



**Audit & Assessment of Quality of Service  
Of  
Cellular Mobile Telephone Service  
Basic Telephone Service (Wireline)  
&  
Broadband Service  
For  
Telecom Regulatory Authority of India  
West Zone – Madhya Pradesh & Chhattisgarh  
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 **MP&CG 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**





## **2. OBJECTIVES AND METHODOLOGY**

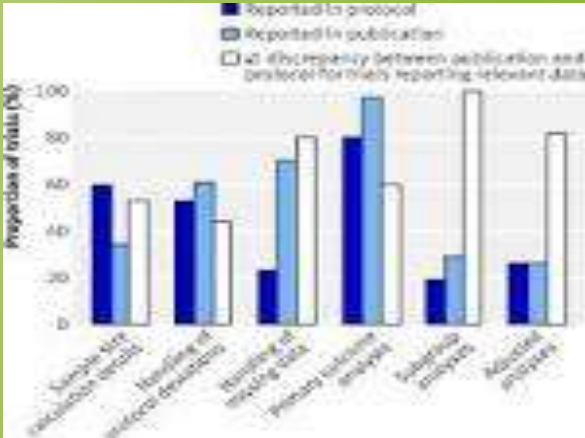
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for 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



### 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 MP&CG circle

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
GSM Operators		July -14	August -14	September -14	
1	AIRCEL	13-15 July-14	17-19 Aug-14	19-21 Sep -14	Dishnet Wireless LTD.Office No. 2 ,Ground Floor Chinnar Incube Business Center, Hoshangabad Road Bhopal M.P. 462023
2	AIRTEL	20-22 July-14	25-27 Aug-14	08-10 Sep -14	47-49 Electronics Complex, Pardeshipura, Indore(M.P.) 452010
3	BSNL(MP)	14-16 July-14	15-17 Aug -14	20-22 Sep -14	BSNL Bhawan,Near paryawas bhawan Bhopal
4	BSNL(CG)	15-17 July-14	21-23 Aug-14	25-27 Sep -14	SDE QoS CM, 2nd floor Auto exchange BSNL Exchange near Lala Ganga Complex GE Road Raipur.
5	VIDEOCON	21-23 July-14	16-18 Aug -14	23-25 Sep -14	Videocon Telecommunication Ltd. 2nd Floor Chinar Fortune City, Hoshangabad Road Bhopal (MP)
6	TATA GSM	20-22 July-14	16-18 Aug-14	22-24 Sep -14	3rd floor, Chinaar Business center, Chinaar Fortune City, Hoshangabad Road,Bhopal M.P. 462023
7	IDEA	21-23 July-14	26-28 Aug -14	09-11 Sep -14	139-140, Electronics Complex, Pardeshi Pura, Indore(M.P.) 452010
8	RCOM GSM	22-24 July-14	27-29 Aug -14	10-12 Sep -14	7th floor, Industry House, AB Road, Indore
9	VODAFONE	19-21 July-14	18-20 Aug -14	24-26 Sep -14	Vodafone Spacetel Ltd, 2nd Floor Center Point New Market TT Nagr , Bhopal 462001
CDMA Operators					
10	RCOM CDMA	14-16 July-14	20-22 Aug-14	10-12 Sep -14	Reliance communication ltd, MCN Suvindh Vihar, Asharam Tiraha, Gandhi nagar, Narsing garh Bypass Road, Bhopal (M.P.) 462036
11	TATA CDMA	20-22 July-14	16-18 Aug-14	22-24 Sep -14	3rd floor, Chinaar Business center, Chinaar Fortune City, Hoshangabad Road,Bhopal M.P. 462023

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

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

### 3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

The QoS audit for basic (wire line) service was to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. Out of **2537** in Madhya Pradesh (present no. of BSNL exchanges), audit was done for **119** sampled (30-Urban and 89-Rural) exchanges & in Chhattisgarh, out of **568** exchanges audit was done for **27** sampled (10 Urban and 17 Rural) exchanges. In case of Private Service provider's one exchange each of TTL & RCL and two exchanges of Bharti Airtel were covered for audit. As Madhya Pradesh Circle is having **244** SDCAs and Chhattisgarh Circle is having **96** SDCAs, so total 146 sampled BSNL exchanges spread over 35 (25 MP and 10 CG ) SDCAs, (10% of SDCAs in MP & CG) have been taken for audit. (**List of BSNL exchanges undertaken for QoS audit attached as Annex-1**)

### 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. Based on this criterion, **119** no. of BSNL (MP) PoPs i.e. 5% of 2386 BSNL (MP) PoPs / Exchanges and **28** no. of BSNL (CG) i.e. 5% of 559 BSNL (CG) PoPs / Exchanges, spread over 10% SDCAs have been taken for QoS audit. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

Discussion with the private broadband service providers revealed that there is no concept of their PoPs on SDCA basis; they are maintaining their entire data on centralized basis so audit has been done for the centralized data.

## **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 Service

(i) From **monthly audit**, it was concluded that on an average, performance of the operators in the MP&CG service area was satisfactory for **Network Parameters**. However, the audit with respect to the parameter **‘Worst affected cells having > 3% TCH drop’** revealed that **Tata (GSM), Vodafone and Tata (CDMA)** failed to meet the benchmark of this parameter with their quarterly average performance as **5.32%, 3.78% and 6.57%** respectively.

(ii) From three days live measurement/assessment, it was revealed that the performance of the operators was satisfactory as they have largely met the benchmarks except for the parameter **‘Worst affected cells> 3 % TCH drops’**, which could not be complied with by **Tata (GSM), BSNL (CG), Vodafone and Tata (CDMA)** in all the three months of the quarter. Their average performance for the quarter was **5.48%, 3.09%, 3.52% and 7.35 %** respectively. The similar non-complied performance of these operators was also observed during the monthly PMR audit.

BSNL (CG) also failed to achieve the benchmark very marginally for parameter CSSR (**94.90%**).

Thus, the assessment of QoS with regard to the parameter ‘Worst affected cells> 3 % TCH drops’ assessed during live measurement is a matter of concern for those operators who could not meet the benchmark.

(iii) With regard to the **Customer Service Quality Parameters**, it is revealed that all operators are in well compliance of the parameters on Metering and Billing Credibility, Termination of Service and Time taken for refunds. However, **RCOM (GSM), Vodafone and RCOM (CDMA)** have not met the benchmark for the parameter “**Billing complaints – Prepaid**” with their performance as **0.26%, 0.17% and 0.23%** respectively.

The compliance with respect to the parameter ‘**Calls answered by Operators (voice to voice)**’ was not met by **RCOM (GSM), Tata (GSM), Videocon and Tata (CDMA)** with their performance of **90.44%, 94.35%, 91.51% and 90.85%** respectively.

(iv) On analyzing the performance of service providers on the basis of **Drive tests**, it was concluded that the service providers **BSNL, RCOM(GSM)/(CDMA) and Idea** could not perform well on one or the other parameters namely ‘**Good Voice Quality**’, ‘**Call Drop rate**’ and ‘**CSSR**’. These service providers need to improve their networks in the interest of the consumers.

## 2. Basic (Wireline) Service

From analysis of QoS audit findings, it was concluded that the performance of **BSNL** was not satisfactory in respect of the parameters Fault Incidences, Fault Repairs, resolution of billing complaints (Postpaid) and Calls answered by Operator (Voice to voice). **TTL** also failed to meet the benchmarks of parameters Fault Incidences, Accessibility to Call Center and Calls answered by Operator (Voice to voice). Hence, **BSNL and TTL** need to improve their services in respect of these parameters.

## 3. Broadband service

From the audit findings, it was concluded that **BSNL** and **TCL** remained under performed for parameter **Fault Repairs**. Whereas **Tikona, BSNL** and **TTL** failed to meet the benchmark of parameter ‘**Calls answered by operators within 90 seconds**’ and **TCL** marginally lagged behind the benchmark of parameter ‘**Service availability/ Uptime**’. Hence, **BSNL and TCL** need to improve their services in respect of these parameters.

## **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	AIRTEL	Sept-14	20 Hrs-21 Hrs
2	AIRCEL	Sept-14	18 Hrs-19 Hrs
3	TATA GSM	Sept-14	20 Hrs-21 Hrs
4	BSNL (MP)	Sept-14	19 Hrs-20 Hrs
5	BSNL (CG)	Sept-14	19 Hrs-20 Hrs
6	IDEA CELLULAR	Sept-14	20 Hrs-21 Hrs
7	RCOM GSM	Sept-14	20 Hrs-21 Hrs
8	VIDEOCON	Sept-14	20 Hrs-21 Hrs
9	VODAFONE	Sept-14	19 Hrs-20 Hrs
<b>CDMA Operators</b>			
10	RCOM CDMA	Sept-14	20 Hrs-21 Hrs
11	TATA CDMA	Sept-14	20 Hrs-21 Hrs

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the MP&CG 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	AIRTEL	18	145	9299	NSN	NSN
2	AIRCEL	1	1	128	Huawei	Huawei
3	TATA GSM	4	26	2888	Huawei	Huawei
4	BSNL (MP)	9	88	3610	Alcatel	Alcatel
5	BSNL (CG)	5	44	1805	Alcatel	Alcatel
6	IDEA CELLULAR	33	73	9481	Ericsson	Ericsson
7	RCOM GSM	12	49	3988	Huawei, Ericsson	ZTE, Alcatel Lucent
8	VIDEOCON	1	10	1557	Huawei	Huawei
9	VODAFONE	7	49	5365	NSN	NSN
<b>CDMA Operators</b>						
10	RCOM CDMA	8	8	1808	Huawei, ZTE, Lucent	Lucent, Huawei
11	TATA CDMA	3	5	449	Huawei & Ericsson	Motorola & Huawei

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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE – JULY 14 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators			
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	July-14	0.25%	0.56%	0.02%	1.93%	1.93%	1.17%	0.39%	0.69%	0.12%	0.76%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	July-14	1.15%	1.56%	0.00%	1.86%	1.94%	1.92%	1.26%	1.89%	0.21%	1.38%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	July-14	99.50%	98.47%	98.42%	96.85%	95.07%	98.16%	98.65%	98.53%	99.59%	98.79%	98.72%
	b) SDCCH/PAGING Channel congestion	<=1%	July-14	0.05%	0.17%	0.11%	0.76%	0.97%	0.39%	0.10%	0.19%	0.36%	0.00%	0.00%
	c) TCH congestion	<=2%	July-14	0.31%	0.00%	0.11%	1.46%	1.95%	0.92%	0.22%	0.29%	0.41%	0.01%	0.12%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	July-14	1.06%	0.93%	0.85%	1.54%	1.94%	1.03%	0.57%	0.72%	0.80%	0.14%	0.65%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	July-14	2.39%	1.62%	<b>6.31%</b>	2.39%	2.84%	1.60%	0.02%	1.71%	<b>3.24%</b>	0.69%	<b>4.85%</b>
	c) Connections with good voice quality	>=95%	July-14	95.74%	99.23%	98.01%	NP	NP	97.44%	97.95%	98.20%	98.93%	99.84%	99.19%
4	No. of POI's having >=0.5% POI congestion		July-14	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – AUGUST 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE – AUG 14 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators			
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Aug-14	0.17%	0.41%	0.02%	1.85%	1.83%	1.09%	0.21%	0.36%	0.15%	0.44%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Aug-14	0.48%	1.56%	0.00%	1.16%	1.94%	1.88%	0.43%	1.74%	0.51%	1.10%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Aug-14	99.51%	98.58%	98.54%	96.83%	95.14%	98.27%	98.67%	99.08%	99.60%	99.07%	99.05%
	b) SDCCH/PAGING Channel congestion	<=1%	Aug-14	0.04%	0.42%	0.03%	0.52%	0.92%	0.34%	0.11%	0.15%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	Aug-14	0.25%	0.00%	0.05%	1.42%	1.80%	0.82%	0.14%	0.14%	0.40%	0.00%	0.06%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Aug-14	1.15%	0.77%	0.74%	1.53%	1.78%	1.11%	0.58%	0.67%	0.82%	0.11%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Aug-14	2.36%	1.60%	5.33%	2.48%	2.90%	1.75%	0.02%	1.55%	2.84%	0.55%	7.50%
	c) Connections with good voice quality	>=95%	Aug-14	95.42%	99.32%	98.12%	NP	NP	97.27%	97.91%	98.19%	98.85%	99.83%	99.12%
4	No. of POI's having >=0.5% POI congestion		Aug-14	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.



**5.1.5 QOS PERFORMANCE OF MONTHLY PMR – SEPTEMBER 14 MONTH:**

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE – SEP 14 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators		
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Sep-14	0.15%	0.18%	0.02%	1.86%	1.97%	0.94%	0.19%	0.21%	0.11%	0.41%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Sep-14	0.35%	0.78%	0.00%	1.11%	1.94%	1.82%	0.15%	1.28%	0.21%	1.55%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Sep-14	99.51%	98.08%	98.49%	96.97%	95.04%	98.63%	98.70%	99.05%	99.71%	99.04%	99.10%
	b) SDCCH/PAGING Channel congestion	<=1%	Sep-14	0.05%	0.39%	0.04%	0.49%	0.28%	0.46%	0.17%	0.13%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Sep-14	0.27%	0.00%	0.04%	1.34%	1.94%	0.96%	0.11%	0.14%	0.29%	0.00%	0.03%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Sep-14	1.13%	0.78%	0.66%	1.53%	1.97%	1.12%	0.57%	0.67%	0.77%	0.11%	0.59%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Sep-14	2.52%	1.40%	<b>4.33%</b>	2.46%	2.93%	1.93%	0.03%	1.56%	<b>5.26%</b>	0.51%	<b>7.35%</b>
	c) Connections with good voice quality	>=95%	Sep-14	95.45%	98.83%	98.11%	NP	NP	97.21%	97.90%	98.17%	98.87%	99.83%	99.15%
4	No. of POI's having >=0.5% POI congestion		Sep-14	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

**5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- SEPTEMBER 14 (JULY TO SEPTEMBER MONTHS AUDITED DATA)**

QUARTERLY QOS PERFORMANCE (AVERAGE OF THREE MONTHS) OF MP&CG CIRCLE														
PMR Generation Data		Bench-mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators			
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.19%	0.38%	0.02%	1.88%	1.91%	1.07%	0.26%	0.42%	0.13%	0.54%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.66%	1.30%	0.00%	1.38%	1.94%	1.87%	0.61%	1.64%	0.31%	1.34%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.51%	98.38%	98.48%	96.88%	95.08%	98.35%	98.67%	98.89%	99.63%	98.97%	98.96%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.05%	0.33%	0.06%	0.59%	0.72%	0.40%	0.13%	0.16%	0.17%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.28%	0.00%	0.07%	1.41%	1.90%	0.90%	0.16%	0.19%	0.37%	0.00%	0.07%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.11%	0.83%	0.75%	1.53%	1.90%	1.09%	0.57%	0.69%	0.80%	0.12%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.42%	1.54%	<b>5.32%</b>	2.44%	2.89%	1.76%	0.02%	1.61%	<b>3.78%</b>	0.58%	<b>6.57%</b>
	c) Connections with good voice quality	>=95%	Quarterly	95.54%	99.13%	98.08%	NP	NP	97.31%	97.92%	98.19%	98.88%	99.83%	99.15%
4	No. of POI's having >=0.5% POI congestion		Quarterly	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

### 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 all 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 MP&CG circle, all the operators were found meeting benchmark on the above parameters.

- **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 operators were complying with the benchmark of this parameter.

- **Parameters related to Network Congestion:**

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

In CDMA system, there is no direct counter defined for reporting Paging Channel Congestion as reported by Tata Teleservices. However, they have a defined counter for Paging Channel Occupancy Ratio (**PCH Average Using Ratio**) which is used to determine the Paging Channel Occupancy which on an average is < 50% on all sites in the network. When the value of this parameter is less than 100%, it is counted as 0% congestion. Thus, there is no congestion on the paging channel in CDMA system.

With respect to this parameter, the performance of the operators is quite satisfactory as all operators met the TRAI specified benchmarks on the congestion parameters. There was no congestion on individual POI links between a service provider vis-à-vis other service providers.

- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

This parameter gives a reliable measurement of the mobile network used by the service provider for maintaining a call once it has been correctly established. Failures in coverage, network congestion and network failures have important impact on this parameter.

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, all the service providers were found to be meeting the TRAI specified benchmark. The lowest call drop rate (average 0.12%) was for RCOM (CDMA) during the quarter.

- ii. Worst affected cells having more than 3% TCH drops

Worst affected cells are defined as cells in which the call drop rate exceeds 3% during cell Bouncing Busy Hour (CBBH) or at any other hour of a day.

The audit with respect to this parameter revealed that all operators (except **Tata (GSM), Vodafone and Tata (CDMA)** met the benchmark for this parameter. The quarterly average performance of Tata (GSM), Vodafone and Tata (CDMA) for this parameter was **5.32%, 3.78% and 6.57%** respectively.

- iii. Connections with good voice quality:

OMCR of BSNL does not support for the data of Voice Quality, so not provided the data for this parameter. The audit results for this parameter indicates that all operators have met the bench mark during the quarter.



**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 MP&CG CIRCLE - JULY 14 MONTH														
Live measurement Data		Bench-mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators			
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.30%	0.81%	0.19%	2.00%	1.81%	1.70%	0.31%	1.27%	0.12%	1.09%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.00%	0.00%	0.83%	0.06%	1.01%	0.00%	0.59%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.55%	97.74%	98.35%	97.04%	<b>94.84%</b>	98.33%	98.57%	98.86%	99.62%	99.09%	98.82%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.02%	0.03%	0.14%	0.84%	<b>1.20%</b>	0.33%	0.35%	0.10%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.23%	0.00%	0.20%	1.78%	<b>2.21%</b>	0.79%	0.17%	0.26%	0.38%	0.00%	0.24%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.03%	0.87%	0.90%	1.58%	1.99%	1.13%	0.56%	0.77%	0.86%	0.15%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.50%	1.56%	<b>7.14%</b>	2.50%	2.87%	2.33%	0.04%	1.99%	<b>3.12%</b>	0.81%	<b>7.01%</b>
	c) Connections with good voice quality	>=95%	Live data	95.51%	98.09%	97.94%	NP	NP	97.35%	97.95%	98.08%	98.88%	99.84%	99.05%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.



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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE - AUG 14 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators	
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.54%	0.00%	1.98%	1.27%	1.22%	0.18%	0.33%	0.20%	0.19%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	1.05%	0.11%	1.27%	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	99.44%	98.75%	98.50%	96.97%	<b>94.97%</b>	98.23%	98.72%	99.02%	99.60%	98.46%	99.11%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.05%	0.45%	0.02%	0.67%	0.84%	0.42%	0.29%	0.07%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.45%	0.00%	0.07%	1.78%	1.81%	0.83%	0.11%	0.20%	0.40%	0.00%	0.03%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.10%	1.08%	0.72%	1.61%	1.52%	1.10%	0.56%	0.66%	0.80%	0.13%	0.58%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.47%	1.65%	<b>5.20%</b>	2.52%	<b>3.01%</b>	1.89%	0.02%	1.32%	2.66%	0.58%	<b>7.86%</b>
	c) Connections with good voice quality	>=95%	Live data	95.41%	99.36%	98.16%	NP	NP	97.25%	97.87%	98.19%	98.85%	99.83%	99.13%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE - SEP 14 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators			
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.17%	0.11%	0.00%	1.92%	1.11%	1.14%	0.21%	0.17%	0.06%	0.53%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.16%	0.11%	1.04%	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	99.57%	97.73%	98.51%	97.12%	<b>94.88%</b>	98.73%	98.70%	98.97%	99.77%	99.22%	99.15%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.02%	0.29%	0.03%	0.44%	0.18%	0.34%	0.31%	0.06%	0.04%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.31%	0.00%	0.03%	1.63%	1.94%	0.88%	0.10%	0.14%	0.23%	0.00%	0.01%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.17%	0.23%	0.65%	1.50%	1.79%	1.09%	0.57%	0.64%	0.75%	0.10%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.49%	1.30%	<b>4.09%</b>	2.57%	<b>3.40%</b>	1.82%	0.03%	1.30%	<b>4.78%</b>	0.45%	<b>7.18%</b>
	c) Connections with good voice quality	>=95%	Live data	95.47%	99.30%	98.09%	NP	NP	97.32%	98.87%	98.13%	98.87%	99.83%	99.13%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

**5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JULY TO SEPTEMBER 2014 MONTHS)**

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – MP&CG CIRCLE														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators		
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.22%	0.49%	0.06%	1.97%	1.40%	1.35%	0.23%	0.59%	0.13%	0.60%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.01%	0.00%	0.00%	1.01%	0.09%	1.11%	0.00%	0.20%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.52%	98.07%	98.45%	97.04%	<b>94.90%</b>	98.43%	98.66%	98.95%	99.66%	98.92%	99.03%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.03%	0.26%	0.06%	0.65%	0.74%	0.36%	0.32%	0.08%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.33%	0.00%	0.10%	1.73%	1.99%	0.83%	0.13%	0.20%	0.34%	0.00%	0.09%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.10%	0.73%	0.76%	1.56%	1.77%	1.11%	0.56%	0.69%	0.80%	0.13%	0.56%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.49%	1.50%	<b>5.48%</b>	2.53%	<b>3.09%</b>	2.01%	0.03%	1.54%	<b>3.52%</b>	0.61%	<b>7.35%</b>
	c) Connections with good voice quality	>=95%	Quarterly	95.46%	98.92%	98.06%	NP	NP	97.31%	98.23%	98.13%	98.87%	99.83%	99.10%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0	0	0	0	0	0

\*NP: Data not provided: ALCATEL LUCENT Technology being used by BSNL and OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

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

From three days live measurement/assessment, it was revealed that the performance of the operators was satisfactory as they have largely met the benchmarks except for the parameter **'Worst affected cells> 3 % TCH drops'**, which could not be complied with by **Tata (GSM), BSNL (CG), Vodafone and Tata (CDMA)** in all the three months of the quarter. Their average performance for the quarter was **5.48%, 3.09%, 3.52% and 7.35 %** respectively. The similar non-complied performance of these operators was also observed during the monthly PMR audit.

BSNL (CG) also failed to achieve the benchmark very marginally for parameter CSSR (**94.90%**).

*Thus, the assessment of QoS with regard to the parameter 'Worst affected cells> 3 % TCH drops' assessed during live measurement is a matter of concern for those operators who could not meet the benchmark.*



5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle- July 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) Total no. of BTSs in the licensed service area		July-14	9224	128	2879	3610	1804	9411	4512	1537	5268	1808	449
	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	17443	535	530	51792	25922	82056	13095	7917	4515	10253	120
	c) BTS Accumulated Downtime	<=2%	July-14	0.25%	0.56%	0.02%	1.93%	1.93%	1.17%	0.39%	0.69%	0.12%	0.76%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		July-14	106	2	0	67	35	181	57	29	11	25	0
	e) Worst affected BTSs due to downtime	<=2%	July-14	1.15%	1.56%	0.00%	1.86%	1.94%	1.92%	1.26%	1.89%	0.21%	1.38%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	<=2%	July-14	99.50%	98.47%	98.42%	96.85%	95.07%	98.16%	98.65%	98.53%	99.59%	98.79%	98.72%
	b) SDCCH/PAGING Congestion	<=3%	July-14	0.05%	0.17%	0.11%	0.76%	0.97%	0.39%	0.10%	0.19%	0.36%	0.00%	0.00%
	c) TCH congestion	<=2%	July-14	0.31%	0.00%	0.11%	1.46%	1.95%	0.92%	0.22%	0.29%	0.41%	0.01%	0.12%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	July-14	1.06%	0.93%	0.85%	1.54%	1.94%	1.03%	0.57%	0.72%	0.80%	0.14%	0.65%
	b) Worst affected cells>3% TCH drop	<=3%	July-14	2.39%	1.62%	6.31%	2.39%	2.84%	1.60%	0.02%	1.71%	3.24%	0.69%	4.85%
	c) % of connections with good voice quality	>=95%	July-14	95.74%	99.23%	98.01%	NP	NP	97.44%	97.95%	98.20%	98.93%	99.84%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		July-14	677	6	546	281	151	448	3	79	511	37.39	66
	e) Total no. of cells (Sector) in the licensed service area		July-14	28353	384	8642	11730	5322	28045	13536	4625	15760	5424	1356
<b>No. of POI's having &gt;=0.5% POI congestion</b>														
4	No. of POI's having >=0.5% POI congestion		July-14	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		July-14	0	0	0	0	0	0	0	0	0	0	0
<b>Network Data</b>														
5	a) Equipped Capacity of Network in Erlang		July-14	309977	893	135223	218150	130000	467481	295000	63231	106544	146000	107871
	b) Total traffic in TCBH in erlang (Avg.)		July-14	209464	2	58327	73705	51688	365289	161904	24010	96133	63062	18461
	c) Total no. of customers served (as per VLR) on last day of the month		July-14	10297196	614	2881906	1937524	882278	18836303	8883325	1061668	4334790	2066881	216368



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - July 14 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) Total no. of BTSs in the licensed service area		Live data	9207	128	2881	3610	1804	9393	4512	1534	5229	1808	449
	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	1977	75	385	5203	2352	11529	1013	1402	443	1418	25
	c) BTS Accumulated Downtime	<=2%	Live data	0.30%	0.81%	0.19%	2.00%	1.81%	1.70%	0.31%	1.27%	0.12%	1.09%	0.08%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	3	0	0	30	1	95	0	9	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.00%	0.00%	0.83%	0.06%	1.01%	0.00%	0.59%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.55%	97.74%	98.35%	97.04%	94.84%	98.33%	98.57%	98.86%	99.62%	99.09%	98.82%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.03%	0.14%	0.84%	1.20%	0.33%	0.35%	0.10%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.23%	0.00%	0.20%	1.78%	2.21%	0.79%	0.17%	0.26%	0.38%	0.00%	0.24%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.03%	0.87%	0.90%	1.58%	1.99%	1.13%	0.56%	0.77%	0.86%	0.15%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.50%	1.56%	7.14%	2.50%	2.87%	2.33%	0.04%	1.99%	3.12%	0.81%	7.01%
	c) % of connections with good voice quality	>=95%	Live data	95.51%	98.09%	97.94%	NP	NP	97.35%	97.95%	98.08%	98.88%	99.84%	99.05%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	708	6	617	298	153	654	6	92	492	44	95
	e) Total no. of cells (Sector) in the licensed service area		Live data	28333	384	8646	11922	5322	28015	13650	4627	15760	5436	1356
<b>No. of POI's having &gt;=0.5% POI congestion</b>														
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle - August 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
<b>Network Service Quality Parameter</b>														
1	<b>Network Availability</b>													
	a) Total no. of BTSs in the licensed service area		Aug-14	9256	128	2886	3610	1804	9448	3988	1550	5309	1810	449
	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	11778	388	394.1	49599	24532	76611.1	6113.5	4144	5738.89	5899	77.13
	c) BTS Accumulated Downtime	<=2%	Aug-14	0.17%	0.41%	0.02%	1.85%	1.83%	1.09%	0.21%	0.36%	0.15%	0.44%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Aug-14	44	2	0	42	35	178	17	27	27	20	0
e) Worst affected BTSs due to downtime	<=2%	Aug-14	0.48%	1.56%	0.00%	1.16%	1.94%	1.88%	0.43%	1.74%	0.51%	1.10%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>													
	a) CSSR (Call Setup Success Rate)	<=2%	Aug-14	99.51%	98.58%	98.54%	96.83%	95.14%	98.27%	98.67%	99.08%	99.60%	99.07%	99.05%
	b) SDCCH/PAGING Congestion	<=3%	Aug-14	0.04%	0.42%	0.03%	0.52%	0.92%	0.34%	0.11%	0.15%	0.07%	0.00%	0.00%
c) TCH congestion	<=2%	Aug-14	0.25%	0.00%	0.05%	1.42%	1.80%	0.82%	0.14%	0.14%	0.40%	0.00%	0.06%	
3	<b>Connection Maintenance (Retainability)</b>													
	a) Call Drop Rate (CDR)	<=2%	Aug-14	1.15%	0.77%	0.74%	1.53%	1.78%	1.11%	0.58%	0.67%	0.82%	0.11%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Aug-14	2.36%	1.60%	<b>5.33%</b>	2.48%	2.90%	1.75%	0.02%	1.55%	2.84%	0.55%	<b>7.50%</b>
	c) % of connections with good voice quality	>=95%	Aug-14	95.42%	99.32%	98.12%	NP	NP	97.27%	97.91%	98.19%	98.85%	99.83%	99.12%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Aug-14	671	6	461	277	154	492	3	72	451	30	102
e) Total no. of cells (Sector) in the licensed service area		Aug-14	28418	384	8653	11159	5322	28107	11964	4666	15879	5430	1356	
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	0	0	0	0	0
	Name of POI not meeting the benchmark		Aug-14	0	0	0	0	0	0	0	0	0	0	0
5	<b>Network Data</b>													
	a) Equipped Capacity of Network in Erlang		Aug-14	303637	893	135374	218150	130000	468493	295000	63759	110495	NP	107871
	b) Total traffic in TCBH in erlang (Avg.)		Aug-14	187579	2	56865	68850	50831	350019	155194	23453	92686	NP	17220
c) Total no. of customers served (as per VLR) on last day of the month		Aug-14	10270531	582	2946291	1931513	884512	18940851	8818860	1102413	4395977	NP	207173	





TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle- August 14 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
<b>Network Service Quality Parameter</b>														
1	<b>Network Availability</b>													
	a) Total no. of BTSs in the licensed service area		Live data	9264	128	2883	3610	1804	9436	3988	1547	5268	1809	449
	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	1296	50	5	5141	1651	8277	510	369	758	244	0
	c) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.54%	0.00%	1.98%	1.27%	1.22%	0.18%	0.33%	0.20%	0.19%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	0	0	38	2	120	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	1.05%	0.11%	1.27%	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	99.44%	98.75%	98.50%	96.97%	94.97%	98.23%	98.72%	99.02%	99.60%	98.46%	99.11%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.05%	0.45%	0.02%	0.67%	0.84%	0.42%	0.29%	0.07%	0.07%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.45%	0.00%	0.07%	1.78%	1.81%	0.83%	0.11%	0.20%	0.40%	0.00%	0.03%	
3	<b>Connection Maintenance (Retainability)</b>													
	a) Call Drop Rate (CDR)	<=2%	Live data	1.10%	1.08%	0.72%	1.61%	1.52%	1.10%	0.56%	0.66%	0.80%	0.13%	0.58%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.47%	1.65%	5.20%	2.52%	3.01%	1.89%	0.02%	1.32%	2.66%	0.58%	7.86%
	c) % of connections with good voice quality	>=95%	Live data	95.41%	99.36%	98.16%	NP	NP	97.25%	97.87%	98.19%	98.85%	99.83%	99.13%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	705.67	6	450	288	160	533	2	62	423	32	107
e) Total no. of cells (Sector) in the licensed service area		Live data	28516	384	8653	11413	5322	28170	12081	4673	15864	5439	1356	
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	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0



TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle - September 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) Total no. of BTSs in the licensed service area		Sep-14	9299	128	2888	3610	1805	9481	3988	1557	5365	1810	449
	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-14	9901	162	338	48415	25599	64152	5340	2345	4192	5321	56
	c) BTS Accumulated Downtime	<=2%	Sep-14	0.15%	0.18%	0.02%	1.86%	1.97%	0.94%	0.19%	0.21%	0.11%	0.41%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Sep-14	33	1	0	40	35	173	6	20	11	28	0
	e) Worst affected BTSs due to downtime	<=2%	Sep-14	0.35%	0.78%	0.00%	1.11%	1.94%	1.82%	0.15%	1.28%	0.21%	1.55%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	<=2%	Sep-14	99.51%	98.08%	98.49%	96.97%	95.04%	98.63%	98.70%	99.05%	99.71%	99.04%	99.10%
	b) SDCCCH/PAGING Congestion	<=3%	Sep-14	0.05%	0.39%	0.04%	0.49%	0.28%	0.46%	0.17%	0.13%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Sep-14	0.27%	0.00%	0.04%	1.34%	1.94%	0.96%	0.11%	0.14%	0.29%	0.00%	0.03%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	Sep-14	1.13%	0.78%	0.66%	1.53%	1.97%	1.12%	0.57%	0.67%	0.77%	0.11%	0.59%
	b) Worst affected cells>3% TCH drop	<=3%	Sep-14	2.52%	1.40%	4.33%	2.46%	2.93%	1.93%	0.03%	1.56%	5.26%	0.51%	7.35%
	c) % of connections with good voice quality	>=95%	Sep-14	95.45%	98.83%	98.11%	NP	NP	97.21%	97.90%	98.17%	98.87%	99.83%	99.15%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Sep-14	718	5	375	273	156	546	4	73	847	28	100
	e) Total no. of cells (Sector) in the licensed service area		Sep-14	28521	384	8667	11103	5325	28261	11952	4692	16091	5542	1356
<b>No. of POI's having &gt;=0.5% POI congestion</b>														
4	No. of POI's having >=0.5% POI congestion		Sep-14	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Sep-14	0	0	0	0	0	0	0	0	0	0	0
<b>Network Data</b>														
5	a) Equipped Capacity of Network in Erlang		Sep-14	304168	627	136769	218150	130000	469591	295000	63992	112891	NP	107871
	b) Total traffic in TCBH in erlang (Avg.)		Sep-14	191624	2	57442	68541	51052	327853	157259	25576	93070	NP	16538
	c) Total no. of customers served (as per VLR) on last day of the month		Sep-14	10302126	545	3011820	1960859	894233	19112545	8842223	1172170	4536095	NP	216452



TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - September 14 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
<b>Network Service Quality Parameter</b>														
<b>Network Availability</b>														
1	a) Total no. of BTSs in the licensed service area		Live data	9260	128	2888	3610	1805	9456	3988	1556	5346	1810	449
	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	1103	10	10	5002	1446	7783	602	187	215	689	7
	c) BTS Accumulated Downtime	<=2%	Live data	0.17%	0.11%	0.00%	1.92%	1.11%	1.14%	0.21%	0.17%	0.06%	0.53%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	42	2	98	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.16%	0.11%	1.04%	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	99.57%	97.73%	98.51%	97.12%	94.88%	98.73%	98.70%	98.97%	99.77%	99.22%	99.15%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.29%	0.03%	0.44%	0.18%	0.34%	0.31%	0.06%	0.04%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.31%	0.00%	0.03%	1.63%	1.94%	0.88%	0.10%	0.14%	0.23%	0.00%	0.01%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.17%	0.23%	0.65%	1.50%	1.79%	1.09%	0.57%	0.64%	0.75%	0.10%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.49%	1.30%	4.09%	2.57%	3.40%	1.82%	0.03%	1.30%	4.78%	0.45%	7.18%
	c) % of connections with good voice quality	>=95%	Live data	95.47%	99.30%	98.09%	NP	NP	97.32%	98.87%	98.13%	98.87%	99.83%	99.13%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	710	5	355	285	181	513	4	61	770	25	97
	e) Total no. of cells (Sector) in the licensed service area		Live data	28478	384	8668	11097	5325	28229	11937	4703	16107	5542	1356
<b>No. of POI's having &gt;=0.5% POI congestion</b>														
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0

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



### 5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS:

#### 5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY to SEPTEMBER 2014 MONTHS AUDITED DATA):

##### QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators									CDMA Operators
<b>Customer Service Quality Parameters</b>													
1	<b>Metering &amp; Billing Credibility -Post Paid</b>												
	A) No. Of bills issued during the quarter		MP&CG	8	439771	308784	1089304	338337	109445	NA	337308	278179	23436
	B) No. of bills disputed including billing complaints during the quarter		MP&CG	0	139	19	445	328	0	NA	330	270	0
	C)% of billing complaints during the quarter	<= 0.1%	MP&CG	0.00	0.03%	0.01%	0.04%	0.10%	0.00%	NA	0.10%	0.10%	0.00%
2	<b>Metering &amp; Billing Credibility -Pre Paid</b>												
	A) Total No. of Pre-paid customers at the end of the quarter		MP&CG	22694	10607130	3080531	17829965	9771952	4400337	2247255	4933808	1985184	1162114
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		MP&CG	0	120	315	4841	25359	0	37	8480	4610	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	MP&CG	0.00%	0.00%	0.01%	0.03%	0.26%	0.00%	0.00%	0.17%	0.23%	0.00%
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		MP&CG	0	259	262	19352	25687	1779	37	8810	4880	16
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		MP&CG	0	259	262	19352	25687	1779	37	8810	4880	15



**QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES**

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators									CDMA Operators
	C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100 % within 4 weeks	MP&CG	100%	100%	100%	100%	100%	100%	100%	100%	100%	94%
	D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	MP&CG	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
<b>4</b>	<b>Response time to customers for assistance</b>												
	A) Total no of calls attempted to customer care/Call center		MP&CG	3611	3561146	4142242	50746730	21414377	1271363	172665	18189216	2919579	64216
	B) Total no. of calls successfully established to customer care/Call center		MP&CG	3575	3560817	4095048	50406405	21191239	1257720	167205	18189216	2884986	62552
	C) % Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	99.00%	99.99%	98.86%	99.33%	98.96%	98.93%	96.84%	100.00%	98.82%	97.41%
	D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		MP&CG	544	6209186	1205881	11944472	6137425	1825834	2028197	4897817	652778	79796
	E) Total number of calls answered by the operator (Voice to voice) within 60/90 seconds		MP&CG	524	6143109	1171904	10914696	5550531	1722639	1856097	4608516	642228	72498
	F) % age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec/90 sec.*100 / Total call attempts )	>=90% (60 Sec.) & >=95% (90 Sec.)	MP&CG	96.32%	98.94%	97.18%	91.38%	90.44%	94.35%	91.51%	94.09%	98.38%	90.85%
<b>5</b>	<b>Termination/closure of service</b>												
	A) Total No. of requests for Termination / Closure of service received during the quarter		MP&CG	0	981	868	10599	341	1656	NA	4931	265	363
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		MP&CG	0	981	868	10599	341	1656	NA	4931	265	363
	C) % of Termination/ Closure of service within 7 days	<=7days	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%



**QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES**

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators								CDMA Operators	
6	Time taken for refunds of deposits after closures.												
	A) No. of Payments/ Refunds due during the quarter		MP&CG	0	417	621	1955	850	915	NA	71	1087	248
	B) No. of Payments/ Refunds Cleared during the quarter		MP&CG	0	417	621	1955	850	915	NA	71	1087	248
	C) Time taken for refunds of deposits after closures.	100% within 60 days	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

NA: Not Applicable

Videocon have no post-paid customers, so data for parameters related to post-paid bills not applicable for them.

Note: For the parameter “% age of calls answered by operator (voice to voice)” – All Service Providers except **Aircel, BSNL, Idea and Vodafone** have given the data for 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:**

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES													
3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators							CDMA Operators		
<b>Response time to customers for assistance</b>													
1	Total no of calls attempted to customer care/Call center		MP&CG	76	122366	121339	440375	787085	45151	6425	567971	139696	2296
	Total no. of calls successfully established to customer care/Call center		MP&CG	76	122366	121117	362974	778847	44807	6256	567971	138104	2223
	% Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	100.00%	100.00%	99.82%	82.42%	98.95%	99.24%	97.37%	100%	98.86%	96.82%
2	Total Calls reached to agent desk for Voice to Voice (Total call attempt)		MP&CG	18	4118733	58516	380916	218238	64659	78135	161922	24580	2419
	Total number of calls answered by the operator (Voice to voice) within 60/90 seconds		MP&CG	18	3951001	58497	334750	216284	61428	71019	158867	24580	2245
	% age of calls answered by operator(voice to voice) (Total call successfully established within 60/90 Sec.*100 / Total call attempts)	>=90% (60 Sec.) & >=95% (90 Sec.)	MP&CG	100%	95.93%	99.97%	87.88%	99.10%	95.00%	90.89%	98.11%	100.00%	92.81%

Note: All Service Providers except **Aircel, BSNL, Idea and Vodafone** have given the data for 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 was largely within the prescribed bench mark against the benchmark of  $\leq 0.1\%$ . However, parameter '**Billing complaints - pre-paid**' remained beyond the benchmark for service providers namely **RCOM (GSM), Vodafone and RCOM (CDMA)** with their performance as **0.26%, 0.17% and 0.23%** respectively.

#### 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. However, **RCOM (GSM), Tata (GSM), Videocon and Tata (CDMA)** have not met the benchmark of 'calls answered by Operators (voice to voice) within 90 seconds. They have achieved their performance as **90.44%, 94.35%, 91.51% and 90.85%** respectively.

#### 4. Termination/Closure of Service

In case of this parameters also, all service providers have settled the closure/termination within the benchmark of 7 days.

#### 5. Time Taken for Refund of deposits after closures

All operators were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure.

#### *Live Measurements:*

The results for **three days live measurements** reveal that all operators (except **Idea**), have met the benchmarks for the parameters 'Accessibility to call center'. However, **Idea, Videocon and Tata (CDMA)** failed to meet the benchmark of 'Call connection to operators (Voice to voice)' with their performance as **87.88%, 90.89% and 92.81%** 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 MP&CG 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)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
AIRCEL	MP&CG	NIL	--	--	--	--	--	--	--	--	--
AIRTEL	MP&CG	NIL	--	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	MP&CG	NIL	100%	--	98%	100%	100%	100%	99%	98%	98%
IDEA	MP&CG	NIL	100%	100%	--	100%	97%	98%	100%	100%	100%
RCOM (GSM)	MP&CG	NIL	100%	100%	100%	--	100%	100%	100%	100%	100%
TATA (GSM)	MP&CG	NIL	100%	100%	99%	100%	--	100%	100%	100%	100%
VIDEOCON	MP&CG	NIL	100%	99%	100%	100%	98%	--	100%	99%	100%
VODAFONE	MP&CG	NIL	100%	100%	100%	100%	100%	99%	--	100%	100%
RCOM (CDMA)	MP&CG	NIL	98%	99%	100%	100%	100%	99%	98%	--	99%
TATA (CDMA)	MP&CG	NIL	99%	100%	100%	99%	100%	100%	100%	100%	--

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 Idea, Vodafone, RCOM(CDMA) and Tata(CDMA) successful interconnection was 98.0%, 99%, 98%, and 98% respectively. From Idea to Tata(GSM) and Videocon was 97% and 98%, from Videocon to BSNL, Tata(GSM) and RCOM(CDMA) was 99%, 98%, and 99% respectively, from Vodafone to Videocon was 99%, from RCOM(CDMA) to Airtel , BSNL, Videocon, Vodafone and Tata(CDMA) was 98%, 99%, 99%,98% and 99% respectively, and from Tata (CDMA) to Airtel and RCOM(GSM) was 99% . 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	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total no of calls attempted to customer care/Call center	MP&CG	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	MP&CG	98	95	100	95	98	97	100	98	97
% Accessibility of Call centre /customer Care (Total call successfully established * 100/ Total call attempts)	MP&CG	98.00%	95.00%	100.00%	95.00%	98.00%	97.00%	100.00%	98.00%	97.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempts)	MP&CG	96	94	99	94	97	95	98	98	95
Total number of calls answered by the operator (Voice to voice) within 90 seconds	MP&CG	94	92	97	92	96	90	97	95	89
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100/Total call attempts)	MP&CG	97.92%	97.87%	97.98%	97.87%	98.97%	94.74%	98.98%	96.94%	93.68%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, Videocon and Tata (CDMA) could connect 94.74% & 93.68% of calls to the operator within 90 Seconds respectively. For other operators, the call connections were in the range of 96.94% to 98.98%.

## 6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS										
Parameter	Circle Name	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	MP&CG	100	100	100	100	100	35	100	100	16
Total No. of calls Answered	MP&CG	92	90	95	88	94	30	96	85	14
Resolution of Billing complaints	MP&CG	92	90	95	88	94	30	96	85	14
%age of cases resolved	MP&CG	100%	100%	100%	100%	100%	100%	100%	100%	100%

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 less due to less number of billing complaints. During live calling, some of the customers did not attend the calls / or their mobile was switch off while some others reported that there complaints have been resolved but not sure of duration of their resolution. However, most of the customers expressed their satisfaction on resolution of the billing 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	RCOM CDMA	TATA GSM	TATA CDMA	VIDEOCON	VODAFONE
100, 101, 108, 1091, 1098, 1090	MP&CG	Rewa	Rewa	20	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Sirmaur	10	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Teonthar	10	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Mauganj	10	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG	Vidisha	Vidisha	20	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Nateran	10	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Lateri	10	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Sironj	10	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Ganjbasoda	10	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Kurwai	10	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG	Bilaspur	Bilaspur	20	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Pali	10	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		KathGhora	10	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Korba	10	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	MP&CG		Janjgir-Champa	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- Aircel having no services in major cities, so the service is not functional.
- NC – No Coverage in respective SDCAs.

The level-1 services were found functional in the SDCAs where there was coverage of the Service providers as mentioned above in the table.

## 7. DRIVE TEST



## **7. OPERATOR ASSESTID 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 three SSA's namely **Rewa, Vidisha and Bilaspur** in the months of July, August and September 2014 respectively. The total route Km covered during drive tests in respective SSAs was **350 Kms, 348 Kms and 387 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 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: REWA SSA (JULY-14)

DRIVE TEST TABLE: 1

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA			
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR		
1	Call Attempts	Highways	NC	NC	199	30	68	30	137	30	141	30	131	34	133	32	135	29	150	30	178	33		
		Major Roads	NC	NC	177	30	80	30	118	31	135	73	120	31	129	31	117	30	128	31	154	31		
		Within City	NC	NC	413	30	187	30	303	31	276	20	243	33	264	30	263	30	330	33	301	35		
		Overall SSA	NC	NC	789	90	335	90	558	92	552	123	494	98	526	93	515	89	608	94	633	99		
2	Blocked Call Rate	Highways	NC	NC	0.50%	0.00%	7.35%	0.00%	0.00%	0.00%	0.71%	0.00%	4.58%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	36.52%	0.00%		
		Major Roads	NC	NC	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	41.56%	0.00%		
		Within City	NC	NC	0.00%	0.00%	6.95%	0.00%	0.00%	0.00%	1.09%	0.00%	2.06%	0.00%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%	21.26%	0.00%		
		Overall SSA	NC	NC	0.13%	0.00%	6.57%	0.00%	0.00%	0.00%	0.72%	0.00%	2.83%	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	30.49%	0.00%		
3	Dropped Call Rate (<=2%)	Highways	NC	NC	0.00%	0.00%	1.59%	0.00%	0.00%	0.00%	0.00%	0.00%	8.00%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.88%	0.00%		
		Major Roads	NC	NC	0.00%	0.00%	2.67%	0.00%	0.00%	0.00%	0.00%	0.00%	4.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.11%	0.00%		
		Within City	NC	NC	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	0.00%		
		Overall SSA	NC	NC	0.13%	0.00%	0.96%	0.00%	0.00%	0.00%	0.00%	0.00%	6.04%	2.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%		
4	(a) 0-4 (w/o frequency hopping for CDMA)	Percentage connections with good voice quality (=>95%)																						
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.19%	100%	97.50%	99.88%	
		Major Roads	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.56%	100%	99.08%	99.93%	
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.19%	100%	98.63%	100%	



**AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER-2014-MP&CG CIRCLE**

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Service Coverage																				
Operators)	Overall SSA	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.27%	100%	98.41%	99.93%	
	(b) 0-5 ( with frequency hopping for GSM Operators)	Highways	NC	NC	95.91%	99.27%	<b>92.48%</b>	<b>88.43%</b>	96.92%	98.98%	96.94%	98.90%	<b>92.02%</b>	97.41%	96.60%	97.79%	97.81%	99.05%	NA	NA	NA	NA	
		Major Roads	NC	NC	95.75%	99.51%	<b>94.60%</b>	99.27%	96.96%	99.45%	97.51%	99.69%	<b>92.94%</b>	100%	96.69%	99.94%	97.92%	99.52%	NA	NA	NA	NA	
		Within City	NC	NC	95.46%	97.74%	<b>92.43%</b>	99.79%	96.73%	96.12%	96.94%	98.65%	<b>92.69%</b>	99.89%	96.01%	99.24%	97.13%	99.46%	NA	NA	NA	NA	
Overall SSA	NC	NC	95.64%	98.83%	<b>92.75%</b>	97.21%	96.84%	98.17%	97.05%	99.32%	<b>92.58%</b>	99.23%	96.31%	98.94%	97.46%	99.32%	NA	NA	NA	NA			
5	In door (>= - 75dBm)	Highways	NC	NC	63.08%	90.75%	42.59%	46.25%	70.05%	79.54%	96.33%	99.90%	48.08%	99.80%	64.70%	98.22%	57.04%	99.35%	68.70%	86.47%	30.86%	85.72%	
		Major Roads	NC	NC	58.06%	98.51%	31.69%	41.76%	70.34%	68.23%	96.20%	96.01%	60.56%	100%	64.70%	99.75%	57.65%	100%	78.80%	100%	42.73%	91.89%	
		Within City	NC	NC	59.72%	920.13%	35.74%	22.76%	79.47%	34.51%	97.49%	100%	57.99%	100%	71.00%	65.40%	72.38%	87.84%	70.14%	70.78%	47.99%	97.57%	
		Overall SSA	NC	NC	60.14%	67.25%	36.67%	36.92%	74.74%	60.57%	96.95%	97.60%	56.01%	99.92%	67.70%	87.70%	64.86%	95.76%	71.72%	85.33%	42.29%	91.31%	
	In-vehicle (>= - 85dBm)	Highways	NC	NC	89.81%	99.91%	76.61%	99.85%	90.59%	99.84%	99.71%	1.00%	80.47%	100%	90.10%	100%	87.35%	99.35%	92.05%	100%	62.98%	100%	
		Major Roads	NC	NC	90.86%	100%	74.63%	82.09%	91.92%	99.58%	99.73%	99.66%	86.58%	100%	91.20%	100%	87.74%	100%	97.63%	100%	75.27%	100%	
		Within City	NC	NC	94.07%	78.87%	74.86%	72.75%	95.64%	95.87%	99.83%	100%	87.45%	100%	93.50%	98.29%	93.20%	99.68%	97.66%	99.72%	80.55%	100%	
		Overall SSA	NC	NC	92.59%	9320.72%	75.37%	84.90%	93.36%	98.42%	99.78%	99.80%	85.42%	100%	92.01%	99.40%	90.37%	99.68%	96.23%	99.90%	74.72%	100%	
	Outdoor-in city (>= - 95dBm)	Highways	NC	NC	98.78%	100%	96.61%	100%	99.27%	100%	100%	100%	96.28%	100%	99.40%	100%	99.09%	99.35%	100%	100%	97.65%	100%	
		Major Roads	NC	NC	99.63%	100%	97.86%	99.48%	99.53%	100%	100%	100%	95.70%	100%	99.22%	100%	99.07%	100%	99.99%	100%	97.69%	100%	
		Within City	NC	NC	99.70%	99.75%	95.92%	99.58%	99.76%	99.99%	100%	100%	97.12%	100%	99.70%	100%	98.96%	100%	100%	100%	98.79%	100%	
		Overall SSA	NC	NC	99.49%	99.92%	96.80%	99.68%	99.56%	100%	100%	100%	96.57%	100%	99.51%	100%	99.02%	99.79%	100%	100%	98.26%	100%	
6	Call Setup	Highways	NC	NC	99.50%	100%	<b>92.65%</b>	100%	100%	100%	99.29%	100%	95.42%	100%	100%	100%	100%	100%	100%	100%	<b>63.48%</b>	100%	

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER-2014-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	93.75%	100%	100%	100%	100%	100%	100%	97.50%	100%	100%	100%	100%	100%	100%	100%
Within City	NC	NC		100%	100%	93.05%	100%	99.67%	100%	98.91%	100%	97.94%	100%	99.62%	100%	100%	100%	100%	100%	100%	78.74%	100%	
Overall SSA	NC	NC		99.87%	100%	93.13%	100%	99.82%	100%	99.28%	100%	97.17%	100%	99.81%	100%	100%	100%	100%	100%	100%	69.51%	100%	
Highways	NC	NC		99.45%	100%	98.81%	100%	99.15%	100%	98.99%	100%	82.35%	100%	99.39%	100%	100%	100%	100%	99.81%	100%	100%	100%	
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	96.69%	100%	97.73%	100%	98.26%	100%	97.64%	100%	83.33%	100%	100%	100%	100%	100%	99.57%	100%	100%	100%	100%
		Within City	NC	NC	100%	100%	96.24%	100%	99.43%	100%	97.29%	100%	92.58%	100%	100%	100%	100%	100%	99.93%	100%	100%	100%	100%
		Overall SSA	NC	NC	99.06%	100%	97.13%	100%	99.14%	100%	97.73%	100%	88.44%	100%	99.84%	100%	100%	100%	99.84%	100%	100%	100%	100%
		Highways	NC	NC	99.45%	100%	98.81%	100%	99.15%	100%	98.99%	100%	82.35%	100%	99.39%	100%	100%	100%	100%	99.81%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

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

7.2 OPERATOR ASSISTED DRIVE TEST: VIDISHA SSA (AUGUST-14)

DRIVE TEST TABLE: 2

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
1	Call Attempts	Highways	16	NC	97	30	83	30	66	30	79	26	73	30	110	30	85	30	39	30	73	30	
		Major Roads	27	31	76	30	45	30	61	NC	74	30	62	30	66	NC	85	30	29	NC	58	30	
		Within City	29	NC	336	30	280	30	289	30	252	26	272	27	330	31	335	30	114	NC	274	30	
		Overall SSA	72	31	509	90	408	90	416	60	405	82	407	87	506	61	505	90	182	30	405	90	
2	Blocked Call Rate	Highways	0.00%	NC	0.00%	0.00%	1.20%	0.00%	0.00%	0.00%	2.53%	0.00%	0.00%	0.00%	0.00%	0.00%	1.18%	0.00%	0.00%	0.00%	1.37%	0.00%	
		Major Roads	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	5.41%	0.00%	8.06%	0.00%	1.52%	NC	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	0.00%	NC	0.60%	0.00%	2.50%	0.00%	0.00%	0.00%	2.78%	0.00%	0.74%	0.00%	0.30%	0.00%	0.30%	0.00%	0.88%	NC	1.09%	0.00%	
		Overall SSA	0.00%	0.00%	0.39%	0.00%	1.96%	0.00%	0.00%	0.00%	3.21%	0.00%	1.72%	0.00%	0.40%	0.00%	0.40%	0.00%	0.55%	0.00%	0.99%	0.00%	
3	Dropped Call Rate (<=2%)	Highways	0.00%	NC	1.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%	3.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Major Roads	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	14.04%	0.00%	0.00%	NC	0.00%	0.00%	0.00%	NC	1.72%	0.00%	
		Within City	0.00%	NC	0.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.41%	0.00%	1.86%	0.00%	0.30%	0.00%	0.00%	0.00%	0.00%	NC	0.74%	0.00%	
		Overall SSA	0.00%	0.00%	0.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	0.00%	3.51%	1.15%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.75%	0.00%	
4	Percentage connections with good voice quality (=>95%)																						
	(a) 0-4 (w/o frequency hopping for CDMA)	Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.81%	100%	97.14%	100%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.88%	NC	98.05%	100%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.55%	NC	94.38%	100%

**AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER-2014-MP&CG CIRCLE**

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	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	NA	NA	NA	NA	NA	99.55%	100%
Operators)	(b) 0-5 ( with frequency hopping for GSM Operators)	Highways	96.14	NC	95.18%	95.62%	<b>83.50%</b>	<b>72.02%</b>	96.27%	99.95%	95.50%	98.41%	95.27%	100%	95.66%	95.60%	96.35%	97.72%	NA	NA	NA	NA
		Major Roads	97.68	99.15%	96.60%	99.18%	<b>89.17%</b>	<b>83.96%</b>	97.98%	NC	96.70%	99.47%	<b>87.13%</b>	99.44%	97.48%	NC	97.16%	99.34%	NA	NA	NA	NA
		Within City	98.74	NC	96.47%	97.26%	<b>88.22%</b>	<b>81.16%</b>	98.80%	99.89%	97.00%	98.08%	<b>93.94%</b>	95.97%	96.08%	99.60%	98.05%	96.37%	NA	NA	NA	NA
		Overall SSA	97.77	99.15%	96.21%	97.33%	<b>87.37%</b>	<b>79.05%</b>	98.28%	99.92%	96.64%	98.68%	<b>93.06%</b>	97.38%	96.36%	97.31%	97.61%	97.75%	NA	NA	NA	NA
Service Coverage																						
5	In door (>= - 75dBm)	Highways	77.62	NC	67.54%	100%	41.78%	96.52%	65.64%	100%	65.35%	88.89%	56.22%	100%	77.83%	100%	79.11%	99.91%	55.00%	99.22%	12.36%	96.11%
		Major Roads	27.02	89.45%	93.73%	100%	72.27%	73.78%	86.82%	NC	85.18%	100%	58.74%	100%	96.16%	NC	94.27%	100%	63.08%	NC	11.70%	98.96%
		Within City	79.05	NC	84.21%	99.80%	45.22%	64.05%	77.33%	99.70%	78.54%	100%	78.68%	80.18%	91.13%	97.60%	88.94%	100%	62.89%	NC	31.56%	36.95%
		Overall SSA	61.23	89.45%	82.83%	99.93%	47.55%	78.36%	89.06%	99.85%	77.12%	96.74%	70.96%	86.77%	88.38%	98.80%	88.14%	99.97%	61.21%	99.22%	22.34%	62.25%
	In-vehicle (>= - 85dBm)	Highways	88.67	NC	94.58%	100%	84.25%	99.94%	88.29%	100%	89.93%	100%	88.73%	100%	96.53%	100%	91.24%	100%	87.81%	99.32%	29.80%	100%
		Major Roads	61.48	98.09%	99.85%	100%	98.35%	99.19%	98.64%	NC	99.49%	100%	91.38%	100%	99.67%	NC	99.35%	100%	95.36%	NC	23.15%	98.96%
		Within City	88.77	NC	97.66%	0.20%	86.56%	99.01%	97.25%	100%	96.97%	100%	95.37%	99.82%	99.06%	99.91%	97.91%	100%	94.66%	NC	65.33%	98.41%
		Overall SSA	79.64	98.09%	97.37%	100%	87.41%	99.39%	98.60%	100%	96.03%	100%	93.49%	99.88%	98.42%	99.91%	97.00%	100%	93.29%	99.32%	47.10%	98.87%
	Outdoor-in city (>= - 95dBm)	Highways	98.96	NC	99.79%	100%	98.82%	100%	98.84%	100%	99.50%	100%	99.78%	100%	99.83%	100%	98.45%	100%	99.20%	99.52%	45.35%	100%
		Major Roads	97.70	100%	99.96%	100%	99.97%	99.94%	100%	NC	100%	100%	99.96%	100%	100%	NC	99.88%	100%	99.25%	NC	34.66%	100%
		Within City	97.24	NC	99.84%	100%	98.55%	99.96%	99.85%	100%	99.96%	100%	99.26%	100%	100%	100%	99.85%	100%	99.21%	NC	92.39%	100%
		Overall SSA	97.97	100%	99.85%	100%	98.76%	99.97%	99.85%	100%	99.87%	100%	99.49%	100%	99.94%	100%	99.61%	100%	99.52%	99.52%	67.84%	100%
6	Call Setup	Highways	100%	100%	100%	100%	98.80%	100%	100%	100%	<b>94.94%</b>	100%	100%	100%	100%	100%	98.82%	100%	100%	100%	98.63%	100%

**AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER-2014-MP&CG CIRCLE**

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Success Rate (>=95%)	Major Roads	100%	100%	100%	100%	100%	100%	100%	NC	91.89%	100%	91.94%	100%	98.48%	NC	100%	100%	100%	NC
Within City	100%	100%		99.40%	100%	97.50%	100%	100%	100%	97.22%	100%	98.90%	100%	99.39%	100%	99.70%	100%	99.12%	NC	98.91%	100%	
Overall SSA	100%	100%		99.61%	100%	100%	100%	100%	100%	95.80%	100%	98.03%	100%	99.41%	100%	99.60%	100%	99.45%	100%	99.01%	100%	
Highways	100%	100%		99.55%	100%	96.90%	100%	100%	100%	98.92%	100%	98.63%	100%	100%	98.95%	98.82%	100%	100%	100%	100%	100%	
7 Hand Over Success Rate (HOSR)	Major Roads	100%	100%	99.29%	100%	100%	100%	100%	NC	100%	100%	92.65%	100%	100%	NC	100%	100%	100%	100%	100%	100%	
	Within City	100%	100%	99.39%	100%	95.99%	100%	99.70%	100%	100%	100%	98.28%	100%	98.62%	100%	99.82%	100%	100%	100%	100%	100%	
	Overall SSA	100%	100%	99.41%	100%	96.51%	100%	99.83%	100%	99.73%	100%	97.63%	100%	99.18%	98.96%	99.66%	100%	100%	100%	100%	100%	
	Highways	100%	100%	99.55%	100%	96.90%	100%	100%	100%	98.92%	100%	98.63%	100%	100%	98.95%	98.82%	100%	100%	100%	100%	100%	

NA: Not Applicable

NC: No Coverage

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



7.3 OPERATOR ASSISTED DRIVE TEST: BILASPUR SSA (SEPTEMBER-14)

DRIVE TEST TABLE: 3

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA			
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR		
1	Call Attempts	Highways	12	NS	120	20	162	20	139	20	131	21	103	20	93	20	93	20	80	22	94	20		
		Major Roads	16	NS	70	20	53	20	70	20	49	17	50	20	43	20	47	20	43	22	55	20		
		Within City	64	30	447	30	359	33	470	30	494	31	430	30	399	30	414	30	383	31	435	30		
		Overall SSA	92	30	637	70	574	73	679	70	674	69	583	70	535	70	554	70	506	40	584	70		
2	Blocked Call Rate	Highways	0.00%	NC	0.83%	0.00%	0.62%	0.00%	1.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Major Roads	0.00%	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Within City	0.00%	0.00%	0.22%	0.00%	1.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.47%	0.00%	1.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.23%	0.00%		
		Overall SSA	0.00%	0.00%	0.31%	0.00%	1.22%	0.00%	0.29%	0.00%	0.00%	0.00%	0.34%	0.00%	0.75%	0.00%	0.36%	0.00%	0.00%	0.00%	0.17%	0.00%		
3	Dropped Call Rate (<=2%)	Highways	0.00%	NC	0.84%	0.00%	0.62%	0.00%	0.72%	0.00%	1.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Major Roads	0.00%	NC	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Within City	0.00%	0.00%	0.22%	0.00%	1.70%	0.00%	0.00%	0.00%	0.00%	0.00%	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Overall SSA	0.00%	0.00%	0.31%	0.00%	1.41%	0.00%	0.15%	0.00%	0.30%	0.00%	0.86%	1.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
4	(a) 0-4 (w/o frequency hopping for CDMA)	Percentage connections with good voice quality (=>95%)																						
		Highways	NA	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.67%	99.56%	96.54%	99.62%	
		Major Roads	NA	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.71%	99.77%	96.01%	97.66%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.12%	99.86%	95.93%	98.66%	

**AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER-2014-MP&CG CIRCLE**

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	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	NA	NA	NA	NA	NA	99.26%	99.75%
Operators)	Highways	98.73	NC	96.06%	97.74%	<b>92.87%</b>	97.90	96.98%	98.95%	<b>91.18%</b>	97.36%	<b>87.50%</b>	<b>93.41%</b>	98.47%	97.18%	99.30%	98.86%	NA	NA	NA	NA	
	Major Roads	98.66	NC	96.18%	<b>94.30%</b>	98.16%	99.87	97.06%	98.79%	<b>94.12%</b>	99.84%	<b>84.43%</b>	99.40%	98.34%	99.62%	98.13%	99.30%	NA	NA	NA	NA	
	Within City	98.8	98.56%	95.48%	99.51%	<b>94.18%</b>	97.02	96.82%	99.19%	<b>93.36%</b>	100%	<b>91.62%</b>	98.61%	98.09%	100%	97.72%	99.61%	NA	NA	NA	NA	
	Overall SSA	98.80	98.56%	95.71%	96.03%	<b>94.31%</b>	98.15	96.88%	99.01%	<b>92.99%</b>	98.79%	<b>89.96%</b>	98.70%	98.18%	99.09%	98.33%	99.31%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Highways	86.26	NC	76.21%	100%	54.03%	88.71%	78.31%	99.85%	83.43%	100%	49.60%	100%	72.99%	82.64%	76.61%	44.80%	63.36%	98.61%	44.06%	88.48%
		Major Roads	78.45	NC	89.32%	99.86%	70.47%	100%	96.96%	99.89%	97.28%	99.12%	72.46%	100%	81.20%	100%	91.39%	100%	76.36%	71.58%	52.67%	100%
		Within City	86.54	99.69%	89.13%	100%	60.81%	96.55%	77.33%	100%	92.43%	100%	62.74%	38.47%	79.23%	99.81%	89.85%	100%	70.09%	0.57%	37.35%	59.96%
		Overall SSA	84.97	99.69%	86.48%	99.92%	60.52%	96.24%	79.92%	99.96%	90.89%	99.70%	61.37%	79.33%	77.81%	94.15%	87.79%	69.38%	69.53%	56.92%	39.77%	85.22%
5	In-vehicle (>= - 85dBm)	Highways	96.78	NC	91.88%	100%	95.18%	100%	94.52%	100%	97.43%	100%	75.23%	100%	86.86%	100%	95.04%	97.49%	97.02%	99.03%	79.62%	100%
		Major Roads	93.29	NC	99.22%	100%	100%	100%	99.93%	100%	99.98%	100%	93.16%	100%	94.33%	0.00%	99.45%	100%	94.98%	99.35%	87.77%	100%
		Within City	97.21	99.85%	98.38%	100%	100%	100%	97.25%	100%	99.44%	100%	85.21%	61.18%	91.79%	100%	98.95%	100%	96.43%	70.93%	71.36%	100%
		Overall SSA	96.41	99.85%	96.32%	100%	99.17%	100%	95.15%	100%	99.06%	100%	84.25%	100%	90.99%	99.91%	98.35%	98.61%	96.40%	89.77%	74.14%	100%
5	Outdoor-in city (>= - 95dBm)	Highways	100	NC	98.54%	100%	100%	100%	99.22%	100%	99.63%	100%	91.54%	100%	96.76%	0.00%	99.95%	100%	99.47%	99.93%	98.65%	100%
		Major Roads	99.09	NC	100%	100%	100%	100%	100%	100%	100%	100%	99.25%	100%	99.61%	0.00%	100%	100%	99.42%	99.45%	99.25%	100%
		Within City	99.74	100%	99.80%	100%	100%	100%	99.85%	100%	99.93%	100%	97.24%	0.35%	98.41%	0.00%	99.96%	100%	99.36%	100%	96.11%	100%
		Overall SSA	99.65	100%	99.46%	100%	100%	100%	99.43%	100%	99.87%	100%	96.34%	100%	98.26%	100%	99.96%	99.97%	99.38%	99.79%	96.80%	100%
6	Call Setup	Highways	100%	NC	99.17%	100%	99.38%	100%	98.56%	100%	100%	100%	100%	100%	100%	100%	98.92%	100%	100%	100%	100%	100%

**AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER-2014-MP&CG CIRCLE**

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Success Rate (>=95%)	Major Roads	100%	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Within City	100%	100%		99.78%	100%	98.32%	100%	100%	100%	100%	100%	99.53%	100%	99.00%	100%	97.10%	100%	100%	100%	100%	99.77%	100%	
Overall SSA	100%	100%		99.69%	100%	98.78%	100%	99.71%	100%	100%	100%	99.66%	100%	99.25%	100%	97.65%	100%	100%	100%	100%	99.83%	100%	
Highways	100%	NC		98.78%	100%	95.72%	100%	99.21%	100%	97.78%	100%	98.67%	100%	100%	100%	100%	100%	100%	99.85%	96.77%	100%	100%	
7	Hand Over Success Rate (HOSR)	Major Roads	100%	NC	100%	100%	94.64%	100%	100%	100%	100%	100%	98.67%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	99.49%	100%	96.38%	100%	99.62%	100%	99.62%	100%	98.97%	100%	100%	100%	99.54%	100%	99.79%	100%	100%	100%	
		Overall SSA	100%	100%	99.39%	100%	95.98%	100%	99.59%	100%	99.41%	100%	98.87%	100%	100%	100%	99.67%	100%	99.82%	98.89%	100%	100%	
		Highways	100%	NC	98.78%	100%	95.72%	100%	99.21%	100%	97.78%	100%	98.67%	100%	100%	100%	100%	100%	99.85%	96.77%	100%	100%	

NA: Not Applicable

NC: No Coverage



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

**DRIVE TEST TABLE: 4**

DRIVE TEST ROUTE OF JULY TO SEPTEMBER 14 – MP&CG 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
REWA	July-14	Rewa / 180KM	Bankuiya Road, Satna Maihar Road, Chirola Colony, Mahajan Tola, Jalwar Road, Bus Stand, Nehru Nagar, Bajarang Nagar, Tilak Nagar, haribhushan Nagar, Ravindra Nagar, Bichiya Panadna Tola, Padra Road, Anand Nagar, Bus Stand.  <b>Indoor:</b> Shilpi Plaza B-Block	Tyothor & Sirmor / 90 KM	Sadahana Village, Rewa Road, Nagar Palika, Rajgarh Road, State Highway 9, Major Dist. Road, Katra Road, Saraswati H. School Sirmour, Chilla Chowraha, Bakhari Ghat, Sohagi Road, Jawa Road, Bus Stand, Teonthar Hospital  <b>Indoor:</b> Bus Stand, Sirmour	Mauganj / 80 KM	NH 7, Rewa Road, Sidhi Road, Barawn Road Mauganj, SKN PG Collage, Tahsil Mauganj, Bus Stand, SKN PG Collage, Tahsil Mauganj, Bus Stand, Barahata Road, Padara Road, Rest house, Naigarh Road, Veterinary Hospital.  <b>Indoor:</b> Bus Stand, Mauganj
VIDISHA	Aug-14	Vidisha / 145 KM	Sri Ram Nagar, Arihan Vihar, Vaishali Nagar, New Bus Stand, Madhav Ganj, Nikasa Market, Durga Nagar, SATI College, Ranagai, Jain College, Gandhi Nagar, SATI College  <b>Indoor:</b> Railway Station Vidisha	Lateri, Nateran, Sironj / 105 KM	Nateran complete SDCA, Lateri complete SDCA, // Sironj : Sironj Town, Panch Kuiyan Temple Area, Sironj Krishi Mandi Area, Sironj Irrigation Division, Patva Tola  <b>Indoor:</b> Sironj Bustand	Ganjbasoda, Kurwai / 98 KM	Kurwai SDCA : Kurwai Fort, Municipal Council Area // Ganjbasoda SDCA: Railway Station, Laxmi Narayan Mandir Area, Gandhi Chowk, Power House, Ward No. 8, Sevendha Road, Lal Patha  <b>Indoor:</b> Railway station Ganjbasoda
BILASPUR	Sep-14	Bilaspur / 190 KM	Agreshan Chowk, CMD chowk, Purana busstand, Gandhi chowk, Railway colony, Gurunanak chowk, Gole Baza, Sadar Bazar, Junna, Ram Shankar nagar, Taiba road, Trimurti colony area, Apna vihar, Transport nagar and Viapar vihar, Link road, Rajiv gandhi road, Mungeli road, Sarkanda Road, Seepat road, Bilaspur - Raipur road, Bilaspur champa road.  <b>Indoor:</b> Magneto Mall	Korwa, Pali, Katghora / 140 KM	Sarvodaya Nagar PALI, Irrigation Dept. road, Brihaspati Bazar, Govt. Hr. Sec. School road, BEO Office Pali, Ward no. - 13 Katghora, Prani Basti Katghora, Transport Nagar, New Bus stand, Old Bus stand, Ravishankar nagar, Niharika, Railway station. <b>Indoor:</b> New Busstand Korba	Champa & Janjgir / 57 KM	Champa Junction Rail Station (SECR), irrigation colony champa, Bhalerai Stadium area, Maruti Township, Rambandha talab, Bramhan Para, Sanjay Nagar, Old Irrigation Colony, Janjgir, Link road, Nihariya baba road, Station road and Kera road.  <b>Indoor:</b> Janjgir Railway station

**7.5 SSA WISE DRIVE TEST OBSERVATION:**

**DRIVE TEST TABLE: 5**

**DRIVE TEST OBSERVATION OF REWA 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	AIRTEL BHARTI	Rewa	--	Sirmor & Tyother	Poor voice quality observed at Sirmor: Reva road	Mauganj	--
2	AIRCEL		NC		NC		
3	BSNL		Poor Rx level & quality observed at Nehru--gar-Kotcha road, Bodhaibag road, Gud chauk road,/ Poor voice quality all over SDCA		Tyother : Poor Rx level & Quality all over SDCA		Poor voice level & Quality over Mauganj NH7 Highway
4	IDEA CELLULAR		--		--		--
5	VODAFONE		Poor voice quality observed at Rewa: Dhekha colony, Sat--RD		--		--
6	VIDEOCON		Poor voice quality observed at (Civil Lines, Model Science College Road)		--		--
7	TATA GSM		Poor voice quality observed at Pandan Tola, Deep Complex		--		--
8	TATA CDMA		Poor voice quality observed at Pandan Tola, Ajghara village, Bagadha road		--		--
9	RCOM GSM		Poor voice quality & RX Level observed at NH-7, SH-9, Udyog Vihar choraha, Police line		Poor voice quality & RX Level observed at Tyother : Rajpura		--
10	RCOM CDMA		--		Poor RX Level observed at Tyother city.		--

NC: No Coverage

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF VIDISHA 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	AIRTEL BHARTI	Vidisha	--	Lateri,-- teran,Seronj	--	Ganjbasoda,Kurwai	Poor voice quality observed at Ganjbasoda : ward no 8 & New bus stand area
2	AIRCEL		--		--		
3	BSNL		Poor voice quality observed at Vidisa : NH-86,Durga Nagar,SATI Collage		--		Poor voice quality observed at Kurwai : Mail market & Primary school
4	IDEA CELLULAR		--		--		
5	VODAFONE		--		--		
6	VIDEOCON		--		--		Poor voice quality observed at Ganjbasoda : Ganghi market
7	TATA GSM		Poor voice quality observed at Vidisha : CHOPAL SAGAR,Durga --gar,SATI Collage		Poor voice quality observed at Sironj : Rohil-Pura Village (SH-23),LBS College Road (SH-14),MPPTL Area.		Poor voice quality observed at : Bareth Village,Sironj Bareth Bypass Road & Pachma road
8	TATA CDMA		--		NC		NC
9	RCOM GSM		Poor voice quality observed at Keria Colony.		--		Poor voice quality observed at Ganjbasoda : Saket -gar , Sironj Tiraha
10	RCOM CDMA		--		--		--

NC: No Coverage

NP: Not Provided, BSNL has not provided the drive test plots despite our best efforts.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF BILASPUR SSA (SEPTEMBER-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	AIRTEL BHARTI	Bilaspur	Poor voice quality observed at Near Hotel Siva	Korwa, Pali, Katgohra	Poor voice quality observed at Katgohra : Near Hanumangari gate / Korwa near Ashok Vatika	Champa & Janjir	--
2	AIRCEL		NC		NC		--
3	BSNL		Found Poor voice quality all over SSA but critical observed at Sarkanda Muktidham		Found Poor voice quality all over SSA but critical observed at Katgohra : near Katghora exch / Korwa: laloo ram colony & traNCport -- gar		--
4	IDEA CELLULAR		Found Poor voice quality all over SSA but critical observed at Tarbahar chock & Railway area		Korwa : Found Poor voice quality all over SSA but critical observed at Darri korba road & Balko area		--
5	VODAFONE		--		--		--
6	VIDEOCON		Poor Rx level observed at MULKALWAR RESIDENCE area		Poor Rx level observed at Pali : Kathghora road / Kathgora :Korba and Ambikapur road		--
7	TATA GSM		--		Korwa : Poor voice quality observed at Darri korba road		--
8	TATA CDMA		Poor voice quality observed at Apolo Road		--		--
9	RCOM GSM		Found Poor voice quality all over SSA but critical observed at Sirgiti indst. Area,Ganesh -- gar,Churche square,Agrsen chauk.		Found Poor voice quality all over SSA but critical observed at Pali : Kathghora road / Korba : Darri korba road ,Balko area ,MP Chauk, Champa road		--
10	RCOM CDMA		--		--		--

NC: No Coverage

## 7.6 KEY FINDINGS ON DRIVE TEST:

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

### July 2014: Rewa SSA

- (i) Drive test across **Rewa SSA** covering Rewa, Tyother, Sirmor and Mauganj SDCAs.
- (ii) No Coverage: Aircel has no coverage in Rewa SSA

**Drive Test Results:** The drive test results revealed that in general, performance of the service providers was satisfactory. However, **RCOM (GSM) and BSNL** was not able to perform within benchmark for parameters 'Call Drop rate' and 'Voice Quality'. The performance of **RCOM (GSM)** for parameters **CDR and Voice Quality** was **6.04 (way beyond the benchmark of <= 2%) and 92.58%** respectively. **Voice Quality and Blocked Call rate for BSNL** was **92.75% and 6.57% respectively**. In respect of parameter **CSSR**, the performance of **BSNL and RCOM (CDMA)** was **93.13% and 69.51% (way below the benchmark of > 95%)** respectively. The poor performance of **RCOM** for parameter **CSSR** also indicates the excessive Call Blocked call rate i.e. **30.49%**.

### Vidisha SSA ( August-14)

- (i) Drive test across **Vidisha SSA** covering Vidisha, Latere, Nateran, Sironj, Ganjbasoda and Kurwai SDCAs.

**Drive Test Results:** In this SSA also, the performance of the service providers was satisfactory except for a few cases of non compliance. However, only **RCOM (GSM)** could not do well in respect of parameters **Call Drop rate and Voice Quality** with its achieved level as **3.51% and 93.06%** respectively on overall SSA basis. **BSNL** also remained under performed for parameter **Voice Quality (87.37% - Outdoor/79.05%-Indoor)**.

### Bilaspur SSA ( September-14)

- (i) Drive test across **Bilaspur SSA** covering Bilaspur, Korwa, Pali, Katghora, Champa and Janigir SDCAs.

**Drive Test Results:** As per the drive test outcome, **BSNL, RCOM (GSM) and Idea** lagged behind in meeting the benchmarks of **Voice Quality** with their performance as **94.31%%, 89.96% and 92.99%** respectively. The performance of other operators for rest of the parameters was satisfactory.

The deficiencies with respect to adequate coverage and voice quality, encountered by different Service providers at various places as shown in the drive tests plots, are detailed in the above tables.-5, 6 & 7.

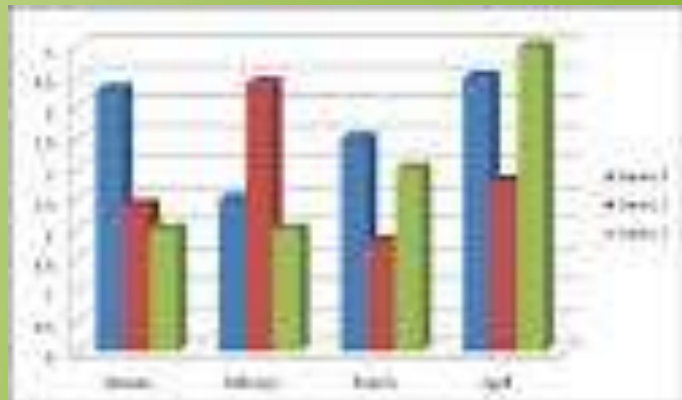
*Thus, on analyzing the overall performance of service providers on the basis of Drive tests, it was concluded that the service providers namely BSNL, RCOM(GSM)/(CDMA) and Idea could not perform well on the parameter 'Good Voice Quality', 'Call Drop rate' and 'CSSR'. These service providers need to improve their networks in the interest of the consumers.*

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

### AVERAGED QUARTERLY PMR

V/S

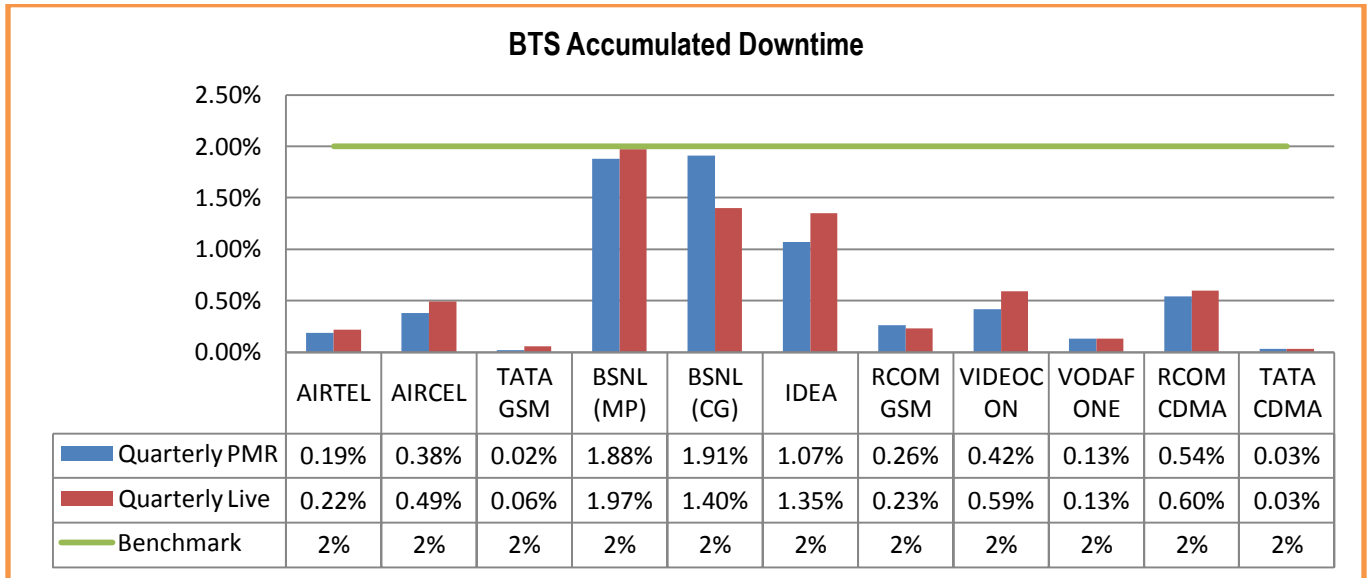
### AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



## 8. GRAPHICAL REPRESENTATION:

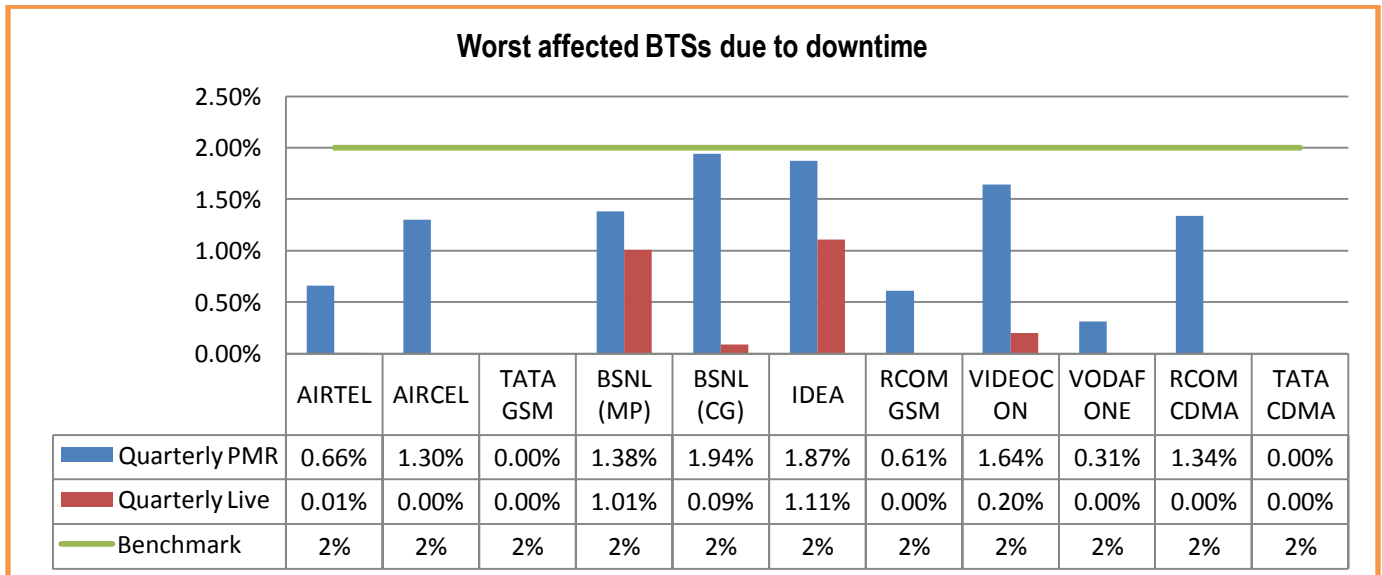
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

### 1. BTS ACCUMULATED DOWNTIME :



All operators are meeting the benchmarks.

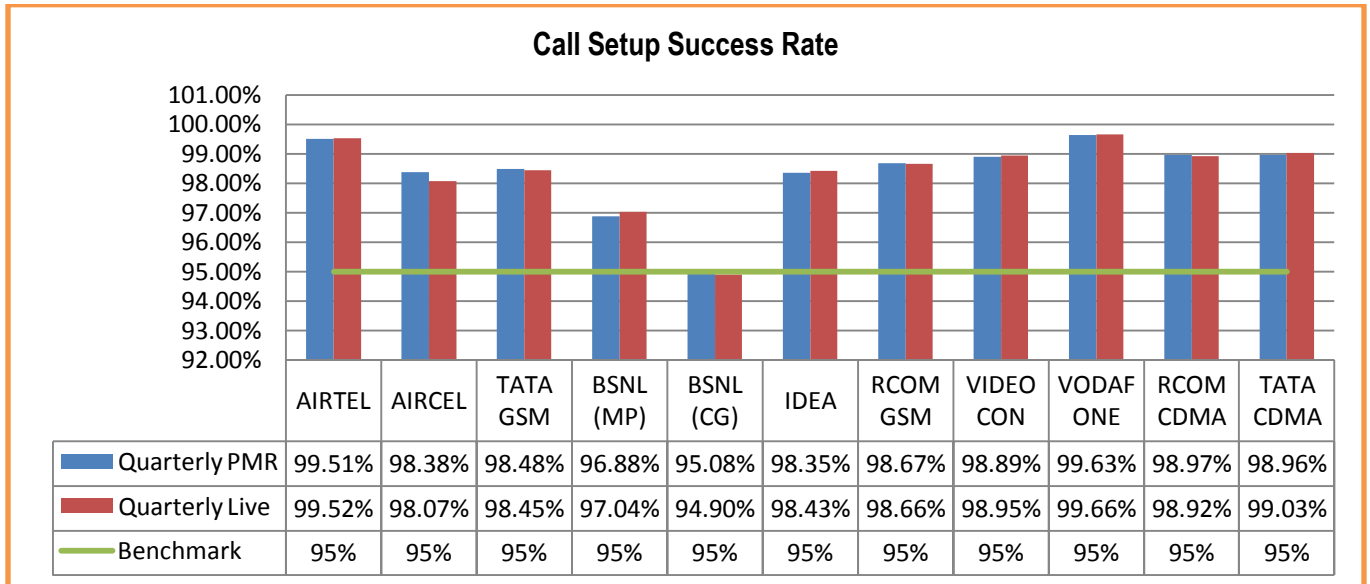
### 2. WORST AFFECTED BTS DUE TO DOWNTIME:



All operators are meeting the benchmarks.

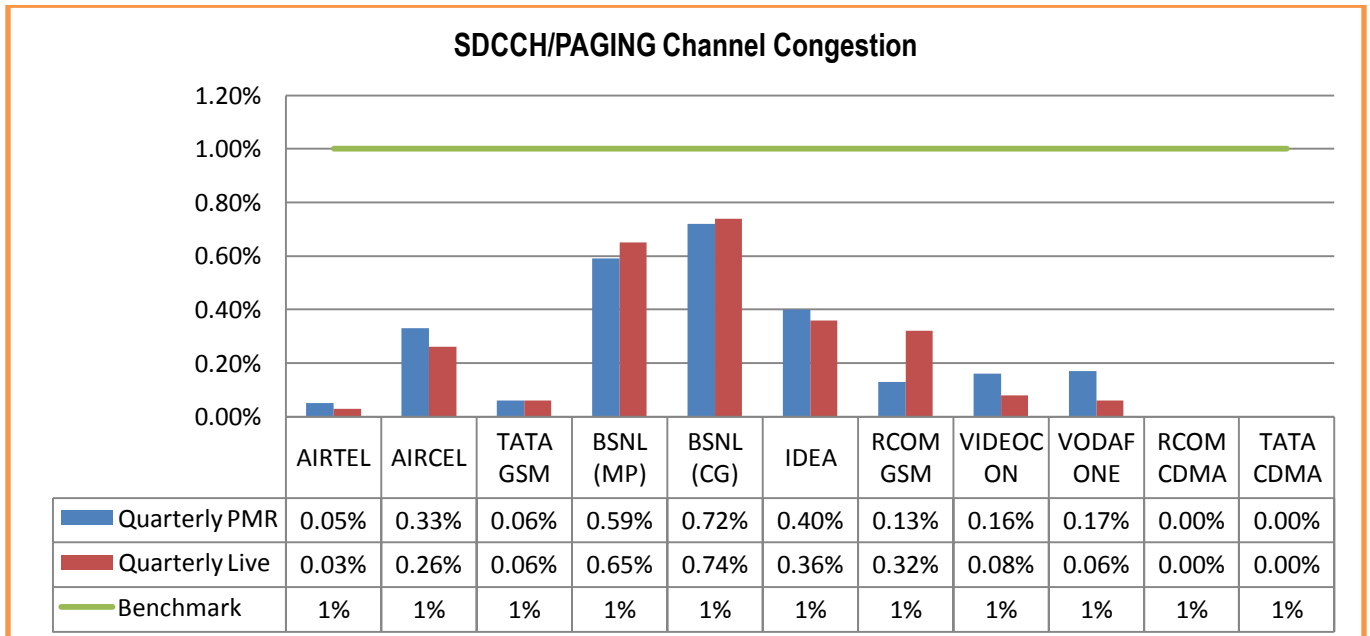


**3. CALL SETUP SUCCESS RATE :**



All operators are meeting the benchmarks except BSNL (CG) during 3 days live measurement.

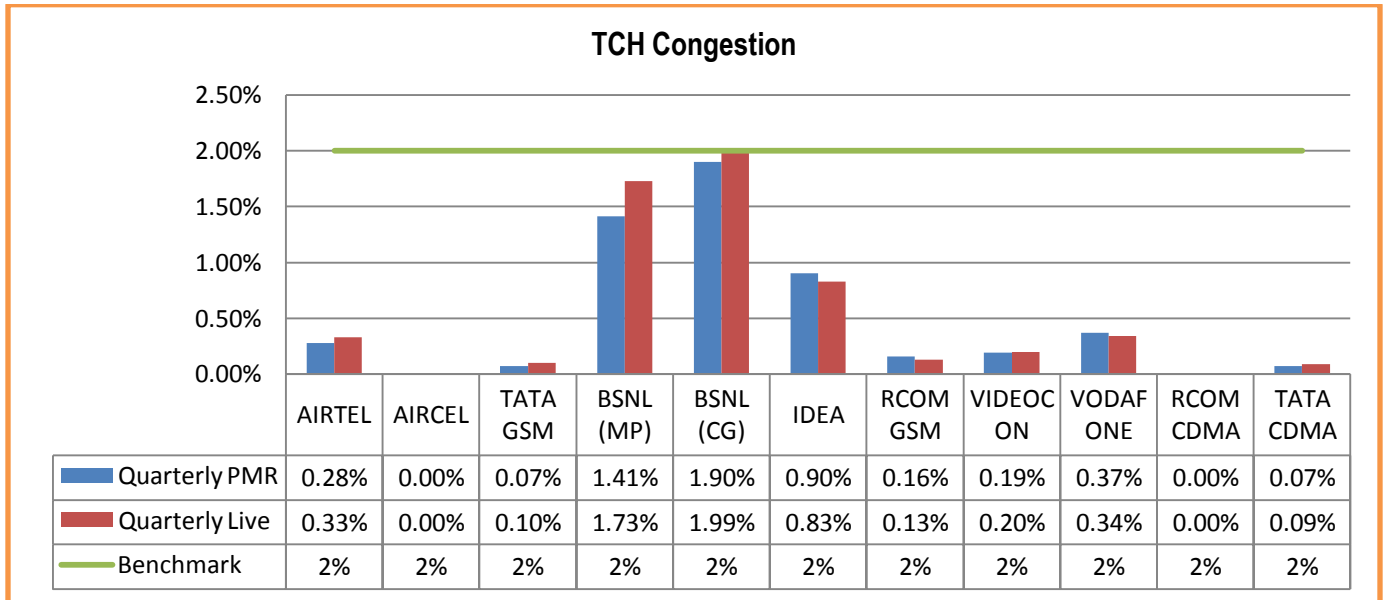
**4. SDCCH/PAGING CHANNEL CONGESTION:**



All operators are meeting the benchmarks.

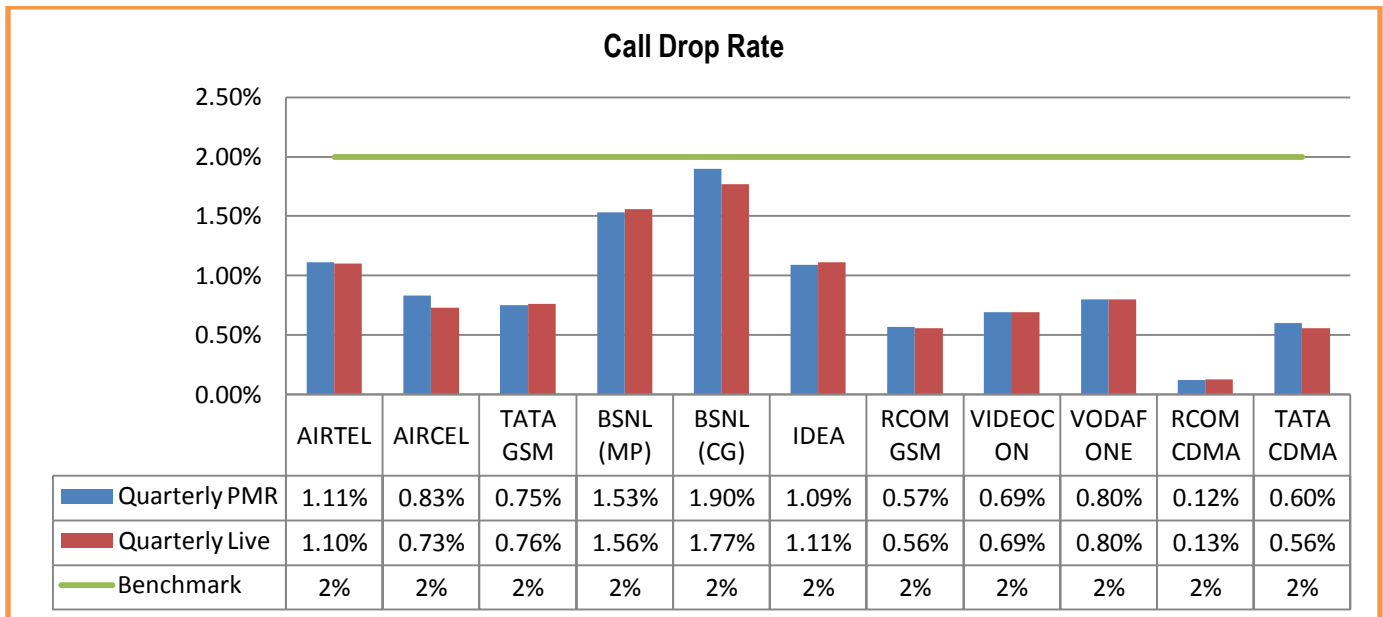


**5. TCH CONGESTION :**



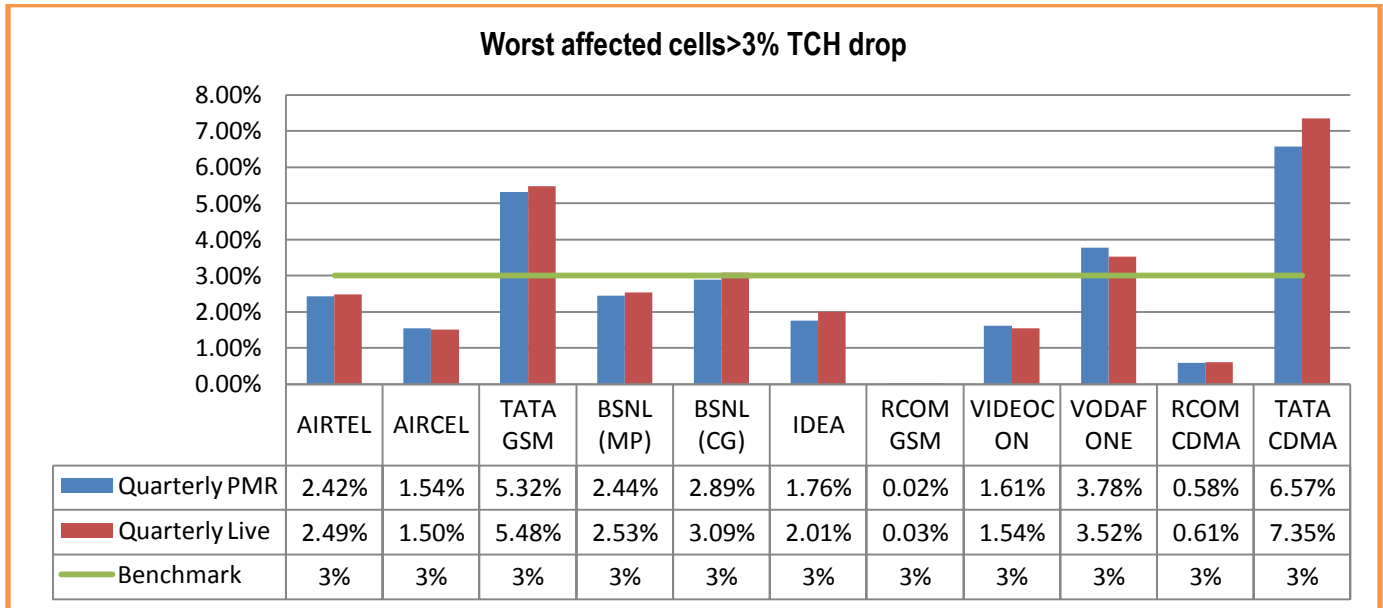
All operators are meeting the benchmarks.

**6. CALL DROP RATE :**



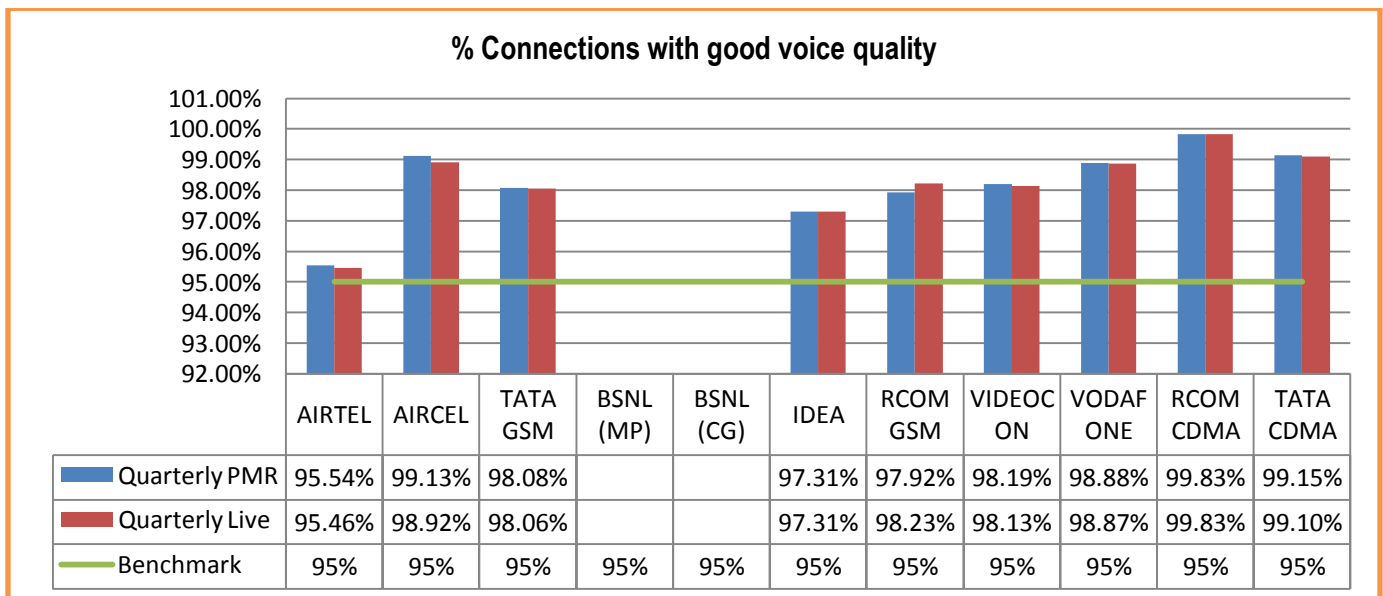
All operators are meeting the benchmarks.

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



All operators are meeting the benchmarks except Tata GSM, Vodafone, Tata CDMA and BSNL CG (3 days live).

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



All operators are meeting the benchmarks. Alcatel Lucent Technology being used by BSNL, OMCR does not support the parameter "Connections with good voice quality", hence BSNL has not provided data for this parameter.

## **9. QOS AUDIT OF BASIC (WIRELINE) SERVICE PROVIDERS**



## 9. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINE)

The QoS audit for basic (wire line) service was to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. Out of **2537** in Madhya Pradesh (present no. of BSNL exchanges), audit was done for **119** sampled (30-Urban and 89-Rural) exchanges & in Chhattisgarh, out of **568** exchanges audit was done for **27** sampled (10 Urban and 17 Rural) exchanges. In case of Private Service provider's one exchange each of TTL & RCL and two exchanges of Bharti Airtel were covered for audit. As Madhya Pradesh Circle is having **244** SDCAs and Chhattisgarh Circle is having **96** SDCAs, so total 146 sampled BSNL exchanges spread over 35 (25 MP and 10 CG ) SDCAs, (10% of SDCAs in MP & CG) have been taken for audit. (List of BSNL exchanges undertaken for QoS audit attached as Annex-1)

Sr. No	Service Provider	Circle	Urban Exchange	Rural Exchange	Total Exchange	No. of Urban Exchanges Covered for audit	No. of Rural Exchanges Covered for audit
1	BSNL	MP	744	1793	2537	30	89
2	BSNL	CG	206	362	568	10	17
3	Bharti	MP&CG	5	0	5	2	0
4	TTL	MP&CG	1	0	1	1	0
5	RCL	MP&CG	1	0	1	1	0
<b>Total Exchanges</b>			<b>957</b>	<b>2155</b>	<b>3112</b>	<b>44</b>	<b>106</b>

For BSNL exchanges, performance against each parameter has been evaluated by taking average of performance value of each parameter for all the audited exchanges. The average value of each parameter has been tabulated as follows:



**9.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON QUARTERLY MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:**

Averaged Audited data for Wireline (Basic) Services – MP&CG Circle								
S/N	Name of Parameter	Benchmark	Period	BSNL (MP)	BSNL (CG)	RCL	TTL	BHARTI AIRTEL
<b>Fault incidences</b>								
1	% of (No. of faults/100 subscribers /month)	< 5%	Quarterly	5.02%	6.44%	0.73%	5.30%	4.82%
<b>Faults Repair/Restoration Time</b>								
2	% of fault repair by next working day(Urban Area)	>90%	Quarterly	88.16%	74.71%	100.00%	94.00%	96.31%
	% of fault repair Within 3 days (Urban Area)	100%	Quarterly	96.74%	88.47%	100.00%	100.00%	100.00%
	% of fault repair by next working day(Rural & hilly Area)	>90%	Quarterly	100.00%	100.00%	NA	NA	NA
	% of fault repair Within 5 days(Rural & hilly Area)	100%	Quarterly	100.00%	100.00%	NA	NA	NA
	Mean time to Repair(MTTR)	≤8 Hrs	Quarterly	3.10	5.87	NA	4	3.28
<b>Rent Rebate</b>								
3	Fault pending > 3 days & <7 days	<i>Rebate for 7 days</i>	Quarterly	852	0	0	0	0
	Fault Pending > 7 days & < 15 days	<i>Rebate for 15 days</i>	Quarterly	363	0	0	0	0
	Fault pending > 15 days	<i>Rebate for 1 month</i>	Quarterly	64	0	0	0	0
<b>Call Completion Ratio(CCR) &amp; Answer to seizure Ratio(ASR)</b>								
4	CCR & ASR	> 55%(CCR)	Quarterly	62.55%	61.34%	83.52%	82.17%	--
<b>Metering &amp; Billing Credibility</b>								
5	% of disputed Bills over bills issued (Post Paid )	< 0.1%	Quarterly	0.01%	0.00%	0.01%	0.00%	0.01%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA	NA	NA	NA
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	<i>100% within 4 weeks</i>	Quarterly	85.37%	100.00%	100.00%	100.00%	100.00%
	Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<i>100% within 1 week of resolution of complaint</i>	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%
<b>POI Congestion</b>								
6	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0	0
<b>Response Time to customer for assistance</b>								
7	A) Total no of calls attempted to customer care/Call center		Quarterly	1728691	347610	147805	469	576273
	B) Total no. of calls successfully established to customer care/Call center		Quarterly	1658896	334158	142083	442	572778



Averaged Audited data for Wireline (Basic) Services – MP&CG Circle								
S/N	Name of Parameter	Benchmark	Period	BSNL (MP)	BSNL (CG)	RCL	TTL	BHARTI AIRTEL
	C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Quarterly	95.96%	96.13%	96.13%	94.20%	99.39%
	D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		Quarterly	438524	1221	147805	442	94414
	E) Total number of calls answered by the operator (Voice to voice) within 60 seconds		Quarterly	422965	969	142083	377	94414
	F) % age of calls answered by operator(voice to voice) (Total call attempt*100/ Total call successfully established within 60 Sec.)	>=90%	Quarterly	96.45%	79.36%	96.129%	85.29%	100.00%
<b>Customer care(promptness in attending to customers request)</b>								
8	% Termination / Closures within 7 days	100% within 7 days	Quarterly	100.00%	Nil	100.00%	Nil	100.00%
	% Time taken for refunds of deposit after closures within 60 days	100% within 60 days	Quarterly	100.00%	Nil	100.00%	Nil	100.00%

NA-Not Applicable

Note: Airtel has not provided data for the parameter "Call Completion Ratio (CCR)" as per TRAI QoS Regulation (Third amendment) dated 21<sup>st</sup> August 2014.

**9.2 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS LIVE MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:**

3 DAYS LIVE DATA FOR WIRELINE (BASIC) SERVICES – MP&CG CIRCLE								
S/ N	Name of Parameter	Bench- mark	Period	BSNL (MP)	BSNL (CG)	RCL	TTL	BHARTI AIRTEL
1	<b>Call Completion Ratio (CCR) &amp; Answer to seizure Ratio(ASR)</b>							
	CCR & ASR	> 55%(CCR) & > 75%(ASR)		70.06%	61.81%	86.70%	83.50%	--
2	<b>POI Congestion</b>							
	No. of POI's having congestion >0.5%			0	0	0	0	0
3	<b>Response Time to customer for assistance</b>							
	Total no of calls attempted to customer care/Call center			45484	32	2034	5	22224
	Total no. of calls successfully established to customer care/Call center			44331	30	1939	5	22224
	% Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%		97.47%	<b>93.75%</b>	95.33%	100%	100.00%
	Total Calls reached to agent desk for Voice to Voice (Total call attempt)			11718	24	1939	5	3273
	Total number of calls answered by the operator (Voice to voice) within 60 seconds			11097	18	1939	5	3269
% age of calls answered by operator (voice to voice) (Total call attempt*100/ Total call successfully established within 60 Sec.)	>=90%		94.70%	<b>80.00%</b>	100.00%	100.00%	99.88%	

Airtel has not provided data for the parameter "Call Completion Ratio (CCR)" as per TRAI QoS Regulation (Third amendment) dated 21<sup>st</sup> August 2014.

### 9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINE)

**Fault Incidences:** The audit of the service providers revealed that **BSNL (MP)**, **BSNL (CG)** and **TTL** were not meeting the benchmark with their performance as **5.02%**, **6.44%** and **5.30%** respectively.

**Fault Repair/Restoration Time:** All operators were found meeting the benchmark for this parameter except BSNL. For parameter **Faults repaired by next working day** the performance of **BSNL (MP)** and **BSNL (CG)** remained under performed with their performance level as **88.16%** and **74.71%** and for **faults repaired within 3 days**, it remained **96.74%** and **88.47%** respectively.

**Mean Time to Repair:** All operators were meeting the benchmarks.

**Call Completion Rate/Answer to seizure ratio:** All the operators were found to have met the benchmark on this parameter at various exchanges.

**Metering and Billing performance:** For this parameter also, the performance of the service providers was found well within the compliance benchmarks. However, the benchmark of parameter '**Resolution of Billing complaints (post-paid)**' could not be met by **BSNL (MP)** with its achieved value as **85.37%** against the benchmark of 100% within 4 weeks.

**POI Congestion:** All operators were found meeting the benchmark for this parameter.

**Response Time to Customer for assistance:** For percentage of calls getting connected to call center, the performance of the service providers was found well within the compliance except **TTL (94.20%)** which was marginally below the benchmark.

With respect to the parameter of calls answered by operator (voice to voice), **BSNL(CG)** and **TTL** could not meet the benchmark with their performance as **79.36%** and **85.29%** respectively against the benchmark of  $\geq 90\%$ .

During 3 days live measurements, only **BSNL (CG)** could not meet the benchmark for the parameters "% Accessibility of call centre /customer Care" and "% age of calls answered by operator (voice to voice)" with their performance as **93.75%** and **80.00%** respectively.

**Termination/Closures:** All operators were found meeting the benchmark on this parameter.

**Time taken for refund of deposit:** All operators were found meeting the benchmark on this parameter.

*Thus, from the above findings that, it was concluded that the performance of BSNL was not satisfactory in respect of the parameters Fault Incidences, Fault Repairs, resolution of billing complaints (Postpaid) and Calls answered by Operator (Voice to voice). TTL also failed to meet the benchmarks of parameters Fault Incidences, Accessibility to Call Center and Calls answered by Operator (Voice to voice). Hence, BSNL and TTL need to improve their services in respect of these parameters.*



### 9.4 INTER OPERATOR CALL ASSESSMENT (WIREFLINE)

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in UP (E) Circle during the time 1000 to 1300 Hrs and 1500 to 1700 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.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT							
Calling Operators	Circle Name	Total No. of calls Made	BHARTI AIRTEL	BSNL MP	BSNL CG	RCL	TTL
BHARTI AIRTEL	MP&CG	100	--	100.00%	100.00%	100.00%	100.00%
BSNL MP	MP&CG	100	100.00%	--	100.00%	100.00%	100.00%
BSNL CG	MP&CG	100	100.00%	100.00%	--	100.00%	100.00%
RCL	MP&CG	100	100.00%	98.00%	100.00%	--	95.00%
TTL	MP&CG	100	100.00%	100.00%	95.00%	95.00%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. However, in case where calls attempted from RCL to BSNL (MP) and TTL , successful interconnection was 98.0% and 95%, from TTL to BSNL(CG) and RCL was 95%. Thus there was no remarkable problem in interconnection from one operator to other operators except in few cases where Service providers could not achieve 100% marks.

### 9.5 LEVEL-1 LIVE CALLING (WIREFLINE)

LEVEL 1 LIVE CALLING								
Emergency no.	Circle Name	No. of calls made	BSNL (MP)	BSNL (CG)	RCL	TTL	BHARTI AIRTEL (Bhopal)	BHARTI AIRTEL (Gwalior)
100	MP & CG	30	✓	✓	✓	✓	✓	✓
101	MP & CG	30	✓	✓	✓	✓	✓	✓
108	MP & CG	30	✓	✓	✓	✓	✓	✓
1090	MP & CG	30	✓	✓	✓	✓	✓	✓
1091	MP & CG	30	✓	✓	✓	✓	✓	✓

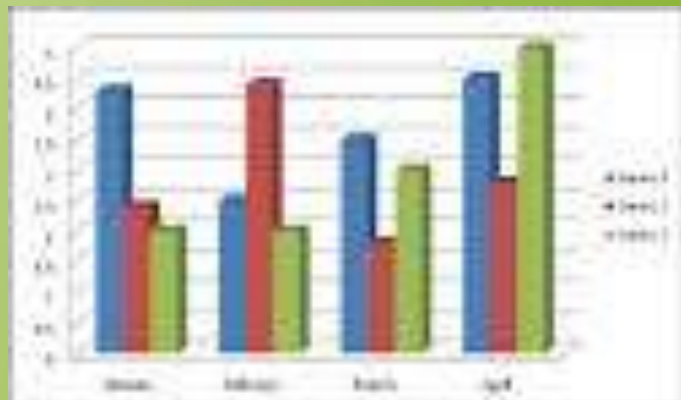
To assess the availability and efficiency of level 1 service such as police, fire, ambulance (emergency services) offered by BSNL, Bharti Airtel, RCL and TTL, the calls were made from telephone provided by service providers , these services were found functional in the networks of all the service providers.

**9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRESERVICE SERVICES)**

LIVE CALLING TO CALL CENTRE								
Parameters	Benchmark	BSNL (MP)	BSNL (CG)	BSNL (MP&CG)	RCOM	TTL	BHARTI AIRTEL (Bhopal)	BHARTI AIRTEL (Gwalior)
Helpline Numbers		1500	1500	1500	180030008383 / 30338383	18002663030	121, 198, 4444121 and 4444198.	121, 198, 4444121 and 4444198.
Total no of calls attempted to customer care/Call center		300	200	500	100	100	100	100
Total no. of calls successfully established to customer care/Call center		290	199	489	97	94	100	99
% Accessibility of Call centre /customer Care (Total call successfully established*100/Total call attempts)	>=95%	96.67%	99.50%	97.80%	97.00%	94.00%	100.00%	99.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempts)		290	199	489	97	94	100	99
Total number of calls answered by the operator (Voice to voice) within 60 seconds		275	190	465	96	84	100	99
% age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec.*100 /Total call attempts)	>=90%	94.83%	95.48%	95.09%	98.96%	89.36%	100.00%	100.00%

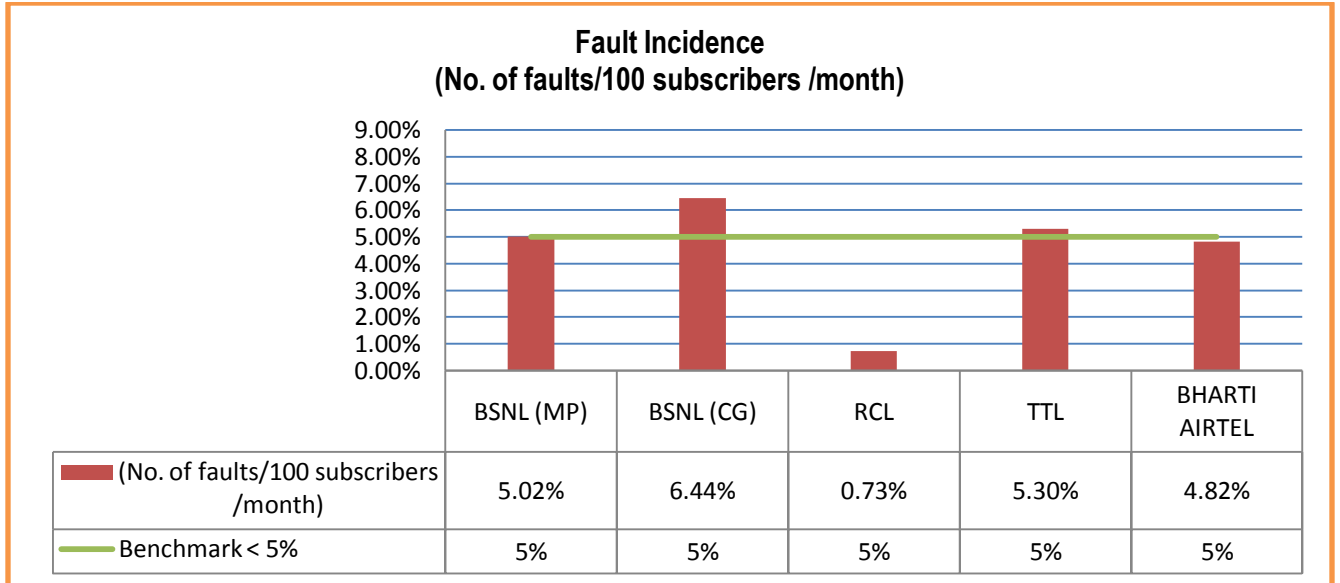
In Live calling, the performance TTL was 94.00% and 89.36% for parameters Accessibility of Call center and Call answered by operator (voice to voice) respectively. Other operators were within the benchmark.

## GRAPHICAL REPRESENTATION OF BASIC (WIRELINE) SERVICES



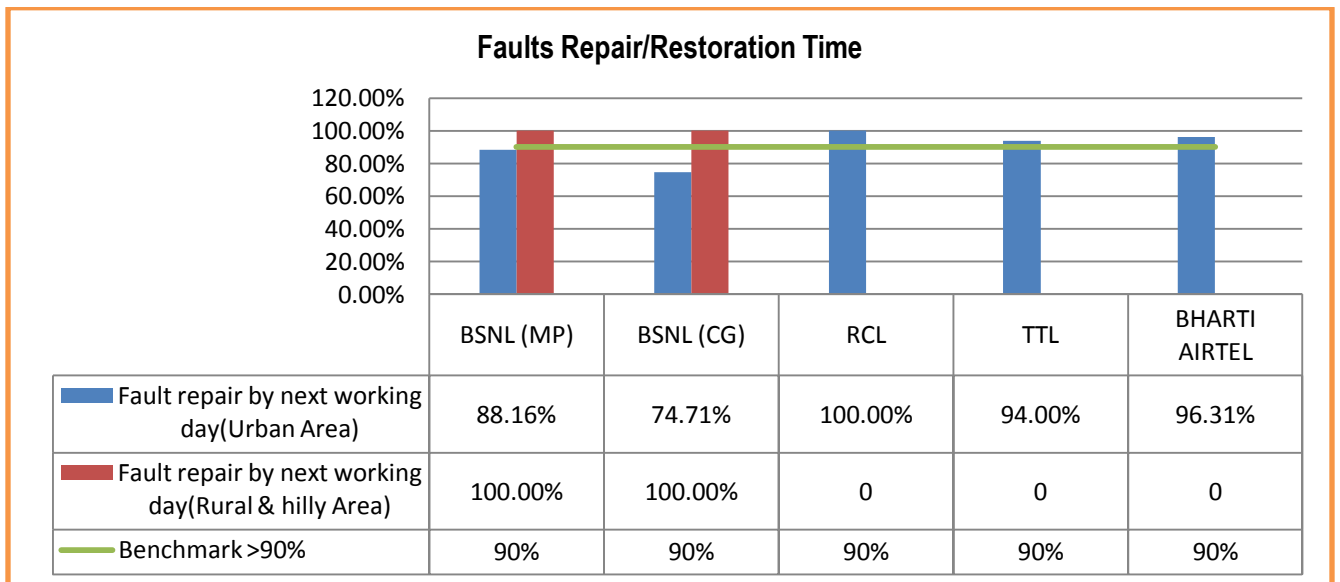
**9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINER) PROVIDERS:**

**1) FAULT INCIDENCE:**



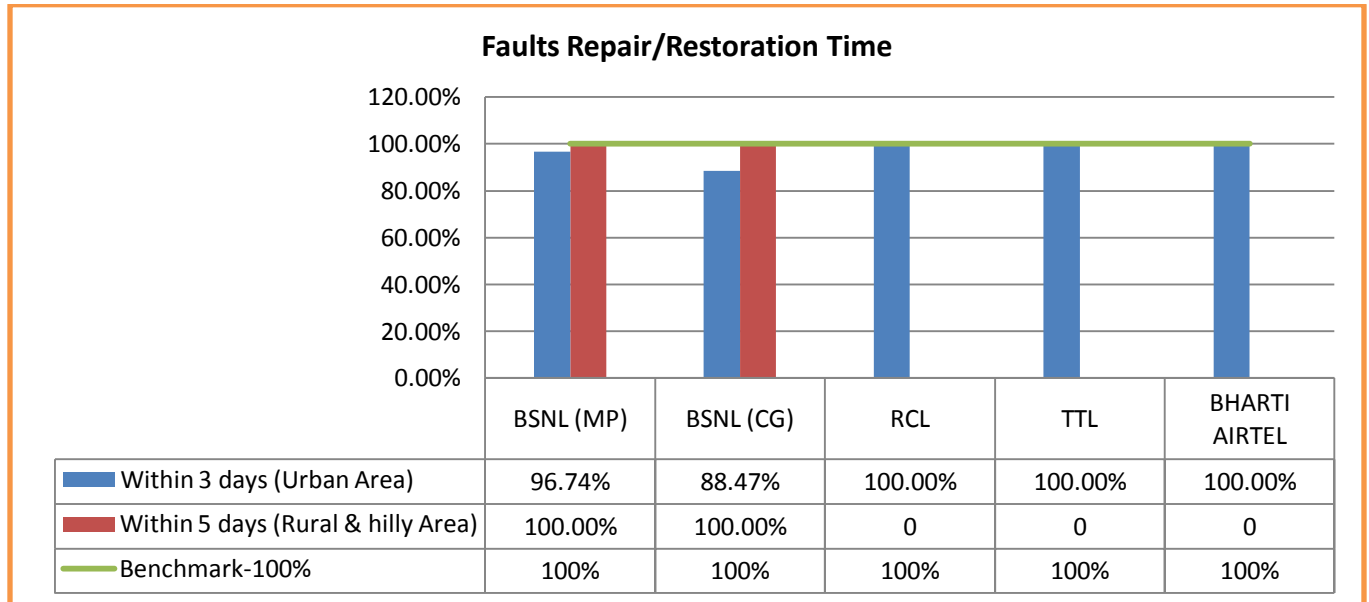
All Operators are meeting the benchmarks except BSNL (MP&CG) and TTL.

**2) FAULTS REPAIR/RESTORATION TIME:**



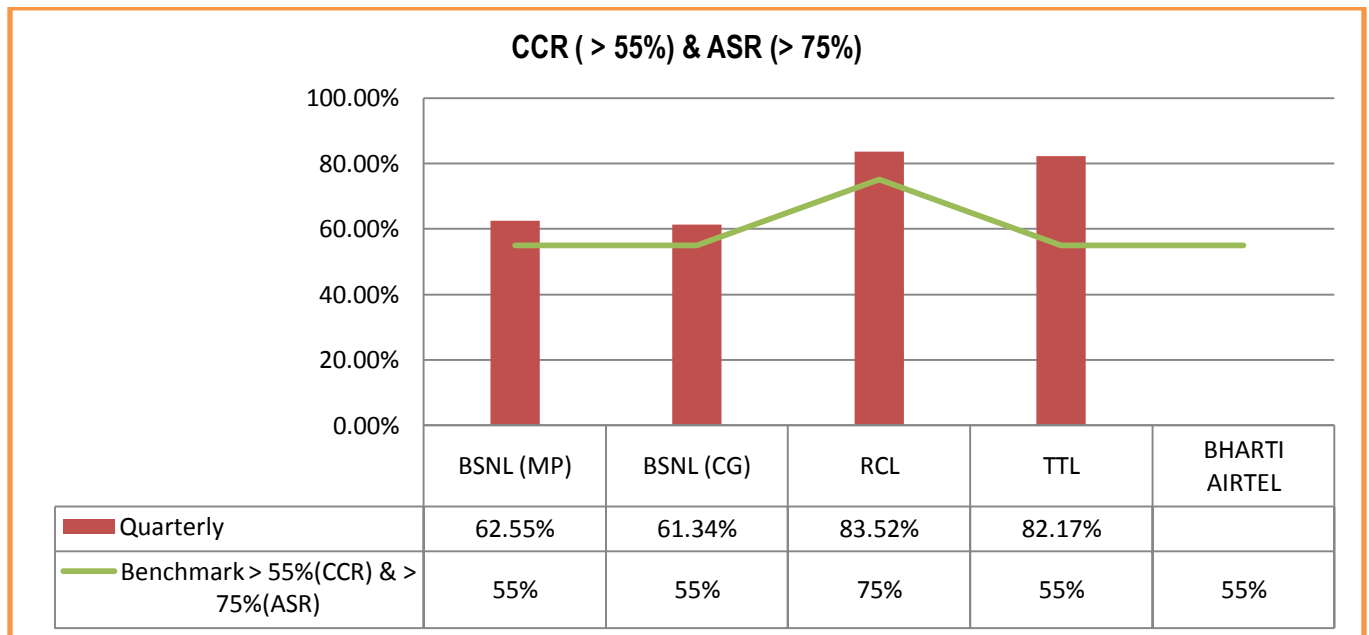
All Operators are meeting the benchmarks except BSNL (MP&CG).

**3) FAULTS REPAIR/RESTORATION TIME WITHIN 3 DAYS & 5 DAYS:**



All Operators are meeting the benchmarks except BSNL (MP&CG).

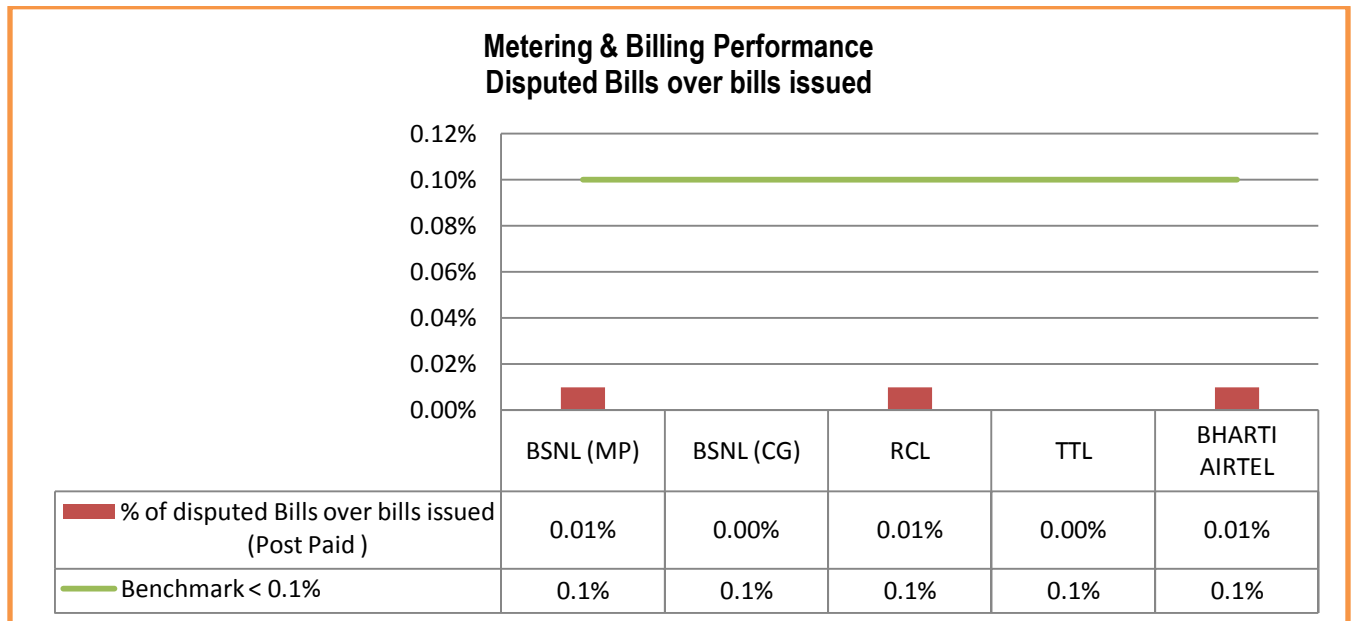
**4) CALL COMPLETION RATIO (CCR) & ANSWER TO SEIZURE RATIO(ASR):**



All Operators are meeting the benchmarks. RCL has provided ASR instead of CCR. Airtel has not provided data for this parameter as per TRAI new amendment.

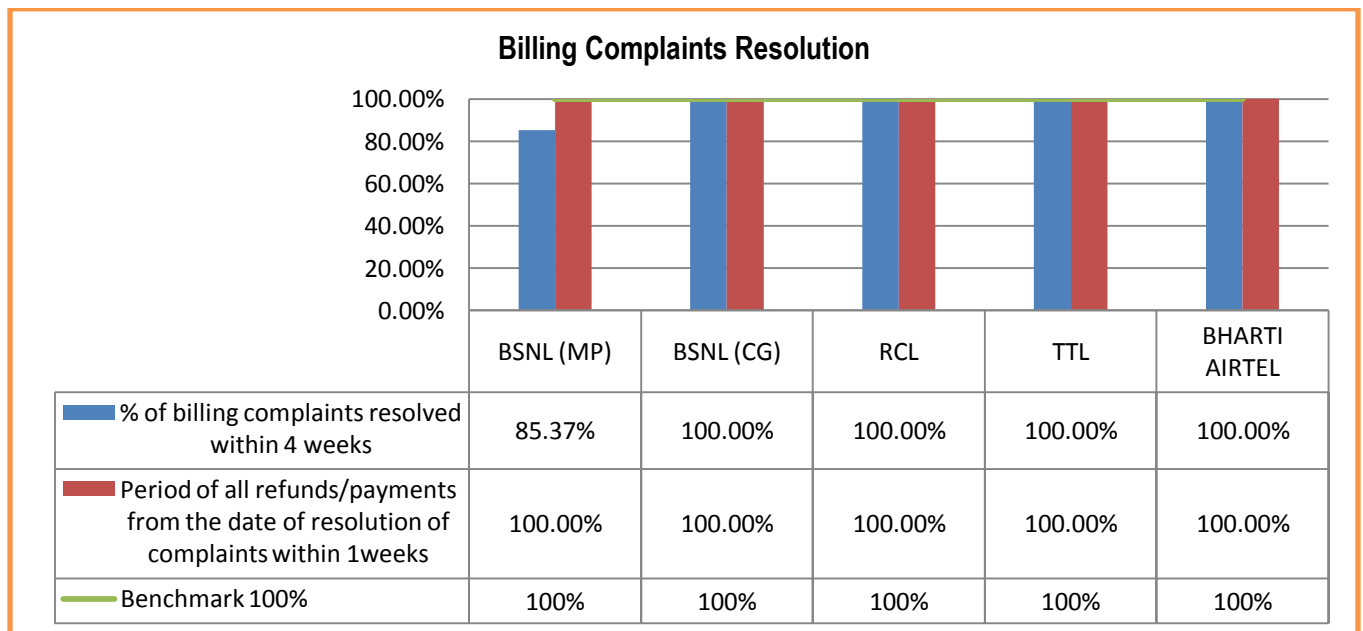
**5) METERING & BILLING PERFORMANCE:**

**a) DISPUTED BILLS OVER BILL ISSUED :**



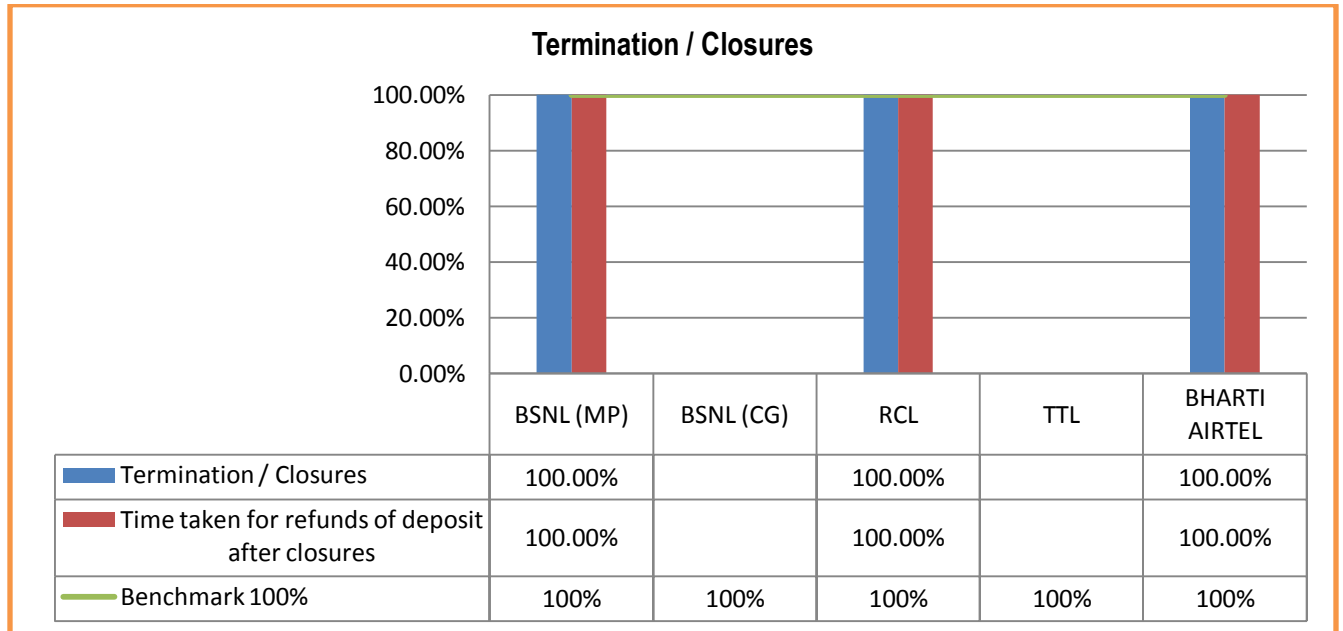
All Operators are meeting the benchmarks.

**b) BILLING COMPLAINT RESOLUTION:**



All Operators are meeting the benchmarks except BSNL MP.

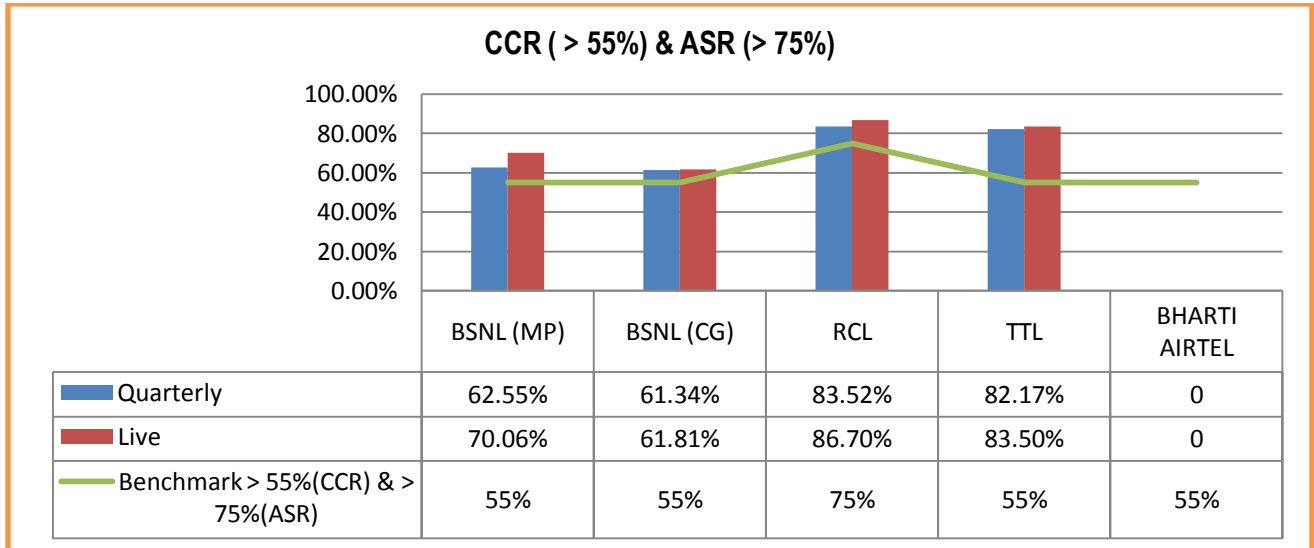
6) TERMINATION & CLOSURES:



All Operators are meeting the benchmarks.

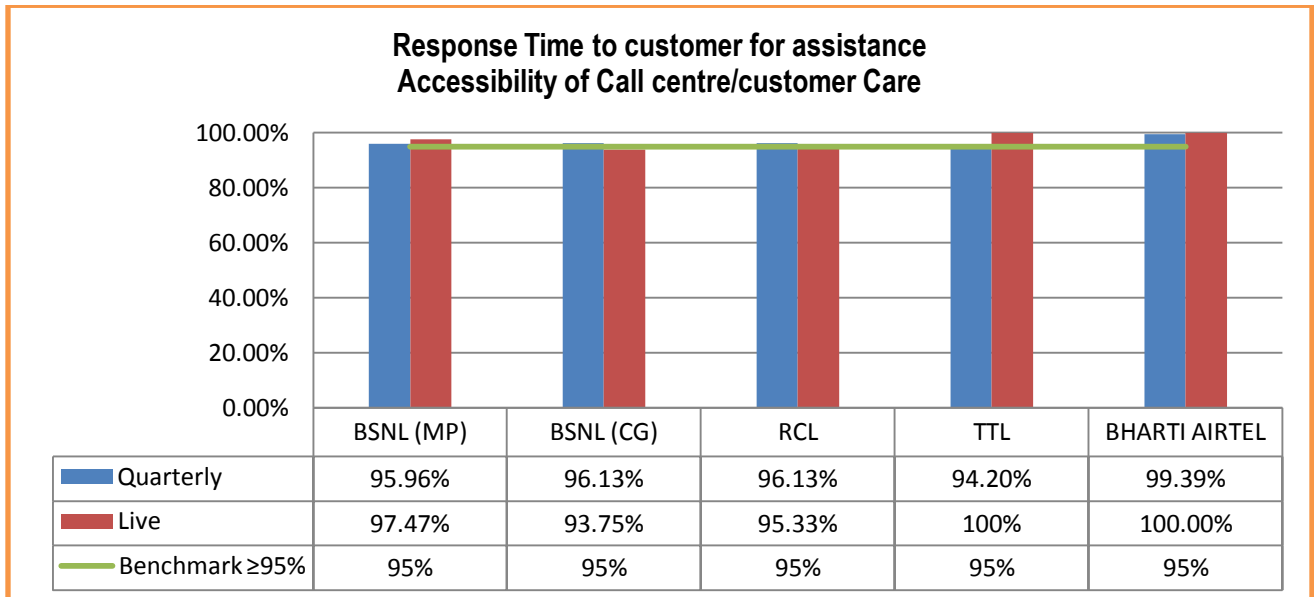
**9.8 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINER) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:**

**1) CALL COMPLETION RATIO (CCR) & ANSWER TO SEIZURE RATIO(ASR):**



All Operators are meeting the benchmarks.

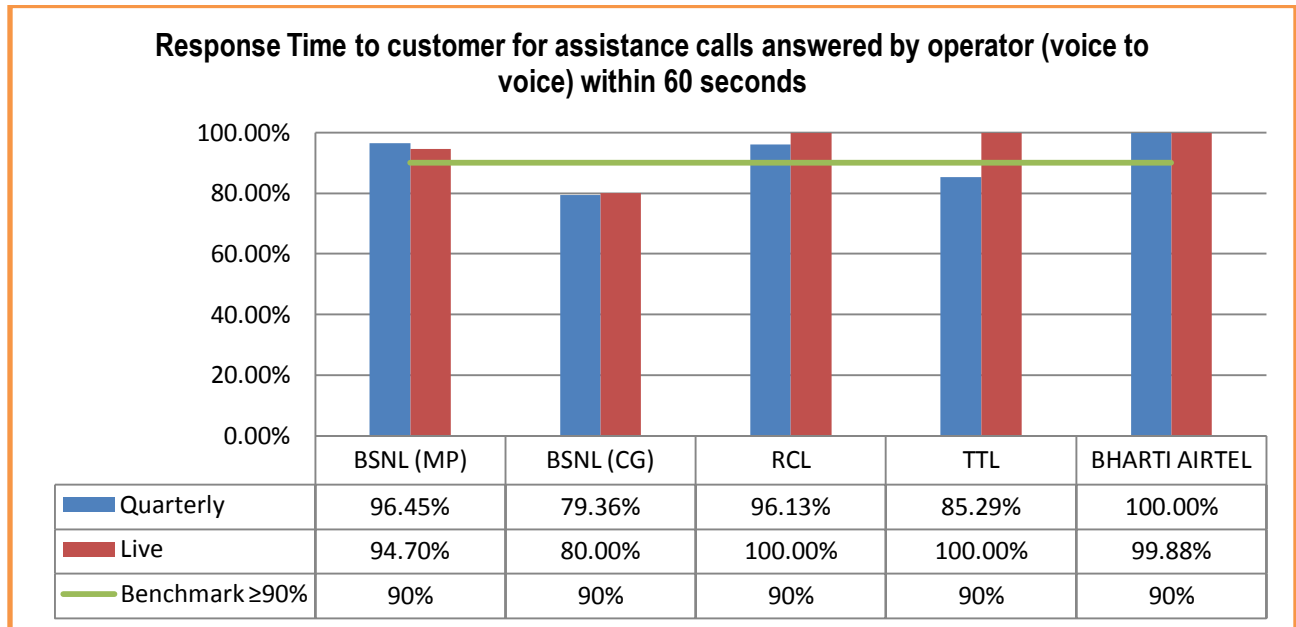
**2) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE ACCESSIBILITY OF CALL CENTRE/CUSTOMER CARE:**



All Operators are meeting the benchmarks except TTL and BSNL-CG (Live).



3) **RESPONSE TIME TO CUSTOMER FOR ASSISTANCE CALL ANSWERED BY OPERATORS :**



All Operators are meeting the benchmarks except BSNL CG (Quarterly & Live) and TTL (Quarterly).

## 10. QOS AUDIT OF BROADBAND SERVICE PROVIDERS



## 10. QUALITY OF SERVICE AUDIT OF 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. Based on this criterion, **119** no. of BSNL (MP) PoPs i.e. 5% of 2386 BSNL (MP) PoPs / Exchanges and **28** no. of BSNL (CG) i.e. 5% of 559 BSNL (CG) PoPs / Exchanges, spread over 10% SDCAs have been taken for QoS audit. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

Discussion with the private broadband service providers revealed that there is no concept of their PoPs on SDCA basis; they are maintaining their entire data on centralized basis so audit has been done for the centralized data.

SR. NO.	SERVICE PROVIDER	AUDIT OF POP LOCATION	TOTAL POPS	ADDRESS
1	BSNL (MP)	MP	<b>2386 (119 POPS COVERED)</b>	BSNL OFFICE BHOPAL, GWALIOR, HOSANGABAD, INDORE, MORENA AND UJJAIN
2	BSNL (CG)	CG	<b>559 (28 POPS COVERED)</b>	BSNL OFFICE RAIPUR & BILASPUR
3	AIRTEL BHARTI	BHOPAL	277	SHOP NO-478 & 14, ABHINAV APPARTMENT, GULMOHAR COLONY, BHOPAL
4	TTL	BHOPAL	1	TATA TELESERVICES LTD. CHINAAR FORTUNE CITY, HOSHANGABAD ROAD, NEAR VRINDAVAN BHABA, BHOPAL (M.P.)
5	TCL	GWALIOR	7	VSNL, TTSL BTS PREMISES, GALI NO. 2, ARYA NAGAR, GWALIOR 474006
6	NSTPL	GWALIOR	9	ADDRESS: 33, MAHARANA PRATAP COLONY, JHANSI ROAD, LASHKAR, GWALIOR.
7	RCOM	DAKC MUMBAI	1	AI8, RELIANCE INFRASTRUCTURE BLDG, A-WING, MBP, MAHAPE, NAVI MUMBAI.
8	TIKONA	INDORE	35	TIKONA DIGITAL NETWORKS PVT. LTD. 107-108, INDUSTRY HOUSE, AB ROAD, INDORE - 452001
9	PACENET	INDORE	20	BROADBAND PACENET INDIA PVT LTD. SHANIVAR DARPAN BUILDING, THIRD FLOOR, 27, PRESS COMPLEX, A B ROAD, INDORE 452008.
10	HATHWAY	BHILAI (CHHATTISGARH)	1	SHOP NO-5 PLOT NO-1 NEAR RAILWAY CROSSING AKASH GANGA SUPELA BHILAI (C.G)
11	ORTAL GROUP	RAIPUR (CHHATTISGARH)	1	ORTEL COMMUNICATIONS LIMITED, BHALLA HOUSE, MEERA DUTAR ROAD, NEAR BOTTLE HOUSE, SHANKAR NAGAR, RAIPUR - 492007, CG.



**10.1 QUARTERLY MEASUREMENT DATA FOR BROADBAND SERVICE PROVIDERS**

**AVERAGED QUARTERLY (JULY TO SEPT 14) AUDIT DATA FOR BROADBAND SERVICES – MP&CG CIRCLE**

<b>Broadband Audit Data</b>		<b>Benchmark</b>	<b>BSNL (MP)</b>	<b>BSNL (CG)</b>	<b>PACENET</b>	<b>TIKONA</b>	<b>HATHWAY</b>	<b>ORTAL COMMUNICATION</b>	<b>RCL</b>	<b>BHARTI AIRTEL</b>	<b>TCL</b>	<b>TTL</b>	<b>NSTPL</b>	
<b>S/ N</b>	<b>Name of Parameter</b>	<b>BROADBAND SERVICE PROVIDERS</b>												
<b>Service Provisioning/Activation Time</b>														
1	A) No of connections registered during the period		1069	275	190	3007	171	193	296	10573	0	102	4	
	B) Total number of connections provided within 15 days of registration on demand during the period		1065	275	190	3007	171	193	296	10573	0	102	4	
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	100% < 15 days	99.63%	100%	100%	100.00%	100.00%	100.00%	100.00%	100%	NA	100%	100%	
	D) Total number of connections provided after 15 days of registration on demand		4	NA	0	0	0	0	0	0	0	0	0	
	E) %age of connections provided after 15 days of registration on demand		0.37%	NA	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA	NA	NA	0.00%
	F) In all cases where payment towards installation charge & SD is taken and the Broadband connection is NP within 15 working days	Credit @ Rs.10/ per day.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>Fault Repair/Restoration Time</b>														
2	A) Total number of faults registered during the period		7457	6978	24	6575	186	4667	647	24910	249	377	15	
	B) Total number of faults repaired by next working day		5710	6779	22	6010	186	4595	647	23378	206	315	15	
	C) % age of faults repaired by next working day	>90%	76.57%	97.15%	91.67%	91.41%	100.00%	98.46%	100.00%	93.85%	82.73%	83.55%	100.00%	
	D) Total number of faults repaired within three working days		7213	6978	24	6523	186	4653	647	24746	232	62	15	
	E) % age of faults repaired within three working days	≥99%	96.73%	100.00%	100.00%	99.21%	100.00%	99.70%	100.00%	99.34%	93.17%	100.00%	100.00%	



**AVERAGED QUARTERLY (JULY TO SEPT 14) AUDIT DATA FOR BROADBAND SERVICES – MP&CG CIRCLE**

Broadband Audit Data		Benchmark	BSNL (MP)	BSNL (CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
S/N	Name of Parameter		BROADBAND SERVICE PROVIDERS										
<b>Rent Rebate</b>													
3	A) Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		13	0	NA	26	NA	6	NA	NA	561	0	NA
	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		9	0	NA	39	NA	8	NA	NA	120	0	NA
	C) Faults Pending for > 15 working days: (Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		0	0	NA	15	NA	0	NA	NA	18	0	NA
<b>Billing Performance</b>													
4	A) Total bills generated during period		144313	9671	2957	35229	1136	5254	18908	391726	307	831	15
	B) Total complaints received from customers/ Bills disputed		244	0	0	112	19	0	57	58	0	6	0
	C) Billing complaints per 100 bills issued	<2%	0.17%	0.00%	0.00%	0.32%	1.67%	0.00%	0.30%	0.01%	0.00%	0.72%	0.00%
	D) Total number of complaints resolved in 4 weeks from date of receipt		244	NA	NA	112	19	5254	57	58	0	6	15
	E) %age billing complaints resolved in 4 weeks	100%	100.00%	NA	NA	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%
	F) Total number of cases requiring refund of deposits after closure		682	Nil	Nil	11	Nil	Nil	1	120	0	NA	Nil
	G) Total number of cases where refund was made in <60 days		682	Nil	Nil	11	Nil	Nil	1	120	0	NA	Nil
	H) Percentage cases in which refund received within 60 days	100%	100.00%	NA	NA	100.00%	NA	NA	100.00%	100.00%	NA	NA	NA
<b>Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)</b>													
5	A) Total number of calls received by the operator		83877	407	24	78377	521	4667	88084	191272	179966	464	NA
	B) Total number of calls answered by the operator within 60 seconds		73889	293	22	48421	420	4667	83635	183842	148509	284	NA
	C) % age calls answered by the operator in 60 seconds	>60%	88.09%	71.99%	91.66%	61.78%	80.61%	100.00%	94.95%	96.12%	82.52%	61.21%	NA



**AVERAGED QUARTERLY (JULY TO SEPT 14) AUDIT DATA FOR BROADBAND SERVICES – MP&CG CIRCLE**

Broadband Audit Data		Benchmark	BSNL (MP)	BSNL (CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
S/N	Name of Parameter		BROADBAND SERVICE PROVIDERS										
	D) Total number of calls answered by the operator within 90 seconds		75123	323	24	62126	505	NA	87346	187028	154713	305	NA
	E) % age calls answered by the operator within 90 seconds	>80%	89.56%	79.36%	100.00%	79.27%	96.93%	NA	99.16%	97.78%	85.97%	65.73%	NA
<b>6</b>	<b>Bandwidth Utilization/ Throughput:</b>												
	<b>POP to ISP Gateway Node [Intra-network] Link(s)</b>												
6.1	A) Total Bandwidth Available at the link for the period days		19000	21096	277	2179	NP	95	10000	191076	337920	3072	10
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		10214	7057	159	1658	NP	73.63	596	36512	162816	2342	6
	C) % age Bandwidth utilized during the period	<80%	53.76%	33.45%	57.00%	76.00%	NP	77.51%	5.960%	19.11%	48.18%	76.24%	60.00%
	<b>ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity</b>												
6.2	A) Total number of upstream links for International connectivity		NA	NA	NA	8	1	NA	11	3	48	3	NA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		NA	NA	NA	0	NA	NA	0	0	0	0	NA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		NA	NA	NA	1415	80	NA	94000	45000	806912	30720	NA
	D) Total international bandwidth utilization during peak hours (TCBH)		NA	NA	NA	1009	58.83	NA	41853	29960	543744	14787	NA
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	NA	NA	NA	71.30%	73.53%	NA	44.52%	66.58%	67.39%	48.13%	NA
	<b>Broadband Connection Speed (download) - from ISP Node to User</b>												
6.3	A) Total committed download speed to the sample subscribers (In mpbs)		NP	2	2	NP	1.17	2.68	2	6	3	6	NP
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		NP	1.89	1.91	NP	1.007	2.15	1.996	6.04	2.58	5.29	NP
	C) % age subscribed speed available to the subscriber during TCBH	>80%	NP	94.50%	95.50%	NP	86.06%	94.90%	99.833%	100.64%	86.00%	88.16%	NP
	<b>Service Availability/Uptime</b>												
7	A) Total operational Hours		2208	2208	2208	2208	2208	2208	2208	2,208	2208	2208	2208
	B) Total downtime (In hours)		23.09	0	21.5	1	8	3.15	9.27	0.99	50.08	8.06	0



**AVERAGED QUARTERLY (JULY TO SEPT 14) AUDIT DATA FOR BROADBAND SERVICES – MP&CG CIRCLE**

Broadband Audit Data		Benchmark	BSNL (MP)	BSNL (CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
S/N	Name of Parameter		BROADBAND SERVICE PROVIDERS										
	C) Total time when the service was available (In Hrs)		2185	2208	2187	2207	22	2204	2199	2,207	2158	2200	2208
	D) % age of Service availability uptime	>98%	98.95%	100.00%	99.03%	99.95%	99.60%	99.84%	99.580%	99.96%	97.73%	99.63%	100.00%
<b>Packet Loss</b>													
8	A) Total number of ping packets transmitted		NP	1000	NP	NP	NP	3000	91000	3000	3000	3350	NP
	B) Total number of ping packets lost		NP	0	NP	NP	NP	0.00%	612	0	0	0	NP
	C) % age packet loss	<1%	NP	0.00%	NP	NP	NP	0.00%	0.673%	0.00%	0.00%	0.00%	NP
9	<b>Network latency (for wired broadband access)</b>												
<b>Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway</b>													
9.1	A) Total number of ping packets transmitted		NP	1000	NP	NP	NP	1000	1000	1000	1000	1000	NP
	C) Average round trip tip time for all the ping transmitted	<120 ms	NP	60	NP	NP	NP	79.33	26.17	71.33	100	65.66	NP
<b>Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)</b>													
9.2	A) Total number of ping packets transmitted		NP	NP	NP	NP	NP	1000	1000	1000	1000	1000	NP
	C) Average round trip tip time for all the ping transmitted	<350 ms	NP	NP	NP	NP	NP	201	34.63	63.66	261	66.24	NP
<b>Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)</b>													
9.3	A) Total number of ping packets transmitted		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA- Not Applicable

NP-Not Provided- Monthly Data Not Monitored by ISPs



**10.2 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS MEASUREMENT DATA VERIFICATION FOR BROADBAND SERVICE PROVIDERS:**

**3 DAYS LIVE DATA FOR BROADBAND SERVICES - MP&CG CIRCLE**

3 days live Broadband Audit Data		Benchmark	BSNL (MP)	BSNL (CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
S/N	Name of Parameter	BROADBAND SERVICE PROVIDERS											
<b>Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)</b>													
1	A) Total number of calls received by the operator		2734	6	1	2210	90	157	3051	6099	3195	8	NA
	B) Total number of calls answered by the operator within 60 seconds		2264	2	1	1549	53	157	2819	5956	2932	7	NA
	C) % age calls answered by the operator in 60 seconds	>60%	82.81%	33.33%	100.00%	70.00%	58.89%	100.00%	92.40%	97.66%	91.77%	87.50%	NA
	D) Total number of calls answered by the operator within 90 seconds		2312	3	0	1932	49	NA	3051	6052	2966	7	NA
	E) % age calls answered by the operator within 90 seconds	>80%	84.56%	50.00%	100.00%	87.42%	54.44%	NA	100.00%	99.23%	92.83%	87.50%	NA
2	<b>Bandwidth Utilization/ Throughput:</b>												
<b>POP to ISP Gateway Node [Intra-network] Link(s)</b>													
2.1	A) Total Bandwidth Available at the link for the period days		20000	21096	292	2240	NA	95	10000	194085	337920	NP	10
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		11724	7057	158.33	1180	NA	76.46	1115	36223	147456	NP	4.6
	C) % age Bandwidth utilized during the period	<80%	58.62%	33.45%	54.22%	52.68%	NA	80.48%	11.15%	18.70%	43.64%	NP	46.00%
<b>ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity</b>													
2.2	A) Total number of upstream links for International connectivity		NA	NA	NA	8	1	NA	11	3	48	3	NA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		NA	NA	NA	0	0	NA	0	0	0	0	NA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		NA	NA	NA	1415	80	NA	104000	45000	955392	20890	NA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		NA	NA	NA	1063.76	58.61	NA	69862	29920	614400	13839	NA
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	NA	NA	NA	75.18	73.26%	NA	67.18%	66.49%	64.31%	66.25%	NA
2.3	<b>Broadband Connection Speed (download) - from ISP Node to User</b>												





**3 DAYS LIVE DATA FOR BROADBAND SERVICES - MP&CG CIRCLE**

3 days live Broadband Audit Data		Benchmark	BSNL (MP)	BSNL (CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
S/N	Name of Parameter	BROADBAND SERVICE PROVIDERS											
	A) Total committed download speed to the sample subscribers (In mpbs)		4.52	3.93	1	2	1.17	14.50	1.5	6	3	2	2.00
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		3.91	3.35	0.9	1.87	1.04	14.01	1.3	6.45	2.88	1.74	2.07
	C) % age subscribed speed available to the subscriber during TCBH	>80%	86.58%	85.24%	90.00%	93.50%	88.72%	96.62%	86.67%	107.50%	96.00%	87.30%	103.50%
<b>Packet Loss</b>													
3	A) Total number of ping packets transmitted		105000	30000	3000	3000	3000	3000	3000	3000	1000	3000	3000
	B) Total number of ping packets lost		547	0	2	33	3	0	0	0	0	1	12
	C) % age packet loss	<1%	0.52%	0.00%	0.07%	1.10%	0.10%	0.00%	0.00%	0.00%	0.00%	0.03%	0.40%
4	<b>Network latency (for wired broadband access)</b>												
<b>Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway</b>													
4.1	A) Total number of ping packets transmitted		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
	B) Total round trip time for all the ping packets transmitted during the period		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<120 ms	63.29	76.03	41.00	26.00	45.00	16.00	11.50	64.00	100.00	62.33	22.30
<b>Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)</b>													
4.2	A) Total number of ping packets transmitted		1000	NA	1000	1000	1000	1000	1000	1000	1000	1000	1000
	B) Total round trip time for all the ping packets transmitted during the period		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<350 ms	248.77	NA	200	84	104	43	23	67	267	120	267
<b>Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)</b>													
4.3	A) Total number of ping packets transmitted		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	<b>Service Availability/Uptime</b>												
	A) Total operational Hours		72	72	72	72	72	72	72	72	72	72	72
	B) Total downtime (In hours)		0	0	0	0	0	0	0	0.03	0	0.22	0



3 DAYS LIVE DATA FOR BROADBAND SERVICES - MP&CG CIRCLE													
3 days live Broadband Audit Data		Benchmark	BSNL (MP)	BSNL (CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
S/N	Name of Parameter		BROADBAND SERVICE PROVIDERS										
	C) Total time when the service was available (In Hrs)		72	72	72	72	72	72	72	71.97	72	71.78	72
	D) % age of Service availability uptime	>98%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.96%	100.00%	99.69%	100.00%

NA: Not Applicable

### 10.3 KEY FINDINGS: BROADBAND SERVICES

**Service Provisioning / Activation Time:** The audit of the service providers revealed that all Broadband service providers were well within the benchmark.

**Fault Repair/Restoration Time:** With regards to the parameter **Fault repaired by next working day**, the performances of Broadband service providers namely **BSNL (MP)**, **TCL** and **TTL** remained under performed with their performance as **76.57%**, **82.73%** and **83.55%** respectively. Whereas for **parameter Fault repaired within three days**, **BSNL (MP)** and **TCL** failed to meet the benchmark having achieved values as **96.73%** and **93.17%** respectively.

**Billing Performance:** For this parameter also the performance of the service providers was found well within the compliance benchmarks.

**Response Time to Customer for assistance by operator (Voice to Voice):** For percentage of calls getting connected to call center and **answered within 60 seconds**, all service providers were found meeting the benchmark for this parameter. However, **Tikona**, **BSNL (CG)** and **TTL** could not meet the benchmark for the parameter “**% age calls answered by the operator within 90 seconds**”; their achievement level was **79.27%**, **79.36%** and **65.73%** respectively.

During live testing, the performance of **Hathway and BSNL (CG)** for the parameter calls answered within 60 seconds and within 90 seconds was below the benchmark achieving **58.89% & 33.33%** (Within 60 seconds) and **54.44% & 50.00%** (Within 90 seconds).

**Bandwidth Utilization/ Throughput:** All the service providers were found using Multiple Router Traffic Grapher (MRTG) and also it was observed that all service providers were reporting combined bandwidth utilization for corporate customers and household customers. The performance of service providers with respect of these parameters was found satisfactory i.e. within benchmark during quarterly audit as well as 3 days live measurement.

**Broadband Connection Speed (download):** All broadband operators were found meeting the benchmark.

**Service Availability/Uptime:** All service providers were found meeting the benchmark for this parameter except **TCL** marginally lagged behind the benchmark by achieving **97.73%**.

**Packet Loss and Network Latency:** It was observed that almost all operators were measuring packet loss and latency by conducting ping test on random basis for their internal assessment. **BSNL**, **Pacenet**, **Tikona**, **Hathway** and **NSTPL** not provided the data for audit as they did not measure the same on monthly basis. However, the ping test conducted during live measurement revealed that all service providers were meeting the benchmark prescribed by TRAI. Only **Tikona** could achieve **1.10%** against the benchmark of **<1%**.

*From the above findings, it was concluded that **BSNL** and **TCL** remained under performed for parameter **Fault Repairs**. Whereas **Tikona** and **TTL** failed to meet the benchmark of parameter **Calls answered by operators within 90 seconds** and **TCL** marginally lagged behind the benchmark of parameter **Service availability up time**.*

### 10.4 CUSTOMER CARE / HELPLINE ASSESSMENT

#### LIVE CALLING TO CALL CENTRE FOR BROADBAND SERVICES

Parameter	Circle Name	BSNL (MP)	BSNL (CG)	BSNL (MP&CG)	PACENET	TIKONA	HATHWAY	ORTAL COMMUNICATION	RCL	BHARTI AIRTEL	TCL	TTL
Helpline number		1504	1504	1504	0731-4262067/069	18002094276, 022-40629629	0788-4062108	1800-120-6060	180030008383 / 30338383	121	1860-266-5555	18002663030
Total No. of calls Attempted (Voice to Voice response)	MP & CG	100	100	200	50	50	100	100	100	100	100	100
Total number of calls answered by the operator within 60 seconds	MP & CG	87	90	177	40	45	89	85	90	97	89	91
% age calls answered by the operator in 60 seconds	MP & CG	87.00%	90.00%	88.50%	80.00%	90.00%	89.00%	85.00%	90.00%	97.00%	89.00%	91.00%
Total number of calls answered by the operator within 90 seconds	MP & CG	95	93	188	50	50	90	92	98	95	85	88
% age calls answered by the operator within 90 seconds	MP & CG	95.00%	93.00%	94.00%	100.00%	100.00%	90.00%	92.00%	98.00%	97.94%	95.51%	96.70%

Note: NSTPL not having call center.

In case of calls answered by operators (voice to voice) within 60 seconds and 90 seconds, when test calls were made to the call centers, all broadband service providers were found meeting the TRAI prescribed benchmark.

## 10.5 LIVE CALLING FOR BILLING COMPLIANTS

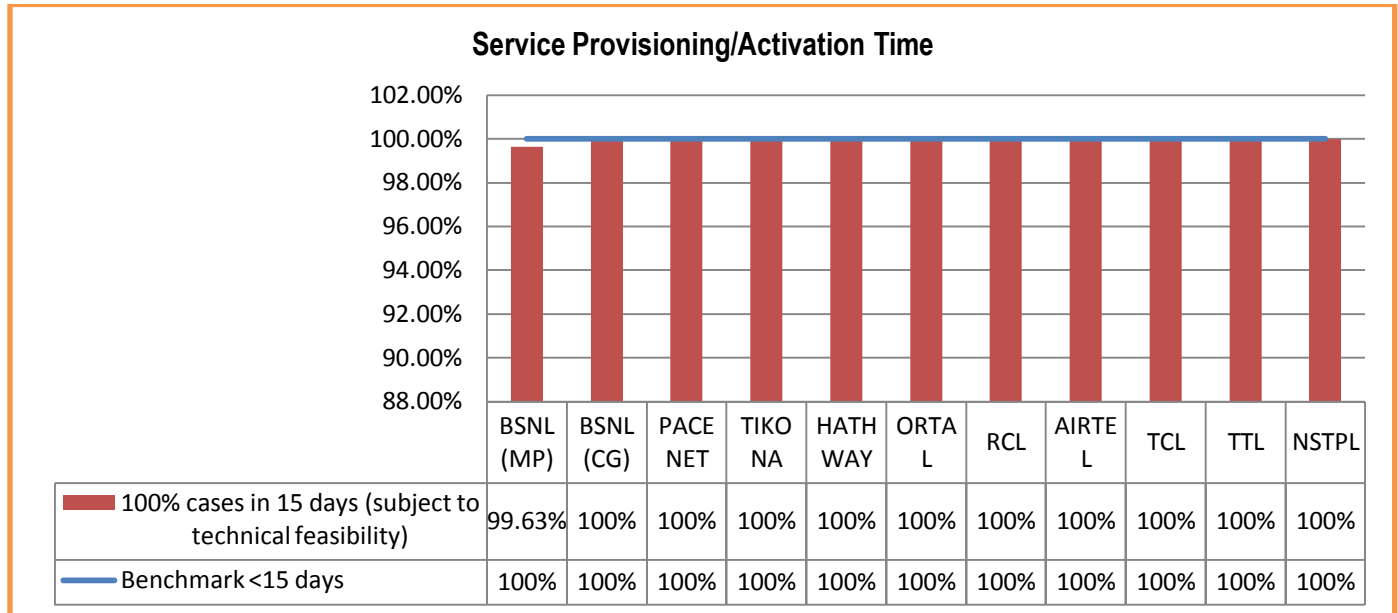
TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS											
PARAMETER	CIRCLE NAME	BSNL (MP)	BSNL (CG)	BSNL (MP & CG)	TIKONA	HATHWAY	RCL	BHARTI AIRTEL	TCL	TTL	NSTPL
Total No. of calls Attempted	MP & CG	100	100	200	65	22	57	50	50	50	10
Total No. of calls Answered	MP & CG	81	75	156	50	22	50	46	45	40	10
Cases resolved within 4 weeks	MP & CG	79	72	151	50	22	50	46	45	39	10
%age of cases resolved	MP & CG	97.53%	96.00%	96.79%	100%	100%	100%	100%	100%	98%	100%

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 while few others reported that there complaints have been resolved but not sure of duration of their resolution. However, most of the customers reported their satisfaction on resolution of the billing complaints.

## **GRAPHICAL REPRESENTATION OF BROADBAND SERVICES**

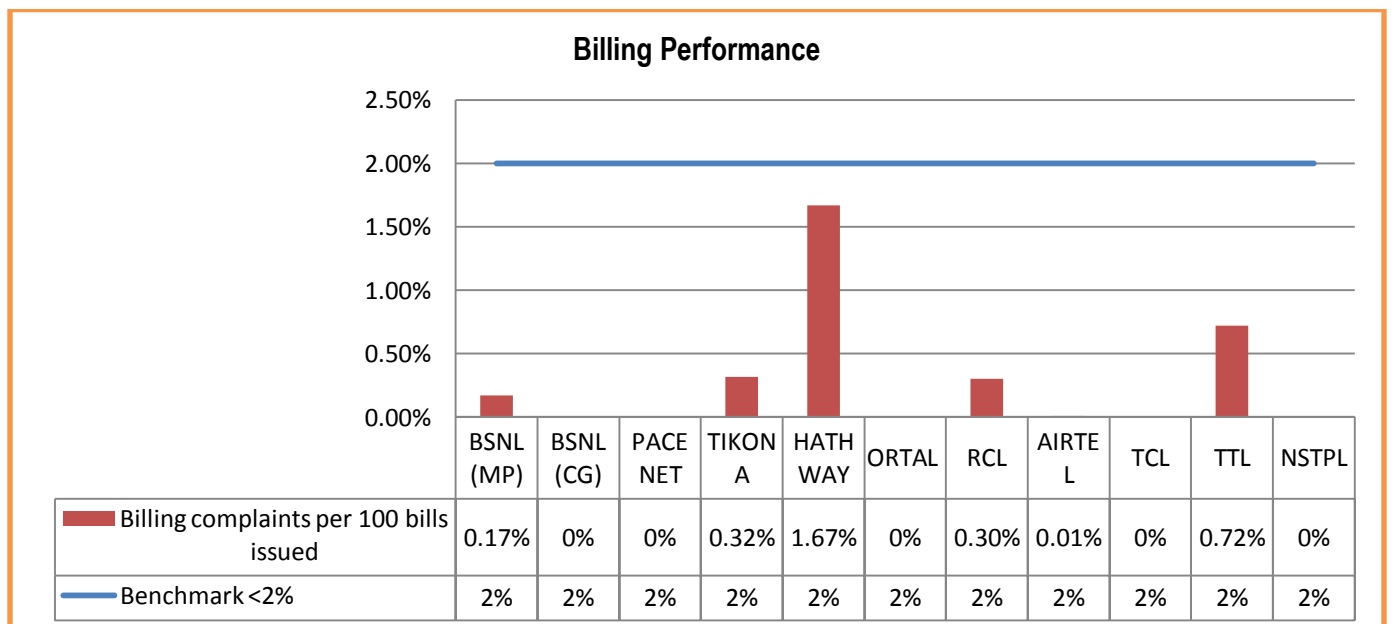
## 10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:

### 1. SERVICE PROVISIONING/ACTIVATION TIME:



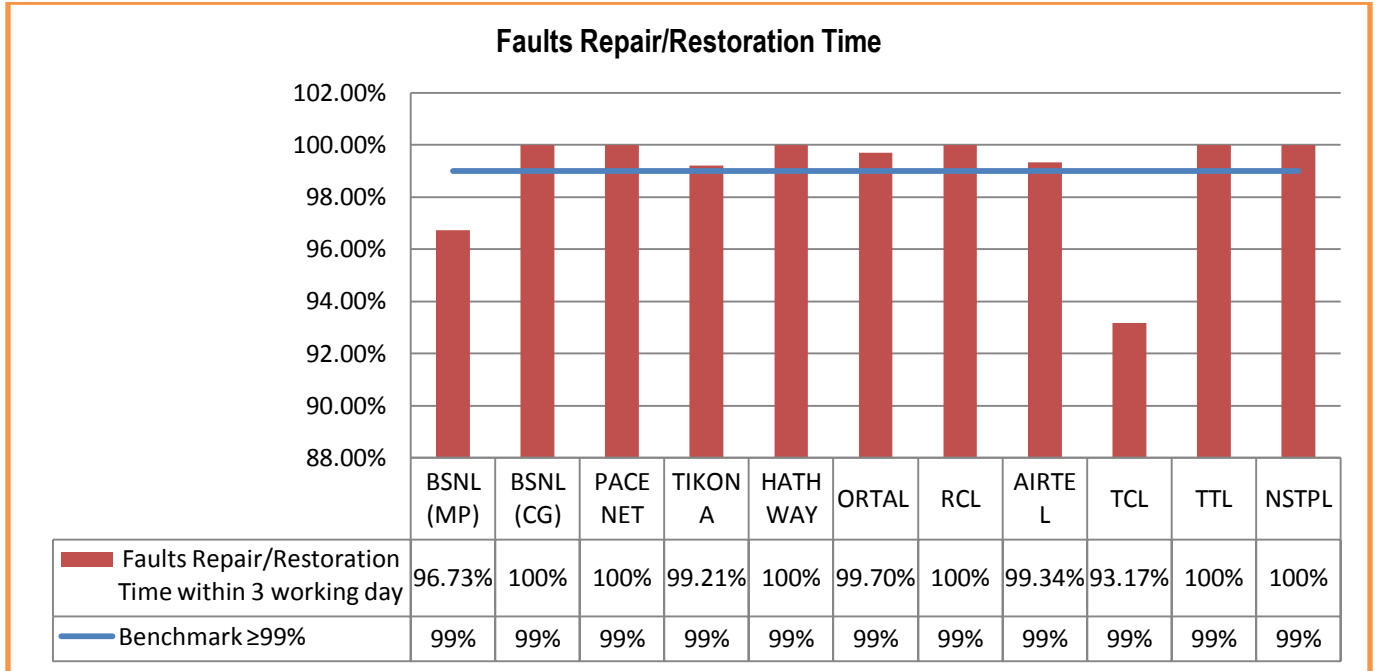
All Operators are meeting the benchmarks except BSNL (MP).

### 2. BILLING PERFORMANCE:



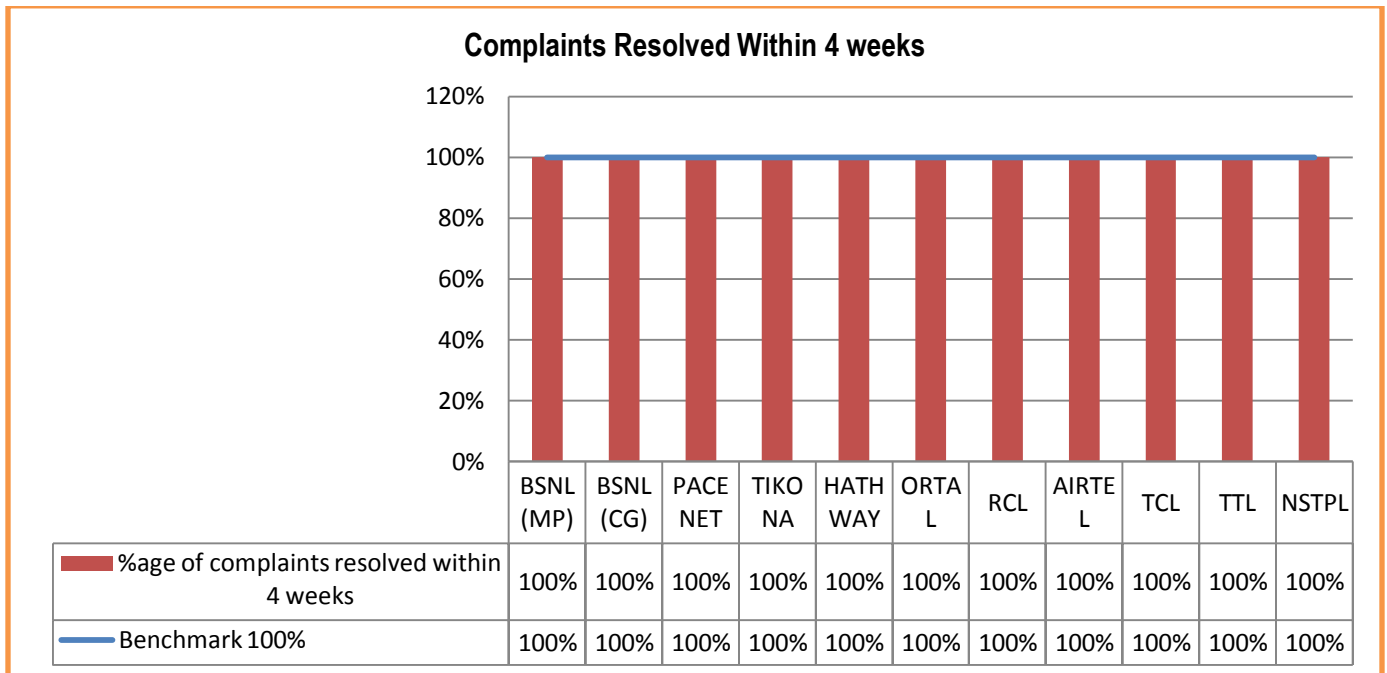
All Operators are meeting the benchmarks.

**3. FAULTS REPAIR/RESTORATION TIME:**



All Operators are meeting the benchmarks except BSNL (MP) and TCL.

**4. COMPLAINT RESOLUTION:**

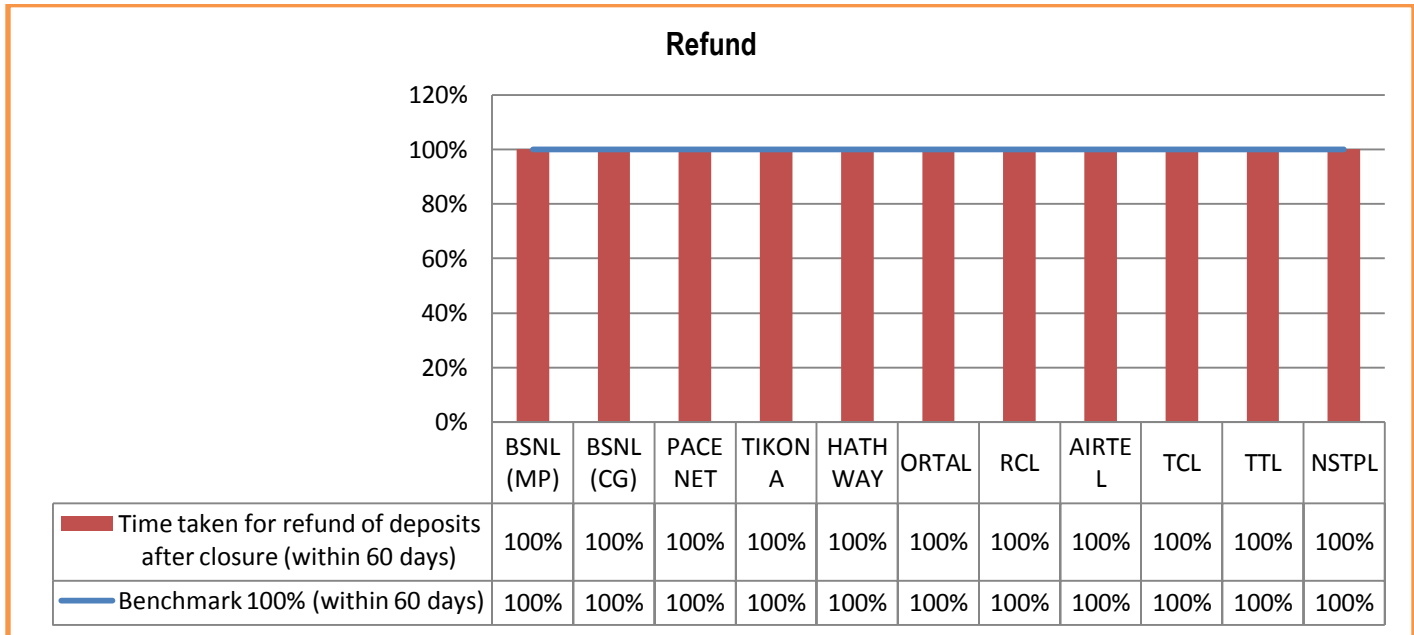


All Operators are meeting the benchmarks.



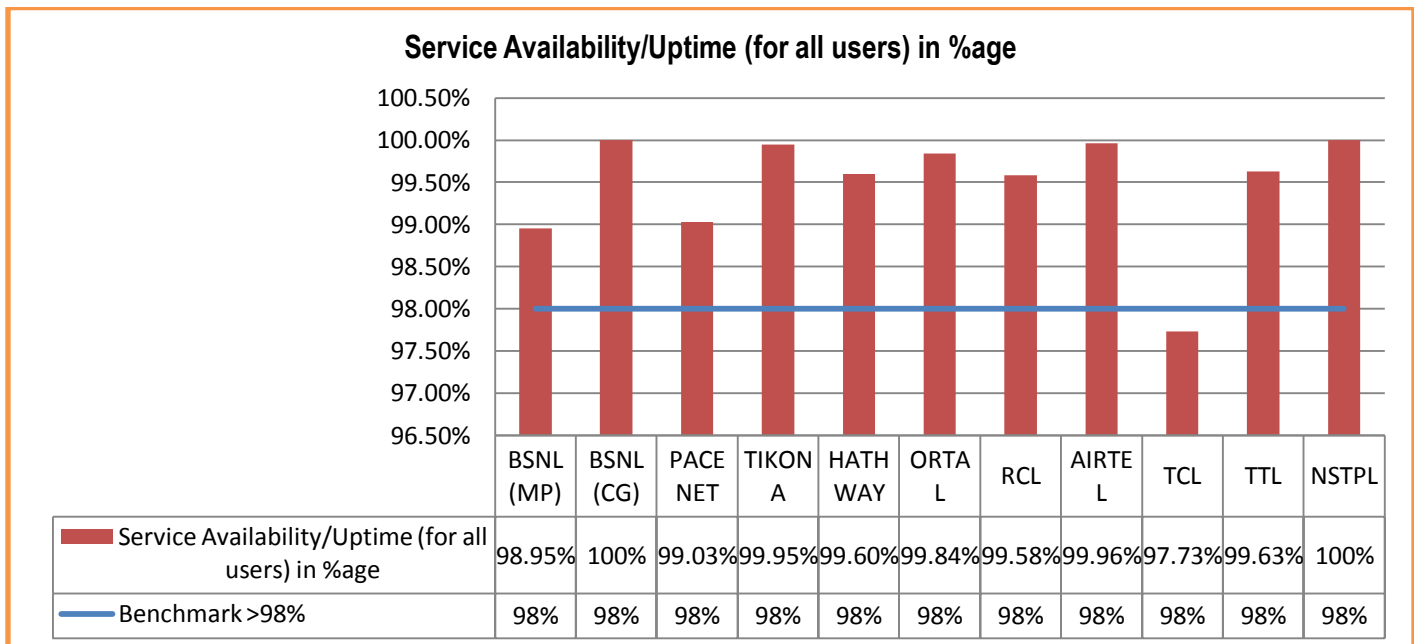


**5. REFUND:**



All Operators are meeting the benchmarks.

**6. SERVICE AVAILABILITY/UPTIME:**

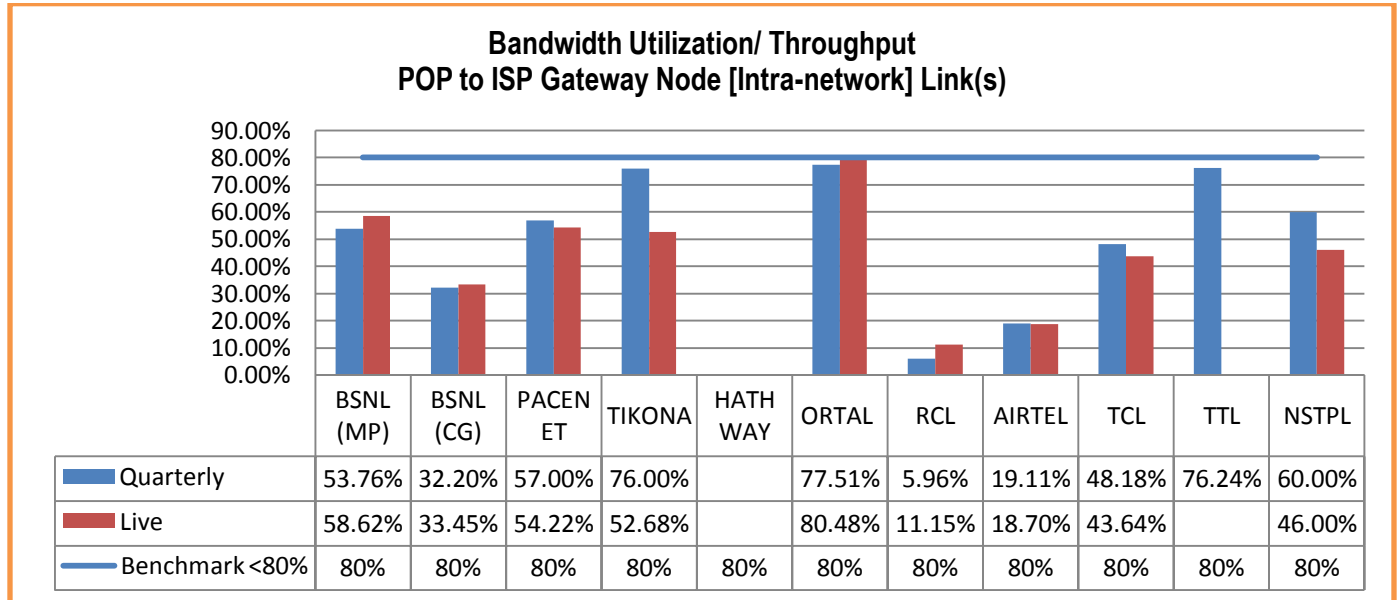


All Operators are meeting the benchmarks except TCL.



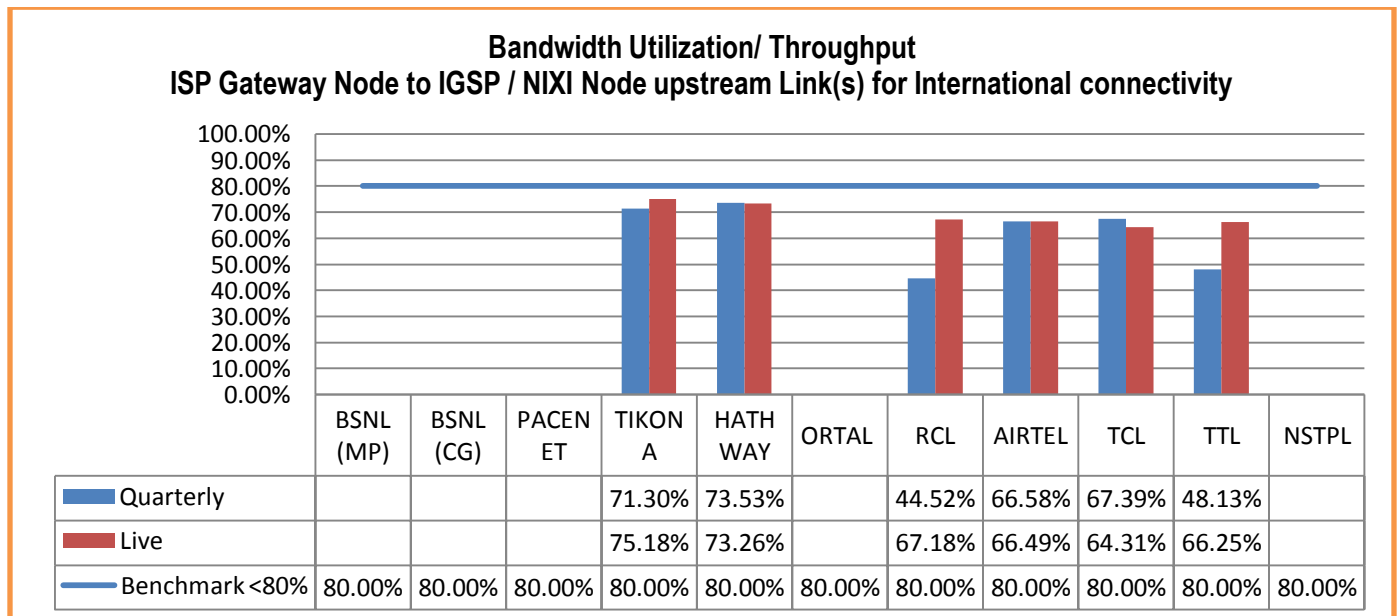
**10.7 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BROADBAND SERVICE PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:**

**1. BROADBAND UTILIZATION/THROUGHPUT POP TO ISP GATEWAY NODE:**



All Operators are meeting the benchmarks except Ortal Communication during 3 days live measurement.

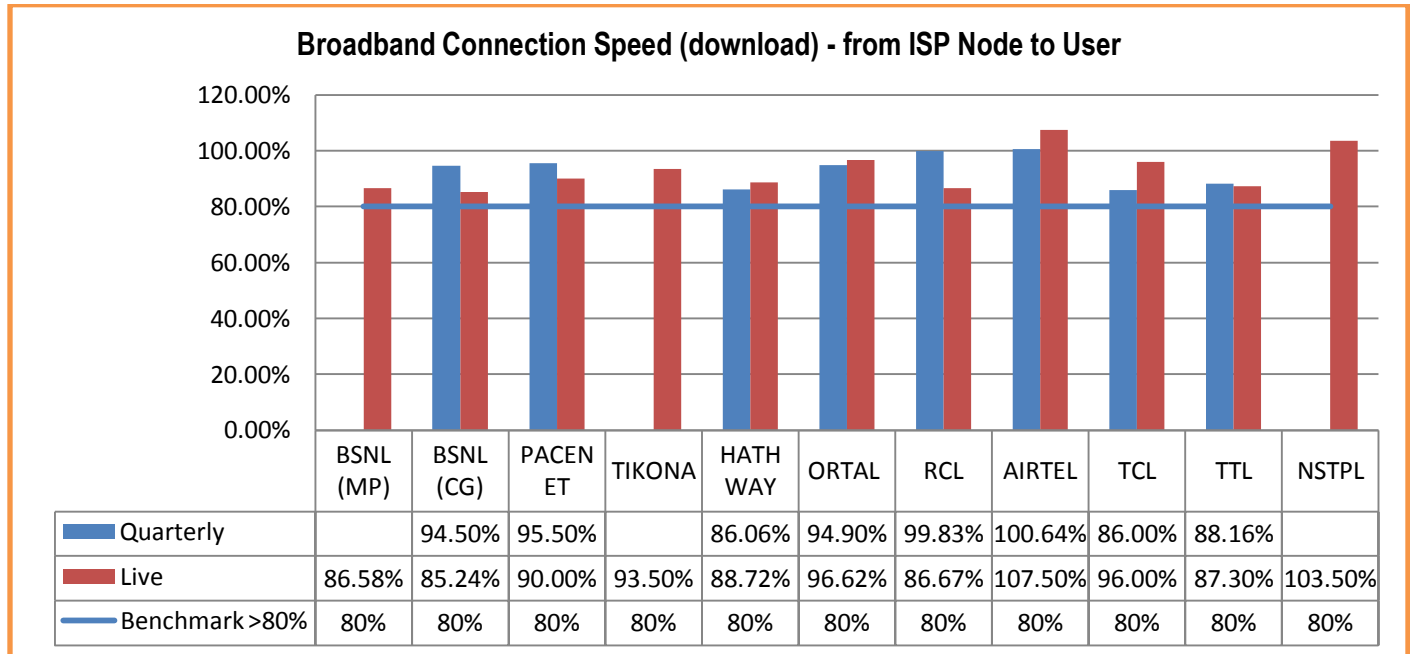
**2. BROADBAND UTILIZATION/THROUGHPUT ISP GATEWAY NODE TO IGSP/NIXI NODE:**



All Operators are meeting the benchmarks.

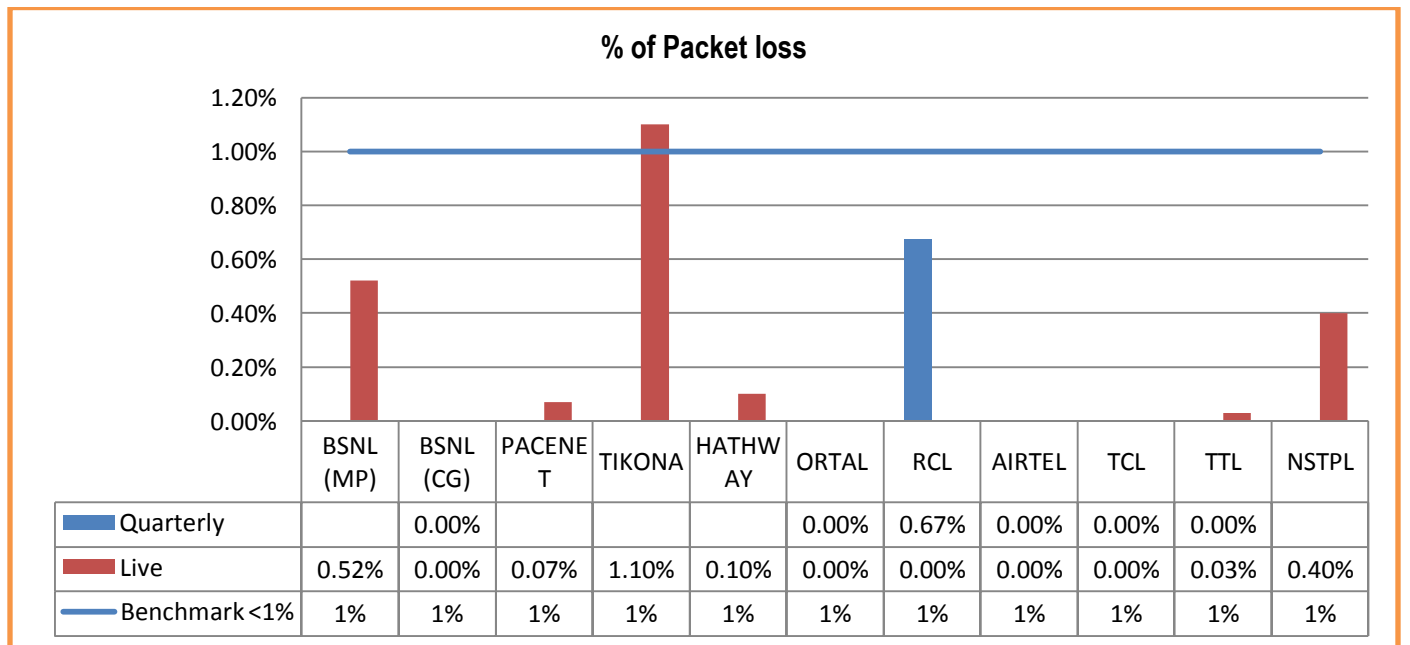


**3. BROADBAND CONNECTION SPEED (DOWNLOAD) FROM ISP NODE TO USER:**



All Operators are meeting the benchmarks.

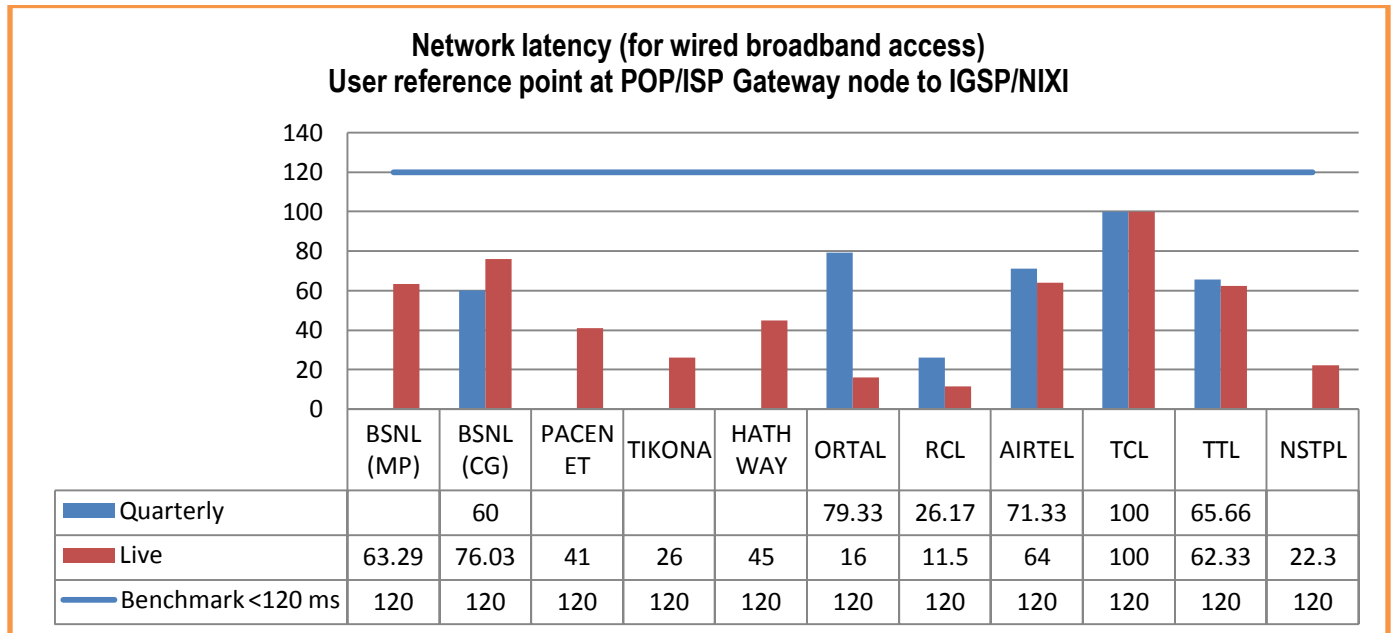
**4. PACKET LOSS:**



All Operators are meeting the benchmarks except Tikona.

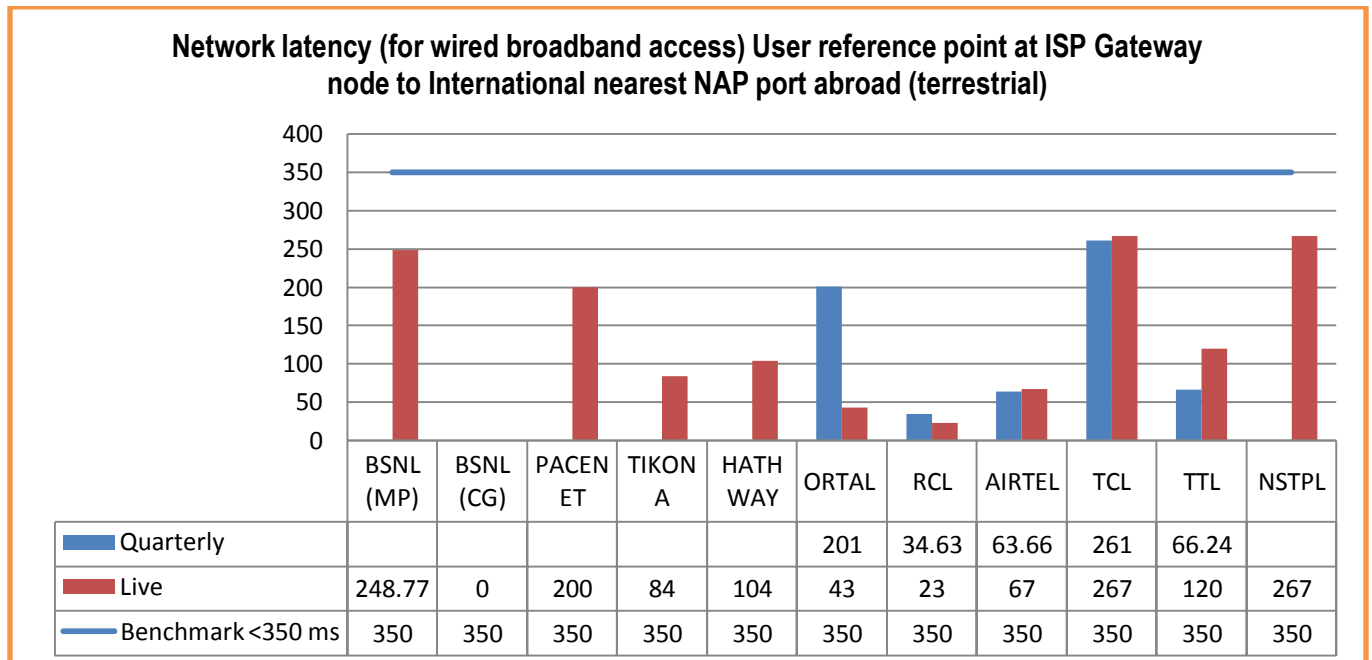


**5. NETWORK LATENCY USER REFERENCE POINT AT POP/ISP GATEWAY NODE TO IGSP/NIXI:**



All Operators are meeting the benchmarks.

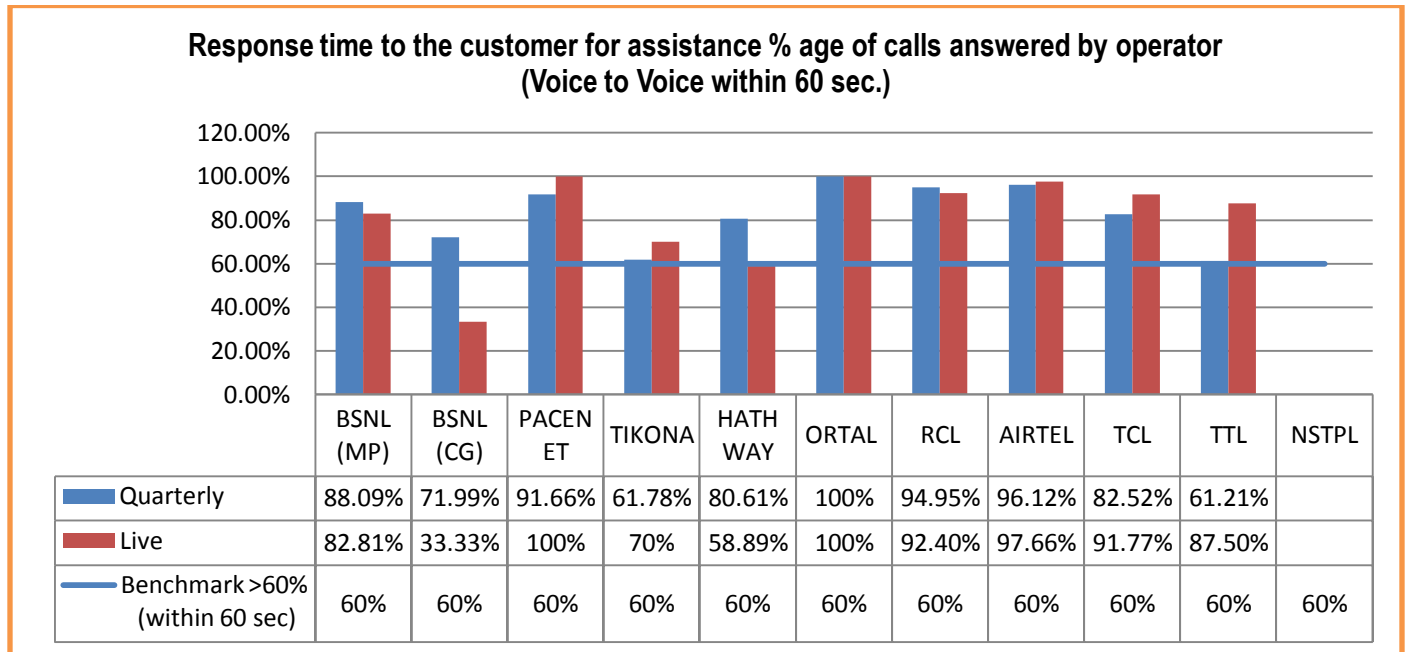
**6. NETWORK LATENCY USER REFERENCE POINT AT ISP GATEWAY NODE TO INTERNATIONAL NEAREST NAP PORT ABROAD (TERRESTRIAL):**



All Operators are meeting the benchmarks.

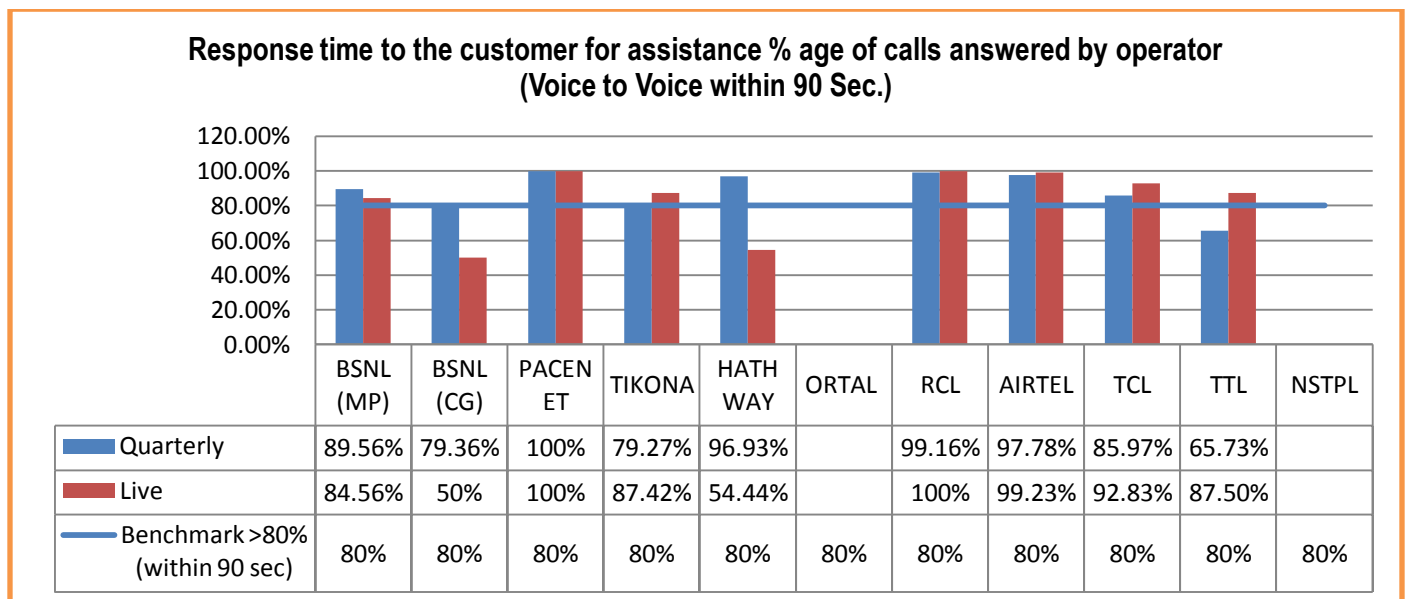


**7. RESPONSE TIME TO THE CUSTOMER FOR ASSISTANCE ACCESSIBILITY BY OPERATOR WITHIN 60 SECONDS:**



All Operators are meeting the benchmarks except BSNL CG and Hathway during 3 days live measurement.

**8. RESPONSE TIME TO THE CUSTOMER FOR ASSISTANCE ACCESSIBILITY BY OPERATOR WITHIN 90 SECONDS:**



All Operators are meeting the benchmarks except Tikona, TTL in Quarterly audit, Hathway (3 days live) and BSNL CG (Quarterly & Live both).

**Annex-1**

**LIST OF THE BSNL EXCHANGES COVERED FOR QOS AUDIT FOR QE-SEPTEMBER 2014:**

SL. NO.	NAME OF EXCHANGES	SDCA	SSA	CATEGORY	TECH TYPE
1	E6 ARERA COLONY-BPL	BHOPAL	BHOPAL	U	OCB-RSU
2	E8 ISHWAR NGR-BPL	BHOPAL	BHOPAL	U	EWSD-RSU
3	FIRDOSH NGR-BPL	BHOPAL	BHOPAL	U	OCB-RSU
4	GANDHI NAGAR-BPL	BHOPAL	BHOPAL	U	DLC-RT
5	GOVINDPURA-BPL	BHOPAL	BHOPAL	U	CDOT-MBM
6	GREEN ACRES-BPL	BHOPAL	BHOPAL	U	DLC-RT
7	ADAMPUR	BHOPAL	BHOPAL	R	AN-RAX
8	BHOURI	BHOPAL	BHOPAL	R	AN-RAX
9	CHOPRA KALAN	BHOPAL	BHOPAL	R	AN-RAX
10	LAMBA KHEDA	BHOPAL	BHOPAL	R	AN-RAX
11	MUGALIA CHHAP	BHOPAL	BHOPAL	R	AN-RAX
12	AHMADPUR	SEHORE	BHOPAL	R	AN-RAX
13	BARKHEDA HASAN	SEHORE	BHOPAL	R	AN-RAX
14	BILKISGANJ	SEHORE	BHOPAL	R	CDOT-RSU
15	AMLAHA	ICCHAWER	BHOPAL	R	AN-RAX
16	BHAUKHEDI	ICCHAWER	BHOPAL	R	AN-RAX
17	BORDI KALAN	ICCHAWER	BHOPAL	R	AN-RAX
18	HOSHANGABAD- MAIN	HOSANGABAD	HOSANGABAD	U	CDOT-MBM
19	HOUSING BD.(RSU)-H.BAD	HOSANGABAD	HOSANGABAD	U	CDOT-RSU
20	BIORA	HOSANGABAD	HOSANGABAD	R	AN-RAX
21	MISROD	HOSANGABAD	HOSANGABAD	R	AN-RAX
22	ACHALKHEDA	HOSANGABAD	HOSANGABAD	R	AN-RAX
23	ARI	HOSANGABAD	HOSANGABAD	R	AN-RAX
24	ROHANA	HOSANGABAD	HOSANGABAD	R	AN-RAX
25	ITARSI-MAIN (OCB)	ITARSI	HOSANGABAD	U	CDOT-RSU
26	RANIPUR	ITARSI	HOSANGABAD	R	AN-RAX
27	JAMANI	ITARSI	HOSANGABAD	R	AN-RAX
28	KESLA	ITARSI	HOSANGABAD	R	AN-RAX
29	BAGHWADA	SEONIMALWA	HOSANGABAD	R	AN-RAX
30	BABADIABHAU	SEONIMALWA	HOSANGABAD	R	AN-RAX
31	SHIVPURKALA	SEONIMALWA	HOSANGABAD	R	AN-RAX
32	POKHARNI	TIMRANI	HOSANGABAD	R	AN-RAX
33	CHARKHEDA	TIMRANI	HOSANGABAD	R	AN-RAX
34	UNDRAKATCHH	TIMRANI	HOSANGABAD	R	AN-RAX
35	ACHLESWAR	GWALIOR	GWALIOR	U	OCB-M
36	CITY CENTRE-GWL	GWALIOR	GWALIOR	U	CDOT-MBM
37	MORAR	GWALIOR	GWALIOR	U	OCB-RSU
38	TRANSPORT NGR.	GWALIOR	GWALIOR	U	OCB-RSU
39	BADAGAON	GWALIOR	GWALIOR	R	AN-RAX
40	BARETHA	GWALIOR	GWALIOR	R	AN-RAX
41	MILAWALI	GWALIOR	GWALIOR	R	CDOT-RSU



SL. NO.	NAME OF EXCHANGES	SDCA	SSA	CATEGORY	TECH TYPE
42	UTILA	GWALIOR	GWALIOR	R	AN-RAX
43	PICHHOR	DABRA	GWALIOR	R	AN-RAX
44	AKWAI	DABRA	GWALIOR	R	AN-RAX
45	CHHIMAK	DABRA	GWALIOR	R	AN-RAX
46	BADONI	DATIYA	GWALIOR	R	CDOT-RSU
47	SUNARI	DATIYA	GWALIOR	R	AN-RAX
48	SONAGIRI	DATIYA	GWALIOR	R	AN-RAX
49	BARAI	GHATIGAON	GWALIOR	R	AN-RAX
50	GHATIGAON	GHATIGAON	GWALIOR	R	AN-RAX
51	MOHNA	GHATIGAON	GWALIOR	R	CDOT-RSU
52	NAYAGAON	GHATIGAON	GWALIOR	R	AN-RAX
53	AHILYA PURA	INDORE	INDORE	U	E-10B-RSU
54	ANNAPURNA	INDORE	INDORE	U	E-10B-RSU
55	ANNAPURNA (HARSHDEEP)	INDORE	INDORE	U	WAN
56	APOLLO TOWER(NEHRU PARK )	INDORE	INDORE	U	DLC-RT
57	BANSI TRADE CENTER(BTC-NEHRU PARK )	INDORE	INDORE	U	DLC-RT
58	AJNOD	SANWER	INDORE	R	AN-RAX
59	CHANDRAWATI GANJ	SANWER	INDORE	R	CDOT-RSU
60	DAKACHYA	SANWER	INDORE	R	AN-RAX
61	DARJI KARADIA	SANWER	INDORE	R	AN-RAX
62	BARGONDA	MHOW	INDORE	R	AN-RAX
63	BHAGORA	MHOW	INDORE	R	AN-RAX
64	CHORAL	MHOW	INDORE	R	AN-RAX
65	HARSOLA	MHOW	INDORE	R	CDOT-RSU
66	AGRA	DEPALPUR	INDORE	R	AN-RAX
67	ATTAHEDA	DEPALPUR	INDORE	R	AN-RAX
68	GIROTA	DEPALPUR	INDORE	R	AN-RAX
69	GOKULPUR	DEPALPUR	INDORE	R	AN-RAX
70	BHARATPURI	UJJAIN	UJJAIN	U	OCB-M
71	DASHERA MAIDAN RSU	UJJAIN	UJJAIN	U	OCB-RSU
72	DEWAS GATE	UJJAIN	UJJAIN	U	CDOT-MBM
73	BADKUMED	UJJAIN	UJJAIN	R	AN-RAX
74	BAKANIA	UJJAIN	UJJAIN	R	AN-RAX
75	CHANDUKHEDI	UJJAIN	UJJAIN	R	AN-RAX
76	DATANA MATANA	UJJAIN	UJJAIN	R	AN-RAX
77	PIPLODA DWARKADHEESH	UJJAIN	UJJAIN	R	AN-RAX
78	KANARDI	TARANA	UJJAIN	R	AN-RAX
79	CHIKLI (TAA)	TARANA	UJJAIN	R	AN-RAX
80	DHABLA HARDU	TARANA	UJJAIN	R	AN-RAX
81	ITAWA	TARANA	UJJAIN	R	AN-RAX
82	AMBODIA	GHATIA	UJJAIN	R	AN-RAX
83	BICHHROD	GHATIA	UJJAIN	R	AN-RAX
84	GHATIA	GHATIA	UJJAIN	R	AN-RAX
85	GOYLA BUJURG	GHATIA	UJJAIN	R	AN-RAX

SL. NO.	NAME OF EXCHANGES	SDCA	SSA	CATEGORY	TECH TYPE
86	BANMORE	MORENA	MORENA	U	CDOT-RSU
87	MORENA A.B.ROAD	MORENA	MORENA	U	CDOT-MBM
88	MORENA(STATION ROAD)	MORENA	MORENA	U	CDOT-RSU
89	TENTRA	SABALGARH	MORENA	R	AN-RAX
90	MATABASIYA	RAGHUNATHPUR	MORENA	R	AN-RAX
91	NOORABAD	MORENA	MORENA	R	AN-RAX
92	SARICHHOLA	MORENA	MORENA	R	AN-RAX
93	JOURA	JOURA	MORENA	U	CDOT-RSU
94	BAGCHINI	JOURA	MORENA	R	AN-RAX
95	PHOOP	BHIND	MORENA	R	AN-RAX
96	DABOH	BHIND	MORENA	R	AN-RAX
97	SUMAOLI	JOURA	MORENA	R	AN-RAX
98	PAHADGARH	SABALGARH	MORENA	R	AN-RAX
99	JHUNDPURA	SABALGARH	MORENA	R	AN-RAX
100	RAMPUR KALAN	SABALGARH	MORENA	R	AN-RAX
101	CHAND KA PURA	AMBAH	MORENA	R	AN-RAX
102	ALAMPUR(BHIND)	LAHAR	MORENA	R	AN-RAX
103	DIMNI	AMBAH	MORENA	R	AN-RAX
104	MAU	GOHAD	MORENA	R	AN-RAX
105	RAUN	LAHAR	MORENA	R	AN-RAX
106	SUNARPURA	MEHGAON	MORENA	R	AN-RAX
107	BIRKHADI	GOHAD	MORENA	R	AN-RAX
108	ASWAR	LAHAR	MORENA	R	AN-RAX
109	ENDORI	GOHAD	MORENA	R	AN-RAX
110	GOHAD	GOHAD	MORENA	U	AN-RAX
111	BARUA NAGAR	BHIND	MORENA	U	CDOT-RSU
112	GALLAMANDI	BHIND	MORENA	U	CDOT-RSU
113	M/W BUILDING	BHIND	MORENA	U	CDOT-RSU
114	MELAGROUND	BHIND	MORENA	U	CDOT-MBM
115	ATER	BHIND	MORENA	R	AN-RAX
116	BARHI	BHIND	MORENA	R	AN-RAX
117	TOLA(RAWAT PURA)	LAHAR	MORENA	R	AN-RAX
118	NAYAGAON(BHIND)	BHIND	MORENA	R	AN-RAX
119	SURPURA	BHIND	MORENA	R	AN-RAX
120	RYP CITY(AUTO EXCH)	RAIPUR	RAIPUR	U	OCB LOCAL
121	RAJENDRA NAGAR	RAIPUR	RAIPUR	U	OCB RSU
122	RYP-CIVIL LINE	RAIPUR	RAIPUR	U	OCB RSU
123	RYP-NEW MANA	RAIPUR	RAIPUR	U	OCB RSU
124	OCB FAFADIH ( MAIN EXCH.)	RAIPUR	RAIPUR	U	MSU
125	ABHANPUR	RAIPUR	RAIPUR	R	CDOT-AN RAX
126	TUMGAON	MAHASAMUND	RAIPUR	R	AN-RAX
127	NADICHOWK [GDR]	MAHASAMUND	RAIPUR	R	AN-RAX
128	GARIABAND	GARIAYBAD	RAIPUR	R	RSU
129	DARRIPARA	GARIAYBAD	RAIPUR	R	AN-RAX
130	AMDI	DHAMTARI	RAIPUR	R	CDOT-256





SL. NO.	NAME OF EXCHANGES	SDCA	SSA	CATEGORY	TECH TYPE
131	CHHATI	DHAMTARI	RAIPUR	R	CDOT-257
132	DEORI	SARAIPALI	RAIPUR	R	ANRAX
133	SANKARA[S]	SARAIPALI	RAIPUR	R	ANRAX
134	TIFRA	BILASPUR	BILASPUR	U	CDOT RSU
135	VYAPAR VIHAR	BILASPUR	BILASPUR	U	OCB 283
136	DAYALBAND	BILASPUR	BILASPUR	U	OCB RSU
137	DEORIKHURD	BILASPUR	BILASPUR	U	CDOT RSU
138	DTO (TARGHAR)	BILASPUR	BILASPUR	U	CDOT RSU
139	BAIMA NAGOI	BILASPUR	BILASPUR	R	ANRAX
140	MUNGELI	MUNGELI	BILASPUR	R	CDOT RSU
141	PATHARIA	MUNGELI	BILASPUR	R	AN-RAX
142	JAIJAIPUR	SAKTI	BILASPUR	R	AN-RAX
143	THATHARI	SAKTI	BILASPUR	R	AN-RAX
144	BELGAHNA	PENDRA	BILASPUR	R	AN-RAX
145	KHONGSARA	PENDRA	BILASPUR	R	AN-RAX
146	BELTARA	KARGI ROAD	BILASPUR	R	AN-RAX

**Annex-2**

**LOCATION OF POP's COVERED FOR QOS AUDIT FOR QE-SEPTEMBER 2014:**

SL.NO.	SERVICE PROVIDER	LOCATION OF POPS	ACTIVITY
1	BSNL	E6 ARERA COLONY-BPL	BB AUDIT
2	BSNL	E8 ISHWAR NGR-BPL	BB AUDIT
3	BSNL	FIRDOSH NGR-BPL	BB AUDIT
4	BSNL	GANDHI NAGAR-BPL	BB AUDIT
5	BSNL	GOVINDPURA-BPL	BB AUDIT
6	BSNL	GREEN ACRES-BPL	BB AUDIT
7	BSNL	ADAMPUR	BB AUDIT
8	BSNL	BHOURI	BB AUDIT
9	BSNL	CHOPRA KALAN	BB AUDIT
10	BSNL	LAMBA KHEDA	BB AUDIT
11	BSNL	MUGALIA CHHAP	BB AUDIT
12	BSNL	AHMADPUR	BB AUDIT
13	BSNL	BARKHEDA HASAN	BB AUDIT
14	BSNL	BILKISGANJ	BB AUDIT
15	BSNL	AMLAHA	BB AUDIT
16	BSNL	BHAUKHEDI	BB AUDIT
17	BSNL	BORDI KALAN	BB AUDIT
18	BSNL	HOSHANGABAD- MAIN	BB AUDIT
19	BSNL	HOUSING BD.(RSU)-H.BAD	BB AUDIT
20	BSNL	BIORA	BB AUDIT
21	BSNL	MISROD	BB AUDIT
22	BSNL	ACHALKHEDA	BB AUDIT
23	BSNL	ARI	BB AUDIT
24	BSNL	ROHANA	BB AUDIT
25	BSNL	ITARSI-MAIN (OCB)	BB AUDIT
26	BSNL	RANIPUR	BB AUDIT
27	BSNL	JAMANI	BB AUDIT
28	BSNL	KESLA	BB AUDIT
29	BSNL	BAGHWADA	BB AUDIT
30	BSNL	BABADIABHAU	BB AUDIT
31	BSNL	SHIVPURKALA	BB AUDIT
32	BSNL	POKHARNI	BB AUDIT
33	BSNL	CHARKHEDA	BB AUDIT
34	BSNL	UNDRAKATCHH	BB AUDIT
35	BSNL	ACHLESWAR	BB AUDIT
36	BSNL	CITY CENTRE-GWL	BB AUDIT
37	BSNL	MORAR	BB AUDIT
38	BSNL	TRANSPORT NGR.	BB AUDIT
39	BSNL	BADAGAON	BB AUDIT
40	BSNL	BARETHA	BB AUDIT



SL.NO.	SERVICE PROVIDER	LOCATION OF POPS	ACTIVITY
41	BSNL	MILAWALI	BB AUDIT
42	BSNL	UTILA	BB AUDIT
43	BSNL	PICHHOR	BB AUDIT
44	BSNL	AKWAI	BB AUDIT
45	BSNL	CHHIMAK	BB AUDIT
46	BSNL	BADONI	BB AUDIT
47	BSNL	SUNARI	BB AUDIT
48	BSNL	SONAGIRI	BB AUDIT
49	BSNL	BARAI	BB AUDIT
50	BSNL	GHATIGAON	BB AUDIT
51	BSNL	MOHNA	BB AUDIT
52	BSNL	NAYAGAON	BB AUDIT
53	BSNL	AHILYA PURA	BB AUDIT
54	BSNL	ANNAPURNA	BB AUDIT
55	BSNL	ANNAPURNA (HARSHDEEP)	BB AUDIT
56	BSNL	APOLLO TOWER(NEHRU PARK )	BB AUDIT
57	BSNL	BANSI TRADE CENTER(BTC-NEHRU PARK )	BB AUDIT
58	BSNL	AJNOD	BB AUDIT
59	BSNL	CHANDRAWATI GANJ	BB AUDIT
60	BSNL	DAKACHYA	BB AUDIT
61	BSNL	DARJI KARADIA	BB AUDIT
62	BSNL	BARGONDA	BB AUDIT
63	BSNL	BHAGORA	BB AUDIT
64	BSNL	CHORAL	BB AUDIT
65	BSNL	HARSOLA	BB AUDIT
66	BSNL	AGRA	BB AUDIT
67	BSNL	ATTAHEDA	BB AUDIT
68	BSNL	GIROTA	BB AUDIT
69	BSNL	GOKULPUR	BB AUDIT
70	BSNL	BHARATPURI	BB AUDIT
71	BSNL	DASHERA MAIDAN RSU	BB AUDIT
72	BSNL	DEWAS GATE	BB AUDIT
73	BSNL	BADKUMED	BB AUDIT
74	BSNL	BAKANIA	BB AUDIT
75	BSNL	CHANDUKHEDI	BB AUDIT
76	BSNL	DATANA MATANA	BB AUDIT
77	BSNL	PIPLODA DWARKADHEESH	BB AUDIT
78	BSNL	KANARDI	BB AUDIT
79	BSNL	CHIKLI (TAA)	BB AUDIT
80	BSNL	DHABLA HARDU	BB AUDIT
81	BSNL	ITAWA	BB AUDIT
82	BSNL	AMBODIA	BB AUDIT
83	BSNL	BICHHROD	BB AUDIT
84	BSNL	GHATIA	BB AUDIT



SL.NO.	SERVICE PROVIDER	LOCATION OF POPS	ACTIVITY
85	BSNL	GOYLA BUJURG	BB AUDIT
86	BSNL	BANMORE	BB AUDIT
87	BSNL	MORENA A.B.ROAD	BB AUDIT
88	BSNL	MORENA(STATION ROAD)	BB AUDIT
89	BSNL	TENTRA	BB AUDIT
90	BSNL	MATABASIYA	BB AUDIT
91	BSNL	NOORABAD	BB AUDIT
92	BSNL	SARICHHOLA	BB AUDIT
93	BSNL	JOURA	BB AUDIT
94	BSNL	BAGCHINI	BB AUDIT
95	BSNL	PHOOP	BB AUDIT
96	BSNL	DABOH	BB AUDIT
97	BSNL	SUMAOLI	BB AUDIT
98	BSNL	PAHADGARH	BB AUDIT
99	BSNL	JHUNDPURA	BB AUDIT
100	BSNL	RAMPUR KALAN	BB AUDIT
101	BSNL	CHAND KA PURA	BB AUDIT
102	BSNL	ALAMPUR(BHIND)	BB AUDIT
103	BSNL	DIMNI	BB AUDIT
104	BSNL	MAU	BB AUDIT
105	BSNL	RAUN	BB AUDIT
106	BSNL	SUNARPURA	BB AUDIT
107	BSNL	BIRKHADI	BB AUDIT
108	BSNL	ASWAR	BB AUDIT
109	BSNL	ENDORI	BB AUDIT
110	BSNL	GOHAD	BB AUDIT
111	BSNL	BARUA NAGAR	BB AUDIT
112	BSNL	GALLAMANDI	BB AUDIT
113	BSNL	M/W BUILDING	BB AUDIT
114	BSNL	MELAGROUND	BB AUDIT
115	BSNL	ATER	BB AUDIT
116	BSNL	BARHI	BB AUDIT
117	BSNL	TOLA(RAWAT PURA)	BB AUDIT
118	BSNL	NAYAGAON(BHIND)	BB AUDIT
119	BSNL	SURPURA	BB AUDIT
120	BSNL	RYP CITY(AUTO EXCH)	BB AUDIT
121	BSNL	RAJENDRA NAGAR	BB AUDIT
122	BSNL	RYP-CIVIL LINE	BB AUDIT
123	BSNL	RYP-NEW MANA	BB AUDIT
124	BSNL	OCB FAFADIH ( MAIN EXCH.)	BB AUDIT
125	BSNL	ABHANPUR	BB AUDIT
126	BSNL	TUMGAON	BB AUDIT
127	BSNL	NADICHOWK [GDR]	BB AUDIT
128	BSNL	GARIABAND	BB AUDIT
129	BSNL	DARRIPARA	BB AUDIT

SL.NO.	SERVICE PROVIDER	LOCATION OF POPS	ACTIVITY
130	BSNL	AMDJ	BB AUDIT
131	BSNL	CHHATI	BB AUDIT
132	BSNL	DEORI	BB AUDIT
133	BSNL	SANKARA[S]	BB AUDIT
134	BSNL	TIFRA	BB AUDIT
135	BSNL	VYAPAR VIHAR	BB AUDIT
136	BSNL	DAYALBAND	BB AUDIT
137	BSNL	DEORIKHURD	BB AUDIT
138	BSNL	DTO (TARGHAR)	BB AUDIT
139	BSNL	BAIMA NAGOI	BB AUDIT
140	BSNL	MUNGELI	BB AUDIT
141	BSNL	PATHARIA	BB AUDIT
142	BSNL	JAIJAIPUR	BB AUDIT
143	BSNL	THATHARI	BB AUDIT
144	BSNL	BELGAHNA	BB AUDIT
145	BSNL	KHONGSARA	BB AUDIT
146	BSNL	BELTARA	BB AUDIT
147	BSNL	GANIYARI	BB AUDIT
148	BHARTI AIRTEL	BHOPAL	BB AUDIT
149	TTL	BHOPAL	BB AUDIT
150	TCL	GWALIOR	BB AUDIT
151	NSTPL	GWALIOR	BB AUDIT
152	RCL	DAKC MUMBAI	BB AUDIT
153	TIKONA	INDORE	BB AUDIT
154	PACENET	INDORE	BB AUDIT
155	HATHWAY	BHILAI (CG)	BB AUDIT
156	ORTAL COMMUNICATION	RAIPUR (CG)	BB AUDIT