



Standards of Service 2009-10

Key Service Performance Indicators

OCTOBER 2010

Revised February 2011

Power and Water Corporation
GPO Box 1921, Darwin NT 0801

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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 2009-10 with respect to each of the key service performance indicators in Schedule 1 of the Code.

1.1 Scope of Data

Power and Water has reported reliability and quality of supply indicators by region. Customer complaints data has also been provided by region, however all other customer service indicators have been provided for the whole of the NT as current system functionality does not support separate reporting.

As stipulated in Schedule 1 (4.5), key service performance indicators have been reported for each quarter where possible. Historical data for 1999-00 to 2009-10 has also been included in this report.

As Power and Water does not apply different standards for different customer categories, 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

In 2009-10, Power and Water met the Network SAIDI, SAIFI and CAIDI reliability standards in the Darwin, Katherine and Tennant Creek regions. Power and Water also met the Generation SAIDI target in the Katherine, Tennant Creek and Alice Springs regions and the SAIFI target in all four regions. In addition, for the first time in three years, the customer service minimum standard set for the number of telephone calls responded to within 20 seconds was met due to continuous improvement initiatives implemented in Power and Water's call centre.

Power and Water's service performance in 2009-10 was affected by a system black incident on 30 January 2010, when a lightning strike hit the two 132kV lines from Channel Island Power Station, leading to a total system black of the Darwin-Katherine Transmission Line (DKTL) system.

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 the system black incident excluded, Power and Water met 35 of the 45 agreed minimum standards of service performance.

Of the 10 targets that were not met, the following are reoccurring from last year:

- Alice Springs Network SAIDI;
- Alice Springs Network SAIFI;
- Alice Springs Network CAIDI;
- Darwin-Urban number of feeders that experience more than 1500 minutes of interruptions per year;
- Darwin and Tennant Creek Generation CAIDI; and

- New connections to new subdivisions (where minor extensions or augmentation is required in urban areas).

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 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
		Adjusted	Adjusted	Adjusted	Adjusted	Adjusted
Darwin	219.9	173	284	232	96	196
Katherine	401	284	153	285	84	201
Tennant Creek	411	134	148	229	119	157
Alice Springs	108	147	173	328	186	210

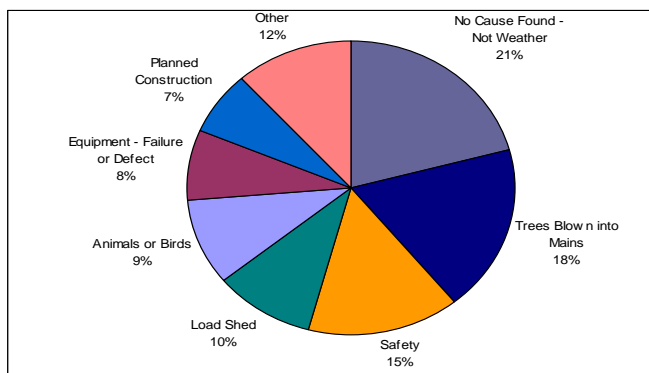
In accordance with Schedule 1 (1.6) of the Code, the 2.5 beta method¹ of calculating a 'major event day' or 'network exclusion event' identified one event that could be removed from the network reliability indicators in 2009-10.

The major event day for Darwin was the system black incident on 30 January 2010. On 30 January 2010, a lightning strike hit the two 132kV lines from Channel Island Power Station, leading to a total system black of the DKTL system. Restoration commenced immediately, with Katherine customers supply restored within the hour and the last customers in Darwin connected 10 hours later. The average interruption time for customers was 5 hours.

The agreed minimum standard for SAIDI was met in Darwin, Katherine and Tennant Creek. Tennant Creek SAIDI performance was 254 minutes below the agreed minimum standard. Alice Springs exceeded the minimum standard in 2009-10.

Graph 1 illustrates the main causes of outages that contributed to SAIDI in Alice Springs.

Graph 1: Alice Springs SAIDI – Cause Descriptions

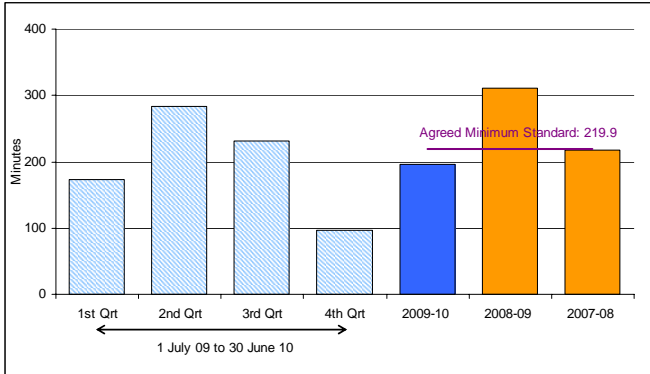


* 'Other' may include causes such as 'High Load Escort', 'Wind – including wind borne materials' and 'Lightning'.

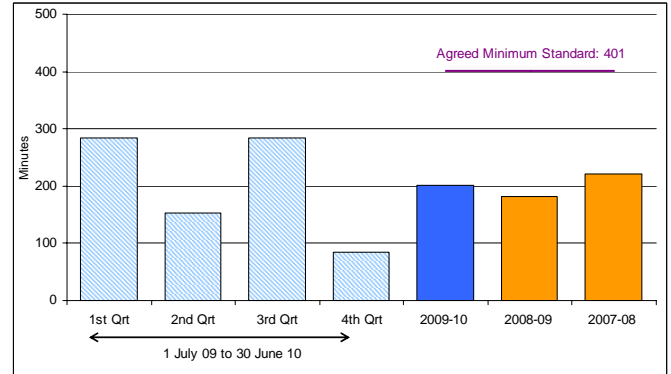
¹ The 2.5 beta method is an internationally accepted standard for excluding outages from reliability data. The method for exclusion is outlined in IEEE Standard 1366-2003.

Graphs 2 to 5 show Power and Water’s quarterly and yearly actual regional performance for the adjusted SAIDI service performance indicator for Power Networks.

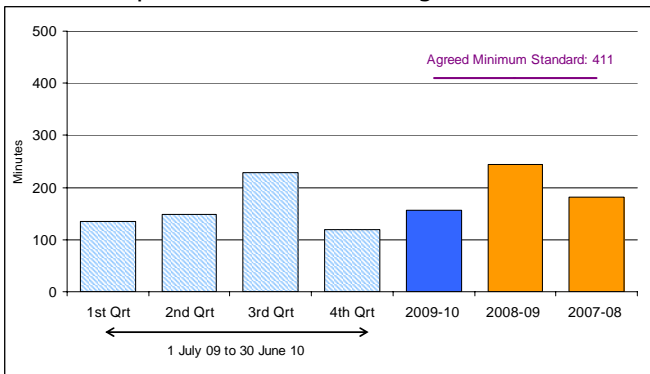
Graph 2: Darwin Region – SAIDI



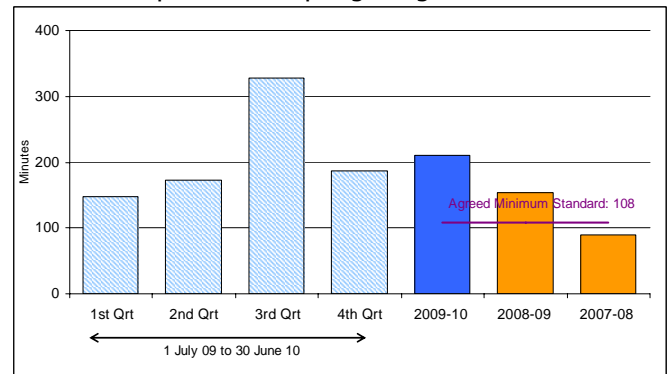
Graph 3: Katherine Region – SAIDI



Graph 4: Tennant Creek Region – SAIDI

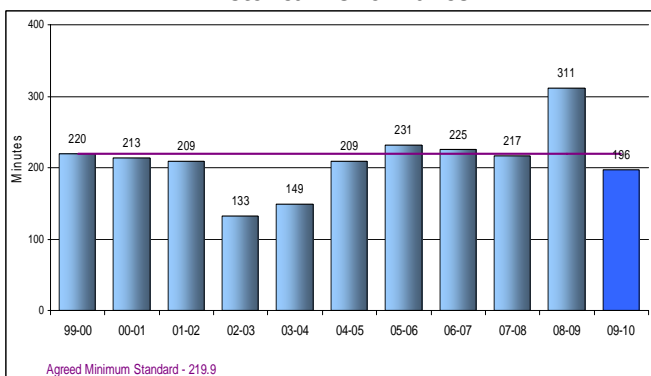


Graph 5: Alice Springs Region – SAIDI

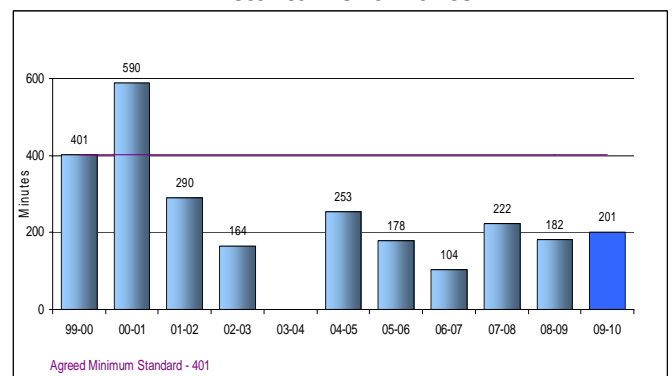


Graphs 6 to 9 show Power and Water’s regional historical performance for the adjusted SAIDI service performance indicator for Power Networks.

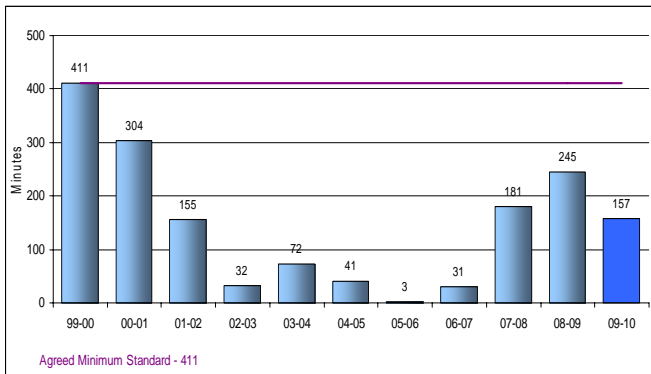
Graph 6: Darwin Region SAIDI – Historical Performance



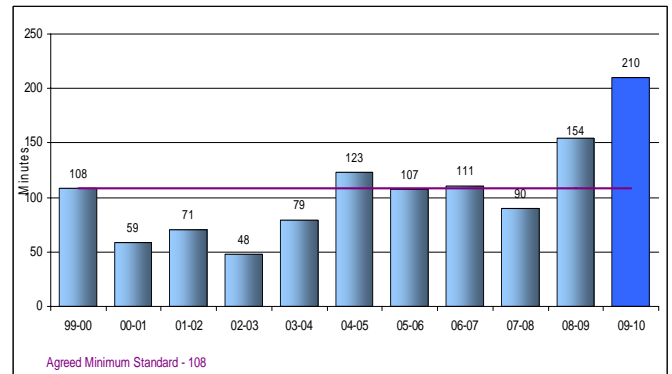
Graph 7: Katherine Region SAIDI – Historical Performance



Graph 8: Tennant Creek Region SAIDI – Historical Performance



Graph 9: Alice Springs Region SAIDI – Historical Performance



Unadjusted SAIDI

Region	Power and Water’s Actual Performance				
	1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
	Unadjusted	Unadjusted	Unadjusted	Unadjusted	Unadjusted
Darwin	173	284	1182	96	434
Katherine	284	153	285	84	201
Tennant Creek	134	148	229	119	157
Alice Springs	147	173	328	186	210

SAIFI

b) the average number of interruptions per customer (“interruption frequency”) – SAIFI

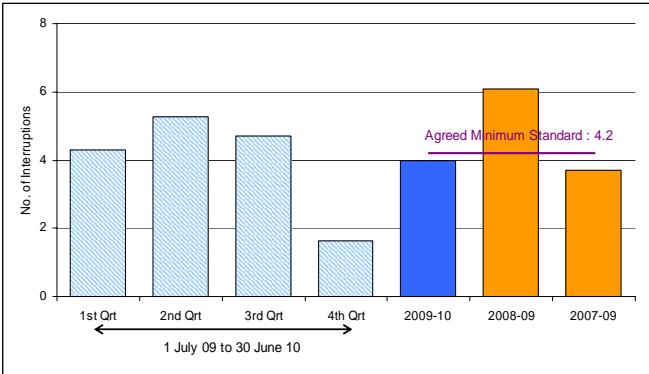
Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
		Adj	Adj	Adj	Adj	Adj
Darwin	4.2	4.3	5.3	4.7	1.6	4.0
Katherine	9.6	6.9	5.6	6.5	3.1	5.5
Tennant Creek	9.8	8.5	6.2	5.7	5.8	6.7
Alice Springs	2.9	4.3	2.5	4.8	3.3	3.7

Power and Water’s network adjusted SAIFI performance in Darwin, Katherine and Tennant Creek was better than the agreed minimum standard.

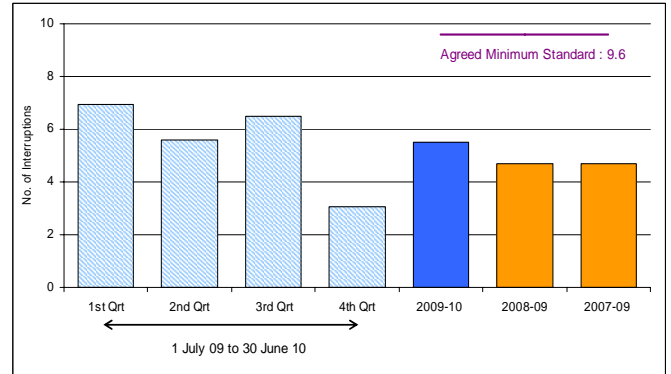
Alice Springs’ interruption frequency was above the minimum standard. The three most significant outages contributing to the Alice Springs system SAIFI in 2009-10 were under frequency load shed, a bird strike on an overhead conductor and an 11kV feeder outage with no cause found.

Graphs 10 to 13 show Power and Water’s actual performance for the adjusted SAIFI reliability standards indicator for Power Networks on a quarterly and annual basis for each region.

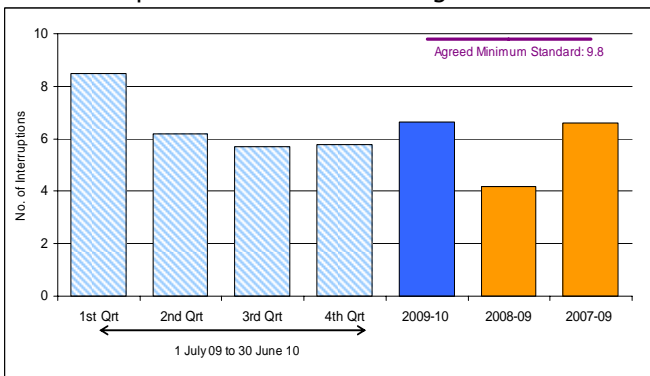
Graph 10: Darwin Region - SAIFI



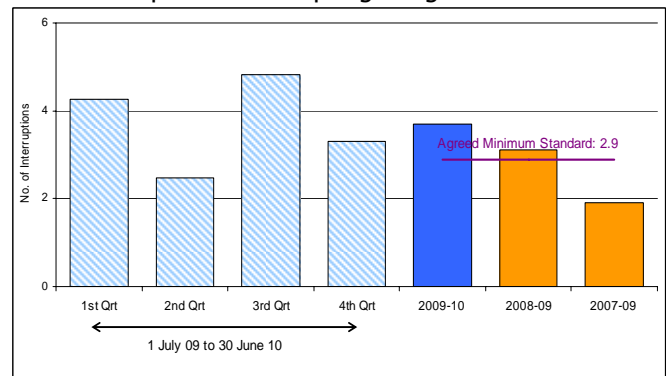
Graph 11: Katherine Region – SAIFI



Graph 12: Tennant Creek Region - SAIFI

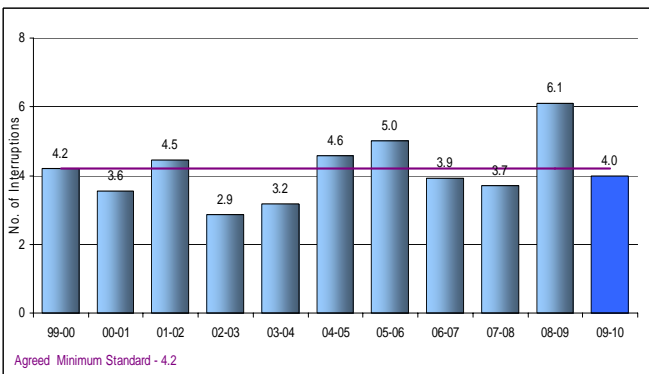


Graph 13: Alice Springs Region – SAIFI

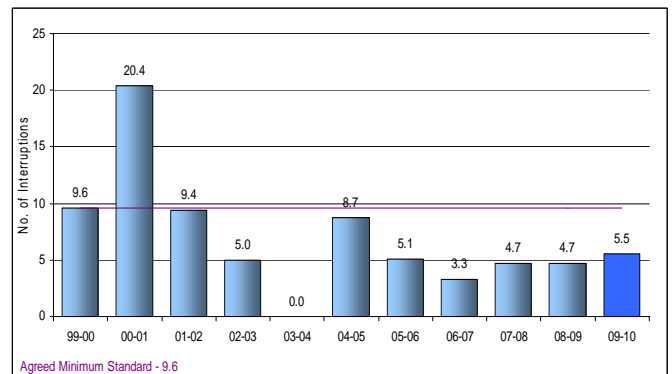


Graphs 14 to 17 show Power and Water’s historical performance for the adjusted SAIFI service performance indicator for Power Networks on an annual basis for each region.

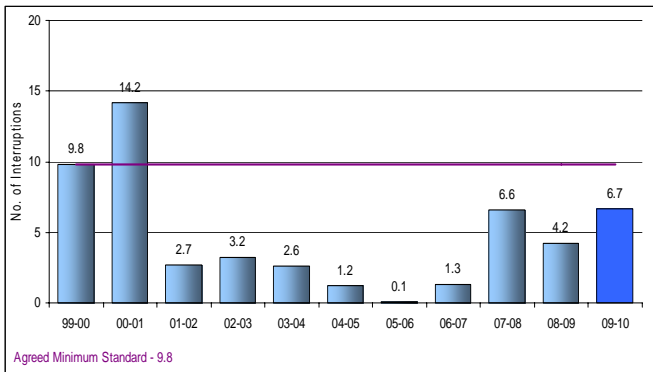
Graph 14: Darwin Region SAIFI – Historical Performance



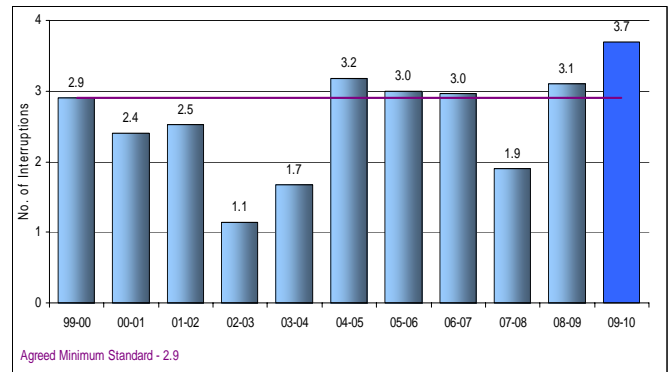
Graph 15: Katherine Region SAIFI – Historical Performance



Graph 16: Tennant Creek SAIFI – Historical Performance



Graph 17: Alice Springs SAIFI – Historical Performance



Unadjusted SAIFI

Region	Power and Water’s Actual Performance				
	1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
	Unadjusted	Unadjusted	Unadjusted	Unadjusted	Unadjusted
Darwin	4.3	5.3	7.9	1.6	4.8
Katherine	6.9	5.6	6.5	3.1	5.5
Tennant Creek	8.5	6.2	5.7	5.8	6.7
Alice Springs	4.3	2.5	4.8	3.3	3.7

CAIDI

(c) the average interruption duration per customer – CAIDI

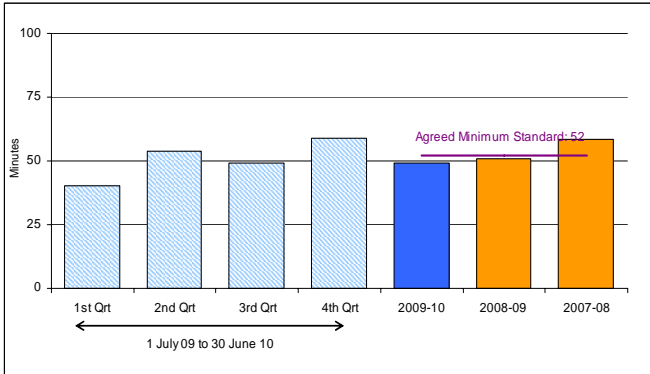
Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
		Adjusted	Adjusted	Adjusted	Adjusted	Adjusted
Darwin	52.0	40.1	53.9	49.3	58.9	49.4
Katherine	42.0	41.0	27.3	43.8	27.5	36.4
Tennant Creek	41.8	15.8	23.9	40.3	20.6	23.6
Alice Springs	37.2	34.5	70.0	68.0	56.2	56.6

The minimum standard was met in Darwin, Katherine and Tennant Creek, and reliability in these regions also improved on the previous year. CAIDI for Alice Springs was above the minimum standard.

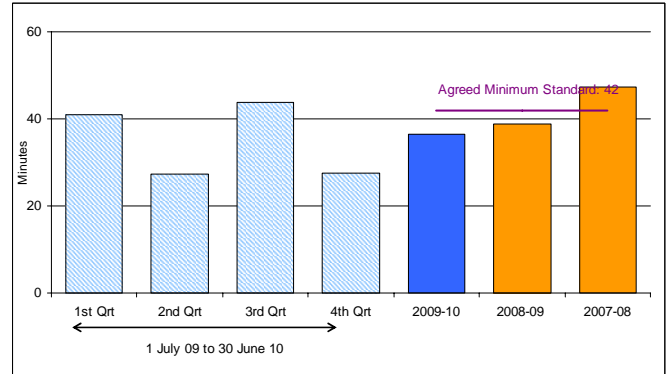
Power and Water considers that the CAIDI performance measurement is a flawed indicator for outages, as the calculation is based on duration of outages over outage frequency. This can result in a situation where having a higher frequency of outages benefits the outcome of the performance indicator, which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

Graphs 18 to 21 show actual performance for the adjusted CAIDI service performance indicator for Power Networks on a quarterly and annual basis for each region.

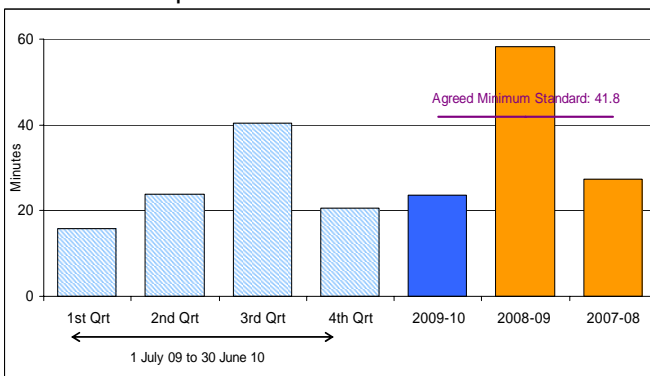
Graph 18: Darwin Region – CAIDI



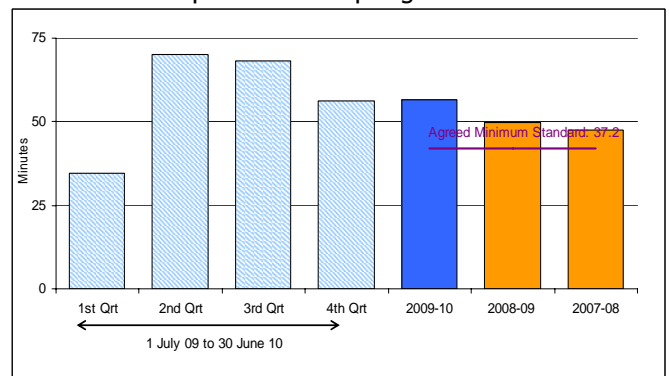
Graph 19: Katherine Region – CAIDI



Graph 20: Tennant Creek - CAIDI

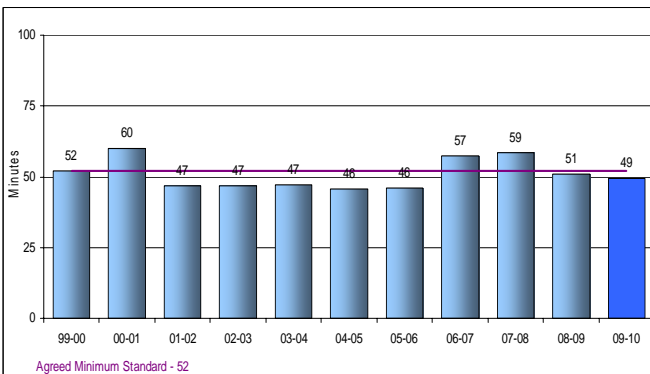


Graph 21: Alice Springs – CAIDI

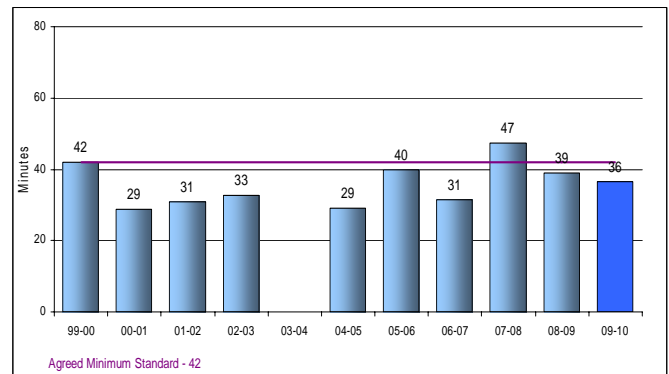


Graphs 22 to 25 show Power and Water’s historical performance for the adjusted CAIDI service performance indicator for Power Networks on an annual basis for each region.

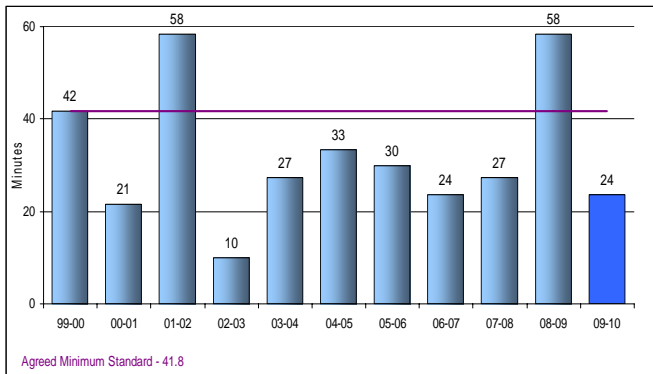
Graph 22: Darwin Region CAIDI – Historical Performance



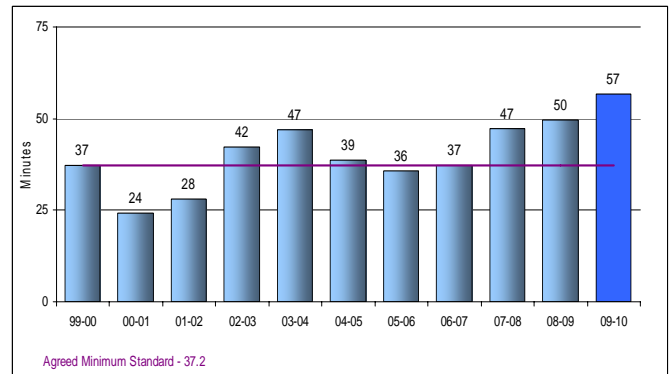
Graph 23: Katherine Region CAIDI – Historical Performance



Graph 24: Tennant Creek Region CAIDI – Historical Performance



Graph 25: Alice Springs Region CAIDI – Historical Performance



Unadjusted CAIDI

Region	Power and Water’s Actual Performance				
	1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
	Unadjusted	Unadjusted	Unadjusted	Unadjusted	Unadjusted
Darwin	40.1	53.9	149.6	58.9	90.8
Katherine	41.0	27.3	43.8	27.5	36.4
Tennant Creek	15.8	23.9	40.3	20.6	23.6
Alice Springs	34.5	70.0	68.0	56.2	56.6

2.2 Generation Reliability

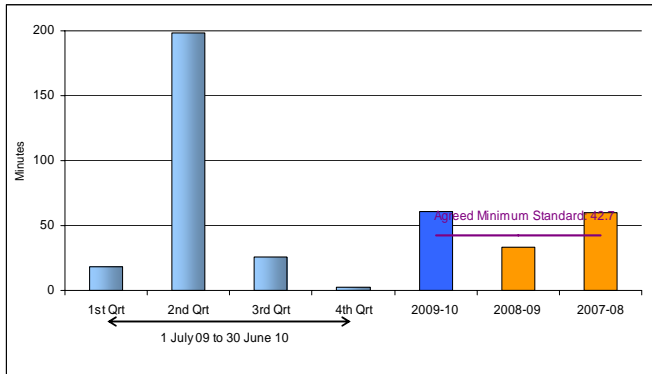
SAIDI

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

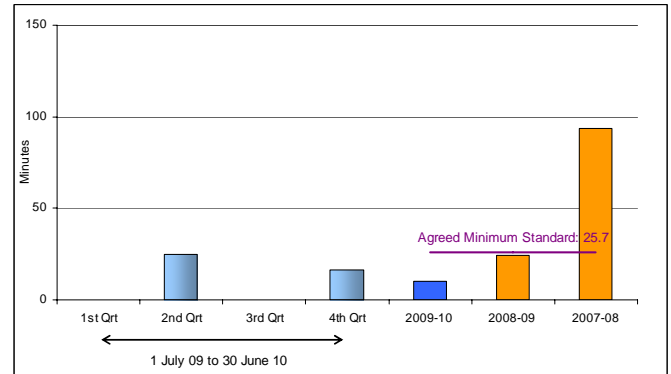
Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin	42.7	18.2	198.3	25.9	2.2	61.1
Katherine	25.7	0.0	25.1	0.0	16.5	10.4
Tennant Creek	125.0	0.0	2.6	0.0	122.3	31.3
Alice Springs	122.5	14.5	16.1	17.0	46.1	23.5

Graphs 26 to 29 show Power and Water’s actual performance for the SAIDI service performance indicator for Generation on a quarterly and annual basis for each region.

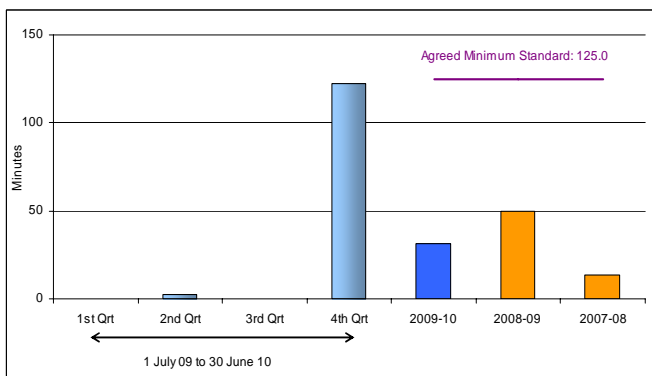
Graph 26: Darwin Region – SAIDI



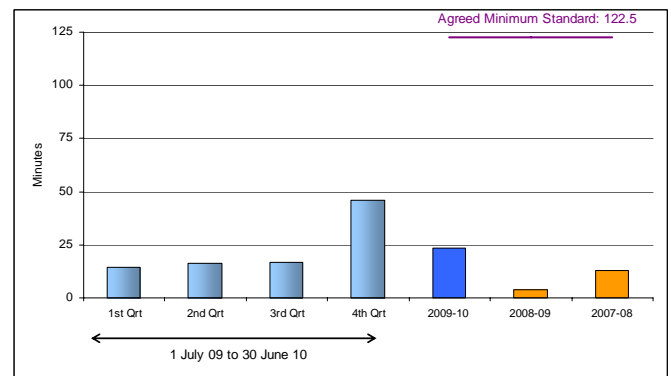
Graph 27: Katherine Region – SAIDI



Graph 28: Tennant Creek – SAIDI



Graph 29: Alice Springs – SAIDI

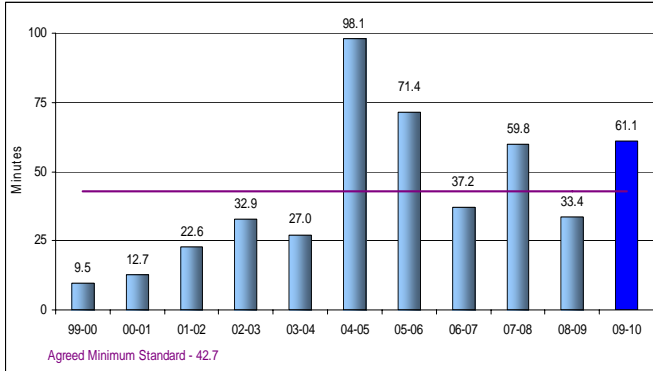


The annual performances for SAIDI in the Katherine, Tennant Creek and Alice Springs regions were within the agreed minimum standards. The annual performance for SAIDI in the Darwin region did not meet the agreed minimum standard.

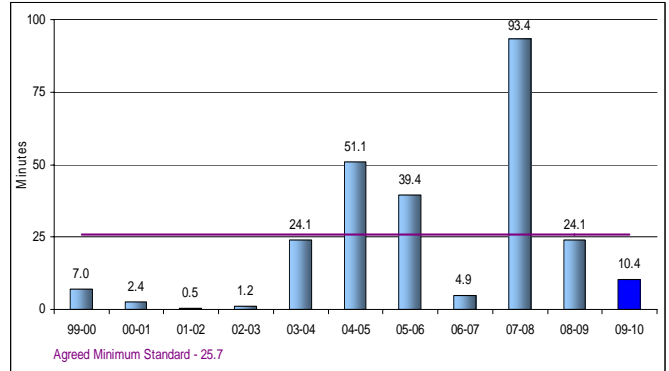
The major cause for exceeding the SAIDI target in the Darwin region was the result of an interruption in gas supply at the Weddell Power Station (WPS). This caused a loss of power to approximately 14,000 customers in the northern suburbs, Palmerston and Katherine. The cause of this interruption was due to the presence of a slug of diesel that had entered the filter/coalescers at the Weddell Metering Station. When this was discovered, NT Gas prudently shut-off gas supply to prevent further damage. Subsequent investigations by Power and Water and APA Group concluded that a slug of diesel from the Bonaparte Gas Pipeline corrosion inhibition program was released and gradually made its way along the Amadeus Basin to Darwin Pipeline, finally entering the Wickham Point Interconnect and the gas delivery system at WPS. It is clear that the liquid collection facility (a large slug catcher) installed at Ban Ban Springs by APA Group was not effective in collecting liquids from the Bonaparte Gas Pipeline as it was designed to.

Graphs 30 to 33 show Power and Water’s historical performance for the SAIDI service performance indicator for Generation on an annual basis for each region.

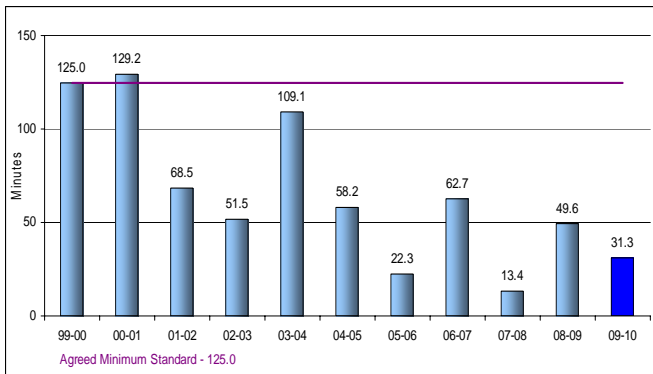
Graph 30: Darwin Region SAIDI – Historical Performance



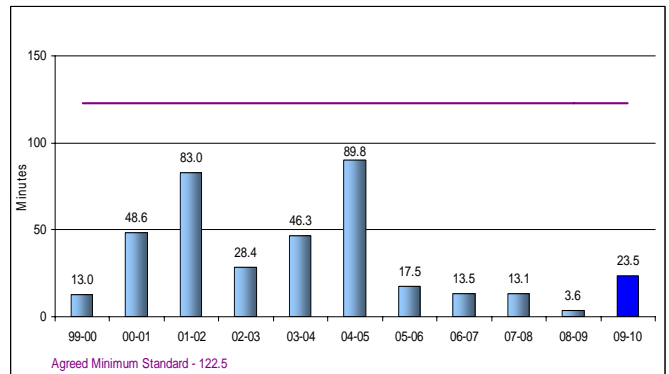
Graph 31: Katherine Region SAIDI – Historical Performance



Graph 32: Tennant Creek Region SAIDI – Historical Performance



Graph 33: Alice Springs Region SAIDI – Historical Performance



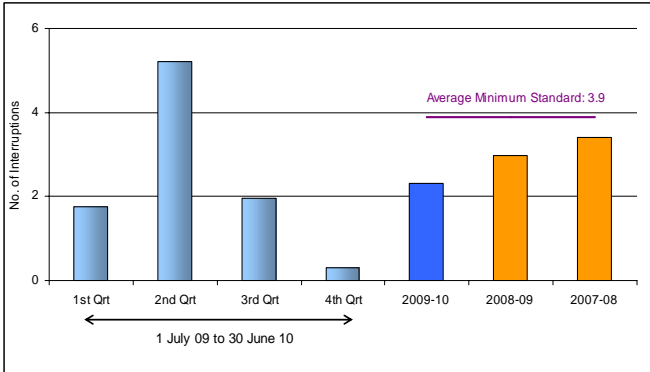
SAIFI

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

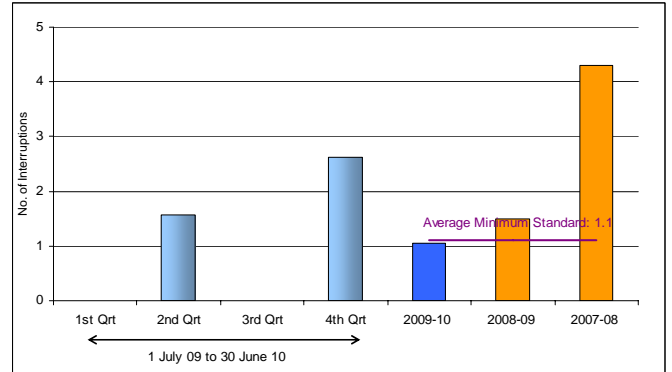
Region	Agreed Minimum Standard	Power and Water's Actual Performance					Annual 2009-10
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10		
Darwin	3.9	1.7	5.2	2.0	0.3	2.3	
Katherine	1.1	0.0	1.6	0.0	2.6	1.0	
Tennant Creek	12.5	0.0	0.1	0.0	3.9	1.0	
Alice Springs	3.6	1.1	0.8	1.8	3.5	1.8	

Graphs 34 to 37 show Power and Water's Generation SAIFI performance on a quarterly and annual basis.

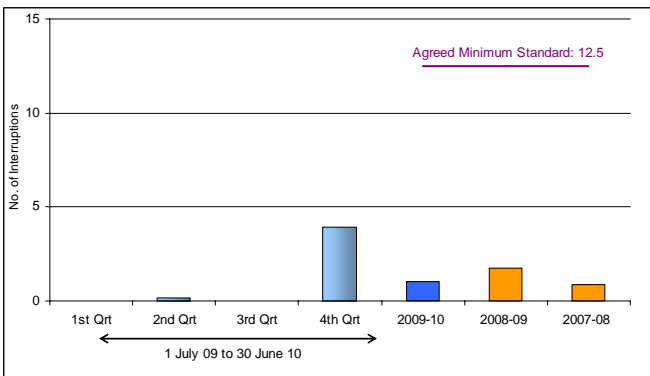
Graph 34: Darwin Region - SAIFI



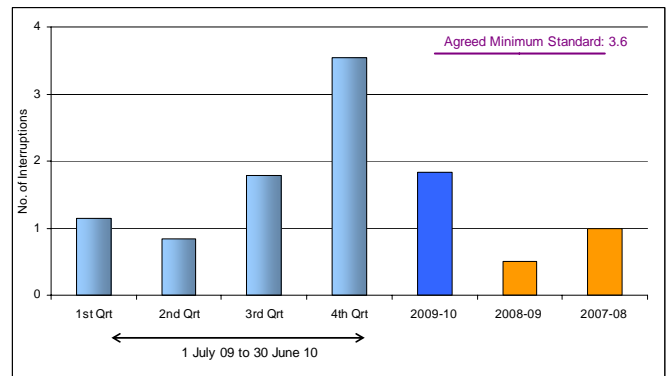
Graph 35: Katherine Region - SAIFI



Graph 36: Tennant Creek Region - SAIFI

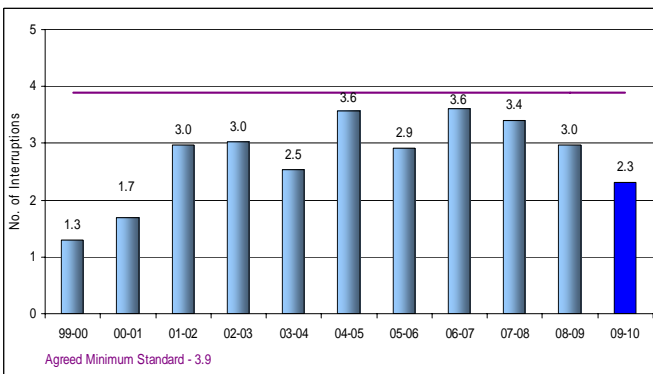


Graph 37: Alice Springs Region - SAIFI

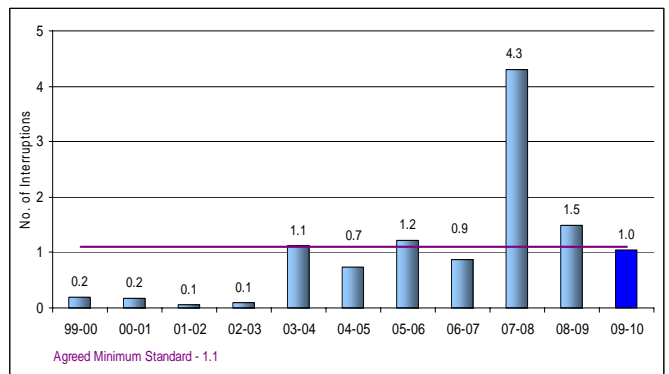


Graphs 38 to 41 show Power and Water's historical Generation SAIFI performance.

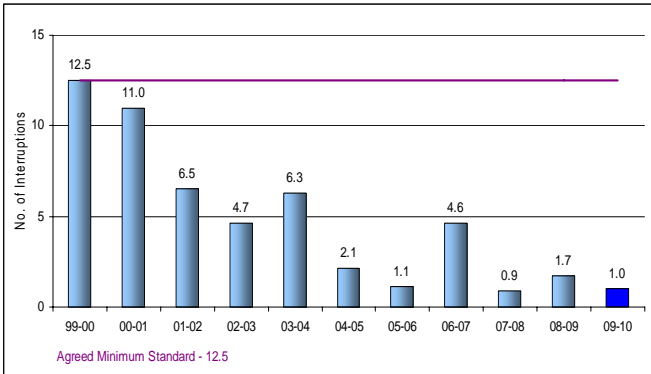
Graph 38: Darwin Region SAIFI - Historical Performance



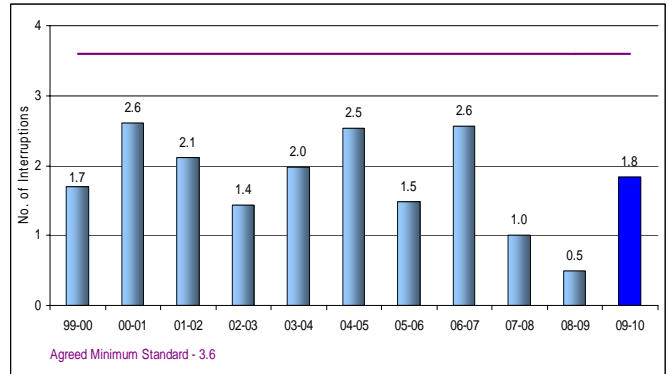
Graph 39: Katherine Region SAIFI - Historical Performance



Graph 40: Tennant Creek Region SAIFI – Historical Performance



Graph 41: Alice Springs Region SAIFI – Historical Performance



The agreed minimum standard was met in all four regions, with the Alice Springs, Tennant Creek and Darwin regions well within the minimum standard.

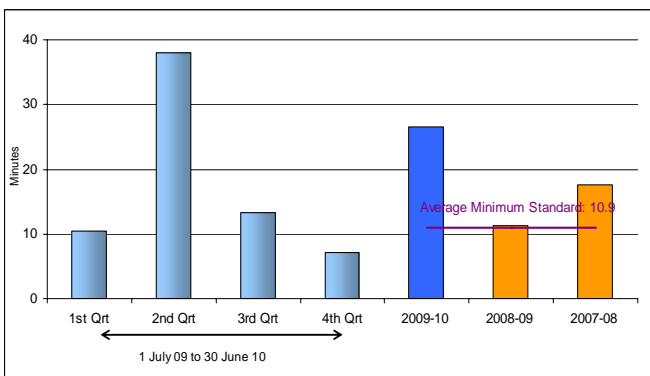
CAIDI

(c) the average interruption duration per customer – CAIDI

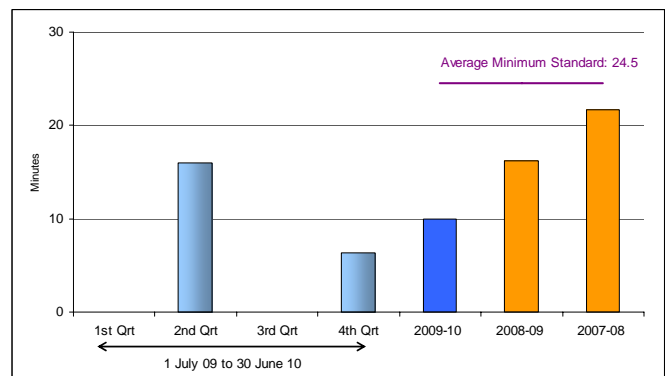
Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin	10.9	10.4	38.0	13.2	7.2	26.5
Katherine	24.5	0.0	16.0	0.0	6.3	9.9
Tennant Creek	10.0	0.0	18.0	0.0	31.1	30.6
Alice Springs	34.2	12.8	19.3	9.5	13.0	12.8

Graphs 42 to 45 show Power and Water's actual performance for the CAIDI service performance indicator for Generation on a quarterly and annual basis for each region.

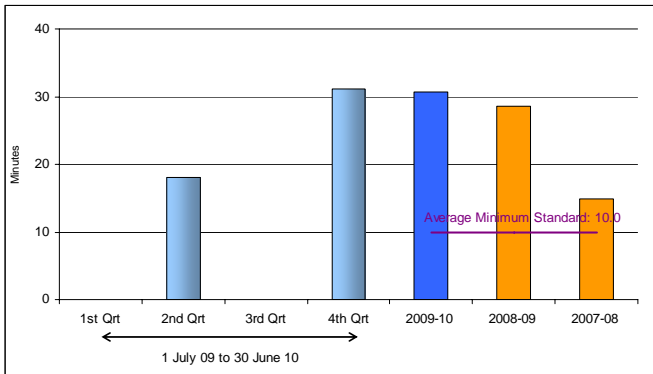
Graph 42: Darwin Region - CAIDI



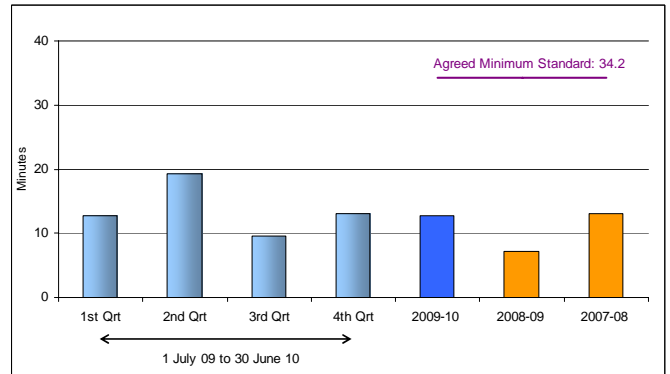
Graph 43: Katherine Region – CAIDI



Graph 44: Tennant Creek Region - CAIDI

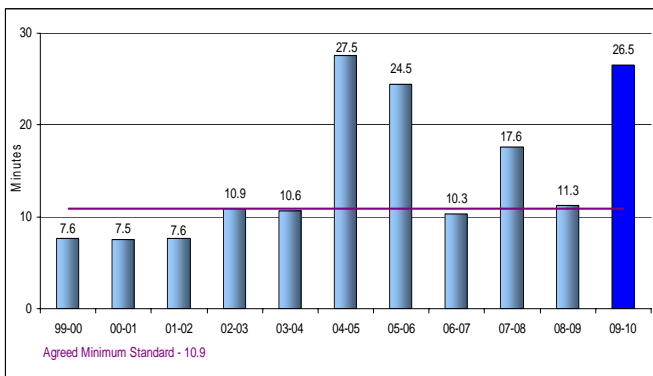


Graph 45: Alice Springs Region – CAIDI

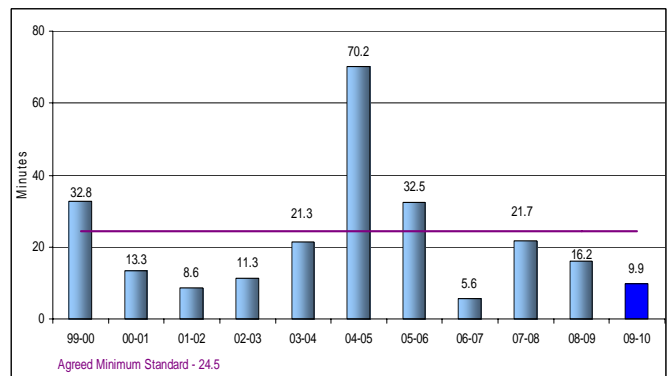


Graphs 46 to 49 show Power and Water’s historical performance for the CAIDI service performance indicator for Generation.

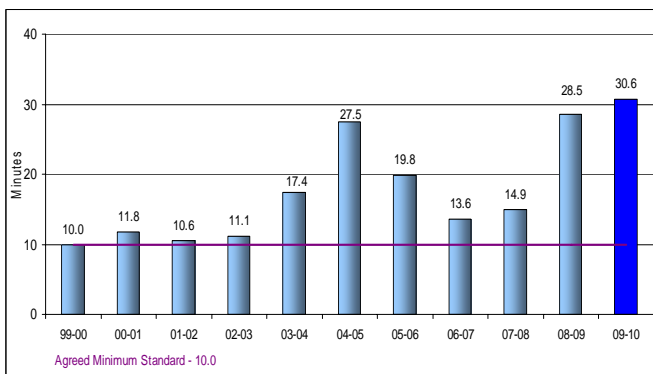
Graph 46: Darwin Region CAIDI – Historical Performance



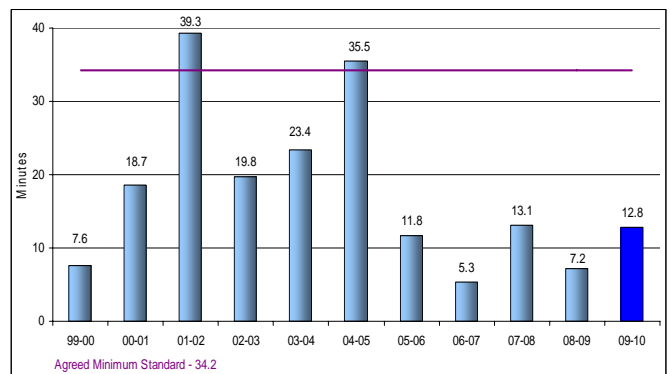
Graph 47: Katherine Region CAIDI – Historical Performance



Graph 48: Tennant Creek Region CAIDI – Historical Performance



Graph 49: Alice Springs Region CAIDI – Historical Performance



Generation’s CAIDI performance in the Darwin and Tennant Creek regions exceeded the minimum standard in 2009-10. These were directly related to gas supply issues which affected Power and Water in 2009-10. The Darwin region, whilst experiencing an increase in duration of outages in 2009-10, recorded a decrease in frequency when compared to previous years. The Generation CAIDI issue in Tennant Creek is misleading as the region has recorded a reduction in both SAIDI and SAIFI.

As mentioned previously, Power and Water considers that the CAIDI performance measurement is 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.

2.3 Feeder Performance

Power and Water has segregated feeders into two categories: interconnected and radial distribution networks. Interconnected power networks are predominantly in the CBD and urban areas of Darwin and Alice Springs, while radial networks are primarily in the rural areas of these larger centres and the smaller regional networks of Katherine and Tennant Creek.

Radial networks are supplied from one source, with little opportunity for interconnection with other circuits for security in the event of an interruption. Thus the number and duration of interruptions are generally higher for radial than interconnected distribution networks.

Urban areas in Darwin and Alice Springs are predominantly fed from 11kV underground and overhead distribution feeders. Rural areas in the larger centres, as well as the smaller regional networks of Katherine and Tennant Creek, are predominantly fed from 22kV overhead distribution feeders.

Interconnected Distribution Networks

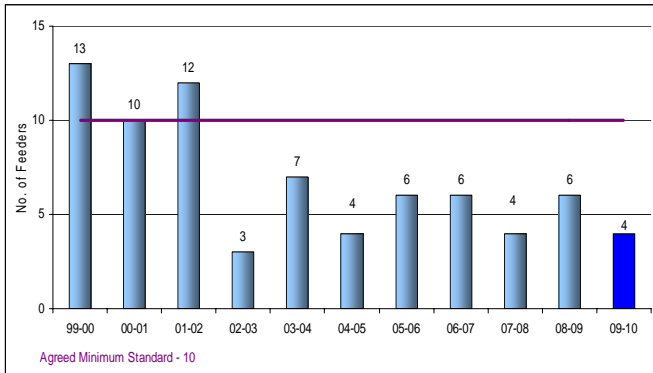
(a) the number of feeders that experience more than 15 interruptions per year

Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin-Urban	10	0	0	0	4	4
Alice Springs	4	0	0	3	0	3

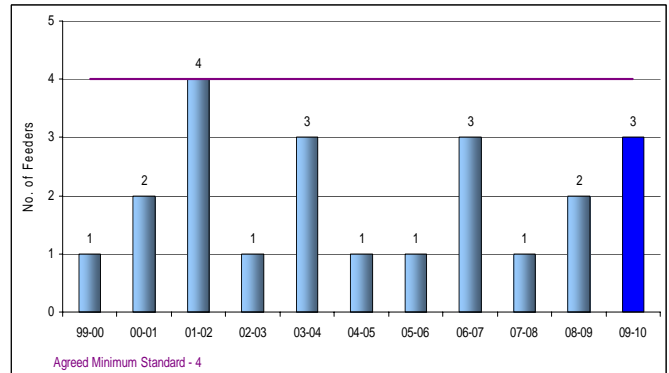
In 2009-10, Power and Water met the agreed minimum standard in both the Darwin-Urban and Alice Springs regions.

Graphs 50 to 51 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.

Graph 50: Darwin-Urban – Historical Performance



Graph 51: Alice Springs – Historical Performance



The feeders that experienced more than 15 interruptions in the Darwin-Urban region were 11BE13 Kormilda, 11CA13 Wanguri, 11CA23 Moil and 11SN01 Fannie Bay. The 11BE13 Kormilda feeder was also a poorly performing feeder in 2008-09.

The feeders that experienced more than 15 interruptions in the Alice Springs region were 22RG13 Brewer 1, 22RG04 Brewer 2 and 22RG09 Farms. The 22RG13 Brewer 1 and 22RG04 Brewer 2 feeders were also poorly performing feeders in 2008-09.

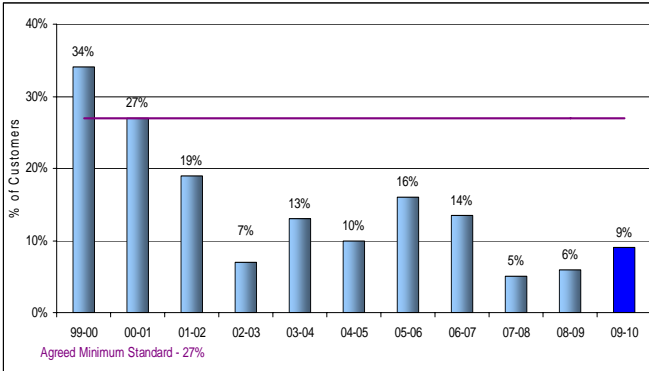
(b) the percentage of consumers supplied by feeders that experience more than 15 interruptions per year

Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin-Urban	27%	0%	0%	0%	9%	9%
Alice Springs	10%	0%	0%	24%	24%	24%

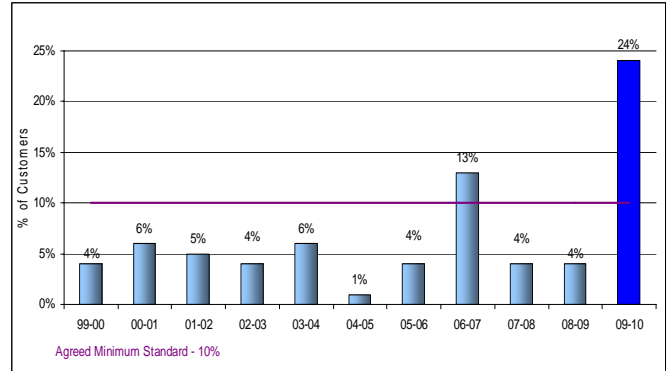
Power and Water met the agreed minimum standard in the Darwin-Urban region but did not achieve the standard for this indicator in the Alice Springs region. The three most significant outages for Alice Springs resulted from an under frequency load shed, a bird strike on an overhead conductor and an 11kV feeder outage with no cause found.

Graphs 52 to 53 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 52: Darwin-Urban – Historical Performance



Graph 53: Alice Springs – Historical Performance



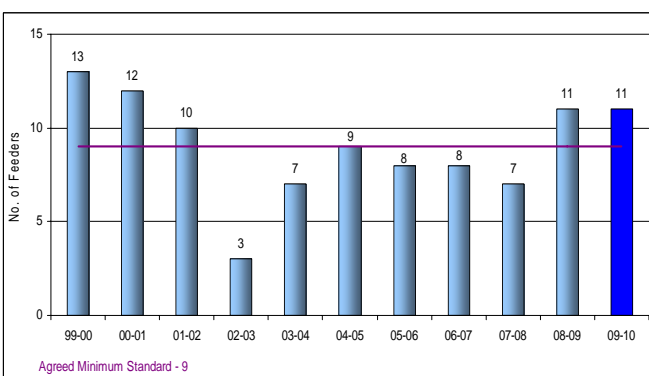
(c) the number of feeders that experience more than 1,500 minutes of interruptions per year

Region	Agreed Minimum Standard	Power and Water’s Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin-Urban	9	1	0	3	7	11
Alice Springs	4	0	1	1	2	4

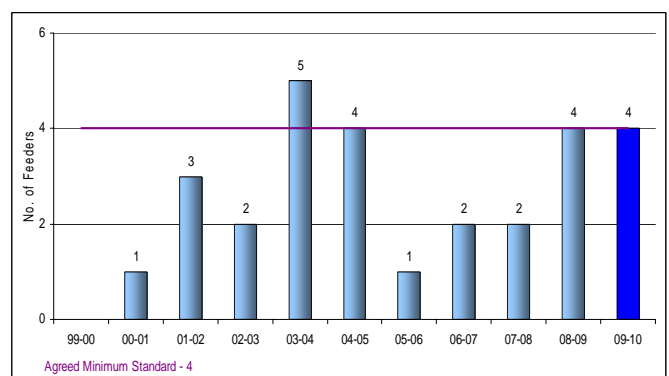
Power and Water did not achieve the standard for this indicator in the Darwin-Urban region, and was in-line with the standard in Alice Springs. The three most significant outages for Darwin-Urban resulted from an under frequency load shed caused by lightning and electrical storms on 30 January 2010.

Graphs 54 to 55 show Power and Water’s historical performance for the number of feeders that experience more than 1,500 minutes of interruptions per year on interconnected distribution networks for the Darwin-Urban and Alice Springs regions.

Graph 54: Darwin-Urban – Historical Performance



Graph 55: Alice Springs – Historical Performance



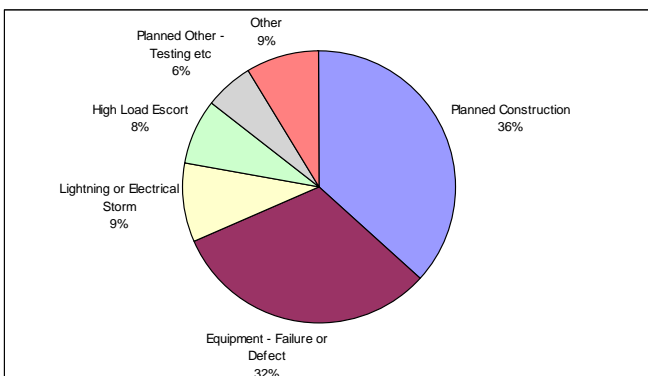
Darwin-Urban > 1,500 minutes or > 15 interruptions

Length (km)	Feeder	Duration	Interruptions
16.6	11SN01 Fannie Bay	1,646	18
15.7	11CA23 Moil	≤ 1,500	17
36.6	11BE13 Kormilda	1,729	16
28.7	11CA13 Wanguri²	1,628	16
Unavailable	11CA24 Parer	6,767	≤ 15
10.4	11BE06 Karama 1	1,893	≤ 15
14.5	11BE10 Karama 2	1,526	≤ 15
11.9	11CA25 Brinkin	2,078	≤ 15
23.1	11SN02 Bagot	1,588	≤ 15
13.3	11SN05 Maranga	1,604	≤ 15
4.6	11SN08 Winnellie	2,290	≤ 15
10.1	11SN19 Ludmilla	2,782	≤ 15

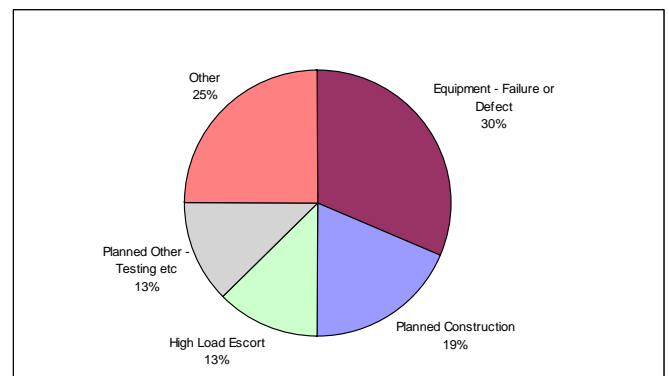
* Bold type indicates consecutively poorly performing feeder. ** Data cleansing due to alignment of Power and Water's feeder lengths with the ESAA definition has resulted in feeder lengths varying from 2008-09 Standards of Service Report.

Of the outages reported in 2009-10 in the Darwin-Urban region, three feeders were also poor performing in 2008-09 (highlighted in bold type in the above table). Graphs 56 to 59 illustrate the main causes of outages that contributed to these poorly performing feeders in the Darwin-Urban region.

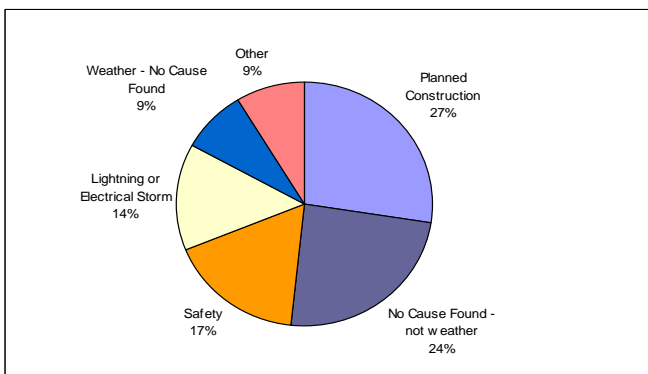
Graph 56: 11BE13 Kormilda: > 1500 Minutes



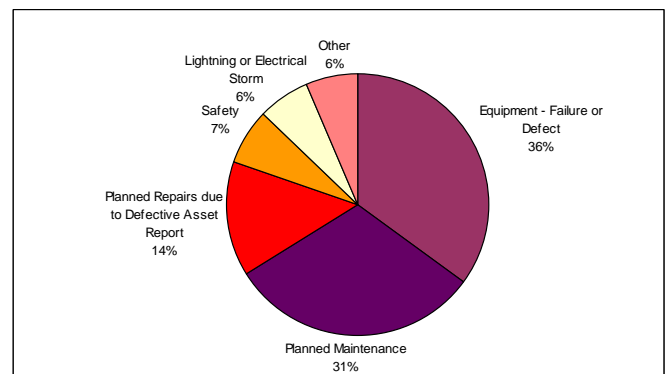
Graph 57: 11BE Kormilda: > 15 Interruptions



Graph 58: 11CA13 Wanguri: > 1500 Minutes



Graph 59: 11BE06 Karama 1: > 1500 Minutes



² Feeder has been re-named. Previously known as 11CA19 Wanguri.

Work on the 11BE13 Kormilda feeder in the last financial year to improve reliability included the upgrading of an air break switch to a more reliable gas break switch and the reconfiguration of the HV network to accommodate road works and high loads on Berrimah road. The substation connected to the 11CA13 Wanguri feeder had been identified as a priority for replacement and was replaced in 2009-10, which will contribute to improved reliability in the future. Reliability works on the 11BE06 Karama feeder in 2009-10 included the general maintenance and replacement of distribution transformers.

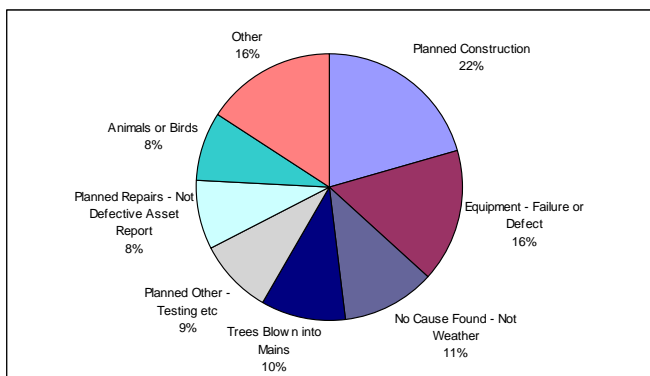
Alice Springs > 1,500 minutes or > 15 interruptions

Length (km)	Feeder	Duration	Interruptions
64.7	22RG13 Brewer 1	2,619	33
97.9	22RG04 Brewer 2	2,818	33
17.7	22RG09 Farms	1,560	21
25.8	11RG06 Sadadeen	3,694	≤ 15

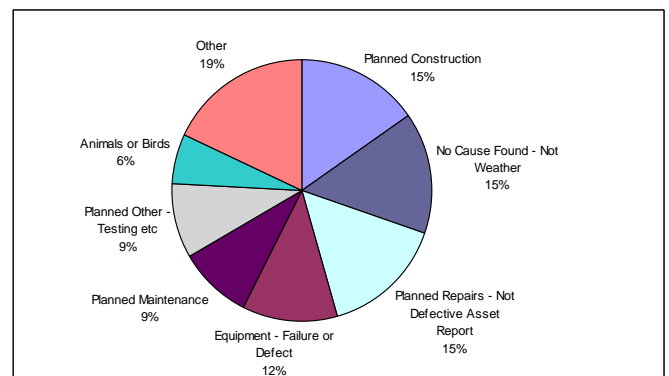
* Bold type indicates consecutively poorly performing feeder. ** Data cleansing due to alignment of Power and Water feeder lengths with the ESAA definition has resulted in feeder lengths varying from 2008-09 Standards of Service Report

In the Alice Springs region, two Brewer feeders have continued to perform below the standard (highlighted in bold type in the above table). However, the performance of these feeders has improved from the previous year. Graphs 60 to 63 illustrate the main causes of outages that contributed to these poorly performing feeders in the Alice Springs region.

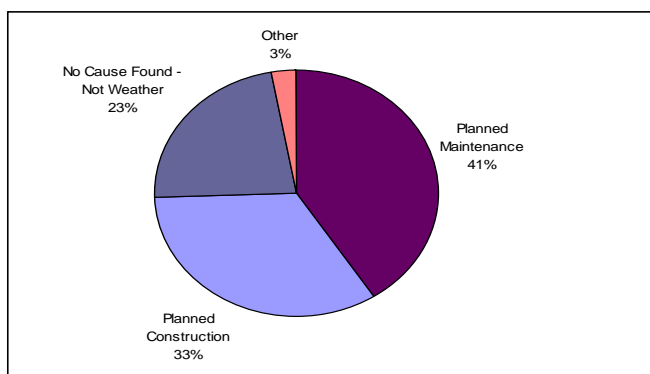
Graph 60: 22RG13 Brewer 1: > 1500 Minutes



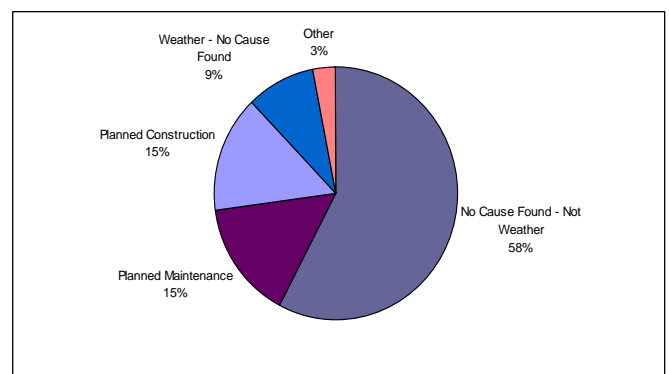
Graph 61: 22RG13 Brewer 1: > 15 Interruptions



Graph 62: 22RG04 Brewer 2: > 1500 Minutes



Graph 63: 22RG04 Brewer 2: > 15 Interruptions



Work on the 22RG13 Brewer 1 feeder to improve reliability included the installation of fuses and cross arms as part of planned maintenance and repairs. Reliability works on the

22RG04 Brewer 2 feeder in 2009-10 included the installation of bird protection and the changing over of HV crossarms from steel to fibreglass.

Radial Distribution Networks

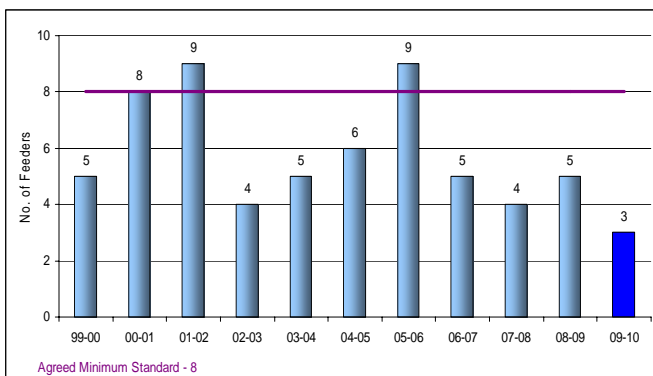
(a) the number of feeders that experience more than 27 interruptions per year

Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin-Rural	8	1	0	0	2	3
Katherine	7	1	0	0	0	1
Tennant Creek	3	0	0	0	1	1

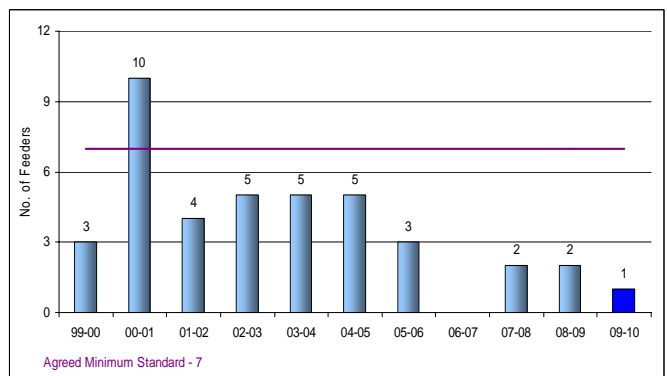
Power and Water met the agreed minimum standard in 2009-10 in each of the regions for this indicator.

Graphs 64 to 66 show Power and Water's historical performance for this indicator for the Darwin-Rural, Katherine and Tennant Creek regions.

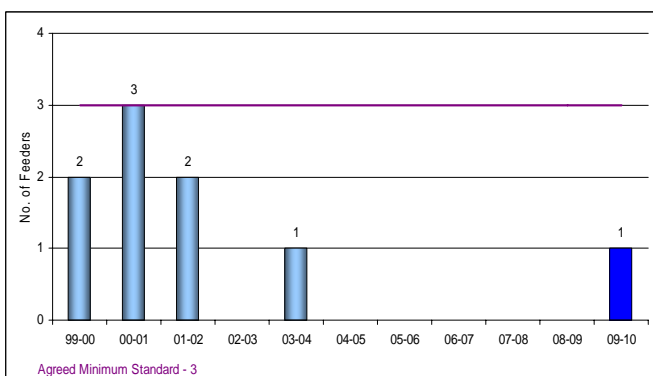
Graph 64: Darwin-Rural – Historical Performance



Graph 65: Katherine – Historical Performance



Graph 66: Tennant Creek – Historical Performance



The feeders that experienced more than 27 interruptions in the Darwin-Rural region were 22HD402 Lambells, 22MA07 Acacia and 22MM13 Dundee. The 22MA07 Acacia feeder was also a poorly performing feeder in 2008-09.

The feeder that experienced more than 27 interruptions in the Katherine region was 22PK07 Mataranka. The 22PK07 Mataranka feeder was also a poorly performing feeder in 2008-09.

The feeder that experienced more than 27 interruptions in the Tennant Creek region was the 22TC202 Feeder 2.

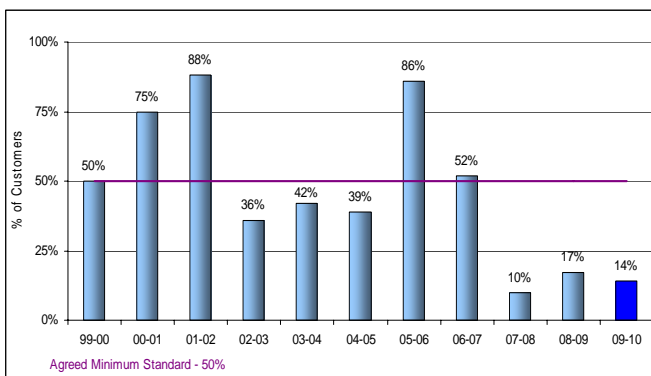
(b) the percentage of consumers supplied by feeders that experience more than 27 interruptions per year

Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin-Rural	50%	5%	5%	5%	14%	14%
Katherine	50%	3%	3%	3%	3%	3%
Tennant Creek	32%	0%	0%	0%	12%	12%

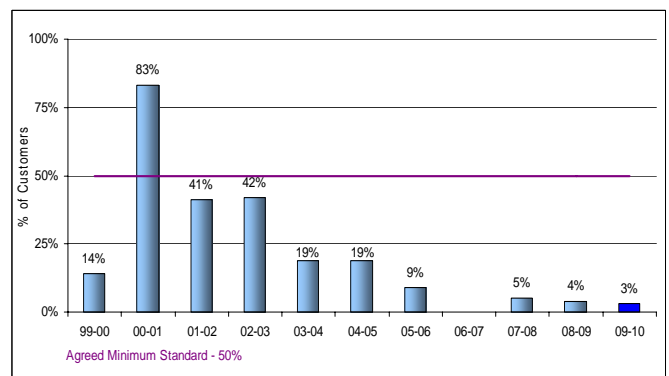
In 2009-10, Power and Water met the agreed minimum standard in each of the regions.

Graphs 67 to 69 show Power and Water's historical performance for this indicator for the Darwin-Rural, Katherine and Tennant Creek regions.

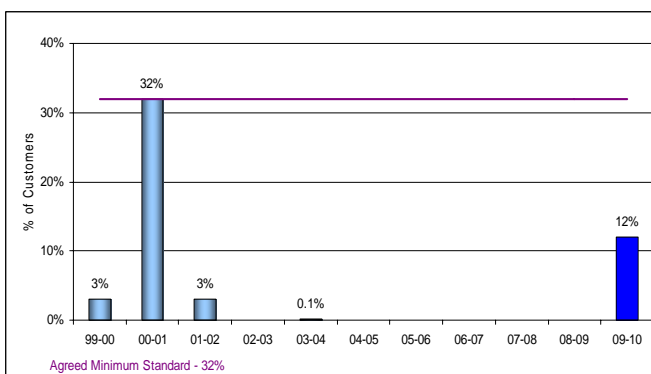
Graph 67: Darwin-Rural – Historical Performance



Graph 68: Katherine – Historical Performance



Graph 69: Tennant Creek – Historical Performance



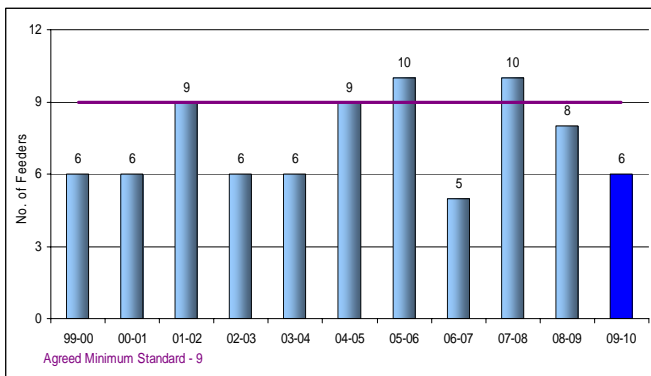
(c) the number of feeders that experience more than 2,500 minutes of interruptions per year

Region	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin-Rural	9	0	1	4	1	6
Katherine	6	0	1	0	0	1
Tennant Creek	3	0	0	1	0	1

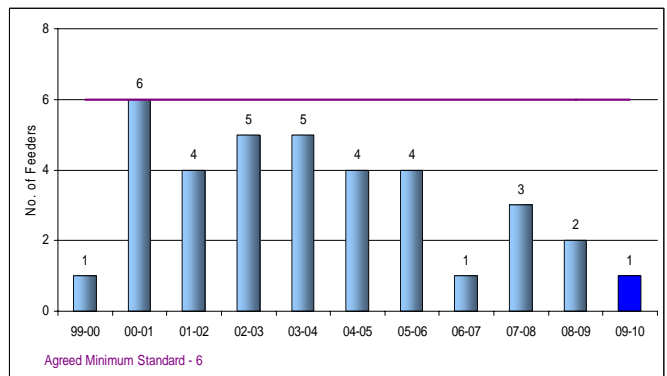
Power and Water was within the agreed minimum standard in each of the regions.

Graphs 70 to 72 show Power and Water's historical performance against this indicator.

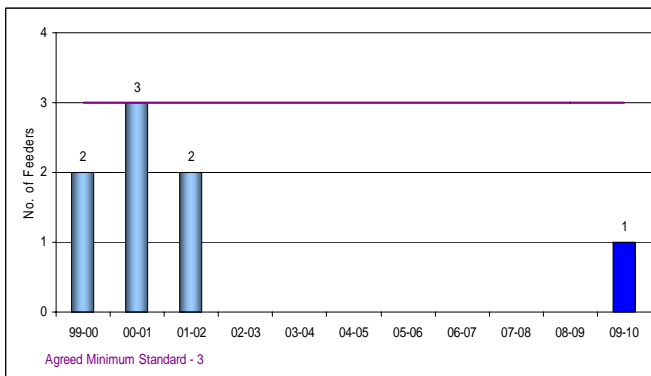
Graph 70: Darwin-Rural – Historical Performance



Graph 71: Katherine – Historical Performance



Graph 72: Tennant Creek – Historical Performance



The number of Darwin-Rural and Katherine feeders that experienced more than 2,500 minutes of interruptions in 2009-10 was within the agreed minimum standard by 3 and 5 feeders respectively, and showed improvement on the previous year. The number of Tennant Creek feeders that experienced more than 2,500 minutes of interruptions in 2009-10 was within the agreed minimum standard by 2 feeders.

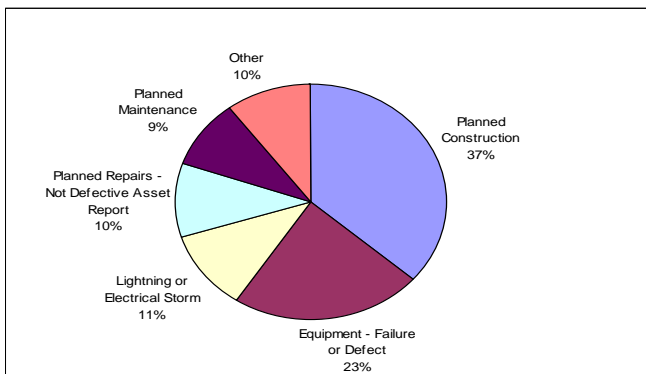
Darwin-Rural > 2,500 minutes or > 27 interruptions

Length (km)	Feeder	Duration	Interruptions
59.1	22HD402 Lambells	2,847	41
189.1	22MM13 Dundee	3,551	32
58.2	22MA07 Acacia	3,016	29
102.0	22PA101 Howard Springs	6,690	≤ 27
97.0	22MA03 Adelaide River	3,201	≤ 27
44.3	22MR103 Mt Bundy	2,684	≤ 27

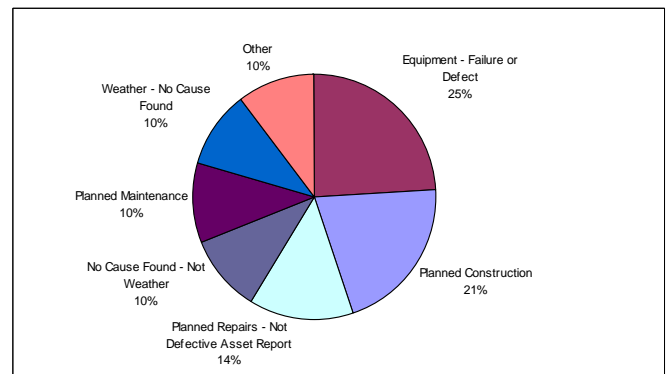
* Bold type indicates consecutively poorly performing feeder. ** Data cleansing due to alignment of Power and Water feeder lengths with the ESAA definition has resulted in feeder lengths varying from 2008-09 Standards of Service Report

Of the outages reported in 2009-10 in the Darwin-Rural region, three feeders were also poor performing in 2008-09. Graphs 73 to 76 illustrate the main causes of outages that contributed to these poorly performing feeders in the Darwin-Rural region.

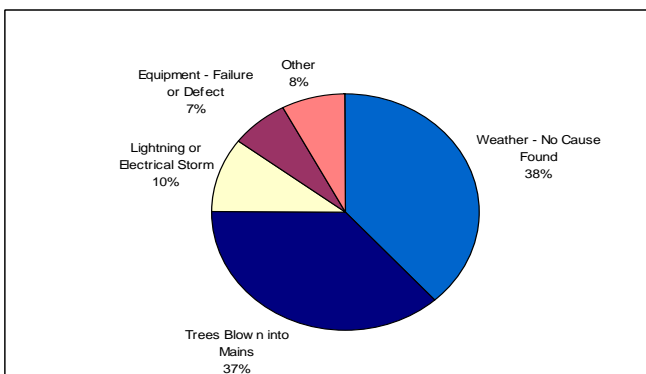
Graph 73: 22MA07 Acacia: > 2500 Minutes



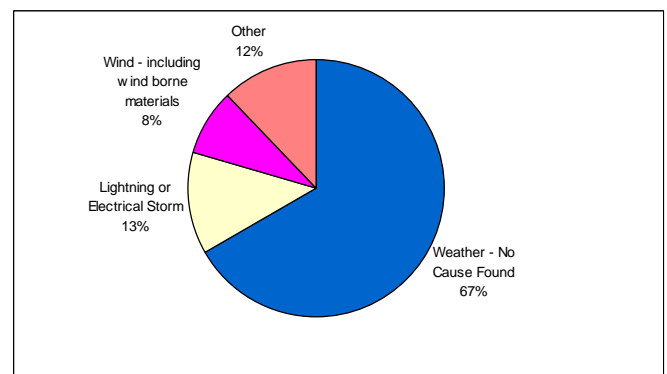
Graph 74: 22MA07 Acacia: > 27 Interruptions



Graph 75: 22MA03 Adelaide River: > 2500 Minutes



Graph 76: 22MR103 Mt Bundy: > 2500 Minutes



Reliability works on the 22MA07 Acacia feeder in 2009-10 included tree trimming and general maintenance and repairs. In 2009-10, approximately 5km of overhead conductor was upgraded on the 22MA03 Adelaide River feeder and work on the 22MR103 Mt Bundy feeder was related to general repairs.

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.

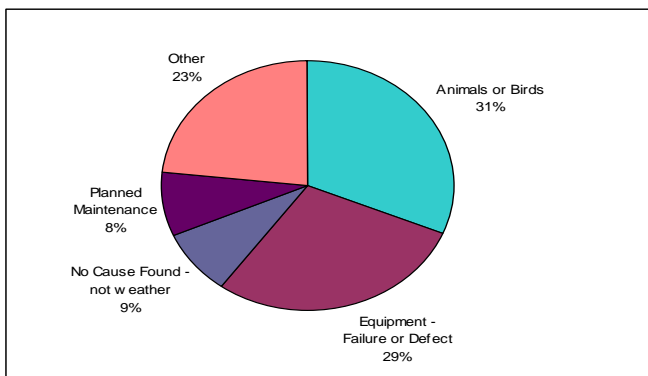
Katherine > 2,500 minutes or > 27 interruptions

Length (km)	Feeder	Duration	Interruptions
291.4	22KP07 Mataranka	4,907	69

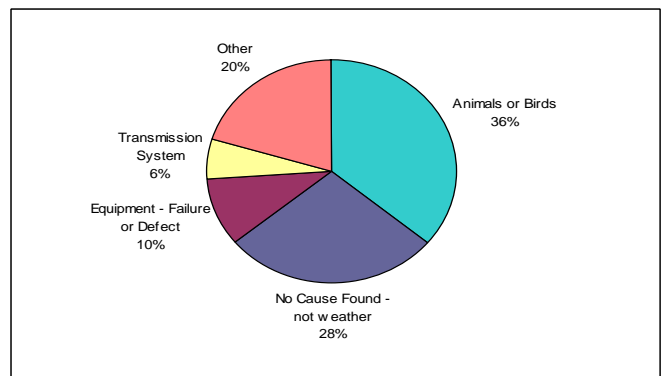
* Bold type indicates consecutively poorly performing feeder. ***Data cleansing due to alignment of Power and Water feeder lengths with the ESAA definition has resulted in feeder lengths varying from 2008/09 Standards of Service Report

The 22KP07 Mataranka feeder was poorly performing in both 2008-09 and 2009-10. Graphs 77 to 78 illustrate the main causes of outages that contributed to this poorly performing feeder in the Katherine region.

Graph 77: 22KP07 Mataranka: > 2500 Minutes



Graph 78: 22KP07 Mataranka: > 27 Interruptions



In the last couple of years many of the outages in this area were due to 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.

A colony of bats in the Fox Road area south of Katherine caused a number of animal related outages in the second half of 2009. Extensive work has been undertaken to improve reliability in this area. These works include:

- The installation of a gas circuit recloser on Ross Road;
- The replacement of steel overhead transformer fuse arms with insulated overhead transformer fuse arms; and
- The installation of transformer fuse animal guards.

The Jilkmिंगgam spur line on the Mataranka feeder has been severely affected by bats during the first half of 2010. The installation of wildlife protection on this tee-off is in progress and a sectionaliser was recently installed to minimise customers affected by line outages.

The complete installation of bat protection along the entire feeder is in progress, along with the installation of additional sectionalisers to minimise the affect of line outages.

Throughout 2009-10, Power and Water continued to upgrade HV insulators on a number of rural feeders in the Darwin and Katherine regions and replaced 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.

Tennant Creek > 2,500 minutes or > 27 interruptions

Length (km)	Feeder	Duration	Interruptions
248.6	22TC202 Feeder 2	2,963	28

No feeders in Tennant Creek have been consecutively reported as poorly performing feeders.

2.4 Network Reliability Initiatives And Action

A great deal of change in the asset management practices of Power Networks is currently underway. Asset failures at Casuarina Zone Substation in October 2008 have resulted in the development and execution of a specific maintenance project termed the Remedial Asset Management Plan (RAMP). This plan is to provide immediate and specific maintenance for many zone substations and transmission and distribution assets.

The Remedial Works Plan is progressing in line with the recommendations of the Davies Report. Over the past year the following milestones have been completed:

- Condition-based maintenance has been carried out on all zone substations assets where appropriate;
- A condition assessment and remedial program is well advanced, with crews on many occasions working through the night to access equipment safely and with minimum disruption to customers;
- Training has been completed on new test gear and technically expert training managers have been appointed;
- A wide ranging restructure of the Power Networks business has continued and key roles have been filled;
- A leadership program and regular staff forums have commenced in Power Networks to improve collaboration with the workforce;
- Three permanent switchboards have been installed at the Casuarina Zone Substation;
- Work at Pine Creek included the accelerated replacement of the failing Pine Creek 132/22kV transformer and remediation of the 132kV Circuit Breakers;
- Accelerated remediation of the failed Batchelor 66/22kV transformer and the subsequent discovery of the 22kV switchboard abnormal cable termination and bus bar installation; and
- The installation of a 22kV capacitor to relieve Generation operations at Katherine has continued.

Improving Distribution Network Reliability

In addition to the RAMP program, the development of longer term asset management and maintenance practices has progressed significantly during 2009-10. The development of the detailed maintenance plan includes time based maintenance (TBM) tasks, as well as identifying specific and refurbishment maintenance tasks.

The TBM plan was completed through the development of asset specific strategies, in consideration of corporate knowledge such as known defects, benchmarked against other utilities and then scheduled in consultation with RAMP and the service delivery group. The implementation of this plan includes the use of detailed work instructions and maintenance sheets to capture asset condition and maintenance history. This has enabled the identification of higher risk assets that require specific maintenance tasks and/or minor refurbishment and replacement.

Key reliability related projects include:

- The programmed replacement of BBC medium voltage distribution switchgear;
- The programmed replacement of oil ring main units;
- Installation of dehumidifiers in at-risk substations;
- The programmed replacement of 132kV pneumatically operated circuit breakers on the DKTL;
- Oil filtering, regeneration and reconditioning of selected power transformers;
- The feeder upgrade program continues with a stronger focus on replacing insulators and crossarms, along with bat protection initiatives. Feeders will be targeted by identifying those with lower reliability based on performance and asset verification information;
- Vegetation issues in the rural area have been significantly addressed. In particular, the introduction of the Jarrafe insulated trimmer has improved the time and effectiveness of tree trimming activities; and
- Verification of data within Power and Water systems is nearing completion for the overhead distribution assets. This will enable Power and Water to better link performance to asset types and components and develop plans that address issues in specific locations.

Through the process of developing the maintenance plan, Power Networks has developed a broader understanding of asset life cycles and industry wide asset related issues, as well as a better awareness of the limitations of the existing systems and the available asset data. Based on this, Power Networks are also reviewing the current capital investment program with a stronger focus on the timely replacement of at-risk assets in order to achieve a more reliable network.

System Black Incident - 30 January 2010

On 30 January 2010, a lightning strike hit the two 132kV lines from Channel Island Power Station, leading to a total system black of the DKTL system. Restoration commenced

immediately, with Katherine customers returned within the hour and the last customers in Darwin connected 10 hours later. The average interruption time for customers was 5 hours.

The Managing Director of Power and Water established a System Black Review Committee to identify the technical and operational sequence of events and to report on improvements and recommendations. The System Controller also conducted an independent review into the incident and reported his findings in the Report Arising from Black System of January 2010. Copies of both reports have been provided to the Commission. Power and Water has since updated the Commission on Power and Water's actions and plans for responding to the recommendations in the two reports.

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 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Northern	n/a	148	224	255	149	776
Katherine	n/a	84	62	138	33	317
Tennant Creek	n/a	8	7	61	1	77
Southern	n/a	22	26	34	32	114
All Customers	n/a	262	319	488	215	1284

In 2009-10, voltage event complaints totalled 1284 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 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
All Customers	2%	1.0%	0.4%	0.5%	0.3%	0.5%

Power and Water met the agreed minimum standard and has done so for the last four 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 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
All Customers	10%	6.2%	4.2%	8.3%	15.1%	7.9%

Power and Water met the agreed minimum standard.

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 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
All Customers	35%	69.5%	70.0%	67.0%	70.4%	69.4%

The agreed minimum standard for new connections not provided to new subdivisions was not met in 2009-10. Where minor extensions or augmentation is necessary, a longer time frame is required to procure large items of distribution equipment, procure contract resources and arrange internal resources for final connection to the network.

(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 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
All Customers	58,679	20,157	23,946	25,460	22,051	91,614
All Customers	63%	63.2%	65.1%	62.8%	62.1%	63.3%

The minimum standard set for the number of telephone calls responded to within 20 seconds was met in 2009-10. This is the first time in three years that the Call Centre has met the minimum standard. It is a particularly good result as Call Centre performance was significantly impacted by unforeseen internal events throughout the year. Despite these constraints, the annual performance target was met as a result of continuous improvement initiatives.

(c) the number of customer complaints

NT Wide	Agreed Minimum Standard	Power and Water's Actual Performance				
		1 st Quarter Jul 09 to Sept 09	2 nd Quarter Oct 09 to Dec 09	3 rd Quarter Jan 10 to Mar 10	4 th Quarter Apr 10 to Jun 10	Annual 2009-10
Darwin		404	474	544	408	1830
Katherine		20	43	59	38	160
Tennant Creek		12	21	19	18	70
Alice Springs		101	81	136	99	417
All Customers	5,146	537	619	758	563	2477

Power and Water met the agreed minimum standard. As required by the Code, Power and Water reports complaints in accordance with the Australian Standard (ISO10002-2006)³ 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."

To further improve its service performance, Power and Water engages a specialist market research company to conduct monthly customer surveys.

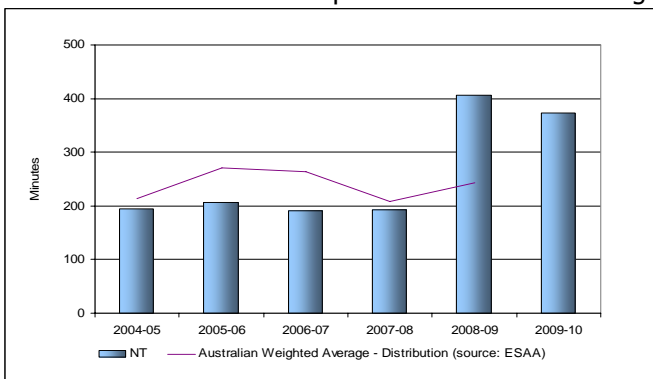
³ The Code refers to Australian Standard 4269:1995, defined as "any expression of dissatisfaction with a product or service offered or provided". This standard has been superseded by ISO10002-2006.

5. NATIONAL BENCHMARKING

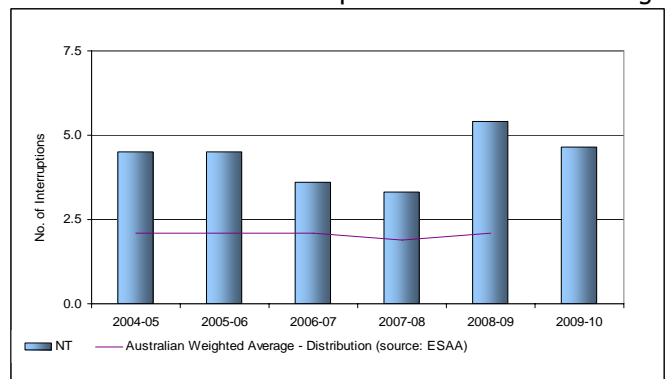
5.1 Unadjusted Network Performance

Graphs 79 to 81 compare Power and Water’s historical unadjusted network performance to the Australian weighted average for distribution networks (as published in Energy Supply Association of Australia’s (ESAA) *Electricity Gas Australia* annual publications).

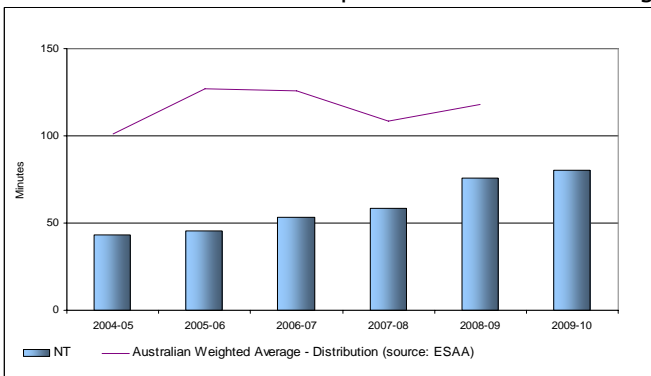
Graph 79: Unadjusted NT SAIDI – Historical Performance compared to Australian Average



Graph 80: Unadjusted NT SAIFI – Historical Performance compared to Australian Average



Graph 81: Unadjusted NT CAIDI – Historical Performance compared to Australian Average



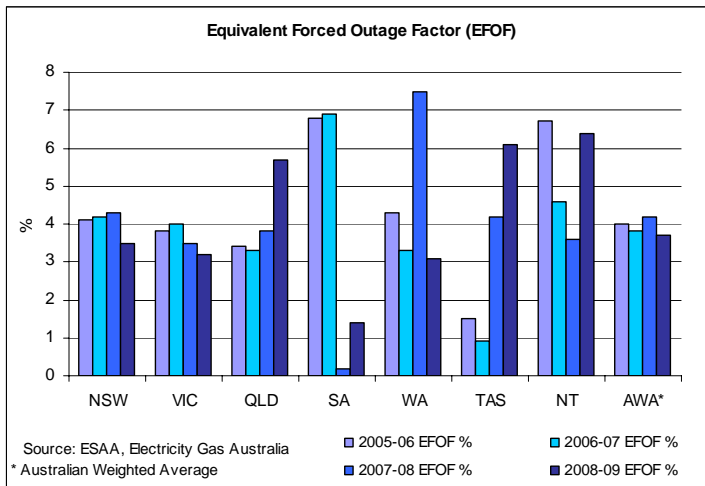
Note: ESAA Australian weighted average figures for 2009-10 have not yet been published.

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 six years to 2009-10 being greater than the national average. Despite this, the duration of outages (SAIDI) over the same period has been less than the national average, with the exception of 2008-09 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. 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.

5.2 Generation Performance

Graph 82 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 82: Equivalent Forced Outage Factor (EFOF) - Historical Performance compared to Australian Average



Note: ESAA Australian weighted average figures for 2009-10 have not yet been published.

Outages on the combined cycle block (sets 4, 5 and 6) resulted in a higher Equivalent Forced Outage Factor (EFOF) than the Australian weighted average in 2008-09.

Generation sets non-financial performance benchmarks based on the unique operating conditions throughout the Northern Territory and good practice in the electricity industry. The targets, while ambitious, also reflect a balance between setting performance benchmarks that will see increasing performance improvement and the economics of delivering substantial improvements in service standards. Reflective of the capital investment program, more plant will now be able to be released for programmed maintenance enabling major plant life extensions which will drive the reduction in EFOF. Weddell and Owen Springs Power Station targets are in line with agreed Channel Island Power Station indicators. Significant works and the improvement of fuel supply at Weddell in 2009-10 have significantly improved the reliability and availability of these units.

6. 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.