

Electricity Industry Network Quality and Reliability Performance Report 2005/06

Economic Regulation Authority



WESTERN AUSTRALIA

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Scope and purpose of the report

The Economic Regulation Authority (Authority) administers industry specific legislation in the areas of electricity, gas, rail and water. The Authority's electricity responsibilities commenced on 30 November 2004. The Authority is responsible for licensing and performance monitoring of gas, electricity and water service providers. Licensing and monitoring of electricity service providers commenced on 1 January 2005 when the *Electricity Industry Act 2004* came into force.

The *Electricity Industry (Network Quality and Reliability) Code 2005* (Code) came into force on 1 January 2006. The Code prescribes standards for the quality and reliability of electricity supply by transmitters and distributors licensed by the Authority. The Code requires transmitters and distributors, as far as is reasonably practicable, to ensure the electricity they supply complies with the prescribed quality and reliability standards. The Code requires transmitters and distributors to publish a report detailing their performance against the standards set out in the Code for each year ending 30 June. The report is to be published on their web site and other media by 1 October each year. An overview of the Code can be found in Appendix 1. The information published in this report is obtained from the information published by transmitters and distributors for the year ending 30 June 2006.

The purpose of this report is to collate the key performance data that has been published by transmitters and distributors licensed by the Authority in a single document. Where possible the report compares the performance of licensees. However, the range of network sizes and customer bases across licensees makes it difficult to provide meaningful comparisons of performance between licensees.

Both Western Power and Horizon Power have reported, as far as practicable, their individual performance for the period prior to the disaggregation of the former Western Power on 1 April 2006 using the data that was collected by Western Power up until that time.

Transmitters and Distributors licensed by the Authority

There were 5 distribution licences, 4 transmission licences and 4 integrated regional licences¹ as at 30 June 2006. Appendix 2 provides details of the licensees and some indication of customer numbers. Only 3 of the 13 licensees, Western Power, Horizon Power and Rottnest Island Authority, have networks that supply electricity to a mixed customer base comprising both large use customers and small use customers. The remaining 10 licensees operate networks that supply electricity to less than 10 large use customers through Power Purchase Agreements or other types of contract.

Three licensees, Alinta Cogeneration (Pinjarra), Alinta Cogeneration (Wagerup) and EDL NGD (WA) Pty, were not operating as at 30 June 2006 and did not publish a report.

¹ The 3 integrated regional licences grant the licensee rights to operate distribution and/or transmission systems

Summary

The following sections provide a summary of the findings presented in this report. The reader is able to obtain a copy of the complete report published by each licensee by following the links in Appendix 3.

Compliance with the Code by transmitters and distributors

The majority of transmitters and distributors reported zero breaches of the provisions of the Code.

Horizon Power reported “*although there is a process to investigate and correct voltage and harmonics complaints, it did not include recording of out of limits events*”. Work is underway to develop systems to record details of quality complaints.

Western Power reported a total of 2215 breaches of the Code, all related to power quality complaints, broken down into 5 categories.

It is interesting to note that some of the transmitters and distributors did not comply with provisions of the Code other than power quality, i.e. that is areas such as network reliability standards, timely publication of the report and independent audits of their report were not completed by some licensees.

Significant interruptions to small use customers

There are only 2 licensees serving small use customers in 2006; Horizon Power and Western Power. Table 1 summarises the significant interruption data published by these licensees.

Table 1: Significant interruptions to small use customer supply reported by Horizon Power and Western Power in 2005/06

	Number of interruptions exceeding 12 hours	Number of urban customer premises interrupted more than 9 times	Number of non-urban customer premises interrupted more than 16 times
Horizon Power	3,136	Not Applicable	378
Western Power	9,985	10,305	34

Horizon Power reported that a large proportion of the interruptions exceeding 12 hours were due to cyclone activity and the subsequent repairs.

Customer Complaints

Table 2 provides a summary of the total complaints received by licensees. Two licensees, Newmont Power Pty Ltd and Pacific Hydro Ltd did not publish any information regarding complaints. This most probably reflects the nature of their businesses, which supply large use customers on power purchase agreements.

Table 2: Total complaints received by transmitters and distributors in 2005/06

Transmitter or Distributor	Total number of customers	Total number of complaints received
Croesus Mining NL	1	0
Electricity Networks Corporation (Western Power)	Approx 870,000	2,231
Regional Power Corporation (Horizon Power)	Approx. 36,000	160
Rottnest Island Authority	114	0
Southern Cross Energy Partnership	2	0
WMC Resources Ltd	7	1

Licensees are required to report the total amounts they have spent addressing complaints. The only licensees to report non-zero values are Horizon Power (\$168,000) and Western Power (\$4,103,900). The majority of the Western Power costs were incurred in the urban area other than the Perth CBD.

Table 3 provides a summary of the payments made to small use customers for failure to give the required notice of a planned interruption of supply (section 18) or for interruptions exceeding 12 hours (section 19).

Table 3: Number and total amount of payments made to eligible customers under sections 18 and 19 of the Code in 2005/06

Transmitter or Distributor	Total number of customers	Total number of payments	Total amount paid (\$)
Croesus Mining NL	1	0	0
Electricity Networks Corporation (Western Power)	Approx 870,000	NA ²	168,620
Regional Power Corporation (Horizon Power)	Approx 36,000	124	9,920
Rottnest Island Authority	114	0	0
Southern Cross Energy Partnership	2	0	0
WMC Resources Ltd	7	0	0

Interruption of supply to customer premises

The reporting of the interruption of supply to customer premises is the largest component of the overall reporting framework. Licensees are required to report on:

- 1) The average length of interruption of supply to customer premises in minutes.

² The report published by Western Power does not specify the number of payments made, however the Authority has calculated a total of 31 payments were made under clause 18 and 2100 payments made under clause 19.

- 2) The average number of interruptions of supply to customer premises.
- 3) The average percentage of time that electricity has been supplied to customer premises.
- 4) The average total length of all interruptions of supply to customer premises in minutes.

Items 1 to 4 are to be reported for each discrete area of the State – Perth CBD, urban areas other than the Perth CBD and all other areas of the State³. For item 4 the Code prescribes the standards set out in Table 4.

Table 4: Standards for the average total length of supply interruptions

Area	Average total length of interruptions (minutes)
Perth CBD	30
Urban Areas	160
Any other area of the State	290

A number of licensees applied the methods set out in IEEE⁴ Standard 1366-2003 to calculate their reliability indices. The Standard includes a method to exclude from the calculations days, called major event days, on which the level of interruption exceeds a calculated threshold based on long term interruption performance. Both Horizon Power and Western Power reported data that included and excluded major event days.

Perth CBD

The only licensee supplying electricity in the Perth CBD is Western Power. The reported values for average total length of all interruptions of supply (22 minutes with major event days included) was within the standard prescribed in the Code (Table 32 below).

Urban Areas other than the Perth CBD

The only licensee supplying electricity in the urban areas other than Perth CBD is Western Power. The reported average total length of all interruptions of supply exceeded the standard prescribed in the Code (160 minutes) by 82 minutes with major event days excluded (Table 33 below) and by 143 minutes with major event days included (Table 34 below). It should be noted that the data was calculated on a 3-year average instead of the 4-year average prescribed in the Code because reliable data for the period 2002/03 was not available.

All other areas of the State

All of the licensees who published reports for 2005/06 were supplying electricity in the non-urban areas of the State. The majority of the licensees reported values for the average total length of all interruptions of supply that were within the 290 minute standard prescribed in the Code. The values reported by Croesus Mining, Rottnest Island Authority,

³ Where applicable the licensee is required to report separately on the North West Interconnected System (NWIS) and each standalone system operated outside of the urban areas.

⁴ Institute of Electrical and Electronics Engineers

Southern Cross Energy and Nickel West were calculated using less than 4 years worth of data so caution should be exercised when assessing compliance with the standard prescribed in the Code.

The reported average total length of all interruptions of supply reported by Western Power exceeded the standard prescribed in the Code (290 minutes) by 228 minutes with major event days excluded (Table 36 below) and by 253 minutes with major event days included (Table 37 below). It should be noted that the data was calculated on a 3-year average instead of the 4-year average prescribed in the Code because reliable data for the period 2002/03 was not available. Over the 3-year reporting period the average minutes of interruption per annum with major event days excluded has fallen by 21%.

Horizon Power reported values for the North West Interconnected System and the 28 standalone supply schemes that it operates. Examination of the data indicates a wide variation in performance across the schemes. The average length of all interruptions to supply exceeded the standard in 11 of the 29 schemes (Canarvon, Esperance, Fitzroy Crossing, Halls Creek, Hopetoun, Kununurra, Laverton, Norseman, Nullagine, Onslow and Wyndham). The overall performance for Horizon Power was marginally above the standard (290 minutes) at 293.84 minutes (Table 42 below). However, the report included a comment that excluding the data on major event days due to Cyclone Clare (9/1/06 and 10/1/06) reduces the overall average from 293.84 minutes to 221 minutes.

COMPLIANCE WITH THE CODE BY DISTRIBUTORS AND TRANSMITTERS

Reporting requirements

This part of the report details breaches of any of the provisions of sections 6(2) (voltage fluctuations) and 7 (harmonics) of the Code by a transmitter or distributor. The reporting requirements are set out in sections 4 and 10 of Schedule 1 of the Code:

Section 4. In respect of each failure by the transmitter or distributor to comply with a provision of this Code or an instrument under section 14(3) (as identified by monitoring records or under section 24 or following a complaint) –

- (a) the total number of breaches of each provision; and
- (b) the remedial action taken in each case.

Section 10. The information published for items 4(a), 6, 7, 8, and 9 in respect of the year ending 30 June preceding the year to which the report relates.

Reports published by transmitters and distributors

The following transmitters and distributors reported zero breaches during the reporting period:

- Croesus Mining N/L;
- Newmont Power Pty Ltd;⁵
- North Western Energy Pty Ltd, Pacific Hydro Group 2 Pty Ltd and Energis Australia Pty Ltd;⁶
- Regional Power Corporation (Horizon Power);⁷
- Rottnest Island Authority
- WMC Resources Limited trading as Nickel West; and
- TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership.

Electricity Networks Corporation (Western Power)

Electricity Networks Corporation (Western Power) has reported a number of breaches (failure to comply with standards) in respect of section 4(a) of Schedule 1 of the Code. It would appear from the report published by Western Power that these breaches arose as a result of customer complaints. Complaints were reported against 5 separate categories: high voltage events, low voltage events, overloads, voltage fluctuations and television interference. Table 5 identifies the number of complaints received for each category.

⁵ The report states that the contracts it has in place with its customers do not require it to have in place a system to measure compliance with and quality or interruption standards.

⁶ The report is silent on the issue of supply quality.

⁷ The report stated that, because Horizon was not formed until 1 April 2006, the data for 2005/06 is not applicable. For the 2005/06 year Horizon reported the status as Under Development and noted that although there is a process to investigate and correct voltage and harmonics complaints, it did not include recording of out of limits events.

Table 5: Western Power power quality complaints for the 12 months to June 2006

High Voltage	Low Voltage	Overloads	Voltage Fluctuations	Television Interference	Total
368	454	267	757	369	2215

SIGNIFICANT INTERRUPTIONS TO SMALL USE CUSTOMERS

Reporting requirements

This part of the report details the number of premises of small use customers that are subjected to significant interruptions. The standards applicable to significant interruptions can be found in section 1.2.2.2 of Appendix 1.

The reporting requirements are set out in section 5 of Schedule 1 of the Code as described below:

The number of premises of small use customers the supply of electricity to which has been interrupted –

- (a) for more than 12 hours continuously; or
- (b) more than the permitted number of times, as that expression is defined in section 12(1),

and in the case of interruptions referred to in paragraph (a), the number of interruptions and the length of each interruption.

Reports published by transmitters and distributors

The following transmitters and distributors reported that they do not supply small use customers and are therefore not required to report under Schedule 1, section 5:

- Croesus Mining N/L;
- Newmont Power Pty Ltd;
- North Western Energy Pty Ltd, Pacific Hydro Group 2 Pty Ltd and Energis Australia Pty Ltd;
- WMC Resources Limited trading as Nickel West; and
- TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership.

Electricity Networks Corporation (Western Power)

Western Power has reported the following significant interruptions to small use customers:

- Customers that have been interrupted for more than 12 hours (customer premises are only counted once): **9,985**
- Total customer interruption count for outages exceeding 12 hours (customer premises are counted each time an outage exceeds 12 hours): **12,120**
- Urban area (including Perth CBD) customers that have been interrupted more than 9 times: **10,305**
- Rural area customers that have been interrupted more than 16 times: **34**

Western Power has commented that there is inadequate data and system functionality to interpret, in a reportable form, the remedial action (Schedule 1, section 4(b)) taken for each individual breach.

Rottnest Island Authority

Rottnest Island Authority has reported the following significant interruptions to small use customers:

- Number of premises that experienced interruptions greater than 12 hours continuous: **Nil**
- Number of premises that experienced more than 16 interruptions⁸: **Nil**

Regional Power Corporation (Horizon Power)

Horizon Power has reported the following significant interruptions to small use customers:

- Number of premises that experienced interruptions greater than 12 hours continuous: **3,136**
- Number of premises that experienced more than 16 interruptions⁹: **378**

Table 6 overleaf provides a detailed breakdown of individual interruption events greater than 12 hours.

⁸ Note that Rottnest Island Authority only services areas designated as “other areas of the State”

⁹ Note that Horizon Power only services areas designated as “other areas of the State”.

Table 6: Horizon Power - interruption events with a duration greater than 12 hours

Date	Customers	Duration (mins)	Comment
9/1/2006	66	2580	Cyclone Clare (MED) ¹⁰
9/1/2006	30	2420	Cyclone Clare (MED)
9/1/2006	205	1761	Cyclone Clare (MED)
9/1/2006	801	1808	Cyclone Clare (MED)
9/1/2006	235	1572	Cyclone Clare (MED)
9/1/2006	3	1782	Cyclone Clare (MED)
9/1/2006	53	7658	Cyclone Clare (MED)
9/1/2006	531	1532	Cyclone Clare (MED)
9/1/2006	377	1531	Cyclone Clare (MED)
9/1/2006	62	1533	Cyclone Clare (MED)
9/1/2006	263	1531	Cyclone Clare (MED)
11/1/2006	72	1036	Cyclone Clare Repairs
11/1/2006	11	986	Cyclone Clare Repairs
12/1/2006	45	1437	Cyclone Clare Repairs
17/1/2006	4	1072	Cyclone Clare Repairs
23/2/2006	21	1078	Esperance Transformer damaged
1/3/2006	5	1667	Hopetoun Damaged Conductor
30/3/2006	131	1403	Cyclone Glenda
30/3/2006	221	1403	Cyclone Glenda

¹⁰ MED is Major Event Day as defined in Standard IEEE 1366. This permits the exclusion of interruption data on days where the system average interruption duration index exceeds a threshold calculated from the historical interruption data (usually 5 years). The purpose of MED is to allow the major events to be studied separately from daily operation.

CUSTOMER COMPLAINTS

Reporting requirements

This part of the report details the number of complaints received from customers in relation to the quality and reliability standards set out in Part 2 of the Code that are subjected to significant interruptions. The standards applicable to significant interruptions can be found in section 1.2.2.2 of Appendix 1.

The reporting requirements are set out in sections 6, 7, 8, 9 and 10 of Schedule 1 of the Code as described below:

Section 6. The total number of complaints received.

Section 7. The total number of complaints received from customers in each of the discrete areas {the Perth CBD, urban areas other than the Perth CBD and all other areas of the State}.

Section 8. The total amount spent by the transmitter or distributor in addressing complaints, other than by way of payment under sections 18 and 19 {of the Code}.

Section 9. The number and total amount of payments made by the transmitter or distributor under each of sections 18 and 19 {of the Code}.

Section 10. The information published for items 4(a), 6, 7, 8, and 9 in respect of the year ending 30 June preceding the year to which the report relates.

Transmitters and distributors who did not publish complaints data in 2005/06

The following transmitters and distributors reported that they do not supply small use customers and are therefore not required to report under Schedule 1, sections 6 to 9 inclusive¹¹:

- Newmont Power Pty Ltd;
- North Western Energy Pty Ltd, Pacific Hydro Group 2 Pty Ltd and Energis Australia Pty Ltd;

Comparison of the total complaints received by transmitters and distributors in 2005/06

Table 7 summarises the total number of complaints received by transmitters and distributors.

¹¹ This is a misinterpretation of Part 2 of the Code, which is not restricted to complaints from small use customers. However, sections 18 and 19 of the Code are restricted to payments made to small use customers.

Table 7: Total complaints received by transmitters and distributors in 2005/06

Transmitter or Distributor	Total number of customers	Total number of complaints received
Croesus Mining NL	1	0
Electricity Networks Corporation (Westerpower)	Approx 870,000	2,231
Regional Power Corporation (Horizon Power)	Approx. 36,000	160
Rottnest Island Authority	114	0
Southern Cross Energy Partnership	2	0
WMC Resources Ltd	7	1

Comparison of the number and total amount of payments made to eligible customers under sections 18 and 19 of the Code in 2005/06

Table 8 summarises the number and total amount of payments made by transmitters and distributors to eligible customers (consume less than 50MWh per annum) under sections 18 (failure to give required notice of planned interruption) and 19 (interruptions exceeding 12 hours) of the Code.

Table 8: Number and total amount of payments made to eligible customers under sections 18 and 19 of the Code in 2005/06

Transmitter or Distributor	Total number of customers	Total number of payments	Total amount paid (\$)
Croesus Mining NL	1	0	0
Electricity Networks Corporation (Westerpower)	Approx 870,000	NA ¹²	168,620
Regional Power Corporation (Horizon Power)	Approx 36,000	124	9,920
Rottnest Island Authority	144	0	0
Southern Cross Energy Partnership	2	0	0
WMC Resources Ltd	7	0	0

¹² The report published by Western Power does not specify the number of payments made, however the Authority has calculated a total of 31 payments were made under clause 18 and 2100 payments made under clause 19.

Reports published by transmitters and distributors

Croesus Mining N/L

Croesus Mining N/L provided a report for the 2005/06 year only as detailed in Table 9 below.

Table 9: Croesus Mining N/L record of complaints

Total number of complaints	Nil
Complaints in each discrete area	Nil
Cost of addressing complaints, other than compensation payments	\$0
Compensation payments Number	Nil
Compensation payments Cost	\$0

Electricity Networks Corporation (Western Power)

Western Power has published the information set out in Tables 10, 11 and 12 in relation to complaints covering the period 2005/06. No information has been published for the period 2004/05.

Table 10: Western Power complaints received - total and by discrete area

Discrete Area	Number of Complaints
Perth CBD	3
Urban areas other than the Perth CBD	1712
Rural	516
Total	2231 ¹³

Table 11: Western Power total amounts spent in addressing complaints

Discrete Area	Amount paid
Perth CBD	\$1,255
Urban areas other than the Perth CBD	\$3,422,980
Rural	\$680,920
Total	\$4,103,900

¹³ Westernpower comments there is a difference between the total number of complaints reported here and the total number presented in Table 5 of this report due to slight disparities in the systems being used to produce the figures.

Table 12: Western Power payments made under sections 18 and 19 of the Code

Type of Payment	Amount
Payments for failure to give required notice of planned interruption	\$620
Payments for supply interruptions exceeding 12 hours	\$168,000

Regional Power Corporation (Horizon Power)

Horizon Power has published the information set out in Tables 13, 14, 15, 16 and 17 in relation to complaints.

Table 13: Horizon Power total number of complaints received

2004/05	2005/06
Not available	160

Table 14: Horizon Power total amount spent addressing complaints

2004/05	2005/06
Not available	\$240,692

Table 15: Horizon Power number and total payments made to customers for failure to give required notice of planned interruption

2004/05		2005/06	
Number	Cost	Number	Cost
Not available	Not available	0	\$0

Table 16: Horizon Power number and total payments made to customers for supply interruptions exceeding 12 hours

2004/05		2005/06	
Number	Cost	Number	Cost
Not available	Not available	124	\$9,920

Table 17: Horizon Power number of complaints in each discrete area

Discrete Area	2004/05	2005/06
NWIS	Not available	35
Broome	Not available	25
Camballin	Not available	0
Canarvon	Not available	8
Cue	Not available	1
Denham	Not available	0
Derby	Not available	5
Esperance	Not available	38
Exmouth	Not available	9
Fitzroy Crossing	Not available	1
Gascoyne Junction	Not available	0
Halls Creek	Not available	3
Hopetoun	Not available	7
Kununurra	Not available	13
Lake Argyle	Not available	0
Laverton	Not available	1
Leonora	Not available	1
Marble Bar	Not available	0
Meekatharra	Not available	1
Menzies	Not available	0
Mount Magnet	Not available	0
Norseman	Not available	4
Nullagine	Not available	0
Onslow	Not available	5
Sandstone	Not available	0
Wiluna	Not available	1
Wittenoom	Not available	0
Wyndham	Not available	2
Yalgoo	Not available	0
Horizon Power Total	Not available	160

Rottnest Island Authority

Rottnest Island Authority has published the information set out in Tables 18, 19, 20 and 21 in relation to complaints.

Table 18: Rottnest Island Authority total number of complaints received

2004/05	2005/06
Not available	0

Table 19: Rottnest Island Authority number of complaints in each discrete area

Discrete Area	2004/05	2005/06
Other areas of the State	N/A	N/A

Table 20: Rottnest Island Authority total amount spent addressing complaints

2004/05	2005/06
Not available	Not Available

Table 21: Rottnest Island Authority payments made to customers for failure to give required notice of interruption

	2004/05	2005/06
Number	Not Available	0
Cost	Not Available	0

Table 22: Rottnest Island Authority payments made to customers for supply interruptions exceeding 12 hours

	2004/05	2005/06
Number	Not Available	0
Cost	Not Available	0

TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership

Southern Cross Energy has published the information set out in Tables 23, 24, 25 and 26.

Table 23: Southern Cross Energy total number of complaints received

	2003/04	2004/05	2005/06
All customers	0	1	0

Table 24: Southern Cross Energy number of complaints received from customers in each discrete area

	2003/04	2004/05	2005/06
BHPB Nickel West - North	0	1	0
Barrick Gold - North	0	0	0
BHPB Nickel West - South	0	0	0

Table 25: Southern Cross Energy total amount spent other than by way of payment under sections 18 and 19 (total amount of time spent in hours¹⁴)

	2003/04	2004/05	2005/06
All customers	0	120	0

Table 26: Southern Cross Energy number and total amount of payments made under sections 18 and 19¹⁵

	2003/04	2004/05	2005/06
Number of payments	0	0	0
Cost of payments	\$0	\$0	\$0

WMC Resources Limited trading as Nickel West

Nickel West has published the information set out in Tables 27, 28, 29 and 30.

Table 27: Nickel West total number of breaches reported

	2003/04	2004/05	2005/06
All customers	0	0	1

¹⁴ The report states that current records maintained by Southern Cross Energy do not include dollar values as this has not been historically required by the Power Purchase Agreements

¹⁵ The report states the Power Purchase Agreements include provisions for liquidated damages to provide incentive for the supplier to maintain availability and reliability in accordance with the contracts.

Table 28: Nickel West number of complaints received from customers in each discrete area

	2003/04	2004/05	2005/06
Agnew Gold Mine Company	0	0	0
Goldfields Mine Management	0	0	0
Lightening Nickel	0	0	0
Mincor Resources NL	0	0	1
St Ives Gold Mine Company	0	0	0
Lanfranchi Nickel Mine	0	0	0
Blair Nickel Mine	0	0	0

Table 29: Nickel West total amount spent other than by way of payment under sections 18 and 19 (total amount of time spent in hours¹⁶)

	2003/04	2004/05	2005/06
All customers	0	0	2

Table 30: Nickel West number and total amount of payments made under sections 18 and 19

	2003/04	2004/05	2005/06
Number of payments	0	0	0
Cost of payments	\$0	\$0	\$0

¹⁶ The report states that current records maintained by Nickel West do not include dollar values as this has not been historically required by the Power Purchase Agreements

INTERRUPTION OF SUPPLY TO CUSTOMER PREMISES

Reporting requirements – reliability indicators

This part of the report details information regarding the key measures of reliability of supply to customer premises. There are three key measures of reliability specified:

- The average length of interruption of supply to customer premises (interruption duration)
- The average number of interruptions of supply to customer premises (interruption frequency)
- The average percentage of time that electricity has been supplied to customer premises (service availability)

The standards applicable to the average total length of interruptions can be found in section 1.2.2.3 of Appendix 1. The Code does not explicitly prescribe standards for interruption frequency nor does it prescribe standards for service availability.

The reporting requirements are set out in sections 11, 12, 13, of Schedule 1 of the Code as described below:

Section 11. For each discrete area –

- (a) the average length of interruption of supply to customer premises expressed in minutes;
- (b) the average number of interruptions of supply to customer premises;
- (c) the average percentage of time that electricity has been supplied to customer premises; and
- (d) the average total length of all interruptions of supply to customer premises expressed in minutes.

Section 12. The information published for each paragraph of item 11 in respect of each of the 3 years ending 30 June preceding the year to which the report relates.

Section 13. For each paragraph of item 11, the average of the 4 amounts under that paragraph in respect of the years comprising –

- (a) the year to which the report relates; and
- (b) the 3 years referred to in item 12.

Section 14. For customer premises in each discrete area {defined in section 2 of Schedule 1}, an estimate of the 25th, 50th, 75th, 90th, 95th and 100th percentile values of –

- (a) the average length of interruption referred to in item 11(a);
- (b) the number of interruptions; and
- (c) the total length of interruptions.

Section 15. For each category of information in item 14(a), (b) and (c), a graph showing the distribution of customer premises across the range of that category.

Reports published by transmitters and distributors

The Code defines 5 discrete areas of the State for the purposes of reporting reliability indicators:

- Perth CBD;
- Urban areas other than the Perth CBD;
- The area served by the North West Interconnected System (NWIS);
- Each area of the State served by an isolated system; and
- All other areas of the State¹⁷.

The remainder of this section of the report presents the reliability data presented by each transmitter or distributor for each of the above discrete areas.

Some of the transmitters and distributors have reported their reliability data using the measurement methodology set out in IEEE Standard 1366 – Guide for Electric Power Distribution Reliability Indices. The key performance indicators that are cited include:

- SAIDI – System Average Duration Interruption Index {11(d)}. This index indicates the total duration of interruption for the average customer during a pre-defined period of time. It is commonly measured in customer minutes or customer hours.
- SAIFI - System Average Frequency Interruption Index {11(b)}. This index indicates how often the average customer experiences a sustained interruption (usually greater than 1 minute) over a predefined period of time.
- CAIDI - Customer Average Duration Interruption Index {11(a)}. This index measures the average time required to restore service. It can be calculated as the ratio of SAIDI/SAIFI.
- ASAI – Average Service Availability Index {11(c)}. This index represents the fraction of time that a customer has received power during the defined reporting period.

The definition in section 11 of Schedule 1 of the Code with a broadly equivalent meaning to each of the IEEE 1366 reliability indices has been included in brackets for cross-reference purposes.

Perth CBD

Electricity Networks Corporation (Western Power) is the only transmitter or distributor that is licensed to supply electricity in the Perth CBD area. Western Power has presented two sets of data for each reliability index in the report. The first data set excludes major event days¹⁸ (Table 31) and the second data set includes major event days (Table 32).

Section 13 of the Code prescribes a maximum value of the average total length of interruptions of supply to customer premises for the Perth CBD area of 30 minutes. It can

¹⁷ The Code requires a transmitter or distributor to report aggregated data for all other areas of the State in addition to reporting disaggregated data for the NWIS and each isolated system relevant to their operations.

¹⁸ Major Event Day is defined in Standard IEEE 1366. This permits the exclusion of interruption data on days where the system average interruption duration index exceeds a threshold calculated from the historical interruption data (usually 5 years). The purpose of MED is to allow the major events to be studied separately from daily operation.

be seen that Western Power has met the standard with and without the inclusion of the major event days.

Table 31: Western Power reliability data for Perth CBD (major event days excluded)

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average
		2003/04	2004/05	2005/06	
SAIDI	Minutes	22	10	11	14 (Code standard is 30 minutes)
SAIFI		0.33	0.14	0.05	0.17
CAIDI	Minutes	67	68	218 ¹⁹	82
ASAI	%	99.996	99.998	99.998	99.997

Table 32: Western Power reliability data for Perth CBD (all faults)

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average
		2003/04	2004/05	2005/06	
SAIDI	Minutes	44	10	11	22 (Code standard is 30 minutes)
SAIFI		0.38	0.14	0.05	0.19
CAIDI	Minutes	117	68	218	115
ASAI	%	99.992	99.998	99.998	99.996

Urban areas other than the Perth CBD

Electricity Networks Corporation (Western Power) is the only transmitter or distributor that is licensed to supply electricity in the urban areas other than the Perth CBD as defined in section 3 of the Code. Western Power has presented two sets of data for each reliability index in the report. The first data set excludes major event days²⁰ (Table 33) and the second data set includes major event days (Table 34).

Section 13 of the Code prescribes a maximum value of the average total length of interruptions of supply to customer premises for urban areas other than the Perth CBD of 160 minutes. It can be seen that Western Power has not met the standard (on a 3-year average rather than the 4 year average prescribed in the Code) with and without the inclusion of the major event days.

²⁰ Major Event Day is defined in Standard IEEE 1366. This permits the exclusion of interruption data on days where the system average interruption duration index exceeds a threshold calculated from the historical interruption data (usually 5 years). The purpose of MED is to allow the major events to be studied separately from daily operation.

Table 33: Western Power reliability data for urban areas other than the Perth CBD (major event days excluded)

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average
		2003/04	2004/05	2005/06	
SAIDI	Minutes	260	248	218	242 (Code standard is 160 minutes)
SAIFI		3.58	3.00	2.70	3.09
CAIDI	Minutes	73	83	81	78
ASAI	%	99.95	99.95	99.96	99.95

Table 34: Western Power reliability data for urban areas other than the Perth CBD (all faults)

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average
		2003/04	2004/05	2005/06	
SAIDI	Minutes	283	408	218	303 (Code standard is 160 minutes)
SAIFI		3.72	3.48	2.70	3.30
CAIDI	Minutes	76	117	81	92
ASAI	%	99.95	99.92	99.96	99.94

Other areas of the State

Section 13 of the Code prescribes a maximum value of the average total length of interruptions of supply to customer premises for all areas of the State other than urban areas and the Perth CBD of 290 minutes..

Croesus Mining NL

Croesus Mining NL has published separate tables providing details of supply outages for the periods 2003/04, 2004/05 and 2005/06. Table 35 summarises this information in the interests of brevity.

Table 35: Croesus Mining NL supply interruption and supply availability information

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average ²¹
		2003/04	2004/05	2005/06	
Number of supply outages		6	0	10	5.33
Average outage time	Minutes	20.0	0.0	26.0	23.8 (Code standard is 290 minutes)
Supply availability	%	99.977	100.0	99.951	99.976

Electricity Networks Corporation (Western Power)

Western Power has reported the non-urban areas of the State under the heading “rural areas”. Western Power has presented two sets of data for each of the 4 reliability indices in the report. The first data set excludes major event days²² (Table 36) and the second data set includes major event days (Table 37).

Table 36: Western Power reliability data for all other areas of the State (major event days excluded)

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average
		2003/04	2004/05	2005/06	
SAIDI	Minutes	590	503	462	518 (Code standard is 290 minutes)
SAIFI		4.88	3.73	3.89	4.16
CAIDI	Minutes	121	135	119	124
ASAI	%	99.89	99.90	99.91	99.90

²¹ These values have been calculated by the Authority using the detailed data in the report

²² Major Event Day is defined in Standard IEEE 1366. This permits the exclusion of interruption data on days where the system average interruption duration index exceeds a threshold calculated from the historical interruption data (usually 5 years). The purpose of MED is to allow the major events to be studied separately from daily operation.

Table 37: Western Power reliability data for all other areas of the State (all faults)

KPI	Unit of Measure	Financial Year ending on 30 June			3 Year Average
		2003/04	2004/05	2005/06	
SAIDI	Minutes	615	552	462	543 (Code standard is 290 minutes)
SAIFI		4.96	4.04	3.89	4.29
CAIDI	Minutes	124	137	119	126
ASAI	%	99.88	99.89	99.91	99.90

Newmont Power Pty Ltd

Newmont Power Pty Ltd published the following response to sections 11 to 15 of Schedule 1 of the Code:

“11. The network is located in only one area, the Kalgoorlie-Boulder LGA. The network suffered no interruptions in the reporting period.

- a) 0 minutes {average length of interruption of supply to customer premises}
- b) 0 {average number of interruptions of supply to customer premises}
- c) 100% {average percentage of time that electricity has been supplied to customers}
- d) 0 minutes {average total length of all interruptions of supply to customer premises}

12. Information relating to the 3 preceding years is not available.

13. This information is not calculable as information to the 3 preceding years is not available.

14. As there are only 2 customer premises the information at the various percentile levels is not available.

15. As per 14.”

North Western Energy Pty Ltd, Pacific Hydro Group 2 Pty Ltd and Energis Australia Pty Ltd (Pacific Hydro Pty Ltd)

Pacific Hydro Pty Ltd have published a number of data tables in response to sections 11 to 13 inclusive of Schedule 1 of the Code. This data is summarised in Table 38 below.

Table 38: Pacific Hydro Pty Ltd supply reliability information

KPI	Measure	2002/03	2003/04	2004/05 ²³	2005/06	4 Year Average
Average length of interruption of supply	Minutes	20.67	37.0	141.8	28.8	73 (Code standard is 290 minutes)
Average annual number of interruptions		1.5	4.5	7.0	6.0	4.625
Average percentage of time that electricity has been supplied	%	99.988	99.937	99.62	99.94	99.872
Average length of all interruptions of supply	Minutes	21	35	143	98	96

Regional Power Corporation (Horizon Power)

Horizon Power provides supply services in 28 standalone areas and the North West Interconnected System (NWIS). As required by the Code, Horizon Power has published a response for each standalone system, the NWIS and the aggregation of all of the systems and this is replicated in Tables 39 to 42 below.

²³ The report includes a comment that the 2004/05 figures do not include the loss of the Ord switchyard to Argyle Diamond Mine transmission line during cyclone Ingrid.

Table 39: Horizon Power average length of interruption of supply to customer premises in minutes (CAIDI)

Discrete Area	2002/03	2003/04	2004/05	2005/06	Average
NWIS	55.88	93.48	82.61	163.45	98.85
Broome	51.37	43.48	39.33	48.13	45.58
Camballin	51.54	45.00	61.54	210.90	92.24
Carnarvon	33.33	28.50	36.59	36.28	33.68
Cue	77.62	28.00	256.92	178.91	135.36
Denham	28.44	38.48	114.00	20.35	50.32
Derby	21.46	9.09	75.00	41.04	36.65
Esperance	40.85	53.68	26.00	31.99	38.13
Exmouth	52.22	60.32	31.79	47.41	47.94
Fitzroy Crossing	52.43	25.50	32.00	36.63	36.64
Gascoyne Junction	13.25	8.33	40.00	10.80	18.10
Halls Creek	35.97	23.03	59.38	45.51	40.97
Hopetoun	259.70	99.30	67.10	95.72	130.46
Kununurra	27.56	20.49	37.73	38.15	30.98
Lake Argyle	10.00	3.00	38.50	16.37	16.97
Laverton	69.71	19.52	68.52	31.54	47.32
Leonora	57.23	20.80	33.21	51.76	40.75
Marble Bar	10.00	15.00	-	-	6.25
Meekatharra	37.59	27.39	26.90	41.83	33.43
Menzies	14.06	12.50	76.67	23.43	31.67
Mount Magnet	57.55	32.71	39.29	40.38	42.48
Norseman	147.37	96.76	-	48.45	73.14
Nullagine	14.62	167.20	15.56	48.65	61.50
Onslow	120.74	123.13	33.68	213.13	122.67
Sandstone	17.40	233.46	27.00	-	69.47
Wiluna	22.05	10.29	84.62	23.89	35.21
Wittenoom	8.43	6.67	-	-	3.77
Wyndham	28.79	17.97	32.54	40.27	29.89
Yalgoo	42.08	36.61	30.00	42.64	37.83
Horizon Power (Total)	-	-	36.27	71.27	53.77

Table 40: Horizon Power average number of interruptions of supply to customer premises (SAIFI)

Discrete Area	2002/03	2003/04	2004/05	2005/06	Average
NWIS	1.02	0.46	1.15	3.45	1.52
Broome	7.3	2.3	1.5	2.45	3.39
Camballin	3.9	3.2	2.6	0.42	2.53
Carnarvon	15.9	8	9.1	3.67	9.17
Cue	6.3	2.5	1.3	0.98	2.77
Denham	4.5	3.3	0.5	0.99	2.32
Derby	9.6	4.4	1.8	5.02	5.21
Esperance	4.7	11.7	15	9.03	10.11
Exmouth	3.6	3.1	2.8	5.18	3.67
Fitzroy Crossing	17.3	8	14.5	5.51	11.33
Gascoyne Junction	8	8.4	6.3	2.58	6.32
Halls Creek	6.2	3.3	9.7	7.93	6.78
Hopetoun	3.3	4.3	14.5	9.38	7.87
Kununurra	4.5	8.2	14.1	8.86	8.92
Lake Argyle	1	1	8	3.14	3.28
Laverton	10.2	12.4	5.4	1.53	7.38
Leonora	6.5	2.5	5.6	2.25	4.21
Marble Bar	1	1	0	0	0.50
Meekatharra	2.9	2.3	8.7	0.99	3.72
Menzies	12.8	2	4.5	2.90	5.55
Mount Magnet	4.9	5.9	7	4.45	5.56
Norseman	3.8	7.1	0	13.33	6.06
Nullagine	5.2	13.2	9.9	4.76	8.27
Onslow	5.4	1.6	3.8	9.7	5.12
Sandstone	5	2.6	1	0	2.15
Wiluna	13.2	6.8	3.9	3.43	6.83
Wittenoom	14	3	0	0	4.25
Wyndham	20.7	7.9	13.8	9.84	13.06
Yalgoo	7.7	6.2	0.4	1.97	4.07
Horizon Power (Total)			6.12	5.13	5.63

Table 41: Horizon Power average percentage of time that electricity has been supplied to customer premises

Discrete Area	2002/03 (%)	2003/04 (%)	2004/05 (%)	2005/06 (%)	Average (%)
NWIS	99.989	99.992	99.982	99.893	99.964
Broome	99.929	99.981	99.989	99.978	99.969
Camballin	99.962	99.973	99.970	99.983	99.972
Carnarvon	99.899	99.957	99.937	99.975	99.942
Cue	99.907	99.987	99.936	99.967	99.949
Denham	99.976	99.976	99.989	99.996	99.984
Derby	99.961	99.992	99.974	99.961	99.972
Esperance	99.963	99.881	99.926	99.945	99.929
Exmouth	99.964	99.965	99.983	99.953	99.966
Fitzroy Crossing	99.827	99.961	99.912	99.962	99.916
Gascoyne Junction	99.980	99.987	99.952	99.995	99.978
Halls Creek	99.958	99.986	99.890	99.931	99.941
Hopetoun	99.837	99.919	99.815	99.829	99.850
Kununurra	99.976	99.968	99.899	99.936	99.945
Lake Argyle	99.998	99.999	99.941	99.990	99.982
Laverton	99.865	99.954	99.930	99.991	99.935
Leonora	99.929	99.990	99.965	99.978	99.965
Marble Bar	99.998	99.997	100.000	100.000	99.999
Meekatharra	99.979	99.988	99.955	99.992	99.979
Menzies	99.966	99.995	99.934	99.987	99.971
Mount Magnet	99.946	99.963	99.948	99.966	99.956
Norseman	99.893	99.870	100.000	99.877	99.910
Nullagine	99.986	99.581	99.971	99.956	99.873
Onslow	99.876	99.963	99.976	99.607	99.855
Sandstone	99.983	99.885	99.995	100.000	99.966
Wiluna	99.945	99.987	99.937	99.984	99.963
Wittenoom	99.978	99.996	100.000	100.000	99.993
Wyndham	99.887	99.973	99.915	99.925	99.925
Yalgoo	99.938	99.957	99.998	99.984	99.969
Horizon Power (Total)			99.958	99.930	99.944

Table 42: Horizon Power average length of all interruptions of supply to customer premises in minutes (SAIDI)²⁴

Discrete Area	2002/03	2003/04	2004/05	2005/06	Average
NWIS	57	43	95	563.23	189.56
Broome	375	100	59	117.69	162.92
Camballin	201	144	160	88.80	148.45
Carnarvon	530	228	333	133.16	306.04
Cue	489	70	334	175.10	267.03
Denham	128	127	57	20.09	83.02
Derby	206	40	135	206.20	146.80
Esperance	192	628	390	288.85	374.71
Exmouth	188	187	89	245.58	177.40
Fitzroy Crossing	907	204	464	201.84	444.21
Gascoyne Junction	106	70	252	27.90	113.98
Halls Creek	223	76	576	360.99	309.00
Hopetoun	857	427	973	897.59	788.65
Kununurra	124	168	532	337.99	290.50
Lake Argyle	10	3	308	51.33	93.08
Laverton	711	242	370	48.24	342.81
Leonora	372	52	186	116.25	181.56
Marble Bar	10	15	0	0	6.25
Meekatharra	109	63	234	41.57	111.89
Menzies	180	25	345	68.04	154.51
Mount Magnet	282	193	275	179.58	232.40
Norseman	560	687	0	645.70	473.17
Nullagine	76	2207	154	231.56	667.14
Onslow	652	197	128	2067.33	761.08
Sandstone	87	607	27	0	180.25
Wiluna	291	70	330	81.82	193.20
Wittenoom	118	20	0	0	34.50
Wyndham	596	142	449	396.24	395.81
Yalgoo	324	227	12	84.16	161.79
Horizon Power (Total)			222	366	293.84²⁵ (Code standard is 290 minutes)

²⁴ Horizon has noted that figures in red indicate where SAIDI is greater than 290 minutes (the standard prescribed by the Code)

²⁵ Horizon Power identified major event days occurred on 9/1/2006 and 10/1/2006 due to Cyclone Clare. The SAIDI for Horizon Power with these outages excluded was 221.

Rottnest Island Authority

Rottnest Island Authority has published the information in Tables 43 to 46 in response to sections 11 to 13 inclusive of Schedule 1 of the Code. In its report the Authority comments that there were no major event days recorded in the reporting period and that data for 2002/03 and 2003/04 is not available.

Table 43: Rottnest Island Authority average length of interruption of supply to customer premises in minutes (CAIDI)

Discrete Area	2004/05	2005/06	Average
Rottnest Island ²⁶	41.09	9.9	25.49

Table 44: Rottnest Island Authority average number of interruptions of supply to customer premises (SAIFI)

Discrete Area	2004/05	2005/06	Average
Rottnest Island	4.33	4.66	4.49

Table 45: Rottnest Island Authority average percentage of time that electricity has been supplied to customer premises

Discrete Area	2004/05	2005/06	Average
Rottnest Island	98.81	98.72	98.765

Table 46: Rottnest Island Authority average total length of all interruptions of supply to customer premises in minutes (SAIDI)

Discrete Area	2004/05	2005/06	Average
Rottnest Island	398	99	248.5 (Code standard is 290 minutes)

TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership

Southern Cross Partnership has published the information set out in Tables 47 to 50 in response to sections 11 to 13 inclusive of Schedule 1 of the Code. In their report Southern Cross Energy comment that the tables include information on the accumulation of all network interruptions for each defined customer. However, based on the location information for their customers it can be deduced that all of their customers lie in the portion of the State defined as all other areas of the State in the Code.

²⁶ The correct definition is "all other areas of the State"

Table 47: Southern Cross Energy average length of interruption of supply to customer premises expressed in minutes

Customer	2002/03	2003/04	2004/05	2005/06	Average
BHBP Nickel West – North	-	41.37	111.66	60.81	71.28
Barrick Gold – North	-	46.58	150.14	79.00	91.91
BHBP Nickel West - South	-	35.00	472.50	134.88	214.13

Table 48: Southern Cross Energy average number of interruptions of supply to customer premises

Customer	2002/03	2003/04	2004/05	2005/06	Average
BHBP Nickel West – North	-	19	35	32	28.7
Barrick Gold – North	-	12	22	11	15.0
BHBP Nickel West - South	-	1	4	8	4.3

Table 49: Southern Cross Energy average percentage of time that electricity has been supplied to customer premises (ASAI)

Customer	2002/03	2003/04	2004/05	2005/06	Average
BHBP Nickel West – North	-	99.85	99.26	99.63	99.58
Barrick Gold – North	-	99.95	99.69	99.92	99.85
BHBP Nickel West - South	-	99.99	99.64	99.79	99.81

Table 50: Southern Cross Energy average length of all interruptions of supply to customer premises expressed in minutes

Customer	2002/03	2003/04	2004/05	2005/06
BHBP Nickel West – North	-	41.37	111.66	60.81
Barrick Gold – North	-	46.58	150.14	79.00
BHBP Nickel West - South	-	35.00	472.50	134.88
Average total length	-	40.98	244.77	91.56 (Code standard is 290 minutes)

WMC Resources Limited trading as Nickel West

Nickel West have published the information set out in Tables 51 to 54 in response to sections 11 to 13 inclusive of Schedule 1 of the Code. In their report Nickel West comment that the tables include information on the accumulation of all network interruptions for each defined customer. However, based on the location information for their customers it can be deduced that all of their customers lie in the portion of the State defined as all other areas of the State in the Code.

Table 51: Nickel West average length of interruption of supply to customer premises expressed in minutes

Customer	2002/03	2003/04	2004/05	2005/06	Average
Agnew Gold Mine Company	-	16.58	121.30	117.56	85.15
Blair Nickel Mine	-	-	-	-	-
Goldfields Mine Management	-	-	-	49.75	49.75
Lanfranchi Nickel Mine	-	-	475.00	183.00	329.00
Lightening Nickel	-	-	-	111.33	111.33
Mincor Resources NL	-	-	475.00	200.50	245.04
St Ives Gold Mine Company	-	-	225.75	182.56	204.16

Table 52: Nickel West average number of interruptions of supply to customer premises

Customer	2002/03	2003/04	2004/05	2005/06	Average
Agnew Gold Mine Company	-	12	23	16	17.0
Blair Nickel Mine	-	-	-	-	-
Goldfields Mine Management	-	-	-	4	4.0
Lanfranchi Nickel Mine	-	-	2	4	3.0
Lightening Nickel	-	-	-	3	3.0
Mincor Resources NL	-	-	2	6	4.0
St Ives Gold Mine Company	-	-	4	9	6.5

Table 53: Nickel West average percentage of time that electricity has been supplied to customer premises (ASAI)

Customer	2002/03 (%)	2003/04 (%)	2004/05 (%)	2005/06 (%)	Average (%)
Agnew Gold Mine Company	-	99.96	99.47	99.64	99.69
Blair Nickel Mine	-	-	-		-
Goldfields Mine Management	-	-	-	99.96	99.96
Lanfranchi Nickel Mine	-	-	99.82	99.86	99.84
Lightening Nickel	-	-	-	99.94	99.94
Mincor Resources NL	-	-	99.82	99.77	99.80
St Ives Gold Mine Company	-	-	99.83	99.69	99.76

Table 54: Nickel West average total length of all interruptions of supply to customer premises expressed in minutes

Customer	2002/03	2003/04	2004/05	2005/06
Agnew Gold Mine Company	-	16.58	121.30	117.56
Blair Nickel Mine	-	-	-	-
Goldfields Mine Management	-	-	-	49.75
Lanfranchi Nickel Mine	-	-	475.00	183.00
Lightening Nickel	-	-	-	111.33
Mincor Resources NL	-	-	475.00	200.50
St Ives Gold Mine Company	-	-	225.75	182.56
Average total length (Code standard is 290 minutes)	-	16.58	324.26	140.78

Reporting requirements – percentile distribution of interruptions

The reporting requirements are set out in sections 14 and 15, of Schedule 1 of the Code as described below:

Section 14. For customer premises in each discrete area {defined in section 2 of Schedule 1}, an estimate of the 25th, 50th, 75th, 90th, 95th and 100th percentile values of –

- (a) the average length of interruption referred to in item 11(a);
- (b) the number of interruptions; and
- (c) the total length of interruptions.

Section 15. For each category of information in item 14(a), (b) and (c), a graph showing the distribution of customer premises across the range of that category.

Reports published by transmitters and distributors

The only licensees who have published percentile distributions of interruption data in response to sections 14 and 15 of Schedule 1 of the Code are Horizon Power and Western Power.

Section 3 of the Code defines 3 discrete areas for the purposes of reporting percentile distributions of interruption data:

- Perth CBD;
- The urban areas of the State other than the Perth CBD;
- All other areas of the State.

The remainder of this section of the report presents the percentile distributions of interruption data presented by Horizon Power and Western Power for the discrete areas identified above.

Horizon Power

Horizon Power only supplies electricity in the discrete area defined as all other areas of the State so the distributional data reported by Horizon is restricted to this single area.

Table 55, 56 and 57 show the percentile distributions of the average length of interruption, the number of interruptions and the total length of interruptions of supply to customer premises respectively

Table 55: Horizon Power - percentile distribution of the average length of interruption of supply to customer premises (minutes)

Percentile	Minutes
25 th	23.94
50 th	41.77
75 th	74.93
90 th	218.58
95 th	446.62
98 th	843.55
100 th	860.77

Table 56: Horizon Power - percentile distribution of the frequency of interruption of supply to customer premises

Percentile	Minutes
25 th	2.62
50 th	4.41
75 th	8.12
90 th	10.62
95 th	13.21
98 th	17.90
100 th	18.26

Table 57: Horizon Power - percentile distribution of the average length of interruptions of supply to customer premises (minutes)

Percentile	Minutes
25 th	109.46
50 th	171.11
75 th	351.04
90 th	1698.49
95 th	2114.17
98 th	3023.22
100 th	3084.92

Western Power

Table 58, 59 and 60 show the percentile distributions of the average length of interruption, the number of interruptions and the total length of interruptions of supply to customer premises respectively.

Table 58: Western Power - percentile distribution of the average length of interruption of supply to customer premises (minutes)

Percentile	25 th	50 th	75 th	90 th	95 th	98 th	100 th
Perth CBD	0	0	0	0	0	222	663
Urban (ex-Perth CBD)	24	55	85	126	169	247	1585
All other areas of the State	32	80	124	206	251	322	953

Table 59: Western Power - percentile distribution of the frequency of interruption of supply to customer premises

Percentile	25 th	50 th	75 th	90 th	95 th	98 th	100 th
Perth CBD	0	0	0	0	0	1	2
Urban (ex-Perth CBD)	1	2	4	6	7	8	24
All other areas of the State	1	3	5	7	8	10	21

Table 60: Western Power - percentile distribution of the total length of interruptions of supply to customer premises (minutes)

Percentile	25 th	50 th	75 th	90 th	95 th	98 th	100 th
Perth CBD	0	0	0	0	0	317	663
Urban (ex-Perth CBD)	40	138	294	516	683	1,017	6,236
All other areas of the State	72	269	543	1,053	1,434	1,918	8,012

Appendix 1 Electricity Industry (Network Quality and Reliability of Supply) Code 2005

The *Electricity Industry (Network Quality and Reliability of Supply) Code 2005* (Code) was gazetted on 1 January 2006. The Code applies to distribution licences, transmission licences and integrated regional licences that include the operation of a distribution or transmission network. There are several parts to the Code, each of which is described below.

1.1 Operating Areas

The Code prescribes a number of operating areas for the purposes of setting quality and reliability standards and reporting on performance against these standards. The areas are defined in Table 61.

Table 61: Operating Areas

Area	Description
Perth CBD	Areas supplied from the Milligan Street Zone Substation or the Hay Street Zone Substation
Urban Areas	The metropolitan region other than the Perth CBD area ²⁷ , Albany, Bunbury, Geraldton, Kalgoorlie and Mandurah
North West interconnected system (NWIS)	The interconnected system located in the Pilbara region of the State supplied by generation plants in Dampier, Port Hedland and Cape Lambert
Any other area of the State	The remaining areas of the State excluding the Urban Areas and the Perth CBD ²⁸

1.2 Quality and reliability standards

1.2.1 Quality Standards

The Code obliges a transmitter or distributor to observe standards in relation to:

- Voltage fluctuations
- Harmonic voltage distortion levels

1.2.2 Reliability Standards

The Code requires a transmitter or distributor to, as far as is reasonably practicable, ensure the supply of electricity to a customer is maintained.

²⁷ The metropolitan region is described in the *Metropolitan Region Town Planning Act 1959*

²⁸ This comprises isolated systems that are not connected to the NWIS or the South West interconnected system

1.2.2.1 Planned interruptions

In the case of planned interruptions to supply the transmitter or distributor is required to give at least 72 hours notice to customers. Notice can be given by direct mailing, newspaper advertisements and radio/television advertisements. The Code prescribes a penalty of \$20 per event where customers are not provided with the minimum period of notice for a planned interruption.

There are standards in relation to the duration of planned interruptions as set out in Table 62 below.

Table 62: Maximum duration of planned interruptions

Customer Location	Temperature (C)	Maximum duration of interruption (hours)
North of 26 th parallel	Any temperature	4
South of 26 th parallel	<30	6
South of 26 th parallel	>30	4

1.2.2.2 Significant interruptions to small use customers

A key measure of the reliability of supply is the interruption frequency or the number of times a customer could expect to experience supply interruptions in a year. The Code focuses on significant supply interruptions to small use customers (who use less than 160MWh per annum).

A significant interruption event is defined as:

- A continuous interruption duration of more than 12 hours.
- In the Perth CBD or Urban areas 9 or more interruptions in any 12 month period ending on 30 June.
- In other areas of the State 16 or more interruptions in any 12 month period ending on 30 June.

If the distributor considers they will not be able to supply electricity without a significant interruption event for 9 out of every 10 years then they must either:

- 5) remedy the cause(s) of the interruptions to achieve the standard; or
- 6) enter into an alternative arrangement with the customer for the supply of electricity to the customer's satisfaction.

There is provision in the Code for an \$80 payment to a customer, upon application, if the customer supply is interrupted for a period exceeding 12 hours. Section 17 of the Code details the circumstances under which the payment might not apply.

1.2.2.3 Standards for the duration of interruption of supply

A key measure of the reliability of supply is average total length of interruptions of supply for each customer premises measured in minutes per annum. This is calculated over a 4-year period by taking the average of the interruption for each of the 4 years and then

averaging the 4 annual averages (average of an average). The Code prescribes a standard for each area as set out in Table 63.

Table 63: Standard for the average total length of supply interruptions

Area	Average total length of interruptions (minutes)
Perth CBD	30
Urban Areas	160
Any other area of the State	290

1.3 Quality investigations

Customers who consider their electricity supply does not meet the required standard have a right to request, in writing, the transmitter or distributor investigate their complaint. The Code prescribes a 20-working day period for the transmitter or distributor to investigate the complaint and report their findings to the customer.

1.4 Monitoring and record keeping

1.4.1 *Provision of information to small use customers*

A transmitter or distributor must make available on request, at no cost to the customer, information about its complaints handling process. This document must inform the customer of any right that the customer has to refer to the electricity ombudsman a complaint that has not been resolved to the customer's satisfaction.

1.4.2 *Performance reporting*

A transmitter and a distributor must arrange for an independent expert to audit and report on the systems that it has in place for monitoring its compliance with the Code during each year ending 30 June.

Section 27 of the Code requires a transmitter and a distributor to publish by 1 October each year an annual report setting out the information in Schedule 1 of the Code. Schedule 1 includes reporting on:

- Failure to comply with the provisions of the Code
- Significant interruptions
- Customer complaints
- Payments made to address complaints
- Supply interruption data (current year and previous 3 years)
- Statistical distribution of supply interruption data
- Graphical representation of the statistical distribution of supply interruption data

The annual report is deemed to be published if copies are available to the public, without cost, from the place(s) where the transmitter or distributor conducts their business and a copy of the it is posted on an internet web site maintained by the transmitter or distributor.

Appendix 2 Transmitters and distributors required to publish a report under the Code in 2006

Where a licensee holds both a transmission and a distribution licence then the report published by the licensee aggregates the data for both networks within each of the applicable operating areas, unless otherwise indicated in the report.

The figures in {brackets} indicate the number of customers each licensee supplies electricity to.

Distribution Licensees

Croesus Mining N/L {1}

Electricity Networks Corporation (Western Power) {approx 870,000²⁹ customers in total}

Newmont Power Pty Ltd {2}

TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership {3}

WMC Resources Limited trading as Nickel West {7}

Transmission Licensees

Alinta Cogeneration (Pinjarra) Pty Ltd³⁰

Alinta Cogeneration (Wagerup) Pty Ltd³⁰

Electricity Networks Corporation (Western Power) {approx. 870,000}

TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership {3}

Integrated Regional Licensees

EDL NGD (WA) Pty Ltd³⁰

North Western Energy Pty Ltd, Pacific Hydro Group 2 Pty Ltd and Energis Australia Pty Ltd {2}

Regional Power Corporation (Horizon Power) {approx 36,000 customers in total}

Rottneest Island Authority {114}

²⁹ Western Power 2006 annual report, page 11

³⁰ These three licensees had not commenced operating a transmission network during the 2005/06 reporting year and are therefore not required to publish a report in 2006.

Appendix 2 Accessing the reports published by transmitters and distributors

To access a copy of the report published by each licensee by following the links to the web sites below.

Croesus Mining NL

<http://www.croesus.com.au/annualreports/2006/distorpt06.pdf>

Electricity Networks Corporation (Western Power)

http://www.westernpower.com.au/documents/annual_reliability_report.pdf?word=annual%20reliability

Newmont Power Pty Ltd

www.newmontpower.newmont.com

North Western Energy Pty Ltd, Pacific Hydro Group 2 Pty Ltd and Energis Australia Pty Ltd (Pacific Hydro Ltd)

http://www.pacifichydro.com.au/Portals/0/20061123_Transmission%20Report.pdf

Regional Power Corporation (Horizon Power)

http://www.horizonpower.com.au/about_us/annual_report.html

Rottnest Island Authority

<http://www.rottnestisland.com/NR/rdonlyres/1867CBFB-92DD-4B49-943A-FCA689EA3E0F/0/NetworkQualityReliabilityofSupply200506.pdf>

TEC Desert Pty Ltd & TEC Desert No.2 Pty Ltd trading as Southern Cross Energy Partnership

<http://www.transalta.com/transalta/webcms.nsf/AllDoc/C122F3C5521876318725717D007BE972?OpenDocument>

WMC Resources Limited trading as Nickel West

<http://bhpbilliton.com/bb/ourBusinesses/stainlessSteelMaterials/nickelWest.jsp>

