



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
WEST ZONE – MADHYA PRADESH & CHHATTISGARH
SERVICE AREAS
(OCTOBER 2013 – DECEMBER 2013)

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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 **MP&CG 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 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 (wireline) and Broadband service, a circle would be audited once in a year.

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, 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.



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 MP&CG circle

SI. No.	Name of Service Provider
GSM Operators	
1	AIRTEL
2	AIRCEL
3	TATA GSM
4	BSNL (MP)
5	BSNL (CG)
6	IDEA(Include USOF)
7	IDEA(Exclude USOF)
8	RCOM GSM
9	VIDEOCON
10	VODAFONE
CDMA Operators	
11	RCOM CDMA
12	TATA CDMA

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

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 MP&CG 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 MP&CG Circle in the quarter ended December 2013.**

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 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 **MP&CG 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	AIRTEL	Dec-13	19:00 - 20:00
2	AIRCEL	Dec-13	18:00 - 19:00
3	TATA GSM	Dec-13	19:00 - 20:00
4	BSNL (MP)	Dec-13	19:00 - 20:00
5	BSNL (CG)	Dec-13	19:00 - 20:00
6	IDEA(Include USOF)	Dec-13	19:00 - 20:00
7	IDEA(Exclude USOF)	Dec-13	19:00 - 20:00
8	RCOM GSM	Dec-13	20:00 - 21:00
9	VIDEOCON	Dec-13	20:00 - 21:00
10	VODAFONE	Dec-13	19:00 - 20:00
CDMA Operators			
9	RCOM CDMA	Dec-13	20:00 - 21:00
10	TATA CDMA	Dec-13	19:00 - 20:00

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



SWITCHES/BSC/BTS DETAILS OF OPERATORS COLLECTED BY TUV –SUD AUDITORS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRTEL	18	146	9172	NSN	NSN
2	AIRCEL	1	1	128	Huawei	Huawei
3	TATA GSM	4	26	2842	Huawei	Huawei
4	BSNL (MP)	9	88	3967	Alcatel	Alcatel
5	BSNL (CG)	5	44	1803	Alcatel	Alcatel
6	IDEA(Include USOF)	33	69	9164	Ericsson	Ericsson
7	IDEA(Exclude USOF)	33	69	8010	Ericsson	Ericsson
8	RCOM GSM	12	49	4888	Huawei, Ericsson	ZTE, Alcatel Lucent
9	VIDEOCON	1	9	1511	Huawei	Huawei
10	VODAFONE	7	46	5062	NSN	NSN
CDMA Operators						
9	RCOM CDMA	8	8	2044	Huawei, ZTE, Lucent	Lucent, Huawei
10	TATA CDMA	5	5	464	Huawei & Ericsson	Motorola & Huawei



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

Cellular Mobile Telephone Services MP&CG Circle- Oct-13 month														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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	0.15%	0.19%	0.00%	1.94%	NP	0.13%	0.20%	0.27%	0.08%	0.43%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Oct-13	0.50%	0.00%	0.00%	1.83%	NP	0.45%	0.49%	1.00%	0.02%	0.78%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	99.45%	99.17%	98.46%	96.15%	NP	99.09%	98.68%	98.87%	99.69%	99.25%	98.72%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-13	0.04%	0.02%	0.04%	0.74%	NP	0.68%	0.02%	0.06%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.21%	0.00%	0.07%	1.89%	NP	0.63%	0.20%	0.25%	0.31%	0.00%	0.07%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Oct-13	1.04%	0.86%	0.72%	1.53%	NP	0.92%	0.57%	0.65%	0.73%	0.08%	0.84%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-13	1.38%	3.65%	2.38%	2.33%	NP	1.43%	0.01%	1.27%	2.15%	0.28%	1.00%
	c) Connections with good voice quality	>=95%	Oct-13	95.90%	99.11%	98.40%	NP	NP	99.02%	97.92%	98.34%	98.98%	99.86%	99.15%
4	No. of POI's having >=0.5% POI congestion		Oct-13	0	0	0	0	NP	0	0	0	0	0	0

*NP: Data not provided



TABLE: 2

Cellular Mobile Telephone Services MP&CG Circle- Nov-13 month															
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA(Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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	0.81%	0.18%	0.00 %	1.73%	1.64 %	3.27%	0.08%	0.17%	0.14%	0.06%	0.30%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Nov-13	0.31%	0.00%	0.00 %	1.23%	0.06 %	7.95%	0.23%	0.61%	0.20%	0.08%	0.34%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	99.52%	98.97%	98.50%	97.52%	95.14%	98.44%	98.50%	98.64%	98.91%	99.73%	99.34%	98.90%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-13	0.04%	0.10%	0.03%	0.53%	0.48%	0.54%	0.54%	0.02%	0.03%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.18%	0.00%	0.04 %	1.61%	1.86 %	0.85%	0.82%	0.20%	0.26%	0.27%	0.00%	0.07%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Nov-13	0.94%	0.60%	0.66 %	1.63%	1.47 %	1.06%	1.02%	0.57%	0.55%	0.73%	0.06%	0.65%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-13	1.13%	4.69%	1.58 %	2.62%	2.92 %	1.75%	1.42%	0.01%	0.99%	2.02%	0.08%	1.07%
	c) Connections with good voice quality	>=95%	Nov-13	96.04%	99.17%	98.50%	NP	98.00%	98.71%	98.74%	97.92%	98.50%	98.98%	99.85%	99.21%
4	No. of POI's having >=0.5% POI congestion		Nov-13	0	0	0	0	0	0	0	0	0	0	0	0

*NP: Data not provided



TABLE: 3

Cellular Mobile Telephone Services MP&CG Circle- Dec-13 month															
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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	0.09%	0.58%	0.01%	1.89%	1.54%	3.36%	0.10%	0.18%	0.11%	0.07%	0.31%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Dec-13	0.16%	1.56%	0.00%	1.28%	1.66%	8.06%	0.24%	0.68%	0.46%	0.00%	0.49%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	99.51%	99.11%	98.50%	97.36%	95.12%	98.51%	98.56%	98.65%	98.82%	99.69%	99.35%	99.02%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-13	0.06%	0.07%	0.04%	0.55%	0.43%	0.46%	0.46%	0.02%	0.11%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.26%	0.00%	0.05%	1.28%	1.86%	0.81%	0.78%	0.17%	0.23%	0.31%	0.00%	0.14%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Dec-13	0.91%	0.73%	0.65%	1.32%	1.36%	0.99%	0.96%	0.57%	0.60%	0.71%	0.06%	0.50%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-13	0.87%	5.21%	1.54%	2.46%	2.67%	1.26%	1.02%	0.01%	1.14%	2.09%	0.26%	0.79%
	c) Connections with good voice quality	>=95%	Dec-13	95.99%	99.32%	98.54%	96.80%	97.00%	98.74%	98.78%	97.90%	98.46%	99.00%	99.85%	99.19%
4	No. of POI's having >=0.5% POI congestion		Dec-13	0	0	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 all CMSPs.**

In MP&CG circle, Idea is operating its service partly on the BTSs of BSNL and KEC providing their own infrastructures such as Tower and power supply under some USOF provisions/agreement. Such BTSs have been named as Idea (include USOF) and BTSs wholly owned by Idea have been named as Idea (exclude USOF)

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 MP&CG circle, all the operators were found meeting benchmark on the above parameters except **Idea (included USOF)**, which could not meet these parameters in the months of November and December 2013. Its performance for parameter 'BTS accumulated downtime' was **3.27% & 3.36%** and in respect of the parameter 'worst affected BTSs due to down time', its performance was **7.95% and 8.06%** in the months of November and December -13 respectively.

- **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 of 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 0.07 %) 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 **Aircel**. Its performance for this parameter was 3.65% (Oct-13), 4.69% (Nov-13) & 5.21% (Dec-13).

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

<u>Quarterly CSD Audit Data</u>		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators							CDMA Operators		
Customer Service Quality Parameters													
1 Metering & Billing Credibility -Post Paid													
	A) No. Of bills issued during the quarter		MP&CG	4	213496	97027	264119	98942	27342	Not App.	73285	101711	34346
	B) No. of bills disputed including billing complaints during the quarter		MP&CG	0	33	20	170	93	0	Not App.	98	98	0
	C)% of billing complaints during the quarter	<= 0.1%	MP&CG	Not App.	0.02%	0.02%	0.06%	0.09%	Not App.	Not App.	0.15%	0.10%	Not App.
2 Metering & Billing Credibility -Pre Paid													
	A) Total No. of Pre-paid customers at the end of the quarter		MP&CG	22691	10051673	3258883	17333141	9741527	3987129	1294720	4341545	2457628	454715
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		MP&CG	0	568	302	2480	9786	0	79	1902	2447	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	MP&CG	Not App.	0.01%	0.01%	0.01%	0.10%	Not App.	0.01%	0.04%	0.10%	Not App.
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		MP&CG	0	601	322	2650	9880	0	79	2000	2545	0
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		MP&CG	0	601	322	2650	9880	0	79	1976	2545	0

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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	MP&CG	Not App.	100.00%	100.00%	100.00%	100.00%	Not App.	100.00%	100.00%	100.00%	Not App.
	D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	MP&CG	Not App.	100.00%	100.00%	100.00%	100.00%	Not App.	100.00%	100.00%	100.00%	Not App.
4	Response time to customers for assistance												
	A) Accessibility of call centre/Customer Care	>=95%	MP&CG	93.00%	100.00%	100.00%	100.00%	98.97%	100.00%	100.00%	100.00%	98.71%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	MP&CG	97.71%	93.86%	92.25%	99.23%	91.24%	91.12%	91.90%	96.00%	94.14%	100.00%
5	Termination/closure of service												
	A) Total No. of requests for Termination / Closure of service received during the quarter		MP&CG	0	660	387	200	183	263	Not App.	1041	89	298
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		MP&CG	0	660	385	200	183	263	Not App.	1041	89	298
	C) % of Termination/ Closure of service within 7 days	<=7days	MP&CG	Not App.	100%	99.48%	100%	100%	100%	Not App.	100%	100%	100%
6	Time taken for refunds of deposits after closures.												
	A) No. of Payments/ Refunds due during the quarter		MP&CG	0	110	309	603	413	88	Not App.	38	497	24
	B) No. of Payments/ Refunds Cleared during the quarter		MP&CG	0	110	309	603	413	88	Not App.	38	497	24
	C)Time taken for refunds of deposits after closures.	100% within 60 days	MP&CG	Not App.	100%	100%	100%	100%	100%	Not App.	100%	100%	100%

Aircel is operating its services in very limited areas in MP&CG circle, so they did not provide the data for the parameters related customer assistance.



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 was well within the prescribed bench mark except **Vodafone** which could not meet the benchmark. Its performance was **0.15%** against the benchmark 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 were found to have met the benchmarks for the above parameters.

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 above parameters comfortably. Aircel is operating its services in very limited areas in MP&CG circle, so they did not provide the data for the parameters related customer assistance.

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 except BSNL which is marginally non-compliant with its performance 99.48%.

5. Time Taken for Refund of deposits after closures

All operators were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure.



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 MP&CG Circle- Oct-13 month														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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%	Live data	0.04%	0.26%	0.01%	1.83%	3.57%	0.15%	0.07%	0.44%	0.07%	0.22%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	1.06%	3.58%	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	99.48%	98.91%	98.49%	97.00%	99.06%	99.11%	98.66%	98.90%	99.68%	99.20%	98.74%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.04%	0.13%	0.07%	0.47%	0.33%	0.32%	0.01%	0.03%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.17%	0.00%	0.05%	1.14%	0.64%	0.61%	0.23%	0.22%	0.32%	0.00%	0.03%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.98%	0.45%	0.71%	1.65%	0.69%	0.67%	0.56%	0.66%	0.72%	0.09%	0.88%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.14%	1.39%	4.16%	2.74%	1.50%	1.30%	0.00%	1.50%	5.16%	0.43%	3.21%
	c) Connections with good voice quality	>=95%	Live data	95.82%	99.51%	98.41%	NP	99.00%	99.02%	97.66%	98.27%	99.01%	99.82%	99.14%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0

*NP: Data not provided



TABLE: 2

Cellular Mobile Telephone Services MP&CG Circle- Nov-13 month															
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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%	Live data	0.08%	0.08%	0.12%	1.83%	1.35%	1.39%	1.21%	0.14%	0.10%	0.07%	0.19%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.06%	0.00%	3.51%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.55%	99.81%	98.42%	97.73%	95.53%	98.62%	98.69%	98.64%	99.00%	99.83%	99.36%	99.02%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.04%	0.00%	0.02%	0.38%	0.37%	0.61%	0.62%	0.01%	0.05%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.18%	0.00%	0.04%	1.40%	1.51%	0.71%	0.67%	0.19%	0.25%	0.17%	0.00%	0.13%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.92%	0.53%	0.70%	1.92%	1.36%	1.05%	1.01%	0.56%	0.57%	0.70%	0.04%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.62%	1.56%	3.11%	2.58%	3.15%	1.72%	1.42%	0.00%	1.00%	5.14%	0.32%	3.35%
	c) Connections with good voice quality	>=95%	Live data	96.13%	99.89%	98.51%	NP	98.00%	98.77%	98.74%	97.90%	98.48%	98.99%	99.85%	99.23%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

*NP: Data not provided



TABLE: 3

Cellular Mobile Telephone Services MP&CG Circle- Dec-13 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators	
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.27%	0.00%	1.78%	1.28%	3.29%	0.06%	0.04%	0.09%	0.07%	0.17%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.03%	0.06%	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	99.52%	99.29%	98.48%	97.05%	95.03%	98.42%	98.49%	98.66%	98.95%	99.76%	99.47%	99.05%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.04%	0.00%	0.02%	0.54%	0.42%	0.55%	0.57%	0.01%	0.05%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.24%	0.00%	0.06%	1.78%	1.95%	0.88%	0.85%	0.18%	0.26%	0.24%	0.00%	0.14%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.94%	0.79%	0.65%	1.78%	1.23%	1.01%	0.98%	0.57%	0.64%	0.68%	0.06%	0.51%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.52%	1.56%	3.06%	2.63%	2.89%	1.50%	1.23%	0.00%	1.17%	5.03%	0.33%	2.64%
	c) Connections with good voice quality	>=95%	Live data	95.95%	99.42%	98.54%	NP	97.00%	98.77%	98.80%	97.91%	98.44%	99.02%	99.85%	99.18%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

*NP: Data not provided



KEY FINDING: 3 DAYS LIVE MEASUREMENTS:

From three days live measurement assessment, it is found that the performance of almost all operators is satisfactory as they are largely meeting the benchmarks except for the parameter '**Worst affected cells> 3 % TCH drops**' which could not be met by some of the operators in different months of the quarter. Benchmarks of the parameters 'BTS accumulated down time' and 'Worst affected BTS due to down time' were also not met by **Idea (included USOF)** in the different months of the quarter.

Vodafone and Tata (GSM) could not meet the benchmark of the parameter 'Worst affected cells> 3 % TCH drops' during live measurements in all the three months with their performance as 5.16% (Oct.), 5.14% (Nov.) & 5.03% (Dec.) and 4.16% (Oct.), 3.11% (Nov.) & 3.06% (Dec.) respectively. **Tata (CDMA), Airtel and BSNL (CG)** also remained non-compliant for the same parameter with their performance as 3.21% (Oct.) & 3.35% (Nov.), 3.14% (Oct.) and 3.15% (Nov.) respectively.

Idea (included USOF) also remained non-compliant with its performance as 3.57% (Oct.) & 3.29% (Dec.) for the parameter 'BTS accumulated down time' and 3.58% (Oct.) for parameter 'Worst affected BTS due to down time'.

Thus, the assessment of QoS with regard to the parameter 'Worst affected cells> 3 % TCH drops' assessed during live measurement is a matter of concern for those operators who could not meet the benchmark.



INTER OPERATOR CALLS ASSESSMENT

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in MP&CG 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)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
AIRCEL	MP&CG	NIL	100%	100%	100%	100%	100%	100%	97%	100%	100%
AIRTEL	MP&CG	NIL	--	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	MP&CG	NIL	100%	--	96%	100%	100%	95%	100%	100%	100%
IDEA	MP&CG	NIL	100%	100%	--	100%	100%	100%	100%	100%	100%
RCOM (GSM)	MP&CG	NIL	100%	100%	100%	--	100%	100%	100%	100%	100%
TATA (GSM)	MP&CG	NIL	100%	100%	100%	100%	--	100%	100%	100%	100%
VIDEOCON	MP&CG	NIL	100%	100%	100%	100%	100%	--	100%	100%	100%
VODAFONE	MP&CG	NIL	100%	100%	100%	100%	100%	100%	--	100%	100%
RCOM (CDMA)	MP&CG	NIL	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA (CDMA)	MP&CG	NIL	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 BSNL to Idea and Videocon were 96% and 95% successful 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)	VIDEOCON	VODAFONE	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%	MP&CG	NP	100%	96%	100%	98.97%	100%	100%	100%	98.56%	100%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	MP&CG	NP	97%	96%	99.4%	98.7%	98.30%	92.38%	96%	95.45%	100%

*NP: Data not provided

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE											
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	MP&CG	NIL	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	MP&CG	NIL	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	MP&CG	NIL	100	100	100	100	100	100	100	100	100
%age of calls got answered	MP&CG	NIL	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

KEY FINDINGS: 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).

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, the performance of all operators was also recorded 100%.

Aircel is operating its services in very limited areas in MP&CG circle, so they did not provide the data for the parameters related customer assistance.



LEVEL-1 LIVE CALLING

Emergency no.	Circle Name	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
101	MP&CG	40	NIL	40	40	40	40	40	40	40	40	40
102	MP&CG	40	NIL	40	40	40	40	40	40	40	40	40
100	MP&CG	30	NIL	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 MP&CG Service area, these services were found functional in the networks of all the service providers.

Aircel having no services in major cities, so the service is not functional.

5. DRIVE TEST

5.1 OPERATOR ASSISTED DRIVE TEST:

In MP&CG 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 Bhopal, Vidisha and Raisen during the month of October-13, Indore, Ujjain and Dewas during November -13 and Raipur, Durg and Rajnandgaon 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 MP&CG 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 \geq -75 dBm for in-door coverage and \geq -85 dBm for in-vehicle.



DRIVE TEST TABLE: 1

Operator-Assisted Drive Test-MP&CG Circle-Oct-13 Month														
S/N	Parameter	City Name	Drive Test Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
				GSM Operators								CDMA Operators		
1	Blocked Call Rate (<=3%)	Bhopal	Oct-13	1.18%	NS	0.00%	2.90%	3.62%	1.32%	0.51%	2.38%	2.32%	0.00%	
		Vidisha	Oct-13	1.00%	NS	0.00%	0.80%	0.65%	0.00%	0.36%	0.64%	0.00%	0.00%	
		Raisen	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.54%	ICR	1.19%	0.00%	NS	
2	Dropped Call Rate (<=2%)	Bhopal	Oct-13	0.00%	NS	1.26%	1.60%	0.00%	1.33%	0.53%	0.00%	1.31%	0.00%	
		Vidisha	Oct-13	0.00%	NS	0.00%	0.76%	0.00%	0.00%	0.00%	1.94%	0.00%	0.00%	
		Raisen	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	1.20%	0.00%	NS	
3	Percentage connections with good voice quality (=>95%)													
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Bhopal	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.50%	99.34%
		Vidisha	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.10%	99.84%
		Raisen	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.58%	NS
	(b) 0-5 (with frequency hopping for GSM Operators)	Bhopal	Oct-13	95.00%	NS	96.32%	78.30%	89.08%	91.33%	91.59%	96.6%	NA	NA	
		Vidisha	Oct-13	95.00%	NS	96.78%	78.92%	90.00%	97.20%	96.57%	98.0%	NA	NA	
Raisen		Oct-13	97.80%	97.64%	95.43%	92.41%	95.00%	98.00%	ICR	97.7%	NA	NA		
4	Service Coverage													
	In door (>= -75dBm)	Bhopal	Oct-13	86.36%	NS	90.70%	72.29%	98.38%	64.49%	86.72%	80.9%	62.70%	94.82%	
		Vidisha	Oct-13	68.80%	NS	83.17%	68.00%	93.05%	75.86%	96.82%	96.2%	75.70%	78.66%	
		Raisen	Oct-13	54.50%	77.56%	73.07%	39.00%	97.98%	45.47%	ICR	58.8%	30.23%	NS	
	In-vehicle (>= -85dBm)	Bhopal	Oct-13	94.09%	NS	99.66%	95.73%	99.99%	89.36%	99.05%	95.6%	92.17%	98.40%	
		Vidisha	Oct-13	94.88%	NS	98.89%	97.80%	99.32%	98.13%	99.71%	99.8%	98.14%	95.28%	
		Raisen	Oct-13	88.60%	94.95%	90.73%	88.30%	99.83%	74.38%	ICR	79.5%	61.23%	NS	
	Outdoor- in city (>= -95dBm)	Bhopal	Oct-13	100.0%	NS	100.0%	100.0%	100.0%	98.98%	100.0%	99.4%	100.0%	98.84%	
		Vidisha	Oct-13	99.60%	NS	99.98%	100.00%	100.00%	100.00%	100.00%	99.90%	100.00%	97.79%	
Raisen		Oct-13	98.20%	99.88%	98.29%	100.00%	100.00%	94.49%	ICR	96.17%	92.08%	NS		
5	Call Setup Success Rate (>=95%)	Bhopal	Oct-13	98.81%	NS	100.00%	93.28%	97.82%	98.68%	96.92%	97.62%	96.81%	100.00%	
		Vidisha	Oct-13	99.00%	NS	100.00%	98.50%	99.35%	100.00%	97.87%	99.36%	100.00%	100.00%	
		Raisen	Oct-13	100.00%	100.00%	100.00%	93.00%	100.00%	99.46%	ICR	98.81%	100.00%	NS	

*NS-Not Services, ICR-Intra Circle Roaming



DRIVE TEST TABLE: 2

Operator-Assisted Drive Test-MP&CG Circle-Nov-13 Month													
S/N	Parameter	City Name	Drive Test Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators			
1	Blocked Call Rate (<=3%)	Indore	Nov-13	0.00%	NS	0.00%	0.76%	1.93%	0.00%	0.66%	0.60%	1.63%	0.00%
		Ujjain	Nov-13	0.00%	NS	0.00%	0.90%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%
		Dewas	Nov-13	0.00%	NS	0.00%	1.39%	0.00%	0.00%	0.52%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Indore	Nov-13	0.00%	NS	0.00%	0.78%	0.00%	1.53%	0.00%	0.00%	2.17%	0.00%
		Ujjain	Nov-13	0.00%	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%
		Dewas	Nov-13	0.00%	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage connections with good voice quality (=>95%)													
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Indore	Nov-13	NA	NS	NA	NA	NA	NA	NA	NA	98.03%	98.07%
		Ujjain	Nov-13	NA	NS	NA	NA	NA	NA	NA	NA	99.52%	98.60%
		Dewas	Nov-13	NA	NS	NA	NA	NA	NA	NA	NA	99.48%	99.16%
	(b) 0-5 (with frequency hopping for GSM Operators)	Indore	Nov-13	95.00%	NS	96.50%	84.40%	95.90%	93.62%	97.41%	97.02%	NA	NA
		Ujjain	Nov-13	95.91%	NS	95.72%	86.13%	93.42%	94.59%	96.90%	96.90%	NA	NA
		Dewas	Nov-13	93.40%	NS	96.88%	94.73%	96.86%	95.40%	97.97%	97.13%	NA	NA
Service Coverage													
4	In door (>= - 75dBm)	Indore	Nov-13	98.00%	NS	87.52%	86.40%	93.30%	69.79%	96.58%	96.79%	73.66%	86.52%
		Ujjain	Nov-13	98.00%	NS	75.92%	90.70%	93.86%	84.28%	96.37%	94.41%	57.67%	82.41%
		Dewas	Nov-13	89.00%	NS	67.05%	94.70%	99.14%	87.14%	93.37%	97.43%	60.06%	74.19%
	In-vehicle (>= - 85dBm)	Indore	Nov-13	100.00%	NS	98.90%	99.20%	99.90%	93.46%	98.82%	99.94%	97.42%	96.44%
		Ujjain	Nov-13	100.00%	NS	98.34%	99.80%	96.43%	98.28%	99.57%	99.70%	92.44%	96.64%
		Dewas	Nov-13	100.00%	NS	94.25%	99.70%	100.00%	98.27%	99.33%	99.90%	84.16%	96.89%
	Outdoor- in city (>= - 95dBm)	Indore	Nov-13	100.00%	NS	99.93%	100.00%	100.00%	99.68%	100.00%	100.00%	100.00%	99.11%
		Ujjain	Nov-13	100.00%	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.98%	98.78%
		Dewas	Nov-13	100.00%	NS	99.92%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.98%
5	Call Setup Success Rate (>=95%)	Indore	Nov-13	98.68%	NS	100.00%	95.50%	95.70%	100.00%	96.66%	97.63%	98.37%	98.07%
		Ujjain	Nov-13	99.34%	NS	100.00%	96.52%	100.00%	100.00%	99.39%	99.32%	100.00%	100.00%
		Dewas	Nov-13	100.00%	NS	100.00%	95.83%	100.00%	100.00%	98.55%	97.67%	100.00%	100.00%



Drive Test Table: 3

Operator-Assisted Drive Test-MP&CG Circle-Dec-13 Month														
S/N	Parameter	City Name	Drive Test Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
				GSM Operators							CDMA Operators			
1	Blocked Call Rate (<=3%)	Raipur	Dec-13	0.00%	NS	0.00%	2.62%	0.49%	4.09%	0.85%	0.00%	0.45%	0.00%	
		Durg	Dec-13	0.00%	NS	0.59%	2.16%	0.00%	3.16%	0.00%	1.00%	0.61%	0.00%	
		Rajnandgaon	Dec-13	0.00%	NS	0.00%	1.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Dropped Call Rate (<=2%)	Raipur	Dec-13	0.53%	NS	0.00%	2.00%	0.00%	4.59%	0.00%	0.00%	0.45%	0.00%	
		Durg	Dec-13	0.52%	NS	0.00%	1.62%	0.00%	1.30%	0.00%	0.00%	0.00%	0.00%	
		Rajnandgaon	Dec-13	0.81%	NS	0.00%	1.40%	0.00%	0.77%	0.00%	0.00%	0.00%	0.00%	
Percentage connections with good voice quality (=>95%)														
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Raipur	Dec-13	NA	NS	NA	NA	NA	NA	NA	NA	97.31%	98.87%	
		Durg	Dec-13	NA	NS	NA	NA	NA	NA	NA	NA	98.52%	99.29%	
		Rajnandgaon	Dec-13	NA	NS	NA	NA	NA	NA	NA	NA	96.40%	99.83%	
	(b) 0-5 (with frequency hopping for GSM Operators)	Raipur	Dec-13	95.00%	NS	98.59%	96.12%	97.88%	87.82%	98.08%	95.76%	NA	NA	
		Durg	Dec-13	96.00%	NS	98.48%	96.68%	97.71%	89.93%	98.37%	97.11%	NA	NA	
		Rajnandgaon	Dec-13	97.00%	NS	98.49%	99.58%	98.76%	89.68%	97.33%	98.69%	NA	NA	
Service Coverage														
4	In door (>= -75dBm)	Raipur	Dec-13	98.00%	NS	86.95%	30.20%	98.36%	95.31%	98.03%	97.96%	87.81%	95.87%	
		Durg	Dec-13	87.00%	NS	91.57%	62.14%	98.49%	99.35%	95.99%	98.43%	91.54%	78.66%	
		Rajnandgaon	Dec-13	81.00%	NS	85.69%	33.77%	90.09%	92.52%	97.14%	97.43%	64.25%	97.98%	
	In-vehicle (>= -85dBm)	Raipur	Dec-13	100.0%	NS	98.87%	86.80%	100.0%	99.96%	99.72%	99.56%	99.88%	98.45%	
		Durg	Dec-13	100.0%	NS	99.55%	97.27%	100.0%	99.97%	99.52%	99.47%	99.69%	98.23%	
		Rajnandgaon	Dec-13	98.00%	NS	98.94%	95.60%	99.61%	98.83%	99.85%	99.90%	93.86%	98.49%	
	Outdoor- in city (>= -95dBm)	Raipur	Dec-13	100.0%	NS	99.97%	100.0%	100.0%	100.0%	100.0%	100.0%	99.88%	100.0%	98.96%
		Durg	Dec-13	100.0%	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.77%	100.0%	99.13%
		Rajnandgaon	Dec-13	100.0%	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	98.74%
5	Call Setup Success Rate (>=95%)	Raipur	Dec-13	98.00%	NS	100.0%	97.38%	99.51%	95.91%	100.0%	100.0%	99.55%	100.0%	
		Durg	Dec-13	99.00%	NS	99.40%	97.88%	100.0%	96.84%	100.0%	99.36%	99.39%	100.0%	
		Rajnandgaon	Dec-13	97.00%	NS	100.0%	98.60%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

*NA: Not Applicable and NS: No service. Aircel is having its services in limited places in MP&CG circle.



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Drive Test MPCG Circle Oct-13 to Dec-13					
Month/Year	City	P1	P2	Across	Congested
Oct-13	BHOPAL	Habibganj Station, Mansarovar, Arera Colony, Bhadbhada Sqaure, Dashera Maidan, Kamla Park, Khanugaon, Lalghati, Gandhi Nagar, New Jail Road, Airport Road	Peoples Dental Hospital, New Minal Residency, Narela, Sonagiri Phase, Jahagirabad Road , Maida Mill, Mahindra Complex	Aman Colony, Berasia Road, Bhopal, Tila Jamalpura, Congress Nagar, Shahjahanabad	Jahagirabad, Shahjahanabad, DIG Colony, Sunder Nagar
	VIDISHA	Mukharjee Nagar, Haripura, Tilak Colony, Police Colony, SATI College, Tilak Chowk, Barai Pura, Peetal Mill, New Bus Stand, Toll Road	Include In P1	Include In P1	Main Market, Main Road, BSNL Office Square
	RAISEN	Collectorate Road, Police Line, Main Road, Sanchi Road	Include In P1	Include In P1	Include In P1
Nov-13	INDORE	Vijay Nagar, Patnipura, Ab Road, Indore Bypass, Ring Road, Mg Road, Manawata Nagar	Shyam Nagar, Banganga, Pologround, Loknayak Nagar, Sudama Nagar, Rajendra Nagar, Choithram Mandi, Navlakkha, Loha Mandi, Snehlata Ganj, Prime City	Kanadiya Square, Sarafa, Tilak Nagar, Mg Road, Regal Square, Rajwada	Rambagh, Rajwada, Sarafa, Cloth Market, Kothari Market, Zinsi
	UJJAIN	Ujjain-Indore Highway, Saidham Colony, Govardhan Nagar, Vednagar, Rishi Nagar, Mahananda, Engg. College	Indra Nagar, VD Market, Cloth Market, Fazalpura, Mohammad Pura, Gopal Mandir, Naisadak, Malipura	Maxi Road, Jaisingh Nagar	3Batti Sqaure, Free Ganj, Laxmi Nagar, Alkapuri, Pandya Khedi, Sethi Nagar
	DEWAS	Dewas Indore Road, Mishrilal Nagar, Indutrial Area, Part Of Dewas Bypass,	Nutan Nagar, Mata Mandir, Bank Notepress, CISF Campus	AB Road, Ujjain Road, Maxi Road	Bus Stand, Super Bazar, Pathan Kua, MG Road, Dewas Eidgah Road



		Balgarh, Meera Bawadi, Mill Road			
Dec-13	RAIPUR	Tatibandh, Kota Raipur, Naya Telibndh, Boodhi Mai Mandir, Boodha Talab, Jail Road, Station Road, Vinayak Vihar, Handipara, Ashwani Nagar	Gopal Udyog, Kapa Basti, Anupam Nagar, New Gayatri Nagar, Vineet Nagar, Rajendra Nagar, Ashoka Millenium, Krishna Colony, Pachpedi	TATIBANDH, Kotaraipur, Chobey Colony, Rajendra Nagar, Ashoka Millenium	Crystal Chembar, Telibandh, Hathipara, Civil Lines, Boodha Talab, Fafadih, Devendra Nagar
	DURG	Sikola Bahta, Shivpara, Panchsheel Nagar, Ganjipara, BSNL Colony, Station Road, Railway Station	Pulgaon Naka, Ward No.52, Minaxi Nagar, Padmanabhपुरi, Kanhaiyapuri Chowk, HUDKO Chowk, Pachripara	Ganjpara, Nahra, Pachripara	Jawahar Chowk, Indira Market, Sindhi Colony, Shivpara
	RAJNANDGAON	Raipur Naka To Police Training Centre Via Lakohli, Gunjline, Jaistambh Chowk, Gudhakulane, Kamtilane, New Bus Stand, Basantpur To Chikhli Via Lalbagh, Kamla College, Shristhi Colony, Motipur, Mamta Nagar, Railway Station	Raipur Naka To Police Training Centre Via Lakohli, Gunjline, Jaistambh Chowk, Gudhakulane, Kamtilane, New Bus Stand, Basantpur To Chikhli Via Lalbagh, Kamla College, Shristhi Colony, Motipur, Mamta Nagar, Railway Station	Durg Raipur Main Road	Main Market



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

- (i)
- (a) Aircel was found having its coverage only in one city (Raisen) out of 9 cities where drive test was carried out during the quarter.
 - (b) Tata (CDMA) has no service in Raisen
 - (c) Videocon is on Intra circle roaming (ICR) with Tata (GSM) in Raisen
- (ii) **In the Month of October-13**, drive test was conducted at Bhopal, Vidisha and Raisen cities. **BSNL, Idea, RCOM and Videocon** failed to meet the benchmark of parameter '% connection with Good Voice Quality'. BSNL also could not meet the benchmark of parameters Call Set up Success Rate (CSSR). The performance of **BSNL** for parameter 'Good Voice Quality' was 78.30% (Bhopal), 78.92 % (Vidisha) & 92.41% (Raisen) and for parameter 'Call Setup Success Rate (CSSR)' was 93.28% (Bhopal) & 93.0% (Raisen). The performance of **Idea, RCOM (GSM) and Videocon** for the parameter 'Voice Quality' was recorded as 89.08% (Bhopal) & 90.0% (Vidisha), 91.33% (Bhopal) and 91.59% (Bhopal) respectively. **Idea** also failed to meet the benchmark of blocked call rate at Bhopal (3.62%).
- (iii) **In the Month of November-13**, drive test was conducted at Indore, Ujjain and Dewas cities. The results of the drive tests carried out in this month also indicate that the parameter '% connection with Good Voice Quality' remained non-compliant for **BSNL, RCOM (GSM), Airtel and Idea**. Apart from this, **RCOM (CDMA)** also failed to meet the benchmark of 'Dropped Call Rate (DCR)' in Indore.
- The performance of **BSNL, RCOM(GSM), Airtel and Idea** in respect of the parameter 'Voice Quality' was 84.4% (Indore), 86.13% (Ujjain)& 94.73% (Dewas), 93.62% (Indore) & 94.59% (Ujjain), 93.40% (Dewas) and 93.43% (Ujjain) respectively, whereas performance of RCOM (CDMA) for parameter 'Dropped Call Rate' was 2.17% at Indore.
- (iv) **In the month of December-13**, drive test was conducted at Raipur, Durg and Rajnandgaon cities. **RCOM (GSM)** was the only operator that could not meet the benchmarks of parameters Blocked Call rate, Dropped Call Rate, and Voice Quality in the above cities. The performance of RCOM (GSM) for parameter Blocked Call Rate was 4.09% (Raipur) and 3.16% (Durg), for parameter Dropped Call Rate was 4.59% (Raipur) and for parameter Voice quality was 87.82% (Raipur), 89.93 % (Durg) and 89.68% (Rajnandgaon).
- (v) In the above drive test tables, NA means not applicable for voice quality (0-4) without frequency hopping for GSM operators and Voice quality (0-5) with frequency hopping for CDMA operators.

Thus, the parameter 'Voice Quality' remained non-compliant repeatedly for some of the Service providers followed by the parameters CSSR, DCR and Blocked Call Rate in few cases.

5.2 INDEPENDENT DRIVE TEST:

The independent drive tests are to be carried out by M/s TUV-SUD 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-SUD 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 MP&CG is satisfactory for **Network Parameters** audited for monthly PMR data. However, in case of three days live measurements, **the performance of some of the service providers in respect of the parameter 'Worst affected cells having > 3% TCH drop'** remained non-compliant repeatedly in all the three months of the quarter.

Vodafone and Tata (GSM) could not meet the benchmark of the parameter 'Worst affected cells > 3 % TCH drops' during live measurements in all the three months with their performance as 5.16% (Oct.), 5.14% (Nov.) & 5.03% (Dec.) and 4.16% (Oct.), 3.11% (Nov.) & 3.06% (Dec.) respectively. **Aircel** performance for this parameter was 3.65% (Oct-13), 4.69% (Nov-13) & 5.21% (Dec-13). Tata (CDMA), Airtel and BSNL (CG) also remained non-compliant for the same parameter with their performance as 3.21% (Oct.) & 3.35% (Nov.), 3.14% (Oct.) and 3.15% (Nov.) respectively.

Idea (included USOF) also remained non-compliant with its performance as 3.57% (Oct.) & 3.29% (Dec.) for the parameter 'BTS accumulated down time' and 3.58% (Oct.) for parameter 'Worst affected BTS due to down time'.

With regard to the **Customer Service Quality Parameters**, it is revealed that all operators are in well compliance of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds except for Vodafone that could not meet the benchmark of '% of billing complaints during the quarter' with its performance of 0.15% against the benchmark of 0.1%

The performance of the service providers with regard to the **drive test**, the parameter 'Voice Quality' remained non-compliant repeatedly for some of the Service providers followed by the parameters CSSR, DCR and Blocked Call Rate in few cases.

Thus, on the basis of overall assessment (three stage audit / verification viz audit of the records, live measurements and drive tests) of Quality of Service of the Service Providers, it is concluded that performance of the operators in the service area MP&CG is satisfactory for Network Parameters audited for monthly PMR data. But the performance of the service providers becomes a matter of concerns in respect of some of the parameters like 'Worst affected cells having > 3% TCH drop', 'Voice Quality', CSSR, DCR when assessed during three days live measurements and drive tests carried out in different cities.



7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle- Oct-13 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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		Oct-13	9145	128	2831	3967	7821	4888	1496	4972	2045	464
	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	297	181.55	52.3	57912	7610	7156	2999	2964.18	6614	26.33
	c) BTS Accumulated Downtime	<=2%	Oct-13	0.15%	0.19%	0.00%	1.94%	0.13%	0.20%	0.27%	0.08%	0.43%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-13	46	0	0	46	35	24	15	1	16	0
e) Worst affected BTSs due to downtime	<=2%	Oct-13	0.50%	0.00%	0.00%	1.83%	0.45%	0.49%	1.00%	0.02%	0.78%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	<=2%	Oct-13	99.45%	99.17%	98.46%	96.15%	99.09%	98.68%	98.87%	99.69%	99.25%	98.72%
	b) SDCCH/PAGING Congestion	<=3%	Oct-13	0.04%	0.02%	0.04%	0.74%	0.68%	0.02%	0.06%	0.08%	0.00%	0.00%
c) TCH congestion	<=2%	Oct-13	0.21%	0.00%	0.07%	1.89%	0.63%	0.20%	0.25%	0.31%	0.00%	0.07%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Oct-13	1.04%	0.86%	0.72%	1.53%	0.92%	0.57%	0.65%	0.73%	0.08%	0.84%

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	b) Worst affected cells>3% TCH drop	<=3%	Oct-13	1.38%	3.65%	2.38%	2.33%	1.43%	0.01%	1.27%	2.15%	0.28%	1.0%
	c) % of connections with good voice quality	>=95%	Oct-13	95.90%	99.11%	98.40%	NP	99.02%	97.92%	98.34%	98.98%	99.86%	99.15%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-13	387	14	202	333	333	1	57	322	17	14
	e) Total no. of cells (Sector) in the licensed service area		Oct-13	28038	384	8489	12274	23359	14664	4488	14966	6135	1401
4	No. of POI's having >=0.5% POI congestion												
	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
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Oct-13	325276.3	696.53	140840.7	227000	399877.7	295000	59470.9	118328.8	146000	111315
	b) Total traffic in TCBH in erlang (Avg.)		Oct-13	202788.8	3.4	48742.7	212071	295290.1	216044	17995	81345.4	77935.4	24028
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-13	9797386	1752	2543036	NP	NP	8376429	681484	3830702	2389987	264510

*NP: Data not provided, Idea (Included USOF) has not provided the data.



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle- Oct-13 month													
S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	IDEA (Included USOF)	RCOM GSM	VIDEOCON	VODAFONE	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	9128	128	2821	3967	8861	14661	1495	14916	2042	464
	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	712	2367	21.72	5214	7586	780	158.33	255	474	0
	c) BTS Accumulated Downtime	<=2%	Live data	0.04%	0.26%	0.01%	1.83%	3.57%	0.07%	0.44%	0.07%	0.22%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	0	0	42	317	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	1.06%	3.58%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	<=2%	Live data	99.48%	98.91%	98.49%	97.00%	99.06%	98.66%	98.90%	99.68%	99.20%	98.74%
	b) SDCCH/PAGING Congestion	<=3%	Live data	0.04%	0.13%	0.07%	0.47%	0.33%	0.01%	0.03%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.17%	0.00%	0.05%	1.14%	0.64%	0.23%	0.22%	0.32%	0.00%	0.03%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.98%	0.45%	0.71%	1.65%	0.69%	0.56%	0.66%	0.72%	0.09%	0.88%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.14%	1.39%	4.16%	2.74%	1.50%	0.00%	1.50%	5.16%	0.43%	3.21%
	c) % of connections with good voice quality	>=95%	Live data	95.82%	99.51%	98.41%	NP	99.00%	97.66%	98.27%	99.01%	99.82%	99.14%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	869	5	352	345	399	0	69	771	26	45
	e) Total no. of cells (Sector) in the licensed service area		Live data	27966	384	8465	12600	26652	14920	4485	14950	6150	1401
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

*NP: Data not provided



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle- Nov-13 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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		Nov-13	9166	128	2838	3967	1803	9044	7890	4887	1501	5022	2042	464
	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	5189	167.84	3797	49305	21352	212703	4663	5927	1457	2343	4394	7.5
	c) BTS Accumulated Downtime	<=2%	Nov-13	0.81%	0.18%	0.00%	1.73%	1.64%	3.27%	0.08%	0.17%	0.14%	0.06%	0.30%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-13	28	0	0	49	1	719	18	30	3	4	7	0
e) Worst affected BTSs due to downtime	<=2%	Nov-13	0.31%	0.00%	0.00%	1.23%	0.06%	7.95%	0.23%	0.61%	0.20%	0.08%	0.34%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	<=2%	Nov-13	99.52%	98.97%	98.50%	97.52%	95.14%	98.44%	98.50%	98.64%	98.91%	99.73%	99.34%	98.90%
	b) SDCCH/PAGING Congestion	<=3%	Nov-13	0.04%	0.10%	0.03%	0.53%	0.48%	0.54%	0.54%	0.02%	0.03%	0.08%	0.00%	0.00%
c) TCH congestion	<=2%	Nov-13	0.18%	0.00%	0.04%	1.61%	1.86%	0.85%	0.82%	0.20%	0.26%	0.27%	0.00%	0.07%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Nov-13	0.94%	0.60%	0.66%	1.63%	1.47%	1.06%	1.02%	0.57%	0.55%	0.73%	0.06%	0.65%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-13	1.13%	4.69%	1.58%	2.62%	2.92%	1.75%	1.42%	0.01%	0.99%	2.02%	0.08%	1.07%
c) % of connections with good voice quality	>=95%	Nov-13	96.04%	99.17%	98.50%	NP	98.00%	98.71%	98.74%	97.92%	98.50%	98.98%	99.85%	99.21%	

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	d) Total No. of cells exceeding 3% TCH drop (call drop)	Nov-13	317	18	135	315	155	472	337	1	44	306	5	15
	e) Total no. of cells (Sector) in the licensed service area	Nov-13	28093	384	8518	12023	5319	27023	23747	14767	4499	15116	6126	1401
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	0	0
	Name of POI not meeting the benchmark	Nov-13	0	0	0	0	0	0	0	0	0	0	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang	Nov-13	325800	696	141136	227000	105000	447295	40051	NP	59259.4	128441	NP	111315
	b) Total traffic in TCBH in erlang (Avg.)	Nov-13	212683	3.468	54716	56438	54046	332916	307009	NP	17558	80813	NP	21720
	c) Total no. of customers served (as per VLR) on last day of the month	Nov-13	9908821	1664	2469117	NP	42509	17045717	NA	NP	744890	3963415	NP	NP



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle- Nov-13 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators											CDMA Operators
Network Service Quality Parameter															
1 Network Availability															
1	a) Total no. of BTSs in the licensed service area		Live data	9144	128	2838	3967	1803	8993	7839	14661	1499	4972	2043	464
	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	510.5	7.75	2.5	5214	1749	21080	526	495	112	258	281	0
	c) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.08%	0.12%	1.83%	1.35%	1.39%	1.21%	0.14%	0.10%	0.07%	0.19%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	42	0	316	1	0	0	0		0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.06%	0.00%	3.51%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
2 Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	<=2%	Live data	99.55%	99.81%	98.42%	97.73%	95.53%	98.62%	98.69%	98.64%	99.00%	99.83%	99.36%	99.02%
	b) SDCCH/PAGING Congestion	<=3%	Live data	0.04%	0.00%	0.02%	0.38%	0.37%	0.61%	0.62%	0.01%	0.05%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.18%	0.00%	0.04%	1.40%	1.51%	0.71%	0.67%	0.19%	0.25%	0.17%	0.00%	0.13%
3 Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.92%	0.53%	0.70%	1.92%	1.36%	1.05%	1.01%	0.56%	0.57%	0.70%	0.04%	0.60%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.62%	1.56%	3.11%	2.58%	3.15%	1.72%	1.42%	0.00%	1.00%	5.14%	0.32%	3.35%
	c) % of connections with good voice quality	>=95%	Live data	96.13%	99.89%	98.51%	NP	98.00%	98.74%	98.77%	97.90%	98.48%	98.99%	99.85%	99.23%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	455	6	265	310	167	466	336	1	45	769	20	47
	e) Total no. of cells (Sector) in the licensed service area		Live data	28031	384	8517	12021	5319	27016	23743	14767	1499	14966	6148	1401
4 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	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0	0



TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle- Dec-13 month															
S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	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		Dec-13	9172	128	2842	3967	1803	9164	5774	4888	1511	5062	2044	464
	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	5947	554	169.22	55650	20660	228898	8010	6540	1825	2528	4702	1320
	c) BTS Accumulated Downtime	<=2%	Dec-13	0.09%	0.58%	0.01%	1.89%	1.54%	3.36%	0.10%	0.18%	0.11%	0.07%	0.31%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-13	15	2	0	51	30	739	19	33	7	1	10	0
e) Worst affected BTSs due to downtime	<=2%	Dec-13	0.16%	1.56%	0.00%	1.28%	1.66%	8.06%	0.24%	0.68%	0.46%	0.00%	0.49%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	<=2%	Dec-13	99.51%	99.11%	98.50%	97.36%	95.12%	98.51%	98.56%	98.65%	98.82%	99.69%	99.35%	99.02%
	b) SDCCH/PAGING Congestion	<=3%	Dec-13	0.06%	0.07%	0.04 %	0.55%	0.43%	0.46%	0.46%	0.02%	0.11%	0.06%	0.00%	0.00%
c) TCH congestion	<=2%	Dec-13	0.26%	0.00%	0.05 %	1.28%	1.86%	0.81%	0.78%	0.17%	0.23%	0.31%	0.00%	0.14%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Dec-13	0.91%	0.73%	0.65%	1.32%	1.36%	0.99%	0.96%	0.57%	0.60%	0.71 %	0.06%	0.50%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-13	0.87%	5.21%	1.54%	2.46%	2.67%	1.26%	1.02%	0.01%	1.14%	2.09 %	0.26%	0.79%
c) % of connections with good voice quality	>=95%	Dec-13	95.99%	99.32%	98.54%	96.80%	97.00%	98.74%	98.78%	97.90%	98.46%	99.00%	99.85%	99.19%	

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	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-13	244	20	131	297	142	343	245	1	52	319	16	11
	e) Total no. of cells (Sector) in the licensed service area		Dec-13	28098	384	8530	12085	5319	27247	23969	14664	4543	15296	6132	1401
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		Dec-13	0	0	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	0	0
Network Data															
5	a) Equipped Capacity of Network in Erlang		Dec-13	323368	699	143262	224000	105000	450143	403571	295000	59903	130573	146000	111315
	b) Total traffic in TCBH in erlang (Avg.)		Dec-13	216286	3	51934	NP	51748	340462	314843	215404	20539	85693	78568	1401
	c) Total no. of customers served (as per VLR) on last day of the month		Dec-13	10037931	1537	2372368	NP	860583	17318976	NA	8660064	824233	4097790	2344364	248841



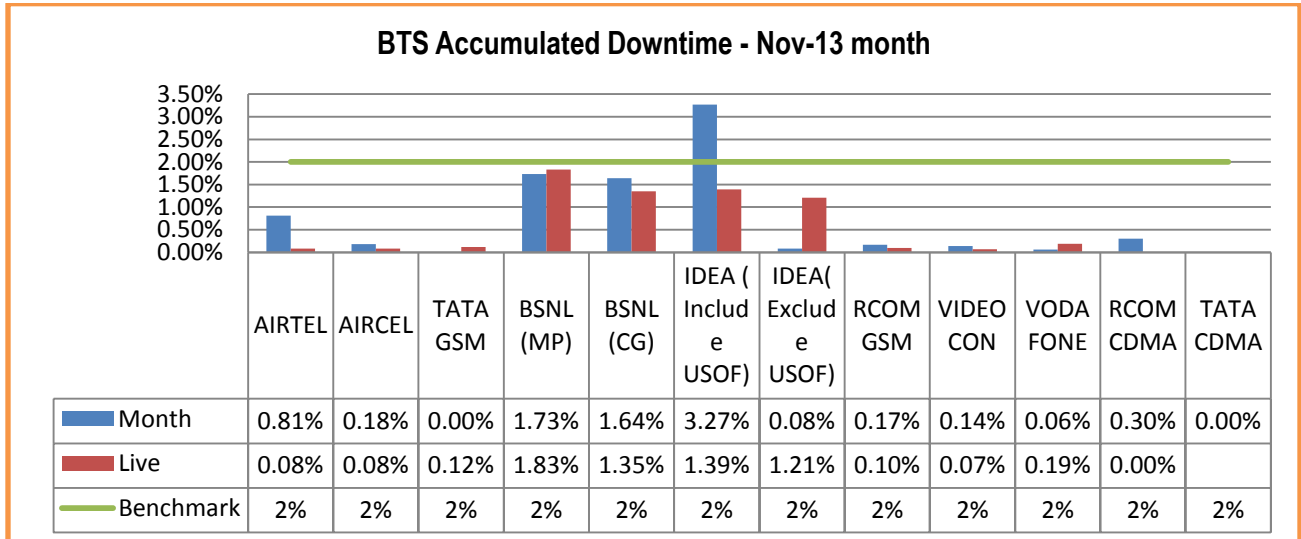
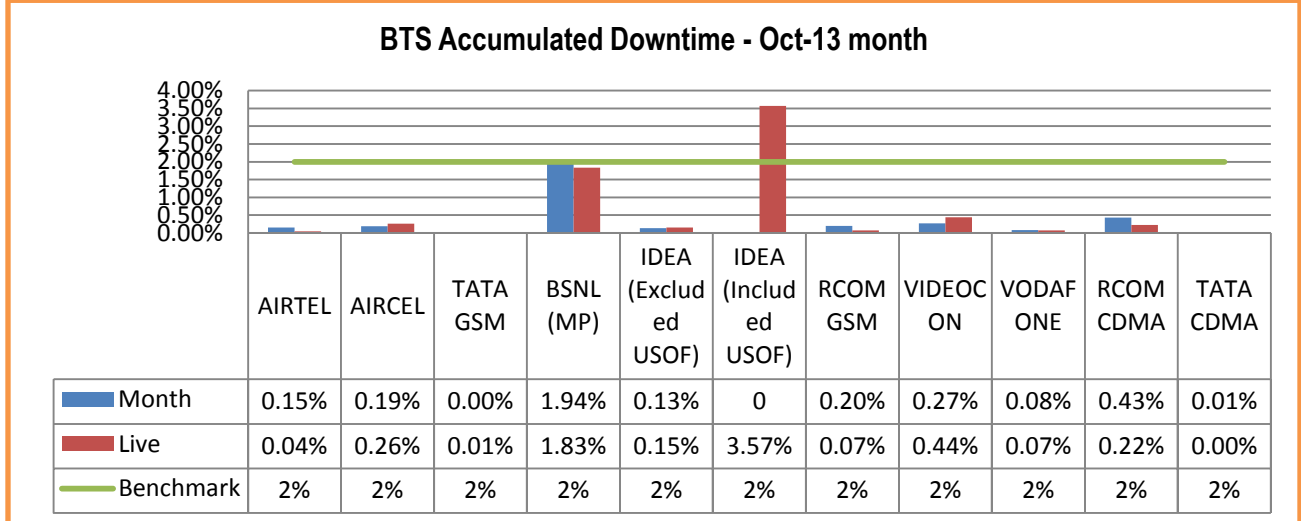
TABLE: 6

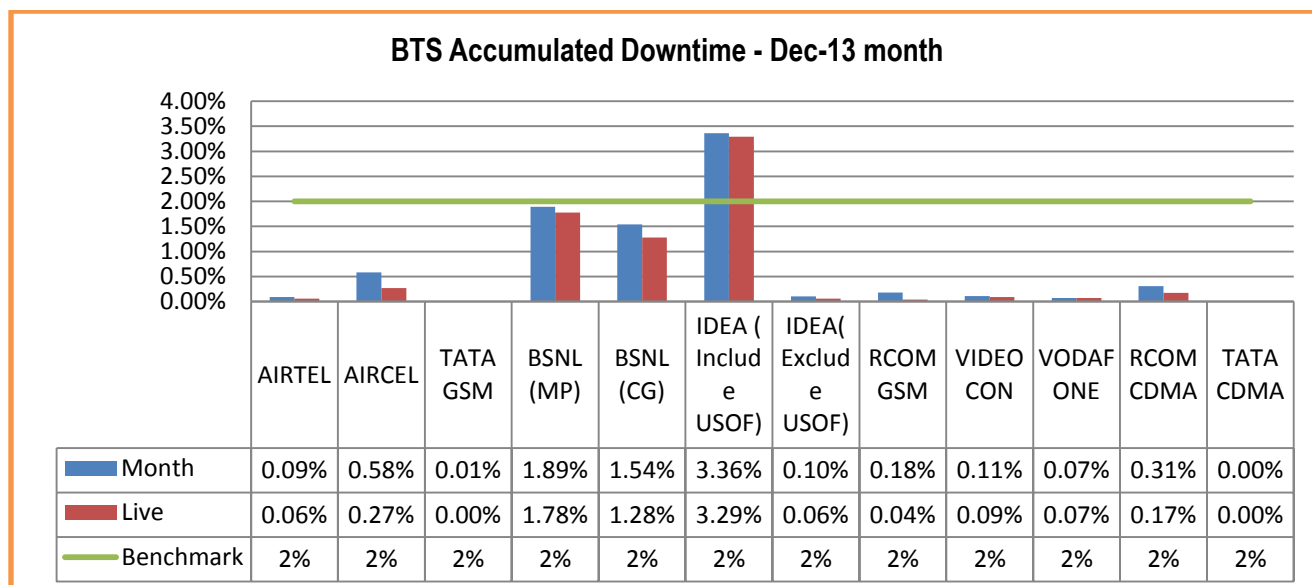
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle- Dec-13 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA (Included USOF)	IDEA (Excluded USOF)	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators	
Network Service Quality Parameter															
1	Network Availability														
	a) Total no. of BTSs in the licensed service area		Live data	9163	128	2838	3967	5409	9044	7890	4887	1504	5022	2042	464
	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	387.2	25.3	2.13	41	1666	21448	353	134	33	237.39	251	0.12
	c) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.27%	0.00%	1.78%	1.28%	3.29%	0.06%	0.04%	0.09%	0.07%	0.17%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0		3	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.03%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	<=2%	Live data	99.52%	99.29%	98.48%	97.05%	95.03%	98.42%	98.49%	98.66%	98.95%	99.76%	99.47%	99.05%
	b) SDCCH/PAGING Congestion	<=3%	Live data	0.04%	0.00%	0.02%	0.54%	0.42%	0.55%	0.57%	0.01%	0.05%	0.08%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.24%	0.00%	0.06%	1.78%	1.95%	0.88%	0.85%	0.18%	0.26%	0.24%	0.00%	0.14%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Live data	0.94%	0.79%	0.65%	1.78%	1.23%	1.01%	0.98%	0.57%	0.64%	0.68%	0.06%	0.51%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.52%	1.56%	3.06%	2.63%	2.89%	1.50%	1.23%	0.00%	1.17%	5.03%	0.33%	2.64%
	c) % of connections with good voice quality	>=95%	Live data	95.95%	99.42%	98.54%	NP	97.00%	98.77%	98.80%	97.91%	98.44%	99.02%	99.85%	99.18%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	428	6	261	318	153	408	295	0	53	760	20	37
e) Total no. of cells (Sector) in the licensed service area		Live data	28090	384	8518	12082	5319	27193	23914	14208	4516	15116	6144	1401	
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	0	0
	Name of POI not meeting the benchmark		Live data	0	0	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:

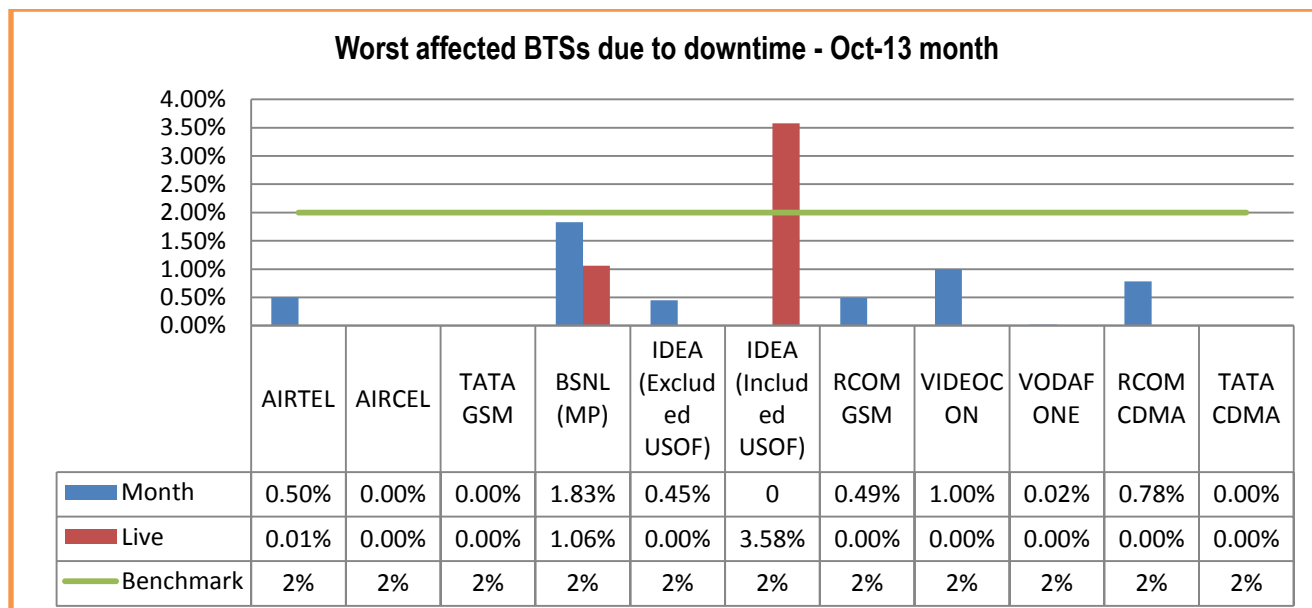
1. BTS ACCUMULATED DOWNTIME :





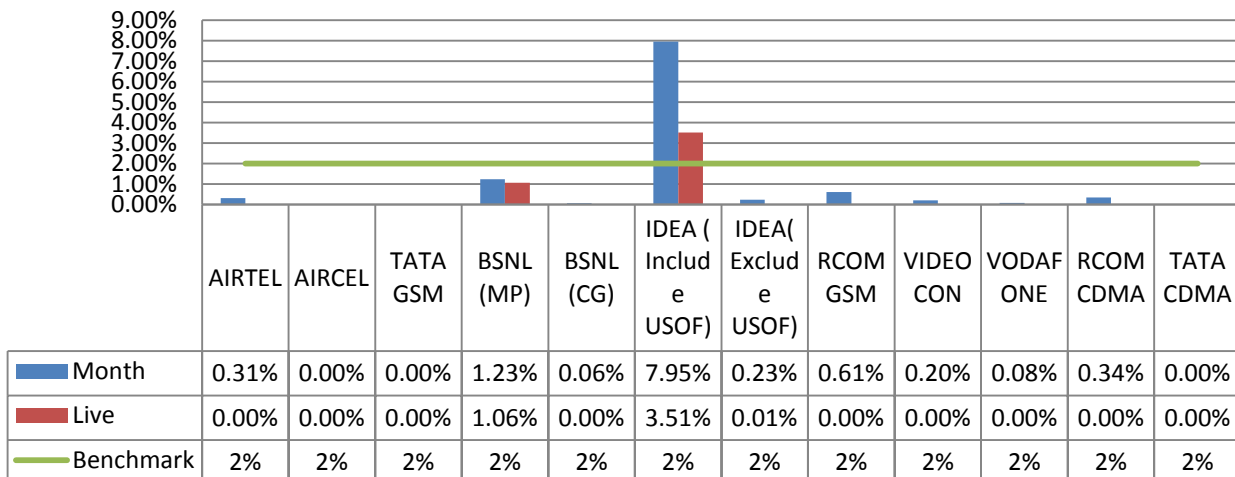
All operators are meeting the benchmarks except Idea (Included USOF) in all three months.

2. WORST AFFECTED BTS DUE TO DOWNTIME:

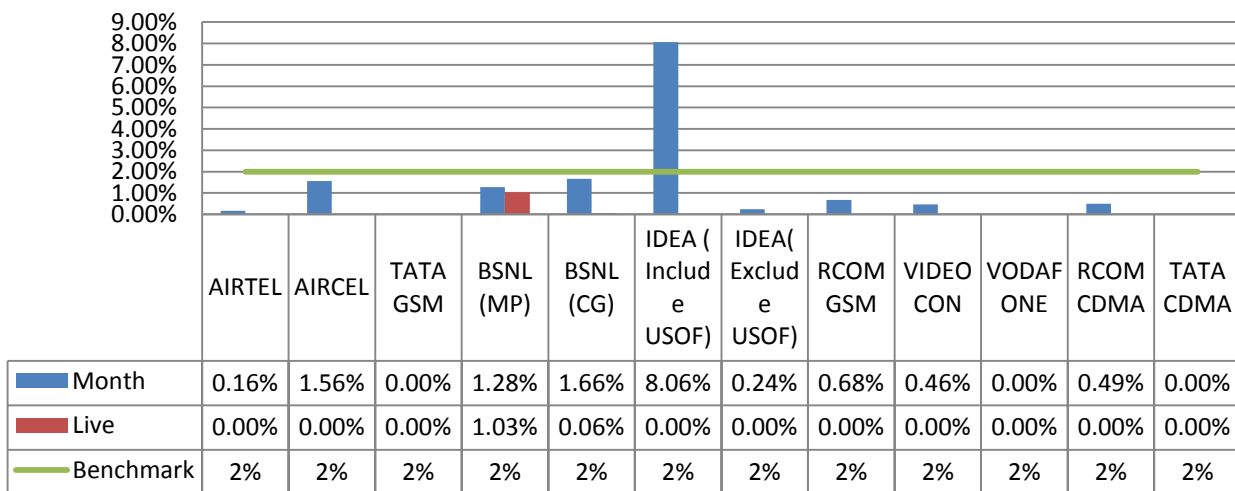




Worst affected BTSs due to downtime - Nov-13 month



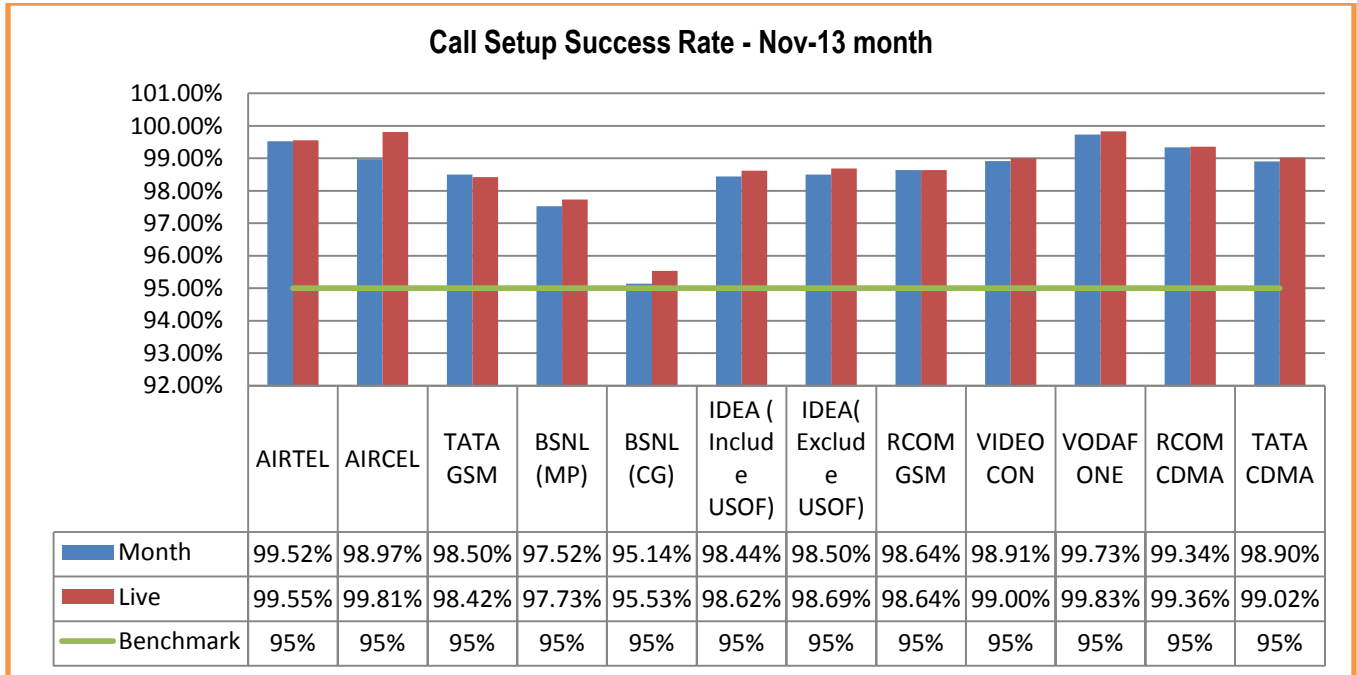
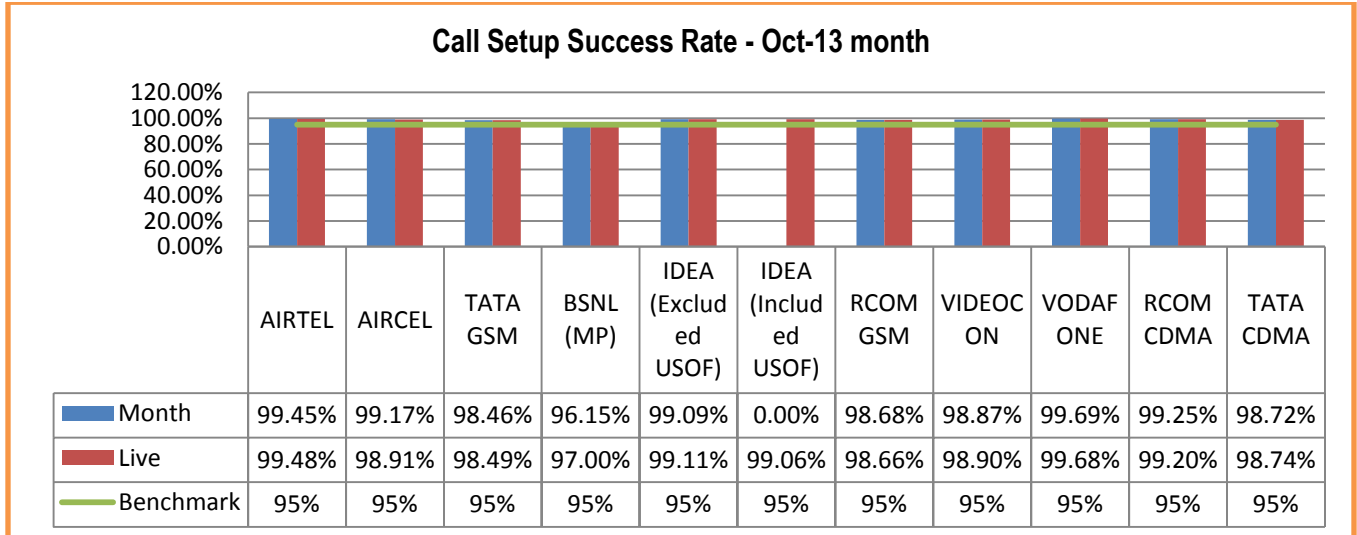
Worst affected BTSs due to downtime - Dec-13 month

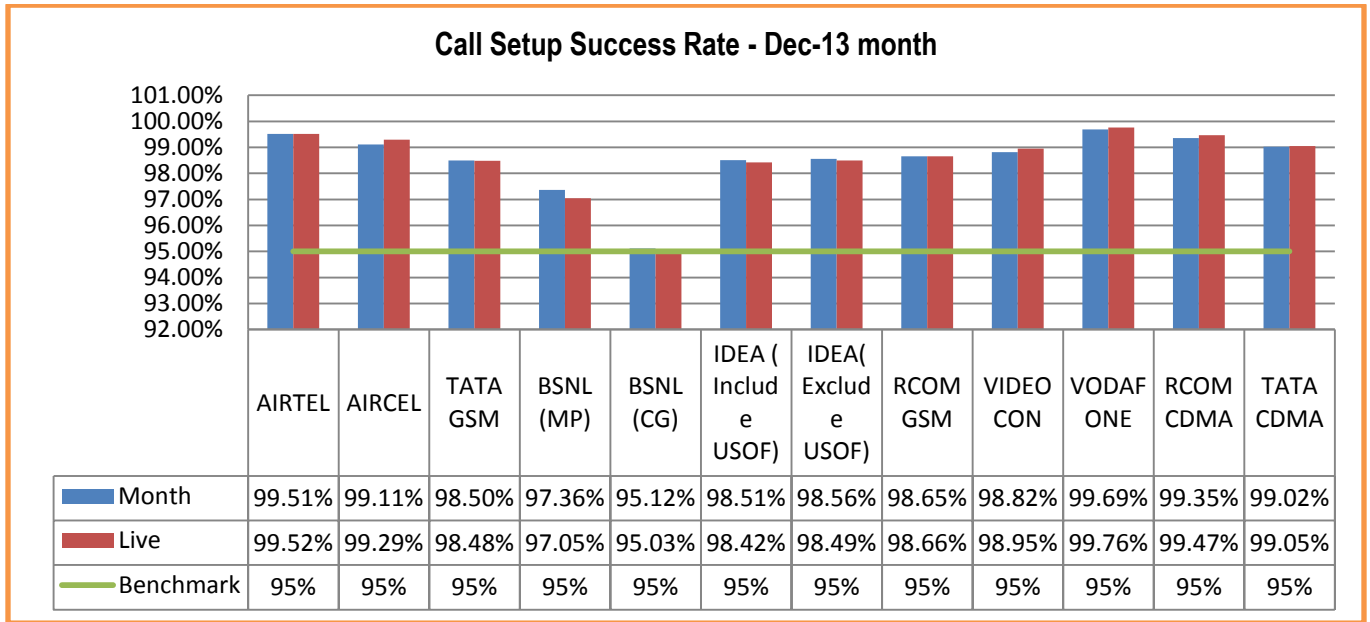


All operators are meeting the benchmarks except Idea (Included USOF) in all three months.



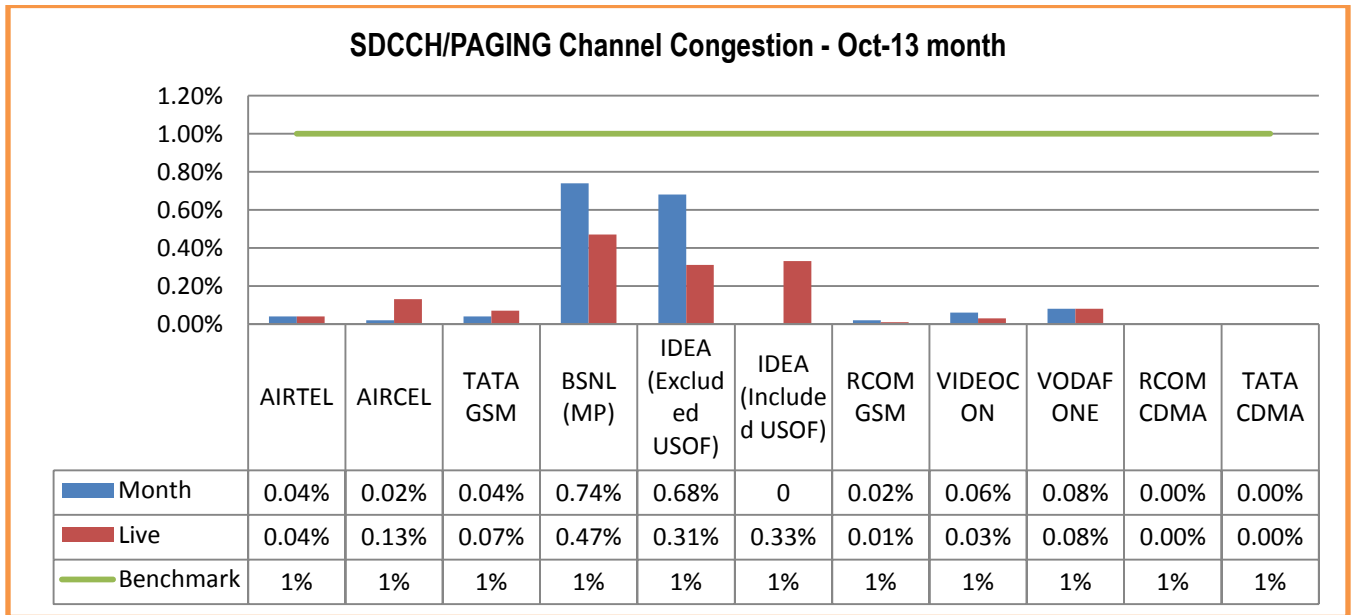
3. CALL SETUP SUCCESS RATE :

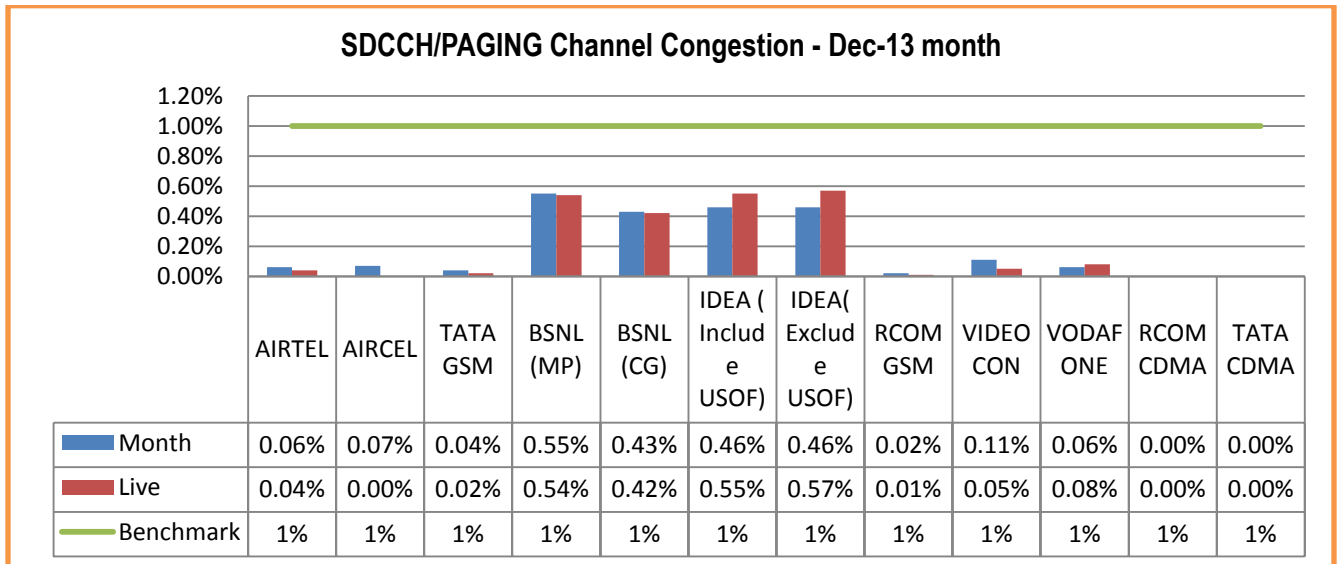
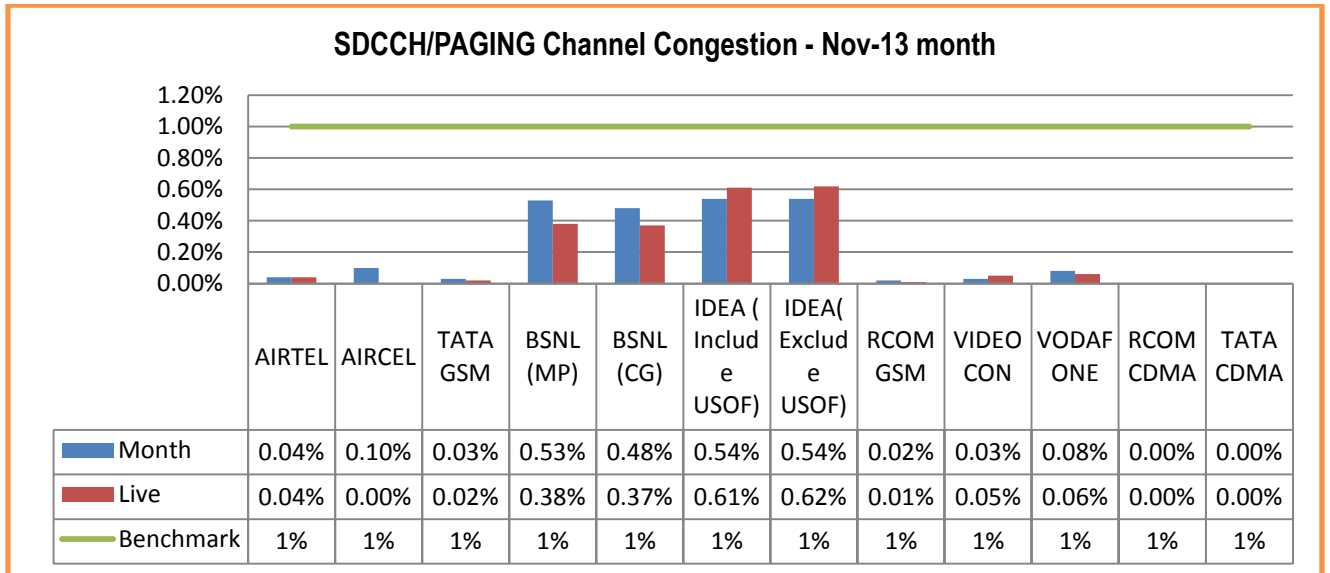




All operators are meeting the benchmarks.

4. SDCCH/PAGING CHANNEL CONGESTION:

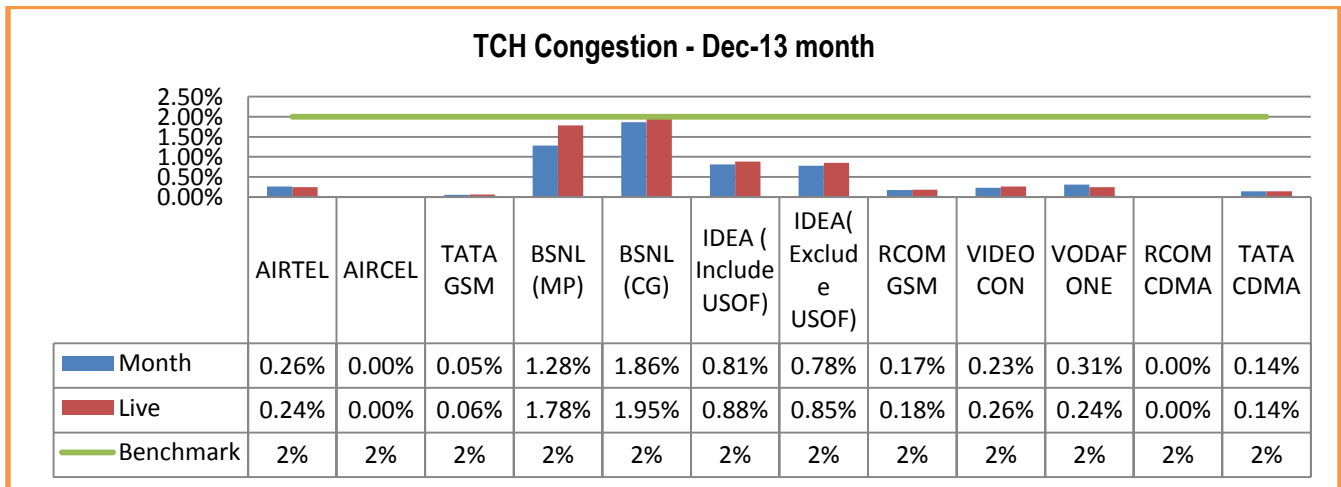
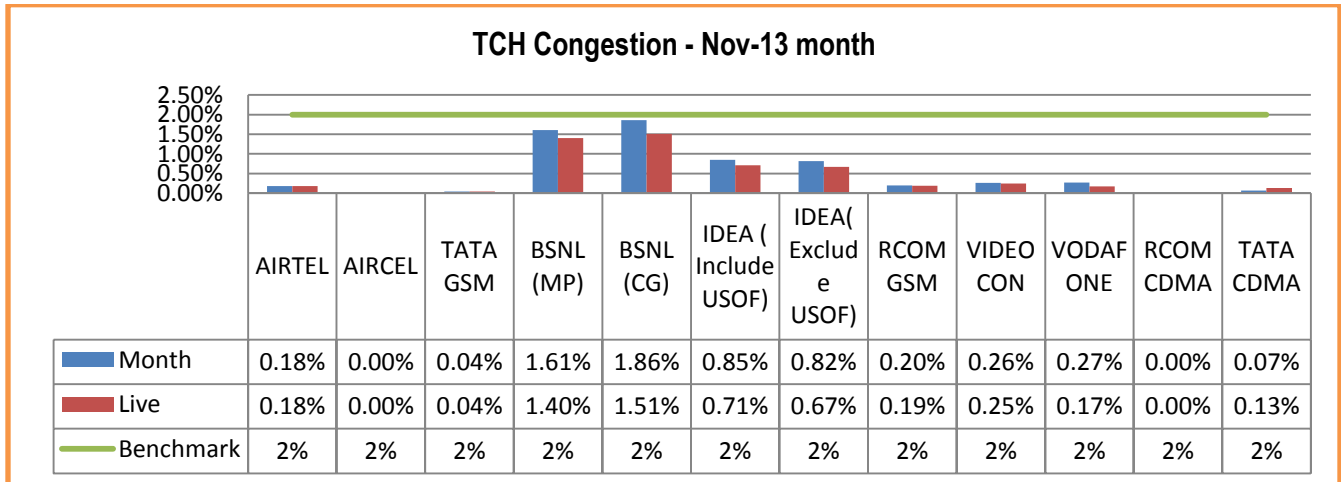
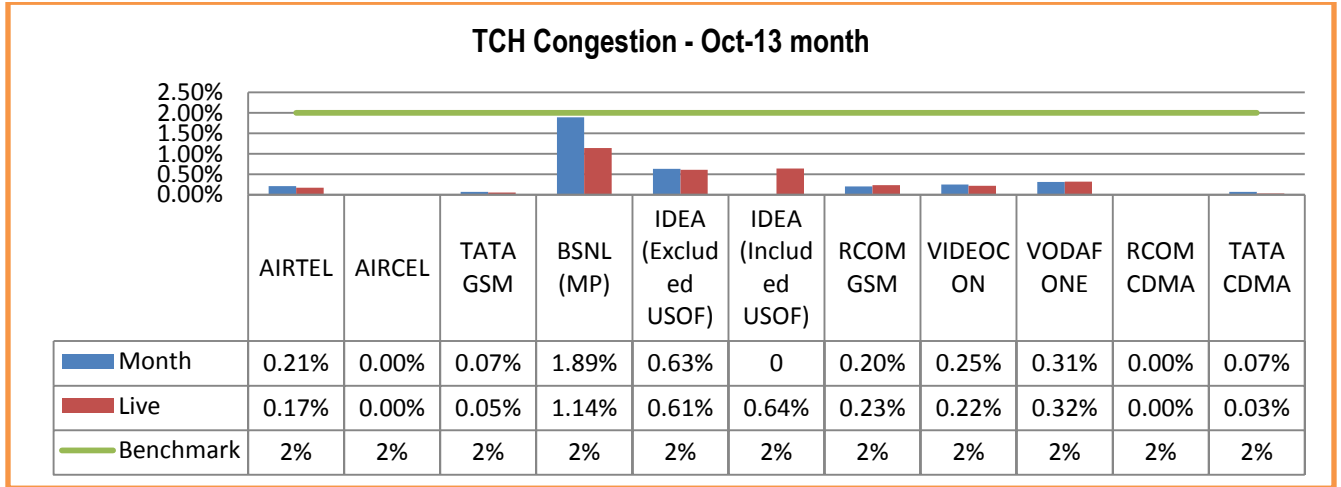




All operators are meeting the benchmarks.



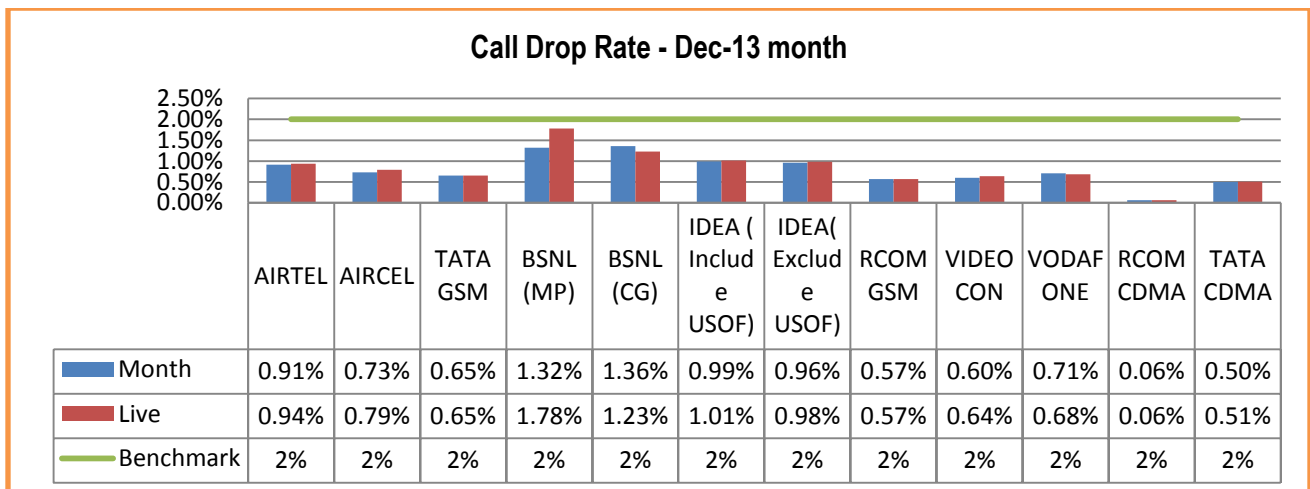
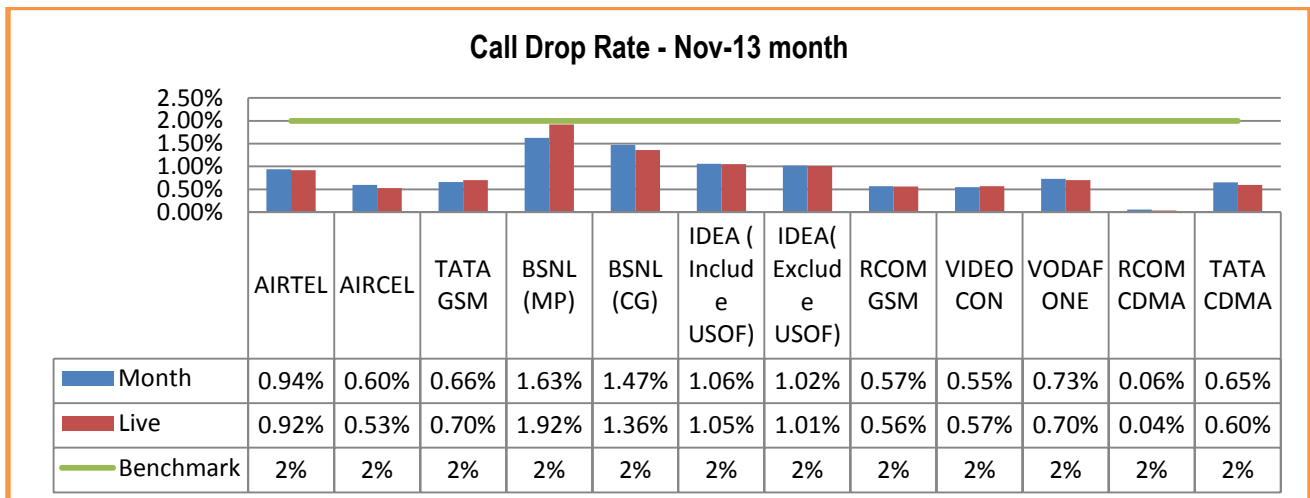
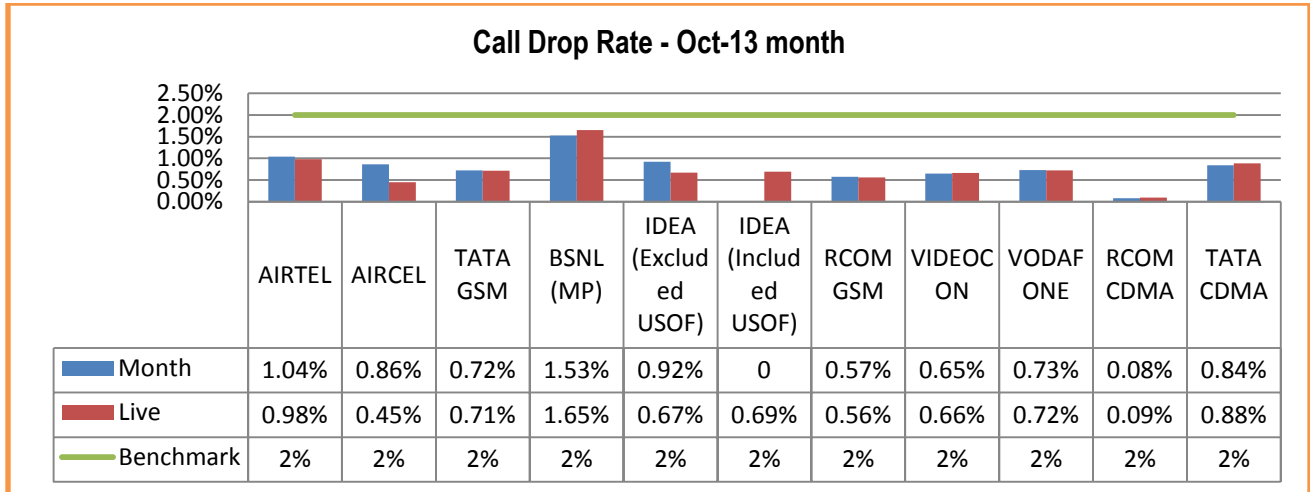
5. TCH CONGESTION :



All operators are meeting the benchmarks.



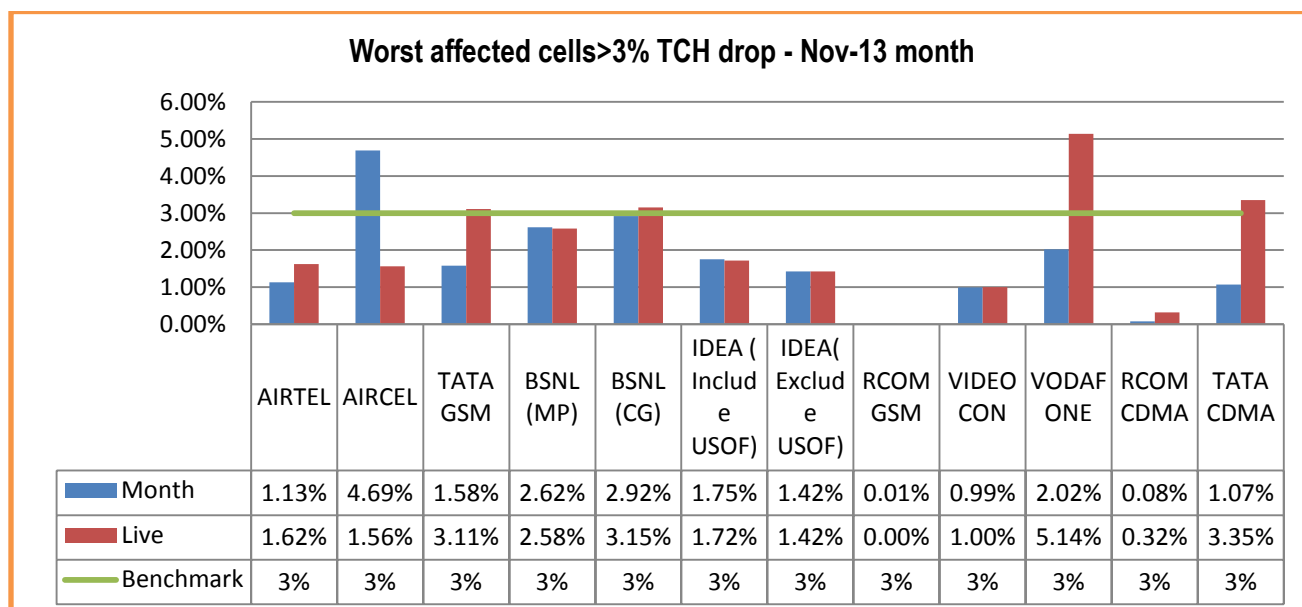
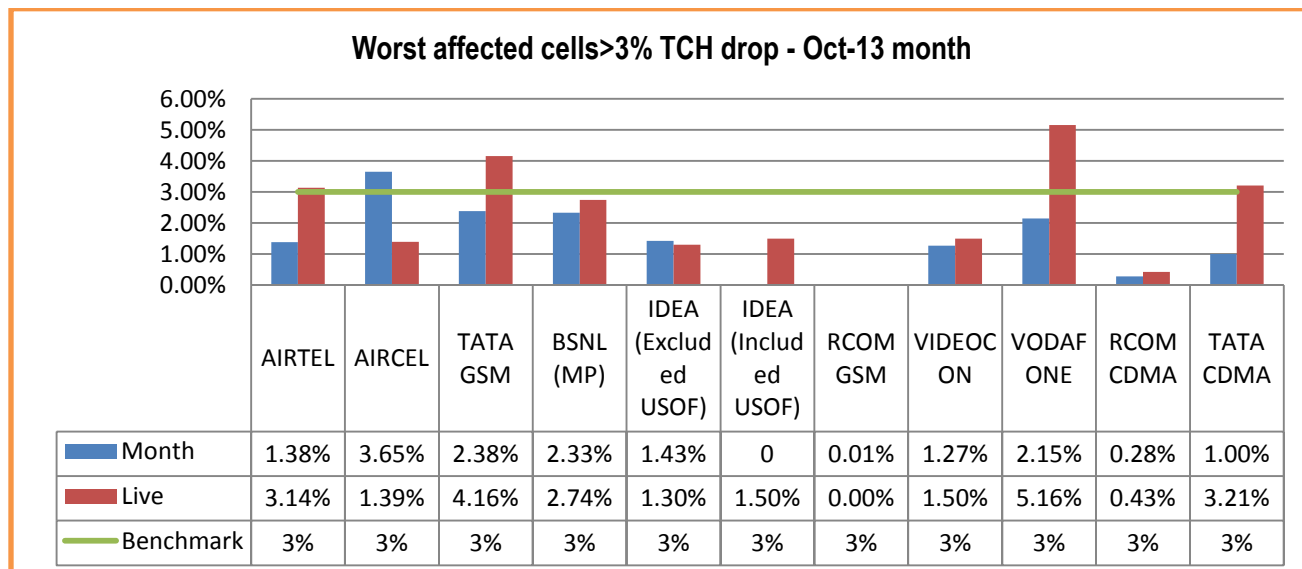
6. CALL DROP RATE :

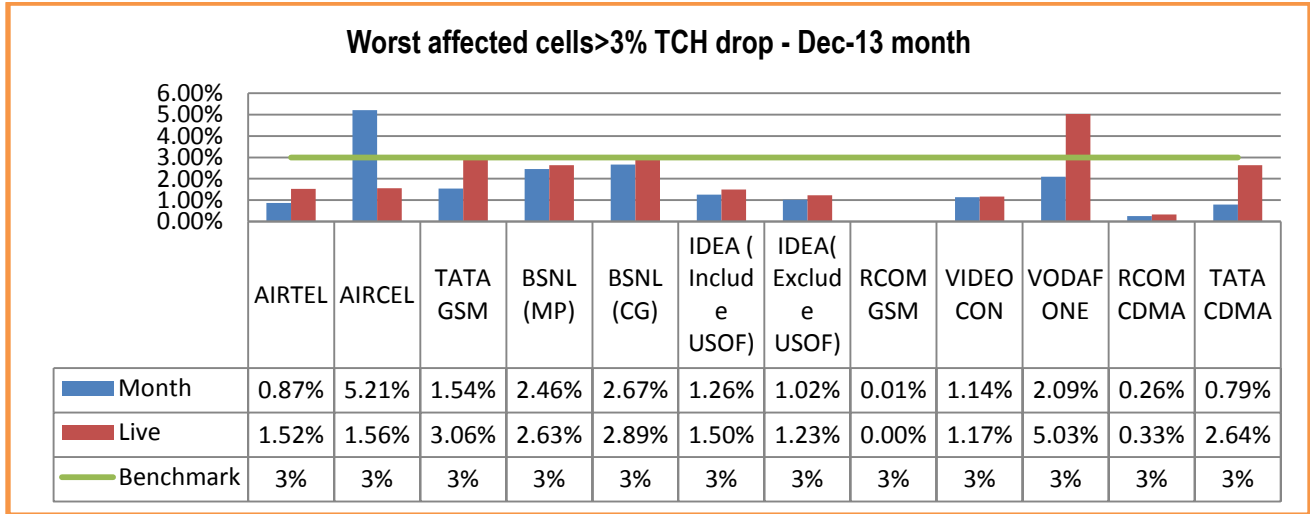


All operators are meeting the benchmarks.



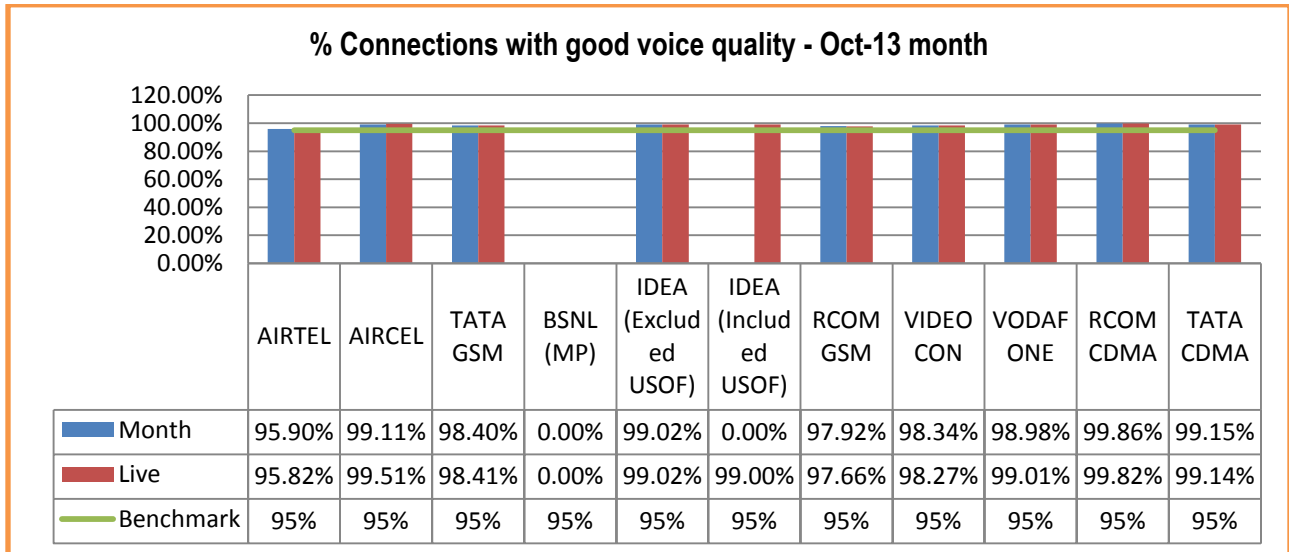
7. WORST AFFECTED CELLS>3% TCH DROP :





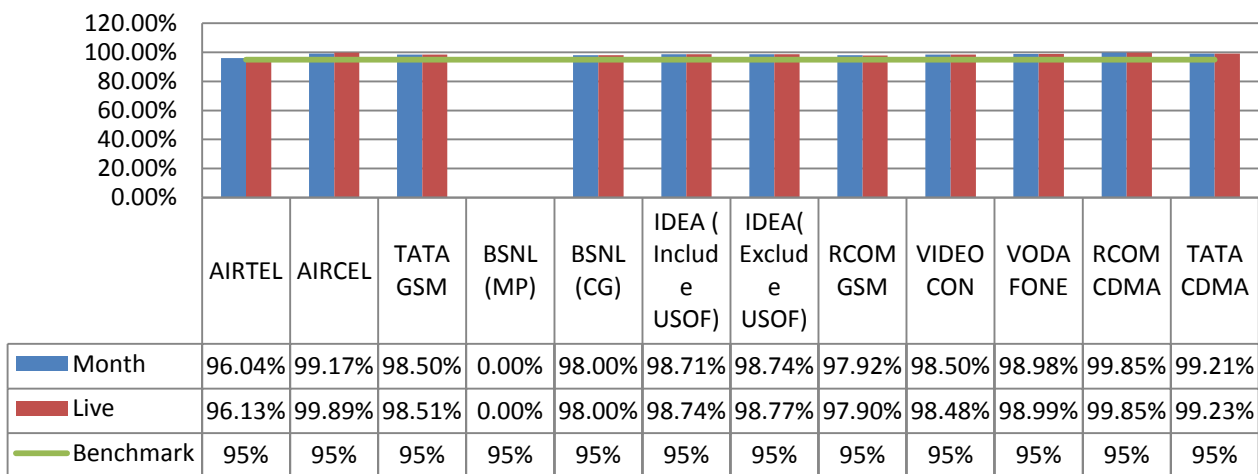
Vodafone and Tata (GSM) could not meet the benchmark of the parameter 'Worst affected cells > 3 % TCH drops' during live measurements in all the three months with their performance as 5.16% (Oct.), 5.14% (Nov.) & 5.03% (Dec.) and 4.16% (Oct.), 3.11% (Nov.) & 3.06% (Dec.) respectively. Tata (CDMA), Airtel, BSNL (CG) and Aircel also remained non-compliant for the same parameter with their performance as 3.21% (Oct.) & 3.35% (Nov.), 3.14% (Oct.) 3.15% (Nov.) and 3.65% (Oct.), 4.69% (Nov) & 5.21% (Dec) respectively.

8. PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:

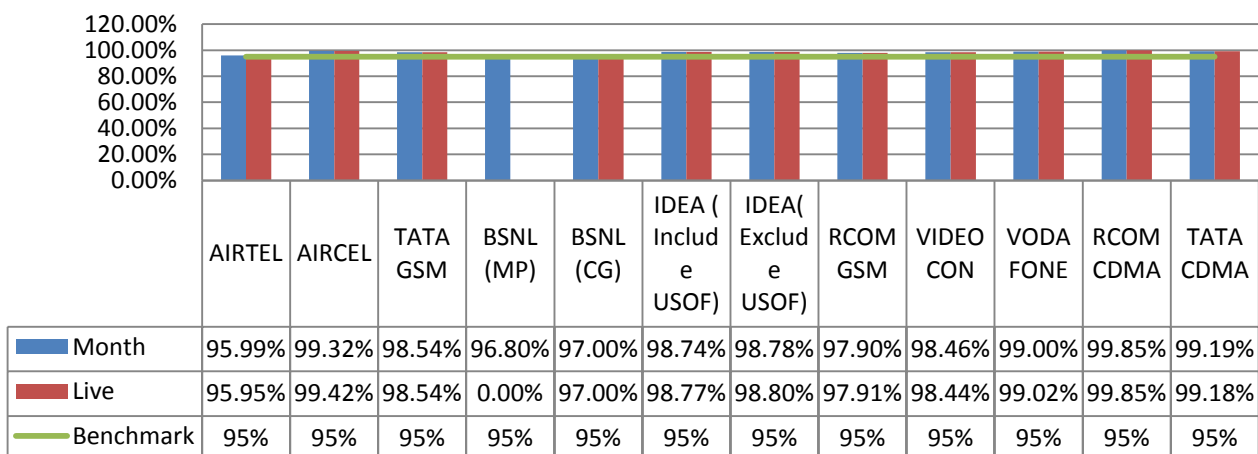




% Connections with good voice quality - Nov-13 month



% Connections with good voice quality - Dec-13 month



All operators are meeting the benchmarks.



9. PMR VERIFICATION SHEET:

a) NETWORK RELATED PARAMETER:

MPCG 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%
AIRTEL	Reported	0.11	0.32	99.49	0.05	0.22	0.96	1.13	95.98	0
	Verified	0.35%	0.32%	99.49%	0.05%	0.22%	0.96%	1.13%	95.98%	0
AIRCEL	Reported	0.32	0.52	99.09	0.07	0.00	0.72	4.51	99.17	0
	Verified	0.32%	0.52%	99.08%	0.06%	0.00%	0.73%	4.52%	99.20%	0
TATA GSM	Reported	0.00	0.00	98.49	0.04	0.05	0.68	1.83	98.48	0
	Verified	0.00%	0.00%	98.49%	0.04%	0.05%	0.68%	1.83%	98.48%	0
BSNL	Reported	1.70	1.52	96.17	0.52	1.70	1.57	2.72	96.80	0
	Verified	1.72%	1.15%	96.07%	0.53%	1.73%	1.45%	2.63%	97.15%	0
IDEA	Reported	3.49	8.61	98.66	0.56	0.78	1.00	1.58	98.82	0
	Verified	2.25%	5.49%	98.68%	0.56%	0.76%	0.99%	1.48%	98.82%	0
RCOM GSM	Reported	0.18	0.59	98.66	0.02	0.19	0.57	0.01	97.91	0
	Verified	0.21%	0.76%	98.72%	0.03%	0.21%	0.60%	0.43%	98.05%	0
VIDEOCON	Reported	0.17	0.56	98.87	0.07	0.25	0.60	1.13	98.43	0
	Verified	0.11%	0.23%	99.14%	0.07%	0.27%	0.63%	1.43%	98.65%	0
VODAFONE	Reported	0.07	0.04	99.70	0.07	0.30	0.72	2.09	98.99	0
	Verified	0.19%	0.29%	99.56%	0.05%	0.19%	0.51%	1.46%	99.28%	0
RCOM CDMA	Reported	0.35	0.54	99.31	0.00	0.00	0.06	0.21	99.85	0
	Verified	0.21%	0.28%	99.14%	0.00%	0.02%	0.32%	0.45%	99.62%	0
TATA CDMA	Reported	0.00	0.00	98.88	0.00	0.09	0.66	0.95	99.18	0
	Verified	0.00%	0.00%	98.96%	0.00%	0.11%	0.58%	0.93%	99.20%	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.
- iii. The data for BSNL MP and BSNL Chhattisgarh has been merged.
- iv. The data for Idea is calculated based on included USOF sites.
- v. Idea has not met the benchmark for the parameter "BTS Accumulated Downtime" and "Worst affected BTSs due to downtime."
- vi. Aircel has not met the benchmark for the parameter "Worst affected cells>3% TCH drop."



b) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

MPCG 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	93.01	97.78	100.00	100.00
	Verified	0.00	0.00	100.00	100.00	93.00%	97.71%	100.00	100.00
AIRTEL	Reported	0.02	0.01	100.00	100.00	100.00	94.00	100.00	100.00
	Verified	0.02%	0.01%	100.00%	100.00%	100.00%	93.86%	100%	100%
BSNL	Reported	0.00	0.05	100.00	100.00	99.50	95.15	100.00	100.00
	Verified	0.02%	0.01%	100.00%	100.00%	100.00%	92.25%	99.48%	100%
IDEA	Reported	0.06	0.01	100.00	100.00	99.54	98.74	100.00	100.00
	Verified	0.06%	0.01%	100.00%	100.00%	100.00%	99.23%	100%	100%
RCOM (GSM)	Reported	0.09	0.10	100.00	100.00	98.97	91.22	100.00	100.00
	Verified	0.09%	0.10%	100.00%	100.00%	98.97%	91.24%	100%	100%
TATA (GSM)	Reported	0.00	0.00	100.00	100.00	99.24	93.52	100.00	100.00
	Verified	0.00	0.00	100.00	100.00	100.00%	91.12%	100%	100%
VIDEOCON	Reported	NA	0.02	100.00	100.00	95.81	91.90	NA	NA
	Verified	NA	0.01%	100.00%	100.00%	100.00%	91.90%	NA	NA
VODAFONE	Reported	0.13	0.04	99.90	100.00	100.00	96.82	100.00	100.00
	Verified	0.15%	0.04%	100.00%	100.00%	100.00%	96.00%	100%	100%
RCOM (CDMA)	Reported	0.10	0.10	100.00	100.00	98.71	94.44	100.00	100.00
	Verified	0.10%	0.10%	100.00%	100.00%	98.71%	94.14%	100%	100%
TATA (CDMA)	Reported	0.00	0.00	100.00	100.00	97.85	92.81	100.00	100.00
	Verified	0.00	0.00	100.00	100.00	100.00%	100.00%	100%	100%

NA: Not Applicable

- 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. Vodafone has not met the benchmark for the parameter “% of billing complaints during the quarter”
- iv. BSNL has not met the benchmark for the parameter “% of Termination/ Closure of service within 7 days”