transfer Loss Factors

Schedule 13 is not prescriptive in the matter of how to calculate transfer loss factors for the transmission system. Since 2001, Power and Water has used the alternative NEMMCO methodology for the calculation of transfer loss factors, and it is proposed that this practice will continue.

This methodology was independently assessed by Electric Power Consulting Pty Ltd (EPC) who were commissioned by the Utilities Commissioner in 2003 to review Power and Water's compliance with the Access Code in 2000. EPC concluded that the methodology was appropriate for use by Power and Water. They also reported that any variations in loss factors so calculated were within the accuracy of the models used for the calculation.

This approach is also in keeping with Schedule 1 of the Energy Loss Factors Code, which is included as Attachment 1 for reference. It is only appropriate for the Darwin/Katherine transmission system as there are no transmission systems in other regulated networks in the NT.

In summary, the alternative NEMMCO methodology involves the following steps, using the power system analysis package PSS/E:

1. Plot the system load duration curve for the forthcoming 12 month period based on loads for the previous 12 months, and determine the ten deciles of the forward-looking load duration curve;
2. Set up ten network models having total loads equal to the loads determined in step 1 and appropriate generation schedules. The following steps are then performed for each of these ten load models:
3. Select a regional reference node. The 132kV bus at Hudson Creek has been determined to be the appropriate node in the Darwin/Katherine transmission system;
4. Determine the losses in the transmission network;
5. Add an incremental load of 1MW to one of the other nodes (buses) in the network. (Note that in the national grid an incremental load of 10MW is used. However, this is considered to be excessively large for the much smaller Darwin/Katherine transmission system);
6. Determine the amount of generation required at the regional reference node to supply the additional losses created in supplying the incremental load;
7. Repeat steps 5 and 6 for every other bus in the network.

The process outlined above produces in the order of 500 incremental generation values at the regional reference node. These are then combined to calculate an average transfer loss factor for the whole network.

4 Calculation Methodology for Distribution Loss Factors

The calculation methodology for distribution loss factors is described in detail in the report from GHD Pty. Ltd., which forms Attachment 2 of this report. Reference should be made to the GHD report for this information.

ATTACHMENT 1

**Schedule 1 of the
Energy Loss Factors Code**

SCHEDULE 1

Methodology to Determine Energy Loss Factors

1. Methodology adopted by Network Provider

1.1 The methodology adopted by the *Network Provider* to calculate *Energy Loss Factors* and the discretions and judgments exercised by the *Network Provider* when applying the methodology:

- (a) must be reasonable, and result in loss factors that are reasonable including, without limitation, by:
 - (i) involving the estimation of energy losses on a basis that does not assume the associated load is physically supplied with electricity generated from the associated generator;
 - (ii) being forward looking in nature;
 - (iii) being capable of approximating actual losses if assumed conditions ultimately were to eventuate during the period of operation of the loss factors;
 - (iv) not giving rise to any material cumulative under or over estimation of actual energy losses over time; and
 - (v) being competitively neutral in their effect upon different licensed retailers (and types of retail operations), upon different licensed generators (and types of generation options), and upon different types of end-users of electricity in the Northern Territory; and
- (b) must otherwise:
 - (i) use information that:
 - (A) is reliable in nature, where information corresponds as closely as is reasonable in the circumstances with actual operations and events;
 - (B) is capable of independent verification; and
 - (C) is reasonably free from error and bias;
 - (ii) be consistent with objects of the *Network Access Code and Act*;
 - (iii) conform with applicable *good electricity industry practice*, applicable general electricity industry practice, and relevant methodologies used among a significant proportion of operators of comparable facilities in the electricity supply industry in Australia.

ATTACHMENT 2

Report for Calculation Methodology for Distribution Loss Factors (GHD Pty. Ltd. – June 2006)

**Power and Water
Corporation**

Report for Calculation
Methodology For Distribution
Loss Factors

June 2006

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- E AUSTRALIAN CAPITAL TERRITORY DISTRIBUTION LOSS FACTORS

1. EXECUTIVE SUMMARY

The methodology proposed by the Power and Water Corporation for calculating Distribution Loss Factors is based on calculating the average energy loss in each of the three sections or components of the distribution network. A Section Loss Factor (SLF) is calculated for each section of the distribution network and customers are allocated a Distribution Loss factor (DLF) based on the section to which they are connected.

The philosophy of using DLF's based on the section of the distribution network the customer is connected to is used by the following companies -

- ▶ AGLE, CitiPower, Powercor, SPI Electricity, and United Energy in Victoria.
- ▶ Energex Limited and Ergon Energy in Queensland.
- ▶ Integral Energy and Country Energy in New South Wales.
- ▶ Aurora Energy in Tasmania, and
- ▶ Western Power in Western Australia.
- ▶ ACTEW Corporation in the Australian Capital Territory

Power and Water's proposed method of calculating the Distribution Loss Factors takes advantage of Power and Water's extensive distribution feeder modelling, feeder load data and technical data on the physical characteristics of the feeders.

Power and Water propose to use average Distribution Loss Factors for all customers except major customers.

For major customers site specific modelling and site specific DLF's will be calculated. Site-specific modelling and DLF's for embedded generators will be considered on a case-by-case basis. Site-specific DLF's would be calculated using section loss factors for the actual feeder or feeders associated with the major customer or embedded generator.

2. INTRODUCTION

Power and Water's power supply network can be divided into two discrete networks -the transmission network and the distribution network.

The transmission network comprises the 132kV and 66kV lines and zone substation transformers to the lower substation bus voltages of 11kV and 22kV. Power and Water analyses the transmission network using load flow software called PSS-E.

The distribution network comprises the 11kV and 22kV feeders connected to the lower voltage bus of the zone substations, the distribution substations (11kV/415 volt and 22kV/415 volt) connected to these feeders and the low voltage (415/240 volt) power lines and the services to individual customers. Power and Water analyses the distribution network using load flow software called PSS/ADEPT.

Energy losses occur in both the transmission network and the distribution network. These losses vary with the generation schedule, the amount of power being transported, and the lengths and configuration of the lines.

Energy losses in the transmission network are analysed separately to the energy losses in the distribution network.

This report details Power and Water's proposed method of analysing the losses in the distribution network and calculating Distribution Loss Factors (DLF's).

It is not practical to measure the energy losses in the power network that can be attributed to an individual customer. Accordingly the energy losses in the networks are estimated using network models and load flow analysis of the transmission and distribution networks. It is impractical for Power and Water to create models and calculate DLF's for each individual customer because of the large number of customers in the competitive market and the time taken to create the models and calculate the DLF's.

Power and Water propose to average the distribution network energy losses over all customers based on where they are connected to the network.

3. ENERGY LOSS FACTOR CODE

The Northern Territory Energy Loss Factor Code is published by the Utilities Commissioner of the Northern Territory pursuant to section 24 of the Utilities Commission Act 2000, the Network Access Act, and the Network Access Code.

The Energy Loss Factor Code took effect on 19 April 2006.

Under the Energy Loss Factor Code the Power and Water Corporation is required to submit to the Commissioner a draft calculation methodology for Energy Loss Factors by 19 July 2006.

Schedule 1 of the Code provides guidelines for the methodology to be followed by the Network Provider in determining Energy Loss Factors.

4. DISTRIBUTION NETWORK DATA

Power and Water has a large amount of data available to assist with the load flow studies and the calculation of the DLF's.

4.1 Facilities Information System (FIS)

Power and Water's FIS is an extensive geographic database of its power network assets.

4.2 Supervisory Control And Data Acquisition (SCADA) System

Power and Water's SCADA System provides remote control and monitoring of the Darwin - Katherine transmission network, all the major zone substations in the Darwin and Katherine regions, the distribution feeders in the Darwin and Katherine regions, and the Lovegrove Zone Substation in Alice Springs and its 11kV feeders.

The SCADA system monitors and records feeder loads in amps on an hourly basis, 24 hours a day, 365 days per year.

The feeder load data is recorded and analysed and maximum demand trends are monitored and charted.

4.3 PSS/ADEPT Load Flow Software and Modelling

PSS/ADEPT is a load flow program specifically designed for analysing distribution networks. Power and Water has detailed models of all its feeders in the Darwin, Katherine, Tennant Creek, and Alice Springs Regions.

The feeder models are up dated on a regular basis.

Limited modelling of the low voltage (415/240 volt) network has also been carried out.

5. PROPOSED METHODOLOGY FOR CALCULATING DISTRIBUTION LOSS FACTORS

5.1 Generic Feeder Model

The Power and Water Corporation proposes to calculate Distribution Loss Factors (DLF) using a generic feeder model that reflects average distribution feeder performance. Using the generic feeder model it is proposed to calculate loss factors for the three different sections of the feeder, the high voltage conductors, the low voltage terminals of distribution transformers, and the low voltage conductors.

The generic feeder characteristics will reflect the average performance of a selected group of 11kV and 22kV feeders in the Darwin Network.

5.2 Section Loss Factors

Power and Water propose calculating section loss factors for each type of connection point on the distribution network. The three connection points to be considered are-

- ▶ Connection to HV conductors – SLF HV Conductors
- ▶ Connection to Distribution Transformer low voltage terminals – SLF Transformer
- ▶ Connection to LV conductors - SLF LV Lines

5.2.1 SLF HV Conductors

Energy losses occur in high voltage feeder conductors in the distribution network. These losses vary with the amount of power being transported, the lengths of the conductors and the configuration of the lines.

$$\text{SLF HV Conductors} = \frac{\text{Energy losses in HV conductors (kWh/A)}}{\text{Energy transmitted in HV conductors (kWh/A)}}$$

5.2.2 SLF Transformer

The distribution network contains a large number of distribution transformers of various manufacture and size. An average transformer loading is to be used in the load flow analysis due to the absence of specific transformer load data.

It is assumed that the transformer “iron” losses” remain constant and manufacturers published data will be used to calculate these losses.

Transformer “copper losses” are load dependent (I^2R) energy losses in the windings of the transformers. Manufacturers published data for winding resistances will be used to calculate these losses. It is recognised that the transformers will not be uniformly loaded and this means that the total copper losses of all the transformers in the generic model will be greater than that calculated in the load flow analysis.

$$\text{SLF Transformer} = \frac{\text{Energy losses in distribution transformers (kWh/A)}}{\text{Energy supplied by the distribution transformers (kWh/A)}}$$

$$\text{SLF Transformer} = \frac{\text{Energy losses (Iron + Copper)}}{\text{Energy supplied by the distribution transformers}} \quad (\text{kWh/A})$$

5.2.3 SLF LV Lines

It is recognised that the customer loads are not uniformly loaded across three phases along the LV conductors and are not uniform in size and this means that the total copper losses of all the transformers in the generic model will be greater than that calculated in the load flow analysis.

$$\text{SLF LV Lines} = \frac{\text{Energy losses in the LV lines}}{\text{Energy delivered by LV lines}} \quad (\text{kWh/A})$$

5.3 Distribution Loss Factors

Distribution Loss factors

$$\text{DLF A} = 1 + \text{SLF HV Conductors}$$

$$\text{DLF B} = \text{DLF HV Conductors} \times (1 + \text{SLF Transformer})$$

$$\text{DLF C} = \text{DLF HV Conductors} \times \text{DLF Transformer} \times (1 + \text{SLF LV Lines})$$

Where-

DLF A is the distribution loss factor to be applied to a customer connected to a distribution line at voltages of 22kV or 11kV. That is a high voltage customer.

DLF B is the distribution loss factor to be applied to a customer connected to the low voltage terminals of a distribution transformer (240/415 V).

DLF C is the distribution loss factor to be applied to a customer connected to a low voltage line at 240/415 V.

5.4 Feeder Load Data (Amps)

Power and Water's SCADA System monitors the majority of the 11kV and 22kV feeders in the greater Darwin and Katherine area.

Feeder loads in amps are recorded every hour, 24 hours per day, and 365 days per year. From this data the Root Mean Square (RMS) value of the feeders' loads can be calculated.

5.5 Individual Feeder Load Flow Studies

Using feeder RMS loads individual feeder performances can be analysed using the PSS/ADEPT load flow software. The individual feeder performances can be averaged to calculate the performance required of the generic feeder.

5.6 Generic Feeder Model

Data on a representative sample of Darwin's 11kV and 22kV feeders in the Facilities Information System is analysed to determine which feeder best fits the "average" feeder conditions. The generic feeder model is created by -

- ▶ Adjusting the total transformer capacity in the selected feeder model so that the feeder's transformer capacity approximates closely to the average distribution transformer capacity of the sampled feeders.
- ▶ Adjusting the feeder load to the average load of the sampled feeders.
- ▶ Adjusting feeder line characteristics of some line sections so that the line losses in the generic feeder equal the average line losses of the sampled feeders.

5.7 Generic Feeder Load

Calculation of DLF's is based on annual energy consumption and annual energy losses. To calculate the annual energy losses the average of the root mean square (RMS) feeder loads calculated from the SCADA data for the selected feeders and the generic model loaded to this value.

5.8 Annual Energy Consumption and Losses in the Generic Feeder

Annual energy consumption = Sum of connected RMS loads (kW) X 8760 (hours per year) (kWh/A)

Annual energy losses in HV conductors = Losses in conductors (kW) X 8760 (hours per year) (kWh/A)

Annual energy losses in the distribution transformers = Iron Losses (assumed constant) (kW) X 8760 (hours per year) + Copper Losses (kW) X 8760 (hours per year) (kWh/A)

Annual energy losses in LV conductors = Losses in conductors (kW) X 8760 (hours per year) (kWh/A)

6. CONCLUSIONS

The methodology for calculating Distribution Loss Factors proposed by the Power and Water Corporation takes advantage of Power and Water's extensive distribution feeder modelling, feeder load data and technical data on the physical characteristics of the feeders to create a generic feeder model that reflects average feeder load and performance.

The philosophy of using DLF's based on the particular section of the network the customer is connected to is used by the following companies -

- ▶ AGLE, CitiPower, Powercor, SPI Electricity, and United Energy in Victoria.
- ▶ Energex Limited and Ergon Energy in Queensland.
- ▶ Integral Energy and Country Energy in New South Wales.
- ▶ Aurora Energy in Tasmania, and
- ▶ Western Power in Western Australia.
- ▶ ACTEW Corporation in the Australian Capital Territory

The methodology complies with the requirements of Schedule 1 of the Northern Territory Energy Loss Factor Code, April 2006.

7. RECOMMENDATION

That the Utilities Commissioner approves the proposed methodology for calculating Distribution Loss Factors.

Appendix A

VICTORIAN NETWORK AVERAGE DLF's
FOR 2006/07

The table below shows the distribution loss factors approved by the Victorian Essential Services Commission for the 2006/07 financial year. Under the column headed Type "Short" refers to a short transmission line, "Long" refers to a long transmission line.

Table A1 Network Average DLF's for 2006-07

Distributor	Distribution Loss Factors					
	Type	DLF A	DLF B	DLF C	DLF D	DLF E
AGLE	Short	1.0076	1.0147	1.0350	1.0518	1.0603
	Long	1.0248	1.0319	1.0523	1.0690	1.0775
CitiPower	Short	1.0039	1.0128	1.0186	1.0443	1.0498
	Long	N/A	N/A	N/A	N/A	N/A
Powercor	Short	1.0046	1.0112	1.0369	1.0634	1.0723
	Long	1.0329	1.0395	1.0652	1.0917	1.1006
SPI Electricity	Short	1.0052	1.0120	1.0416	1.0602	1.0666
	Long	1.0405	1.0473	1.0769	1.0956	1.1020
United Energy	Short	1.0049	1.0110	1.0179	1.0379	1.0508
	Long	1.0234	1.0295	1.0364	1.0564	1.0693

Table A1 reproduced from NEMMCO publication Distribution Loss Factors for the 2006/07 Financial Year.

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 66kV or 22kV)

DLF B is the distribution loss factor to be applied to a second tier customer or market customer connected to the low voltage side of a zone substation (at 22kV, 11kV or 6.6kV)

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 22kV, 11kV or 6.6kV.

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.

Appendix B

**QUEENSLAND DISTRIBUTION LOSS
FACTORS FOR TARIFF CLASSES FOR
2006/07**

The Queensland Competition Authority has approved the following distribution loss factors for Tariff Class consumers for the 2006/07 financial year.

Table B1 Energex Distribution Loss factors for Tariff Classes

Network level	Distribution Loss Factor	
	Applied in 2005/06	Applied in 2006/07
110kV connected	1.0049	1.0050
33kV connected	1.0176	1.0181
11kV Bus connected	1.0229	1.0235
11kV line connected	1.0367	1.0381
LV Bus connected	1.0482	1.0503
LV Line connected	1.0819	1.0860

Table reproduced from NEMMCO publication Distribution Loss Factors for the 2006/07 Financial Year.

Table B2 Ergon Energy Tariff Class Distribution Loss factors

Network Level	DLF's Applied in 2005/06		DLF's Applied in 2006/07	
	East Zone	West Zone	East Zone	West Zone
Sub-Trans Bus	1.011	1.017	1.014	1.043
Sub-Trans Bus	1.028	1.062	1.025	1.054
22/11 kV Bus	1.028	1.072	1.023	1.083
22/11 kV Line	1.048	1.105	1.044	1.120
LV Bus	1.081	1.133	1.076	1.158
LV Line	1.124	1.195	1.103	1.229

Table reproduced from NEMMCO publication Distribution Loss Factors for the 2006/07 Financial Year.

Appendix C

SOUTH AUSTRALIAN DISTRIBUTION LOSS FACTORS FOR 2006/07

Distribution loss factors approved by the Essential Services Commission of South Australia.

Table C1 Distribution Connection Point Class Distribution Loss Factors

Class	Tariff	MSATS DLF Code	2006/07 DLF	2005/06 DLF
Low Voltage	Unmetered	NLV2	1.0799	1.0799
	Residential	NLV2	1.0799	1.0799
	Controlled load	NLV2	1.0799	1.0799
	Business Single rate	NLV2	1.0799	1.0799
	Business Two Rate	NLV2	1.0799	1.0799
Low Voltage T/F	Medium LV Demand	NLV1	1.0649	1.0649
	LV Demand	NLV1	1.0649	1.0649
	Large LV Demand	NLV1	1.0649	1.0649
HV	HV	NHV1	1.0409	1.0409
Substation	Substation	NZS1	1.0219	1.0219

Table reproduced from NEMMCO publication Distribution Loss Factors for the 2006/07 Financial Year.

Appendix D
NEW SOUTH WALES DISTRIBUTION
LOSS FACTORS FOR 2005/06

The NSW Independent Pricing and Regulatory Tribunal (IPART) had not provided NEMMCO with approved distribution loss factors for NSW for inclusion in NEMMCO's publication – Distribution Loss Factors For The 2006/07 Financial Year. The tables below are the distribution loss factors for the 2005/06 financial year.

The NSW jurisdictional regulator, the Independent Pricing and Regulatory Tribunal (IPART) has approved the following distribution loss factors for NSW for the 2005/06 financial year.

Table D1 Integral Energy's Approved 2005/06 DLF's for 2005/06

Tariff Class	DLF Code	Applied in 2004/05	To Apply in 2005/06
132kV Network	HNVL	1.0053	1.0053
Transmission Substation	HSTS	1.0105	1.0105
Sub transmission Network	HSTL	1.0182	1.0182
Zone Substation	HHVT	1.0227	1.0227
High Voltage Network	HHVL	1.0360	1.0360
Distribution Substation	HLVT	1.0702	1.0702
Low Voltage Network	HLVL	1.0855	1.0855

Table reproduced from NEMMCO publication Distribution Loss Factors for the 2005/06 Financial Year.

Table D2 Country Energy's Approved 2005/06 DLF's for tariff Class Customers

Class	DLF Code	Applied in 2004/05	To Apply in 2005/06
Sub transmission	BS0A	1.0281	1.0281
High Voltage Substation	BH5A	1.0365	1.0365
High Voltage Line (Urban)	BH0A	1.0388	1.0388
LV Urban & Metered at CE Substation	BL5A	1.0483	1.0483
Low Voltage Line (Urban)	BL0A	1.0933	1.0933
Low Voltage Line (Non urban)	BL1A	1.1389	1.1389

Table reproduced from NEMMCO publication Distribution Loss Factors for the 2005/06 Financial Year.

Appendix E

AUSTRALIAN CAPITAL TERRITORY DISTRIBUTION LOSS FACTORS

The Australian Capital Territory jurisdictional regulator, the Independent Competition and Regulatory Commission (ICRC), has approved the following distribution loss factors for the ACT for the 2006/07 financial year.

Connection	DLF Code	Distribution Loss Factor
Low Voltage	AL00	1.0506
High Voltage	AH00	1.0302

Table reproduced from NEMMCO publication Distribution Loss Factors for the 2006/07 Financial Year.

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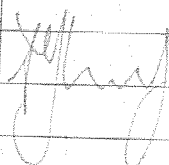
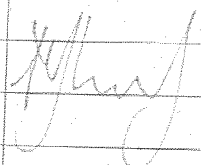
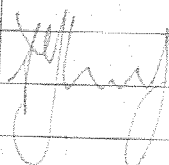
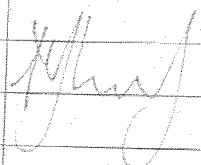
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