



**Audit & Assessment of Quality of Service  
Of  
Cellular Mobile Telephone Service  
For  
Telecom Regulatory Authority of India**

**West Zone – Madhya Pradesh & Chhattisgarh  
Service Area  
(January 2015 – March 2015)**

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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**





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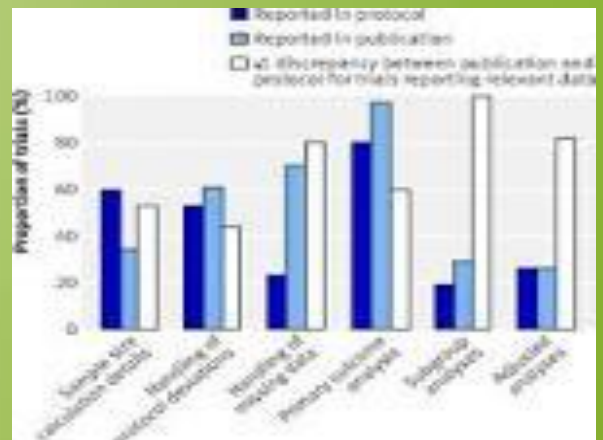
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for Himanchal Pradesh, J&K and Maharashtra & Goa circles during the quarter January 2015 – March 2015.**

The Scope of work as per the Terms of Reference (TOR) includes the following:

- i) Preparation of Performance Monitoring reports (PMRs) and uploading in the system.
- ii) Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days during each audit.
- iii) Monthly audit based on one month data of the SPs.
- iv) Drive test of the RF networks.
- v) Audit of the performance of call centers with respect to their accessibility and percentage of calls answered by the operators and random customer feedback by calling the customers to get feedback of the services provided by the service providers.
- vi) Transfer of data generated by the RF drive test/Live measurements / PMR/ monthly audit to the server located at TRAI premises on real time basis.

### 3. SAMPLE SIZE



### 3. SAMPLE SIZE

#### 3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

- 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centers (MSC's) of all the Cellular Mobile Service Providers or Unified Access Service Providers (UASP) were covered for audit in specified circles/service areas. Following are the various operators covered in MP&CG circle

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
		January-15	February-15	March -15	
<b>GSM Operators</b>					
1	AIRCEL	06 to 08 Jan - 15	08 to 10 Feb - 15	08 to 10 Mar - 15	Dishnet Wireless LTD.Office No. 2 ,Ground Floor Chinnar Incube Business Center, Hoshangabad Road Bhopal M.P. 462023
2	AIRTEL	09 to 11 Jan - 15	20 to 22 Feb - 15	20 to 22 Mar - 15	47-49 Electronics Complex, Pardeshipura, Indore(M.P.) 452010
3	BSNL(MP)	11 to 13 Jan - 15	09 to 11 Feb - 15	16 to 18 Mar - 15	BSNL Bhawan,Near paryawas bhawan Bhopal
4	BSNL(CG)	29 to 31 Jan - 15	11 to 3 Feb - 15	18 to 20 Mar - 15	SDE QoS CM, 2nd floor Auto exchange BSNL Exchange near Lala Ganga Complex GE Road Raipur.
5	VIDEOCON	10 to 12 Jan - 15	10 to 12 Feb - 15	17 to 19 Mar - 15	Videocon Telecommunication Ltd. 2nd Floor Chinar Fortune City, Hoshangabad Road Bhopal (MP)
6	TATA GSM	10 to 12 Jan - 15	09 to 11 Feb - 15	15 to 17 Mar - 15	3rd floor, Chinaar Business center, Chinaar Fortune City, Hoshangabad Road,Bhopal M.P. 462023
7	IDEA	10 to 12 Jan - 15	21 to 23 Feb - 15	21 to 23 Mar - 15	139-140, Electronics Complex, Pardeshi Pura, Indore(M.P.) 452010
8	RCOM GSM	12 to 14 Jan - 15	18 to 20 Feb - 15	22 to 24 Mar - 15	7th floor, Industry House, AB Road, Indore
9	VODAFONE	23 to 25 Jan - 15	10 to 12 Feb - 15	17 to 19 Mar - 15	Vodafone Spacetel Ltd, 2nd Floor Center Point New Market TT Nagr , Bhopal 462001
<b>CDMA Operators</b>					
10	RCOM CDMA	12 to 14 Jan - 15	18 to 20 Feb - 15	17 to 19 Mar - 15	Reliance communication ltd, MCN Suvindh Vihar, Asharam Tiraha, Gandhi nagar, Narsing garh Bypass Road, Bhopal (M.P.) 462036
11	TATA CDMA	10 to 12 Jan - 15	09 to 11 Feb - 15	15 to 17 Mar - 15	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 March 2015.

**The data generated by monthly PMR and 3-days live measurements audit for the period January 2015 to March 2015 has been successfully uploaded to the server located at TRAI premises.**

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

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles only **once in a year. Based on this criterion, QoS audit for basic (wire line) service was not required to be done for MP & CG Circle in the quarter ended March- 2015.**

### 3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV–SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle **once in a year. Based on this criterion, the QoS audit for Broadband service was not required to be done for MP & CG Circle in the quarter ended March- 2015.**

## **4. EXECUTIVE SUMMARY**



## 4. EXECUTIVE SUMMARY

The executive summary put in a nutshell the key findings of the Audit by providing: -

- “Service provider performance report” for Cellular mobile, Basic (wire line) and Broadband services , which gives a foretaste of the performance of various operators against the benchmark specified by TRAI, during the months in which the Audit was carried out by TUV-SUD Auditors.
- “Parameter wise critical findings” for Cellular mobile, Basic (wire line) and Broadband services: This indicates key observations and findings from different activities carried out during the Audit process.
- TUV-SUD conducted audit involved a 3 stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. On the basis of the three days live measurement, the auditors checked the busy hour of the day for the service provider and collected the data for this busy hour for the month in which the audit was conducted Finally, the performance of the service providers was also gauged by conducting drive tests in three select SSAs per service provider per quarter.
- The three stage audit / verification viz audit of the records, live measurements and drive tests of all the cellular mobile operators was repeated every month. In case of Basic (Wire line) and Broadband, this exercise is required to be carried out on quarterly basis.
- **Essence of compliance report of service providers with respect to the QoS:**

### 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)** and **Tata (CDMA)** failed to meet the benchmark of this parameter with their quarterly average performance as **3.40% and 7.61%** 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), Vodafone and Tata (CDMA)** in all the three months of the quarter. Their average performance for the quarter was **3.34%, 3.37%, and 9.01 %** respectively. The similar non-complied performance of these operators was also observed during the monthly PMR audit.

(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.

In regard to the parameter '**Response Time to the Customer for assistance**', all service providers are in compliance of the parameters '**Accessibility of call center**' and '**Calls answered by Operators (voice to voice)**' within 90 seconds.

The results for **three days live measurements** reveal that only Aircel has not met the benchmark of '**Call answered by operators (Voice to voice)**' with its performance as **92.31%**.

(iv) 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) and RCOM(CDMA)** 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.

## **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	March-15	19 Hrs-20 Hrs
2	AIRCEL	March-15	18 Hrs-19 Hrs
3	TATA GSM	March-15	19 Hrs-20 Hrs
4	BSNL (MP)	March-15	19 Hrs-20 Hrs
5	BSNL (CG)	March-15	19 Hrs-20 Hrs
6	IDEA CELLULAR	March-15	19 Hrs-20 Hrs
7	RCOM GSM	March-15	20 Hrs-21 Hrs
8	VIDEOCON	March-15	20 Hrs-21 Hrs
9	VODAFONE	March-15	20 Hrs-21 Hrs
<b>CDMA Operators</b>			
10	RCOM CDMA	March-15	20 Hrs-21 Hrs
11	TATA CDMA	March-15	19 Hrs-20 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	9482	NSN	NSN
2	AIRCEL	1	1	128	Huawei	Huawei
3	TATA GSM	4	26	2869	Huawei	Huawei
4	BSNL (MP)	9	83	3623	Alcatel	Alcatel
5	BSNL (CG)	5	45	1814	Alcatel	Alcatel
6	IDEA CELLULAR	34	75	9768	Ericsson	Ericsson
7	RCOM GSM	12	49	3983	Huawei, Ericsson	ZTE, Alcatel Lucent
8	VIDEOCON	1	10	1639	Huawei	Huawei
9	VODAFONE	8	49	5665	NSN	NSN
<b>CDMA Operators</b>						
10	RCOM CDMA	8	8	1812	Huawei, ZTE, Lucent	Lucent, Huawei
11	TATA CDMA	3	5	428	Huawei & Ericsson	Motorola & Huawei

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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE – JANUARY 15 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%	Jan-15	0.09%	0.25%	0.01%	1.96%	1.92%	0.42%	0.18%	0.14%	0.09%	0.45%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Jan-15	0.11%	0.78%	0.00%	1.02%	1.82%	1.44%	0.65%	0.50%	0.13%	1.71%	0.22%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	99.60%	98.66%	98.64%	96.98%	95.39%	97.86%	98.77%	99.13%	99.58%	99.23%	99.12%
	b) SDCCH/PAGING Channel congestion	<=1%	Jan-15	0.06%	0.28%	0.03%	0.59%	0.86%	0.80%	0.15%	0.11%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.38%	0.00%	0.04%	1.49%	1.94%	1.65%	0.12%	0.12%	0.42%	0.00%	0.11%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Jan-15	0.77%	0.54%	0.59%	1.40%	1.91%	0.89%	0.55%	0.55%	0.74%	0.07%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jan-15	2.20%	1.04%	<b>3.28%</b>	2.24%	2.66%	1.88%	0.02%	1.10%	2.99%	0.39%	<b>7.28%</b>
	c) Connections with good voice quality	>=95%	Jan-15	96.74%	99.48%	98.86%	NP	NP	97.12%	97.89%	98.65%	98.89%	99.85%	99.17%
4	No. of POI's having >=0.5% POI congestion		Jan-15	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 – FEBRUARY- 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE – FEBRUARY 15 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%	Feb-15	0.07%	0.27%	0.01%	1.94%	1.97%	0.62%	0.17%	0.18%	0.10%	0.43%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Feb-15	0.12%	1.56%	0.00%	1.02%	1.93%	1.46%	0.65%	0.98%	0.18%	1.71%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	99.47%	98.44%	98.60%	96.72%	95.40%	97.75%	98.71%	99.06%	99.46%	99.33%	98.44%
	b) SDCCH/PAGING Channel congestion	<=1%	Feb-15	0.07%	0.18%	0.04%	0.59%	0.99%	0.74%	0.04%	0.17%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-15	0.63%	0.00%	0.06%	1.61%	1.87%	1.63%	0.15%	0.17%	0.54%	0.00%	0.81%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Feb-15	0.76%	0.77%	0.58%	1.45%	1.96%	0.85%	0.56%	0.54%	0.72%	0.08%	0.37%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Feb-15	2.22%	1.04%	3.34%	2.33%	2.79%	2.05%	0.02%	1.15%	2.77%	0.40%	8.24%
	c) Connections with good voice quality	>=95%	Feb-15	96.31%	99.41%	98.81%	NP	NP	97.02%	97.89%	98.57%	98.85%	99.84%	99.19%
4	No. of POI's having >=0.5% POI congestion		Feb-15	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 – MARCH- 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE – MARCH 15 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%	Mar-15	0.11%	0.22%	0.02%	1.93%	1.89%	0.53%	0.10%	0.23%	0.14%	0.41%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	Mar-15	0.09%	0.78%	0.00%	1.08%	1.98%	1.48%	0.65%	1.10%	0.37%	1.71%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	99.56%	98.40%	98.59%	96.30%	95.41%	97.93%	98.79%	99.03%	99.40%	99.33%	99.16%
	b) SDCCH/PAGING Channel congestion	<=1%	Mar-15	0.07%	0.10%	0.05%	0.55%	0.98%	0.63%	0.05%	0.13%	0.21%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-15	0.55%	0.00%	0.05%	1.51%	1.89%	1.49%	0.15%	0.17%	0.60%	0.00%	0.04%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Mar-15	0.67%	0.88%	0.57%	1.50%	1.81%	0.85%	0.15%	0.55%	0.75%	0.08%	0.44%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Mar-15	1.88%	1.30%	<b>3.57%</b>	2.37%	2.90%	2.13%	0.04%	1.19%	2.92%	0.44%	<b>7.30%</b>
	c) Connections with good voice quality	>=95%	Mar-15	97.35%	99.30%	98.82%	NP	NP	97.01%	97.87%	98.51%	98.82%	99.84%	99.19%
4	No. of POI's having >=0.5% POI congestion		Mar-15	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- MARCH- 15(JAN-FEB-MAR-2015 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	0.09%	0.25%	0.01%	1.94%	1.93%	0.52%	0.15%	0.18%	0.11%	0.43%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.11%	1.04%	0.00%	1.04%	1.91%	1.46%	0.65%	0.86%	0.23%	1.71%	0.07%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.54%	98.50%	98.61%	96.67%	95.40%	97.85%	98.76%	99.07%	99.48%	99.30%	98.91%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.07%	0.19%	0.04%	0.58%	0.94%	0.72%	0.08%	0.14%	0.13%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.52%	0.00%	0.05%	1.54%	1.90%	1.59%	0.14%	0.15%	0.52%	0.00%	0.32%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.73%	0.73%	0.58%	1.45%	1.89%	0.86%	0.42%	0.55%	0.74%	0.08%	0.43%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.10%	1.13%	<b>3.40%</b>	2.31%	2.78%	2.02%	0.03%	1.15%	2.89%	0.41%	<b>7.61%</b>
	c) Connections with good voice quality	>=95%	Quarterly	96.80%	99.40%	98.83%	NP	NP	97.05%	97.88%	98.58%	98.85%	99.84%	99.18%
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 0.08%) 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) and Tata (CDMA)** met the benchmark for this parameter. The quarterly average performance of **Tata (GSM) and Tata (CDMA)** for this parameter was **3.40% and 7.61%** 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) – JANUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE - JANUARY 15 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	0.08%	0.17%	0.01%	1.95%	0.87%	0.53%	0.14%	0.11%	0.09%	0.48%	0.18%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.94%	0.17%	0.22%	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	99.65%	99.06%	98.59%	96.80%	95.48%	97.81%	98.71%	99.08%	99.46%	99.19%	99.09%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.03%	0.00%	0.04%	0.50%	0.79%	0.89%	0.02%	0.09%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.35%	0.00%	0.06%	1.91%	1.66%	1.69%	0.11%	0.14%	0.54%	0.00%	0.16%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.75%	0.70%	0.60%	1.48%	1.69%	0.88%	0.55%	0.55%	0.72%	0.08%	0.43%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.05%	1.74%	3.20%	2.13%	2.53%	1.90%	0.02%	1.13%	4.23%	0.44%	7.35%
	c) Connections with good voice quality	>=95%	Live data	97.30%	99.31%	98.82%	NP	NP	97.15%	97.87%	98.62%	98.89%	99.84%	99.19%
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) – FEBRUARY-15 MONTH:**

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE - FEBRUARY 15 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	0.06%	0.45%	0.01%	1.93%	0.93%	0.52%	0.12%	0.22%	0.03%	0.43%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.88%	0.28%	0.24%	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	99.42%	99.12%	98.66%	96.70%	96.65%	97.29%	98.73%	99.09%	99.66%	99.29%	98.73%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.07%	0.05%	0.03%	0.68%	1.00%	0.72%	0.02%	0.15%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.86%	0.00%	0.04%	1.82%	1.83%	1.46%	0.16%	0.11%	0.34%	0.00%	0.59%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.74%	0.79%	0.58%	1.52%	1.79%	0.81%	0.56%	0.55%	0.68%	0.08%	0.40%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.00%	0.78%	3.00%	2.40%	2.59%	1.82%	0.02%	1.16%	2.81%	0.37%	<b>9.18%</b>
	c) Connections with good voice quality	>=95%	Live data	96.29%	98.76%	98.84%	NP	NP	97.02%	97.87%	98.59%	98.88%	99.84%	99.31%
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: ALICATEL 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) – MARCH 15 MONTH:**

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE - MARCH 15 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	0.07%	0.03%	0.02%	1.88%	0.94%	0.49%	0.15%	0.24%	0.17%	0.52%	0.17%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.91%	0.28%	0.22%	0.00%	0.12%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.91%	98.58%	98.57%	96.19%	95.83%	97.99%	98.80%	99.02%	99.41%	99.23%	98.68%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.26%	0.08%	0.05%	0.65%	0.93%	0.59%	0.01%	0.12%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.53%	0.00%	0.07%	1.81%	1.94%	1.48%	0.16%	0.17%	0.59%	0.00%	0.03%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.62%	0.56%	0.64%	1.75%	1.91%	0.82%	0.54%	0.58%	0.76%	0.09%	0.42%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.70%	1.22%	<b>3.83%</b>	2.40%	2.58%	1.98%	0.07%	1.18%	<b>3.06%</b>	0.42%	<b>10.49%</b>
	c) Connections with good voice quality	>=95%	Live data	97.59%	98.77%	98.75%	NP	NP	97.04%	97.86%	98.49%	98.80%	99.84%	99.18%
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 JANUARY TO MARCH 2015 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	0.07%	0.22%	0.01%	1.92%	0.91%	0.51%	0.14%	0.19%	0.10%	0.48%	0.13%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.00%	0.91%	0.24%	0.23%	0.00%	0.04%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.66%	98.92%	98.61%	96.56%	95.99%	97.70%	98.75%	99.06%	99.51%	99.24%	98.83%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.12%	0.04%	0.04%	0.61%	0.91%	0.73%	0.02%	0.12%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.58%	0.00%	0.06%	1.85%	1.81%	1.54%	0.14%	0.14%	0.49%	0.00%	0.26%
<b>Connection maintenance (Retainability)</b>														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.70%	0.68%	0.61%	1.58%	1.80%	0.84%	0.55%	0.56%	0.72%	0.08%	0.42%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	1.92%	1.25%	<b>3.34%</b>	2.31%	2.57%	1.90%	0.04%	1.16%	<b>3.37%</b>	0.41%	<b>9.01%</b>
	c) Connections with good voice quality	>=95%	Quarterly	97.06%	98.95%	98.80%	NP	NP	97.07%	97.87%	98.57%	98.86%	99.84%	99.23%
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), Vodafone and Tata (CDMA)** in all the three months of the quarter. Their average performance for the quarter was **3.34%, 3.37%, and 9.01 %** respectively. The similar non-complied performance of **Tata GSM / Tata CDMA** was also observed during the monthly PMR audit.

*Thus, the assessment of QoS with regard to the parameter as mentioned above during live measurement is a matter of concern for the 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- Jan 15 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		Jan-15	9373	128	2898	3623	1809	9732	3983	1605	5465	1816	446
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jan-15	5976	235	256	52735	25782	30266	5264	1669	3473	6038	175
	c) BTS Accumulated Downtime	<=2%	Jan-15	0.09%	0.25%	0.01%	1.96%	1.92%	0.42%	0.18%	0.14%	0.09%	0.45%	0.05%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jan-15	10	1	0	37	33	140	26	8	7	31	1
	e) Worst affected BTSs due to downtime	<=2%	Jan-15	0.11%	0.78%	0.00%	1.02%	1.82%	1.44%	0.65%	0.50%	0.13%	1.71%	0.22%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	<=2%	Jan-15	99.60%	98.66%	98.64%	96.98%	95.39%	97.86%	98.77%	99.13%	99.58%	99.23%	99.12%
	b) SDCCH/PAGING Congestion	<=3%	Jan-15	0.06%	0.28%	0.03%	0.59%	0.86%	0.80%	0.15%	0.11%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.38%	0.00%	0.04%	1.49%	1.94%	1.65%	0.12%	0.12%	0.42%	0.00%	0.11%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	Jan-15	0.77%	0.54%	0.59%	1.40%	1.91%	0.89%	0.55%	0.55%	0.74%	0.07%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	Jan-15	2.20%	1.04%	<b>3.28%</b>	2.24%	2.66%	1.88%	0.02%	1.10%	2.99%	0.39%	<b>7.28%</b>
	c) % of connections with good voice quality	>=95%	Jan-15	96.74%	99.48%	98.86%	NP	NP	97.12%	97.89%	98.65%	98.89%	99.85%	99.17%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jan-15	630	4	285	256	142	547	2	53	490	21	98
	e) Total no. of cells (Sector) in the licensed service area		Jan-15	28693	384	8685	11437	5337	29106	11949	4800	16378	5448	1347
<b>No. of POI's having &gt;=0.5% POI congestion</b>														
4	No. of POI's having >=0.5% POI congestion		Jan-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jan-15	0	0	0	0	0	0	0	0	0	0	0
<b>Network Data</b>														
5	a) Equipped Capacity of Network in Erlang		Jan-15	287103	623	137979	224500	130000	475237	NP	67872	117431	NP	107133
	b) Total traffic in TCBH in erlang (Avg.)		Jan-15	214094	3	60905	68129	54768	384879	NP	28261	98814	NP	14906
	c) Total no. of customers served (as per VLR) on last day of the month		Jan-15	10668900	441	3313816	1921347	912368	20276816	NP	1449524	4915307	NP	204329

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - Jan 15 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	9324	128	2892	3623	1809	9667	3983	1579	5415	1812	446
	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	562	15.81	13.9	5084	1131	3711	406	128	341.04	631	57.87
	c) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.17%	0.01%	1.95%	0.87%	0.53%	0.14%	0.11%	0.09%	0.48%	0.18%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	34	3	21	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.94%	0.17%	0.22%	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	99.65%	99.06%	98.59%	96.80%	95.48%	97.81%	98.71%	99.08%	99.46%	99.19%	99.09%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.03%	0.00%	0.04%	0.50%	0.79%	0.89%	0.02%	0.09%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.35%	0.00%	0.06%	1.91%	1.66%	1.69%	0.11%	0.14%	0.54%	0.00%	0.16%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.75%	0.70%	0.60%	1.48%	1.69%	0.88%	0.55%	0.55%	0.72%	0.08%	0.43%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.05%	1.74%	<b>3.20%</b>	2.13%	2.53%	1.90%	0.02%	1.13%	<b>4.23%</b>	0.44%	<b>7.35%</b>
	c) % of connections with good voice quality	>=95%	Live data	97.30%	99.31%	98.82%	NP	NP	97.15%	97.87%	98.62%	98.89%	99.84%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	586	6.67	278	244	135	553	2	54	692	24	99
	e) Total no. of cells (Sector) in the licensed service area		Live data	28651	384	8680	11437	5337	29090	12048	4780	16343	5439	1347
<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 – Feb 15 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		Feb-15	9412	128	2904	3623	1809	9738	3983	1627	5615	1812	446
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Feb-15	4510	228	160	47166	23940	40598	4465	1988	3597	5237	42
	c) BTS Accumulated Downtime	<=2%	Feb-15	0.07%	0.27%	0.01%	1.94%	1.97%	0.62%	0.17%	0.18%	0.10%	0.43%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Feb-15	11	2	0	37	35	142	26	16	10	31	0
	e) Worst affected BTSs due to downtime	<=2%	Feb-15	0.12%	1.56%	0.00%	1.02%	1.93%	1.46%	0.65%	0.98%	0.18%	1.71%	0.00%
<b>Connection Establishment (Accessibility)</b>														
2	a) CSSR (Call Setup Success Rate)	<=2%	Feb-15	99.47%	98.44%	98.60%	96.72%	95.40%	97.75%	98.71%	99.06%	99.46%	99.33%	98.44%
	b) SDCCH/PAGING Congestion	<=3%	Feb-15	0.07%	0.18%	0.04%	0.59%	0.99%	0.74%	0.04%	0.17%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-15	0.63%	0.00%	0.06%	1.61%	1.87%	1.63%	0.15%	0.17%	0.54%	0.00%	0.81%
<b>Connection Maintenance (Retainability)</b>														
3	a) Call Drop Rate (CDR)	<=2%	Feb-15	0.76%	0.77%	0.58%	1.45%	1.96%	0.85%	0.56%	0.54%	0.72%	0.08%	0.37%
	b) Worst affected cells>3% TCH drop	<=3%	Feb-15	2.22%	1.04%	3.34%	2.33%	2.79%	2.05%	0.02%	1.15%	2.77%	0.40%	8.24%
	c) % of connections with good voice quality	>=95%	Feb-15	96.31%	99.41%	98.81%	NP	NP	97.02%	97.89%	98.57%	98.85%	99.84%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Feb-15	642	4	291	266	149	601	3	57	461	22	111
	e) Total no. of cells (Sector) in the licensed service area		Feb-15	28855	384	8705	11437	5337	29293	12078	4938	16671	5451	1347
<b>No. of POI's having &gt;=0.5% POI congestion</b>														
4	No. of POI's having >=0.5% POI congestion		Feb-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Feb-15	0	0	0	0	0	0	0	0	0	0	0
<b>Network Data</b>														
5	a) Equipped Capacity of Network in Erlang		Feb-15	284959	620	138197	224500	130000	478235	295000	68644	121839	146000	107133
	b) Total traffic in TCBH in erlang (Avg.)		Feb-15	228919	2	64672	62260	57318	412126	160156	31267	106873	64974	13919
	c) Total no. of customers served (as per VLR) on last day of the month		Feb-15	10824756	352	3008649	1921572	912090	20583532	9227957	1511650	5028940	1891564	189785



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - Feb 15 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	9379	128	2899	3623	1809	9732	3982	1615	5497	1812	446
	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	377	42	11	5030	1212	3642	356	256	134	565	10
	c) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.45%	0.01%	1.93%	0.93%	0.52%	0.12%	0.22%	0.03%	0.43%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	32	5	23	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.88%	0.28%	0.24%	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	99.42%	99.12%	98.66%	96.70%	96.65%	97.29%	98.73%	99.09%	99.66%	99.29%	98.73%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.07%	0.05%	0.03%	0.68%	1.00%	0.72%	0.02%	0.15%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.86%	0.00%	0.04%	1.82%	1.83%	1.46%	0.16%	0.11%	0.34%	0.00%	0.59%
3	<b>Connection Maintenance (Retainability)</b>													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.74%	0.79%	0.58%	1.52%	1.79%	0.81%	0.56%	0.55%	0.68%	0.08%	0.40%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.00%	0.78%	3.00%	2.40%	2.59%	1.82%	0.02%	1.16%	2.81%	0.37%	9.18%
	c) % of connections with good voice quality	>=95%	Live data	96.29%	98.76%	98.84%	NP	NP	97.02%	97.87%	98.59%	98.88%	99.84%	99.31%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	576	3	261	275	138	532	2	57	468	20	124
	e) Total no. of cells (Sector) in the licensed service area		Live data	28844	384	8701	11437	5337	29293	12072	4891	16663	5451	1347
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 - March 15 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>1 Network Availability</b>														
	a) Total no. of BTSs in the licensed service area		Mar-15	9482	128	2869	3623	1814	9768	3983	1639	5665	1812	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Mar-15	7429	205	409	51968	25521	38458	2880	2862	5988	5578	261
	c) BTS Accumulated Downtime	<=2%	Mar-15	0.11%	0.22%	0.02%	1.93%	1.89%	0.53%	0.10%	0.23%	0.14%	0.41%	0.08%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Mar-15	9	1	0	39	36	145	26	18	21	31	0
	e) Worst affected BTSs due to downtime	<=2%	Mar-15	0.09%	0.78%	0.00%	1.08%	1.98%	1.48%	0.65%	1.10%	0.37%	1.71%	0.00%
<b>2 Connection Establishment (Accessibility)</b>														
	a) CSSR (Call Setup Success Rate)	<=2%	Mar-15	99.56%	98.40%	98.59%	96.30%	95.41%	97.93%	98.79%	99.03%	99.40%	99.33%	99.16%
	b) SDCCH/PAGING Congestion	<=3%	Mar-15	0.07%	0.10%	0.05%	0.55%	0.98%	0.63%	0.05%	0.13%	0.21%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-15	0.55%	0.00%	0.05%	1.51%	1.89%	1.49%	0.15%	0.17%	0.60%	0.00%	0.04%
<b>3 Connection Maintenance (Retainability)</b>														
	a) Call Drop Rate (CDR)	<=2%	Mar-15	0.67%	0.88%	0.57%	1.50%	1.81%	0.85%	0.15%	0.55%	0.75%	0.08%	0.44%
	b) Worst affected cells>3% TCH drop	<=3%	Mar-15	1.88%	1.30%	3.57%	2.37%	2.90%	2.13%	0.04%	1.19%	2.92%	0.44%	7.30%
	c) % of connections with good voice quality	>=95%	Mar-15	97.35%	99.30%	98.82%	NP	NP	97.01%	97.87%	98.51%	98.82%	99.84%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Mar-15	546	5	310	271	155	624	5	59	495	24	97
	e) Total no. of cells (Sector) in the licensed service area		Mar-15	28991	384	8693	11437	5352	29291	12078	4949	16941	5451	1323
<b>4 No. of POI's having &gt;=0.5% POI congestion</b>														
	No. of POI's having >=0.5% POI congestion		Mar-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Mar-15	0	0	0	0	0	0	0	0	0	0	0
<b>5 Network Data</b>														
	a) Equipped Capacity of Network in Erlang		Mar-15	617	138497	224500	130000	479326	NP	69067	123241	NP	105467	617
	b) Total traffic in TCBH in erlang (Avg.)		Mar-15	2	62893	61321	54418	406958	NP	32605	109162	NP	13737	2
	c) Total no. of customers served (as per VLR) on last day of the month		Mar-15	426	3005745	1922154	910161	20760035	NP	1553970	5123849	NP	184268	426

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - March 15 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	9403	128	2905	3623	1814	9738	3982	1633	5621	1815	446
	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	507	2.9	33.4	4894	1224	3439	418	288	678	673.3	55
	c) BTS Accumulated Downtime	<=2%	Live data	0.07%	0.03%	0.02%	1.88%	0.94%	0.49%	0.15%	0.24%	0.17%	0.52%	0.17%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	33	5	21	0	2	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.91%	0.28%	0.22%	0.00%	0.12%	0.00%	0.00%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.91%	98.58%	98.57%	96.19%	95.83%	97.99%	98.80%	99.02%	99.41%	99.23%	98.68%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.26%	0.08%	0.05%	0.65%	0.93%	0.59%	0.01%	0.12%	0.09%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.53%	0.00%	0.07%	1.81%	1.94%	1.48%	0.16%	0.17%	0.59%	0.00%	0.03%	
3	<b>Connection Maintenance (Retainability)</b>													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.62%	0.56%	0.64%	1.75%	1.91%	0.82%	0.54%	0.58%	0.76%	0.09%	0.42%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.70%	1.22%	<b>3.83%</b>	2.40%	2.58%	1.98%	0.07%	1.18%	<b>3.06%</b>	0.42%	<b>10.49%</b>
	c) % of connections with good voice quality	>=95%	Live data	97.59%	98.77%	98.75%	NP	NP	97.04%	97.86%	98.49%	98.80%	99.84%	99.18%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	492	5	334	274	138	579	8	59	518	23	141
e) Total no. of cells (Sector) in the licensed service area		Live data	28928	384	8711	11437	5352	29222	12018	4959	16952	5451	1347	
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

## **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 (JANUARY TO MARCH 2015 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>													
<b>1 Metering &amp; Billing Credibility -Post Paid</b>													
	A) No. Of bills issued during the quarter		MP&CG	9	617133	283037	1406554	351201	124865	NA	369455	262811	19835
	B) No. of bills disputed including billing complaints during the quarter		MP&CG	0	103	10	1384	324	0	NA	242	181	0
	C)% of billing complaints during the quarter	<= 0.1%	MP&CG	0.00%	0.02%	0.00%	0.10%	0.09%	0.00%	NA	0.07%	0.07%	0.00%
<b>2 Metering &amp; Billing Credibility -Pre Paid</b>													
	A) Total No. of Pre-paid customers at the end of the quarter		MP&CG	21191	11185154	2985500	18926324	10311199	4668099	2850999	6247722	1955751	321640
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		MP&CG	0	209	172	5121	9307	0	19	5119	1756	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	MP&CG	0.00%	0.002%	0.01%	0.03%	0.09%	0.00%	0.00%	0.08%	0.09%	0.00%
<b>3 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	312	182	37704	9631	2642	19	5361	1937	18
	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	312	182	37704	9631	2642	19	5361	1937	18

**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) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter.		MP&CG	0	312	182	37704	9631	2642	19	5361	1937	18
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
<b>4</b>	<b>Response time to customers for assistance</b>												
	A) Total no of calls attempted to customer care/Call center		MP&CG	3421	3081584	3095334	51991744	17800141	1240049	624643	16928055	2434097	61656
	B) Total no. of calls successfully established to customer care/Call center		MP&CG	3350	3081584	3084619	51148068	17615203	1217494	624643	16928055	2383261	60503
	C) % Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	97.92%	100.00%	99.65%	98.38%	98.96%	98.18%	100.00%	100.00%	97.91%	98.13%
	D) Total Calls reached to operator for Voice to Voice (Total call attempt)		MP&CG	661	4178191	1582459	11589107	4926082	2151220	2111816	4946631	416655	64730
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		MP&CG	651	4066321	1573468	11418816	4863848	2090900	2031114	4908846	405359	63191

**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	
	F) % age of calls answered by operator(voice to voice) (Total call successfully established within 90 sec.*100 / Total call attempts )	>=95%	MP&CG	98.49%	97.32%	99.43%	98.53%	98.74%	97.20%	96.18%	99.24%	97.29%	97.62%
<b>5 Termination/closure of service</b>													
	A) Total No. of requests for Termination / Closure of service received during the quarter		MP&CG	0	927	691	14315	947	2138	NA	5084	559	578
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		MP&CG	0	927	691	14315	947	2138	NA	5084	559	578
	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%
<b>6 Time taken for refunds of deposits after closures.</b>													
	A) No. of Payments/ Refunds due during the quarter		MP&CG	0	297	626	2032	1913	504	NA	7882	1322	152
	B) No. of Payments/ Refunds Cleared during the quarter		MP&CG	0	297	626	2032	1913	504	NA	7882	1322	152
	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.

**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	79	92403	57286	2112606	573756	38964	22022	607239	77334	1798
	Total no. of calls successfully established to customer care/Call center		MP&CG	79	92403	57286	2053300	567906	38623	22022	607239	75853	1767
	% Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	100.00%	100.00%	100.00%	97.19%	98.98%	99.12%	100.00%	100.00%	98.08%	98.28%
2	Total Calls reached to operator for Voice to Voice (Total call attempt)		MP&CG	26	130322	57286	388969	147496	65676	85638	185007	4689	1982
	Total number of calls answered by the operator (Voice to voice) within 90 seconds		MP&CG	24	128947	57286	380082	146650	65297	81860	182540	4604	1971
	% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempts)	>=95%	MP&CG	92.31%	98.94%	100.00%	97.72%	99.43%	99.42%	95.59%	98.67%	98.19%	99.45%



### 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 within the prescribed bench mark against the benchmark of  $\leq 0.1\%$ .

#### 2. Resolution of Billing complaints and applying credits -

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

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

#### 3. Response Time to the Customer for assistance

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

All service providers are in compliance with respect to the parameter **Accessibility of call center** and **'calls answered by Operators (voice to voice) within 90 seconds**.

#### 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 Aircel), have met the benchmarks for the parameters **'Accessibility to call center'** and **'Call answered by operators (Voice to voice)'**. **Only Aircel** has failed to meet the benchmark of the parameter **'Call answered by operators (Voice to voice)'** with its performance as **92.31%**.

## **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)	VIDEOCOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
AIRCEL	MP&CG	NIL	--	--	--	--	--	--	--	--	--
AIRTEL	MP&CG	NIL	--	100%	100%	99%	100%	98%	98%	99%	99%
BSNL	MP&CG	NIL	100%	--	97%	97%	99%	98%	98%	98%	100%
IDEA	MP&CG	NIL	99%	99%	--	100%	97%	99%	100%	97%	99%
RCOM (GSM)	MP&CG	NIL	100%	100%	100%	--	100%	98%	99%	100%	100%
TATA (GSM)	MP&CG	NIL	99%	99%	100%	99%	--	100%	100%	100%	99%
VIDEOCOCON	MP&CG	NIL	100%	100%	99%	100%	98%	--	99%	99%	100%
VODAFONE	MP&CG	NIL	98%	99%	99%	98%	100%	100%	--	100%	98%
RCOM (CDMA)	MP&CG	NIL	99%	99%	100%	100%	98%	99%	99%	--	100%
TATA (CDMA)	MP&CG	NIL	100%	100%	100%	99%	100%	100%	100%	99%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. Thus there was no remarkable problem in interconnection from one operator to other operators. Call inter connections were ranging from 97 % to 100%.

Thus there was no remarkable problem in interconnection from one operator to other operators. Aircel was not having coverage in major cities in MP&CG circle.

## 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	100	100	100	96	100	100	100	97	100
% Accessibility of Call centre /customer Care (Total call successfully established * 100/ Total call attempts)	MP&CG	100.00%	100.00%	100.00%	96.00%	100.00%	100.00%	100.00%	97.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempts)	MP&CG	97	99	96	96	100	100	99	95	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	MP&CG	97	99	95	94	99	99	98	93	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100/Total call attempts)	MP&CG	100.00%	100.00%	98.96%	97.92%	99.00%	99.00%	98.99%	97.89%	100.00%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, call connection to the operators were ranging from 97.89 to 100% within 90 Seconds.

## 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	19	100	100	18
Total No. of calls Answered	MP&CG	90	98	97	90	89	15	95	85	15
Resolution of Billing complaints	MP&CG	89	97	97	88	89	15	94	84	15
%age of cases resolved	MP&CG	98.89%	98.98%	100.00%	97.78%	100.00%	100.00%	98.95%	98.82%	100.00%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. During live calling, some of the customers did not attend the calls while some others reported that there complaints have been resolved but not sure of duration of their resolution. % age of resolution of billing complaints was ranging from 97.78% to 100%. Most of the customers were satisfied with the resolution of Billing Complaints.

**6.4 LEVEL -1 CALLING ASSESSMENT:**

LEVEL 1 LIVE CALLING															
Emergency no.	Month of Drive Test	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)	
100, 101, 102, 108, 1090,	Jan-15	Betul	Betul	5	NC	✓	✓	✓	✓	✓	✓	✓	X	✓	
			Ghodadongari	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Athner	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Prabhapattan	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Multai	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Chicholi	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Bhainsdehi	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
	Feb-15	Chhindwara	Chhindwara	5	NC	✓	✓	✓	✓	X	✓	✓	✓	X	✓
			Chaurai	5	NC	✓	✓	✓	✓	X	✓	✓	✓	X	NC
			Saunsar	5	NC	✓	✓	✓	✓	X	✓	✓	✓	X	NC
			Padhuma	5	NC	✓	✓	✓	✓	X	✓	✓	✓	X	NC
			Parasia	5	NC	✓	✓	✓	✓	X	✓	✓	✓	X	NC
			Junnardeo	5	NC	✓	✓	✓	✓	X	✓	✓	✓	X	NC
			Tamia	5	NC	✓	✓	✓	✓	X	NC	NC	✓	X	NC
	Mar-15	Morena	Morena	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	X
			Ambah	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Jaura	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Sabalgarh	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Gohad	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Mehgaon	5	NC	✓	✓	✓	✓	✓	✓	✓	✓	X	NC
			Bhind	5	NC	✓	✓	✓	✓	✓	✓	NC	NC	✓	X

- 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. Call connections to the emergency numbers in the network RCOM GSM were not matured at Chhindwara and for RCOM CDMA at Betul , Chhindwara and Morena SSAs. The same has been marked as 'X'.

## 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 **Betul, Chindwara and Morena** in the months of January, February and March 2015 respectively. The total route Km covered during drive tests in respective SSAs was **330 Kms, 350 Kms and 363 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: BETUL SSA (JANUARY-15)

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	79	20	61	20	68	20	88	20	63	20	78	20	70	20	19	30	59	20	
		Major Roads	NC	NC	54	20	40	20	78	21	55	20	47	10	51	20	66	20	13	NC	30	10	
		Within City	NC	NC	263	20	220	20	220	24	271	20	204	20	277	20	262	20	54	NC	147	20	
		Overall SSA	NC	NC	396	60	321	60	366	65	414	60	314	50	406	60	398	60	86	30	236	50	
2	Blocked Call Rate	Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	1.47%	0.00%	1.14%	0.00%	1.59%	0.00%	2.56%	0.00%	0.00%	0.00%	0.00%	0.00%	1.69%	0.00%	
		Major Roads	NC	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%	NC	0.00%	0.00%	
		Within City	NC	NC	0.76%	0.00%	0.45%	0.00%	0.45%	0.00%	0.74%	0.00%	0.00%	0.00%	0.72%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Overall SSA	NC	NC	0.51%	0.00%	0.31%	0.00%	0.55%	0.00%	0.72%	0.00%	0.32%	0.00%	0.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.42%	0.00%	
3	Dropped Call Rate (<=2%)	Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.15%	0.00%	3.17%	0.00%	1.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Major Roads	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.49%	0.00%	0.37%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Overall SSA	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	1.59%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
4	Percentage connections with good voice quality (=>95%)																						
	(a) 0-4 (w/o frequency hopping for CDMA)	Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.94%	99.69%	98.84%	100%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.74%	NC	99.29%	100%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.74%	NC	99.54%	100%



AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-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	
			Operators)	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.59%	99.69%	99.32%
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	NC	NC	96.44%	98.75%	91.48%	82.59%	98.11%	98.45%	97.71%	97.55%	97.34%	96.41%	96.64%	98.12%	98.14%	98.79%	NA	NA	NA	NA		
	Major Roads	NC	NC	96.60%	99.44%	88.42%	99.85%	97.92%	100%	97.56%	99.76%	98.70%	100%	97.99%	100%	98.30%	99.36%	NA	NA	NA	NA		
	Within City	NC	NC	97.61%	99.44%	92.91%	99.85%	98.91%	99.94%	98.05%	99.18%	97.41%	97.48%	98.00%	100%	98.44%	99.36%	NA	NA	NA	NA		
	Overall SSA	NC	NC	97.27%	99.21%	92.08%	94.11%	98.65%	99.50%	97.93%	98.76%	97.54%	98.13%	97.77%	99.43%	98.37%	99.15%	NA	NA	NA	NA		
5	Service Coverage																						
	In door (>= - 75dBm)	Highways	NC	NC	70.52%	100%	33.99%	70.18%	73.97%	99.08%	52.89%	100%	54.06%	100%	85.15%	95.46%	73.47%	91.03%	0.00%	0.00%	47.88%	100%	
		Major Roads	NC	NC	88.97%	99.81%	47.99%	40.25%	81.53%	99.78%	69.52%	95.81%	78.64%	33.40%	93.26%	95.45%	87.27%	99.77%	12.85%	NC	69.73%	100%	
		Within City	NC	NC	81.88%	99.81%	36.42%	40.25%	83.22%	52.09%	60.14%	96.60%	59.76%	64.69%	91.36%	93.94%	84.69%	99.77%	7.06%	NC	58.60%	96.22%	
		Overall SSA	NC	NC	80.46%	99.87%	39.47%	50.23%	84.08%	81.91%	59.83%	97.51%	64.15%	66.03%	89.93%	94.94%	82.90%	96.66%	6.57%	0.00%	58.74%	98.74%	
	In-vehicle (>= - 85dBm)	Highways	NC	NC	89.86%	100%	77.91%	99.90%	89.83%	99.96%	86.06%	100%	88.47%	100%	92.90%	99.98%	91.75%	100%	0.32%	0.00%	82.07%	100%	
		Major Roads	NC	NC	98.36%	100%	92.23%	97.38%	94.92%	99.93%	93.18%	100%	99.91%	100%	98.10%	99.91%	97.83%	100%	50.35%	NC	96.94%	100%	
		Within City	NC	NC	94.52%	100%	85.04%	97.38%	93.49%	97.74%	91.79%	100%	87.72%	99.15%	97.60%	99.89%	96.85%	100%	29.43%	NC	85.52%	100%	
		Overall SSA	NC	NC	94.25%	100%	85.06%	98.22%	95.28%	99.13%	90.85%	100%	92.03%	99.72%	96.20%	99.93%	96.02%	100%	26.99%	0.00%	88.18%	100%	
	Outdoor-in city (>= - 95dBm)	Highways	NC	NC	97.72%	100%	96.60%	100%	98.70%	100%	98.83%	100%	99.27%	100%	98.95%	100%	98.91%	100%	23.92%	30.06%	95.90%	100%	
		Major Roads	NC	NC	99.73%	100%	99.65%	100%	98.97%	100%	99.75%	100%	99.94%	100%	99.47%	100%	99.89%	100%	81.45%	NC	100%	100%	
		Within City	NC	NC	99.34%	100%	98.75%	100%	99.36%	99.59%	99.71%	100%	98.34%	100%	99.46%	100%	99.73%	100%	66.31%	NC	96.02%	100%	
		Overall SSA	NC	NC	98.93%	100%	98.33%	100%	99.07%	99.85%	99.54%	100%	99.18%	100%	99.29%	100%	99.51%	100%	60.45%	30.06%	97.31%	100%	
	6	Call Setup	Highways	NC	NC	100%	100%	100%	100%	98.53%	100%	98.86%	100%	98.41%	100%	97.44%	100%	100%	100%	100%	100%	98.31%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-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%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC
Within City	NC	NC		99.24%	100%	99.55%	100%	99.55%	100%	99.26%	100%	100%	100%	98.56%	100%	100%	100%	100%	100%	NC	99.32%	100%	
Overall SSA	NC	NC		99.49%	100%	99.69%	100%	99.45%	100%	99.28%	100%	99.68%	100%	98.52%	100%	100%	100%	100%	100%	100%	98.31%	100%	
Highways	NC	NC		99.29%	100%	95.83%	100%	100%	100%	98.55%	100%	100%	100%	100%	100%	98.82%	97.14%	100%	100%	100%	100%	100%	
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC	100%	100%
		Within City	NC	NC	99.33%	100%	98.95%	100%	99.70%	100%	99.24%	100%	100%	100%	99.35%	100%	100%	100%	100%	100%	NC	100%	100%
		Overall SSA	NC	NC	99.43%	100%	98.15%	100%	99.80%	100%	99.26%	100%	100%	100%	99.47%	100%	99.78%	98.73%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.29%	100%	95.83%	100%	100%	100%	98.55%	100%	100%	100%	100%	100%	98.82%	97.14%	100%	100%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

7.2 OPERATOR ASSISTED DRIVE TEST: CHINDWARA SSA (FEBRUARY-15)

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	22	NC	125	20	124	20	100	20	117	21	104	20	137	20	120	20	65	22
Major Roads	15	30			67	20	68	20	68	20	66	20	55	20	80	20	69	21	28	NC	62	20	
Within City	31	NC			239	20	275	20	204	20	222	20	200	20	221	20	233	20	96	NC	203	21	
Overall SSA	68	30			431	60	467	60	372	60	405	61	359	60	438	60	422	61	189	22	382	62	
2	Blocked Call Rate	Highways	0.00%	NC	0.00%	0.00%	5.65%	0.00%	0.00%	0.00%	0.00%	0.00%	6.73%	0.00%	0.73%	0.00%	0.00%	0.00%	0.00%	0.00%	10.26%	0.00%	
		Major Roads	0.00%	0.00%	0.00%	0.00%	4.41%	0.00%	0.00%	0.00%	0.00%	0.00%	12.73%	0.00%	0.00%	0.00%	1.45%	0.00%	0.00%	NC	20.97%	0.00%	
		Within City	0.00%	NC	0.84%	0.00%	1.45%	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%	0.43%	0.00%	1.04%	NC	0.00%	0.00%	
		Overall SSA	0.00%	0.00%	0.46%	0.00%	3.00%	0.00%	0.27%	0.00%	0.00%	0.00%	5.01%	0.00%	0.23%	0.00%	0.47%	0.00%	0.53%	0.00%	6.54%	0.00%	
3	Dropped Call Rate (<=2%)	Highways	0.00%	NC	0.00%	0.00%	6.14%	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%	4.76%	0.00%	
		Major Roads	0.00%	0.00%	0.00%	0.00%	4.69%	0.00%	0.00%	0.00%	0.00%	0.00%	2.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	0.00%	NC	0.42%	0.00%	1.15%	0.00%	0.49%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.99%	0.00%	
		Overall SSA	0.00%	NC	0.23%	0.00%	2.95%	0.00%	0.27%	0.00%	0.00%	0.00%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.96%	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	98.51%	99.81%	95.15%	100%	
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.57%	NC	98.37%	100%	
Within		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.42%	NC	99.16%	98.54%		

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-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
			Operators)																			
		City																				
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.17%	99.81%	97.85%	99.59%
(b) 0-5 (with frequency hopping for GSM Operators)		Highways	98.34	NC	95.37%	96.93%	<b>86.40%</b>	95.42%	96.96%	95.38%	96.25%	99.04%	<b>94.97%</b>	99.30%	97.89%	99.19%	96.51%	97.19%	NA	NA	NA	NA
		Major Roads	98.87	99.27%	96.33%	98.35%	<b>89.40%</b>	<b>86.29%</b>	97.19%	98.49%	95.78%	96.21%	<b>94.56%</b>	100%	98.45%	99.96%	97.16%	99.53%	NA	NA	NA	NA
		Within City	99.00	NC	96.10%	99.79%	<b>88.11%</b>	99.38%	97.74%	95.59%	95.47%	99.43%	97.08%	100%	98.62%	99.82%	97.62%	99.13%	NA	NA	NA	NA
		Overall SSA	98.76	99.27%	95.93%	98.35%	<b>87.88%</b>	<b>93.60%</b>	97.42%	96.45%	95.76%	98.32%	96.09%	99.79%	98.38%	99.63%	97.17%	98.57%	NA	NA	NA	NA
5	Service Coverage																					
	In door (>= - 75dBm)	Highways	37.21	NC	75.76%	100%	37.76%	53.39%	64.65%	94.58%	87.96%	100%	55.37%	100%	89.93%	99.91%	85.30%	100%	25.48%	99.52%	58.65%	100%
		Major Roads	43.59	97.96%	84.70%	100%	48.24%	71.43%	80.21%	100%	98.44%	100%	73.84%	100%	98.03%	100%	95.33%	99.72%	41.07%	NC	60.45%	100%
		Within City	37.56	NC	77.69%	5.88%	43.55%	58.94%	60.66%	98.90%	91.24%	87.29%	74.74%	77.00%	92.21%	100%	88.51%	100%	55.18%	NC	71.02%	6.38%
		Overall SSA	39.46	97.96%	79.38%	68.63%	42.80%	61.30%	68.51%	97.60%	91.54%	95.70%	67.99%	92.33%	93.39%	99.97%	88.99%	99.91%	43.95%	99.52%	63.37%	68.79%
	In-vehicle (>= - 85dBm)	Highways	71.53	NC	91.63%	100%	82.69%	98.80%	88.09%	99.75%	97.24%	100%	84.52%	100%	96.72%	100%	98.01%	100%	57.81%	100%	82.83%	100%
		Major Roads	79.71	100%	97.12%	100%	94.62%	99.18%	98.61%	100%	99.83%	100%	94.42%	100%	99.82%	100%	99.41%	100%	87.46%	NC	84.85%	100%
		Within City	70.38	NC	95.33%	50.65%	91.73%	98.25%	89.31%	100%	96.78%	97.57%	94.46%	100%	97.98%	100%	98.67%	100%	85.15%	NC	93.77%	97.16%
		Overall SSA	73.88	100%	94.69%	83.55%	89.90%	98.75%	92.00%	99.91%	97.42%	99.18%	91.14%	100%	98.17%	100%	98.64%	100%	77.33%	100%	87.15%	99.05%
	Outdoor-in city (>= - 95dBm)	Highways	95.02	NC	99.13%	100%	96.62%	99.85%	97.75%	100%	99.53%	100%	98.28%	100%	99.34%	100%	99.94%	100%	88.34%	100%	96.27%	100%
		Major Roads	99.86	100%	99.83%	100%	98.95%	100%	99.93%	100%	100%	100%	99.83%	100%	99.99%	100%	100%	100%	99.87%	NC	96.15%	100%
		Within City	97.73	NC	99.65%	92.07%	98.18%	100%	98.70%	100%	99.56%	97.85%	99.56%	100%	99.86%	100%	100%	100%	99.19%	NC	99.54%	100%
		Overall	97.54	100%	99.54%	97.36%	97.91%	99.95%	98.80%	100%	99.63%	99.27%	99.22%	100%	99.73%	100%	99.98%	100%	96.05%	100%	97.32%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-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	
			SSA																				
6	Call Setup Success Rate (>=95%)	Highways	100%	NC	100%	100%	94.35%	100%	100%	100%	100%	100%	93.27%	100%	99.27%	100%	100%	100%	100%	100%	100%	89.74%	100%
		Major Roads	100%	100%	100%	100%	95.59%	100%	100%	100%	100%	100%	87.27%	100%	100%	100%	98.55%	100%	100%	NC	79.03%	100%	
		Within City	100%	NC	99.16%	100%	98.55%	100%	99.51%	100%	100%	100%	98.00%	100%	100%	100%	98.71%	100%	98.96%	NC	100%	100%	
		Overall SSA	100%	100%	99.54%	100%	97.00%	100%	99.73%	100%	100%	100%	94.99%	100%	99.77%	100%	99.05%	100%	99.47%	100%	93.46%	100%	
7	Hand Over Success Rate (HOSR)	Highways	100%	NC	99.50%	100%	96.53%	100%	99.53%	100%	98.80%	100%	98.92%	100%	99.56%	100%	100%	100%	100%	100%	100%	100%	100%
		Major Roads	100%	100%	99.17%	100%	97.96%	100%	100%	100%	98.77%	100%	100%	100%	100%	100%	100%	100%	100%	NC	100%	100%	
		Within City	100%	NC	98.67%	100%	96.95%	100%	99.71%	100%	97.34%	100%	100%	100%	100%	100%	99.70%	100%	99.38%	NC	100%	100%	
		Overall SSA	100%	100%	99.00%	100%	96.91%	100%	99.72%	100%	98.04%	100%	99.61%	100%	99.85%	100%	99.84%	100%	99.68%	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: MORENA SSA (MARCH-15)

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	9	NC	168	20	112	20	125	21	163	20	159	21	185	20	137	20	58	28	172	21	
		Major Roads	20	NC	113	20	35	20	87	20	113	20	75	24	109	20	93	22	34	NC	82	24	
		Within City	37	30	299	20	277	20	274	20	287	20	292	22	273	20	264	22	140	20	288	22	
		Overall SSA	66	30	580	60	424	60	486	61	563	60	526	67	567	60	494	64	232	48	542	67	
2	Blocked Call Rate	Highways	0.00%	NC	0.00%	0.00%	1.79%	0.00%	0.00%	0.00%	1.84%	0.00%	1.26%	4.76%	0.00%	0.00%	0.73%	0.00%	0.00%	0.00%	1.74%	0.00%	
		Major Roads	0.00%	NC	0.00%	0.00%	2.86%	0.00%	0.00%	0.00%	0.00%	0.00%	1.33%	8.33%	0.00%	0.00%	1.08%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	0.00%	0.00%	0.00%	0.00%	1.44%	0.00%	0.00%	0.00%	0.35%	0.00%	4.45%	0.00%	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	0.35%	0.00%	
		Overall SSA	0.00%	0.00%	0.00%	0.00%	1.65%	0.00%	0.00%	0.00%	0.71%	0.00%	3.04%	4.48%	0.00%	0.00%	1.42%	0.00%	0.00%	0.00%	0.74%	0.00%	
3	Dropped Call Rate (<=2%)	Highways	0.00%	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	1.27%	0.00%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.59%	0.00%
		Major Roads	0.00%	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.46%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	0.00%	0.00%	0.00%	0.00%	0.73%	0.00%	0.00%	0.00%	0.70%	0.00%	5.02%	0.00%	0.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Overall SSA	0.00%	0.00%	0.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.36%	3.33%	4.51%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.19%	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	98.67%	99.45%	90.67%	86.88%	
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.36%	NC	85.10%	100%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.91%	98.37%	73.24%	94.90%	

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-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
			Operators)																			
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.78%	98.97%	79.20%	88.46%	
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	99.27%	NC	97.87%	95.40%	93.59%	100%	97.34%	98.92%	97.07%	98.49%	93.16%	96.89%	96.89%	100%	95.53%	98.57%	NA	NA	NA	NA	
	Major Roads	98.83%	NC	98.07%	99.62%	91.21%	100%	97.18%	98.31%	97.35%	97.22%	92.67%	98.10%	97.09%	99.87%	95.13%	99.04%	NA	NA	NA	NA	
	Within City	98.41%	99.32%	98.01%	98.02%	95.46%	95.15%	96.74%	95.71%	97.46%	96.64%	95.15%	93.24%	97.52%	97.40%	96.54%	97.83%	NA	NA	NA	NA	
	Overall SSA	98.66%	99.32%	97.98%	97.74%	94.50%	95.55%	96.96%	97.67%	97.33%	97.38%	94.12%	96.50%	97.26%	99.10%	96.01%	98.46%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= -75dBm)	Highways	45.40%	NC	68.44%	92.41%	58.64%	100%	79.29%	26.82%	85.22%	99.85%	64.87%	65.84%	81.47%	100%	73.76%	96.62%	58.78%	19.12%	50.58%	48.40%
		Major Roads	55.70%	NC	71.71%	60.01%	72.97%	95.39%	72.33%	94.00%	85.55%	100%	80.62%	98.14%	89.04%	99.43%	86.35%	96.82%	58.65%	NC	65.09%	99.91%
		Within City	66.10%	99.56%	81.09%	99.85%	71.73%	100%	73.51%	72.14%	89.94%	100%	72.04%	100%	89.91%	100%	84.03%	100%	45.35%	97.51%	59.61%	100%
		Overall SSA	55.73%	99.56%	73.75%	84.09%	67.78%	98.46%	95.26%	100%	87.71%	99.95%	72.51%	87.99%	87.26%	99.82%	81.48%	97.74%	50.52%	52.66%	58.42%	82.77%
5	In-vehicle (>= -85dBm)	Highways	84.20%	NC	92.22%	99.96%	91.86%	100%	96.91%	96.61%	97.52%	99.96%	92.49%	79.22%	95.59%	100%	92.86%	99.81%	88.98%	97.27%	87.56%	48.79%
		Major Roads	84.50%	NC	92.29%	98.97%	88.91%	99.85%	94.39%	99.75%	97.32%	100%	97.26%	100%	98.71%	100%	96.92%	100%	83.43%	NC	93.08%	100%
		Within City	89.90%	100%	96.72%	100%	92.54%	100%	95.07%	98.76%	99.53%	100%	94.14%	100%	98.79%	100%	98.12%	100%	82.61%	98.37%	92.34%	100%
		Overall SSA	86.20%	100%	93.74%	99.64%	91.10%	99.95%	99.59%	100%	98.51%	99.99%	94.63%	93.07%	97.83%	100%	96.40%	99.93%	84.30%	97.74%	90.99%	82.93%
5	Outdoor-in city (>= -95dBm)	Highways	99.30%	NC	99.34%	100%	99.98%	100%	99.64%	99.98%	99.91%	100%	99.91%	99.86%	99.27%	100%	99.26%	100%	98.54%	98.83%	99.46%	100%
		Major Roads	99.90%	NC	99.12%	100%	97.19%	100%	99.43%	100%	99.88%	100%	100%	100%	99.86%	100%	99.52%	100%	98.15%	NC	99.90%	100%
		Within City	99.80%	100%	99.79%	100%	99.29%	100%	99.51%	99.99%	99.97%	100%	99.69%	100%	99.86%	100%	99.80%	100%	97.74%	98.85%	99.70%	100%
		Overall SSA	99.66%	100%	99.42%	100%	98.82%	100%	99.53%	99.99%	99.94%	100%	99.87%	99.95%	99.69%	100%	99.60%	100%	97.99%	98.84%	99.69%	100%
6	Call Setup	Highways	100%	NC	99.40%	100%	98.21%	100%	100%	100%	98.16%	100%	98.74%	95.24%	100%	100%	99.27%	100%	100%	100%	98.26%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-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
7	Success Rate (>=95%)	Major Roads	100%	NC	99.12%	100%	97.14%	100%	100%	100%	100%	100%	98.67%	91.67%	100%	100%	98.92%	100%	100%	NC	100%	100%
		Within City	100%	100%	99.33%	100%	98.19%	100%	100%	100%	99.65%	100%	95.55%	100%	100%	100%	98.11%	100%	100%	100%	99.65%	100%
		Overall SSA	100%	100%	99.31%	100%	98.11%	100%	100%	100%	99.29%	100%	96.96%	95.52%	100%	100%	98.58%	100%	100%	100%	99.26%	100%
		Highways	100%	NC	99.72%	100%	92.37%	100%	100%	100%	98.91%	100%	98.33%	100%	99.11%	100%	100%	100%	99.86%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	100%	NC	100%	100%	95.65%	100%	100%	100%	97.74%	100%	100%	100%	100%	100%	96.74%	100%	100%	NC	100%	100%
		Within City	100%	100%	100%	100%	98.46%	100%	100%	100%	98.81%	100%	93.93%	100%	99.31%	100%	97.23%	100%	99.85%	99.36%	100%	100%
		Overall SSA	100%	100%	99.91%	100%	96.51%	100%	100%	100%	98.60%	100%	96.45%	100%	99.39%	100%	97.86%	100%	99.87%	99.70%	100%	100%
		Highways	100%	NC	99.72%	100%	92.37%	100%	100%	100%	98.91%	100%	98.33%	100%	99.11%	100%	100%	100%	99.86%	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.



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

**DRIVE TEST TABLE: 4**

DRIVE TEST ROUTE OF JANUARY TO MARCH 15 – MP&CG CIRCLE							
Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
<b>BETUL</b>	<b>Jan-15</b>	Betul & Ghoda-dongri / 115 KM	<p><b>Betul:</b> Gharha ghat road, Tikari road, Link road, Kargil chaouk, sani mandir road, Gurudwara road, NH-69, New siwaji nagar, Patel nagar, SH19B, Genda chaouk bus stop, Patel ward bus stop, Vivekanand University, Dawoodi masjid, near jyoti talkis</p> <p><b>Ghoda-Dondri:</b> Dongro bada, market area, Police chauki, gallamandi, primary school, railway station</p> <p><b>Indoor:</b> Betul Railway Station</p>	Multai, Prabhat pattan & Athner / 105 KM	<p><b>Multai:</b> Multai masjid, Police chauki, prathmik chikitsalay, Multai jail, jail road, hospital road, PWI houce &amp; multai collage, govt hospital, nagpur naka, railway station, bus stand.</p> <p><b>Prabhat pattan:</b> Basti road, Boys hostel, market &amp; mando area, primary hospital, harjan basti.</p> <p><b>Athner:</b> Bazar chauk, Govt school, subhas chauraha, market area, ganesh medical.</p> <p><b>Indoor:</b> Multai Railway station</p>	Bhainsdehi & Chicholi / 110 KM	<p><b>Bhainsdehi :</b> Bajaj chauk, Vikash nagar, Rajodha village, towards jogali village.</p> <p><b>Chicholi:</b> chhota chicholi, main city area, kanya school, kargil chauk.</p> <p><b>Indoor:</b> Chicholi Square</p>
<b>CHINDWARA</b>	<b>Feb-15</b>	Chhindawara & Chaurai / 150 KM	<p><b>Chhindawara :</b> Jabalpur Highway(Over Bridge- Railway Station- Rangarhi), Parasiya HW(Pahada Colony- Circuit House-Vishnu Nagar-Partala-Bypaas), Nagpur Highway(Stadium- Congress Bhavan-Kamthi wala-Chandangaon- Abhishek Hyundai- Engineering College), Narsinghpur Highway(Hanuman Mandir-Lalbag-HLL-SARNA)</p> <p><b>Chaurai :</b> Chandgaon, Police Line, Professor Colony, Chourai railway station, Karaboh Road,</p>	Sausar & Pandurna / 90 KM	<p><b>Sausar :</b> Mohgaon Road (Via Gawande Colony), Khandseoni, Kuddam, Nimni, Berdi(Over Bridge-Chore park), Chhindwara Road(Civil Hospital-Over Bridge-Chore Park-Bus stand-Guest House-BSNL), Nagpur Highway(Bus Stand-Shankar Nagar- Degree College), Betul Highway(Bus stand-Police station-Post Office-Khari Ward-Bypaas)</p> <p><b>Pandurna :</b> Jam, Ambada Road, Pandhurna : kasba, Warjali, Bhandargondi, Sawargaon, Bamhni, Seoni Road, Gadkhapa.</p>	Parasiya, Junnrdeo & Tamiya / 110KM	<p><b>Parasiya :</b> Parasia to Tamia road, Bakul road, Chhindwara road, Pench area, Chowki Mohala, Chip House Ward No16, NangliBazar, Sahu Mohala, Unique Girl Collage, Central Station Road, Magazine line, Bagranj Chowk.</p> <p><b>Junnrdeo :</b> JaunarDev to Tamia road, Chindwara Road, Damuha road, Ward No-1 Hanatiya road, Vill Parati, Nagar Palika Parshad, Gandhi Chowk, Tehsil Road, Purani Basti, Jamai Makt.</p> <p><b>Tamiya :</b> TAMIA Town, Panchayat &amp;</p>

DRIVE TEST ROUTE OF JANUARY TO MARCH 15 – MP&CG CIRCLE

Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
			<p>Sitapar, Chandanwara Highway.</p> <p><b>Indoor:</b> Bus Stand &amp; Railway station Chhindwara</p>		<p><b>Indoor:</b> Hotel Aditya Residency &amp; Bus Stand Pandhurana</p>		<p>School area.</p> <p><b>Indoor:</b> Railway Station JanuarDev</p>
MORENA	Mar-15	Morena & Ambah / 149 KM	<p><b>Morena:</b>MS Road, Mahavir pura,Police line, Bypass road, Ambah road, Railway road Morena, Agra Road, Gwalior Road,Joura road,MS road ,Ambah road,Bypass.</p> <p><b>Ambah :</b> Morena road, By pass, NCC Ground,Jagga choraha, sadar bazar, Parsaha choraha, By pass, Porsha road.</p> <p><b>Indoor:</b> Railway Station Morena</p>	Joura & Sabalgarh / 109 KM	<p><b>Jaura:</b>Civil hospital ,Police line, Joura Tehsil, Railway station, Alapur, Main Market, Hanuman chouraha, Morena road, Sabalgarh road.</p> <p><b>Sabalgarh:</b>Sabalgarh Railway station, Bus stand Daboori ganj ,Post office Santar no.5, Govt. rest house, ICICI bank, Diwan PalaceKhar nala.</p> <p><b>Indoor:</b> PHE office Jaura</p>	Bhind, Mehgaon, & Gohad / 105 KM	<p><b>Bhind :</b> Bhind bus stand,SP Office ,Jail Road, Lahar Road, PG College, Post office, Police Line, Gori Talab, Goal Market, Netaji Subhash chowak, Meera nagar ,Yadunath</p> <p><b>Mehgaon :</b> Gohad road,Gormi road, Mau road, Bhind road Mehgaon.</p> <p><b>Gohad:</b>Gwalior- Bhind Highway Gohad Choraha, Mau Road, Bus Stand, Bada Bazar, Gohad Market, Khati Mohalla, Gohad Fort, Gohad Chowk, Police colony.</p> <p><b>Indoor:</b> Bus Stand Bhind</p>

**7.5 SSA WISE DRIVE TEST OBSERVATION:**

**DRIVE TEST TABLE: 5**

**DRIVE TEST OBSERVATION OF BETUL SSA (JAN-15)**

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Betul & Ghodadongari	No Coverage	Athner,Prabhpattan & Multai	No Coverage	BhainsDehi & Chicholi	No Coverage
2	AIRTEL		--		--		BhainsDehi SDCA : Poor Rx Level Observed around Jogari & Rajodha village
3	BSNL		Betul SDCA : Worst voice quality observed at Civil line,Tikari mohalla & Sabzi mandi area		Multai SDCA : Worst quality observed at Multai Railway station area		--
4	IDEA		Betul SDCA : Poor voice quality observed at Civil line,Tikari mohalla.		--		--
5	VODAFONE		Betul SDCA : Poor voice quality observed at Oil factory & Civil line.		--		--
6	TATA GSM		Betul SDCA :Poor voice quality observed at Civil line,Tikari mohalla & Raliway station area		--		--
7	TATA CDMA		Betul SDCA : Worst Rx-Power observed at all over Betul SDCA		No Coverage		No Coverage
8	RCOM GSM		Betul SDCA :Poor voice quality observed at Betul Nagpur Highway, KalaPatha,KothiBazar, Sadar Bajar , Betul Ganj.		--		--
9	RCOM CDMA		Betul SDCA: Poor voice quality observed at Betul Nagpur Highway, KalaPatha,KothiBazar, Sadar Bajar , Betul Ganj.		--		Chicholi SDCA : Poor voice quality observed at all over SDCA
10	VIDEOCON		Betul SDCA :Poor voice quality observed at Civil line,Tikari mohalla & Raliway station area		--		--

**Common Troublesome Areas:** Civil line,Tikari mohalla and Railway station area

DRIVE TEST TABLE: 6

**DRIVE TEST OBSERVATION OF CHINDWARA SSA (FEB-15)**

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Chhindwara, Chaurai	No Coverage	Saunsar, Pandhurna	Pandhurna SDCA : Poor Rx Level & Rx Quality In Bhopal Nagpur Highway, Poor Level In Main Market Area	Parasia, Jamai, Tamia	No Coverage
2	AIRTEL		Chhindwara SDCA: Poor Rx Quality observed in HB Colony & Teachers Colony		Pandhurna SDCA : Poor Rx Level & Rx Quality observed at Bhopal Nagpur Bypass. Saunsar : Poor Rx Quality observed at NH26B.		Parasia SDCA : Poor Rx quality observed Near By Parasia Station Road & Parasia Bypass
3	BSNL						
4	IDEA		Chhindwara SDCA: Poor voice quality observed at Krishi Upaj Mandi Crossing ,Seoni Road . Chauri SDCA: by pass road to chhindawara		Saunsar SDCA : Poor Rx Quality In Civil Lines Area. Pandhurna SDCA Poor Rx Quality Pandhurna Bypass Near Bhopal-Nagpur Highway		--
5	VODAFONE		Chhindwara SDCA: Poor voice quality observed at Patel Ishwar Nagar Chauri SDCA : by pass road to chhindawara		Saunsar SDCA: Poor voice quality observed at Pandhurna		--
6	TATA GSM		Chhindwara SDCA : Poor Rx Level in Janta Colony,Poor Rx Quality in Teachers Colony, Gole Ganj, Bail Bajar, Railway Station, Nai Abadi, Ganesh Colony,Sanchar Nagar,BarariPura, Gandhi Ganj.		Pandhurna SDCA : Poor Rx Quality Observed Near Vashiwad,Shankar nagar		Parasia SDCA : Poor Rx Quality observed Near Chandameta,Station Road, Shivpuri By-Pass, Tehsil Road
7	TATA CDMA		Chhindwara SDCA: Poor voice quality observed at RamGadi, Rambagh, Lahgadua.		No Coverage		No Coverage
8	RCOM GSM		Chhindwara SDCA: Poor voice quality observed at Teachers colony,Lalbag road,Kolathana,Bypass road,Gandhi ganj.		Pandhurna SDCA:Poor Rx Level & Rx Quality observed at Bhopal Nagpur Bypass & Highway & Saunsar SDCA : Poor Rx Quality In Civil Line Saunsar Town.		--
9	RCOM CDMA		Chhindwara SDCA: Poor Rx Level & Rx Quality observed at Khaji Road Shivam Sundaram Colony,Nai Abadi, Ganesh Colony, NH-46.		Pandhurna SDCA : Poor Rx Level & Rx Quality observed at Nagpur Bypass & Highway.		Parasia SDCA : Poor Rx Quality observed Near PTC Colony, Station Road , Main Road
10	VIDEOCON		Chhindwara SDCA : Poor Rx Quality observed at Teachers Colony, Railway Station, Nai Abadi, Ganesh Colony,Sanchar Nagar,Janta Colony.		Pandhurna : Poor Rx Level & Rx Quality observed at Bhopal Nagpur Bypass & Highway.		Parasia SDCA :Poor Rx Quality observed around Main Road & Bypass Area.

**Common Troublesome Areas:** Pandhurna SDCA : Bhopal Nagpur Highway and Chhindwara SDCA:Teachers colony & Janta colony.

DRIVE TEST TABLE: 7

**DRIVE TEST OBSERVATION OF MORENA SSA (MARCH-15)**

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL		NC		NC		--
2	AIRTEL		Morena SDCA: Observed Poor Rx Level On National Highway Near Hingona Khurd, Poor Rx Quality Near ByPass . Ambah SDCA : Observed Poor Rx Level at Pinahat Road, Main Market, Porsa Chauraha, MS Road.		Jaura SDCA: Observed Poor Rx Level On MS Road Sabalgarh SDCA: Observed Gudiamaphi & Kutghan place.		Gohad SDCA : Observed Poor Rx Level on Gohad Main Road, Bypass road. Mehgaon SDCA : Observed Poor Rx Level at Mehgaon all mail roads. Bhind SDCA: Observed Very Poor Rx Level Near SH2 Manpura , Poor Rx Quality near Phoop Road.
3	BSNL	Morena, Ambah	Morena SDCA :Observed Poor Rx Level & Rx Quality On National Highways, Poor Rx Quality on MS Road, Station Road, Jiwaji ganj, Ganesh Pura , Gopal Pura, Sanjay Colony, New Housing Board Colony, Morena Jaura Road . Ambah SDCA : Observed Poor Rx Level In Pinahat Road, Main Market, Near Karan Petrol Pump MS Road.	Jaura, Sabalgarh	Jaura SDCA: Observed Poor Rx Level On MS Road & Poor Rx Quality In All Over SDCA . Sabalgarh SDCA : Observed Poor Rx Level on M S Road and Sheopur Road .	Gohad, Mehgaon, Bhind	Bhind SDCA: Observed Poor Rx Level at Ater Road, Etawah Road, Gwalior Road, Galla Mandi Area, Lahar Road, Bypass and Poor Rx Quality at Ater Road, Gall mandi Area, Mela Ground, Bhind- Etawah Highway, Bhind- Gwalior Highway, Lahar Road, Bhind Bypass. Gohad SDCA : Observed Poor Rx Level near Gohad Chauraha, Gohad Bypass, Main Market and Poor Rx Quality at Gwalior and Bhind Road
4	IDEA		Morena SDCA: Observed Poor Rx Level & Rx Quality On National Highways, Poor Rx Quality in MS Road, Station Road, Jiwaji ganj, Ganesh Pura , Gopal Pura, Sanjay Colony, New Housing Board Colony, Morena Jaura Road. Ambah SDCA : Observed Poor Rx Level In Pinahat Road, Main Market, Near Karan Petrol Pump MS Road, Poor Rx Quality In MS Road, Bypass Area, Porsa Road, Main Market Area.		Jaura SDCA: Observed Poor Rx Level On MS Road, Poor Rx Quality at Railway Station Road and Jail Road. Sabalgarh SDCA : Observed Poor Rx Quality at M S Road and Sheopur Road.		Mehgaon SDCA: Observed Near Jeskpura village road at Bhind road-.
5	VODAFONE		Morena SDCA: Observed 'Poor Rx Level in Morena - Ambah Bypass , Duttapura, Mahavir Pura Area. Ambah SDCA : Observed Very Poor Rx Quality in Jaloni Road, Ambah -Porsa Road, Morena- Ambah Road , Pinahat Road, Main Market.		Jaura SDCA: Observed 'Poor Rx Level On MS Road, Near Post Office, Main Market Area. Sabalgarh SDCA : Observed Poor Rx Quality Near Ram Mandir Tiraha, MS Road,		Gohad SDCA: Observed 'Poor Rx Level & Rx Quality at Gohad Tiraha, Gohad main Road, Gohad Bypass. Mehgaon SDCA : Observed Poor Quality in Porsa Road, Bhind Road. Bhind SDCA : Observed Poor Rx Quality & Rx Level at Etawah Road and

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
					Sheopur Road, Kutghan and Station Road.		Ater Road, Poor Rx Quality at Melaground area, Bhind Bypass, Gol Market, Phoop Road.
6	TATA GSM		Morena SDCA: Poor Rx Level & Quality in New housing board colony, Near Railway station and railway colony area, Amabah by pass. Ambah : Poor Rx Level & Quality at Morena road, Ambah by pass, Porsha road.		Jora SDCA: Observed Poor Rx Level & Quality at Near by Jora railway station and Alapur.		Bhind SDCA: Observed Poor Rx Level & Quality at Lahar road, Agrwal colony, Gwalior colony, Melaground area, Bhind Bypass, Gol Market. Gohad SDCA : Observed 'Poor Rx Level & Rx Quality at Gohad Tiraha, Gohad main Road, Gohad Bypass
7	TATA CDMA		--		--		--
8	RCOM GSM		Morena SDCA : Observed Poor Rx Level & Rx Quality AB Road, Morena Bypass, Ambah Tiraha, Jaura Road, New HB Colony, Ganesh Pura, Old HB Colony, Anaj Mandi, MahavirPura, NainaGarh Road, GaneshPura, GopalPura, Sanjay Colony. Ambah SDCA : Observed Poor Rx Level & Quality Near Karan Petrol Pump, MS Road, Porsa Road, Jaloni Road, Pinahat Road		Jaura SDCA : Observed Poor Rx Level On MS Road, Poor Rx Quality on Dak Bangla Area, Alapur Road, Navodaya School Road / Sabalgarh SDCA: Observed Poor Rx Level & Rx Quality In MS Road		Bhind SDCA: Observed Poor Rx Quality at Etawah Road, Moti Nagar, Ater Road, Bus Stand, Melaground, Mahavir Ganj.
9	RCOM CDMA		Morena SDCA: Observed Poor Rx Level & Rx Quality AB Road, Morena-Ambah Bypass, Poor Rx Quality & Rx Level in New HB Colony, Jiwaji Ganj.		Jaura & Sabalgarh SDCA : Observed Very Poor Rx Level observed in both SDCA		--
10	VIDEOCON		Morena SDCA: Observed Poor Rx Level & Quality in New housing board colony, Near Railway station and railway colony area, Amabah by pass.		--		--

**Common Troublesome Areas:** **Morena SDCA:** NH-3, Ambah By pass, MS Road, New Housing board colony; **Jaura SDCA:** Morena Road & Sabalgarh road; **Bhind SDCA:** Itawah road, Gwalior road, Lahar Road.

DRIVE TEST TABLE: 8

**NO NETWORK COVERAGE STATUS OF DRIVE TEST – JANUARY TO MARCH 15**

S. No	Month of Drive Test	Operator	SSA	Total SDCA Covered	Status of no network coverage area (SDCA Name)	ICR Status (SDCA Name)
1	Jan-15	Aircel	Betul	Betul, Athner, Prabhapattan, Ghodadongri, Multai, Bhainsdehi, Chicholi	No Coverage all over SSA/SDCA	No
		Airtel			No coverage issue	No
		BSNL			No coverage issue	No
		Idea			No coverage issue	No
		Videocon			No coverage issue	Videocon is on ICR with TATA GSM at Betul, Ghodadongari, Multai, Athner & Bhesdehi SDCA
		Vodafone			No coverage issue	No
		Tata GSM			No coverage issue	No
		Tata CDMA			Athner, Prabhapattan, Ghodadongri, Multai, Bhainsdehi, Chicholi	No
		RCOM GSM			No coverage issue	No
		RCOM CDMA			No coverage issue	No
2	Feb-15	Aircel	Chhindwara	Chiindwara, Chaurai, Parasia, Jamai, Saunsar, Tamia, Pandhurna	Chiindwara, Chaurai, Parasia, Jamai, Saunsar, Taamia	No
		Airtel			No coverage issue	No
		BSNL			No coverage issue	No
		Idea			No coverage issue	No
		Videocon			Tamia	Videocon is on ICR with TATA GSM at Chaurai, Parasia, Jamai, Saunsar, Pandhurna
		Vodafone			No coverage issue	Vodafone is on ICR with Idea Cellular at Tamia SDCA
		Tata GSM			Tamia	No
		Tata CDMA			Chaurai, Parasia, Jamai, Saunsar, Taamia, Pandhurna	No
		RCOM GSM			No coverage issue	No
		RCOM CDMA			No coverage issue	No
3	Mar-15	Aircel	Morena	Morena, Ambah, Jaura, Sabalgarh, Gohad, Mehgaon, Bhind	Morena, Ambah, Jaura, Sabalgarh, Mehgaon, Bhind	No
		Airtel			No coverage issue	No
		BSNL			No coverage issue	No
		Idea			No coverage issue	No
		Videocon			No coverage issue	No
		Vodafone			No coverage issue	No
		Tata GSM			No coverage issue	No
		Tata CDMA			Ambah, Jaura, Sabalgarh, Gohad & Mehgaon	No
		RCOM GSM			No coverage issue	No
		RCOM CDMA			No coverage issue	No

## 7.6 KEY FINDINGS ON DRIVE TEST:

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

### January -2015: Betul SSA

- (i) Drive test was conducted across **Betul SSA** covering Betul, Ghodadongri, Multai and Chicholi SDCAs (330 Kms).
- (ii) Aircel was not having its coverage in entire Betul SSA.

**Drive Test Results:** The drive test results revealed that performance of the service providers in general, was satisfactory. However, **BSNL** was not able to meet the benchmark of parameter '**Voice Quality**' with its achieved level as **92.08% (Outdoor) / 94.11 % (Indoor)**.

### February -2015: Chindwara SSA

- (i) Drive test was conducted across **Chindwara SSA** covering Chindwara, Chaurai, Sausar, Panduma, Parasiya, Junnrdeo and Tamiya SDCAs (350 Kms).

**Drive Test Results:** In this SSA also, the performance of the service providers was satisfactory except for a few cases of non compliance. **BSNL** could not do well in respect of parameters **Call Drop rate and Voice Quality** with its achieved level as **2.95% and 87.88%(Outdoor) / 93.60% (Indoor)** respectively on overall SSA basis. **Call setup success rate / Block Call rate for RCOM (GSM) / CDMA was 94.99% and 93.48% / 5.01% and 6.54% respectively** showing congestion in their networks.

### March-2015 : Morena SSA

- (i) Drive test conducted across **Morena SSA** covering Morena, Ambah, Joura, Sabalgarh, Bhind, Mehgaon and Gohad SDCAs (363 Kms).

**Drive Test Results:** As per the drive test outcome, **BSNL, RCOM (GSM) and RCOM (CDMA)** lagged behind the benchmark of parameter **Voice Quality** with their performance as **94.50 %, 94.12% and 79.20%** respectively. **RCOM (GSM)** also failed to meet the benchmark of parameters **Call drop rate** with its performance as **4.51%**, whereas **Idea** remained non-complied for parameter Call drop rate in Indoor (**3.33%**). 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.

**The detail of Network coverage and Intra Circle Roaming (ICR) status of different service providers at various locations in the three SSAs is given in table-8.**

*Thus, 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) and RCOM(CDMA)** 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.*

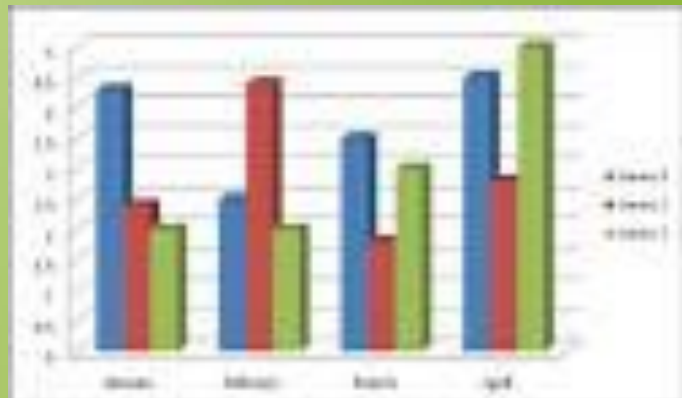


## 8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

### AVERAGED QUARTERLY PMR

V/S

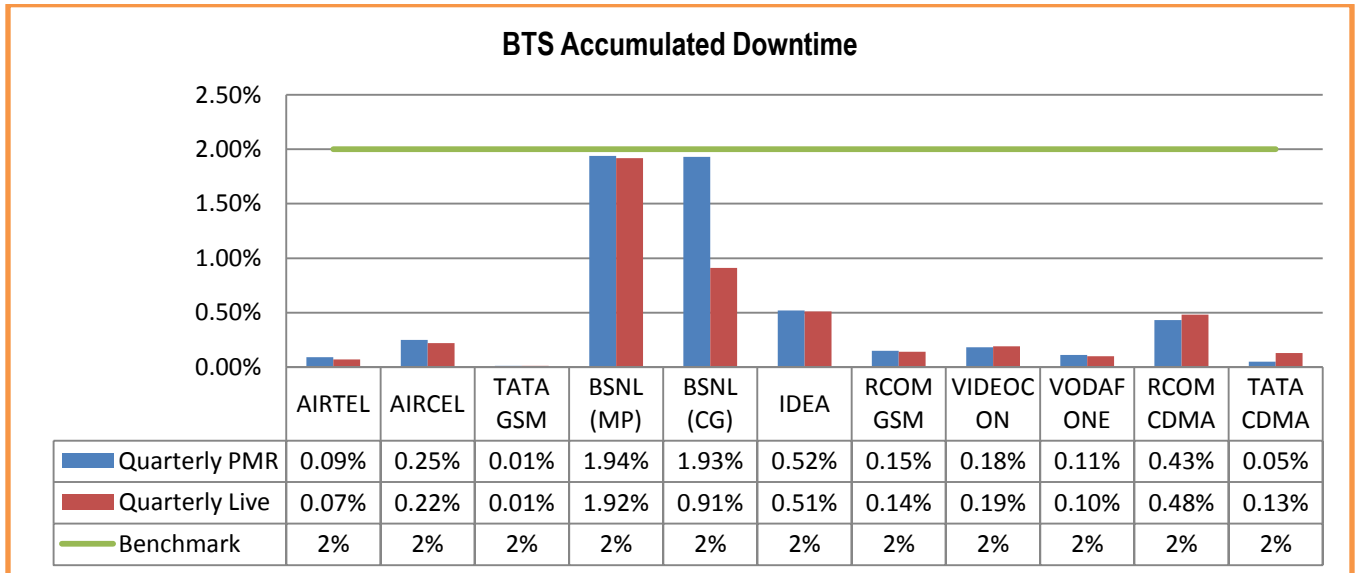
### AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



## 8. GRAPHICAL REPRESENTATION (CMTS):

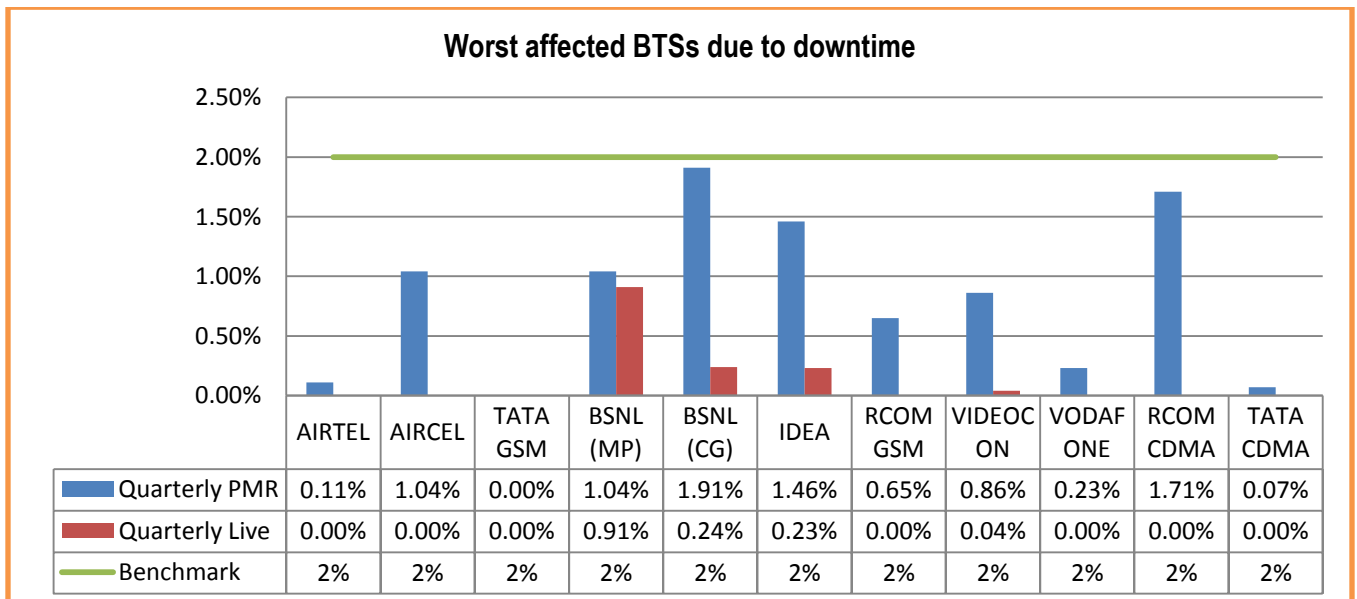
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

### 1. BTS ACCUMULATED DOWNTIME :



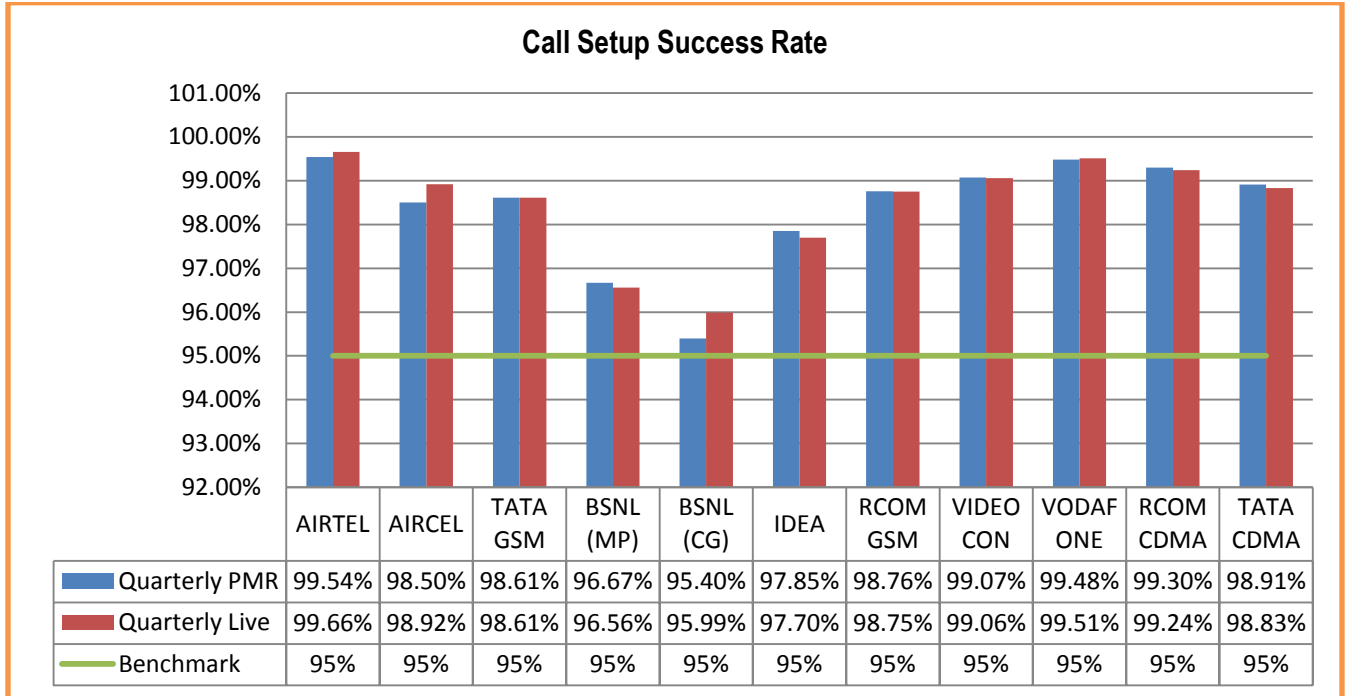
All operators are meeting the benchmarks.

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



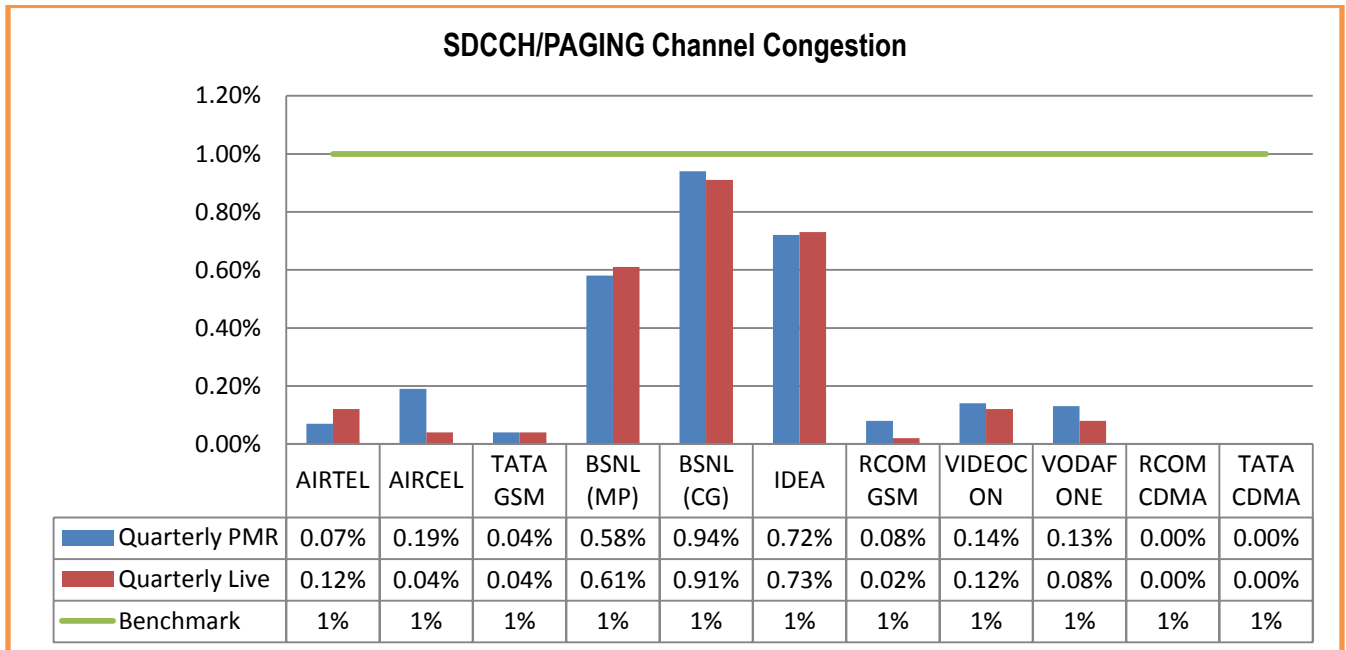
All operators are meeting the benchmarks.

**3. CALL SETUP SUCCESS RATE :**



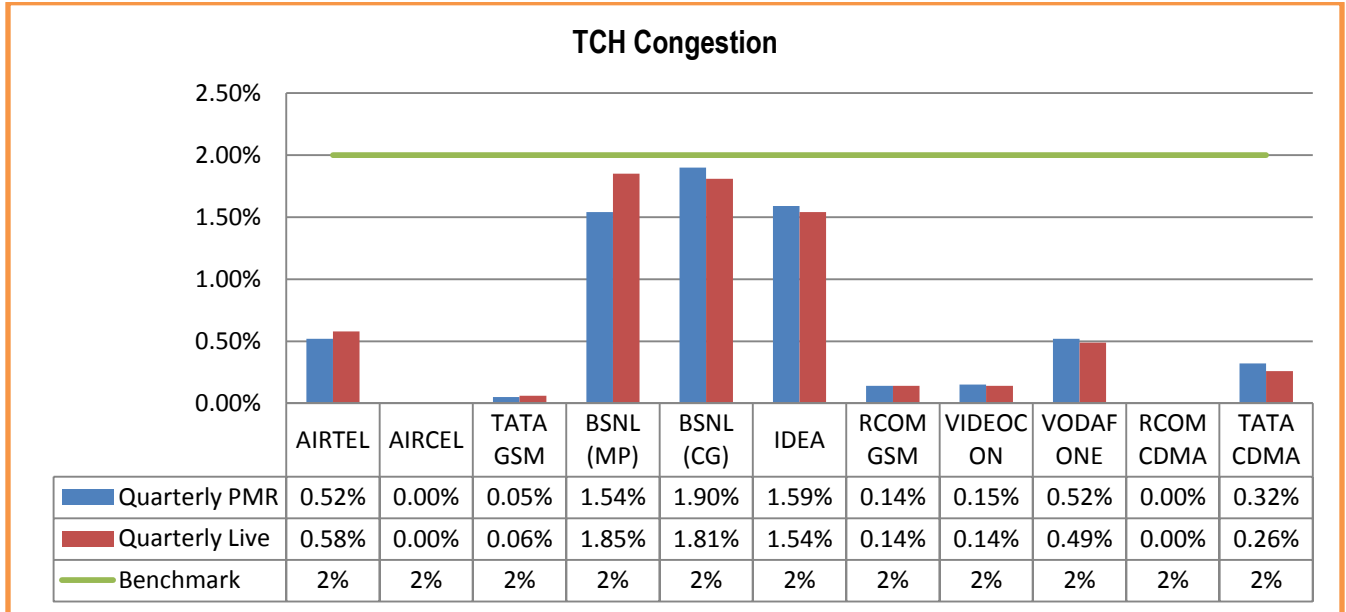
All operators are meeting the benchmarks.

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



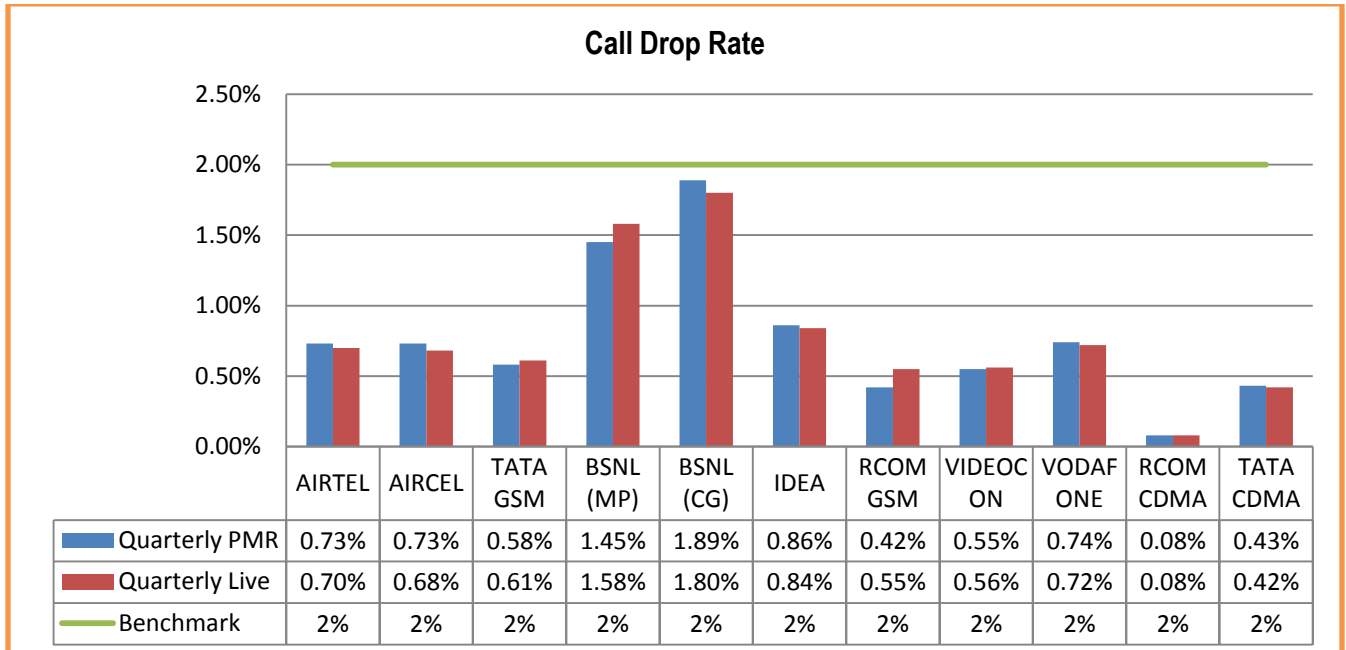
All operators are meeting the benchmarks.

**5. TCH CONGESTION :**



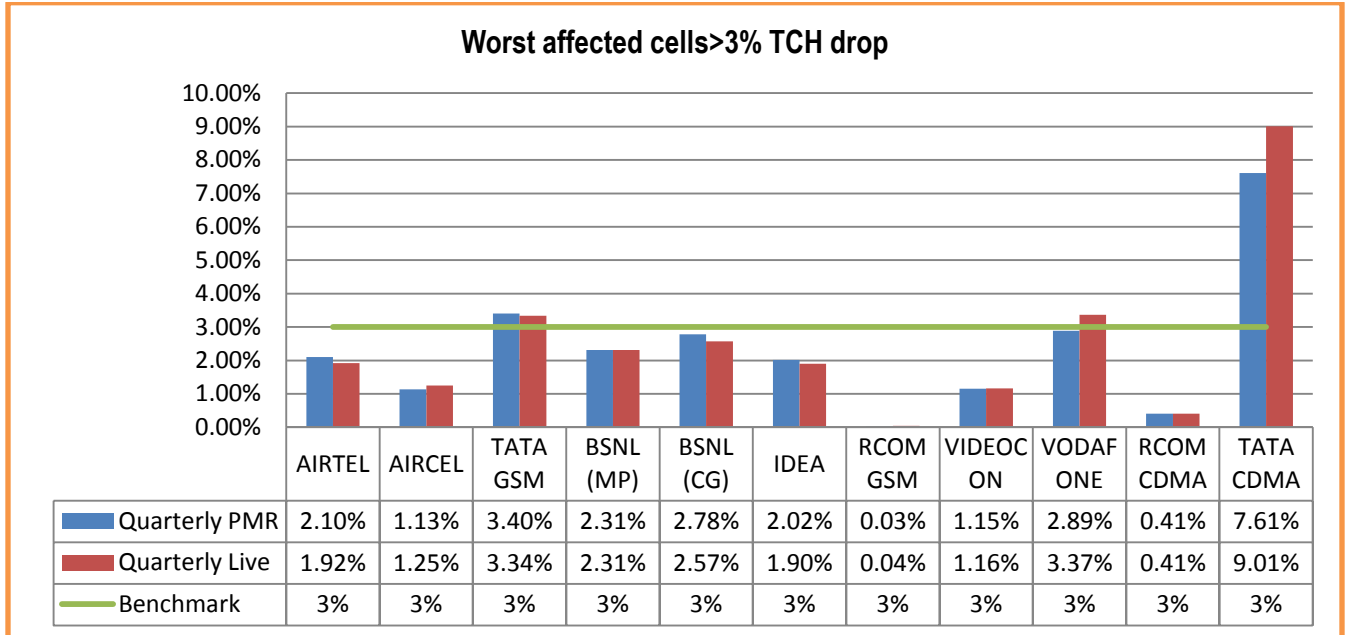
All operators are meeting the benchmarks.

**6. CALL DROP RATE :**



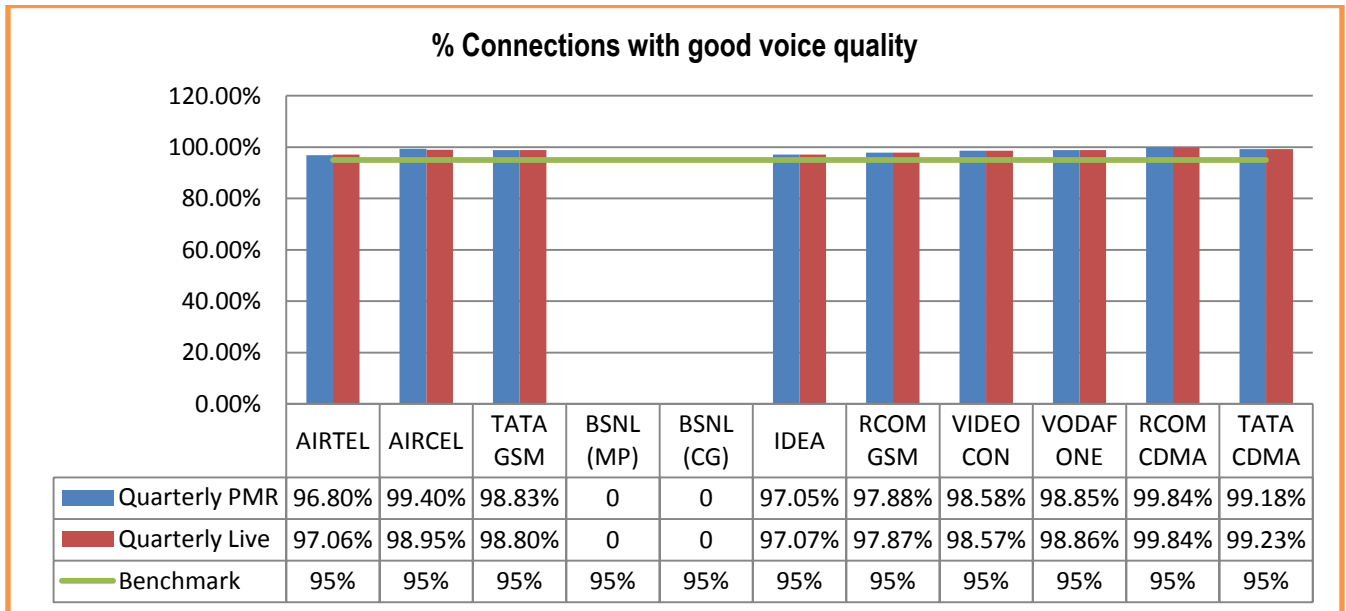
All operators are meeting the benchmarks.

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



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

**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.