



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
NORTH ZONE – RAJASTHAN SERVICE AREA
(JANUARY 2014 – MARCH 2014)

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PREFACE

The Telecom Regulatory Authority of India (TRAI) was established in 1997 by an Act of Parliament, called the Telecom Regulatory Authority of India Act, 1997, to regulate telecom services. The Authority's mission is to ensure that the interest of consumers are protected and at the same time to nurture conditions for growth of telecommunications, broadcasting and cable services in a manner and at a pace which will enable India to play a leading role in emerging global information society.

The Authority, in exercise of its functions as per the provisions in the TRAI Act, has been entrusted to measure the Quality of Service provided by the Service Providers from time to time and to compare them with the benchmarks so as to assess the level of performance. In pursuance of this, TRAI has appointed **M/s TUV-SUD South Asia Pvt. Ltd.** to carry out "Audit and Assessment of Quality of Service" provided by Basic (Wire line), Cellular Mobile and Broadband service providers in terms of the benchmarks specified in the respective regulations, in **North and West** Zones.

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **Rajasthan circle** against the QoS bench marks laid down by TRAI in the respective regulations.



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1. BACKGROUND





1. BACKGROUND

Telecom Regulatory Authority of India has been entrusted to “lay down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical survey of such service provided by the service providers so as to protect interest of the consumers of telecommunication services” vide sub-clause (v) of clause (b) of sub-section (1) of section 11 of the Telecom Regulatory Authority of India Act, 1997 (24 of 1997).

The purpose of laying down Quality of Service Parameters is to:

- i) Create conditions for consumer satisfaction by making known the quality of service, which the Service provider is required to provide, and the user has a right to expect.
- ii) Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.
- iii) Generally protect the interests of consumers of telecommunication services.

TRAI, the regulatory watch dog for the Quality of Service for the telecom services – Basic (Wire line), Cellular Mobile (Wireless) and Broadband has commissioned **M/s TUV-SUD South Asia Pvt. Ltd.** for conducting audit and assessment of quality of service of service providers, in terms of the benchmarks specified in the “The Standards of Quality of Service of Basic Telephone Service (Wire line) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated 20th March, 2009 and the Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6th October, 2006 on zonal basis for **North Zone and West Zone** comprising of the following Telecom Circles/Metro Service Areas:

North Zone: Delhi, Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Uttar Pradesh-East and Uttar Pradesh-West (including Uttarakhand). For the cellular mobile telephone service the service area of Delhi includes Ghaziabad, Faridabad, Noida and Gurgaon.

West Zone: Mumbai, Maharashtra (including Goa and excluding Mumbai), Gujarat and Madhya Pradesh (including Chhattisgarh).



The Audit exercise would assess the Quality of Service of telecom operators providing Basic (Wire line), Cellular Mobile (Wireless) and Broadband services by auditing the relevant QoS records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI. The audit would be carried out by **TUV-SUD South Asia** every quarter across all the Circles/Service areas of **North** and **West** Zones for Cellular Mobile Service. However, in respect of Basic telephone service (wire line) and Broadband service, a circle would be audited once in a year.

2. OBJECTIVES AND METHODOLOGY





2. OBJECTIVES AND METHODOLOGY

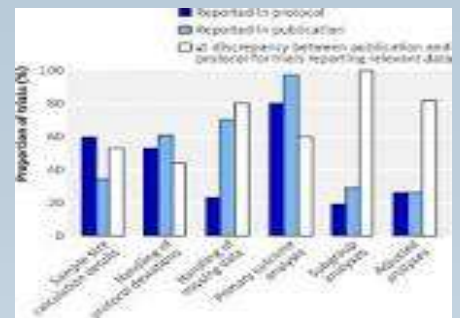
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service is carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) is undertaken for J&K , Himachal Pradesh & Mumbai circles and for Broadband service, the audit is done for J&K , Himachal Pradesh, Haryana, Delhi & Mumbai Circles during the quarter January – March 2014.**

The Scope of work as per the Terms of Reference (TOR) includes the following:

- i) Preparation of Performance Monitoring reports (PMRs) and uploading in the system.
- ii) Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days during each audit.
- iii) Monthly audit based on one month data of the SPs.
- iv) Drive test of the RF networks.
- v) Audit of the performance of call centers with respect to their accessibility and percentage of calls answered by the operators and random customer feedback by calling the customers to get feedback of the services provided by the service providers.
- vi) Transfer of data generated by the RF drive test/Live measurements / PMR/ monthly audit to the server located at TRAI premises on real time basis.

3. SAMPLE SIZE





3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

- 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centers (MSC's) of all the Cellular Mobile Service Providers or Unified Access Service Providers (UASP) were covered for audit in specified circles/service areas. Following are the various operators covered in Rajasthan circle

Sl. No.	Service Provider	Dates of live measurement Audit			Audit Location
		Jan-14	Feb-14	Mar-14	
GSM Operators					
1	AIRCEL	6,7 & 8 Jan	21,22 &24 Feb.	7,8 &11 Mar.	Aircel limited, 1st & 2nd Floor, Navajyoti, Amrapali Circle,C-Block,Vaishali Nagar, Jaipur-302021
2	AIRTEL	7,8 & 9 Jan	21,22 &24 Feb.	10,11 &12 Mar.	Bharti Hexacom Limited, K-21, Malviya Marg, c-scheme , Jaipur-302001
3	BSNL	8,9 & 10 Jan	20,21 & 22 Feb	5,6 &7 Mar.	Bharat Sanchar Nigam Ltd. (BSNL) Room no. 116, Bajaj Nagar MSC, First Floor, BSNL Bajaj Nagar, JLN marg, jaipur- 302015
4	IDEA	6,7 & 8 Jan	20,21 & 22 Feb	6,7 & 8 Mar.	Idea Cellular Ltd. Plot-C, Sahkar Marg, Jaipur- 302001
5	RCOM GSM	8,9 &10 Jan	18,19 & 20 Feb	11,12 &13 Mar.	Reliance Communications Ltd. F-161, E-170, Road No-12, VKIA, Jaipur-302013
6	TATA GSM	16,17 &18 Jan	10,11 &12 Feb.	7,8 &10 Mar.	Tata Teleservices Limited, The Guman-1, Amrapali circle, Vaishali nagar, jaipur-302021
7	VODAFONE	6,7 & 8 Jan	19,20 & 21 Feb.	5,6 &7 Mar.	Vodafone Ltd. 5th Floor,Gaurav Tower,Malviya Nagar jaipur, -302017
CDMA Operators					
8	MTS	9,10 &11 Jan.	20, 21 & 22 Feb.	7,8 &10 Mar.	Sistema Shyam Teleservices Ltd. 3, MTS Tower, Amrapali Circle Vaishali Nagar, Jaipur.
9	RCOM CDMA	8,9 &10 Jan	18,19 &20 Feb	11,12 & 13 Mar.	Reliance Communications Ltd. F-161, E-170, Road No-12, VKIA, Jaipur-302013
10	TATA CDMA	15,16 &18 Jan.	10,11 &12 Feb.	7,8 &10 Mar.	Tata Teleservices Limited, The Guman-1, Amrapali circle, Vaishali nagar, jaipur-302021

For all the above operators, audit was conducted in all the three months of the Quarter ended March 2014.

Transfer of data generated by monthly PMR and 3-days live measurements audit for the period January 2014 to March 2014 has been successfully uploaded to the server located at TRAI premises.



3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. **However, QoS audit for basic (wire line) service was not required to be done for Rajasthan Circle in the quarter ended March 2014.**

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV-SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle. **However, the QoS audit for Broadband service was not required to be done for Rajasthan Circle in the quarter ended March 2014.**

4. EXECUTIVE SUMMARY





4. EXECUTIVE SUMMARY

The executive summary put in a nutshell the key findings of the Audit by providing: -

- “*Service provider performance report*” for Cellular mobile, Basic (wire line) and Broadband services , which gives a foretaste of the performance of various operators against the benchmark specified by TRAI, during the months in which the Audit was carried out by TUV-SUD Auditors

- “*Parameter wise critical findings*” for Cellular mobile, Basic (wire line) and Broadband services: This indicates key observations and findings from different activities carried out during the Audit process

- TUV-SUD conducted audit involved a 3 stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. On the basis of the three days live measurement, the auditors checked the busy hour of the day for the service provider and collected the data for this busy hour for the month in which the audit was conducted. Finally, the performance of the service providers was also gauged by conducting drive tests in three select SSAs per service provider per quarter.

The three stage audit / verification viz audit of the records, live measurements and drive tests of all the cellular mobile operators was repeated every month. In case of Basic (Wire line) and Broadband, this exercise is required to be carried out on quarterly basis.

**4.1 MONTHLY DATA VERIFICATION FOR CELLULAR
MOBILE SERVICE PROVIDERS
(NETWORK SERVICE QUALITY PARAMETER)**





4.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON MONTHLY DATA VERIFICATION: NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES.

BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	AIRCEL	March-2014	19:00 - 20:00
2	AIRTEL	March-2014	20:00 - 21:00
3	BSNL	March-2014	19:00 - 20:00
4	IDEA	March-2014	20:00 - 21:00
5	RCOM GSM	March-2014	20:00 - 21:00
6	TATA GSM	March-2014	20:00 - 21:00
7	VODAFONE	March-2014	20:00 - 21:00
CDMA Operators			
8	MTS	March-2014	20:00 - 21:00
9	RCOM CDMA	March-2014	19:00 - 20:00
10	TATA CDMA	March-2014	20:00 - 21:00

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the Rajasthan circle.

SWITCHES/BSC/BTS DETAILS OF OPERATORS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRCEL	2	11	1508	NSN	NSN
2	AIRTEL	43	82	7789	Ericsson	Ericsson
3	BSNL	15	51	3852	Ericsson	NSN & Ericsson
4	IDEA	11	41	5468	Ericsson	Ericsson
5	RCOM GSM	4	15	2209	Huawei	Huawei
6	TATA GSM	3	12	1400	Huawei	Huawei
7	VODAFONE	12	84	6621	NSN	NSN
CDMA Operators						
8	MTS	2	6	1589	ZTE	ZTE
9	RCOM CDMA	6	6	1340	Huawei, Lucent, Ericsson & ZTE	Huawei & Lucent
10	TATA CDMA	5	6	688	Ericsson & Huawei	Huawei & Motorola



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES - RAJASTHAN CIRCLE- JAN-14 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Jan-14	0.14%	0.06%	1.85%	0.08%	0.24%	0.06%	0.02%	0.42%	0.07%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Jan-14	0.00%	0.18%	1.62%	0.06%	0.14%	0.00%	0.11%	0.90%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-14	97.27%	99.15%	98.65%	99.18%	99.65%	98.57%	99.81%	99.06%	98.98%	98.14%
	b) SDCCH/PAGING Channel congestion	<=1%	Jan-14	0.20%	0.14%	1.07%	0.12%	0.08%	0.06%	0.06%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-14	0.44%	0.26%	1.61%	0.36%	0.06%	0.04%	0.19%	0.00%	0.43%	0.72%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Jan-14	0.67%	0.76%	1.27%	1.54%	0.34%	0.69%	0.73%	0.07%	0.72%	0.73%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jan-14	1.79%	1.31%	1.46%	2.76%	0.23%	4.50%	2.46%	0.23%	1.61%	5.52%
	c) Connections with good voice quality	>=95%	Jan-14	97.67%	99.07%	98.00%	95.44%	98.73%	98.68%	97.45%	99.72%	98.90%	98.92%
4	No. of POI's having >=0.5% POI congestion		Jan-14	0	0	0	0	0	0	0	0	0	0



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES - RAJASTHAN CIRCLE- FEB-14 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Feb-14	0.07%	0.05%	1.88%	0.06%	0.22%	0.08%	0.02%	0.45%	0.08%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Feb-14	0.00%	0.15%	1.21%	0.02%	0.14%	0.00%	0.12%	0.30%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-14	97.25%	99.06%	98.78%	99.18%	99.62%	98.53%	99.79%	99.05%	98.78%	97.59%
	b) SDCCH/PAGING Channel congestion	<=1%	Feb-14	0.20%	0.15%	0.84%	0.18%	0.06%	0.03%	0.08%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-14	0.71%	0.31%	1.18%	0.38%	0.07%	0.06%	0.21%	0.00%	0.39%	1.28%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Feb-14	0.66%	0.84%	1.36%	1.39%	0.35%	0.65%	0.69%	0.06%	0.72%	0.74%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Feb-14	1.82%	1.14%	1.91%	2.28%	0.05%	4.04%	2.11%	0.25%	1.56%	5.58%
	c) Connections with good voice quality	>=95%	Feb-14	97.50%	99.02%	97.91%	95.43%	98.70%	98.65%	97.42%	99.72%	99.22%	98.90%
4	No. of POI's having >=0.5% POI congestion		Feb-14	0	0	0	0	0	0	0	0	0	0



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES - RAJASTHAN CIRCLE- MAR-14 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Mar-14	0.08%	0.06%	1.83%	0.07%	0.25%	0.07%	0.02%	0.41%	0.08%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Mar-14	0.00%	0.17%	1.84%	0.04%	0.23%	0.00%	0.11%	0.52%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-14	97.26%	98.93%	98.75%	98.70%	99.60%	98.56%	99.70%	98.74%	98.81%	97.74%
	b) SDCCH/PAGING Channel congestion	<=1%	Mar-14	0.32%	0.18%	0.84%	0.40%	0.02%	0.03%	0.11%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-14	0.92%	0.37%	1.30%	0.85%	0.08%	0.08%	0.30%	0.01%	0.40%	1.18%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Mar-14	0.66%	0.84%	1.32%	1.30%	0.38%	0.62%	0.69%	0.10%	0.71%	0.69%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Mar-14	1.82%	1.16%	1.71%	1.89%	0.03%	3.89%	1.98%	0.43%	1.61%	5.86%
	c) Connections with good voice quality	>=95%	Mar-14	97.41%	98.99%	98.29%	95.44%	98.71%	98.63%	97.36%	99.72%	99.20%	98.86%
4	No. of POI's having >=0.5% POI congestion		Mar-14	0	0	0	0	0	0	0	0	0	0



TABLE OF QUARTERLY QOS PERFORMANCE:

TABLE: 4

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-MARCH-14) - RAJASTHAN CIRCLE													
PMR Generation Data		Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.10%	0.06%	1.85%	0.07%	0.24%	0.07%	0.02%	0.43%	0.08%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.17%	1.73%	0.04%	0.17%	0.00%	0.11%	0.57%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	97.26%	99.05%	98.73%	99.02%	99.62%	98.55%	99.77%	98.95%	98.86%	97.82%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.24%	0.16%	0.92%	0.23%	0.05%	0.04%	0.08%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.69%	0.31%	1.36%	0.53%	0.07%	0.06%	0.23%	0.00%	0.41%	1.06%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.66%	0.81%	1.32%	1.41%	0.36%	0.65%	0.70%	0.08%	0.72%	0.72%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	1.81%	1.20%	1.69%	2.31%	0.10%	4.14%	2.18%	0.30%	1.59%	5.65%
	c) Connections with good voice quality	>=95%	Quarterly	97.53%	99.03%	98.15%	95.44%	98.71%	98.65%	97.41%	99.72%	99.11%	98.89%
4	No. of POI's having >=0.5% POI congestion		Quarterly	0	0	0	0	0	0	0	0	0	0



KEY FINDINGS: CELLULAR MOBILE SERVICES

The audit of network related parameters for cellular mobile service providers was conducted at their respective MSCs in the circle.

TUV conducted audit for cellular mobile operators based on **three stage audit / verification viz audit of the records, live measurements and drive tests. This exercise has been repeated every month for CMSPs.**

Network Service Quality Parameters:

- **Network Availability**

- i. BTS Accumulated Downtime (Not Available for Service):
- ii. Worst affected BTSs due to downtime

For measuring the performance against the benchmark for this parameter, down time of each BTS lasting for more than 1 hour at a time in a day during the period of a month has been taken for computation.

In Rajasthan circle, **all the operators were found meeting benchmark on the above parameters** 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter.

- **Connection Establishment (Accessibility)**

- i. Call Set-up Success Rate(CSSR)

CSSR includes complete signaling in the call set up process and does not aim to measure the performance of the called exchange or that of the Point of Interconnection (POI). CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made. All the operators were found to be calculating the parameter as per the TRAI's specified norms.

PMR audit revealed that all operators met the benchmark, prescribed for this parameter.

- **Parameters related to Network Congestion:**

The parameters namely SDCCH / Paging Channel Congestion, TCH and POI are prescribed with the aim of measuring the congestion in the network.

In CDMA system, there is no direct counter defined for reporting Paging Channel Congestion as reported by Tata Teleservices. However, they have a defined counter for Paging Channel Occupancy Ratio (PCH Average Using Ratio) which is used to determine the Paging Channel Occupancy which on an average is < 50% on all sites in the network. When the value of this parameter is less than 100%, it is counted as 0% congestion. Thus, there is no congestion on the paging channel in CDMA system.

With respect to this parameter, the performance of the operators is quite satisfactory as all operators met the TRAI specified benchmarks on the congestion parameters. There was **no congestion on individual POI** links between a service provider vis-à-vis other service providers.



▪ **Connection Maintenance (Retainability)**

i. Call Drop Rate:

This parameter gives a reliable measurement of the mobile network used by the service provider for maintaining a call once it has been correctly established. Failures in coverage, network congestion and network failures have important impact on this parameter.

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, **all the service providers were found to be meeting** the TRAI specified benchmark. The lowest call drop rate (average 0.08%) was for RCOM (CDMA) during the quarter.

ii. Worst affected cells having more than 3% TCH drops

Worst affected cells are defined as cells in which the call drop rate exceeds 3% during cell Bouncing Busy Hour (CBBH) or at any other hour of a day.

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter except Tata Tele Services (TTSL). **Tata (GSM) and Tata (CDMA)** could not meet the benchmark of this parameter with their achievement as **4.50% (Jan-14), 4.04% (Feb-14) & 3.89% (Mar-14)** and **5.52%, 5.58 % and 5.86 %** during the respective months of the quarter. The performance of Tata (GSM) and Tata (CDMA) for this parameter, on average of three months was **4.14% and 5.65 %** respectively.

Aircel has provided the data on monthly basis but not on daily basis as required for audit.

iii. Connections with good voice quality:

Some of the Operators are measuring this parameter through the system generated data at their switches whereas some are measuring through their periodic drive tests. The audit results for this parameter indicate that **all operators have met the bench mark** during the quarter.

4.2 CUSTOMER SERVICE QUALITY (CSD) PARAMETERS





4.2 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT-QE MAR-14:

CSD Data for Cellular Mobile Telephone Services - QE March-14

Quarterly CSD Audit Data		Bench-mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S / N	Name of Parameter			GSM Operators							CDMA Operators		
1 Metering & Billing Credibility -Post Paid													
	A) No. of bills issued during the quarter		RAJ	38839	278313	126172	85053	33681	NA	337707	53328	70408	74893
	B) No. of bills disputed including billing complaints during the quarter		RAJ	5	47	65	39	28	NA	257	43	65	0
	C)% of billing complaints during the quarter	<= 0.1%	RAJ	0.01%	0.02%	0.05%	0.05%	0.08%	NA	0.08%	0.08%	0.09%	0.00%
2 Metering & Billing Credibility -Pre Paid													
	A) Total No. of Pre-paid customers at the end of the quarter		RAJ	4467282	15379141	5765517	5841086	4836611	1120074	9418800	2090389	963367	1268969
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		RAJ	16	297	162	1022	4821	0	2667	417	946	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	RAJ	0.00%	0.00%	0.00%	0.02%	0.10%	0.00%	0.03%	0.02%	0.10%	0.00%
3 Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints													
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		RAJ	21	344	226	1061	4849	7	2924	460	1011	120
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		RAJ	21	344	216	1061	4849	7	2924	460	1011	120

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C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100 % within 4 week	RAJ	100.00%	100.00%	95.58%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	RAJ	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
4 Response time to customers for assistance													
A) Accessibility of call centre/Customer Care	>=95%	RAJ	93.34%	99.95%	100.00%	98.49%	99.00%	99.19%	100.00%	99.40%	98.44%	96.68%	
B) % call answered by operators(voice to voice) within 60 sec.	>=90%	RAJ	80.13%	94.00%	30.20%	96.66%	91.08%	92.15%	86.21%	97.17%	94.33%	94.11%	
5 Termination/closure of service													
A) Total No. of requests for Termination / Closure of service received during the quarter		RAJ	287	791	20019	466	178	NA	2394	903	190	166	
B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		RAJ	287	791	20019	445	178	NA	2394	903	190	166	
C) % of Termination/ Closure of service within 7 days	<=7da ys	RAJ	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%	100.00%
6 Time taken for refunds of deposits after closures.													
A) No. of Payments/ Refunds due during the quarter		RAJ	171	372	425	404	163	101	3768	255	384	101	
B) No. of Payments/ Refunds Cleared during the quarter		RAJ	171	372	284	404	163	101	3768	116	384	101	
C) Time taken for refunds of deposits after closures.	100% within 60 days	RAJ	100.00%	100.00%	66.82%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



KEY FINDINGS: CUSTOMER SERVICE DELIVERY PARAMETERS

1. Metering and billing credibility-(Post paid & Pre-paid)

The performance of the service providers with respect to the parameter metering and billing credibility for **both post-paid and pre-paid is well within the prescribed bench mark of <=0.1 %**.

2. Resolution of Billing complaints and applying credits -

- i. Resolution of billing /charging complaints*
- ii. Period of applying credit/waiver/adjustment to customer's account from the date of resolution of complaints*

All operators except BSNL have 100 % resolved the billing complaints within stipulated period of 4 weeks. **Only BSNL could not meet the benchmark with its achievement of 95.58 % against the benchmark of 100%**. In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % refund in one week.

3. Response Time to the Customer for assistance

- i. Accessibility of call centre/customer care*
- ii. Percentage of calls answered by Operators (Voice to Voice)*

All service providers are in compliance with respect to the parameter accessibility of call center. However, **Aircel, BSNL and Vodafone have not met the benchmark of calls answered by Operators (voice to voice) within 60 seconds**. They have achieved their performance as **80.13%, 30.20% and 86.21%** respectively. Thus performance of these operators for this parameter **was very poor and needs immediate attention**.

4. Termination/Closure of Service

In case of this parameters also, **all service providers have settled the closure/termination within the benchmark of 7 days**.

5. Time Taken for Refund of deposits after closures

All operators, except BSNL were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure. **Only BSNL failed to comply with the TRAI norms as its achievement was 66.82% only**.

**4.3 3-DAYS LIVE MEASUREMENT DATA VERIFICATION FOR
CELLULAR MOBILE SERVICE PROVIDERS
(NETWORK SERVICE QUALITY PARAMETER)**





4.3 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3-DAYS LIVE MEASUREMENT DATA VERIFICATION CONDUCTED IN EACH MONTH OF THE QUARTER:

A) NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES RAJASTHAN CIRCLE- JAN-14 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.07%	1.94%	0.09%	0.21%	0.07%	0.03%	0.19%	0.18%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.06%	0.21%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.30%	99.16%	97.32%	99.18%	99.67%	98.53%	99.83%	98.99%	99.02%	98.37%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.05%	0.13%	0.51%	0.23%	0.01%	0.03%	0.06%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.29%	0.28%	1.63%	0.37%	0.05%	0.06%	0.17%	0.30%	0.46%	0.62%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.66%	0.75%	1.25%	1.60%	0.32%	0.68%	0.73%	0.09%	0.59%	0.70%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.64%	1.21%	1.79%	2.92%	0.23%	4.43%	2.62%	0.26%	1.17%	5.58%
	c) Connections with good voice quality	>=95%	Live data	97.80%	99.09%	98.67%	95.54%	98.80%	98.70%	97.41%	99.74%	98.74%	98.93%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES RAJASTHAN CIRCLE- FEB-14 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.10%	0.04%	1.90%	0.05%	0.19%	0.05%	0.02%	0.42%	0.08%	0.11%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.04%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.39%	99.18%	98.74%	99.25%	99.62%	98.49%	99.80%	99.21%	98.01%	96.93%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.19%	0.10%	1.14%	0.14%	0.02%	0.06%	0.04%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.66%	0.27%	1.46%	0.34%	0.07%	0.04%	0.20%	0.00%	0.71%	1.97%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.65%	0.82%	1.35%	1.33%	0.36%	0.65%	0.72%	0.06%	0.70%	0.73%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.59%	1.06%	2.19%	2.12%	0.01%	4.07%	2.46%	0.38%	1.68%	5.11%
	c) Connections with good voice quality	>=95%	Live data	97.54%	99.02%	98.33%	95.47%	98.73%	98.67%	97.35%	99.72%	99.22%	98.92%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES RAJASTHAN CIRCLE- MAR-14 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.11%	0.05%	1.52%	0.10%	0.24%	0.02%	0.03%	0.43%	0.11%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.05%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.06%	98.88%	98.75%	99.07%	99.61%	98.57%	99.78%	98.35%	98.73%	98.52%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.56%	0.23%	0.72%	0.26%	0.02%	0.03%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.25%	0.37%	1.29%	0.50%	0.08%	0.08%	0.22%	0.01%	0.45%	0.44%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.68%	0.86%	1.33%	1.38%	0.36%	0.62%	0.68%	0.07%	0.70%	0.67%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.00%	1.20%	2.03%	2.22%	0.03%	4.13%	1.92%	0.48%	1.35%	5.64%
	c) Connections with good voice quality	>=95%	Live data	97.44%	98.98%	98.33%	95.38%	98.73%	98.64%	97.35%	99.72%	99.21%	98.88%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0



TABLE OF QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT DATA:

TABLE: 4

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE-MARCH-14) – RAJASTHAN CIRCLE													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.11%	0.05%	1.79%	0.08%	0.21%	0.05%	0.03%	0.35%	0.12%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.05%	0.14%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	97.25%	99.07%	98.27%	99.17%	99.63%	98.53%	99.80%	98.85%	98.59%	97.94%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.27%	0.15%	0.79%	0.21%	0.02%	0.04%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.73%	0.31%	1.46%	0.40%	0.07%	0.06%	0.20%	0.10%	0.54%	1.01%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.66%	0.81%	1.31%	1.44%	0.35%	0.65%	0.71%	0.07%	0.66%	0.70%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	1.74%	1.16%	2.00%	2.42%	0.09%	4.21%	2.33%	0.37%	1.40%	5.44%
	c) Connections with good voice quality	>=95%	Quarterly	97.59%	99.03%	98.44%	95.46%	98.75%	98.67%	97.37%	99.73%	99.06%	98.91%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0	0	0	0	0



KEY FINDINGS: 3 DAYS LIVE MEASUREMENTS

From three days live measurement assessment, it is found that the performance of all operators is satisfactory as they have largely met the benchmarks except the parameter ‘Worst affected cells> 3 % TCH drops”, which could not be complied with by Tata (GSM) and Tata (CDMA) in all the three months of this quarter. The performance of Tata (GSM) and Tata (CDMA) for this parameter, calculated taking average of three months was **4.21% and 5.44 %** respectively. **The similar non-compliance of Tata (GSM) and Tata (CDMA) was also observed for monthly audit of the quarter.**

BSNL was having congestion on SDCCH Channel marginally beyond the benchmark (1.14%) in the month of Feb-14.

B) CUSTOMER SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES-QE-MAR-14													
3 days live CSD Audit Data		Benchmark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S/N	Name of Parameter			GSM Operators						CDMA Operators			
RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE													
1	Total no of calls attempted to customer care/Call center		Rajasthan	12498	113312	4559	19409	377102	19125	212701	79872	20370	11958
	Total no. of calls successfully established to customer care/Call center		Rajasthan	12227	113312	4559	19292	373227	19125	212701	79468	20065	11958
	% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempt)	>=95%	Rajasthan	97.83%	100.00%	100.00%	99.40%	98.97%	100.00%	100.00%	99.49%	98.50%	100.00%
	Total Calls reached to agent desk for Voice to Voice (Total call attempt)		Rajasthan	11455	113312	1559	89471	37300	1613	78020	37563	9440	1246
	Total number of calls answered by the operator (Voice to voice) within 60 seconds		Rajasthan	9456	108753	1547	81287	31591	1528	72401	36944	8883	1154
	% age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec.*100 / Total call attempt)	>=90%	Rajasthan	82.55%	95.98%	99.23%	90.85%	84.69%	94.73%	92.80%	98.35%	94.10%	92.62%



CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	Rajasthan	100	100	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	Rajasthan	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	Rajasthan	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempt)	Rajasthan	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	Rajasthan	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 60 seconds	Rajasthan	100	100	76	100	100	100	100	100	100	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec.*100 / Total call attempt)	Rajasthan	100.00%	100.00%	76.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

The results for three days live measurements reveal that all operators have met the benchmarks for the parameters Accessibility to call center and call connection to operators (Voice to voice) within 60 seconds except **Aircel and RCOM GSM. Aircel and RCOM (GSM)** could achieve their performance with respect to the parameter call answered by operators (voice to voice) as **82.55% and 84.69%**.

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, **BSNL could connect 76 %** of calls to the operator within 60 Seconds.

INTER OPERATOR CALLS ASSESSMENT





INTER OPERATOR CALLS ASSESSMENT

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in Rajasthan service area during the time 1100 to 1400 Hrs and 1600 to 1900 was carried out by TUV auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators. While doing this exercise, the radio part, the switch part and POI in between the two operators are involved. Congestion in any of these network elements could result in congestion in the network.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT											
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
AIRCEL	<i>Rajasthan</i>	--	100%	100%	100%	100%	100%	100%	100%	100%	100%
AIRTEL	<i>Rajasthan</i>	100%	--	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	<i>Rajasthan</i>	100%	100%	--	100%	100%	100%	100%	100%	100%	100%
IDEA	<i>Rajasthan</i>	100%	100%	100%	--	100%	100%	100%	100%	100%	100%
RCOM (GSM)	<i>Rajasthan</i>	100%	100%	100%	100%	--	100%	100%	100%	100%	100%
TATA (GSM)	<i>Rajasthan</i>	100%	100%	100%	100%	100%	--	100%	100%	100%	100%
VODAFONE	<i>Rajasthan</i>	100%	100%	100%	100%	100%	100%	--	100%	100%	100%
MTS	<i>Rajasthan</i>	100%	100%	100%	100%	100%	100%	100%	--	100%	100%
RCOM (CDMA)	<i>Rajasthan</i>	100%	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA (CDMA)	<i>Rajasthan</i>	100%	100%	100%	100%	100%	100%	100%	100%	100%	--

The result of the testing revealed that the inter connection performance among the operators is quite satisfactory as there was hardly any problem in interconnection from one operator to other operators because of no congestion on individual POIs of the respective service providers.

LEVEL-1 LIVE CALLING





LEVEL-1 LIVE CALLING

LEVEL 1 LIVE CALLING													
Emergency no.	Circle Name	SSA Name	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
100	Rajasthan	Ajmer and Barmer	30	30	30	30	30	30	30	30	30	30	30
101	Rajasthan		30	30	30	30	30	30	30	30	30	30	30
102	Rajasthan		30	30	30	30	30	30	30	30	30	30	30
108	Rajasthan		30	30	30	30	30	30	30	30	30	30	30

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various mobile service providers, the calls were made from mobile phones provided by the service providers. In these SSA of Rajasthan service areas, the emergency services as mentioned in the above table were found functional in the networks of all the service providers

5. DRIVE TEST





5. DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were required to be carried out in three select SSA's namely **Ajmer, Barmer and Bhilwara** in the months of January, February and March 2014 respectively, covering minimum 300 Km distance in each SSA. Drive test at Bhilwara SSA could not be conducted due to law & order problems at Bhilwara on the first scheduled dates (24th to 26th March-14) and then due to other problems related to the General elections on the next scheduled dates. The matter was put in the knowledge of TRAI RO Jaipur and Head Office as well.

The performance of the operators has been highlighted below in the tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour.

For measuring voice quality, Rx Qual samples on a scale from 0 to 7 for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. As per the QoS norms, Rx Qual between 0- 5 for GSM operators and between 0-4% FER value for CDMA operators is considered to be good, where as Rx Qual beyond this benchmark is considered to be bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in dBm at street level with strength ≥ -75 dBm for in-door coverage and ≥ -85 dBm for in-vehicle.

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-RAJASTHAN CIRCLE



DRIVE TEST TABLE: 1

OPERATOR-ASSISTED DRIVE TEST AT AJMER SSA IN JAN-14 MONTH- RAJASTHAN CIRCLE													
S/N	Parameter	SSA Name: Ajmer	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators	
1	Call Attempts	Day-1	Jan-14	111	158	157	173	161	145	164	152	160	162
		Day-2	Jan-14	90	132	120	155	130	94	133	142	148	121
		Day-3	Jan-14	116	186	117	137	139	86	161	135	145	190
		Over all SSA Result	Total	317	476	394	465	430	325	458	429	453	473
2	Blocked Call Rate	Day-1	Jan-14	0.00%	0.00%	2.55%	0.58%	0.00%	0.00%	0.00%	0.00%	0.63%	0.00%
		Day-2	Jan-14	0.00%	0.00%	0.83%	1.31%	0.00%	1.06%	0.00%	0.00%	0.68%	0.00%
		Day-3	Jan-14	0.00%	0.00%	0.85%	0.73%	0.00%	1.16%	0.00%	0.00%	0.69%	0.00%
		Over all SSA Result	Total	0.00%	0.00%	1.52%	0.86%	0.00%	0.62%	0.00%	0.00%	0.66%	0.00%
3	Dropped Call Rate (<=2%)	Day-1	Jan-14	0.00%	0.00%	0.00%	0.58%	0.00%	0.69%	0.00%	0.00%	0.63%	1.85%
		Day-2	Jan-14	0.00%	0.00%	0.00%	0.66%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%
		Day-3	Jan-14	0.00%	0.00%	0.00%	0.00%	0.00%	1.18%	0.00%	0.00%	0.69%	1.58%
		Over all SSA Result	Total	0.00%	0.00%	0.00%	0.44%	0.00%	0.62%	0.00%	0.00%	0.67%	1.27%
Percentage connections with good voice quality (=>95%)													
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Jan-14	NA	NA	NA	NA	NA	NA	NA	99.76%	99.92%	95.59%
		Day-2	Jan-14	NA	NA	NA	NA	NA	NA	NA	99.86%	97.49%	98.80%
		Day-3	Jan-14	NA	NA	NA	NA	NA	NA	NA	99.88%	98.79%	95.56%
		Over all SSA Result	Total	NA	NA	NA	NA	NA	NA	NA	99.83%	98.77%	96.37%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Jan-14	97.50%	95.84%	95.55%	95.21%	98.11%	97.52%	95.78%	NA	NA	NA
		Day-2	Jan-14	97.65%	95.13%	96.64%	96.90%	97.53%	98.50%	96.03%	NA	NA	NA
		Day-3	Jan-14	97.15%	95.29%	95.28%	95.66%	97.15%	98.63%	96.23%	NA	NA	NA
		Over all SSA Result	Total	97.41%	95.43%	95.82%	95.92%	97.62%	98.06%	96.00%	NA	NA	NA
Service Coverage													
5	In door (>= -75dBm)	Day-1	Jan-14	54.81%	59.39%	99.13%	80.19%	76.59%	39.41%	85.68%	88.50%	89.61%	81.79%
		Day-2	Jan-14	46.14%	24.92%	81.47%	49.85%	49.36%	38.00%	77.32%	82.27%	33.08%	58.80%
		Day-3	Jan-14	57.04%	59.18%	96.11%	75.81%	68.19%	26.65%	52.60%	63.07%	80.24%	73.90%
		Over all SSA Result	Total	53.21%	49.98%	92.66%	68.76%	65.31%	35.60%	72.61%	78.75%	68.66%	72.85%
	In-vehicle (>= -85dBm)	Day-1	Jan-14	90.57%	89.33%	99.99%	96.86%	97.86%	89.29%	99.17%	99.64%	99.92%	93.95%
		Day-2	Jan-14	85.50%	71.91%	99.40%	85.92%	82.94%	95.80%	97.82%	96.40%	62.70%	86.11%
		Day-3	Jan-14	92.08%	88.86%	99.95%	97.29%	96.11%	86.78%	92.91%	97.14%	98.55%	92.17%
		Over all SSA Result	Total	89.71%	84.43%	99.79%	93.42%	92.61%	90.32%	96.77%	97.78%	87.79%	91.28%
	Outdoor- in city (>= -95dBm)	Day-1	Jan-14	99.24%	99.44%	100.00%	99.94%	99.90%	100.00%	99.96%	100.00%	100.00%	99.52%
		Day-2	Jan-14	99.80%	98.29%	99.97%	98.46%	97.79%	100.00%	99.98%	99.98%	100.00%	96.88%

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		Day-3	Jan-14	99.48%	99.16%	100.00%	99.90%	99.81%	100.00%	99.94%	99.99%	100.00%	98.48%
		Over all SSA Result	Total	99.21%	99.02%	100.00%	99.44%	99.21%	100.00%	99.96%	99.99%	100.00%	98.44%
6	Call Setup Success Rate (>=95%)	Day-1	Jan-14	100.00%	100.00%	97.45%	99.42%	100.00%	100.00%	100.00%	100.00%	99.38%	98.15%
		Day-2	Jan-14	100.00%	100.00%	99.17%	98.71%	100.00%	98.94%	100.00%	100.00%	99.32%	100.00%
		Day-3	Jan-14	100.00%	100.00%	99.15%	99.27%	100.00%	98.84%	100.00%	100.00%	99.31%	98.42%
		Over all SSA Result	Total	100.00%	100.00%	98.48%	99.14%	100.00%	99.38%	100.00%	100.00%	99.34%	98.73%
7	Hand Over Success Rate (HOSR)	Day-1	Jan-14	100.00%	99.66%	99.26%	98.98%	99.44%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Jan-14	100.00%	99.48%	100.00%	98.94%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-3	Jan-14	100.00%	99.69%	100.00%	99.36%	100.00%	99.30%	99.70%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	100.00%	99.65%	99.64%	99.10%	99.80%	99.84%	99.87%	100.00%	100.00%	100.00%



DRIVE TEST TABLE: 2

OPERATOR-ASSISTED DRIVE TEST AT AJMER SSA IN JAN-14 MONTH- RAJASTHAN CIRCLE - INDOOR														
S/N	Parameter	Ajmer SSA	Drive Test Period	Indoor Location	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
					GSM Operators						CDMA Operators			
1	Call Attempts	Day 1	Jan-14	Cine Mall Ajmer	10	10	10	10	12	10	10	11	20	11
		Day 2	Jan-14	Bus Stand Nasirabad	10	10	10	10	10	20	10	11	20	11
		Day 3	Jan-14	Kanha Mall Beawar	11	10	10	10	10	20	10	10	20	10
		Overall SSA	Jan-14		31	30	30	30	30	32	50	30	32	60
2	Blocked Call Rate	Day 1	Jan-14	Cine Mall Ajmer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day 2	Jan-14	Bus Stand Nasirabad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day 3	Jan-14	Kanha Mall Beawar	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	Jan-14		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Day 1	Jan-14	Cine Mall Ajmer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day 2	Jan-14	Bus Stand Nasirabad	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day 3	Jan-14	Kanha Mall Beawar	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	Jan-14		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)													
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day 1	Jan-14	Cine Mall Ajmer	NA	NA	NA	NA	NA	NA	NA	99.80%	100.00%	99.08%
		Day 2	Jan-14	Bus Stand Nasirabad	NA	NA	NA	NA	NA	NA	NA	99.67%	100.00%	99.76%
		Day 3	Jan-14	Kanha Mall Beawar	NA	NA	NA	NA	NA	NA	NA	99.52%	99.57%	99.25%
		Overall SSA	Jan-14		NA	NA	NA	NA	NA	NA	NA	99.66%	99.88%	99.36%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day 1	Jan-14	Cine Mall Ajmer	98.88%	96.26%	99.34%	98.19%	99.43%	97.48%	97.73%	NA	NA	NA
		Day 2	Jan-14	Bus Stand Nasirabad	99.56%	96.49%	99.63%	100.00%	99.36%	100.00%	99.26%	NA	NA	NA
		Day 3	Jan-14	Kanha Mall Beawar	96.78%	95.94%	99.25%	99.30%	99.52%	98.71%	98.83%	NA	NA	NA
Overall SSA		Jan-14		98.43%	96.22%	99.41%	98.94%	99.43%	99.10%	98.61%	NA	NA	NA	
5	Service Coverage													
	In door (>= -75dBm)	Day 1	Jan-14	Cine Mall Ajmer	45.30%	99.56%	86.46%	96.39%	86.64%	8.75%	99.96%	97.84%	60.47%	100.00%

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6	Overall SSA	Day 2	Jan-14	Bus Stand Nasirabad	55.41%	48.57%	52.10%	60.26%	52.01%	97.17%	99.14%	97.14%	0.00%	97.14%
		Day 3	Jan-14	Kanha Mall Beawar	12.08%	86.86%	47.87%	89.07%	47.78%	4.96%	94.44%	98.32%	100.00%	98.32%
		Overall SSA	Jan-14		37.80%	87.74%	62.14%	87.53%	63.09%	45.82%	97.85%	97.77%	53.99%	98.51%
		Day 1	Jan-14	Cine Mall Ajmer	92.80%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	In-vehicle (>= - 85dBm)	Day 2	Jan-14	Bus Stand Nasirabad	99.26%	83.76%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 3	Jan-14	Kanha Mall Beawar	93.83%	99.94%	100.00%	99.88%	100.00%	72.67%	99.96%	100.00%	100.00%	100.00%
		Overall SSA	Jan-14		95.33%	94.78%	100.00%	99.91%	100.00%	88.49%	99.99%	100.00%	100.00%	100.00%
		Day 1	Jan-14	Cine Mall Ajmer	99.10%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	Outdoor-in city (>= - 95dBm)	Day 2	Jan-14	Bus Stand Nasirabad	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 3	Jan-14	Kanha Mall Beawar	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA	Jan-14		99.70%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 1	Jan-14	Cine Mall Ajmer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	Call Setup Success Rate (>=95%)	Day 2	Jan-14	Bus Stand Nasirabad	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 3	Jan-14	Kanha Mall Beawar	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA	Jan-14		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 1	Jan-14	Cine Mall Ajmer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Hand Over Success Rate (HOSR)	Day 2	Jan-14	Bus Stand Nasirabad	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
	Day 3	Jan-14	Kanha Mall Beawar	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
	Overall SSA	Jan-14		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
	Day 1	Jan-14	Cine Mall Ajmer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

DRIVE TEST TABLE: 3

OPERATOR-ASSISTED DRIVE TEST AT BARMER SSA IN FEB-14 MONTH- RAJASTHAN CIRCLE													
S/N	Parameter	SSA Name: Barmer	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators	
1	Call Attempts	Day-1	Feb-14	70	211	136	61	70	74	144	79	90	377
		Day-2	Feb-14	19	220	120	40	NS	17	169	25	33	NS
		Day-3	Feb-14	108	200	203	190	101	131	214	111	131	220
		Over all SSA Result	Total	197	631	459	291	171	222	527	215	254	597
2	Blocked Call Rate	Day-1	Feb-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.22%	0.00%
		Day-2	Feb-14	0.00%	0.00%	3.33%	0.00%	NS	0.00%	0.00%	0.00%	0.00%	NS

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		Day-3	Feb-14	0.00%	0.00%	1.97%	4.21%	0.00%	1.53%	0.00%	0.00%	1.53%	0.00%
		Over all SSA Result	Total	0.00%	0.00%	1.74%	2.75%	0.00%	0.90%	0.00%	0.00%	0.00%	1.57%
3	Dropped Call Rate (<=2%)	Day-1	Feb-14	0.00%	0.47%	3.82%	0.00%	0.00%	0.00%	0.00%	0.00%	1.11%	0.27%
		Day-2	Feb-14	0.00%	0.00%	1.72%	0.00%	NS	0.00%	0.00%	0.00%	0.00%	NS
		Day-3	Feb-14	0.00%	0.00%	4.81%	1.10%	0.00%	1.55%	0.00%	0.00%	1.55%	0.45%
		Over all SSA Result	Total	0.00%	0.16%	3.69%	0.71%	0.00%	0.91%	0.00%	0.00%	0.00%	1.19%
Percentage connections with good voice quality (=>95%)													
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Feb-14	NA	NA	NA	NA	NA	NA	NA	99.74%	98.81%	99.42%
		Day-2	Feb-14	NA	NA	NA	NA	NA	NA	NA	99.89%	96.18%	NS
		Day-3	Feb-14	NA	NA	NA	NA	NA	NA	NA	99.64%	98.52%	99.42%
		Over all SSA Result	Total	NA	NA	NA	NA	NA	NA	NA	99.71%	98.39%	99.42%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Feb-14	96.62%	95.27%	94.85%	96.39%	96.84%	99.31%	95.85%	NA	NA	NA
		Day-2	Feb-14	99.28%	95.22%	94.12%	98.31%	NS	95.71%	95.67%	NA	NA	NA
		Day-3	Feb-14	98.12%	95.43%	92.06%	95.73%	98.60%	96.75%	96.23%	NA	NA	NA
		Over all SSA Result	Total	97.61%	95.30%	93.42%	96.22%	97.89%	97.55%	95.79%	NA	NA	NA
Service Coverage													
5	In-door (>= -75dBm)	Day-1	Feb-14	56.83%	53.44%	60.33%	81.50%	56.21%	38.27%	70.50%	60.35%	32.83%	78.00%
		Day-2	Feb-14	48.74%	52.50%	49.08%	47.73%	NS	66.96%	44.31%	89.70%	83.87%	NS
		Day-3	Feb-14	55.81%	54.37%	53.65%	59.26%	38.82%	39.27%	51.56%	69.02%	56.62%	75.67%
		Over all SSA Result	Total	55.71%	53.33%	54.41%	61.94%	45.78%	41.12%	54.92%	68.47%	53.38%	76.56%
5	In-vehicle (>= -85dBm)	Day-1	Feb-14	95.64%	85.90%	85.42%	99.30%	96.69%	96.42%	95.40%	93.49%	95.78%	96.00%
		Day-2	Feb-14	79.17%	88.35%	72.40%	72.54%	NS	99.30%	86.61%	98.77%	93.00%	NS
		Day-3	Feb-14	90.92%	90.09%	79.36%	82.58%	92.93%	96.14%	92.15%	96.06%	99.66%	88.57%
		Over all SSA Result	Total	91.94%	88.17%	79.31%	84.40%	94.43%	96.47%	91.40%	95.48%	96.53%	91.39%
5	Outdoor-in city (>= -95dBm)	Day-1	Feb-14	99.66%	98.16%	96.22%	99.92%	99.80%	100.00%	99.83%	98.98%	100.00%	97.40%
		Day-2	Feb-14	97.86%	98.14%	91.66%	96.58%	NS	100.00%	99.65%	99.96%	100.00%	NS
		Day-3	Feb-14	99.76%	99.03%	94.74%	92.45%	99.87%	100.00%	99.92%	99.47%	100.00%	98.27%
		Over all SSA Result	Total	99.59%	98.41%	94.37%	94.47%	99.84%	100.00%	99.81%	99.36%	100.00%	97.94%
6	Call Setup Success Rate (>=95%)	Day-1	Feb-14	100.00%	100.00%	96.32%	100.00%	100.00%	100.00%	100.00%	100.00%	97.78%	99.47%
		Day-2	Feb-14	100.00%	100.00%	96.67%	100.00%	NS	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Feb-14	100.00%	100.00%	92.12%	95.79%	100.00%	98.47%	100.00%	100.00%	98.47%	99.55%
		Over all SSA Result	Total	100.00%	100.00%	94.55%	97.25%	100.00%	99.10%	100.00%	100.00%	98.43%	99.50%
7	Hand Over Success Rate (HOSR)	Day-1	Feb-14	100.00%	100.00%	97.76%	100.00%	100.00%	99.00%	98.96%	100.00%	100.00%	100.00%
		Day-2	Feb-14	100.00%	100.00%	98.39%	100.00%	NS	100.00%	99.11%	100.00%	100.00%	NS
		Day-3	Feb-14	100.00%	100.00%	87.16%	98.92%	100.00%	98.67%	99.64%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	100.00%	100.00%	91.46%	99.35%	100.00%	98.83%	99.28%	100.00%	100.00%	100.00%



DRIVE TEST TABLE: 4

OPERATOR-ASSISTED DRIVE TEST AT BARMER SSA IN FEB-14 MONTH- RAJASTHAN CIRCLE - INDOOR														
S/N	Parameter	Barmer SSA	Drive Test Period	Indoor Location	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
					GSM Operators						CDMA Operators			
1	Call Attempts	Day 1	Feb-14	Bus Stand Barmer	10	10	11	10	11	10	10	10	10	10
		Day 2	Feb-14	Annapurna Hotel	10	10	11	11	NS	10	11	10	10	NS
		Day 3	Feb-14	Nakoda Ji	10	10	16	11	11	10	11	10	10	12
		Overall SSA	Feb-14		30	30	38	32	22	30	32	30	30	22
2	Blocked Call Rate	Day 1	Feb-14	Bus Stand Barmer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day 2	Feb-14	Annapurna Hotel	0.00%	0.00%	0.00%	0.00%	NS	0.00%	0.00%	0.00%	0.00%	NS
		Day 3	Feb-14	Nakoda Ji	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	Feb-14		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Day 1	Feb-14	Bus Stand Barmer	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day 2	Feb-14	Annapurna Hotel	0.00%	0.00%	0.00%	0.00%	NS	0.00%	0.00%	0.00%	0.00%	NS
		Day 3	Feb-14	Nakoda Ji	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	Feb-14		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)													
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day 1	Feb-14	Bus Stand Barmer	NA	NA	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%
		Day 2	Feb-14	Annapurna Hotel	NA	NA	NA	NA	NA	NA	NA	99.91%	100.00%	NS
		Day 3	Feb-14	Nakoda Ji	NA	NA	NA	NA	NA	NA	NA	100.00%	96.10%	99.70%
		Overall SSA	Feb-14		NA	NA	NA	NA	NA	NA	NA	99.97%	99.40%	99.80%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day 1	Feb-14	Bus Stand Barmer	98.80%	99.59%	98.88%	98.87%	99.15%	95.40%	97.26%	NA	NA	NA
		Day 2	Feb-14	Annapurna Hotel	99.24%	98.77%	99.66%	100.00%	NS	92.15%	98.71%	NA	NA	NA
		Day 3	Feb-14	Nakoda Ji	98.98%	99.45%	99.68%	100.00%	99.28%	77.67%	99.65%	NA	NA	NA
Overall SSA		Feb-14		98.95%	99.25%	99.44%	99.27%	99.22%	87.97%	98.58%	NA	NA	NA	
5	Service Coverage													
	In door (>= -75dBm)	Day 1	Feb-14	Bus Stand Barmer	28.76%	66.34%	97.96%	88.60%	64.94%	89.66%	100.00%	44.20%	100.00%	100.00%
		Day 2	Feb-14	Annapurna Hotel	74.26%	63.79%	48.57%	83.33%	NS	94.95%	82.13%	99.66%	100.00%	NS
		Day 3	Feb-14	Nakoda Ji	0.49%	94.20%	90.55%	81.58%	4.37%	27.23%	0.85%	11.81%	0.00%	0.00%
		Overall SSA	Feb-14		39.06%	75.13%	90.32%	86.36%	34.80%	64.18%	58.98%	53.84%	99.38%	36.57%

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	In-vehicle (>= -85dBm)	Day 1	Feb-14	Bus Stand Barmer	94.35%	99.93%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 2	Feb-14	Annapurna Hotel	99.86%	99.54%	83.76%	100.00%	NS	100.00%	99.55%	100.00%	100.00%	NS
		Day 3	Feb-14	Nakoda Ji	12.34%	100.00%	95.08%	100.00%	87.25%	53.15%	73.11%	81.10%	40.74%	4.97%
		Overall SSA	Feb-14		85.54%	99.82%	97.38%	100.00%	93.65%	79.10%	90.29%	93.94%	99.63%	39.72%
	Outdoor-in city (>= -95dBm)	Day 1	Feb-14	Bus Stand Barmer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day 2	Feb-14	Annapurna Hotel	100.00%	99.93%	100.00%	100.00%	NS	100.00%	100.00%	100.00%	100.00%	NS
		Day 3	Feb-14	Nakoda Ji	97.86%	100.00%	100.00%	100.00%	99.86%	100.00%	99.97%	97.59%	100.00%	91.48%
		Overall SSA	Feb-14		99.73%	99.98%	100.00%	100.00%	99.93%	100.00%	99.99%	99.23%	100.00%	94.59%
6	Call Setup Success Rate (>=95%)	Day 1	Feb-14	Bus Stand Barmer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Day 2	Feb-14	Annapurna Hotel	100.00%	100.00%	100.00%	100.00%	NS	100.00%	100.00%	100.00%	100.00%	NS
		Day 3	Feb-14	Nakoda Ji	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA	Feb-14		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Hand Over Success Rate (HOSR)	Day 1	Feb-14	Bus Stand Barmer	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Day 2	Feb-14	Annapurna Hotel	100.00%	100.00%	100.00%	100.00%	NS	100.00%	100.00%	100.00%	100.00%	NS
		Day 3	Feb-14	Nakoda Ji	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA	Feb-14		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 5

DRIVE TEST ROUTE OF JAN TO MAR - 14							
Name of SSA	Date of Drive Test	Day 1		Day 2		Day 3	
		Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered
AJMER	29th to 31th Jan-14	Ajmer, Pushkar and Kishangarh (130 Km)	<p>Ajmer:- BSNL Exchange, Gandhi bhawan, Railway station, Railway colony, Ramgang, Purani chungji, Subash Nagar, Adarsh Nagar, Nagar, Alwar gate, MAYO collage, Kuman Nagar. Railway Colony-Patel Ground-swamy complex-bus stand-central jail-civil line-shastri Nagar-JLN Hospital-Anand Nagar-Panchsheel-Vaishali Nagar-Kotda-cine world-foy sagar-Ram Nagar-Mittal hospital-Private bus stand.</p> <p>Pushker:- Chungi-Pushker Gate-Mela Ground-BRAHMA Mandir-Ganeda-Pushker railway station-BSNL exchange-Bus stand-Tri murti-Old pushker.</p> <p>Kishangarh:- Ajmer-kishangarh highway, Prachia, Arvind Mill, BUS Stand, Railway station, R K Community center, Purani Mill, Jaipur bye pass, Marble industrial area, Gandi Nagar, Paharia choraha, City Road, BSNL Exchange, Hospital, Old kishangarh, sarwari gate, Mazeti road, Link Road.</p>	Kekri, Sarwar and Nasirabad (124 Km)	<p>Kekri:- Nasirabad to Kekri Highway-Ajmer Road-Vijay Nagar Road-Private Bus Stand, Sarwar Road, Negadiya Road, Jaipur bye pass, Bghera Road, Jaipur road, Vinayek City, Kekri bazar, Bus stand, BSNL exchange, Ajmer Road.</p> <p>Sarwar:- Bus Stand, Sarwar Darwaza, Dargah Road, Hingoniya Road, Fatehgarh Road.</p> <p>Nasirabad:- Kota road, Gandi Chowk, Nasirabad bazar, sadar bazar, railway station, gandhi chowk, bheru chowk, ramsar road, Bhilwara bye pass, bus stand, dilwari chowk, balwanta choraha.</p>	Beawar and Vijay Nagar (110 Km)	<p>Beawar:- Kharwa, Beawar bus stand, Railway station, Jodhpur Road, Mewari gate, Ajmeri Gate, Dilwara road, Masuda Road, Bhim moter, Chand Gate, Hospital, Pandit moter, Vijay Nagar road.</p> <p>Vijay Nagar:- Vijay Nagar city, bus stand, court, Gulabpura river, Market, Badanwara, Bhinay Road, masuda road, Railway station, Tatuti road, Nasirabad road.</p>
BARMER	17th to 19th Feb-14	Barmer (C) - Barmer (SW) - Dhorimana - Chohtan (CN) (117 Km)	<p>Barmer BSNL Exchange - Utterlai Road - Jashber Dham - Jalipa-Jaisalmer Road - Indira Nagar - Barmer Collectrate - Laxmi Cinema - Chohtan Circle - Badra Circle - Kalash International Hotel- RIICO Industrial Area - Samdari Road - Bus Stand Barmer - Chohtan Circle - Mahadev Petrol Pump - Rani Gaon - Nomadi Gaon - Samlor - Chohtan - Alamsar - Dhanau - Bhunia - Dhorimana</p>	Barmer (N) KANOT - Barmer (W) Ramsar - SHEO (E) - SHEO (W) HARSANI (138 Km)	<p>Barmer BSNL Exchange - Derasar - Hathma - Ramsar - Dathani - Ranasar - Harsani - Dudaberi - Nand - Kotra - Sheo - Bhiyad - Kanosar - Undu - Sawai Padam Singh - Kanod.</p>	Pachpadra - Pachpadra (Balotra) - Siwana (E) Samdari - Siwana (W) (140 Km)	<p>Barmer BSNL exchange - Utterlai - Kawas - Baytu - Dudwa - Bagundi - Pachpadra Refinery Road - Secondary School Pachpadra - Back side BSNL Exchange Pachpadra - Pachpadra Bus Stand - Gulab Circle - Pachpadra - Balotra road - Balotra Industrial Area Phase 1 - Balotra Industrial Area Phase 2 - Balotra Railway Station - Khethshwar Colony - Kanshro ka Bas - Balotra Industrial Area - Balotra - Barmer Road - Jasol - Nakora - Aashatra - Siwana - Meli - Karmawas - Samdari</p>



SSA WISE OBSERVATIONS MADE DURING THE DRIVE TESTS:

The following observations have been made during drive tests conducted in various parts of SDCAs in select SSAs. The observations are based on plots depicting the RX Signal level and Quality across the routes followed for drive test.

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF AJMER SSA: JAN-14

S. NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Jan-14	Ajmer	Ajmer, Pushakar & Kishangarh	Poor RX Level & Quality at Geegal town(Kishangarh), Poor Quality in Data Nagar (Ajmer), Poor Rx Level in near pushkar bus stand	Kekri, Sarwar & Nasirabad	Poor Rx Level & Quality near Framji Chowk (Nasirabad), Poor Quality in Sarwar main Road, Poor Rx Level between Sarwar to Kekri highway	Beawar, Bijay Nagar & Bandhanwara	Poor Rx Level near Daula ganj Railway crossing, Khrwa Village (Beawar), Poor Rx Level & Quality at Bandhanwara outer towards Bijaynagar, Poor Rx Level near Railway Crossing (Bijaynagar)
2	BSNL				Poor Quality near Gulabbari (Ajmer)		---		Poor Quality near Daula ganj Railway crossing (Beawar)
3	TATA GSM				Poor Rx Level & Quality near Gagwana Village (Kishangarh)		Poor Rx Level & Quality on highway between Nasirabad to Sarwar and Sarwar to Kekri		Poor Rx Level between Bandhanwara to Bijay Nagar, Poor Quality near Beawar Industrial Area
4	TATA CDMA				No coverage between Gagwana & Gegal Village (Kishangarh), Poor Rx Level at Pushakr City		No highway coverage between Nasirabad to Kekri, Poor Rx Level between Sarwar to Kekri		Poor Rx Level & Quality between Bandhanwara to Bijay Nagar, Poor Qaulity near Daula ganj Railway crossing (Beawar)
5	IDEA				Poor Rx Level & Quality at Naryan Colony, Akhri Village (Kishangarh) and between Indra Colony to Gagwana Village (Ajmer)		Poor Rx Level & Quality between Lohanwara to Sarana Village, Sarana to Gayala & Sarwer to Kekri		Poor Quality near Peeplai Village(Beawar) and Bandhanwara outer towards Bijaynagar
6	RCOM GSM				Poor Rx Level & Quality at Gegal, Gagwana Village (Kishangarh)		No highway coverage between Nasirabad to Kekri via Sarwar, Poor Rx Level at Outer of Nasirabad		No highway coverage between Bandhanwara to Bijay Nagar



7	RCOM CDMA				Poor RX Level at Geegal town(Kishangarh), Poor Rx Level in near pushkar bus stand		Poor Rx Level & Quality on highway between Nasirabad to Sarwar and Poor Rx Level Between Sarwar to Kekri		Poor Rx Level between Bandhanwara to Bijay Nagar, Poor Rx Level near Daula ganj Railway crossing (Beawar), Poor Quality Near Bhairu ka Nohra
8	MTS				Poor Rx Level at Ganhera (Pushkar)		Poor Rx Level near Sarana Village and Poor Level Patches between Sarwar to Kekeri, Poor Level near Dhan mandi (Kekri)		Poor Rx Level near Peeplai Village(Beawar) and Bandhanwara outer towards Bijaynagar
9	VODAFONE				Poor Quality patches near Ajay Nagar, Agra Gate (Ajmer) Poor Quality between Indra Colony to Gagwana Village		Poor Quality Patches between Sarwar to Kekri		Poor Quality near Daula ganj Railway crossing (Beawar), Poor Quality at Bandhanwara outer towards Bijaynagar
10	AIRCEL				Poor Rx Level & Quality near Badi Basti (Kishangarh), Poor Rx Level at Indira Colony (Ajmer)		No highway coverage between Nasirabad to Kekri via Sarwar, Poor Rx Level at Outer of Nasirabad, Kekri towards Sarwar Road		Poor Rx Level & Quality near Beawar Industrial Area



DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF BARMER SSA: FEB-14

S. NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Feb-14	Barmer	Barmer (C) - Barmer (SW) - Dhorimana - Chohtan (CN)	Call drop between Barmer to Chohtan	Barmer (N) KANOT - Barmer (W) Ramsar - SHEO (E) - SHEO (W) HARSANI	Poor Rx Level at Kanod Outer	Pachpadra - Pachpadra (Balotra) - Siwana (E) Samdari - Siwana (W)	Poor Rx Level near Balotra
2	BSNL				RNRGO001, REU62026, REU62001 Sites were down, No coverage between Dhanau to Dhorimanna		No coverage between Barmer to Ramsar bcoz some sites was down, Poor Rx Level at Dudaberi village, No coverage between Sites REGUG001 to REBHY001 & RERJB010 to RNZBR091		Poor Rx Level & Quality between Kawas to Baytu, RNHBJ002 site was down
3	TATA GSM				No coverage on highway covered in Day1		No coverage on highway covered in Day2		No coverage on highway between Pachpadra to Balotra & Balotra to Samdari
4	TATA CDMA				No coverage on highway covered in Day1		No coverage on highway covered in Day2		No coverage on highway between Pachpadra to Balotra & Balotra to Samdari
5	IDEA				No coverage on highway & No coverage at Dhorimanna		No coverage on highway & No coverage at Ramsar & Kanod		Poor coverage between Kawas to Baytu, Poor Rx Level & Quality at outer of Pachpadra, No high coverage between Siwana to Samdari, Poor Rx Level & Quality near Aashtra, Indirana village
6	RCOM GSM				No coverage on highway, Poor Rx Level & Quality at Baldev Nagar (Barmer City)		Only coverage at Kanasar		No coverage on highway covered in Day3
7	RCOM CDMA				No coverage on highway covered in Day1		No coverage on highway covered in Day2		No coverage on highway covered in Day3



8	MTS			No coverage on highway covered in Day1		No coverage on highway covered in Day2		No coverage on highway covered in Day3
9	VODAFONE			No observation		Poor Quality at Suntana		No observation
10	AIRCEL			No coverage on highway between Barmer to Chothan & Chothan to Dhorimanna		No coverage on highway between Barmer to Ramsar, Ramsar to Sheo & Sheo to Kanod		Poor Quality & Rx Level between Kawas & Pachpadra, Poor Rx Level between Pachpadra to Balotra, Poor Rx Level between Balotra to Salonkian ka bas & Outer of samdari

KEY FINDINGS: DRIVE TEST

The key observations that could be derived from the results of the drive tests are as under –

- (i) **In the Month of January-14**, drive test was conducted at Ajmer SSA covering Ajmer, Pushakar , Kishangarh Kekri, Sarwar, Nasirabad, Beawar, Vijay Nagar & Bandhanwara. Though the service providers have met the benchmarks of network related parameters, yet some deficiencies with respect to inadequate coverage and voice quality were observed during the drive tests at the various places are detailed in the above table - 6.
- (ii) **In the Month of Feb-14**, drive test was conducted at Barmer SSA for three consecutive days covering Barmer (C) - Barmer (SW) - Dhorimana - Chohtan (CN) Barmer (N) Kanot - Barmer (W) Ramsar - Sheo (E) - Sheo (W) Harsani -Pachpadra - Pachpadra (Balotra) - Siwana (E) Samdari - Siwana (W). The performance of BSNL was found lagging behind the benchmark during the drive tests conducted on one or the other day. The performance of **BSNL** for parameter Blocked call rate was **3.33%** on Day-2 of drive test , for parameters ‘Call drop rate, Good Voice Quality and Call setup Success rate’, their performance on SSA level was **3.69% , 93.42% and 94.55%** respectively. The deficiencies with respect to inadequate coverage and voice quality, observed during the drive tests, at the various places are detailed in the above table - 7.

In case of Indoor drive test, **RCOM (GSM)** could not meet the benchmark for the parameter ‘Good voice quality’ with its performance as **87.97%**.
- (iii) **In the month of March-14**, drive test at Bhilwara SSA could not be conducted due to law & order problems at Bhilwara on the first scheduled dates (24th to 26th March-14) and then due to other problems related to the General elections on the next scheduled dates. The matter was put in the knowledge of TRAI RO Jaipur and Head Office as well.

*The performance of the service providers with regard to the Drive Test, revealed that **BSNL** was the only operator which could not meet the benchmarks of the prime network parameters namely Block Call Rate, Call Drop Rate, Voice Quality and CSSR at different locations of Barmer SSA where the drive test was conducted in the month of Feb-2014.*

6. ESSENCE OF COMPLIANCE REPORT OF SERVICE PROVIDERS WITH RESPECT TO THE QOS





6. ESSENCE OF COMPLIANCE REPORT OF SERVICE PROVIDERS WITH RESPECT TO THE QOS

From the months' audit and 3 days live assessment, it was revealed that the performance of the service providers in Rajasthan Service area was satisfactory for network related parameters except for one parameter namely '**Worst affected cells having > 3% TCH drop**' which could not be met by Tata Tele Services (TTSL). **Tata (GSM) and Tata (CDMA)** could not meet the benchmark of this parameter with their achievement as **4.50% (Jan-14), 4.04% (Feb-14) & 3.89% (Mar-14)** and **5.52%, 5.58 % & 5.86%** respectively. The performance of **Tata (GSM) and Tata (CDMA)** for this parameter, on average of three months was **4.14% and 5.65 %** respectively.

The similar non-compliance of Tata (GSM) and Tata (CDMA) was also observed for 3 days live measurements during the quarter.

With regard to the **Customer Service Quality Parameters**, it is revealed that all operators except BSNL are in well compliance of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds. The performance of **BSNL** is below the benchmark in respect of parameters '**% billing complaints resolved within 4 weeks**' (**95.58 %**). With respect to parameter Call answered by operators (voice to voice), **Aircel, BSNL and Vodafone** have not met the benchmark with their performance as **80.13%, 30.20% and 86.21%** respectively. **BSNL** was also **failed to comply** with the TRAI norms in respect to the parameter **Refund of deposits within 60 days as its achievement was 66.82% (way below the benchmark of 100%)**.

Thus performance of BSNL, Aircel and Vodafone for the parameters mentioned above **was very poor and needs immediate attention**

The performance of the service providers with regard to the Drive Test, **BSNL** is the only operator which could not meet the benchmarks of the prime network parameters namely Block Call Rate, Call Drop Rate, Voice Quality and CSSR at different locations of Barmer SSA where the drive test was conducted in the month of Feb-2014.

7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES





7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES RAJASTHAN CIRCLE:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Rajasthan Circle- Jan-14 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Jan-14	1448	7753	3771	5211	2206	1400	6604	1338	1584	688
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jan-14	1529.57	3445.67	51889.34	3091.95	3943.72	589	1208.37	4194	787.92	127.10
	c) BTS Accumulated Downtime	<=2%	Jan-14	0.14%	0.06%	1.85%	0.08%	0.24%	0.06%	0.02%	0.42%	0.07%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jan-14	0	14	61	3	3	0	7	12	0	0
e) Worst affected BTSs due to downtime	<=2%	Jan-14	0.00%	0.18%	1.62%	0.06%	0.14%	0.00%	0.11%	0.90%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Jan-14	97.27%	99.15%	98.65%	99.18%	99.65%	98.57%	99.81%	99.06%	98.98%	98.14%
	b) SDCCH/PAGING Congestion	<=1%	Jan-14	0.20%	0.14%	1.07%	0.12%	0.08%	0.06%	0.06%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Jan-14	0.44%	0.26%	1.61%	0.36%	0.06%	0.04%	0.19%	0.00%	0.43%	0.72%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Jan-14	0.67%	0.76%	1.27%	1.54%	0.34%	0.69%	0.73%	0.07%	0.72%	0.73%
	b) Worst affected cells>3% TCH drop	<=3%	Jan-14	1.79%	1.31%	1.46%	2.76%	0.23%	4.50%	2.46%	0.23%	1.61%	5.52%
	c) % of connections with good voice quality	>=95%	Jan-14	97.67%	99.07%	98.00%	95.44%	98.73%	98.68%	97.45%	99.72%	98.90%	98.92%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jan-14	76	303	143	429	16	189	496	9	81	122
e) Total no. of cells (Sector) in the licensed service area		Jan-14	4255	23126	9823	15521	6667	4197	20103	4010	5030	2203	
4	No. of POI's having >=0.5% POI congestion												

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	No. of POI's having >=0.5% POI congestion		Jan-14	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jan-14	0	0	0	0	0	0	0	0	0	0
	Network Data												
5	a) Equipped Capacity of Network in Erlang		Jan-14	77483	451113	265400	216181	102000	68241	267619	116000	97000	170314
	b) Total traffic in TCBH in erlang (Avg.)		Jan-14	79919	369017	106261	155019	89406	26038	231934	38907	65230	29520
	c) Total no. of customers served (as per VLR) on last day of the month		Jan-14	2990857	14819966	2665412	6005913	4682381	635391	9354365	1019589	1196181	439172



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Jan-14 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Live data	1420	7714	3771	5032	2220	1400	6599	1338	1579	688
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	132.59	372	5258	343.80	336.25	69.13	157.87	181.30	68.80	8.25
	c) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.07%	1.94%	0.09%	0.21%	0.07%	0.03%	0.19%	0.18%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	5	8	0	0	0	2	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.06%	0.21%	0.00%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.30%	99.16%	97.32%	99.18%	99.67%	98.53%	99.83%	98.99%	99.02%	98.37%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.05%	0.13%	0.51%	0.23%	0.01%	0.03%	0.06%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.29%	0.28%	1.63%	0.37%	0.05%	0.06%	0.17%	0.30%	0.46%	0.62%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.66%	0.75%	1.25%	1.60%	0.32%	0.68%	0.73%	0.09%	0.59%	0.70%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.64%	1.21%	1.79%	2.92%	0.23%	4.43%	2.62%	0.26%	1.17%	5.58%
	c) % of connections with good voice quality	>=95%	Live data	97.80%	99.09%	98.67%	95.54%	98.80%	98.70%	97.41%	99.74%	98.74%	98.93%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	69	279	176	448	15	186	527	10	59	123
e) Total no. of cells (Sector) in the licensed service area		Live data	4226	23091	9823	15368	6602	4192	20092	4010	5016	2203	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Rajasthan Circle- Feb-14 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		Feb-14	1477	7782	3797	5324	2208	1400	6609	1339	1591	688
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Feb-14	704.43	128	48063.32	2158.03	3319.88	778.30	1079.67	4065.20	902.59	304.92
	c) BTS Accumulated Downtime	<=2 %	Feb-14	0.07%	0.05%	1.88%	0.06%	0.22%	0.08%	0.02%	0.45%	0.08%	0.07%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Feb-14	0	12	46	1	3	0	8	4	0	0
	e) Worst affected BTSs due to downtime	<=2 %	Feb-14	0.00%	0.15%	1.21%	0.02%	0.14%	0.00%	0.12%	0.30%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95 %	Feb-14	97.25%	99.06%	98.78%	99.18%	99.62%	98.53%	99.79%	99.05%	98.78%	97.59%
	b) SDCCH/PAGING Congestion	<=1 %	Feb-14	0.20%	0.15%	0.84%	0.18%	0.06%	0.03%	0.08%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2 %	Feb-14	0.71%	0.31%	1.18%	0.38%	0.07%	0.06%	0.21%	0.00%	0.39%	1.28%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2 %	Feb-14	0.66%	0.84%	1.36%	1.39%	0.35%	0.65%	0.69%	0.06%	0.72%	0.74%
	b) Worst affected cells>3% TCH drop	<=3 %	Feb-14	1.82%	1.14%	1.91%	2.28%	0.05%	4.04%	2.11%	0.25%	1.56%	5.58%
	c) % of connections with good voice quality	>=95 %	Feb-14	97.50%	99.02%	97.91%	95.43%	98.70%	98.65%	97.42%	99.72%	99.22%	98.90%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Feb-14	79	265	187	363	3	170	424	10	78	123
	e) Total no. of cells (Sector) in the licensed service area		Feb-14	4361	23245	9823	16042	6563	4198	20130	4013	5043	2204
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Feb-14	0	0	0	0	0	0	0	0	0	0

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	Name of POI not meeting the benchmark		Feb-14	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Feb-14	78256	449336	265400	222120	102000	68347	267504	116000	97000	170355
	b) Total traffic in TCBH in erlang (Avg.)		Feb-14	85598	391591	106261	172144	87967	27574	247471	42949	65023	31111
	c) Total no. of customers served (as per VLR) on last day of the month		Feb-14	3043741	15013363	2665412	6181421	4745487	613056	9459951	1004488	1213881	437129



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Feb-14 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Live data	1474	7774	3797	5255	2208	1400	6606	1339	1587	688
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	102.32	235	5183	188.77	294.83	47.07	106.77	400.90	88.32	18.78
	c) BTS Accumulated Downtime	<=2%	Live data	0.10%	0.04%	1.90%	0.05%	0.19%	0.05%	0.02%	0.42%	0.08%	0.11%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	3	2	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.04%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.39%	99.18%	98.74%	99.25%	99.62%	98.49%	99.80%	99.21%	98.01%	96.93%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.19%	0.10%	1.14%	0.14%	0.02%	0.06%	0.04%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.66%	0.27%	1.46%	0.34%	0.07%	0.04%	0.20%	0.00%	0.71%	1.97%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.65%	0.82%	1.35%	1.33%	0.36%	0.65%	0.72%	0.06%	0.70%	0.73%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.59%	1.06%	2.19%	2.12%	0.01%	4.07%	2.46%	0.38%	1.68%	5.11%
	c) % of connections with good voice quality	>=95%	Live data	97.54%	99.02%	98.33%	95.47%	98.73%	98.67%	97.35%	99.72%	99.22%	98.92%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	70	248	215	340	1	171	495	15	85	113
e) Total no. of cells (Sector) in the licensed service area		Live data	4391	23258	9823	16075	6563	4197	20130	4013	5047	2204	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0



TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Rajasthan Circle- Mar-14 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		Mar-14	1508	7789	3852	5468	2212	1400	6621	1340	1589	688
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Mar-14	928.15	3357	52347.70	2862	4087.05	780.29	1224.92	4130.30	914.29	197.77
	c) BTS Accumulated Downtime	<=2%	Mar-14	0.08%	0.06%	1.83%	0.07%	0.25%	0.07%	0.02%	0.41%	0.08%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Mar-14	0	13	71	2	5	0	7	7	0	0
	e) Worst affected BTSs due to downtime	<=2%	Mar-14	0.00%	0.17%	1.84%	0.04%	0.23%	0.00%	0.11%	0.52%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-14	97.26%	98.93%	98.75%	98.70%	99.60%	98.56%	99.70%	98.74%	98.81%	97.74%
	b) SDCCH/PAGING Congestion	<=1%	Mar-14	0.32%	0.18%	0.84%	0.40%	0.02%	0.03%	0.11%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-14	0.92%	0.37%	1.30%	0.85%	0.08%	0.08%	0.30%	0.01%	0.40%	1.18%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Mar-14	0.66%	0.84%	1.32%	1.30%	0.38%	0.62%	0.69%	0.10%	0.71%	0.69%
	b) Worst affected cells>3% TCH drop	<=3%	Mar-14	1.82%	1.16%	1.71%	1.89%	0.03%	3.89%	1.98%	0.43%	1.61%	5.86%
	c) % of connections with good voice quality	>=95%	Mar-14	97.41%	98.99%	98.29%	95.44%	98.71%	98.63%	97.36%	99.72%	99.20%	98.86%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Mar-14	81	270	168	316	2	163	399	17	81	129
	e) Total no. of cells (Sector) in the licensed service area		Mar-14	4461	23328	9823	16760	6570	4199	20173	4016	5065	2204
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Mar-14	0	0	0	0	0	0	0	0	0	0

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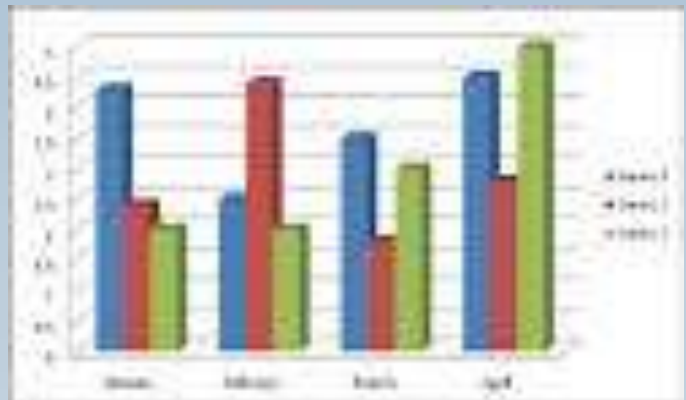
	Name of POI not meeting the benchmark		Mar-14	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Mar-14	80801	449538	265400	226846	102000	68257	270969	116000	97000	170355
	b) Total traffic in TCBH in erlang (Avg.)		Mar-14	88877	417266	114535	179357	94782	28807	260868	44916	65820	32593
	c) Total no. of customers served (as per VLR) on last day of the month		Mar-14	3105657	15214230	2709807	6309526	4802386	609459	9696539	996549	1242505	432425



TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Mar-14 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		Live data	1492	7801	3814	5334	2209	1400	6610	1340	1591	688
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	122.34	307	4177.73	369.60	385.95	24.70	119.87	419.65	125.73	11.33
	c) BTS Accumulated Downtime	<=2%	Live data	0.11%	0.05%	1.52%	0.10%	0.24%	0.02%	0.03%	0.43%	0.11%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	4	7	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.05%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.06%	98.88%	98.75%	99.07%	99.61%	98.57%	99.78%	98.35%	98.73%	98.52%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.56%	0.23%	0.72%	0.26%	0.02%	0.03%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.25%	0.37%	1.29%	0.50%	0.08%	0.08%	0.22%	0.01%	0.45%	0.44%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.68%	0.86%	1.33%	1.38%	0.36%	0.62%	0.68%	0.07%	0.70%	0.67%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.00%	1.20%	2.03%	2.22%	0.03%	4.13%	1.92%	0.48%	1.35%	5.64%
	c) % of connections with good voice quality	>=95%	Live data	97.44%	98.98%	98.33%	95.38%	98.73%	98.64%	97.35%	99.72%	99.21%	98.88%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	89	280	199	362	2	174	388	19	69	124
	e) Total no. of cells (Sector) in the licensed service area		Live data	4443	23343	9823	16340	6566	4200	20161	4016	5070	2204
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

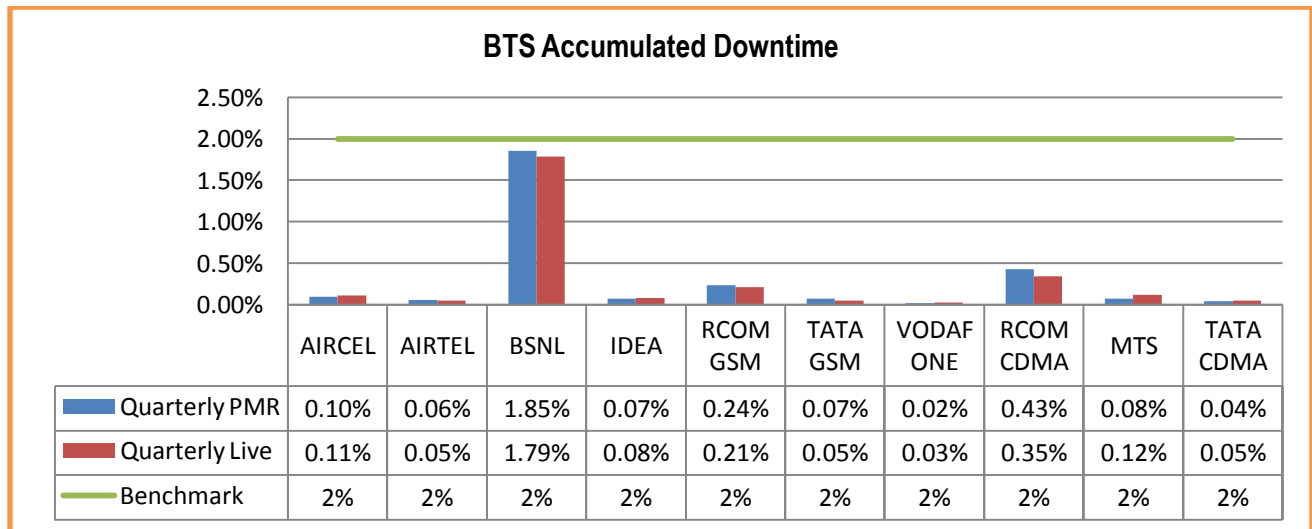
8. GRAPHICAL REPRESENTATION





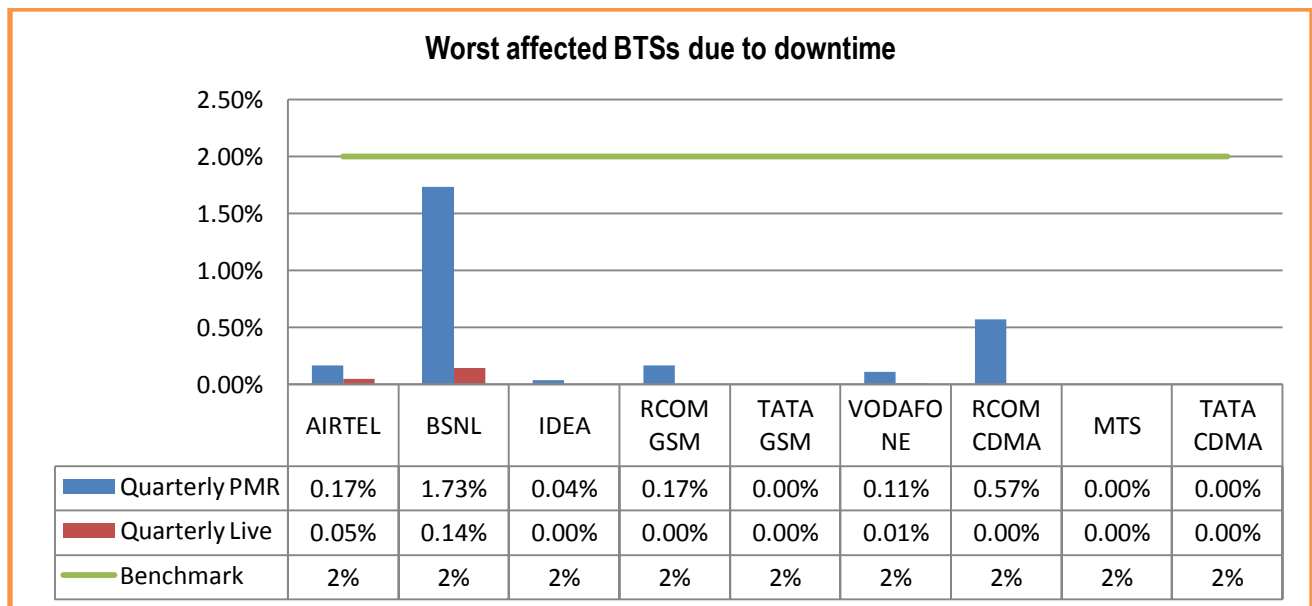
8. GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE CELLULAR MOBILE SERVICE PROVIDERS- QUARTERLY AVERAGED OF PMR V/S 3-DAYS LIVE MEASUREMENT:

1) BTS ACCUMULATED DOWNTIME



All operators are meeting the benchmarks.

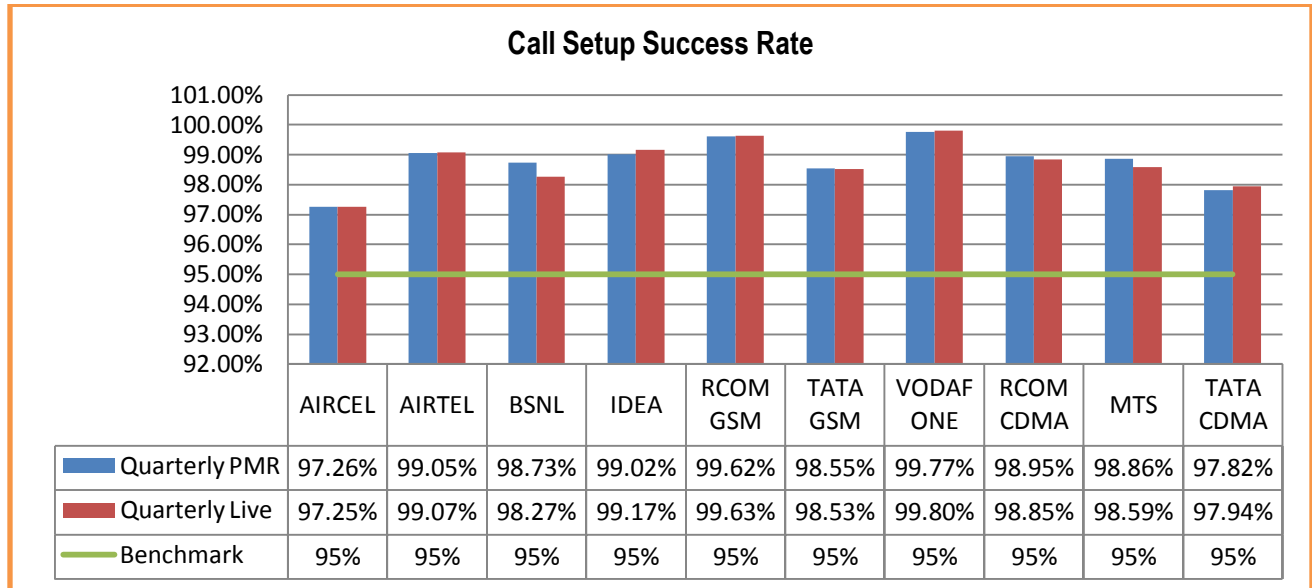
2) WORST AFFECTED BTSS DUE TO DOWNTIME:



All operators are meeting the benchmarks.

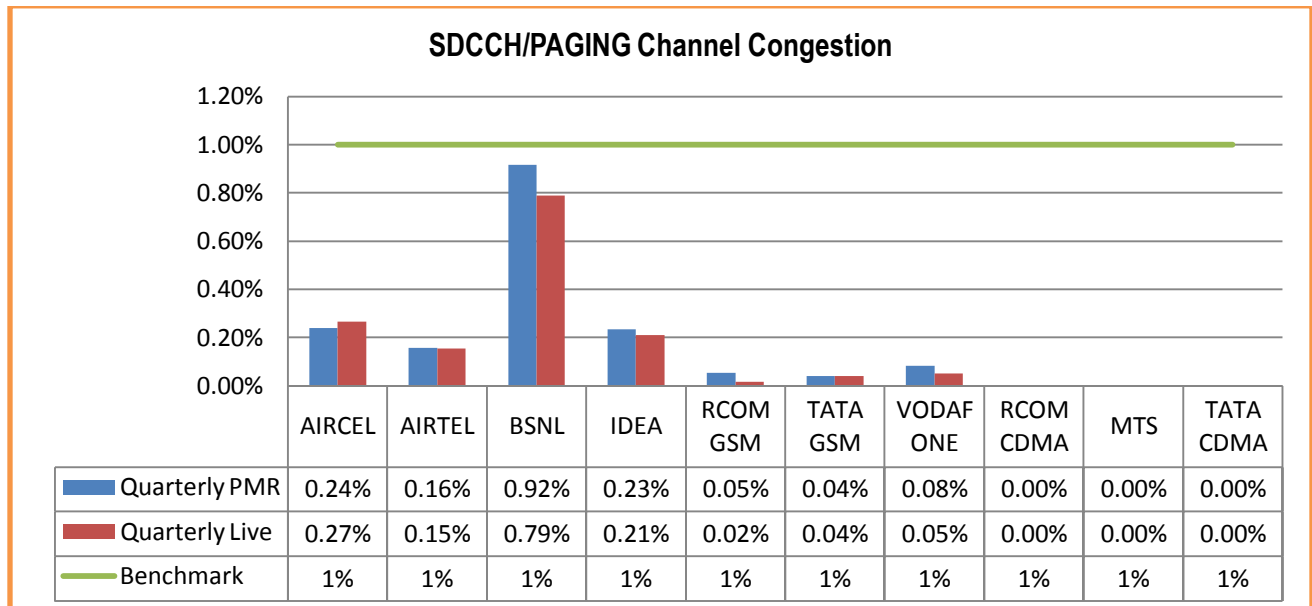


3) CALL SETUP SUCCESS RATE



All operators are meeting the benchmarks.

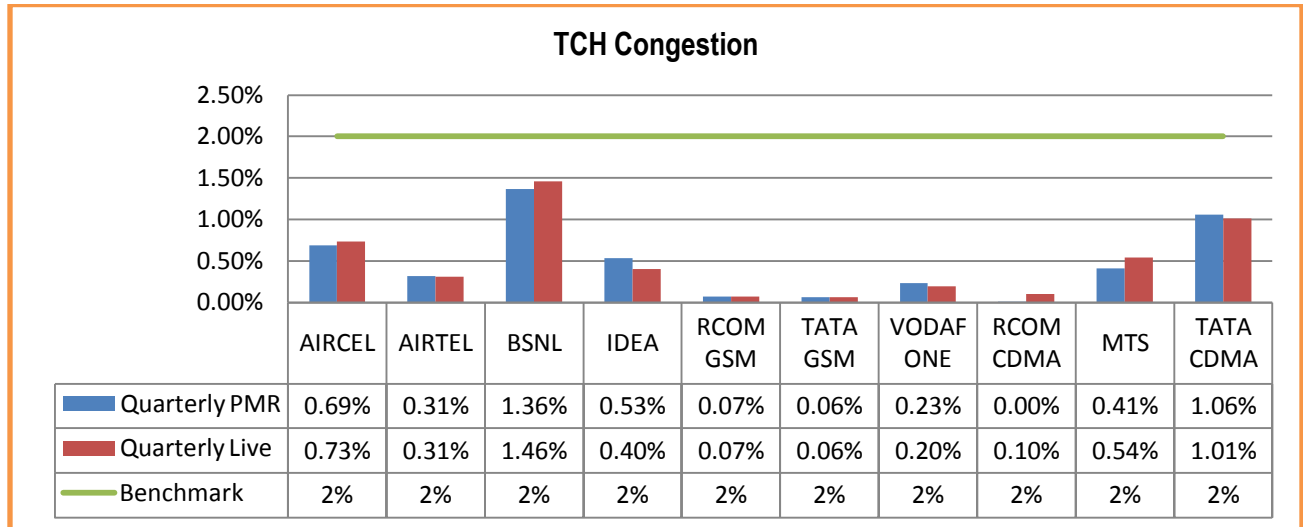
4) SDCCH/PAGING CHANNEL CONGESTION:



All operators are meeting the benchmarks.

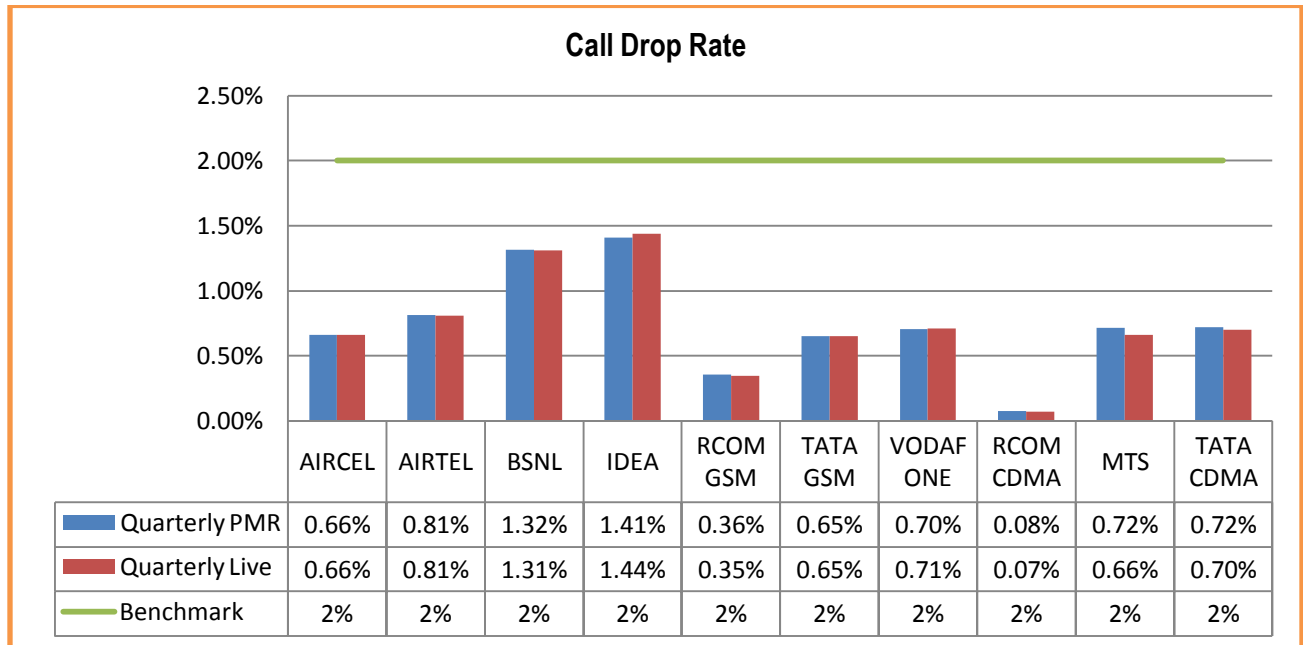


5) TCH CONGESTION:



All operators are meeting the benchmarks.

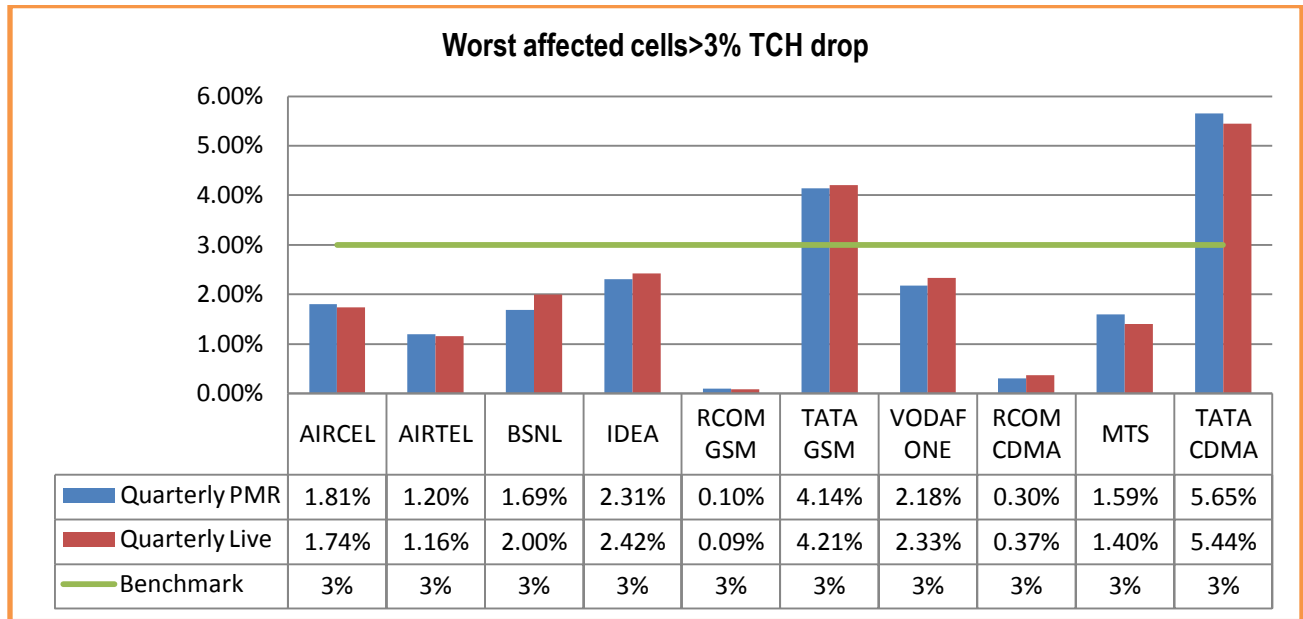
6) CALL DROP RATE:



All operators are meeting the benchmarks.

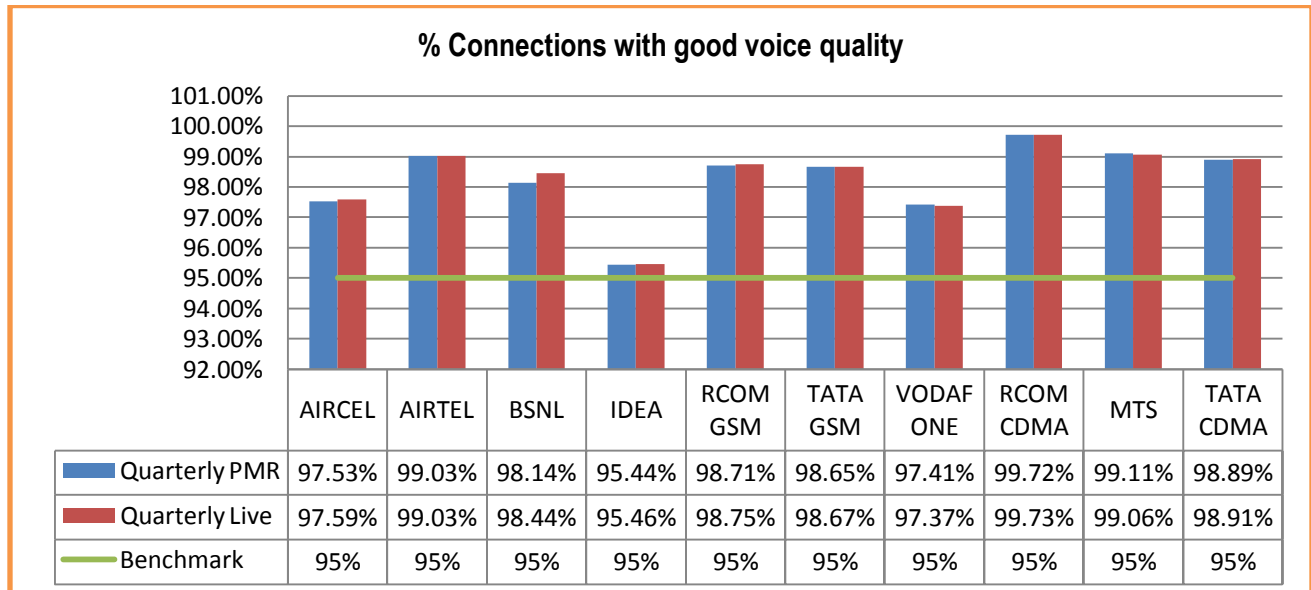


7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Tata GSM and Tata CDMA.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks.