



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
NORTH ZONE – UTTAR PRADESH (WEST) CIRCLE
(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 **UP(W) 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 UP(W) circle

SI .No.	Name of Service Provider
GSM Operators	
1	AIRCEL
2	AIRTEL
3	BSNL (UP-W)
4	BSNL UTTRAKHAND
5	IDEA
6	RCOM GSM
7	TATA GSM
8	UNINOR
9	VODAFONE
CDMA Operators	
10	MTS
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 (WIRELINER) SERVICES

- The QoS audit for basic (wireline) 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 (wireline) service was not required to be done for UP(W) 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 UP(W) 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 99 (3x11x3) drive tests in three months of quarter ended December 2013 were carried out in **UP(W) 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 (UP-W)	Dec-13	19:00 - 20:00
4	BSNL UTTARAKHAND	Dec-13	20:00 - 21:00
5	IDEA	Dec-13	19:00 - 20:00
6	RCOM GSM	Dec-13	19:00 - 20:00
7	TATA GSM	Dec-13	19:00 - 20:00
8	UNINOR	Dec-13	19:00 - 20:00
9	VODAFONE	Dec-13	19:00 - 20:00
CDMA Operators			
10	MTS	Dec-13	20:00 - 21:00
11	RCOM CDMA	Dec-13	19:00 - 20:00
12	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 UP(W) 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	3	7	628	ZTE	ZTE
2	AIRTEL	19	71	6557	Ericsson	Ericsson
3	BSNL (UP-W)	12	32	2182	Ericsson, NSN & ZTE	Ericsson, NSN & ZTE
4	BSNL UTTRAKHAND	5	14	837	Ericsson & ZTE	Ericsson, NSN & ZTE
5	IDEA	16	54	6976	NSN	NSN
6	RCOM GSM	4	14	2386	Huawei	Huawei
7	TATA GSM	3	18	1842	NSN	NSN
8	UNINOR	9	22	2894	Ericsson	Ericsson
9	VODAFONE	11	95	6109	NSN	NSN
CDMA Operators						
10	MTS	1	1	323	Huawei	Huawei
11	RCOM CDMA	3	4	1346	Huawei & Lucent	Huawei & Lucent
12	TATA CDMA	5	4	591	Huawei & Ericsson	Huawei & Motorola



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- OCT-13 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	0.22%	0.17%	1.01%	0.65%	0.03%	0.01%	0.13%	0.21%	0.20%	0.07%	0.27%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Oct-13	1.59%	0.53%	1.93%	0.00%	0.00%	1.20%	0.84%	1.04%	1.10%	0.00%	0.90%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	98.81%	97.79%	97.71%	96.45%	99.98%	99.63%	98.88%	97.99%	99.40%	99.55%	98.28%	98.95%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-13	0.15%	0.61%	0.94%	0.65%	0.49%	0.03%	0.02%	0.20%	0.14%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.15%	1.12%	1.05%	1.60%	0.55%	0.03%	0.18%	1.49%	0.60%	0.00%	0.02%	0.13%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Oct-13	0.58%	1.28%	1.96%	1.71%	0.98%	0.24%	0.73%	0.47%	0.75%	0.47%	0.22%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-13	2.01%	1.65%	1.06%	2.61%	2.46%	0.01%	6.40%	2.00%	1.13%	1.46%	0.65%	0.69%
	c) Connections with good voice quality	>=95%	Oct-13	97.64%	97.51%	95.34%	96.52%	95.94%	99.63%	97.94%	97.07%	97.45%	99.27%	99.78%	98.14%
4	No. of POI's having >=0.5% POI congestion		Oct-13	0	0	0	0	0	0	0	0	0	0	0	0



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- NOV-13 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	0.15%	0.13%	1.26%	0.67%	0.03%	0.24%	0.07%	0.13%	0.16%	0.05%	0.29%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Nov-13	0.96%	0.32%	1.88%	0.00%	0.00%	0.76%	0.11%	0.59%	0.00%	0.00%	0.60%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	99.04%	97.25%	97.91%	97.04%	99.95%	99.69%	98.92%	98.07%	99.23%	99.60%	98.71%	98.89%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-13	0.09%	0.90%	0.91%	0.81%	0.96%	0.04%	0.02%	0.25%	0.18%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.22%	1.30%	1.23%	1.82%	0.62%	0.03%	0.19%	1.40%	0.77%	0.00%	0.01%	0.24%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Nov-13	0.49%	1.32%	1.96%	1.29%	0.92%	0.22%	0.64%	0.45%	0.73%	0.47%	0.05%	0.53%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-13	1.64%	1.93%	1.04%	2.45%	2.30%	0.02%	1.12%	1.41%	2.36%	1.26%	0.50%	0.59%
	c) Connections with good voice quality	>=95%	Nov-13	97.76%	97.67%	96.06%	96.52%	96.00%	99.09%	98.06%	97.12%	97.50%	99.26%	99.78%	98.10%
4	No. of POI's having >=0.5% POI congestion		Nov-13	0	0	0	0	0	0	0	0	0	0	0	0

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TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- DEC-13 MONTH

<u>PMR Generation Data</u>		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	0.24%	0.40%	1.30%	0.65%	0.05%	0.27%	0.09%	0.12%	0.13%	0.04%	0.31%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Dec-13	1.43%	0.32%	0.73%	0.00%	0.00%	0.71%	0.22%	0.17%	1.15%	0.00%	0.82%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	99.07%	97.48%	96.41%	98.41%	99.98%	99.69%	98.87%	98.12%	99.32%	99.61%	98.63%	99.09%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-13	0.27%	0.94%	0.50%	0.78%	0.56%	0.03%	0.03%	0.18%	0.11%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.10%	1.25%	1.31%	1.74%	0.76%	0.03%	0.23%	1.38%	0.68%	0.01%	0.01%	0.12%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Dec-13	0.51%	1.27%	1.19%	1.36%	0.82%	0.23%	0.65%	0.44%	0.71%	0.45%	0.15%	0.48%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-13	1.37%	2.84%	2.03%	2.53%	2.24%	0.01%	1.17%	1.26%	2.08%	1.07%	0.52%	0.32%
	c) Connections with good voice quality	>=95%	Dec-13	97.89%	97.69%	97.97%	96.17%	96.35%	99.05%	98.08%	97.20%	97.67%	99.25%	99.78%	96.92%
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-SUD 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 UP(W) circle, all the operators were found meeting benchmark of 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 meeting the benchmark successfully 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 paging channel in CDMA system.

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



▪ **Connection Maintenance (Retainability)**

i. Call Drop Rate:

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

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, all the service providers were found to be meeting the TRAI specified benchmark. The lowest call drop rate (average 0.14 %) 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 (GSM)**. Tata (GSM) could not meet the benchmark with its performance of **6.40 %** during the months of October 2013.

iii. Connections with good voice quality:

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 (JK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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		UPW	19	144396	23440	37498	431737	18039	25338	NA	180252	6026	64170	31240
	B) No. of bills disputed including billing complaints during the quarter		UPW	0	35	0	14	212	15	0	NA	96	6	60	0
	C) % of billing complaints during the quarter	<= 0.1%	UPW	0.00%	0.02%	0.00%	0.04%	0.05%	0.08%	0.00%	NA	0.05%	0.10%	0.09%	0.00%
2	Metering & Billing Credibility -Pre Paid														
	A) Total No. of Pre-paid customers at the end of the quarter		UPW	109132	6461077	1142203	3240324	10776392	4311252	3428848	5289486	9204257	300183	1561084	388018
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		UPW	0	1464	11	52	368	4296	1	507	2315	232	1552	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	UPW	0.00%	0.00%	0.00%	0.00%	0.03%	0.10%	0.00%	0.01%	0.03%	0.08%	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		UPW	0	1499	11	66	580	4311	1	507	2411	238	1612	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		UPW	0	1499	11	66	580	4311	1	507	2411	238	1612	0
	C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100% within 4 week	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.0%	100.00%	100.0%

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D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
4 Response time to customers for assistance															
A) Accessibility of call centre/Customer Care	>=95 %	UPW	87.91%	100.00%	99.55%	99.55%	100.00%	98.52%	100.00%	96.29%	100.00%	97.70%	97.73%	100.00%	
B) % call answered by operators(voice to voice) within 60 sec.	>=90 %	UPW	93.17%	92.13%	68.41%	68.41%	95.00%	92.92%	94.00%	96.68%	92.83%	97.20%	93.68%	97.60%	
C) Total no. of call attempts to call centre & customer care nos. during TCBH during the quarter		UPW	15240	1412810	378742	1385276	8856243	2197519	495994	7425982	9612618	146848	1059177	57036	
D) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH during the quarter		UPW	13558	1301613	377038	1379042	8856243	2164996	495994	7150478	9612618	143470	1035134	57036	
5 Termination/closure of service															
A) Total No. of requests for Termination / Closure of service received during the quarter		UPW	0	516	0	140	1152	43	219	NA	516	173	246	446	
B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		UPW	0	516	0	140	1152	43	219	NA	516	173	246	446	
C) % of Termination/ Closure of service within 7 days	<=7d ays	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%	
6 Time taken for refunds of deposits after closures.															
A) No. of Payments/ Refunds due during the quarter		UPW	0	207	0	68	1704	154	75	NA	1495	0	468	66	
B) No. of Payments/ Refunds Cleared during the quarter		UPW	0	207	0	68	1704	154	75	NA	1495	0	468	66	
C)Time taken for refunds of deposits after closures.	100 % withi n 60 days	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%	

*NA-Not Applicable



KEY FINDINGS:

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 $\leq 0.1\%$. Uninor was not having the post paid customers.

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 except **Aircel** were in compliance with respect to the parameter accessibility of call center. The performance of **Aircel** for this parameter was recorded as **87.91%**. **BSNL (UK & UP-W)** has failed to meet the benchmark of calls answered by Operators (voice to voice). It's achievement for this parameter was **68.41%**. The call center is common for BSNL (Uttarakhand) and BSNL (UPW).

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 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 UP(W) CIRCLE- OCT-13 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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%	Live data	0.09%	0.10%	1.00%	0.69%	0.02%	0.14%	0.18%	0.23%	0.06%	0.11%	0.18%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.02%	0.69%	0.00%	0.00%	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	99.04%	98.11%	97.46%	96.48%	99.98%	99.60%	98.88%	97.87%	99.36%	99.58%	98.54%	99.10%
	b) SDCCCH/PAGING Channel congestion	<=1%	Live data	0.05%	0.35%	0.90%	0.71%	0.42%	0.02%	0.07%	0.29%	0.06%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.09%	0.99%	0.98%	1.30%	0.52%	0.04%	0.21%	1.60%	0.64%	0.00%	0.73%	0.04%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.54%	1.38%	1.92%	1.97%	1.00%	0.25%	0.84%	0.49%	0.74%	0.45%	0.20%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	0.00%	1.66%	2.80%	2.40%	2.85%	0.00%	7.26%	2.08%	2.66%	1.30%	0.92%	1.67%
	c) Connections with good voice quality	>=95%	Live data	97.74%	97.50%	95.57%	96.41%	95.61%	99.02%	97.94%	96.96%	97.31%	99.24%	99.75%	98.59%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- NOV-13 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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%	Live data	0.13%	0.09%	1.09%	1.91%	0.03%	0.22%	0.06%	0.19%	0.30%	0.05%	0.25%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.02%	1.01%	0.00%	0.00%	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	98.63%	97.74%	96.98%	95.90%	99.98%	99.68%	99.02%	98.06%	99.33%	99.60%	98.65%	99.17%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.09%	0.68%	0.97%	0.73%	0.35%	0.06%	0.01%	0.46%	0.12%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.28%	1.21%	1.17%	1.87%	0.58%	0.04%	0.18%	1.42%	0.67%	0.01%	0.01%	0.02%
Connection maintenance (retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.49%	1.36%	1.97%	1.52%	0.81%	0.22%	0.60%	0.45%	0.77%	0.45%	0.17%	0.53%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	NP	1.67%	2.88%	3.16%	2.27%	0.00%	4.20%	1.48%	2.45%	1.04%	0.57%	2.58%
	c) Connections with good voice quality	>=95%	Live data	97.73%	97.68%	95.66%	96.31%	96.19%	99.13%	98.09%	97.11%	97.48%	99.24%	99.76%	97.60%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

*NP-Not Provided



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- DEC-13 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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%	Live data	0.13%	0.10%	1.42%	1.09%	0.05%	0.20%	0.06%	0.04%	0.33%	0.01%	0.45%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.24%	1.75%	0.00%	0.00%	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	98.98%	97.58%	96.72%	97.91%	99.97%	99.74%	98.98%	98.17%	99.40%	99.58%	98.29%	99.21%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.17%	0.83%	0.87%	0.73%	0.33%	0.02%	0.05%	0.21%	0.10%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.09%	1.22%	1.72%	1.74%	0.72%	0.04%	0.20%	1.36%	0.60%	0.01%	0.01%	0.02%
Connection maintenance (retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.52%	1.23%	1.77%	1.47%	0.79%	0.16%	0.61%	0.42%	0.72%	0.40%	0.19%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	5.66%	1.70%	2.74%	2.39%	2.59%	0.00%	4.31%	1.00%	2.16%	0.87%	0.57%	1.19%
	c) Connections with good voice quality	>=95%	Live data	97.87%	97.69%	97.17%	96.78%	96.44%	99.29%	98.07%	97.15%	97.60%	99.25%	99.76%	NP
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

*NP-Not Provided

KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days live measurement assessment, it was found that the performance of the operators was in compliance for most of the parameters 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.

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 its performance as 7.26% (Oct.), 4.20% (Nov.) & 4.31% (Dec.)

BSNL (Uttarakhand) and Aircel also remained non-compliant with its performance as 3.16% (Nov.) & 5.66% (Dec.) respectively.



INTER OPERATOR CALLS ASSESSMENT

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in UP(W) 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 (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
AIRCEL	UPW	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
AIRTEL	UPW	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
BSNL (UK)	UPW	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
BSNL (UP-W)	UPW	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
IDEA	UPW	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
RCOM GSM	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
TATA GSM	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%
UNINOR	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%
VODAFONE	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%
MTS	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%
RCOM CDMA	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%
TATA CDMA	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--

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



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 (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators									CDMA Operators		
1	A) Accessibility of call centre/Customer Care	>=95%	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	98.88%	100.00%	96.35%	100.00%	97.35%	97.49%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	UPW	85.00%	95.00%	91.97%	91.65%	97.33%	95.10%	92.00%	97.34%	90.00%	97.49%	94.60%	97.00%

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE													
	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
Total No. of calls Attempted	UPW	100	100	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	UPW	100	100	100	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	UPW	100	100	100	100	100	100	100	100	100	100	100	100
%age of calls got answered	UPW	100.00%	100.00%	100.00%	100.00%	100.00%	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 Aircel which could perform with 85.00% of calls connected to operator within 60 seconds.

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, all operators were able to connect the calls with their call center operators/agents successfully.



LEVEL-1 LIVE CALLING

LEVEL 1 LIVE CALLING														
Emergency no.	Circle Name	No. of calls made	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
101	UPW	50	50	50	50	50	50	50	50	50	50	50	50	50
102	UPW	50	50	50	50	50	50	50	50	50	50	50	50	50
100	UPW	30	30	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 UP (W) 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 UP (W) Service area, total 99 drive tests in three months of the quarter ended December 2013 @ of 3 drive tests per operator per month (total 3x11x3=99 drive tests) were conducted covering Meerut, Muzaffarnagar and Baghpat during the month of October-13, Haridwar, Dehradun and Tehri during November -13 and Agra, Hathras and Mathura cities during December-2013. 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 routes were so selected that the drive test could cover the congested areas/commercial areas of the above 09 cities in UP (W) 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

OPERATOR-ASSISTED DRIVE TEST-UP(W) CIRCLE-OCT-13 MONTH														
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators				
1	Blocked Call Rate (<=3%)	Meerut	Oct-13	NS	0.00%	ND	0.00%	1.39%	0.00%	1.72%	0.00%	0.00%	0.71%	0.00%
		Muzaffarnagar	Oct-13	NS	0.00%	ND	1.16%	2.08%	0.00%	1.82%	0.00%	ICR	0.00%	0.00%
		Baghpat	Oct-13	NS	0.00%	ND	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	2.74%	0.00%
2	Dropped Call Rate (<=2%)	Meerut	Oct-13	NS	0.00%	ND	0.00%	0.70%	0.92%	1.75%	0.00%	0.00%	0.00%	0.00%
		Muzaffarnagar	Oct-13	NS	0.00%	ND	0.00%	2.13%	0.00%	0.93%	0.00%	ICR	0.00%	0.00%
		Baghpat	Oct-13	NS	0.00%	ND	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	0.00%	0.00%
Percentage connections with good voice quality (=>95%)														
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Meerut	Oct-13	NS	NA	ND	NA	NA	NA	NA	NA	99.34%	95.56%	98.01%
		Muzaffarnagar	Oct-13	NS	NA	ND	NA	NA	NA	NA	NA	ICR	92.60%	98.14%
		Baghpat	Oct-13	NS	NA	ND	NA	NA	NA	NA	NA	ICR	97.47%	99.63%
	(b) 0-5 (with frequency hopping for GSM Operators)	Meerut	Oct-13	NS	95.56%	ND	96.31%	92.43%	95.60%	95.08%	96.82%	NA	NA	NA
		Muzaffarnagar	Oct-13	NS	95.78%	ND	97.10%	90.40%	96.15%	95.11%	96.40%	ICR	NA	NA
		Baghpat	Oct-13	NS	98.82%	ND	98.22%	96.52%	97.58%	95.09%	97.72%	ICR	NA	NA
Service Coverage														
4	In door (>= -75dBm)	Meerut	Oct-13	NS	78.10%	ND	97.05%	87.13%	79.40%	60.83%	75.52%	90.06%	96.96%	100.00%
		Muzaffarnagar	Oct-13	NS	88.09%	ND	96.86%	73.74%	72.89%	68.42%	92.03%	ICR	95.30%	100.00%
		Baghpat	Oct-13	NS	75.68%	ND	97.13%	92.50%	42.69%	65.64%	90.83%	ICR	50.67%	100.00%
	In-vehicle (>= -85dBm)	Meerut	Oct-13	NS	96.65%	ND	99.74%	98.90%	97.46%	91.30%	97.35%	99.58%	99.99%	100.00%
		Muzaffarnagar	Oct-13	NS	99.43%	ND	99.99%	89.25%	98.49%	94.01%	98.93%	ICR	100.00%	100.00%
		Baghpat	Oct-13	NS	97.26%	ND	99.98%	99.05%	49.50%	92.24%	99.74%	ICR	96.27%	109.00%
	Outdoor- in city (>= -95dBm)	Meerut	Oct-13	NS	99.86%	ND	100.00%	99.96%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%
		Muzaffarnagar	Oct-13	NS	99.99%	ND	100.00%	98.46%	100.00%	100.00%	100.00%	ICR	100.00%	100.00%
		Baghpat	Oct-13	NS	99.90%	ND	100.00%	100.00%	51.29%	100.00%	100.00%	ICR	100.00%	109.00%
5	Call Setup Success Rate (>=95%)	Meerut	Oct-13	NS	100.00%	ND	100.00%	98.61%	100.00%	98.28%	100.00%	100.00%	99.29%	100.00%
		Muzaffarnagar	Oct-13	NS	100.00%	ND	98.84%	97.92%	100.00%	98.18%	100.00%	ICR	100.00%	100.00%
		Baghpat	Oct-13	NS	100.00%	ND	100.00%	100.00%	100.00%	100.00%	100.00%	ICR	97.26%	100.00%

- NS-Not in Service
- ND-Not Done: BSNL did not turn up for drive test despite TUV –SUD follow up.
- ICR-Intra Circle Roaming
- NA-Not Applicable



DRIVE TEST TABLE: 2

OPERATOR-ASSISTED DRIVE TEST-UP(W) CIRCLE-NOV-13 MONTH														
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators		
1	Blocked Call Rate (<=3%)	Haridwar	Nov-13	NS	0.00%	2.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Dehradun	Nov-13	1.89%	0.98%	15.65%	0.50%	0.93%	ICR	0.00%	0.00%	0.00%	0.88%	0.00%
		Tehri	Nov-13	NS	0.00%	2.70%	0.00%	ICR	0.00%	0.00%	0.00%	NS	1.81%	NS
2	Dropped Call Rate (<=2%)	Haridwar	Nov-13	NS	0.00%	1.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Dehradun	Nov-13	0.00%	0.00%	2.06%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.89%	0.00%
		Tehri	Nov-13	NS	0.00%	8.11%	2.04%	ICR	0.00%	0.00%	0.00%	NS	1.85%	NS
Percentage connections with good voice quality (=>95%)														
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Haridwar	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	99.02%	97.45%	97.10%
		Dehradun	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	99.01%	92.00%	98.10%
		Tehri	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	NS	96.30%	NS
	(b) 0-5 (with frequency hopping for GSM Operators)	Haridwar	Nov-13	NS	96.32%	100.00%	97.98%	95.13%	95.25%	95.04%	97.11%	NA	NA	NA
		Dehradun	Nov-13	98.14%	95.22%	95.46%	96.58%	93.42%	ICR	95.62%	96.63%	NA	NA	NA
		Tehri	Nov-13	NS	98.27%	95.21%	96.80%	ICR	99.38%	97.03%	96.86%	NA	NA	NA
Service Coverage														
4	In door (>= -75dBm)	Haridwar	Nov-13	NS	98.78%	68.09%	96.45%	88.44%	93.99%	68.89%	94.31%	86.38%	98.01%	94.95%
		Dehradun	Nov-13	98.10%	97.30%	79.63%	99.91%	86.51%	ICR	73.24%	88.17%	99.56%	99.95%	86.85%
		Tehri	Nov-13	NS	87.75%	81.87%	92.59%	ICR	76.36%	52.55%	93.05%	NS	60.31%	NS
	In-vehicle (>= -85dBm)	Haridwar	Nov-13	NS	99.94%	93.32%	99.78%	99.81%	99.40%	92.09%	99.18%	99.60%	99.80%	100.00%
		Dehradun	Nov-13	99.98%	99.60%	98.65%	100.00%	98.31%	ICR	95.37%	99.45%	100.00%	100.00%	99.86%
		Tehri	Nov-13	NS	96.54%	99.17%	99.52%	ICR	93.30%	86.40%	99.16%	NS	87.08%	NS
	Outdoor- in city (>= -95dBm)	Haridwar	Nov-13	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.92%	100.00%	100.00%
		Dehradun	Nov-13	100.00%	99.87%	100.00%	100.00%	99.68%	ICR	100.00%	99.88%	100.00%	100.00%	100.00%
		Tehri	Nov-13	NS	99.74%	99.95%	100.00%	ICR	100.00%	100.00%	99.90%	NS	100.00%	NS
5	Call Setup Success Rate (>=95%)	Haridwar	Nov-13	NS	100.00%	97.92%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Dehradun	Nov-13	98.11%	99.02%	84.35%	99.50%	99.07%	ICR	98.18%	100.00%	100.00%	99.12%	100.00%
		Tehri	Nov-13	NS	100.00%	94.59%	100.00%	ICR	100.00%	100.00%	100.00%	NS	98.18%	NS

- NS-Not in Service
- ICR-Intra Circle Roaming
- NA-Not Applicable

AUDIT & ASSESSMENT OF QOS FOR QE-DECEMBER-2013-UP (WEST) CIRCLE



DRIVE TEST TABLE: 3

OPERATOR-ASSISTED DRIVE TEST-UP(W) CIRCLE-DEC-13 MONTH														
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators							CDMA Operators			
1	Blocked Call Rate (<=3%)	Agra	Dec-13	0.77%	0.00%	0.00%	0.00%	2.14%	ICR	5.49%	0.00%	0.00%	0.71%	0.00%
		Hathras	Dec-13	NS	0.00%	7.36%	0.00%	0.00%	0.00%	0.88%	0.00%	ICR	0.00%	0.00%
		Mathura	Dec-13	NS	0.00%	6.84%	0.00%	2.20%	0.00%	1.16%	0.00%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Agra	Dec-13	1.54%	0.00%	3.13%	0.00%	0.00%	ICR	0.00%	0.00%	0.00%	0.00%	0.86%
		Hathras	Dec-13	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	ICR	1.09%	0.00%
		Mathura	Dec-13	NS	0.00%	0.00%	0.00%	1.10%	0.88%	0.00%	0.00%	0.00%	3.30%	0.00%
Percentage connections with good voice quality (=>95%)														
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Agra	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	98.26%	98.03%	97.51%
		Hathras	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	ICR	99.84%	97.29%
		Mathura	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	98.10%	99.35%	95.88%
	(b) 0-5 (with frequency hopping for GSM Operators)	Agra	Dec-13	96.16%	97.02%	92.92%	96.72%	91.98%	ICR	96.08%	96.70%	NA	NA	NA
		Hathras	Dec-13	NS	98.92%	90.94%	100.00%	97.56%	95.15%	96.07%	97.57%	NA	NA	NA
		Mathura	Dec-13	NS	97.21%	93.03%	95.81%	92.35%	96.72%	96.12%	97.04%	NA	NA	NA
Service Coverage														
4	In door (>= -75dBm)	Agra	Dec-13	87.36%	89.20%	46.20%	98.53%	88.26%	ICR	73.39%	97.70%	87.91%	92.66%	94.35%
		Hathras	Dec-13	NS	90.70%	96.69%	99.82%	74.16%	71.50%	80.37%	94.51%	ICR	82.13%	76.39%
		Mathura	Dec-13	NS	83.20%	56.94%	99.24%	80.44%	92.15%	77.85%	98.94%	87.96%	76.50%	73.52%
	In-vehicle (>= -85dBm)	Agra	Dec-13	97.71%	98.27%	89.84%	99.99%	99.04%	ICR	95.80%	99.58%	98.18%	99.95%	99.74%
		Hathras	Dec-13	NS	99.67%	99.50%	99.99%	91.91%	95.50%	98.51%	99.76%	ICR	97.60%	98.37%
		Mathura	Dec-13	NS	98.05%	91.90%	99.99%	95.35%	99.37%	96.29%	99.77%	99.87%	92.10%	99.05%
	Outdoor- in city (>= -95dBm)	Agra	Dec-13	99.93%	99.81%	100.00%	100.00%	99.99%	ICR	100.00%	99.89%	100.00%	100.00%	100.00%
		Hathras	Dec-13	NS	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	99.96%	ICR	100.00%	99.98%
		Mathura	Dec-13	NS	99.94%	99.54%	100.00%	100.00%	100.00%	99.97%	99.95%	100.00%	99.34%	99.98%
5	Call Setup Success Rate (>=95%)	Agra	Dec-13	99.23%	100.00%	96.92%	100.00%	97.86%	ICR	94.51%	100.00%	100.00%	99.29%	100.00%
		Hathras	Dec-13	NS	100.00%	92.64%	100.00%	100.00%	100.00%	99.12%	100.00%	ICR	100.00%	100.00%
		Mathura	Dec-13	NS	100.00%	93.16%	100.00%	97.80%	100.00%	98.84%	100.00%	100.00%	100.00%	100.00%

- NS-Not in Service
- ICR-Intra Circle Roaming
- NA-Not Applicable



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Drive Test UPW Circle Oct-13 to Dec-13						
Month/Year	City	P1	P2	Across	Congested	In Building
Oct-13	MEERUT	PARTAPUR BYPASS, BIT,MIET,SARDHNA COWK,KRISHNA PUBLIC SCHOOL,RELIANCE-MCN2,MODIPURAM,MIL ANGE MALL	MILANGE MALL,MODIPURAM,RELIANCE MCN2,KRISHNA PUBLIC SCHOOL,SARDHNA CHOWK,MIET,BIT ,PARTAPUR BYPASS	MEDICAL COLLEGE,TEJ GADI,SOHRAB GATE,HAPUR ADDA,EVIJ CHOK,BCCHA PARK,BEGUM BRIDGE	BEGUM BRIDGE,DELHI ROADWAYS BUS STAND, SADAR,TEERTHAN KAR MHAVEER CHOWK, BAGHPAT ADDA, FOOTBALL CHOWK,FLYOVER SBJI MANDI	KRISHNA PLAZA TEJGADI
	MUZZAFFARNAGAR	RANA CHOWK,SUJDU CHUNGI,DM RESIDENCE,MEENAKSHI CHOWK,SHIV CHOWK,AHILYA BAI CHOWK, DISTT. HOSPITAL, RAMPUR TIRAHA,MUZZAFFARANGAR BYPASS,RANA CHOWK	RANA CHOWK,MUZZAFFARNAGAR BYPASS,RAMPUR TIRAHA,DISTT. HOSPITAL, AHILYA BAI CHOWK, SHIV CHOWK, MEENAKSHI CHOWK,DM RESIDENCE, SUJDU CHUNGI, RANA CHOWK	JANSATH BYPASS BRIDGE,S.D. ENGINEERING COLLEGE,ALM ASPUR CHOWK,JANSATH ADDA,RAILWAY OVER BRIDGE,MHAVIR CHOWK,MEENAKSHI CHOWK	MHAVIR CHOWK,PRAKASH CHOWK,ROADWAYS BUS STAND,RAILWAY STATION,OMEGA HOTEL,BHOPA OVERBRIDGE,NEW MANDI,BHOPA ROAD, GRAND PLAZA MALL	GRAND PLAZA MALL
	BAGHPAT	BAGHPAT BYPASS CHOWK AT MEERUT ROAD, MHILATHANA,DELHI BAGHPAT ROAD,MAIN CHOWK,MEERUT ROAD,BAGHPAT BYPASS CHOWK	BAGHPAT BYPASS CHOWK,MEERUT ROAD, MAIN CHOWK,DELHI BAGHPAT ROAD,MHILATHANA,BAGHPAT BYPASS CHOWK	Nasha mukti kendra-Delhi road-Yes bank-Badaut road-Cent Jyoti high school	Mahila police thana-Chamrawal road-Bus stand-Mohalla Khurshyan	YES BANK
Nov-13	HARIDWAR	SINGHDWAR-HAR KI PAUDI-SHANTIKUNJ-BHEEMGODA-NH-58 TOWARDS RORKEE-SINGHDWAR	RANIPUR MODE-BHEL-INDUSTRIAL AREA-BILKESHWAR COLONY-LALTARA BRIDGE-RANIPUR MODE	RAILWAY STATION-BUS STAND-ARYA NAGAR-SINGHDWAR	RANIPUR MODE-SIDCUL-SHIVALIK NAGAR-RANIPUR MODE	VINAYAK HOTEL



	DEHRADUN	ISBT-GMS ROAD-BALLUPUR CHOWK-CHAKRATA ROAD-GHANTAGHAR	GHANTAGHAR-DHRAMPUR-RISPNA BRIDGE-HARIDWAR BYPASS ROAD-ISBT	SAI TEMPLE-GHNTA GHAR-RAILWAY STATION-ARHAT BZAR-PATEL NAGAR-NIRANJANPUR-ISBT	RACE COURSE-POLICE LINE-GURU GOVIND SINGH CHOWK-ARAGHAR CHOWK-NEHRU COLONY-HIMALYAN INSTITUTE OF TECHNOLOGY	CITY JUNCTION MALL NEAR ISBT
	NEW TEHRI	SHIVMURTI TIRAHA-HANUMAN CHOWK-SHIVMURTI TIRAHA	SHIVMURTI TIRAHA-VIKAS BHWAN-MAGISTRATE HOUSE-SSP OFFICE-DISTT. HOSPITAL	NOT DONE DUE TO NON AVAILABILTY OF CENTRAL ROAD IN TEHRI DUE TO HILLY TERRAIN	JAI BADRI KEDAR LODGE-KENDIRYA VIDHYALYA-POST OFFICE-RADHA SWAMI STSANG BHWAN-GAUSHALA-ANCHAL DAIRY-SARASWATI SHISHU MANDIR	RADHA SWAMI STSANG BHWAN
Dec-13	AGRA	PIZZA HUT-BHGWAN TALKIZ-DISTT COURT-ISBT-GURU KA TAL GURUDWARA-FORTIS HOSPITAL-SIKANDRA-MARIUM TOMB-BHGWATI DHABA-MOOLCHAND MEDICITY-OP GARDENS-ARTONI	ARTONI-OP GARDEN-MOOLCHAND MEDICITY-BHAGWATI DHABA-MARIUM TOMB-SIKANDRA-FORTIS HOSPITAL-GURU KA TAL GURUDWARA-ISBT-DISTT COURT-BHGWAN TALKIZ-PIZA HUT	SHREE TALKIZ-SANJAY PALACE-ST.JOHN'S CROSSING-DHOLPUR HOUSE CROSSING-SAI KI TAKIA-PARTAPURA-AJMER ROAD-MALL ROAD-AGRESAN CHOWK-TAJ MAHAL	KHANDARI-DYAL BAGH-NTRAJ PURAM-KAMLA NAGAR-BALKESHWAR COLONY-NYI ABADI-MG ROAD-BHAGWAN TALKIZ	PIZZA HUT NEAR TAJ MAHAL
	MATHURA	MSANI-GOVERDHAN CHOWK-MANDI CHOWK-REFINERY TOWN-REFINERY GATE NO. 9	REFINERY GATE NO. 9 AGRA ROAD-REFINERY TOWN-MANDI CHOWK-GOVERDHAN CHOWK-MSANI	MSANI-GOVERDHAN CHOWK-BHUTESHWAR-MATHURA CANTT.-MOTI KUNJ-OLD RTO OFFICE	RAILWAY STATION-DAMPERE NAGAR-VIKAS BAZAR-DISTT. HOSPITAL-KOTWALI MATHURA-MSANI	HIGHWAY PLAZA



	HATHRAS	TRIPURARI NAGAR- MATHURA ROAD- SUJATA HOSPITAL- RAM DARBAR CHOWK- RAM BAGH INTER COLLEGE-ALIGARH ROAD-KACCHARI	KACHHARI- ALIGARH ROAD- RAM BAGH INTER COLLEGE- RAM DARBAR CHOWK-SUJATA HOSPITAL- MATHURA ROAD- TRIPURARI NAGAR	CHAKKI BZAR- CHAMAR GATE- JALESAR ROAD-SYAM NAGAR- MADHAVGADI- KILAGATE-JAIN TEMPLE NYAGANJ- PTTHAR BZAR- MOTI BZAR- BANS MANDI- MURSAN GATE- TRIPURARI NAGAR	HARI EYE HOSPITAL- GAUSHALA ROAD-RAILWAY STATION- SDABAD GATE- KOTWALI-TALAB CHOURAHA- GHANTAGHAR- KHATIKHANA CHOURAHA- RAILWAY YARD	SARASWAT I INTER COLLEGE
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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 two cities (Dehradun and Agra) out of 9 cities where drive tests were carried out during the quarter. Tata (GSM) is on ICR with Aircel at Dehradun and Agra.
 - (b) MTS is not having its services in Tehri and is on Intra circle roaming (ICR) with Tata (CDMA) in Muzaffarnagar, Baghpat and Hathras.
 - (c) TATA (CDMA) has no service in Tehri .
 - (d) 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.
- (ii) **In the Month of October-13**, drive tests were conducted at Meerut, Muzaffarnagar and Baghpat. BSNL did not turn up for drive test. **RCOM (GSM)** failed to meet the benchmark for parameter 'Good Voice Quality' and Dropped Call Rate (DCR). Its performance for Voice Quality was **92.43%** & **90.40%** at Meerut & Muzaffarnagar respectively and for parameter DCR; it was **2.13 %** at Muzaffarnagar. **RCOM (CDMA)** also could meet the benchmark of Voice Quality at Muzaffarnagar with its performance as **92.60 %**.
- (iii) **In the Month of November-13**, drive test was conducted at Hardwar, Dehradun and Tehri cities. The results of the drive tests carried out in this month revealed that performance of **BSNL** was way beyond the benchmark of parameters Blocked Call rate at Dehradun (**15.65%**), Dropped Call rate at Tehri (**8.11%**) and Call setup Success Rate (CSSR) at Dehradun (**84.35%**) and at Tehri (**94.59%**). The performance of **RCOM (GSM)** and **RCOM (CDMA)** for parameter 'Good Voice Quality' was recorded as **93.42 %** and **92.00%** respectively at Dehradun. Thus service providers need to improve their network quality in these cities for one or the other parameters.
- (iv) **In the month of December-13**, drive test was conducted at Agra, Hathras and Mathura. The drive test results suggest that **BSNL**, **RCOM** and **Uninor** should improve its network quality in these cities for some of the parameters. **BSNL** could not meet the benchmarks of parameters Blocked Call Rate at Hathras (**7.36%**) & Mathura (**6.84%**), Good Voice Quality at Agra (**92.92%**), Hathras (**90.94%**) & Mathura (**93.03%**) and CSSR at Hathras (**92.64%**) & Mathura (**93.16%**). **RCOM (GSM)** failed to meet the benchmark for the parameter Good Voice Quality at Agra and Mathura with its performance as **91.98 %** and **92.35 %** respectively, whereas **RCOM (CDMA)** failed to meet benchmark of DCR with performance as **3.30 %** at Mathura. **Uninor** was lagging behind in meeting the benchmark of Blocked call rate (5.49%) and CSSR (**94.51%**) at Agra

Thus, the parameters Voice Quality ,DCR , Blocked Call Rate and CSSR remained non-compliant repeatedly for BSNL and RCOM (GSM/CDMA) in different cities where drive tests were conducted during the quarter ended December 2013. The service providers need to improve their network quality with respect to these parameters.

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 UP(W) is satisfactory for **Network Parameters** as most of the parameters were found to be complied with during monthly QoS audit except only one parameter namely '**Worst affected cells having > 3% TCH drop**' which could not be met by Tata (GSM) in the month of October 2013. In case of 3 days live measurements, this parameter also remained non-compliant by BSNL, Tata (GSM) and Aircel in different months of the quarter.

With regard to the **Customer Service Quality Parameters**, all service providers were found to have complied with the most of the parameters. However, the benchmark of parameter 'Accessibility of call center' could not be met by Aircel with its performance as 87.91% and the benchmark of parameter 'Calls answered by Operators (voice to voice) within 60 seconds' could not be met by BSNL (UK & UP-W) with their performance as 68.41%. The call center is common for BSNL (Uttarakhand) and BSNL (UPW).

The performance of the service providers with regard to the drive test, revealed that the parameters Voice Quality, DCR, Blocked Call Rate and CSSR remained non-compliant repeatedly for BSNL and RCOM (GSM/CDMA) in different cities where drive tests were conducted during the quarter ended December 2013. The service providers need to improve their network quality with respect to these parameters.



7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- Oct-13 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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		Oct-13	628	6602	2172	835	6702	2415	1797	2893	6109	323	1327	642
	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	1041.99	8479.15	16251	4032.37	1693	154	1771.99	4480.55	8958.36	167.50	2860	78.08
	c) BTS Accumulated Downtime	<=2%	Oct-13	0.22%	0.17%	1.01%	0.65%	0.03%	0.01%	0.13%	0.21%	0.20%	0.07%	0.27%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-13	10	35	42	0	0	29	10	30	67	0	12	0
	e) Worst affected BTSs due to downtime	<=2%	Oct-13	1.59%	0.53%	1.93%	0.00%	0.00%	1.20%	0.84%	1.04%	1.10%	0.00%	0.90%	0.00%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	98.81%	97.79%	97.71%	96.45%	99.98%	99.63%	98.88%	97.99%	99.40%	99.55%	98.28%	98.95%
	b) SDCCH/PAGING Congestion	<=1%	Oct-13	0.15%	0.61%	0.94%	0.65%	0.49%	0.03%	0.02%	0.20%	0.14%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.15%	1.12%	1.05%	1.60%	0.55%	0.03%	0.18%	1.49%	0.60%	0.00%	0.02%	0.13%
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Oct-13	0.58%	1.28%	1.96%	1.71%	0.98%	0.24%	0.73%	0.47%	0.75%	0.47%	0.22%	0.60%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-13	2.01%	1.65%	1.06%	2.61%	2.46%	0.01%	6.40%	2.00%	1.13%	1.46%	0.65%	0.69%
	c) % of connections with good voice	>=95%	Oct-13	97.64%	97.51%	95.34%	96.52%	95.94%	99.63%	97.94%	97.07%	97.45%	99.27%	99.78%	98.14%

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	quality													
	d) d) Total No. of cells exceeding 3% TCH drop (call drop)	Oct-13	38	329	68	66	495	1	345	176	208	15	26	14
	e) Total no. of cells (Sector) in the licensed service area	Oct-13	1892	19887	6464	2512	20122	7245	5400	8776	18376	1029	3981	2037
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	0	0
	Name of POI not meeting the benchmark	Oct-13	0	0	0	0	0	0	0	0	0	0	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang	Oct-13	28577.40	204929	195390	118000	272481	122000	80000	150550.55	259310.73	21000	86000	219227
	b) Total traffic in TCBH in erlang (Avg.)	Oct-13	161	145379.61	94182	298024	276074	94985	51988.50	168594.75	238511.12	3299.06	32451	33146.94
	c) Total no. of customers served (as per VLR) on last day of the month	Oct-13	24369	5871267	1475158	753643	10721825	4246945	1580063	4066727	9003518	125338	1516733	476460

AUDIT & ASSESSMENT OF QOS FOR QE-DECEMBER-2013-UP (WEST) CIRCLE



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(W) Circle- Oct-13 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (JK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	628	6569	2172	835	6678	2419	1797	2891	6109	323	1332	642
	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	14.13	479.57	1554.60	415.77	128	238.67	80.09	484.49	259.45	24.60	174.96	8.26
	c) BTS Accumulated Downtime	<=2%	Live data	0.09%	0.10%	1.00%	0.69%	0.02%	0.14%	0.18%	0.23%	0.06%	0.11%	0.18%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	1	15	0	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.02%	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.04%	98.11%	97.46%	96.48%	99.98%	99.60%	98.88%	97.87%	99.36%	99.58%	98.54%	99.10%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.05%	0.35%	0.90%	0.71%	0.42%	0.02%	0.07%	0.29%	0.06%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.09%	0.99%	0.98%	1.30%	0.52%	0.04%	0.21%	1.60%	0.64%	0.00%	0.73%	0.04%
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Live data	0.54%	1.38%	1.92%	1.97%	1.00%	0.25%	0.84%	0.49%	0.74%	0.45%	0.20%	0.55%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	0.00%	1.66%	2.80%	2.40%	2.85%	0.00%	7.26%	2.08%	2.66%	1.30%	0.92%	1.67%
	c) % of connections with good voice quality	>=95%	Live data	97.74%	97.50%	95.57%	96.41%	95.61%	99.02%	97.94%	96.96%	97.31%	99.24%	99.75%	98.59%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	NP	329	182	62	575	0	285	182	489	13	37	84
	e) Total no. of cells (Sector) in the licensed service area		Live data	NP	19774	6484	2585	20166	7246	5435	8723	18397	1029	3996	2037
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

• NP-Not Provided

AUDIT & ASSESSMENT OF QOS FOR QE-DECEMBER-2013-UP (WEST) CIRCLE



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- Nov-13 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	628	6576	2182	837	6772	2378	1825	2893	6109	323	1342	643
	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	679.42	6537.7	19792	4030	1305	4057	937.16	2754.71	6995.81	113.12	2587	58.21
	c) BTS Accumulated Downtime	<=2%	Nov-13	0.15%	0.13%	1.26%	0.67%	0.03%	0.24%	0.07%	0.13%	0.16%	0.05%	0.29%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-13	6	21	41	0	0	18	2	17	0	0	8	0
	e) Worst affected BTSs due to downtime	<=2%	Nov-13	0.96%	0.32%	1.88%	0.00%	0.00%	0.76%	0.11%	0.59%	0.00%	0.00%	0.60%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	99.04%	97.25%	97.91%	97.04%	99.95%	99.69%	98.92%	98.07%	99.23%	99.60%	98.71%	98.89%
	b) SDCCH/PAGING Congestion	<=1%	Nov-13	0.09%	0.90%	0.91%	0.81%	0.96%	0.04%	0.02%	0.25%	0.18%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.22%	1.30%	1.23%	1.82%	0.62%	0.03%	0.19%	1.40%	0.77%	0.00%	0.01%	0.24%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Nov-13	0.49%	1.32%	1.96%	1.29%	0.92%	0.22%	0.64%	0.45%	0.73%	0.47%	0.05%	0.53%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-13	1.64%	1.93%	1.04%	2.45%	2.30%	0.02%	1.12%	1.41%	2.36%	1.26%	0.50%	0.59%
	c) % of connections with good voice quality	>=95%	Nov-13	97.76%	97.67%	96.06%	96.52%	96.00%	99.09%	98.06%	97.12%	97.50%	99.26%	99.78%	98.10%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-13	31	378	68	63	466	2	62	124	435	13	20	12

AUDIT & ASSESSMENT OF QOS FOR QE-DECEMBER-2013-UP (WEST) CIRCLE



	e) Total no. of cells (Sector) in the licensed service area	Nov-13	1892	19553	6493	2588	20286	7134	5522	8778	18376	1029	4026	2040
No. of POI's having >=0.5% POI congestion														
4	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
Network Data														
5	a) Equipped Capacity of Network in Erlang	Nov-13	28577.4	204199.90	195390	118000	268358	122000	80000	152882.90	258770.09	21000	86000	219596
	b) Total traffic in TCBH in erlang (Avg.)	Nov-13	194.39	144380.24	97492.95	297839	274859	95565.13	32338.54	171031.66	240972.27	3033.75	32531.61	30457.06
	c) Total no. of customers served (as per VLR) on last day of the month	Nov-13	24583	5831136	1480957	854124	10876043	4042904	1598128	4165093	8170959	137289	1486022	451534



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(W) Circle- Nov-13 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	628	6575	2179	837	6703	2378	1819	2893	6109	323	1291	643
	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	56.57	432.87	1714	1149.86	150	373	79.91	388.40	1333.13	13.21	229	0
	c) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.09%	1.09%	1.91%	0.03%	0.22%	0.06%	0.19%	0.30%	0.05%	0.25%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	1	22	0	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.02%	1.01%	0.00%	0.00%	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	98.63%	97.74%	96.98%	95.90%	99.98%	99.68%	99.02%	98.06%	99.33%	99.60%	98.65%	99.17%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.09%	0.68%	0.97%	0.73%	0.35%	0.06%	0.01%	0.46%	0.12%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.28%	1.21%	1.17%	1.87%	0.58%	0.04%	0.18%	1.42%	0.67%	0.01%	0.01%	0.02%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.49%	1.36%	1.97%	1.52%	0.81%	0.22%	0.60%	0.45%	0.77%	0.45%	0.17%	0.53%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	NP	1.67%	2.88%	3.16%	2.27%	0.00%	4.20%	1.48%	2.45%	1.04%	0.57%	2.58%
	c) % of connections with good voice quality	>=95%	Live data	97.73%	97.68%	95.66%	96.31%	96.19%	99.13%	98.09%	97.11%	97.48%	99.24%	99.76%	97.60%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	NP	331	187	82	461	0	231	130	457	11	22	53
	e) Total no. of cells (Sector) in the licensed service area		Live data	1892	19806	6484	2587	20300	7153	5504	8778	18655	1029	3873	2040
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

• NP-Not Provided

AUDIT & ASSESSMENT OF QOS FOR QE-DECEMBER-2013-UP (WEST) CIRCLE



TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- Dec-13 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (JK)	IDEA	RCOM GSM	TATA GSM	UNINOR	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	628	6557	2182	837	6976	2386	1842	2894	6109	323	1346	591
	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	1110.7	19294.38	21073	4061.59	2315	4730	1204.77	8626.95	5812.05	103.31	3117	85.79
	c) BTS Accumulated Downtime	<=2%	Dec-13	0.24%	0.40%	1.30%	0.65%	0.05%	0.27%	0.09%	0.12%	0.13%	0.04%	0.31%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-13	9	21	16	0	0	17	4	5	45	0	11	0
	e) Worst affected BTSs due to downtime	<=2%	Dec-13	1.43%	0.32%	0.73%	0.00%	0.00%	0.71%	0.22%	0.17%	1.15%	0.00%	0.82%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	99.07%	97.48%	96.41%	98.41%	99.98%	99.69%	98.87%	98.12%	99.32%	99.61%	98.63%	99.09%
	b) SDCCH/PAGING Congestion	<=1%	Dec-13	0.27%	0.94%	0.50%	0.78%	0.56%	0.03%	0.03%	0.18%	0.11%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.10%	1.25%	1.31%	1.74%	0.76%	0.03%	0.23%	1.38%	0.68%	0.01%	0.01%	0.12%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Dec-13	0.51%	1.27%	1.19%	1.36%	0.82%	0.23%	0.65%	0.44%	0.71%	0.45%	0.15%	0.48%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-13	1.37%	2.84%	2.03%	2.53%	2.24%	0.01%	1.17%	1.26%	2.08%	1.07%	0.52%	0.32%
	c) % of connections with good voice quality	>=95%	Dec-13	97.89%	97.69%	97.97%	96.17%	96.35%	99.05%	98.08%	97.20%	97.67%	99.25%	99.78%	96.92%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-13	26	558	124	63	462	1	65	110	381	11	21	6

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	e) Total no. of cells (Sector) in the licensed service area	Dec-13	1892	19622	6180	2495	20671	7158	5574	8776	18376	1029	4038	1856	
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	0	0	
	Name of POI not meeting the benchmark	Dec-13	0	0	0	0	0	0	0	0	0	0	0	0	
5	Network Data														
	a) Equipped Capacity of Network in Erlang	Dec-13	28577.40	199774.11	130154	118000	275609.74	122000	115695.61	146646.29	260845.74	21000	86000	109552	
	b) Total traffic in TCBH in erlang (Avg.)	Dec-13	221.41	142504.82	42644	254479	284295.42	93340.54	32663.62	181457.47	245891.90	3190.83	30079.35	28807	
	c) Total no. of customers served (as per VLR) on last day of the month	Dec-13	24156	6068841	1505123	747441	11102468	4081858	1615916	4344304	9264259	135137	1451918	462083	

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TABLE: 6

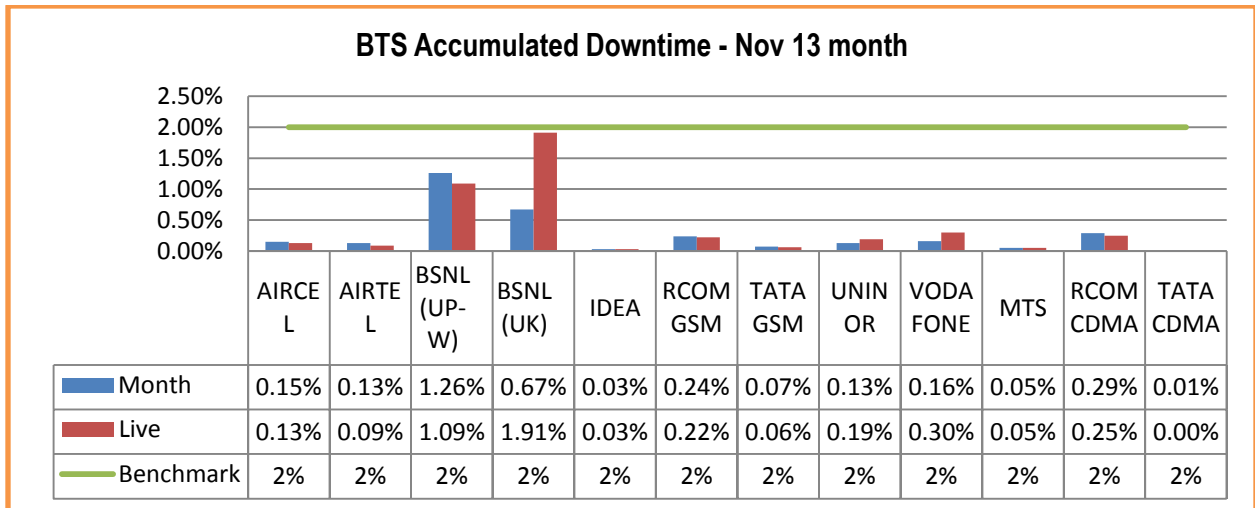
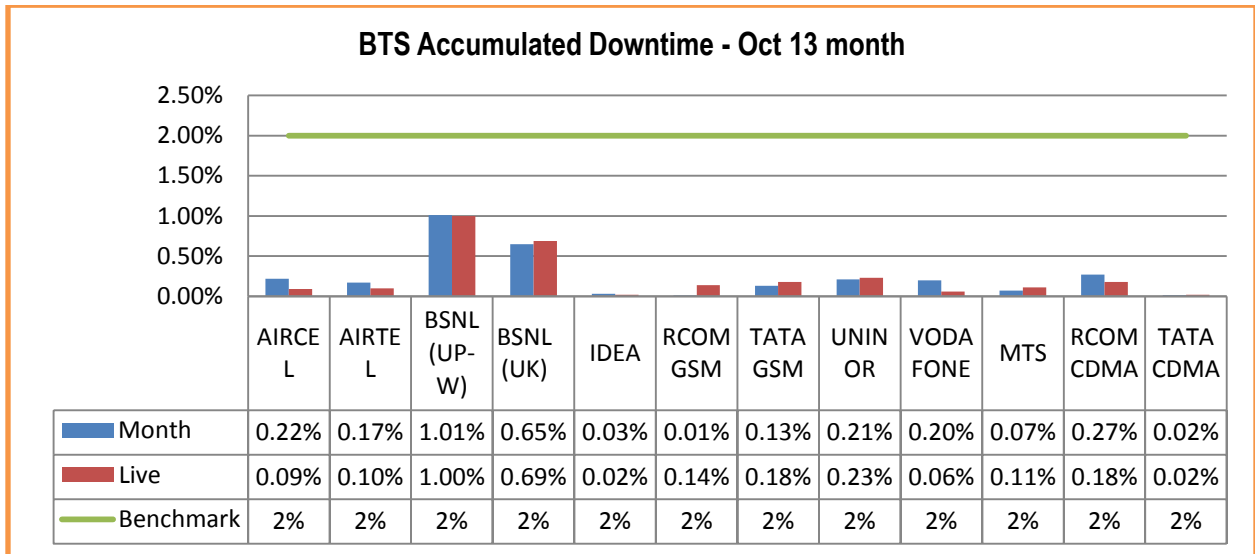
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(W) Circle- Dec-13 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators			
Network Service Quality Parameter															
Network Availability															
1	a) Total no. of BTSs in the licensed service area		Live data	628	6576	2188	837	6779	2378	1828	2891	6109	323	1342	591
	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	60.92	484	2240	656.38	266	344	82.44	74.67	1440.46	3.35	437	0
	c) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.10%	1.42%	1.09%	0.05%	0.20%	0.06%	0.04%	0.33%	0.01%	0.45%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	16	38	0	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.24%	1.75%	0.00%	0.00%	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	98.98%	97.58%	96.72%	97.91%	99.97%	99.74%	98.98%	98.17%	99.40%	99.58%	98.29%	99.21%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.17%	0.83%	0.87%	0.73%	0.33%	0.02%	0.05%	0.21%	0.10%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.09%	1.22%	1.72%	1.74%	0.72%	0.04%	0.20%	1.36%	0.60%	0.01%	0.01%	0.02%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.52%	1.23%	1.77%	1.47%	0.79%	0.16%	0.61%	0.42%	0.72%	0.40%	0.19%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	5.66%	1.70%	2.74%	2.39%	2.59%	0.00%	4.31%	1.00%	2.16%	0.87%	0.57%	1.19%
	c) % of connections with good voice quality	>=95%	Live data	97.87%	97.69%	97.17%	96.78%	96.44%	99.29%	98.07%	97.15%	97.60%	99.25%	99.76%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	107	332	185	59	533	0	238	88	397	9	22	78
	e) Total no. of cells (Sector) in the licensed service area		Live data	1892	19546	6751	2458	20565	4258	5532	8772	18376	1029	3867	1856
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

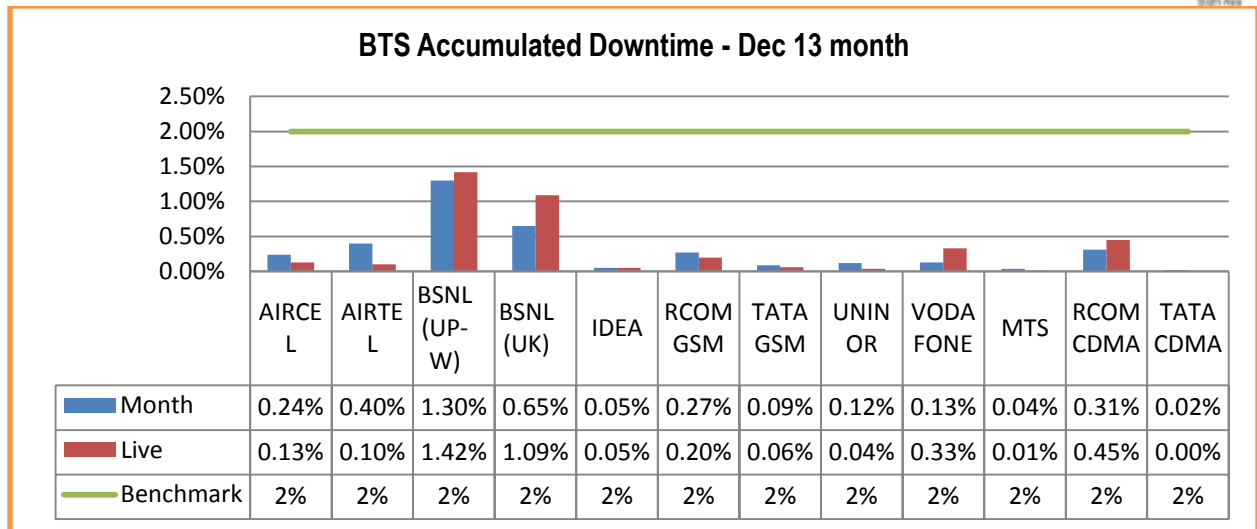
• NP-Not Provided



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

1) BTS ACCUMULATED DOWNTIME :

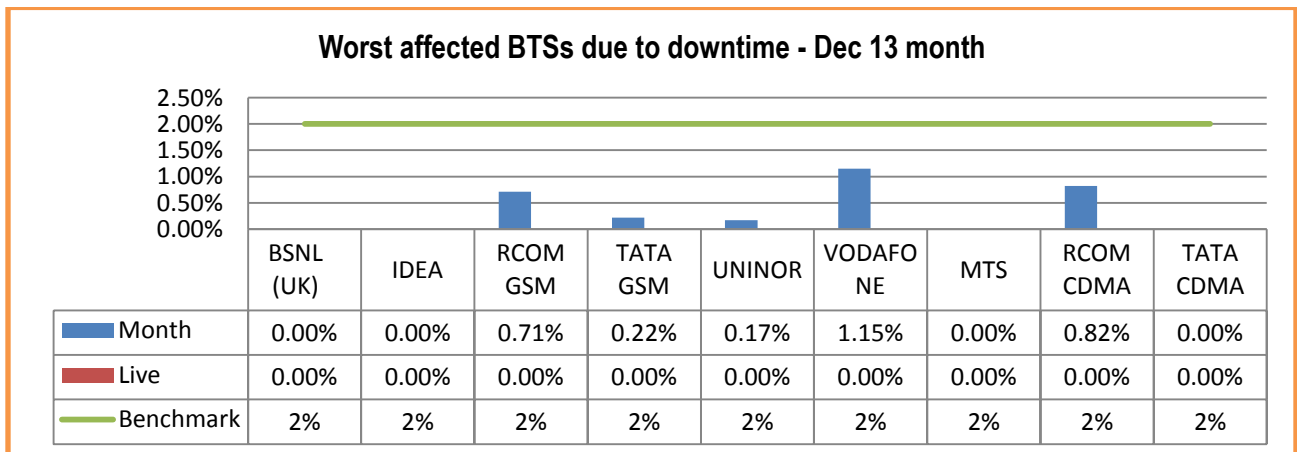
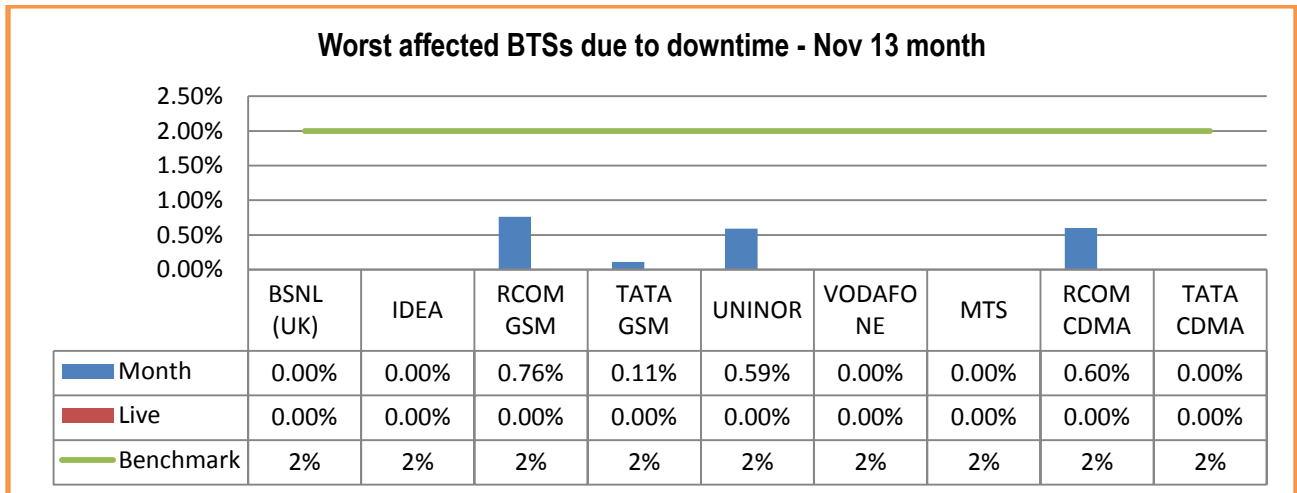
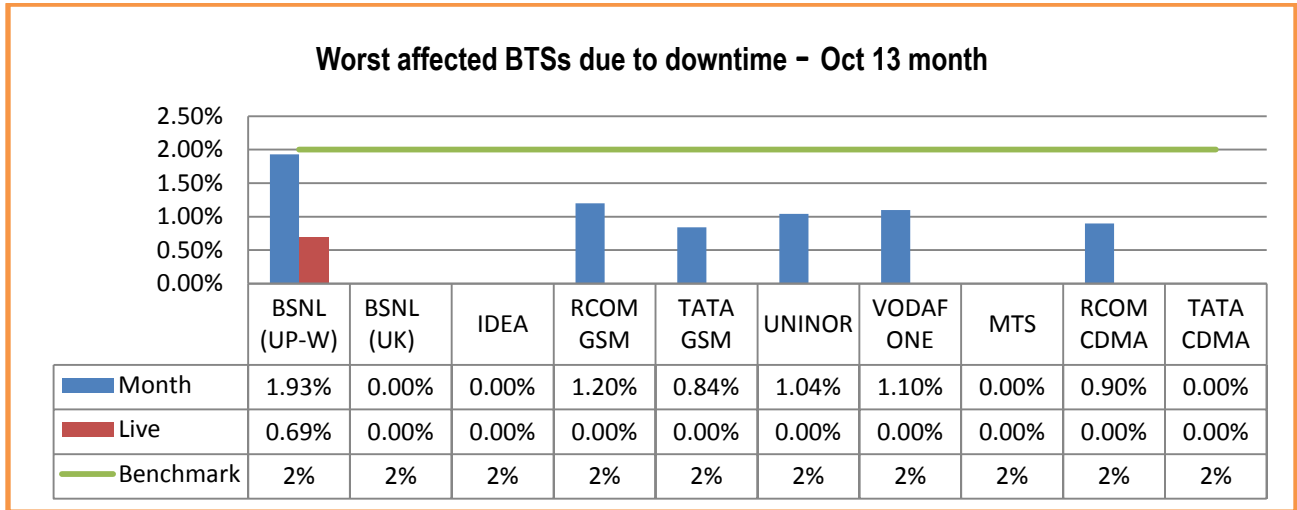




All operators are meeting the benchmarks.



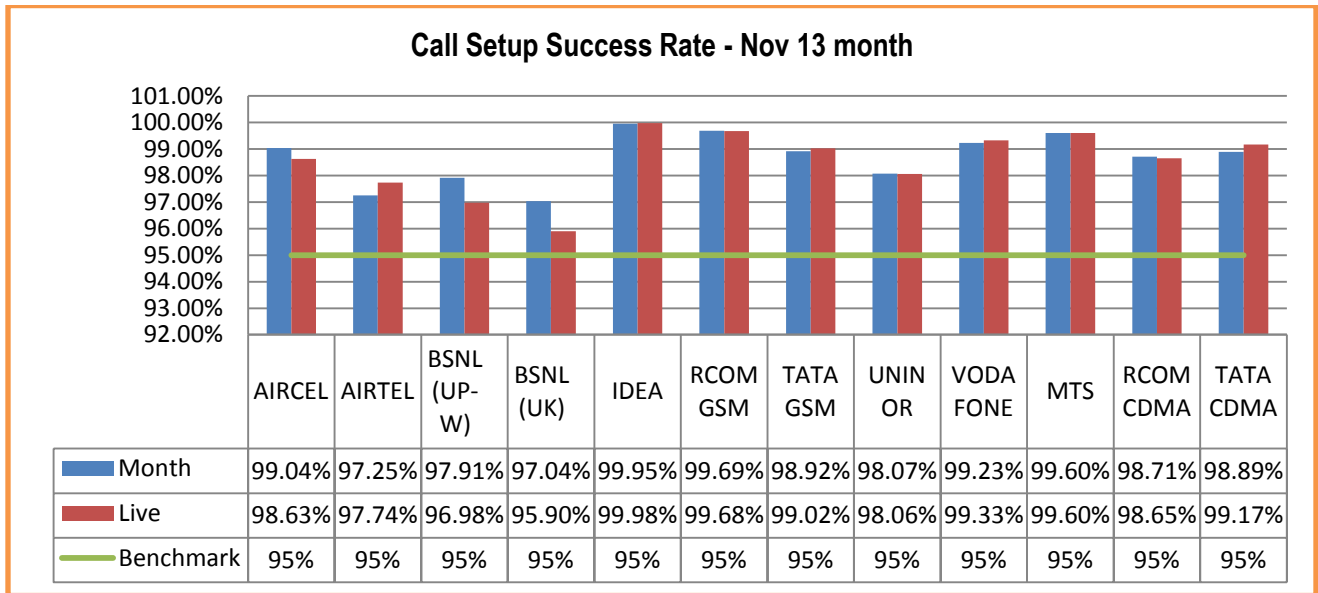
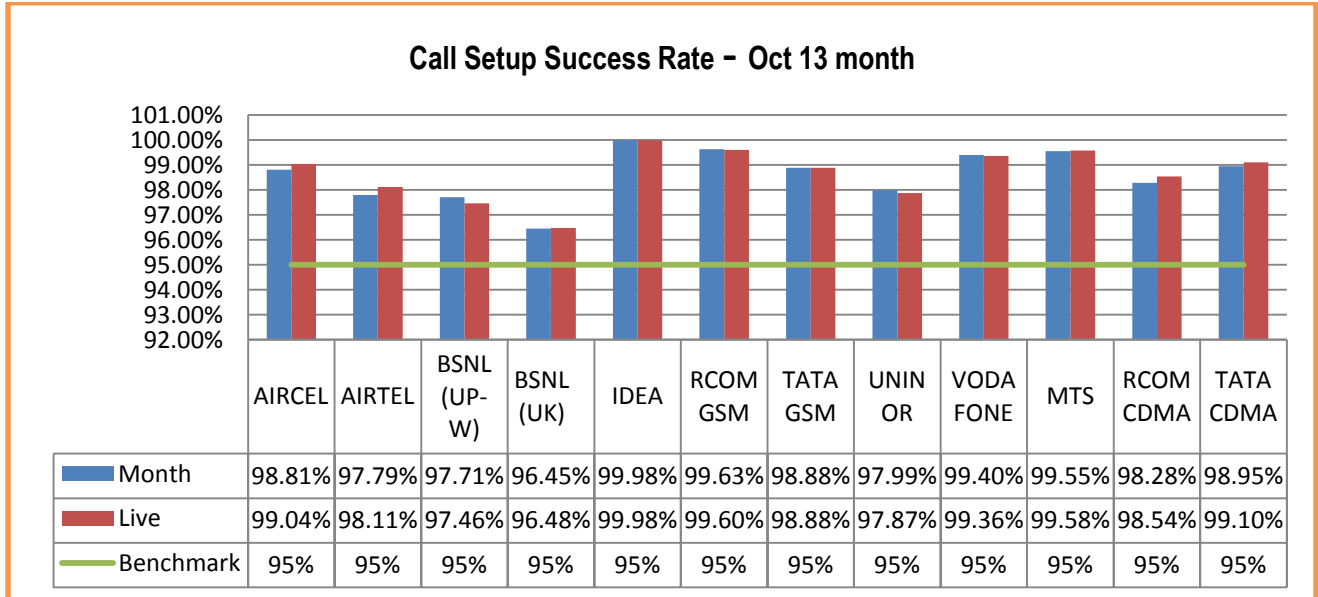
2) **WORST AFFECTED BTSs DUE TO DOWNTIME :**

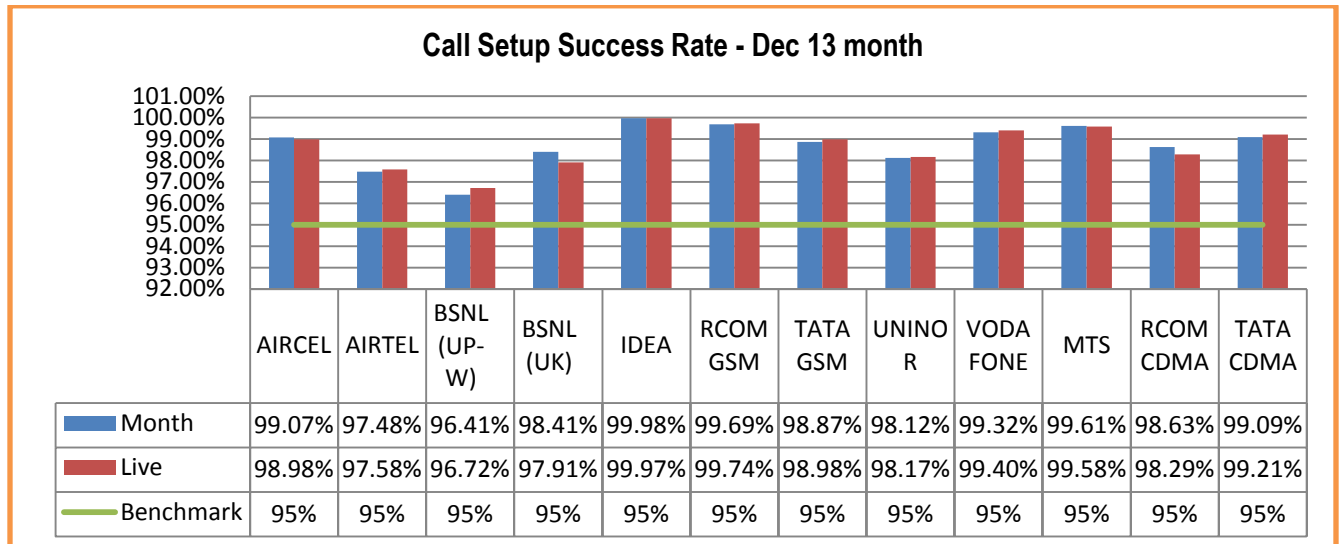


All operators are meeting the benchmarks.



3) CALL SETUP SUCCESS RATE :

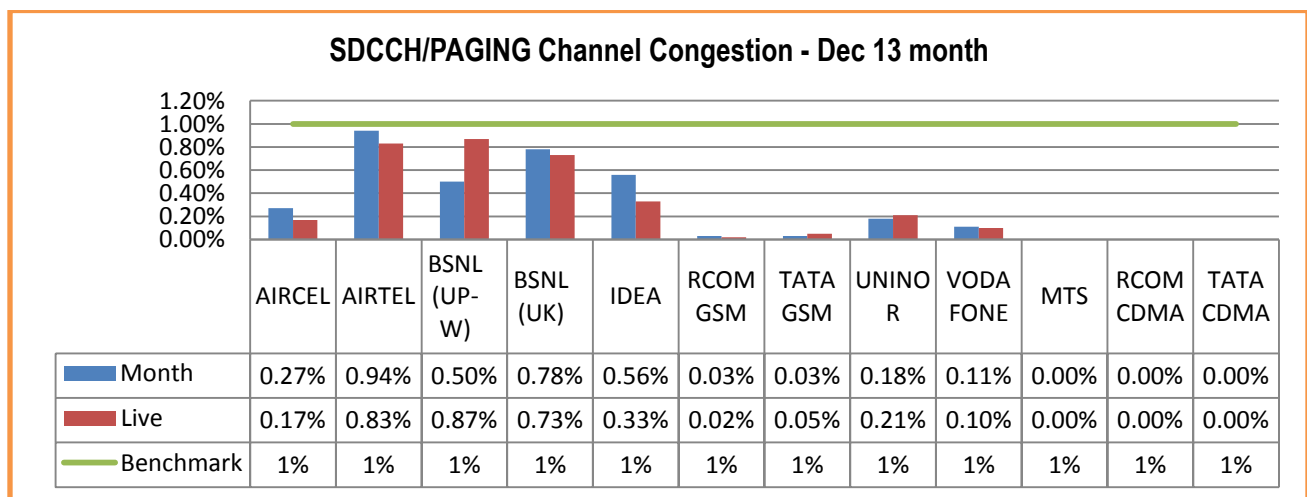
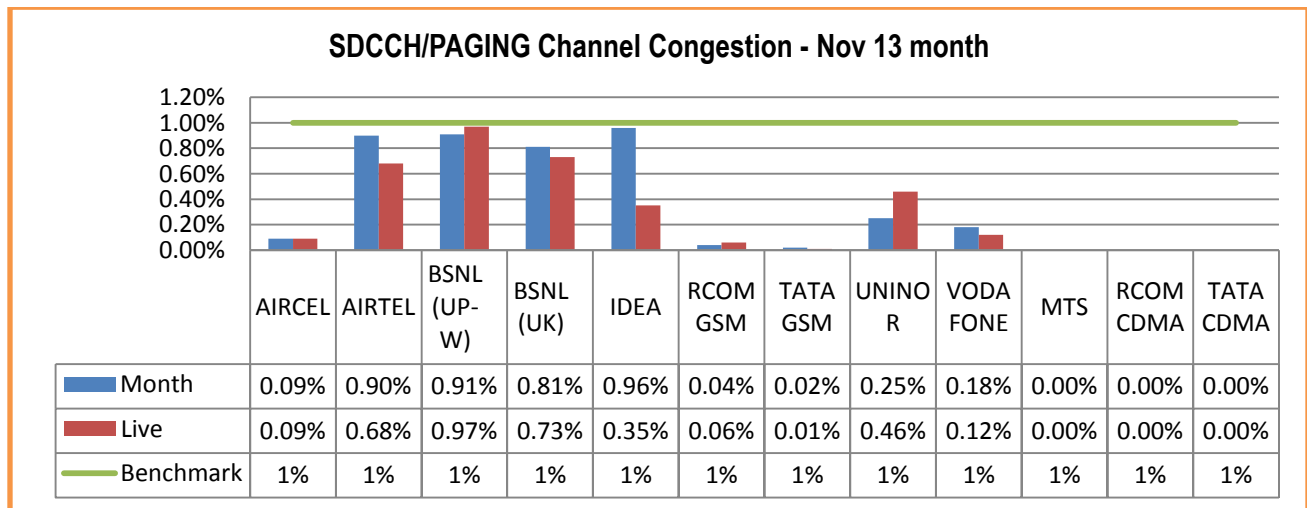
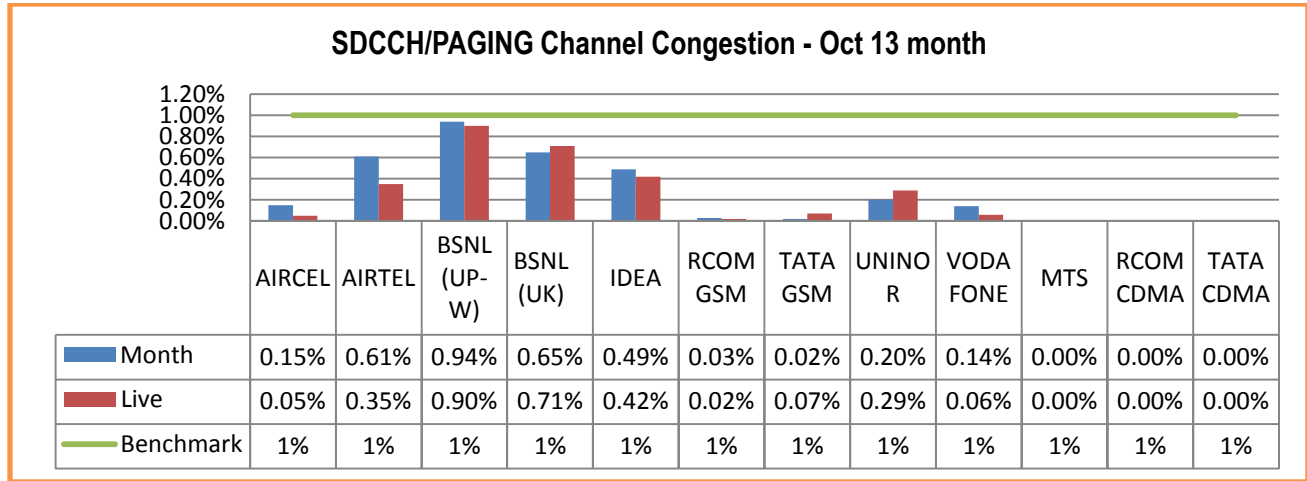




All operators are meeting the benchmarks.



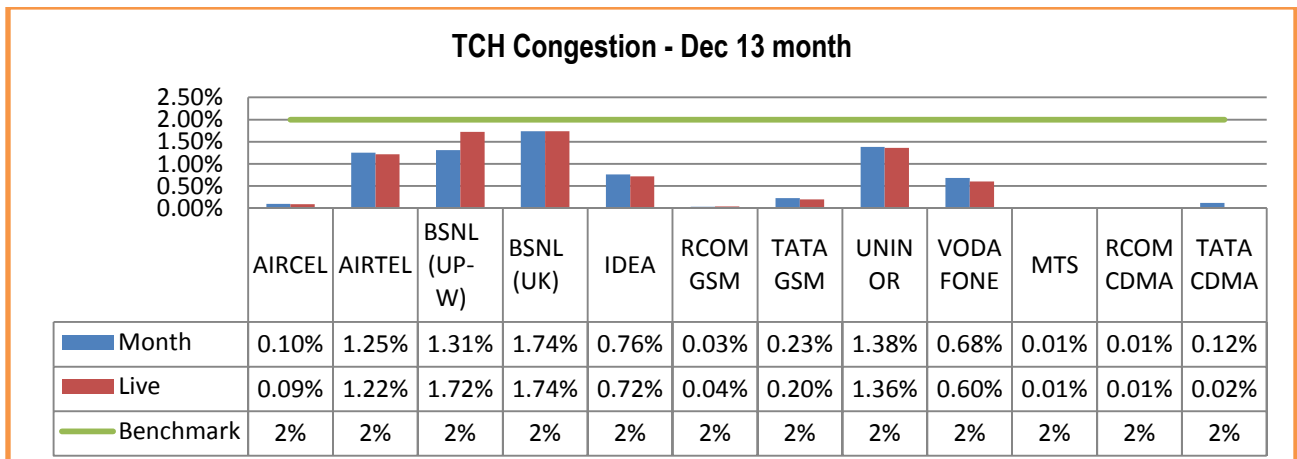
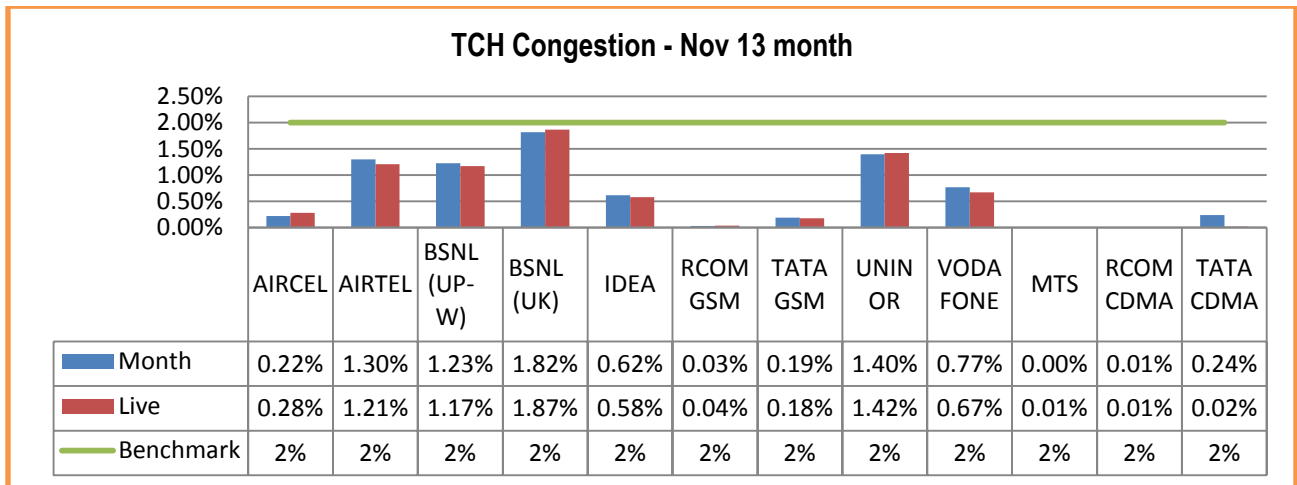
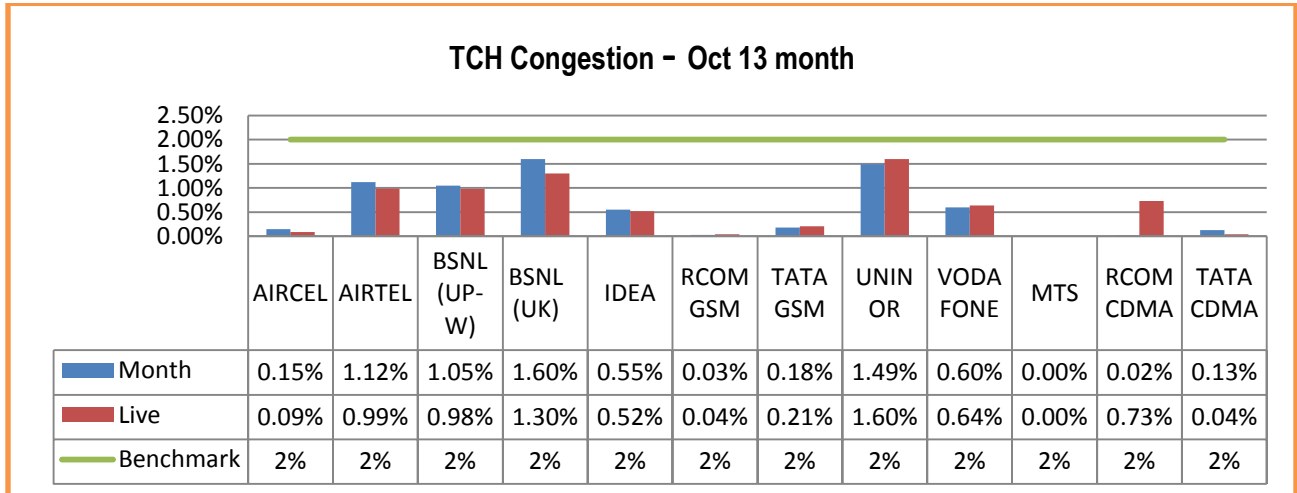
4) SDCCH/PAGING CHANNEL CONGESTION :



All operators are meeting the benchmarks.



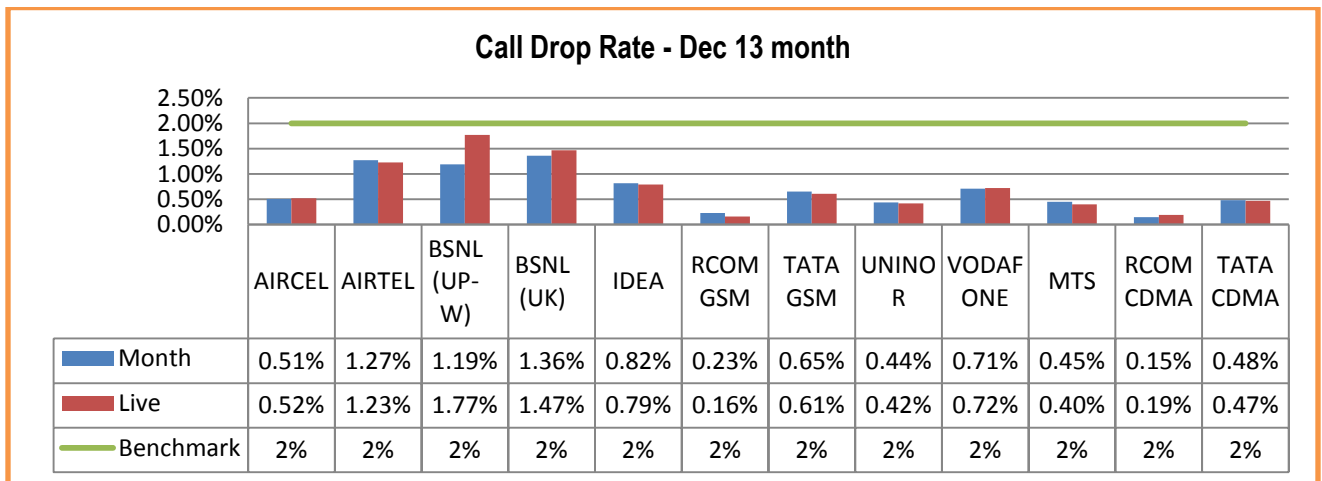
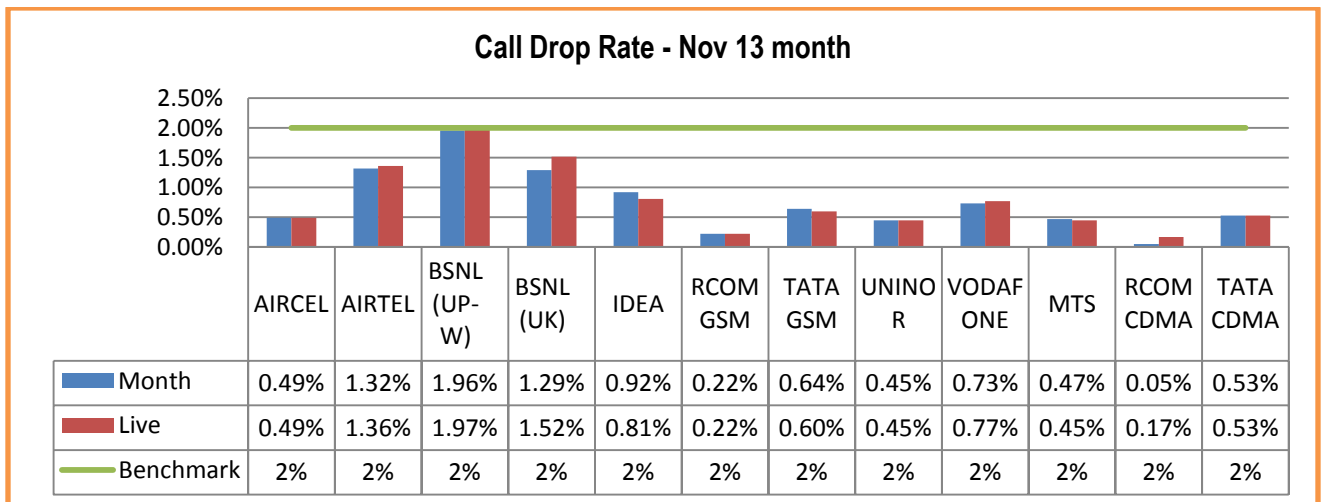
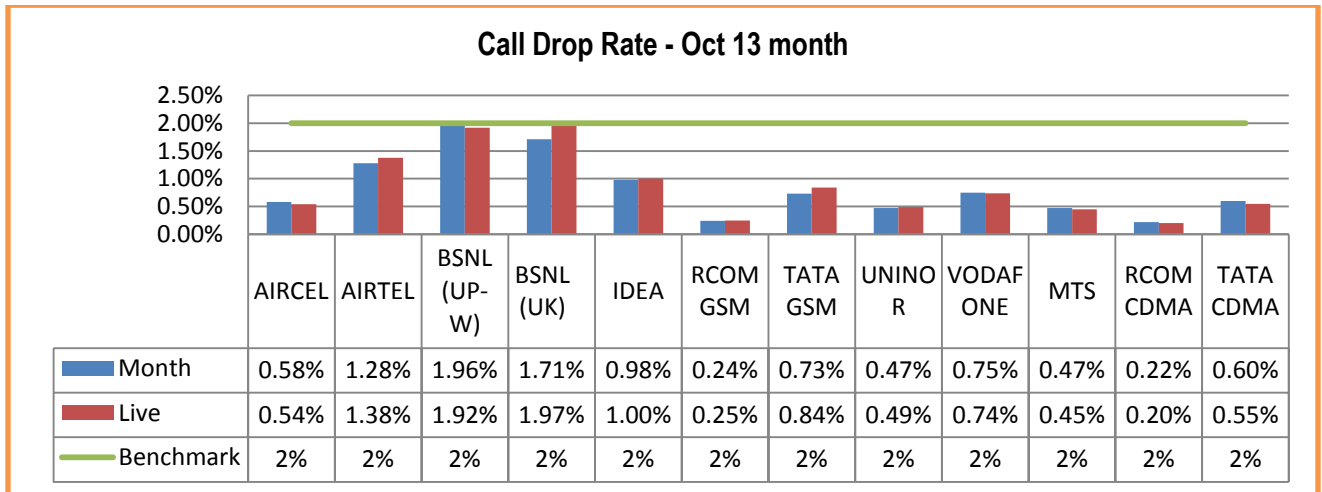
5) TCH CONGESTION:



All operators are meeting the benchmarks.



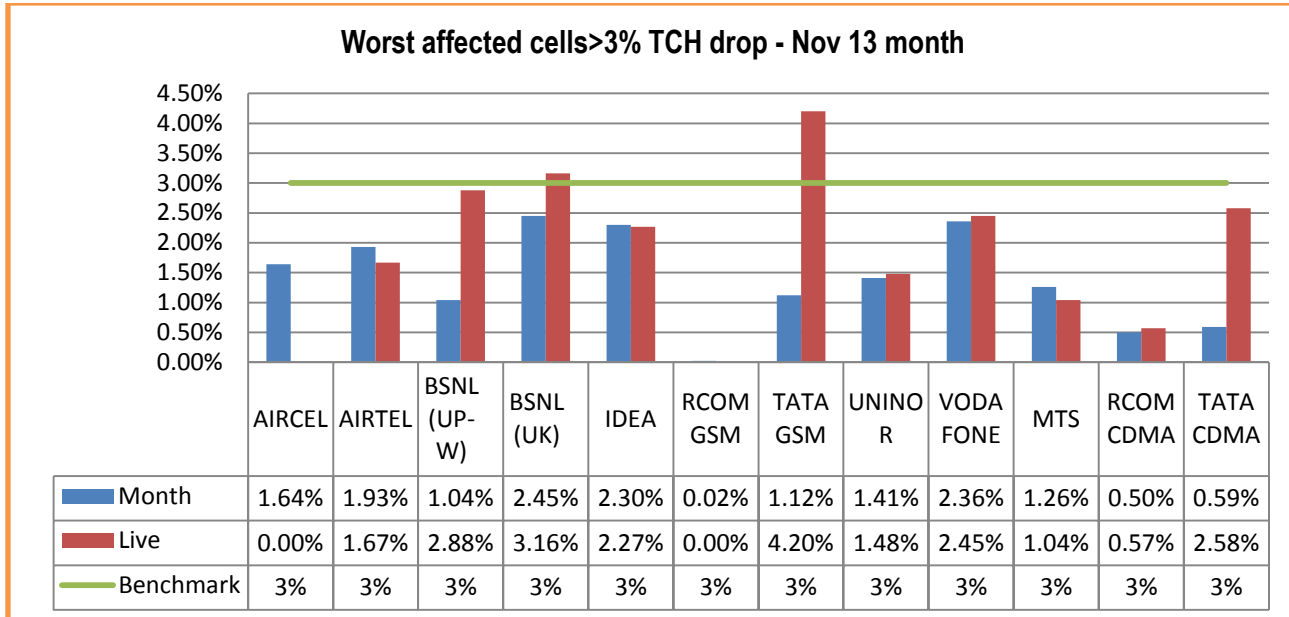
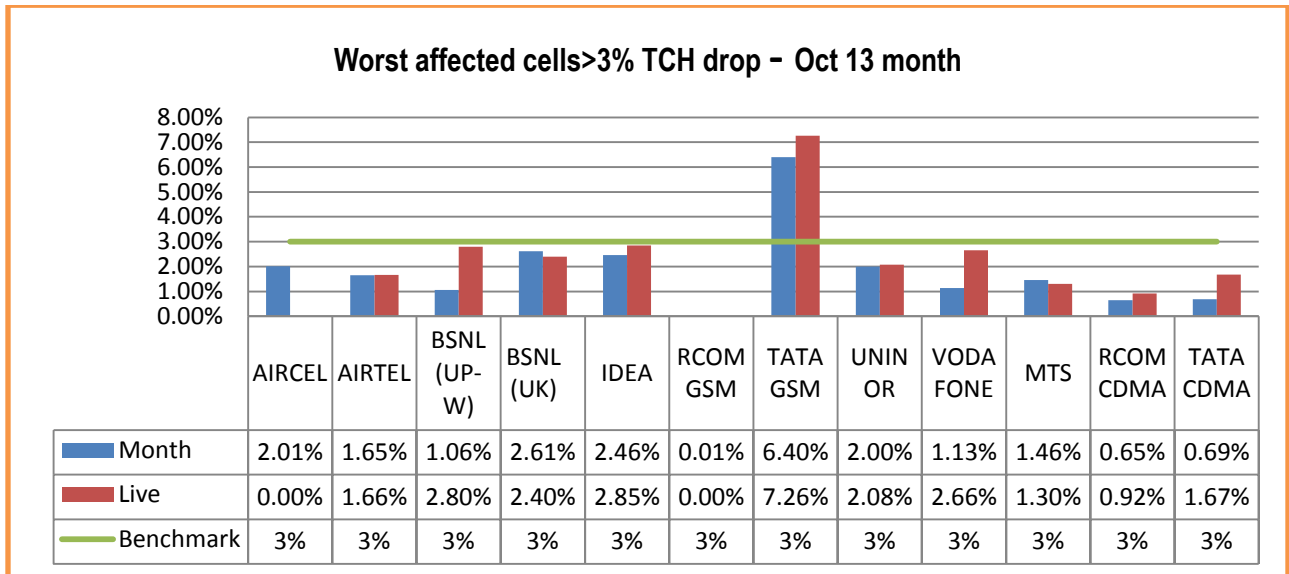
6) CALL DROP RATE :

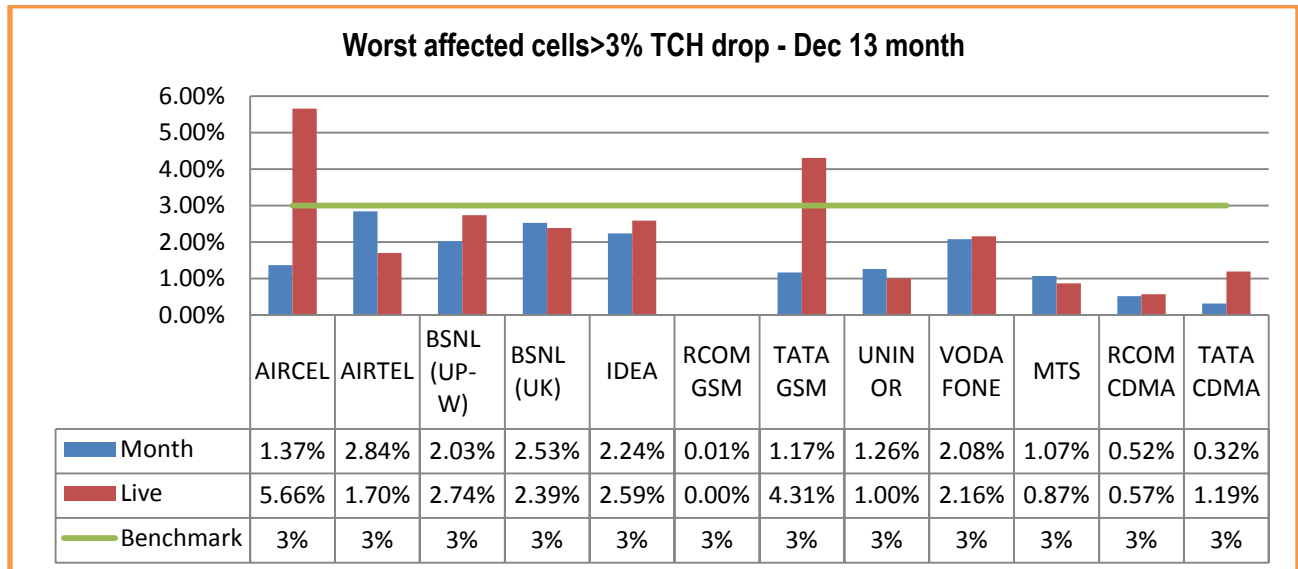


All operators are meeting the benchmarks.



7) WORST AFFECTED CELLS>3% TCH DROP :





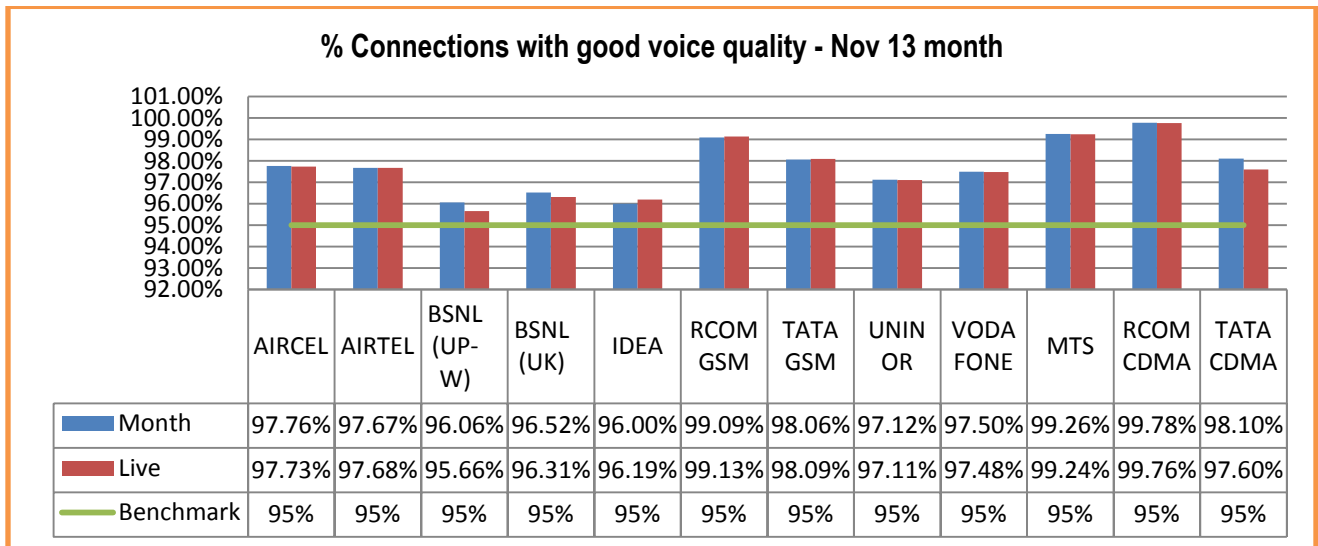
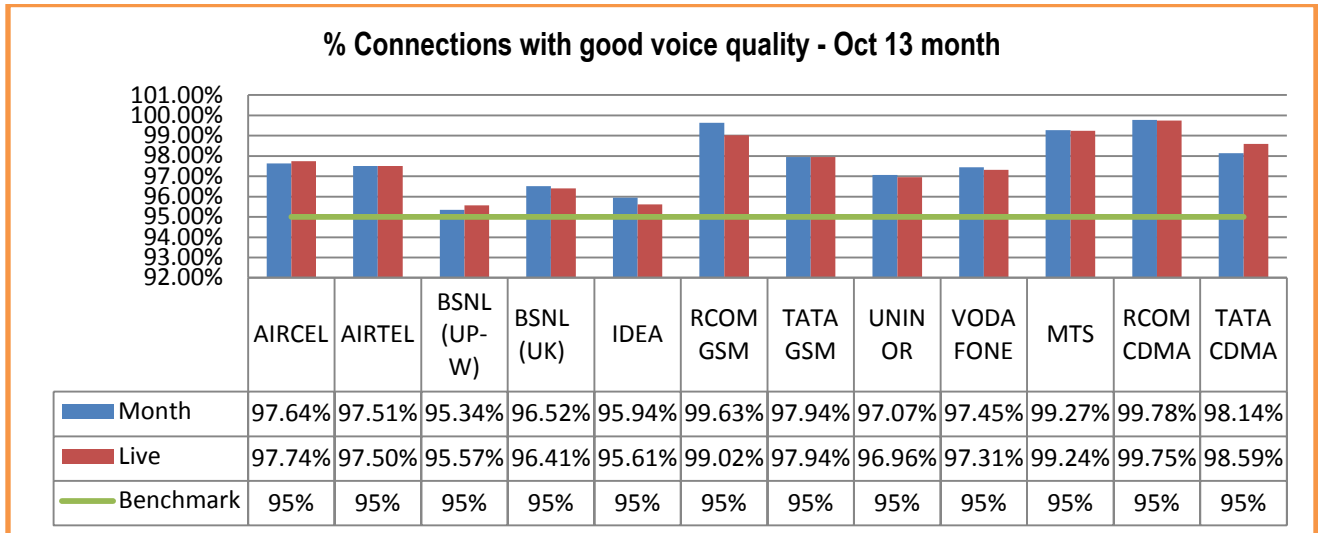
Tata (GSM) could not meet the benchmark of the parameter 'Worst affected cells> 3 % TCH drops' during live measurements in all the three months with its performance as 7.26% (Oct.), 4.20% (Nov.) & 4.31% (Dec.)

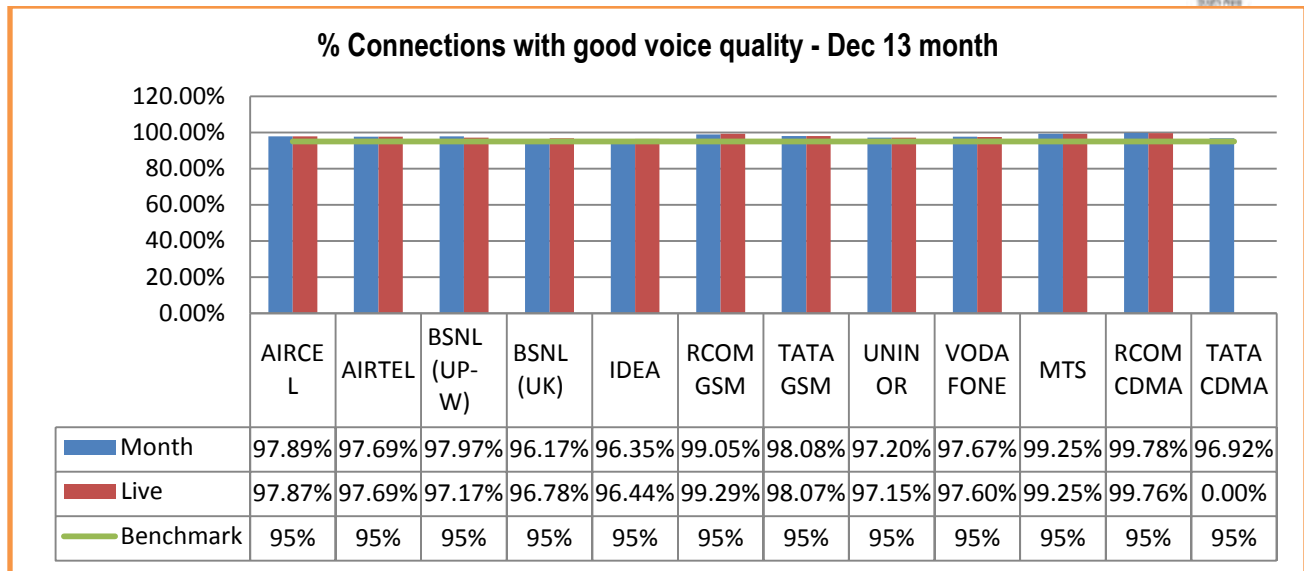
BSNL (Uttarakhand) and Aircel also remained non-compliant with its performance as 3.16% (Nov.) & 5.66% (Dec.) respectively.

Aircel could not meet the benchmark of the parameter 'Worst affected cells> 3 % TCH drops' during live measurements in December month with its performance as 5.66%.



8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :





All operators are meeting the benchmarks.



9. PMR VERIFICATION SHEET:

a) NETWORK RELATED PARAMETER:

UP(W) 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	0.20	1.33	98.97	0.17	0.16	0.53	1.67	97.76	0
	Verified	0.20%	1.33%	98.97%	0.17%	0.16%	0.53%	1.67%	97.76%	0
AIRTEL	Reported	0.16	0.39	97.51	0.82	1.22	1.29	2.14	97.62	0
	Verified	0.23%	0.39%	97.51%	0.82%	1.22%	1.29%	2.14%	97.62%	0
BSNL	Reported	0.95	1.90	97.17	0.74	1.45	1.57	2.49	96.58	0
	Verified	0.92%	0.76%	97.32%	0.77%	1.46%	1.58%	1.95%	96.43%	0
IDEA	Reported	0.04	0.09	99.94	0.67	0.64	0.91	2.33	96.10	0
	Verified	0.04%	0.00%	99.97%	0.67%	0.64%	0.91%	2.33%	96.10%	0
RCOM GSM	Reported	0.26	0.89	99.67	0.03	0.03	0.23	0.02	99.05	0
	Verified	0.17%	0.89%	99.67%	0.03%	0.03%	0.23%	0.01%	99.26%	0
TATA GSM	Reported	0.10	0.29	98.89	0.02	0.20	0.67	1.50	98.03	0
	Verified	0.10%	0.39%	98.89%	0.02%	0.20%	0.67%	2.90%	98.03%	0
UNINOR	Reported	0.16	0.60	98.06	0.22	1.43	0.45	1.56	97.13	0
	Verified	0.15%	0.60%	98.06%	0.21%	1.42%	0.45%	1.56%	97.13%	0
VODAFONE	Reported	0.16	0.91	99.32	0.14	0.68	0.73	1.12	97.53	0
	Verified	0.16%	0.75%	99.32%	0.14%	0.68%	0.73%	1.86%	97.54%	0
MTS	Reported	0.05	0.00	99.59	0.00	0.00	0.46	1.26	99.26	0
	Verified	0.05%	0.00%	99.59%	0.00%	0.00%	0.46%	1.26%	99.26%	0
RCOM CDMA	Reported	0.29	0.77	98.54	0.00	0.01	0.17	0.56	99.78	0
	Verified	0.29%	0.77%	98.54%	0.00%	0.01%	0.14%	0.56%	99.78%	0
TATA CDMA	Reported	0.02	0.00	98.98	0.00	0.17	0.54	0.53	97.72	0
	Verified	0.02%	0.00%	98.98%	0.00%	0.16%	0.54%	0.53%	97.72%	0

- I. The above data is averaged for three months of the quarter ending December-2013.
- II. The data for BSNL UP (West) and BSNL Uttarakhand has been merged.
- III. The PMR data provided by the service providers is largely matching with verified (audited) data and all service providers are meeting the benchmark.



b) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

UP(W) 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	87.91	94.28	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	87.91%	93.17%	100.00%	100.00%
AIRTEL	Reported	0.03	0.02	100.00	99.98	100.00	92.00	100.00	100.00
	Verified	0.02%	0.00%	100.00%	100.00%	100.00%	92.13%	100.00%	100.00%
BSNL	Reported	0.00	0.00	100.00	100.00	100.00	68.20	100.00	100.00
	Verified	0.02%	0.00%	100.00%	100.00%	99.55%	68.41%	100.00%	100.00%
IDEA	Reported	0.05	0.00	100.00	100.00	99.57	97.33	100.00	100.00
	Verified	0.05%	0.03%	100.00%	100.00%	100.00%	95.00%	100.00%	100.00%
RCOM (GSM)	Reported	0.08	0.10	100.00	100.00	98.54	92.85	100.00	100.00
	Verified	0.08%	0.10%	100.00%	100.00%	98.52%	92.92%	100.00%	100.00%
TATA (GSM)	Reported	0.00	0.00	100.00	100.00	99.37	94.51	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	94.00%	100.00%	100.00%
UNINOR	Reported	NA	0.03	100.00	NA	96.23	96.68	NA	NA
	Verified	NA	0.01%	100.00%	100.00%	96.29%	96.68%	NA	NA
VODAFONE	Reported	0.05	0.02	100.00	100.00	100.00	93.35	100.00	100.00
	Verified	0.05%	0.03%	100.00%	100.00%	100.00%	92.83%	100.00%	100.00%
MTS	Reported	0.10	0.01	100.00	100.00	97.80	97.32	100.00	NA
	Verified	0.10%	0.08%	100.00%	100.00%	97.70%	97.20%	100.00%	100.00%
RCOM (CDMA)	Reported	0.09	0.10	100.00	100.00	97.74	93.74	100.00	100.00
	Verified	0.09%	0.10%	100.00%	100.00%	97.73%	93.68%	100.00%	100.00%
TATA (CDMA)	Reported	0.00	0.00	100.00	100.00	98.74	97.52	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	97.60%	100.00%	100.00%

NA-Not Applicable

- I. The above data is averaged for three months of the quarter ending December-2013.
- II. The data for BSNL UP (West) and BSNL Uttarakhand has been merged.
- III. The PMR data provided by the service providers is largely matching with verified (audited) data and all service providers are meeting the benchmark except Aircel for the parameter "Accessibility of call centre/Customer Care"
- IV. BSNL has not met the benchmark for the parameter "% call answered by operators (voice to voice) within 60 sec".