



**Audit & Assessment of Quality of Service  
Of  
Cellular Mobile Telephone Service  
For  
Telecom Regulatory Authority of India  
North Zone – Jammu & Kashmir Service Area  
(July 2014 – September 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 20<sup>th</sup> March, 2009 and the Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6<sup>th</sup> 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**





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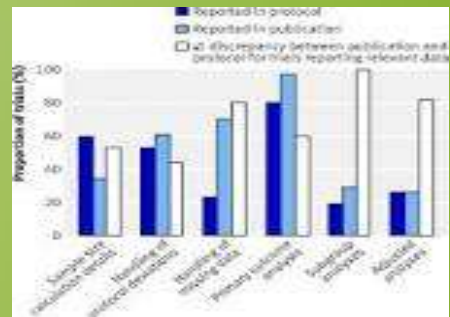
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 UP (E), UP (W) and MP&CG circles during the quarter July – September 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



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#### 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	
		GSM Operators	July-14	August-14		September-14
1	AIRCEL		12, 14 to 15 Jul-14	7 to 9 Aug-14	ND	Dishnet Wireless Limited , 2nd floor North Block Bahu Plaza Jammu
2	AIRTEL		13 to 15 Jul-14	8, 11 to 12 Aug-14	ND	Bharti Airtel Campus, Plot No 21, Rajiv Gandhi Information and Technology Park, Chandigarh, 160101
3	BSNL		7 to 9 Jul-14	5 to 7 Aug-14	ND	BSNL 4th floor, Rail Head Complex Jammu
4	IDEA		9 to 11 Jul-14	6 to 8 Aug-14	ND	Idea Office Phase -7 Industrial Area, Mohali
5	RCOM GSM		8 to 10 Jul-14	10 to 12 Aug-14	ND	Reliance Communication Limited Narwal KC Business Park Jammu
6	VODAFONE		7 to 9 Jul-14	20 to 22 Aug-14	ND	Vodafone Spacetel Ltd. 4th floor (B) , North Block Bahu Plaza Complex Jammu-180004

ND: Not done: - The report for QE September-14 has been prepared based on the data of two months i.e. July and August-2014 as no audit has been conducted for the month of September 2014 due to heavy floods in J&K Service area damaging the network elements.

### 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. **However, QoS audit for basic (wire line) service was not required to be done for Jammu & Kashmir Circle in the quarter ended September- 2014, as it has already been done in QE March 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 once in a year. **However, the QoS audit for Broadband service was not required to be done for Jammu & Kashmir Circle in the quarter ended September- 2014, as it has already been done in the QE March 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
- **The report for QE September-14 has been prepared based on the data of two months i.e. July and August-2014 as no audit has been conducted for the month of September 2014 due to heavy floods in J&K Service area damaging the vital network elements.**

- **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 the service providers in J&K service area was satisfactory for **Network Parameters** as all of them (**except Aircel**) were found meeting the benchmarks of all the parameters. Only **Aircel** failed to meet the benchmark of the parameters **‘BTS Accumulated Downtime’**, **‘Worst affected BTSs due to downtime’**, **TCH Congestion**, **Worst affected Cells> 3% TCH drops** and **Voice Quality** with its average performance of **2.08%**, **14.15%**, **2.67%**, **14.57%** and **93.33%** 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’**, **‘TCH Congestion’**, **‘Worst affected cells> 3 % TCH drops’** and **‘% Connections with good voice quality’**. The average performance of **Aircel** for these parameters,

**2.08%, 2.53%, 15.01%** (way beyond the benchmark of  $\leq 3\%$ ) and **93.28%** respectively. **This non-compliance is in sync with the Monthly audited PMR of Aircel.**

**BSNL** also could not meet the benchmark for the parameter '**BTS Accumulated down Time**'. Its achieved level was **2.03%**.

(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, **RCOM (GSM)** remained non-complied with the parameter '**Billing Complaints – Prepaid**' with its performance as **0.30%**. With respect to the parameter '**Accessibility of call center**', **Aircel** and **Airtel** were under performed having achieved their performance level as **93.12%** and **89.75%** respectively. **Airtel** also failed to meet the benchmark of '**calls answered by Operators (voice to voice)**'. Its achieved level was **81.08%**. Whereas **RCOM (GSM)** has not met the benchmark of 'calls answered by Operators (voice to voice) within **90 seconds** as they provided the data for 90 seconds. **RCOM (GSM)** has achieved its performance as **94.74%** against the benchmark of  $\geq 95\%$ . **Aircel** could not meet the benchmark for the parameter "**Termination/closure of service**" with its performance as **99.42%** against the benchmark of 100%.

(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
<b>GSM OPERATORS</b>			
1	AIRCEL	Aug-14	21:00 - 22:00
2	AIRTEL	Aug-14	20:00 - 21:00
3	BSNL	Aug-14	19:00 - 20:00
4	IDEA	Aug-14	21:00 - 22:00
5	RCOM GSM	Aug-14	22:00 - 23:00
6	VODAFONE	Aug-14	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.

#### 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
<b>GSM OPERATORS</b>						
1	AIRCEL	6	22	2105	Ericsson	Ericsson
2	AIRTEL	11	30	2710	Ericsson	Ericsson
3	BSNL	8	22	1172	Ericsson	Ericsson, NSN & ZTE
4	IDEA	2	6	885	Ericsson	Ericsson
5	RCOM GSM	2	6	890	Huawei	Huawei
6	VODAFONE	4	16	1480	NSN	NSN

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JULY 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- JULY 14 MONTH									
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
<b>Network Service Quality Parameter</b>									
<b>Network Availability</b>									
1	a) BTS Accumulated Downtime	<=2%	July-14	1.79%	0.07%	1.52%	0.31%	0.43%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	July-14	11.53%	0.11%	1.96%	1.92%	1.57%	0.41%
<b>Connection Establishment (Accessibility)</b>									
2	a) CSSR (Call Setup Success Rate)	>=95%	July-14	97.14%	98.10%	97.45%	99.17%	99.53%	98.64%
	b) SDCCH/PAGING Channel congestion	<=1%	July-14	0.87%	0.68%	0.74%	0.08%	0.01%	0.01%
	c) TCH congestion	<=2%	July-14	2.41%	0.38%	1.16%	0.42%	0.05%	0.22%
<b>Connection maintenance (Retainability)</b>									
3	a) CDR (Call Drop Rate)	<=2%	July-14	1.54%	0.53%	1.19%	1.62%	0.50%	0.64%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	July-14	14.19%	1.22%	2.01%	2.26%	0.06%	2.81%
	c) Connections with good voice quality	>=95%	July-14	93.33%	98.19%	96.51%	96.10%	98.70%	98.27%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	July-14	0	0	0	0	0	0

**5.1.4 QOS PERFORMANCE OF MONTHLY PMR – AUGUST 14 MONTH:**

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - AUGUST 14 MONTH									
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	Name of Parameter			GSM Operators					
<b>Network Service Quality Parameter</b>									
<b>Network Availability</b>									
1	a) BTS Accumulated Downtime	<=2%	Aug-14	2.37%	0.07%	1.42%	0.42%	0.37%	0.12%
	b) Worst affected BTSs due to downtime	<=2%	Aug-14	16.77%	0.11%	1.88%	1.92%	0.67%	0.61%
<b>Connection Establishment (Accessibility)</b>									
2	a) CSSR (Call Setup Success Rate)	>=95%	Aug-14	96.57%	98.27%	97.96%	99.10%	99.51%	98.69%
	b) SDCCH/PAGING Channel congestion	<=1%	Aug-14	0.84%	0.45%	0.92%	0.20%	0.01%	0.01%
	c) TCH congestion	<=2%	Aug-14	2.93%	0.37%	1.26%	0.52%	0.04%	0.24%
<b>Connection maintenance (Retainability)</b>									
3	a) CDR (Call Drop Rate)	<=2%	Aug-14	1.65%	0.51%	1.29%	1.48%	0.47%	0.56%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Aug-14	14.94%	1.18%	2.69%	2.29%	0.06%	2.76%
	c) Connections with good voice quality	>=95%	Aug-14	93.33%	98.14%	97.13%	95.83%	98.77%	98.25%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Aug-14	0	0	0	0	0	0

**5.1.5 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF JULY & AUGUST 2014 MONTHS AUDITED DATA)**

QUARTERLY QOS PERFORMANCE (AVERAGE OF TWO 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					
<b>Network Service Quality Parameter</b>									
<b>Network Availability</b>									
1	a) BTS Accumulated Downtime	<=2%	Quarterly	2.08%	0.07%	1.47%	0.37%	0.40%	0.09%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	14.15%	0.11%	1.92%	1.92%	1.12%	0.51%
<b>Connection Establishment (Accessibility)</b>									
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	96.86%	98.19%	97.71%	99.14%	99.52%	98.67%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.86%	0.57%	0.83%	0.14%	0.01%	0.01%
	c) TCH congestion	<=2%	Quarterly	2.67%	0.38%	1.21%	0.47%	0.05%	0.23%
<b>Connection maintenance (Retainability)</b>									
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.60%	0.52%	1.24%	1.55%	0.49%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	14.57%	1.20%	2.35%	2.28%	0.06%	2.79%
	c) Connections with good voice quality	>=95%	Quarterly	93.33%	98.17%	96.82%	95.97%	98.74%	98.26%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0

### 5.1.6 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 September-14 has been prepared based on the data of two months i.e. July and August-2014 as no audit has been conducted for the month of September 2014 due to heavy floods in J&K Service area damaging the vital network elements.***

#### **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**' in both months with its average performance of **2.08%** & **14.15%** respectively.

- **Connection Establishment (Accessibility)**

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

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

**All the operators were found to have met 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 pegging 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 'TCH Congestion' with its average performance as 2.67%.**

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.

All Service Providers have met the benchmark except **Aircel. Aircel failed to meet the benchmark of the parameter 'Worst affected cells having more than 3% TCH drops' in both months with its average performance of 14.57%.**

- 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 in the month of July and August-14 with its average performance of 93.33%.**

**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) – JULY 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE – JULY 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					
<b>Network Service Quality Parameter</b>									
<b>Network Availability</b>									
1	a) BTS Accumulated Downtime	<=2%	Live data	2.20%	0.07%	1.87%	0.30%	0.40%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.57%	98.21%	99.03%	99.23%	99.50%	98.57%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.75%	0.55%	0.63%	0.06%	0.01%	0.02%
	c) TCH congestion	<=2%	Live data	1.98%	0.39%	0.76%	0.39%	0.04%	0.30%
<b>Connection maintenance (Retainability)</b>									
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.57%	0.56%	0.77%	1.52%	0.48%	0.61%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	14.93%	1.26%	1.85%	2.70%	0.04%	2.65%
	c) Connections with good voice quality	>=95%	Live data	93.40%	98.21%	98.83%	95.89%	98.70%	98.30%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0



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

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- AUGUST 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					
<b>Network Service Quality Parameter</b>									
<b>Network Availability</b>									
1	a) BTS Accumulated Downtime	<=2%	Live data	1.96%	0.06%	2.19%	0.38%	0.19%	0.11%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.17%	0.00%	0.00%	0.07%
<b>Connection Establishment (Accessibility)</b>									
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.40%	98.13%	98.07%	98.88%	99.56%	98.77%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.74%	0.52%	0.94%	0.20%	0.01%	0.00%
	c) TCH congestion	<=2%	Live data	3.07%	0.40%	1.44%	0.76%	0.03%	0.24%
<b>Connection maintenance (Retainability)</b>									
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.41%	0.48%	1.47%	1.50%	0.44%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	15.08%	1.03%	2.51%	2.41%	0.04%	2.68%
	c) Connections with good voice quality	>=95%	Live data	93.15%	98.16%	97.12%	95.97%	98.77%	98.27%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

**5.2.3 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JULY & AUGUST 2014 MONTHS DATA)**

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF TWO 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					
<b>Network Service Quality Parameter</b>									
<b>Network Availability</b>									
1	a) BTS Accumulated Downtime	<=2%	Quarterly	2.08%	0.07%	2.03%	0.34%	0.30%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.09%	0.00%	0.00%	0.04%
<b>Connection Establishment (Accessibility)</b>									
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	96.99%	98.17%	98.55%	99.06%	99.53%	98.67%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.75%	0.54%	0.79%	0.13%	0.01%	0.01%
	c) TCH congestion	<=2%	Quarterly	2.53%	0.40%	1.10%	0.58%	0.04%	0.27%
<b>Connection maintenance (Retainability)</b>									
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.49%	0.52%	1.12%	1.51%	0.46%	0.58%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	15.01%	1.15%	2.18%	2.56%	0.04%	2.67%
	c) Connections with good voice quality	>=95%	Quarterly	93.28%	98.19%	97.98%	95.93%	98.74%	98.29%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0

**5.2.4 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:**

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 down Time**', '**TCH Congestion**', '**Worst affected cells> 3 % TCH drops**' and '**% Connections with good voice quality**'. The average performance of **Aircel** for these parameters, **2.08%**, **2.53%**, **15.01%** (way beyond the benchmark of <=3%) and **93.28%** respectively.

**BSNL** also could not meet the benchmark for the parameter '**BTS Accumulated down Time**' and its achievement level was **2.03%**.

5.2.5 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - July 14 month									
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
<b>Network Service Quality Parameter</b>									
1	<b>Network Availability</b>								
	a) Total no. of BTSs in the licensed service area		July-14	2098	2697	1172	885	890	1480
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		July-14	27894	1461	13244	2040	2828	683
	c) BTS Accumulated Downtime	<=2%	July-14	1.79%	0.07%	1.52%	0.31%	0.43%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		July-14	242	3	23	17	14	6
	e) Worst affected BTSs due to downtime	<=2%	July-14	11.53%	0.11%	1.96%	1.92%	1.57%	0.41%
2	<b>Connection Establishment (Accessibility)</b>								
	a) CSSR (Call Setup Success Rate)	>=95%	July-14	97.14%	98.10%	97.45%	99.17%	99.53%	98.64%
	b) SDCCH/PAGING Congestion	<=1%	July-14	0.87%	0.68%	0.74%	0.08%	0.01%	0.01%
	c) TCH congestion	<=2%	July-14	2.41%	0.38%	1.16%	0.42%	0.05%	0.22%
3	<b>Connection Maintenance (Retainability)</b>								
	a) Call Drop Rate (CDR)	<=2%	July-14	1.54%	0.53%	1.19%	1.62%	0.50%	0.64%
	b) Worst affected cells>3% TCH drop	<=3%	July-14	14.19%	1.22%	2.01%	2.26%	0.06%	2.81%
	c) % of connections with good voice quality	>=95%	July-14	93.33%	98.19%	96.51%	96.10%	98.70%	98.27%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		July-14	887	96	70	60	2	125
	e) Total no. of cells (Sector) in the licensed service area		July-14	6253	7909	3498	2653	2666	4450
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>								
	No. of POI's having >=0.5% POI congestion		July-14	0	0	0	0	0	0
	Name of POI not meeting the benchmark		July-14	0	0	0	0	0	0
5	<b>Network Data</b>								
	a) Equipped Capacity of Network in Erlang		July-14	127259	107939	64000	25215	40000	32027
	b) Total traffic in TCBH in erlang (Avg.)		July-14	73354	91015	35928	12972	--	24391
	c) Total no. of customers served (as per VLR) on last day of the month		July-14	1857947	2190199	913227	375515	--	699462

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – July 14 month									
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
<b>Network Service Quality Parameter</b>									
1	<b>Network Availability</b>								
	a) Total no. of BTSs in the licensed service area		Live data	2104	2726	1172	885	890	1472
	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	3338	131	1575	189	259	37
	c) BTS Accumulated Downtime	<=2%	Live data	2.20%	0.07%	1.87%	0.30%	0.40%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	97.57%	98.21%	99.03%	99.23%	99.50%	98.57%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.75%	0.55%	0.63%	0.06%	0.01%	0.02%
c) TCH congestion	<=2%	Live data	1.98%	0.39%	0.76%	0.39%	0.04%	0.30%	
3	<b>Connection Maintenance (Retainability)</b>								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.57%	0.56%	0.77%	1.52%	0.48%	0.61%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	14.93%	1.26%	1.85%	2.70%	0.04%	2.65%
	c) % of connections with good voice quality	>=95%	Live data	93.40%	98.21%	98.83%	95.89%	98.70%	98.30%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	934	101	65	72	1	118
e) Total no. of cells (Sector) in the licensed service area		Live data	6255	7989	3498	2653	2666	4436	
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>								
	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

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle – August 14 month									
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
<b>Network Service Quality Parameter</b>									
1	<b>Network Availability</b>								
	a) Total no. of BTSs in the licensed service area		Aug-14	2105	2710	1172	885	890	1480
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Aug-14	37113	1354	12397	2762	2436	1306
	c) BTS Accumulated Downtime	<=2%	Aug-14	2.37%	0.07%	1.42%	0.42%	0.37%	0.12%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Aug-14	353	3	22	17	6	9
e) Worst affected BTSs due to downtime	<=2%	Aug-14	16.77%	0.11%	1.88%	1.92%	0.67%	0.61%	
2	<b>Connection Establishment (Accessibility)</b>								
	a) CSSR (Call Setup Success Rate)	>=95%	Aug-14	96.57%	98.27%	97.96%	99.10%	99.51%	98.69%
	b) SDCCH/PAGING Congestion	<=1%	Aug-14	0.84%	0.45%	0.92%	0.20%	0.01%	0.01%
c) TCH congestion	<=2%	Aug-14	2.93%	0.37%	1.26%	0.52%	0.04%	0.24%	
3	<b>Connection Maintenance (Retainability)</b>								
	a) Call Drop Rate (CDR)	<=2%	Aug-14	1.65%	0.51%	1.29%	1.48%	0.47%	0.56%
	b) Worst affected cells>3% TCH drop	<=3%	Aug-14	14.94%	1.18%	2.69%	2.29%	0.06%	2.76%
	c) % of connections with good voice quality	>=95%	Aug-14	93.33%	98.14%	97.13%	95.83%	98.77%	98.25%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Aug-14	934	94	94	61	2	123
e) Total no. of cells (Sector) in the licensed service area		Aug-14	6249	7948	3498	2653	2666	4461	
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>								
	No. of POI's having >=0.5% POI congestion		Aug-14	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Aug-14	0	0	0	0	0	0
5	<b>Network Data</b>								
	a) Equipped Capacity of Network in Erlang		Aug-14	127130	107554	64000	25707	40000	32390
	b) Total traffic in TCBH in erlang (Avg.)		Aug-14	81886	99732	38488	13385	15184	26129
	c) Total no. of customers served (as per VLR) on last day of the month		Aug-14	1978341	2642435	907742	389858	404996	709506

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- J&K Circle – Aug 14 month									
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
				GSM Operators					
<b>Network Service Quality Parameter</b>									
1	<b>Network Availability</b>								
	a) Total no. of BTSs in the licensed service area		Live data	2104	2697	1172	885	890	1480
	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	2965	107	1846	242	120	117
	c) BTS Accumulated Downtime	<=2%	Live data	1.96%	0.06%	2.19%	0.38%	0.19%	0.11%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	2	0	0	1
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.17%	0.00%	0.00%	0.07%	
2	<b>Connection Establishment (Accessibility)</b>								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.40%	98.13%	98.07%	98.88%	99.56%	98.77%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.74%	0.52%	0.94%	0.20%	0.01%	0.00%
c) TCH congestion	<=2%	Live data	3.07%	0.40%	1.44%	0.76%	0.03%	0.24%	
3	<b>Connection Maintenance (Retainability)</b>								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.41%	0.48%	1.47%	1.50%	0.44%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	15.08%	1.03%	2.51%	2.41%	0.04%	2.68%
	c) % of connections with good voice quality	>=95%	Live data	93.15%	98.16%	97.12%	95.97%	98.77%	98.27%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	948	82	88	64	1	120
e) Total no. of cells (Sector) in the licensed service area		Live data	6285	7909	3498	2653	2666	4461	
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>								
	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

## **CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS**



### 5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS-QE SEPT 14:

#### 5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY to SEPTEMBER MONTHs AUDITED DATA):

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 14									
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/ N	Name of Parameter			GSM Operators					
<b>Customer Service Quality Parameters</b>									
1	<b>Metering &amp; Billing Credibility -Post Paid</b>								
	A) No. of bills issued during the quarter		Jammu & Kashmir	351820	278651	817965	71693	62205	122568
	B) No. of bills disputed including billing complaints during the quarter		Jammu & Kashmir	2	73	NP	14	50	53
	C)% of billing complaints during the quarter	<= 0.1%	Jammu & Kashmir	0.001%	0.03%	NP	0.02%	0.08%	0.04%
2	<b>Metering &amp; Billing Credibility -Pre Paid</b>								
	A) Total No. of Pre-paid customers at the end of the quarter		Jammu & Kashmir	2130362	2690985	923834	397684	700149	848795
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Jammu & Kashmir	79	122	NP	104	2083	152
	C) % of Pre-paid Charging Complaints	<= 0.1%	Jammu & Kashmir	0.004%	0.005%	NP	0.03%	0.30%	0.02%
3	<b>Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints</b>								
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		Jammu & Kashmir	81	195	NP	410	2133	205
	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	81	195	NP	410	2133	205
	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%	NP	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%	NP	100.00%	100.00%	100.00%
4	<b>Response time to customers for assistance</b>								
	A) Total no of calls attempted to customer care/Call center		Jammu & Kashmir	15463591	1505439	NP	1248856	4190616	3041231



QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 14									
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/ N	Name of Parameter			GSM Operators					
	B) Total no. of calls successfully established to customer care/Call center		Jammu & Kashmir	14399070	1351163	NP	1223825	4129892	3041231
	C) % Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%		93.12%	89.75%	NP	98.00%	98.55%	100.00%
	D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)			2608464	2828206	NP	442794	79422	658911
	E) Total number of calls answered by the operator (Voice to voice) within 60/90 seconds			2381145	2293112	NP	415682	75245	647897
	F) % age of calls answered by operator (voice to voice) (Total call successfully established within 60 Sec / 90 sec *100/ Total call attempt.)	>=90% (60 Sec.) & >=95% (90 Sec.)		91.29%	81.08%	NP	93.88%	*94.74%	*98.33%
5	<b>Termination/closure of service</b>								
	A) Total No. of requests for Termination / Closure of service received during the quarter		Jammu & Kashmir	3128	1036	1352	756	265	466
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		Jammu & Kashmir	3110	1036	1352	756	265	466
	C) % of Termination/ Closure of service within 7 days	<=7days	Jammu & Kashmir	99.42%	100.00%	100.00%	100.00%	100.00%	100.00%
6	<b>Time taken for refunds of deposits after closures.</b>								
	A) No. of Payments/ Refunds due during the quarter		Jammu & Kashmir	1286	314	1352	248	235	153
	B) No. of Payments/ Refunds Cleared during the quarter		Jammu & Kashmir	1286	314	1352	248	235	153
	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%

NP: Data Not Provided: BSNL was having some technical problem in fetching the data related to the billing and call centre, as their new Call centre was under commissioning, so they did not provide the data for this quarter.

\*Calls answered by operators (Voice to voice) in 90 seconds as per TRAI QoS Regulation (Third amendment) dated 21<sup>st</sup> August 2014.

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE – SEPTEMBER 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					
<b>RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE</b>									
1	Total no of calls attempted to customer care/Call center		J & K	420529	68219	NP	42157	79893	99754
	Total no. of calls successfully established to customer care/Call center		J & K	407280	68219	NP	41189	79180	99754
	% Accessibility of Call centre /customer Care (Total calls successfully established*100/ Total call attempt)	>=95%	J & K	96.85%	100.00%	NP	97.70%	99.11%	100.00%
2	Total Calls reached to agent desk for Voice to Voice (Total call attempt)		J & K	73651	102425	NP	13023	1615	22809
	Total number of calls answered by the operator (Voice to voice) within 60/90 seconds		J & K	71878	58564	NP	12506	1596	22789
	% age of calls answered by operator(voice to voice) (Total calls successfully established within 60 Sec / 90 sec.*100/ Total call attempt)	>=90% (60 Sec.) & >=95% (90 Sec.)	J & K	97.59%	<b>57.18%</b>	NP	*96.03%	*98.82%	*99.91%

NP: Data Not Provided: BSNL was having some technical problem in fetching the data related to the billing and call centre, as their new Call centre was under commissioning, so they did not provide the data for this quarter.

\*Calls answered by operators (Voice to voice) in 90 seconds as per TRAI QoS Regulation (Third amendment) dated 21<sup>st</sup> August 2014.

### 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. However, **RCOM (GSM)** lagged behind in meeting the benchmark for parameter '**Billing Complaints – Prepaid**' with its performance as **0.30%**.

#### 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** and **Airtel** having achieved their performance as **93.12%** and **89.75%** respectively. **Airtel** also failed to meet the benchmark of '**calls answered by Operators (voice to voice)**'. Its achieved level was **81.08%**. Whereas **RCOM (GSM)** has not met the benchmark of 'calls answered by Operators (voice to voice) within **90 seconds** as they provided the data for 90 seconds. **RCOM (GSM)** has achieved its performance as **94.74%** against the benchmark of  $\geq 95\%$ .

#### 4. Termination/Closure of Service

In case of this parameters also, all service providers have settled 100% closures within 7 days except **Aircel**. **Aircel** could not meet the benchmark for the parameter "Termination/closure of service" with its performance as **99.42%** against the benchmark of 100%.

#### 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 **Airtel** could not meet the benchmark with its performance as **57.18%**. Thus the performance of **Airtel** was way below the benchmark.

## **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%	96.00%	---	95.00%	100.00%	100.00%
IDEA	J&K	100.00%	100.00%	95.00%	---	98.00%	95.00%
RCOM GSM	J&K	100.00%	98.00%	95.00%	100.00%	---	96.00%
VODAFONE	J&K	100.00%	100.00%	98.00%	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, Airtel and Idea, successful interconnection was 95%, 96% and 95% respectively. Idea to BSNL, RCOM (GSM) and Vodafone was 95%, 98% and 95% respectively, RCOM(GSM) to Airtel, BSNL and Vodafone was 98%, 95% and 96% , and Vodafone to BSNL was 98%. 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	90	100	100	100
Total no. of calls successfully established to customer care/Call center	J & K	100	100	90	100	96	100
% Accessibility of Call centre /customer Care (Total calls successfully established * 100 / Total call attempts)	J & K	100.00%	100.00%	90.00%	100.00%	96.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	J & K	98	100	90	100	96	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	J & K	98	100	56	100	94	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total calls attempts)	J & K	100.00%	100.00%	62.00%	100.00%	98.00%	100.00%

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, BSNL and RCOM (GSM) could connect 62% and 98% of calls respectively to the operator within 60 Seconds.

## 6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS							
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	VODAFONE
<b>Total No. of calls Attempted</b>	J & K	81	100	ND	100	100	100
<b>Total No. of calls Answered</b>	J & K	54	67	ND	69	63	72
<b>Cases resolved within 4 weeks</b>	J & K	54	67	ND	69	63	72
<b>%age of cases resolved</b>	J & K	100.00%	100.00%	ND	100.00%	100.00%	100.00%

ND: Not done due to BSNL not provided the detail of billing complaints.

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	UDHAMPUR	REASI	9	√	√	√	√	√	√
			BHADERWAH	9	√	√	√	√	√	√
			DODA	9	√	√	√	√	√	√
			UDHAMPUR	9	√	√	√	√	√	√
			RAMBAN	9	√	√	√	√	√	√
100, 101, 102	J&K	RAJOURI	KALAKOT	9	√	√	√	No Coverage	√	No Coverage
			NOWSHERA	9	√	√	√	√	√	√
			RAJOURI	9	√	√	√	√	√	√
			POONCH	9	√	√	√	√	√	No Coverage
			SURENKOT	9	√	√	√	√	√	√

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 and Vodafone have no coverage in Kalakot, and Poonch SDCAs as mentioned in the table above.

## 7. DRIVE TEST





## **7. OPERATOR ASSISTED DRIVE TEST**

In terms of TRAI's letter dated 21<sup>st</sup> 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 **Udhampur and Rajouri** in the months of July and August 2014 respectively. **The drive tests in the month of September-14 could not be conducted due to heavy floods in J&K, very badly damaging the networks of the service providers.** The total route Kms covered during the drive tests in the respective SSAs was **410 Kms** and **405 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  $\geq -75$  dBm for in-door coverage and  $\geq -85$  dBm for in-vehicle.

7.1 OPERATOR ASSISTED DRIVE TEST: UDHAMPUR SSA (JULY-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	Chopra Hotel Udhampur	94	30	131	30	100	30	82	30	79	30	108	30
		Highway	Hotel Regency	212	30	175	30	208	30	94	30	173	30	187	30
		Within City	Hotel Surya	66	30	116	30	88	30	44	NC	84	30	67	30
		<b>Overall SSA</b>		<b>372</b>	<b>90</b>	<b>422</b>	<b>90</b>	<b>396</b>	<b>90</b>	<b>220</b>	<b>60</b>	<b>336</b>	<b>90</b>	<b>362</b>	<b>90</b>
2	Blocked Call Rate	Major Road	Chopra Hotel Udhampur	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	Hotel Regency	0.00%	0.00%	0.00%	0.00%	1.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.53%	0.00%
		Within City	Hotel Surya	1.52%	0.00%	0.00%	0.00%	1.14%	0.00%	0.00%	NC	0.00%	0.00%	0.00%	0.00%
		<b>Overall SSA</b>		<b>0.27%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.52%</b>	<b>0.00%</b>	<b>0.45%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.28%</b>	<b>0.00%</b>
3	Dropped Call Rate (<=2%)	Major Road	Chopra Hotel Udhampur	0.00%	0.00%	0.00%	0.00%	1.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	Hotel Regency	0.00%	0.00%	0.00%	0.00%	0.49%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	Hotel Surya	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	0.00%	0.00%
		<b>Overall SSA</b>		<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.51%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>
4	<b>Percentage connections with good voice quality (=&gt;95%)</b>														
	(a) 0-4 (w/o frequency hopping for CDMA)	Major Road	Chopra Hotel Udhampur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	Hotel Regency	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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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	Hotel Surya	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		<b>Overall SSA</b>		<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	
	(b) 0-5 ( with frequency hopping for GSM Operators)	Major Road	Chopra Hotel Udampur	96.12%	100.00%	96.48%	99.22%	<b>94.25%</b>	97.38%	96.47%	100.00%	96.89%	99.45%	98.00%	99.57%	
		Highway	Hotel Regency	95.24%	95.90%	96.41%	99.61%	<b>91.28%</b>	<b>94.68%</b>	95.55%	100.00%	98.34%	99.31%	97.86%	99.46%	
		Within City	Hotel Surya	97.43%	97.29%	96.06%	100.00%	<b>92.20%</b>	96.74%	97.06%	NC	97.48%	99.28%	97.40%	99.38%	
		<b>Overall SSA</b>		<b>96.21%</b>	<b>97.04%</b>	<b>96.35%</b>	<b>99.61%</b>	<b>92.25%</b>	<b>96.22%</b>	<b>96.49%</b>	<b>100.00%</b>	<b>97.80%</b>	<b>99.34%</b>	<b>97.82%</b>	<b>99.47%</b>	
	<b>Service Coverage</b>															
	5	In door (>= - 75dBm)	Major Road	Chopra Hotel Udampur	87.98%	18.52%	96.50%	100.00%	75.07%	84.35%	71.76%	86.20%	49.34%	98.12%	75.61%	100.00%
Highway			Hotel Regency	62.78%	94.93%	84.83%	97.38%	55.01%	99.94%	37.26%	42.40%	43.68%	54.81%	49.76%	90.81%	
Within City			Hotel Surya	94.30%	63.70%	99.09%	100.00%	94.02%	91.67%	79.21%	NC	65.21%	94.71%	78.36%	82.40%	
<b>Overall SSA</b>				<b>81.50%</b>	<b>73.47%</b>	<b>92.38%</b>	<b>99.15%</b>	<b>69.10%</b>	<b>92.13%</b>	<b>62.00%</b>	<b>69.16%</b>	<b>50.00%</b>	<b>84.03%</b>	<b>62.87%</b>	<b>91.07%</b>	
In-vehicle (>= - 85dBm)		Major Road	Chopra Hotel Udampur	96.73%	100.00%	99.87%	100.00%	94.32%	99.91%	92.31%	98.00%	82.42%	99.94%	94.62%	100.00%	
		Highway	Hotel Regency	89.42%	100.00%	98.24%	100.00%	82.88%	100.00%	68.13%	99.50%	81.98%	99.15%	81.97%	99.83%	
		Within City	Hotel Surya	99.29%	99.64%	99.96%	100.00%	99.80%	99.66%	94.54%	NC	95.81%	99.84%	97.33%	99.81%	
		<b>Overall SSA</b>		<b>95.07%</b>	<b>99.89%</b>	<b>99.23%</b>	<b>100.00%</b>	<b>89.68%</b>	<b>99.87%</b>	<b>84.51%</b>	<b>98.58%</b>	<b>85.29%</b>	<b>99.67%</b>	<b>88.64%</b>	<b>99.88%</b>	
Outdoor- in city (>= - 95dBm)		Major Road	Chopra Hotel Udampur	100.00%	100.00%	100.00%	100.00%	99.58%	100.00%	98.96%	99.70%	96.13%	100.00%	99.45%	100.00%	
		Highway	Hotel Regency	100.00%	100.00%	100.00%	100.00%	98.20%	100.00%	95.36%	100.00%	97.17%	99.86%	96.23%	99.96%	
		Within City	Hotel Surya	100.00%	100.00%	99.95%	100.00%	100.00%	100.00%	99.90%	NC	99.83%	100.00%	99.87%	100.00%	
		<b>Overall SSA</b>		<b>100.00%</b>	<b>100.00%</b>	<b>99.99%</b>	<b>100.00%</b>	<b>98.97%</b>	<b>100.00%</b>	<b>97.99%</b>	<b>99.82%</b>	<b>97.55%</b>	<b>99.96%</b>	<b>97.87%</b>	<b>99.99%</b>	
6	<b>Call Setup Success Rate</b>	Major Road	Chopra Hotel Udampur	100.00%	100.00%	100.00%	100.00%	99.00%	100.00%	98.78%	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
	(>=95%)	Highway	Hotel Regency	100.00%	100.00%	100.00%	100.00%	98.08%	100.00%	100.00%	100.00%	100.00%	100.00%	99.47%	100.00%
		Within City	Hotel Surya	98.48%	100.00%	100.00%	100.00%	98.86%	100.00%	100.00%	NC	100.00%	100.00%	100.00%	100.00%
		<b>Overall SSA</b>		<b>99.73%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>98.48%</b>	<b>100.00%</b>	<b>99.55%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>99.72%</b>	<b>100.00%</b>
7	<b>Hand Over Success Rate (HOSR)</b>	Major Road	Chopra Hotel Udampur	100.00%	100.00%	98.52%	100.00%	97.08%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Highway	Hotel Regency	100.00%	100.00%	99.53%	100.00%	97.89%	100.00%	100.00%	100.00%	99.20%	100.00%	99.71%	100.00%
		Within City	Hotel Surya	100.00%	100.00%	100.00%	100.00%	98.41%	100.00%	97.73%	NC	99.14%	100.00%	100.00%	100.00%
		<b>Overall SSA</b>		<b>100.00%</b>	<b>100.00%</b>	<b>99.37%</b>	<b>100.00%</b>	<b>97.76%</b>	<b>100.00%</b>	<b>99.43%</b>	<b>100.00%</b>	<b>99.41%</b>	<b>100.00%</b>	<b>99.88%</b>	<b>100.00%</b>

- NA-Not Applicable
- NC-No Coverage

7.2 OPERATOR ASSISTED DRIVE TEST: RAJOURI SSA (AUGUST-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	Ashirwad Hotel Rajouri	63	30	52	30	47	30	70	30	94	30	71	30
		Highway	Khan Plaza Surankot	274	30	266	30	220	30	163	30	165	30	171	30
		Within City	Hotel Sai Nowshera	78	30	66	30	52	30	71	30	70	30	46	30
		<b>Overall SSA</b>		<b>415</b>	<b>90</b>	<b>384</b>	<b>90</b>	<b>319</b>	<b>90</b>	<b>304</b>	<b>90</b>	<b>329</b>	<b>90</b>	<b>288</b>	<b>90</b>
2	Blocked Call Rate	Major Road	Ashirwad Hotel Rajouri	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.43%	0.00%	1.06%	0.00%	1.41%	0.00%
		Highway	Khan Plaza Surankot	0.00%	0.00%	0.38%	0.00%	4.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	Hotel Sai Nowshera	1.28%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		<b>Overall SSA</b>		<b>0.24%</b>	<b>0.00%</b>	<b>0.26%</b>	<b>0.00%</b>	<b>2.82%</b>	<b>0.00%</b>	<b>0.33%</b>	<b>0.00%</b>	<b>0.30%</b>	<b>0.00%</b>	<b>0.35%</b>	<b>0.00%</b>
3	Dropped Call Rate (<=2%)	Major Road	Ashirwad Hotel Rajouri	0.00%	0.00%	0.00%	0.00%	2.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	Khan Plaza Surankot	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.58%	0.00%
		Within City	Hotel Sai Nowshera	0.00%	0.00%	1.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		<b>Overall SSA</b>		<b>0.00%</b>	<b>0.00%</b>	<b>0.26%</b>	<b>0.00%</b>	<b>0.32%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.35%</b>	<b>0.00%</b>
4	<b>Percentage connections with good voice quality (=&gt;95%)</b>														
	(a) 0-4 (w/o frequency hopping for CDMA)	Major Road	Ashirwad Hotel Rajouri	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	Khan Plaza Surankot	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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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	Hotel Sai Nowshera	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		<b>Overall SSA</b>		<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
	(b) 0-5 ( with frequency hopping for GSM Operators)	Major Road	Ashirwad Hotel Rajouri	96.28%	97.40%	96.90%	99.61%	<b>94.01%</b>	99.60%	96.61%	98.72%	98.13%	96.27%	98.35%	99.13%
		Highway	Khan Plaza Surankot	95.87%	95.91%	96.59%	100.00%	95.12%	98.24%	96.52%	99.60%	97.93%	99.53%	97.92%	99.41%
		Within City	Hotel Sai Nowshera	96.32%	98.84%	95.93%	99.52%	<b>94.62%</b>	97.69%	95.82%	100.00%	97.35%	99.55%	98.41%	99.54%
		<b>Overall SSA</b>		<b>96.05%</b>	<b>97.17%</b>	<b>96.46%</b>	<b>99.72%</b>	<b>94.86%</b>	<b>98.58%</b>	<b>96.31%</b>	<b>99.46%</b>	<b>97.87%</b>	<b>98.56%</b>	<b>98.10%</b>	<b>99.36%</b>
<b>Service Coverage</b>															
5	In door (>= - 75dBm)	Major Road	Ashirwad Hotel Rajouri	54.24%	100.00%	94.69%	100.00%	71.96%	93.57%	70.57%	23.86%	54.28%	34.12%	68.70%	96.00%
		Highway	Khan Plaza Surankot	51.90%	100.00%	78.57%	18.22%	52.45%	99.48%	48.08%	100.00%	43.58%	78.62%	41.92%	97.54%
		Within City	Hotel Sai Nowshera	92.45%	93.34%	98.32%	100.00%	89.74%	98.75%	58.28%	19.87%	61.98%	70.99%	72.87%	66.80%
		<b>Overall SSA</b>		<b>65.92%</b>	<b>97.71%</b>	<b>86.62%</b>	<b>71.54%</b>	<b>61.91%</b>	<b>96.91%</b>	<b>55.57%</b>	<b>57.47%</b>	<b>49.75%</b>	<b>62.86%</b>	<b>53.40%</b>	<b>86.92%</b>
	In-vehicle (>= - 85dBm)	Major Road	Ashirwad Hotel Rajouri	89.01%	100.00%	99.69%	100.00%	90.25%	100.00%	86.86%	93.18%	84.99%	98.34%	88.92%	99.85%
		Highway	Khan Plaza Surankot	83.07%	100.00%	94.59%	100.00%	81.53%	100.00%	75.01%	100.00%	76.50%	99.73%	75.27%	99.99%
		Within City	Hotel Sai Nowshera	99.22%	100.00%	99.96%	100.00%	99.91%	100.00%	98.06%	76.16%	88.93%	99.82%	95.73%	96.66%
		<b>Overall SSA</b>		<b>89.05%</b>	<b>100.00%</b>	<b>96.90%</b>	<b>100.00%</b>	<b>86.05%</b>	<b>100.00%</b>	<b>84.31%</b>	<b>91.78%</b>	<b>80.97%</b>	<b>99.34%</b>	<b>81.90%</b>	<b>98.85%</b>
	Outdoor- in city (>= - 95dBm)	Major Road	Ashirwad Hotel Rajouri	100.00%	100.00%	99.98%	100.00%	98.86%	100.00%	100.00%	100.00%	98.58%	99.97%	98.14%	99.99%
		Highway	Khan Plaza Surankot	100.00%	100.00%	99.78%	100.00%	97.59%	100.00%	100.00%	100.00%	96.29%	100.00%	95.37%	100.00%
		Within City	Hotel Sai Nowshera	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	100.00%	100.00%	98.85%	100.00%	99.95%	99.90%
		<b>Overall SSA</b>		<b>100.00%</b>	<b>100.00%</b>	<b>99.87%</b>	<b>100.00%</b>	<b>98.20%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>97.34%</b>	<b>99.99%</b>	<b>96.79%</b>	<b>99.96%</b>

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	Ashirwad Hotel Rajouri	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.57%	100.00%	98.94%	100.00%	98.59%	100.00%
		Highway	Khan Plaza Surankot	100.00%	100.00%	99.62%	100.00%	95.91%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Within City	Hotel Sai Nowshera	98.72%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		<b>Overall SSA</b>		<b>99.76%</b>	<b>100.00%</b>	<b>99.74%</b>	<b>100.00%</b>	<b>97.18%</b>	<b>100.00%</b>	<b>99.67%</b>	<b>100.00%</b>	<b>99.70%</b>	<b>100.00%</b>	<b>99.65%</b>	<b>100.00%</b>
7	Hand Over Success Rate (HOSR)	Major Road	Ashirwad Hotel Rajouri	100.00%	100.00%	100.00%	100.00%	98.81%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Highway	Khan Plaza Surankot	100.00%	100.00%	100.00%	100.00%	97.58%	100.00%	100.00%	100.00%	98.86%	100.00%	99.73%	100.00%
		Within City	Hotel Sai Nowshera	98.72%	100.00%	100.00%	100.00%	99.13%	100.00%	99.04%	100.00%	100.00%	100.00%	100.00%	100.00%
		<b>Overall SSA</b>		<b>99.76%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>98.28%</b>	<b>100.00%</b>	<b>99.61%</b>	<b>100.00%</b>	<b>99.40%</b>	<b>100.00%</b>	<b>99.84%</b>	<b>100.00%</b>

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

**7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:**

**DRIVE TEST TABLE: 3**

**DRIVE TEST ROUTE OF JULY TO AUGUST 14 – 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
<b>UDHAMPUR</b>	July-14	Udhampur, Reasi / <b>130KM</b>	1) REASI: (A) MAJOR ROAD: DOMEL CHECK POST- KATRA HIGHWAY- DHANSAL BABA- BABA JITTO ROAD- BAGGAN, REASI (B) WITH IN CITY: REASI BUS STAND- ARMY CANTONMENT-, KATRA CITY-POLICE POST KATRA.  (2) UDHAMPUR: (A) MAJOR ROAD : TIKRI-AIRFORCE STATION- GADHEE- NH-UDHAMPUR- MAND -GADI, REHMBAL, (B) WITH IN CITY: CHOPRA MARKET UDHAMPUR.- RAILWAY STATION ROAD.  <b>INDOOR: CHOPRA HOTEL UDHAMPUR</b>	Udhampur, Ramban / <b>145KM</b>	1) UDHAMPUR: (A) MAJOR ROAD: ARMY CANTONMENT -T MORH UDHAMPUR- CHENANI-KUD (B) WITH IN CITY: SLATHIA CHOWK- ROUNDMAI-SLADA SWENA-UDHAMPUR BUS STAND  2) RAMBAN (A) MAJOR ROAD: BATOTE ROAD- RAMBAN HIGHWAY- BHATTI-MAITRA, (B) WITHIN CITY: RAMBAN POLICE CHECK POST- RAMBAN CITY.  <b>INDOOR: HOTEL REGENCY RAMBAN</b>	Bhaderwah, doda / <b>135KM</b>	BHADERWAH: (A) MAJOR ROAD - ASSAR-SARI BAZAR- BHADERWAH HIGHWAY- POLICE STATON (B) WITH IN CITY: BHDERWAH BUS STAND-SARONSARI, DARDU-PRANOO.  (2) DODA: (A) MAJOR ROAD: PULL DODA- DODA HIGHWAY- KHILLANI- KHODA PANI -DODA CITY (B) WITHIN CITY: DODA CITY- RAMGHAR-THOR- BATOTE CITY.  <b>INDOOR: HOTEL SURYA BHADERWAH</b>
<b>RAJOURI</b>	Aug-14	Kalakot, Nowshera / <b>125KM</b>	KALAKOT: (A) MAJOR ROAD: BHAMLA- SUNDERBANI HIGWAY- SIOT MORH-KALAKOT ROAD-CITY (B) WITH IN CITY: KALAKOT CITY-BUS STAND  (2) NOWSHERA: (A) MAJOR ROAD: NOWSHERA	Rajouri, Surenkot/ <b>125KM</b>	RAJOURI: (A) WITHIN CITY: RAJORI CITY- JAWAHAR NAGAR- GUJJAR MANDI. (B) MAJOR ROAD: THANAMANDI HIGHWAY, THANAMANDI CITY- SHADRA SHARIF.  (2) SURENKOT: (A) WITHIN CITY: HOSPITAL ROAD-	Poonch, Nowshera / <b>155KM</b>	(1) POONCH: (A) WITHIN CITY: POONCH CITY - GURUDARA-HIGH COURT ROAD POONCH (B) MAJOR ROAD: SURENKOT HIGHWAY- MANDI ROAD- POONCH HIGHWAY - BUS STAND (C) WITHIN CITY: ,SANGIOT- BAROTGALI-MAJAKOT





		<p>HIGHWAY- RAJOURI CHECK POST-MAIN ROAD.                  (B) WITH IN CITY: TATAPANI DANGRI-NALA ROAD.</p> <p><b>INDOOR:</b> ASHIRWAD HOTEL RAJOURI</p>		<p>SUREANKOT BUS STAND.                  (B) MAJOR ROAD: SURANKOT HIGHWAY- DERA DA GALI-BAFLIAZ-FAZALABAD-MUGHAL ROAD</p> <p><b>INDOOR:</b> KHAN PLAZA SURANKOT</p>		<p>(2) NOWSHERA:                  (A) MAJOR ROAD: RAJOURI CHECK POST- NOWSHERA HIGHWAY                  (B) WITH IN CITY: NOWSHERA CITY, BUS STAND –SIOT.</p> <p><b>INDOOR:</b> HOTEL SAI NOWSHERA</p>
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## 7.5 SSA WISE DRIVE TEST OBSERVATION:

### DRIVE TEST TABLE: 4

#### DRIVE TEST OBSERVATION OF UDHAMPUR SSA – JULY 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	Udhampur & Katra	Poor Level at Mand & Ramban Outer	Ramban	---	Doda & Badarwah	Poor Level between Pul Doda & Pranoo, near Assar
2	AIRTEL		Poor Quality near Bagga, Katra Outer, Reasi Outer, near Anoo		Poor Quality near Ramban, Sewanar		Poor Level & Quality at Ramban Outer, Doda Outer
3	BSNL		Poor Level & Quality near Reasi Outer, Udhampur Outer		Poor Level & Quality near Sewanar, Ramban		Poor Level & Quality near Doda, Tipri, Badarwah
4	IDEA		Poor Level near Domel, Rehambal and Poor Level & Quality near Anoo, Katra Outer, Reasi Outer		Poor Level near Chanderkot, Chenani, Sewana, Salada		NC
5	RCOM GSM		Poor Level & Quality near Reasi, Baggan, Katra Outer		Poor Level near Sewanar, Chenani, Roundmail Udhampur		Poor Level near Thor, Khillani, Pranoo, Badarwah Outer
6	VODAFONE		Poor Level near Reasi Outer		---		Poor Level near Assar

NC: No Coverage

**DRIVE TEST TABLE: 5**

**DRIVE TEST OBSERVATION OF RAJOURI SSA – AUGUST 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	Kalakot & Nowshera	Poor Level at Kalakot Outer, Bhambla Outer	Rajouri & Surenkot	No coverage at Dera ki gali and Poor Level near Thanamandi	Poonch & Nowshera	Poor Level near Manjakot
2	AIRTEL		Poor Level & Quality near Rajouri Outer and Poor Level at Kalakot Outer, near Siot Morh		Poor Level near Surankot and Poor Quality near Dera ki gali, Than mandi, Rajouri Outer		Poor Level & Quality near Kallar, Poor Quality near Kalai, Surankot, Manjakot, Nusehra
3	BSNL		Poor Level & Quality near Siot Morh, Sunder Bani, Kalakot Outer		Poor Level & Quality near Surankot, Thanamandi		Poor Level & Quality near Maniyakot, Nusehra
4	IDEA		Poor Level & Quality between Sunderban to Bhambla, near Balshama, Siot Morh		Poor Level & Quality near Dera ki gali, Poor Level between Saj to Rajouri		Poor Level near Manjakot, Surankot Outer, Nusehra, Narian
5	RCOM GSM		Poor Level near Kalakot, Dharamsal, Siot Morh, Sunderbani Outer		Poor Level near Thanmandi, Shadra, Rajouri Outer		Poor Level near Surankot, Jiranwal, Nusehra
6	VODAFONE		Poor Level near Sunderbani		Poor Level near Surankot, Thanmandi Outer, Rajouri Outer		Poor Level near Manjakot

## 7.6 KEY FINDINGS ON DRIVE TEST:

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

- (i) **In the Month of July -14**, drive tests were conducted across **Udhampur SSA** covering Udhampur, Reasi, Ramban, Bhaderwah and Doda 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 **92.25%** on SSA basis.
- (ii) **In the Month of August-14**, drive tests were conducted across **Rajouri SSA** covering Kalakot, Nowshera, Rajouri, Surenkot and Poonch SDCAs. In this SSA also, the performance of all service providers was satisfactory as they were mostly meeting QoS norms, except **BSNL** remained non-complied for parameters **Voice Quality (90.37%)**.
- (iii) **In the month of September -14**, drive tests were not conducted due to heavy floods in J&K.

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- 5, 6 for respective SSAs.

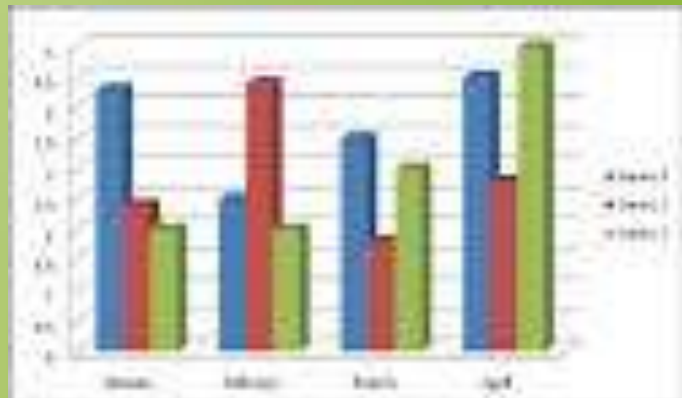
*Thus the results of drive tests indicate that most of the operators have performed fairly well within the benchmarks in two SSAs where drive tests were conducted during the quarter. Only **BSNL** remained under performed in respect of the parameters **Voice Quality** in these SSAs.*

## 8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

### AVERAGED QUARTERLY PMR

V/S

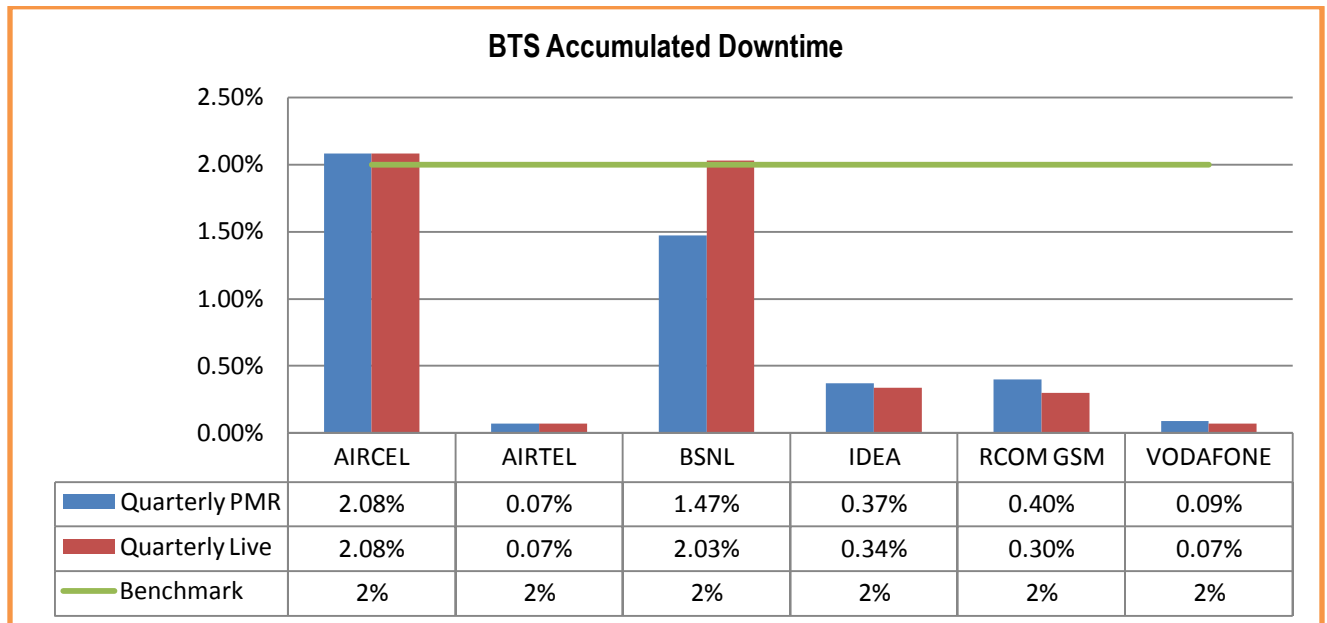
### AVERAGED QUARTERLY 3-DAYS LIVE MEASUREMENT



## 8. GRAPHICAL REPRESENTATION:

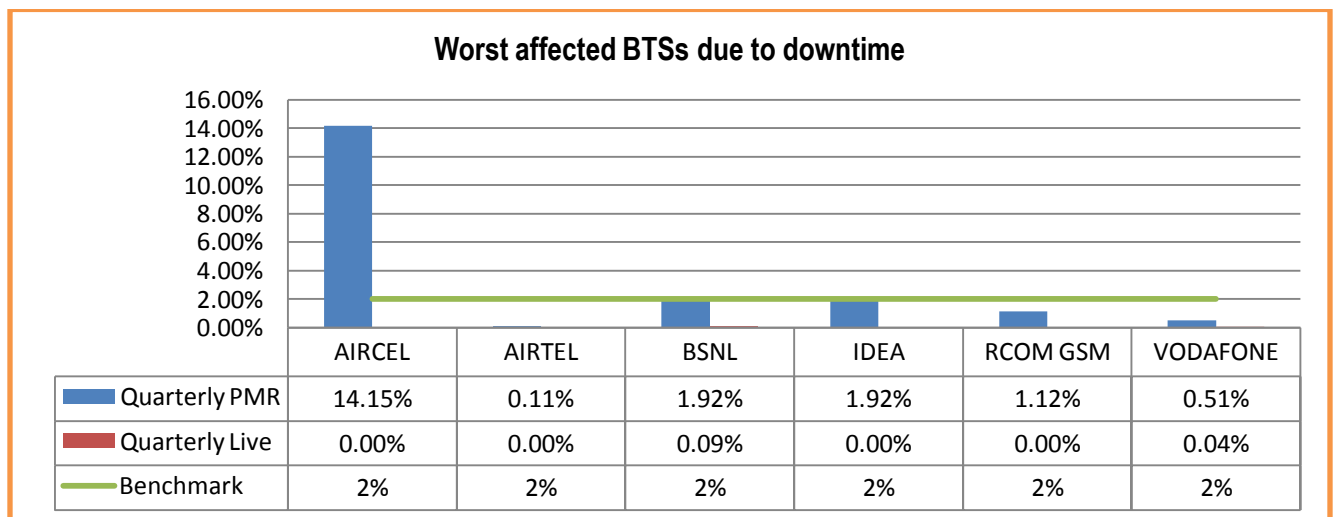
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

### 1) BTS ACCUMULATED DOWNTIME :



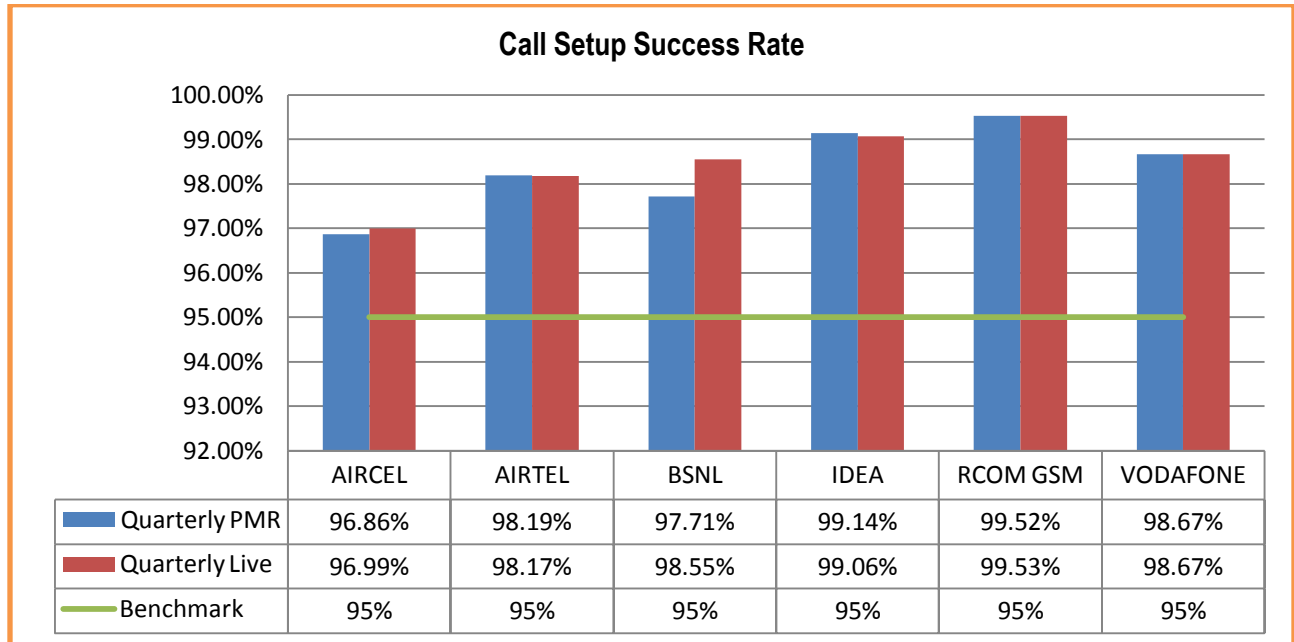
All operators are meeting the benchmarks except Aircel and BSNL (3 days live measurement).

### 2) WORST AFFECTED BTSS DUE TO DOWNTIME :



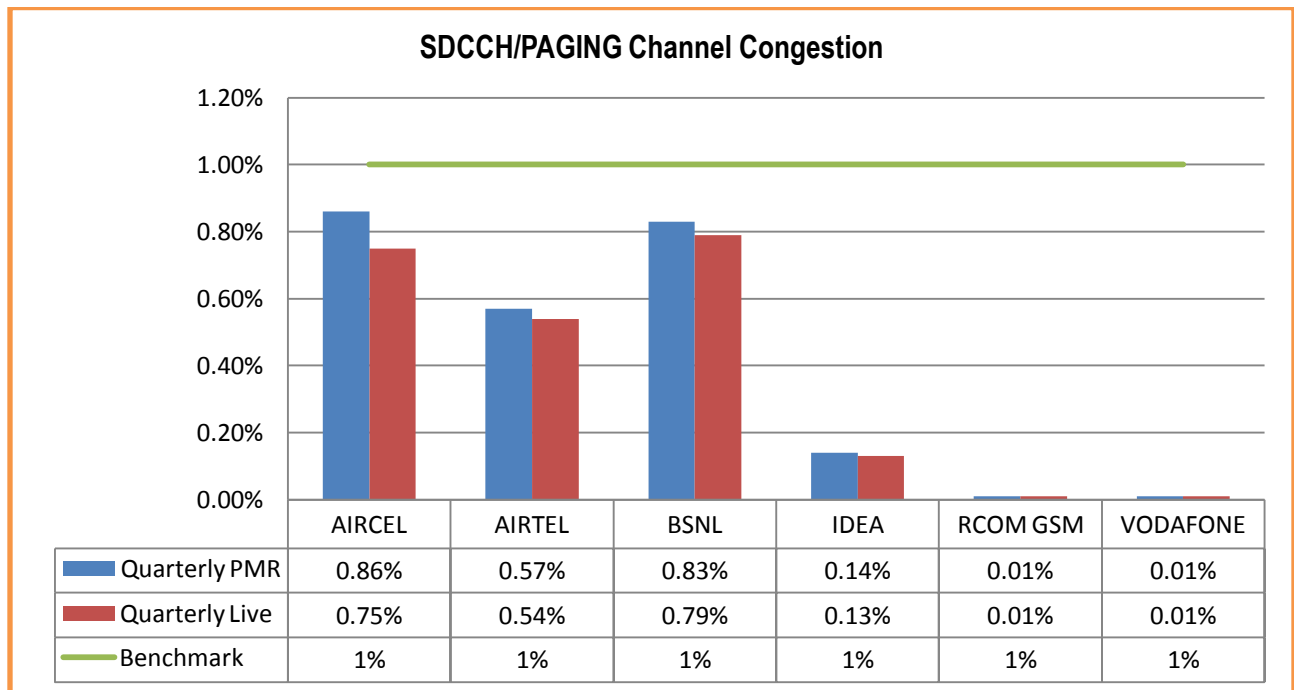
All operators are meeting the benchmarks except Aircel.

3) CALL SETUP SUCCESS RATE :



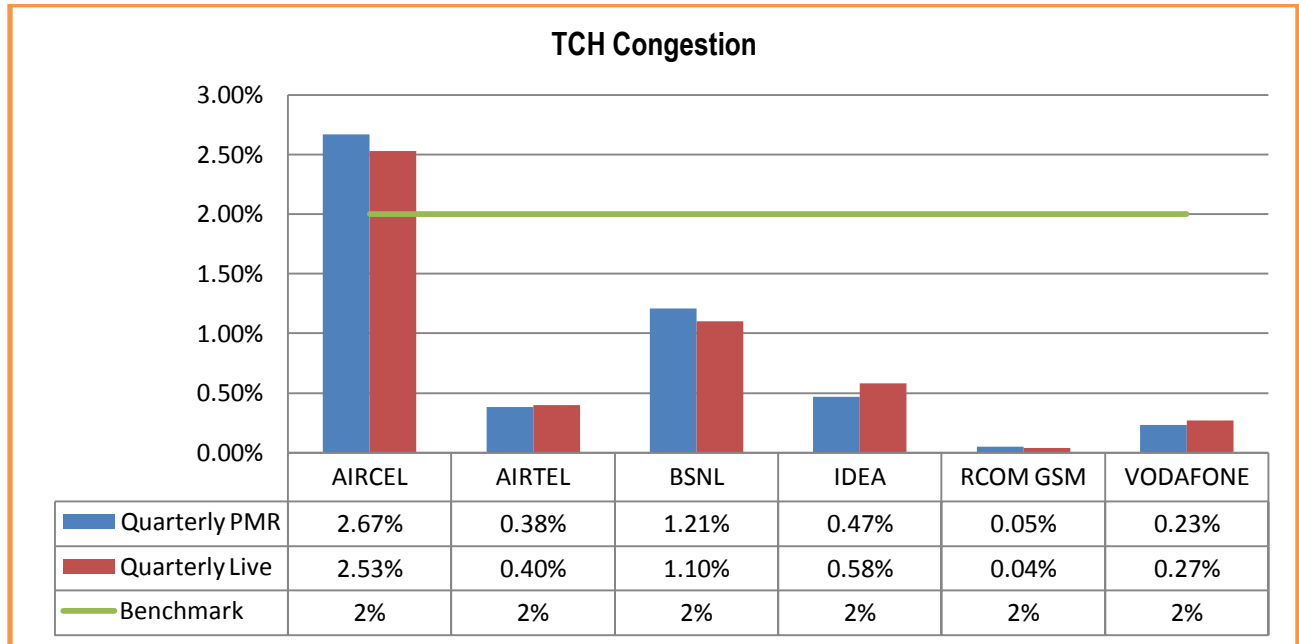
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION :



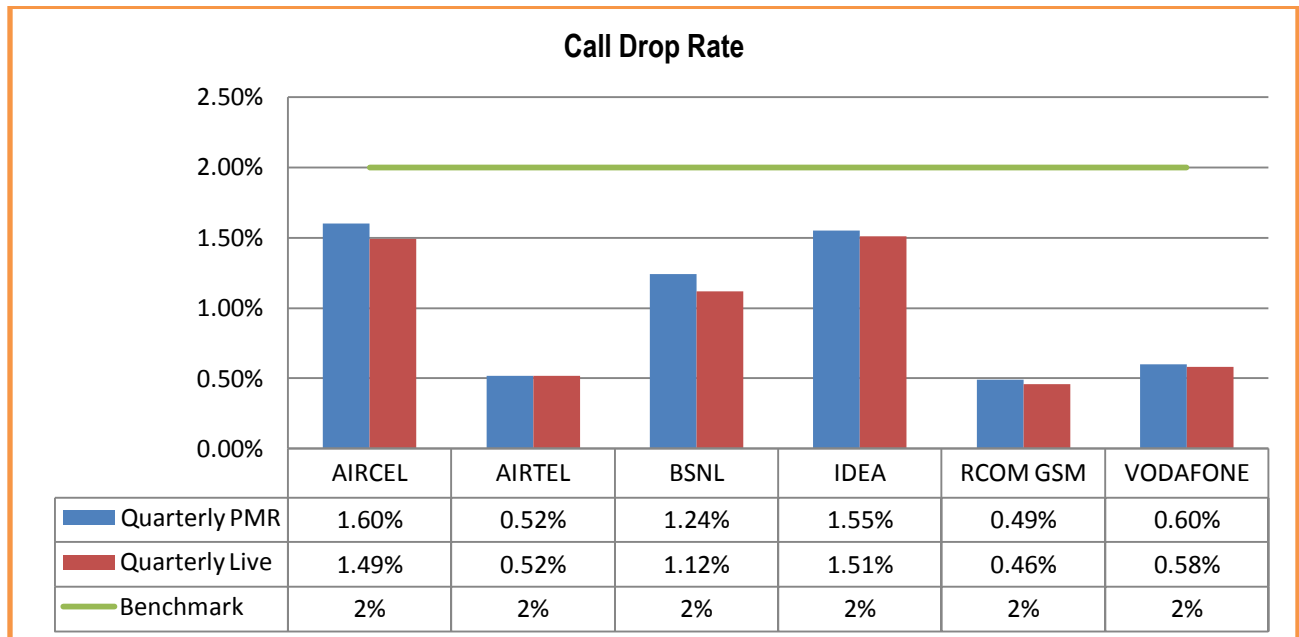
All operators are meeting the benchmarks.

5) TCH CONGESTION :



All operators are meeting the benchmarks except Aircel.

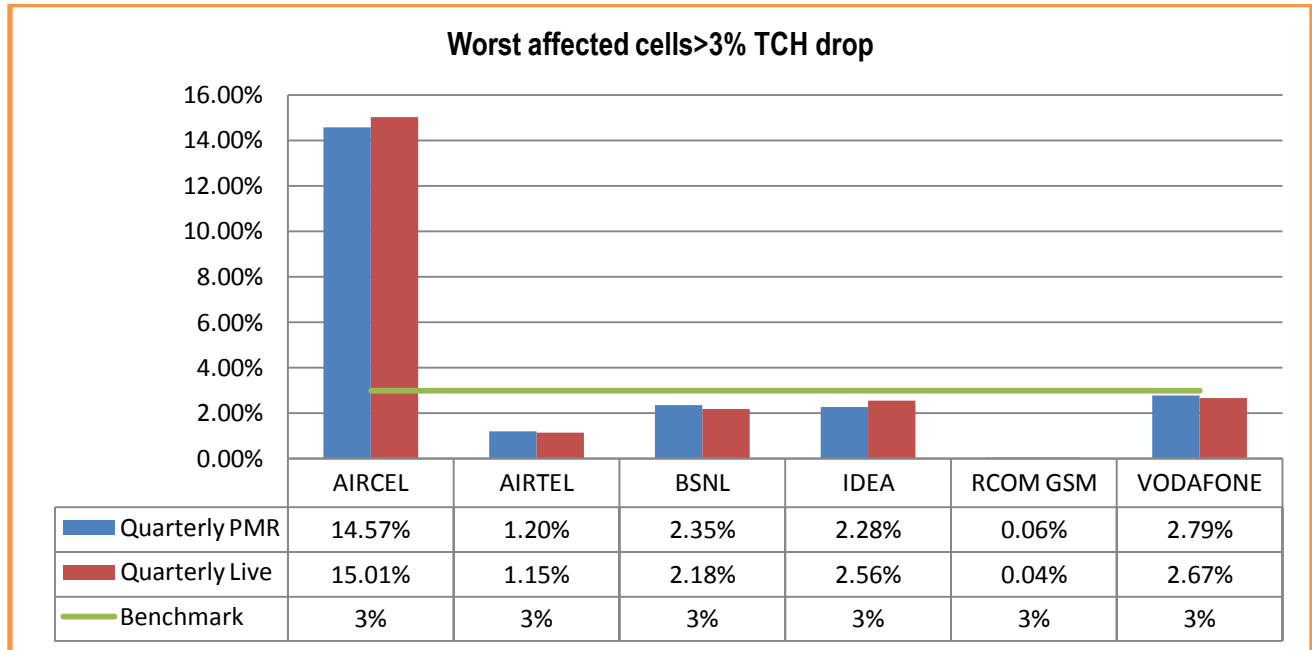
6) CALL DROP RATE :



All operators are meeting the benchmarks.

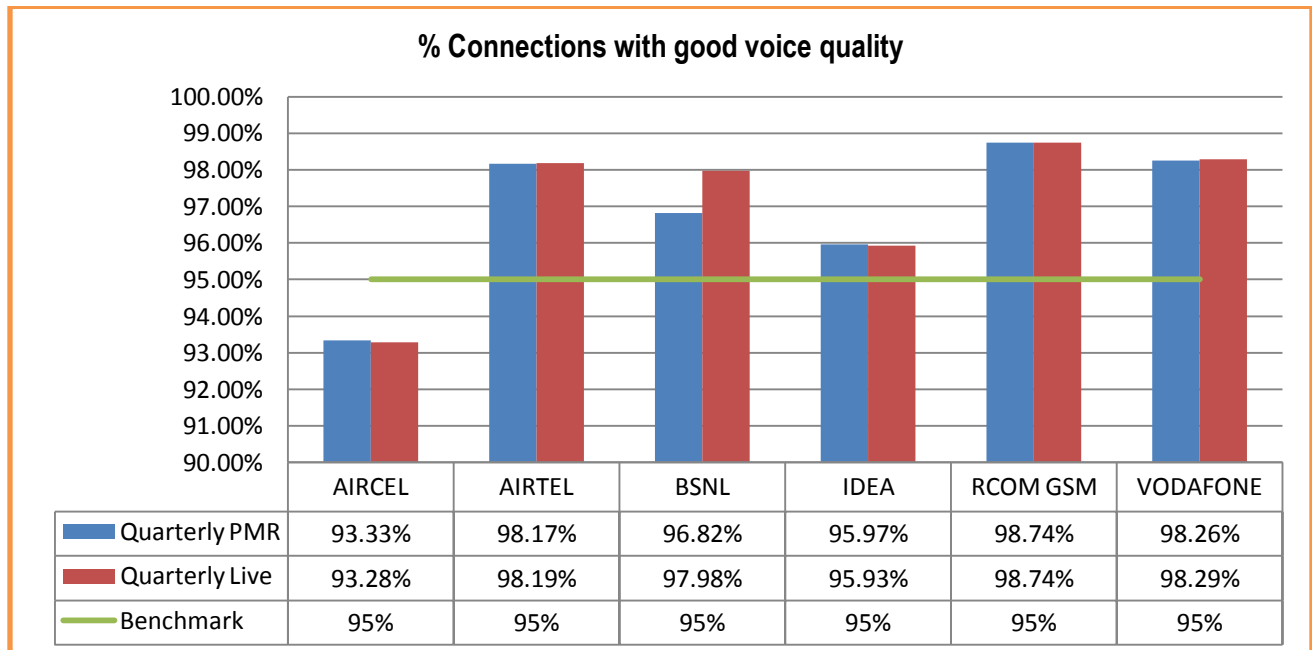


7) WORST AFFECTED CELLS>3% TCH DROP :



All operators are meeting the benchmarks except Aircel.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :



All operators are meeting the benchmarks except Aircel.