



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
NORTH ZONE – UTTAR PRADESH (EAST) CIRCLE
(OCTOBER 2013 – DECEMBER 2013)

TUV-SUD SOUTH ASIA PVT LTD.
C-153/1, OKHLA INDUSTRIAL AREA
PHASE – 1, NEW DELHI - 110020
TEL: +91 11 30889611, FAX: +91-11-30889595



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(E) circle** against the QoS bench marks laid down by TRAI in the respective regulations.



Index of Contents

1. BACKGROUND	4
2. OBJECTIVES AND METHODOLOGY	5
3. SAMPLE SIZE	6
3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS	6
3.2 SAMPLING FOR BASIC (WIRELIN) SERVICES	7
3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS	7
4. EXECUTIVE SUMMARY	7
4.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON MONTHLY DATA VERIFICATION: NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES.....	8
KEY FINDINGS: CELLULAR MOBILE SERVICES	11
4.2 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT-QE DEC-13: .	14
KEY FINDINGS.....	15
4.3 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3-DAYS LIVE MEASUREMENT DATA VERIFICATION CONDUCTED IN EACH MONTH OF THE QUARTER:.....	17
A) NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES.....	17
KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:	19
B) CUSTOMER SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES.....	21
KEY FINDINGS:.....	21
5. DRIVE TEST	22
5.1 OPERATOR ASSISTED DRIVE TEST:.....	22
KEY FINDINGS.....	28
5.2 INDEPENDENT DRIVE TEST:.....	29
6. ESSENCE OF COMPLIANCE REPORT OF SERVICE PROVIDERS WITH RESPECT TO THE QOS	30
7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE:	31
8. GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE CELLULAR MOBILE SERVICE PROVIDERS-MONTHLY V/S 3-DAYS LIVE MEASUREMENT:.....	39
9. PMR VERIFICATION SHEET:.....	49



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(E) circle

Sl. No.	Name of Service Provider
GSM Operators	
1	AIRCEL
2	AIRTEL
3	BSNL
4	IDEA
5	RCOM GSM
6	UNINOR
7	TATA GSM
8	VODAFONE
CDMA Operators	
9	RCOM CDMA
10	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 (WIRELIN) 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(E) 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(E) 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 **UP(E) circle.**

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



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

BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	AIRCEL	Dec-13	19:00 - 20:00
2	AIRTEL	Dec-13	19:00 - 20:00
3	BSNL	Dec-13	20:00 - 21:00
4	IDEA	Dec-13	19:00 - 20:00
5	RCOM GSM	Dec-13	19:00 - 20:00
6	UNINOR	Dec-13	19:00 - 20:00
7	TATA GSM	Dec-13	19:00 - 20:00
8	VODAFONE	Dec-13	19:00 - 20:00
CDMA Operators			
9	RCOM CDMA	Dec-13	19:00 - 20:00
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 UP(E) 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	24	2887	ZTE	ZTE
2	AIRTEL	45	107	9448	Ericsson	Ericsson
3	BSNL	25	99	6095	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	10	41	6964	NSN	NSN
5	RCOM GSM	4	19	3227	Huawei	Huawei
6	UNINOR	10	28	4034	Ericsson	Ericsson
7	TATA GSM	4	22	2433	NSN	NSN
8	VODAFONE	18	140	8980	NSN	NSN
CDMA Operators						
9	RCOM CDMA	9	11	1819	Huawei & Lucent	Huawei & Lucent
10	TATA CDMA	4	6	455	Huawei & Ericsson	Huawei, ZTE & Motorola



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE- OCT-13 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	0.41%	0.83%	1.83%	0.20%	0.28%	0.39%	0.00%	0.61%	0.44%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Oct-13	1.68%	1.05%	0.38%	1.02%	0.61%	1.96%	0.00%	0.00%	1.63%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	97.52%	99.47%	98.06%	98.64%	99.41%	97.26%	97.94%	99.47%	98.11%	98.78%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-13	0.80%	0.09%	1.08%	0.82%	0.14%	0.43%	0.06%	0.19%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.32%	0.38%	1.94%	1.23%	0.06%	1.77%	0.80%	0.53%	0.02%	0.05%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Oct-13	0.60%	0.88%	0.45%	1.16%	0.28%	0.70%	0.85%	1.34%	0.22%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-13	3.71%	2.69%	1.58%	2.88%	0.01%	2.55%	6.96%	2.61%	0.22%	5.73%
	c) Connections with good voice quality	>=95%	Oct-13	96.23%	98.55%	98.00%	96.23%	98.83%	96.08%	98.00%	95.58%	99.75%	99.26%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Oct-13	0	0	0	0	0	1	0	15	0	0



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE- NOV-13 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators
Network Service Quality Parameter													
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Nov-13	0.41%	0.62%	1.77%	0.18%	0.20%	0.36%	0.01%	0.43%	0.31%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Nov-13	1.67%	1.02%	0.57%	0.75%	0.43%	1.86%	0.00%	1.92%	0.49%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	97.46%	99.42%	97.50%	98.52%	99.51%	97.31%	98.26%	99.32%	98.70%	98.56%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-13	0.69%	0.12%	0.84%	0.69%	0.12%	0.29%	0.07%	0.27%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.29%	0.42%	1.40%	1.45%	0.05%	1.60%	0.56%	0.68%	0.01%	0.42%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	Nov-13	0.66%	0.77%	0.50%	1.15%	0.28%	0.71%	0.78%	1.27%	0.13%	0.49%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-13	3.03%	2.67%	2.00%	2.83%	0.01%	2.43%	6.35%	2.55%	0.04%	7.58%
	c) Connections with good voice quality	>=95%	Nov-13	96.42%	98.68%	97.00%	96.39%	98.86%	95.96%	97.54%	95.73%	99.77%	95.94%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Nov-13	4	0	0	0	0	0	0	15	0	0



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE- DEC-13 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	0.37%	0.63%	1.77%	0.25%	0.21%	0.41%	0.93%	0.36%	0.30%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Dec-13	1.52%	0.98%	0.57%	1.05%	0.59%	1.93%	0.00%	1.73%	0.71%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	98.67%	99.49%	97.52%	98.52%	99.48%	97.77%	98.20%	99.40%	98.68%	98.56%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-13	0.86%	0.10%	0.84%	0.57%	0.07%	0.71%	0.07%	0.20%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.36%	0.38%	1.40%	1.45%	0.05%	1.33%	0.60%	0.60%	0.01%	0.19%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Dec-13	0.65%	0.69%	0.46%	1.06%	0.28%	0.68%	0.79%	1.07%	0.21%	0.49%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-13	2.87%	2.63%	1.96%	2.83%	0.01%	2.03%	6.19%	2.20%	0.44%	7.58%
	c) Connections with good voice quality	>=95%	Dec-13	96.55%	98.80%	97.00%	96.90%	98.85%	96.40%	97.66%	96.16%	99.77%	95.94%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Dec-13	0	0	0	0	0	0	0	4	0	0

KEY FINDINGS: CELLULAR MOBILE SERVICES

The audit of network related parameters for cellular mobile service providers was conducted at their respective MSCs in the circle, however in case of Reliance Communication; the audit of Customer service related parameters was conducted at their central NOC at DAKC Mumbai.

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

The audit for BSNL has been done for the network coming under jurisdiction of GM / BSNL/ Lucknow in all the three months.



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

▪ **Connection Establishment (Accessibility)**

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

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

All the operators were comfortably meeting the benchmark on this parameter.

▪ **Parameters related to Network Congestion:**

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

In CDMA system, there is no direct counter defined for reporting Paging Channel Congestion as reported by Tata Teleservices. However, they have a defined counter for Paging Channel Occupancy Ratio (PCH Average Using Ratio) which is used to determine the Paging Channel Occupancy which on an average is < 50% on all sites in the network. When the value of this parameter is less than 100%, it is counted as 0% congestion. Thus, there is no congestion on the 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 except BSNL. BSNL could not meet the benchmark for parameter 'SDCCH Channel Congestion' with its performance as 1.08% marginally beyond the benchmark in the month of October-2013.

POI Congestion: With respect to this parameter, Vodafone was found to have congestion on 15 POIs in month of October, on 15 POIs in November and 4 POIs in the month of December-2013. Whereas Uninor and Aircel were having congestion on 1 POI and 4 POIs in the months of October and November respectively.



▪ **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 0.19 %) 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** and **Tata (GSM / CDMA)** which remained non compliant in all the 3 months of the quarter. The performance level of **Tata (GSM)** was **6.96%**, **6.35%** & **6.19%** and that of **Tata (CDMA)**, the performance level was **5.73%**, **7.58%** & **7.58%** in the months of October, November and December 2013 respectively.

Aircel also failed to achieve the benchmark for this parameter in the month of October and November 2013 with its performance as **3.71%** and **3.03%** respectively.

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	IDEA	RCOM GSM	TATA GSM	UNINOR	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		UPE	1702	219067	87715	87951	20229	29328	NA	321540	97303	17249
	B) No. of bills disputed including billing complaints during the quarter		UPE	0	19	40	41	16	1	NA	200	93	1
	C) % of billing complaints during the quarter	<= 0.1%	UPE	0.00%	0.01%	0.05%	0.05%	0.08%	0.00%	NA	0.06%	0.10%	0.01%
2	Metering & Billing Credibility -Pre Paid												
	A) Total No. of Pre-paid customers at the end of the quarter		UPE	3718847	15521417	9837297	7588015	5644480	4031770	7731675	14361648	2843355	382007
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		UPE	3	2376	726	443	5597	3	353	3507	2847	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	UPE	0.00%	0.01%	0.01%	0.01%	0.10%	0.00%	0.00%	0.02%	0.10%	0.00%
3	Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints												
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		UPE	3	2395	766	484	5613	4	353	3707	2940	1
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		UPE	3	2395	766	484	5613	4	353	3707	2940	1
	C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100 % within 4 week	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	UPE	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												

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



	A) Accessibility of call centre/Customer Care	>=95 %	UPE	72.77%	100.00%	100.00%	100.00%	99.17%	100.00%	95.04%	100.00%	97.52%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90 %	UPE	93.00%	96.00%	86.00%	97.00%	96.99%	96.00%	97.00%	93.00%	93.37%	97.66%
5	Termination/closure of service												
	A) Total No. of requests for Termination / Closure of service received during the quarter		UPE	18	887	41766	100	31	231	NA	4159	302	58
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		UPE	18	887	41031	100	31	231	NA	4159	302	58
	C) % of Termination/ Closure of service within 7 days	<=7days	UPE	100.00%	100.00%	98.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
6	Time taken for refunds of deposits after closures.												
	A) No. of Payments/ Refunds due during the quarter		UPE	63	209	23921	167	110	81	NA	631	414	23
	B) No. of Payments/ Refunds Cleared during the quarter		UPE	63	209	23920	167	110	81	NA	631	414	23
	C)Time taken for refunds of deposits after closures.	100% within 60 days	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

• NA-Not Applicable as Uninor is not having Post paid connection

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 <=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 have 100 % resolved the billing complaints within stipulated period of 4 weeks. In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % refund in one week.

3. Response Time to the Customer for assistance

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



All service providers are in compliance with respect to the parameter accessibility of call center except Aircel. **Aircel** failed to achieve the benchmark for the parameter 'Accessibility of call center/Customer care' with its performance as **72.77%**. **BSNL** have not met the benchmark of parameter 'Calls answered by Operators (voice to voice) within 60 sec'. It has achieved its performance as **86.0%**.

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. **BSNL** could achieve its performance as **98.0%**.

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(E) CIRCLE- OCT-13 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCON GSM	UNINOR	TATA GSM	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	0.16%	0.96%	NP	0.16%	0.24%	0.31%	0.00%	0.61%	0.31%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.62%	NP	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	94.84%	99.45%	NP	98.73%	99.43%	97.66%	97.95%	99.30%	99.04%	98.12%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	1.25%	0.10%	NP	0.69%	0.03%	0.40%	0.04%	0.20%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.31%	0.87%	NP	1.01%	0.07%	1.45%	0.65%	0.70%	0.02%	0.18%
Connection maintenance (retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.56%	0.92%	NP	1.21%	0.31%	0.69%	0.82%	1.50%	0.23%	0.56%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.66%	2.78%	NP	2.80%	0.00%	2.55%	6.90%	2.34%	0.23%	5.59%
	c) Connections with good voice quality	>=95%	Live data	96.04%	98.49%	NP	95.97%	98.87%	96.31%	97.38%	95.20%	99.72%	99.26%
4	No. of POI having >=0.5% congestion		Live data	0	0	NP	0	0	1	0	4	0	0

NP-Not Provided, BSNL has not provided the data despite our best effort.



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE- NOV-13 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	0.38%	0.78%	3.09%	0.18%	0.24%	0.41%	0.00%	0.79%	0.32%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.73%	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	98.66%	99.46%	98.13%	98.71%	99.50%	97.24%	97.63%	99.36%	98.13%	98.41%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.59%	0.10%	0.57%	0.85%	0.35%	0.30%	0.29%	0.22%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.25%	0.81%	1.87%	1.27%	0.05%	1.51%	0.77%	0.64%	0.02%	0.16%
Connection maintenance (retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.67%	0.78%	0.45%	1.20%	0.27%	0.76%	0.80%	1.14%	0.12%	0.33%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.74%	2.75%	0.14%	2.89%	0.00%	2.69%	6.38%	2.41%	0.00%	5.46%
	c) Connections with good voice quality	>=95%	Live data	96.64%	98.65%	96.27%	96.17%	98.86%	95.74%	97.58%	95.97%	99.77%	NP
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	4	0	0

• NP-Not Provided



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE- DEC-13 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	0.43%	0.58%	4.72%	0.25%	0.17%	0.29%	0.16%	0.42%	0.24%	0.16%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.21%	0.46%	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	98.57%	99.48%	96.99%	98.36%	99.54%	97.94%	98.29%	95.85%	98.75%	98.07%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.78%	0.09%	0.74%	0.48%	0.05%	0.34%	0.04%	0.27%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.32%	0.89%	1.06%	1.61%	0.05%	1.26%	0.58%	0.61%	0.01%	0.57%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.68%	0.72%	1.81%	1.09%	0.27%	0.65%	0.78%	1.21%	0.71%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.26%	2.77%	0.16%	2.65%	0.00%	1.80%	6.83%	2.58%	0.55%	9.02%
	c) Connections with good voice quality	>=95%	Live data	96.44%	98.77%	97.01%	96.73%	98.92%	96.44%	97.62%	95.81%	99.78%	NP
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	10	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 some of the operators was not as per the norms of the TRAI for some of the parameters. Aircel could not meet the benchmark of the parameters CSSR, SDCCH Congestion and Worst affected cells with its performance as 94.84% (Oct-13), 1.25% (Oct-13) and 3.66% (Oct-13) & 3.26 (Dec-13) respectively . BSNL could not meet the benchmark of 'BTS Accumulated downtime' with its performance as 3.09% and 4.72% in the month of November and December-2013 respectively.

With respect to the parameters 'Worst affected Cells> 3% TCH drop', Tata (GSM) and Tata (CDMA) failed to meet the benchmark in all the three months of the quarter. The performance of Tata (GSM) was 6.90%, 6.38% & 6.83% and that of Tata (CDMA) was 5.59%, 5.46% & 9.02% in the respective months of the quarter.

Similar performance of Tata (GSM), Tata (CDMA) and Aircel was also observed in monthly PMR audit.

Uninor and Vodafone were found having congestion on individual POIs during live measurements carried out in respective months of the quarter.

The live measurement audit could not be performed for BSNL in the month of October as their nodal officer for this purpose could not be known from BSNL despite our repeated efforts.



INTER OPERATOR CALLS ASSESSMENT

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in UP(E) 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 ASSESSMENTBASED ON LIVE MEASUREMENT											
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
AIRCEL	UP-E	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
AIRTEL	UP-E	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
BSNL	UP-E	83.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	85.00%	100.00%	100.00%
IDEA	UP-E	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
RCOM GSM	UP-E	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%
TATA GSM	UP-E	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%
UNINOR	UP-E	100.00%	100.00%	88.00%	100.00%	100.00%	100.00%	--	89.00%	100.00%	100.00%
VODAFONE	UP-E	85.00%	100.00%	82.00%	100.00%	100.00%	100.00%	87.00%	--	100.00%	100.00%
RCOM CDMA	UP-E	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%
TATA CDMA	UP-E	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 satisfactory for most of the operators. However, Calls attempted from BSNL to Aircel and Vodafone were 83% & 85%, from Uninor to BSNL & Vodafone were 88% & 89% and from Vodafone to Aircel, BSNL and Uninor were 85%, 82% and 87% successful respectively.



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	UNINOR	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%	UPE	100.00%	100.00%	100.00%	100.00%	99.54%	100.00%	96.67%	100.00%	97.01%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	UPE	96.00%	97.00%	60.00%	98.16%	96.03%	96.65%	96.31%	93.60%	94.46%	92.00%

- NA-Not Applicable

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE											
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
Total No. of calls Attempted	UPE	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	UPE	100	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	UPE	100	100	100	100	100	100	100	100	100	100
%age of calls got answered	UPE	100.00%	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) except BSNL which has performed with 60.00% of calls connected to operator.

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, 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	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
101	UPE	40	40	40	40	40	40	40	40	40	40	40
102	UPE	40	40	40	40	40	40	40	40	40	40	40
100	UPE	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(E) 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(E) 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 across Lucknow, Barabanki and Raibareilly during the month of October-13, Allahabad, Jaunpur and Varanasi during November -13 and Jhansi, Lalitpur and Mahoba 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 (E) 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(E) CIRCLE-OCT-13 MONTH													
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators							CDMA Operators		
1	Blocked Call Rate (<=3%)	Lucknow	Oct-13	0.44%	0.00%	1.67%	0.36%	1.19%	1.60%	0.00%	0.00%	0.00%	1.08%
		Barabanki	Oct-13	0.00%	0.00%	1.05%	0.00%	3.82%	1.88%	0.00%	0.00%	0.00%	0.00%
		Raibarely	Oct-13	0.00%	0.00%	0.90%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Lucknow	Oct-13	0.00%	0.00%	1.69%	0.00%	1.81%	0.54%	0.38%	0.53%	1.82%	1.69%
		Barabanki	Oct-13	0.00%	0.00%	1.06%	0.00%	3.31%	0.00%	0.00%	0.00%	1.30%	0.00%
		Raibarely	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	1.14%	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)	Lucknow	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	98.58%	96.69%
		Barabanki	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	99.36%	98.55%
		Raibarely	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	99.30%	97.57%
	(b) 0-5 (with frequency hopping for GSM Operators)	Lucknow	Oct-13	95.51%	100.00%	97.24%	95.14%	92.76%	95.02%	100.00%	95.82%	NA	NA
		Barabanki	Oct-13	95.09%	100.00%	96.74%	95.69%	96.26%	95.20%	76.19%	95.80%	NA	NA
		Raibarely	Oct-13	95.27%	100.00%	96.90%	91.78%	95.29%	95.33%	94.12%	95.64%	NA	NA
Service Coverage													
4	In door (>= -75dBm)	Lucknow	Oct-13	87.30%	92.64%	68.75%	88.15%	37.22%	51.36%	83.43%	97.61%	90.74%	91.75%
		Barabanki	Oct-13	33.43%	79.84%	75.13%	55.44%	55.13%	70.07%	67.79%	90.82%	43.91%	62.39%
		Raibarely	Oct-13	56.75%	70.53%	61.78%	73.74%	88.78%	92.18%	56.75%	86.27%	62.93%	58.13%
	In-vehicle (>= -85dBm)	Lucknow	Oct-13	99.56%	99.10%	97.75%	99.32%	77.53%	93.62%	99.19%	100.00%	100.00%	99.98%
		Barabanki	Oct-13	82.60%	94.19%	97.27%	93.34%	79.27%	96.97%	95.00%	99.74%	85.98%	96.15%
		Raibarely	Oct-13	98.65%	92.68%	88.96%	96.69%	99.57%	99.89%	89.39%	32.20%	97.55%	99.11%
	Outdoor- in city (>= -95dBm)	Lucknow	Oct-13	100.00%	100.00%	99.87%	100.00%	98.63%	99.89%	100.00%	100.00%	100.00%	99.98%
		Barabanki	Oct-13	98.57%	100.00%	99.96%	100.00%	94.57%	99.89%	100.00%	99.97%	99.92%	100.00%
		Raibarely	Oct-13	100.00%	100.00%	99.45%	99.82%	100.00%	100.00%	100.00%	5.00%	100.00%	99.98%
5	Call Setup Success Rate (>=95%)	Lucknow	Oct-13	99.56%	100.00%	98.33%	99.64%	98.81%	98.40%	100.00%	99.47%	100.00%	97.30%
		Barabanki	Oct-13	100.00%	100.00%	98.95%	100.00%	96.18%	95.73%	100.00%	100.00%	100.00%	100.00%
		Raibarely	Oct-13	100.00%	100.00%	99.10%	100.00%	100.00%	98.88%	100.00%	100.00%	100.00%	100.00%

• NA-Not Applicable



DRIVE TEST TABLE: 2

OPERATOR-ASSISTED DRIVE TEST-UP(E) CIRCLE-NOV-13 MONTH													
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators							CDMA Operators		
1	Blocked Call Rate (<=3%)	Allahabad	Nov-13	0.00%	0.00%	ND	1.14%	0.69%	0.00%	ICR	0.68%	0.00%	0.00%
		Jaunpur	Nov-13	0.85%	0.00%	ND	2.40%	0.58%	0.00%	0.00%	0.00%	1.66%	0.00%
		Varanasi	Nov-13	0.52%	0.00%	ND	1.32%	1.05%	0.00%	0.41%	0.00%	0.51%	0.74%
2	Dropped Call Rate (<=2%)	Allahabad	Nov-13	0.00%	0.00%	ND	0.00%	0.35%	0.00%	ICR	0.00%	0.71%	0.00%
		Jaunpur	Nov-13	0.00%	0.00%	ND	0.00%	0.00%	0.00%	0.42%	0.00%	1.11%	0.00%
		Varanasi	Nov-13	0.00%	0.00%	ND	0.00%	0.53%	0.00%	0.41%	0.00%	0.51%	0.00%
Percentage connections with good voice quality (=>95%)													
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Allahabad	Nov-13	NA	NA	NA	NA	NA	NA	ICR	NA	98.44%	98.08%
		Jaunpur	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	94.62%	96.59%
		Varanasi	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	98.09%	96.90%
	(b) 0-5 (with frequency hopping for GSM Operators)	Allahabad	Nov-13	93.34%	95.23%	ND	89.00%	94.36%	95.02%	ICR	94.14%	NA	NA
		Jaunpur	Nov-13	98.06%	95.45%	ND	89.26%	95.04%	95.42%	95.98%	97.36%	NA	NA
		Varanasi	Nov-13	95.08%	96.82%	ND	94.08%	92.51%	95.00%	100.00%	95.32%	NA	NA
Service Coverage													
4	In door (>= -75dBm)	Allahabad	Nov-13	78.01%	82.04%	ND	2.33%	92.78%	93.05%	ICR	99.62%	85.17%	89.19%
		Jaunpur	Nov-13	37.84%	76.79%	ND	12.82%	60.28%	77.32%	31.09%	90.93%	44.31%	40.05%
		Varanasi	Nov-13	60.18%	89.80%	ND	2.94%	42.07%	89.44%	58.00%	90.25%	83.39%	77.24%
	In-vehicle (>= -85dBm)	Allahabad	Nov-13	99.13%	98.95%	ND	2.38%	99.53%	99.68%	ICR	99.99%	97.99%	99.99%
		Jaunpur	Nov-13	86.97%	96.99%	ND	13.32%	88.03%	94.84%	76.85%	98.77%	63.54%	86.03%
		Varanasi	Nov-13	95.65%	98.63%	ND	2.98%	82.95%	98.33%	87.54%	97.53%	91.88%	99.25%
	Outdoor- in city (>= -95dBm)	Allahabad	Nov-13	99.98%	99.96%	ND	2.38%	100.00%	99.94%	ICR	100.00%	100.00%	99.99%
		Jaunpur	Nov-13	99.45%	99.82%	ND	13.38%	94.66%	99.67%	99.99%	99.99%	85.07%	98.96%
		Varanasi	Nov-13	99.77%	99.67%	ND	2.98%	98.40%	99.88%	100.00%	99.99%	99.80%	99.99%
5	Call Setup Success Rate (>=95%)	Allahabad	Nov-13	100.00%	100.00%	ND	96.59%	99.31%	98.11%	ICR	99.32%	100.00%	100.00%
		Jaunpur	Nov-13	99.15%	100.00%	ND	94.29%	98.84%	100.00%	100.00%	100.00%	98.34%	100.00%
		Varanasi	Nov-13	99.48%	100.00%	ND	98.68%	98.95%	100.00%	99.59%	100.00%	99.49%	99.26%

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



DRIVE TEST TABLE: 3

OPERATOR-ASSISTED DRIVE TEST-UP(E) CIRCLE-DEC-13 MONTH													
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators							CDMA Operators		
1	Blocked Call Rate (<=3%)	Jhansi	Dec-13	2.58%	0.00%	0.61%	1.42%	10.46%	4.64%	ICR	0.00%	0.63%	0.00%
		Lalitpur	Dec-13	ICR	0.00%	0.00%	0.67%	5.06%	0.00%	0.00%	0.00%	0.00%	NS
		Mahoba	Dec-13	ICR	0.00%	1.85%	8.40%	1.06%	1.85%	0.00%	0.00%	6.15%	11.11%
2	Dropped Call Rate (<=2%)	Jhansi	Dec-13	0.00%	0.00%	1.23%	0.00%	1.96%	0.00%	ICR	0.00%	1.27%	2.07%
		Lalitpur	Dec-13	ICR	0.00%	0.00%	0.00%	7.59%	0.00%	0.00%	0.00%	1.45%	NS
		Mahoba	Dec-13	ICR	0.67%	0.00%	0.00%	5.32%	0.94%	3.33%	0.00%	4.92%	2.08%
Percentage connections with good voice quality (=>95%)													
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Jhansi	Dec-13	NA	NA	NA	NA	NA	NA	ICR	NA	94.99%	95.40%
		Lalitpur	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	98.98%	NS
		Mahoba	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	98.82%	96.47%
	(b) 0-5 (with frequency hopping for GSM Operators)	Jhansi	Dec-13	96.30%	95.62%	97.62%	92.33%	96.91%	95.22%	ICR	99.50%	NA	NA
		Lalitpur	Dec-13	ICR	95.60%	97.13%	93.48%	93.00%	95.08%	95.97%	98.71%	NA	NS
		Mahoba	Dec-13	ICR	96.00%	94.07%	97.12%	94.67%	95.22%	95.84%	99.52%	NA	NA
Service Coverage													
4	In door (>= -75dBm)	Jhansi	Dec-13	72.45%	98.00%	56.06%	90.27%	7.44%	89.04%	ICR	92.32%	80.29%	58.22%
		Lalitpur	Dec-13	ICR	76.50%	55.31%	83.20%	3.39%	42.77%	46.69%	74.07%	49.33%	NS
		Mahoba	Dec-13	ICR	50.67%	35.27%	62.21%	5.21%	52.92%	67.76%	66.14%	51.30%	20.12%
	In-vehicle (>= -85dBm)	Jhansi	Dec-13	94.50%	99.96%	93.96%	99.00%	28.83%	99.36%	ICR	99.89%	98.69%	94.21%
		Lalitpur	Dec-13	ICR	97.96%	86.50%	98.39%	19.05%	89.16%	85.71%	98.89%	78.37%	NS
		Mahoba	Dec-13	ICR	86.65%	86.90%	94.53%	28.83%	87.01%	89.87%	96.82%	69.11%	64.46%
	Outdoor- in city (>= -95dBm)	Jhansi	Dec-13	99.84%	99.98%	100.00%	99.86%	75.70%	99.97%	ICR	100.00%	100.00%	100.00%
		Lalitpur	Dec-13	ICR	98.13%	99.47%	100.00%	68.96%	99.68%	100.00%	100.00%	96.14%	NS
		Mahoba	Dec-13	ICR	99.37%	100.00%	100.00%	86.54%	97.46%	99.99%	100.00%	84.42%	100.00%
5	Call Setup Success Rate (>=95%)	Jhansi	Dec-13	97.40%	100.00%	98.18%	98.58%	89.54%	95.36%	ICR	100.00%	99.36%	96.67%
		Lalitpur	Dec-13	ICR	100.00%	100.00%	98.67%	96.20%	100.00%	100.00%	100.00%	100.00%	NS
		Mahoba	Dec-13	ICR	100.00%	98.15%	91.60%	98.73%	98.15%	96.67%	100.00%	93.85%	88.89%

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



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Drive Test UPE Circle Oct-13 to Dec-13						
Month/Year	City	P1	P2	Across	Congested	In Building
Oct-13	LUCKNOW	Matyari Choraha, Chinhat Tiraha, Gomti Nagar, Sahid Path, Sahid Path, Nahriya Choraha, Krishna Nagar, Airport, Airport, Nahriya Choraha, Buddheshwar, Alamnagar, Rajaji puram extention, Campell Road, Campell Road, Balaganj, Thakurnaj, Chowk, Pakkapul	Pakkapul, Khadra, Faizullaganj, Mahibullapur, Sitapur Road, Sitapur Road, Engg. College Choraha, Teripuliya, Kalyanpur, Khurram Ngr, Munchi Pulia, Polytechnic Choraha, Chinhat Tiraha, Chinhat Tiraha, Matiyari	Polytechnic Choraha, Alambagh Choraha, Charbag, Sitapur Road	Chinhat Tiraha, Hazratganj, Mawaiya, Alambagh Choraha	Fun Cinema, INOX
	BARABANKI	Safedabad, Civil Lines, Barabanki Railway Station, Deva Road, Deva Road, Somaiya Nagar, Darhara, Naka Paisar, Vijay Nagar, Dushehrabag, Lala Bazar, Banki, D M office, Civil Lines, Dushehrabag, Lakhpeda Baad, Barabanki Bypass, Safedabad	Dushehrabag, Lakhpeda Baad, Barabanki Bypass, Safedabad, Lala Bazar, Banki, D M office, Civil Lines, Deva Road, Somaiya Nagar, Darhara, Naka Paisar, Vijay Nagar, Dushehrabag, Safedabad, Civil Lines, Barabanki Railway Station, Deva Road	Safedabad, Ghanta Ghar, Naka, Barel	Chaya Choraha, Dhanokhar Choraha, Dushehrabag, Lakhphera Bagh Colony	
	RAIBARELI	Rattapur Chorha, Sarvodya Nagar, Malik Mau Road, Manika Cinema, Manika Cinema, Nirala Nagar, Anand Nagar, Ali Miya Chowk, Ali Miya Chowk, Town Hall, Takia, Qila bazar, Qila bazar, Tripula Choraha, Ratapur Choraha	Rattapur Chorha, Sarvodya Nagar, Malik Mau Road, Manika Cinema, Manika Cinema, Nirala Nagar, Anand Nagar, Ali Miya Chowk, Ali Miya Chowk, Town Hall, Takia, Qila bazar, Qila bazar, Tripula Choraha, Ratapur Choraha	Rattapur Chorha, P&T Colony, Chandan Nagar, Bara Ghusiana	Manika Cinema, Gora Bazar Chouraha, Ghanta Ghar, Civil Lines	
Nov-13	ALLAHABAD	Civil Line Bus Stand, Balson Choraha, Hira Halwai, Railway Station	Bus Stand to Bank Road, Bank Road to Bus Stand, Bus Stand to Teliyarganj,	Rajapur, Alopibaag Chungi, Bahran Choraha, Railway Station	Alopibaag, Dhoomanganj, High Court, Railway Station	Big Bazar

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



			Mundera to Bus Stand			
	JAUNPUR	Bus Stand, Gudai Ganj, Navpadwa, Kalichabad	Sipah Choraha, Kabiruddinpur, Sakar Nanda, Purvanchal University	Aajmari, Olarganj, Kachari Road, Varanasi Road	Olarganj, Khwaja Tola, Kila Road, Station Road	Varun Hotel
	VARANASI	Babatpur, Shivpur, Ashapur, Nadesar	Sigra, Lahartara, B.H.U., Rathyatra	Cannt, Lahurabir, Belupur, B.H.U.	Assi Ghat, Sonarpura, Gadoliya, Luxa	IP MALL
Dec-13	JHANSI	RLY STN., GERMANI HOSPITAL, GWALIOR BYPASS MEDICAL COLLEGE, SADAR BY CANTT. RLY STN.	SADAR BY CANTT, MEDICAL COLLEGE BY GWALIOR BYPASS, GERMANI HOSPITAL, RLY STN.	ELITE TO MEDICAL & GWALIOR BYPASS, GWALIOR BYPASS, ELITE TO AWAS VIKAS, ELITE TO POLY TECHNIQUE	MANIK CHOWK, MINERWA, ROBERT GANJ, BUS STAND	CITY LIFE
	LALITPUR	RLY STN, SAGAR BYPASS, BYPASS TO LALLITPUR ELITE, ELITE TO RLY STN	RLY STN. TO ELITE, ELITE TO BYPASS, BYPASS TO LALITPUR BYPASS, BYPASS TO SAGAR BYPASS TO STATION	ELITE TO BYPASS, BYPASS TO ASHOK NAGAR, ELITE TO GHANTAGHAR, GHANTAGHAR TO INDIAN OIL	ELITE TO RAM NAGAR, RAM NAGAR TO GHANTAGHAR, ZILA PARISHAD, BAZAR	PARIWAR COMPLE X
	MAHOBA	RLY. STN., POLICE LINE, AWAS VIKAS HIGHWAY, PERMANAND CHOWK TO RLY. STN.	RLY.STN. TO PERMANAND CHOWK, AWAS VIKAS HIGHWAY, HIGH WAY TO POLICE LINE, POLICE LINE TO RLY. STN.	FOOD MARKET, ALHA CHOWK, ALHA CHOWK TO CHHATARPUR HIGHWAY, PERMANAND CHOWK	MAIN MARKET, ALHA CHOWK, BUS STAND	RAHUL HOTEL



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

- (i)
 - (a) Aircel is on Intra circle roaming (ICR) with Tata (GSM) in Lalitpur and Mahoba cities.
 - (b) Tata (GSM) is on Intra circle roaming (ICR) with Aircel in Allahabad and Jhansi cities.
 - (c) TATA (CDMA) has no service in Lalitpur.
 - (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 Lucknow, Barabanki and Raibarely. **RCOM (GSM)** failed to meet the benchmark for parameter 'Good Voice Quality', Blocked Call Rate and Dropped Call Rate (DCR). Its performance for Voice Quality was **92.76%** at Lucknow, for parameter Blocked call Rate was **3.82%** at Barabanki and for parameter DCR; performance was **3.31 %** at Barabanki. **Tata (GSM)** and **Idea** also could not meet the benchmark of Voice Quality. **Tata (GSM)** could achieve **76.19%** (Barabanki) & **94.12%** (Raibarely) and **Idea** was lagging behind in meeting the benchmark of Voice Quality (**91.78%**) at Raibarely.
- (iii) **In the Month of November-13**, drive tests were conducted at Allahabad, Jaunpur and Varanasi cities. BSNL did not turn up for drive test. The results of the drive tests carried out in this month revealed that performance of **idea** was below the benchmarks in respect of parameter Voice Quality and Call set-up success rate. The performance of Idea for Voice Quality was **89%** (Allahabad), **89.26%** (Jaunpur) & **94.08%** (Varanasi) and for parameter Call setup Success Rate (CSSR), it was **94.29%** at Jaunpur. **RCOM (GSM)** failed to meet the benchmark for the parameter Good Voice Quality at Allahabad and Varanasi with its performance as **94.36 %** and **92.51 %** respectively. **Vodafone, RCOM (CDMA) and Aircel** also failed to meet the benchmark for the parameter Good Voice Quality at Allahabad, Jaunpur and Allahabad with their performance as **94.14 %**, **94.62%** and **93.34%** respectively. Thus, the 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 were conducted at Jhansi, Lalitpur and Mahoba cities. The drive test results suggest that **RCOM (GSM), RCOM (CDMA), Tata (CDMA)** and Idea need to improve their network quality in these cities for the prime network parameters. **RCOM (GSM)** could not meet the benchmarks of parameters Blocked Call Rate at Jhansi (**10.46%**) & Lalitpur (**5.06%**), Dropped Call Rate (DCR) at **7.59%** (Lalitpur), **5.32%** (Mahoba), Good Voice Quality at Lalitpur (**93%**), Mahoba (**94.67%**) and CSSR at Jhansi (**89.54%**).
RCOM (CDMA) failed to meet the benchmark for the parameter Blocked Call Rate at Mahoba (**6.51%**), DCR at **4.92%** (Mahoba) and CSSR at Mahoba (**93.85%**).
Tata (CDMA) also failed to meet the benchmark for the parameter Blocked Call Rate at Mahoba (**11.11%**), DCR at Jhansi (**2.07%**) & Mahoba (**2.08%**) and CSSR at Mahoba (**88.89%**). **Tata (GSM)** was lagging behind in meeting the benchmark of DCR (**3.33%**) at Mahoba city.



Idea could not achieve the benchmark for the parameter Blocked Call Rate at Mahoba (**8.40%**), Good Voice Quality at Jhansi (**92.33%**), at Lalitpur (**93.48%**) and CSSR at Mahoba (**91.60%**).

BSNL was lagging behind in meeting the benchmark of Good Voice Quality at Mahoba **94.07%**.

Thus, the parameters Voice Quality ,DCR , Blocked Call Rate and CSSR remained non-compliant repeatedly for Tata (CDMA), RCOM (GSM/CDMA) and Idea 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 monthly audit findings, it was concluded that the service providers largely met the benchmarks except for one parameter namely 'Worst affected cells having > 3% TCH drop'. Tata (GSM), Tata (CDMA) which remained non compliant in all the 3 months of the quarter. The performance level of Tata (GSM) was 6.96%, 6.35% & 6.19% and that of Tata (CDMA), the performance level was 5.73%, 7.58% & 7.58% in the months of October, November and December 2013 respectively. Aircel also failed to achieve the benchmark for this parameter in the month of October and November 2013 with its performance as 3.71% and 3.03% respectively.

Three days live measurement assessment, indicated that performance of some of the operators was not as per the norms of the TRAI for some of the parameters. Aircel could not meet the benchmark of the parameters CSSR, SDCCCH Congestion and Worst affected cells with its performance as 94.84% (Oct-13), 1.25% (Oct-13) and 3.66% (Oct-13) & 3.26 (Dec-13) respectively. BSNL could not meet the benchmark of 'BTS Accumulated downtime' with its performance as 3.09% and 4.72% in the month of November and December-2013 respectively. With respect to the parameters 'Worst affected Cells > 3% TCH drop', Tata (GSM) and Tata (CDMA) failed to meet the benchmark in all the three months of the quarter. The performance of Tata (GSM) was 6.90%, 6.38% & 6.83% and that of Tata (CDMA) was 5.59%, 5.46% & 9.02% in the respective months of the quarter.

With regard to the **Customer Service Quality Parameters**, it is revealed that most of the operators were in well compliance of the parameters on Metering and Billing Credibility, Termination of Service and Time taken for refunds. However, in case of the parameter 'Response Time to Customers', Aircel failed to achieve the benchmark for the parameter 'Accessibility of call center/Customer care' with its performance as 72.77% and BSNL failed to achieve benchmark of parameter Calls answered by Operators (voice to voice) within 60 sec with its performance as 86.0%.

In case of parameter 'Termination/Closure of Service', BSNL could settle 98.0% of cases within 7 days.

The performance of the service providers based on the results **drive test**, indicated that the service providers namely RCOM (GSM/CDMA), Idea, Tata (GSM/CDMA) were needed to improve their network quality as these service providers remained under performed in respect of the parameters Voice Quality, Dropped call rate, Blocked call rate and CSSR in most of the cities where drive tests were carried out during the quarter ended December 2013.



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

TABLE: 1

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	2854	9333	528	6679	3253	4030	2405	8977	1845	601
	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	8724	57751	7201	318	6875	11791.42	69.12	40525	5881	176.38
	c) BTS Accumulated Downtime	<=2%	Oct-13	0.41%	0.83%	1.83%	0.20%	0.28%	0.39%	0.00%	0.61%	0.44%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-13	48	98	2	69	20	79	0	0	30	0
e) Worst affected BTSs due to downtime	<=2%	Oct-13	1.68%	1.05%	0.38%	1.02%	0.61%	1.96%	0.00%	0.00%	1.63%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	97.52%	99.47%	98.06%	98.64%	99.41%	97.26%	97.94%	99.47%	98.11%	98.78%
	b) SDCCH/PAGING Congestion	<=1%	Oct-13	0.80%	0.09%	1.08%	0.82%	0.14%	0.43%	0.06%	0.19%	0.00%	0.00%
c) TCH congestion	<=2%	Oct-13	0.32%	0.38%	1.94%	1.23%	0.06%	1.77%	0.80%	0.53%	0.02%	0.05%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Oct-13	0.60%	0.88%	0.45%	1.16%	0.28%	0.70%	0.85%	1.34%	0.22%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-13	3.71%	2.69%	1.54%	2.88%	0.01%	2.55%	2.17%	2.61%	0.22%	5.73%
	c) % of connections with good voice quality	>=95%	Oct-13	96.23%	98.55%	98.00%	96.23%	98.83%	96.08%	98.00%	95.58%	99.75%	99.26%
d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-13	319	748	25	580	1	312	492	691	12	105	

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



	e) Total no. of cells (Sector) in the licensed service area		Oct-13	8587	27821	1584	20142	9705	12238	7063	26482	5535	1824
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	1	0	15	0	0
	Name of POI not meeting the benchmark		Oct-13	0	0	0	0	0	Lakhimpur BSNL L2	0		0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Oct-13	127882.73	510113.47	435800	206981.59	140000	208807.18	137538.20	486838	176000	113000
	b) Total traffic in TCBH in erlang (Avg.)		Oct-13	88298.77	441785.80	239112.46	172246.95	120403.37	239524.99	49526.81	431216	574000	7191.38
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-13	3154983	15352202	4524024	7623657	5368512	5693196	2182962	14365318	2684399	271752

- **Vodafone POIs congestion details:** Reliance NLD, BSNL L1, Faizabad BSNL, Aircel UPE, BSNL Lakhimpur L2, Airtel UPW, BSNL Deoria L2, BSNL Gazipur L2, BSNL L2 Mau, BSNL L2 Azamgarh, Idea UPW, Uninor UPW, BSNL Behraich, BSNL Basti, and BSNL Barabanki L2.



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle- Oct-13 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	2853	9300	NP	6737	3235	4030	2405	8933	1814	601
	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	326.09	6320	NP	755.75	553	910	0	3291.77	408	18.93
	c) BTS Accumulated Downtime	<=2%	Live data	0.16%	0.94%	NP	0.16%	0.24%	0.31%	0.00%	0.61%	0.31%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	58	NP	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.62%	NP	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	94.84%	99.45%	NP	98.73%	99.43%	97.66%	97.95%	99.30%	99.04%	98.12%
	b) SDCCH/PAGING Congestion	<=1%	Live data	1.25%	0.10%	NP	0.69%	0.03%	0.40%	0.04%	0.20%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.31%	0.87%	NP	1.01%	0.07%	1.45%	0.65%	0.70%	0.02%	0.18%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.56%	0.92%	NP	1.21%	0.31%	0.69%	0.82%	1.50%	0.23%	0.56%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.66%	2.78%	NP	2.80%	0.00%	2.55%	6.90%	2.34%	0.23%	5.59%
	c) % of connections with good voice quality	>=95 %	Live data	96.04%	98.49%	NP	95.97%	98.87%	96.31%	97.38%	95.20%	99.72%	99.26%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	314	769	NP	568	0	311	489	619	13	102
e) Total no. of cells (Sector) in the licensed service area		Live data	8575	27679	NP	20284	9705	12169	7096	26467	5442	1826	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Live data	0	0	NP	0	0	1	0	4	0	0
	Name of POI not meeting the benchmark		Live data	0	0	NP	0	0	Lakhimpur BSNL L2	0		0	0

- NP-Not Provided
- Vodafone POIs congestion details: BSNL L2 Mau, BSNL L2 Gazipur, Idea UPW, BSNL L2 Azamgarh.

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



TABLE: 3

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	2867	9333	528	6755	3237	4030	2411	8938	1819	455
	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	8485.83	41793	6952	8660.35	4598	10314.06	201.89	27664	4081	210.5
	c) BTS Accumulated Downtime	<=2%	Nov-13	0.41%	0.62%	1.77%	0.18%	0.20%	0.36%	0.01%	0.43%	0.31%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-13	48	96	3	51	14	75	0	171	9	0
	e) Worst affected BTSs due to downtime	<=2%	Nov-13	1.67%	1.02%	0.57%	0.75%	0.43%	1.86%	0.00%	1.92%	0.49%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	97.46%	99.42%	97.50%	98.52%	99.51%	97.31%	98.26%	99.32%	98.70%	98.56%
	b) SDCCH/PAGING Congestion	<=1%	Nov-13	0.69%	0.12%	0.84%	0.69%	0.12%	0.29%	0.07%	0.27%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.29%	0.42%	1.40%	1.45%	0.05%	1.60%	0.56%	0.68%	0.01%	0.42%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Nov-13	0.66%	0.77%	0.50%	1.15%	0.28%	0.71%	0.78%	1.27%	0.13%	0.49%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-13	3.03%	2.67%	2.00%	2.83%	0.01%	2.43%	6.35%	2.55%	0.04%	7.58%
	c) % of connections with good voice quality	>=95%	Nov-13	96.42%	98.68%	97.00%	96.39%	98.86%	95.96%	97.54%	95.73%	99.77%	95.94%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-13	260	751	31	575	33	296	456	677	2	104
	e) Total no. of cells (Sector) in the licensed service area		Nov-13	8587	28089	1584	20291	9652	12215	7174	26564	5467	1369
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Nov-13	4	0	0	0	0	0	0	15	0	0
	Name of POI not meeting the benchmark		Nov-13		0	0	0	0	0	0		0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Nov-13	128740.96	505014	435800	204674	140000	210882.76	138200.25	486098.44	176000	75563

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



b) Total traffic in TCBH in erlang (Avg.)	Nov-13	91338.97	458053.83	241106.30	178250	127470.31	244044.87	49407	437111	74700	9584
c) Total no. of customers served (as per VLR) on last day of the month	Nov-13	3222886	15691300	4537055	7923214	5384046	5836403	2201110	14839253	2746808	184135

- **Aircel POIs congestion details:** Uninor, Idea UP(W), Aircel UP (W) and BSNL L1
- **Vodafone POIs congestion details:** BSNL Fatehpur L2, BSNL Sitapur L2, BSNL Deoria L2, Cellone UPW, BSNL Orai L2, BSNL Jhanshi L2, BSNL Gazipur L2, BSNL Faizabad L2, BSNL Shahjahanpur L2, BSNL Barabanki L2, BSNL Sitapur L2, VSNL NLD, Vodafone NLD 5, Uninor UPE 1, Uninor UPE-4



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle- Nov-13 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	2858	9356	528	6720	3227	4030	2405	8881	1845	601
	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	733.30	5273	1173.83	886.43	559.60	1177.25	0	5043	423.02	10.48
	c) BTS Accumulated Downtime	<=2%	Live data	0.38%	0.78%	3.09%	0.18%	0.24%	0.41%	0.00%	0.79%	0.32%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	68	0	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.73%	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	98.66%	99.46%	98.13%	98.71%	99.50%	97.24%	97.63%	99.36%	98.13%	98.41%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.59%	0.10%	0.57%	0.85%	0.35%	0.30%	0.29%	0.22%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.25%	0.81%	1.87%	1.27%	0.05%	1.51%	0.77%	0.64%	0.02%	0.16%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.67%	0.78%	0.45%	1.20%	0.27%	0.76%	0.80%	1.14%	0.12%	0.33%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.74%	2.75%	0.14%	2.89%	0.00%	2.69%	6.38%	2.41%	0.00%	5.46%
	c) % of connections with good voice quality	>=95%	Live data	96.64%	98.65%	96.27%	96.17%	98.86%	95.74%	97.58%	95.97%	99.77%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	235	769	25	587	0	329	454	640	0	100
e) Total no. of cells (Sector) in the licensed service area		Live data	8599	27995	18285	20282	9637	12228	7110	26568	5467	1826	
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	4	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0		0	0

• NP-Not Provided

• Vodafone POIs congestion details: BSNL L2 Shahjahanpur, BSNL Faizabad L2, BSNL L2 Barabanki, BSNL L2 Fatehpur.



TABLE: 5

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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		Dec	2887	9448	528	6964	3227	4034	2433	8980	1819	455
	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	7954.26	44404	6952	12908	5072	12407.34	167.14	23984	4076	210.50
	c) BTS Accumulated Downtime	<=2%	Dec	0.37%	0.63%	1.77%	0.25%	0.21%	0.41%	0.93%	0.36%	0.30%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec	44	93	2	73	19	78	0	155	13	0
	e) Worst affected BTSs due to downtime	<=2%	Dec	1.52%	0.98%	0.57%	1.05%	0.59%	1.93%	0.00%	1.73%	0.71%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec	98.67%	99.49%	97.52%	98.52%	99.48%	97.77%	98.20%	99.40%	98.68%	98.56%
	b) SDCCH/PAGING Congestion	<=1%	Dec	0.86%	0.10%	0.84%	0.57%	0.07%	0.71%	0.07%	0.20%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec	0.36%	0.38%	1.40%	1.45%	0.05%	1.33%	0.60%	0.60%	0.01%	0.19%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Dec	0.65%	0.69%	0.46%	1.06%	0.28%	0.68%	0.79%	1.07%	0.21%	0.49%
	b) Worst affected cells>3% TCH drop	<=3%	Dec	2.87%	2.63%	1.96%	2.83%	0.01%	2.03%	6.19%	2.20%	0.44%	7.58%
	c) % of connections with good voice quality	>=95%	Dec	96.55%	98.80%	97.00%	96.90%	98.85%	96.40%	97.66%	96.16%	99.77%	95.94%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec	250	743	31	581	1	248	447	584	24	104
	e) Total no. of cells (Sector) in the licensed service area		Dec	8690	28246	1584	20526	9652	12235	7213	26572	5467	1369
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Dec	0	0	0	0	0	0	0	4	0	0
	Name of POI not meeting the benchmark		Dec	0	0	0	0	0	0	0		0	0
Network Data													
5	a) Equipped Capacity of Network in Erlang		Dec	126496.65	498341.79	435800	206639	140000	202695.25	139250.17	485459.72	176000	75563
	b) Total traffic in TCBH in erlang (Avg.)		Dec	96182.17	426335.06	238641.6	180334	123334.26	261011.92	49768.34	439042	69604	9584
	c) Total no. of customers served (as per VLR) on last day of the month		Dec	3355057	15135784	4496935	7867136	5373907	6058017	2190560	14702656	2716213	184135

• **Vodafone POIs congestion details:** Uninor local, Uninor UPW, Aircel UPW and Videocon UPE



TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle- Dec-13 month

S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	2871	9383	528	6772	3227	4033	2421	8938	1819	455
	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	897	3915	1793.46	1204.13	399.23	855.21	2.87	2710	312.43	52.20
	c) BTS Accumulated Downtime	<=2%	Live data	0.43%	0.58%	4.72%	0.25%	0.17%	0.29%	0.16%	0.42%	0.24%	0.16%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	6	43	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.21%	0.46%	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	98.57%	99.48%	96.99%	98.36%	99.54%	97.94%	98.29%	95.85%	98.75%	98.07%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.78%	0.09%	0.74%	0.48%	0.05%	0.34%	0.04%	0.27%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.32%	0.89%	1.06%	1.61%	0.05%	1.26%	0.58%	0.61%	0.01%	0.57%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.68%	0.72%	1.81%	1.09%	0.27%	0.65%	0.78%	1.21%	0.71%	0.55%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.26%	2.77%	0.16%	2.65%	0.00%	1.80%	6.83%	2.58%	0.55%	9.02%
	c) % of connections with good voice quality	>=95%	Live data	96.44%	98.77%	97.01%	96.73%	98.92%	96.44%	97.62%	95.81%	99.78%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	282	776	29	541	0	220	491	685	30	123
	e) Total no. of cells (Sector) in the licensed service area		Live data	8640	27995	18285	20401	9652	12235	7188	26580	5467	1367
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	10	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0		0	0

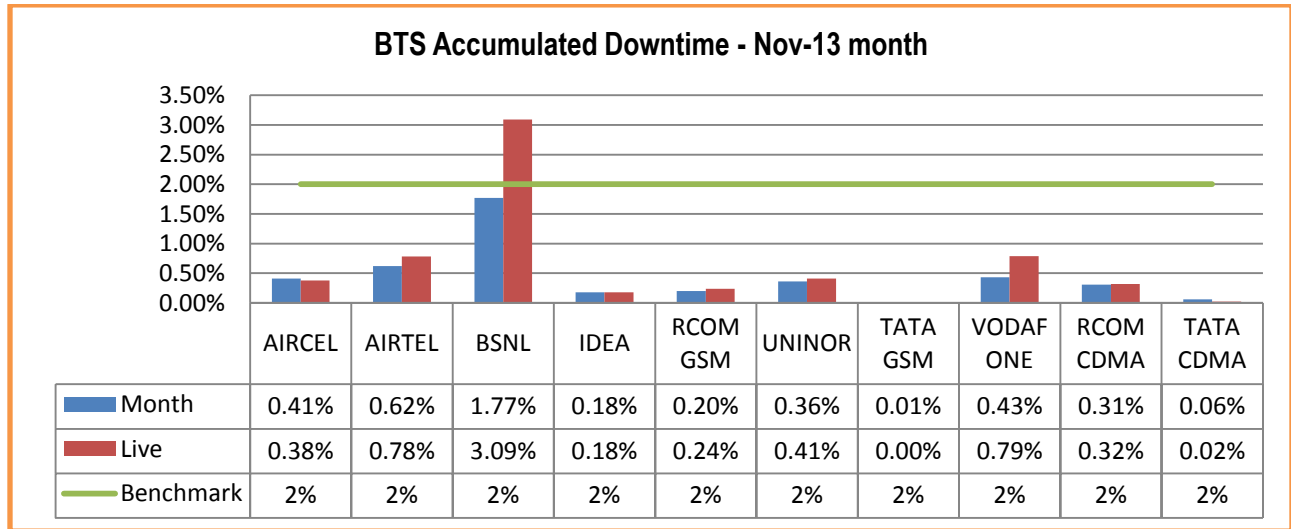
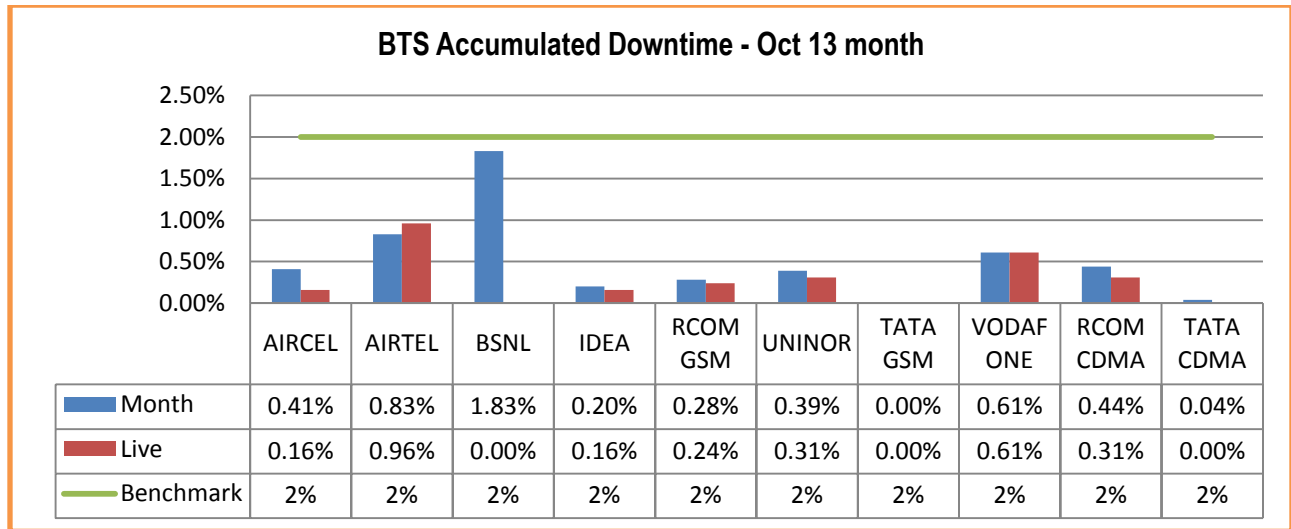
• **NP-Not Provided**

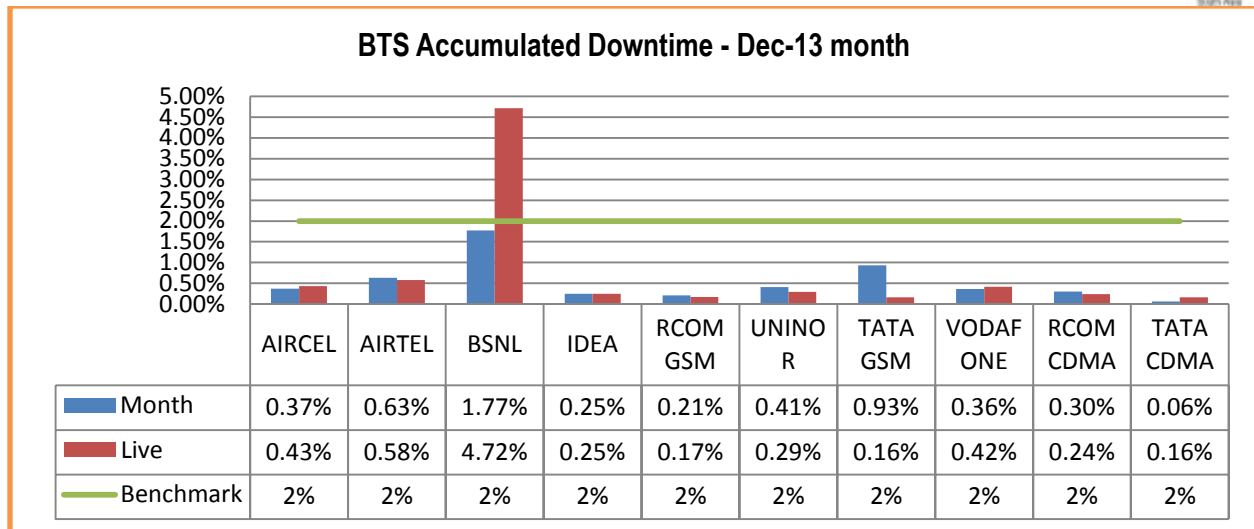
• **Vodafone POIs congestion details:** Uninor UPE-2, Aircel UPW-1, BSNL Ballia L2, BSNL Mau L2, BSNL L2,Uninor UPW, Airtel UPW, Aircel UPW, BSNL Sitapur L2 and BSNL Faizabad L2.



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

1) BTS ACCUMULATED DOWNTIMES:

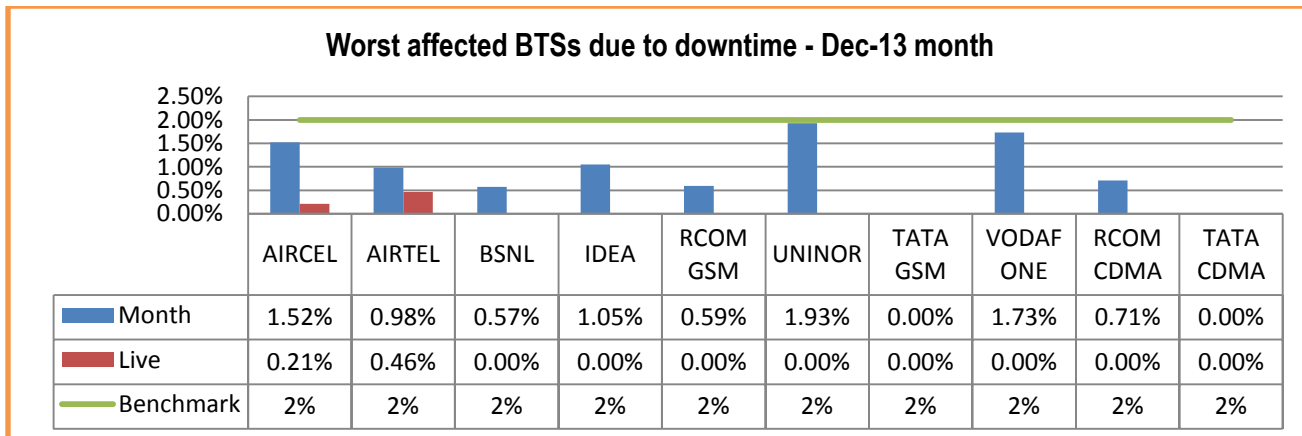
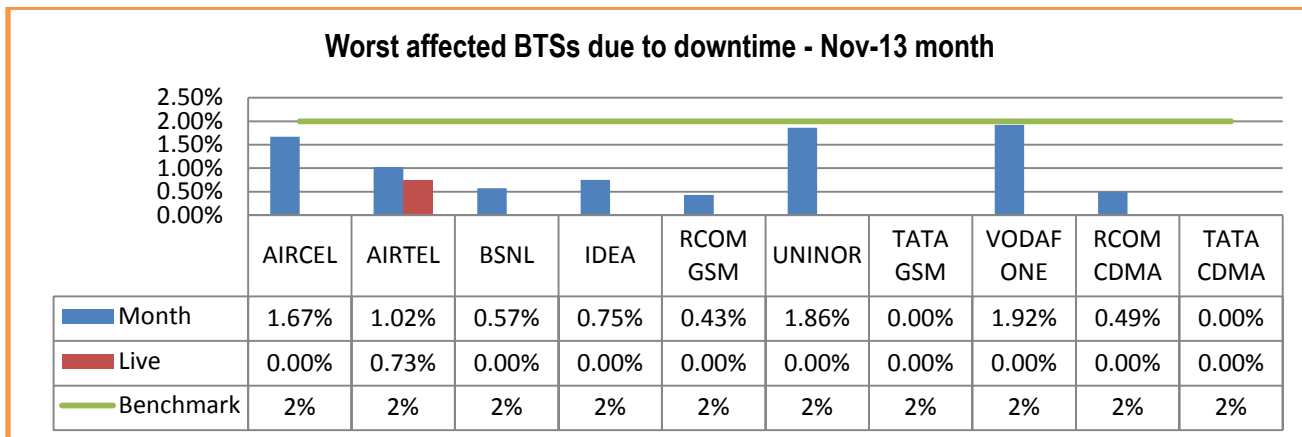
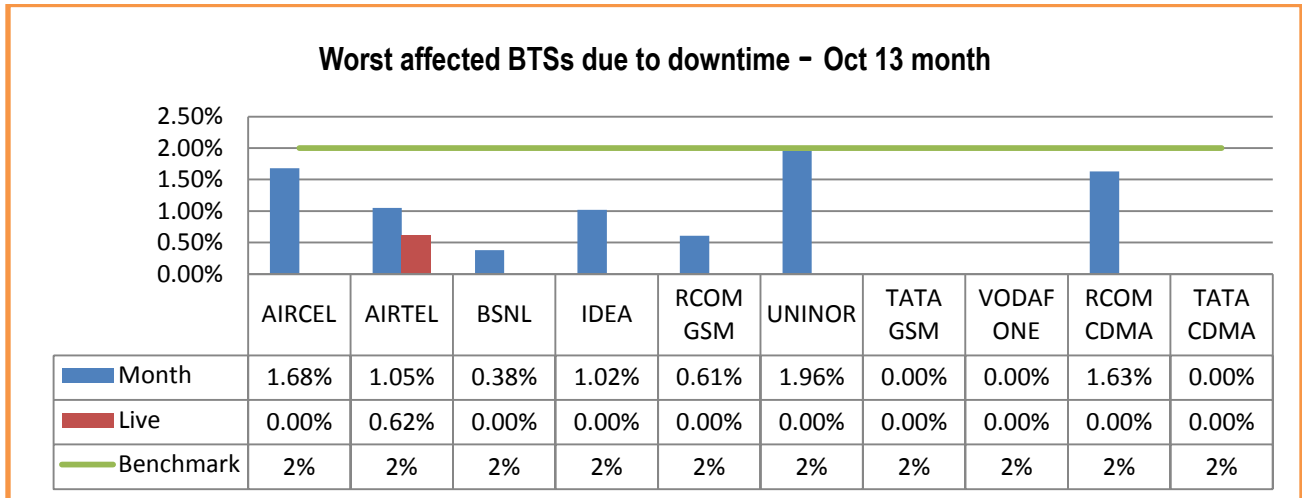




All operators are meeting the benchmarks except BSNL. BSNL could not meet the benchmark in 3-days live measurement in the month of November and December 2013.



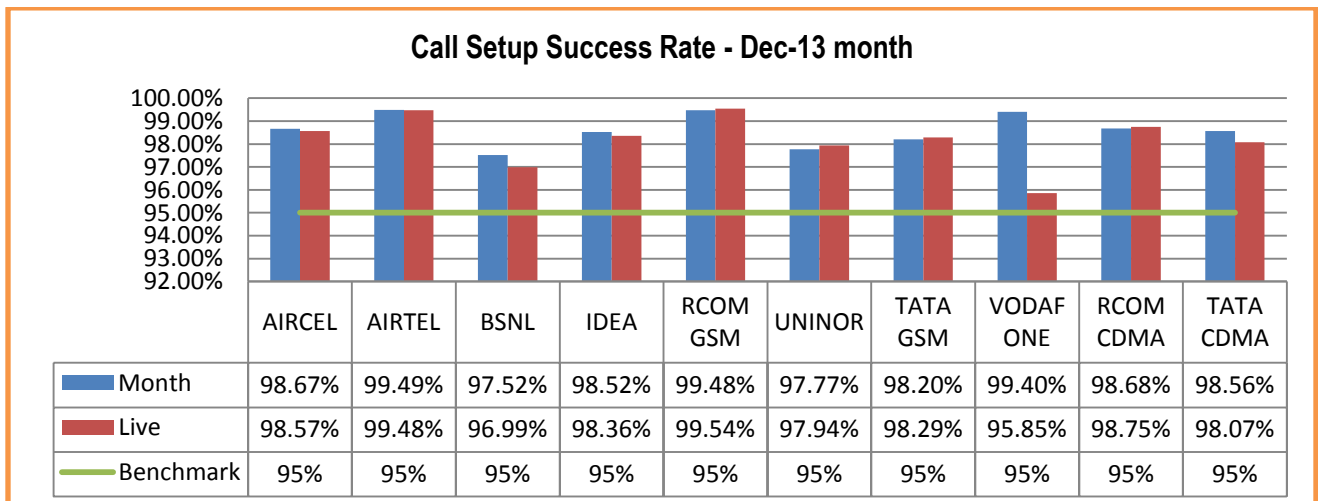
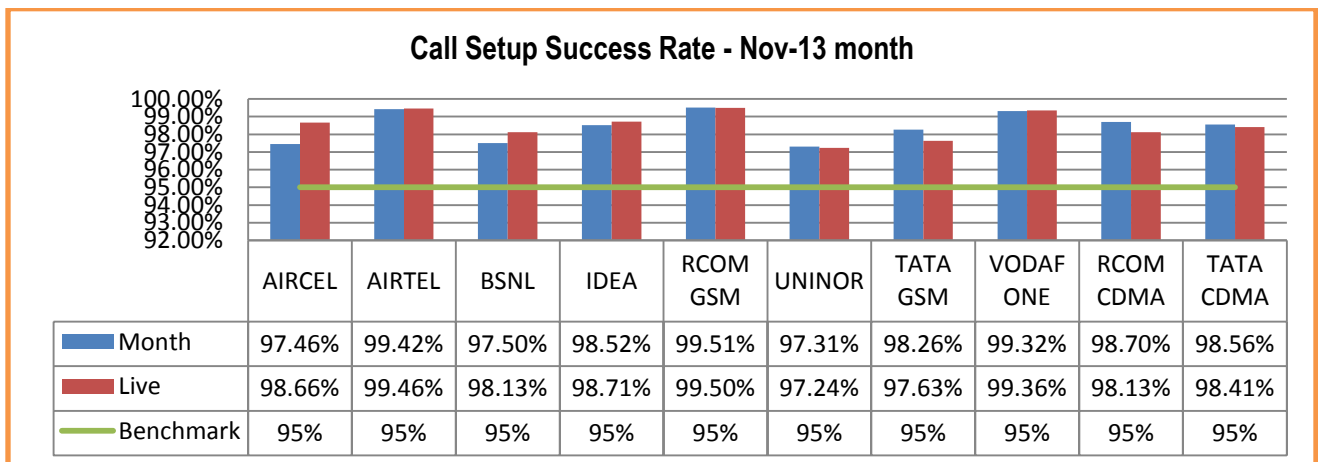
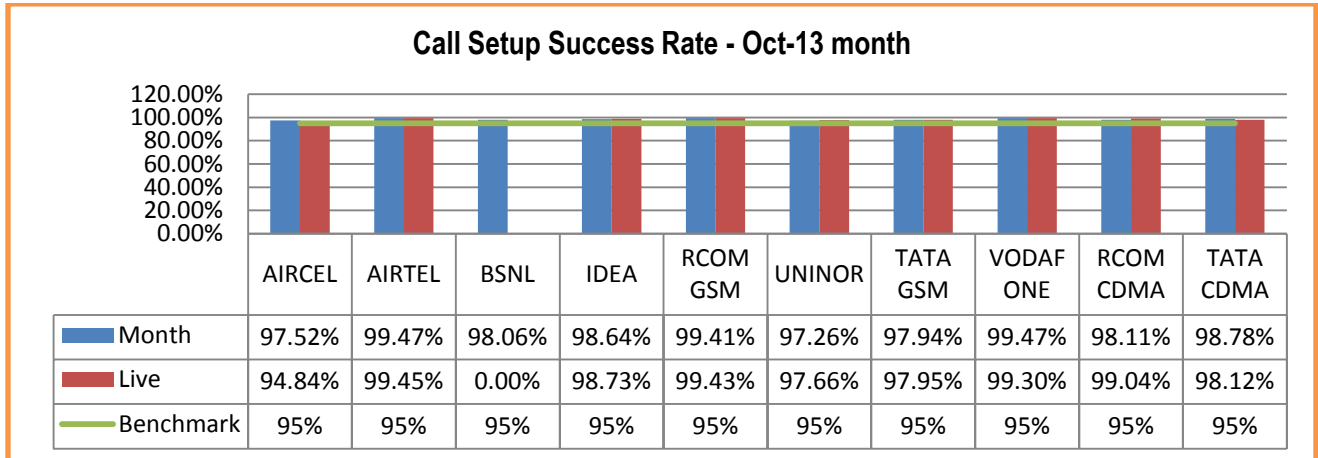
2) WORST AFFECTED BTSS DUE TO DOWNTIME:



All operators are meeting the benchmarks.



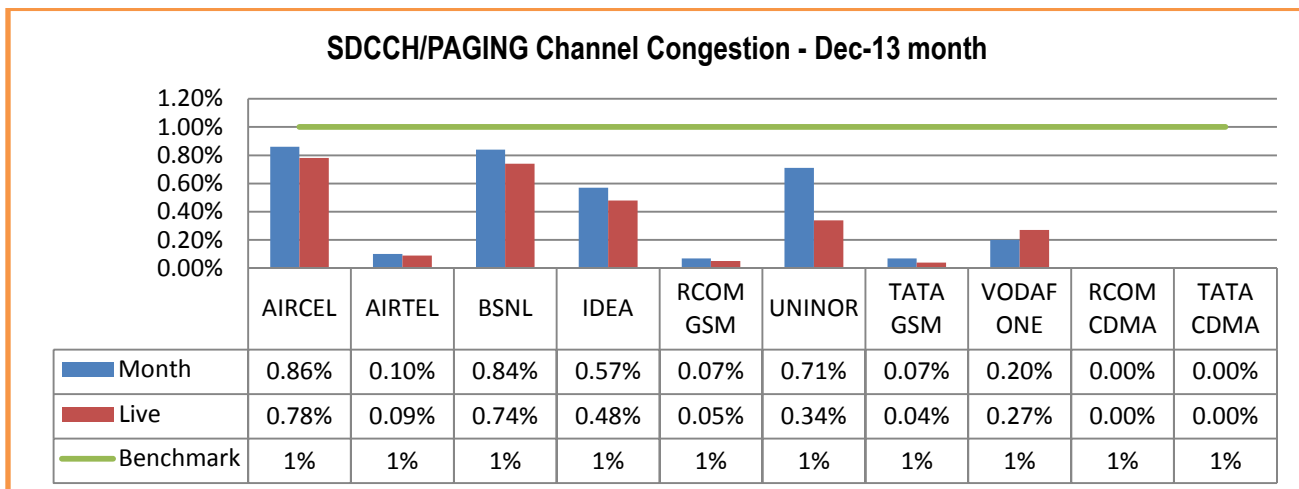
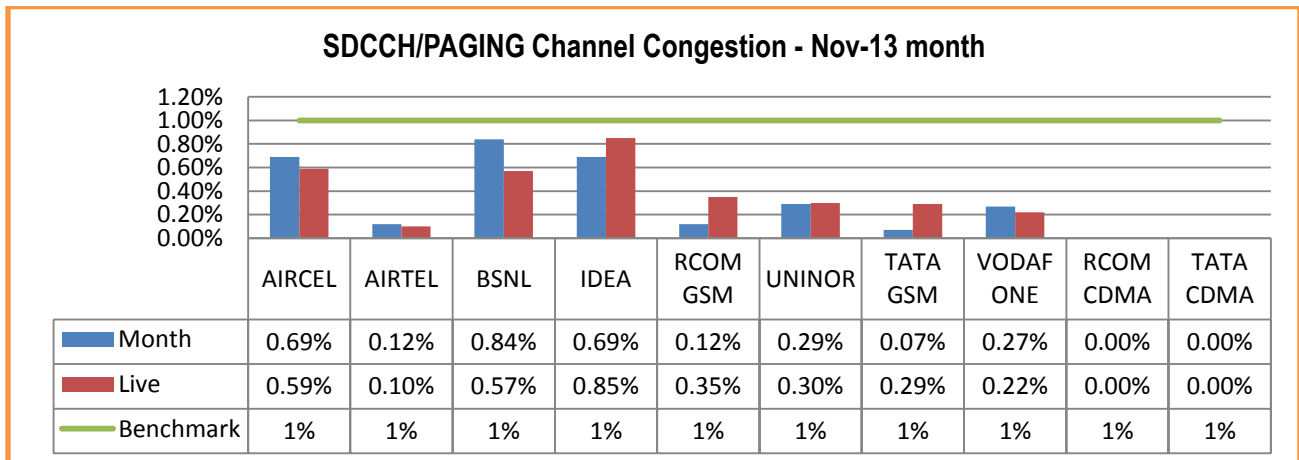
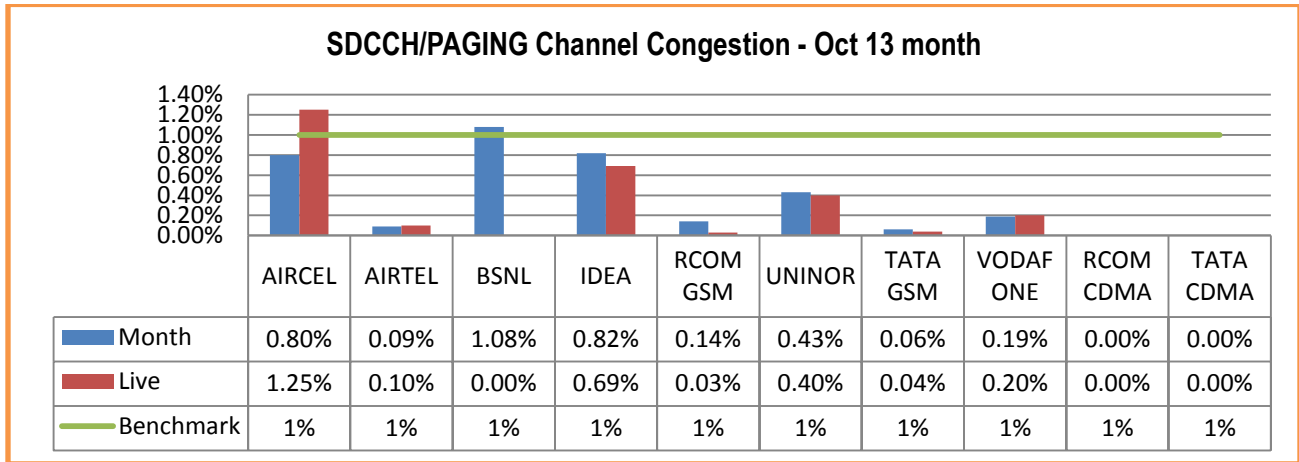
3) CALL SETUP SUCCESS RATE:



All operators are meeting the benchmarks.



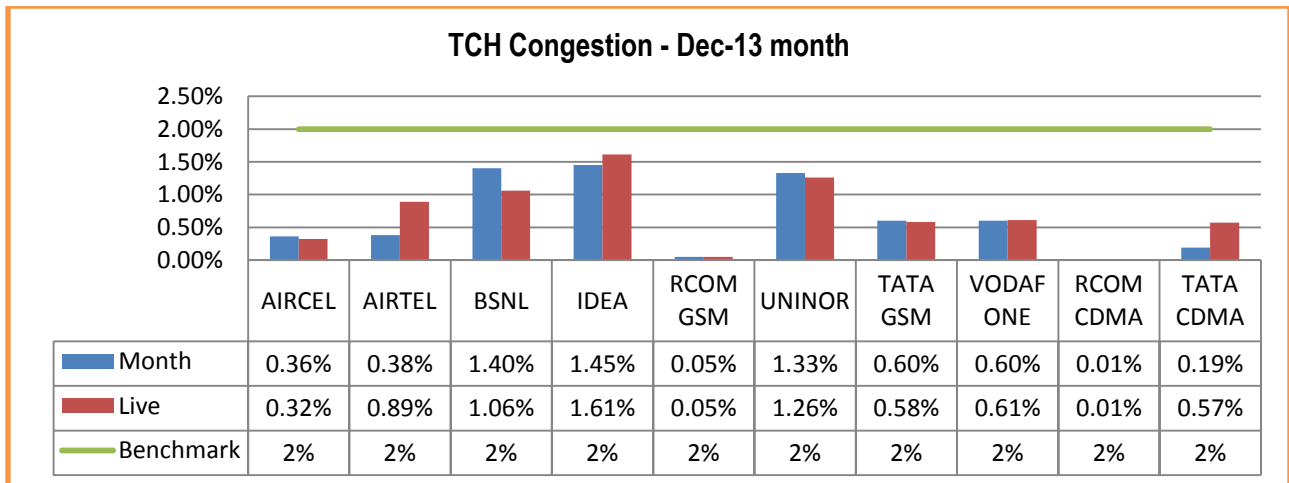
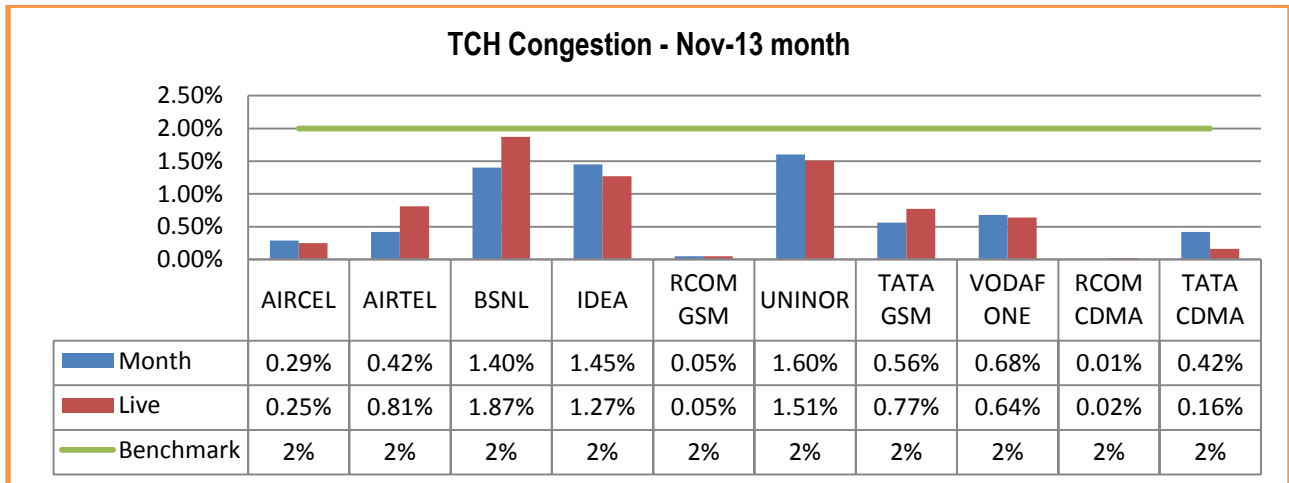
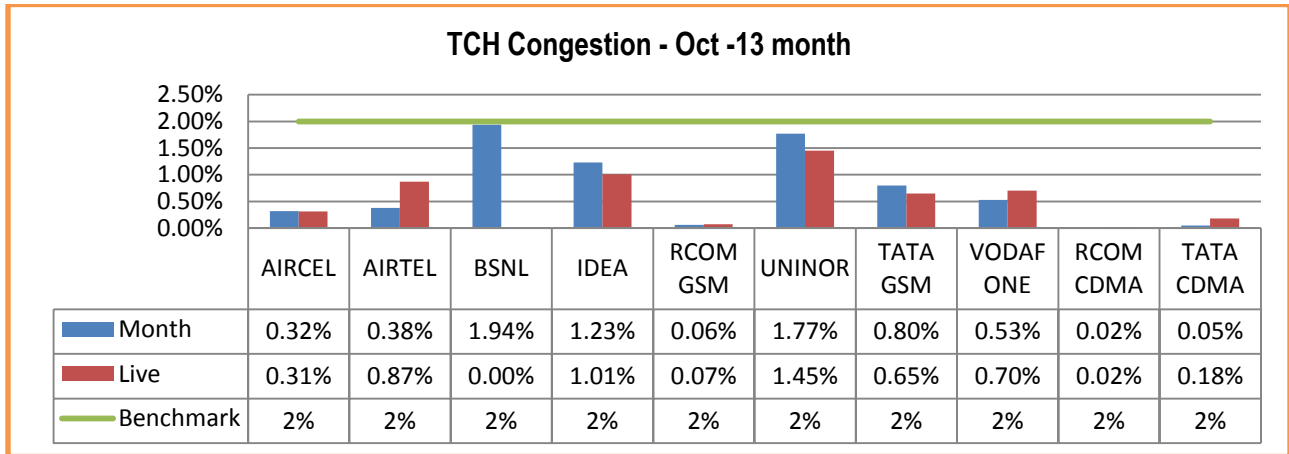
4) SDCCH/PAGING CHANNEL CONGESTION:



All operators are meeting the benchmarks except BSNL (Month) & Aircel (3 days live) in the month of October-2013.



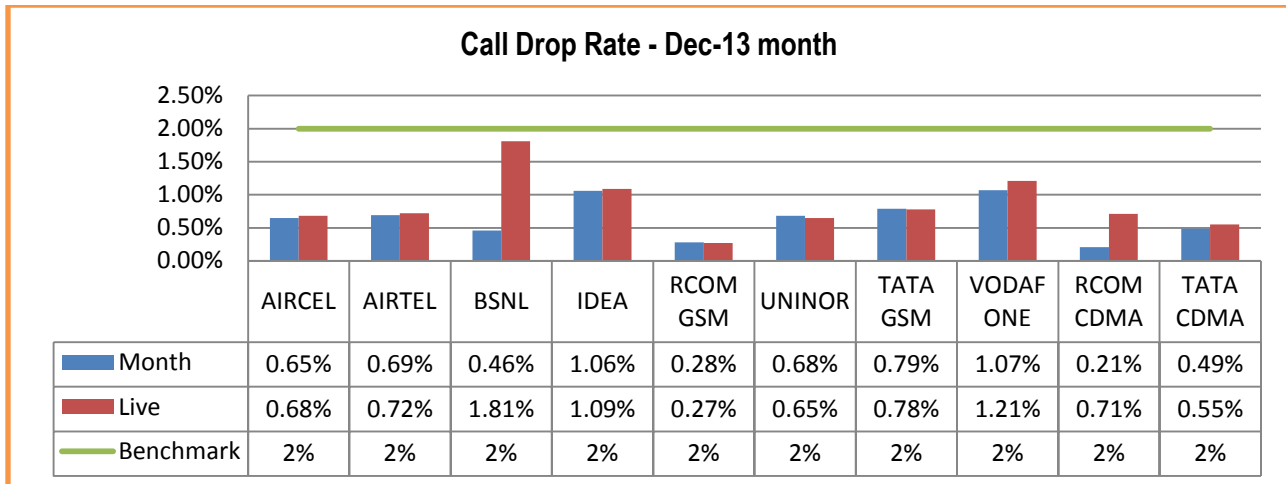
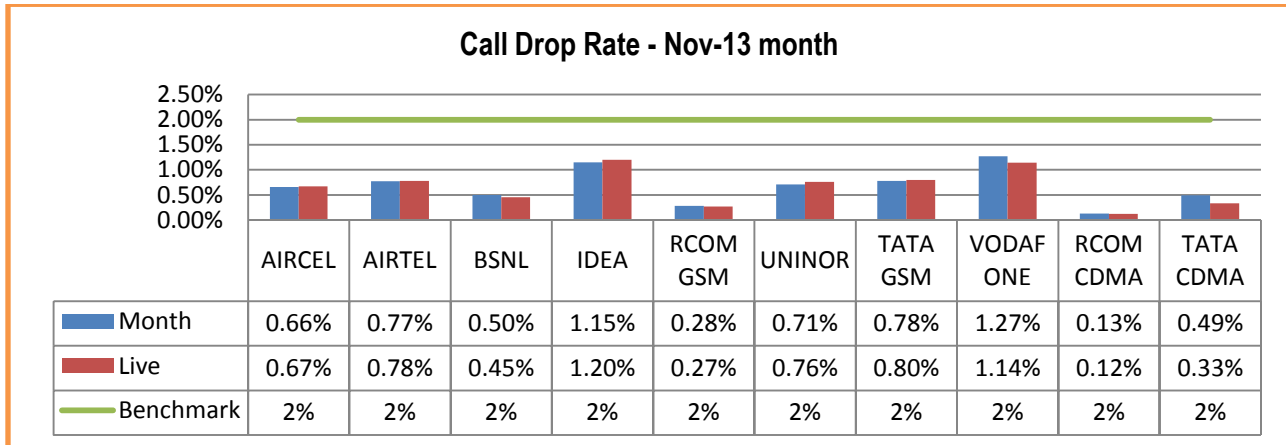
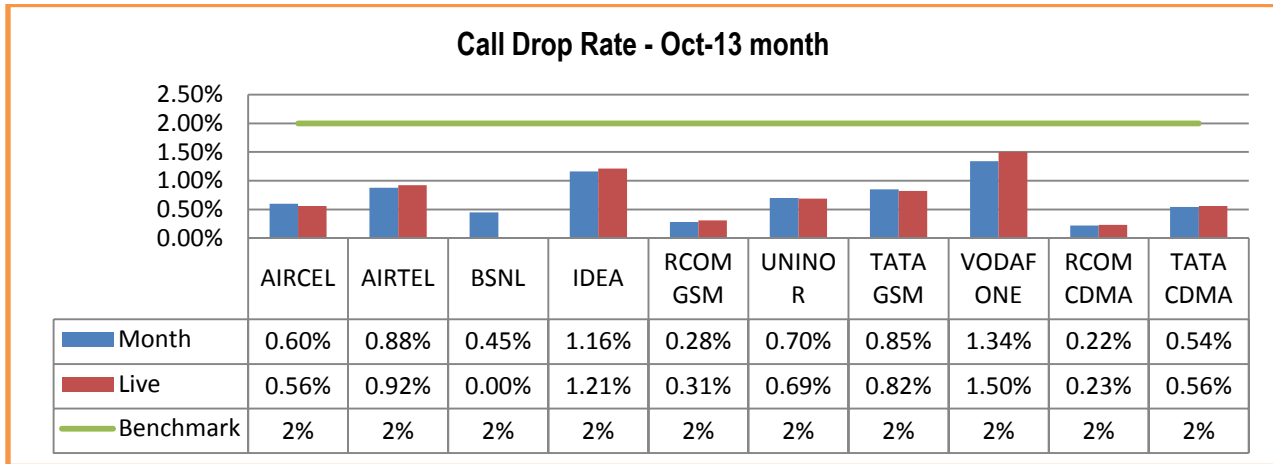
5) TCH CONGESTION:



All operators are meeting the benchmarks.



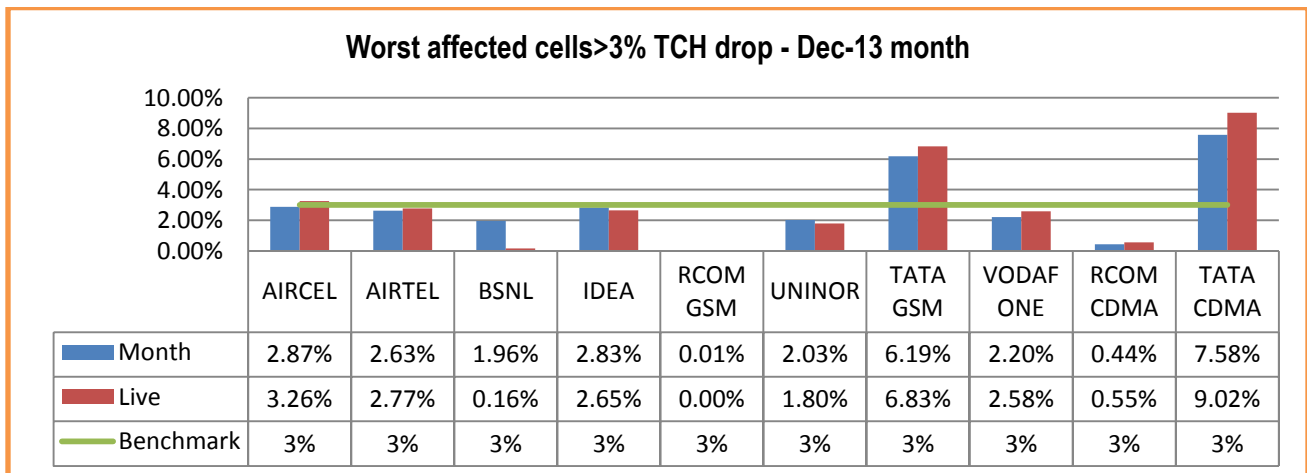
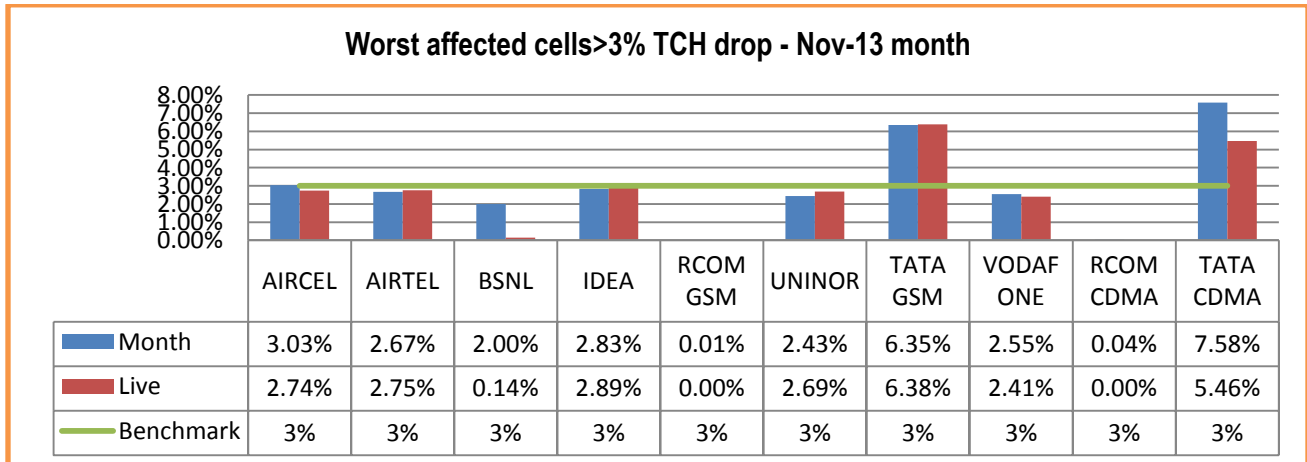
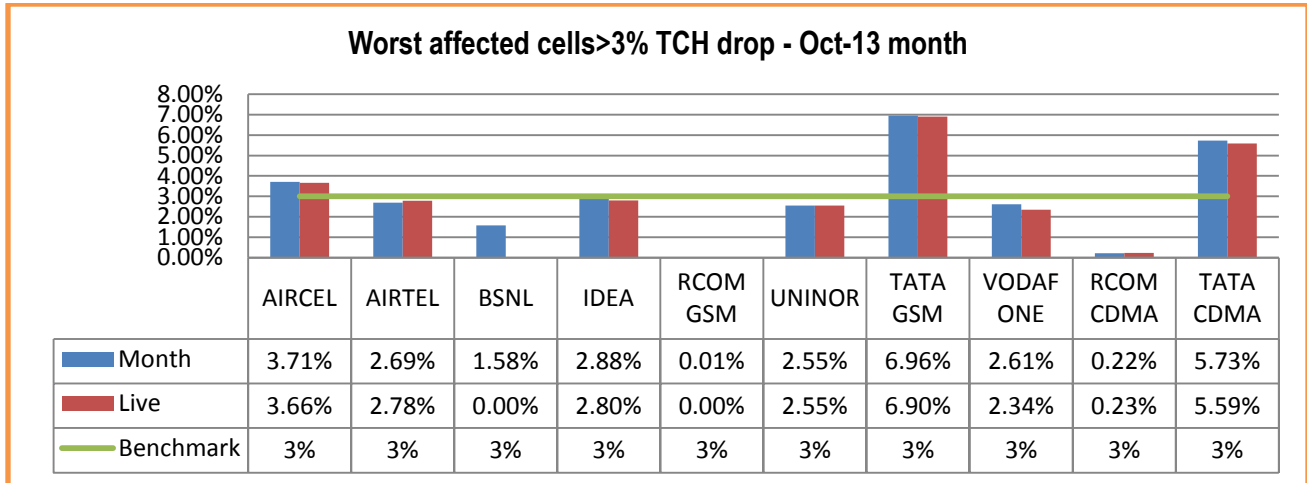
6) CALL DROP RATE:



All operators are meeting the benchmarks.



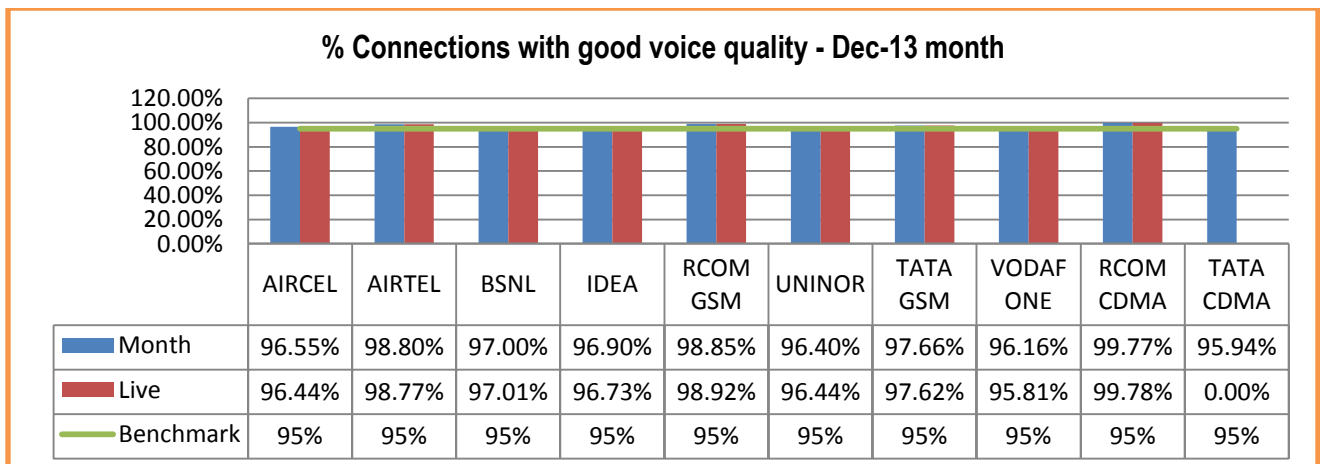
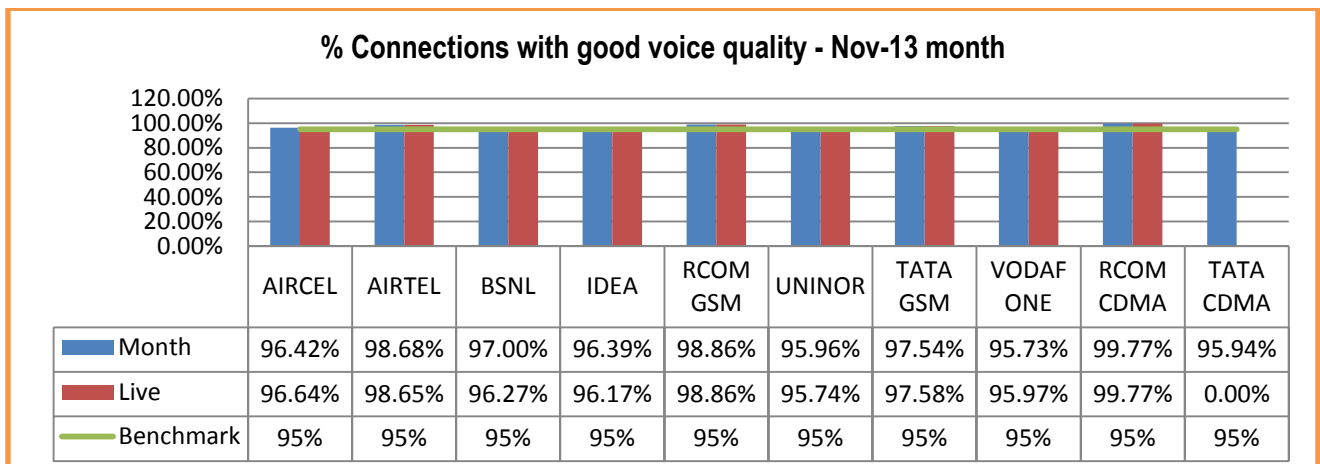
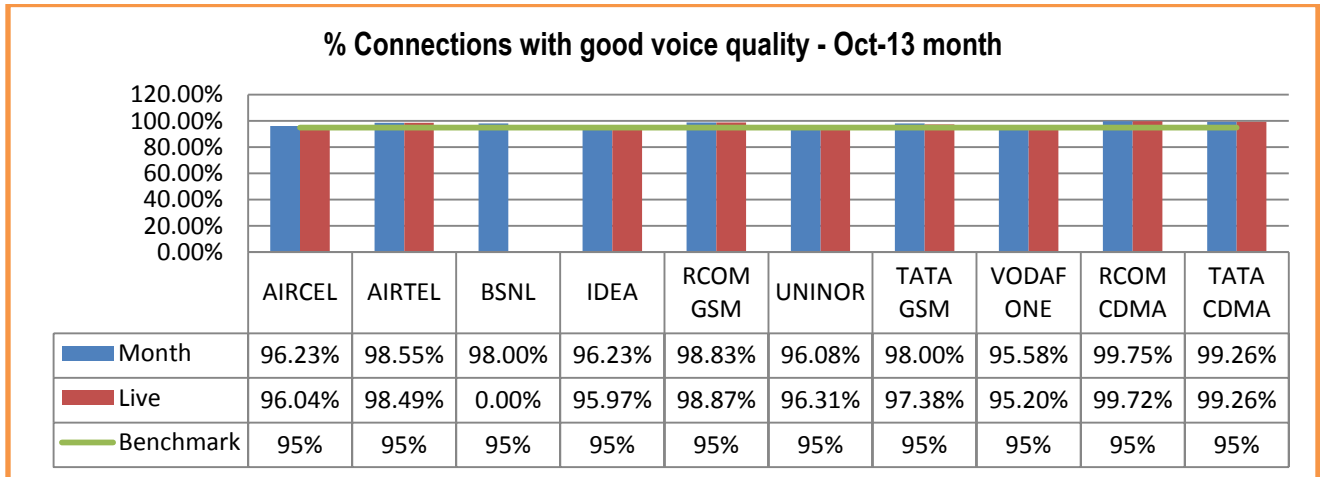
7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Tata (GSM & CDMA) in October, November and December 2013 and Aircel in month of October & November 2013 during monthly audit.



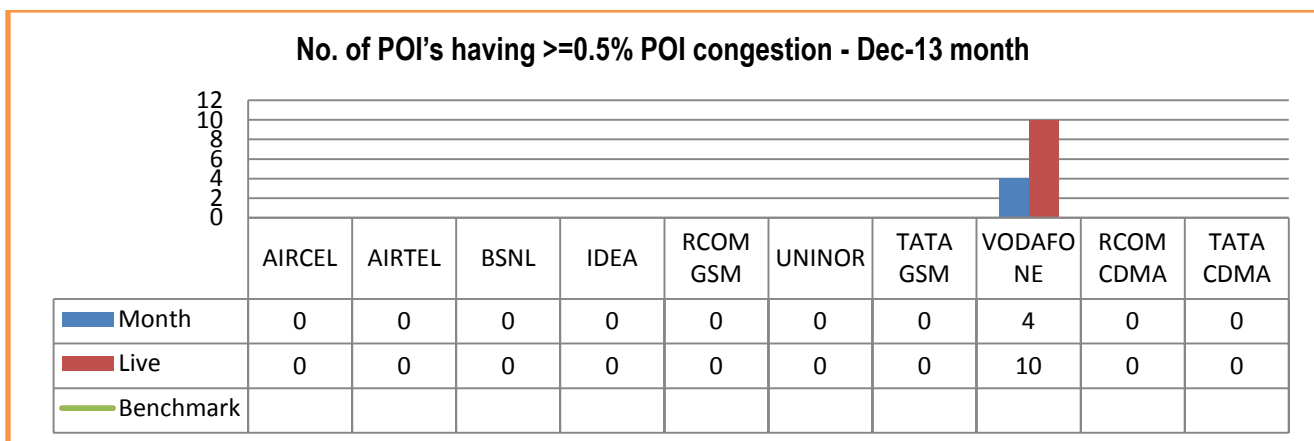
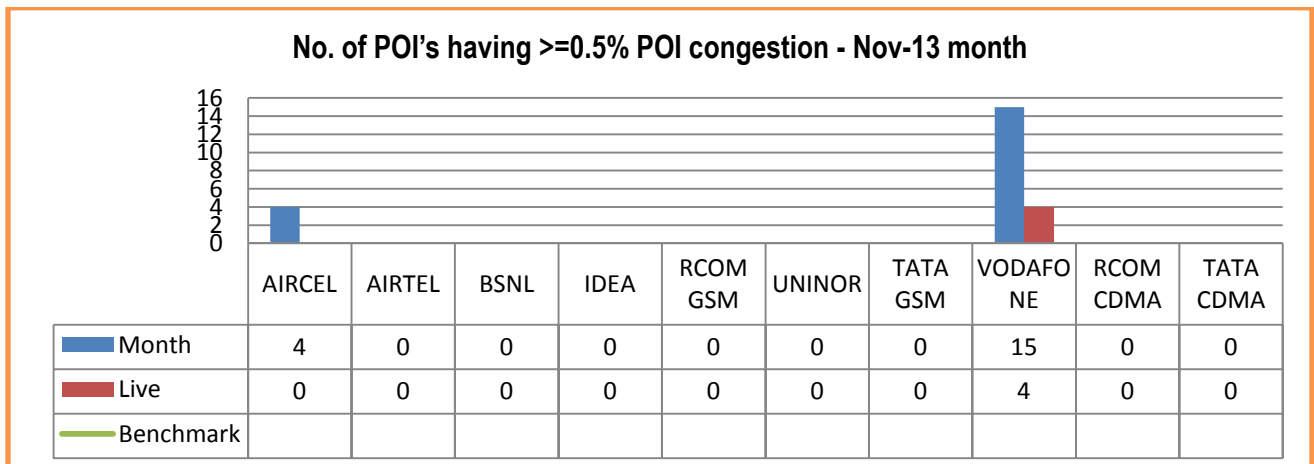
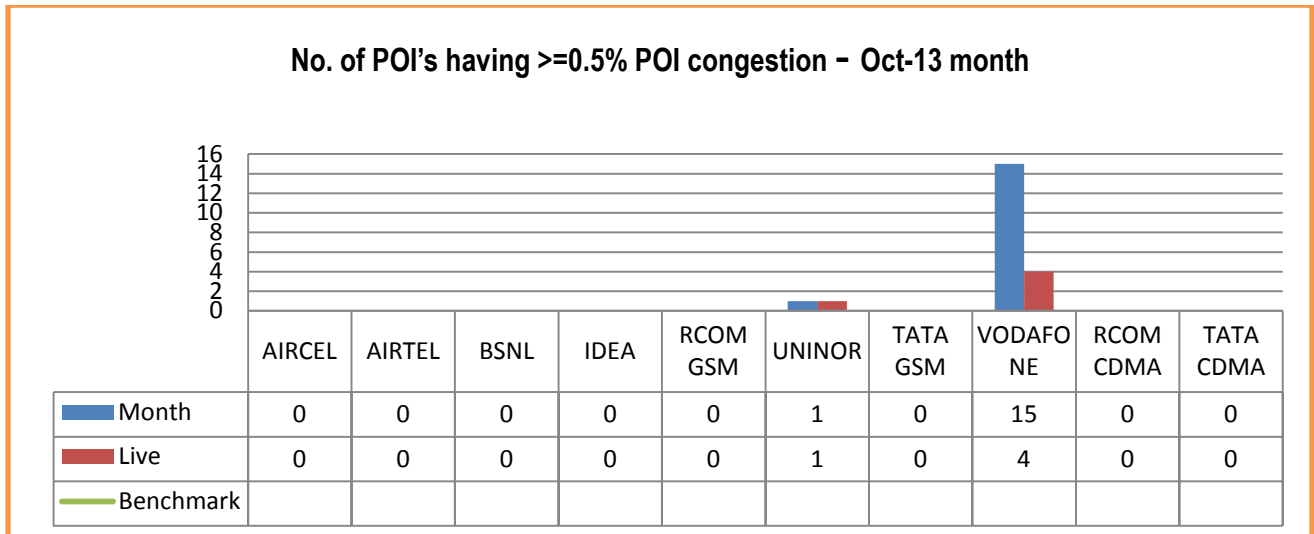
8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks.



9) NO. OF POI'S HAVING $\geq 0.5\%$ POI CONGESTION:



All operators are meeting the benchmarks except Vodafone in month of October, November and December 2013, Aircel in the month of November 2013 and Uninor in the month of October-13.



9. PMR VERIFICATION SHEET:

a) NETWORK RELATED PARAMETER:

UP(E) 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	0.40	1.63	97.78	0.79	0.33	0.63	1.17	96.39	0
	Verified	0.40%	1.62%	97.88%	0.78%	0.32%	0.64%	3.20%	96.40%	1
AIRTEL	Reported	0.69	1.02	99.46	0.10	0.39	0.78	2.66	98.67	0
	Verified	0.69%	1.02%	99.46%	0.10%	0.39%	0.78%	2.66%	98.68%	0
BSNL	Reported	1.25	0.84	97.00	0.73	1.57	1.60	2.53	96.67	0
	Verified	1.79%	0.51%	97.69%	0.92%	1.58%	0.47%	1.85%	97.33%	0
IDEA	Reported	0.21	0.94	98.56	0.69	1.37	1.12	2.85	96.53	0
	Verified	0.21%	0.94%	98.56%	0.69%	1.38%	1.12%	2.85%	96.51%	0
RCOM GSM	Reported	0.23	0.55	99.47	0.11	0.05	0.28	0.01	98.85	0
	Verified	0.23%	0.54%	99.47%	0.11%	0.05%	0.28%	0.01%	98.85%	0
UNINOR	Reported	0.39	1.92	97.43	0.47	1.58	0.70	2.33	96.14	0
	Verified	0.39%	1.92%	97.45%	0.48%	1.57%	0.70%	2.34%	96.15%	0
TATA GSM	Reported	0.01	0.00	98.13	0.07	0.66	0.81	1.72	97.57	0
	Verified	0.31%	0.00%	98.13%	0.07%	0.65%	0.81%	6.50%	97.73%	0
VODAFONE	Reported	0.47	1.78	99.40	0.22	0.60	1.22	2.45	95.83	0
	Verified	0.47%	1.22%	99.40%	0.22%	0.60%	1.23%	2.45%	95.82%	11
RCOM CDMA	Reported	0.35	0.95	98.50	0.00	0.01	0.19	0.22	99.76	0
	Verified	0.35%	0.94%	98.50%	0.00%	0.01%	0.19%	0.23%	99.76%	0
TATA CDMA	Reported	0.04	0.00	98.57	0.00	0.19	0.53	2.95	97.56	0
	Verified	0.05%	0.00%	98.63%	0.00%	0.22%	0.51%	6.96%	97.05%	0

- I. The above data is averaged for three months of the quarter ending December-2013.
- II. The PMR data provided by the service providers is largely matching with verified (audited) data .However in case of the parameter "Worst affected cells>3% TCH drop" for Aircel, Tata GSM and CDMA, there was significant variation between the reported and verified data. It could be due to different way of calculating the performance with respect to this parameter by the service providers.
- III. Aircel and Vodafone have reported no congestion on any individual POI but on verification it was found that they were having congestion on 1 and 11 POIs respectively.



b) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

UP(E) 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	88.84	92.71	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	72.77%	93.00%	100.00%	100.00%
AIRTEL	Reported	0.01	0.02	100.00	99.97	100.00	96.00	100.00	100.00
	Verified	0.01%	0.01%	100.00%	100.00%	100.00%	96.00%	100.00%	100.00%
BSNL	Reported	0.08	0.07	100.00	100.00	97.32	91.00	100.00	100.00
	Verified	0.05%	0.01%	100.00%	100.00%	100.00%	86.00%	98.00%	100.00%
IDEA	Reported	0.05	0.01	100.00	100.00	99.98	99.17	100.00	100.00
	Verified	0.05%	0.01%	100.00%	100.00%	100.00%	97.00%	100.00%	100.00%
RCOM (GSM)	Reported	0.08	0.10	100.00	100.00	99.15	97.04	100.00	100.00
	Verified	0.08%	0.10%	100.00%	100.00%	99.17%	96.99%	100.00%	100.00%
TATA (GSM)	Reported	0.00	0.00	100.00	100.00	99.34	95.70	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	96.00%	100.00%	100.00%
UNINOR	Reported	NA	0.01	100.00	NA	96.16	97.01	NA	NA
	Verified	NA	0.00%	100.00%	100.00%	95.04%	97.00%	NA	NA
VODAFONE	Reported	0.06	0.02	100.00	100.00	100.00	93.77	100.00	100.00
	Verified	0.06%	0.02%	100.00%	100.00%	100.00%	93.00%	100.00%	100.00%
RCOM (CDMA)	Reported	0.10	0.10	100.00	100.00	97.54	93.40	100.00	100.00
	Verified	0.10%	0.10%	100.00%	100.00%	97.52%	93.37%	100.00%	100.00%
TATA (CDMA)	Reported	0.00	0.00	100.00	100.00	99.34	96.93	100.00	100.00
	Verified	0.01%	0.00%	100.00%	100.00%	100.00%	97.66%	100.00%	100.00%

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. Aircel has not met the benchmark 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." and "% of Termination/ Closure of service within 7 days"