



# Standards of Service 2008-09

## Key Service Performance Indicators

OCTOBER 2009

Power and Water Corporation  
GPO Box 1921, Darwin NT 0801

---

## TABLE OF CONTENTS

<b>1. INTRODUCTION.....</b>	<b>2</b>
1.1 Scope of Data .....	2
1.2 Summary of Service Levels Achieved .....	2
<b>2. RELIABILITY OF SUPPLY INDICATORS .....</b>	<b>3</b>
2.1 Network Reliability.....	3
2.2 Generation Reliability.....	10
2.3 Feeder Performance .....	15
2.4 Network Reliability Initiatives and Action.....	22
<b>3. QUALITY STANDARD INDICATORS .....</b>	<b>23</b>
3.1 Quality.....	23
<b>4. CUSTOMER SERVICE INDICATORS .....</b>	<b>24</b>
4.1 Customer Service .....	24
<b>5. CONSECUTIVE BREACHES .....</b>	<b>26</b>
<b>6. NATIONAL BENCHMARKING .....</b>	<b>26</b>
6.1 Unadjusted Network Performance .....	26
6.2 Generation Performance .....	27
<b>7. CONTACT DETAILS .....</b>	<b>28</b>

## **1. INTRODUCTION**

In accordance with clause 8.1 of the Northern Territory Electricity Standards of Service Code (the Code), Power and Water Corporation (Power and Water) submits the actual standards achieved in 2008-09 with respect to each of the key service performance indicators in Schedule 1 of the Code.

### **1.1 Scope of Data**

Generation and Network indicators of reliability standards have been provided for each region. Power and Water has also provided a regional breakdown of customer complaints data (including complaints related to voltage events). As stipulated in Schedule 1 (4.5), key service performance indicators have been reported for each quarter and on a quarterly 12 month rolling average basis where possible. Historical data for 1999-00 to 2008-09 has also been included in this report.

As Power and Water does not apply different standards for different customers, key service performance indicators have not been separately reported for customer categories as stipulated by Schedule 1 (4.4).

### **1.2 Summary of Service Levels Achieved**

Power and Water's service performance in 2008-09 was affected by failures at the Casuarina Zone Substation in September and October 2008 and a major storm in Alice Springs in September 2008.

The Code allows Power and Water to remove the effect of severe interruptions to supply on its key reliability indicators, based on the 2.5 beta method, in order to determine the underlying network-related reliability performance. With the effects of these events excluded, Power and Water met 34 of the 46 agreed minimum standards of service performance.

Of the 12 that were not met, five (Alice Springs Network CAIDI, Katherine Generation SAIFI, Darwin and Tennant Creek Generation CAIDI and the number of telephone calls responded to within 20 seconds) were consecutive breaches. These breaches are discussed at the end of this report.

Generation reliability improved in 2008-09 with reductions in outage frequency and duration in most regions.

## 2. RELIABILITY OF SUPPLY INDICATORS

### 2.1 Network Reliability

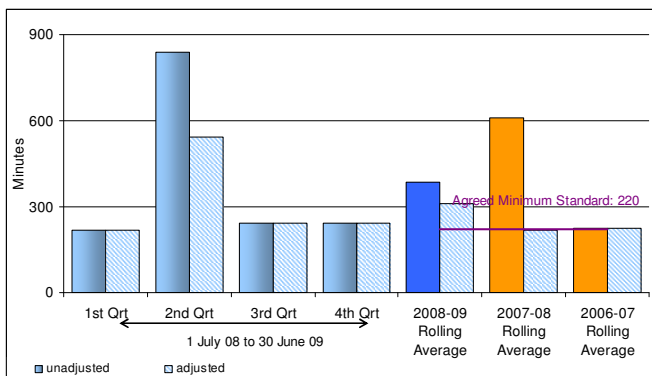
#### SAIDI

(a) the average minutes of off-supply per customer ("interruption duration") - SAIDI

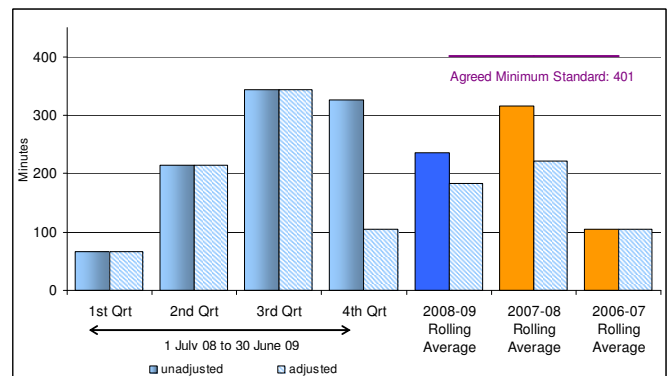
Region	Agreed Minimum Standard	Power and Water's Actual Performance									
		1 <sup>st</sup> Quarter Jul 08 to Sept 08		2 <sup>nd</sup> Quarter Oct 08 to Dec 08		3 <sup>rd</sup> Quarter Jan 09 to Mar 09		4 <sup>th</sup> Quarter Apr 09 to Jun 09		Annual 2008-09	
		Unadj	Adj	Unadj	Adj	Unadj	Adj	Unadj	Adj	Unadj	Adj
Darwin	220	217	217	841	542	244	244	244	244	386	311
Katherine	401	66	66	215	215	343	343	327	105	235	182
Tennant Creek	411	38	38	180	180	316	316	323	323	245	245
Alice Springs	108	1,858	104	196	196	76	76	93	93	593	154

Graphs 1 to 4 show Power and Water's quarterly and yearly actual performance for the unadjusted and adjusted SAIDI service performance indicators for Power Networks, for each region.

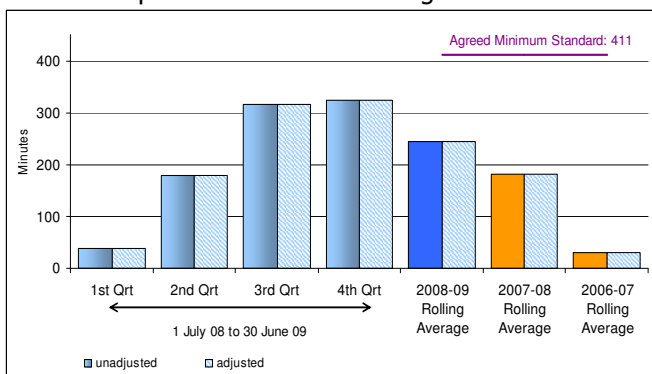
Graph 1: Darwin Region – SAIDI



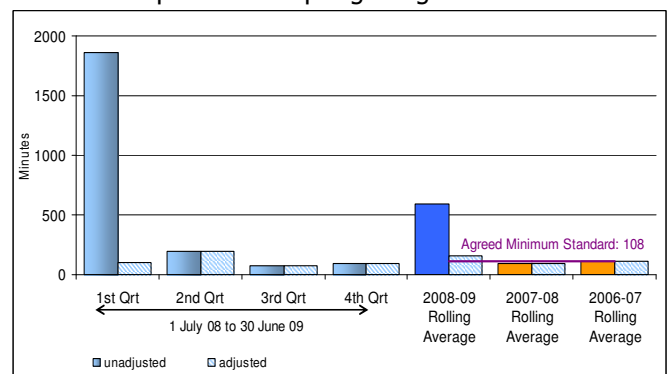
Graph 2: Katherine Region – SAIDI



Graph 3: Tennant Creek Region – SAIDI

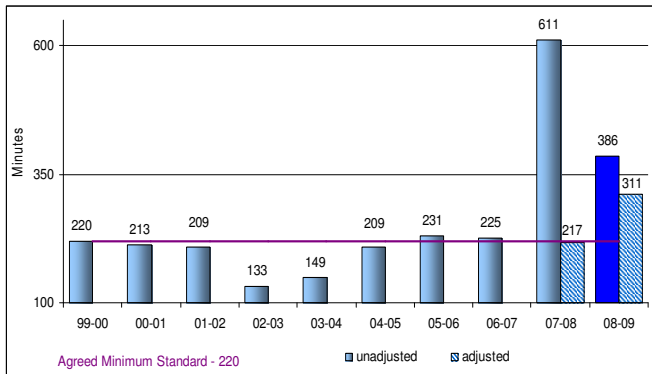


Graph 4: Alice Springs Region – SAIDI

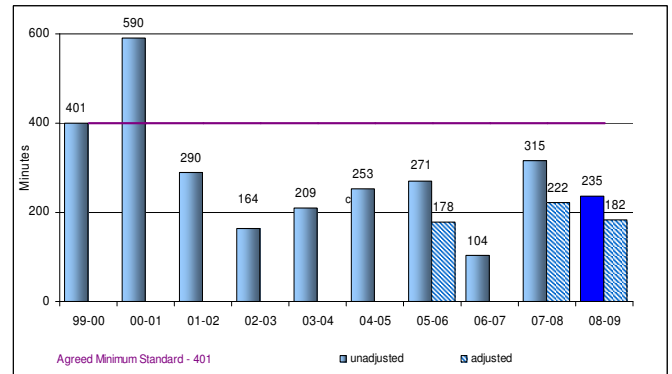


Graphs 5 to 8 show Power and Water’s historical performance for the unadjusted and adjusted SAIDI service performance indicator for Power Networks for each region.

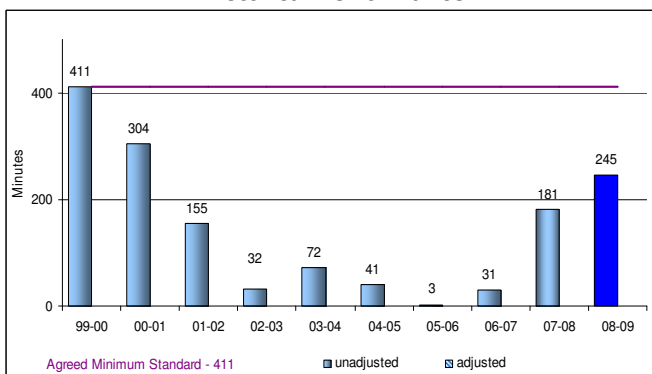
Graph 5: Darwin Region SAIDI – Historical Performance



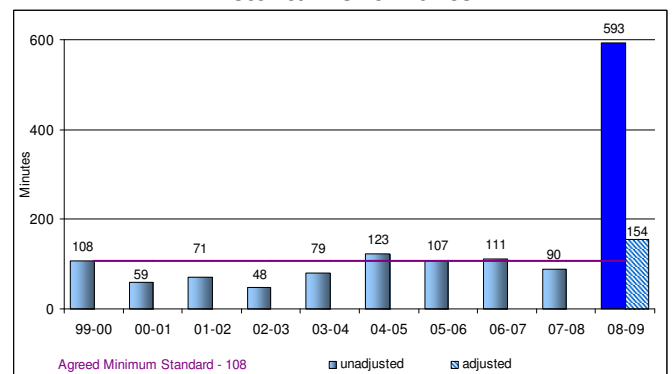
Graph 6: Katherine Region SAIDI - Historical Performance



Graph 7: Tennant Creek Region SAIDI – Historical Performance



Graph 8: Alice Springs Region SAIDI – Historical Performance



\* No adjustments have been applied.

### Unadjusted

Power and Water’s Darwin and Alice Springs network performance against the SAIDI indicator did not meet the agreed minimum standard. Katherine and Tennant Creek regions were within the required standards.

In September and October 2008, approximately 15,000 customers in the Darwin region were affected by power outages as a result of equipment failures in and around the Casuarina 66/11kv Zone Substation. The faults involved an 11kV circuit breaker, two 11kV cable boxes and three 11kV cables. For further details on the cause of the outages and the extensive measures Power and Water has taken to address these issues, refer to the Mervyn Davies Report at Power and Water’s website: [www.powerwater.com.au](http://www.powerwater.com.au). Power and Water is on schedule to replace the 11kV switchboard in the first quarter of 2010.

SAIDI performance in Alice Springs was affected by a severe storm on 22 September 2008. The storm, with wind gusts of about 100km/h, resulted in most customers experiencing power outages due to fallen trees. Flash flooding restricted access by Power and Water Network crews sent to make repairs. Damage resulted in significant repairs and maintenance over the following weeks, but the Alice Springs region performed well for the remainder of the reporting period.

Power and Water's network performance in the Katherine region has improved from 2007-08 and unadjusted SAIDI has reduced to 235 minutes which is 166 minutes less than the minimum standard. A significant percentage of outages in this area are caused by local bat colonies clustering on the poles. Power and Water has continued insulating feeders in the region to reduce the impact of this.

Tennant Creek SAIDI performance was 166 minutes below the agreed minimum standard. With data collection for Tennant Creek becoming more reliable in 2007-08 and 2008-09, Power and Water acknowledges that the minimum standard for Tennant Creek may no longer reflect the current operating environment for the region. With a continuing reliable data set, Power and Water is open to discussions with the Commission to recast the agreed minimum standard for Tennant Creek in coming years.

Power and Water network reliability improvement initiatives are still being applied across the entire network, including building and upgrading zone substations and switching stations, installing bat guards on poles, installing fibreglass cross arms, installing additional reclosers (in conjunction with vegetation trimming programs), undergrounding powerlines and investing in additional generating plant to improve the reliability and quality of power supply.

### Adjusted

In accordance with Schedule 1 (1.6) of the Code, the 2.5 beta method<sup>1</sup> of calculating a 'major event day' or 'network exclusion event' identified three events that could be removed from the network reliability indicators.

The major event day for Darwin was the subsequent failure at the Casuarina Zone Substation on 2 October 2008. The adjusted figure reduces the annual SAIDI total by 75 minutes. Although the first incident on 19 September 2008 affected more customers for a longer duration, it was not excluded under the 2.5 beta method. The 2.5 beta method is calculated in relation to the number of customers affected, and as more customers experienced the first outage the duration for customer outage threshold was not exceeded.

A major event day was recorded in Katherine on 12 May 2009, due to an outage caused by a flashover on the 22kV distribution board at the Katherine Power Station. This affected approximately 1,400 customers for 125 minutes. The adjusted figure reduces the annual SAIDI total by 53 minutes.

Alice Springs' major event day was the result of a severe storm on 22 September 2008, with many feeders affected due to strong winds and flying debris. Excluding this reduces the annual SAIDI total by 439 minutes.

---

<sup>1</sup> The 2.5 beta method is an internationally accepted standard for excluding outages from reliability data. The 2.5 beta method removes the reliability data on days when the minutes off supply exceed a certain threshold, which is based on historical reliability data. This is consistent with the approach that other interstate regulators and the AER have adopted.

---

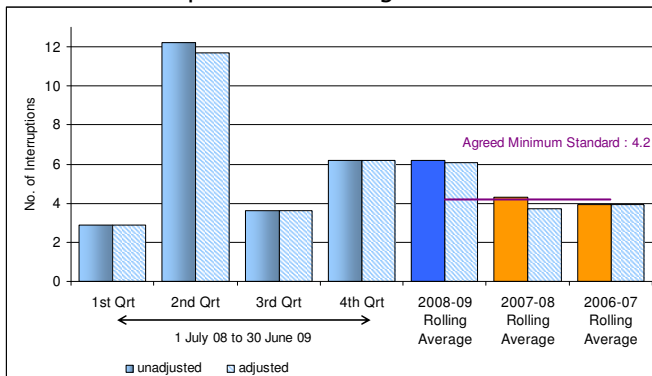
**SAIFI**

*b) the average number of interruptions per customer ("interruption frequency") – SAIFI*

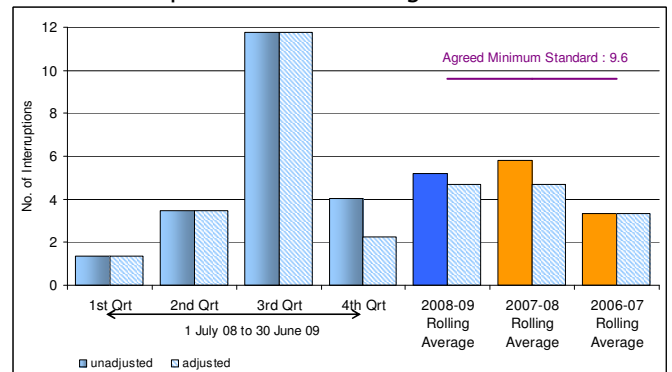
Region	Agreed Minimum Standard	Power and Water's Actual Performance									
		1 <sup>st</sup> Quarter Jul 08 to Sept 08		2 <sup>nd</sup> Quarter Oct 08 to Dec 08		3 <sup>rd</sup> Quarter Jan 09 to Mar 09		4 <sup>th</sup> Quarter Apr 09 to Jun 09		Annual 2008-09	
		Unadj	Adj	Unadj	Adj	Unadj	Adj	Unadj	Adj	Unadj	Adj
Darwin	4.2	2.9	2.9	12.2	11.7	3.6	3.6	6.2	6.2	6.2	6.1
Katherine	9.6	1.4	1.4	3.5	3.5	11.8	11.8	4.0	2.3	5.2	4.7
Tennant Creek	9.8	0.6	0.6	3.3	3.3	7.0	7.0	4.2	4.2	4.2	4.2
Alice Springs	2.9	3.9	1.2	5.1	5.1	2.2	2.2	2.5	2.5	3.7	3.1

Graphs 9 to 12 show Power and Water's actual performance for the unadjusted and adjusted SAIFI reliability standards indicator for Power Networks on a quarterly and annual basis for each region.

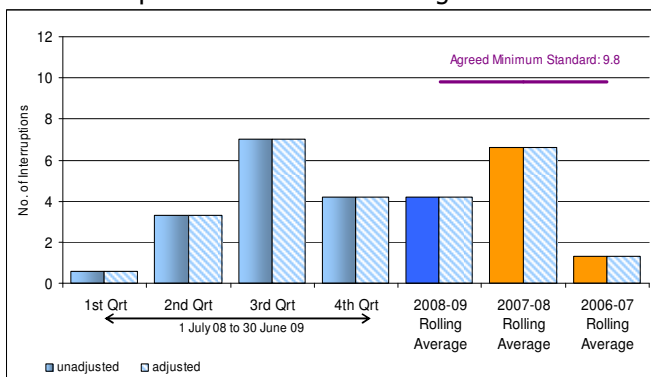
Graph 9: Darwin Region - SAIFI



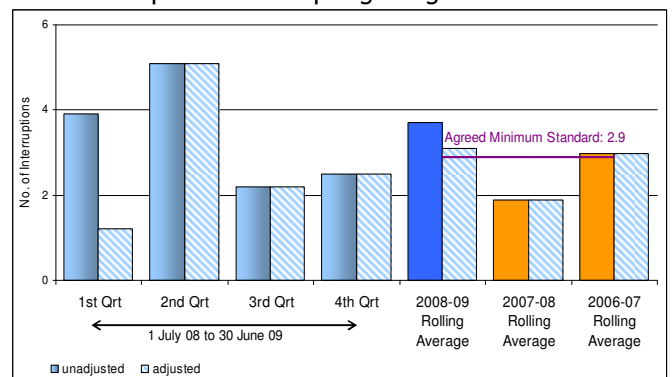
Graph 10: Katherine Region – SAIFI



Graph 11: Tennant Creek Region - SAIFI

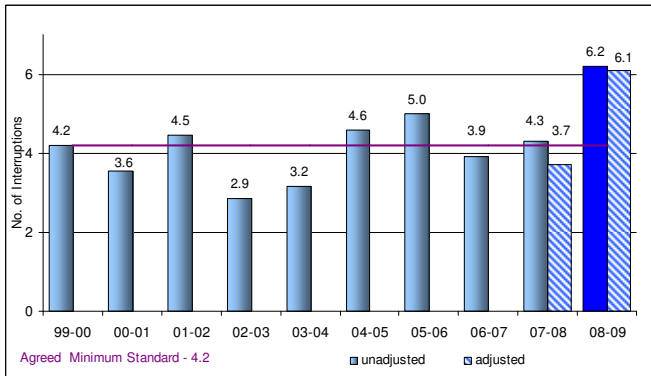


Graph 12: Alice Springs Region – SAIFI

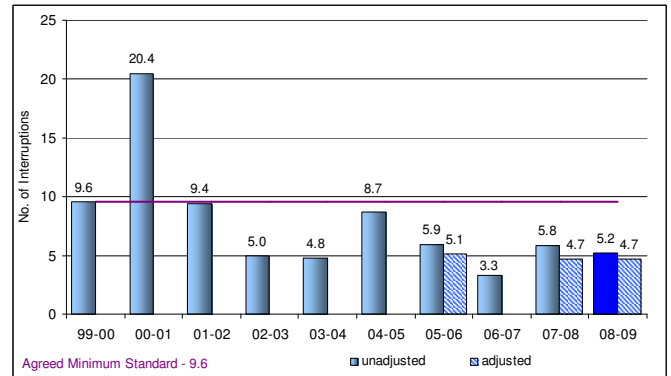


Graphs 13 to 16 show Power and Water’s historical performance for the unadjusted and adjusted SAIFI service performance indicator for Power Networks on an annual basis for each region.

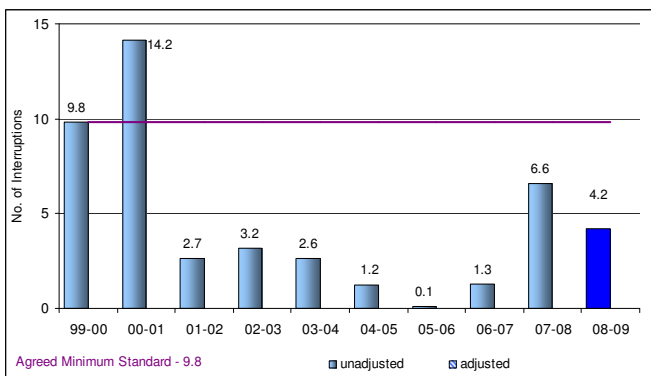
Graph 13: Darwin Region SAIFI – Historical Performance



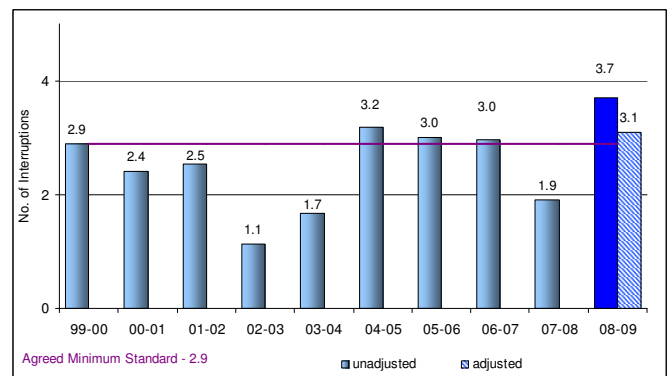
Graph 14: Katherine Region SAIFI – Historical Performance



Graph 15: Tennant Creek SAIFI – Historical Performance



Graph 16: Alice Springs SAIFI – Historical Performance



\* No adjustments have been applied.

Power and Water’s network SAIFI performance in Katherine and Tennant Creek was better than the agreed minimum standard. The ongoing network upgrades and continuation of maintenance programs has resulted in fewer interruptions than 2007-08 in these regions.

Darwin and Alice Springs’ interruption frequency was above the minimum standard primarily as a result of the events mentioned above. The high frequency of outages after these events relates to subsequent repairs and maintenance.

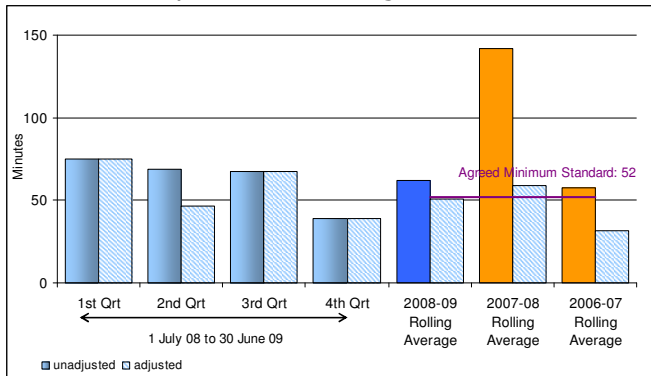
**CAIDI**

*(c) the average interruption duration per customer – CAIDI*

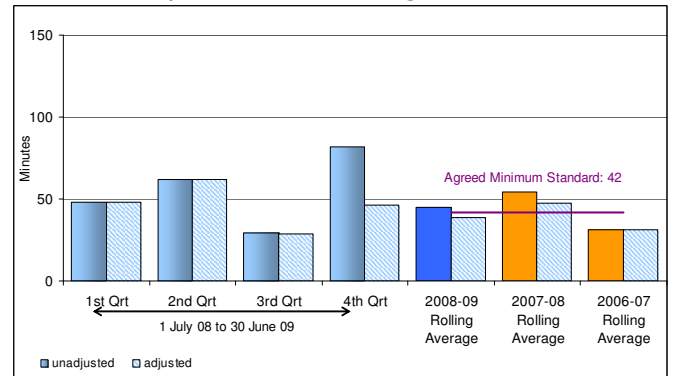
Region	Agreed Minimum Standard	Power and Water's Actual Performance									
		1 <sup>st</sup> Quarter Jul 08 to Sept 08		2 <sup>nd</sup> Quarter Oct 08 to Dec 08		3 <sup>rd</sup> Quarter Jan 09 to Mar 09		4 <sup>th</sup> Quarter Apr 09 to Jun 09		Annual 2008-09	
		Unadj	Adj	Unadj	Adj	Unadj	Adj	Unadj	Adj	Unadj	Adj
Darwin	52.0	76	76	69	46	68	68	39	39	62	51
Katherine	42.0	48	48	62	62	29	29	82	46	45	39
Tennant Creek	41.8	61	61	55	55	45	45	77	77	58	58
Alice Springs	37.2	472	87	39	39	34	34	37	37	160	50

Graphs 17 to 20 show actual performance for the unadjusted and adjusted CAIDI service performance indicators for Power Networks on a quarterly and annual basis for each region.

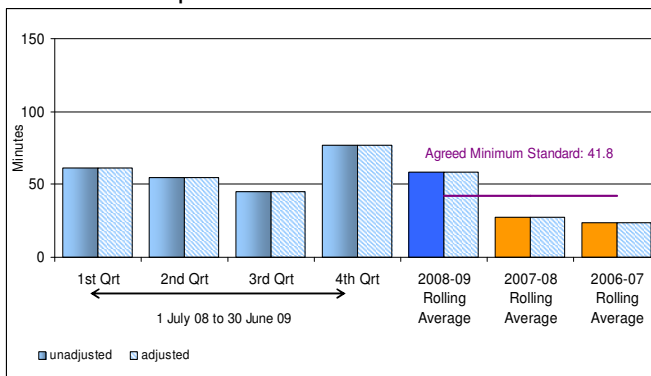
Graph 17: Darwin Region – CAIDI



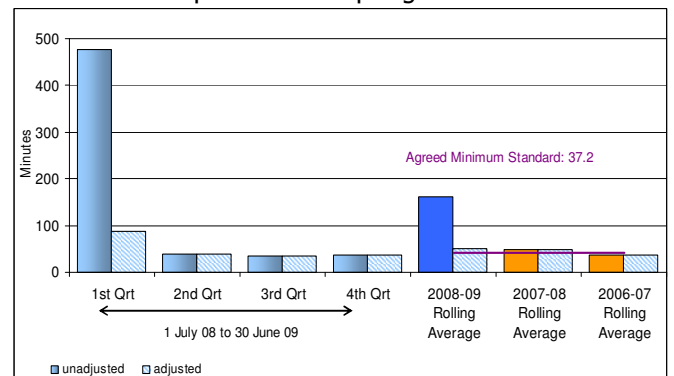
Graph 18: Katherine Region – CAIDI



Graph 19: Tennant Creek - CAIDI

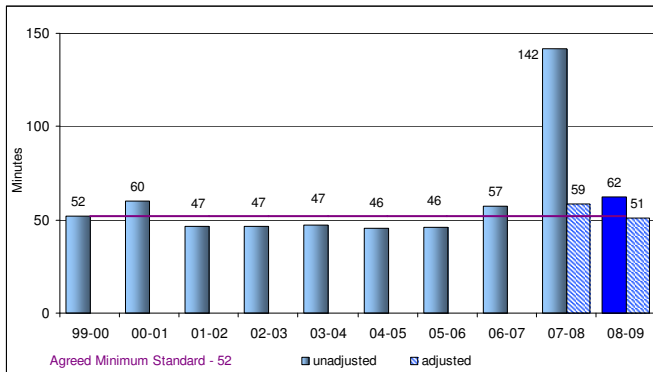


Graph 20: Alice Springs – CAIDI

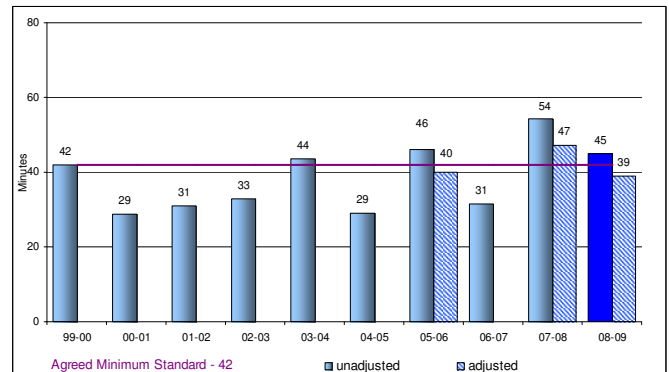


Graphs 21 to 24 show Power and Water’s historical performance for the unadjusted and adjusted CAIDI service performance indicator for Power Networks on an annual basis for each region.

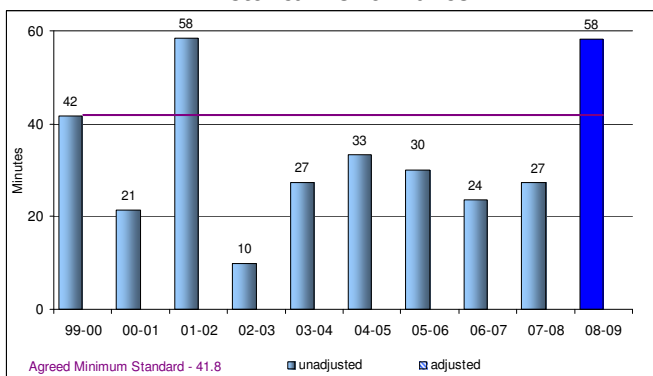
Graph 21: Darwin Region CAIDI – Historical Performance



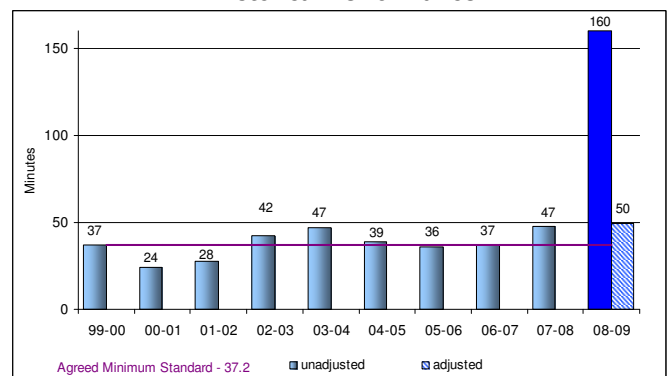
Graph 22: Katherine Region CAIDI – Historical Performance



Graph 23: Tennant Creek Region CAIDI – Historical Performance



Graph 24: Alice Springs Region CAIDI – Historical Performance



\* No adjustments have been applied.

For both the Darwin and Katherine regions in 2008-09, unadjusted CAIDI breached the agreed minimum standards. Despite this, in both regions customers experienced an average interruption duration slightly lower than the previous year and adjusted CAIDI was within the minimum standards.

Tennant Creek CAIDI performance in 2008-09 was above the agreed minimum standard. While the duration of outages increased from 2007-08, the frequency was reduced.

Alice Springs’ unadjusted performance in 2008-09 was above the minimum standard by 122.8 minutes due to the severe storm that occurred on 22 September 2008. Excluding this, the minimum standard was breached by 12.8 minutes.

The CAIDI performance measurement remains a flawed indicator for outages, as the calculation is based on duration of outages over outage frequency. This can result in a situation where having a higher frequency of outages benefits the outcome of the performance indicator, which may not reflect improvement in either duration or frequency of outages.

## 2.2 Generation Reliability

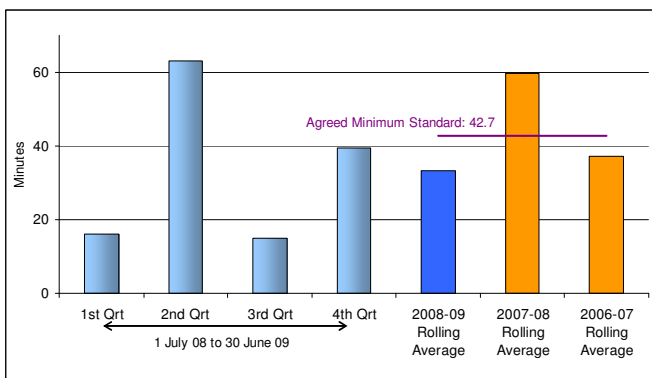
### SAIDI

(a) the average minutes of off-supply per customer ("interruption duration") - SAIDI

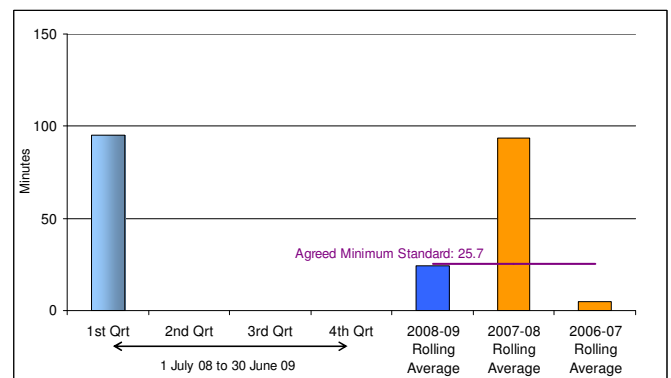
Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin	42.7	16.2	63.1	14.9	39.5	33.4
Katherine	25.7	95.1	0.0	0.0	0.0	24.1
Tennant Creek	125.0	1.3	40.3	39.0	117.6	49.6
Alice Springs	122.5	0.0	6.3	8.1	0.0	3.6

Graphs 25 to 28 show Power and Water's actual performance for the SAIDI service performance indicator for Generation on a quarterly and annual basis.

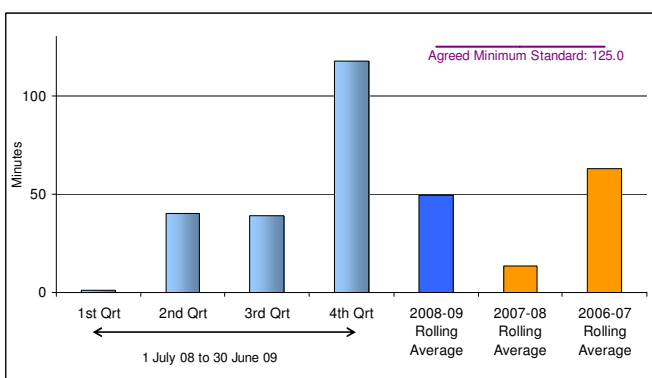
Graph 25: Darwin Region – SAIDI



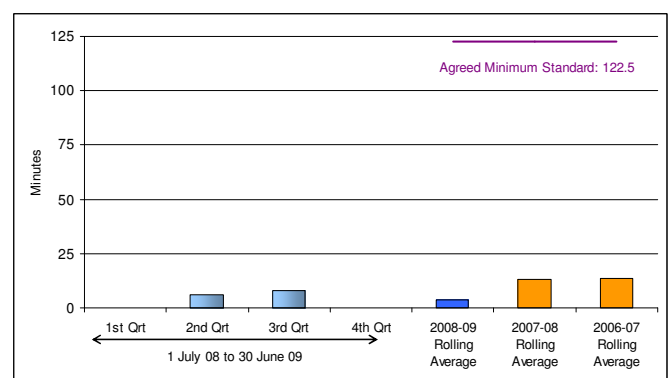
Graph 26: Katherine Region – SAIDI



Graph 27: Tennant Creek – SAIDI



Graph 28: Alice Springs – SAIDI



The annual performances for SAIDI in all regions were within the agreed minimum standards.

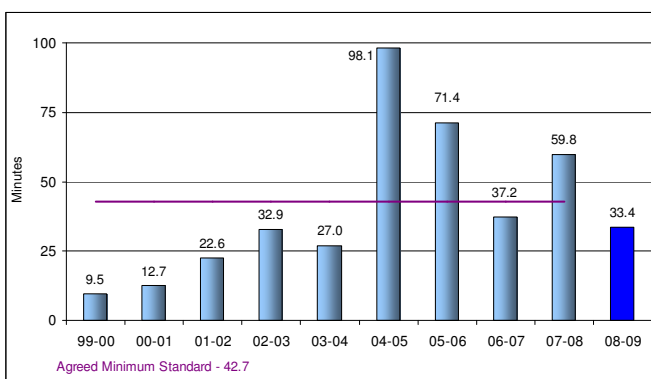
In the Darwin region, the peak in quarter 2 was the result of Weddell Set 1 tripping due to works on the gas skid. The resulting load shed affected mostly the northern suburbs and Palmerston area.

Katherine had good generation reliability, experiencing no generation outages for the year, except in the first quarter. This was the result of a fault on the Pine Creek feeder causing a loss of generation at the Pine Creek Power Station.

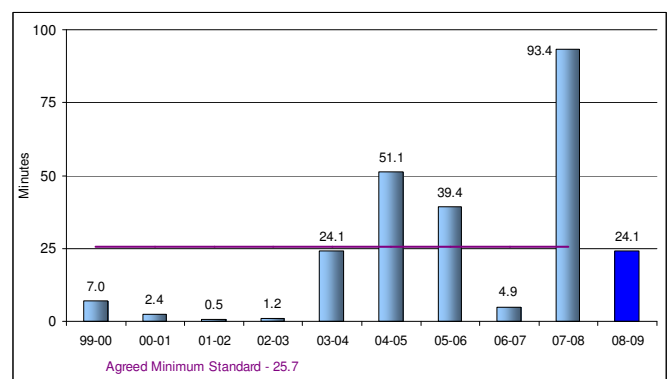
Tennant Creek generation was affected in quarter 4 by a feeder fault that caused loss of generation and subsequent load shedding. This did not result in the agreed minimum standard being exceeded.

Graphs 29 to 32 show Power and Water’s historical performance for the SAIDI service performance indicator for Generation on an annual basis for each region.

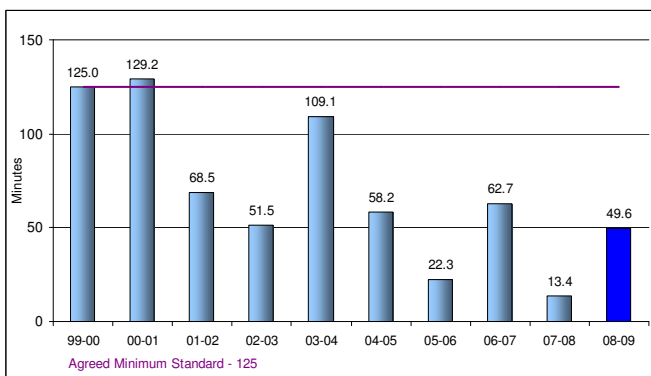
Graph 29: Darwin Region SAIDI – Historical Performance



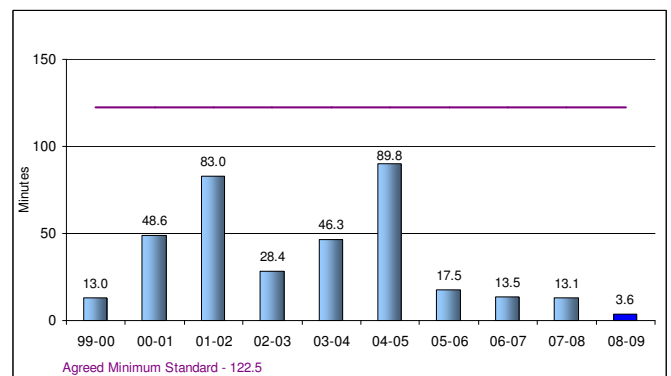
Graph 30: Katherine Region SAIDI – Historical Performance



Graph 31: Tennant Creek Region SAIDI – Historical Performance



Graph 32: Alice Springs Region SAIDI – Historical Performance



In 2008-09, generation SAIDI performance in all regions was within the standard. Weddell Power Station was commissioned and brought online to boost the capacity of the Darwin-Katherine grid. Improvements were also made to Channel Island Power Station with an engine replacement for Set 7 resulting in improved reliability.

Alice Springs’ generation performance has been consistently within the minimum standard and has improved on previous years. This ongoing reliability improvement may indicate a need to re-evaluate minimum standards for the region. Tennant Creek has been consistently well within the agreed minimum standard, suggesting the same.

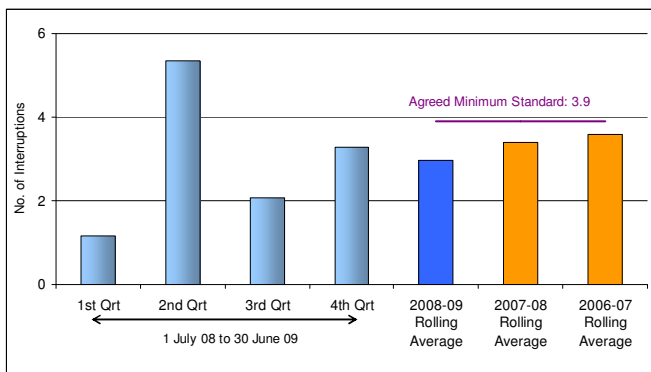
**SAIFI**

*b) the average number of interruptions per customer ("interruption frequency") – SAIFI*

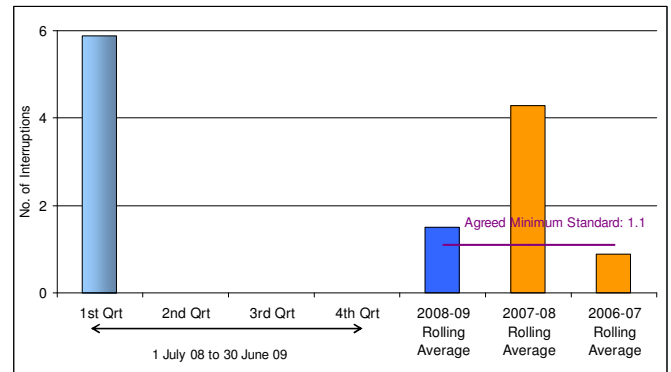
Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin	3.9	1.2	5.4	2.1	3.3	3.0
Katherine	1.1	5.9	0.0	0.0	0.0	1.5
Tennant Creek	12.5	0.1	1.5	2.1	3.3	1.7
Alice Springs	3.6	0.0	0.8	1.3	0.0	0.5

Graphs 33 to 36 show Power and Water's Generation SAIFI performance on a quarterly and annual basis.

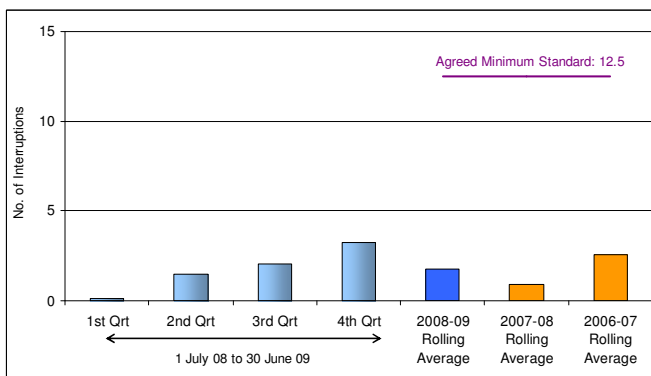
Graph 33: Darwin Region - SAIFI



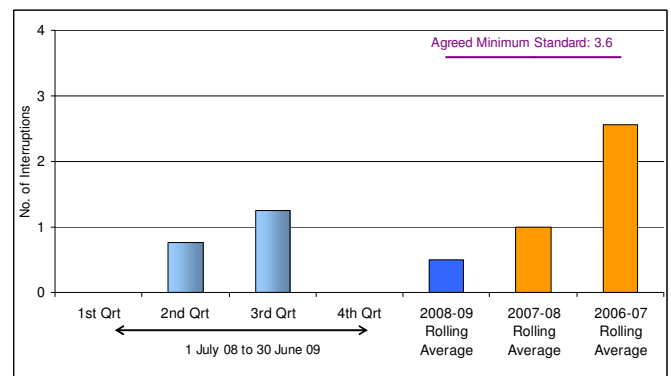
Graph 34: Katherine Region – SAIFI



Graph 35: Tennant Creek Region - SAIFI

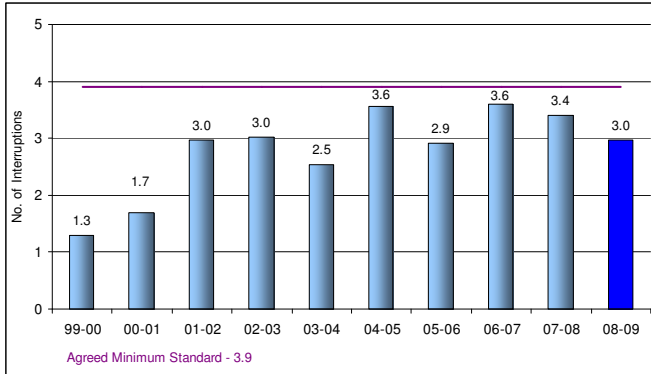


Graph 36: Alice Springs Region – SAIFI

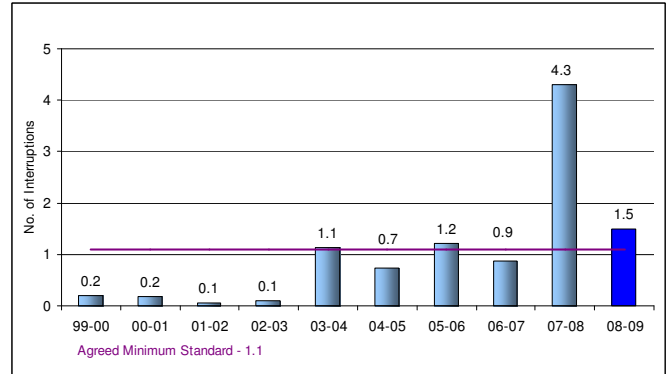


Graphs 37 to 40 show Power and Water’s historical Generation SAIFI performance.

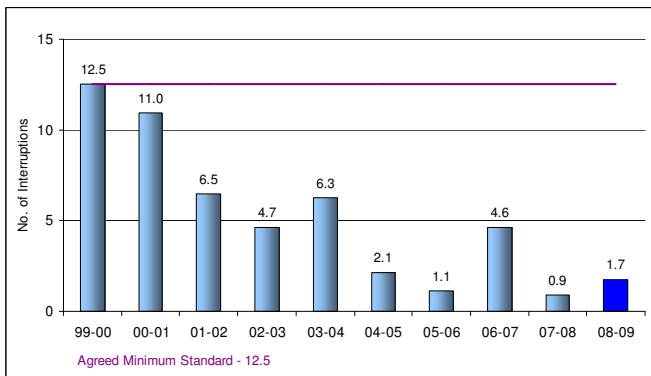
Graph 37: Darwin Region SAIFI – Historical Performance



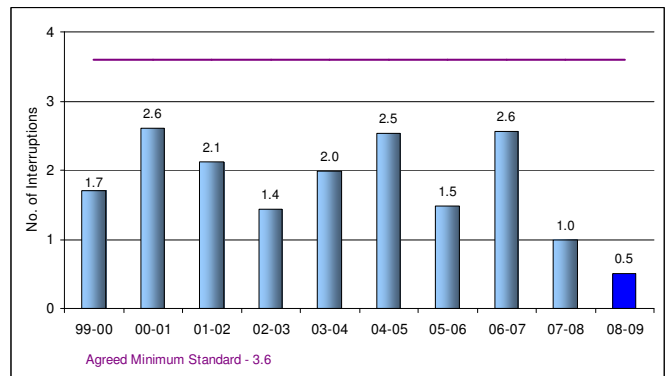
Graph 38: Katherine Region SAIFI – Historical Performance



Graph 39: Tennant Creek Region SAIFI – Historical Performance



Graph 40: Alice Springs Region SAIFI – Historical Performance



Darwin and Alice Springs regions show continued improvement over the previous three years. Alice Springs and Tennant Creek regions are well within the minimum standard. The 2008-09 results, combined with the outcomes from prior years, suggest that the minimum standards may need to be reviewed.

Katherine was the only region not to meet the agreed minimum standard, which can be attributed to the outages caused by a bushfire affecting and subsequently tripping the Manton-Pine Creek 132kV line and causing loss of generation at the Pine Creek Power Station.

The peaks seen in some quarters for respective regions are directly related to the issues associated with SAIDI mentioned above.

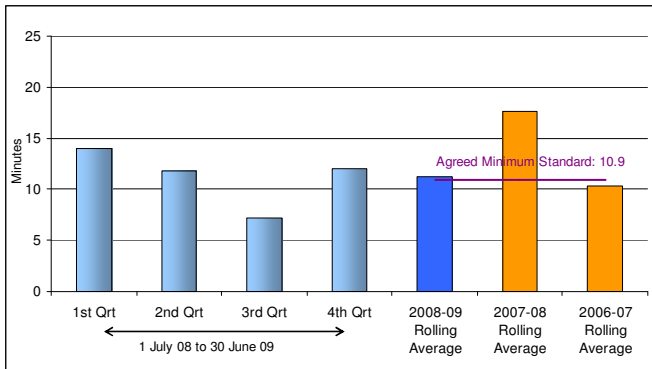
**CAIDI**

(c) the average interruption duration per customer – CAIDI

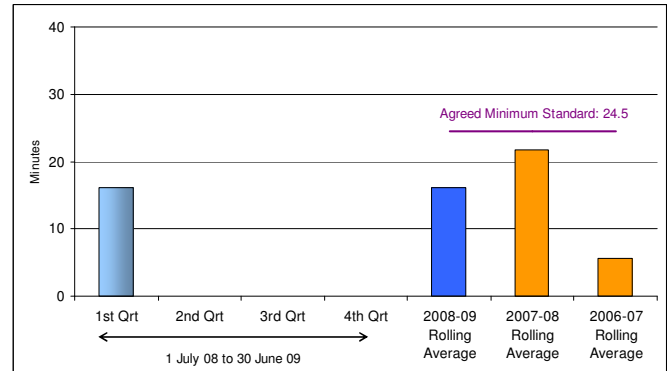
Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin	10.9	13.9	11.8	7.2	12.0	11.3
Katherine	24.5	16.2	0.0	0.0	36.6	16.2
Tennant Creek	10.0	9.3	26.9	19.0	36.0	28.5
Alice Springs	34.2	0.0	8.3	6.5	0.0	7.2

Graphs 41 to 44 show Power and Water’s actual performance for the CAIDI service performance indicator for Generation on a quarterly and annual basis.

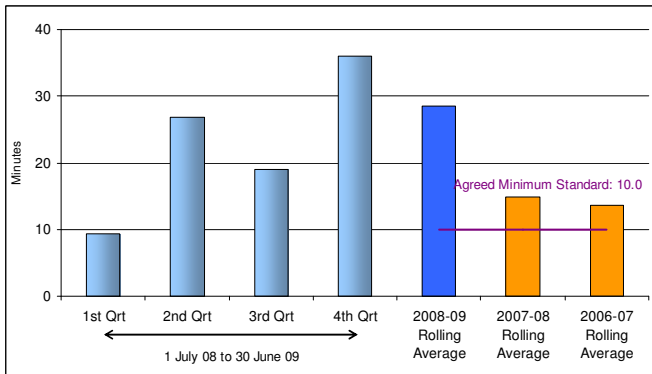
Graph 41: Darwin Region - CAIDI



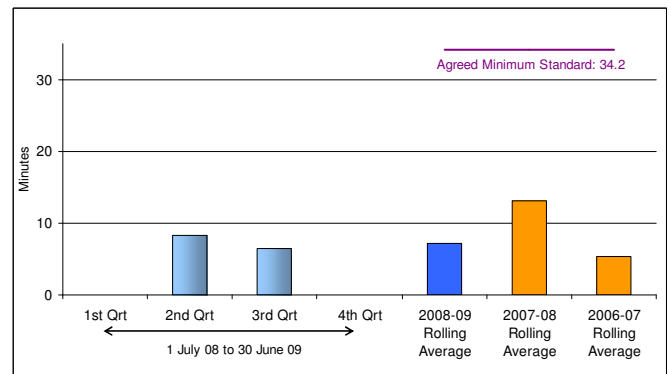
Graph 42: Katherine Region – CAIDI



Graph 43: Tennant Creek Region - CAIDI

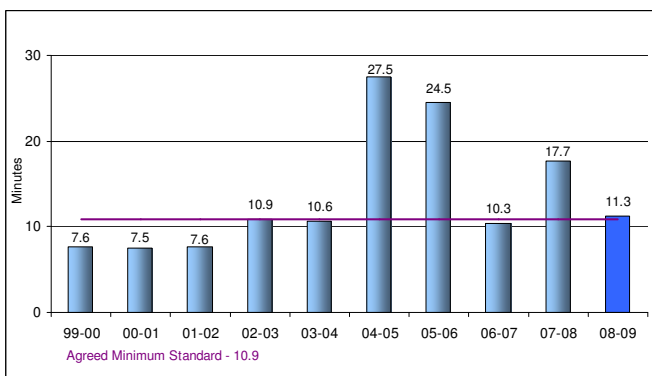


Graph 44: Alice Springs Region – CAIDI

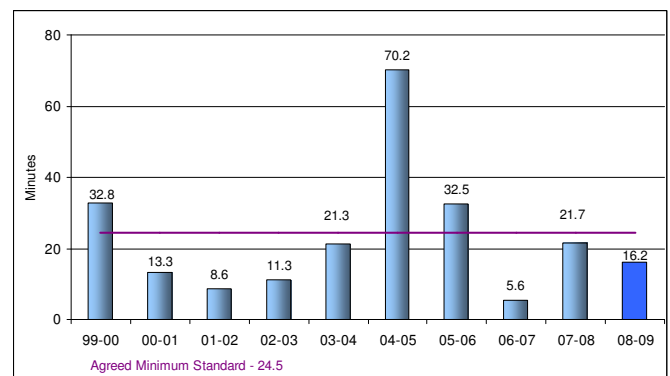


Graphs 45 to 48 show Power and Water’s historical performance for the CAIDI service performance indicator for Generation.

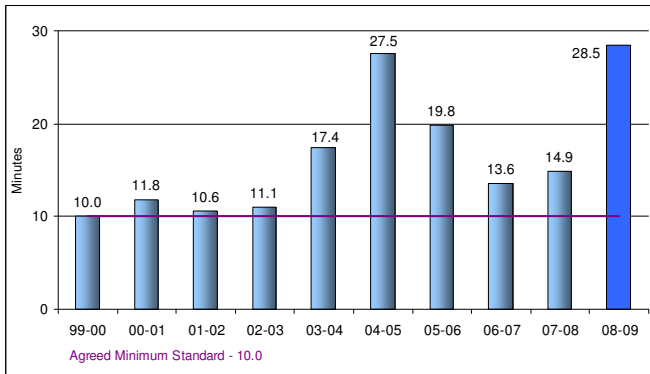
Graph 45: Darwin Region CAIDI – Historical Performance



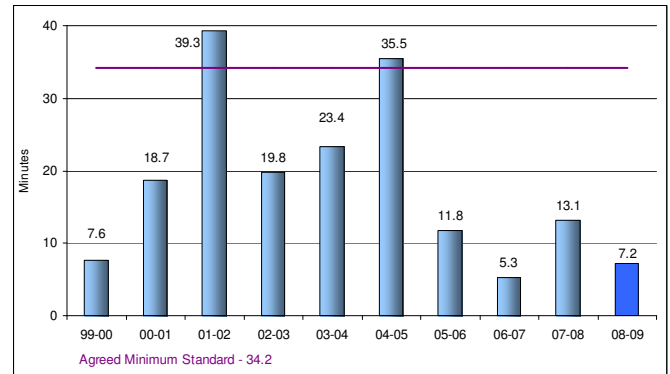
Graph 46: Katherine Region CAIDI – Historical Performance



Graph 47: Tennant Creek Region CAIDI – Historical Performance



Graph 48: Alice Springs Region CAIDI – Historical Performance <sup>2</sup>



Generation’s CAIDI performance in the Darwin and Tennant Creek regions in 2008-09 breached the minimum standard. For Tennant Creek, this is the result of an increase in SAIDI, whilst SAIFI remained relatively constant. The Darwin region, whilst breaching the standard, showed improvement in both SAIDI and SAIFI on the previous year.

### 2.3 Feeder Performance

Power and Water has segregated feeders into two categories: interconnected and radial distribution networks. Radial networks are predominantly supplied from one source, with little opportunity for interconnections with other circuits for security in the event of planned and unplanned interruptions. Thus the number and duration of interruptions is higher for radial than interconnected distribution networks.

#### Interconnected Distribution Networks

(a) the number of feeders that experience more than 15 interruptions per year

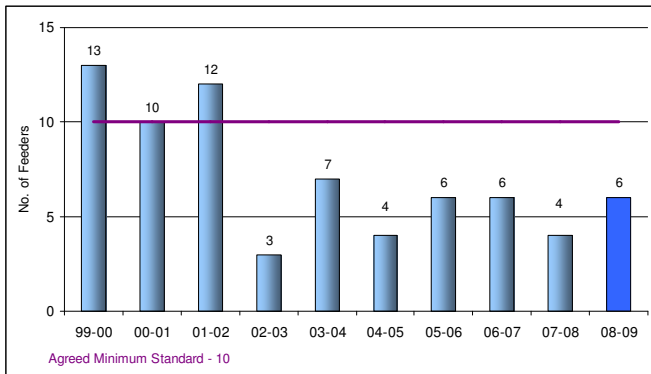
Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin-Urban	10	0	1	2	3	6
Alice Springs	4	0	0	2	0	2

Power and Water met the agreed minimum standard in both the Darwin-Urban and Alice Springs regions.

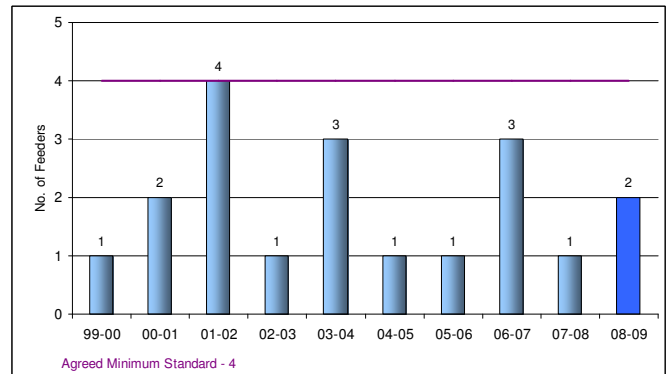
Graphs 49 to 50 on the following page show Power and Water’s historical performance for the number of feeders that experience more than 15 interruptions per year on interconnected distribution networks in the Darwin-Urban and Alice Springs region.

<sup>2</sup> The historical performance graph for this indicator that was published in the 2007-08 Standards of Service Report was incorrect.

Graph 49: Darwin-Urban – Historical Performance



Graph 50: Alice Springs – Historical Performance



The feeders that experienced more than 15 interruptions in the Darwin – Urban region were 11BE13-Kormilda, 11BE01-Leanyer, 11BE04-McMillans, 11BE06-Karama 1, 11BE09-Jail and 11PA10-Driver. The 11BE13-Kormilda and 11BE09-Jail feeders were also poorly performing feeders in 2007-08.

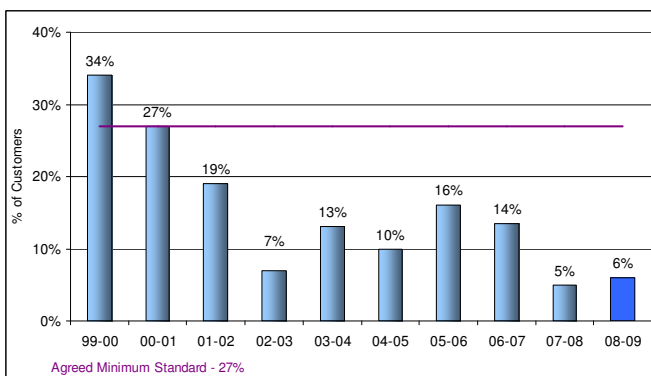
*(b) the percentage of consumers supplied by feeders that experience more than 15 interruptions per year*

Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin-Urban	27%	0%	2%	3%	6%	6%
Alice Springs	10%	0%	0%	4%	4%	4%

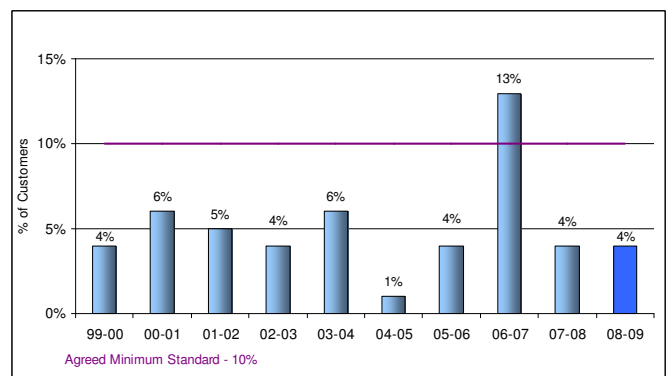
Power and Water met the agreed minimum standard in both the Darwin-Urban and Alice Springs regions.

Graphs 51 to 52 show Power and Water’s historical performance for the percentage of customers supplied by feeders that experience more than 15 interruptions per year on interconnected distribution networks for the Darwin-Urban and Alice Springs regions.

Graph 51: Darwin-Urban – Historical Performance



Graph 52: Alice Springs – Historical Performance



The percentage of Darwin-Urban customers supplied by feeders that experienced more than 15 interruptions during 2008-09 was well within the minimum standard and in line with standards achieved in the previous year.

The percentage of Alice Springs customers supplied by feeders that experienced more than 15 interruptions during 2008-09 was consistent with 2007-08 at 4%.

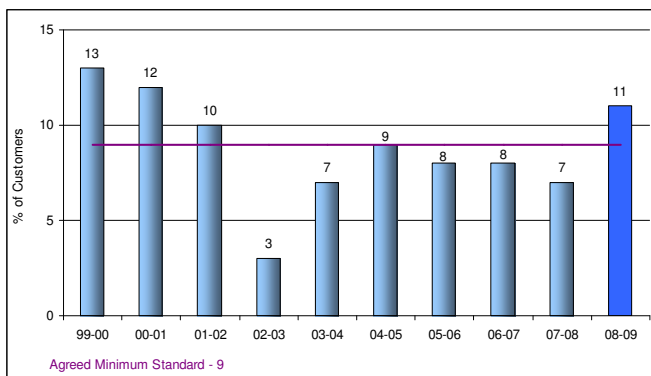
(c) the number of feeders that experience more than 1,500 minutes of interruptions per year

Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin-Urban	9	0	3	4	4	11
Alice Springs	4	2	1	1	0	4

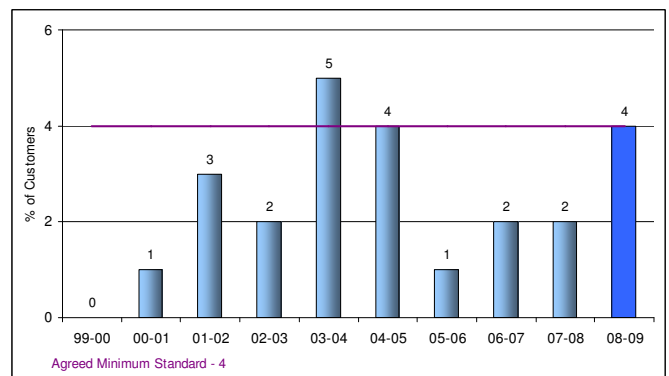
Power and Water did not achieve the standard for this indicator in the Darwin-Urban region, and was in-line with the standard in Alice Springs.

Graphs 53 to 54 show Power and Water's historical performance for the number of feeders that experience more than 1,500 minutes of interruptions per year for interconnected distribution networks for the Darwin-Urban and Alice Springs regions.

Graph 53: Darwin-Urban – Historical Performance



Graph 54: Alice Springs – Historical Performance



Darwin-Urban > 1,500 minutes or 15 interruptions

Length (km)	Feeder	Duration	Interruptions
46.8	11BE01 Leanyer	1,942	17
33.9	11BE04 McMillans	3,368	25
27.1	11BE06 Karama 1	2,220	19
27.2	<b>11BE09 Jail</b>	<b>1,917</b>	<b>19</b>
24.1	<b>11BE13 Kormilda</b>	<b>2,127</b>	<b>16</b>
19.2	11PA10 Driver	1,834	19
13.5	11CA10 Moil	1,722	n/a
22.8	11CA19 Wanguri	1,608	n/a
3.1	11CA27 Patterson	1,811	n/a
7.0	11CZ07 Stuart Park	1,833	n/a
6.4	11DU02 Jingili	1,510	n/a

\* Bold type indicates consecutive breaches. \*\* n/a indicates feeders did not exceed standard.

Darwin-Urban feeders experienced an increase in frequency and duration of outages. Of the outages reported in 2008-09, two feeders were also poor performing in 2007-08. In 2008-09, 60% of the outages involving the 11BE13-Kormilda feeder and 70% for the 11BE09-Jail feeder were due to planned works as part of the condition assessment program, maintenance and testing.

Alice Springs > 1,500 minutes or 15 interruptions

Length (km)	Feeder	Duration	Interruptions
0.9	<b>22RG04 Brewer 2</b>	<b>3,700</b>	<b>45</b>
5.2	<b>22RG13 Brewer 1</b>	<b>3,111</b>	<b>29</b>
5.6	11RG01 Gap	2,195	6
3.1	11LG16 Braitling	1,582	4

Bold type indicates consecutive breaches.

In the Alice Springs region, two Brewer feeders have continued to be poorly performing against the standard. 22RG04-Brewer 2 and 22RG13-Brewer 1 outages for 2008-09 were for planned maintenance and construction in anticipation of Owen Springs Power Station connecting to the network. Weather-related events accounted for 20% of all outages on the Brewer 2 feeder and 40% on Brewer 1.

### Radial Distribution Networks

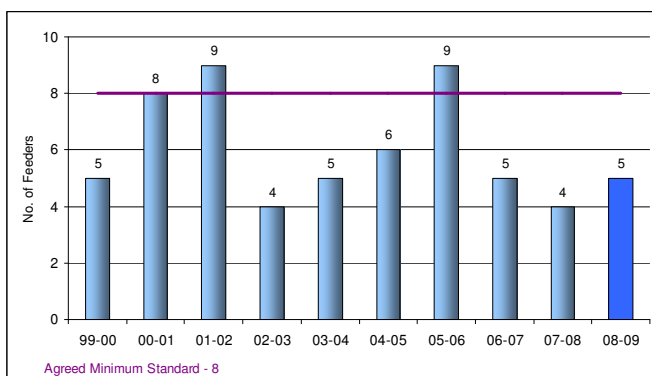
(a) the number of feeders that experience more than 27 interruptions per year

Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin-Rural	8	0	0	2	3	5
Katherine	7	0	0	1	1	2
Tennant Creek	3	0	0	0	0	0

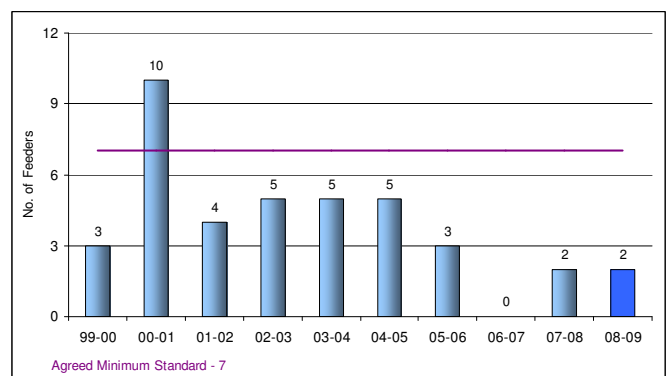
Power and Water met the agreed minimum standard in 2008-09 in each of the regions under this indicator.

Graphs 55 to 56 show Power and Water's historical performance for this indicator for the Darwin-Rural and Katherine regions.

Graph 55: Darwin-Rural – Historical Performance



Graph 56: Katherine – Historical Performance

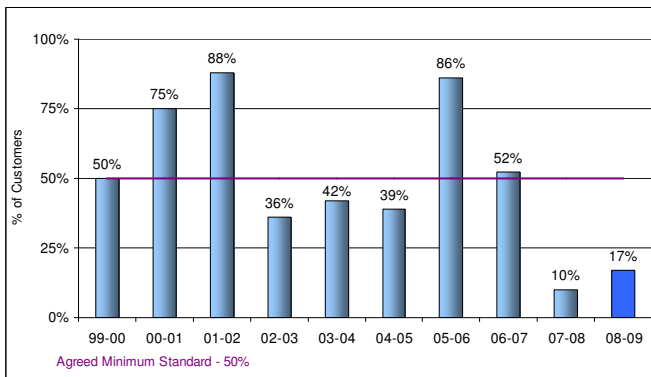


(b) the percentage of consumers supplied by feeders that experience more than 27 interruptions per year

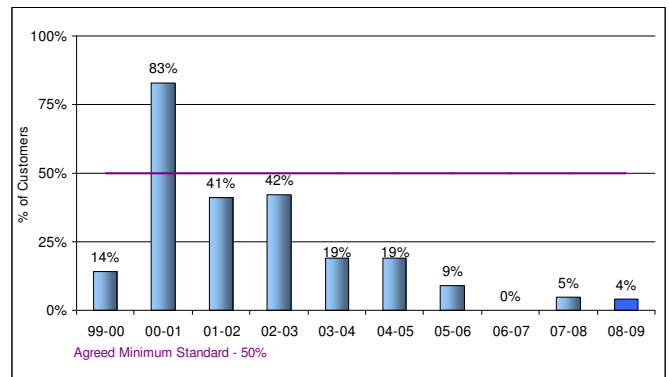
Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin-Rural	50%	0%	0%	10%	17%	17%
Katherine	50%	0%	0%	4%	4%	4%
Tennant Creek	32%	0%	0%	0%	0%	0%

In 2008-09, Power and Water met the agreed minimum standard in each of the regions. Graphs 57 to 58 show Power and Water's historical performance for this indicator for the Darwin-Rural and Katherine regions.

Graph 57: Darwin-Rural – Historical Performance



Graph 58: Katherine – Historical Performance



The percentage of Darwin-Rural customers supplied by feeders that experienced more than 27 interruptions increased slightly in 2008-09 from the previous year.

The percentage of Katherine customers supplied by feeders that experienced more than 27 interruptions during 2008-09 has continued to decrease as a result of ongoing work to increase protection against animals and weather.

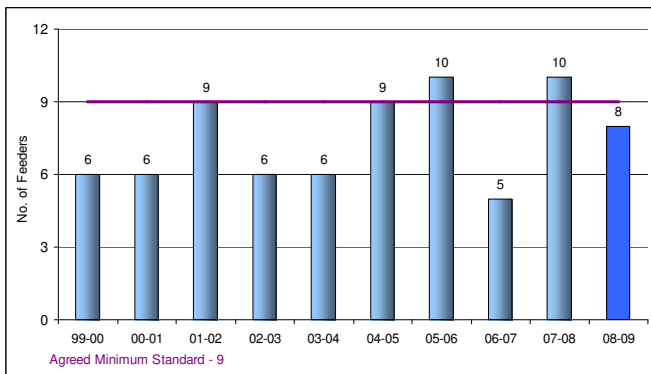
(c) the number of feeders that experience more than 2,500 minutes of interruptions per year

Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin-Rural	9	0	4	2	2	8
Katherine	6	0	0	1	1	2
Tennant Creek	3	0	0	0	0	0

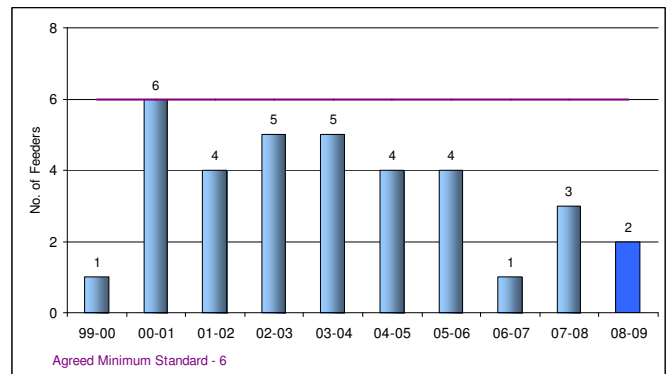
Power and Water was within the agreed minimum standard in each of the regions.

Graphs 59 to 60 on the following page show Power and Water's historical performance against this indicator.

Graph 59: Darwin-Rural – Historical Performance



Graph 60: Katherine – Historical Performance



The number of Darwin-Rural and Katherine feeders that experienced more than 2,500 minutes of interruptions in 2008-09 was within the agreed minimum standard by 1 and 4 feeders respectively and showed improvement on the previous year.

Darwin-Rural > 2,500 minutes or 27 interruptions

Length (km)	Feeder	Duration	Interruptions
260.8	<b>22MM11 Darwin River</b>	<b>4,957</b>	<b>41</b>
92.6	<b>22MA02 Batchelor</b>	<b>3,666</b>	<b>38</b>
49.2	<b>22MA07 Acacia</b>	<b>2,649</b>	33
104.4	<b>22MM05 Herbert</b>	<b>2,653</b>	32
89.1	<b>22MA03 Adelaide River</b>	<b>4,110</b>	<b>28</b>
23.1	22HD403 Middle Point	8,495	n/a
22.7	22MR103 Mt Bundy	8,357	n/a
3.1	22MR303 Toms Gully	7,732	n/a

\* Bold type indicates consecutive breaches. \*\* n/a indicates feeders did not exceed standard.

Darwin-Rural feeder performance was within the agreed minimum standard for 2008-09, although five feeders have been identified as having performed poorly in consecutive years.

The Darwin River feeder is one of the longest in the Territory, stretching 260.8 kilometres. Power and Water continues to implement feeder maintenance and upgrades which has reduced the duration of the outages from 2007-08. 40% of outages affecting the Darwin River feeder were due to planned repairs, maintenance and construction.

The Batchelor, Acacia and Adelaide River areas are also supplied by long radial feeders. The majority of outages and interruptions were to perform planned repairs, maintenance and construction.

The Herbert feeder is 104.4 kilometres and supplies approximately 1,500 customers in the McMinns, Humpty Doo and Howard Springs area. The major causes of outages in the last year have been due to vegetation touching or falling onto powerlines, lightning strikes and storms, safety (emergency shutdowns) and fauna such as birds, bats and possums. Planned work accounted for 33% of outages.

Power and Water is proposing to sectionalise rural feeders by converting air break switches into gas circuit reclosers. This will reduce the duration of outages by automatically sectionalising long feeders during outages. Other possible solutions are the installation of insulated aerial bundled conductors in areas where vegetation is a problem and increasing the vegetation management program for rural feeders.

Customers in the rural area historically and continually experience loss of power supply due to animals, especially bats, making contact with power lines and shorting out power. Power and Water continues to upgrade high voltage insulators on overhead powerlines and replace them with longer post top insulators. This provides greater clearance for birds and animals, and also makes the system more resistant to lightning strikes. New overhead power line extensions are now using fibreglass crossarms as an alternative to steel crossarms as this also reduces the potential for supply interruptions due to fruit bat activity. Vermin guards specifically designed to keep away small animals and fruit bats are being installed around insulators on the top of power poles.

Katherine > 2,500 minutes or 27 interruptions

Length (km)	Feeder	Duration	Interruptions
98.0	<b>22KP06 Pine Creek</b>	<b>2,575</b>	30
259.0	<b>22KP07 Mataranka</b>	<b>3,939</b>	<b>38</b>

\* Bold type indicates consecutive breaches.

22KP07 Mataranka feeder is Katherine's longest feeder. The major outage causes for 2008-09 are planned maintenance or construction, animals and birds, equipment failure and vegetation.

In the last couple of years many of the outages in this area are recloses that last for less than half of one second. These are activated as a safety mechanism when tree branches or animals come into contact with the lines. If the cause of the outage clears when power is interrupted, the restoration will occur automatically when the line is re-energised (or reclosed). This points towards bats/animals being the primary problem. Further investigation will be undertaken to determine what more can be done to minimise disruptions from fruit bats on this feeder and improve performance. Options include more animal guards, increased sectionalisation of the feeder and in serious problems areas the use of HV aerial bundled cables, although this does increase costs.

It is unavoidable where customers are supplied from radial feeders and no alternative supply feeder is available, outages of limited duration will occur due to planned maintenance, repairs and construction.

## 2.4 Network Reliability Initiatives And Action

### Casuarina Zone Substation

Following the power outages resulting from equipment failures at Casuarina Zone Substation in September and October 2008, Mr Mervyn Davies conducted an independent enquiry into all matters associated with our operations in Zone Substations. In response to the recommendations arising from the enquiry, Power and Water has taken a twofold approach. The first is a short term action plan, the Remedial Asset Management Program (RAMP), on the immediate issues identified by the Davies Report. The second is to undertake the Long Term Actions Plan (LTAP) to improve Power and Water's electricity network maintenance practices.

Power and Water has also developed a Remedial Works Plan to formalise the key steps to address the 'immediate actions' specified in the Davies Report.

In general, the Remedial Works Plan:

- Identifies all electrical network assets that are 'at risk', being any classification other than 'low' risk. Assets will be generally classified as low risk if they have been commissioned within the last five years.
- Schedules the condition testing of all zone substation assets that are 'at risk' in a formal order of priority, partly governed by wet and dry season conditions.
- Schedules actions to repair zone substation equipment where condition tests have identified results that are below minimum standard or specification based on a 50% likelihood of remedial action being required.
- Schedules the duration of work at a zone substation site based on multiple work crews where possible.
- Establishes an improved process for collecting, storing and reporting asset condition monitoring results.
- Establishes an improved process for identifying equipment spares, and for ensuring that the condition of those spares is always above minimum acceptable standard and specification.
- Provides supplementary training to Power Networks staff to ensure that modern maintenance techniques are known and well understood.
- Provides Power Network staff with a clear view of what work is required to be performed in the short term to ensure that sound knowledge of the state of the electrical assets is known.
- Demonstrates in a favourable way to a third party, whether that be an auditor, a member of the Government or a member of the public, the extent to which Power and Water has addressed the issues identified by the Davies Report.

## Improving Distribution Network Reliability

In addition to the measures mentioned above, Power and Water is continuing to implement several initiatives to improve reliability of the distribution network. These include:

- The increased number of staff and expertise in its Asset Management Group, providing a more comprehensive approach to monitoring and analysis of feeder and network performance.
- The feeder upgrade program will continue with a focus on replacing insulators and crossarms and the installation of re-closers and upgrade work to minimise faults or improve system security of both overhead and underground feeders. Sectionalisers are to be installed where appropriate to reduce the number of customers affected in rural areas.
- All new construction to be built with fibreglass crossarms and post insulators for rural lines, with the majority built with offset construction and overhead earth wire.
- Power and Water will continue to install animal protection technology to highly affected areas.
- Continuing to install lightning arrestors more strategically within its overhead distribution system to reduce re-closes and outages caused by lightning.
- The nearing completion of the Darwin Undergrounding Project in Rapid Creek and Millner.
- An increase in planned outages for the upgrading, repairs, maintenance and construction of the network with minimal impact on supply to customers.
- The submission of a Network Reliability Report to the Utilities Commission as part of the annual Power System Review.

## 3. QUALITY STANDARD INDICATORS

### 3.1 Quality

*(a) the number of complaints received in relation to voltage events such as voltage dips, swells, spikes etc.*

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Northern		144	285	216	147	792
Katherine		14	54	5	36	109
Tennant Creek		4	5	6	6	21
Southern		33	36	43	27	139
All Customers	n/a	<b>195</b>	<b>380</b>	<b>270</b>	<b>216</b>	<b>1,061</b>

Power and Water reported in 2007-08 that voltage event complaints totalled 1,117 across the Northern Territory.

## 4. CUSTOMER SERVICE INDICATORS

### 4.1 Customer Service

(a) the percentage of new connections not provided within the required time limit

*New connections not provided to existing supply properties within 24 hours*

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
All Customers	2%	0.48%	1.03%	0.76%	0.81%	0.77%

Power and Water met the agreed minimum standard and has done so for the last three years.

*New connections not provided to new subdivisions in urban areas within 5 working days*

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
All Customers	10%	10.7%	12.8%	9.2%	4.3%	8.7%

Power and Water met the agreed minimum standard; this is a 7.3% improvement from the previous year.

*New connections not provided to new subdivisions where minor extensions or augmentation is required in urban areas within 10 weeks*

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
All Customers	35%	63%	62%	71%	70%	66.5%

The agreed minimum standard for new connections not provided to new subdivisions was not met in 2008-09. Power and Water commences work on subdivisions once payment has been received from either the developer or customer. Delays have occurred primarily due to resources currently focussed on maintenance work within RAMP. Delays can also be attributed to the design and procurement of transformers, and in some cases waiting on the required work from developers.

(b) the number and percentage of telephone calls responded to within 20 seconds from when the customer selects to speak to a human operator.

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
All Customers	58,679	19,398	20,467	23,880	23,268	87,013
All Customers	63%	55%	58%	66%	70%	62%

The call response time minimum standard was not met due to system and resource constraints, compounded by an increase of 11% in call demands compared to 2007-08. These issues were addressed in the second quarter of 2008-09 with introduced process changes resulting in a marked improvement in the third and fourth quarters.

Call centre software was upgraded to feature improved Interactive Voice Response (IVR) options tree allowing skills-based routing, and the introduction of a Message Assignment Facility (MAF) which is activated during supply incidents. Front counter staff can act as overflow agents to assist in high volume call periods, increasing disaster contingency capability. Training for new staff was reviewed and expanded from 1 to 2 weeks, and temporary staff were employed where necessary.

In 2009-10, it is expected that Customer Service will continue to expand on improvements to include automatic call back facilities within the call centre.

*(c) the number of customer complaints*

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 <sup>st</sup> Quarter Jul 08 to Sept 08	2 <sup>nd</sup> Quarter Oct 08 to Dec 08	3 <sup>rd</sup> Quarter Jan 09 to Mar 09	4 <sup>th</sup> Quarter Apr 09 to Jun 09	Annual 2008-09
Darwin		401	413	503	401	1,718
Katherine		36	32	62	30	160
Tennant Creek		5	9	9	16	39
Alice Springs		98	64	85	71	318
<b>All Customers</b>	<b>5,146</b>	<b>540</b>	<b>518</b>	<b>659</b>	<b>518</b>	<b>2,235</b>

Power and Water met the agreed minimum standard. Overall, the NT had a 4% decrease in complaints compared to 2007-08. Power and Water received a similar level of complaints last year due to extended outages caused by Cyclone Helen on 4-5 January 2008, with approximately 15,000 customers affected by extended outages totalling 392 SAIDI minutes.

In 2008-09, Power and Water recorded an increase in power outage notifications from customers due to the Casuarina Zone Substation incidents and the severe storm in Alice Springs. In the second quarter of the reporting period, 34.5% of all power outage notifications (from a total of 1,928) can be directly related to these incidents. (Note that multiple calls for the same outages were received but only new incidents were recorded as multiple reports cause delays in response times for work crews and potential re-work for system controllers.)

The majority of the customer notifications were not treated as complaints, as it was assessed that the customers were either making enquiries of outage times or advising of no power. As required by the Code, Power and Water reports complaints in accordance with the Australian Standard (ISO10002-2006)<sup>3</sup> which defines a complaint as *"An expression of dissatisfaction made to an organisation, related to its products, or the complaint handling process itself, where a response or resolution is explicitly or implicitly expected."* As part of Power and Water's complaint handling policy, customers are advised that *"Power and Water relies on customers and the broader community to assist us in identifying faults. All calls notifying Power and Water of a fault will be recorded as such, unless you request otherwise"*.

During these incidents Power and Water was proactive in advising customers of restoration periods which included regular media updates, Call Centre IVR messages,

<sup>3</sup> The Code refers to Australian Standard 4269:1995, defined as *"any expression of dissatisfaction with a product or service offered or provided"*. This standard has been superseded by ISO10002-2006.

increased staffing numbers and extended call centre hours to assist customer queries. Power and Water provided customers affected by the Casuarina Zone Substation incident and who also met certain outage time criteria with a rebate to compensate for the length of the outages.

To further improve its service performance, Power and Water commenced monthly customer surveys from May 2009, conducted by a specialist market research company.

## 5. CONSECUTIVE BREACHES

Consecutive breaches (based on adjusted data) of the agreed minimum standards were only reported for five of the 46 performance indicators: Alice Springs Network CAIDI, Katherine Generation SAIFI, Darwin and Tennant Creek Generation CAIDI and the number of telephone calls responded to within 20 seconds.

Power and Water is implementing and continuing a number of programs and initiatives to improve feeder and hence network reliability. As well as an asset review focusing on substations, works are planned to improve the reliability of feeders in problem areas.

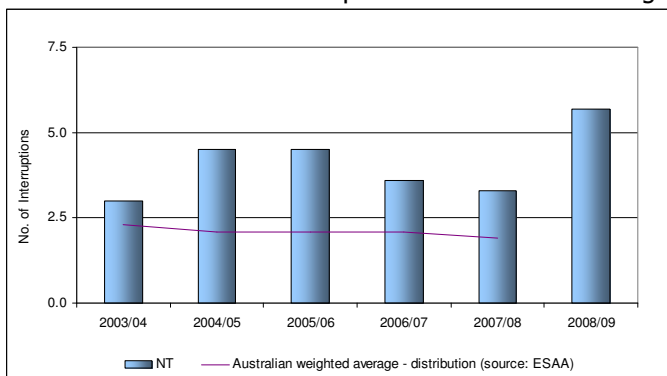
Power and Water’s call centre response was affected by system and personnel constraints. Power and Water has implemented procedural changes, upgraded call centre software and extended training of new and temporary staff.

## 6. NATIONAL BENCHMARKING

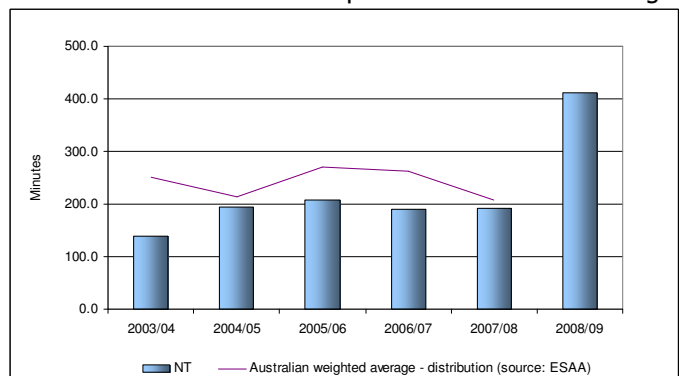
### 6.1 Unadjusted Network Performance

Graphs 61 to 63 compare Power and Water’s historical unadjusted network performance to the Australian weighted average for distribution networks (as published in the Energy Supply Association of Australia’s (ESAA) *Electricity Gas Australia* annual publications).

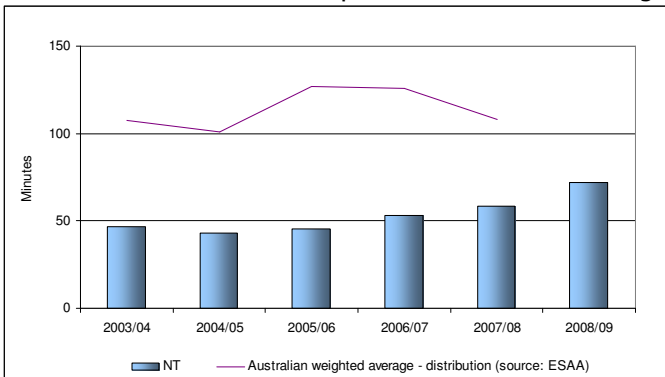
Graph 61: Unadjusted NT SAIFI – Historical Performance compared to Australian Average



Graph 62: Unadjusted NT SAIDI – Historical Performance compared to Australian Average



Graph 63: Unadjusted NT CAIDI – Historical Performance compared to Australian Average



\* No adjustments have been applied.

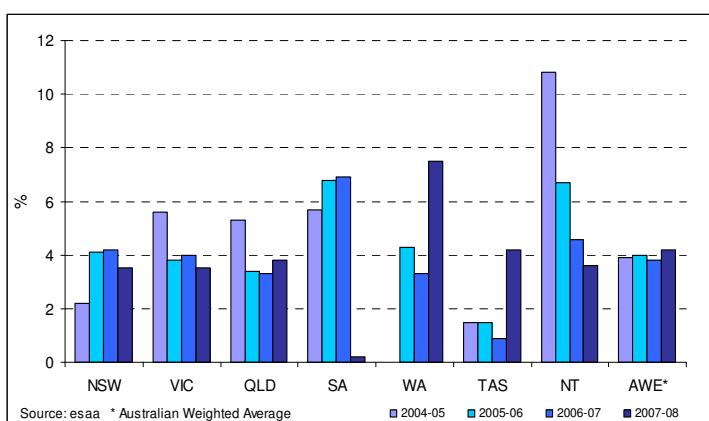
The Northern Territory is a challenging environment in which to maintain reliable power supply. Lightning, storms, fruit bats and vegetation have resulted in the frequency of network outages (SAIFI) over the last five years to 2007-08 being greater than the national average. Despite this, the duration of outages (SAIDI) over the same period has been less than the national average, due to continued Power and Water network reliability improvement initiatives applied across the entire network. CAIDI is well below the national average, as it is a function of Power and Water’s lower outage duration compared to a higher frequency of outages.

National data for 2008-09 has not yet been released. However, it is likely that Power and Water will exceed the Australian average for both SAIDI and SAIFI in 2008-09. This is primarily due to the impact of the major and subsequent failures at the Casuarina Zone Substation in September and October 2008 and the major storm in Alice Springs in September 2008.

## 6.2 Generation Performance

Graph 64 compares Power and Water’s historical generation performance to interstate generators and to the Australian weighted average (as published in ESAA’s *Electricity Gas Australia* annual publications).

Graph 64: Equivalent Forced Outage Factor (EFOF) - Historical Performance compared to Australian Average



Based on the latest information available from ESAA, Graph 64 shows continual improvement in Power and Water's generation reliability performance over the period 2004-05 to 2007-08, as measured by the percentage of time generating units are unavailable due to forced outages. The same continual improvement is not evident in other States. The improvement in forced outages in the Territory can be primarily attributed to an improved and more rigorous maintenance and repairs program.

The commissioning of the new Weddell Power Station will allow planned effective maintenance to be scheduled subject to demand profile. Outages on the combine cycle block (sets 4, 5 and 6) in 2008-09 will result in EFOF higher than the expected Australian weighted average. Life extension programs are being investigated for the combine cycle block to address this issue given the advanced age of the plant. If it is economically viable, this will again bring EFOF in-line with the Australian weighted average.

With respect to reporting, Generation's management focus going forward will be to enhance the quality and accuracy of outage performance reporting.

## **7. CONTACT DETAILS**

For clarification or further details pertaining to the information contained in this report, please contact Ms Djuna Pollard, Manager Regulation, Pricing and Economic Analysis, on (08) 8985 8431 or at [djuna.pollard@powerwater.com.au](mailto:djuna.pollard@powerwater.com.au).