



**Audit & Assessment of Quality of Service
Of
Cellular Mobile Telephone Service
For
Telecom Regulatory Authority of India
North Zone – Jammu & Kashmir Service Area
(October 2014 – December 2014)**

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PREFACE

The Telecom Regulatory Authority of India (TRAI) was established in 1997 by an Act of Parliament, called the Telecom Regulatory Authority of India Act, 1997, to regulate telecom services. The Authority's mission is to ensure that the interest of consumers are protected and at the same time to nurture conditions for growth of telecommunications, broadcasting and cable services in a manner and at a pace which will enable India to play a leading role in emerging global information society.

The Authority, in exercise of its functions as per the provisions in the TRAI Act, has been entrusted to measure the Quality of Service provided by the Service Providers from time to time and to compare them with the benchmarks so as to assess the level of performance. In pursuance of this, TRAI has appointed **M/s TUV-SUD South Asia Pvt. Ltd.** to carry out "Audit and Assessment of Quality of Service" provided by Basic (Wire line), Cellular Mobile and Broadband service providers in terms of the benchmarks specified in the respective regulations, in North and West Zones.

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **J&K circle** against the QoS bench marks laid down by TRAI in the respective regulations.

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1. BACKGROUND



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



2. OBJECTIVES AND METHODOLOGY

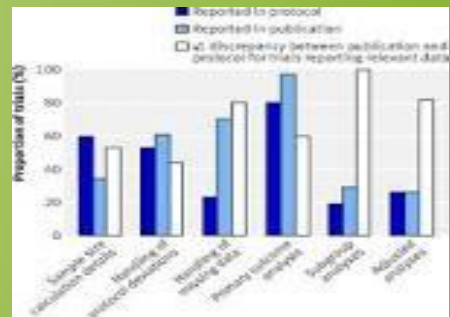
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was 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, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for Delhi, Haryana and Mumbai circles during the quarter October – December 2014.**

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. 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	Dates of live measurement Audit			Audit Location/Address
		October-14	November-14	December-14	
	GSM Operators	October-14	November-14	December-14	
1	AIRCEL	15 to 17 Oct-14	8, 10 & 11 Nov-14	8 to 10 Dec-14	Dishnet Wireless Limited , 2nd floor North Block Bahu Plaza Jammu
2	AIRTEL	ND	12 to 14 Nov-14	8 to 10 Dec-14	Bharti Airtel Campus, Plot No 21, Rajiv Gandhi Information and Technology Park, Chandigarh, 160101
3	BSNL	9 to 11 Oct-14	6 to 8 Nov-14	6, 8 & 9 Dec-14	BSNL 4th floor, Rail Head Complex Jammu
4	IDEA	13 to 15 Oct-14	5 to 7 Nov-14	5, 8 & 9 Dec-14	Idea Office Phase -7 Industrial Area, Mohali
5	RCOM GSM	ND	ND	ND	Reliance Communication Limited Narwal KC Business Park Jammu
6	VODAFONE	ND	12 to 14 Nov-14	4 to 6 Dec-14	Vodafone Spacetel Ltd. 4th floor (B) , North Block Bahu Plaza Complex Jammu-180004

For all the above operators, audit was conducted in all the three months of the Quarter ended Dec - 2014.

The data generated by monthly PMR and 3-days live measurements audit for the period October 2014 to December 2014 has been successfully uploaded to the server located at TRAI premises.

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles **once in a year**. **Based on this criterion, QoS audit for basic (wire line) service was not required to be done for Jammu & Kashmir Circle in the quarter ended December- 2014.**

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 only **once in a year**. **Based on this criterion, the QoS audit for Broadband service was not required to be done for Jammu & Kashmir Circle in the quarter ended December- 2014,**

4. EXECUTIVE SUMMARY



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 drive tests in three select SSAs per service provider per quarter.
- 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
- **Essence of compliance report of service providers with respect to the QoS:**

(i) From monthly PMR audit it has been concluded that the performance of **Aircel** and **Vodafone** in J&K service area was not satisfactory as they could not comply with the benchmarks of **Network Parameters**. **Aircel** failed to meet the benchmark of the parameters ‘**BTS Accumulated Downtime**’, ‘**Worst affected BTSs due to downtime**’, **SDCCH Congestion**, **TCH Congestion**, **CSSR**, **Worst affected Cells> 3% TCH drops** and **Voice Quality** with its average performance of **2.56%**, **17.14%**, **1.27%**, **5.35%**, **94.16%** **13.99%** and **93.44%** respectively. **Vodafone** also remained non-complied for parameters **Worst affected BTSs due to downtime** and **Worst affected Cells> 3% TCH drops** with its performance as **3.11%** and **3.08%** respectively.

(ii) From three days live measurement assessment, it is found that the performance of all operators is satisfactory as they have largely met the benchmarks except **Aircel** which could not meet the benchmarks of parameters **BTS Accumulated Downtime**, **BTS Accumulated down Time**, **CSSR**, **SDCCH Congestion**, **TCH Congestion**, **Worst affected cells> 3 % TCH drops** and **% Connections with good voice quality**. The average performance of **Aircel** for these parameters was **2.53%**, **94%**, **1.10%**, **5.51%**, **13.77%** and **93.29%** respectively. **Vodafone** also could not

meet the benchmark for the parameter '**Worst Affected Cells > 3% TCH Drop**' with its achieved value as **3.03%**, marginally beyond the benchmark.

This non-compliance is in sync with the Monthly audited PMR of Aircel.

(iii) 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 and Time taken for refunds. However, **Aircel** could not meet the benchmark of parameter '**Accessibility**' having achieved its performance as **92.07**. **Airtel and BSNL** have also failed to meet the benchmark of '**calls answered by Operators (voice to voice)**' within **90 seconds** with their performance as **94.69% and 58.84%** respectively. **The performance of BSNL was way below the benchmark of > 95%.**

(iv) The results of **Drive Tests** revealed that most of the operators have performed fairly well within the benchmarks in two SSAs where drive tests were conducted during the quarter. **Only BSNL** remained under performed in respect of the parameters **Voice Quality** in these SSAs.

5. PMR AUDIT REPORT



5. PMR AUDIT REPORTS:

5.1 MONTHLY PMR:

5.1.1 BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM OPERATORS			
1	AIRCEL	Dec-14	20:00 - 21:00
2	AIRTEL	Dec-14	20:00 - 21:00
3	BSNL	Dec-14	19:00 - 20:00
4	IDEA	Dec-14	21:00 - 22:00
5	RCOM GSM	Dec-14	--
6	VODAFONE	Dec-14	22:00 - 23:00

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

5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

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	2107	Ericsson	Ericsson
2	AIRTEL	12	31	2765	Ericsson	Ericsson
3	BSNL	7	21	1187	Ericsson	Ericsson, NSN & ZTE
4	IDEA	2	6	906	Ericsson	Ericsson
5	RCOM GSM	--	--	--	--	--
6	VODAFONE	3	15	1505	NSN	NSN

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – OCTOBER- 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- OCTOBER 14 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%	Oct-14	2.96%	0.08%	1.31%	0.74%	ND	0.66%
	b) Worst affected BTSs due to downtime	<=2%	Oct-14	21.29%	0.07%	1.95%	1.70%	ND	5.06%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-14	92.23%	98.11%	97.39%	98.00%	ND	96.60%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-14	2.83%	0.38%	0.84%	0.84%	ND	1.88%
	c) TCH congestion	<=2%	Oct-14	7.21%	0.52%	1.34%	1.32%	ND	3.20%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Oct-14	1.68%	0.50%	1.37%	1.67%	ND	0.96%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-14	16.01%	1.11%	2.28%	2.56%	ND	3.22%
	c) Connections with good voice quality	>=95%	Oct-14	92.77%	98.14%	97.92%	96.11%	ND	97.85%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Oct-14	0	0	0	0	ND	0

ND: Not Done

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – NOVEMBER-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - NOVEMBER 14 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-14	2.78%	0.13%	1.49%	0.69%	ND	0.32%
	b) Worst affected BTSs due to downtime	<=2%	Nov-14	17.21%	0.07%	1.60%	1.81%	ND	2.47%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-14	94.16%	98.34%	97.66%	98.84%	ND	96.42%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-14	0.62%	0.24%	0.83%	0.33%	ND	0.28%
	c) TCH congestion	<=2%	Nov-14	5.36%	0.49%	1.10%	0.78%	ND	1.75%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Nov-14	1.48%	0.50%	1.13%	1.54%	ND	0.69%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-14	13.77%	1.14%	2.19%	2.62%	ND	3.05%
	c) Connections with good voice quality	>=95%	Nov-14	93.44%	98.15%	97.57%	96.44%	ND	98.15%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Nov-14	0	0	0	0	ND	0

ND: Not Done

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – DECEMBER-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - DECEMBER 14 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-14	1.93%	0.13%	1.72%	0.63%	ND	0.28%
	b) Worst affected BTSs due to downtime	<=2%	Dec-14	12.92%	0.11%	1.85%	1.88%	ND	1.79%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-14	96.08%	98.41%	99.02%	97.95%	ND	97.27%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-14	0.35%	0.24%	0.86%	0.07%	ND	0.06%
	c) TCH congestion	<=2%	Dec-14	3.49%	0.39%	0.61%	1.60%	ND	1.17%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Dec-14	1.40%	0.47%	0.62%	1.73%	ND	0.84%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-14	12.20%	1.02%	2.25%	2.35%	ND	2.98%
	c) Connections with good voice quality	>=95%	Dec-14	94.11%	98.28%	98.33%	96.99%	ND	98.34%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Dec-14	0	0	0	0	ND	0

ND: Not Done

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR – (AVERAGE OF OCT-NOV-DEC- 2014 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF THREE MONTHS DATA) OF J&K CIRCLE									
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%	Quarterly	2.56%	0.11%	1.51%	0.69%	ND	0.42%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	17.14%	0.08%	1.80%	1.80%	ND	3.11%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	94.16%	98.29%	98.02%	98.26%	ND	96.76%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	1.27%	0.29%	0.84%	0.41%	ND	0.74%
	c) TCH congestion	<=2%	Quarterly	5.35%	0.47%	1.02%	1.23%	ND	2.04%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.52%	0.49%	1.04%	1.65%	ND	0.83%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	13.99%	1.09%	2.24%	2.51%	ND	3.08%
	c) Connections with good voice quality	>=95%	Quarterly	93.44%	98.19%	97.94%	96.51%	ND	98.11%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	ND	0

ND: Not Done

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit of network related parameters for cellular mobile service providers was conducted at their respective MSCs in the circles

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 report for QE December-14 has been prepared based on the data audited for all the operators except RCOM (GSM). RCOM (GSM) was not available for QoS audit saying that their network damaged due to heavy floods was still under renovation. They have further informed that they would not get their network audited till the end of February 2015 as requested by COAI to TRAI.

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 operators (except **Aircel**) 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. Only **Aircel** failed to meet the benchmark of the parameter '**BTS Accumulated Downtime**' & '**Worst affected BTSs due to downtime**' with its average performance of **2.56%** & **17.14%** respectively. **Vodafone** also failed to meet the benchmark of '**Worst affected BTSs due to downtime**' (**3.11%**).

- **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 have met the benchmark on this parameter except Aircel with its average performance as 94.16%.

- **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 (Except Aircel) met the TRAI specified benchmarks on the congestion parameters. Aircel failed to meet the benchmark of SDCCH Congestion and 'TCH Congestion' with its average performance as 1.27% and 5.35% respectively.**

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.**

- 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.

Aircel and Vodafone failed to meet the benchmark of the parameter 'Worst affected cells having more than 3% TCH drops' with their average performance of 13.99% and 3.08% respectively.

- iii. Connections with good voice quality:

The Operators are measuring this parameter through the system generated data at their switches. The audit results for this parameter indicates that all operators have met the bench mark **except Aircel** during the quarter. **Aircel failed to meet the benchmark for this parameter with its average performance of 93.44%.**

**3-DAYS LIVE MEASUREMENT DATA VERIFICATION FOR
CELLULAR MOBILE SERVICE PROVIDERS
(NETWORK SERVICE QUALITY PARAMETER)**



5.2 LIVE MEASUREMENT DATA (3-DAYS) FOR CELLULAR MOBILE SERVICE PROVIDERS (NETWORK SERVICE QUALITY PARAMETER):

5.2.1 LIVE MEASUREMENT DATA (3-DAYS) – OCTOBER- 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE – OCTOBER 14 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	2.05%	ND	1.78%	1.60%	ND	ND
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	ND	0.67%	1.13%	ND	ND
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	93.08%	ND	97.42%	98.26%	ND	ND
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	1.59%	ND	0.88%	0.77%	ND	ND
	c) TCH congestion	<=2%	Live data	6.37%	ND	1.31%	1.21%	ND	ND
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.65%	ND	1.35%	1.59%	ND	ND
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	15.78%	ND	2.21%	2.80%	ND	ND
	c) Connections with good voice quality	>=95%	Live data	92.78%	ND	98.24%	96.67%	ND	ND
4	No. of POI having >=0.5% congestion		Live data	0	ND	0	0	ND	ND

5.2.2 LIVE MEASUREMENT DATA (3-DAYS) – NOVEMBER-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - NOVEMBER 14 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	3.55%	0.11%	1.66%	1.48%	ND	ND
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.51%	0.24%	ND	ND
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	92.46%	98.39%	97.67%	98.32%	ND	ND
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	1.31%	0.27%	0.82%	0.60%	ND	ND
	c) TCH congestion	<=2%	Live data	7.06%	0.45%	1.01%	1.24%	ND	ND
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.46%	0.49%	1.04%	1.50%	ND	ND
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	13.42%	1.08%	2.88%	2.84%	ND	ND
	c) Connections with good voice quality	>=95%	Live data	93.24%	98.14%	97.46%	97.51%	ND	ND
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	ND	ND

5.2.3 LIVE MEASUREMENT DATA (3-DAYS) – DECEMBER-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - DECEMBER 14 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	1.99%	0.07%	1.77%	0.34%	ND	0.30%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.25%	0.11%	ND	0.00%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.45%	98.52%	98.87%	98.02%	ND	96.68%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.41%	0.25%	0.82%	0.14%	ND	0.03%
	c) TCH congestion	<=2%	Live data	3.11%	0.42%	0.72%	1.51%	ND	1.60%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.35%	0.46%	0.73%	1.81%	ND	0.85%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	12.10%	1.00%	2.34%	2.76%	ND	3.03%
	c) Connections with good voice quality	>=95%	Live data	93.86%	98.32%	98.83%	97.16%	ND	98.25%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	ND	0

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF OCTOBER –NOVEMBER- DECEMBER 2014 MONTHS DATA)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – J&K CIRCLE									
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%	Quarterly	2.53%	0.09%	1.74%	1.14%	ND	0.30%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.48%	0.49%	ND	0.00%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	94.00%	98.46%	97.99%	98.20%	ND	96.68%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	1.10%	0.26%	0.84%	0.50%	ND	0.03%
	c) TCH congestion	<=2%	Quarterly	5.51%	0.44%	1.01%	1.32%	ND	1.60%
Connection maintenance (Retainability)									
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.49%	0.48%	1.04%	1.63%	ND	0.85%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	13.77%	1.04%	2.48%	2.80%	ND	3.03%
	c) Connections with good voice quality	>=95%	Quarterly	93.29%	98.23%	98.18%	97.11%	ND	98.25%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	ND	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

As the networks of the service providers damaged due to floods in J&K region were still under repairs so Airtel, RCOMGSM & Vodafone not co-operated for live measurement in the month of October-14, RCOM GSM & Vodafone in the month of November -14 and RCOMGSM in the month of December-14. Hence, live assessment has been evaluated based on the data available in the respective months.

Aircel has failed to meet the benchmarks of all the prime network parameters namely **BTS Accumulated down time, CSSR, SDCCH/TCH congestion, Worst Affected Cells > 3% TCH Drops, and Good Voice Quality** with its performance as **2.53%, 94.00%, 1.10%, 5.51%, 13.77% and 93.29%** respectively. **Vodafone** also could not meet the benchmark for the parameter **‘Worst Affected Cells > 3% TCH Drop** with its achievement value as **3.03%**, marginally beyond the benchmark.

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - October 14 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		Oct-14	2006	2698	1177	822	ND	1483
	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-14	44104.56	1689.95	11460.00	4530.47	ND	7239.43
	c) BTS Accumulated Downtime	<=2%	Oct-14	2.96%	0.08%	1.31%	0.74%	ND	0.66%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-14	427	2	23	14	ND	75
	e) Worst affected BTSs due to downtime	<=2%	Oct-14	21.29%	0.07%	1.95%	1.70%	ND	5.06%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Oct-14	92.23%	98.11%	97.39%	98.00%	ND	96.60%
	b) SDCCH/PAGING Congestion	<=1%	Oct-14	2.83%	0.38%	0.84%	0.84%	ND	1.88%
	c) TCH congestion	<=2%	Oct-14	7.21%	0.52%	1.34%	1.32%	ND	3.20%
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Oct-14	1.68%	0.50%	1.37%	1.67%	ND	0.96%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-14	16.01%	1.11%	2.28%	2.56%	ND	3.22%
	c) % of connections with good voice quality	>=95%	Oct-14	92.77%	98.14%	97.92%	96.11%	ND	97.85%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-14	928	88	80	62	ND	144
	e) Total no. of cells (Sector) in the licensed service area		Oct-14	5795	7912	3498	2407	ND	4467
4	No. of POI's having >=0.5% POI congestion								
	No. of POI's having >=0.5% POI congestion		Oct-14	0	0	0	0	ND	0
	Name of POI not meeting the benchmark		Oct-14	0	0	0	0	ND	0
5	Network Data								
	a) Equipped Capacity of Network in Erlang		Oct-14	122687	107676	72000	23266	ND	36229
	b) Total traffic in TCBH in erlang (Avg.)		Oct-14	75471	93943	27036	12033	ND	22762
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-14	1929315	2486407	866992	390741	ND	711642

ND: Audit not done

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – October 14 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	2090	ND	1046	799	ND	ND
	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	3085.56	ND	1337.00	918.86	ND	ND
	c) BTS Accumulated Downtime	<=2%	Live data	2.05%	ND	1.78%	1.60%	ND	ND
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	ND	7	9	ND	ND
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	ND	0.67%	1.13%	ND	ND
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	93.08%	ND	97.42%	98.26%	ND	ND
	b) SDCCH/PAGING Congestion	<=1%	Live data	1.59%	ND	0.88%	0.77%	ND	ND
	c) TCH congestion	<=2%	Live data	6.37%	ND	1.31%	1.21%	ND	ND
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.65%	ND	1.35%	1.59%	ND	ND
	b) Worst affected cells>3% TCH drop	<=3%	Live data	15.78%	ND	2.21%	2.80%	ND	ND
	c) % of connections with good voice quality	>=95%	Live data	92.78%	ND	98.24%	96.67%	ND	ND
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	978	ND	77	67	ND	ND
	e) Total no. of cells (Sector) in the licensed service area		Live data	6195	ND	3498	2383	ND	ND
4	No. of POI's having >=0.5% POI congestion								
	No. of POI's having >=0.5% POI congestion		Live data	0	ND	0	0	ND	ND
	Name of POI not meeting the benchmark		Live data	0	ND	0	0	ND	ND

ND: Audit not done

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - November 14 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		Nov-14	2068	2697	1187	886	ND	1499
	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-14	41458.75	2514.39	12758.00	3974.29	ND	3407.66
	c) BTS Accumulated Downtime	<=2%	Nov-14	2.78%	0.13%	1.49%	0.69%	ND	0.32%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-14	356	2	19	16	ND	37
	e) Worst affected BTSs due to downtime	<=2%	Nov-14	17.21%	0.07%	1.60%	1.81%	ND	2.47%
Connection Establishment (Accessibility)									
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-14	94.16%	98.34%	97.66%	98.84%	ND	96.42%
	b) SDCCH/PAGING Congestion	<=1%	Nov-14	0.62%	0.24%	0.83%	0.33%	ND	0.28%
	c) TCH congestion	<=2%	Nov-14	5.36%	0.49%	1.10%	0.78%	ND	1.75%
Connection Maintenance (Retainability)									
3	a) Call Drop Rate (CDR)	<=2%	Nov-14	1.48%	0.50%	1.13%	1.54%	ND	0.69%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-14	13.77%	1.14%	2.19%	2.62%	ND	3.05%
	c) % of connections with good voice quality	>=95%	Nov-14	93.44%	98.15%	97.57%	96.44%	ND	98.15%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-14	830	91	77	65	ND	137
	e) Total no. of cells (Sector) in the licensed service area		Nov-14	6028	7953	3520	2485	ND	4490
No. of POI's having >=0.5% POI congestion									
4	No. of POI's having >=0.5% POI congestion		Nov-14	0	0	0	0	ND	0
	Name of POI not meeting the benchmark		Nov-14	0	0	0	0	ND	0
Network Data									
5	a) Equipped Capacity of Network in Erlang		Nov-14	121899	105687	72000	25387	ND	36682
	b) Total traffic in TCBH in erlang (Avg.)		Nov-14	75913	91828	34153	13036	ND	23335
	c) Total no. of customers served (as per VLR) on last day of the month		Nov-14	1959452	2732762	877134	406596	ND	728619

ND: Audit not done

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – November 14 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	2033	2756	1177	823	ND	1487
	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	5200.17	219.54	1409.00	877.49	ND	216.87
	c) BTS Accumulated Downtime	<=2%	Live data	3.55%	0.11%	1.66%	1.48%	ND	0.20%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	6	2	ND	2
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.51%	0.24%	ND	0.13%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	92.46%	98.39%	97.67%	98.32%	ND	96.14%
	b) SDCCH/PAGING Congestion	<=1%	Live data	1.31%	0.27%	0.82%	0.60%	ND	0.28%
	c) TCH congestion	<=2%	Live data	7.06%	0.45%	1.01%	1.24%	ND	1.08%
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.46%	0.49%	1.04%	1.50%	ND	0.59%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	13.42%	1.08%	2.88%	2.84%	ND	3.13%
	c) % of connections with good voice quality	>=95%	Live data	93.24%	98.14%	97.46%	97.51%	ND	98.04%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	815	87	101	69	ND	140
	e) Total no. of cells (Sector) in the licensed service area		Live data	6070	8087	3498	2440	ND	4482
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	ND	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	ND	0

TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - December 14 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-14	2106	2765	1187	906	ND	1505
	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-14	30201	2742	15150	4255	ND	3147
	c) BTS Accumulated Downtime	<=2%	Dec-14	1.93%	0.13%	1.72%	0.63%	ND	0.28%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-14	272	3	22	17	ND	27
	e) Worst affected BTSs due to downtime	<=2%	Dec-14	12.92%	0.11%	1.85%	1.88%	ND	1.79%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Dec-14	96.08%	98.41%	99.02%	97.95%	ND	97.27%
	b) SDCCH/PAGING Congestion	<=1%	Dec-14	0.35%	0.24%	0.86%	0.07%	ND	0.06%
	c) TCH congestion	<=2%	Dec-14	3.49%	0.39%	0.61%	1.60%	ND	1.17%
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Dec-14	1.40%	0.47%	0.62%	1.73%	ND	0.84%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-14	12.20%	1.02%	2.25%	2.35%	ND	2.98%
	c) % of connections with good voice quality	>=95%	Dec-14	94.11%	98.28%	98.33%	96.99%	ND	98.34%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-14	757	83	79	63	ND	135
	e) Total no. of cells (Sector) in the licensed service area		Dec-14	6208	8092	3528	2686	ND	4527
4	No. of POI's having >=0.5% POI congestion								
	No. of POI's having >=0.5% POI congestion		Dec-14	0	0	0	0	ND	0
	Name of POI not meeting the benchmark		Dec-14	0	0	0	0	ND	0
5	Network Data								
	a) Equipped Capacity of Network in Erlang		Dec-14	117222	108321	72000	25594	ND	38557
	b) Total traffic in TCBH in erlang (Avg.)		Dec-14	73723	88776	35157	13739	ND	25998
	c) Total no. of customers served (as per VLR) on last day of the month		Dec-14	2034420	2744305	873850	426394	ND	739328

ND: Audit not done

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – December 14 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	2091	2770	1187	886	ND	1499
	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	2991.21	143.32	1510.00	216.58	ND	321.27
	c) BTS Accumulated Downtime	<=2%	Live data	1.99%	0.07%	1.77%	0.34%	ND	0.30%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	3	1	ND	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.25%	0.11%	ND	0.00%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.45%	98.52%	98.87%	98.02%	ND	96.68%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.41%	0.25%	0.82%	0.14%	ND	0.03%
	c) TCH congestion	<=2%	Live data	3.11%	0.42%	0.72%	1.51%	ND	1.60%
3	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.35%	0.46%	0.73%	1.81%	ND	0.85%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	12.10%	1.00%	2.34%	2.76%	ND	3.03%
	c) % of connections with good voice quality	>=95%	Live data	93.86%	98.32%	98.83%	97.16%	ND	98.25%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	755	81	83	73	ND	137
	e) Total no. of cells (Sector) in the licensed service area		Live data	6242	8119	3528	7962	ND	4518
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	ND	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	ND	0

ND: Audit not done

CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS



5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS-QE DEC.14:

5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (OCTOBER TO DECEMBER MONTHS AUDITED DATA):

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE DECEMBER 14									
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									
Metering & Billing Credibility -Post Paid									
1	A) No. of bills issued during the quarter		Jammu & Kashmir	358342	309505	811897	76442	62332	133380
	B) No. of bills disputed including billing complaints during the quarter		Jammu & Kashmir	4	128	238	26	25	85
	C)% of billing complaints during the quarter	<= 0.1%	Jammu & Kashmir	0.001%	0.04%	0.03%	0.03%	0.04%	0.06%
Metering & Billing Credibility -Pre Paid									
2	A) Total No. of Pre-paid customers at the end of the quarter		Jammu & Kashmir	2336138	2737736	905473	438577	716057	1005530
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Jammu & Kashmir	7	75	783	42	630	188
	C) % of Pre-paid Charging Complaints	<= 0.1%	Jammu & Kashmir	0.00%	0.003%	0.09%	0.01%	0.09%	0.02%
Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints									
3	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		Jammu & Kashmir	11	203	1021	458	655	273
	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	11	203	1021	458	655	273
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		Jammu & Kashmir	11	203	1021	458	655	273
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	Jammu & Kashmir	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	Jammu & Kashmir	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE DECEMBER 14									
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/ N	Name of Parameter			GSM Operators					
	F) % 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%
Response time to customers for assistance									
	A) Total no of calls attempted to customer care/Call center		Jammu & Kashmir	15057962	1768391	212195	1486199	2594337	3311451
	B) Total no. of calls successfully established to customer care/Call center.		Jammu & Kashmir	13863515	1757835	212195	1438303	2565870	3311451
4	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%		92.07%	99.40%	100.00%	96.78%	98.90%	100.00%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)			2457958	2722074	446794	460496	50635	776672
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds			2430030	2577511	262897	439972	48580	770557
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%		98.86%	94.69%	58.84%	95.54%	95.94%	99.21%
Termination/closure of service									
	A) Total No. of requests for Termination / Closure of service received during the quarter		Jammu & Kashmir	3360	916	1481	661	321	494
5	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		Jammu & Kashmir	3360	916	1481	661	321	494
	C) % of Termination/ Closure of service within 7 days	<=7days	Jammu & Kashmir	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Time taken for refunds of deposits after closures.									
	A) No. of Payments/ Refunds due during the quarter		Jammu & Kashmir	1102	245	1481	199	343	280
6	B) No. of Payments/ Refunds Cleared during the quarter		Jammu & Kashmir	1102	245	1481	199	343	280
	C) Time taken for refunds of deposits after closures.	100% within 60 days	Jammu & Kashmir	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE - DEC 2014):

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE – DECEMBER 14									
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) Total no of calls attempted to customer care/Call center		J & K	469858	57878	10543	60945	108625	111430
	B) Total no. of calls successfully established to customer care/Call center.		J & K	460565	57878	10543	59638	107246	111430
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	J & K	98.02%	100.00%	100.00%	97.86%	98.73%	100.00%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		J & K	80239	81617	11985	16637	1792	26531
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		J & K	79462	81035	11717	15040	1772	26343
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	J & K	99.03%	99.29%	97.76%	90.40%	98.88%	99.29%

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

1. Metering and billing credibility-(Post paid & Pre-paid)

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid is well within the prescribed bench mark of $\leq 0.1\%$ for all the operators.

2. Resolution of Billing complaints and applying credits -

- i. Resolution of billing /charging complaints
- ii. Period of applying credit/waiver/adjustment to customer's account from the date of resolution of complaints

All operators were found to have met the benchmarks for the above parameters.

3. Response Time to the Customer for assistance

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

All service providers are in compliance with respect to the parameter 'Accessibility of call center' against the benchmark of 95%, except **Aircel** having achieved its performance as **92.07**. **Airtel and BSNL** have failed to meet the benchmark of 'calls answered by Operators (voice to voice)' within 90 seconds with their performance as **94.69% and 58.84%** respectively. **The performance of BSNL was way below the benchmark of > 95%.**

4. Termination/Closure of Service

In case of this parameters also, all service providers have settled 100% closures within 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.

Live Measurements:

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 answered by operators (Voice to voice) only one operator namely **Idea** could not meet the benchmark with its performance as **90.40%**.

6. LIVE CALLING ASSESSMENT



6. LIVE CALLING ASSESSMENT:

6.1 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	95.00%	100.00%	---	100.00%	92.00%	100.00%
IDEA	J&K	100.00%	100.00%	100.00%	---	100.00%	100.00%
RCOM GSM	J&K	92.00%	95.00%	94.00%	100.00%	---	96.00%
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 case where Calls attempted from BSNL to Aircel and RCOM GSM, successful interconnection was 95% and 92% respectively. RCOM GSM to Aircel, Airtel, BSNL and Vodafone was 92%, 95%, 94% and 96% respectively. Thus there was no remarkable problem in interconnection from one operator to other operators.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE							
Parameter	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 attempted to customer care/Call center.	J & K	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	J & K	96	100	98	100	98	100
% Accessibility of Call centre /customer Care (Total calls successfully established * 100 / Total call attempts)	J & K	96.00%	100.00%	98.00%	100.00%	98.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	J & K	96	100	98	100	98	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	J & K	95	98	63	100	92	96
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total calls attempts)	J & K	98.96%	98.00%	64.29%	100.00%	93.88%	96.00%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, Aircel, Airtel, BSNL, RCOM (GSM) & Vodafone could connect 98.96%, 98%, 64.29%, 93.88 and 96% of calls respectively to the operator within 90 Seconds.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS							
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	VODAFONE
Total No. of calls Attempted	J & K	11	100	100	100	100	100
Total No. of calls Answered	J & K	4	47	32	53	44	39
Cases resolved within 4 weeks	J & K	4	47	32	53	44	39
%age of cases resolved	J & K	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling some of the customers whose bill were disputed. During live calling, some of the customers did not attend the calls while few others reported that they don't exactly remember about the resolution of complaints. However, the customers in general were expressed their satisfaction on resolution of their complaints.

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING										
Emergency no.	Circle Name	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
100,101,102	J&K	Jammu	Jammu	9	√	√	√	√	√	√
			Akhnoor	9	√	√	√	√	√	√
			Samba	9	√	√	√	√	√	√
			Kathua	9	√	√	√	√	√	√
100,101,102	J&K	Udhampur	Reasi	9	√	√	√	√	√	√
			Mahore	9	√	√	√	NC	√	NC
			Udhampur	9	√	√	√	√	√	√
			Ramnagar	9	√	√	√	√	√	√
			Bhaderwah	9	√	√	√	NC	√	√
			Doda	9	√	√	√	NC	√	√

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 each SSA. In these SSA of J&K service areas, the emergency services as mentioned in the above table were found functional in the networks of all the service providers. However, **Idea** has no coverage in Mahore, Bhaderwah, Doda SDCAs and **Vodafone** has no coverage in Mahore SDCA as mentioned in the table above.

7. DRIVE TEST



7. OPERATOR ASSISTED DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in two SSA's namely **Jammu and Udhampur** in the months of October and December 2014 respectively. **The drive tests in the month of November-14 could not be conducted due to heavy floods in Srinagar SSA, badly damaging the networks of the service providers.** The total route Kms covered during the drive tests in the respective SSAs was **397 Kms** and **420 Kms** respectively. 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. 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.

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.

7.1 OPERATOR ASSISTED DRIVE TEST: JAMMU SSA (OCTOBER-14)

DRIVE TEST TABLE – 1

S/N	Parameter	Classification of route covered	Indoor location	AIRCEL		AIRTEL		BSNL		IDEA		RCOM GSM		VODAFONE	
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor
1	Call Attempts	Major Road	Mubarak Mandi Complex	105	30	148	30	159	30	117	30	120	30	140	30
		Highway	Karan Nagar Complex	122	30	134	30	134	30	83	30	118	30	132	30
		Within City	D-Mart khunjwani	138	30	71	30	103	31	105	30	85	30	94	30
		Overall SSA		365	90	353	90	396	91	305	90	323	90	366	90
2	Blocked Call Rate	Major Road	Mubarak Mandi Complex	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.85%	0.00%	0.00%	0.00%	0.71%	0.00%
		Highway	Karan Nagar Complex	0.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	D-Mart khunjwani	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA		0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%	0.27%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	Mubarak Mandi Complex	0.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.86%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	Karan Nagar Complex	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	D-Mart khunjwani	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA		0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)														
	(a) 0-4 (w/o frequency hopping for CDMA)	Major Road	Mubarak Mandi Complex	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	Karan Nagar Complex	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

S/N	Parameter	Classification of route covered	Indoor location	AIRCEL		AIRTEL		BSNL		IDEA		RCOM GSM		VODAFONE	
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor
	Operators)	Within City	D-Mart khunjwani	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Overall SSA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	Mubarak Mandi Complex	97.56%	99.61%	95.62%	99.23%	92.33%	95.32%	96.29%	99.61%	96.58%	99.49%	97.29%	99.51%
		Highway	Karan Nagar Complex	97.64%	99.62%	95.81%	99.61%	91.62%	97.82%	97.02%	98.78%	96.96%	98.95%	96.45%	98.34%
	Operators)	Within City	D-Mart khunjwani	97.92%	98.46%	95.72%	99.61%	92.87%	97.01%	96.49%	98.37%	96.40%	99.63%	96.59%	99.23%
		Overall SSA		97.70%	99.22%	95.72%	99.48%	92.24%	96.72%	96.58%	99.00%	96.64%	99.38%	96.79%	99.03%
Service Coverage															
5	In door (>= - 75dBm)	Major Road	Mubarak Mandi Complex	96.53%	97.11%	96.68%	96.78%	72.63%	93.10%	43.76%	81.80%	28.24%	8.85%	68.70%	96.81%
		Highway	Karan Nagar Complex	94.27%	100.00%	96.77%	100.00%	70.99%	99.90%	21.60%	78.50%	30.27%	88.72%	66.29%	100.00%
		Within City	D-Mart khunjwani	97.50%	100.00%	97.23%	97.38%	74.05%	99.20%	32.59%	98.30%	26.72%	40.65%	72.16%	100.00%
		Overall SSA		96.27%	99.00%	96.82%	98.04%	72.46%	97.46%	33.28%	86.01%	28.45%	50.60%	68.75%	98.93%
	In-vehicle (>= - 85dBm)	Major Road	Mubarak Mandi Complex	99.41%	100.00%	99.62%	100.00%	94.29%	99.90%	75.81%	92.60%	83.79%	98.56%	87.47%	99.97%
		Highway	Karan Nagar Complex	99.12%	100.00%	99.69%	100.00%	95.95%	100.00%	48.12%	98.90%	72.28%	99.49%	89.26%	100.00%
		Within City	D-Mart khunjwani	99.64%	100.00%	99.71%	100.00%	96.37%	100.00%	68.38%	100.00%	80.36%	78.01%	90.20%	100.00%
		Overall SSA		99.41%	100.00%	99.67%	100.00%	95.40%	99.97%	64.89%	96.16%	79.25%	93.17%	88.86%	99.99%
	Outdoor- in city (>= - 95dBm)	Major Road	Mubarak Mandi Complex	100.00%	100.00%	99.79%	100.00%	99.85%	100.00%	100.00%	100.00%	100.00%	100.00%	97.12%	100.00%
		Highway	Karan Nagar Complex	100.00%	100.00%	99.89%	100.00%	99.96%	100.00%	100.00%	100.00%	100.00%	100.00%	98.41%	100.00%
		Within City	D-Mart khunjwani	100.00%	100.00%	99.77%	100.00%	99.90%	100.00%	100.00%	100.00%	100.00%	100.00%	97.59%	100.00%
		Overall SSA		100.00%	100.00%	99.83%	100.00%	99.90%	100.00%	100.00%	100.00%	100.00%	100.00%	97.72%	100.00%

S/N	Parameter	Classification of route covered	Indoor location	AIRCEL		AIRTEL		BSNL		IDEA		RCOM GSM		VODAFONE	
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor
6	Call Setup Success Rate (>=95%)	Major Road	Mubarak Mandi Complex	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.15%	100.00%	100.00%	100.00%	99.29%	100.00%
		Highway	Karan Nagar Complex	99.18%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Within City	D-Mart khunjwani	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA		99.73%	100.00%	100.00%	100.00%	100.00%	100.00%	99.67%	100.00%	100.00%	100.00%	99.73%	100.00%
7	Hand Over Success Rate (HOSR)	Major Road	Mubarak Mandi Complex	99.42%	100.00%	99.71%	100.00%	99.14%	100.00%	99.37%	100.00%	100.00%	100.00%	99.69%	100.00%
		Highway	Karan Nagar Complex	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Within City	D-Mart khunjwani	79.31%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA		92.11%	100.00%	99.86%	100.00%	99.64%	100.00%	99.72%	100.00%	100.00%	100.00%	99.88%	100.00%

- NA-Not Applicable

7.2 OPERATOR ASSISTED DRIVE TEST: UDHAMPUR SSA (DECEMBER-14)

DRIVE TEST TABLE – 2

S/N	Parameter	Classification of route covered	Indoor location	AIRCEL		AIRTEL		BSNL		IDEA		RCOM GSM		VODAFONE	
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor
1	Call Attempts	Major Road	Hotel Surya, Reasi	97	30	113	30	84	30	45	30	84	30	79	30
		Highway	Prem Sweet Kud	208	30	191	30	145	30	84	30	128	30	157	30
		Within City	Khan Hotel Chanderkot City	56	30	60	30	78	30	27	30	72	30	64	30
		Overall SSA		361	90	364	90	307	90	156	90	284	90	300	90
2	Blocked Call Rate	Major Road	Hotel Surya, Reasi	1.03%	0.00%	0.00%	0.00%	1.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	Prem Sweet Kud	0.48%	0.00%	0.00%	0.00%	3.45%	0.00%	0.00%	0.00%	0.00%	0.00%	1.27%	0.00%
		Within City	Khan Hotel Chanderkot City	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA		0.55%	0.00%	0.00%	0.00%	2.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	Hotel Surya, Reasi	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	Prem Sweet Kud	0.00%	0.00%	0.00%	0.00%	2.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	Khan Hotel Chanderkot City	0.00%	0.00%	0.00%	0.00%	1.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA		0.00%	0.00%	0.00%	0.00%	1.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)														
	(a) 0-4 (w/o frequency hopping for CDMA)	Major Road	Hotel Surya, Reasi	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	Prem Sweet Kud	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

S/N	Parameter	Classification of route covered	Indoor location	AIRCEL		AIRTEL		BSNL		IDEA		RCOM GSM		VODAFONE		
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	
	Operators)	Within City	Khan Hotel Chanderkot City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		Overall SSA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	Hotel Surya, Reasi	96.35%	99.62%	96.13%	99.61%	94.82%	95.56%	97.53%	99.22%	98.09%	99.75%	97.51%	99.78%
			Highway	Prem Sweet Kud	96.51%	100.00%	96.48%	97.68%	96.54%	95.70%	96.83%	99.61%	97.95%	99.63%	98.10%	99.54%
			Within City	Khan Hotel Chanderkot City	96.88%	99.18%	96.41%	100.00%	93.48%	91.80%	97.46%	99.60%	97.20%	99.65%	97.61%	99.38%
			Overall SSA		96.54%	99.60%	96.35%	99.10%	95.51%	94.35%	97.22%	99.48%	97.82%	99.68%	97.84%	99.57%
	Service Coverage															
	5	In door (>= - 75dBm)	Major Road	Hotel Surya, Reasi	89.28%	100.00%	90.41%	100.00%	50.34%	66.13%	56.63%	22.89%	37.90%	29.35%	71.26%	99.92%
Highway			Prem Sweet Kud	79.75%	100.00%	87.52%	100.00%	61.65%	68.54%	29.31%	21.43%	30.04%	52.35%	45.74%	56.94%	
Within City			Khan Hotel Chanderkot City	94.24%	100.00%	97.95%	100.00%	94.47%	69.48%	70.44%	38.21%	47.65%	52.45%	75.57%	82.40%	
Overall SSA				85.34%	100.00%	90.35%	100.00%	65.46%	68.04%	48.59%	27.59%	35.73%	43.65%	58.69%	79.77%	
In-vehicle (>= - 85dBm)		Major Road	Hotel Surya, Reasi	96.57%	100.00%	99.05%	100.00%	87.41%	94.31%	75.34%	83.30%	68.33%	97.87%	92.44%	100.00%	
		Highway	Prem Sweet Kud	94.63%	100.00%	98.45%	100.00%	83.18%	95.73%	55.18%	96.34%	61.70%	98.11%	77.15%	97.50%	
		Within City	Khan Hotel Chanderkot City	99.54%	100.00%	99.98%	100.00%	99.48%	95.80%	91.27%	95.21%	75.76%	98.03%	93.46%	99.81%	
		Overall SSA		96.13%	100.00%	98.92%	100.00%	87.47%	95.27%	70.87%	91.50%	66.35%	97.99%	84.57%	99.10%	
Outdoor- in city (>= - 95dBm)		Major Road	Hotel Surya, Reasi	98.69%	100.00%	100.00%	100.00%	95.81%	100.00%	99.10%	100.00%	98.60%	100.00%	98.48%	100.00%	
		Highway	Prem Sweet Kud	98.90%	100.00%	99.24%	100.00%	97.33%	100.00%	99.05%	100.00%	98.31%	100.00%	93.68%	99.94%	
		Within City	Khan Hotel Chanderkot City	99.08%	100.00%	100.00%	100.00%	100.00%	100.00%	99.15%	100.00%	98.38%	100.00%	99.13%	99.94%	
		Overall SSA		98.87%	100.00%	99.63%	100.00%	97.49%	100.00%	99.09%	100.00%	98.41%	100.00%	96.08%	99.98%	
6	Call Setup	Major Road	Hotel Surya, Reasi	98.97%	100.00%	100.00%	100.00%	98.81%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

S/N	Parameter	Classification of route covered	Indoor location	AIRCEL		AIRTEL		BSNL		IDEA		RCOM GSM		VODAFONE	
				Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor
	Success Rate (>=95%)	Highway	Prem Sweet Kud	99.52%	100.00%	100.00%	100.00%	96.55%	100.00%	100.00%	100.00%	100.00%	100.00%	98.73%	100.00%
		Within City	Khan Hotel Chanderkot City	100.00%	100.00%	100.00%	100.00%	97.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Overall SSA		99.45%	100.00%	100.00%	100.00%	97.39%	100.00%	100.00%	100.00%	100.00%	100.00%	99.33%	100.00%
		Major Road	Hotel Surya, Reasi	100.00%	100.00%	100.00%	100.00%	96.63%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Hand Over Success Rate (HOSR)	Highway	Prem Sweet Kud	99.66%	100.00%	100.00%	100.00%	97.04%	100.00%	100.00%	100.00%	98.48%	100.00%	99.59%	100.00%
		Within City	Khan Hotel Chanderkot City	100.00%	100.00%	100.00%	100.00%	96.64%	100.00%	100.00%	100.00%	100.00%	100.00%	99.34%	100.00%
		Overall SSA		99.83%	100.00%	100.00%	100.00%	96.80%	100.00%	100.00%	100.00%	99.43%	100.00%	99.66%	100.00%

- NA-Not Applicable
- The service providers having block call rate more than 3% have been shaded in yellow colour.

7.3 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 3

DRIVE TEST ROUTE OF OCTOBER & DECEMBER 2014 – J&K CIRCLE							
Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered
JAMMU	OCT-14	JAMMU/ 120KM	(A) MAJOR ROAD: MUBARAK MANDI, PANJTHIRTHI, VIKRAM CHOWK, NARWAL, SATWARI (B) HIGHWAY: SATWARI, MIRANSAHIB, RS PURA BORDER, SIDHRA (C) WITHIN CITY : CANAL ROAD, REHARI, NAGROTA,J AGTI	JAMMU /AKHNOOR 132KM	(A) MAJOR ROAD: PACCA DANGA, BAKSHI NAGAR, TALAB TILLO , MARH (B) HIGHWAY: AKHNOOR, KOTBHALWAL, BANTALAB, ROOP NAGAR, JANIPUR, AMPHALLA (C) WITHIN CITY : AKHNOOR CITY	SAMBA/KATHUA 145KM	(A) MAJOR ROAD: KACHI CHAWNI, GANGYAL, KALUCHAK, BARI BRAHMNA, VIJAYPUR, SAMBA (B) HIGHWAY: HIRANAGAR, CHADWAL, KATHUA JATWAL (C) WITHIN CITY: KATHUA CITY, PALLI MORH, BARNOTI, INDUSTRIAL ESTATE
UDHAMPUR	DEC-14	REASI, MAHORE/ 120KM	(A) MAJOR ROAD : DOMAIL,KATRA RAILWAY STATION, HELIPAD ROAD, KATRA BUS STAND. (B) HIGHWAY: REASI HIGHWAY, BABA JITTO, DHANSAL BABA, BABA JITTO, REASI CITY. MAHORE HIGHWAY,J YOTIPURAM, KANTHAN (C) WITHIN CITY: REASI BUS STAND ,KALILKA MANDIR ROAD ,REASI CITY	UDHAMPUR/ RAMNAGAR/ 140KM	(A) MAJOR ROAD : SMVDU UNIVERSITY ROAD ,TIKRI, GHARI,MH, CHOPRA TOWN, ARMY CANTONMENT UDHAMPUR TOWN, (B) HIGHWAY: RAMNAGAR HIGHWAY, THONDA POODAN, SLADA, CHENANI, RAMANAGAR CITY KUD CITY (C) WITHIN CITY: UDHAMPUR CITY, BUS STAND, DHAR ROAD.	BHADERWAH / DODA / RAMBAN / 160KM	(A) MAJOR ROAD :BATOTE CITY,THAR, RAMGAR, ASSAR ,KHILANI, PULL DODA, DODA BUS STAND (B) HIGHWAY: DRANA, DRADU, PALWAL, BHADERWAH TOIWN, PERRA , CHANDERKOT. (C) WITHIN CITY : BHARDEWAH CITY

7.4 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 4

DRIVE TEST OBSERVATION OF JAMMU SSA – OCT 14

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Jammu, Nagrota, Sidra & RS Pura	Poor Level near Nagrota, Jammu outer, RS Pura	Agor, Shamechak, Akhnoor & Bantalab	Poor Level near Akhnoor outer, Ambgrota, Talabtillo	Samba, Kathua & Hiranagar	Poor Level near Baribrahama, Samba outer, Barnauti Ind Area
2	AIRTEL		Poor Level & Quality near Nandani, Sidra, Poor Quality near Satwari Chowk, RS Pura		Poor Quality at Akhnoor outer, Bern, Bantalab outer, Shamechak		Poor Quality near Baribrahama, Kathua outer
3	BSNL		Poor Level & Quality near Nandani, RS Pura		Poor Level & Quality near Akhnoor outer		Poor Level & Quality near Budhi, Baribrahama
4	IDEA		Poor Level & Quality near Nagrota, Jagti, Sidra, Panjtirthi, Miran Sahib		Poor Level & Quality near Akhnoor outer, Kot Bhalwal, Talab Tillo, No coverage between Akhnoor to Bantalab		Poor Level & Quality near Baribrahama, Samba outer, Barnauti Ind Area
5	RCOM GSM		Poor Level & Quality near RS Pura, Nagrota		Poor Level near Akhnoor outer, Ambgrota, Marh		Poor Level near Jatwal
6	VODAFONE		Poor Level & Quality near Nagrota, Jammu outer, RS Pura		Poor Level & Quality at Akhnoor City, Akhnoor outer, near Shamechak		Poor Level & Quality near Samba, No coverage at Barnauti Ind Area

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF UDHAMPUR SSA – DECEMBER 14

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Reasi & Mahore	Poor Level & Quality near Jyotipuram outer, Reasi outer	Udhampur & Ramnagar	Poor Level near Slada, Domel, Tikri, Ramnagar HW Dharadhan	Bhaderwah, Doda & Ramban	Poor Level & Quality near Puldoda, Pranu
2	AIRTEL		Poor Level & Quality near Agar Balian, Salan		Poor Level & Quality near Dharadhan, Poor Quality near Kud, Ghaghot, Rehmbal		Poor Level & Quality near Batote, Poor Quality at Doda outer, Bhaderwah outer
3	BSNL		Poor Level & Quality near Salal, Agar Balian, Arnas		Poor Level & Quality near Sewana, Ghaaghot, Domel outer		Poor Level & Quality near Batote, Korapani, Mandalla, Tipri
4	IDEA		Poor Level & Quality near Baba Jitto Rd, Katra outer, Reasi outer, Jyotipuram		Poor Level on Highway, Poor Quality near Domel, Slada, Tikri		No Coverage between Batote to Korapani, Poor Level & Quality Chanderkote to Batote
5	RCOM GSM		Poor Level on Highway covered in day 1		Poor Level on Highway covered in day 2, Poor Quality near T Morh		Poor Level on Highway covered in day 3, Poor Quality near Dradu
6	VODAFONE		Poor Level & Quality near Jyotipuram outer, Reasi outer, No coverage between Jyotipuram to Arnas		Poor Level & Quality on Cheneni, No coverage at Ghaghot		Poor Level near Assar, Kora Pani

DRIVE TEST TABLE: 6

NO NETWORK COVERAGE STATUS OF DRIVE TEST – OCTOBER TO DECEMBER 14

Sr. No	Month of Drive Test	Circle	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
1	Oct'14	J&K	AIRCEL	Jammu	Akhnoor, Jammu, Kathua, Samba	Samachak, Suchetghar international border	NO
			AIRTEL			Samachak, suchetghar international border	NO
			IDEA			Idea has no coverage from marh , ambgrota & bavetalab to akhnoor road, rspura kathua industrial estate, suchetghar international border	ICR with Aircel in Marh town
			RCOM (GSM)			No coverage in kathua industrial estate ,suchetghar international border	NO
			VODAFONE			No coverage in kathua industrial estate ,marh to samachak, suchetghar international border	NO
			BSNL			Samachak, suchetghar international border	NO
			2			Dec '14	J&K
AIRTEL	No coverage from pantnitop to batote	NO					
IDEA	No coverage from agar jitto to reasi , jyotipuram to kanthan , idea has no coverage in doda and bhaderwah sdca	NO					
RCOM (GSM)	No coverage from Pantnitop to Batote.	ICR with Aircel on Bhaderwah Highway					
VODAFONE	No coverage from Pantnitop to Batote.	NO					
BSNL	No coverage from Pantnitop to Batote.	NO					

7.5 KEY FINDINGS ON DRIVE TEST:

The key observations derived from the results of the drive tests were as under –

- (i) **In the Month of October -14**, drive tests were conducted across **Jammu SSA** covering Jammu, Akhnoor, Samba and Kathua SDCAs. The performance of all service providers was found satisfactory as they were largely meeting all the benchmarks, except **BSNL** could not meet the benchmark of **'Voice quality'** with its performance as **92.24%** on SSA basis.
- (ii) **In the Month of November-14**, drive tests scheduled for **Srinagar SSA**, could not be conducted due to the networks of the service providers damaged due to floods were still under repairs .
- (iii) **In the month of December -14**, drive tests were conducted across Udampur SSA covering Reasi, Udampur, Ramnagar, Bhaderwah, Doda and Kishatwar SDCAs. The service providers were largely meeting the benchmarks on overall SSA level. However, BSNL could not meet the benchmark of **'Voice quality'** with its performance as **94.35%** (Indoor) on SSA basis.

Further, the deficiencies with respect to adequate coverage and voice quality, encountered by different Service providers at the various places as shown in the drive tests plots, are detailed in the above tables- 4, 5 for respective SSAs.

The detail of Network coverage and Intra Circle Roaming (ICR) status of different service providers at various locations in the three SSAs is given in table-6.

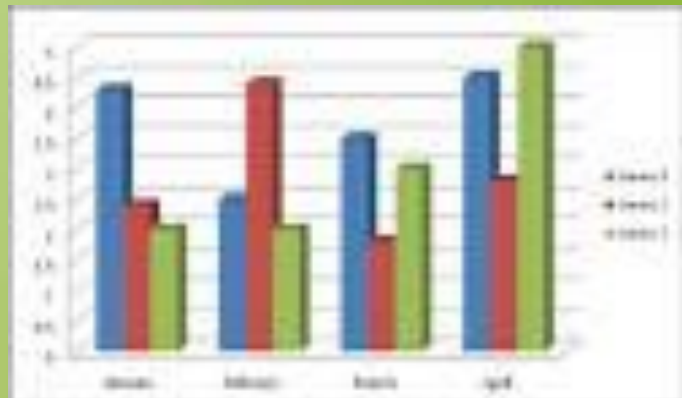
Thus the results of drive tests indicate that most of the operators have performed fairly well within the benchmarks in two SSAs where drive tests were conducted during the quarter.

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

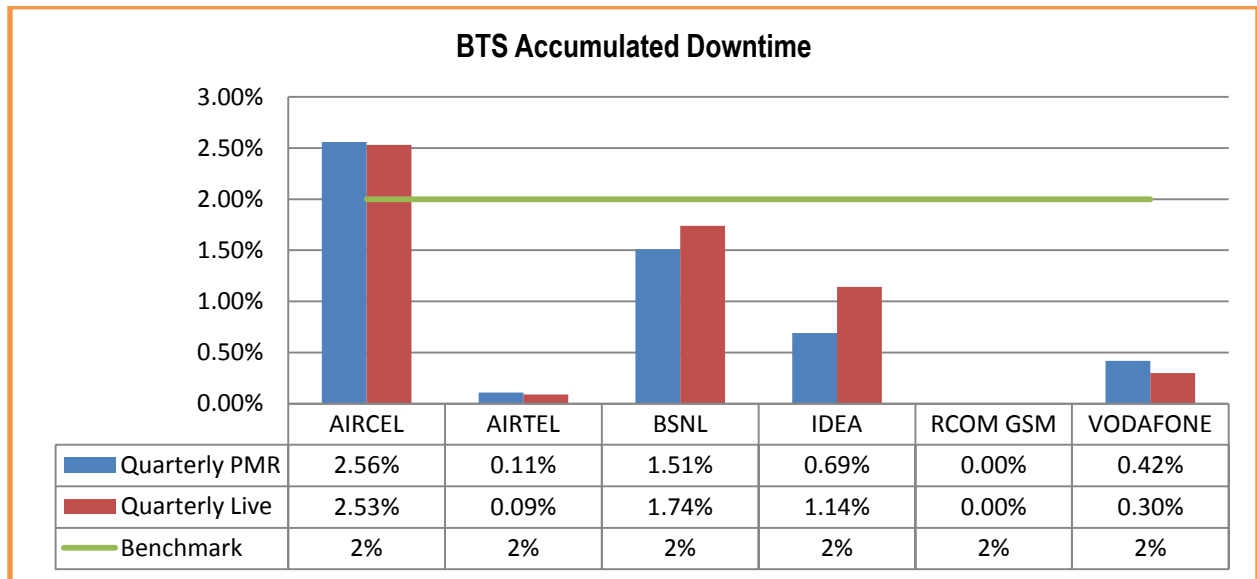
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION:

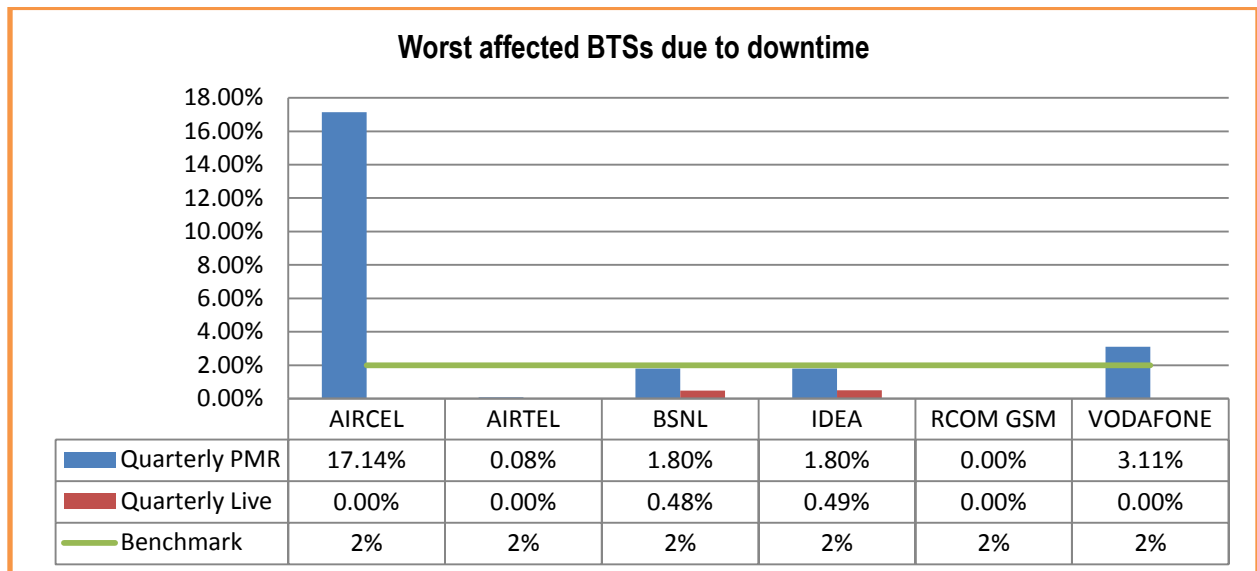
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME :



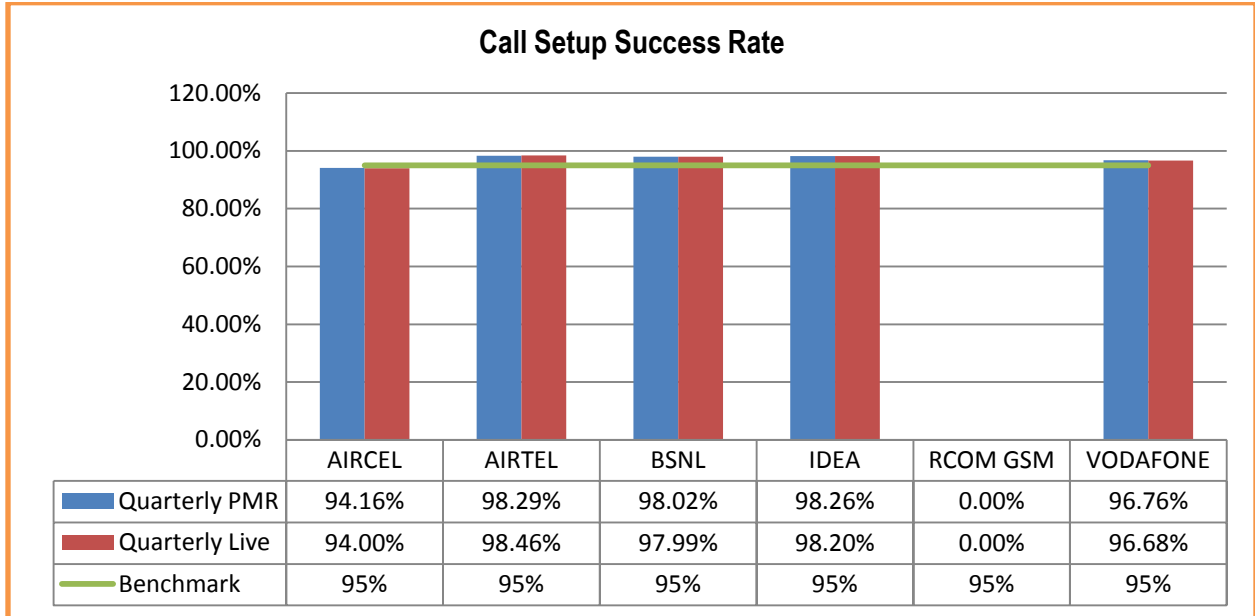
All operators are meeting the benchmarks except Aircel.

2) WORST AFFECTED BTSS DUE TO DOWNTIME :



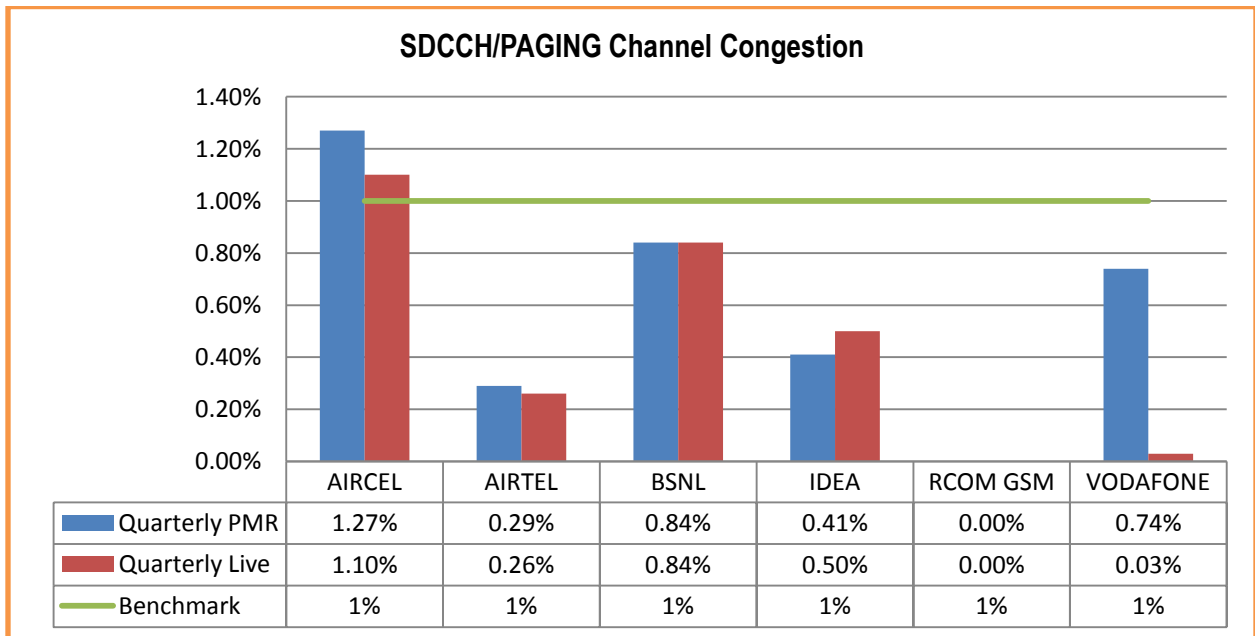
All operators are meeting the benchmarks except Aircel & Vodafone.

3) CALL SETUP SUCCESS RATE :



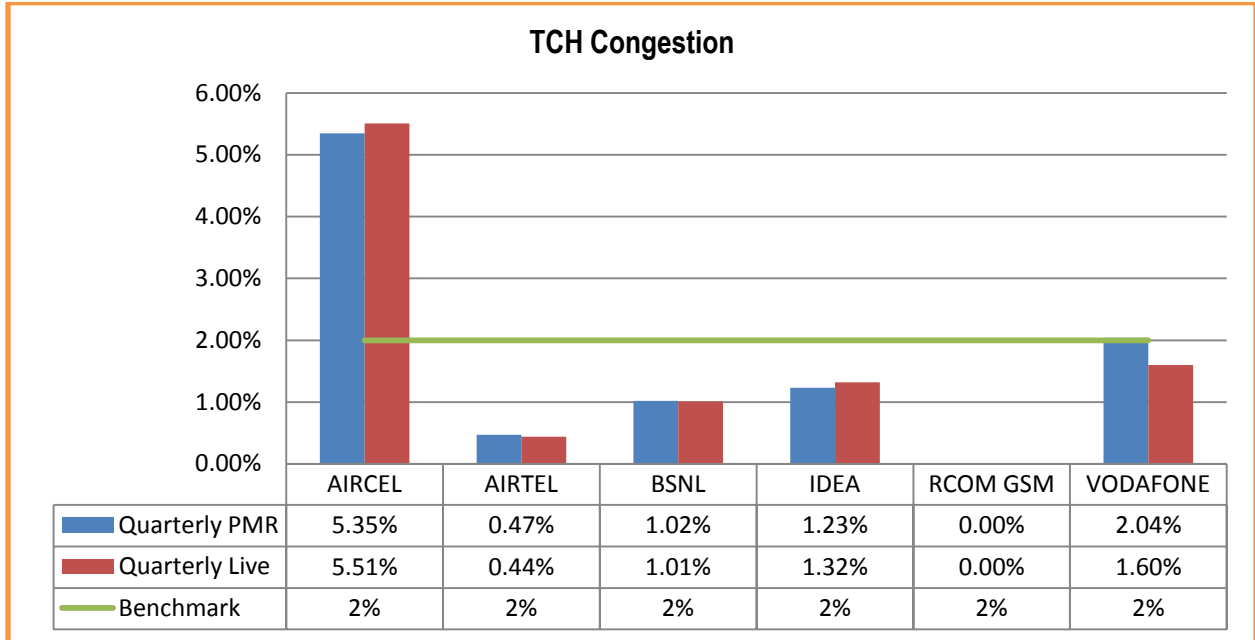
All operators are meeting the benchmarks except Aircel.

4) SDCCH/PAGING CHANNEL CONGESTION :



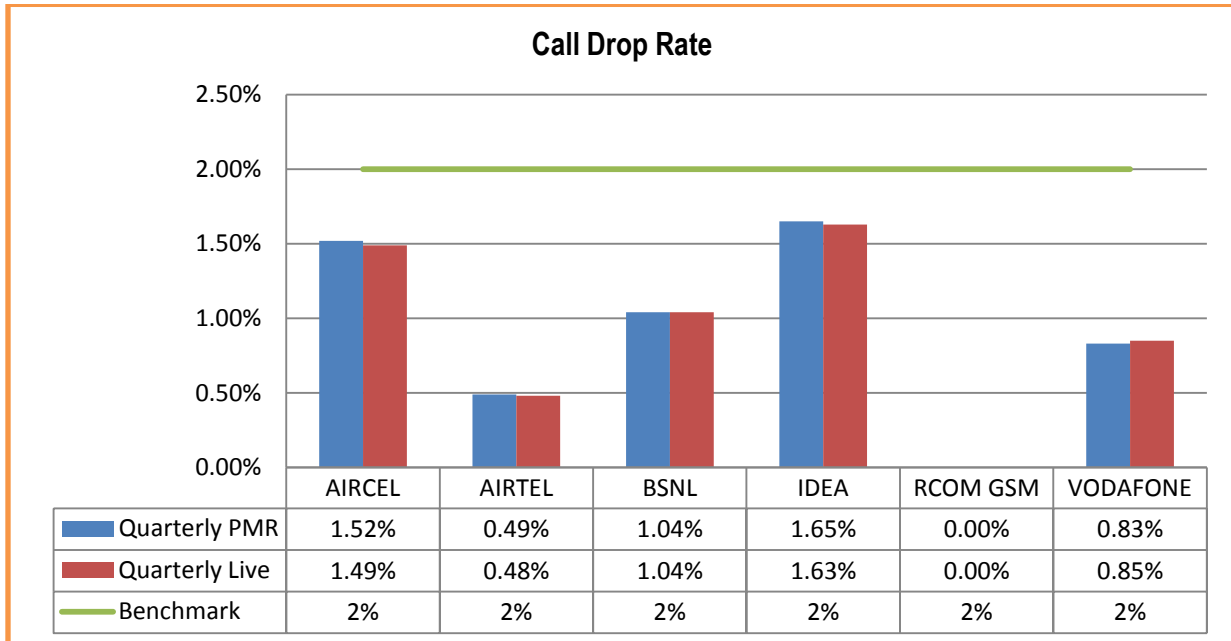
All operators are meeting the benchmarks except Aircel.

5) TCH CONGESTION :



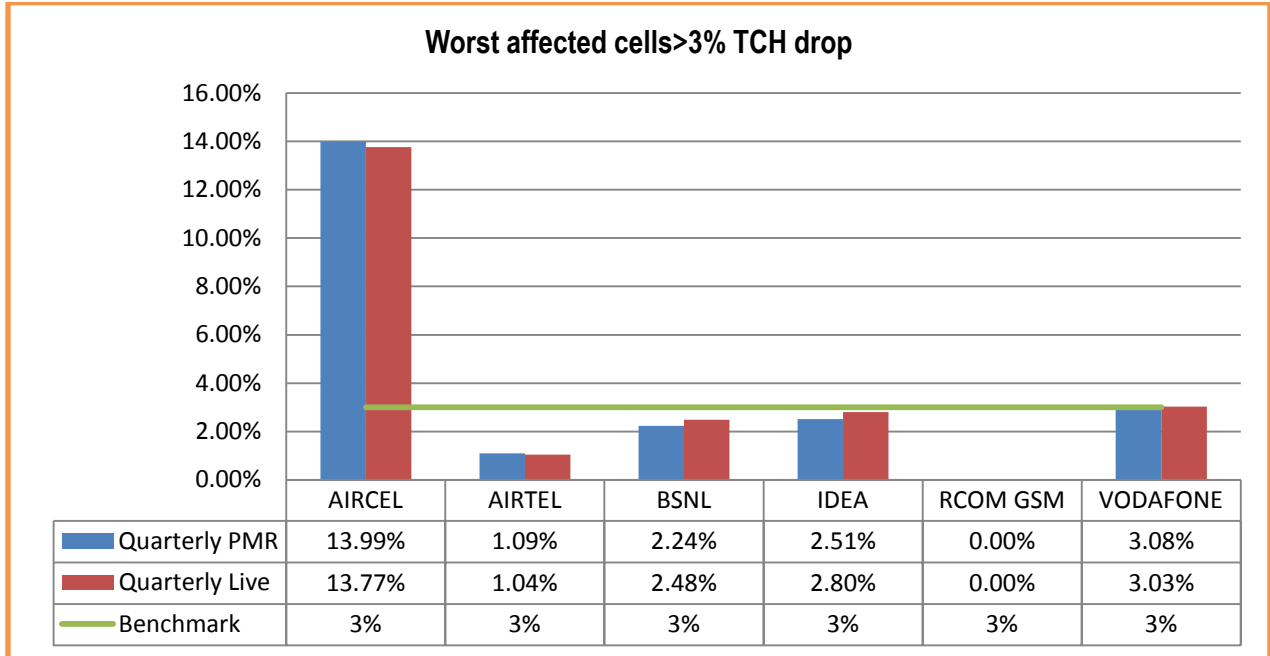
All operators are meeting the benchmarks except Aircel.

6) CALL DROP RATE :



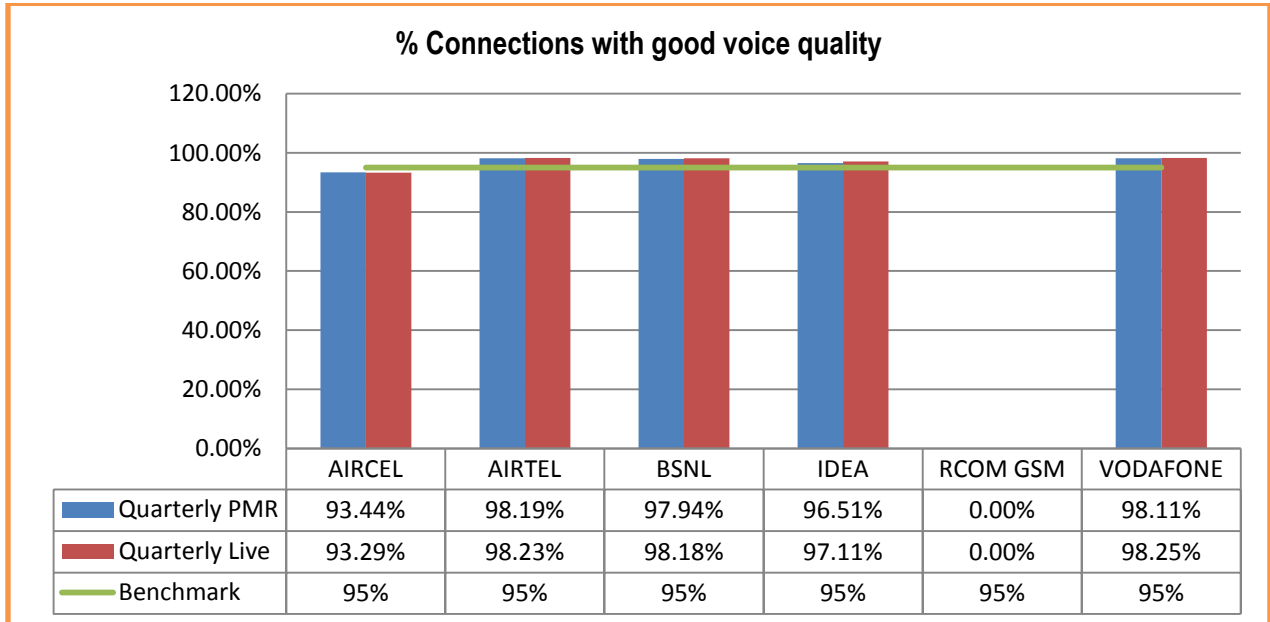
All operators are meeting the benchmarks.

7) **WORST AFFECTED CELLS>3% TCH DROP :**



All operators are meeting the benchmarks except Aircel.

8) **PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :**



All operators are meeting the benchmarks except Aircel.