



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
NORTH ZONE – JAMMU & KASHMIR 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 **J&K 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 J&K circle

Sl. No.	Name of Service Provider
GSM Operators	
1	AIRCEL
2	AIRTEL
3	BSNL
4	IDEA
5	RCOM GSM
6	VODAFONE

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 J&K 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 J&K 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 54 (3x6x3) drive tests in three months of quarter ended December 2013 were carried out in **J&K 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	18:00 - 19:00
2	AIRTEL	Dec-13	20:00 - 21:00
3	BSNL	Dec-13	19:00 - 20:00
4	IDEA	Dec-13	19:00 - 20:00
5	RCOM GSM	Dec-13	19:00 - 20:00
6	VODAFONE	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 J&K 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	6	22	2138	Ericsson	Ericsson
2	AIRTEL	11	30	2634	Ericsson	Ericsson
3	BSNL	7	22	1149	Ericsson	Ericsson, NSN & ZTE
4	IDEA	2	5	805	Ericsson	Ericsson
5	RCOM GSM	2	6	982	Huawei	Huawei
6	VODAFONE	4	15	1329	NSN	NSN



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- OCT-13 MONTH									
<u>PMR Generation Data</u>		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) BTS Accumulated Downtime	<=2%	Oct-13	0.45%	0.09%	1.66%	0.17%	0.23%	0.63%
	b) Worst affected BTSs due to downtime	<=2%	Oct-13	1.98%	0.11%	0.06%	0.89%	1.02%	0.30%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	96.52%	98.69%	99.86%	99.29%	99.63%	98.29%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-13	0.32%	0.22%	0.58%	0.10%	0.01%	0.01%
	c) TCH congestion	<=2%	Oct-13	1.63%	0.25%	0.84%	0.27%	0.04%	0.03%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Oct-13	0.71%	0.53%	0.85%	1.14%	0.47%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-13	2.48%	1.10%	2.10%	2.60%	0.31%	2.57%
	c) Connections with good voice quality	>=95%	Oct-13	95.23%	99.15%	NP	96.31%	98.53%	98.30%
4	No. of POI's having >=0.5% POI congestion		Oct-13	0	0	0	0	0	0

*NP-Not Provided



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- NOV-13 MONTH									
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) BTS Accumulated Downtime	<=2%	Nov-13	0.28%	0.08%	1.71%	0.31%	0.22%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Nov-13	1.98%	0.08%	1.91%	1.45%	0.61%	0.15%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	96.51%	99.09%	97.39%	98.69%	99.66%	98.47%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-13	0.35%	0.06%	0.74%	0.16%	0.01%	0.01%
	c) TCH congestion	<=2%	Nov-13	1.66%	0.15%	1.34%	0.87%	0.04%	0.11%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Nov-13	0.65%	0.49%	1.38%	1.14%	0.41%	0.56%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-13	2.05%	1.05%	2.36%	2.82%	0.04%	2.52%
	c) Connections with good voice quality	>=95%	Nov-13	96.36%	98.56%	NP	96.17%	98.75%	98.49%
4	No. of POI's having >=0.5% POI congestion		Nov-13	0	0	0	0	0	0

*NP-Not Provided



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- DEC-13 MONTH									
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) BTS Accumulated Downtime	<=2%	Dec-13	0.49%	0.07%	1.08%	0.25%	0.26%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Dec-13	1.96%	0.15%	1.90%	1.61%	1.22%	0.08%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	95.32%	99.10%	97.77%	98.46%	99.67%	98.57%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-13	0.73%	0.11%	0.80%	0.09%	0.01%	0.01%
	c) TCH congestion	<=2%	Dec-13	1.85%	0.16%	1.42%	0.19%	0.03%	0.09%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Dec-13	0.58%	0.46%	1.46%	1.10%	0.36%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-13	1.70%	0.89%	1.93%	2.27%	0.04%	2.57%
	c) Connections with good voice quality	>=95%	Dec-13	95.90%	98.58%	NP	95.60%	98.89%	98.49%
4	No. of POI's having >=0.5% POI congestion		Dec-13	0	0	0	0	0	0

*NP-Not Provided

KEY FINDINGS: CELLULAR MOBILE SERVICES

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

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



Network Service Quality Parameters:

- **Network Availability**

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

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

In J&K 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. 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 0.41 %) was for RCOM (GSM) 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 operators have met the bench mark successfully during the quarter.

iii. Connections with good voice quality:

The Operators, mostly are measuring this parameter through the system generated data at their switches whereas BSNL measuring through their periodic drive tests. Hence, BSNL has not provided the data for this parameter. 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	VODAFONE
S/ N	Name of Parameter			GSM Operators					
Customer Service Quality Parameters									
1	Metering & Billing Credibility -Post Paid								
	A) No. of bills issued during the quarter		Jammu & Kashmir	43457	93037	268987	22217	21720	36781
	B) No. of bills disputed including billing complaints during the quarter		Jammu & Kashmir	0	30	85	4	18	14
	C)% of billing complaints during the quarter	<= 0.1%	Jammu & Kashmir	0.00%	0.03%	0.03%	0.02%	0.08%	0.04%
2	Metering & Billing Credibility -Pre Paid								
	A) Total No. of Pre-paid customers at the end of the quarter		Jammu & Kashmir	2046871	2467709	896077	253438	653045	677701
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Jammu & Kashmir	2	558	66	36	644	135
	C) % of Pre-paid Charging Complaints	<= 0.1%	Jammu & Kashmir	0.00%	0.02%	0.07%	0.01%	0.10%	0.01%
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		Jammu & Kashmir	2	588	151	40	662	149
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		Jammu & Kashmir	2	588	151	40	662	149
	C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100 % within 4 week	Jammu & Kashmir	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	Jammu & Kashmir	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%	Jammu & Kashmir	93.01%	100.00%	100.00%	95.00%	98.71%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	Jammu & Kashmir	90.10%	94.00%	64.33%	97.00%	91.34%	100.00%



5	Termination/closure of service								
	A) Total No. of requests for Termination / Closure of service received during the quarter		<i>Jammu & Kashmir</i>	482	714	425	84	83	167
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		<i>Jammu & Kashmir</i>	482	714	425	84	83	167
	C) % of Termination/ Closure of service within 7 days	<i><=7days</i>	<i>Jammu & Kashmir</i>	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
6	Time taken for refunds of deposits after closures.								
	A) No. of Payments/ Refunds due during the quarter		<i>Jammu & Kashmir</i>	76	80	425	45	112	58
	B) No. of Payments/ Refunds Cleared during the quarter		<i>Jammu & Kashmir</i>	76	80	425	45	112	58
	C)Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	<i>Jammu & Kashmir</i>	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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 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, are in compliance with respect to the parameter accessibility of call center. **Aircel** has not met the benchmark of ‘Accessibility of call centre/customer care with its performance as **93.01%** against the benchmark of 95%.

BSNL was not found to have met the benchmark of ‘calls answered by Operators (voice to voice) within 60 seconds’. It’s achieved level was **64.33%**, which is way below the benchmark of 90%.

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 J&K CIRCLE- OCT-13 MONTH									
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) BTS Accumulated Downtime	<=2%	Live data	0.48%	0.07%	0.65%	0.23%	0.18%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.09%	99.12%	99.34%	99.52%	99.62%	98.19%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.25%	0.03%	0.58%	0.10%	0.76%	0.00%
	c) TCH congestion	<=2%	Live data	1.22%	0.14%	0.86%	0.14%	0.04%	0.29%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.69%	0.49%	0.86%	0.01%	0.46%	0.59%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.48%	1.01%	2.12%	2.44%	0.00%	0.03%
	c) Connections with good voice quality	>=95%	Live data	95.29%	99.17%	NP	96.98%	98.56%	98.21%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

*NP-Not Provided



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- NOV-13 MONTH									
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) BTS Accumulated Downtime	<=2%	Live data	0.46%	0.08%	1.71%	0.23%	0.37%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.52%	98.93%	98.64%	99.46%	99.65%	98.48%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.17%	0.08%	0.75%	0.17%	0.01%	0.004%
	c) TCH congestion	<=2%	Live data	0.95%	0.22%	1.44%	0.24%	0.04%	0.10%
Connection maintenance (retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.65%	0.50%	1.46%	1.10%	0.43%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.16%	1.03%	2.30%	2.55%	0.00%	2.54%
	c) Connections with good voice quality	>=95%	Live data	97.28%	98.49%	NP	96.68%	98.61%	98.49%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

*NP-Not Provided



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- DEC-13 MONTH									
<u>Live measurement Data</u>		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.09%	1.35%	0.08%	0.24%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.39%	99.17%	97.65%	99.58%	99.69%	98.74%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.22%	0.04%	0.68%	0.07%	0.01%	0.02%
	c) TCH congestion	<=2%	Live data	1.10%	0.14%	1.22%	0.12%	0.03%	0.07%
Connection maintenance (retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.63%	0.47%	1.23%	1.07%	0.40%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.29%	0.85%	2.27%	2.08%	0.01%	2.50%
	c) Connections with good voice quality	>=95%	Live data	97.37%	98.59%	NP	96.60%	98.82%	98.53%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

*NP-Not Provided

KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days live measurement assessment, it is found that the service providers are largely meeting the benchmarks. Thus the performance of the service provides is in sync when we compare their performance on monthly basis.



INTER OPERATOR CALLS ASSESSMENT

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

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT							
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
AIRCEL	J&K	--	100.00%	100.00%	100.00%	100.00%	100.00%
AIRTEL	J&K	100.00%	--	100.00%	100.00%	100.00%	100.00%
BSNL	J&K	97.00%	100.00%	--	100.00%	100.00%	100.00%
IDEA	J&K	100.00%	100.00%	100.00%	--	100.00%	100.00%
RCOM GSM	J&K	100.00%	100.00%	100.00%	100.00%	--	100.00%
VODAFONE	J&K	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. However, in one case where Calls attempted from BSNL to Aircel was 97%. There was hardly any problem in interconnection from one operator to other operators.



B) CUSTOMER SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES-QE-DEC-13									
3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/ N	Name of Parameter			GSM Operators					
Response time to customers for assistance									
1	A) Accessibility of call centre/Customer Care	>=95%	J&K	98.71%	100.00%	100.00%	100.00%	98.67%	100.00%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	J&K	96.88%	86.00%	29.85%	99.00%	92.18%	98.00%

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE							
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Total No. of calls Attempted	J&K	100	100	100	100	100	100
Total No. of calls connected to IVR	J&K	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	J&K	98	100	100	100	100	100
%age of calls got answered	J&K	98.00%	100.00%	100.00%	100.00%	100.00%	100.00%

KEY FINDINGS: The results for three days live measurements revealed that all operators have met the benchmarks for the parameters 'Accessibility to call center'. However, in case of call connection to operators (Voice to voice) within 60 seconds only two operators namely Airtel and BSNL could not met the benchmark with their performance as 86.00% and 29.85% respectively. Thus the performance of BSNL was way below the benchmark.

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, Aircel could connect 98% of calls to the operator within 60 Seconds.



LEVEL-1 LIVE CALLING

LEVEL 1 LIVE CALLING								
Emergency no.	Circle Name	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	VODAFONE
100	J&K	30	30	30	30	30	30	30
101	J&K	40	40	40	40	40	40	40
102	J&K	40	40	40	40	40	40	40

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 J&K 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 J&K Service area, total 54 drive tests in three months of the quarter ended December 2013 @ of 3 drive tests per operator per month (total 3x6x3=54 drive tests) were conducted covering Srinagar, Anantnag and Baramulla during the month of October-13, Udhampur, Kathua and Jammu during November -13 and Samba, Katra and Rajouri cities during December-2013 and the performance of the operators has been highlighted below in the Tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. A sample of about 120 - 150 test calls were made during a drive test covering about a distance of 100 K.M. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour. The routes were so selected that the drive test could cover the congested areas/commercial areas of the above 09 cities in J&K 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-J&K CIRCLE-OCT-13 MONTH										
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE	
				GSM Operators						
1	Blocked Call Rate (<=3%)	Srinagar	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	1.18%	
		Anantnag	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Baramulla	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	3.57%	
2	Dropped Call Rate (<=2%)	Srinagar	Oct-13	0.00%	0.00%	5.41%	0.00%	0.00%	0.00%	
		Anantnag	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Baramulla	Oct-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
3	Percentage connections with good voice quality (=>95%)									
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Srinagar	Oct-13	NA	NA	NA	NA	NA	NA	
		Anantnag	Oct-13	NA	NA	NA	NA	NA	NA	
		Baramulla	Oct-13	NA	NA	NA	NA	NA	NA	
	(b) 0-5 (with frequency hopping for GSM Operators)	Srinagar	Oct-13	95.75%	97.70%	100.00%	96.30%	96.09%	100.00%	
		Anantnag	Oct-13	96.26%	96.86%	100.00%	97.46%	96.46%	100.00%	
Baramulla		Oct-13	96.52%	97.98%	100.00%	98.43%	96.25%	100.00%		
4	Service Coverage									
	In door (>= -75dBm)	Srinagar	Oct-13	81.52%	86.64%	63.30%	39.73%	90.40%	91.00%	
		Anantnag	Oct-13	42.21%	82.21%	78.72%	39.01%	79.53%	77.18%	
		Baramulla	Oct-13	79.87%	85.46%	79.53%	28.19%	94.01%	75.00%	
	In-vehicle (>= -85dBm)	Srinagar	Oct-13	97.74%	99.04%	94.79%	76.89%	98.93%	99.00%	
		Anantnag	Oct-13	84.31%	98.07%	98.61%	80.18%	97.98%	97.58%	
		Baramulla	Oct-13	97.02%	99.04%	97.02%	57.98%	99.80%	97.00%	
	Outdoor- in city (>= -95dBm)	Srinagar	Oct-13	99.94%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Anantnag	Oct-13	99.39%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Baramulla	Oct-13	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
	5	Call Setup Success Rate (>=95%)	Srinagar	Oct-13	100.00%	100.00%	100.00%	100.00%	100.00%	98.82%
			Anantnag	Oct-13	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Baramulla			Oct-13	100.00%	100.00%	96.00%	100.00%	100.00%	96.43%	

- NA-Not Applicable



DRIVE TEST TABLE: 2

OPERATOR-ASSISTED DRIVE TEST-J&K CIRCLE-NOV-13 MONTH									
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
1	Blocked Call Rate (<=3%)	Udhampur	Nov-13	0.00%	0.00%	1.20%	0.00%	0.00%	0.00%
		Kathua	Nov-13	0.00%	0.00%	0.00%	0.00%	0.92%	0.00%
		Jammu	Nov-13	0.00%	0.00%	4.26%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Udhampur	Nov-13	0.00%	0.00%	1.22%	0.00%	0.00%	0.00%
		Kathua	Nov-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Jammu	Nov-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Percentage connections with good voice quality (=>95%)								
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Udhampur	Nov-13	NA	NA	NA	NA	NA	NA
		Kathua	Nov-13	NA	NA	NA	NA	NA	NA
		Jammu	Nov-13	NA	NA	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Udhampur	Nov-13	95.97%	96.01%	95.55%	95.49%	96.63%	98.19%
		Kathua	Nov-13	95.48%	97.16%	90.39%	95.82%	97.64%	98.88%
Jammu		Nov-13	95.51%	96.13%	79.15%	95.22%	95.47%	98.13%	
4	Service Coverage								
	In door (>= -75dBm)	Udhampur	Nov-13	93.89%	94.37%	89.80%	61.68%	63.20%	91.60%
		Kathua	Nov-13	91.04%	92.36%	92.99%	49.10%	53.75%	81.68%
		Jammu	Nov-13	98.60%	99.31%	91.70%	57.44%	56.68%	96.61%
	In-vehicle (>= -85dBm)	Udhampur	Nov-13	99.66%	99.74%	99.29%	92.98%	83.53%	99.30%
		Kathua	Nov-13	99.67%	99.83%	99.82%	89.11%	89.93%	97.05%
		Jammu	Nov-13	99.95%	100.00%	99.95%	92.96%	89.39%	99.96%
	Outdoor- in city (>= -95dBm)	Udhampur	Nov-13	99.96%	100.00%	99.60%	100.00%	95.79%	99.96%
		Kathua	Nov-13	100.00%	99.99%	100.00%	100.00%	99.28%	99.98%
Jammu		Nov-13	99.99%	100.00%	100.00%	100.00%	99.40%	100.00%	
5	Call Setup Success Rate (>=95%)	Udhampur	Nov-13	100.00%	100.00%	98.80%	100.00%	100.00%	100.00%
		Kathua	Nov-13	100.00%	100.00%	96.70%	100.00%	99.08%	100.00%
		Jammu	Nov-13	100.00%	100.00%	95.74%	100.00%	100.00%	100.00%

- NA-Not Applicable



DRIVE TEST TABLE: 3

OPERATOR-ASSISTED DRIVE TEST-J&K CIRCLE-DEC-13 MONTH									
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
1	Blocked Call Rate (<=3%)	Samba	Dec-13	0.00%	0.00%	1.01%	0.00%	0.00%	0.00%
		Katra	Dec-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Rajouri	Dec-13	0.00%	0.00%	2.25%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Samba	Dec-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Katra	Dec-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Rajouri	Dec-13	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Percentage connections with good voice quality (=>95%)								
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Samba	Dec-13	NA	NA	NA	NA	NA	NA
		Katra	Dec-13	NA	NA	NA	NA	NA	NA
		Rajouri	Dec-13	NA	NA	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Samba	Dec-13	96.33%	97.61%	93.65%	96.39%	96.87%	97.96%
		Katra	Dec-13	96.44%	97.99%	96.53%	97.45%	97.19%	98.74%
Rajouri		Dec-13	96.23%	97.95%	95.05%	96.40%	97.17%	98.98%	
4	Service Coverage								
	In door (>= -75dBm)	Samba	Dec-13	91.30%	92.53%	71.19%	65.55%	92.66%	87.63%
		Katra	Dec-13	95.05%	92.24%	96.63%	30.63%	92.27%	91.11%
		Rajouri	Dec-13	86.05%	92.15%	92.02%	55.34%	93.35%	89.72%
	In-vehicle (>= -85dBm)	Samba	Dec-13	99.83%	99.49%	95.16%	92.22%	99.26%	98.84%
		Katra	Dec-13	99.86%	98.18%	98.46%	82.63%	99.22%	98.49%
		Rajouri	Dec-13	99.19%	98.68%	98.47%	88.70%	98.85%	98.59%
	Outdoor- in city (>= -95dBm)	Samba	Dec-13	100.00%	100.00%	99.74%	99.61%	99.96%	100.00%
		Katra	Dec-13	99.99%	99.96%	100.00%	99.50%	99.97%	100.00%
Rajouri		Dec-13	99.95%	99.94%	100.00%	99.21%	99.73%	100.00%	
5	Call Setup Success Rate (>=95%)	Samba	Dec-13	100.00%	100.00%	98.99%	100.00%	100.00%	100.00%
		Katra	Dec-13	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Rajouri	Dec-13	100.00%	100.00%	97.75%	100.00%	100.00%	100.00%

- NA-Not Applicable



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Detail of the routes covered during the drive tests – J&K Circle Oct-13 to Dec-13						
Month/Year	City	Periphery-1	Periphery-2	Across the City	Congested	In Building
Oct-13	SRINAGAR	GPO- Dalgate- khanyar-rainawari-Hawal - Lalbazar- University- Hazratbal-Ranawari-NIT- nowhatta-Eidgah-Soura- Boardway-sonwar-batwara- Shivpora	Qamarwari-noorbag-parimpora-Shaltang-HMT-Bemina-Tangpora-Sanatnagar-bagat - Barzullah-Rambagh-Hyderpora-peerbagh-Humhama-Airport	Pandach-Ahmadnagar-Gulabagh-Elahibagh-Zukura-Habak-Ganderbal crossingLawaypora-HMT-Zainkote- ompora budgam-crossing	LD Hospital-Lal chowk-HSHS-maisuma- Residency Road- Batamallo- Karanagar-chattabal-Safakadal-Gogiwara- Nowhatta- Bohrikadel-fathakadel-Nawakadel-Raziakadel	KRISHNA PLAZA TEJGADI
	BARAMULLA	Drangbal-Khanpora-Sagrama-Umer Colony	Dak-Bangalow-Ushkura-Rangwar-Hajibal-Kanulbagh	Bhat Mohalla-Janbaz Pora Maqbool abad-Kanspora-Kanil Road	Jadeed Road-Kanli Bagh-khawja sahib-Dc Office Road	GRAND PLAZA MALL
	ANANTNAG	KHANABAL-WANPOH-MATTAN-ASHAJI PORA	ANCHIDORA-IQBAL COLONY-K.P. ROAD-JANGLAT MANDI	RAILWAY ROUTE-KHANABAL-BYEPASS-MATTAN-EIDGAH ASHAJIPORA	BUS STAND-LAL CHOWK-MEHMAN GALI-Dc Office Road	YES BANK
Nov-13	JAMMU	AIRPORT TO BARI-BRAHMNA-RITZ HOTEL,SATWARI CHOWK,CHANNI HIMMAT-TRIKIUTA NAGAR-GREEN BELT PARK	BARIBRAHMNA TO SAINIK COLONY TO AIRPORT-RITZ HOTEL TO SATWARI CHOWK-TRIKUTA NAGAR,CHANNI HIMMAT	JEWEL TO AMPHALLA-SARWAL-ROOP NAGAR-BANTALAB-JANIPUR	SHALAMAR-JEWEL CHOWK-INDRA CHOWK, KC COLONY-GHANDI NAGAR GOLE MARKET-VIKRAM CHOWK	VINAYAK HOTEL
	KATHUA	CHADWAL-KALIBARI-LAKHANPUR	LAKHANPUR-KALIBARI-KATHUA	RAILWAY STATION KATHUA-LAKHANPUR-KATHUA-SHAEDI CHOWK	RAILWAY STATION KATHUA-SHAEDI CHOWK-PEER BABA	CITY JUNCTION MALL NEAR ISBT



	UDHAMPUR	DHAR ROAD VENUS CHOWK-ISKON TEMPLE DHAR ROAD-POWER GRID STATION T MORH-INDUSTRIAL ROAD RAILWAY ROAD	DHAR ROAD VENUS CHOWK-POWER GRID STATION T MORH-INDUSTRIAL ROAD RAILWAY ROAD	COURT ROAD-OLD HOSPITAL ROAD-SALATHIA ROAD-LINK ROAD BUS STAND	COURT ROAD-OLD HOSPITAL ROAD-SALATHIA ROAD-LINK ROAD BUS STAND	RADHA SWAMI STSANG BHWAN
Dec-13	SAMBA	BARIBRAHMNA-SARORE-TARORE-JAKH-VIJAYPUR-SUPWAL-SAMBA	SAMBA-VIJAYPUR-SUPWAL-TARORE-JAKH-SARORE-BARIBRAHMNA	RAILWAY STATION ROAD-COURT ROAD-SUMBH ROAD-BHARGAV COLLEGE	PAKKI MANDI-SAMBA MAIN MARKET-PUSWALIA MANDI-MAHESHWAR DWAR-RAILWAY STATION ROAD	PIZZA HUT NEAR TAJ MAHAL
	KATRA	DOMEL-COUNTRY INN-ANUP-KALIKA NAGAR-RAILWAY STATION	RAILWAY STATION-KALIKA NAGAR-ANUP-COUNTRY INN	HOSPITAL ROAD-BUS STAND-POLICE STATION KATRA-POLICE STATION KATRA	RAILWAY ROAD-MAIN MARKET KATRA-HELIPAD-BHAWAN ROAD-CHINTAMANITE MPLE-BAN GANGA-REASI ROAD-MAIN MARKET	HIGHWAY PLAZA
	RAJOURI	CHATYARI-DANGRI-MURDAPUR-BATHUNZ-SALANI BRIDGE-DAK BANGLOW-THANIMANDI ROAD	BSGBU UNIVERSITY-POLICE HEADQUARTER(PHQ)-SALANI BRIDGE,BATHUNZ-MURDAPUR-DANGRI-CHATYARI	GOVT. DEGREE COLLEGE-RAJOURI HOSPITAL-GUJJAR MANDI-BUS STAND	BUS STAND,ARMY UNITS-SALANI BRIDGE-JAWHAR NAGAR-KALAKOTE ROAD	SARASWATI INTER COLLEGE



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

- (i) **In the Month of October-13**, drive test was conducted at Srinagar, Anantnag and Baramulla cities. **Vodafone** could not meet the benchmarks of parameter Blocked Call Rate at Baralulla (**3.57 %**) and **BSNL** failed to meet the benchmarks of the parameters Dropped call rate at Srinagar (**5.41%**).
- (ii) **In the Month of November-13**, drive test was conducted at Udhampur, Kathua and Jammu cities. **BSNL** failed to meet the benchmarks of the parameters Blocked call rate at Jammu and Good Voice Quality at Kathua & Jammu. The performance of BSNL with respect to 'Blocked call rate' at Jammu was **4.26%** and with respect to parameter 'Good Voice Quality' was @ **90.39 %** (Kathua) and **79.15 %** (Jammu)
- (iii) **In the month of December-13**, drive test was conducted at Samba, Katra and Rajouri. **BSNL** could not meet the benchmarks of the parameter Good Voice Quality at Samba with its performance as **93.65%** at Samba.

Thus the results of drive tests indicate that BSNL is the only operator that remained non-compliant in respect of the parameters Blocked call rate, Call drop rate and Good voice quality in different cities where drive tests were carried out, followed by Vodafone which failed to meet the benchmark of Blocked call rate at Baramullla.

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 PMR audit & 3 days live findings, it can be concluded that the performance of the service providers in the service area J&K is satisfactory for **Network Parameters** as all of them were found meeting the benchmarks of all the parameters.

With regard to the **Customer Service Quality Parameters**, it was revealed that all operators were largely in well compliance of most of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds. Only Aircel was non-compliant of the benchmark of 'Accessibility of call centre/customer care with its performance as 93.01% against the benchmark of 95%. BSNL was not found to have met the benchmark of 'calls answered by Operators (voice to voice) within 60 seconds'. It's achieved level was 64.33%, which is way below the benchmark of 90%. Similar performance of BSNL was observed during 3 days live measurement with its performance level as 29.85% which again way below the benchmark, followed by Airtel with its performance of 86%.

The results of **Drive Test**, indicated that BSNL was the only operator that remained non-compliant in respect of the parameters Blocked call rate, Call drop rate and Good voice quality in different cities where drive tests were carried out, followed by Vodafone which failed to meet the benchmark of Blocked call rate at Baramulla.



7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle- Oct-13 month									
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) Total no. of BTSs in the licensed service area		Oct-13	2119	2614	1149	673	982	1329
	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	7037	1718.77	14180	90.74	1702	625.02
	c) BTS Accumulated Downtime	<=2%	Oct-13	0.45%	0.09%	1.66%	0.17%	0.23%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-13	42	3	1	6	10	4
	e) Worst affected BTSs due to downtime	<=2%	Oct-13	1.98%	0.11%	0.06%	0.89%	1.02%	0.30%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	96.52%	98.69%	99.86%	99.29%	99.63%	98.29%
	b) SDCCH/PAGING Congestion	<=1%	Oct-13	0.32%	0.22%	0.58%	0.10%	0.01%	0.01%
	c) TCH congestion	<=2%	Oct-13	1.63%	0.25%	0.84%	0.27%	0.04%	0.03%
Connection Maintenance (Retainability)									
3	a) Call Drop Rate (CDR)	<=2%	Oct-13	0.71%	0.53%	0.85%	1.14%	0.47%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-13	2.48%	1.10%	2.10%	2.60%	0.31%	2.57%
	c) % of connections with good voice quality	>=95%	Oct-13	95.23%	99.15%	NP	96.31%	98.53%	98.30%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-13	157	85	67	49	9	103
	e) Total no. of cells (Sector) in the licensed service area		Oct-13	6335	7629	3183	1896	2937	4001
No. of POI's having >=0.5% POI congestion									
4	No. of POI's having >=0.5% POI congestion		Oct-13	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Oct-13	0	0	0	0	0	0
Network Data									
5	a) Equipped Capacity of Network in Erlang		Oct-13	133877.10	132274.02	72000	18418	40000	28359.53
	b) Total traffic in TCBH in erlang (Avg.)		Oct-13	70245	87761.76	31355	8340	15757.82	23809.48
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-13	1707807	2447690	827652	234291	371955	613914

*NP-Not Provided



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- J&K Circle- Oct-13 month									
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
Network Service Quality Parameter									
1	Network Availability								
	a) Total no. of BTSs in the licensed service area		Live data	2119	2614	1149	663	980	1327
	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	773	129.06	1612	110.26	124	41.04
	c) BTS Accumulated Downtime	<=2%	Live data	0.48%	0.07%	1.95%	0.23%	0.18%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	1	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.09%	99.12%	99.34%	99.52%	99.62%	98.19%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.25%	0.03%	0.58%	0.10%	0.76%	0.00%
c) TCH congestion	<=2%	Live data	1.22%	0.14%	0.86%	0.14%	0.04%	0.29%	
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Live data	0.69%	0.49%	0.86%	0.01%	0.46%	0.59%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.48%	1.01%	2.12%	2.44%	0.00%	2.58%
	c) % of connections with good voice quality	>=95%	Live data	95.29%	99.17%	NP	96.98%	98.56%	98.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	157	77	68	48	0	103
e) Total no. of cells (Sector) in the licensed service area		Live data	6335	7656	3183	1968	2931	4000	
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
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0

*NP-Not Provided



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle- Nov-13 month									
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
Network Service Quality Parameter									
1	Network Availability								
	a) Total no. of BTSs in the licensed service area		Nov-13	2123	2626	1154	760	982	1329
	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	4286.18	1420.25	14144	1692.25	1577	313
	c) BTS Accumulated Downtime	<=2%	Nov-13	0.28%	0.08%	1.71%	0.31%	0.22%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-13	42	2	22	11	6	2
	e) Worst affected BTSs due to downtime	<=2%	Nov-13	1.98%	0.08%	1.91%	1.45%	0.61%	0.15%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	96.51%	99.09%	97.39%	98.69%	99.66%	98.47%
	b) SDCCH/PAGING Congestion	<=1%	Nov-13	0.35%	0.06%	0.74%	0.16%	0.01%	0.01%
	c) TCH congestion	<=2%	Nov-13	1.66%	0.15%	1.34%	0.87%	0.04%	0.11%
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Nov-13	0.65%	0.49%	1.38%	1.14%	0.41%	0.56%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-13	2.05%	1.05%	2.36%	2.82%	0.04%	2.52%
	c) % of connections with good voice quality	>=95%	Nov-13	96.36%	98.56%	NP	96.17%	98.75%	98.49%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-13	130	81	67	58	1	101
	e) Total no. of cells (Sector) in the licensed service area		Nov-13	6348	7690	2859	2063	2937	4007
4	No. of POI's having >=0.5% POI congestion								
	No. of POI's having >=0.5% POI congestion		Nov-13	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Nov-13	0	0	0	0	0	0
5	Network Data								
	a) Equipped Capacity of Network in Erlang		Nov-13	131667	129403.48	20231.39	17387	40000	28359.53
	b) Total traffic in TCBH in erlang (Avg.)		Nov-13	72507	92422.80	8097.08	8385	15155.5	23809.48
	c) Total no. of customers served (as per VLR) on last day of the month		Nov-13	1711860	2445038	238775	231890	370881	613914

*NP-Not Provided



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- J&K Circle- Nov-13 month									
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
Network Service Quality Parameter									
Network Availability									
1	a) Total no. of BTSs in the licensed service area		Live data	2123	2614	1152	673	982	1329
	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	709.67	156.51	1417	109.19	265	21.85
	c) BTS Accumulated Downtime	<=2%	Live data	0.46%	0.08%	1.71%	0.23%	0.37%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	1	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.52%	98.93%	98.64%	99.46%	99.65%	98.48%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.17%	0.08%	0.75%	0.17%	0.01%	0.004%
	c) TCH congestion	<=2%	Live data	0.95%	0.22%	1.44%	0.24%	0.04%	0.10%
Connection Maintenance (Retainability)									
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.65%	0.50%	1.46%	1.10%	0.43%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.16%	1.03%	2.30%	2.55%	0.00%	2.54%
	c) % of connections with good voice quality	>=95%	Live data	97.28%	98.49%	NP	96.68%	98.61%	98.49%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	73	79	71	51	0	102
	e) Total no. of cells (Sector) in the licensed service area		Live data	6338	7656	3098	2015	2937	4007
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
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0

*NP-Not Provided



TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle- Dec-13 month									
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
Network Service Quality Parameter									
1	Network Availability								
	a) Total no. of BTSs in the licensed service area		Dec-13	2138	2634	1155	805	981	1329
	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	7768.7	1463.92	9265	1516.05	1873	427.68
	c) BTS Accumulated Downtime	<=2%	Dec-13	0.49%	0.07%	1.08%	0.25%	0.26%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-13	42	4	22	13	12	1
e) Worst affected BTSs due to downtime	<=2%	Dec-13	1.96%	0.15%	1.90%	1.61%	1.22%	0.08%	
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	95.32%	99.10%	97.77%	98.46%	99.67%	98.57%
	b) SDCCH/PAGING Congestion	<=1%	Dec-13	0.73%	0.11%	0.80%	0.09%	0.01%	0.01%
c) TCH congestion	<=2%	Dec-13	1.85%	0.16%	1.42%	0.19%	0.03%	0.09%	
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Dec-13	0.58%	0.46%	1.46%	1.10%	0.36%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-13	1.70%	0.89%	1.93%	2.27%	0.04%	2.57%
	c) % of connections with good voice quality	>=95%	Dec-13	95.90%	98.58%	NP	95.60%	98.89%	98.49%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-13	109	69	56	52	1	103
e) Total no. of cells (Sector) in the licensed service area		Dec-13	6393	7713	2912	2293	2935	4007	
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
	Name of POI not meeting the benchmark		Dec-13	0	0	0	0	0	0
5	Network Data								
	a) Equipped Capacity of Network in Erlang		Dec-13	122476.33	124860.88	72000	21902	40000	29054.07
	b) Total traffic in TCBH in erlang (Avg.)		Dec-13	50011.89	88937.31	31355	8364	15156	20931.11
c) Total no. of customers served (as per VLR) on last day of the month		Dec-13	1755005	2461819	827652	258440	370881	618652	

*NP-Not Provided



TABLE: 6

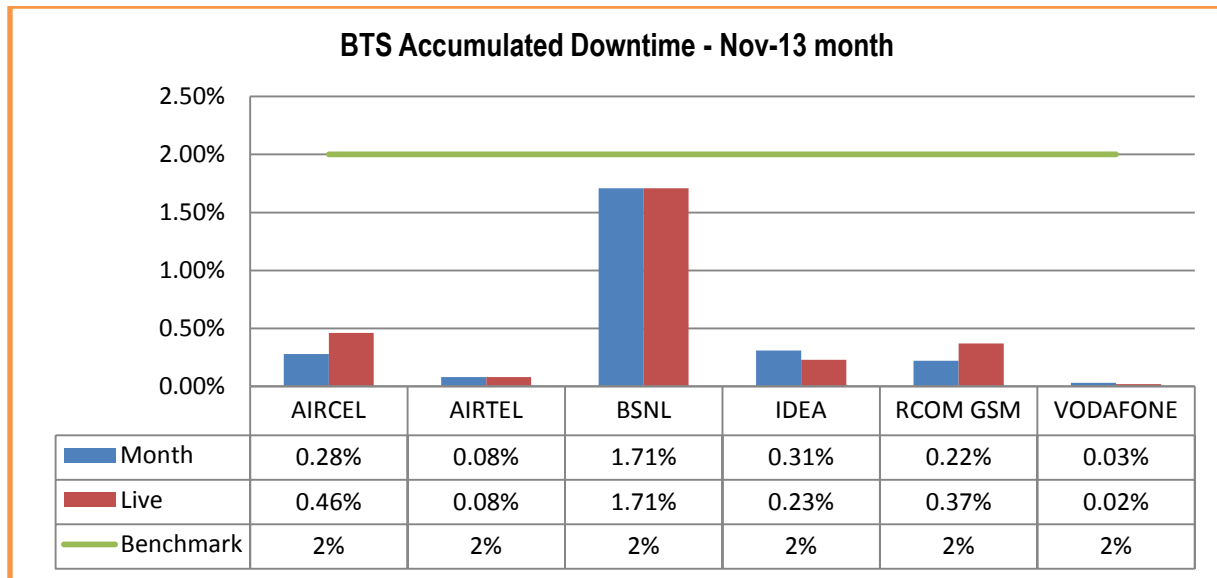
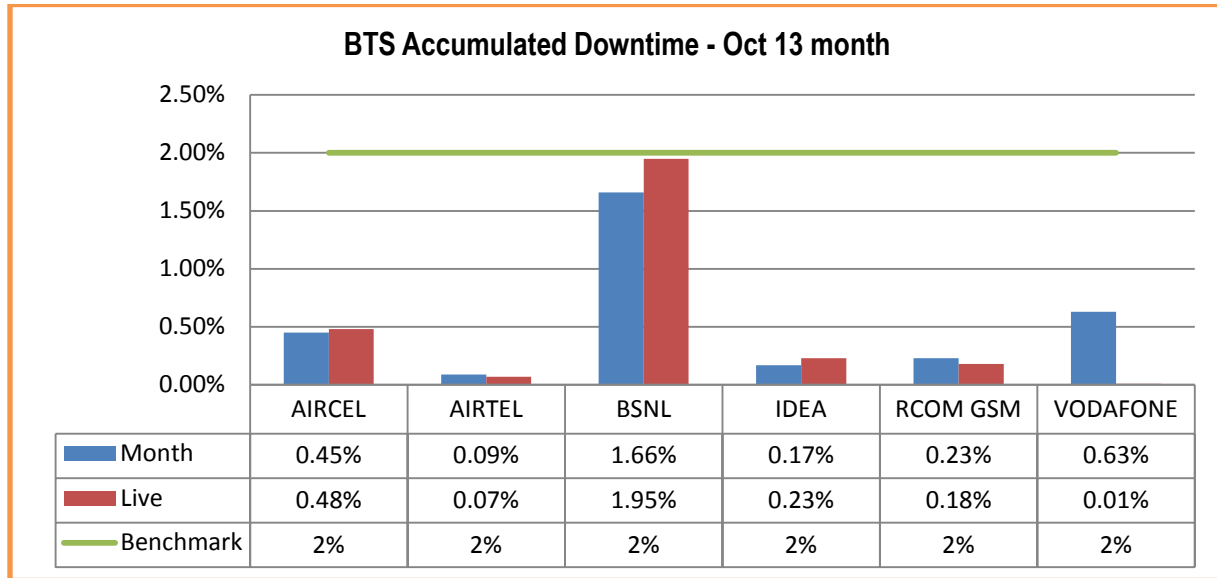
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- J&K Circle- Dec-13 month									
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
Network Service Quality Parameter									
1	Network Availability								
	a) Total no. of BTSs in the licensed service area		Live data	2124	2626	3462	760	982	1329
	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	294	55.76	1119	41.06	169	32.79
	c) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.09%	1.35%	0.08%	0.24%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	1	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.39%	99.17%	97.65%	99.58%	99.69%	98.74%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.22%	0.04%	0.68%	0.07%	0.01%	0.02%
	c) TCH congestion	<=2%	Live data	1.10%	0.14%	1.22%	0.12%	0.03%	0.07%
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Live data	0.63%	0.47%	1.23%	1.07%	0.40%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.29%	0.85%	2.27%	2.08%	0.01%	2.50%
	c) % of connections with good voice quality	>=95%	Live data	97.37%	98.59%	NP	96.60%	98.82%	98.53%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	82	65	67	47	1	100
	e) Total no. of cells (Sector) in the licensed service area		Live data	6350	7690	2950	2273	2937	4007
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
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0

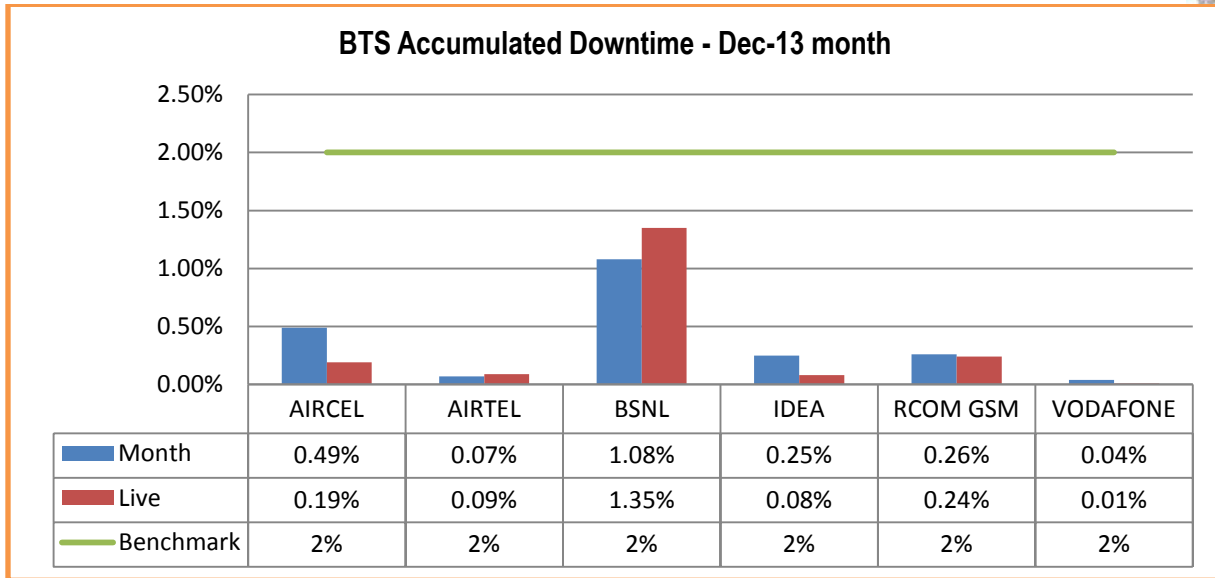
*NP-Not Provided



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

1) BTS ACCUMULATED DOWNTIME :

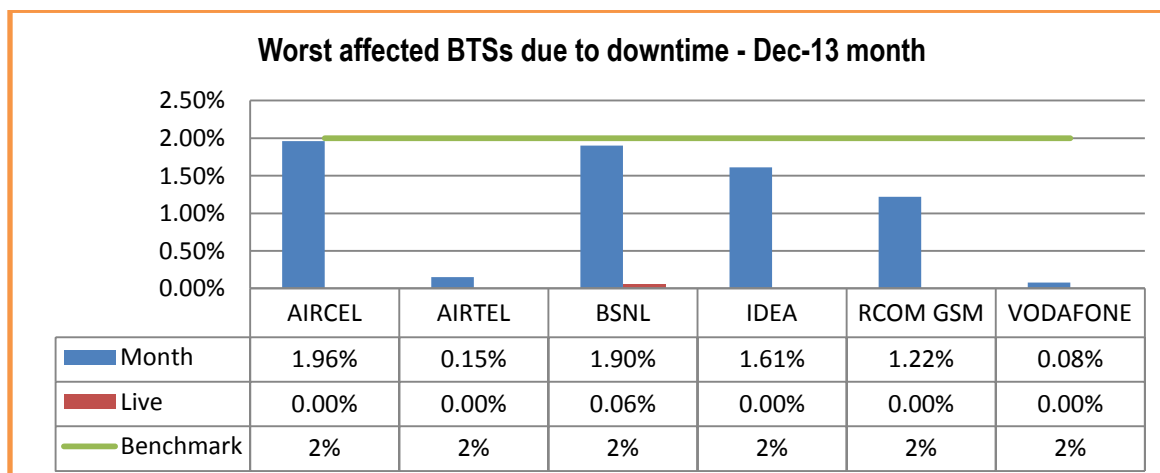
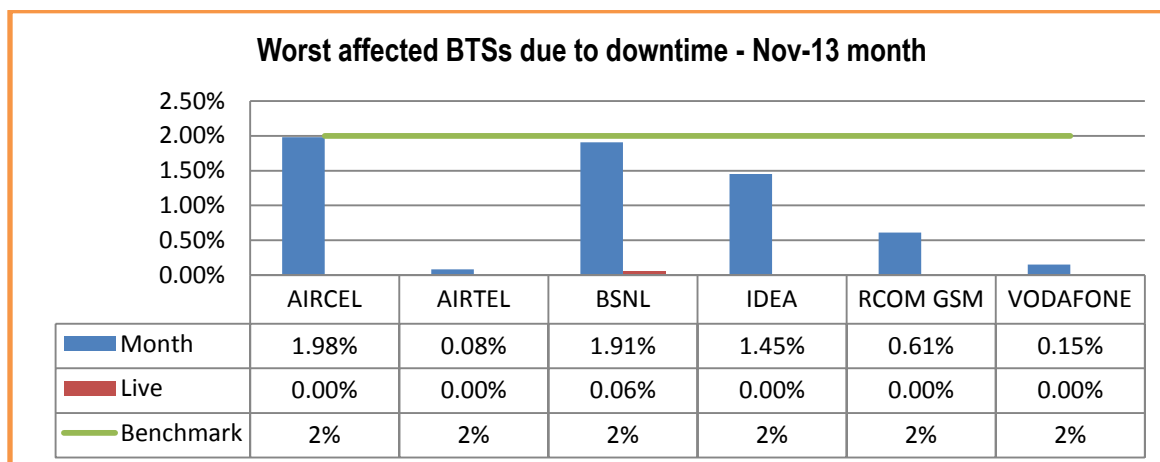
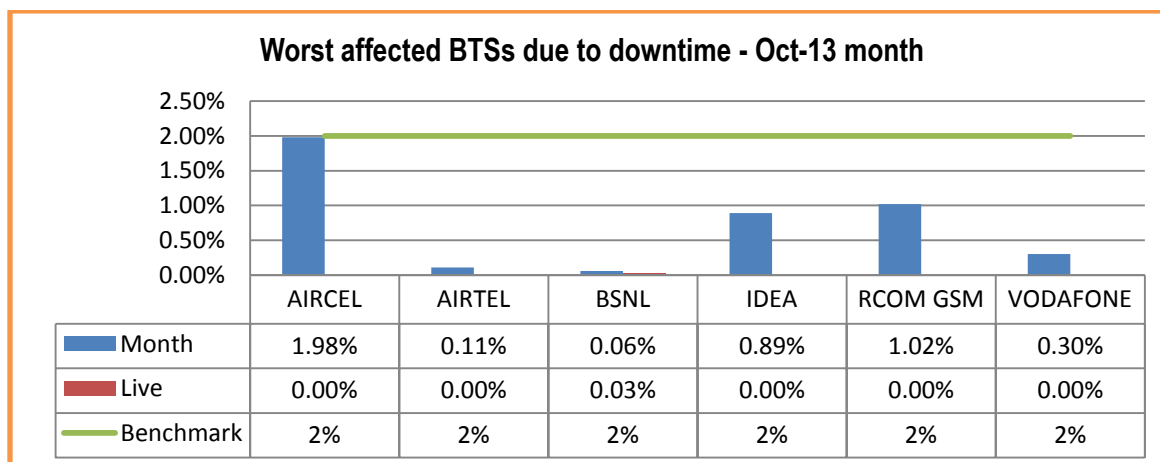




All operators are meeting the benchmarks.



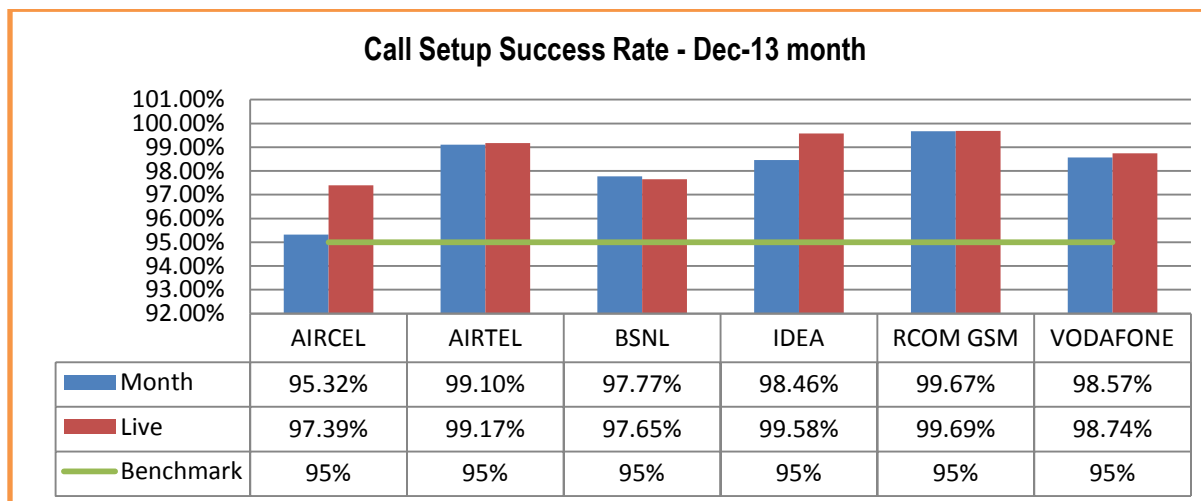
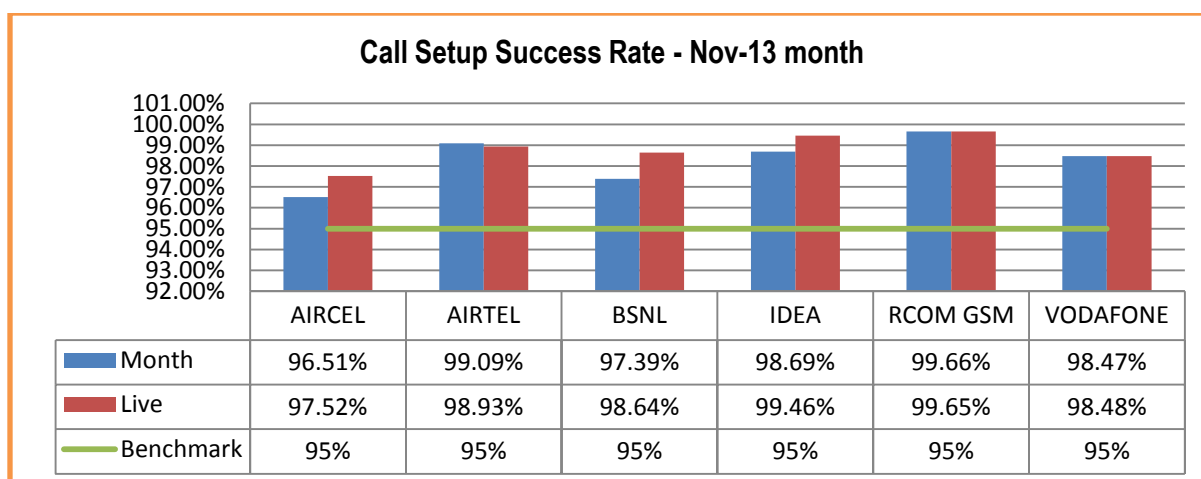
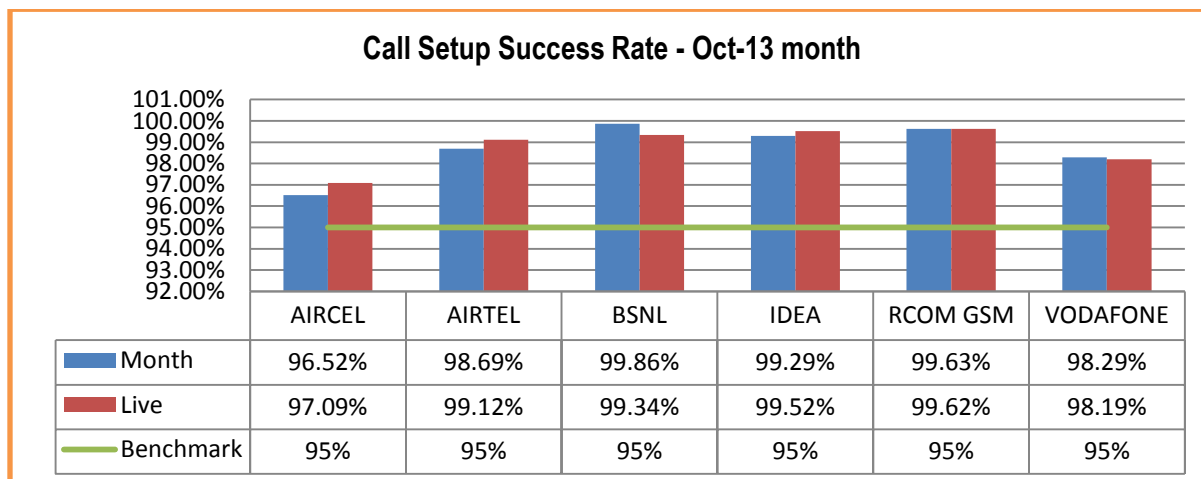
2) WORST AFFECTED BTSS DUE TO DOWNTIME :



All operators are meeting the benchmarks.



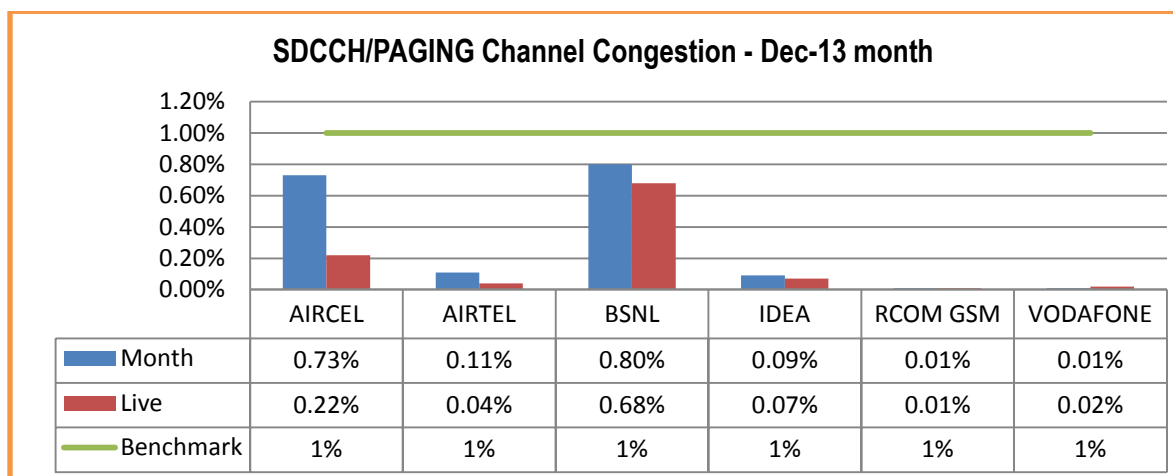
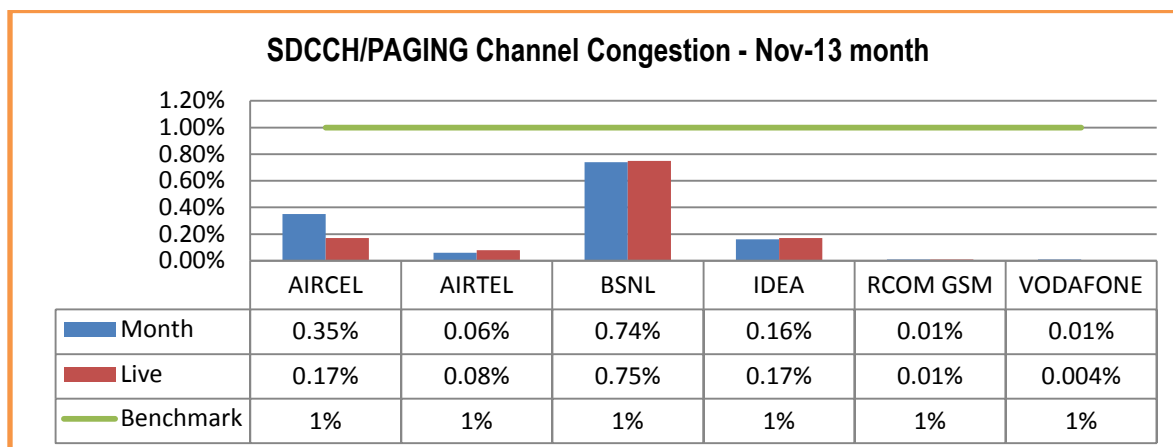
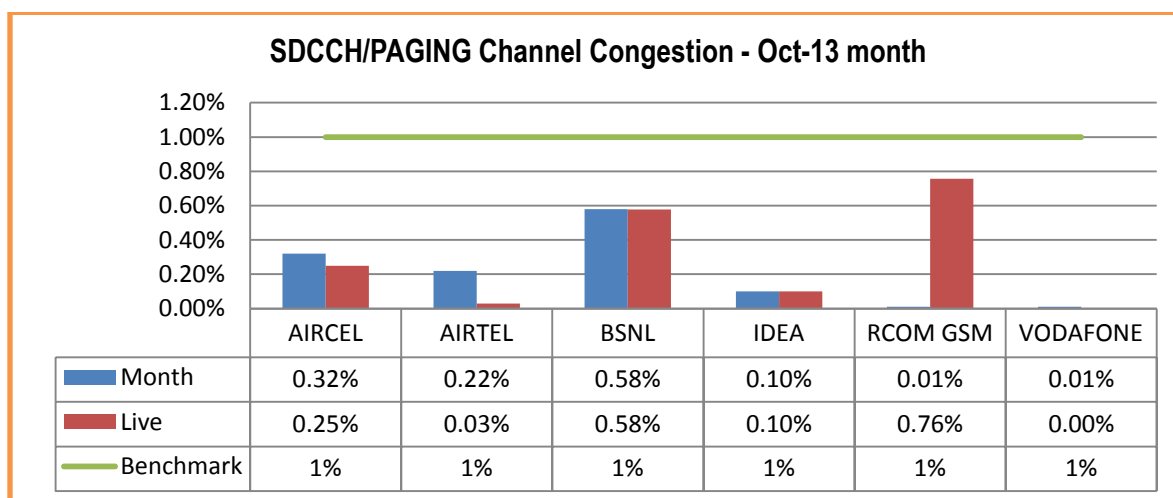
3) CALL SETUP SUCCESS RATE :



All operators are meeting the benchmarks.



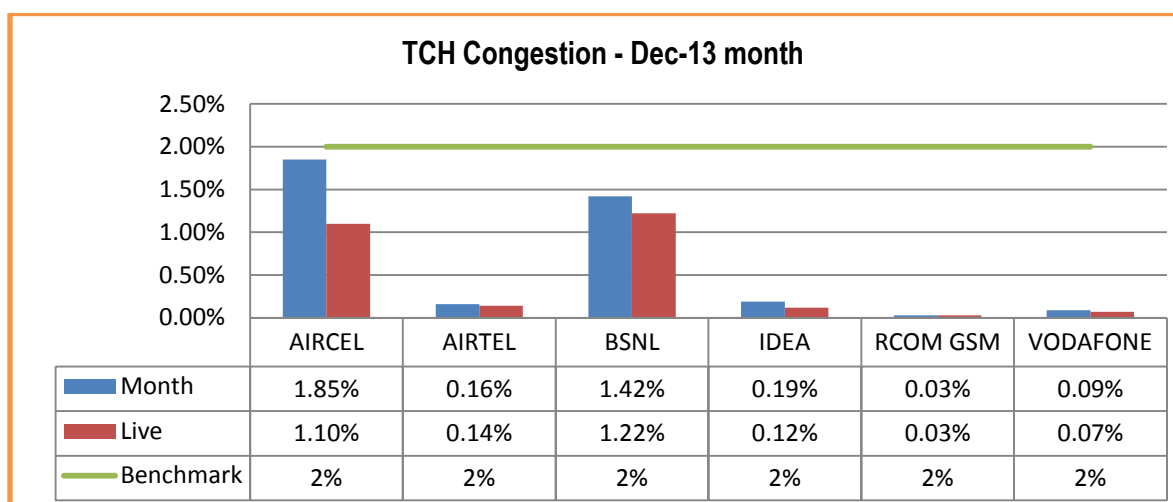
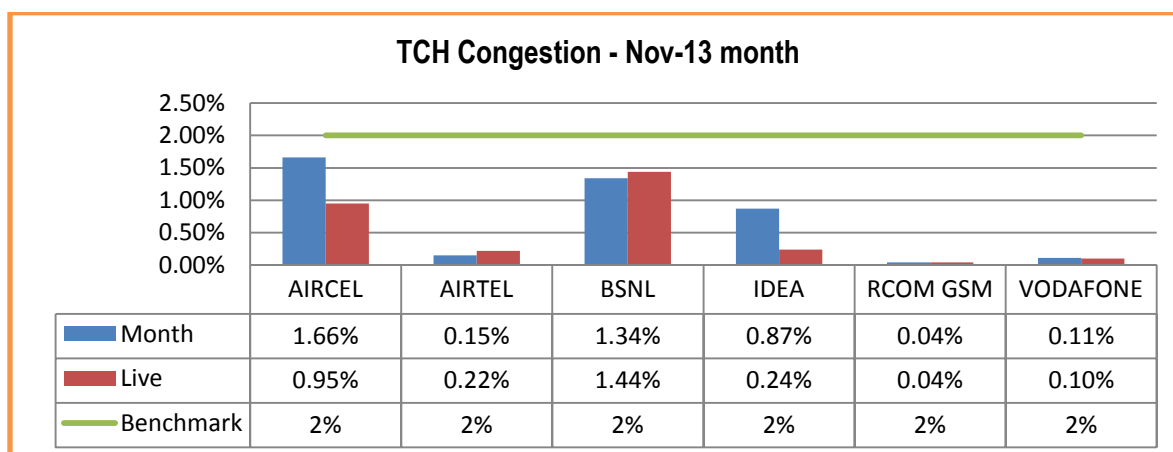
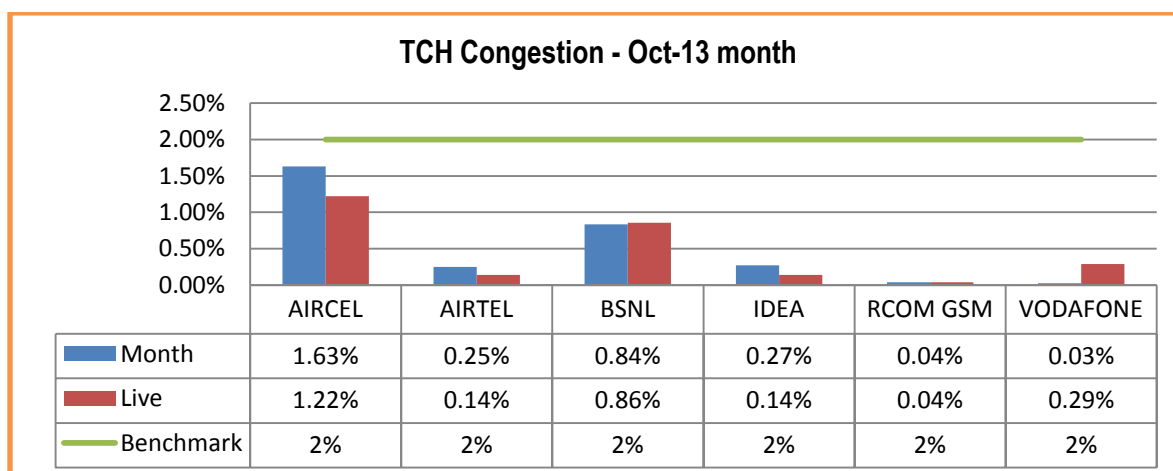
4) SDCCH/PAGING CHANNEL CONGESTION :



All operators are meeting the benchmarks.



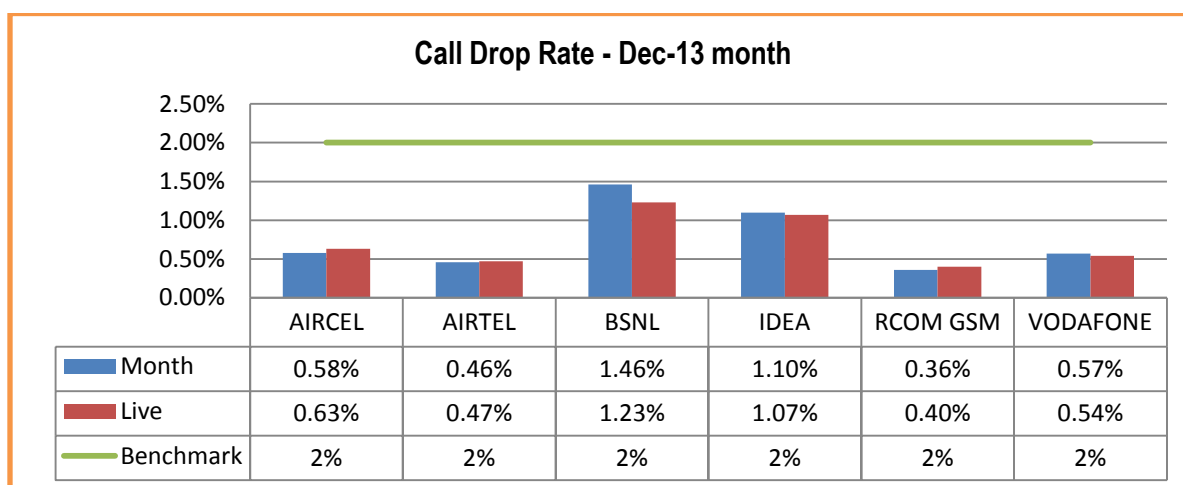
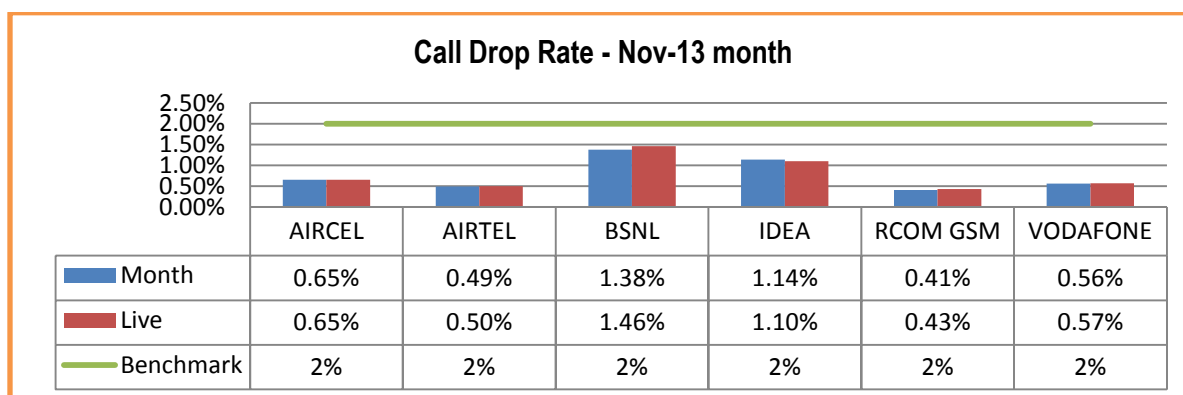
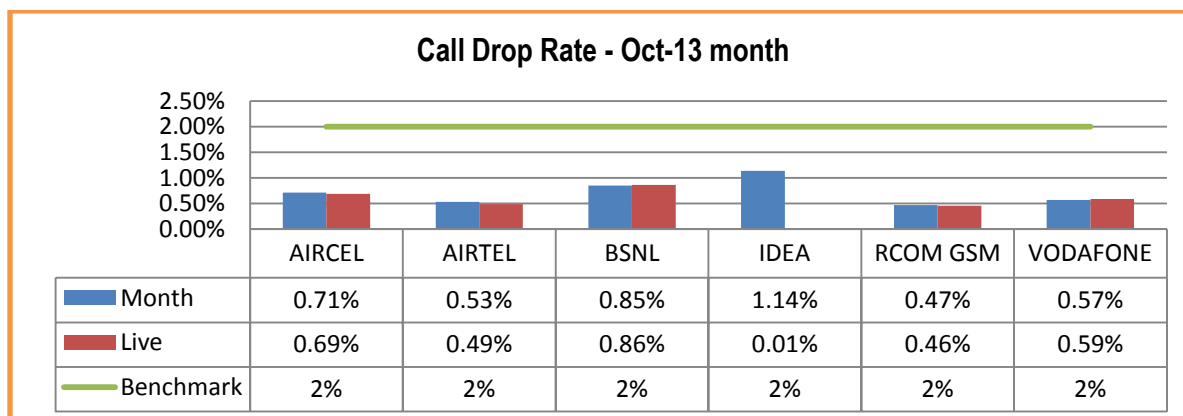
5) TCH CONGESTION :



All operators are meeting the benchmarks.



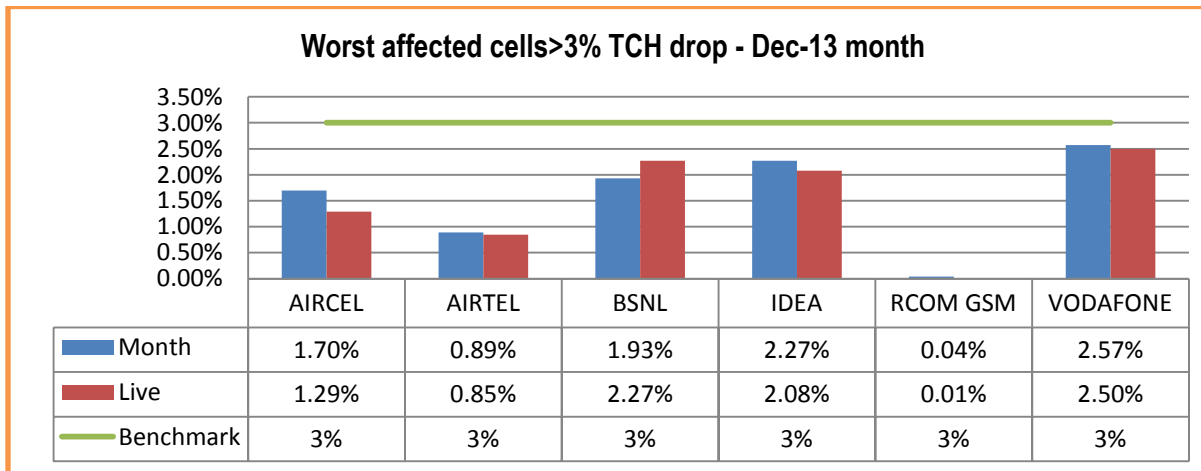
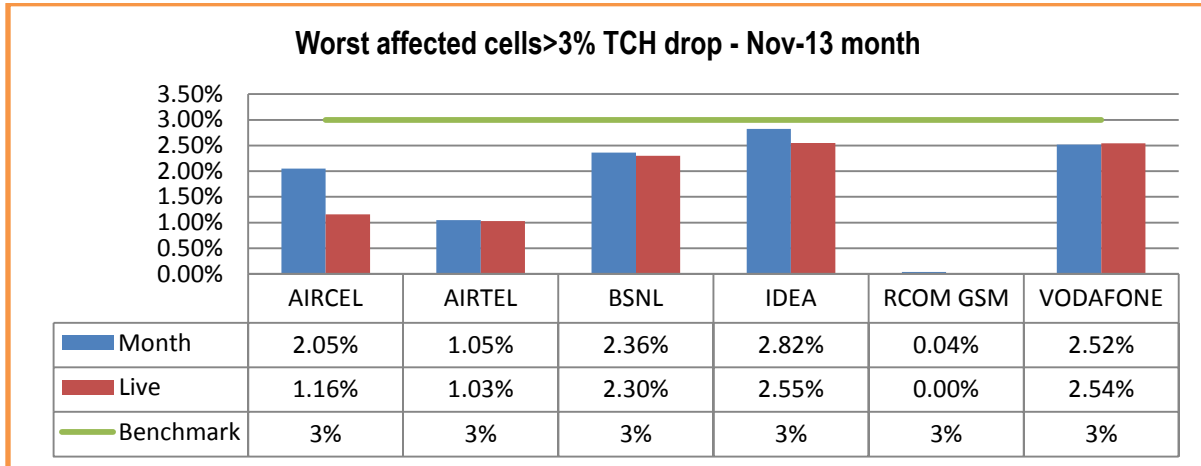
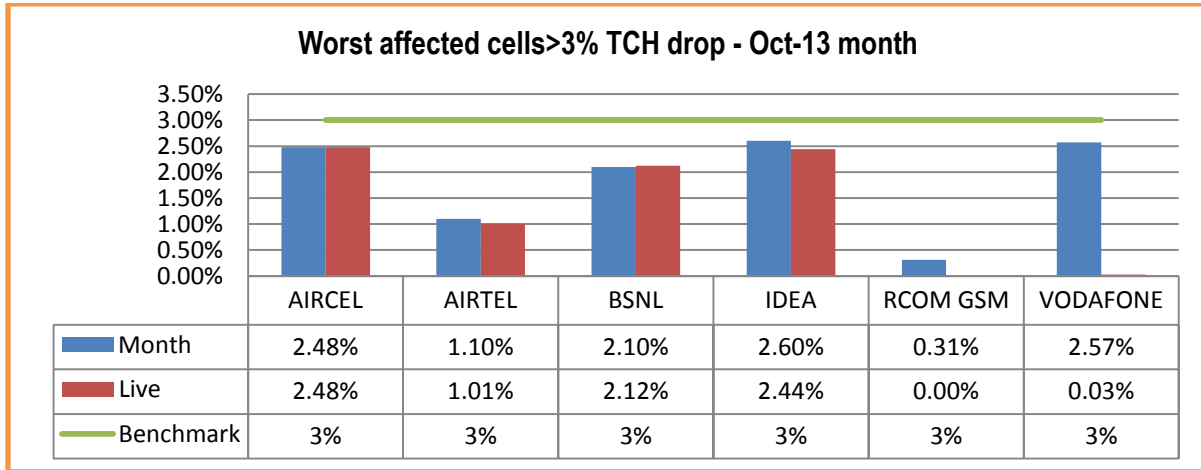
6) CALL DROP RATE :



All operators are meeting the benchmarks.



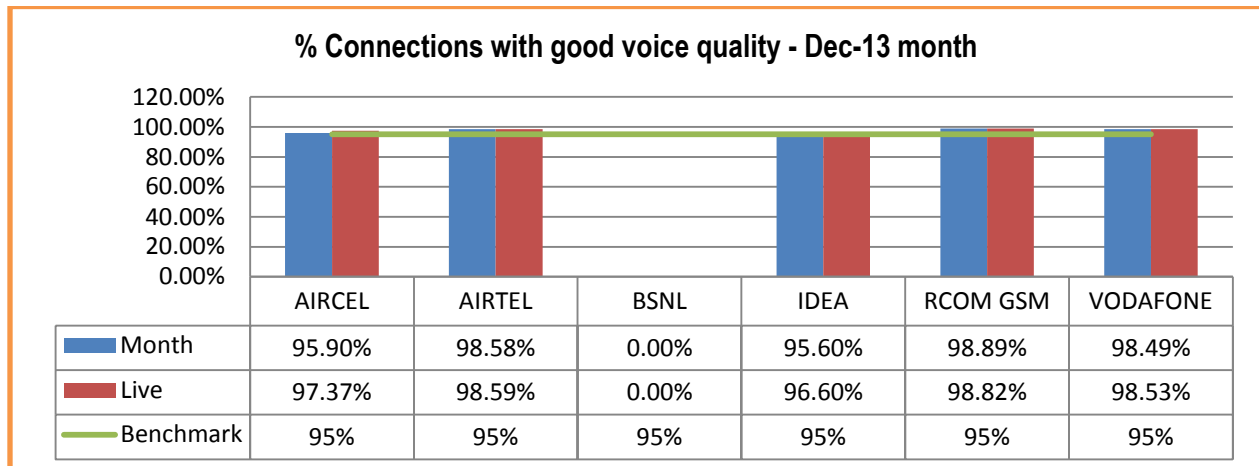
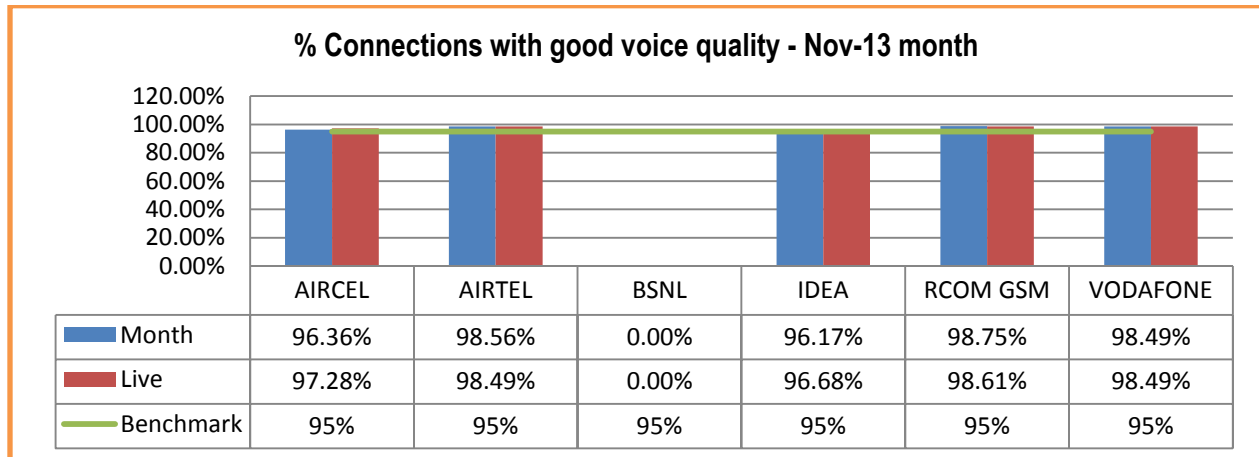
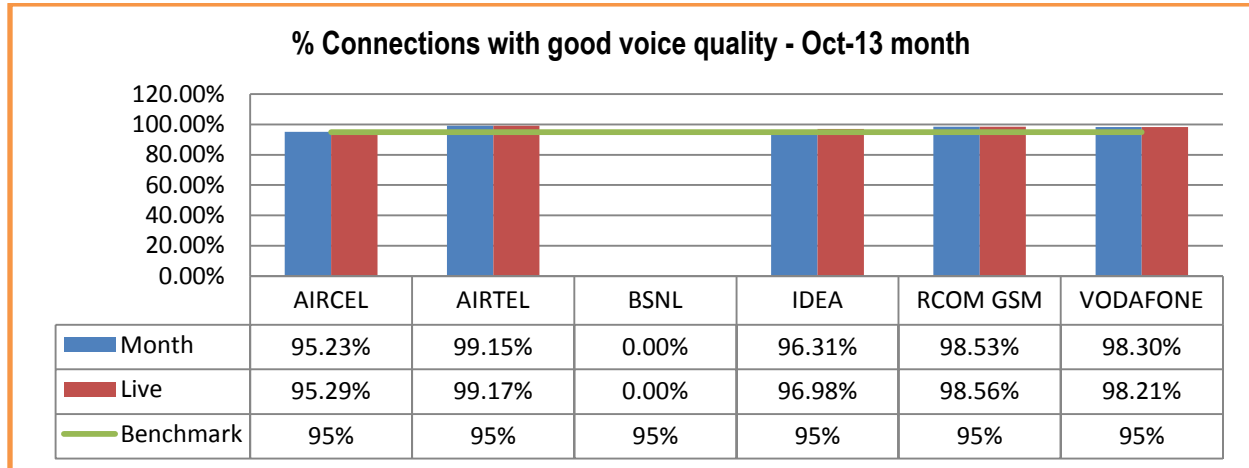
7) WORST AFFECTED CELLS>3% TCH DROP :



All operators are meeting the benchmarks.



8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :



All operators are meeting the benchmarks. BSNL has not provided the data for the parameter 'Good Voice Quality'.



9. PMR VERIFICATION SHEET:

a) NETWORK RELATED PARAMETER:

Jammu & Kashmir 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	1.97	96.11	0.47	1.74	0.65	2.08	95.83	0
	Verified	0.41%	1.97%	96.12%	0.47%	1.71%	0.65%	2.08%	95.83%	0
AIRTEL	Reported	0.08	0.11	98.96	0.13	0.19	0.49	1.02	98.76	0
	Verified	0.08%	0.11%	98.96%	0.13%	0.19%	0.49%	1.01%	98.76%	0
BSNL	Reported	1.53	1.87	98.00	0.80	1.37	1.43	2.13	98.00	0
	Verified	1.48%	1.29%	98.34%	0.71%	1.20%	1.23%	2.13%	NP	0
IDEA	Reported	0.24	1.32	98.87	0.12	0.44	1.13	2.56	96.03	0
	Verified	0.24%	1.32%	98.81%	0.12%	0.44%	1.13%	2.56%	96.03%	0
RCOM GSM	Reported	0.24	0.95	99.65	0.01	0.04	0.41	0.06	98.72	0
	Verified	0.24%	0.95%	99.65%	0.01%	0.04%	0.41%	0.13%	98.72%	0
VODAFONE	Reported	0.05	0.18	98.44	0.01	0.15	0.57	2.55	98.43	0
	Verified	0.23%	0.18%	98.44%	0.01%	0.08%	0.57%	2.55%	98.43%	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. Hence there is no discrepancy between reported and verified data.



b) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

Jammu & Kashmir Circle		% of billing complaints during the quarter	% of Pre-paid Charging Complaints	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	% of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	Accessibility of call centre/Customer Care	% call answered by operators(voice to voice) within 60 sec.	% of Termination/ Closure of service within 7 days	Time taken for refunds of deposits after closures.
Benchmark		<= 0.1%	<= 0.1%	100 % within 4 week	<=1 week	>=95%	>=90%	100% within <=7days	100% within 60 days
AIRCEL	Reported	0.00	0.00	100.00	100.00	93.01	91.36	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	93.01%	90.10%	100.00%	100.00%
AIRTEL	Reported	0.03	0.02	100.00	100.00	100.00	94.00	100.00	100.00
	Verified	0.03%	0.02%	100.00%	100.00%	100.00%	94.00%	100.00%	100.00%
BSNL	Reported	0.00	0.00	100.00	100.00	100.00	64.00	100.00	100.00
	Verified	0.03%	0.07%	100.00%	100.00%	100.00%	64.33%	100.00%	100.00%
IDEA	Reported	0.02	0.01	100.00	100.00	94.90	96.50	100.00	100.00
	Verified	0.02%	0.01%	100.00%	100.00%	95.00%	97.00%	100.00%	100.00%
RCOM (GSM)	Reported	0.08	0.10	100.00	100.00	98.71	92.61	100.00	100.00
	Verified	0.08%	0.10%	100.00%	100.00%	98.71%	91.34%	100.00%	100.00%
VODAFONE	Reported	0.04	0.02	100.00	100.00	100.00	99.22	100.00	100.00
	Verified	0.04%	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

- i. The above data is averaged for three months of the quarter ending December-2013.
- ii. The PMR data provided by the service providers is largely matching with verified (audited) data.
- iii. 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."