Audit & Assessment of Quality of Service

Of

Cellular Mobile Telephone Service

For

Telecom Regulatory Authority of India

North Zone – Jammu & Kashmir Service Area

(July 2015 – September 2015)

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 6thOctober, 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 (wire line) and Broadband service, a circle would be audited once in a year.

2. OBJECTIVES AND METHODOLOGY

2. <u>OBJECTIVES AND METHODOLOGY</u>

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 2015 – September 2015.**

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
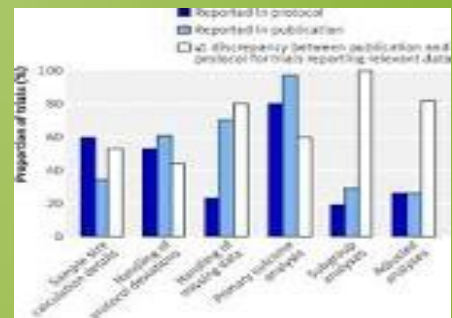
3. SAMPLE SIZE

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
GSM Operators		July -15	August -15	September -15	
1	AIRCEL	7 to 9 Jul-15	6, 7 & 10 Aug-15	7 to 9 Sep-15	Dishnet Wireless Limited , 2nd floor North Block Bahu Plaza Jammu
2	AIRTEL	22 to 24 Jul-15	21, 24 & 25 Aug-15	8 to 10 Sep-15	Bharti Airtel Campus, Plot No 21, Rajiv Gandhi Information and Technilogy Park, Chandigarh, 160101
3	BSNL	8 to 10 Jul-15	3 to 5 Aug-15	8 to 10 Sep-15	BSNL 4th floor, Rail Head Complex Jammu
4	IDEA	14 to 16 Jul-15	13, 14 & 17 Aug-15	9 to 11 Sep-15	Idea Office Phase -7 Industrial Area,Mohali
5	RCOM GSM	9 to 11 Jul-15	9 to 11 Aug-15	9 to 11 Sep-15	Reliance Communication Limited Narwal KC Business Park Jammu
6	VODAFONE	6 to 8 Jul-15	11 to 13 Aug-115	16 to 18 Sep-15	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 Sept. 2015.

The data generated by monthly PMR and 3-days live measurements audit for the period July 2015 to September 2015 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 only **once in a year. Based on this criterion, QoS audit for basic (wire line) service was not required to be done for J&K Circle in the quarter ended September- 2015, as the same has already been done during QE March 2015.**

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 J&K Circle in the quarter ended September - 2015, as the same has already been done during QE March 2015.**

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:**

(1) Cellular Mobile

(i) From monthly PMR audit it has been concluded that the performance of **Aircel** 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 '**Worst affected BTSs due to downtime', TCH Congestion, Worst affected Cells> 3% TCH drops and Voice Quality** with its average performance **as 4.00%, 2.35%,   13.76% and 94.87%** respectively**.**

(ii) From live assessment, it was revealed that **only Aircel** failed to meet the benchmark of network parameters namely **TCH congestion and Worst Affected Cells > 3% TCH Drops and Connection with good voice quality,** with its performance as **3.31%, 11.79% and 94.65%** respectively.

(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

All service providers are in compliance with respect to the parameter 'Accessibility of call center' against the benchmark of 95%. However, **Aircel, Airtel, BSNL and RCOM GSM** have failed to meet the benchmark of **'Calls answered by Operators (voice to voice)' within 90 seconds** with their performance as **92.77%, 92.21%, 76.81% and 66.72%** respectively**. The performance of BSNL and RCOM GSM was way below the benchmark of > 95%.**

In case of parameter **Termination/Closure** also, all service providers except **Aircel**, have settled 100% closures within 7 days. The performance of **Aircel** was **98.28%.**

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), Airtel, BSNL and RCOM (GSM)** could not meet the benchmark with their performance as **69.50%, 51.77%** and **87.35% respectively.**

(iv)The results of **Drive Tests** revealed that most of the operators have performed fairly well within the benchmarks in the above SSAs except BSNL and Idea. BSNL could not perform up to the mark for parameter **Voice quality** in Rajauri, Udhampur and Jammu SSAs and **Idea** remained under performed in Udhampur SSA.

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	September -15	20:00 - 21:00
2	AIRTEL	September -15	19:00 - 20:00
3	BSNL	September -15	19:00 - 20:00
4	IDEA	September -15	21:00 - 22:00
5	RCOM GSM	September -15	22:00 -23:00
6	VODAFONE	September -15	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	2211	Ericsson	Ericsson
2	AIRTEL	12	33	2807	Ericsson	Ericsson
3	BSNL	8	21	1154	Ericsson	Ericsson, NSN & ZTE
4	IDEA	2	7	1110	Ericsson	Ericsson
5	RCOM GSM	1	4	829	Huawei	Huawei
6	VODAFONE	3	16	1565	NSN	NSN

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JULY- 15 MONTH:

	CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE- JULY 15 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%	July-15	0.95%	0.13%	1.72%	0.57%	0.83%	0.25%
	b) Worst affected BTSs due to downtime	<=2%	July-15	0.00%	0.21%	1.89%	1.80%	1.45%	1.35%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	>=95%	July-15	95.93%	98.25%	96.30%	98.34%	99.50%	98.06%
	b) SDCCH/PAGING Channel congestion	<=1%	July-15	0.78%	0.39%	0.40%	0.13%	0.02%	0.06%
	c) TCH congestion	<=2%	July-15	**3.32%**	0.45%	1.63%	1.24%	0.04%	0.62%
	Connection maintenance (Retainability)								
3	a) CDR (Call Drop Rate)	<=2%	July-15	1.39%	0.59%	1.69%	1.67%	0.48%	0.78%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	July-15	**11.89%**	1.67%	2.47%	2.07%	0.01%	2.87%
	c) Connections with good voice quality	>=95%	July-15	**94.54%**	97.77%	98.18%	96.32%	98.70%	98.15%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	July-15	0	0	0	0	0	0

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – AUGUST-15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE – AUGUST 15 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%	Aug-15	0.84%	0.13%	1.63%	0.47%	0.56%	0.24%
	b) Worst affected BTSs due to downtime	<=2%	Aug-15	**5.25%**	0.14%	1.47%	1.80%	1.44%	0.83%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	>=95%	Aug-15	97.14%	98.22%	96.26%	98.69%	99.57%	98.07%
	b) SDCCH/PAGING Channel congestion	<=1%	Aug-15	**1.54%**	0.52%	0.47%	0.19%	0.02%	0.05%
	c) TCH congestion	<=2%	Aug-15	**2.10%**	0.35%	1.48%	0.89%	0.04%	0.57%
	Connection maintenance (Retainability)								
3	a) CDR (Call Drop Rate)	<=2%	Aug-15	1.67%	0.55%	1.54%	1.70%	0.42%	0.78%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Aug-15	**14.99%**	1.44%	2.28%	2.37%	0.04%	2.83%
	c) Connections with good voice quality	>=95%	Aug-15	**94.78%**	97.71%	98.36%	96.56%	98.72%	98.22%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Aug-15	0	0	0	0	0	0

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – SEPTEMBER-15 MONTH:

	CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - SEPEMBER 15 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%	Sep-15	1.05%	0.12%	1.53%	0.53%	0.48%	0.18%
	b) Worst affected BTSs due to downtime	<=2%	Sep-15	**6.74%**	0.18%	1.65%	1.80%	1.45%	0.70%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	>=95%	Sep-15	97.69%	97.20%	96.20%	97.96%	99.65%	99.01%
	b) SDCCH/PAGING Channel congestion	<=1%	Sep-15	0.46%	0.38%	0.41%	0.17%	0.01%	0.02%
	c) TCH congestion	<=2%	Sep-15	1.63%	0.42%	1.41%	1.55%	0.04%	0.99%
	Connection maintenance (Retainability)								
3	a) CDR (Call Drop Rate)	<=2%	Sep-15	1.54%	0.58%	1.49%	1.64%	0.39%	0.83%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Sep-15	**14.41%**	1.81%	2.03%	2.40%	0.02%	2.84%
	c) Connections with good voice quality	>=95%	Sep-15	95.28%	97.79%	98.25%	96.77%	98.80%	98.44%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Sep-15	0	0	0	0	0	0

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR – (AVERAGE OF JULY-AUGUST-SEPT- 2015 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	0.95%	0.13%	1.63%	0.52%	0.62%	0.22%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	**4.00%**	0.18%	1.67%	1.80%	1.45%	0.96%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	96.92%	97.89%	96.25%	98.33%	99.57%	98.38%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.93%	0.43%	0.43%	0.16%	0.02%	0.04%
	c) TCH congestion	<=2%	Quarterly	**2.35%**	0.41%	1.51%	1.23%	0.04%	0.73%
	Connection maintenance (Retainability)								
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.53%	0.57%	1.57%	1.67%	0.43%	0.80%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	**13.76%**	1.64%	2.26%	2.28%	0.02%	2.85%
	c) Connections with good voice quality	>=95%	Quarterly	**94.87%**	97.76%	98.26%	96.55%	98.74%	98.27%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0

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.**

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 parameter worst affected BTSs due to down time'. **Aircel** failed to meet the benchmark of the parameter '**Worst affected BTSs due to downtime**' with its average performance as **4.00%**.

- ▪ **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.

- ▪ **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 **2.35%.**

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.

Only Aircel failed to meet the benchmark of the parameter '**Worst affected cells having more than 3% TCH drops**' with its average performance of **13.76 %.**

    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 only **Aircel** has failed to meet the benchmark with its performance as **94.87%.**

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 MEASURMENT DATA (3-DAYS) – JULY- 15 MONTH:

	CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE – JULY 15 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	1.26%	0.19%	1.66%	0.52%	0.93%	0.25%
	b) Worst affected BTSs due to downtime	**<=2%**	Live data	0.38%	0.00%	0.00%	0.28%	0.00%	0.00%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	**>=95%**	Live data	95.98%	98.49%	96.19%	98.47%	99.52%	97.89%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Live data	0.38%	0.34%	0.40%	0.12%	0.02%	0.09%
	c) TCH congestion	**<=2%**	Live data	3.28%	0.31%	1.54%	1.14%	0.04%	0.87%
	Connection maintenance (Retainability)								
3	a) CDR (Call Drop Rate)	**<=2%**	Live data	1.33%	0.59%	1.72%	1.63%	0.46%	0.88%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Live data	11.31%	1.68%	2.39%	2.43%	0.00%	2.90%
	c) Connections with good voice quality	**>=95%**	Live data	94.75%	97.75%	98.17%	95.79%	98.71%	98.20%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

5.2.2 LIVE MEASURMENT DATA (3-DAYS) – AUGUST-15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - AUGUST 15 MONTH									
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
S/N	**Name of Parameter**			**GSM Operators**					
	Network Service Quality Parameter								
	Network Availability								
1	a) BTS Accumulated Downtime	**<=2%**	Live data	0.85%	0.12%	1.69%	0.70%	0.58%	0.24%
	b) Worst affected BTSs due to downtime	**<=2%**	Live data	0.37%	0.00%	0.00%	0.00%	0.00%	0.13%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	**>=95%**	Live data	96.56%	98.27%	96.28%	98.49%	99.63%	97.94%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Live data	0.58%	0.50%	0.47%	0.17%	0.01%	0.03%
	c) TCH congestion	**<=2%**	Live data	**2.61%**	0.32%	1.60%	1.08%	0.04%	0.66%
	Connection maintenance (Retainability)								
3	a) CDR (Call Drop Rate)	**<=2%**	Live data	1.54%	0.55%	1.66%	1.69%	0.40%	0.84%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Live data	**13.31%**	1.43%	2.29%	2.36%	0.03%	2.86%
	c) Connections with good voice quality	**>=95%**	Live data	**94.66%**	97.69%	98.22%	96.90%	98.71%	98.16%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

5.2.3 LIVE MEASURMENT DATA (3-DAYS) – SEPTEMBER-15 MONTH:

					CELLULAR MOBILE TELEPHONE SERVICES J&K CIRCLE - SEPTEMBER 15 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								
1	**Network Availability**								
	a) BTS Accumulated Downtime	**<=2%**	Live data	0.88%	0.07%	1.70%	0.33%	0.47%	0.24%
	b) Worst affected BTSs due to downtime	**<=2%**	Live data	0.23%	0.00%	0.00%	0.09%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	**>=95%**	Live data	95.37%	97.49%	96.37%	97.97%	99.66%	97.00%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Live data	0.60%	0.55%	0.43%	0.28%	0.01%	0.06%
	c) TCH congestion	**<=2%**	Live data	**4.05%**	0.38%	1.48%	1.54%	0.04%	1.65%
3	**Connection maintenance (Retainability)**								
	a) CDR (Call Drop Rate)	**<=2%**	Live data	1.28%	0.57%	1.53%	1.80%	0.40%	0.85%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Live data	**10.74%**	1.72%	2.19%	2.30%	0.01%	2.80%
	c) Connections with good voice quality	**>=95%**	Live data	**94.53%**	97.70%	98.25%	96.58%	98.79%	98.44%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JULY- AUGUST- SEPTEMBER 2015 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								
1	**Network Availability**								
	a) BTS Accumulated Downtime	**<=2%**	Quarterly	1.00%	0.13%	1.68%	0.52%	0.66%	0.24%
	b) Worst affected BTSs due to downtime	**<=2%**	Quarterly	0.33%	0.00%	0.00%	0.12%	0.00%	0.04%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	**>=95%**	Quarterly	95.97%	98.08%	96.28%	98.31%	99.60%	97.61%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Quarterly	0.52%	0.46%	0.43%	0.19%	0.01%	0.06%
	c) TCH congestion	**<=2%**	Quarterly	**3.31%**	0.34%	1.54%	1.25%	0.04%	1.06%
3	**Connection maintenance (Retainability)**								
	a) CDR (Call Drop Rate)	**<=2%**	Quarterly	1.38%	0.57%	1.64%	1.71%	0.42%	0.86%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Quarterly	**11.79%**	1.61%	2.29%	2.36%	0.01%	2.85%
	c) Connections with good voice quality	**>=95%**	Quarterly	**94.65%**	97.71%	98.21%	96.42%	98.74%	98.27%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From live assessment, it was revealed that **only Aircel** failed to meet the benchmark of network parameters namely **TCH congestion and Worst Affected Cells > 3% TCH Drops and Connection with good voice quality,** with its performance as **3.31%, 11.79% and 94.65%** respectively.

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - July 15 month								
						GSM Operators			
Network Service Quality Parameter									
	Network Availability								
	a) Total no. of BTSs in the licensed service area		July-15	2136	2799	1162	1110	830	1554
1	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-15	15176.31	2761.94	14892.00	4705.66	5108.00	2874.63
	c) BTS Accumulated Downtime	<=2%	July-15	0.95%	0.13%	1.72%	0.57%	0.83%	0.25%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		July-15	0	6	22	20	12	21
	e) Worst affected BTSs due to downtime	<=2%	July-15	0.00%	0.21%	1.89%	1.80%	1.45%	1.35%
	Connection Establishment (Accessibility)								
2	a) CSSR (Call Setup Success Rate)	>=95%	July-15	95.93%	98.25%	96.30%	98.34%	99.50%	98.06%
	b) SDCCH/PAGING Congestion	<=1%	July-15	0.78%	0.39%	0.40%	0.13%	0.02%	0.06%
	c) TCH congestion	<=2%	July-15	**3.32%**	0.45%	1.63%	1.24%	0.04%	0.62%
	Connection Maintenance (Retainability)								
	a) Call Drop Rate (CDR)	<=2%	July-15	1.39%	0.59%	1.69%	1.67%	0.48%	0.78%
	b) Worst affected cells>3% TCH drop	<=3%	July-15	**11.89%**	1.67%	2.47%	2.07%	0.01%	2.87%
3	c) % of connections with good voice quality	>=95%	July-15	**94.54%**	97.77%	98.18%	96.32%	98.70%	98.15%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		July-15	753	139	85	66	0	133
	e) Total no. of cells (Sector) in the licensed service area		July-15	6337	8335	3459	3188	2486	4632
	No. of POI's having >=0.5% POI congestion								
4	No. of POI's having >=0.5% POI congestion		July-15	0	0	0	0	0	0
	Name of POI not meeting the benchmark		July-15	0	0	0	0	0	0
	Network Data								
	a) Equipped Capacity of Network in Erlang		July-15	126340	112105	108000	30807	40000	39917
5	b) Total traffic in TCBH in erlang (Avg.)		July-15	77116	94177	31191	15855	12291	31617
	c) Total no. of customers served (as per VLR) on last day of the month		July-15	2171123	2965482	880853	541185	402412	845175

TABLE: 2

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – July 15 month
				GSM Operators
Network Service Quality Parameter
1	**Network Availability**
	a) Total no. of BTSs in the licensed service area		Live data	2133	2787	1168	1055	2490	1530
	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	1934.19	374.27	1398.00	397.43	554.00	270.21
	c) BTS Accumulated Downtime	<=2%	Live data	1.26%	0.19%	1.66%	0.52%	0.93%	0.25%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	8	0	0	3	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.38%	0.00%	0.00%	0.28%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	95.98%	98.49%	96.19%	98.47%	99.52%	97.89%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.38%	0.34%	0.40%	0.12%	0.02%	0.09%
	c) TCH congestion	<=2%	Live data	**3.28%**	0.31%	1.54%	1.14%	0.04%	0.87%
3	**Connection Maintenance (Retainability)**
	a) Call Drop Rate (CDR)	<=2%	Live data	1.33%	0.59%	1.72%	1.63%	0.46%	0.88%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	**11.31%**	1.68%	2.39%	2.43%	0.00%	2.90%
	c) % of connections with good voice quality	>=95%	Live data	**94.75%**	97.75%	98.17%	95.79%	98.71%	98.20%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	712	140	83	77	0	134
	e) Total no. of cells (Sector) in the licensed service area		Live data	6300	8327	3471	3163	2486	4617
4	**No. of POI's having >=0.5% POI congestion**
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0

TABLE: 3

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - August 15 month								
								GSM Operators	
Network Service Quality Parameter									
1	**Network Availability**								
	a) Total no. of BTSs in the licensed service area		Aug-15	2134	2807	1154	1110	831	1563
	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-15	13352.98	2696.68	13979.00	3876.03	3438.60	2792.54
	c) BTS Accumulated Downtime	<=2%	Aug-15	0.84%	0.13%	1.63%	0.47%	0.56%	0.24%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Aug-15	112	4	17	20	12	13
	e) Worst affected BTSs due to downtime	<=2%	Aug-15	**5.25%**	0.14%	1.47%	1.80%	1.44%	0.83%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	Aug-15	97.14%	98.22%	96.26%	98.69%	99.57%	98.07%
	b) SDCCH/PAGING Congestion	<=1%	Aug-15	**1.54%**	0.52%	0.47%	0.19%	0.02%	0.05%
	c) TCH congestion	<=2%	Aug-15	**2.10%**	0.35%	1.48%	0.89%	0.04%	0.57%
3	**Connection Maintenance (Retainability)**								
	a) Call Drop Rate (CDR)	<=2%	Aug-15	1.67%	0.55%	1.54%	1.70%	0.42%	0.78%
	b) Worst affected cells>3% TCH drop	<=3%	Aug-15	**14.99%**	1.44%	2.28%	2.37%	0.04%	2.83%
	c) % of connections with good voice quality	>=95%	Aug-15	**94.78%**	97.71%	98.36%	96.56%	98.72%	98.22%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Aug-15	958	121	78	79	1	133
	e) Total no. of cells (Sector) in the licensed service area		Aug-15	6392	8390	3435	3329	2489	4699
4	**No. of POI's having >=0.5% POI congestion**								
	No. of POI's having >=0.5% POI congestion		Aug-15	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Aug-15	0	0	0	0	0	0
5	**Network Data**								
	a) Equipped Capacity of Network in Erlang		Aug-15	131472	114248	108000	31342	40000	39365
	b) Total traffic in TCBH in erlang (Avg.)		Aug-15	82951	100964	32853	16586	12325	32378
	c) Total no. of customers served (as per VLR) on last day of the month		Aug-15	2063910	2968145	883545	545323	397511	847458

TABLE: 4

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
	Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – August 15 month								
						GSM Operators			
Network Service Quality Parameter									
1	**Network Availability**								
	a) Total no. of BTSs in the licensed service area		Live data	2143	2824	1162	1110	831	1554
	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	1306.96	240.34	1414.00	559.24	350.00	264.96
	c) BTS Accumulated Downtime	<=2%	Live data	0.85%	0.12%	1.69%	0.70%	0.58%	0.24%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	8	0	0	0	0	2
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.37%	0.00%	0.00%	0.00%	0.00%	0.13%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	96.56%	98.27%	96.28%	98.49%	99.63%	97.94%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.58%	0.50%	0.47%	0.17%	0.01%	0.03%
	c) TCH congestion	<=2%	Live data	**2.61%**	0.32%	1.60%	1.08%	0.04%	0.66%
3	**Connection Maintenance (Retainability)**								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.54%	0.55%	1.66%	1.69%	0.40%	0.84%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	**13.31%**	1.43%	2.29%	2.36%	0.03%	2.86%
	c) % of connections with good voice quality	>=95%	Live data	**94.66%**	97.69%	98.22%	96.90%	98.71%	98.16%
	d)Total No. of cells exceeding 3% TCH drop (call drop)		Live data	851	121	79	79	1	134
	e) Total no. of cells (Sector) in the licensed service area		Live data	6397	8449	3453	3329	2489	4690
4	**No. of POI's having >=0.5% POI congestion**								
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0

TABLE: 5

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
	Detailed Network Data Assessment of Cellular Mobile Telephone Services- J&K Circle - September 15 month								
						GSM Operators			
Network Service Quality Parameter									
1	**Network Availability**								
	a) Total no. of BTSs in the licensed service area		Sep-15	2165	2807	1154	1110	829	1565
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Sep-15	16342.01	2516.06	12751.00	4216.77	2888.28	2013.92
	c) BTS Accumulated Downtime	<=2%	Sep-15	1.05%	0.12%	1.53%	0.53%	0.48%	0.18%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Sep-15	146	5	19	20	12	11
	e) Worst affected BTSs due to downtime	<=2%	Sep-15	**6.74%**	0.18%	1.65%	1.80%	1.45%	0.70%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	Sep-15	97.69%	97.20%	96.20%	97.96%	99.65%	99.01%
	b) SDCCH/PAGING Congestion	<=1%	Sep-15	0.46%	0.38%	0.41%	0.17%	0.01%	0.02%
	c) TCH congestion	<=2%	Sep-15	1.63%	0.42%	1.41%	1.55%	0.04%	0.99%
3	**Connection Maintenance (Retainability)**								
	a) Call Drop Rate (CDR)	<=2%	Sep-15	1.54%	0.58%	1.49%	1.64%	0.39%	0.83%
	b) Worst affected cells>3% TCH drop	<=3%	Sep-15	**14.41%**	1.81%	2.03%	2.40%	0.02%	2.84%
	c) % of connections with good voice quality	>=95%	Sep-15	95.28%	97.79%	98.25%	96.77%	98.80%	98.44%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Sep-15	924	152	70	80	1	134
	e) Total no. of cells (Sector) in the licensed service area		Sep-15	6412	8413	3435	3329	2483	4712
4	**No. of POI's having >=0.5% POI congestion**								
	No. of POI's having >=0.5% POI congestion		Sep-15	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Sep-15	0	0	0	0	0	0
5	**Network Data**								
	a) Equipped Capacity of Network in Erlang		Sep-15	131928	113587	108000	32120	40000	39085
	b) Total traffic in TCBH in erlang (Avg.)		Sep-15	79479	98495	32134	18492	12433	34058
	c) Total no. of customers served (as per VLR) on last day of the month		Sep-15	2078506	2672220	846140	561446	407147	859360

TABLE: 6

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - J&K Circle – Sept. 15 month									
						GSM Operators			
Network Service Quality Parameter									
1	**Network Availability**								
	a) Total no. of BTSs in the licensed service area		Live data	2148	2825	1154	1110	829	1565
	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	1361.26	142.36	1414.00	263.88	280.00	272.67
	c) BTS Accumulated Downtime	<=2%	Live data	0.88%	0.07%	1.70%	0.33%	0.47%	0.24%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	5	0	0	1	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.23%	0.00%	0.00%	0.09%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	95.37%	97.49%	96.37%	97.97%	99.66%	97.00%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.60%	0.55%	0.43%	0.28%	0.01%	0.06%
	c) TCH congestion	<=2%	Live data	**4.05%**	0.38%	1.48%	1.54%	0.04%	1.65%
3	**Connection Maintenance (Retainability)**								
	a) Call Drop Rate (CDR)	<=2%	Live data	1.28%	0.57%	1.53%	1.80%	0.40%	0.85%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	**10.74%**	1.72%	2.19%	2.30%	0.01%	2.80%
	c) % of connections with good voice quality	>=95%	Live data	**94.53%**	97.70%	98.25%	96.58%	98.79%	98.44%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	680	145	75	77	0	132
	e) Total no. of cells (Sector) in the licensed service area		Live data	6333	8446	3435	3329	2483	4712
4	**No. of POI's having >=0.5% POI congestion**								
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0

CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS-QE SEPT.15:

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 2015									
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		J&K	331547	344619	819962	94407	90114	157451
	B) No. of bills disputed including billing complaints during the quarter		J&K	4	20	377	20	81	63
	C)% of billing complaints during the quarter	<= 0.1%	J&K	**0.001%**	**0.01%**	**0.05%**	**0.02%**	**0.09%**	**0.04%**
	Metering & Billing Credibility -Pre Paid								
2	A) Total No. of Pre-paid customers at the end of the quarter		J&K	2405540	3190655	925965	551517	795599	1161468
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		J&K	29	68	272	146	710	803
	C) % of Pre-paid Charging Complaints	<= 0.1%	J&K	**0.001%**	**0.002%**	**0.03%**	**0.03%**	**0.09%**	**0.07%**
	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		J&K	33	88	649	1115	791	866
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		J&K	33	88	649	1115	791	866
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		J&K	33	88	649	1115	791	866
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	J&K	**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	J&K	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	J&K	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

	QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 2015								
	Quarterly CSD Audit Data	**Bench- mark**	**Circle Name**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM GSM**	**VODAFONE**
S/ N	**Name of Parameter**			**GSM Operators**					
4	**Response time to customers for assistance**								
	A) Total no of calls attempted to customer care/Call center		J&K	16164580	3752365	164963	1670824	942478	2956248
	B) Total no. of calls successfully established to customer care/Call center.		J&K	15491649	3751954	164963	1629305	924818	2956248
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	J&K	**95.84%**	**99.99%**	**100.00%**	**97.52%**	**98.13%**	**100.00%**
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		J&K	2116218	2325830	396356	504379	529292	859007
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		J&K	1963259	2144653	304444	500806	353131	851568
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	J&K	**92.77%**	**92.21%**	**76.81%**	**99.29%**	**66.72%**	**99.13%**
5	**Termination/closure of service**								
	A) Total No. of requests for Termination / Closure of service received during the quarter		J&K	2558	1413	675	1033	625	859
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		J&K	2514	1413	675	1033	625	859
	C) % of Termination/ Closure of service within 7 days	<=7days	J&K	**98.28%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
6	**Time taken for refunds of deposits after closures.**								
	A) No. of Payments/ Refunds due during the quarter		J&K	623	191	510	333	173	550
	B) No. of Payments/ Refunds Cleared during the quarter		J&K	623	191	510	333	173	550
	C) Time taken for refunds of deposits after closures.	100% within 60 days	J&K	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

NB: Calculation for the parameter "Accessibility of call center / Customer care" of RCOM GSM are based on two month average data i.e. August 15 & September 15 as July 15 month data were not provided by RCOM GSM due to TTI server issue.

5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE - JUNE 2015):

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE – SEPTEMBER 15									
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	493672	58768	6028	17960	577	84904
	B) Total no. of calls successfully established to customer care/Call center.		J&K	481479	58768	6028	17718	575	84904
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	J&K	97.53%	100.00%	100.00%	98.65%	99.65%	100.00%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		J&K	77452	86347	13026	17960	27648	26596
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		J&K	75876	60008	6743	17691	24150	26417
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	J&K	97.97%	69.50%	51.77%	98.50%	87.35%	99.33%

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 <=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%. However, **Aircel, Airtel, BSNL and RCOM GSM** have failed to meet the benchmark of **'Calls answered by Operators (voice to voice)' within 90 seconds** with their performance as **92.77%, 92.21%, 76.81% and 66.72%** respectively**. The performance of BSNL and RCOM GSM was way below the benchmark of > 95%.**

4. *Termination/Closure of Service*

In case of this parameters also, all service providers except Aircel, have settled 100% closures within 7 days. The performance of **Aircel** was **98.28%.**

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), Airtel, BSNL and RCOM (GSM)** could not meet the benchmark with their performance as **69.50%, 51.77%** and **87.35% respectively.**

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%	100%	100%	100%	100%
AIRTEL	J&K	100%	----	100%	100%	100%	100%
BSNL	J&K	100%	100%	----	100%	100%	100%
IDEA	J&K	100%	100%	100%	----	100%	100%
RCOM GSM	J&K	100%	100%	100%	100%	-----	100%
VODAFONE	J&K	100%	100%	100%	100%	100%	----

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory as there was no 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	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total calls successfully established * 100 / Total call attempts)	J&K	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	J&K	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	J&K	95	100	72	100	92	97
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total calls attempts)	J&K	95.00%	100.00%	72.00%	100.00%	92.00%	97.00%

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, Idea, RCOM (GSM) & Vodafone could connect 95.00%, 100.00%, **72.00%,** 100.00%, **92.00%** and 97.00% of calls respectively to the operator within 90 Seconds.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

Performance (live calling for billing complaints)							
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	VODAFONE
Total No. of calls Attempted	J&K	33	88	120	125	125	130
Total No. of calls Answered	J&K	30	76	100	112	100	100
Cases resolved within 4 weeks	J&K	30	76	100	112	100	100
%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 for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, some of the customers did not attend the calls, so shortfall was made good by taking other complaints to make verification of 100 Complaints. However, most of the customers reported their satisfaction on resolution of the billing complaints

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING											
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
July'15	J&K	Rajouri	Poonch	**100 101 102**	10	√	√	√	√	√	NC
			Rajouri	**100 101 102**	10	√	√	√	√	√	√
			Kalakot	**100 101 102**	10	√	√	√	NC	√	NC
			Nowshera	**100 101 102**	20	√	√	√	√	√	√
August'15	J&K	Udhampur	Udhampur	**100 101 102**	10	√	√	√	√	√	√
			Doda	**100 101 102**	10	√	√	√	NC	√	√
			Bhaderwah	**100 101 102**	10	√	√	√	NC	√	√
			Ramban	**100 101 102**	20	√	√	√	√	√	√
Sep'15	J&K	Jammu	Jammu	**100 101 102**	10	√	√	√	√	√	√
			Akhnoor	**100 101 102**	10	√	√	√	√	√	√
			Samba	**100 101 102**	10	√	√	√	√	√	√
			Kathua	**100 101 102**	10	√	√	√	√	√	√
			Basholi	**100 101 102**	10	√	√	√	NC	√	√

NC: No Coverage
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.

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 three SSA's namely **Rajouri, Udhampur and Jammu** in the months of July, August and September 2015 respectively. The total route Kms covered during the drive tests in respective SSAs was **305 KMs, 302 KMs and 303 KMs**. 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: RAJOURI SSA (JULY-15)

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	HOTEL ASHRIWAD	240	30	261	30	142	30	64	30	76	30	78	30
		Highway	KHANPLAZA SURANKOT	151	30	166	30	110	30	164	30	97	30	90	30
		Within City	HOTEL CITY NOWSHERA	68	30	53	30	47	30	78	30	74	30	58	30
		Overall SSA		459	90	480	90	299	90	306	90	247	90	226	90
2	Blocked Call Rate	Major Road	HOTEL ASHRIWAD	0.00%	0.00%	0.38%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	KHANPLAZA SURANKOT	0.00%	0.00%	0.00%	0.00%	3.64%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	HOTEL CITY NOWSHERA	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.72%	0.00%
		Overall SSA		0.00%	0.00%	0.21%	0.00%	2.34%	0.00%	0.33%	0.00%	0.00%	0.00%	0.44%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	HOTEL ASHRIWAD	0.00%	0.00%	0.00%	0.00%	2.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	KHANPLAZA SURANKOT	0.00%	0.00%	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	0.00%	0.00%	1.11%	0.00%
		Within City	HOTEL CITY NOWSHERA	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		0.00%	0.00%	0.00%	0.00%	1.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%
4	**Percentage connections with good voice quality (=>95%)**														
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Road	HOTEL ASHRIWAD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	KHANPLAZA SURANKOT	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Within City	HOTEL CITY NOWSHERA	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

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
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	HOTEL ASHRIWAD	96.84%	97.13%	97.89%	99.61%	94.24%	94.68%	99.60%	99.59%	96.35%	97.64%	98.79%	99.69%
		Highway	KHANPLAZA SURANKOT	96.91%	99.61%	97.63%	99.21%	94.71%	97.29%	98.78%	100.00%	97.22%	97.59%	98.82%	99.53%
		Within City	HOTEL CITY NOWSHERA	96.62%	99.60%	98.34%	99.61%	93.59%	95.12%	98.83%	98.48%	96.07%	98.02%	99.31%	99.86%
		Overall SSA		96.84%	98.78%	97.85%	99.48%	94.27%	95.64%	99.04%	99.50%	96.67%	97.75%	98.94%	99.69%
5	**Service Coverage**														
	In door (>= -75dBm)	Major Road	HOTEL ASHRIWAD	80.56%	100%	34.39%	99.96%	52.43%	99.68%	15.73%	96.92%	33.58%	24.90%	38.53%	95.16%
		Highway	KHANPLAZA SURANKOT	84.00%	100%	35.77%	28.78%	53.41%	99.26%	10.56%	97.88%	33.40%	98.12%	54.64%	99.92%
		Within City	HOTEL CITY NOWSHERA	87.32%	99.64%	42.60%	63.98%	73.06%	98.05%	10.78%	11.35%	33.95%	52.34%	55.00%	96.17%
		Overall SSA		82.58%	99.88%	35.84%	63.98%	56.46%	99.05%	12.14%	78.30%	33.58%	57.58%	49.12%	97.06%
	In-vehicle (>= -85dBm)	Major Road	HOTEL ASHRIWAD	95.38%	100%	79.66%	100%	72.34%	100%	27.57%	100%	73.50%	94.50%	72.62%	99.95%
		Highway	KHANPLAZA SURANKOT	96.56%	100%	81.95%	100%	71.34%	99.97%	23.63%	100%	65.14%	99.83%	82.78%	100%
		Within City	HOTEL CITY NOWSHERA	96.13%	100%	93.73%	100%	94.73%	100%	25.29%	85.11%	75.71%	94.50%	82.98%	99.70%
		Overall SSA		95.90%	100%	82.11%	100%	76.06%	99.99%	25.24%	96.69%	70.48%	96.19%	79.29%	99.88%
	Outdoor- in city (>= -95dBm)	Major Road	HOTEL ASHRIWAD	99.55%	100%	99.65%	100%	91.52%	100%	85.36%	100%	92.73%	100%	95.24%	100%
		Highway	KHANPLAZA SURANKOT	99.87%	100%	99.66%	100%	89.00%	100%	83.99%	100%	91.78%	100%	97.76%	100%
		Within City	HOTEL CITY NOWSHERA	97.80%	100%	99.92%	100%	100%	100%	85.18%	100%	95.92%	100%	96.40%	100%
		Overall SSA		99.47%	100%	99.68%	100%	92.25%	100%	84.71%	100%	92.95%	100%	96.54%	100%
6	Call Setup Success Rate (>=95%)	Major Road	HOTEL ASHRIWAD	100%	100%	99.62%	100%	97.89%	100%	100%	100%	100%	100%	100%	100%
		Highway	KHANPLAZA SURANKOT	100%	100%	100%	100%	96.36%	100%	99.39%	100%	100%	100%	100%	100%
		Within City	HOTEL CITY NOWSHERA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.28%	100%

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
		Overall SSA		**100%**	**100%**	**99.79%**	**100%**	**97.66%**	**100%**	**99.67%**	**100%**	**100%**	**100%**	**99.56%**	**100%**
7	**Hand Over Success Rate (HOSR)**	Major Road	HOTEL ASHRIWAD	99.74%	100%	100%	100%	98.01%	100%	100%	100%	100%	100%	100%	100%
		Highway	KHANPLAZA SURANKOT	99.64%	100%	100%	100%	98.19%	100%	100%	100%	98.33%	100%	100%	100%
		Within City	HOTEL CITY NOWSHERA	99.25%	100%	100%	100%	98.57%	98.46%	100%	100%	100%	100%	100%	100%
		Overall SSA		**99.63%**	**100%**	**100%**	**100%**	**98.17%**	**98.46%**	**100%**	**100%**	**99.55%**	**100%**	**100%**	**100%**

- NA-Not Applicable

- The service Providers having block call rate more than 3% have been shaded in yellow colour.

7.2 OPERATOR ASSISTED DRIVE TEST: UDHAMPUR SSA (AUGUST-15)

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	TOURIST DHABA KUD	171	30	195	30	226	30	90	30	92	30	143	30
		Highway	KHANPLAZA DODA	109	30	106	30	124	30	69	ND	115	30	101	30
		Within City	SHARMA RESTAURANT CHENANI	26	30	29	30	45	30	24	30	54	30	24	30
		Overall SSA		**306**	**90**	**330**	**90**	**395**	**90**	**183**	**60**	**261**	**90**	**268**	**90**
2	Blocked Call Rate	Major Road	TOURIST DHABA KUD	0.58%	0.00%	0.00%	0.00%	2.21%	0.00%	1.11%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	KHANPLAZA DODA	0.00%	0.00%	0.00%	0.00%	2.42%	0.00%	0.00%	ND	0.00%	0.00%	0.99%	0.00%
		Within City	SHARMA RESTAURANT CHENANI	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		**0.33%**	**0.00%**	**0.00%**	**0.00%**	**2.03%**	**0.00%**	**0.55%**	**0.00%**	**0.00%**	**0.00%**	**0.37%**	**0.00%**
3	Dropped Call Rate (<=2%)	Major Road	TOURIST DHABA KUD	0.00%	0.00%	0.00%	0.00%	2.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	KHANPLAZA DODA	0.00%	0.00%	0.00%	0.00%	2.48%	0.00%	0.00%	ND	0.00%	0.00%	0.00%	0.00%
		Within City	SHARMA RESTAURANT CHENANI	3.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA		**0.33%**	**0.00%**	**0.00%**	**0.00%**	**2.07%**	**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 Operators)	Major Road	TOURIST DHABA KUD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	KHANPLAZA DODA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Within City	SHARMA RESTAURANT CHENANI	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
		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	TOURIST DHABA KUD	95.43%	99.62%	97.64%	100.00%	94.72%	96.84%	97.65%	99.61%	95.85%	98.70%	97.89%	99.75%
		Highway	KHANPLAZA DODA	95.89%	96.90%	98.08%	100.00%	95.85%	96.97%	98.20%	ND	96.40%	98.41%	97.82%	99.38%
		Within City	SHARMA RESTAURANT CHENANI	96.61%	98.09%	98.49%	99.61%	93.43%	96.09%	68.24%	100.00%	95.88%	97.56%	98.19%	99.18%
		Overall SSA		95.70%	98.21%	97.92%	99.86%	94.89%	96.63%	92.18%	99.80%	96.06%	98.24%	97.89%	99.44%
5	**Service Coverage**														
	In door (>= -75dBm)	Major Road	TOURIST DHABA KUD	67.03%	100%	72.90%	100%	58.10%	94.68%	12.99%	21.43%	36.13%	29.35%	48.18%	89.12%
		Highway	KHANPLAZA DODA	73.32%	100%	79.17%	100%	57.72%	93.56%	12.04%	ND	31.20%	52.35%	44.10%	82.40%
		Within City	SHARMA RESTAURANT CHENANI	90.17%	100%	98.33%	100%	59.48%	88.05%	9.28%	100%	47.55%	52.45%	74.53%	52.19%
		Overall SSA		71.28%	100%	78.89%	100%	58.16%	92.08%	11.93%	61.88%	37.17%	44.62%	49.07%	74.61%
	In-vehicle (>= -85dBm)	Major Road	TOURIST DHABA KUD	88.46%	100%	86.05%	100%	66.32%	99.45%	33.53%	96.24%	65.96%	97.87%	79.31%	93.63%
		Highway	KHANPLAZA DODA	90.21%	100%	91.12%	100%	69.44%	99.97%	26.68%	ND	62.06%	98.11%	74.42%	99.81%
		Within City	SHARMA RESTAURANT CHENANI	97.95%	100%	99.93%	100%	90.51%	99.23%	24.16%	100%	75.07%	98.03%	96.63%	96.89%
		Overall SSA		89.89%	100%	89.83%	100%	70.27%	99.55%	29.03%	98.18%	66.80%	98.00%	79.05%	96.76%
	Outdoor- in city (>= -95dBm)	Major Road	TOURIST DHABA KUD	98.98%	100%	96.95%	100%	94.91%	100%	87.01%	99.62%	98.63%	100%	96.57%	100%
		Highway	KHANPLAZA DODA	98.89%	100%	98.79%	100%	93.85%	100%	85.46%	ND	98.40%	100%	94.72%	100%
		Within City	SHARMA RESTAURANT CHENANI	99.97%	100%	100%	100%	99.95%	100%	84.85%	100%	98.41%	100%	99.98%	99.84%
		Overall SSA		99.03%	100%	98.01%	100%	95.22%	100%	85.98%	99.82%	98.49%	100%	96.18%	99.95%

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	TOURIST DHABA KUD	99.42%	100%	100%	100%	97.79%	100%	98.89%	100%	100%	100%	100%	100%
		Highway	KHANPLAZA DODA	100%	100%	100%	100%	97.58%	100%	100%	ND	100%	100%	99.01%	100%
		Within City	SHARMA RESTAURANT CHENANI	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA		**99.67%**	**100%**	**100%**	**100%**	**97.97%**	**100%**	**99.45%**	**100%**	**100%**	**100%**	**99.63%**	**100%**
7	Hand Over Success Rate (HOSR)	Major Road	TOURIST DHABA KUD	99.62%	100%	100%	100%	96.15%	100%	100%	100%	100%	100%	99.62%	100%
		Highway	KHANPLAZA DODA	100%	100%	100%	100%	96.97%	100%	100%	100%	100%	100%	98.74%	100%
		Within City	SHARMA RESTAURANT CHENANI	100%	100%	100%	100%	97.87%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA		**99.81%**	**100%**	**100%**	**100%**	**96.71%**	**100%**	**100%**	**100%**	**100%**	**100%**	**99.38%**	**100%**

- **NA-Not Applicable**

7.3 OPERATOR ASSISTED DRIVE TEST: JAMMU SSA (SEPTEMBER-15)

DRIVE TEST TABLE – 3

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	KARAN NAGAR COMPLEX	168	30	215	30	160	30	106	30	102	30	129	30
		Highway	FAUJI DHABBA BARNAUTI	169	30	145	30	220	30	116	30	115	30	160	30
		Within City	RAJA DHABBA MAHANPUR	62	30	50	30	69	30	43	30	69	30	53	30
		Overall SSA		**399**	**90**	**410**	**90**	**449**	**90**	**265**	**90**	**286**	**90**	**342**	**90**
2	Blocked Call Rate	Major Road	KARAN NAGAR COMPLEX	0.00%	0.00%	0.47%	0.00%	2.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	FAUJI DHABBA BARNAUTI	0.59%	0.00%	0.69%	0.00%	2.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.63%	0.00%
		Within City	RAJA DHABBA MAHANPUR	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		**0.25%**	**0.00%**	**0.49%**	**0.00%**	**2.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.29%**	**0.00%**
3	Dropped Call Rate (<=2%)	Major Road	KARAN NAGAR COMPLEX	0.00%	0.00%	0.47%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	FAUJI DHABBA BARNAUTI	0.60%	0.00%	0.69%	0.00%	1.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	RAJA DHABBA MAHANPUR	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		**0.25%**	**0.00%**	**0.49%**	**0.00%**	**0.91%**	**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	KARAN NAGAR COMPLEX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Highway	FAUJI DHABBA BARNAUTI	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

S/N	Parameter (Operators)	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
		Within City	RAJA DHABBA MAHANPUR	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	KARAN NAGAR COMPLEX	98.41%	99.81%	96.15%	97.32%	92.20%	98.67%	95.88%	99.61%	96.62%	98.18%	96.10%	99.45%
		Highway	FAUJI DHABBA BARNAUTI	98.25%	97.86%	96.27%	97.31%	93.31%	99.78%	97.34%	100.00%	96.04%	97.86%	96.40%	99.73%
		Within City	RAJA DHABBA MAHANPUR	99.12%	98.09%	97.40%	100.00%	92.57%	99.42%	96.79%	99.60%	95.68%	97.04%	96.61%	98.20%
		Overall SSA		98.51%	98.73%	96.44%	98.21%	92.81%	99.29%	96.71%	99.74%	96.16%	97.71%	96.32%	99.12%
5	**Service Coverage**														
	In door (>= -75dBm)	Major Road	KARAN NAGAR COMPLEX	72.45%	61.77%	83.26%	100.00%	52.38%	100.00%	14.12%	48.52%	42.09%	94.46%	56.59%	92.01%
		Highway	FAUJI DHABBA BARNAUTI	84.31%	95.14%	78.66%	94.91%	51.80%	99.00%	11.28%	98.50%	43.21%	95.14%	47.72%	94.30%
		Within City	RAJA DHABBA MAHANPUR	90.50%	100.00%	84.89%	96.15%	58.65%	79.70%	12.81%	99.64%	56.86%	75.13%	69.43%	10.55%
		Overall SSA		81.73%	82.94%	81.68%	97.03%	53.08%	92.91%	12.60%	82.29%	46.16%	88.71%	54.37%	65.42%
	In-vehicle (>= -85dBm)	Major Road	KARAN NAGAR COMPLEX	91.72%	99.93%	95.65%	100.00%	81.93%	100.00%	32.35%	56.67%	73.12%	99.52%	84.71%	99.60%
		Highway	FAUJI DHABBA BARNAUTI	94.45%	100.00%	92.69%	100.00%	86.97%	99.90%	30.15%	100.00%	78.44%	100.00%	78.72%	99.96%
		Within City	RAJA DHABBA MAHANPUR	97.35%	100.00%	93.01%	100.00%	89.60%	100.00%	29.59%	100.00%	83.65%	99.66%	90.16%	85.07%
		Overall SSA		94.20%	99.97%	93.91%	100.00%	85.64%	99.97%	30.82%	85.61%	77.70%	99.73%	82.72%	94.84%
	Outdoor- in city (>= -95dBm)	Major Road	KARAN NAGAR COMPLEX	99.74%	100.00%	99.62%	100.00%	95.71%	100.00%	86.78%	100.00%	91.22%	100.00%	98.24%	100.00%
		Highway	FAUJI DHABBA BARNAUTI	99.33%	100.00%	99.16%	100.00%	98.46%	100.00%	86.12%	100.00%	95.75%	100.00%	96.98%	100.00%
		Within City	RAJA DHABBA MAHANPUR	99.96%	100.00%	99.50%	100.00%	99.58%	100.00%	86.33%	100.00%	96.89%	100.00%	99.28%	100.00%
		Overall SSA		99.61%	100.00%	99.41%	100.00%	97.68%	100.00%	86.40%	100.00%	94.30%	100.00%	97.81%	100.00%
6	**Call Setup**	Major Road	KARAN NAGAR COMPLEX	100.00%	100.00%	99.53%	100.00%	97.50%	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	FAUJI DHABBA BARNAUTI	99.41%	100.00%	99.31%	100.00%	97.73%	100.00%	100.00%	100.00%	100.00%	100.00%	99.38%	100.00%
		Within City	RAJA DHABBA MAHANPUR	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		**99.75%**	**100.00%**	**99.51%**	**100.00%**	**98.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**99.71%**	**100.00%**
7	**Hand Over Success Rate (HOSR)**	Major Road	KARAN NAGAR COMPLEX	99.72%	100.00%	99.39%	100.00%	96.90%	100.00%	99.45%	100.00%	100.00%	100.00%	99.73%	100.00%
		Highway	FAUJI DHABBA BARNAUTI	100.00%	100.00%	99.49%	100.00%	96.64%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Within City	RAJA DHABBA MAHANPUR	100.00%	100.00%	98.92%	100.00%	97.04%	100.00%	100.00%	100.00%	100.00%	100.00%	99.28%	100.00%
		Overall SSA		**99.87%**	**100.00%**	**99.35%**	**100.00%**	**96.79%**	**100.00%**	**99.77%**	**100.00%**	**100.00%**	**100.00%**	**99.79%**	**100.00%**

- **NA-Not Applicable**

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

DRIVE TEST ROUTE OF JULY TO SEPTEMBER 2015 – 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
Rajaouri	July-15	Kalakot / Rajouri - 90Kms	Rajouri Sdca- Highway: Bhambla To Sunderbani ,Thanda Major Road: Siot Morh To Kalakot Highway To Rajouri City, Rajouri To Baba Gulam University With In City: Rajouri Bus Stand , Jawahar Nagar	Poonch – 90 Kms	Poonch Sdca- Major Road: Rajouri To Thanamandi Highway: Bufliazt To Dkg,Surenkot With In City: Ponch City , Bus Stand	Poonch / Nowshera- 125 Kms	Poonch,Chandak,Mandi ,Sathra,Jhulas,Kg Top, ,Mankote Mehnder,Dharglon, Bimber Gali,Manjakote,Gambhir Bhramna,Rajouri Dhangri,Kallar, Chityar,Chingus,Nariyan ,Anyatpur Nowshera
Udhampur	Aug-15	Udhampur / 102 Kms	Major Road- Domel Chowk To Tikri, Mand To Rehmbal Highway- Udhampur,Sarmilo,Chena ni To Kud,Patnitop With In City- Udhampur City To Slathia Chowk,Jheni Chowk	Bhaderwah / Doda – 110 Kms	Major Road- Patnitop ,Batote,Doda ,Assar Pull Doda Highway- Pull Doda To Bhaderwah Highway With In City- Bhaderwah City To Bus Stand	Ramban/ 90 Kms	Major Road- Batote ,Nashri To Pedda ,Chanderkot, Ramban Highway Highway- Ramban Maita , Kundi ,Patnitop With In City- Ramban City ,Bus Stand
Jammu	Sep-15	Jammu /Akhnoor – 106 Kms	Major Road- Satwari, Miransahib, Rspura Town, Suchetgar, Bakshi Nagar To Akhnoor Highway- Akhnoor, Kot Bhalwal To Barnai, Roop Nagar To Jammu With In City: Panjthirthi To Jain Bazar To Parade To Bus Stand	Samba /Kathua – 109 Kms	Major Road : Karannagar Bus Tand, Jewel, Satwari, Gangyal To Samba Highway- Samba To Chadwal To Kathua With In City- Katua City, Kathua Indsutrial Area	Basholi – 88 Kms	Major Road- Panjthirthi ,Sidhra ,Nagrota ,Bajalata ,Surinsar Highway: Mansar Highway, Ramkot, Phinter, Thara, Mandi With In City- Billawar City, Basholi City

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF RAJOURI SSA – JULY 15

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 / Rajouri	Poor Rx Level and Rx Quality Near Baba Gulam University Road.	Poonch	Poonch Sdca: Poor Rx Level and Rx Quality Near Bufliaz To Dkg.	Poonch / Nowshera	Poonch Sdca: Poor Rx Level and Rx Quality Near Mandi Area ,And Poonch To Mendhar Highway.
2	AIRTEL		Rajouri Sdca: Poor Rx Level and Rx Quality Near Baba Gulam University Road.		Poonch Sdca; Poor Coverage In Bufliaz To Dkg		Poonch Sdca: Poor Coverage In Mandi Area ,And Poonch To Mendhar Highway
3	BSNL		Rajouri Sdca : Bsnl Has Poor Coverage In Baba Gulam University		Poonch Sdca; Poor Rx Level and Rx Quality Near Bufliaz To Dkg.		Poonch Sdca: Poor Rx Level and Rx Quality Near Mandi Area and Poonch To Mendhar Highway.
4	IDEA		Kalakot Sdca : Poor Rx Level and Rx Quality Near Kalakot Road , Rajouri Sdca; Poor Coverage In Baba Gulam University Road.		Poonch Sdca; Poor Rx Level and Rx Quality Near Bufliaz To Dkg.		Poor Rx Level and Rx Quality Near Manjakot, Gambhir Brahmna, Muradpur.
5	RCOM GSM		Kalakot Sdca: Poor Rx Level and Rx Quality Near Kalakot Road , Rajouri Sdca: Reliance Has Poor Coverage From Rajouri City To Baba Gulam University Road.		Poor Rx Level and Rx Quality Between Kalai and Surankote City, In Thannmandi, Fatehpur.		Poor Rx Level and Rx Quality Between Lambheri and Dandesar, In Rajjal.
6	VODAFONE		Rajouri Sdca: Poor Rx Level and Rx Quality Near Baba Gulam University Road.		Poonch Sdca: Poor Rx Level and Rx Quality Near Bufliaz To Dkg.		Poonch Sdca:Poor Rx Level and Rx Quality NearMandi Area ,And Poonch To Mendhar Highway.

DRIVE TEST TABLE: 6
DRIVE TEST OBSERVATION OF UDHAMPUR SSA – AUGUST 15

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	Poor Rx Level and Rx Quality From Patnitop to Sanasar Road, Near Manthal, Poor Rx Quality From Manthal to Domel.	Doda / Bhaderwah	Poor Rx Quality from Patnitop to Batote Highway,Batote to Pull Doda.	Ramban / Udhampur	Poor Rx Quality from Batote to Chanderkot.
2	AIRTEL		Poor Rx Level and Rx Quality Near Nathatop,		Poor Rx Level and Rx Quality in Batote and Assar SDCA's.		Poor Rx Level and Rx Quality Near Batote and Chenani.
3	BSNL		Poor Rx Quality in all SDCA's Covered on Day-1.		Poor Rx Level and Rx Quality in Ramgarh and Assar.		Poor Rx Quality in Covered SDCA's on Day2.
4	IDEA		They Have Coverage in Major SDCA's with Poor Rx Level and Quality At Outer.		NO Coverage		Poor Rx Level and Rx Quality In Covered SDCA's.
5	RCOM GSM		Poor Rx Level and Rx Quality in Nathatop, Patnitop and Kud SDCA.		Poor Rx Level and Rx Quality Near Assar, Bhall, Baderwah City and Khelani.		Poor Rx Level and Rx Quality In Kud SDCA.
6	VODAFONE		Poor Rx Level and Rx Quality in Patnitop SDCA.		Poor Rx Level and Rx Quality Assar and Kora Pani.		They Have Coverage in Major SDCA's with Poor Rx Level and Quality At Outer.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF JAMMU SSA – SEPTEMBER 15

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	Akhnoor / Jammu	Poor Rx Quality In All Covered SDCA's on Day 1.	Samba / Kathua	Poor Rx Level and Rx Quality in Samba SDCA.	Basholi	Poor Rx Level and Rx Quality In All Covered SDCA on Day 3.
2	AIRTEL		Poor Rx Level and Rx Quality Near Malpura, Bern. Poor Rx Quality In Akhnoor, Chauna Patti and Jammu.		Poor Rx Quality Near Vijaypur, Baribrahmna.		Poor Rx Level and Rx Quality Near Nagrota, Mansar. Poor Rx Quality In All Covered SDCA's on Day 3.
3	BSNL		Poor Rx Quality In All Covered SDCA's on Day 1.		Poor Rx Quality In Jammu, Baribrahmna, Sansuha and Kathua.		Poor Rx Level and Rx Quality In All Covered SDCA on Day 3.
4	IDEA		Poor Rx Level and Rx Quality Near Kot Bhalwal, Kullian. Poor Rx Quality In All Covered SDCA's On Day 1.		Poor Rx Level and Rx Quality Near Dayala Chack, Barnauti, Kathua City, Chadwal,		They Have Coverage in Major SDCA's with Poor Rx Level and Quality At Outer.
5	RCOM GSM		Poor Rx Level and Rx Quality In All Covered SDCA on Day 1.		Overall Good Coverage and Quality In Covered SDCA's on Day 2.		Poor Rx Level and Rx Quality In All Covered SDCA on Day 3.
6	VODAFONE		Poor Rx Quality Near Chauna Patti, Akhnoor, RS Pura.		Poor Rx Quality Near Samba, Vijaypur.		They Have Coverage in Major SDCA's with Poor Rx Level and Quality At Outer.

DRIVE TEST TABLE: 8

NO NETWORK COVERAGE STATUS OF DRIVE TEST – JULY TO SEPT 15

Sr. No	Month of Drive Test	Circle	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
1	July'15	J&K	Voadfone	Rajouri	Poonch / Nowshera / Kalakot / Rajouri	Vodafone Has No Coverage In Kalakot SDCA, Poonch SDCA	No
			Aircel			None	No
			Airtel			None	No
			RCOM GSM			None	No
			Idea			Idea Has No Coverage In Kalakot SDCA	No
			BSNL			None	No
2	Aug '15	J&K	Voadfone	Udhampur	Ramban / Doda / Bhaderwah / Udhampur	None	No
			Aircel			None	No
			Airtel			None	No
			RCOM GSM			None	No
			Idea			Idea Has No Coverage In Doda And Bhaderwah SDCA.	No
			Bsnl			None	No
3	Sep '15	J&K	Voadfone	Jammu	Jammu / Akhnoor / Basholi / samba / Kathua	None	Vodafone is On ICR With Aircel In Basholi SDCA.
			Aircel			None	No
			Airtel			None	No
			RCOM GSM			None	No
			Idea			Idea Has No Coverage In Basholi SDCA.	No
			Bsnl			None	No

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 -15**, drive tests were conducted across **Rajouri SSA** covering Kalakot , Rajouri, Poonch and Nowshera SDCAs.The performance of all service providers was found satisfactory as they were in well compliance of all the benchmarks, except **BSNL** could not meet the benchmark of '**Voice quality'** with its performance as **94.27%** on SSA basis.

(ii) **In the Month of August-15**, drive tests were conducted across **Udhampur SSA** covering Udhampur , Bhaderwah , Doda and Ramban SDCAs. In this SSA also, the performance of the service providers was well within the norms except **BSNL** remained under performed for parameter **Voice Quality** and **CDR** with its achieved value as **94.89% and 2.07% respectively and Idea** remained under performed for parameter **Voice Quality** with its performance as **92.18%.**

(iii) **In the month of September -15**, drive tests were conducted across **Jammu SSA** covering Jammu , Akhnoor , Samba, Kathua and Basholi SDCAs. The service providers met the benchmarks of all the parameters on overall SSA level except **BSNL** failed to meet the benchmark of **Voice Quality** with its performance as **92.81%.**

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 and 7 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-8.

*Thus the results of drive tests indicate that most of the operators have performed fairly well within the benchmarks in the above SSAs except BSNL and Idea. BSNL could not perform up to the mark for parameter **Voice quality** in these SSAs and **Idea** remained under performed in Udhampur SSA.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)
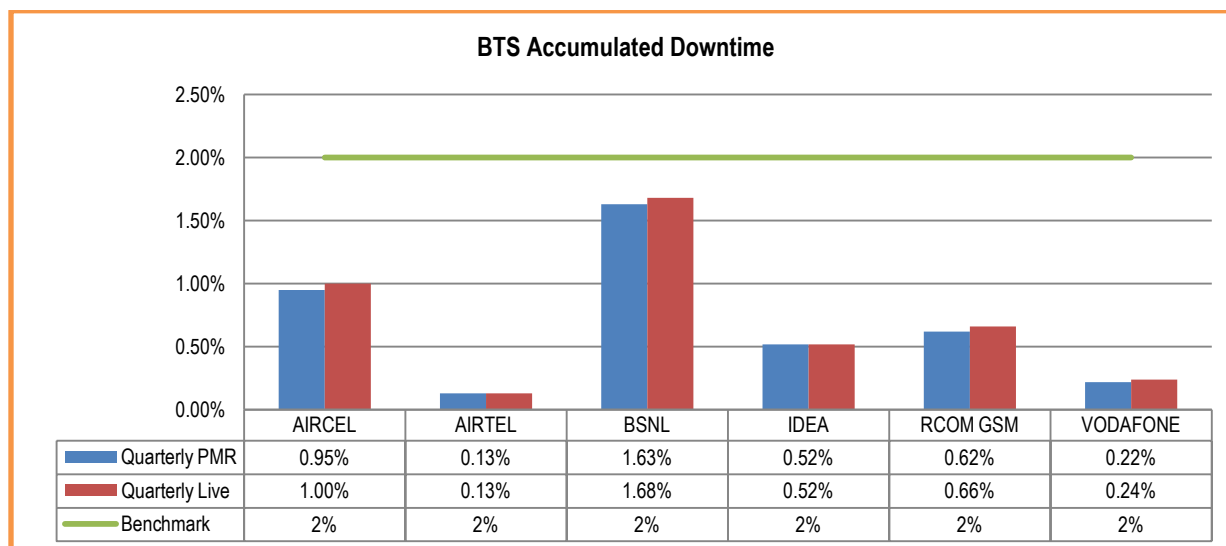
AVERAGED QUARTERLY PMR

V/S

AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT
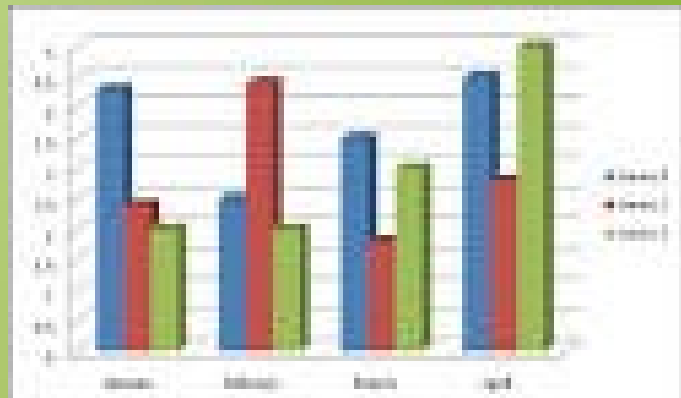
8. GRAPHICAL REPRESENTATION (CMTS):

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

1) BTS ACCUMULATED DOWNTIME :

BTS Accumulated Downtime

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	0.95%	0.13%	1.63%	0.52%	0.62%	0.22%
Quarterly Live	1.00%	0.13%	1.68%	0.52%	0.66%	0.24%
Benchmark	2%	2%	2%	2%	2%	2%

All operators are meeting the benchmarks..

2) WORST AFFECTED BTSS DUE TO DOWNTIME :

Worst affected BTSs due to downtime

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	4.00%	0.18%	1.67%	1.80%	1.45%	0.96%
Quarterly Live	0.33%	0.00%	0.00%	0.12%	0.00%	0.04%
Benchmark	2%	2%	2%	2%	2%	2%
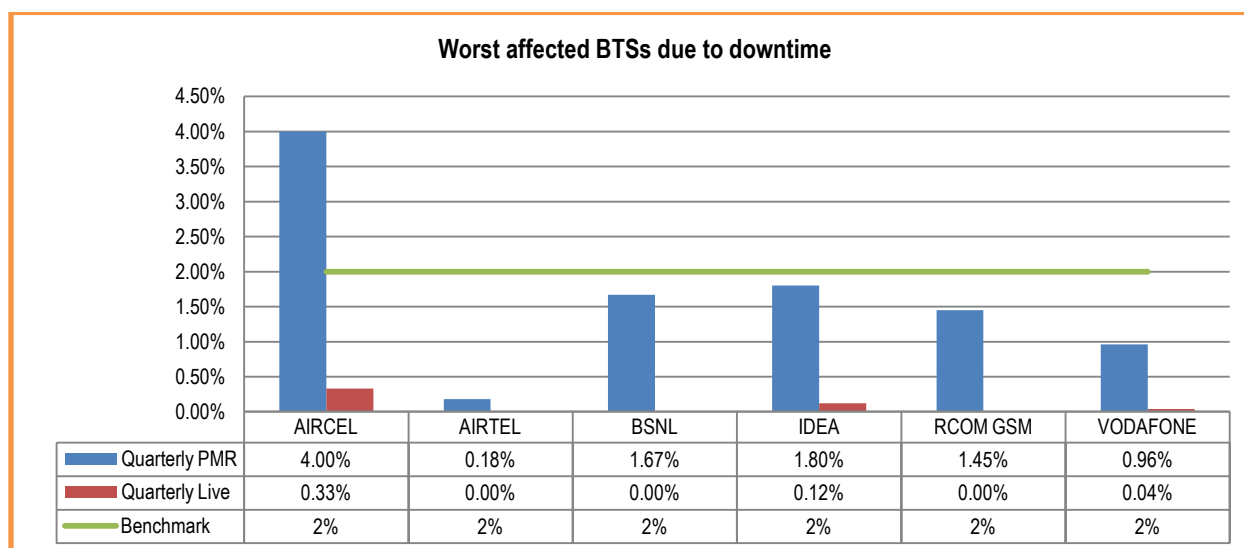
All operators are meeting the benchmarks except Aircel (during monthly PMR).

3) CALL SETUP SUCCESS RATE :

Call Setup Success Rate

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	96.92%	97.89%	96.25%	98.33%	99.57%	98.38%
Quarterly Live	95.97%	98.08%	96.28%	98.31%	99.60%	97.61%
Benchmark	95%	95%	95%	95%	95%	95%
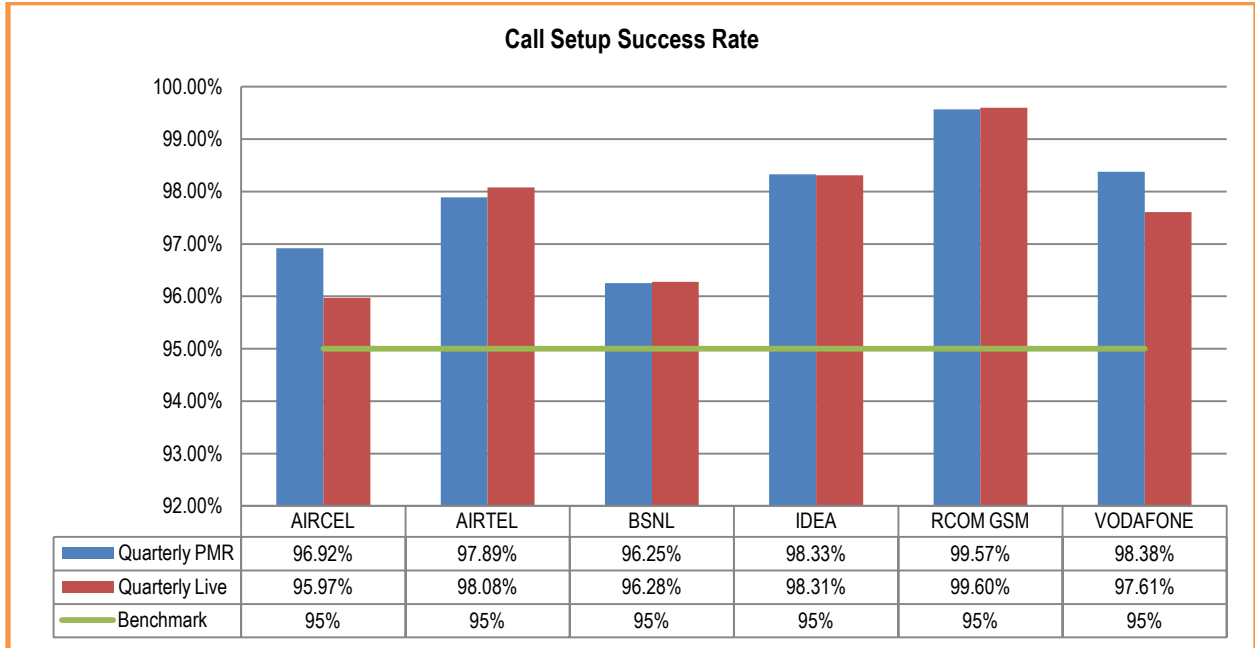
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION :

SDCCH/PAGING Channel Congestion

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	0.93%	0.43%	0.43%	0.16%	0.02%	0.04%
Quarterly Live	0.52%	0.46%	0.43%	0.19%	0.01%	0.06%
Benchmark	1%	1%	1%	1%	1%	1%
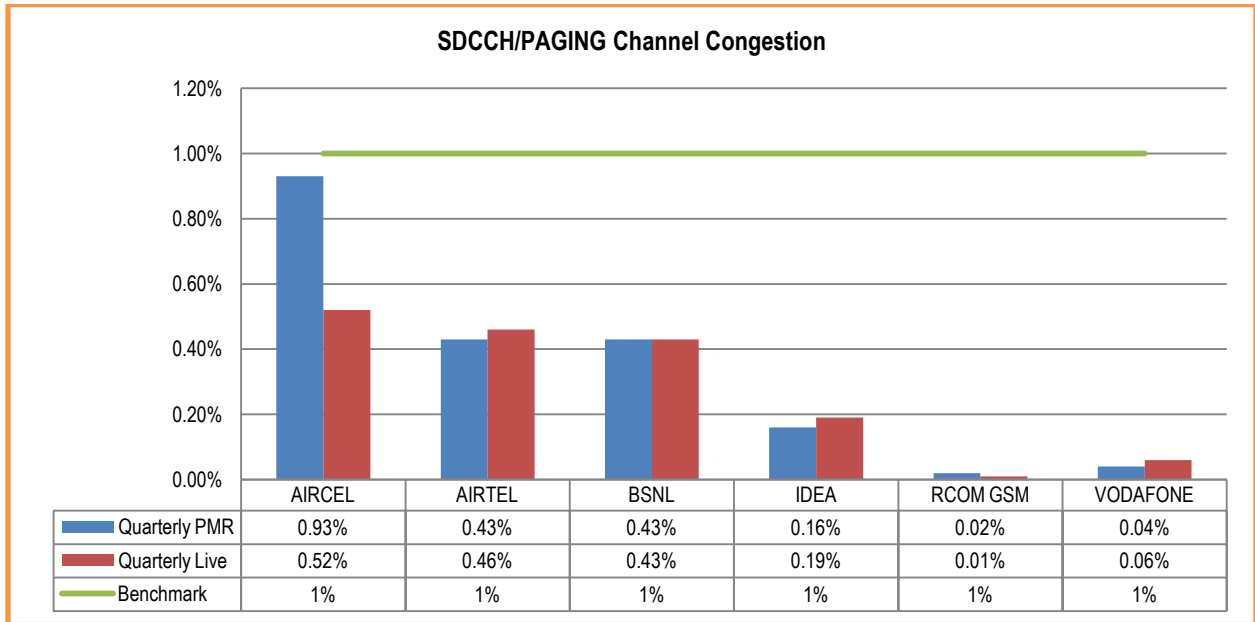
All operators are meeting the benchmarks.

5) TCH CONGESTION :

TCH Congestion

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	2.35%	0.41%	1.51%	1.23%	0.04%	0.73%
Quarterly Live	3.31%	0.34%	1.54%	1.25%	0.04%	1.06%
Benchmark	2%	2%	2%	2%	2%	2%
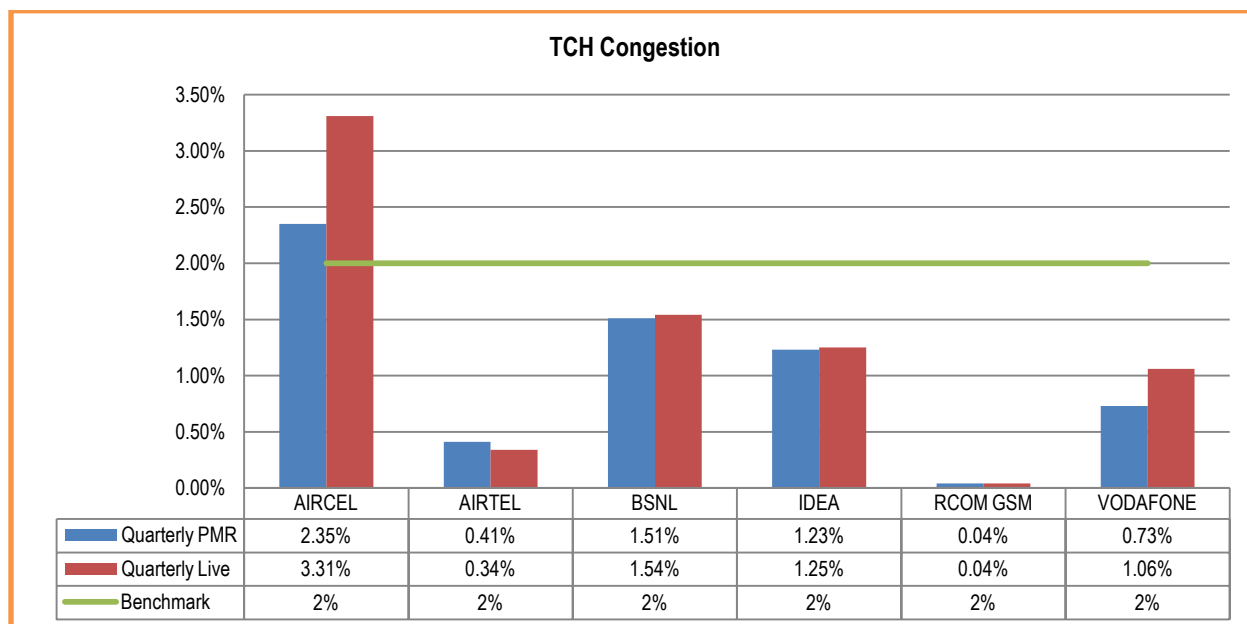
All operators are meeting the benchmarks except Aircel.

6) CALL DROP RATE :

Call Drop Rate

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	1.53%	0.57%	1.57%	1.67%	0.43%	0.80%
Quarterly Live	1.38%	0.57%	1.64%	1.71%	0.42%	0.86%
Benchmark	2%	2%	2%	2%	2%	2%
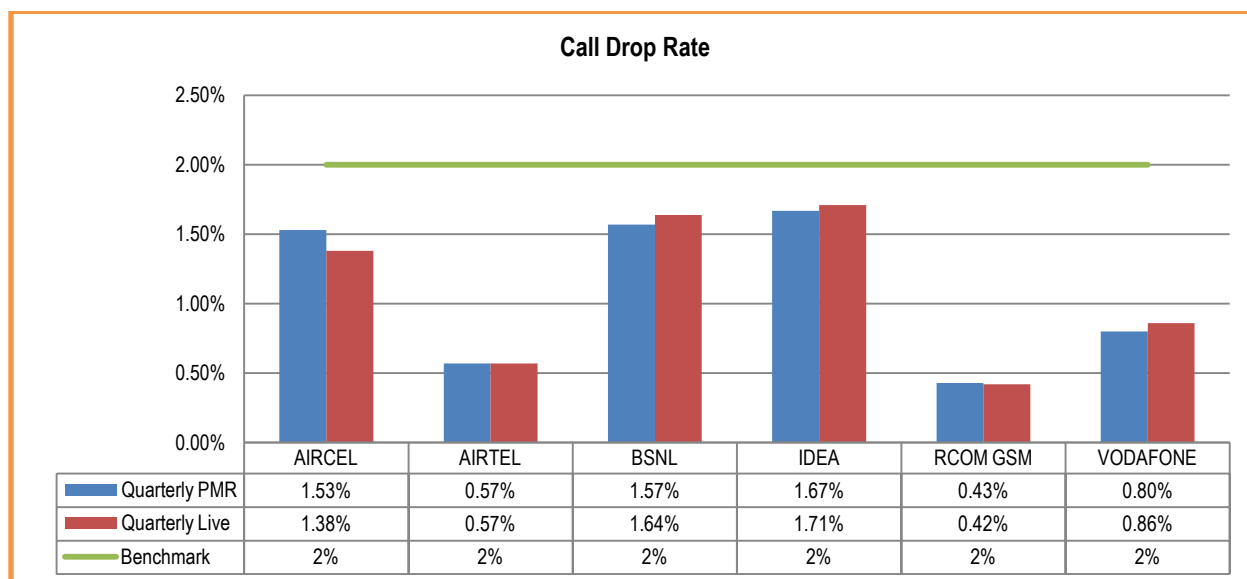
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP :

Worst affected cells>3% TCH drop

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	13.76%	1.64%	2.26%	2.28%	0.02%	2.85%
Quarterly Live	11.79%	1.61%	2.29%	2.36%	0.01%	2.85%
Benchmark	3%	3%	3%	3%	3%	3%
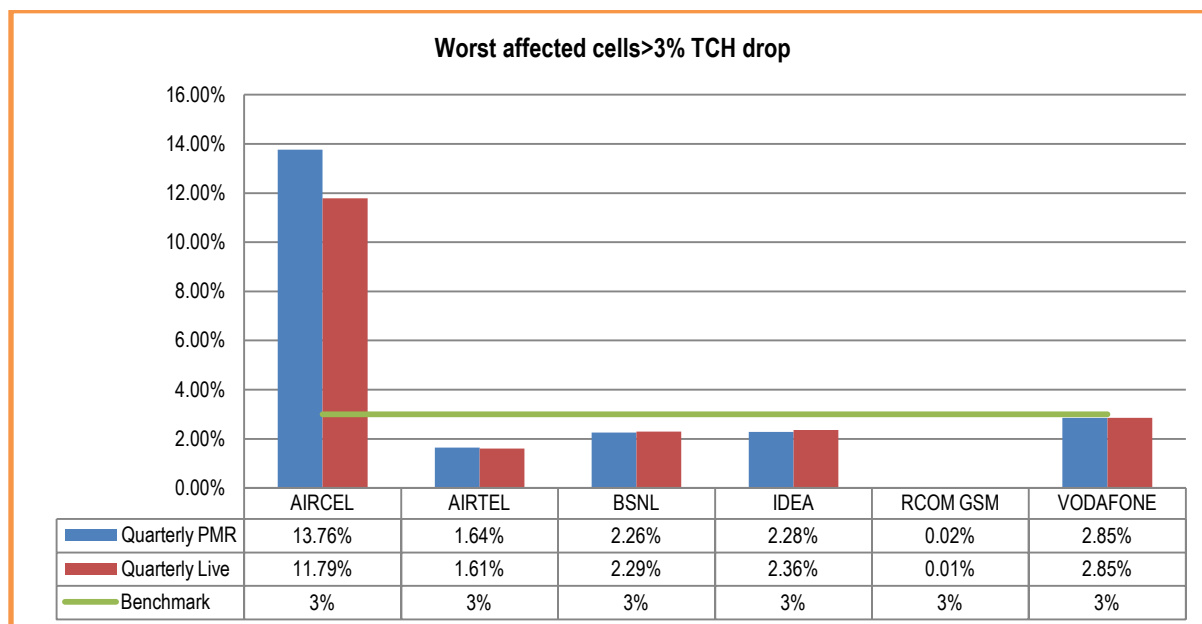
All operators are meeting the benchmarks except Aircel.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :

% Connections with good voice quality

	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
Quarterly PMR	94.87%	97.76%	98.26%	96.55%	98.74%	98.27%
Quarterly Live	94.65%	97.71%	98.21%	96.42%	98.74%	98.27%
Benchmark	95%	95%	95%	95%	95%	95%
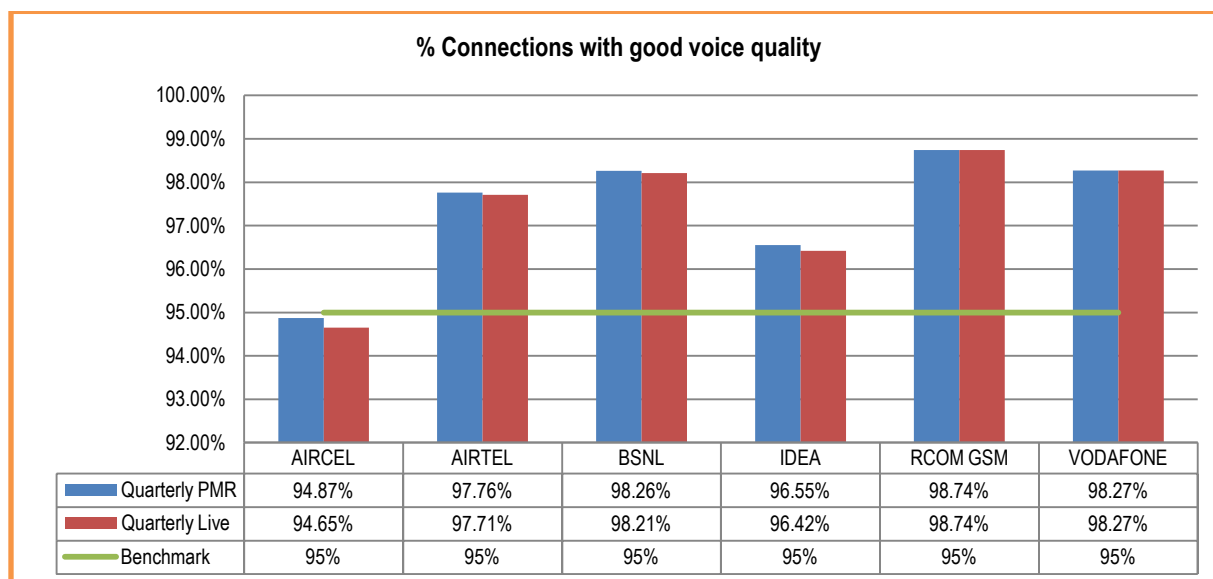
All operators are meeting the benchmarks expect Aircel.

9. PMR VERIFICATION TABLE:

(i) NETWORK RELATED PARAMETERS:

Name of Service Provider	Parameter	BTS Accumulated Downtime	Worst affected BTSs due to downtime	CSSR (Call Setup Success Rate)	SDCCH / PAGING Channel congestion	TCH congestion	CDR (Call Drop Rate)	Worst affected cells>3% TCH drop (Call drop) rate	Connections with good voice quality	No. of POI's having >=0.5% POI congestion
Benchmark		≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.5%
AIRCEL	Reported	0.93	5.63	96.92	0.64	2.35	1.53	13.76	94.87	0
	Verified	0.95%	4.00%	96.92%	0.93%	2.35%	1.53%	13.76%	94.87%	0
AIRTEL	Reported	0.13	0.18	98.12	0.45	0.40	0.57	1.59	97.75	0
	Verified	0.13%	0.18%	97.89%	0.43%	0.41%	0.57%	1.64%	97.76%	0
BSNL	Reported	1.61	1.67	96.25	0.43	1.51	1.57	2.25	98.26	0
	Verified	1.63%	1.67%	96.25%	0.43%	1.51%	1.57%	2.26%	98.26%	0
IDEA	Reported	0.52	1.80	98.33	0.10	0.94	1.11	2.28	96.55	0
	Verified	0.52%	1.80%	98.33%	0.16%	1.23%	1.67%	2.28%	96.55%	0
RCOM GSM	Reported	0.60	1.49	99.57	0.01	0.04	0.43	0.03	98.74	0
	Verified	0.62%	1.45%	99.57%	0.02%	0.04%	0.43%	0.02%	98.74%	0
VODAFONE	Reported	0.22	0.96	98.38	0.04	0.73	0.80	2.83	98.27	0
	Verified	0.22%	0.96%	98.38%	0.04%	0.73%	0.80%	2.85%	98.27%	0

➢ The above data is average for three months of the quarter ending September-2015
➢ The PMR data provided by the service providers is largely matching with verified (audited) data. However the variation in data has been indicated by yellow colour.
➢ Aircel has not met the benchmark for the parameters "Worst affected BTSs due to downtime", "TCH Congestion", "Worst affected cells>3% TCH drop (Call drop) rate" and "Connections with good voice quality".

(ii) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

Name of Service Provider	Parameter	Metering and billing credibility - post paid	Metering and billing credibility - pre paid	Resolution of billing / charging complaints	Resolution of billing / charging complaints	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 90 seconds	%age requests for Termination / Closure of service	Time taken for refund of deposits after closures
Benchmark		<= 0.1%	<= 0.1%	98% within 4 weeks	100% within 6 weeks	within 1 week of resolution of complaint	>=95%	≥ 95%	100% within <=7days	100% within 60 days
AIRCEL	Reported	0.00	0.00	100.00	100.00	100.00	95.84	92.77	98.28	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	95.84%	**92.77%**	**98.28%**	100.00%
AIRTEL	Reported	0.01	0.00	100.00	100.00	100.00	100.00	92.21	100.00	100.00
	Verified	0.01%	0.00%	100.00%	100.00%	100.00%	99.99%	**92.21%**	100.00%	100.00%
BSNL	Reported	0.05	0.01	100.00	100.00	100.00	100.00	82.00	100.00	100.00
	Verified	0.05%	0.03%	100.00%	100.00%	100.00%	100.00%	**76.81%**	100.00%	100.00%
IDEA	Reported	0.02	0.03	100.00	100.00	100.00	97.52	99.29	100.00	100.00
	Verified	0.02%	0.03%	100.00%	100.00%	100.00%	97.52%	99.29%	100.00%	100.00%
RCOM (GSM)	Reported	0.09	0.09	100.00	100.00	100.00	98.13	66.72	100.00	100.00
	Verified	0.09%	0.09%	100.00%	100.00%	100.00%	98.13%	**66.72%**	100.00%	100.00%
VODAFONE	Reported	0.00	0.00	100.00	100.00	100.00	100.00	99.13	100.00	100.00
	Verified	0.04%	0.07%	100.00%	100.00%	100.00%	100.00%	99.13%	100.00%	100.00%

➢ The above data is average for three months of the quarter ending September-2015.
➢ The PMR data provided by the service providers is largely matching with verified (audited) data. However the variation in data has been indicated by yellow colour.
➢ Aircel, Airtel, BSNL and RCOM GSM have not met the benchmark for the parameter "% call answered by operators (voice to voice) within 90 sec".
➢ Aircel has not met the benchmark for the parameter "%age requests for Termination / Closure of service".