Service Standard Performance Report

Year ending 30 June 2013

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Table of contents

Table of figures and tables

1 Executive Summary

Western Power publishes the Service Standard Performance Report annually to detail its performance against the 17 Service Standard Benchmarks (SSB) defined in Western Power's current approved Access Arrangement (AA3).

This information is published in accordance with the Electricity Networks Access Code 2004 and the requirements of Western Power's electricity transmission and distribution licences.

This report covers the year ending 30 June 2013.

Introduction

Western Power's purpose is to connect people with electricity safely, reliably and affordably.

As a regulated business, it is required to comply with a broad range of obligations covering many facets of its activity. Western Power recognises that compliance programs are critical to providing stakeholders with a transparent view of its performance in key areas.

This report contributes to this transparency by presenting information on Western Power's reliability performance against levels agreed for its third Access Arrangement (AA3) ending 30 June 2017.

Reliability of supply

Reliability of supply reflects the service Western Power provides to its customers by measuring the performance of its transmission and distribution networks.

As part of the AA3 Further Final Determination, Western Power is required to:

- Maintain service at levels consistent with historical averages of the three years to 30 June 2012.
- Improve service levels only where this is of value to the customer and can be done efficiently.

The minimum levels of service required of Western Power are defined by 17 **Service Standards Benchmarks** (SSB) covering distribution and transmission reliability and security of supply, call centre and streetlight performance.

Western Power's AA3 Distribution and Transmission licences require it to:

- Meet the service levels defined by the SSBs.
- Publish the Service Standard Performance Report (this Report) annually on SSB performance.

The impact of investment on service level performance

Western Power's AA3 network investment program has a number of fundamental drivers, such as safety, growth, security of supply, asset condition and reliability.

Reliability service standards performance is influenced by all of these investment drivers, particularly those activities associated with network asset maintenance and replacement.

It is important to note that there can be a lag of up to 12 months before service levels begin to reflect the benefits of these works. This is particularly true for long feeders, due to number of assets involved.

Performance summary

- Average service levels were maintained in many areas of the network, due largely to increased investment in the maintenance and replacement of overhead assets, particularly wood poles. Areas in which this was not the case require targeted remediation.
- Performance surpassed required levels in 16 of the 17 defined SSBs. The sole benchmark not met was "Rural Long System Average Interruption Frequency Index (SAIFI)", which applies to the distribution network. (See "Weather events" below for additional information.)
- Performance exceeded target for 9 of the 14 SSBs subject to the Service Standard Adjustment Mechanism.
- Circuit availability and call centre performance improved, particularly in relation to weather-related incidents.
- CBD and Urban (Perth metropolitan) reliability improved.
- Streetlight response and repair times within the metropolitan area improved.

Environmental factors

Environmental factors can influence network reliability levels significantly in rural areas.

Weather events

Approximately 80% of Western Power's licence area is supplied by long rural feeders (Rural Long network). These are frequently subject to varying environmental conditions and impacts that are predominantly beyond Western Power's control. Although the service standard benchmarks recognise exclusions of major events, many other weather-related events affect the performance of the network, particular in more remote regions.

For example, the significant increase in lightning activity (compared to the previous three years) resulted in more interruptions to supply. This affects reliability in rural areas more than any other factor and was largely responsible for failing to meet the Rural Long SAIFI SSB.

Strong wind conditions continued to have an impact on overhead assets, although the influence of windborne debris remained relatively constant during the reporting period.

Overhead asset failures

The frequency of overhead asset and equipment failures remained consistent with levels reported over the previous four years.

Fauna or vegetation contacting overhead assets

- While the frequency of vegetation contacting the overhead assets was relatively consistent with levels reported for the previous four years, some improvement was observed over the reporting period.
- While the frequency of birds and animals contacting the overhead assets was relatively consistent with levels reported for the previous four years, some improvement was observed over the reporting period.

Managing poor service performance

Western Power continuously monitors reliability performance to highlight those areas of the network not meeting the required standards.

These areas are subject to detailed analysis and investigation to identify the requirements for achieving and maintaining acceptable levels of performance.

Rural short and rural long feeders continue to present the greatest reliability challenges and are subject to a range of remediation activities, including detailed overhead line patrols and subsequent maintenance works.

Based on the network investments planned for AA3, all SSBs other than Rural Long SAIFI are likely be maintained throughout AA3.

Due to major storm events after the end of the reporting period, Rural Long SAIFI compliance is now unlikely until after 30 June 2015.

2 Background

In accordance with its electricity transmission licence (ELT2)[1] and electricity distribution licence (ELD1)[2] and the Electricity Networks Access Code 2004[3] (Access Code), Section 11.1, Western Power[4] must provide *reference services* at a service standard, at least equivalent to the service standard benchmarks set out in the access arrangement.

The Access Code, Section 11.2, requires the Economic Regulation Authority (Authority)[5] to publish Western Power's actual service standards performance against the service standard benchmarks.

Accordingly, with respect to Access Code, Section 11.4 a request[6] has been received from the Authority for Western Power to provide, by 23 September 2013, Western Power's Service Standard Performance Report (this report), in the format prescribed within the request.

The purpose of this report is to provide relevant information on the actual service standards performance against the service standard benchmarks contained in Western Power's third Access Arrangement (AA3)[7], for the 12 month reporting period, 1 July 2012 to 30 June 2013 (2012/13 period).

This report is the first year of reporting service standards performance for AA3.

The Western Power Network is defined by the Access Code as the portion of the South West Interconnected Network (SWIN) that is owned by the Electricity Network Corporation (Western Power). For the purposes of this report and in referencing the Access Code, EDL1, ETL2 and AA3, the terms distribution network and transmission network are used throughout this report.

The Western Power Network covers a geographic area from Kalbarri down to Albany, and from Perth through to Kalgoorlie (Figure 1) of approximately 254,920 square kilometres, much of which is isolated and unpopulated. It has a diverse asset base which includes more than 800,000 poles and almost 100,000 circuit kilometres of power lines.

The distribution network consists of 748 feeders, connected to the transmission network at 154 terminal and zone substations, with approximately 66,000 distribution substations providing an electricity supply to over one million customers and approximately 237,670 streetlights.

[1] Electricity Industry Act 2004, Electricity Transmission Licence, Electricity Networks Corporation (t/a Western Power) ELT2, Version 6, 19 September 2012

[2] Electricity Industry Act 2004, Electricity Distribution Licence, Electricity Networks Corporation (t/a Western Power) ELD1, Version 7, 1 January 2012

[3] Electricity Industry Act 2004, Electricity Networks Access Code 2004 published by Western Australian Government

[4] Electricity Networks Corporation (t/a Western Power) ABN 18540492861

[5] Economic Regulation Authority established by the Economic Regulation Authority Act 2003

[6] Letter dated 3 July 2013 (Authority Reference D108364) with attached Service Standard Performance Report Template

[7] Western Power's current approved Access Arrangement (AA3) for 1 July 2012 to 30 June 2017

Figure 1: Western Power Network licence area

3 How to read this report

In accordance with the Authority's Service Standard Performance Report Template:

Section 3 outlines and describes the *reference services* provided by Western Power relevant to the Access Code, Section 11.1, within the AA3 period;

Section 4 outlines and describes the service standard benchmarks relevant for the AA3 period;

Section 5 outlines and describes the actual performance against the AA3 service standard benchmarks for the first year of AA3, namely 1 July 2012 to 30 June 2013 (2012/13 period);

Sections 6 outlines and describes the recognised exclusions defined for the AA3 service standard benchmarks;

Sections 7 outlines and describes the Service Standards Adjustment Mechanism (SSAM) relevant for AA3;

Appendix A provides charts for each of the AA3 service standard benchmarks and targets with the trend of historical performance for the preceding five year period.

4 Reference Services

Under its AA3 and in accordance with the Access Code Sections 5.1 and 11.1, Western Power provides reference services for entry, exit and bi-directional services.

There are:

- 11 *reference services* at *network exit points* for *users* (*exit services*);
- 2 *reference services* at *network entry points* for *users* (*entry services*); and
- 4 bi-directional *reference services* at *network entry/exit points* (*bi-directional services*).

4.1 Reference Services for network entry points

An *entry service* is a *covered service* provided by Western Power at an *entry point* under which the *user* may transfer electricity into the network at the *entry point*.

An *entry point* is a point on a *covered network* identified as such in an *access contract* at which, subject to the *access contract*, electricity is more likely to be transferred into the network than transferred out of the network.

The following table lists the *entry point reference services*.

Table 1: Network *entry point reference services*

Reference Service		*Reference Service* Description
B1	Distribution *Entry Service*	An *entry service* combined with a connection service and a standard metering service at an *entry point* on the distribution system.
B2	Transmission *Entry Service*	An *entry service* combined with a connection service and a standard metering service at an *entry point* on the transmission system.

4.2 Reference Services for network exit points

An *exit service* is a *covered service* provided by Western Power at an *exit point* under which the *user* may transfer electricity out of the network at the *exit point*.

An *exit point* is a point on a *covered network* identified as such in an *access contract* at which, subject to the *access contract*, electricity is more likely to be transferred out of the network than transferred into the network.

The following table lists the *exit point reference services*.

Table 2: Network *exit point reference services*

Reference Service		*Reference Service* Description
A1	Anytime Energy (Residential) *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the low voltage (415 volts or less) distribution system.
A2	Anytime Energy (Business) *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the low voltage (415 volts or less) distribution system.
A3	Time of Use Energy (Residential) *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the low voltage (415 volts or less) distribution system.
A4	Time of Use Energy (Business) *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the low voltage (415 volts or less) distribution system.
A5	High Voltage Metered Demand *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the high voltage (6.6 kV or higher) distribution system.
A6	Low Voltage Metered Demand *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the low voltage (415 volts or less) distribution system.
A7	High Voltage Contract Maximum Demand *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the high voltage (6.6 kV or higher) distribution system
A8	Low Voltage Contract Maximum Demand *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the low voltage (415 volts or less) distribution system.
A9	Street lighting *Exit Service* (including streetlight maintenance)	An *exit service* combined with a connection service at an *exit point* on the low voltage (415 volts or less) distribution system for the purpose of public street lighting, plus the service of the provision and maintenance of the streetlight.
A10	Un-Metered Supplies *Exit Service*	An *exit service* combined with a connection service at an *exit point* on the low voltage (415 volts or less) distribution system.
A11	Transmission *Exit Service*	An *exit service* combined with a connection service and a standard metering service at an *exit point* on the transmission system.

4.3 Reference services for bi-directional network entry and exit points

A bi-directional service is a *covered service* provided by Western Power at a bidirectional point under which the *user* may transfer electricity into and out of the network.

A bi-directional point is a point on a *covered network* identified as such in an *access contract* at which, subject to the *access contract*, electricity is both transferred into the network and transferred out of the network.

The following table lists the bi-directional point *reference services*.

Table 1: Network bi-directional *reference services*

Reference Service		*Reference Service* Description
C1	Anytime energy (residential) bi-directional service	A bi-directional service combined with a connection service and a standard meter service at a bi-directional point on the low voltage (415 volts or less) distribution system.
C2	Anytime energy (business) bi-directional service	A bi-directional service combined with a connection service and a standard meter service at a bi-directional point on the low voltage (415 volts or less) distribution system.
C3	Anytime energy (business) bi-directional service	A bi-directional service combined with a connection service and a standard meter service at a bi-directional point on the low voltage (415 volts or less) distribution system.
C4	Time of use (business) bi-directional service	A bi-directional service combined with a connection service and a standard meter service at a bi-directional point on the low voltage (415 volts or less) distribution system.

5 Service standard benchmarks

Under its AA3 and in accordance with the Access Code Section 11.2, there are 17 *service standard benchmarks* which Western Power is required to monitor and meet. These measures, similar to those used throughout Australia, are set at minimum service levels, representing the service that will be achieved most of the time.

The *service standard benchmarks* (SSBs) and *service standard targets* (SSTs) were agreed with the Authority and set in November 2012, as part of the AA3 Final Determination, after the commencement of the AA3 period.

The Service Standards Adjustment Mechanism (SSAM) financial incentive scheme considers 14 of the 17 SSBs and provides rewards or penalties for performance against the SSTs.

The SSBs and SSTs were set on the basis of maintaining the levels of service performance throughout the AA3 period consistent with average service performance experienced by customers over the past 5 years (except for SAIDI and SAIFI measures, which were based on 3 years).

5.1 Distribution network service standards

For the *reference services* A1 to A10, B1 and C1 to C4, the *service standard benchmarks* are expressed in terms of:

- System Average Interruption Duration Index (SAIDI);
- System Average Interruption Frequency Index (SAIFI); and
- Call centre performance: – percentage of fault calls responded to in 30 seconds or less (after exclusions).

The SAIDI and SAIFI metrics are defined in accordance with the National Regulatory Reporting Requirements[8] (NRRR) and can be described as:

- SAIDI –Total number of minutes, on average, that a customer on a distribution network is without electricity in a year; and
- SAIFI – The average number of times a customer's electricity supply is interrupted per year

5.1.1 SAIDI

SAIDI, measured over a 12 month period, by NRRR definition is the sum of the duration of each customer interruption (customer minutes interrupted) - lasting more than one minute attributable solely to the distribution network (after exclusions), divided by the average of the total number of connected customers at the beginning and end of the reporting period.

The unit of measure is minutes per year.

The lower the minutes per year, the higher the level of service performance.

[8] National Regulatory Reporting for electricity distribution and retail businesses, Utility Regulators Forum discussion paper, March 2002 c Commonwealth of Australia

The following exclusions apply to SAIDI:

- a Major Event Day (MED) in accordance with IEEE1366-2003 definitions;
- interruptions shown to be caused by a fault or other event on the transmission network or a third party system (for instance, without limitation interruptions caused by an intertrip signal, generator unavailability or a customer installation);
- planned interruptions; and
- force majeure events.

The SSBs and SSTs expressed in terms of SAIDI for each year of the AA3 period are shown in Table 2.

Table 2: SAIDI SSBs and SSTs for each year ending 30 June

SAIDI	Minutes per year	
	SSB	SST
CBD	39.9	20.3
Urban	183.0	136.6
Rural Short	227.8	207.8
Rural Long	724.8	582.2

5.1.2 SAIFI

SAIFI, measured over a 12 month period, by NRRR definition is the total number of customer interruptions, lasting more than one minute, attributable solely to the distribution network (after exclusions), divided by the average of the total number of connected customers at the beginning and end of the reporting period.

The unit of measure is interruptions per year.

The lower the number of interruptions per year, the higher the level of service performance.

The exclusions for SAIDI discussed above, also apply to SAIFI.

The SSBs and SSTs expressed in terms of SAIFI for each year of the AA3 period are shown in Table 3.

Table 3: SAIFI SSBs and SSTs for each year ending 30 June

SAIFI	Interruptions per year	
	SSB	SST
CBD	0.26	0.14
Urban	2.12	1.36
Rural Short	2.61	2.27
Rural Long	4.51	4.06

5.1.3 Distribution network feeder classifications

The feeder classification, consistent with the NRRR, applied to Western Power's distribution network and used to report service standards performance in accordance with AA3 include: CBD; Urban; Rural Short; and Rural Long.

Definitions are provided in Table 4.

Table 4: Feeder classifications

Feeder Category	Description
CBD	A feeder supplying predominantly commercial, high-rise buildings, supplied by a predominantly underground distribution network containing significant interconnection and redundancy when compared to urban areas
Urban	A feeder, which is not a CBD feeder, with actual maximum demand over the reporting period per total feeder route length greater than 0.3 MVA/km.
Rural Short	A feeder which is not a CBD or urban feeder with a total feeder route length less than 200 km
Rural Long	A feeder which is not a CBD or urban feeder with a total feeder route length greater than 200 km

5.1.4 Call centre performance

Call centre performance, measured over a 12 month period, is the number of fault calls responded to in 30 seconds or less (after exclusions), divided by the total number of fault calls.

The unit of measure is percentage of calls per year.

The higher the percentage of calls per year, the higher the level of service performance.

The following exclusions apply to call centre performance:

- calls abandoned by a caller in 4 seconds or less of their postcode being automatically determined or when a valid postcode is entered by the caller;
- all telephone calls received on a MED which is excluded from SAIDI and SAIFI; and
- a fact or circumstance beyond the control of Western Power affecting the ability to receive calls to the extent that Western Power could not contract on reasonable terms to provide for the continuity of service.

The SSB and SST expressed in terms of call centre performance for each year of the AA3 period are shown in Table 5.

Table 5: Call centre performance SSB and SST for each year ending 30 June

Call centre performance	Percentage of calls per year	
	SSB	SST
	77.5%	87.6%

5.2 Transmission network service standards

In respect of the *reference services* A11 and B2 available to users directly connected to the transmission network, the service standard benchmarks are described below.

5.2.1 Circuit Availability

Circuit Availability is the availability of the transmission network and is measured by the actual number of hours the transmission network circuits are available, divided by the total possible hours available (after exclusions).

The unit of measure is percentage of hours per year.

The higher the percentage of hours per year, the higher the level of service performance.

The following exclusions apply to circuit availability:

- interruptions on non-transmission primary equipment (primary equipment operating at voltages less than 66 kV, including zone substation power transformers);
- unregulated transmission network assets;
- supply interruptions shown to be caused by a fault or other event on a '3rd party system' e.g. inter-trip signal, generator outage, customer installation;
- force majeure events; and
- duration of planned interruptions for major construction work, including periods where availability is temporarily restored, is to be capped at 14 days in calculating transmission line availability.

The SSBs and SSTs expressed in terms of Circuit Availability for each year of the AA3 period are shown in Table 6.

Table 6: Circuit Availability SSB and SST for each year ending 30 June

Circuit Availability	Percentage of hours per year	
	SSB	SST
	97.7%	98.1%

5.2.2 System Minutes Interrupted

System Minutes Interrupted is the summation of Mega Watt (MW) minutes of unserved energy at substations which are connected to the transmission network (meshed or radial) divided by the system peak MW.

The unit of measure is minutes per year.

The lower the minutes per year, the higher the level of service performance.

The following exclusions apply to System Minutes Interrupted:

- unregulated transmission network assets;
- supply interruptions shown to be caused by a fault or other event on a '3rd party system' e.g. inter-trip signal, generator outage, customer installation; and
- force majeure events.

The SSBs and SSTs expressed in terms of System Minutes Interrupted for each year of the AA3 period are shown in Table 7. Note there are no SSTs for system minutes interrupted for the Meshed network.

Table 7: System Minutes Interrupted SSBs and SSTs for each year ending 30 June

System Minutes Interrupted	Minutes per year	
	SSB	SST
Meshed	12.5	N/A
Radial	5.0	1.9

5.2.3 Loss of supply event frequency

Loss of supply event frequency is the frequency of unplanned customer interruption events where the loss of supply:

- exceeds 0.1 system minutes interrupted; and
- exceeds 1.0 system minutes interrupted.

The unit of measure is number of events per year.

The lower the number of events per year, the higher the level of service performance.

The exclusions applied to system minutes interrupted also apply to Loss of Supply Event Frequency. In addition, planned interruptions and interruptions with a duration lasting less than one minute are excluded.

The SSBs and SSTs expressed in terms of Loss of Supply Event Frequency for each year of the AA3 period are shown in Table 8.

Table 8: Loss of Supply Event Frequency SSBs and SSTs for each year ending 30 June

Loss of Supply Event Frequency	Number of events per year	
	SSB	SST
> 0.1 system minutes interrupted	33	24
> 1 system minutes interrupted	4	2

5.2.4 Average Outage Duration

Average Outage Duration is total number of minutes duration of all unplanned interruptions on the transmission network divided by the number of unplanned interruption events (after exclusions).

The unit of measure is minutes per year.

The lower the minutes per year, the higher the level of service performance.

The exclusions that apply to Loss of Supply Event Frequency also apply to Average Outage Duration. In addition, any event contribution to Average Outage Duration is capped at 14 days.

The SSBs and SSTs expressed in terms of Average Outage Duration for each year of the AA3 period are shown in Table 9.

Table 9: Average outage duration SSB and SST for each year ending 30 June

Average Outage Duration	Minutes per year	
	SSB	SST
	886	698

5.3 Street lighting repair time

For the *reference service* A9, the SSBs are expressed in terms of street lighting repair time.

Street lighting repair time is the average number of business days to repair a faulty streetlight.

The unit of measure is average number of business days.

The lower the average number of business days, the higher the level of service performance.

The SSBs expressed in terms of street lighting repair time for each year of the AA3 period are shown in Table 10. Note there are no SSTs for this reference service.

Table 10: Street lighting repair time SSBs for each year ending 30 June

Street lighting repair time	SSB – average number of business days
Metropolitan area	5
Regional area	9

The following exclusions apply to street lighting repair time:

- force majeure events; and
- streetlights for which Western Power is not responsible for streetlight maintenance.

5.3.1 Areas

The areas defined for street lighting repair times are defined as follows:

Metropolitan area

The areas of the State defined in Part 1.5 of the *Code of Conduct for the Supply of Electricity to Small Use Customers 2012*.

Regional area

All areas in the Western Power Network other than the metropolitan area.

6 Actual service standard performance

6.1 Summary of service standards performance

Western Power met 16 out of 17 SSBs for the 2012/13 period.

The SSB which Western Power did not meet was Rural Long SAIFI.

There has been a significant wide spread increase in lightning activity recorded[9] across rural areas of the state during the past year compared to the previous 3 years (refer Appendix B, Figure 21). Consequently, lightning strikes have been a significant contributor to the deterioration in reliability performance levels of customers supplied by the rural long distribution network, resulting in Rural Long SAIFI performing worse than the prescribed SSB. Other lesser contributors or causes (such as overhead asset failures and fauna or vegetation contacting equipment), have also negatively influenced the Rural Long SAIFI performance (refer Appendix B, Figures 20, 21 and 22). Interestingly, if the lighting activity affecting the rural long network was the same as that during the previous 3 years, Rural Long SAIFI would have been within its prescribed SSB for the 2012/13 period.

The applicable work programs completed during the 2012/13 period, the continuation of these programs, as well as the approach to focus on the worst performing areas are expected to improve the performance of the Rural Long SAIFI towards meeting the prescribed SSB during the AA3 period. The overhead asset associated work programs such as the increased pole replacement and associated asset maintenance work programs completed during the 2012/13 period have contributed to the performance of most of the service standards.

6.1.1 Trends in interruption causes

The trend of overhead asset / equipment failures over the past 12 months remains consistent with the past 4 years, with similar volumes and types of assets causing supply interruptions (refer Appendix C, Figure 25). Reducing overhead asset / equipment failures is expected to be achieved through the implementation of the applicable asset strategies and approved asset maintenance and replacement programs.

The trend of vegetation contacting the overhead assets, and subsequently causing an interruption, has been relatively constant for the past 4 years (Appendix C, Figure 26), however a slight downward trend in the number of incidents has occurred over the past 12 months. Regular reviews of the vegetation strategy and overall vegetation management plans are expected to maintain this downward trend.

While the trend in the number of incidents of birds and animals (fauna) contacting overhead assets and causing an interruption, has been relatively constant for the past 4 years, there has been a slight downward trend emerging over the past 12 months (Figure 27). Regular reviewing of

[9] Source: Lightning detection system produced by the Australian company Global Position and Tracking Systems [GPATS] Pty Ltd.

the fauna strategy and overall fauna management plans are expected to maintain this downward trend.

The impact of inclement weather, particularly wind and wind-borne debris has been relatively constant over the past 4 years (refer Appendix C, Figure 28).

6.1.2 Areas of focus - worst performing areas in distribution reliability

Periodic review of reliability metrics continue to identify areas where analysis and detailed investigation activities are required, with a focus on the worst performing areas across the network.

To date the majority of these focus areas are on rural short and rural long feeders.

In a number of these focus areas a detailed overhead line patrol has been initiated from which applicable remedial maintenance activities are identified and undertaken. Where this has taken place there has been an improvement in reliability at a local community level. An example of this is the small town of Ravensthorpe which, through undertaking this approach on parts of the 300 km long distribution feeder supplying the town, has experienced an improvement over the past 6 months.

Western Power's actual service standard performance against its 17 SSBs is summarised in Table 11.

Sections 6.2, 6.3 and 6.4 provide explanatory details of Western Power's service standard performance against the service standard benchmark, while Appendix A shows the recent 5 year trends of distribution network performance.

Table 11: Service Standard performance summary

			2012/ 13			
			SSB	SST	Actual	Benchmark Met?
Distribution	SAIDI	CBD	39.9	20.3	7.6	√
		Urban	183.0	136.6	102.7	√
		Rural Short	227.8	207.8	181.4	√
		Rural Long	724.8	582.2	685.4	√
	SAIFI	CBD	0.26	0.14	0.03	√
		Urban	2.12	1.36	1.16	√
		Rural Short	2.61	2.27	2.17	√
		Rural Long	4.51	4.06	4.91	×
	Call Centre Performance		77.5%	87.6%	90.6%	√
Transmission	Circuit Availability		97.7%	98.1%	98.4%	√
	System Minutes Interrupted	Meshed Network	12.5	N/A	4.5	√
		Radial Network	5.0	1.9	2.3	√
	Loss of Supply Events	>0.1 System Minute interrupted	33	24	13	√
		>1 System Minute interrupted	4	2	2	√
	Average Outage Duration		886	698	866	√
Street lighting repair time	Metropolitan area		5 days	N/A	1.23	√
	Regional area		9 days	N/A	2.01	√

6.2 Distribution

Table 12: Distribution performance commentary for the 2012/13 period

Service Standard	2012/13			Comments
	SSB	SST	Actual	
CBD SAIDI	39.9	20.3	7.6	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 16 minutes. The primary contributor to the improvement in performance, in comparison to the 2011/12 period, was a decrease in the number of interruptions resulting from cable failures in the distribution network during the 2012/13 period. Cable failures are the predominant contributor to the actual performance of the CBD network. Note: The CBD SAIDI performance is volatile over short periods of time due to the combined effects of fewer connection numbers and the relatively long repair times for faults in an underground CBD network. Refer Section 6.1.1 for Major Event Days (MEDs) which were excluded from the total CBD SAIDI.
Urban SAIDI	183.0	136.6	102.7	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 119 minutes. The primary contributor to the improvement in performance, in comparison to the 2011/12 period, was a reduction in the duration of faults resulting from external influencing factors such as lightning, vandalism, vegetation, vehicles and fauna. The primary contributor to the actual performance was overhead equipment and underground asset failures. The same works, vegetation and associated programs which were completed during the 2012/13 period, are expected to result in Urban SAIDI performance meeting the benchmark for the 2013/14 period, noting there is approximately a 12 month lag in the SAIDI impact of investment. Refer Section 6.1.1 for MEDs which were excluded from the total Urban SAIDI.
Rural Short SAIDI	227.8	207.8	181.4	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 191 minutes. The primary contributor to the improvement in performance, in comparison to the 2011/12 period, was a reduction in the number of interruptions resulting from external influencing factors such as lightning, vandalism and vegetation. The primary contributor to the actual performance was overhead equipment failures followed by interruptions of unknown cause and equipment failures of underground assets. The same works, vegetation and associated programs which were completed during the 2012/13 period, are expected to result in Rural Short SAIDI performance meeting the benchmark for the 2013/14 period, noting there is approximately a 12 month lag in the SAIDI impact of investment. Refer Section 6.1.1 for MEDs which were excluded from the total Rural Short SAIDI.

Service Standard	2012/13			Comments
	SSB	SST	Actual	
Rural Long SAIDI	724.8	582.2	685.4	Performance was better than the AA3 benchmark however worse than the 2011/12 period performance of 556 minutes. The primary contributor to the deterioration in performance in comparison to the 2011/12 period, was an increase in the duration of faults resulting from overhead equipment failures within the distribution network, as well as external factors such as lightning, other storm activity and vegetation. The primary contributor to the actual performance was interruptions from lightning activity and equipment failures of overhead assets. The same works, vegetation and associated programs which were completed during the 2012/13 period, are expected to result in Rural Long SAIDI performance meeting the benchmark for the 2013/14 period, noting there is approximately a 12 month lag in the SAIDI impact of investment. Refer Section 6.1.1 for MEDs which were excluded from the total Rural Long SAIDI.
CBD SAIFI	0.26	0.14	0.03	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 0.16. The primary contributor to the improvement in performance, in comparison to the 2011/12 period, was a decrease in the number of interruptions resulting from cable failures in the distribution network during the 2012/13 period. Cable failures are the predominant contribution of the actual performance of the CBD network. Note: The CBD SAIFI performance is volatile over short periods of time due to the combined effects of fewer connections numbers. Refer Section 6.1.1 for MEDs which were excluded from the total CBD SAIFI.
Urban SAIFI	2.12	1.36	1.16	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 1.20. The primary contributor of the improvement in performance, in comparison to the 2011/12 period, was a reduction in the customer interruptions resulting from external influencing factors such as vandalism, vegetation, vehicles and fauna. The primary contributor to the actual performance was overhead equipment failures followed by interruptions of unknown cause and equipment failures of underground assets. The same works, vegetation and associated programs which were completed during the 2012/13 period, are expected to result in Urban SAIFI performance meeting the benchmark for the 2013/14 period, noting there is approximately a 12 month lag in the SAIFI impact of investment. Refer Section 6.1.1 for MEDs which were excluded from the total Urban SAIFI.

Service Standard	2012/13			Comments
	SSB	SST	Actual	
Rural Short SAIFI	2.61	2.27	2.17	Performance was better than the AA3 benchmark however worse than the 2011/12 period performance of 2.10. The primary contributor to this deterioration in performance, in comparison to the 2011/12 period, was an increase in the customer interruptions arising from emergency outages from hazards, followed by interruptions of unknown cause. The primary contributor to the actual performance was interruptions of unknown cause and equipment failures of overhead assets. The same works, vegetation and associated programs which were completed during the 2012/13 period, are expected to result in Rural Short SAIFI performance meeting the benchmark for the 2013/14 period, noting there is approximately a 12 month lag in the SAIFI impact of investment Refer Section 6.1.1 for MEDs which were excluded from the total Rural Short SAIFI.
Rural Long SAIFI	4.51	4.06	4.91	Performance was worse than the AA3 benchmark and worse than the 2011/12 period performance of 4.33. There has been a significant wide spread increase in lightning activity recorded across rural areas of the state during the past year compared to that experienced during the AA2 period. Consequently, lightning strikes have been a significant contributor to the deterioration in reliability performance levels on the Rural Long network. Other contributors or causes (such as overhead asset failures and fauna or vegetation contacting equipment), while much less prevalent than lightning activity, have also negatively influenced the Rural Long SAIFI performance. Interestingly, if the lightning activity affecting the rural long network during the 2012/13 period was the same as that during the previous 3 years, the Rural Long SAIFI would have met the AA3 benchmark The primary contributor to the actual performance was interruptions from unknown causes and lightning activity. Specific analysis, field investigations and detailed overhead line patrols targeting those poor performing areas of the Rural Long network has resulted in remedial maintenance activities being undertaken in specific locations. Forecasted performance, recognising: - the AA3 investment works programs - the past three years average performance levels - the applicable work programs completed during the 2012/13 period, - the continuation of those same work programs; and - the worst performing focus area program, indicates that Rural Long SAIFI is unlikely to meet the benchmark until after the 2014/15 period, noting there is approximately a 12 month lag in the SAIFI impact of investment. Refer Section 6.1.1 for MEDs which were excluded from the total Rural Long SAIFI.

Service Standard	2012/13			Comments
	SSB	SST	Actual	
Call centre performance	77.5%	87.6%	90.6%	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 85.0%. The improved performance has been achieved through redistribution of staff within the call centre and increased provision of self-serve information for customers. Refer Section 6.1.1 for MEDs which were excluded from the total call centre performance.

6.3 Transmission

Table 13: Transmission performance commentary for the 2012/13 period

Service Standard	2012/13			Comments
	SSB	SST	Actual	
Circuit availability	97.7%	98.1%	98.4%	Performance was better than the AA3 benchmark however, was slightly worse than the 2011/12 period performance of 98.5%. While the majority of circuit unavailability was due to planned work on the transmission network, primary transmission asset equipment failure contributed 0.3% to the circuit unavailability. However, despite the worsening performance, improved maintenance coordination contributed to Circuit Availability performance being better than benchmark and is expected to meet the benchmark for the 2013/14 period. The performance excludes Circuit Availability related to extended planned interruptions for major construction work greater than 14 days (refer to Section 7.3.2 for details).
System Minutes Interrupted Meshed Network	12.5	N/A	4.50	Performance was better than the AA3 benchmark however worse than the 2011/12 period performance of 3.98 minutes. The primary contributor to the decrease in performance from 2011/12 was an increase in supply interruptions attributed to equipment failures, particularly a forced outage in a substation in June 2013. However, better supply restoration utilising the network control Distribution Management System to restore customers via the distribution system assisted in maintaining this measure at a low level. Performance is expected to continue to meet the benchmark for the 2013/14 period.
System Minutes Interrupted Radial Network	5.0	1.9	2.30	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 2.5 minutes. The primary contributor to this improvement in performance, in comparison to 2011/12 period, was a reduction in asset failures, namely pole failures, on the radial circuits. Plant upgrades and targeted maintenance on circuits that have had experienced poor performance in previous years commenced in 2012/13 and will continue in 2013/14. Some circuits in the radial network are highly susceptible to environmental events, which may affect performance until maintenance activities and planned upgrades are completed. Upon completion of this work in 2013/14, performance is expected to continue to meet the benchmark for the AA3 period.

Service Standard	2012/13			Comments
	SSB	SST	Actual	
Loss of supply events >0.1 system minutes interrupted	33	24	13	Performance was better than the AA3 benchmark and better than the 2011/12 period performance of 18. The primary contributor to the improvement in performance is the implementation of improved supply restoration processes through utilising the network control Distribution Management System. Performance is expected to continue to meet the benchmark for the 2013/14 period.
Loss of supply events >1 system minutes interrupted	4	2	2	Performance was better than the AA3 benchmark however worse than the 2011/12 period performance of 1. The loss of supply events that exceeded 1 system minutes interrupted in 2012/13 were due to: • a primarily plant equipment failure within a substation. • an interruption on a radial circuit during lighting activity Performance is expected to continue to meet the benchmark for the 2013/14 period.
Average Outage Duration	886	698	866	Performance was better than the AA3 benchmark however worse than the 2011/12 period performance of 844 minutes. The primary contributor to the decrease in performance was the unexpected failure of major plant at the Muja Terminal Substation, which resulted in the 14 day cap being reached. Such an incident involving major transmission primary plant has not occurred since Western Power was established in 2006. Through out the incident period alternative system operational arrangement were put in place so there was no impact to customers. Performance is expected to continue to meet the benchmark for the 2013/14 period.

6.4 Street lighting repair time

Table 14: Street lighting repair time performance commentary for the 2012/13 period

	Service Standard	2012/13		Comments
		Benchmark	Actual	
Street lighting repair time	Metropolitan area	≤ 5 days	1.23	Performance was better than the AA3 benchmark. This performance has been assisted by the grouping of faults with repair crews within specific geographical localities within the metropolitan area. The practice of fault grouping is expected to ensure that street lighting repair times in the metropolitan area meets the benchmark for the 2013/14 period.
	Regional area	≤ 9 days	2.01	Performance was better than the AA3 benchmark. This performance has been assisted by the improved scheduling of repair crews and other resources within regional areas. The resource scheduling practices are expected to ensure that street lighting repair times in the regional area meets the benchmark for the 2013/14 period.

6.5 Western Power Network performance

Western Power does not have SSB measures for the total Network. However as shown in Table 15, the reliability performance of the Network for the 2012/13 period was comparable to the previous year.

Table 15: Overall reliability performance of the Network

		2011/12	2012/13
Distribution	SAIDI	177	175[10]
	SAIFI	1.71	1.75
Transmission - System Minutes Interrupted[11]		6.52	6.82

For the distribution network, SAIDI improved by 1 per cent and SAIFI worsened by 2 per cent. System minutes interrupted for the transmission network worsened by 5 per cent. Overall, customers received a supply from the network 99.93[12] per cent of the time during 2012/13.

The five year trend, up to 30 June 2013, for the network SAIDI and SAIFI are shown below in Figure 2 and Figure 3, respectively

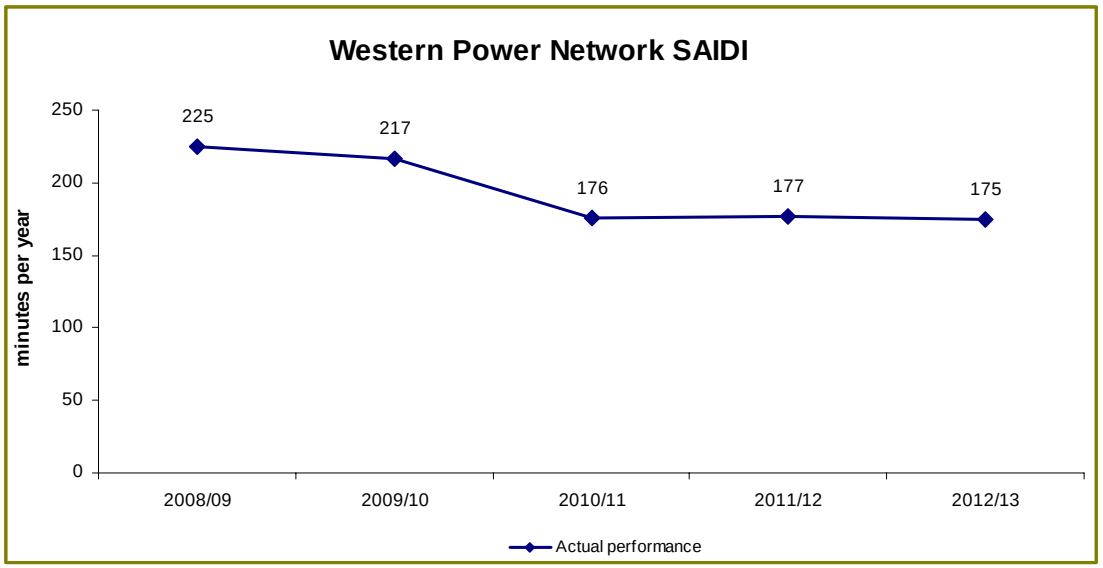

Figure 2: Network SAIDI (5 year trend)

[10] The SAIDI of 175 minutes here is based on the same rules as defined in AA3, it is not comparable to other published SAIDI figures – namely Western Power's State of the Infrastructure and Corporate Annual Reports.

[11] System Minutes Interrupted for the Network has never been a reporting measure in either the current or any previous Access Arrangement.

[12] Includes transmission and distribution performance and does not factor in any exclusions

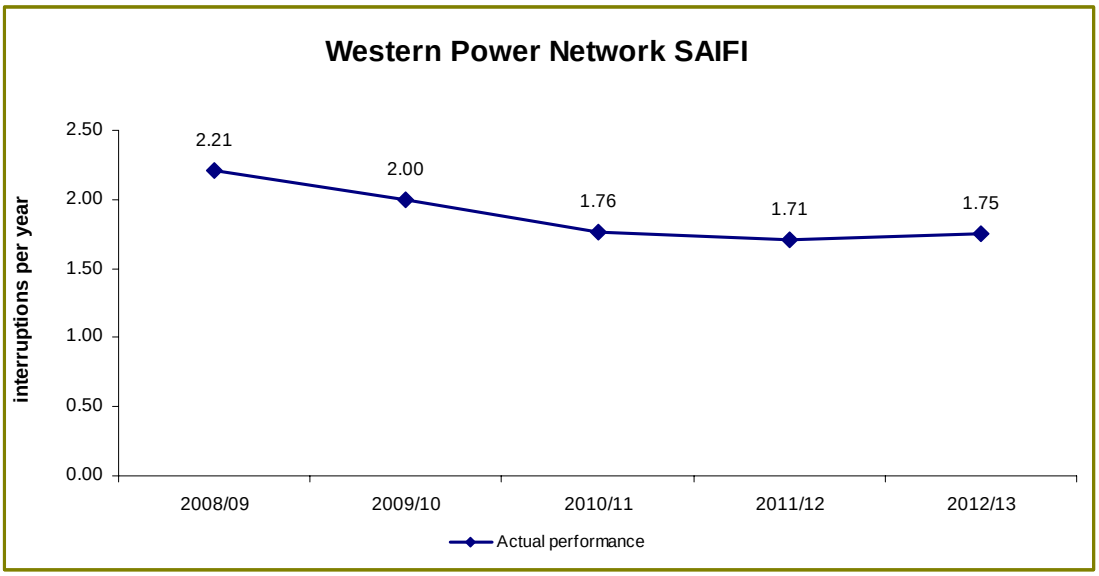

Figure 3: Western Power Network SAIFI (5 year trend)

7 Exclusions from SSB performance

As outlined in section 4, the service standards and the service standard adjustment mechanism (SSAM) financial incentive scheme provide for certain events to be excluded from the distribution and transmission reference service performance.

7.1 Distribution performance – SAIDI, SAIFI

Based on the exclusions described in section 4.1, for the 2012/13 period, the distribution performance service standards in terms of SAIDI and SAIFI exclude the interruptions described below.

7.1.1 Major Event Days

The exclusion of MEDs classified in accordance with IEEE 1366-2003 applies to SAIDI and SAIFI performance for each feeder classification and Call centre performance.

There were 4 days during the 12 months to 30 June 2013 which exceeded the daily MED SAIDI threshold of 5.46 minutes. Table 16 shows:

- SAIDI (minutes per year) and SAIFI (interruptions per year), which have been excluded from the 2012/13 period due to these 4 MEDs; and
- Call centre performance (percentage calls per year), is the percentage number of fault calls responded to in 30 seconds or less against the total number of fault calls during these 4 MEDs.

Table 16: SAIDI, SAIFI and call centre performance exclusions due to MEDs

		2012/13
SAIDI	CBD	1
	Urban	54
	Rural Short	73
	Rural Long	117
SAIFI	CBD	0.04
	Urban	0.21
	Rural Short	0.28
	Rural Long	0.50
Call centre performance		78.6%

The 4 days that exceeded the MED SAIDI threshold are detailed below, showing the SAIDI and SAIFI for these days and Call centre performance across the Network over the period of each storm or MED event.

7.1.1.1 28 November 2012

(SAIDI = 41.58 minutes, SAIFI = 0.147 interruptions, Call centre performance = 78.3%)

Two storm fronts passed through Metropolitan Perth and the South West region, propagating across the Network, resulting in damage to overhead network assets, and more than 130,000 customers experiencing supply interruptions.

7.1.1.2 12 December 2012

(SAIDI = 5.56 minutes, SAIFI = 0.036 interruptions, Call centre performance = 85.6%)

High rainfall occurred across the southern parts of the Network, resulting in multiple faults and damage to the distribution network. Approximately 32,000 customers across the Network experienced supply interruptions.

7.1.1.3 15 January 2013

(SAIDI = 5.58 minutes, SAIFI = 0.021 interruptions, Call centre performance = 89.2%)

Major lighting activity across several parts of the Network, resulted in multiple faults and damage to the distribution network. Approximately 17,000 customers across the Network experienced supply interruptions.

7.1.1.4 22 February 2013

(SAIDI = 12.49 minutes, SAIFI = 0.048 interruptions, Call centre performance = 70.9%)

Pole top fire activity across the Perth Metropolitan area, following sustained pollution from smoke from a significant bushfire coupled with light rain, resulted in approximately 47,000 customers experiencing supply interruptions.

7.1.2 Transmission network interruptions

The SAIDI (minutes per year) and SAIFI (interruptions per year) that were excluded due to supply interruptions caused by the transmission network are outlined in Table 17.

Table 17: SAIDI and SAIFI exclusions due to the transmission network interruptions

		2012/13
SAIDI	CBD	4
	Urban	4
	Rural Short	7
	Rural Long	29
SAIFI	CBD	0.18
	Urban	0.16
	Rural Short	0.13
	Rural Long	0.34

7.1.3 Other third party network interruptions

The SAIDI (minutes per year) and SAIFI (interruptions per year) that were excluded due to supply interruptions caused by generator unavailability or customer equipment are outlined in Table 18.

Table 18: SAIDI and SAIFI exclusions due to other third party network interruptions

		2012/13
SAIDI	CBD	2
	Urban	5
	Rural Short	5
	Rural Long	7
SAIFI	CBD	0.01
	Urban	0.09
	Rural Short	0.08
	Rural Long	0.11

These third party network supply interruptions include:

- a generator failure on the 6 March 2013, resulting in the automatic de-energisation of circuits to stabilise the frequency on the transmission network.
- over 2,700 faults attributed to customer installations or other third party equipment.

7.1.4 Planned interruptions

The SAIDI (minutes per year) and SAIFI (interruptions per year) that were excluded due to planned supply interruptions required to undertake safe work activities on the distribution network and mitigate the risk of unplanned interruptions, are outlined in Table 19.

Table 19: SAIDI and SAIFI exclusions due to planned interruptions

		2012/13
SAIDI	CBD	24
	Urban	67
	Rural Short	144
	Rural Long	206
SAIFI	CBD	0.18
	Urban	0.21
	Rural Short	0.47
	Rural Long	0.68

7.1.5 Force Majeure

There were no events on the distribution network that were classified as *force majeure*.

7.2 Distribution performance – Call centre performance

Based on the exclusions described in section 5.1, for the 2012/13 period, the distribution performance service standards in terms of call centre performance exclude the fault call non compliances as indicated below:

7.2.1 Abandoned calls – 4 seconds or less

These calls are currently not captured or recorded within our systems.

7.2.2 Major Event Days

See 7.1.1 for the details of the MEDs for the 2012/13 period.

7.2.3 Extra ordinary events

There were no extraordinary events on the distribution network affecting the call centre performance.

7.3 Transmission performance

Based on the exclusions described in section 5.2, the transmission performance for the AA3 period excludes the interruptions described below.

7.3.1 Force majeure

There were no events on the transmission network that were classified as *force majeure*.

7.3.2 Planned interruptions - major construction work exceeding 14 days

In calculating circuit availability, planned interruptions for major construction work are capped at 14 days.

Table 20 shows the number of planned supply interruptions for major construction work that exceeded the 14 day cap in each financial year of the AA3 period.

Table 20: Planned interruptions for major construction work exceeding 14 days

	2012/13
Number of planned interruptions	14

8 Service Standard Adjustment Mechanism

8.1 Overview

The Authority applies a financial reward or penalty to Western Power in relation to the actual performance for 14 SSBs through the SSAM.

The SSAM applies to the SSBs for SAIDI, SAIFI, Circuit Availability, call centre performance, System Minutes Interrupted - radial, Loss of Supply Event Frequency and Average Outage Duration.

A reward or penalty is calculated based on the difference between the actual performance and the SST and capped at the SSB, as outlined in Western Power's approved Access Arrangement 3 (AA3).

8.2 Actual performance

Western Power has met or exceeded the expected level of performance[13] for the SSAM target for 9 out of the 14 SSB measures subject to this financial incentive scheme.

Improvements were achieved for Circuit Availability through improved maintenance coordination and call centre performance through redistribution of staff within the call centre and increased provision of self-service information for customers.

Table 21 shows the results of the SSAM for the performance for the 2012/13 period.

All values are expressed in real dollars as at 30 June 2012.

[13] The SSAM target was set at a 50% probability of achieving for the AA3 period

Table 21: Service Standard Adjustment Mechanism results for 2012/13 period

	Service Standard (SS)		Incentive Rate			SSB	SST	SS Actuals (SSA)	SS Difference (SSD)	Penalty (-) or Reward (+)
			$ unit rate	Reward	Penalty					
Distribution	SAIDI	CBD	per SAIDI minute	$67,817	$67,817	39.9	20.3	7.6	12.7	$861,276
		Urban		$529,816	$529,816	183	136.6	102.7	33.9	$17,960,762
		Rural Short		$223,472	$223,472	227.8	207.8	181.4	26.4	$5,899,661
		Rural Long		$65,219	$65,219	724.8	582.2	685.4	-103.2	-$6,730,601
	SAIFI	CBD	per 0.01 SAIFI event	$87,081	$87,081	0.26	0.14	0.03	0.11	$957,891
		Urban		$548,988	$548,988	2.12	1.36	1.16	0.2	$10,979,760
		Rural Short		$222,511	$222,511	2.61	2.27	2.17	0.1	$2,225,110
		Rural Long		$101,725	$101,725	4.51	4.06	4.91	-0.45	-$4,577,625
	Call centre performance		per 0.1%	-$41,495	-$41,084	77.5%	87.6%	90.60%	-3.00%	$1,244,850
	Total distribution penalty/reward									**$28,821,084**
Transmission	Circuit Availability		per 0.1%	-$817,186	-$408,593	97.7%	98.1%	98.4%	-0.3%	$2,451,558
	System Minutes Interrupted -radial		per system minute	$105,443	$172,039	5.0	1.9	2.3	-0.4	-$68,816
	Loss of Supply Event Frequency	>0.1 system minutes interrupted	per loss of supply event	$36,319	$27,240	33	24	13	11	$399,509
		>1 system minutes interrupted		$163,437	$163,437	4	2	2	0	$0
	Average Outage Duration		per duration minute	$3,477	$2,495	886	698	866	-168	-$419,160
	Total transmission penalty/reward									**$2,363,091**
	Total penalty/reward for 2012/13								**$31,184,176**	

Appendix A. Service standard performance graphs – 2008/09 to 2016/17

The following graphs show the actual performance of the service standards for the five financial years up to 2012/13, and the SSBs and SSTs (if applicable) during the AA3 period. Included within these graphs are the AA2 SSBs (where relevant) for the purpose of understanding trends. Details and further information regarding AA2 performance has been provided in previous service standard performance reports throughout the AA2 period.

A.1 Distribution Performance

- Figure 4 to Figure 11 show the SAIDI and SAIFI of the CBD, Urban, Rural Short and Rural Long networks.
- Figure 12 shows the call centre performance.

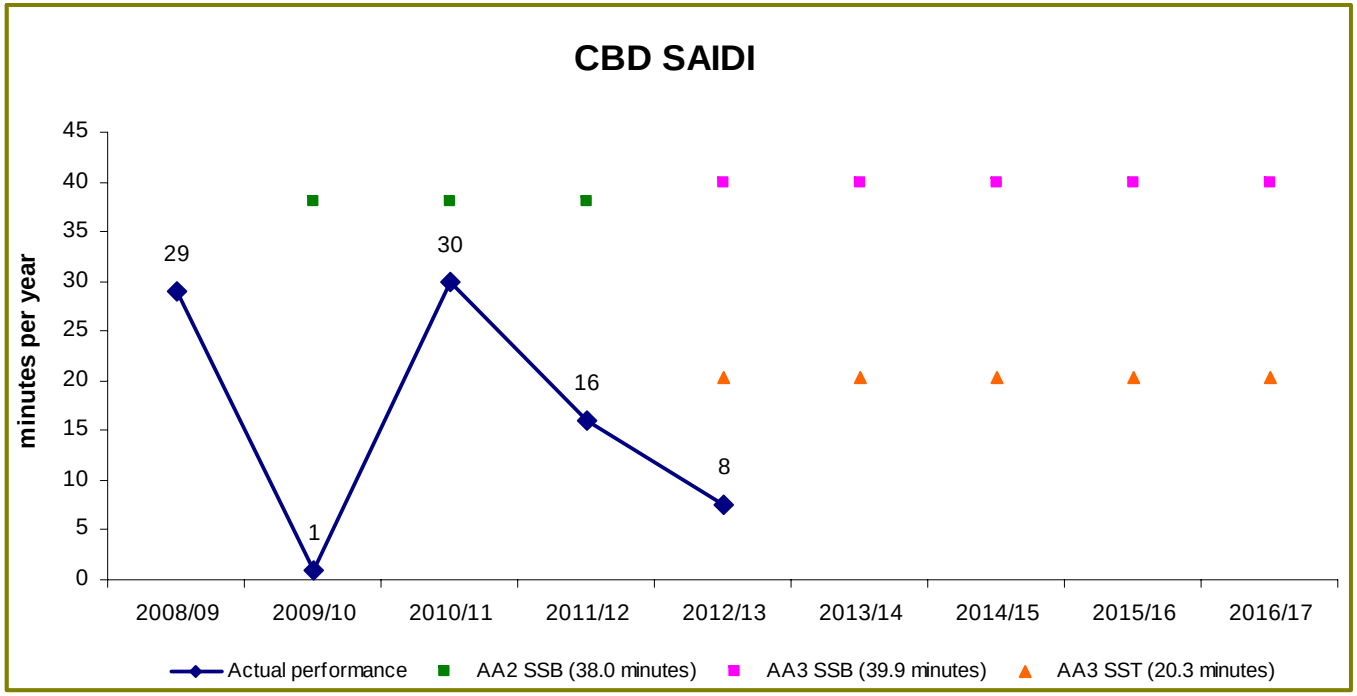

Figure 4: CBD SAIDI

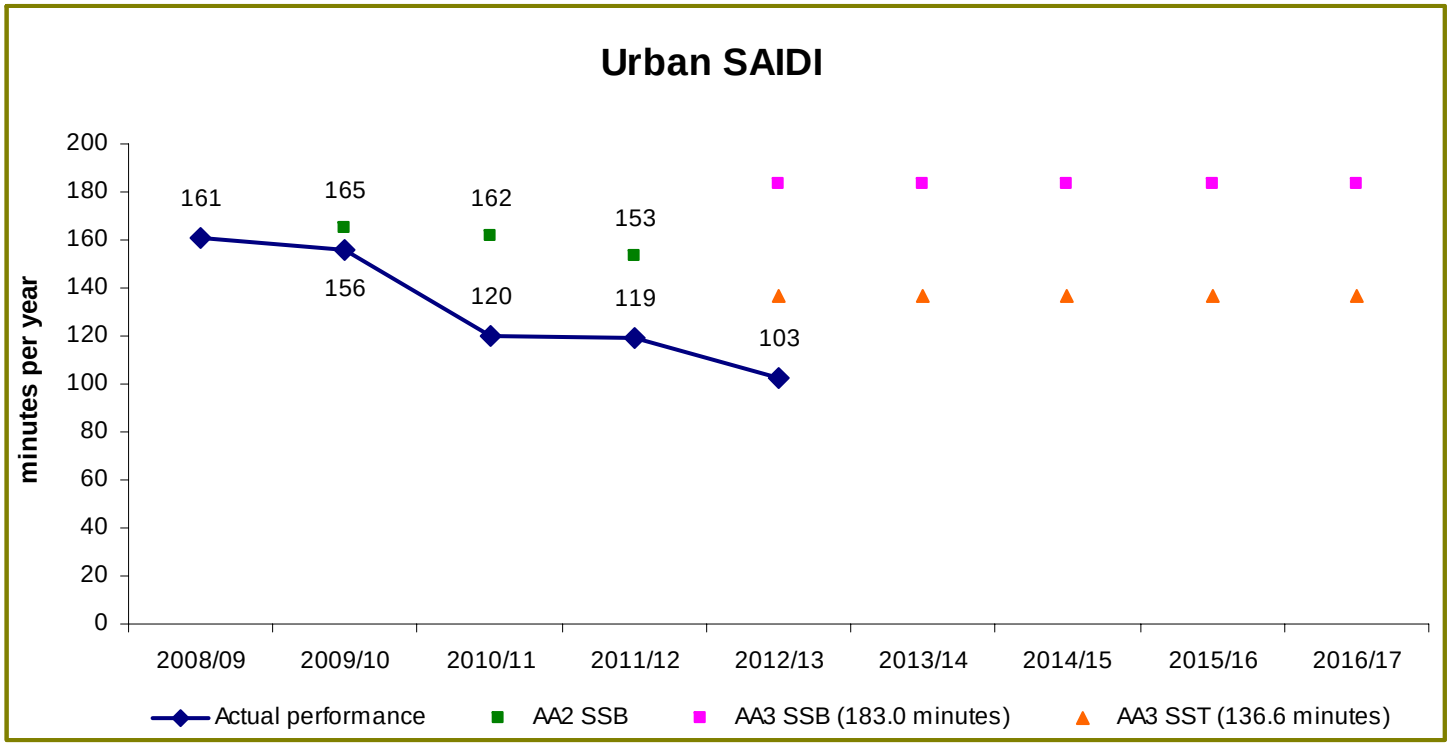

Figure 5: Urban SAIDI

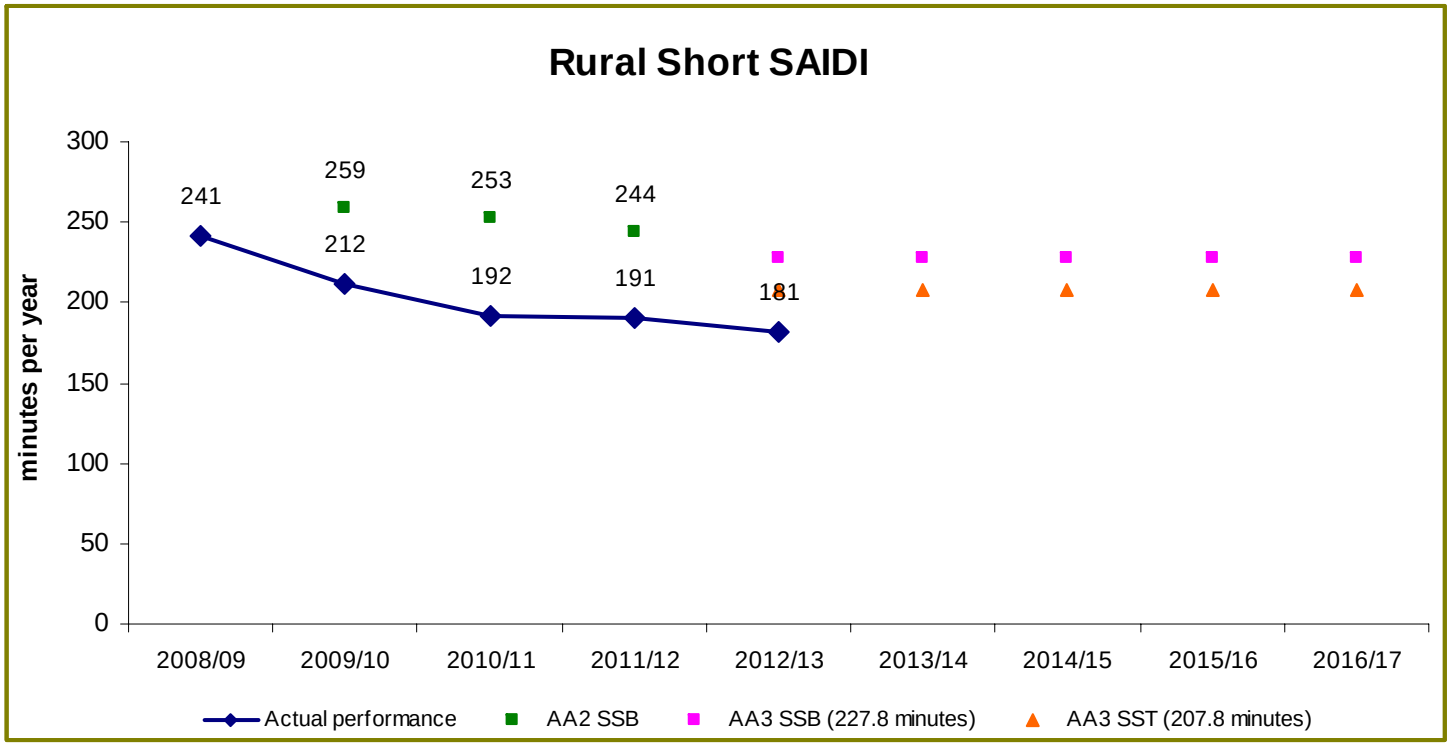

Figure 6: Rural Short SAIDI

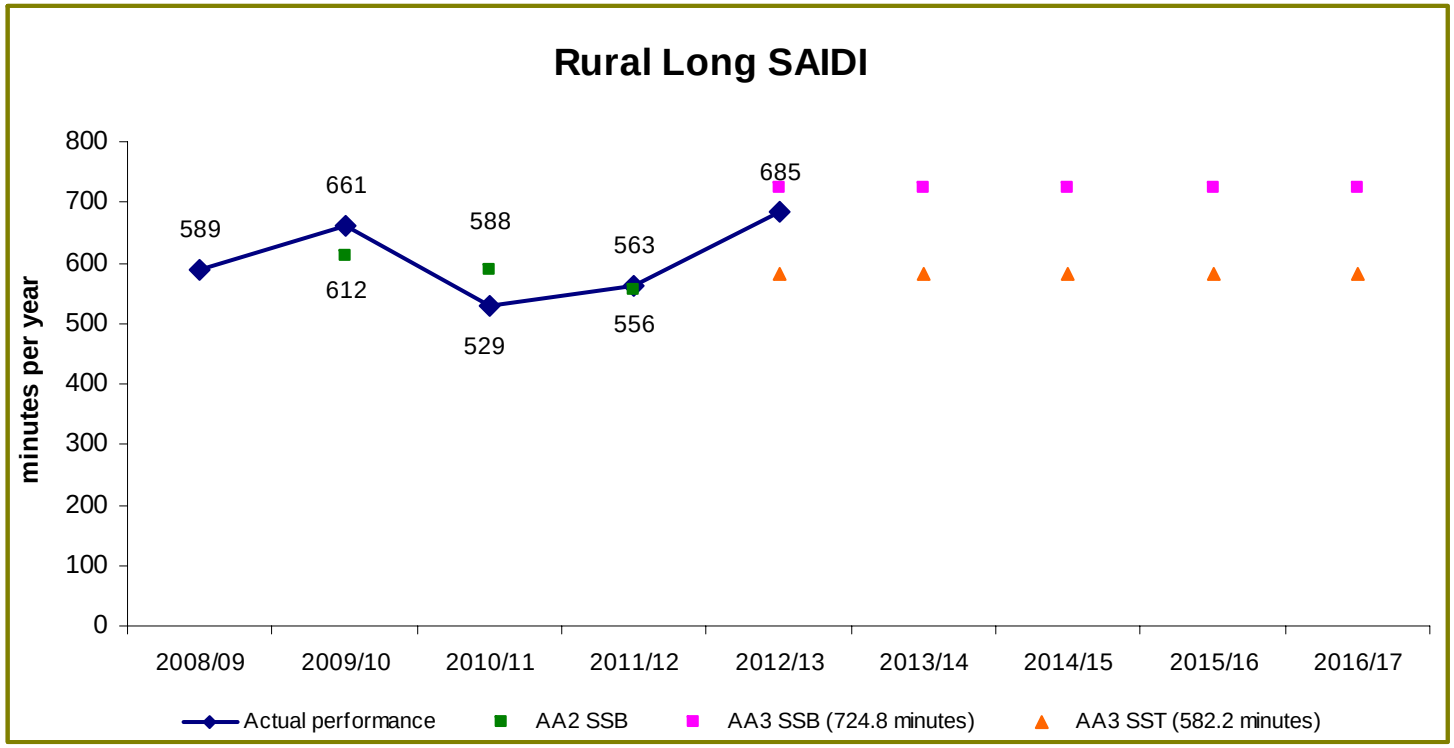

Figure 7: Rural Long SAIDI

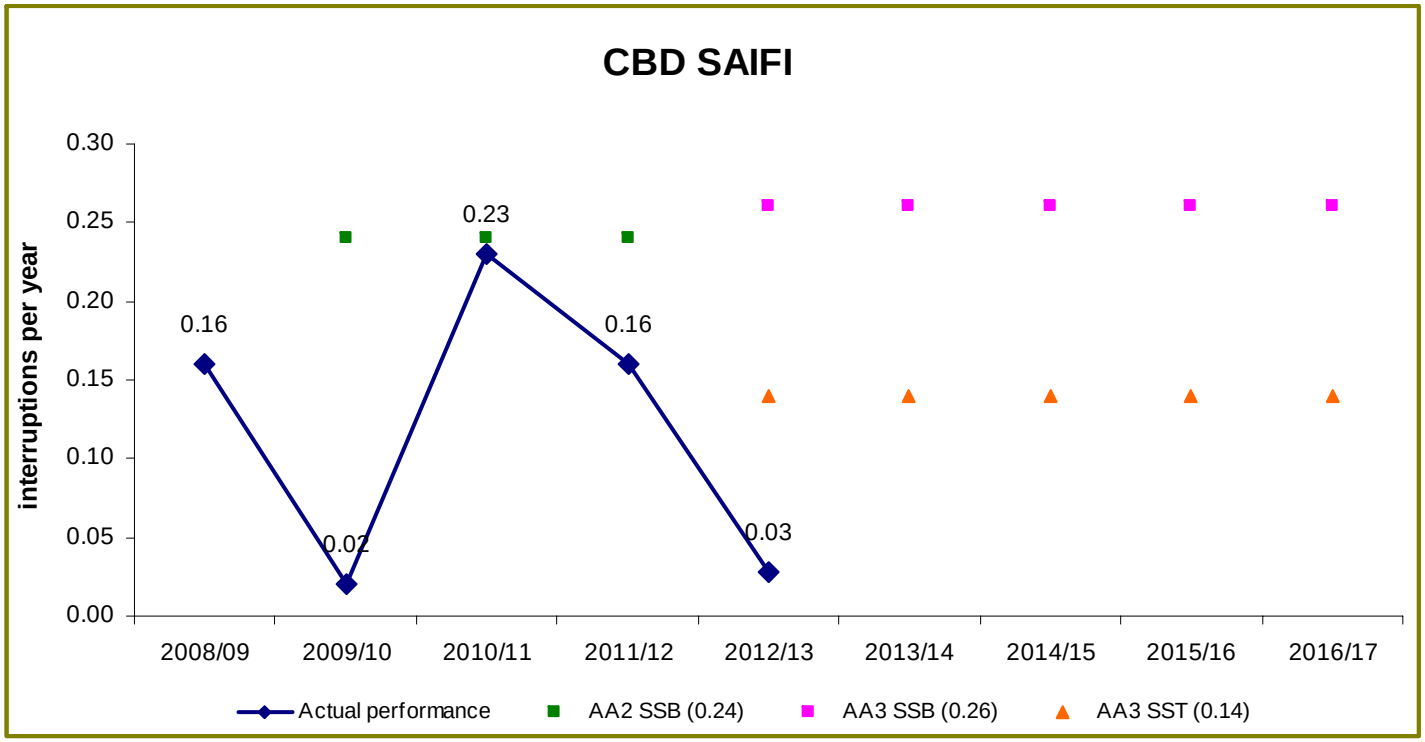

Figure 8: CBD SAIFI

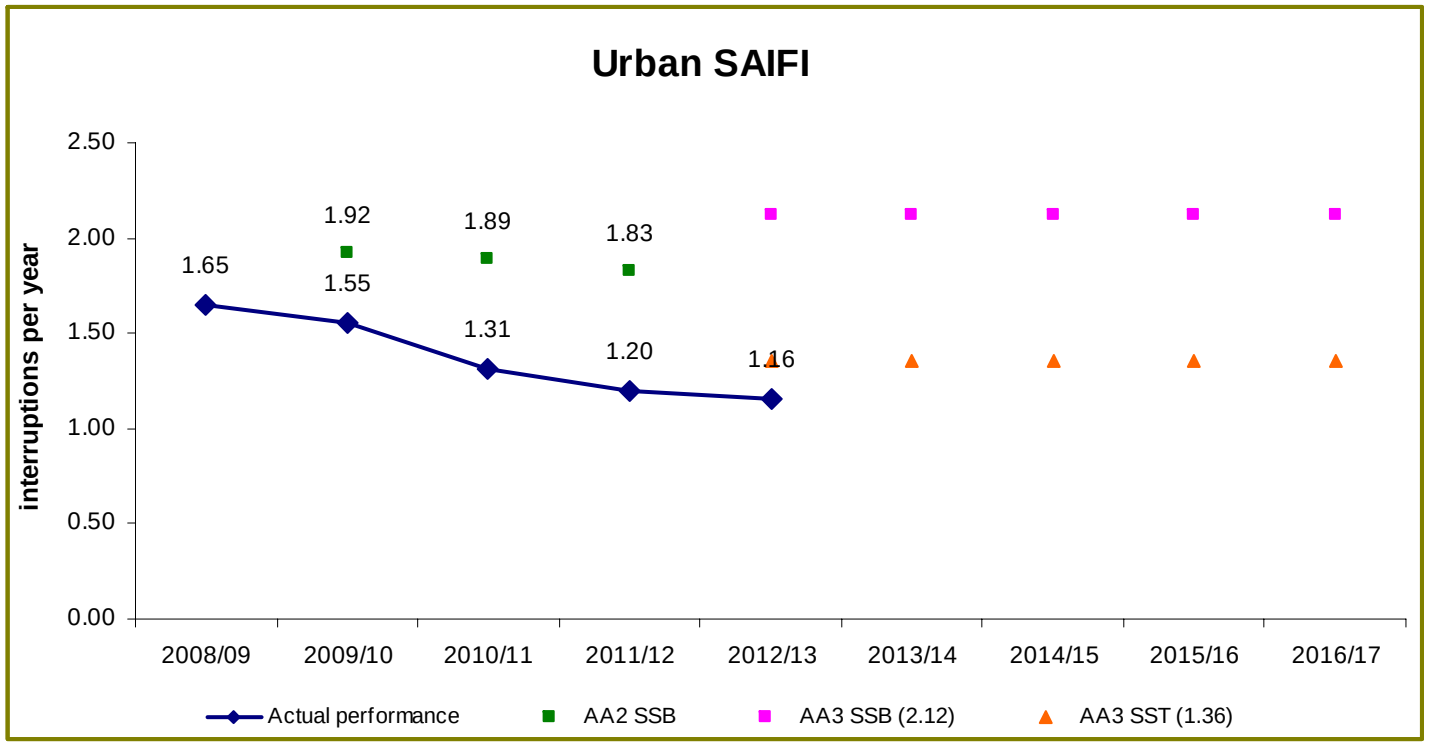

Figure 9: Urban SAIFI

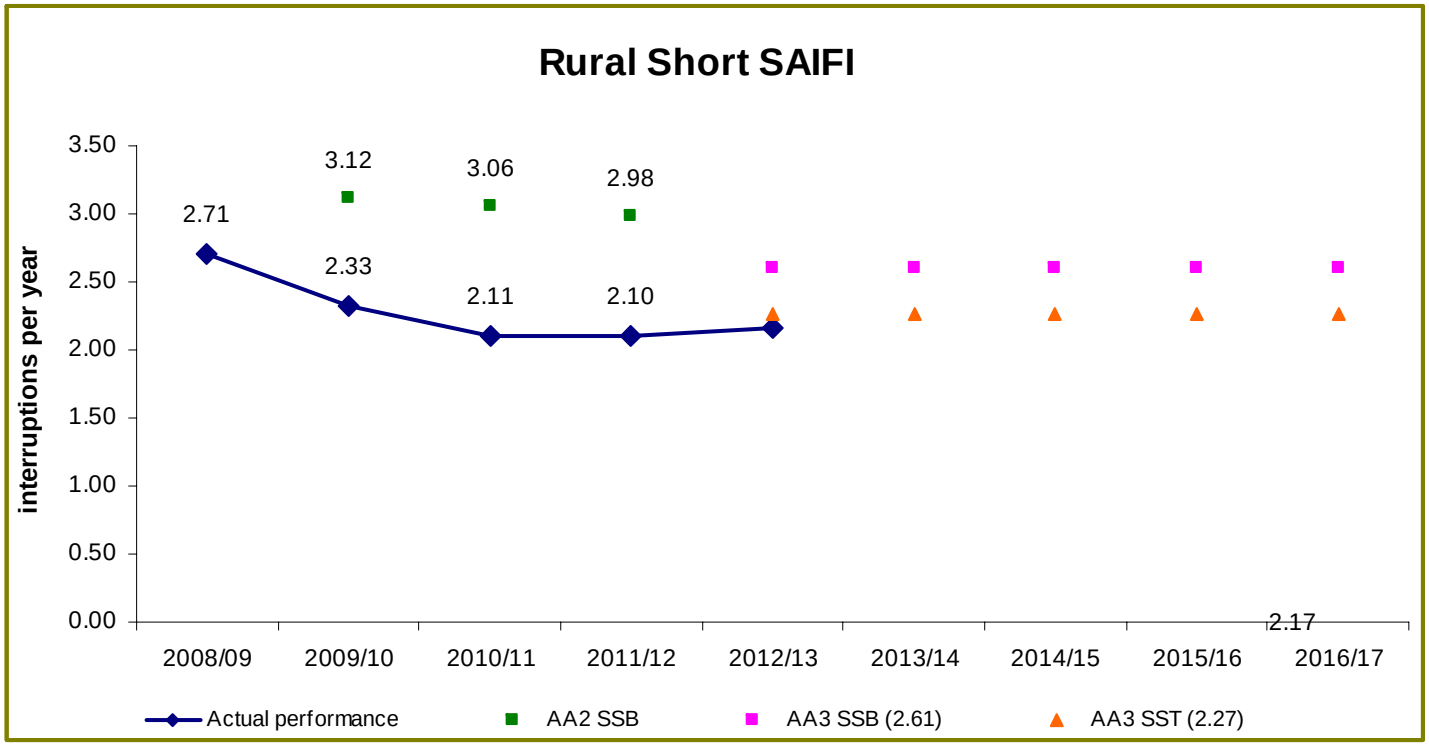

Figure 10: Rural Short SAIFI

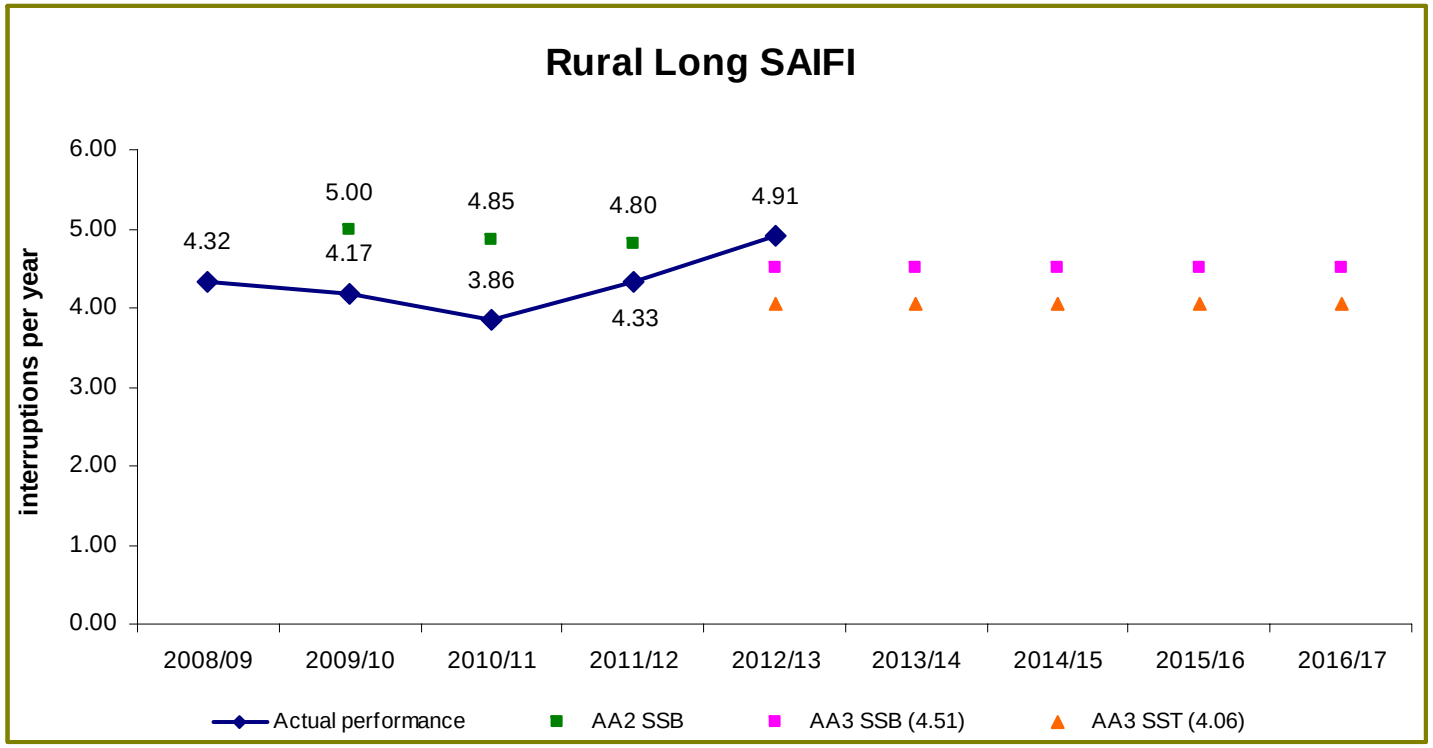

Figure 11: Rural Long SAIFI

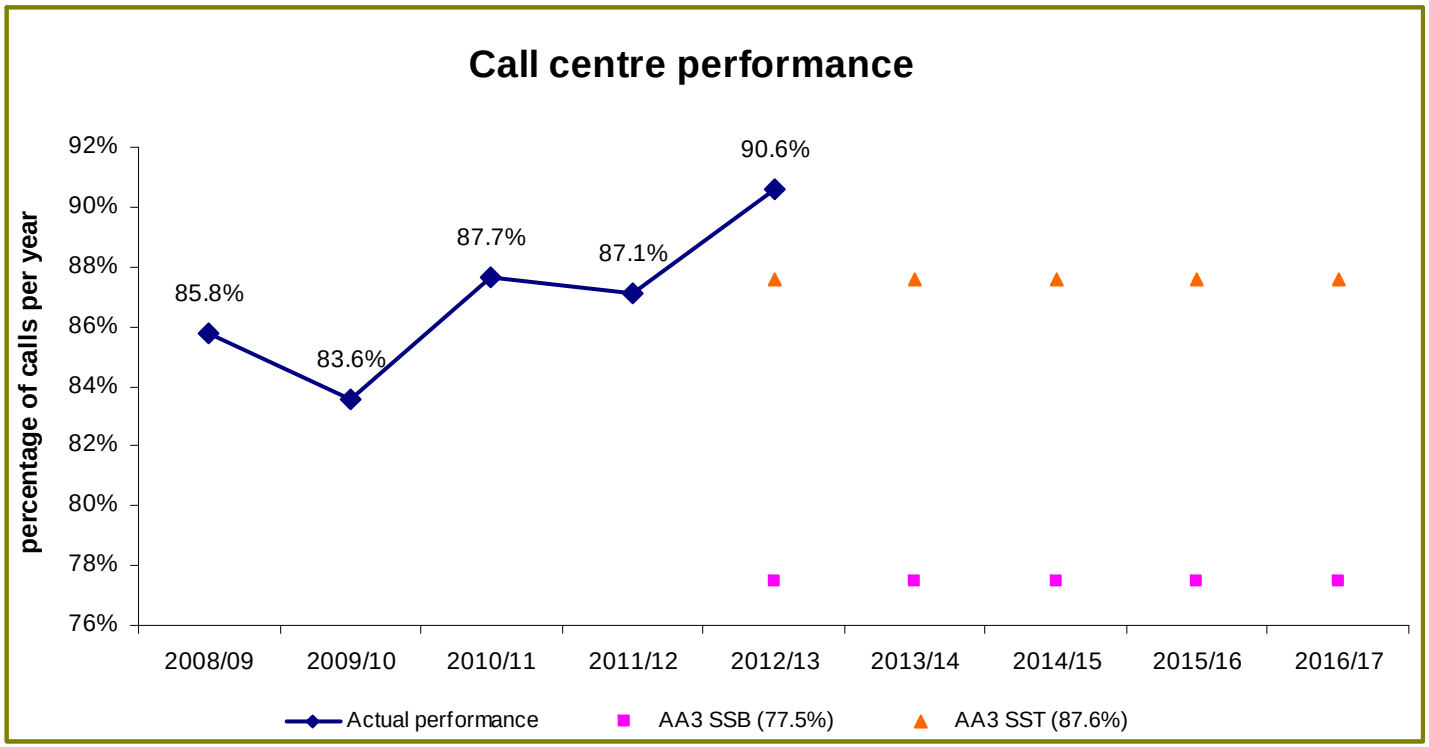

Figure 12: Call centre performance

Note:
There were no applicable service standard benchmarks for call centre performance during the AA2 period.

A.2 Transmission performance

- Figure 13 shows the circuit availability
- Figure 14 and Figure 15 show the system minutes interrupted for the meshed and radial networks
- Figure 16 and Figure 17 show the loss of supply event frequency for > 0.1 and > 1 system minutes
- Figure 18 show the average interruption duration

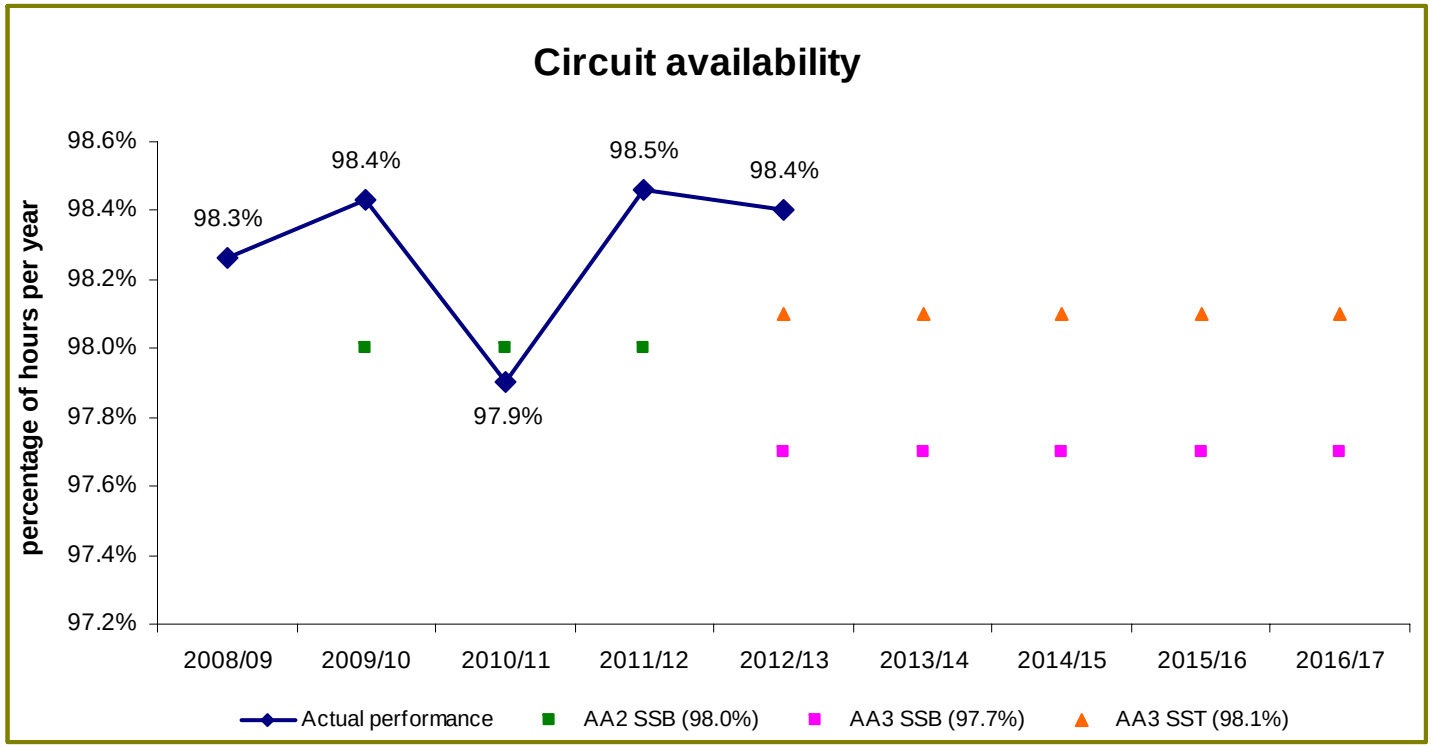

Figure 13: Circuit availability

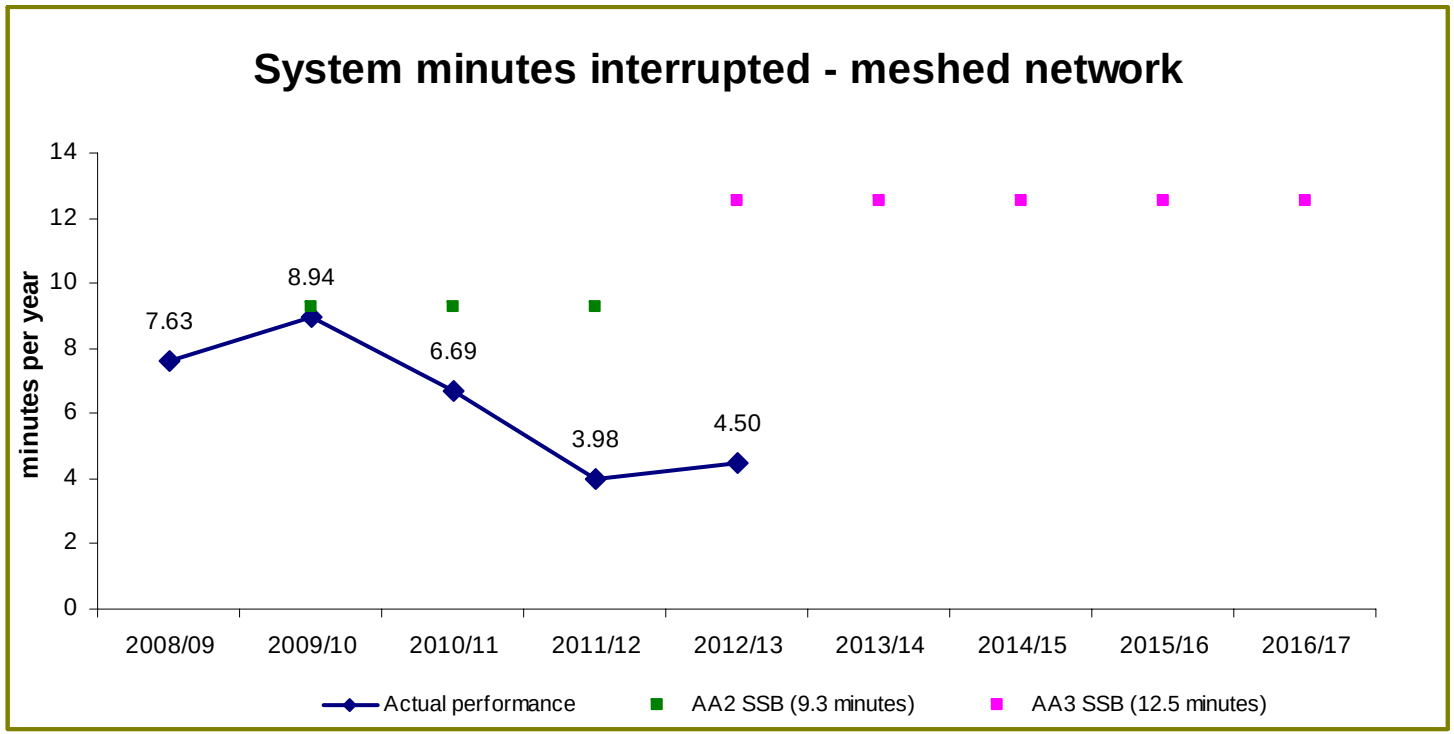

Figure 14: System minutes interrupted – meshed network

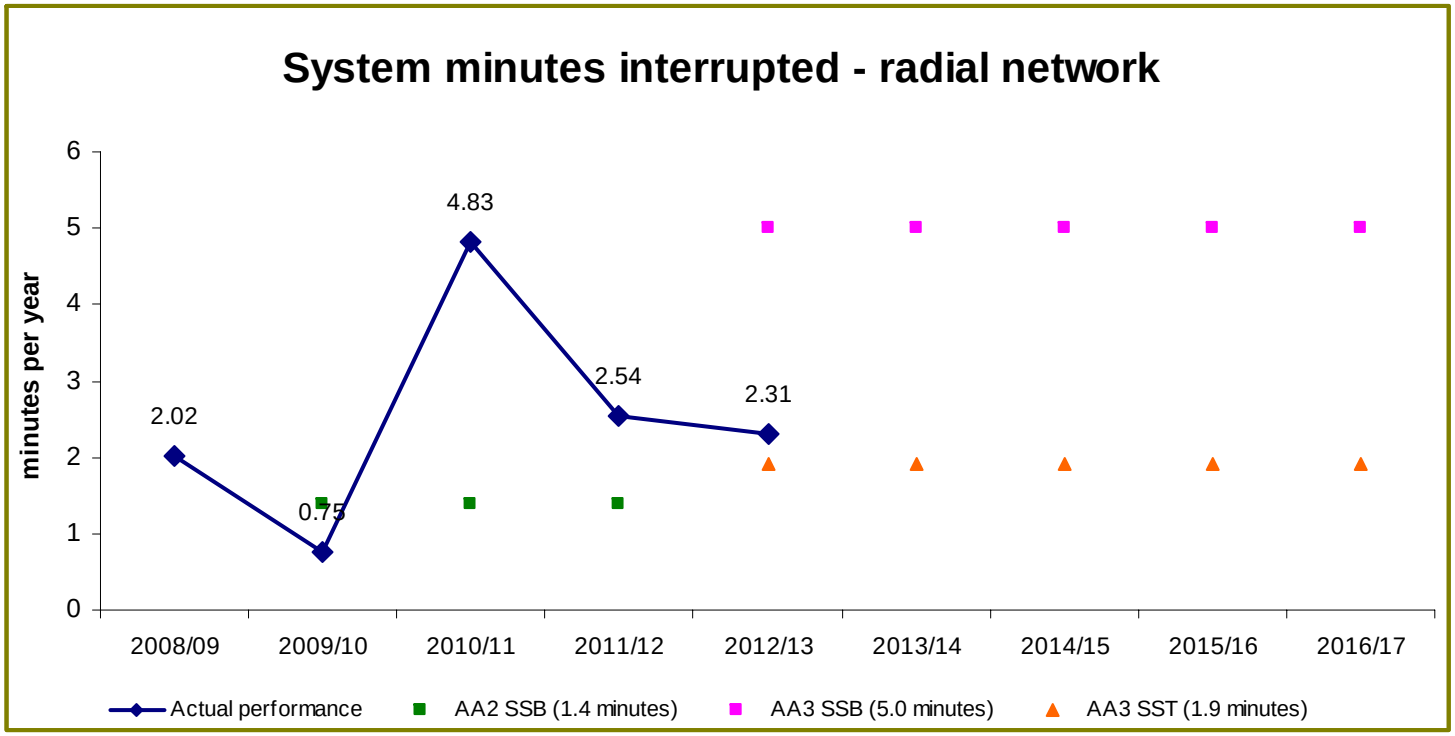

Figure 15: System minutes interrupted – radial network

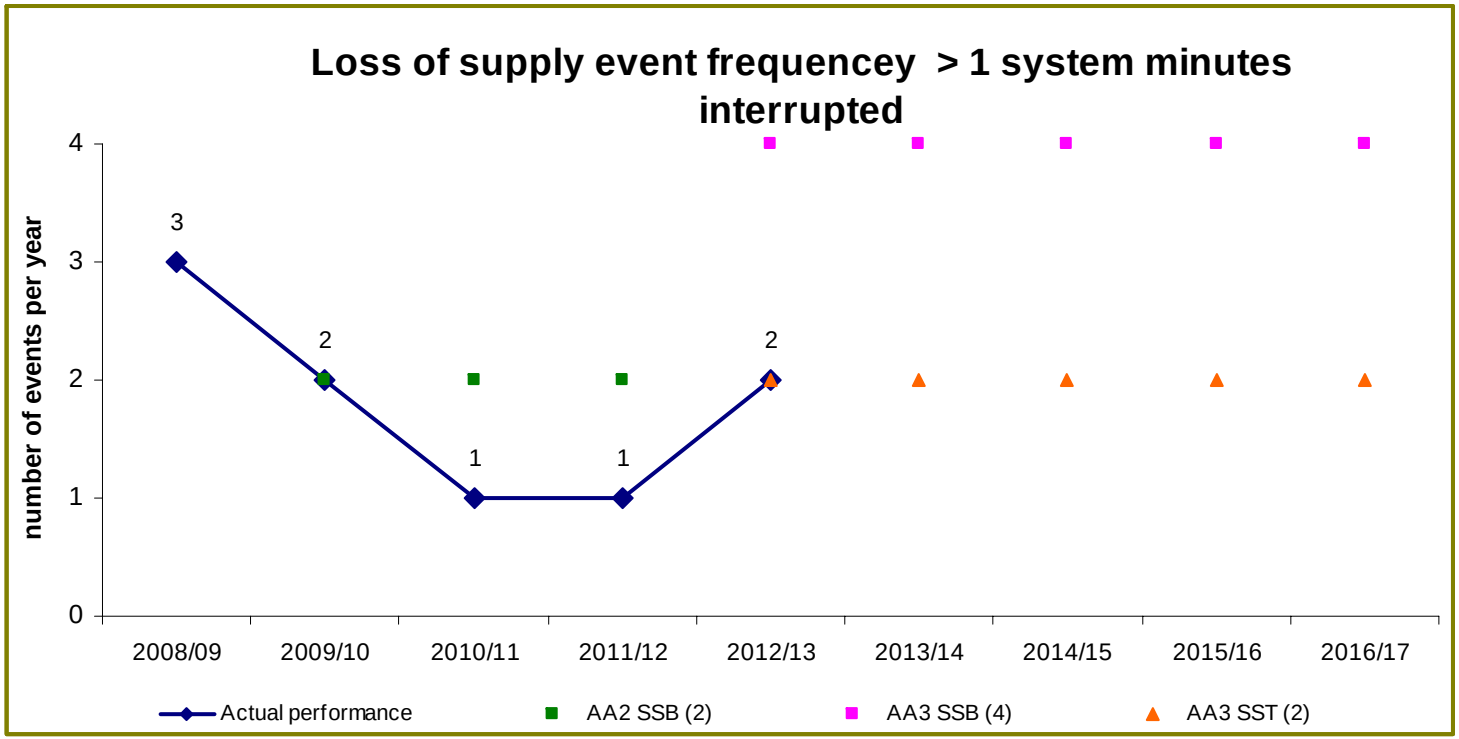

Figure 16: Loss of supply event frequency > 1 system minutes interrupted

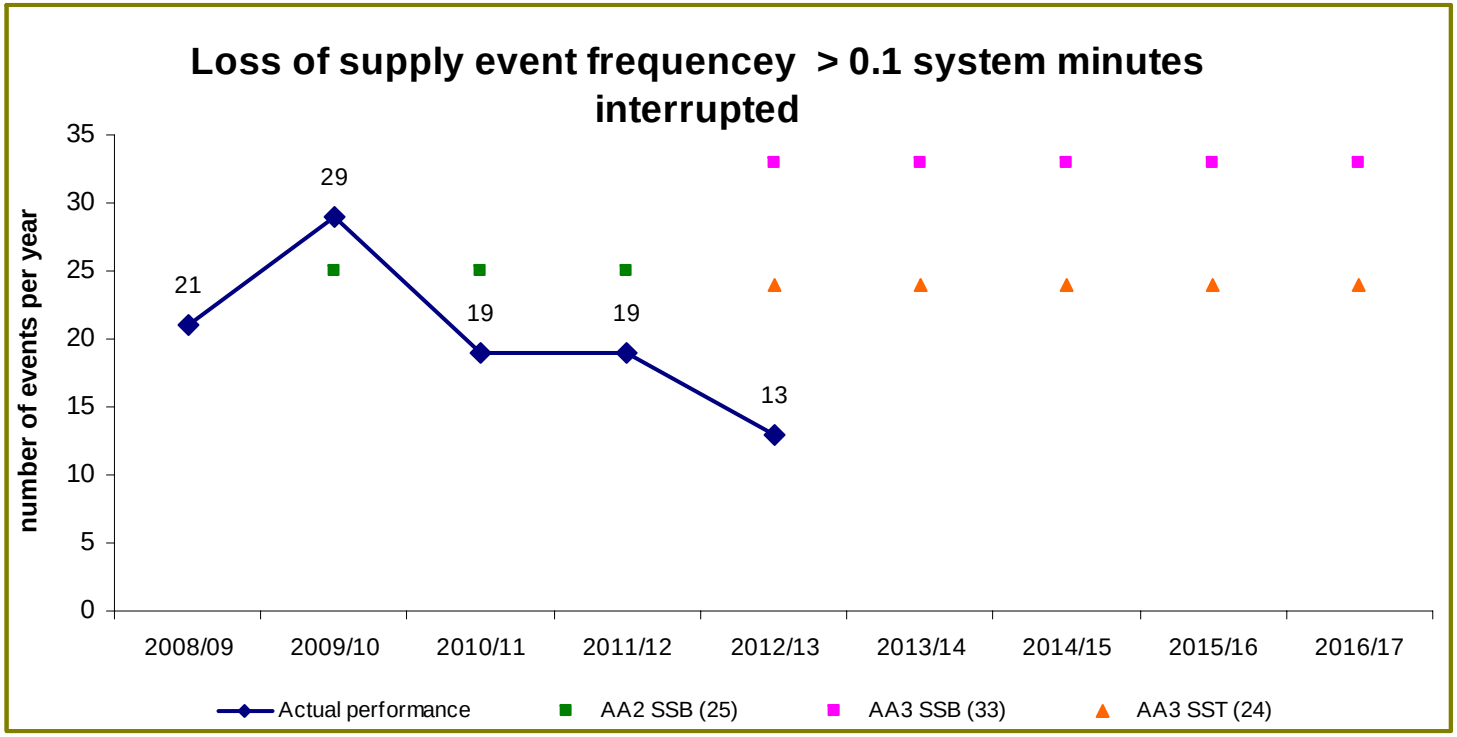

Figure 17: Loss of supply event frequency > 0.1 system minutes interrupted

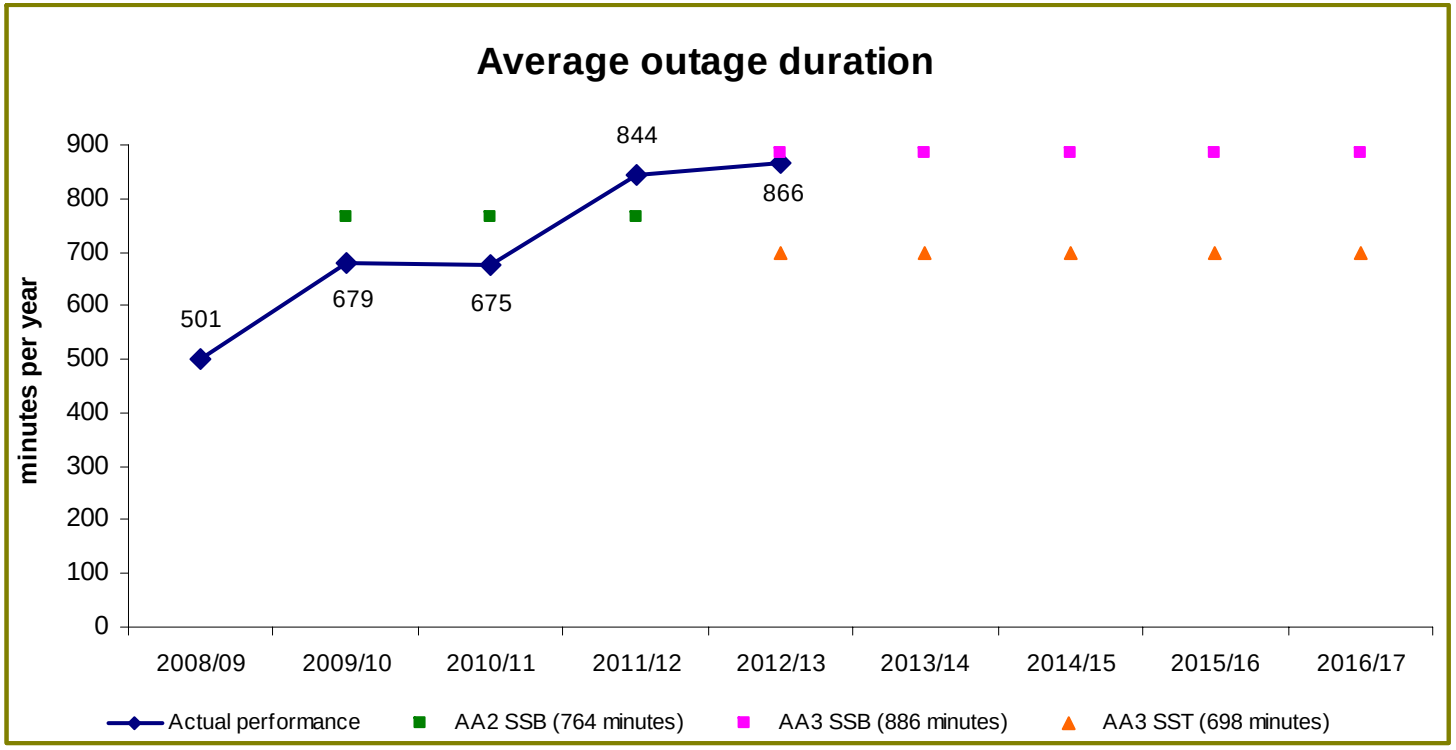

Figure 18: Average outage duration

A.3 Street lighting repair time

Figure 19 and Figure 20 show the street lighting repair time for the metropolitan and regional areas

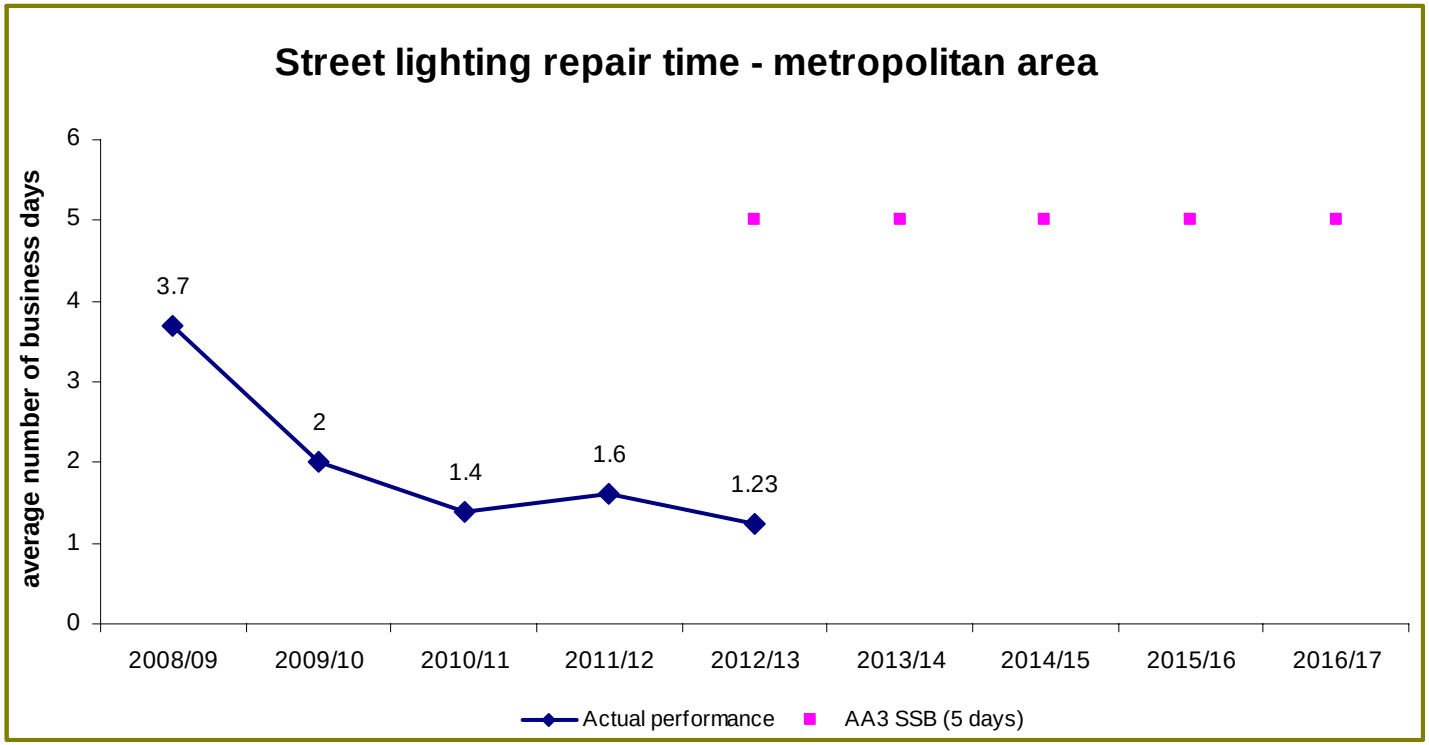

Figure 19: street lighting repair time – Metropolitan area

Note:
The street lighting repair time service standard benchmark was defined using different regions in the AA2 period.
The actual performance values shown in Figure 19 reflect a retrospective calculated value to match the AA3 period benchmarks.

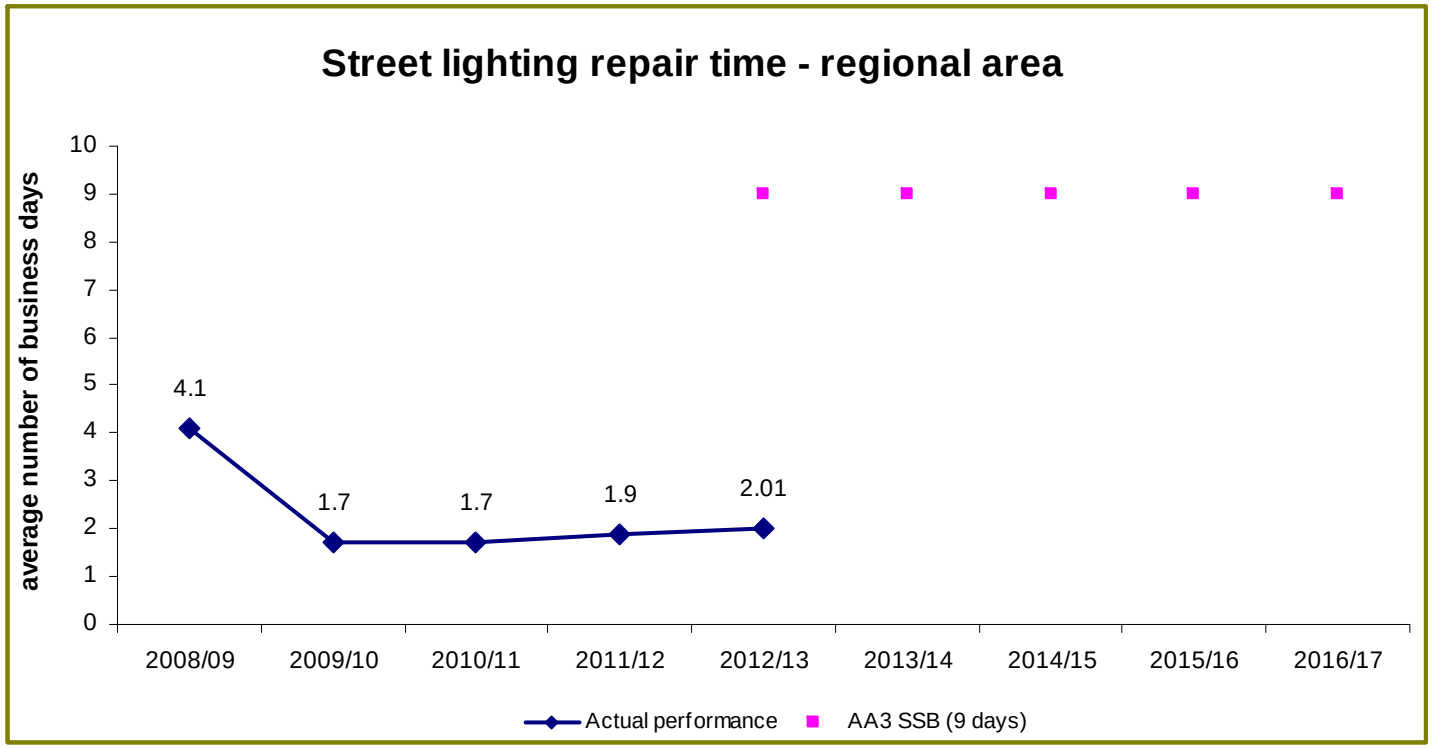

Figure 20: Street lighting repair time – Regional area

Note:
The street lighting repair time service standard benchmark was defined using different regions in the AA2 period.
The actual performance values shown in Figure 20 reflect a retrospective calculated value to match the AA3 period benchmarks.

Appendix B. Trends of fault causes for Rural Long SAIFI

The following graphs show the trends, over the past eight years up to June 2013, by key causes of interruptions (lightning, overhead equipment failure, fauna and vegetation) which contribute to SAIFI within the Rural Long networks.

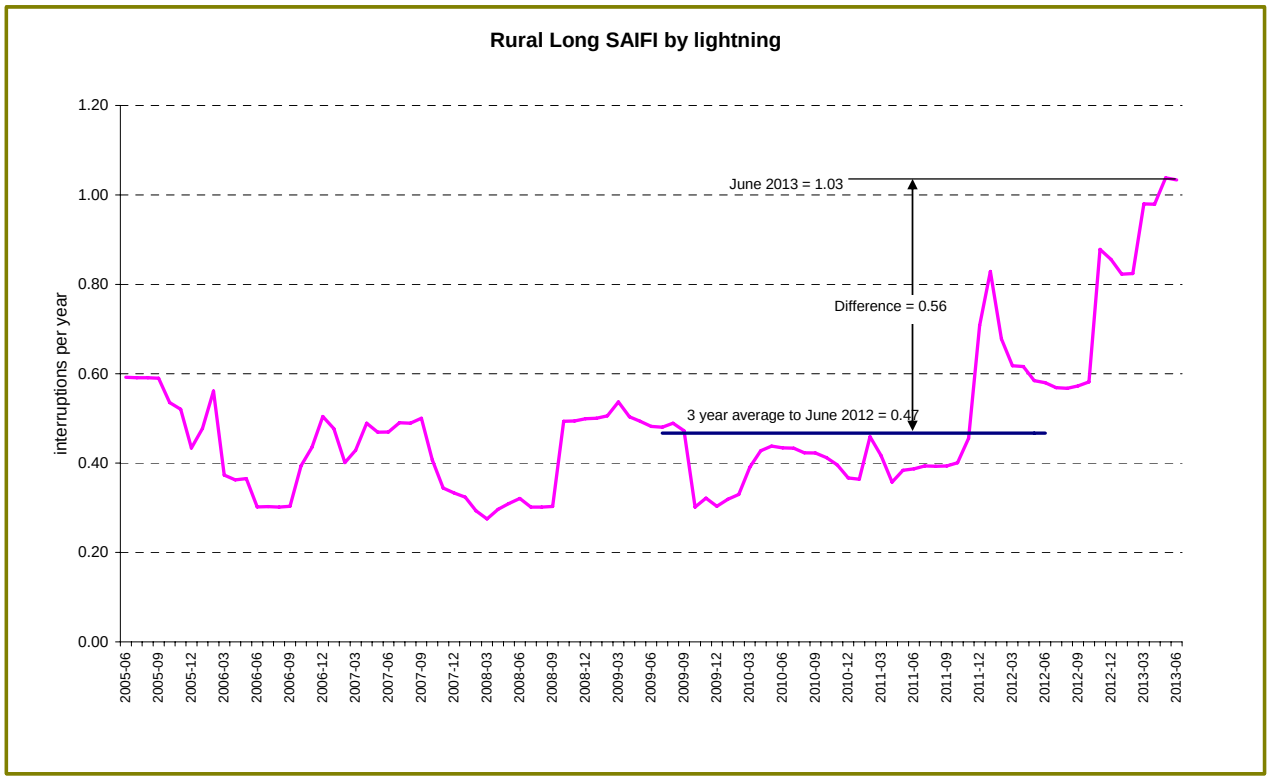

Figure 21: Rural Long SAIFI – lightning cause trend

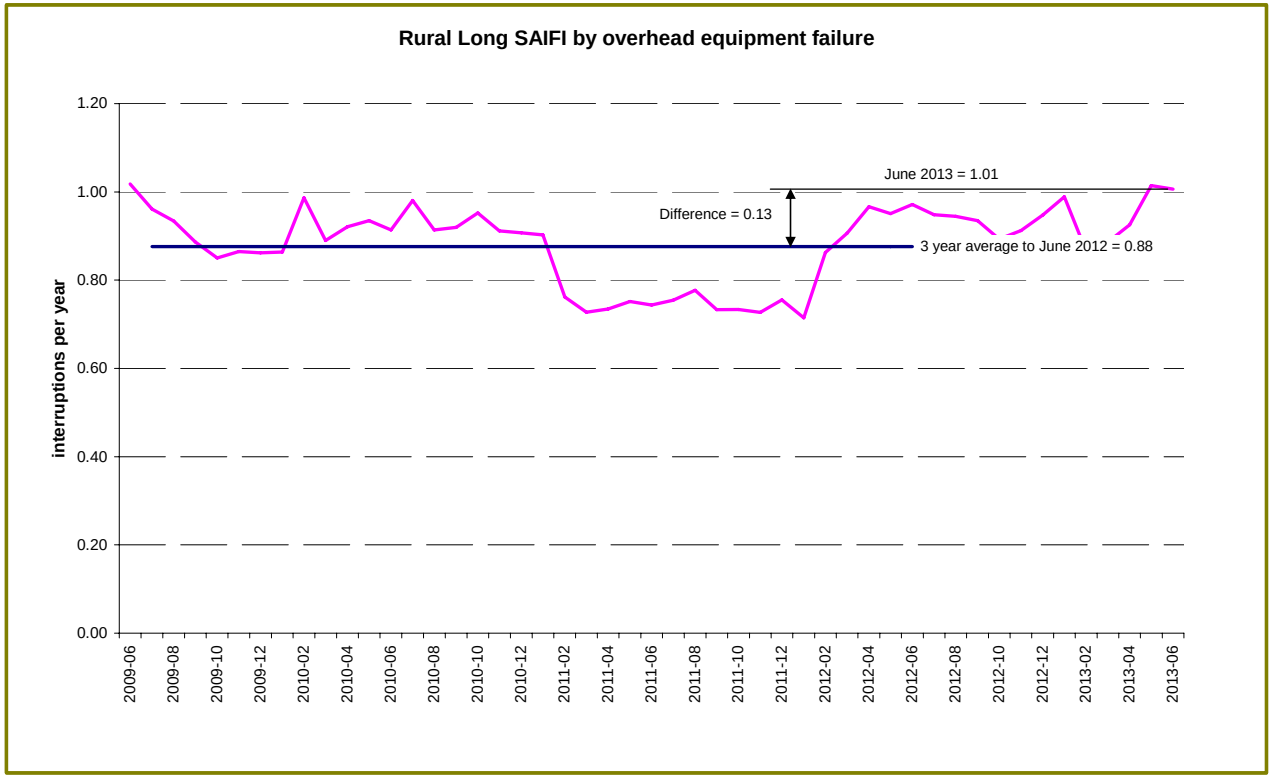

Figure 22: Rural Long SAIFI – overhead equipment failure cause trend

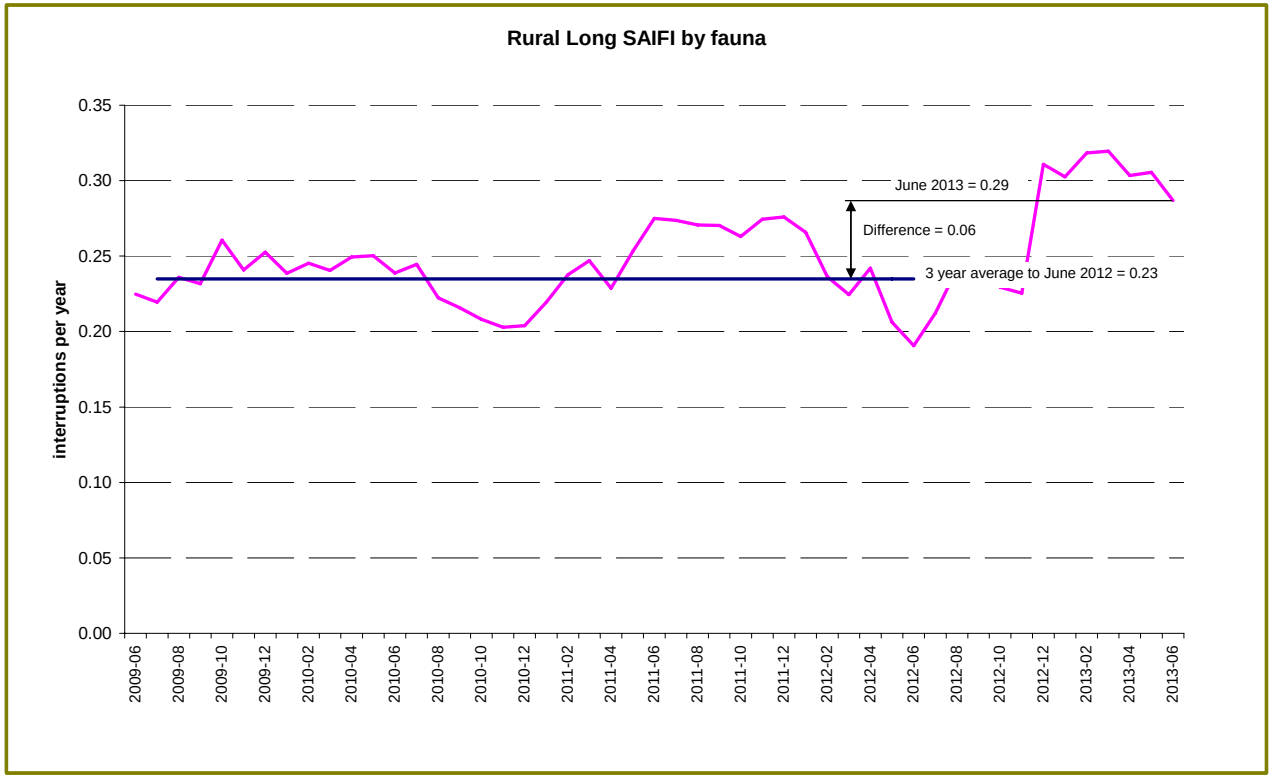

Figure 23: Rural Long SAIFI – fauna cause trend

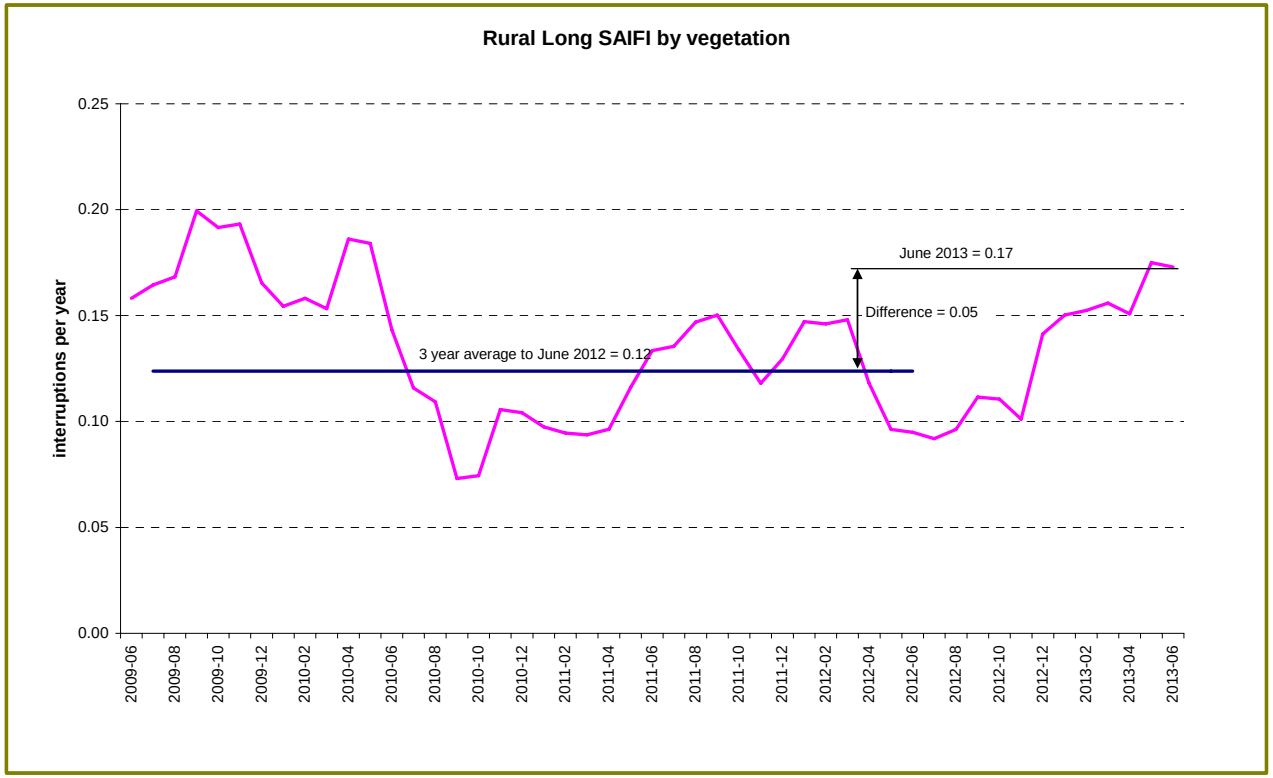

Figure 24: Rural Long SAIFI – vegetation cause trend

Appendix C. Trends of fault causes by Network SAIFI

The following appendix C graphs show the trends, over the past eight years up to June 2013, by key causes of interruptions (overhead equipment failure, vegetation, fauna and wind) which contribute to the Network SAIFI.

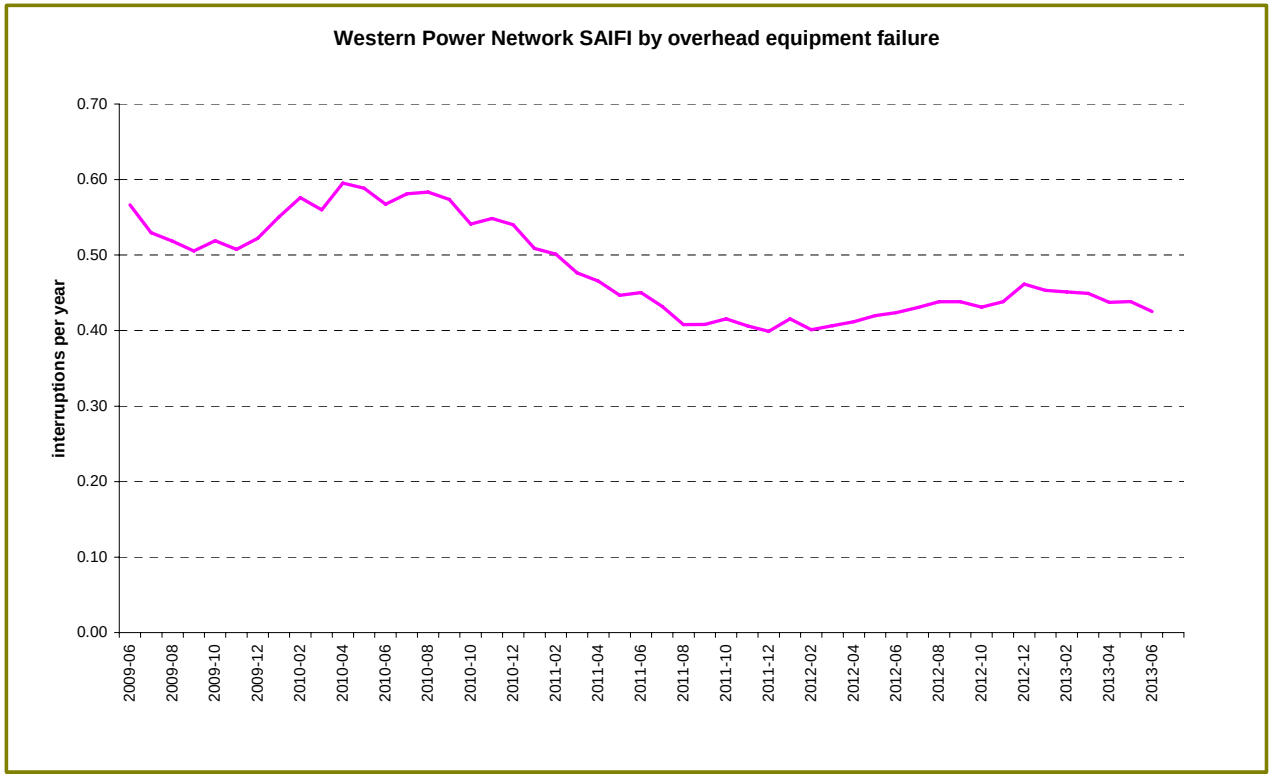

Figure 25: Network SAIFI – overhead equipment failure cause trend

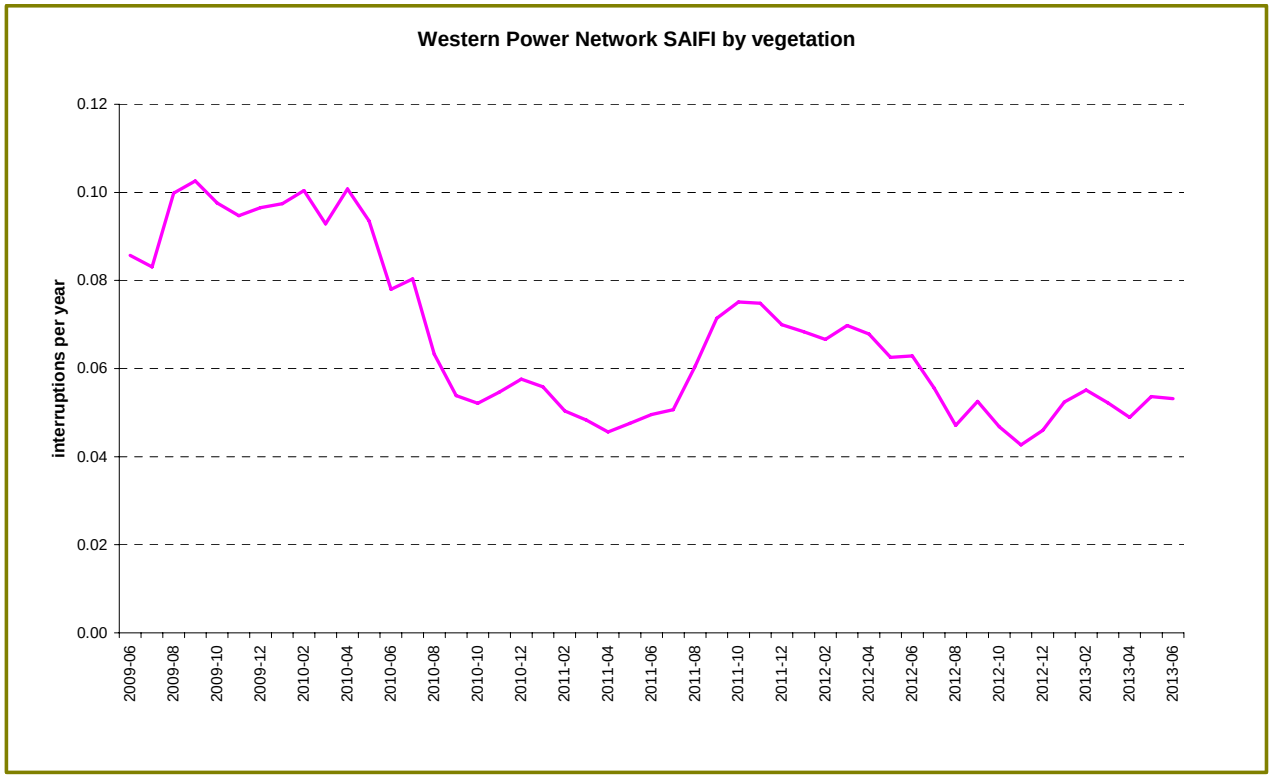

Figure 26: Network SAIFI – vegetation cause trend

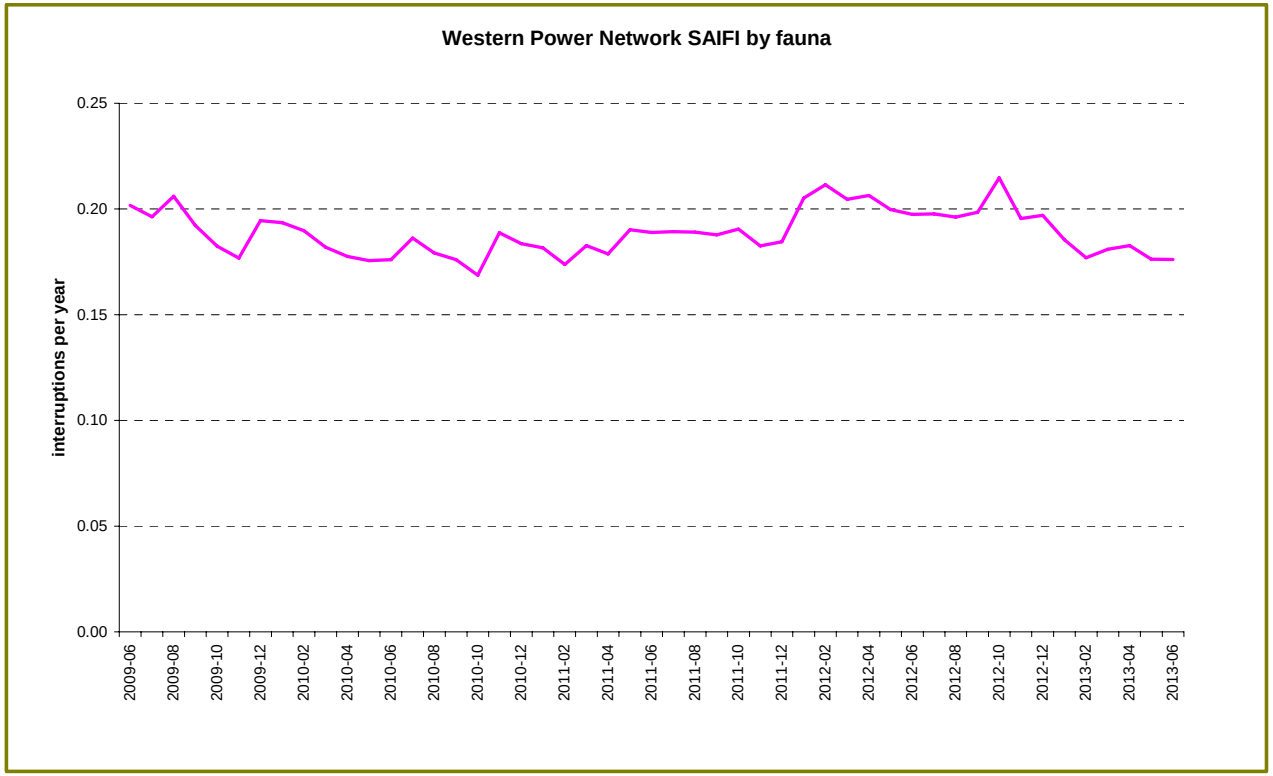

Figure 27: Network SAIFI – fauna cause trend

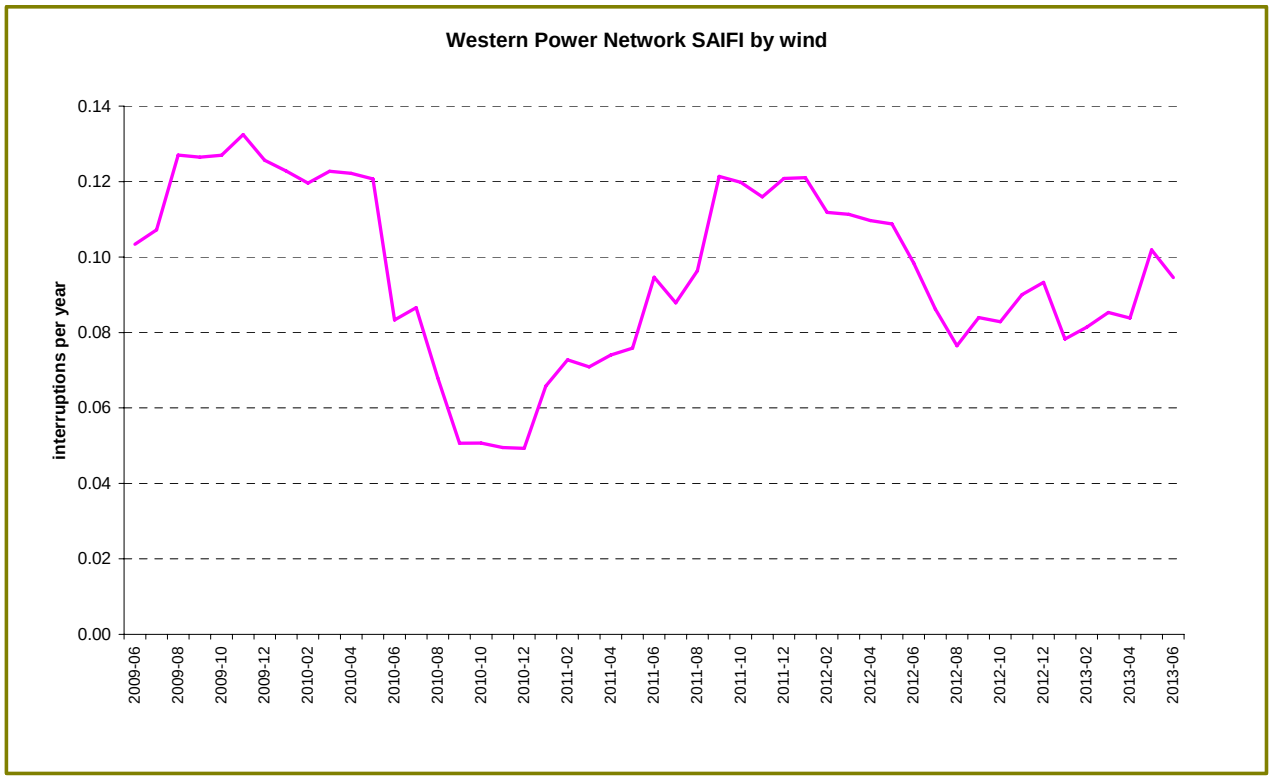

Figure 28: Network SAIFI – wind cause trend