REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE

FOR

TELECOM REGULATORY AUTHORITY OF INDIA

NORTH ZONE – RAJASTHAN SERVICE AREA

(OCTOBER 2013 – DECEMBER 2013)

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

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 6thOctober, 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. <u>OBJECTIVES AND METHODOLOGY</u>

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, Delhi, Haryana & Maharashtra Circles also include audit for Basic (Wire line) and Broadband services as mandated by TRAI, during the quarter October- December 2013.**

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.

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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
	GSM Operators	**Oct-13**	**Nov-13**	**Dec-13**	
1	AIRCEL	26 to 28 Oct-13	11 to 13 Nov-13	8 to 10 Dec-13	1st & 2nd Floor, Dainik Navjyoti, Amrapali Circle, C-Block, Vaishali Nagar, Jaipur.
2	AIRTEL	19 to 21 Oct-13	19 to 21 Nov-13	5 to 7 Dec-13	Bharti Airtel limited, K-21, Malviya Nagar, C-Scheme, Jaipur.
3	BSNL	29 to 31 Oct-13	19 to 21 Nov-13	5 to 7 Dec-13	DE(MSC), CMTS Wing, Circle Office, BSNL, PGMTD Campus, M.I. Road, Jaipur.
4	IDEA	15 to 17 Oct-13	11 to 13 Nov-13	7 to 10 Dec-13	Idea Cellular Limited, Plot C, Sehkar Marg, Nr. Bais Godam, Jaipur
5	RCOM GSM	19 to 21 Oct-13	12 to 14 Nov-13	6 to 10 Dec-13	Reliance Communications Ltd., F-161, E-170, Road No-12, VKIA, Jaipur.
6	TATA GSM	28 to 30 Oct-13	22 to 24 Nov-13	7 to 9 Dec-13	Tata Teleservices Limited Guman-1, Vaishali Nagar,Jaipur, Jaipur.
7	VODAFONE	18 to 20 Oct-13	19 to 21 Nov-13	3 to 5 Dec-13	Vodafone Digilink Limited, 5th Floor , Gaurav Tower, Malviya Nagar, Jaipur.
	CDMA Operators				
8	MTS	22 to 23 Oct-13	14 to 16 Nov-13	6 to 8 Dec-13	Sistema Shyam Teleservices Ltd. 3, MTS Tower, Amrapali Circle Vaishali Nagar, Jaipur.
9	RCOM CDMA	19 to 21 Oct-13	12 to 14 Nov-13	6 to 10 Dec-13	Reliance Communications Ltd., F-161, E-170, Road No-12, VKIA, Jaipur.
10	TATA CDMA	28 to 30 Oct-13	22 to 24 Nov-13	7 to 9 Dec-13	Tata Teleservices Limited Guman-1, Vaishali Nagar,Jaipur.

For all the above operators, audit was conducted in all the three months of the Quarter ended December 2013.

Transfer of data generated by monthly PMR and 3-days live measurements audit for the period Oct-2013 to Dec-2013 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 December 2013.**

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 December 2013.**

4. <u>EXECUTIVE SUMMARY</u>

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 3 drive tests in different cities of a circle/service area per service provider per month. Thus total 90 (3x10x3) drive tests in three months of quarter ended December 2013 were carried out in **Rajasthan circle.**

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 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	Dec-13	19:00 - 20:00
2	AIRTEL	Dec-13	19:00 - 20:00
3	BSNL	Dec-13	19:00 - 20:00
4	IDEA	Dec-13	19:00 - 20:00
5	RCOM GSM	Dec-13	20:00 - 21:00
6	TATA GSM	Dec-13	20:00 - 21:00
7	VODAFONE	Dec-13	19:00 - 20:00
CDMA Operators			
8	MTS	Dec-13	20:00 - 21:00
9	RCOM CDMA	Dec-13	19:00 - 20:00
10	TATA CDMA	Dec-13	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	1413	NSN	NSN
2	AIRTEL	43	83	7709	Ericsson	Ericsson
3	BSNL	15	51	3754	Ericsson	NSN & Ericsson
4	IDEA	11	37	5011	Ericsson	Ericsson
5	RCOM GSM	4	15	2220	Huawei	Huawei
6	TATA GSM	3	12	1400	Huawei	Huawei
7	VODAFONE	12	84	6597	NSN	NSN
CDMA Operators						
8	MTS	2	6	1579	ZTE	ZTE
9	RCOM CDMA	6	6	1388	Huawai, Lucent, Ericsson & ZTE	Huawai & Lucent
10	TATA CDMA	5	6	2197	Ericsson & Huawei	Huawai & Motorola

TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Oct-13	0.07%	0.10%	1.90%	0.12%	0.32%	0.00%	0.49%	0.05%	0.48%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Oct-13	0.00%	0.21%	1.91%	0.20%	0.50%	0.00%	0.28%	0.00%	0.38%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	96.13%	98.89%	98.86%	99.18%	99.59%	98.56%	99.77%	99.15%	99.14%	98.93%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-13	0.32%	0.28%	0.36%	0.42%	0.02%	0.04%	0.18%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.50%	0.34%	1.25%	0.36%	0.06%	0.05%	0.23%	0.25%	0.00%	0.12%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Oct-13	0.84%	0.90%	1.72%	1.30%	0.27%	0.72%	0.83%	0.50%	0.09%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-13	1.09%	1.91%	2.94%	2.52%	0.11%	5.04%	2.57%	0.92%	0.42%	7.25%
	c) Connections with good voice quality	>=95%	Oct-13	97.13%	98.92%	98.34%	95.69%	98.71%	98.62%	97.09%	98.72%	99.70%	98.98%
4	**No. of POI's having >=0.5% POI congestion**		Oct-13	0	0	0	0	0	0	0	0	0	0

Table title (within table): **Cellular Mobile Telephone Services Rajasthan Circle- Oct-13 month**

TABLE: 2

	Cellular Mobile Telephone Services Rajasthan Circle- Nov-13 month													
PMR Generation Data		**Bench- mark**	**Audit Period**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM GSM**	**TATA GSM**	**VODAFONE**	**MTS**	**RCOM CDMA**	**TATA CDMA**	
S/N	**Name of Parameter**			**GSM Operators**							**CDMA Operators**			
	Network Service Quality Parameter													
	Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Nov-13	0.04%	0.08%	1.84%	0.06%	0.26%	0.02%	0.25%	0.03%	0.37%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Nov-13	0.00%	0.22%	1.81%	0.02%	0.58%	0.00%	0.85%	0.00%	0.52%	0.00%
	Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	96.98%	98.91%	99.92%	99.03%	99.66%	98.54%	99.71%	99.35%	99.24%	98.60%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-13	0.21%	0.23%	0.55%	0.23%	0.10%	0.02%	0.24%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.59%	0.36%	1.89%	0.51%	0.06%	0.06%	0.29%	0.12%	0.01%	0.48%
	Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Nov-13	0.61%	0.79%	1.34%	1.28%	0.34%	0.66%	0.73%	0.59%	0.11%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-13	0.54%	1.28%	1.48%	2.58%	0.04%	**4.25%**	2.40%	1.38%	0.46%	5.62%
	c) Connections with good voice quality	>=95%	Nov-13	97.60%	99.01%	98.03%	95.57%	98.73%	98.68%	97.26%	98.71%	99.57%	99.00%
4	**No. of POI's having >=0.5% POI congestion**		Nov-13	0	0	0	0	0	0	0	0	0	0

TABLE: 3

	Cellular Mobile Telephone Services Rajasthan Circle- Dec-13 month												
PMR Generation Data		**Bench- mark**	**Audit Period**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM GSM**	**TATA GSM**	**VODAFONE**	**MTS**	**RCOM CDMA**	**TATA CDMA**
S/N	**Name of Parameter**			**GSM Operators**							**CDMA Operators**		
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Dec-13	0.05%	0.05%	1.84%	0.06%	0.22%	0.03%	0.06%	0.03%	0.40%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Dec-13	0.00%	0.14%	1.92%	0.02%	0.33%	0.00%	0.17%	0.00%	0.45%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	97.01%	99.13%	99.92%	99.07%	99.67%	98.54%	99.75%	99.33%	99.10%	97.70%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-13	0.17%	0.15%	0.47%	0.16%	0.02%	0.02%	0.15%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.22%	0.28%	1.45%	0.46%	0.06%	0.04%	0.25%	0.14%	0.00%	1.21%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Dec-13	0.22%	0.78%	1.28%	1.30%	0.33%	0.69%	0.74%	0.65%	0.09%	0.73%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-13	0.59%	1.21%	1.59%	2.74%	0.03%	**4.34%**	2.44%	1.56%	0.22%	**5.98%**
	c) Connections with good voice quality	>=95%	Dec-13	97.74%	99.05%	98.06%	95.61%	98.78%	98.72%	97.42%	98.71%	99.72%	98.90%
4	**No. of POI's having >=0.5% POI congestion**		Dec-13	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. However, in case of Reliance Communication, the audit of Customer service related parameters was conducted at their central NOC at DAKC Mumbai.

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.

All the operators were comfortably meeting the benchmark on 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 pegging 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 .09%) 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) with its performance of 5.04 % (Oct-13), 4.25% (Nov-13) & 4.34% (Dec-13) and Tata (CDMA) with its performance of 7.25 %, 5.62 % and 5.98 % during the months of October, November and December 2013** could not meet the bench mark.

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 indicates that **all operators have met the bench mark successfully** during the quarter.

4.2 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT-QE DEC-13:

				CSD Data for Cellular Mobile Telephone Services-QE Dec-13									
	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	32664	314171	126305	78388	31063	27	307861	52878	74776	78618
	B) No. of bills disputed including billing complaints during the quarter		RAJ	0	36	0	57	27	0	276	39	71	0
	C)% of billing complaints during the quarter	<= 0.1%	RAJ	0.00%	0.01%	0.00 %	0.07%	0.09%	0.0%	0.09%	0.07%	0.10%	0.00%
2	**Metering & Billing Credibility -Pre Paid**												
	A) Total No. of Pre-paid customers at the end of the quarter		RAJ	3888977	14869569	5677273	5560873	4871418	1457604	9084590	2199593	990515	855829
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		RAJ	12	684	96	971	4823	0	4096	319	987	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	RAJ	0.00%	0.00%	0.00 %	0.02%	0.10%	0.00%	0.05%	0.01%	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	12	4668	96	2061	4851	5	4372	357	1058	106
	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	12	4668	57	2061	4851	5	4372	357	1058	106

	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%	59.38%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%	100.0%
	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%	100.0%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%	100.0%
4	**Response time to customers for assistance**												
	A) Accessibility of call centre/Customer Care	*>=95 %*	RAJ	100.0%	100.00%	100.00%	99.47%	99.00%	100.0%	100.00%	99.37%	98.95%	100.0%
	B) % call answered by operators(voice to voice) within 60 sec.	*>=90 %*	RAJ	100.00%	93.00%	24.85%	99.72%	88.74%	99.00%	96.82%	97.19%	96.03%	98.00%
5	**Termination/closure of service**												
	A) Total No. of requests for Termination / Closure of service received during the quarter		RAJ	257	822	15312	475	151	0	2083	817	164	508
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		RAJ	257	822	15312	475	151	0	2083	817	164	508
	C) % of Termination/ Closure of service within 7 days	*<=7d ays*	RAJ	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%	100.0%
6	**Time taken for refunds of deposits after closures.**												
	A) No. of Payments/ Refunds due during the quarter		RAJ	151	290	311	300	183	0	3853	198	470	64
	B) No. of Payments/ Refunds Cleared during the quarter		RAJ	151	290	210	300	183	0	3853	198	470	64
	C) Time taken for refunds of deposits after closures.	*100% within 60 days*	RAJ	100.00%	100.00%	67.52%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%	100.0%

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 59.38 % 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, **BSNL and RCOM (GSM) have not met the benchmark of calls answered by Operators (voice to voice). They have achieved their performance as 24.85% and 88.74% respectively.**

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 it's achievement was 67.52% only**.

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- Oct-13 month													
Live measurement Data		Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators							CDMA Operators		
S/N	Name of Parameter												
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Live data	0.05%	0.09%	1.49%	0.10%	0.22%	0.01%	0.53%	0.03%	0.27%	0.23%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.09%	0.02%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.00%	98.92%	97.34%	99.11%	99.61%	98.57%	99.85%	99.06%	99.37%	99.09%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.35%	0.21%	0.94%	0.70%	0.02%	0.01%	0.13%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.63%	0.38%	1.86%	0.40%	0.06%	0.04%	0.16%	0.37%	0.00%	0.00%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.91%	1.08%	1.92%	1.36%	0.27%	0.68%	0.81%	0.48%	0.07%	0.52%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.02%	2.14%	1.87%	2.35%	0.00%	4.83%	2.66%	0.78%	0.70%	6.24%
	c) Connections with good voice quality	>=95%	Live data	97.00%	98.94%	98.33%	95.57%	98.71%	98.68%	97.12%	98.72%	99.71%	NP
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- Nov-13 month												
Live measurement Data		**Bench-mark**	**Average of 3 Days**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM GSM**	**TATA GSM**	**VODAFONE**	**MTS**	**RCOM CDMA**	**TATA CDMA**
S/N	**Name of Parameter**			**GSM Operators**								**CDMA Operators**		

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	**<=2%**	Live data	0.04%	0.15%	1.77%	0.06%	0.40%	0.01%	0.25%	0.02%	0.72%	0.06%
	b) Worst affected BTSs due to downtime	**<=2%**	Live data	0.00%	0.07%	0.01%	0.00%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	**>=95%**	Live data	97.47%	99.08%	97.34%	99.31%	99.61%	98.54%	99.74%	99.36%	99.37%	97.63%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Live data	0.04%	0.19%	0.66%	0.21%	0.26%	0.03%	0.62%	0.00%	0.00%	0.00%
	c) TCH congestion	**<=2%**	Live data	0.16%	0.29%	1.69%	0.28%	0.07%	0.05%	0.26%	0.13%	0.06%	1.41%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	**<=2%**	Live data	0.61%	0.76%	1.38%	1.26%	0.52%	0.67%	0.74%	0.64%	0.57%	0.61%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Live data	1.40%	1.20%	2.04%	2.56%	0.04%	**4.24%**	2.56%	1.79%	0.42%	5.52%
	c) Connections with good voice quality	**>=95%**	Live data	97.61%	99.04%	98.33%	95.67%	98.61%	98.69%	97.32%	98.71%	98.37%	98.97%
4	**No. of POI having >=0.5% congestion**		Live data	0	0	0	0	0	0	0	0	0	0

TABLE: 3

Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
Cellular Mobile Telephone Services Rajasthan Circle- Dec-13 month													
S/N	Name of Parameter					GSM Operators					CDMA Operators		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.06%	1.86%	0.05%	0.14%	0.02%	0.07%	0.02%	0.29%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.05%	0.09%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.45%	99.13%	98.96%	99.32%	99.67%	98.56%	99.71%	99.32%	99.27%	97.39%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.16%	0.16%	0.44%	0.13%	0.02%	0.03%	0.22%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.24%	0.28%	1.40%	0.21%	0.06%	0.04%	0.29%	0.16%	0.22%	1.63%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.60%	0.77%	1.30%	1.28%	0.33%	0.68%	0.73%	0.64%	0.41%	0.68%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.55%	1.20%	1.82%	2.69%	0.03%	**4.56%**	2.45%	1.60%	0.20%	5.01%
	c) Connections with good voice quality	>=95%	Live data	97.64%	99.04%	97.67%	95.62%	99.01%	98.72%	97.37%	98.72%	99.71%	98.89%
4	**No. of POI having >=0.5% congestion**		Live data	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 are largely meeting the benchmarks except the parameter 'Worst affected cells> 3 % TCH drops". This parameter is not met very marginally by **Aircel (3.02%) in the month of Oct-13 and by Tata (CDMA) in all the three months of the quarter (i.e. 6.24 %, 5.52 % and 5.01% for Oct, Nov, and Dec-13 respectively). The similar performance of Tata (CDMA) has been observed for monthly audit and by Tata (GSM) in all the three months of the quarter (i.e. 4.83 %, 4.24 % and 4.56% for Oct, Nov, and Dec-13 respectively).**

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	*Rajasthan*	--	100%	98%	100%	100%	100%	100%	97%	100%	100%
AIRTEL	*Rajasthan*	100%	--	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	*Rajasthan*	97%	100%	--	100%	100%	98%	100%	100%	100%	97%
IDEA	*Rajasthan*	100%	100%	100%	--	100%	100%	100%	100%	100%	100%
RCOM (GSM)	*Rajasthan*	100%	100%	100%	100%	--	100%	100%	100%	100%	100%
TATA (GSM)	*Rajasthan*	100%	100%	100%	100%	100%	--	100%	100%	100%	100%
VODAFONE	*Rajasthan*	100%	100%	100%	100%	100%	100%	--	100%	100%	100%
MTS	*Rajasthan*	100%	100%	100%	100%	100%	100%	100%	--	100%	100%
RCOM (CDMA)	*Rajasthan*	100%	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA (CDMA)	*Rajasthan*	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. However, Calls attempted from **Aircel to BSNL and MTS were 98% and 97% successful and BSNL to Aircel, Tata GSM and Tata CDMA were 97%, 98% and 97% respectively and there is hardly any problem in interconnection for other operators.**

B) CUSTOMER SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

	CSD 3 days live data for Cellular Mobile Telephone Services-QE-Dec-13												
	3 days live 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**		
	Response time to customers for assistance												
1	A) Accessibility of call centre/Customer Care	>=95%	RAJ	98.00%	100.00%	100.00%	99.46%	99.01%	100.00%	100.00%	100.00%	99.16%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	RAJ	98.00%	93.00%	61.66%	99.73%	99.16%	98.00%	95.00%	94.00%	99.22%	97.00%

CUSTOMER CARE / HELPLINE ASSESSMENT

	LIVE CALLING TO CALL CENTRE										
	Circle Name	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM (GSM)**	**TATA (GSM)**	**VODAFONE**	**MTS**	**RCOM (CDMA)**	**TATA (CDMA)**
Total No. of calls Attempted	RAJ	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	RAJ	100	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	RAJ	100	100	82	100	100	100	100	100	100	100
%age of calls got answered	RAJ	100.00%	100.00%	82.00%	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) except **BSNL which has performed with 61.66% of calls connected to operator.**

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 82% of calls to the operator within 60 Seconds**.

LEVEL-1 LIVE CALLING

Emergency no.	Circle Name	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
100	*Rajasthan*	*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*
139	*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 Rajasthan service area, these services were found functional in the networks of all the service providers.**

5. DRIVE TEST

5.1 OPERATOR ASSISTED DRIVE TEST:

In Rajasthan Service area, total **90 drive tests** in three months of the quarter ended December 2013 @ of 3 drive tests per operator per month (total 3x10x3=90 drive tests) were conducted covering Jaipur, Alwar and Dausa during the month of October-13, Kota, Baran and Bundi during November -13 and Jodhpur, Pali and Sirohi cities during December-2013 and 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. A sample of about 120 - 150 test calls were made during a drive test covering about a distance of 100 K.M. 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. The routs were so selected that the drive test could cover the congested areas/commercial areas of the above 09 cities in Rajasthan circle.

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 FERs 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.

DRIVE TEST TABLE: 1

S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
						GSM Operators						CDMA Operators	
1	Blocked Call Rate (<=3%)	Jaipur	Oct-13	0.74%	0.00%	0.00%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.63%
		Alwar	Oct-13	ICR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Dausa	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Jaipur	Oct-13	0.74%	0.00%	1.78%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.63%
		Alwar	Oct-13	ICR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Dausa	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.00%
3	Percentage connections with good voice quality (=>95%)												
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Jaipur	Oct-13	*NA	NA	NA	NA	NA	NA	NA	99.18%	99.70%	99.79%
		Alwar	Oct-13	NA	NA	NA	NA	NA	NA	NA	98.98%	99.98%	94.45%
		Dausa	Oct-13	NA	NA	NA	NA	NA	NA	NA	98.82%	99.76%	99.42%
	(b) 0-5 (with frequency hopping for GSM Operators)	Jaipur	Oct-13	96.12%	99.20%	100.00%	96.22%	95.42%	ICR	95.46%	NA	NA	NA
		Alwar	Oct-13	ICR	97.59%	99.03	95.86%	96.87%	95.74%	95.47%	NA	NA	NA
		Dausa	Oct-13	95.16%	97.78%	100.00%	97.62%	98.96%	ICR	97.70%	NA	NA	NA
4	Service Coverage												
	In door (>= -75dBm)	Jaipur	Oct-13	82.31%	87.61%	93.64%	90.91%	71.30%	ICR	80.16%	85.20%	94.56%	99.60%
		Alwar	Oct-13	ICR	83.97%	88.23%	88.17%	53.17%	73.03%	75.92%	82.67%	55.74%	76.95%
		Dausa	Oct-13	73.11%	66.25%	74.78%	84.72%	46.74%	ICR	79.16%	80.79%	58.24%	44.12%
	In-vehicle (>= -85dBm)	Jaipur	Oct-13	98.17%	98.67%	99.86%	99.69%	98.65%	ICR	98.11%	100.00%	100.00%	100.00%
		Alwar	Oct-13	ICR	96.46%	99.69%	99.49%	97.12%	98.76%	97.41%	99.53%	92.54%	98.73%
		Dausa	Oct-13	97.04%	94.09%	98.86%	98.06%	93.78%	ICR	98.97%	99.70%	86.56%	78.86%
	Outdoor- in city (>= -95dBm)	Jaipur	Oct-13	100.0%	99.99%	100.00%	99.99%	100.00%	ICR	100.00%	100.00%	100.00%	100.00%
		Alwar	Oct-13	ICR	99.87%	100.00%	99.99%	100.00%	99.99%	99.79%	100.00%	100.00%	100.00%
		Dausa	Oct-13	100.0%	99.90%	99.91%	99.97%	100.00%	ICR	100.00%	100.00%	100.00%	100.00%
5	Call Setup Success Rate (>=95%)	Jaipur	Oct-13	99.26%	100.00%	100.00%	100.00%	100.00%	ICR	100.00%	100.00%	100.00%	99.37%
		Alwar	Oct-13	ICR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Dausa	Oct-13	100.0%	100.00%	100.00%	100.00%	100.00%	ICR	100.00%	100.00%	100.00%	100.00%

Operator-Assisted Drive Test-Rajasthan Circle-Oct-13 Month

*ICR: Intra Circle Roaming, *NA: Not Applicable

DRIVE TEST TABLE: 2

S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
							GSM Operators					CDMA Operators	
1	Blocked Call Rate (<=3%)	Kota	Nov-13	ICR	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Baran	Nov-13	ICR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Bundi	Nov-13	ICR	0.00%	11.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Kota	Nov-13	ICR	0.00%	4.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Baran	Nov-13	ICR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.94%
		Bundi	Nov-13	ICR	0.00%	5.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.49%
3	Percentage connections with good voice quality (=>95%)													
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Kota	Nov-13	NA	NA	NA	NA	NA	NA	NA	99.12%	99.98%	99.26%
		Baran	Nov-13	NA	NA	NA	NA	NA	NA	NA	97.86%	97.57%	97.80%
		Bundi	Nov-13	NA	NA	NA	NA	NA	NA	NA	99.61%	100.00%	96.49%
	(b) 0-5 (with frequency hopping for GSM Operators)	Kota	Nov-13	ICR	97.77%	96.75%	96.73%	95.31%	98.20%	95.77%	NA	NA	NA
		Baran	Nov-13	ICR	97.77%	90.97%	96.22%	96.50%	99.01%	95.89%	NA	NA	NA
		Bundi	Nov-13	ICR	96.99%	90.20%	96.17%	98.18%	98.09%	96.99%	NA	NA	NA
4	Service Coverage													
	In door (>= -75dBm)	Kota	Nov-13	ICR	72.79%	81.23%	87.50%	71.58%	78.74%	90.95%	88.23%	83.84%	88.31%
		Baran	Nov-13	ICR	45.33%	83.25%	84.78%	52.77%	63.49%	84.77%	65.89%	71.72%	32.53%
		Bundi	Nov-13	ICR	51.64%	78.78%	77.86%	33.89%	70.13%	80.77%	83.17%	61.33%	67.67%
	In-vehicle (>= -85dBm)	Kota	Nov-13	ICR	90.37%	98.66%	99.19%	100.00%	98.73%	99.58%	99.16%	98.90%	99.20%
		Baran	Nov-13	ICR	84.79%	98.90%	98.67%	98.79%	95.13%	99.68%	97.57%	94.15%	92.80%
		Bundi	Nov-13	ICR	84.66%	96.91%	98.22%	96.72%	98.66%	98.93%	98.62%	89.11%	94.27%
	Outdoor- in city (>= -95dBm)	Kota	Nov-13	ICR	100.00%	100.00%	99.95%	100.00%	99.96%	100.00%	99.91%	100.00%	99.92%
		Baran	Nov-13	ICR	100.00%	100.00%	99.99%	100.00%	99.95%	100.00%	100.00%	100.00%	99.94%
		Bundi	Nov-13	ICR	100.00%	100.00%	99.90%	99.99%	99.76%	99.98%	99.99%	100.00%	100.00%
5	Call Setup Success Rate (>=95%)	Kota	Nov-13	ICR	100.00%	87.50%	100.00%	100.00%	100.00%	100.00%	100.00%	97.62%	100.00%
		Baran	Nov-13	ICR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.06%
		Bundi	Nov-13	ICR	100.00%	88.71%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Operator-Assisted Drive Test-Rajasthan Circle-Nov-13 Month

*ICR: Intra Circle Roaming, *NA: Not Applicable

DRIVE TEST TABLE: 3

S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
							GSM Operators					CDMA Operators	
1	Blocked Call Rate (<=3%)	Jodhpur	Dec-13	0.00%	1.87%	7.94%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.00%
		Pali	Dec-13	ICR	0.00%	6.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Sirohi	Dec-13	0.00%	0.00%	5.00%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	ICR
2	Dropped Call Rate (<=2%)	Jodhpur	Dec-13	1.03%	0.00%	5.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.92%
		Pali	Dec-13	ICR	0.00%	2.99%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.00%
		Sirohi	Dec-13	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	ICR
3	Percentage connections with good voice quality (=>95%)												
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Jodhpur	Dec-13	NA	NA	NA	NA	NA	NA	NA	99.71%	98.21%	99.06%
		Pali	Dec-13	NA	NA	NA	NA	NA	NA	NA	99.72%	99.82%	97.67%
		Sirohi	Dec-13	NA	NA	NA	NA	NA	NA	NA	99.83%	99.81%	ICR
	(b) 0-5 (with frequency hopping for GSM Operators)	Jodhpur	Dec-13	96.04%	95.3%	93.49%	96.6%	95.57%	ICR	95.57%	NA	NA	NA
		Pali	Dec-13	ICR	97.4%	91.47%	97.3%	99.36%	97.8%	96.01%	NA	NA	NA
		Sirohi	Dec-13	98.46%	98.4%	97.10%	97.0%	98.79%	ICR	96.18%	NA	NA	NA
4	Service Coverage												
	In door (>= -75dBm)	Jodhpur	Dec-13	51.27%	77.79%	76.61%	84.44%	51.07 %	ICR	95.47 %	92.44 %	97.94%	86.28%
		Pali	Dec-13	ICR	81.11%	76.00%	76.41%	39.25 %	74.29 %	88.83%	90.04 %	81.96 %	68.10%
		Sirohi	Dec-13	74.39%	68.69%	82.77%	77.97%	34.06 %	ICR	86.03 %	86.97%	42.09 %	ICR
	In-vehicle (>= -85dBm)	Jodhpur	Dec-13	94.47%	98.11%	97.87%	99.40%	91.86 %	ICR	99.89 %	99.77%	99.99 %	98.71%
		Pali	Dec-13	ICR	96.20%	98.60%	97.71%	89.27%	98.29 %	99.84 %	99.99 %	98.51%	99.03%
		Sirohi	Dec-13	97.50%	93.44%	98.98%	99.00%	83.41 %	ICR	99.63 %	99.76 %	77.42%	ICR
	Outdoor- in city (>= -95dBm)	Jodhpur	Dec-13	99.96%	99.99%	100.0%	99.99%	100.0%	ICR	100.00 %	100.00%	100.00 %	100.00%
		Pali	Dec-13	ICR	99.83%	100.0%	99.98%	100.0%	100.0%	100.00%	100.00%	100.00 %	100.00%
		Sirohi	Dec-13	99.91%	99.88%	100.0%	100.00%	100.0%	ICR	100.00 %	100.00%	100.00 %	ICR
5	Call Setup Success Rate (>=95%)	Jodhpur	Dec-13	100.00%	97.20%	92.06%	100.00%	100.0%	ICR	100.00%	100.00%	100.00%	98.08%
		Pali	Dec-13	ICR	100.00%	93.06%	100.00%	100.0%	100.0%	100.00%	100.00%	100.00%	100.00%
		Sirohi	Dec-13	100.00%	100.00%	95.00%	100.00%	100.0%	ICR	100.00%	100.00%	100.00%	ICR

Operator-Assisted Drive Test-Rajasthan Circle-Dec-13 Month

*ICR: Intra Circle Roaming, *NA: Not Applicable

DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Month/Year	City	Peripehry-1	Peripehry-2	Across the City	Congested	In Building
Oct-13	Jaipur	BSNL Office(MI Road)-Ajmeri Gate-JLN Marg-Rajasthan University-Jhawahar Circle-Sanganer- B2 Bypass-Dhanvantri Hospital-Mansarovar	Mansarovar-Nirman Nagar-Shayam Nagar-Vaishali Nagar-Khati Pura-Vaishali Nagar-Khatipura-Chomu Road-Choumucircle-Sikar Road-Road No. 9	Ambavadi-Collectrate-BJP Karyala-22 Godaum-Lakxmi Mandir-Tonk Phatak-Gandhi Nagar Station Gate No. 2-Durgarpura-V2 Bypass	Pink City-Jal Mahal-Subhash Circle-Chand Pole	GT Tower
	Alwar	Hanuman Circle-Naman Hotel-Bhagatsingh Circle-Transport Nagar-Kali Mori-Itarana	Bhagatsingh Circle-Jail Chauraha-Rath Nagar-Vijay Nagar-Sec-10-Tijara Fatak-Buddh Vihar-Hasn Khan Mewati Nagar-Katoriwala	Telco Circle-Cross Point-Bhagat Singh Circle To Moti Doongri-Bhawani Top-Malviya Nagar-Kati Ghati	Ashok Circle-Police Control Room-Hope Circus-Ghantaghar,Nangli Circle	City Mall-Cross Point Mall
	Dausa	Gandhi Circle-Lalsot Road-Govt Hospital-Anaj Mandi-Collectrate-Jaipur Bharatpur Bypass	Railway Station-NH11	Collectrate-Krishna Hospital-Jaipur Bypass Road	Dausa Main Market	Collector Office
Nov-13	Kota	Railway Station-Kherli Phatak-JDB Colony-Talab Bridge-Cant-Kotri Circle-Guman Pura-Borkheda-New Railway Colony-Railway Station	Guman Pura-Ghodiwala Circle-CAD Circle-TT Hospital-Keshavpura Circle-Mahaveer Nagar-Rangbari-Khadi Ganesh Ji-Anantpura-Jhalawar Road-Vigyan Nagar-Aerodram Circle	Keshavraypatan Circle-Kurhadi-Chambal Bridge-Nayapura-Antaghar Circle-Police Line-Borkheda-Baran Road	New Cloth Market-Sabji Mandi-Rampura Khai Road-Ladpur	City Mall
	Baran	Mandi Tiraha-Ospital Road-Dolmeha Ground-Jitendra Nagar-Mangrol Road-Pratap Chok	Pratap Chowk-Shabed Road-Ambedkar Circle-Shivpuri Highway-Mandola Crossing	Mangrol Road-Pratap Chowk-Jhalawar Road	Mandi Tiraha-Market-Govt. Hospital Road-Kiran Market-Pratapchowk-Charmurti Chorawh	Bus Stand
	Bundi	Kota Highway-Balchandpara-Chhota Talab-KN Circle-Indira Market-Devpura-Police Line-Chhatarpur	Highway, Police Line	Nanjivansangh-Nainwa Road-Bahadur Circle-New Colony-Gayatri Nagar-Chittorroad	Balachandpara-Nahar Ka Chata-Meera Gate Circle-Indira Market-Lanka Gate-Khumba Stadium-Chhatarpur	Bus Stand

Dec-13	Jodhpur	Sardarpura -Rotary Circle-Akhliya, Shastri Nagar,Power House-Heavy Ind Area-Bsnl Office-	Paach Bathi-Ratnada-Sojati Gate-Rly Station	Dps Bus Stand-Pali By Pass-Mahatmagandhi Hospital-Jalori Gate	Sardarpura B,C,D Road-Sardapura Interior-Jaljog Dense-Olympic Circle	Big Bazar
	Pali	Overbridge-Iti Stadium-Industrial Area-Devi Nagar-Police Line-Sarvodhya Nagar-Sbi-Railway Overbridge- Pali Overbridge	Manthan Takess-Lodia Talab Pal-Bajrang Bagh-Chungi Naka-Gmtd Stone-By Pass Circuit House Board-New Bus Stand-Collectrate-Suraj Pole-Gandhi Circle-Manthan Takiess	Krishi Mandi-Sai Baba Mandir-Mill Gate-Suroj Pole-Sojat Road-Govt. College-Dak Bangla-Old Bus Stand-Mandia Road-Jpr Bypass-Polly. Tech. College-Panihari Hotel-New Bus Stand	Residential Area-Housing Board-Suraj Pole-V.D.Nagar-Jantha Colony	New Bus Stand
	Sirohi	Mandva Hanumanji-Teen Batti Chorah-Police Line-Govt. Quarter-Rto Office-Bhataleda Choraha-Gujrat Hospital-Bus Stand-Jail Choraha-Ahinsa Circle-Place Road-Saneshwar Ji Road-Buggi Khana-Baba Ramdeo Hote	Police Line, Palace Road	Baba Ramdeo-Collectrate-Goheli Chorah-Goheli Village	Main Market	Bus Stand

KEY FINDINGS: DRIVE TEST

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

(i)

    (a) Aircel is not operating its service on its own network at Alwar, Kota, Baran, and Bundi cities, but is on ICR with Tata (GSM). At Pali city, it is on ICR jointly with Idea and Tata (GSM).

    (b) Tata (GSM) is on ICR with Aircel at Jaipur, Dausa and with Vodafone at Sirohi cities. At Jodhpur, it is on ICR jointly with Idea and Aircel.

    (c) Tata (CDMA) is on ICR with MTS at Sirohi.

(ii) **In the Month of October-13**, drive test was conducted at Jaipur, Alwar and Dausa. Tata (CDMA) could not meet the benchmarks of parameter Good Voice quality at Alwar (94.45%).

(iii) **In the Month of November-13**, drive test was conducted at Kota, Baran and Bundi cities. BSNL failed to meet the benchmarks of the parameters Blocked call rate, Dropped call rate and Call Set up Success rate (CSSR) at Kota & Bundi, and Good voice quality at Baran & Bundi . Blocked call rate was achieved @ 12.50 % (Kota) & 11.29 % (Bundi), Dropped call rate @ 4.16 % (Kota) & 5.45 % (Bundi) and CSSR @ 87.50 % (Kota) & 88.71 % (Bundi). The performance of BSNLwith respect to the parameter Good Voice Quality was @ 90.97 % (Baran) and 90.20 % (Bundi).

Tata (CDMA), also could not met the benchmark of the parameter Dropped call rate at Baran and Bundi Its performance was 2.94% and 3.49% at these cites respectively.

(iv) **In the month of December-13**, drive test was conducted at cities Jodhpur, Pali and Sirohi. BSNL repeated the same performance as was in the month of November-13 with respect to the parameters Blocked call rate, Dropped call rate, Good voice quality and CSSR as it could not meet the benchmarks of these parameters at these cities. BSNL achieved Blocked call rate 7.94 % (Jodhpur) , 6.94 % (Pali) & 5.00 % (Sirohi), Dropped call rate 5.17 % (Jodhpur) & 2.99 % (Pali), Voice Quality 93.49 % (Jodhpur) & 91.41 % (Pali) and CSSR, 92.06 % (Jodhpur) & 93.06 % (Pali).

*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 cities where the drive test was conducted in the month of November and December 2013. The bench mark of Voice Quality was also not met by **Vodafone** at Dausa and Tata (CDMA) at Alwar.*

5.2 INDEPENDENT DRIVE TEST:

The independent drive tests are to be carried out by M/s TUV for any service provider on receiving advice from TRAI, based on any complaint from subscribers, relating to poor network coverage in certain areas of the cities. As TUV was not advised by TRAI to conduct the drive test independently on the basis of Subscribers complaint or otherwise, the independent drive tests were not conducted by TUV in this quarter.

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

From month audit & 3 days live findings, it can be concluded that on an average, performance of the operators in the service area Rajasthan is satisfactory for **Network Parameters** except for one parameter namely **'Worst affected cells having > 3% TCH drop'** which could not be met by Tata . **Tata (GSM)** with its performance of 5.04 % (Oct-13), 4.25% (Nov-13) & 4.34% (Dec-13) and **Tata (CDMA)** with its performance of 7.25 %, 5.62 % and 5.98 % during the months of October, November and December 2013 could not met the bench mark. The similar performance of **Tata (CDMA & GSM)** has been observed for 3 days live measurements.

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 **BSN**L is way below the benchmark in respect of parameters '% billing complaints resolved within 4 weeks' (59.38%), '% of calls answered by operators (voice to voice)(24.85%) and 'time taken for refunds of deposits' (67.52%). The parameter '% of calls answered by operators (voice to voice)' is also not met by **RCOM GSM** (88.74%).

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 cities where the drive test was conducted in the month of November and December 2013. The bench mark of Voice Quality was also mot met by Tata (CDMA) at Alwar.

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

TABLE: 1

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
							GSM Operators					CDMA Operators	
Network Service Quality Parameter													
	Network Availability												
1	a) Total no. of BTSs in the licensed service area		Oct-13	1356	7747	3715	4703	2399	1439	6587	1589	1338	710
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Oct-13	708	5899	52369	3963	5916	26	24163	645	4907	218
	c) BTS Accumulated Downtime	<=2%	Oct-13	0.07%	0.10%	1.90%	0.12%	0.32%	0.00%	0.49%	0.05%	0.48%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-13	0	16	72	3	12	0	19	0	6	0
	e) Worst affected BTSs due to downtime	<=2%	Oct-13	0.00 %	0.21%	1.91%	0.20%	0.50%	0.00%	0.28%	0.00%	0.38%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95 %	Oct-13	96.13%	98.89 %	98.86%	99.18 %	99.59%	98.56%	99.77%	99.15%	99.14%	98.93 %
	b) SDCCH/PAGING Congestion	<=1%	Oct-13	0.32%	0.28%	0.36%	0.42%	0.02%	0.04%	0.18%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.50%	0.34%	1.25%	0.36%	0.06%	0.05%	0.23%	0.25%	0.00%	0.12%

Table heading (spanning): **Detailed Network Data Assessment of Cellular Mobile Telephone Services- Rajasthan Circle- Oct-13 month**

	Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	*<=2%*	Oct-13	0.84%	0.90%	1.72%	1.30%	0.27%	0.72%	0.83%	0.50%	0.09%	0.60%
	b) Worst affected cells>3% TCH drop	*<=3%*	Oct-13	1.09%	1.91%	2.94%	2.52%	0.11%	5.04%	2.57%	0.92%	0.42%	7.25%
	c) % of connections with good voice quality	*>=95 %*	Oct-13	97.13%	98.92 %	98.34%	95.69 %	98.71%	98.62%	97.09 %	98.72%	99.70%	98.98%
	d) d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-13	44	443	231	356	9	215	524	46	13	162
	e) Total no. of cells (Sector) in the licensed service area		Oct-13	4043	23165	11048	14335	7138	4259	19915	5003	4010	2243
	No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Oct-13	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Oct-13	0	0	0	0	0	0	0	0	0	0
	Network Data												
5	a) Equipped Capacity of Network in Erlang		Oct-13	70467	453395	265400	185928	102000	69696.6	269608	97000	116000	234561
	b) Total traffic in TCBH in erlang (Avg.)		Oct-13	65414	362041	114002	151432	96871	26418	234039	54254	36945	42497
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-13	2667717	14120930	2718436	5661869	4626776	735570	9051068	1109686	1036597	470165

TABLE: 2

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	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	1344	7747	3715	4627	2398	1400	6585	1589	1388	710
	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	50.18	503.17	3999	346.85	380.83	10.99	2493.73	36	262.08	16.30
	c) BTS Accumulated Downtime	<=2%	Live data	0.05%	0.09%	1.49%	0.10%	0.22%	0.01%	0.53%	0.03%	0.27%	0.23%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	7	1	0	1	0	53	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.09%	0.02%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.00%	98.92%	97.34%	99.11%	99.61%	98.57%	99.85%	99.06%	99.37%	99.09%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.35%	0.21%	0.94%	0.70%	0.02%	0.01%	0.13%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.63%	0.38%	1.86%	0.40%	0.06%	0.04%	0.16%	0.37%	0.00%	0.00%
3	**Connection Maintenance (Retainability)**												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.91%	1.08%	1.92%	1.36%	0.27%	0.68%	0.81%	0.48%	0.07%	0.52%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.02%	2.14%	1.87%	2.35%	0.00%	4.83%	2.66%	0.78%	0.70%	6.24%
	c) % of connections with good voice quality	>=95%	Live data	97.00%	98.94%	98.33%	95.57%	98.71%	98.68%	97.12%	98.72%	99.71%	*NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	121	497	207	332	0	203	530	39	25	138
	e) Total no. of cells (Sector) in the licensed service area		Live data	4001	23210	11048	14091	7133	4199	19909	5004	4010	2213
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

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Oct-13 month

*NP: Data Not Provided

TABLE: 3

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators							CDMA Operators		
Network Service Quality Parameter													
	Network Availability												
1	a) Total no. of BTSs in the licensed service area		Nov-13	1365	7761	3754	4809	2402	1400	6590	1580	1337	683
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Nov-13	414.54	4442	49786	2243.5	4423.07	250.54	11708.80	371.92	3606	89.30
	c) BTS Accumulated Downtime	<=2%	Nov-13	0.04%	0.08%	1.84%	0.06%	0.26%	0.02%	0.25%	0.03%	0.37%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-13	0	17	68	1	14	0	56	0	7	0
	e) Worst affected BTSs due to downtime	<=2%	Nov-13	0.00%	0.22%	1.81%	0.02%	0.58%	0.00%	0.85%	0.00%	0.52%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	96.98 %	98.91 %	99.92%	99.03%	99.66%	98.54 %	99.71 %	99.35%	99.24%	98.60 %
	b) SDCCH/PAGING Congestion	<=1%	Nov-13	0.21%	0.23%	0.55%	0.23%	0.10%	0.02%	0.24%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.59%	0.36%	1.89%	0.51%	0.06%	0.06%	0.29%	0.12%	0.01%	0.48%
3	**Connection Maintenance (Retainability)**												

	a) Call Drop Rate (CDR)	<=2%	Nov-13	0.61%	0.79%	1.34%	1.28%	0.34%	0.66%	0.73%	0.59%	0.11%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-13	0.54%	1.28%	1.48%	2.58%	0.04%	**4.25%**	2.40%	1.38%	0.46%	**5.62%**
	c) % of connections with good voice quality	>=95%	Nov-13	97.60 %	99.01 %	98.03%	95.57%	98.73%	98.68 %	97.26 %	98.71%	99.57%	99.00 %
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-13	22	297	145	378	3	178	479	69	18	123
	e) Total no. of cells (Sector) in the licensed service area		Nov-13	4064	23195	9823	14680	7146	4196	20006	4986	4007	2181
4	**No. of POI's having >=0.5% POI congestion**												
	No. of POI's having >=0.5% POI congestion		Nov-13	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Nov-13	0	0	0	0	0	0	0	0	0	0
5	**Network Data**												
	a) Equipped Capacity of Network in Erlang		Nov-13	72689.35	449890	265400	198090	NP	68410.4	268676.71	97000	NP	238251
	b) Total traffic in TCBH in erlang (Avg.)		Nov-13	62115.69	362037.65	114010	144843	NP	25267.962	229799.37	57776	NP	35248.861
	c) Total no. of customers served (as per VLR) on last day of the month		Nov-13	2693946	14528051	2718346	5770055	NP	702304	9100236	1112853	NP	436248

*NP: Data Not Provided

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Nov-13 month

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	MTS	RCOM CDMA	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	1358	7752	3720	4708	2401	1398	6587	1578	1337	683
	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	49.95	839	4751	206	697.85	14.55	1201.67	23.77	688.95	27.40
	c) BTS Accumulated Downtime	<=2%	Live data	0.04%	0.15%	1.77%	0.06%	0.40%	0.01%	0.25%	0.02%	0.72%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	5	1	0	0	0	27	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.07%	0.01%	0.00%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.47%	99.08%	97.34%	99.31%	99.61%	98.54%	99.74 %	99.36%	99.37%	97.63%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.04%	0.19%	0.66%	0.21%	0.26%	0.03%	0.62%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.16%	0.29%	1.69%	0.28%	0.07%	0.05%	0.26%	0.13%	0.06%	1.41%
3	**Connection Maintenance (Retainability)**												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.61%	0.76%	1.38%	1.26%	0.52%	0.67%	0.74%	0.64%	0.57%	0.61%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.40%	1.20%	2.04%	2.56%	0.04%	**4.24%**	2.56%	1.79%	0.42%	**5.52%**
	c) % of connections with good voice quality	>=95%	Live data	97.61%	99.04%	98.33%	95.67%	98.61%	98.69%	97.32 %	98.71%	98.37%	98.97%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	57	273	200	368	3	178	512	89	17	119
	e) Total no. of cells (Sector) in the licensed service area		Live data	4043	23196	9823	14352	7144	4199	20006	4980	4007	2162
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- Dec-13 month									
S/N	**Name of Parameter**	**Bench- mark**	**Audit Period**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM GSM**	**TATA GSM**	**VODAFONE**	**MTS**	**RCOM CDMA**	**TATA CDMA**
				GSM Operators							CDMA Operators		
Network Service Quality Parameter													
	Network Availability												
1	a) Total no. of BTSs in the licensed service area		Dec-13	1413	7709	3754	5011	2402	1400	6597	1578	1338	683
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Dec-13	493.61	2746	51398.87	2211.50	3950.33	301.62	2846.42	301.97	4019.15	108
	c) BTS Accumulated Downtime	<=2%	Dec-13	0.05%	0.05%	1.84%	0.06%	0.22%	0.03%	0.06%	0.03%	0.40%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-13	0	11	72	1	8	0	11	0	6	0
	e) Worst affected BTSs due to downtime	<=2%	Dec-13	0.00%	0.14%	1.92%	0.02%	0.33%	0.00%	0.17%	0.00%	0.45%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	97.01 %	99.13 %	99.92 %	99.07 %	99.67%	98.54 %	99.75%	99.33 %	99.10%	97.70 %
	b) SDCCH/PAGING Congestion	<=1%	Dec-13	0.17%	0.15%	0.47%	0.16%	0.02%	0.02%	0.15%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.22%	0.28%	1.45%	0.46%	0.06%	0.04%	0.25%	0.14%	0.00%	1.21%

	Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Dec-13	0.60%	0.78%	1.28%	1.30%	0.33%	0.69%	0.74%	0.65%	0.09%	0.73%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-13	0.59%	1.21%	1.59%	2.74%	0.03%	**4.34%**	2.44%	1.56%	0.22%	**5.98%**
	c) % of connections with good voice quality	>=95%	Dec-13	97.74 %	99.05 %	98.06 %	95.61 %	98.78%	98.69%	97.42%	98.71 %	99.72%	98.90 %
	d) d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-13	25	279	156	420	71	182	490	78	9	131
	e) Total no. of cells (Sector) in the licensed service area		Dec-13	4210	23080	9823	15320	7147	4199	20052	4996	4010	2197
4	**No. of POI's having >=0.5% POI congestion**												
	No. of POI's having >=0.5% POI congestion		Dec-13	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Dec-13	0	0	0	0	0	0	0	0	0	0
5	**Network Data**												
	a) Equipped Capacity of Network in Erlang		Dec-13	74360.9	450007	265400	208106.89	102000	68416.4	NP	97000	116000	170068
	b) Total traffic in TCBH in erlang (Avg.)		Dec-13	63133.72	362038.65	111547	149085.03	89406	25076.238	NP	56046.29	38907	31652.335
	c) Total no. of customers served (as per VLR) on last day of the month		Dec-13	2884937	14577256	2567852	5855134	4682381	661412	NP	1155324	1019589	443078

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Dec-13 month												
S/N	**Name of Parameter**	**Bench- mark**	**Average of 3 Days**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM GSM**	**TATA GSM**	**VODAFONE**	**MTS**	**RCOM CDMA**	**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	1374	7747	3754	4839	2402	1400	6590	1578	1337	683
	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	0	116	5020	185.30	244.60	18.35	345.34	21.42	279.72	17.30
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.06%	1.86%	0.05%	0.14%	0.02%	0.07%	0.02%	0.29%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	4	3	0	0	0	13	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.05%	0.09%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.45%	99.13%	98.96%	99.32%	99.67%	98.56%	99.71 %	99.32%	99.27%	97.39%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.16%	0.16%	0.44%	0.13%	0.02%	0.03%	0.22%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.24%	0.28%	1.40%	0.21%	0.06%	0.04%	0.29%	0.16%	0.22%	1.63%
	Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.60%	0.77%	1.30%	1.28%	0.33%	0.68%	0.73%	0.64%	0.41%	0.68%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.55%	1.20%	1.82%	2.69%	0.03%	**4.56%**	2.45%	1.60%	0.20%	**5.01%**
	c) % of connections with good voice quality	>=95%	Live data	97.64%	99.04%	97.67%	95.62%	99.01%	98.72%	97.37 %	98.72%	99.71%	98.89%
	d) d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	63	277	179	397	2	192	491	80	8	110
	e) Total no. of cells (Sector) in the licensed service area		Live data	4086	23177	9823	14372	7147	4200	20041	4987	4007	2194
	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 OF PERFORMANCE OF THE CELLULAR MOBILE SERVICE PROVIDERS-MONTHLY V/S 3-DAYS LIVE MEASUREMENT:

1) BTS ACCUMULATED DOWNTIME

BTS Accumulated Downtime - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.07%	0.10%	1.90%	0.12%	0.32%	0.00%	0.49%	0.05%	0.48%	0.04%
Live	0.05%	0.09%	1.49%	0.10%	0.22%	0.01%	0.53%	0.03%	0.27%	0.23%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

BTS Accumulated Downtime - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.04%	0.08%	1.84%	0.06%	0.26%	0.02%	0.25%	0.03%	0.37%	0.02%
Live	0.04%	0.15%	1.77%	0.06%	0.40%	0.01%	0.25%	0.02%	0.72%	0.06%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

BTS Accumulated Downtime - Dec-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.05%	0.05%	1.84%	0.06%	0.22%	0.03%	0.06%	0.03%	0.40%	0.02%
Live	0.00%	0.06%	1.86%	0.05%	0.14%	0.02%	0.07%	0.02%	0.29%	0.04%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

All operators are meeting the benchmarks.

2) WORST AFFECTED BTSS DUE TO DOWNTIME:

Worst affected BTSs due to downtime - Oct-13 month

	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.21%	1.91%	0.20%	0.50%	0.00%	0.28%	0.00%	0.38%	0.00%
Live	0.09%	0.02%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%

Worst affected BTSs due to downtime - Nov-13 month

	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.22%	1.81%	0.02%	0.58%	0.00%	0.85%	0.00%	0.52%	0.00%
Live	0.07%	0.01%	0.00%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%

Worst affected BTSs due to downtime - Dec-13 month

	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.14%	1.92%	0.02%	0.33%	0.00%	0.17%	0.00%	0.45%	0.00%
Live	0.05%	0.09%	0.00%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%

All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE

Call Setup Success Rate - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	96.13%	98.89%	98.86%	99.18%	99.59%	98.56%	99.77%	99.15%	99.14%	98.93%
Live	96.00%	98.92%	97.34%	99.11%	99.61%	98.57%	99.85%	99.06%	99.37%	99.09%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

Call Setup Success Rate - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	96.98%	98.91%	99.92%	99.03%	99.66%	98.54%	99.71%	99.35%	99.24%	98.60%
Live	97.47%	99.08%	97.34%	99.31%	99.61%	98.54%	99.74%	99.36%	99.37%	97.63%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

Call Setup Success Rate - Dec-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	97.01%	99.13%	99.92%	99.07%	99.67%	98.54%	99.75%	99.33%	99.10%	97.70%
Live	97.45%	99.13%	98.96%	99.32%	99.67%	98.56%	99.71%	99.32%	99.27%	97.39%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:

SDCCH/PAGING Channel Congestion - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.32%	0.28%	0.36%	0.42%	0.02%	0.04%	0.18%	0.00%	0.00%	0.00%
Live	0.35%	0.21%	0.94%	0.70%	0.02%	0.01%	0.13%	0.00%	0.00%	0.00%
Benchmark	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

SDCCH/PAGING Channel Congestion - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.21%	0.23%	0.55%	0.23%	0.10%	0.02%	0.24%	0.00%	0.00%	0.00%
Live	0.04%	0.19%	0.66%	0.21%	0.26%	0.03%	0.62%	0.00%	0.00%	0.00%
Benchmark	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

SDCCH/PAGING Channel Congestion - Dec-13 month

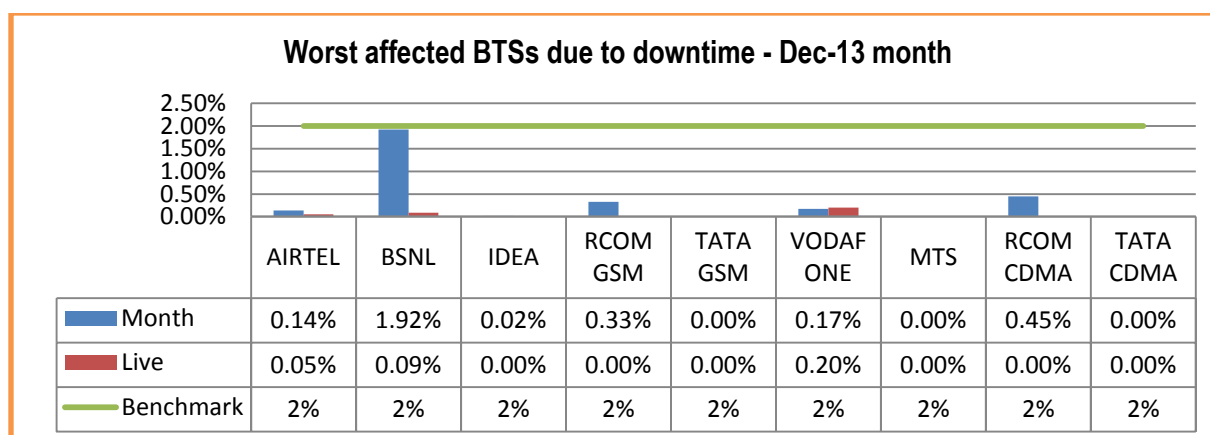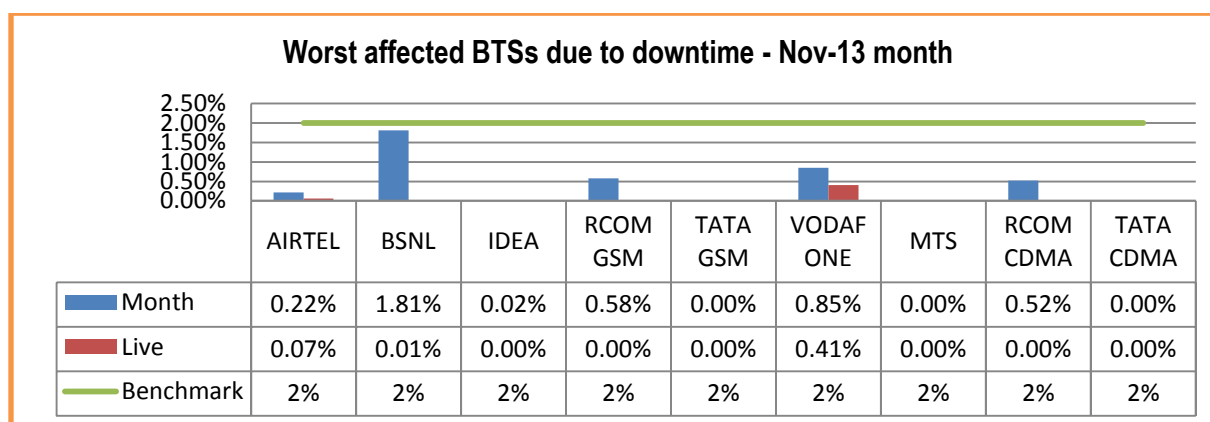|	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.17%	0.15%	0.47%	0.16%	0.02%	0.02%	0.15%	0.00%	0.00%	0.00%
Live	0.16%	0.16%	0.44%	0.13%	0.02%	0.03%	0.22%	0.00%	0.00%	0.00%
Benchmark	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%

All operators are meeting the benchmarks.

5) TCH CONGESTION:

TCH Congestion - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.50%	0.34%	1.25%	0.36%	0.06%	0.05%	0.23%	0.25%	0.00%	0.12%
Live	0.63%	0.38%	1.86%	0.40%	0.06%	0.04%	0.16%	0.37%	0.00%	0.00%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

TCH Congestion - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.59%	0.36%	1.89%	0.51%	0.06%	0.06%	0.29%	0.12%	0.01%	0.48%
Live	0.16%	0.29%	1.69%	0.28%	0.07%	0.05%	0.26%	0.13%	0.06%	1.41%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

TCH Congestion - Dec-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.22%	0.28%	1.45%	0.46%	0.06%	0.04%	0.25%	0.14%	0.00%	1.21%
Live	0.24%	0.28%	1.40%	0.21%	0.06%	0.04%	0.29%	0.16%	0.22%	1.63%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

All operators are meeting the benchmarks.

6) CALL DROP RATE:
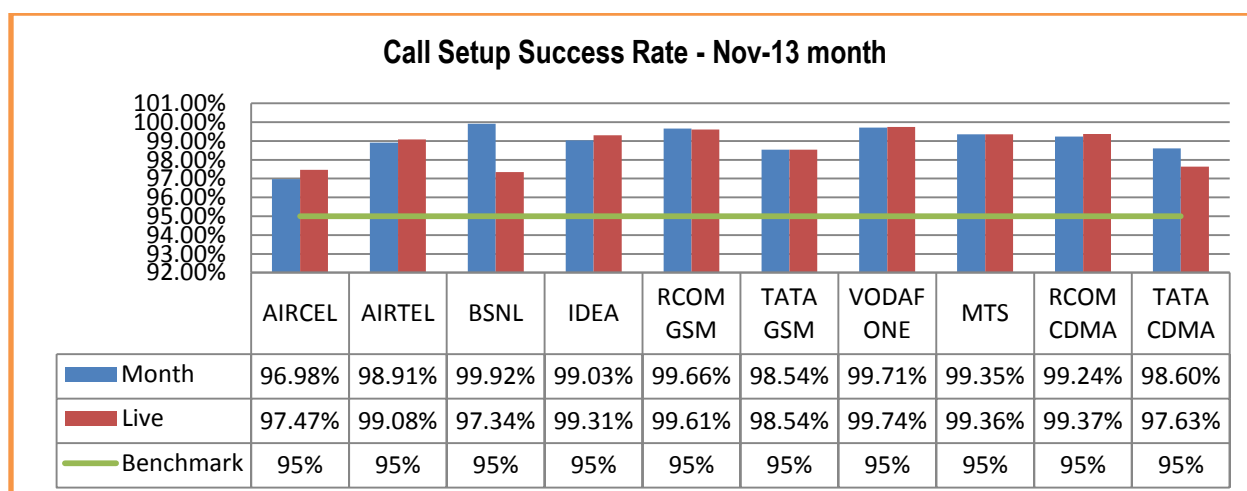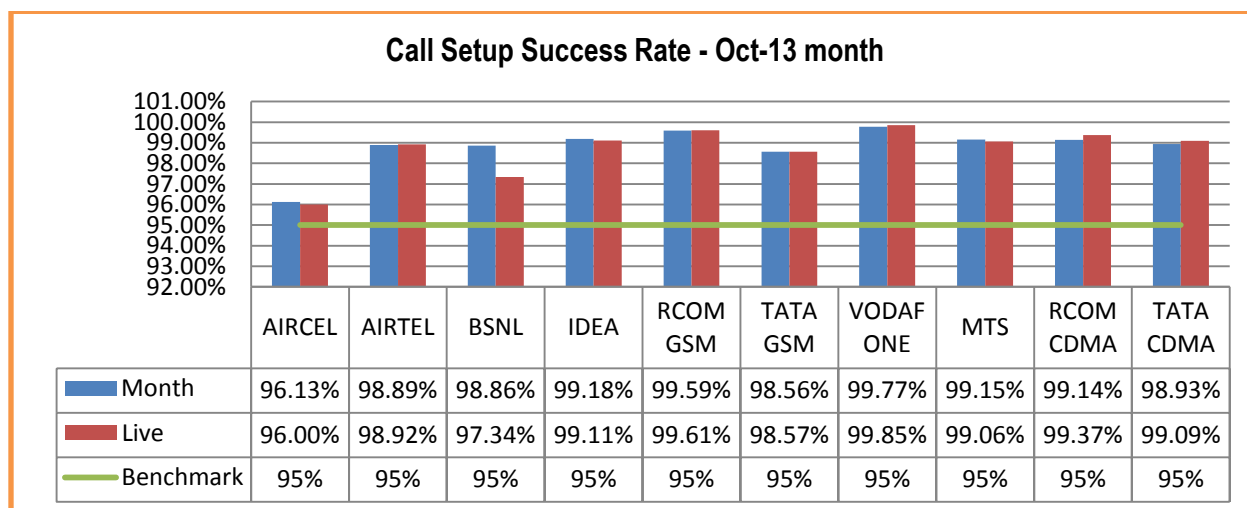
Call Drop Rate - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.84%	0.90%	1.72%	1.30%	0.27%	0.72%	0.83%	0.50%	0.09%	0.60%
Live	0.91%	1.08%	1.92%	1.36%	0.27%	0.68%	0.81%	0.48%	0.07%	0.52%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

Call Drop Rate - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.61%	0.79%	1.34%	1.28%	0.34%	0.66%	0.73%	0.59%	0.11%	0.54%
Live	0.61%	0.76%	1.38%	1.26%	0.52%	0.67%	0.74%	0.64%	0.57%	0.61%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

Call Drop Rate - Dec-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.60%	0.78%	1.28%	1.30%	0.33%	0.69%	0.74%	0.65%	0.09%	0.73%
Live	0.60%	0.77%	1.30%	1.28%	0.33%	0.68%	0.73%	0.64%	0.41%	0.68%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%

All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP:

Worst affected cells>3% TCH drop - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	1.09%	1.91%	2.94%	2.52%	0.11%	5.04%	2.57%	0.92%	0.42%	7.25%
Live	3.02%	2.14%	1.87%	2.35%	0.00%	4.83%	2.66%	0.78%	0.70%	6.24%
Benchmark	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

Worst affected cells>3% TCH drop - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.54%	1.28%	1.48%	2.58%	0.04%	4.25%	2.40%	1.38%	0.46%	5.62%
Live	1.40%	1.20%	2.04%	2.56%	0.04%	4.24%	2.56%	1.79%	0.42%	5.52%
Benchmark	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

Worst affected cells>3% TCH drop - Dec-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	0.59%	1.21%	1.59%	2.74%	0.03%	4.34%	2.44%	1.56%	0.22%	5.98%
Live	1.55%	1.20%	1.82%	2.69%	0.03%	4.56%	2.45%	1.60%	0.20%	5.01%
Benchmark	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%

Tata (GSM) in month of October 2013 and Tata (CDMA) in entire quarter have not met the benchmark.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:

% Connections with good voice quality - Oct-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	97.13%	98.92%	98.34%	95.69%	98.71%	98.62%	97.09%	98.72%	99.70%	98.98%
Live	97.00%	98.94%	98.33%	95.57%	98.71%	98.68%	97.12%	98.72%	99.71%	0.00%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

% Connections with good voice quality - Nov-13 month

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	97.60%	99.01%	98.03%	95.57%	98.73%	98.68%	97.26%	98.71%	99.57%	99.00%
Live	97.61%	99.04%	98.33%	95.67%	98.61%	98.69%	97.32%	98.71%	98.37%	98.97%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

% Connections with good voice quality - Dec-13 month

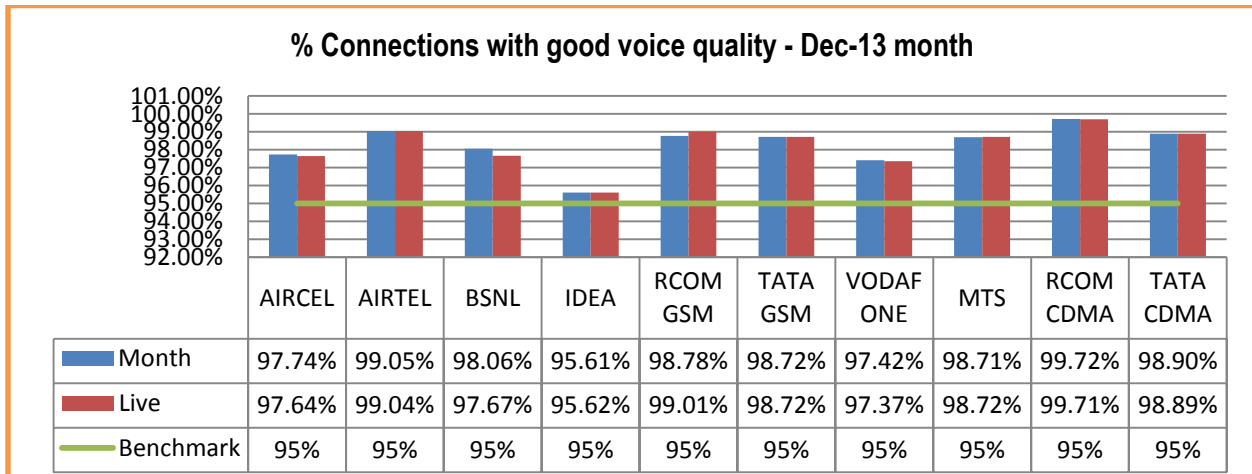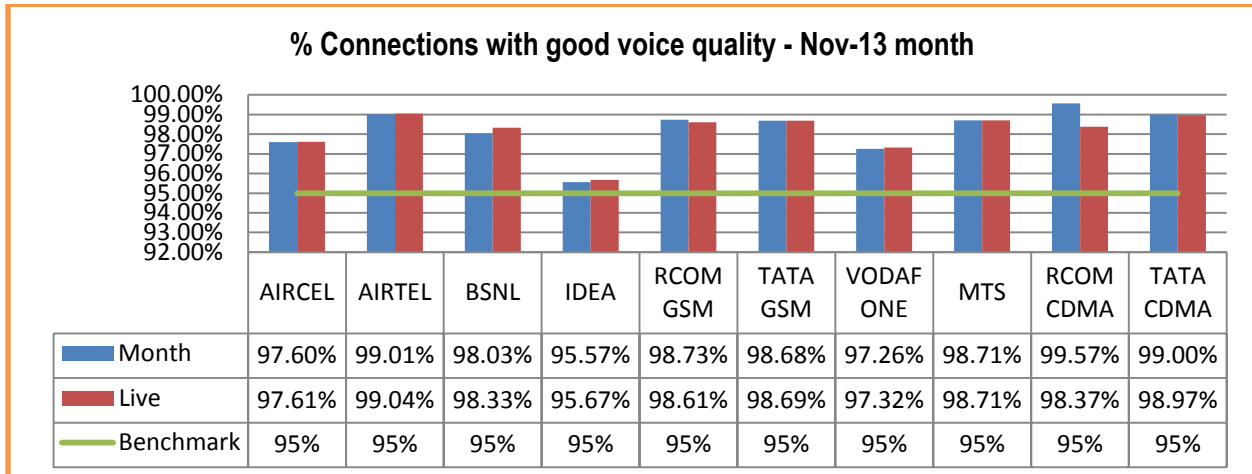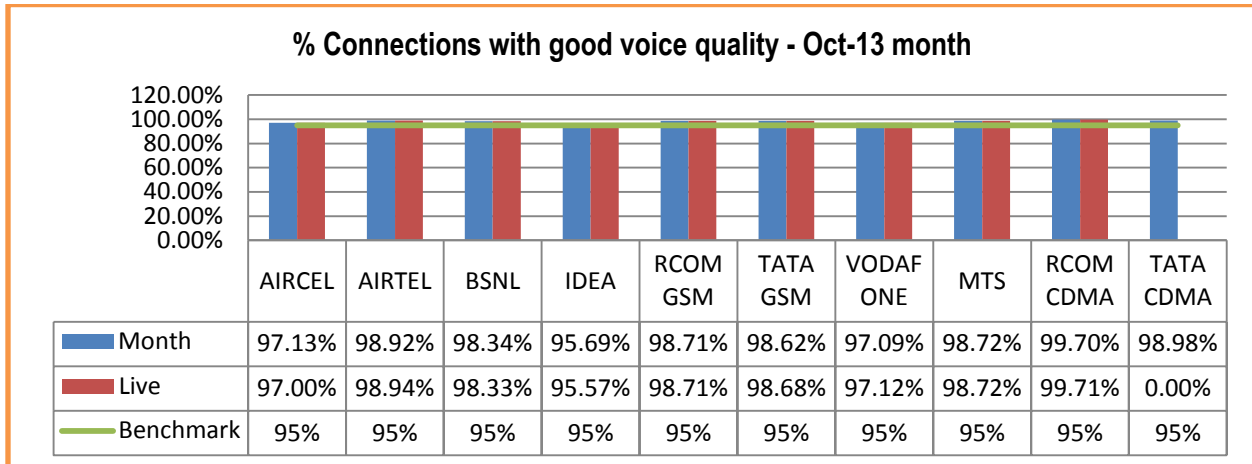|	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAF ONE	MTS	RCOM CDMA	TATA CDMA
Month	97.74%	99.05%	98.06%	95.61%	98.78%	98.72%	97.42%	98.71%	99.72%	98.90%
Live	97.64%	99.04%	97.67%	95.62%	99.01%	98.72%	97.37%	98.72%	99.71%	98.89%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

All operators are meeting the benchmarks. Tata (CDMA) has not provided the data for live measurement in month of October 2013.

9. PMR VERIFICATION SHEET:

a) NETWORK RELATED PARAMETER:

Rajasthan Circle		BTS Accumulated Downtime	Worst affected BTSs due to downtime	CSSR (Call Setup Success Rate)	SDCCH/PAGING Channel congestion	TCH congestion	CDR (Call Drop Rate)	Worst affected cells>3% TCH drop (Call drop) rate	Connections with good voice quality	No. of POI's having >=0.5% POI congestion
Benchmark		≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.5%
AIRCEL	**Reported**	0.05	0.17	96.69	0.24	0.44	0.68	0.74	97.49	0
	Verified	0.05%	0.00%	96.71%	0.23%	0.44%	0.56%	0.74%	97.49%	0
AIRTEL	**Reported**	0.08	0.19	98.98	0.22	0.33	0.82	1.47	98.99	0
	Verified	0.08%	0.19%	98.98%	0.22%	0.33%	0.82%	1.47%	98.99%	0
BSNL	**Reported**	1.83	1.90	99.00	0.33	1.17	1.60	2.90	98.30	0
	Verified	1.86%	1.88%	99.57%	0.46%	1.53%	1.45%	2.00%	98.14%	0
IDEA	**Reported**	0.08	0.03	99.09	0.27	0.44	1.29	2.60	95.62	0
	Verified	0.08%	0.08%	99.09%	0.27%	0.44%	1.29%	2.61%	95.62%	0
RCOM GSM	**Reported**	0.20	0.47	99.64	0.05	0.06	0.31	0.06	98.75	0
	Verified	0.27%	0.47%	99.64%	0.05%	0.06%	0.31%	0.06%	98.74%	0
TATA GSM	**Reported**	0.04	0.00	98.55	0.03	0.05	0.69	1.15	98.67	0
	Verified	0.02%	0.00%	98.55%	0.03%	0.05%	0.69%	4.54%	98.67%	0
VODAFONE	**Reported**	0.27	0.91	99.74	0.19	0.26	0.77	0.66	97.26	0
	Verified	0.27%	0.43%	99.74%	0.19%	0.26%	0.77%	2.47%	97.26%	0
MTS	**Reported**	0.04	0.00	99.28	0.00	0.17	0.58	1.29	98.71	0
	Verified	0.04%	0.00%	99.28%	0.00%	0.17%	0.58%	1.29%	98.71%	0
RCOM CDMA	**Reported**	0.26	0.42	99.16	0.00	0.00	0.10	0.37	99.67	0
	Verified	0.42%	0.45%	99.16%	0.00%	0.00%	0.10%	0.37%	99.66%	0
TATA CDMA	**Reported**	0.03	0.00	98.41	0.00	0.61	0.63	2.88	98.96	0
	Verified	0.03%	0.00%	98.41%	0.00%	0.60%	0.62%	6.28%	98.96%	0

I.   The above data is averaged for three months of the quarter ending December-2013.
II. The PMR data provided by the service providers is largely matching with verified (audited) data .However in case of the parameter "**Worst affected cells>3% TCH drop**" for Tata GSM and CDMA, there was significant variation between the reported and verified data. It could be due to different way of calculating the performance with respect to this parameter by Tata GSM/CDMA.
III. In case of Vodafone also there is a variation between reported and verified data for the parameter "**Worst affected cells>3% TCH drop**", however it is meeting the benchmark.

b) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

Rajasthan Circle		% of billing complaints during the quarter	% of Pre-paid Charging Complaints	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	% of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	Accessibility of call centre/Customer Care	% call answered by operators(voice to voice) within 60 sec.	% of Termination/ Closure of service within 7 days	Time taken for refunds of deposits after closures.
Benchmark		<= 0.1%	<= 0.1%	100 % within 4 week	<=1 week	>=95%	>=90%	100% within <=7days	100% within 60 days
AIRCEL	**Reported**	0.00	0.00	100.00	100.00	98.74	90.18	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
AIRTEL	**Reported**	0.01	0.00	100.00	100.00	100.00	93.00	100.00	100.00
	Verified	0.01%	0.00%	100.00%	100.00%	100.00%	93.00%	100.00%	100.00%
BSNL	**Reported**	0.00	0.10	100.00	100.00	99.00	93.00	100.00	100.00
	Verified	0.00%	0.00%	**59.38%**	100.00%	100.00%	**24.85%**	100.00%	**67.52%**
IDEA	**Reported**	0.07	0.02	100.00	100.00	99.43	98.84	100.00	100.00
	Verified	0.07%	0.02%	100.00%	100.00%	99.47%	99.72%	100.00%	100.00%
RCOM (GSM)	**Reported**	0.09	0.10	100.00	100.00	99.00	88.00	100.00	100.00
	Verified	0.09%	0.10%	100.00%	100.00%	99.00%	**88.74%**	100.00%	100.00%
TATA (GSM)	**Reported**	0.00	0.00	100.00	100.00	99.33	93.84	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	99.00%	100.00%	100.00%
VODAFONE	**Reported**	0.09	0.04	100.00	100.00	100.00	98.79	100.00	100.00
	Verified	0.09%	0.05%	100.00%	100.00%	100.00%	96.82%	100.00%	100.00%
MTS	**Reported**	0.07	0.04	100.00	100.00	99.37	97.20	100.00	100.00
	Verified	0.07%	0.01%	100.00%	100.00%	99.37%	97.19%	100.00%	100.00%
RCOM (CDMA)	**Reported**	0.10	0.10	100.00	100.00	98.96	98.40	100.00	100.00
	Verified	0.10%	0.10%	100.00%	100.00%	98.95%	96.03%	100.00%	100.00%
TATA (CDMA)	**Reported**	0.00	0.00	100.00	100.00	97.94	94.94	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	98.00%	100.00%	100.00%

i.   The above data is averaged for three months of the quarter ending December-2013.
ii.   The PMR data provided by the service providers is largely matching with verified (audited) data.
iii.   BSNL and RCOM GSM have not met the benchmark for the parameter "% call answered by operators (voice to voice) within 60 sec."
iv.   BSNL has not met the benchmark for the parameter "Time taken for refunds of deposits after closures.".

10. RECOMMENDATION WITH RESPECT TO QUALITY OF SERVICE

From the findings of QoS audit, It was observed that the some of the service providers were not complying with the benchmarks of the parameters **'Worst affected cells having > 3% TCH drop' , 'Metering & Billing related parameters' and '% of calls answered by operators (voice to voice)'.**

The results of drive tests revealed that the performance of service providers remained non- compliant with respect to the parameters namely **Block Call Rate, Call Drop Rate, Voice Quality and Call Setup Success Rate (CSSR)**.

The drive test measurement is true assessment of Quality of Service of individual service provider which indicates the areas of concern where the benchmark of the network related parameter are not complied with. The subscribers are suffering with deficiencies in the network of their service providers in certain areas / pockets where they are residing/ working .The respective service providers need to take corrective actions in the affected areas in a time bound manner.

TRAI may convene a meeting with the service providers and advice them for corrective actions in time bound manner to remove the deficiency in their network, In the interest of their subscribers.