

# 2016/17 Loss Factor Report

Resubmitted: 2 June 2016



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## 1. Introduction

This report details the loss factors calculated for the 2016/17 financial year as required by section 2.27 of the Market Rules.

To comply with the obligations under section 2.27 of the Market Rules Western Power has:

- Recalculated all transmission loss factors
- Recalculated all average distribution loss factors
- Recalculated all individual distribution loss factors for customers with a CMD greater than 7,000 kVA
- Recalculated all individual distribution loss factors for customers with a CMD between 1,000 and 7,000 kVA located greater than 10 km from the electrically closest substation
- Recalculated the individual distribution loss factors for customers with a CMD between 1,000 and 7,000 kVA located less than 10 km from the electrically closest substation, where an individual distribution loss factor has been elected by the associated retailer
- Recalculated all individual distribution loss factors for distribution connected generation customers

## 2. Basis for Calculation

Western Power calculates loss factors in accordance with the Market procedure for determining loss factors. The following sections provide further detail on the methodology used by Western Power in calculating loss factors.

### 2.1 Transmission loss factors

Western Power has calculated the transmission loss factors in accordance with section 4.1 of the Market procedure for determining loss factors using the software package T-price.

### 2.2 Average distribution loss factors

Western Power has calculated the average distribution loss factors in accordance with section 4.2 of the Market procedure for determining loss factors.

The methodology calculates the average distribution loss factors by:

- Determining losses within the zone substation transformers
- Determining HV feeder losses
- Determining distribution transformer losses
- Determining LV feeder losses (allowing separately for residential and commercial losses)

Western Power allocates the average distribution losses based on the usage of the various components of the network. An appropriate basis for this allocation is the reference services (offered in Western Power's access arrangement) and in accordance with the Market procedure for determining loss factors Western Power has determined an average loss factor for relevant reference services.

### 2.3 Individual distribution loss factors

Western Power calculates the individual distribution loss factors in accordance with section 4.2 of the *Market procedure for determining loss factors*.

The methodology used to calculate the individual distribution loss factors uses the formulae and methodology detailed in Schedule 4 of the Electricity Distribution Regulations 1997.<sup>1</sup> Schedule 4 of the Electricity Distribution Regulations 1997 is reproduced below:

- |     |   |
|-----|---|
| 1.  | To calculate the loss factor for a distribution connection which is an exit point a corporation must follow the following steps:                |
| (a) | the corporation must determine the line losses assuming the distribution connection was not there and assuming feeder maximum load;             |
| (b) | the corporation must determine the line losses assuming only the distribution connection was there and assuming feeder maximum load;            |
| (c) | the corporation must determine the total line losses assuming all the distribution connections are there (including the distribution connection |

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<sup>1</sup> For sites supplied from multiple feeders the distribution loss factor has been determined as if the load is evenly split across the feeders. The resultant distribution loss factor is the average of the calculated distribution loss factors.

for which the loss factor is being determined) and assuming feeder maximum load;

- (d) the corporation must allocate a share of the total line losses calculated under step (c) to the distribution connection for which the loss factor is being determined based on the ratio of the result of step (b) and the sum of the results of steps (a) and (b);
- (e) the corporation must calculate the loss factor for the distribution connection by applying the following formula:

$$LF_{Exit} = 1 + \frac{A}{B}$$

where —

- A (in kW) is the share of the total line losses allocated to the distribution connection under step (d);
- B (in kW) is the contract maximum demand for the distribution connection.

2. To calculate the loss factor for a distribution connection which is an entry point a corporation must follow the following steps:

- (a) the corporation must determine the line losses assuming the distribution connection was not there and assuming feeder maximum load;
- (b) the corporation must determine the total line losses assuming all the distribution connections are there (including the distribution connection for which the loss factor is being determined) and assuming feeder maximum load;
- (c) the corporation must calculate the loss decrease or increase for the distribution connection for which the loss factor is being determined by subtracting the result of step (b) from the result of step (a);
- (d) the corporation must calculate the loss factor for the distribution connection by applying the following formula:

$$LF_{Entry} = 1 + \frac{A}{B}$$

where —

- A (in kW) is the loss increase or decrease calculated for the distribution connection under step (c);
- B (in kW) is the declared sent-out capacity for the distribution connection.

### 3. Transmission Loss Factors

Western Power has calculated the following transmission loss factors for the 2016/17 financial year.

**Table 1 - Transmission Loss Factors**

TLF Code	Description	Applied in 2015/16	To apply in 2016/17
TAPA	Alcoa Pinjarra (Alcoa)	1.0056	0.9921
TAPL	Alcoa Pinjarra (Alinta)	0.9962	0.9898
TBLB	Bluewaters	0.9994	0.9998
TBLS	Boulder (SCE)	1.1903	1.1795
TKRA	Karara Three Springs	1.0355	1.0432
TLWA	Lanwehr (Alinta)	1.0098	1.0129
TMBA	Mumbida Wind Farm	0.9570	0.9696
TMDP	Merredin Power Station (Nammarkin)	1.0439	0.9997
TMGS	Greenough River Solar Farm (Mungarra)	1.0010	1.0187
TMSK	Mason Road (KPP)	1.0180	1.0261
TOLA	Oakley (Alinta)	1.0132	1.0146
TSAV	Transmission SWIN Average	1.0388	1.0380
TUAV	Transmission Urban Average	1.0370	1.0394
TWKG	West Kalgoorlie GTs	1.0854	1.1557
TWOJ	Worsley (Joint Venture)	0.9863	0.9821
TWOW	Worsley (Worsley)	0.9896	0.9866
WAFM	Australian Fused Materials	1.0212	1.0282
WAKW	Kwinana Alcoa	1.0186	1.0265
WALB	Albany	1.0684	1.0711
WAMT	Amherst	1.0328	1.0381
WAPM	Australian Paper Mills	1.0360	1.0411
WARK	Arkana	1.0378	1.0400
WBCH	Beechboro	1.0382	1.0404
WBCT	Balcatta	1.0398	1.0418
WBDE	Baandee (WC)	1.1554	1.0578
WBDP	Binningup Desalination Plant	1.0142	1.0127
WBEC	Beckenham	1.0327	1.0327
WBEL	Belmont	1.0307	1.0328
WBGGM	Boddington Gold Mine	1.0090	1.0093
WBHK	Broken Hill Kwinana	1.0205	1.0280
WBIB	Bibra Lake	1.0277	1.0342
WBKF	Black Flag	1.2004	1.1619
WBLD	Boulder	1.1906	1.1434
WBNP	Beenup	1.0258	1.0283
WBNY	Bounty	1.0813	1.0710
WBOD	Boddington	1.0078	1.0083
WBPM	British Petroleum	1.0214	1.0287
WBSI	Marriott Road Barrack Silicon Smelter	1.0143	1.0126
WBSN	Busselton	1.0453	1.0458
WBTN	Bridgetown	1.0118	1.0145
WBTY	Bentley	1.0325	1.0353

TLF Code	Description	Applied in 2015/16	To apply in 2016/17
WBUH	Bunbury Harbour	1.0147	1.0138
WBYF	Byford	1.0302	1.0338
WCAP	Capel	1.0349	1.0348
WCAR	Carrabin	1.1848	1.1042
WCBP	Mason Road CSBP	1.0200	1.0269
WCCL	Cockburn Cement Ltd	1.0241	1.0288
WCCT	Cockburn Cement	1.0254	1.0303
WCGW	Collgar Windfarm	1.0031	0.9923
WCKN	Clarkson	1.0372	1.0413
WCKT	Cook Street	1.0400	1.0430
WCLN	Clarence Street	1.0359	1.0389
WCLP	Coolup	1.0469	1.0484
WCOE	Collie	1.0187	1.0226
WCOL	Collier	1.0361	1.0390
WCPN	Chapman	1.0100	1.0286
WCPS	Collie PWS	0.9960	0.9966
WCTE	Cottesloe	1.0367	1.0414
WCUN	Cunderdin	1.0817	1.0837
WCVE	Canning Vale	1.0283	1.0305
WDTN	Darlington	1.0382	1.0412
WDUR	Durlacher	1.0096	1.0265
WEDD	Edmund Street	1.0341	1.0398
WEDG	Edgewater	1.0434	1.0458
WEMD	Emu Downs	1.0131	1.0148
WENB	Eneabba	1.0304	1.0336
WFFD	Forrestfield	1.0380	1.0405
WFRT	Forrest Ave	1.0425	1.0453
WGGV	Golden Grove	1.0572	1.0629
WGNI	Glen Iris	1.0250	1.0281
WGNL	Gosnells	1.0289	1.0313
WGNN	Newgen Neerabup	1.0278	1.0374
WGTN	Geraldton	1.0096	1.0265
WHAY	Hay Street	1.0399	1.0430
WHBK	Henley Brook	1.0366	1.0401
WHEP	Herdsman Parade	1.0441	1.0483
WHFS	Hadfields	1.0396	1.0418
WHIS	Hismelt	1.0181	1.0219
WHZM	Hazelmere	1.0337	1.0355
WJDP	Joondalup	1.0400	1.0410
WJTE	Joel Terrace	1.0396	1.0422
WKAT	Katanning	1.0519	1.0521
WKDA	Kalamunda	1.0393	1.0423
WKDL	Kewdale	1.0301	1.0320
WKDN	Kondinin	1.0471	1.0375
WKDP	Kwinana Desalination Plant	1.0185	1.0261
WKEL	Kellerberrin	1.0797	1.0706
WKEM	Kemerton PWS	1.0082	1.0101

TLF Code	Description	Applied in 2015/16	To apply in 2016/17
WKMC	Cataby Kerr McGee	1.0321	1.0349
WKMK	Kerr McGee Kwinana	1.0172	1.0245
WKMM	Muchea Kerr McGee	1.0340	1.0362
WKND	Kwinana Donaldson Road (Western Energy)	1.0191	1.0267
WKOJ	Kojonup	1.0332	1.0284
WKPS	Kwinana PWS	1.0174	1.0236
WLDE	Landsdale	1.0407	1.0429
WMAG	Manning Street	1.0405	1.0490
WMBR	Mt Barker	1.0541	1.0575
WMCR	Medical Centre	1.0428	1.0478
WMDN	Maddington	1.0312	1.0307
WMDY	Munday	1.0367	1.0397
WMED	Medina	1.0243	1.0309
WMER	Merredin 66kV	1.0628	1.0508
WMGA	Mungarra GTs	0.9963	1.0059
WMHA	Mandurah	1.0281	1.0268
WMIL	Milligan Street	1.0404	1.0420
WMJP	Manjimup	1.0179	1.0202
WMJX	Midland Junction	1.0345	1.0368
WMLG	Malaga	1.0359	1.0379
WMOR	Moora	1.0461	1.0488
WMOY	Morley	1.0400	1.0420
WMPS	Muja PWS	1.0000	1.0000
WMRR	Marriot Road	1.0124	1.0106
WMRV	Margaret River	1.1003	1.0982
WMSR	Mason Road	1.0182	1.0260
WMSS	Meadow Springs	1.0271	1.0264
WMUC	Muchea	1.0358	1.0378
WMUL	Mullaloo	1.0404	1.0423
WMUR	Murdoch	1.0262	1.0298
WMWR	Mundaring Weir	1.0432	1.0479
WMYR	Myaree	1.0398	1.0458
WNBH	North Beach	1.0411	1.0431
WNED	Nedlands	1.0430	1.0471
WNFL	North Fremantle	1.0340	1.0384
WNGK	NewGen Kwinana	1.0209	1.0231
WNGN	Narrogin	1.0490	1.0427
WNOR	Northam	1.0475	1.0582
WNOW	Nowgerup	1.0341	1.0370
WNPH	North Perth	1.0398	1.0433
WOCN	O'Connor	1.0382	1.0438
WOPK	Osborne Park	1.0408	1.0421
WPBY	Padbury	1.0415	1.0437
WPCY	Piccadilly	1.1943	1.1528
WPIC	Picton 66kv	1.0149	1.0136
WPJR	Pinjar	1.0298	1.0322
WPKS	Parkeston	1.1896	1.1468



TLF Code	Description	Applied in 2015/16	To apply in 2016/17
WPLD	Parklands	1.0265	1.0248
WPNJ	Pinjarra	1.0200	1.0167
WRAN	Rangeway	1.0096	1.0275
WRGN	Regans	1.0342	1.0363
WROH	Rockingham	1.0244	1.0314
WRTN	Riverton	1.0276	1.0310
WRVE	Rivervale	1.0305	1.0327
WSFT	South Fremantle 66kV	1.0246	1.0246
WSNR	Southern River	1.0281	1.0304
WSPA	Shenton Park	1.0413	1.0452
WSRD	Sutherland	1.0402	1.0452
WSUM	Summer St	1.0403	1.0431
WSVY	Sawyers Valley	1.0422	1.0458
WTLN	Tomlinson Street	1.0307	1.0300
WTSG	Three Springs	1.0336	1.0382
WTST	Three Springs Terminal	1.0443	1.0499
WTTS	Tate Street	1.0309	1.0330
WUNI	University	1.0431	1.0456
WVPA	Victoria Park	1.0352	1.0352
WWAG	Wagin	1.0537	1.0503
WWAI	Waikiki	1.0261	1.0320
WWCL	Western Collieries	0.9949	0.9956
WWDN	Wembley Downs	1.0436	1.0479
WWEL	Welshpool	1.0299	1.0321
WWGA	Wangara	1.0406	1.0425
WWGP	Wagerup	0.9964	0.9825
WWKT	West Kalgoorlie	1.1848	1.1446
WWLN	Willetton	1.0275	1.0297
WWMG	Western Mining	1.0208	1.0283
WWNO	Wanneroo	1.0359	1.0385
WWNT	Wellington Street	1.0421	1.0460
WWSD	Westralian Sands	1.0283	1.0298
WWUN	Wundowie	1.0543	1.0625
WWWF	Walkaway Windfarm	0.9384	0.9519
WYCP	Yanchep	1.0358	1.0382
WYER	Yerbillon	1.1920	1.1080
WYKE	Yokine	1.0398	1.0421
WYLN	Yilgarn	1.0950	1.0753

## 4. Average Distribution Loss Factors

Western Power has calculated the following average distribution loss factors for the 2016/17 financial year.

**Table 2 - Average Distribution Loss Factors**

DLF Code	Description	Applied in 2015/16	To apply in 2016/17
QRT1	A1 - Anytime Energy (Residential)	1.0658	1.0507
QRT2	A2 - Anytime Energy (Business)	1.0440	1.0408
QRT3	A3 - Time of Use Energy (Residential)	1.0658	1.0507
QRT4	A4 - Time of Use Energy (Business)	1.0440	1.0408
QRT5	A5 - High Voltage Metered Demand	1.0198	1.0202
QRT6	A6 - Low Voltage Metered Demand	1.0366	1.0374
QR7Z	A7 - High Voltage Contract Maximum Demand (Zone Substat Connected)	1.0055	1.0055
QZSC	Zone Substation Connections	1.0055	1.0055
QNLF	Transmission Connected (No DLF)	1.0000	1.0000
QNWM	Notional Wholesale Meter	1.0612	1.0492
QAVG	Distribution System Wide Average Loss Factor	1.0481	1.0415
QR13	C1 – Anytime Energy (Residential) Bi-directional	1.0658	1.0507
QR14	C2 – Anytime Energy (Business) Bi-directional	1.0440	1.0408
QR15	C3 – Time of Use Energy (Residential) Bi-directional	1.0658	1.0507
QR16	C4 – Time of Use Energy (Business) Bi-directional	1.0440	1.0408

## 5. Individual Distribution Loss Factors

Western Power has calculated the following individual distribution loss factors for the 2016/17 financial year.

**Table 3 - Individual Distribution Loss Factors**

DLF Code	Description	Applied in 2015/16	To apply in 2016/17
QAAL	AIR LIQUIDE WA PTY LTD	1.0087	1.0078
QAAM	AMP CAPITAL INVESTORS LIMITED	1.0100	1.0098
QAUS	BRICKWORKS BUILDING PRODUCTS PTY LTD	1.0451	1.0456
QBBW	BREMER BAY WINDFARM	1.3641	1.3675
QBGC	BGC (AUSTRALIA) PTY LTD	1.0076	1.0074
QBGM	BGM MANAGEMENT COMPANY PTY LTD	1.0556	1.0545
QBGM	BGC (AUSTRALIA) PTY LTD	1.0378	1.0289
QBMA	HANKING GOLD MINING PTY LTD	1.0137	1.0055
QBMB	HANKING GOLD MINING PTY LTD	1.0125	1.0132
QBMC	HANKING GOLD MINING PTY LTD	1.0120	1.0116
QBNB	BGC (AUSTRALIA) PTY LTD	1.0145	1.0174
QBOC	BOC GASES AUSTRALIA LIMITED	1.0078	1.0055
QBPA	SOUTHERN PORTS AUTHORITY PORT OF BUNBURY	1.0063	1.0064
QBTF	NVESTA PROP & CWLTH SUPERANNUATION CORP	1.0060	1.0057
QBUR	BURSWOOD RESORT CASINO	1.0065	1.0066
QBWE	BROOKFIELD COMMERCIAL OPERATIONS PTY LTD	1.0070	1.0070
QCBC	COCKBURN CEMENT LIMITED	1.0933	1.0927
QCBH	CO-OPERATIVE BULK HANDLING LIMITED	1.0520	1.0523
QCEM	COCKBURN CEMENT LIMITED	1.0063	1.0062
QDCS	DEPARTMENT OF CORRECTIVE SERVICES	1.0247	1.0235
QDMS	DORAL MINERAL SANDS PTY LTD	1.0720	1.0826
QDOD	DEPARTMENT OF DEFENCE	1.0157	1.0123
QFFM	WESTERN AREAS NL	1.1309	1.1405
QFIE	FLETCHER INTERNATIONAL EXPORTS PTY LTD	1.0744	1.0770
QFLM	LA MANCHA RESOURCES AUST PTY LTD	1.0272	1.0221
QFPA	FREMANTLE PORT AUTHORITY	1.0060	1.0060
QGES	APF MANAGEMENT AND PERRON INVESTMENTS PT	1.0084	1.0083
QGLM	BRICKWORKS BUILDING PRODUCTS PTY LTD	1.0348	1.0334
QGRI	THE GRIFFIN COAL MINING CO PTY LTD	1.0345	1.0383
QHFM	HARVEY FRESH (1994) LTD	1.0692	1.0699
QHMP	FMR INVESTMENTS PTY LTD	1.0557	1.0375
QHRO	HR OPERATIONS PTY LTD HYATT REGENCY PERT	1.0075	1.0075
QHVI	EG GREEN & SONS PTY LTD (Harvey Beef)	1.1210	1.1265
QIRL	ILUKA RESOURCES LIMITED	1.0964	1.1020
QKBG	KANOWNA BELLE GOLD MINES LIMITED	1.0693	1.0914
QKEM	KEMERTON SILICA SAND PTY LTD	1.0707	1.0721
QKUD	KUNDANA GOLD PTY LIMITED	1.0137	1.0064
QLJS	LEND LEASE PROPERTY MAN (AUSTRALIA) P/L	1.0093	1.0091
QLMR	LA MANCHA RESOURCES AUST PTY LTD	1.0891	1.0379
QMIC	MILLENNIUM INORGANIC CHEMICALS LTD	1.0325	1.0343

<b>DLF Code</b>	<b>Description</b>	<b>Applied in 2015/16</b>	<b>To apply in 2016/17</b>
QPAG	PADDINGTON GOLD PTY LIMITED	1.0674	1.0641
QRPH	ROYAL PERTH HOSPITAL	1.0058	1.0058
QRRR	DEPARTMENT OF DEFENCE	1.1297	1.1254
QSER	SERCO AUSTRALIA PTY LTD	1.0287	1.0243
QSIT	SITA AUSTRALIA PTY LTD	1.0120	1.0124
QSMP	ST MARTINS PROPERTIES AUSTRALIA	1.0070	1.0071
QTAL	THE GRIFFIN COAL MINING CO PTY LTD	1.0699	1.0726
QTCL	TELSTRA	1.0071	1.0071
QTMH	FOCUS OPERATIONS PTY LTD	1.1035	1.0242
QWAC	WESTRALIA AIRPORTS CORPORATION PTY LTD	1.0149	1.0141
QWAN	WESTERN AREAS NL	1.0976	1.0766
QWCB	WATER CORPORATION	1.0081	1.0081
QWCD	WATER CORPORATION	1.0122	1.0120
QWCE	WATER CORPORATION	1.0067	1.0070
QWCF	WATER CORPORATION	1.0179	1.0158
QWCG	WATER CORPORATION	1.0854	1.0795
QWCT	WATER CORPORATION	1.0120	1.0117
QWCW	WATER CORPORATION	1.0307	1.0301
QWHS	WESTFIELD SHOPPINGTOWN CAROUSEL PTY LTD	1.0138	1.0161
QWMD	LAMINEX GROUP PTY LTD	1.0262	1.0262
QARG	ARGENT (BULLANT) PTY LTD	1.0121	1.0122
QCMA	CRISTAL MINING AUSTRALIA LIMITED	1.0344	1.0374
QNEW	NEWMONT POWER PTY LTD	1.0971	1.0421
QBUL	CO OPERATIVE BULK HANDLING LTD	1.0206	1.0223
QWCA	WATER CORPORATION	1.0095	1.0094
QWCI	WATER CORPORATION	1.0069	1.0079
QWCJ	WATER CORPORATION	1.0064	1.0061
QWCK	WATER CORPORATION	1.0065	1.0106
QAAL	AIR LIQUIDE WA PTY LTD	1.0087	1.0078
QKEY	KEYSBROOK LEUCOXENE PTY LTD		1.0211
QJAN	JANDAKOT AIRPORT HOLDINGS		1.0091
QWBE	WESBEAM PTY LTD		1.0109
QBRA	BRADKEN RESOURCES PTY LTD		1.0066
QPGO	PADDINGTON GOLD PTY LIMITED		1.0066
QBGB	BGC (AUSTRALIA) PTY LTD	1.0113	1.0093
QGBP	BGC (AUSTRALIA) PTY LTD	1.0057	1.0057
QGRA	GRAND HOTEL MANAGEMENT LIMITED		1.0096
QWFL	WESFARMERS LPG PTY LTD		1.0065
QAMC	AMCOR BEVERAGE CANS		1.0069
QCEB	CEBAS PTY LTD		1.0057
QWCL	WATER CORPORATION		1.0074
QWCM	WATER CORPORATION		1.0113
QWCN	WATER CORPORATION		1.0055
QANF	ANDERSON WIND FARM	1.0311	1.0193
QAWF	ALBANY WIND FARM	0.9824	0.9419
QDWF	DENMARK WINDFARM	1.3039	1.1873
QHLG	WASTE GAS RESOURCES PTY LTD	1.0053	1.0053

<b>DLF Code</b>	<b>Description</b>	<b>Applied in 2015/16</b>	<b>To apply in 2016/17</b>
QKWF	VERVE ENERGY	1.2134	1.2167
QLGA	LANDFILL GAS & POWER PTY LTD (Red Hill)	1.0156	1.1332
QLGC	LANDFILL GAS & POWER PTY LTD	1.0260	1.0303
QLGD	LANDFILL GAS & POWER PTY LTD	1.0188	1.0195
QMBW	MT BARKER POWER COMPANY	1.0302	1.0268
QPEA	LANDFILL MANAGEMENT SYSTEMS	1.0152	1.0081
QPEB	A G L ENERGY SERVICES	1.0031	1.0000
QPED	LANDFILL MANAGEMENT SYSTEMS	1.0100	1.0097
QTCG	TESLA CORPORATION MANAGEMENT PTY LTD GTN	0.9978	1.0076
QTCK	TESLA CORPORATION MANAGEMENT PTY LTD KEM	1.0053	1.0055
QTCN	TESLA CORPORATION MANAGEMENT PTY LTD NORTH	0.9569	0.9889
QTES	TESLA CORPORATION MANAGEMENT PTY LTD PIC	1.0016	1.0040
QVEW	VERVE ENERGY	1.0057	1.0057
QWHF	WEST HILLS FARM	1.1003	1.0636
QCTE	A RICHARDS PTY LTD		1.0087
QDER	DEPT OF ENVIRONMENT REGULATION		1.0173
QFUR	FURMANITE AUSTRALIA PTY LTD		1.0119

## 6. Explanation for changes in loss factors

In accordance with clause 2.21(b)ii of the Market procedure for determining loss factors Western Power is required to provide an explanation for any changes of more than 0.025 in any transmission or distribution loss factors when compared to the previous year.

In general, loss factors increase with demand at a node and decrease with increasing generation at a node. Loss factors can also be affected by changes in network configuration.

### 6.1 Transmission Loss Factors

Loss factors for the transmission network are calculated based on half hour data for the whole system over the whole year. Individual transmission loss factors are not only affected by the quantity of usage at a node but also the time the usage occurs, and being a meshed network they are also affected by usage at other nearby nodes.

Table 4 is a list of the transmission loss factors that moved by more than 0.025 in 2015/16. Exact reasons for the movements are difficult to determine but as all points affected are on or near the 220kV line to Kalgoorlie, the changes are most likely to be a correction from the changes in the previous year. The changes in the previous year were caused by the transformer failures at Muja substation and resulted in a change of operating patterns at many substations, affecting many loss factors near Muja and on the 220kV system.

**Table 4 - Transmission Loss Factors changed by more than 0.025 – Muja to West Kalgoorlie**

TLF Code	Description	Applied in 2015/16	To apply in 2016/17	Change
TMDP	Merredin Power Station (Nammarkin)	1.0439	0.9997	-0.0442
TWKG	West Kalgoorlie GTs	1.0854	1.1557	0.0703
WBDE	Baandee (WC)	1.1554	1.0578	-0.0976
WBKF	Black Flag	1.2004	1.1619	-0.0385
WBLD	Boulder	1.1906	1.1434	-0.0472
WCAR	Carrabin	1.1848	1.1042	-0.0806
WPCY	Piccadilly	1.1943	1.1528	-0.0415
WPKS	Parkeston	1.1896	1.1468	-0.0428
WWKT	West Kalgoorlie	1.1848	1.1446	-0.0402
WYER	Yerbillon	1.1920	1.1080	-0.0840

### 6.2 Average Distribution Loss Factors

No average distribution loss factors have changed by more than 0.025 when compared to the previous year.

### 6.3 Individual Distribution Loss Factors

The following individual distribution loss factors have changed by more than 0.025 when compared to the previous year:

**Table 5 - Individual Distribution Loss Factors changed by more than 0.025**

DLF Code	Description	Applied in 2015/16	To apply in 2016/17	Change
QAWF	ALBANY WINFARM	0.9824	0.9419	-0.0405
QDWF	DENMARK WINDFARM	1.3039	1.1873	-0.1166
QLMR	LA MANCHA RESOURCES	1.0891	1.0379	-0.0512
QNEW	NEWMONT POWER PTY LTD	1.0971	1.0421	-0.0550
QTCN	TESLA CORPORATION - NORTHAM	0.9569	0.9889	0.0320
QTMH	FOCUS OPERATIONS PTY LTD	1.1035	1.0242	-0.0793
QWHF	WEST HILLS FARM	1.1003	1.0636	-0.0367

The following table sets out the reasons for the changes in the individual distribution loss factors:

**Table 6 – Reason for Individual Distribution Loss Factors change by more than 0.025**

DLF Code	Reason for change in loss factor
QAWF	One of the Albany Windfarm connection points has changed the feeder it is supplied from, affecting its overall loss factor.
QDWF	Movement of one of the Albany Windfarm connection points also affects this customer loss factor
QLMR	The feeder peak load is higher compared to last year, reducing the relative share of this customer
QNEW	The feeder peak load is higher compared to last year, reducing the relative share of this customer
QTCN	The net value of feeder peak without other private parallel generators and HV loads is significantly higher and the voltage set point is lower as compared to last year's
QTMH	The customer has reduced their contract maximum demand from last year contributing to a reduction in loss factor
QWHF	Incorrect load scaling was carried out in last year's study and has been corrected in this year's study giving a more accurate representation of the losses on the network.

## Appendix A - Individual Transmission Loss Factors by NMI

The following NMIs are for customers connected directly to the transmission system along with the transmission loss factor code Western Power has assigned.

**Table 7 - Transmission Loss Factors by NMI**

NMI	TLF Code
8001000116	WBHK
8001000118	WKMK
8001000126	WWMG
8001000127	WWMG
8001000128	WWMG
8001000129	WCCL
8001000279	WPKS
8001000291	WAFM
8001000347	WEDG
8001000499	TMSK
8001000500	TMSK
8001000616	WKMM
8001000640	WWCL
8001000641	WWCL
8001000646	WGGV
8001000659	WKMC
8001000707	WALB
8001000708	WALB
8001000732	TAPA
8001000733	WAKW
8001000736	WCBP
8001000741	TBLS
8001000743	TWOW
8001000744	TWOJ
8001000764	WSUM
8001000776	WWSD
8001000823	WTLN
8001000954	TAPA
8001001007	WWGP
8001001211	WWWF
8001001212	WWWF



NMI	TLF Code
8001016070	WBEC
8001018020	WKEM
8001018021	WKEM
8001018932	TAPL
8001019478	TWOW
8001019484	WEMD
8001019485	WEMD
8001019487	WKDP
8001019590	TOLA
8001019784	TLWA
8001019785	TLWA
8001019790	WPLD
8001019791	WGNI
8002013337	TBLB
8002013343	WNGK
8002013364	WMPS
8002013365	WKPS
8002013366	WCPS
8002013368	WPJR
8002013369	WKPS
8002013370	WGTN
8002013371	TWKG
8002013372	WMGA
8002013375	WBGM
8002013379	WKMK
8002013796	TBLB
8002014313	WPKS
8002015326	WGNN
8002016124	WKND
8002016403	WCGW
8002016404	WCGW
8002016407	TWOW
8002016415	WBSI
8002016416	WBSI
8002016417	WBSI
8002016490	TKRA

NMI	TLF Code
8002016491	TKRA
8002016504	WKPS
8002016505	WKPS
8002016506	TMGS
8002016510	TMDP
8002016519	TMBA
8002016571	WNOW
8002016585	WSRD
8002112635	WBDP

## Appendix B - Individual Distribution Loss Factors by NMI

The individual distribution loss factors calculated for the 2016/17 financial year are associated with the following NMIs.

**Table 8 - Individual Distribution Loss Factors by NMI**

NMI	DLF Code	Required or Optional <sup>2</sup>
8001000286	QAAL	Optional
8001000673	QAAM	Optional
8001000674	QAAM	Optional
8001002460	QAUS	Required
8001000864	QBGC	Optional
8001020092	QBGM	Required
8002067264	QBGQ	Required
8001001009	QBMA	Required
8001000359	QBMB	Required
8001000830	QBMC	Required
8001003787	QBNB	Required
8002206185	QBOC	Required
8001000329	QBPA	Required
8001000703	QBTF	Optional
8001000704	QBTF	Optional
8001000652	QBUR	Optional
8001000653	QBUR	Optional
8001000541	QBWE	Optional
8001000542	QBWE	Optional

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<sup>2</sup> Individual distribution loss factors have been assessed as either required or optional in accordance with section 3.2.5 of the *Market procedure for determining loss factors*. The calculation of optional distribution loss factors is at the cost of the retailer.

<b>NMI</b>	<b>DLF Code</b>	<b>Required or Optional<sup>2</sup></b>
8001000428	QCBC	Required
8001000780	QCBH	Required
8001000130	QCEM	Required
8001008631	QDCS	Required
8001011455	QDMS	Required
8001000333	QDOD	Required
8001000287	QFFM	Required
8001000539	QFIE	Required
8002034918	QFLM	Required
8001000612	QFPA	Optional
8001019750	QFPA	Optional
8001000613	QFPA	Optional
8001000547	QGES	Optional
8001000546	QGES	Optional
8001011882	QGLM	Required
8001017284	QGRI	Required
8002016580	QHFM	Required
8001000451	QHMP	Required
8001017256	QHRO	Optional
8001000345	QHVI	Required
8002114136	QIRL	Required
8001000824	QKBG	Required
8001000125	QKEM	Required
8001000669	QKUD	Required
8001000670	QKUD	Required

<b>NMI</b>	<b>DLF Code</b>	<b>Required or Optional<sup>2</sup></b>
8001000668	QLJS	Optional
8001000667	QLJS	Optional
8002191360	QLMR	Required
8001000706	QMIC	Required
8001000745	QPAG	Required
8001000665	QRPH	Optional
8001000666	QRPH	Optional
8001000863	QRRR	Required
8001006864	QSER	Required
8002055189	QSIT	Required
8001000520	QSMP	Optional
8001000519	QSMP	Optional
8001000121	QTAL	Required
8001000831	QTCL	Optional
8001000356	QTMH	Required
8001000533	QWAC	Required
8001000534	QWAC	Required
8001000878	QWAN	Required
8001000280	QWCB	Optional
8001020053	QWCD	Required
8001000282	QWCE	Optional
8001000529	QWCF	Optional
8001000530	QWCF	Optional
8001000790	QWCG	Required
8001000527	QWCT	Optional

<b>NMI</b>	<b>DLF Code</b>	<b>Required or Optional<sup>2</sup></b>
8001000528	QWCT	Optional
8001000284	QWCW	Required
8001000692	QWHS	Optional
8001000691	QWHS	Optional
8001000325	QWMD	Required
8001000493	QARG	Required
8002166160	QCMA	Required
8001000998	QNEW	Required
8001009577	QBUL	Required
8001000259	QWCA	Optional
8001008047	QWCI	Optional
8002109233	QWCJ	Optional
8001000624	QWCK	Optional
8001000623	QWCK	Optional
8002227767	QAAL	Required
8002247735	QKEY	Required
8002035499	QJAN	Optional
8002141398	QJAN	Optional
8001000650	QWBE	Optional
8001000651	QWBE	Optional
8001000414	QBRA	Optional
8001000458	QPGO	Optional
8002019353	QBGB	Optional
8001000274	QBGP	Optional
8001015838	QGRA	Optional

<b>NMI</b>	<b>DLF Code</b>	<b>Required or Optional<sup>2</sup></b>
8001000829	QWFL	Optional
8001000365	QAMC	Optional
8002002527	QCEB	Optional
8002256973	QWCL	Optional
8001006363	QWCM	Optional
8001000614	QWCN	Optional
8001000615	QWCN	Optional
8002148204	QANF	Required
8001000708	QAWF	Required
8001000707	QAWF	Required
8002016475	QAWF	Required
8002016529	QDWF	Required
8001019433	QHLG	Required
8002013336	QKWF	Required
8001000158	QLGA	Required
8001000738	QLGC	Required
8001000234	QLGD	Required
8002016408	QMBW	Required
8001000916	QPEA	Required
8001000122	QPEB	Required
8001018080	QPED	Required
8002016507	QTCG	Required
8002016508	QTCK	Required
8002016509	QTCN	Required
8002016420	QTES	Required

<b>NMI</b>	<b>DLF Code</b>	<b>Required or Optional<sup>2</sup></b>
8001002378	QVEW	Required
8002016499	QWHF	Required
8001012464	QCTE	Required
8002049183	QDER	Required
8002221497	QFUR	Required



## Appendix C - Extinct Loss Factor Codes

The following loss factor codes have not been recalculated for the 2016/17 financial year.

**Table 9 - Individual Distribution Loss Factors by NMI**

Loss Factor Code	Reason not calculated
QBLB	Retailer elected not to calculate
QBLM	Retailer elected not to calculate
QCUR	Moved to QR7Z
QIRG	Retailer elected not to calculate
QJIM	Retailer elected not to calculate
QKPS	Site no longer operating
QMGS	Retailer elected not to calculate
QMID	Retailer elected not to calculate
QMIE	Retailer elected not to calculate
QNFM	Retailer elected not to calculate
QPTC	Retailer elected not to calculate
QRCS	Retailer elected not to calculate
QWCH	Moved to QRT5
QWCS	Retailer elected not to calculate
QWGS	Retailer elected not to calculate

## Appendix D - Alternative Presentation of Average DLFs

To enable comparison with distribution loss factors within the NEM the following table presents the average distribution loss factors based on network level. However, for the purposes of the WA market the average distribution loss factors are as per section 4.

**Table 10 - Average Distribution Loss Factors by Network Level – For Information Only**

Network Level	Distribution Loss Factor	
	Applied in 2015/16	To apply in 2016/17
6.6kV/11kV/22kV/33kV Bus Connected	1.0055	1.0055
6.6kV/11kV/22kV/33kV Line Connected	1.0198	1.0202
LV Bus Connected	1.0366	1.0374
LV Line Connected (Commercial)	1.0440	1.0409
LV Line Connected (Streetlighting/UMS)	1.0612	1.0497
LV Line Connected (Residential)	1.0658	1.0513
Transmission Connected (No DLF)	1.0000	1.0000
Distribution System Wide Average Loss Factor	1.0481	1.0418