



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

**West Zone – Madhya Pradesh & Chhattisgarh
Service Area**

(October 2014 – December 2014)

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PREFACE

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

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

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **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 20th March, 2009 and the Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6th October, 2006 on zonal basis for **North Zone and West Zone** comprising of the following Telecom Circles/Metro Service Areas:

North Zone: Delhi, Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Uttar Pradesh-East and Uttar Pradesh-West (including Uttarakhand). For the cellular mobile telephone service the service area of Delhi includes Ghaziabad, Faridabad, Noida and Gurgaon.

West Zone: Mumbai, Maharashtra (including Goa and excluding Mumbai), Gujarat and Madhya Pradesh (including Chhattisgarh).

The Audit exercise would assess the Quality of Service of telecom operators providing Basic (Wire line), Cellular Mobile (Wireless) and Broadband services by auditing the relevant QoS records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks

stipulated by TRAI. The audit would be carried out by **TUV-SUD South Asia** every quarter across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. However, in respect of Basic telephone service (wireline) and Broadband service, a circle would be audited once in a year.

2. OBJECTIVES AND METHODOLOGY



2. OBJECTIVES AND METHODOLOGY

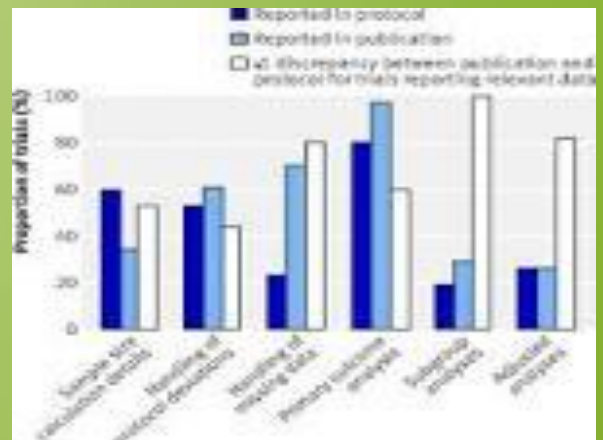
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for Delhi, Haryana and Mumbai circles during the quarter October – December 2014.**

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

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

3. SAMPLE SIZE



3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

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

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

- For all the above operators, audit was conducted in all the three months of the Quarter ended Dec - 2014.
- The data generated by monthly PMR and 3-days live measurements audit for the period October 2014 to December 2014 has been successfully uploaded to the server located at TRAI premises.**

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles 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 December- 2014.**

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV–SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle **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 December- 2014.**

4. EXECUTIVE SUMMARY



4. EXECUTIVE SUMMARY

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

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

1. Cellular Mobile Service

(i) From **monthly audit**, it was concluded that on an average, performance of the operators in the MP&CG service area was satisfactory for **Network Parameters**. However, the audit with respect to the parameter **‘Worst affected cells having > 3% TCH drop’** revealed that **Tata (GSM), Vodafone and Tata (CDMA)** failed to meet the benchmark of this parameter with their quarterly average performance as **3.37%, 3.82% and 7.08%** 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 **3.39%, 3.89%, and 7.29 %** respectively. The similar non-complied performance of these operators was also observed during the monthly PMR audit.

Apart from this, **BSNL (CG)** also failed to achieve the benchmarks of parameters **BTS Accumulated Down Time, CSSR, TCH Congestion and CDR** with its performance as **2.24%, 94.84%, 2.26% and 2.03%** respectively.

Thus, the assessment of QoS with regard to the parameters as mentioned above during live measurement is a matter of concern for those operators who could not meet the benchmark.

(iii) With regard to the **Customer Service Quality Parameters**, it is revealed that all operators are in well compliance of the parameters on Metering and Billing Credibility, Termination of Service and Time taken for refunds. However, parameter '**Billing complaints - pre-paid**' remained beyond the benchmark for service provider **Vodafone** with its performance as **0.15**

All service providers are in compliance with respect to the parameter **Accessibility of call center**. However, **RCOM (GSM), Tata (GSM) and Tata (CDMA)** have not met the benchmark of '**calls answered by Operators (voice to voice) within 90 seconds**'. They have achieved their performance as **91.54%%, 91.52% and 94.78%** respectively.

The results for **three days live measurements** reveal that all operators (except Tata GSM), have met the benchmarks for the parameters '**Accessibility to call center**' and '**Call connection to operators (Voice to voice)**'. **Tata (GSM)** has failed to meet the benchmark of **Accessibility** with its performance as **94.05%** respectively.

(iv) On analyzing the performance of service providers on the basis of **Drive tests**, it was concluded that the service providers *namely **BSNL, RCOM (GSM) and Idea** could not perform well on the parameter '**Good Voice Quality**' and '**Call Drop rate**'. 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
GSM Operators			
1	AIRTEL	Dec-14	20 Hrs-21 Hrs
2	AIRCEL	Dec-14	18 Hrs-19 Hrs
3	TATA GSM	Dec-14	19 Hrs-20 Hrs
4	BSNL (MP)	Dec-14	19 Hrs-20 Hrs
5	BSNL (CG)	Dec-14	19 Hrs-20 Hrs
6	IDEA CELLULAR	Dec-14	19 Hrs-20 Hrs
7	RCOM GSM	Dec-14	20 Hrs-21 Hrs
8	VIDEOCON	Dec-14	20 Hrs-21 Hrs
9	VODAFONE	Dec-14	19 Hrs-20 Hrs
CDMA Operators			
10	RCOM CDMA	Dec-14	20 Hrs-21 Hrs
11	TATA CDMA	Dec-14	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
GSM Operators						
1	AIRTEL	18	147	9324	NSN	NSN
2	AIRCEL	1	1	128	Huawei	Huawei
3	TATA GSM	4	26	2891	Huawei	Huawei
4	BSNL (MP)	9	88	3623	Alcatel	Alcatel
5	BSNL (CG)	5	44	1805	Alcatel	Alcatel
6	IDEA CELLULAR	34	73	9667	Ericsson	Ericsson
7	RCOM GSM	12	49	3983	Huawei, Ericsson	ZTE, Alcatel Lucent
8	VIDEOCON	1	10	1569	Huawei	Huawei
9	VODAFONE	7	49	5409	NSN	NSN
CDMA Operators						
10	RCOM CDMA	8	8	1812	Huawei, ZTE, Lucent	Lucent, Huawei
11	TATA CDMA	3	5	446	Huawei & Ericsson	Motorola & Huawei

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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE – OCTOBER 14 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter	GSM Operators							CDMA Operators					
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Oct-14	0.17%	0.40%	0.01%	1.91%	1.99%	0.74%	0.18%	0.20%	0.10%	0.41%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Oct-14	0.53%	0.78%	0.00%	1.08%	1.94%	1.69%	0.23%	1.02%	0.09%	0.88%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-14	99.58%	98.14%	98.59%	96.89%	95.10%	98.44%	98.77%	99.17%	99.69%	99.20%	99.02%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-14	0.03%	0.18%	0.06%	0.55%	0.33%	0.61%	0.05%	0.08%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-14	0.26%	0.00%	0.04%	1.33%	1.93%	1.24%	0.10%	0.08%	0.31%	0.00%	0.08%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Oct-14	1.01%	0.65%	0.56%	1.51%	1.92%	0.98%	0.55%	0.57%	0.73%	0.09%	0.56%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-14	2.15%	1.33%	3.59%	2.56%	2.90%	1.56%	0.02%	1.19%	2.97%	0.46%	7.34%
	c) Connections with good voice quality	>=95%	Oct-14	95.90%	99.20%	98.38%	NP	NP	97.21%	97.96%	98.68%	98.91%	99.84%	99.17%
4	No. of POI's having >=0.5% POI congestion		Oct-14	0	0	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE – NOVEMBER 14 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators	
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Nov-14	0.12%	0.25%	0.02%	1.97%	1.91%	0.47%	0.26%	0.22%	0.07%	0.59%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Nov-14	0.28%	0.78%	0.00%	1.08%	1.99%	1.51%	0.50%	1.16%	0.04%	1.49%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-14	99.68%	98.30%	98.59%	96.50%	95.10%	98.17%	98.76%	99.07%	99.62%	99.23%	99.20%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-14	0.02%	0.13%	0.03%	0.56%	0.72%	0.68%	0.08%	0.07%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-14	0.28%	0.00%	0.04%	1.67%	1.93%	1.56%	0.11%	0.09%	0.38%	0.00%	0.03%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Nov-14	0.92%	0.56%	0.54%	1.56%	1.96%	0.95%	0.55%	0.59%	0.71%	0.08%	0.62%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-14	2.00%	1.19%	3.31%	2.39%	2.85%	1.38%	0.02%	1.19%	4.20%	0.46%	6.83%
	c) Connections with good voice quality	>=95%	Nov-14	96.42%	99.29%	98.64%	NP	NP	97.30%	97.89%	98.63%	98.91%	99.84%	99.19%
4	No. of POI's having >=0.5% POI congestion		Nov-14	0	0	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE – DECEMBER 14 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Dec-14	0.10%	0.26%	0.04%	1.95%	1.97%	0.46%	0.25%	0.21%	0.09%	0.62%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Dec-14	0.14%	0.78%	0.03%	1.10%	1.94%	1.46%	0.65%	1.15%	0.09%	1.71%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-14	99.72%	99.02%	98.57%	96.73%	95.03%	98.22%	98.77%	99.13%	99.64%	99.16%	98.99%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-14	0.03%	0.16%	0.04%	0.68%	0.83%	0.79%	0.15%	0.12%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-14	0.36%	0.00%	0.05%	1.57%	1.96%	1.49%	0.12%	0.10%	0.36%	0.00%	0.18%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Dec-14	0.82%	0.77%	0.57%	1.37%	1.97%	0.93%	0.54%	0.58%	0.73%	0.08%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-14	2.09%	1.12%	3.20%	2.25%	2.86%	1.77%	0.03%	1.21%	4.29%	0.44%	7.07%
	c) Connections with good voice quality	>=95%	Dec-14	97.19%	98.89%	98.87%	NP	NP	97.37%	97.87%	98.69%	98.88%	99.85%	99.19%
4	No. of POI's having >=0.5% POI congestion		Dec-14	0	0	0	0	0	0	0	0	0	0	0

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

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR-AVERAGE OF QE- DECEMBER- 14(OCT. TO DEC. 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	
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.13%	0.30%	0.02%	1.94%	1.96%	0.56%	0.23%	0.21%	0.09%	0.54%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.32%	0.78%	0.01%	1.09%	1.96%	1.55%	0.46%	1.11%	0.07%	1.36%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.66%	98.49%	98.58%	96.71%	95.08%	98.28%	98.77%	99.12%	99.65%	99.20%	99.07%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.03%	0.16%	0.04%	0.60%	0.63%	0.69%	0.09%	0.09%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.30%	0.00%	0.04%	1.52%	1.94%	1.43%	0.11%	0.09%	0.35%	0.00%	0.10%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.92%	0.66%	0.56%	1.48%	1.95%	0.95%	0.55%	0.58%	0.72%	0.08%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.08%	1.21%	3.37%	2.40%	2.87%	1.57%	0.02%	1.20%	3.82%	0.45%	7.08%
	c) Connections with good voice quality	>=95%	Quarterly	96.50%	99.13%	98.63%	NP	NP	97.29%	97.91%	98.67%	98.90%	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), Vodafone and Tata (CDMA)** met the benchmark for this parameter. The quarterly average performance of **Tata (GSM), Vodafone and Tata (CDMA)** for this parameter was **3.37%, 3.82% and 7.08%** 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) – OCTOBER 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE - OCTOBER 14 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators				
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.53%	0.33%	0.01%	1.99%	2.07%	1.01%	0.19%	0.25%	0.07%	0.45%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	1.16%	0.28%	0.88%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.60%	97.15%	98.55%	96.37%	94.64%	98.45%	98.78%	99.17%	99.73%	99.26%	99.12%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.03%	0.15%	0.05%	0.52%	0.72%	0.47%	0.06%	0.10%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.28%	0.00%	0.04%	1.89%	2.05%	1.23%	0.09%	0.08%	0.27%	0.00%	0.01%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.03%	0.91%	0.56%	1.52%	2.02%	0.98%	0.55%	0.57%	0.74%	0.11%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.48%	1.13%	3.87%	2.64%	2.78%	1.85%	0.02%	1.44%	3.06%	0.53%	9.04%
	c) Connections with good voice quality	>=95%	Live data	95.93%	99.39%	98.37%	NP	NP	97.30%	97.92%	98.69%	98.88%	99.84%	99.15%
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) – NOVEMBER-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE - NOV 14 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators	
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.12%	0.68%	0.00%	1.83%	2.23%	0.51%	0.30%	0.23%	0.07%	0.49%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.08%	0.39%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.67%	99.86%	98.59%	96.73%	94.88%	98.09%	98.76%	99.08%	99.51%	99.33%	99.21%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.02%	0.22%	0.02%	0.59%	0.71%	0.62%	0.05%	0.08%	0.18%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.23%	0.00%	0.05%	1.75%	2.26%	1.66%	0.13%	0.12%	0.49%	0.11%	0.04%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.93%	0.90%	0.54%	1.46%	2.03%	0.95%	0.54%	0.59%	0.72%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.02%	1.22%	3.32%	2.34%	2.77%	1.22%	0.01%	1.12%	4.34%	0.63%	6.48%
	c) Connections with good voice quality	>=95%	Live data	96.24%	99.42%	98.77%	NP	NP	97.32%	97.90%	98.62%	98.91%	99.84%	99.20%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE - DEC 14 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.21%	0.28%	0.02%	1.94%	2.42%	0.45%	0.21%	0.25%	0.08%	0.46%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.94%	0.39%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.74%	98.51%	98.61%	96.71%	95.01%	98.11%	98.80%	99.08%	99.67%	99.36%	99.15%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.01%	0.06%	0.04%	0.66%	0.79%	0.90%	0.24%	0.28%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.37%	0.00%	0.03%	1.89%	2.48%	1.62%	0.11%	0.15%	0.33%	0.00%	0.03%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.90%	0.38%	0.56%	1.39%	2.03%	0.95%	0.53%	0.57%	0.74%	0.06%	0.61%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.06%	1.39%	2.99%	2.31%	2.76%	1.80%	0.04%	1.11%	4.28%	0.36%	6.36%
	c) Connections with good voice quality	>=95%	Live data	96.96%	98.76%	98.93%	NP	NP	97.37%	97.88%	98.70%	98.85%	99.84%	99.21%
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 OCTOBER TO DECEMBER 2014 MONTHS)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – MP&CG CIRCLE														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators				
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.29%	0.43%	0.01%	1.92%	2.24%	0.66%	0.23%	0.24%	0.07%	0.47%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.00%	1.06%	0.35%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.67%	98.51%	98.58%	96.60%	94.84%	98.22%	98.78%	99.11%	99.64%	99.32%	99.16%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.02%	0.14%	0.04%	0.59%	0.74%	0.66%	0.12%	0.15%	0.13%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.29%	0.00%	0.04%	1.84%	2.26%	1.50%	0.11%	0.12%	0.36%	0.04%	0.03%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.95%	0.73%	0.55%	1.46%	2.03%	0.96%	0.54%	0.58%	0.73%	0.08%	0.56%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.19%	1.25%	3.39%	2.43%	2.77%	1.62%	0.02%	1.22%	3.89%	0.46%	7.29%
	c) Connections with good voice quality	>=95%	Quarterly	96.38%	99.19%	98.69%	NP	NP	97.33%	97.90%	98.67%	98.88%	99.84%	99.19%
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 **3.39%, 3.89%, and 7.29 %** respectively. The similar non-complied performance of these operators was also observed during the monthly PMR audit.

Apart from this, **BSNL (CG)** also failed to achieve the benchmarks of parameters **BTS Accumulated Down Time, CSSR, TCH Congestion and CDR** with its performance as **2.24%, 94.84%, 2.26% and 2.03%** respectively.

Thus, the assessment of QoS with regard to the parameters as mentioned above during live measurement is a matter of concern for those operators who could not meet the benchmark.

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Oct-14	9309	128	2889	3623	1805	9517	3985	1566	5365	1811	447
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Oct-14	12042.54	382.25	212.2	51408	26741	52081.23	5233	2322	3863.42	5481	246.78
	c) BTS Accumulated Downtime	<=2%	Oct-14	0.17%	0.40%	0.01%	1.91%	1.99%	0.74%	0.18%	0.20%	0.10%	0.41%	0.07%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-14	49	1	0	39	35	161	9	16	5	16	0
	e) Worst affected BTSs due to downtime	<=2%	Oct-14	0.53%	0.78%	0.00%	1.08%	1.94%	1.69%	0.23%	1.02%	0.09%	0.88%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	<=2%	Oct-14	99.58%	98.14%	98.59%	96.89%	95.10%	98.44%	98.77%	99.17%	99.69%	99.20%	99.02%
	b) SDCCH/PAGING Congestion	<=3%	Oct-14	0.03%	0.18%	0.06%	0.55%	0.33%	0.61%	0.05%	0.08%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-14	0.26%	0.00%	0.04%	1.33%	1.93%	1.24%	0.10%	0.08%	0.31%	0.00%	0.08%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Oct-14	1.01%	0.65%	0.56%	1.51%	1.92%	0.98%	0.55%	0.57%	0.73%	0.09%	0.56%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-14	2.15%	1.33%	3.59%	2.56%	2.90%	1.56%	0.02%	1.19%	2.97%	0.68%	7.34%
	c) % of connections with good voice quality	>=95%	Oct-14	95.90%	99.20%	98.38%	NP	NP	97.21%	97.96%	98.68%	98.91%	99.84%	99.17%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-14	614	5	312	286	154.16	443	2	56	481	25	99
	e) Total no. of cells (Sector) in the licensed service area		Oct-14	28586.84	384	8670	11164	5325	28410	11955	4715	16169	5436	1350
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		Oct-14	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Oct-14	0	0	0	0	0	0	0	0	0	0	0
Network Data														
5	a) Equipped Capacity of Network in Erlang		Oct-14	301879	627	137151	224500	130000	469698	NP	64278	111809	NP	107379
	b) Total traffic in TCBH in erlang (Avg.)		Oct-14	197682	2	57203	68541	47997	356149	NP	23975	92024	NP	15584
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-14	10363130	526	3068308	1976092	880229	19441568	NP	1215155	4646118	NP	209520

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - Oct 14 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Live data	9287	128	2889	3623	1805	9464	3985	1562	5365	1811	447
	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	3572	30.73	14.53	5192	2689	6905	539	282	278.05	592	6.23
	c) BTS Accumulated Downtime	<=2%	Live data	0.53%	0.33%	0.01%	1.99%	2.07%	1.01%	0.19%	0.25%	0.07%	0.45%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	0	0	42	5	83	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	1.16%	0.28%	0.88%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.60%	97.15%	98.55%	96.37%	94.64%	98.45%	98.78%	99.17%	99.73%	99.26%	99.12%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.03%	0.15%	0.05%	0.52%	0.72%	0.47%	0.06%	0.10%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.28%	0.00%	0.04%	1.89%	2.05%	1.23%	0.09%	0.08%	0.27%	0.00%	0.01%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.03%	0.91%	0.56%	1.52%	2.02%	0.98%	0.55%	0.57%	0.74%	0.11%	0.60%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.48%	1.13%	3.87%	2.64%	2.78%	1.85%	0.02%	1.44%	3.06%	0.53%	9.04%
	c) % of connections with good voice quality	>=95%	Live data	95.93%	99.39%	98.37%	NP	NP	97.30%	97.92%	98.69%	98.88%	99.84%	99.15%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	708	4.33	336	295	148	526	3	68	496	29	122
	e) Total no. of cells (Sector) in the licensed service area		Live data	28579	384	8671	11160	5325	28394	12082	4717	16209	5436	1350
No. of POI's having >=0.5% POI congestion														
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 – November 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Nov-14	9303	128	2891	3623	1805	9589	3983	1555	5372	1812	447
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Nov-14	7939.23	227	495.1	51317	24778	32543.78	7459	2451	2830.57	7645	66.19
	c) BTS Accumulated Downtime	<=2%	Nov-14	0.12%	0.25%	0.02%	1.97%	1.91%	0.47%	0.26%	0.22%	0.07%	0.59%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-14	26	1	0	39	36	145	20	18	2	27	0
	e) Worst affected BTSs due to downtime	<=2%	Nov-14	0.28%	0.78%	0.00%	1.08%	1.99%	1.51%	0.50%	1.16%	0.04%	1.49%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	<=2%	Nov-14	99.68%	98.30%	98.59%	96.50%	95.10%	98.17%	98.76%	99.07%	99.62%	99.23%	99.20%
	b) SDCCH/PAGING Congestion	<=3%	Nov-14	0.02%	0.13%	0.03%	0.56%	0.72%	0.68%	0.08%	0.07%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-14	0.28%	0.00%	0.04%	1.67%	1.93%	1.56%	0.11%	0.09%	0.38%	0.00%	0.03%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Nov-14	0.92%	0.56%	0.54%	1.56%	1.96%	0.95%	0.55%	0.59%	0.71%	0.08%	0.62%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-14	2.00%	1.19%	3.31%	2.39%	2.85%	1.38%	0.02%	1.19%	4.20%	0.46%	6.83%
	c) % of connections with good voice quality	>=95%	Nov-14	96.42%	99.29%	98.64%	NP	NP	97.30%	97.89%	98.63%	98.91%	99.84%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-14	573	5	287	273	152	396	2	56	680	25	92
	e) Total no. of cells (Sector) in the licensed service area		Nov-14	28579	384	8673	11437	5322	28637	11949	4694	16189	5436	1347
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		Nov-14	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Nov-14	0	0	0	0	0	0	0	0	0	0	0
Network Data														
5	a) Equipped Capacity of Network in Erlang		Nov-14	294571	627	137419	224500	130000	470411	295000	64003	114183	146000	107149
	b) Total traffic in TCBH in erlang (Avg.)		Nov-14	196121	2	60991	67986	52504	381511	143933	27750	99289	52675	17036
	c) Total no. of customers served (as per VLR) on last day of the month		Nov-14	10445603	510	3211625	1955280	895724	19548725	9131947	1300069	4723172	1929552	197993

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - November 14 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	9303	128	2889	3623	1805	9517	3984	1551	5372	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	790	62.23	10.22	4765	2902	3499	858	258	271.54	642	3.13
	c) BTS Accumulated Downtime	<=2%	Live data	0.12%	0.68%	0.00%	1.83%	2.23%	0.51%	0.30%	0.23%	0.07%	0.49%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	39	7	43	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.08%	0.39%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.67%	99.86%	98.59%	96.73%	94.88%	98.09%	98.76%	99.08%	99.51%	99.33%	99.21%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.22%	0.02%	0.59%	0.71%	0.62%	0.05%	0.08%	0.18%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.23%	0.00%	0.05%	1.75%	2.26%	1.66%	0.13%	0.12%	0.49%	0.11%	0.04%	
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.93%	0.90%	0.54%	1.46%	2.03%	0.95%	0.54%	0.59%	0.72%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.02%	1.22%	3.32%	2.34%	2.77%	1.22%	0.01%	1.12%	4.34%	0.63%	6.48%
	c) % of connections with good voice quality	>=95%	Live data	96.24%	99.42%	98.77%	NP	NP	97.32%	97.90%	98.62%	98.91%	99.84%	99.20%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	578	4.67	288	262	148	349.67	1	52	703	26	87
e) Total no. of cells (Sector) in the licensed service area		Live data	28594	384	8674	11164	5325	28578	12088	4691	16204	4180	1347	
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	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 - December 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Dec-14	9324	128	2892	3623	1805	9667	3983	1569	5409	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		Dec-14	7166.64	248.17	815.87	52470	26412	33413.98	7542	2496	3439.1	8339	207.36
	c) BTS Accumulated Downtime	<=2%	Dec-14	0.10%	0.26%	0.04%	1.95%	1.97%	0.46%	0.25%	0.21%	0.09%	0.62%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-14	13	1	1	40	35	141	26	18	5	31	0
e) Worst affected BTSs due to downtime	<=2%	Dec-14	0.14%	0.78%	0.03%	1.10%	1.94%	1.46%	0.65%	1.15%	0.09%	1.71%	0.00%	
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	<=2%	Dec-14	99.72%	99.02%	98.57%	96.73%	95.03%	98.22%	98.77%	99.13%	99.64%	99.16%	98.99%
	b) SDCCH/PAGING Congestion	<=3%	Dec-14	0.03%	0.16%	0.04%	0.68%	0.83%	0.79%	0.15%	0.12%	0.08%	0.00%	0.00%
c) TCH congestion	<=2%	Dec-14	0.36%	0.00%	0.05%	1.57%	1.96%	1.49%	0.12%	0.10%	0.36%	0.00%	0.18%	
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Dec-14	0.82%	0.77%	0.57%	1.37%	1.97%	0.93%	0.54%	0.58%	0.73%	0.08%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-14	2.09%	1.12%	3.20%	2.25%	2.86%	1.77%	0.03%	1.21%	4.29%	0.44%	7.07%
	c) % of connections with good voice quality	>=95%	Dec-14	97.19%	98.89%	98.87%	NP	NP	97.37%	97.87%	98.69%	98.88%	99.85%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-14	597	4	277	257	152	511	3	57	698	24	95
e) Total no. of cells (Sector) in the licensed service area		Dec-14	28587	384	8677	11437	5325	28878	11949	4729	16257	5445	1348	
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Dec-14	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Dec-14	0	0	0	0	0	0	0	0	0	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang		Dec-14	295676	627	137649	224500	130000	472746	295000	64468	115032	146000	107189
	b) Total traffic in TCBH in erlang (Avg.)		Dec-14	191572	3	61347	68024	52036	374964	157191	29884	98947	59409	16418
c) Total no. of customers served (as per VLR) on last day of the month		Dec-14	10529651	466	2978468	1949157	904529	19912130	9216614	1419498	4787490	1672435	205047	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - December 14 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Live data	9306	128	2891	3623	1805	9589	3983	1561	5391	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	1392	25.55	46.43	5064	3141	3087	610	279	293.41	596	2.46
	c) BTS Accumulated Downtime	<=2%	Live data	0.21%	0.28%	0.02%	1.94%	2.42%	0.45%	0.21%	0.25%	0.08%	0.46%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	34	7	19	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.94%	0.39%	0.20%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.74%	98.51%	98.61%	96.71%	95.01%	98.11%	98.80%	99.08%	99.67%	99.36%	99.15%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.01%	0.06%	0.04%	0.66%	0.79%	0.90%	0.24%	0.28%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.37%	0.00%	0.03%	1.89%	2.48%	1.62%	0.11%	0.15%	0.33%	0.00%	0.03%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.90%	0.38%	0.56%	1.39%	2.03%	0.95%	0.53%	0.57%	0.74%	0.06%	0.61%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.06%	1.39%	2.99%	2.31%	2.76%	1.80%	0.04%	1.11%	4.28%	0.36%	6.36%
	c) % of connections with good voice quality	>=95%	Live data	96.96%	98.76%	98.93%	NP	NP	97.37%	97.88%	98.70%	98.85%	99.84%	99.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	589	5	259	264	147	518	5	52	697	20	86
	e) Total no. of cells (Sector) in the licensed service area		Live data	28578	384	8677	11437	5325	28846	12077	4724	16285	5439	1347
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS:

5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (OCTOBER to DECEMBER 2014 MONTHS AUDITED DATA):

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/N	Name of Parameter			GSM Operators									CDMA Operators
Customer Service Quality Parameters													
1 Metering & Billing Credibility -Post Paid													
	A) No. Of bills issued during the quarter		MP&CG	9	531325	289035	1152602	335247	118256	NA	360353	268077	21723
	B) No. of bills disputed including billing complaints during the quarter		MP&CG	0	116	11	554	95	2	NA	259	78	0
	C)% of billing complaints during the quarter	<= 0.1%	MP&CG	0.00%	0.02%	0.00%	0.05%	0.03%	0.00%	NA	0.07%	0.03%	0.00%
2 Metering & Billing Credibility -Pre Paid													
	A) Total No. of Pre-paid customers at the end of the quarter		MP&CG	22691	10806607	3158675	18421607	9985307	4743664	2426766	5603443	1968763	344897
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		MP&CG	0	81	226	7611	8986	2	21	8485	1769	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	MP&CG	0.00%	0.00%	0.01%	0.04%	0.09%	0.00%	0.00%	0.15%	0.09%	0.00%
3 Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints													
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		MP&CG	0	197	237	34219	9081	3810	21	8744	1847	21
	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	197	237	34219	9081	3810	21	8744	1847	21

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	197	237	34219	9081	3810	21	8744	1847	21
	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%
4	Response time to customers for assistance												
	A) Total no of calls attempted to customer care/Call center		MP&CG	2153	3493039	3266491	52210480	24881839	1442987	628326	16953016	3457295	61146
	B) Total no. of calls successfully established to customer care/Call center		MP&CG	2109	3493039	3258031	51722838	24618907	1422813	628326	16953016	3406583	59570
	C) % Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	97.96%	100.00%	99.74%	99.07%	98.94%	98.60%	100.00%	100.00%	98.53%	97.42%
	D) Total Calls reached to operator for Voice to Voice (Total call attempt)		MP&CG	543	4835887	1635812	11642571	6081396	2224758	2296952	4958134	596105	68201
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		MP&CG	531	4756696	1631194	11552693	5566606	2036024	2189009	4906011	587685	64640

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	97.79%	98.36%	99.72%	98.57%	91.54%	91.52%	95.30%	98.95%	98.59%	94.78%
5 Termination/closure of service													
	A) Total No. of requests for Termination / Closure of service received during the quarter		MP&CG	0	746	804	9584	457	1728	NA	5399	349	295
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		MP&CG	0	746	804	9584	457	1728	NA	5399	349	295
	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%
6 Time taken for refunds of deposits after closures.													
	A) No. of Payments/ Refunds due during the quarter		MP&CG	0	398	712	1689	1523	235	NA	7735	1502	45
	B) No. of Payments/ Refunds Cleared during the quarter		MP&CG	0	398	712	1689	1523	235	NA	7735	1502	45
	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	
Response time to customers for assistance													
1	Total no of calls attempted to customer care/Call center		MP&CG	52	118312	101365	384256	630843	611591	19677	540985	89160	28306
	Total no. of calls successfully established to customer care/Call center		MP&CG	52	118312	101334	370970	630843	575172	19677	540985	87487	27823
	% Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	100.00%	100.00%	99.97%	96.54%	100.00%	94.05%	100.00%	100.00%	98.12%	98.29%
2	Total Calls reached to operator for Voice to Voice (Total call attempt)		MP&CG	11	148776	52125	373386	191076	47796	63521	160124	20162	2055
	Total number of calls answered by the operator (Voice to voice) within 90 seconds		MP&CG	11	148235	51855	368284	190076	46963	62348	155243	20121	2018
	% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempts)	>=95%	MP&CG	100.00%	99.64%	99.48%	98.63%	99.48%	98.26%	98.15%	96.95%	99.80%	98.20%

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid was largely within the prescribed bench mark against the benchmark of $\leq 0.1\%$. However, parameter '**Billing complaints - pre-paid**' remained beyond the benchmark for service provider **Vodafone** with its performance as **0.15%**.

2. Resolution of Billing complaints and applying credits -

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

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

3. Response Time to the Customer for assistance

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

All service providers are in compliance with respect to the parameter Accessibility of call center. However, **RCOM (GSM), Tata (GSM) and Tata (CDMA)** have not met the benchmark of '**calls answered by Operators (voice to voice) within 90 seconds**'. They have achieved their performance as **91.54%%, 91.52% and 94.78%** respectively.

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

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

Live Measurements:

The results for **three days live measurements** reveal that all operators (except Tata GSM), have met the benchmarks for the parameters '**Accessibility to call center**' and '**Call connection to operators (Voice to voice)**'. **Tata (GSM)** has failed to meet the benchmark of **Accessibility** with its performance as **94.05%** respectively.

6. LIVE CALLING ASSESSMENT



6. LIVE CALLING ASSESSMENT:

6.1 INTER OPERATOR CALLS ASSESSMENT:

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in MP&CG Service area during the time 1100 to 1400 Hrs and 1600 to 1900 was carried out by TUV auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators. While doing this exercise, the radio part, the switch part and POI in between the two operators are involved. Congestion in any of these network elements could result in congestion in the network.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT											
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
AIRCEL	MP&CG	NIL	--	--	--	--	--	--	--	--	--
AIRTEL	MP&CG	NIL	--	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	MP&CG	NIL	100%	--	95%	100%	100%	100%	95%	100%	100%
IDEA	MP&CG	NIL	100%	96%	--	100%	95%	95%	100%	100%	100%
RCOM (GSM)	MP&CG	NIL	100%	100%	100%	--	100%	100%	100%	100%	100%
TATA (GSM)	MP&CG	NIL	100%	100%	95%	100%	--	100%	100%	100%	100%
VIDEOCON	MP&CG	NIL	100%	96%	100%	100%	100%	--	100%	97%	100%
VODAFONE	MP&CG	NIL	100%	100%	100%	100%	100%	96%	--	100%	100%
RCOM (CDMA)	MP&CG	NIL	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA (CDMA)	MP&CG	NIL	100%	100%	100%	100%	100%	100%	100%	100%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. However, in case where Calls attempted from BSNL to Idea and Vodafone successful interconnection was 95.0% and 95% respectively. From Idea to BSNL, Tata(GSM) and Videocon was 96%, 95% and 95%, from Tata GSM to Idea was 95%, from Videocon to BSNL and RCOM CDMA was 96% and 97% respectively and from Vodafone to Videocon was 96%. 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	100	100	100	100	98	100
% Accessibility of Call centre /customer Care (Total call successfully established * 100/ Total call attempts)	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempts)	MP&CG	100	100	100	100	100	100	100	98	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	MP&CG	100	100	100	100	100	100	100	98	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%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, all service providers were able to connect 100% of calls to the operator 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	21	100	100	21
Total No. of calls Answered	MP&CG	99	98	97	94	90	16	97	95	15
Resolution of Billing complaints	MP&CG	99	98	97	94	90	16	97	95	15
%age of cases resolved	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was less due to less number of billing complaints. During live calling, some of the customers did not attend the calls / or their mobile was switch off while some others reported that there complaints have been resolved. Thus, most of the customers expressed their satisfaction on resolution of the billing complaints.

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING													
Emergency no.	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VIDEOCON	VODAFONE
100, 101, 108, 1091, 1098, 1090	DURG	Durg, Damda	24	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Khairgarh, Chuikhadan	24	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓
		Rajnandgaon, Dongargarh	24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	JABALPUR	Jabalpur	12	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Katni, VijayRaghogarth	24	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Sihora, Kundam	24	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100, 101, 108, 1091, 1098, 1090	UJJAIN	Ujjain	12	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Mahidpur, Tarana, Ghatiya	36	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓
		Badnagar	12	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓

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

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

7. DRIVE TEST



7. OPERATOR ASSESTID DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three SSA's namely **Durg, Jabalpur and Ujjain** in the months of October, November and December 2014 respectively. The total route Km covered during drive tests in respective SSAs was **316 Kms, 351 Kms and 320 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 ≥ -75 dBm for in-door coverage and ≥ -85 dBm for in-vehicle.

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

DRIVE TEST TABLE: 1

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			1	Call Attempts	Highways	11	NC	78	25	62	22	84	29	135	25	94	25	63	25	43	24	15	26
Major Roads	NC	NC			70	20	54	30	87	20	96	20	71	20	68	20	51	20	42	NC	64	20	
Within City	66	33			356	20	365	20	377	20	343	20	390	20	293	20	274	20	169	20	298	20	
Overall SSA	77	33			504	65	481	72	548	69	574	65	555	65	424	65	368	64	226	46	442	65	
2	Blocked Call Rate	Highways	0.00%	NC	0.00%	0.00%	1.61%	5.00%	0.00%	0.00%	0.00%	0.00%	3.19%	0.00%	0.00%	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%	2.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	0.00%	0.00%	0.56%	0.00%	1.11%	0.00%	0.00%	0.00%	0.58%	0.00%	1.03%	0.00%	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.34%	0.00%	
		Overall SSA	0.00%	0.00%	0.40%	0.00%	1.05%	1.37%	0.00%	0.00%	0.35%	0.00%	1.62%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.23%	0.00%
3	Dropped Call Rate (<=2%)	Highways	0.00%	NC	0.00%	0.00%	1.64%	5.00%	0.00%	0.00%	0.00%	0.00%	2.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Major Roads	NC	NC	0.00%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	5.63%	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%	1.66%	0.00%	0.00%	0.00%	0.00%	0.00%	3.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Overall SSA	0.00%	0.00%	0.00%	0.00%	1.89%	1.37%	0.00%	0.00%	0.00%	0.00%	2.52%	0.00%	0.00%	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	99.74%	100%	98.65%	96.17%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.77%	NC	98.16%	100%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.79%	100%	97.92%	97.95%

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.78%	100%	98.08%
Operators)	Highways	99.18%	NC	96.53%	98.30%	96.22%	96.10%	97.76%	98.83%	95.44%	99.48%	93.84%	99.60%	99.03%	99.44%	98.25%	99.73%	NA	NA	NA	NA	
	Major Roads	NC	NC	96.58%	99.50%	93.60%	97.81%	97.54%	97.06%	95.43%	97.80%	92.15%	100%	98.59%	98.20%	97.87%	99.57%	NA	NA	NA	NA	
	Within City	99.11%	98.74%	96.26%	95.33%	94.53%	97.02%	97.59%	99.20%	95.23%	96.20%	94.33%	98.22%	98.45%	99.23%	98.30%	99.43%	NA	NA	NA	NA	
	Overall SSA	99.13%	98.74%	96.34%	97.73%	94.65%	97.02%	97.61%	98.42%	95.30%	97.61%	93.96%	99.12%	98.55%	99.00%	98.23%	99.59%	NA	NA	NA	NA	
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	99.18%	NC	96.53%	98.30%	96.22%	96.10%	97.76%	98.83%	95.44%	99.48%	93.84%	99.60%	99.03%	99.44%	98.25%	99.73%	NA	NA	NA	NA	
	Major Roads	NC	NC	96.58%	99.50%	93.60%	97.81%	97.54%	97.06%	95.43%	97.80%	92.15%	100%	98.59%	98.20%	97.87%	99.57%	NA	NA	NA	NA	
	Within City	99.11%	98.74%	96.26%	95.33%	94.53%	97.02%	97.59%	99.20%	95.23%	96.20%	94.33%	98.22%	98.45%	99.23%	98.30%	99.43%	NA	NA	NA	NA	
	Overall SSA	99.13%	98.74%	96.34%	97.73%	94.65%	97.02%	97.61%	98.42%	95.30%	97.61%	93.96%	99.12%	98.55%	99.00%	98.23%	99.59%	NA	NA	NA	NA	
5	Service Coverage																					
	In door (>= - 75dBm)	Highways	94.71%	NC	66.08%	100%	76.42%	100%	77.70%	99.97%	95.79%	100%	81.65%	100%	78.96%	99.93%	73.02%	100%	51.24%	100%	49.29%	90.02%
		Major Roads	NC	NC	79.75%	99.45%	84.52%	100%	93.61%	98.45%	99.69%	99.89%	87.18%	100%	80.98%	94.41%	94.62%	62.70%	63.75%	NC	58.89%	100%
		Within City	94.60%	99.58%	49.69%	98.09%	73.92%	73.54%	79.97%	96.96%	96.93%	99.66%	88.66%	100%	79.81%	99.50%	88.30%	100%	55.68%	75.05%	55.57%	99.71%
		Overall SSA	94.62%	99.58%	55.50%	99.32%	76.01%	90.32%	81.76%	98.65%	97.21%	99.86%	87.30%	100%	79.92%	97.95%	86.74%	88.48%	56.91%	89.13%	55.06%	95.36%
	In-vehicle (>= - 85dBm)	Highways	98.81%	NC	92.35%	100%	100%	100%	95.83%	100%	99.92%	100%	95.28%	100%	91.44%	100%	89.94%	100%	87.33%	100%	84.48%	99.76%
		Major Roads	NC	NC	96.86%	99.89%	100%	100%	99.76%	100%	100%	100%	97.30%	100%	93.71%	100%	99.63%	99.32%	94.47%	NC	91.84%	100%
		Within City	99.62%	99.57%	88.13%	100%	100%	99.99%	96.69%	100%	99.95%	100%	96.80%	100%	93.76%	99.65%	97.89%	100%	95.99%	99.81%	89.65%	100%
		Overall SSA	99.50%	99.97%	89.74%	99.94%	100%	100%	97.04%	100%	99.95%	100%	96.61%	100%	92.97%	99.88%	96.88%	99.79%	95.19%	99.92%	89.15%	99.89%
	Outdoor-in city (>= - 95dBm)	Highways	100%	NC	99.66%	100%	100%	100%	99.85%	100%	100%	100%	99.94%	100%	98.94%	100%	98.06%	100%	100%	100%	99.27%	100%
		Major Roads	NC	NC	99.93%	100%	100%	100%	100%	100%	100%	100%	99.81%	100%	99.51%	100%	100%	100%	99.98%	NC	99.97%	100%
		Within City	100%	100%	99.63%	100%	100%	100%	99.78%	100%	100%	100%	99.05%	100%	98.92%	99.69%	99.62%	100%	99.94%	100%	99.54%	100%
Overall SSA		100%	100%	99.66%	100%	100%	100%	99.82%	100%	100%	100%	99.30%	100%	99.12%	99.90%	99.42%	100%	99.95%	100%	99.56%	100%	
6	Call Setup	Highways	100%	NC	100%	100%	96.77%	90.91%	100%	100%	100%	100%	96.81%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	98.15%	100%	100%	100%	100%	100%	97.18%	100%	100%	100%	100%	100%	100%	100%	NC
	Within City	100%	100%	99.44%	100%	97.26%	100%	100%	100%	99.42%	100%	98.97%	100%	99.66%	100%	99.27%	100%	100%	100%	100%	99.66%	100%	
	Overall SSA	100%	100%	99.60%	100%	97.30%	97.22%	100%	100%	99.65%	100%	98.38%	100%	99.76%	100%	99.46%	100%	100%	100%	100%	99.77%	100%	
7	Hand Over Success Rate (HOSR)	Highways	100%	NC	100%	100%	98.85%	100%	100%	100%	100%	100%	99.59%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Major Roads	NC	NC	98.48%	100%	100%	100%	100%	100%	100%	100%	99.12%	100%	100%	100%	100%	100%	99.38%	NC	100%	100%	
		Within City	100%	100%	99.70%	100%	98.81%	100%	99.43%	100%	100%	100%	99.11%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	99.56%	100%	99.01%	100%	99.61%	100%	100%	100%	99.17%	100%	100%	100%	100%	100%	99.91%	100%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

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

7.2 OPERATOR ASSISTED DRIVE TEST: JABALPUR SSA (NOVEMBER-14)

DRIVE TEST TABLE: 2

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Highways	20	NC	147	20	139	21	84	29	154	23	137	20	161	20	144	20	121	23	138	20
		Major Roads	23	NC	101	20	90	21	87	20	113	20	111	20	106	20	122	20	112	NC	116	20
		Within City	46	22	258	20	251	21	377	20	239	27	249	20	232	20	245	20	217	NC	248	20
		Overall SSA	89	22	506	60	480	63	548	69	506	70	497	60	499	60	511	60	450	23	502	60
2	Blocked Call Rate	Highways	0.00%	NC	0.00%	0.00%	8.63%	0.00%	0.00%	0.00%	0.00%	0.00%	1.46%	0.00%	0.00%	0.00%	0.69%	0.00%	0.00%	0.00%	0.72%	0.00%
		Major Roads	0.00%	NC	0.00%	0.00%	1.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.82%	0.00%	0.89%	NC	4.31%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	4.38%	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%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.00%	0.00%	0.39%	0.00%	0.22%	0.00%	1.20%	0.00%
3	Dropped Call Rate (<=2%)	Highways	0.00%	NC	0.00%	0.00%	1.57%	0.00%	0.00%	0.00%	0.00%	0.00%	2.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Major Roads	0.00%	NC	0.00%	0.00%	4.49%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	1.80%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	0.00%	0.00%	0.00%	0.00%	3.63%	0.00%	0.00%	0.00%	0.41%	0.00%	0.00%	NC	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	1.75%	0.00%	0.00%	0.00%	0.00%	0.00%	3.04%	1.67%	0.00%	0.00%	0.20%	0.00%	0.00%	0.00%	0.40%	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	98.15%	95.95%	94.95%	100%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.48%	NC	95.54%	100%
Within		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.04%	NC	97.78%	100%	

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
Operators)	City																					
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.92%	95.95%	96.49%	100%
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	98.29%	NC	96.67%	95.93%	96.01%	86.73%	98.27%	100%	95.98%	95.71%	91.07%	95.50%	96.53%	99.30%	96.01%	92.02%	NA	NA	NA	NA	
	Major Roads	98.38%	NC	96.35%	98.63%	91.29%	99.96%	98.55%	100%	95.65%	97.21%	92.68%	100%	97.12%	99.99%	96.78%	99.18%	NA	NA	NA	NA	
	Within City	98.43%	98.84%	96.73%	97.72%	95.06%	99.76%	97.69%	99.57%	95.59%	98.69%	93.90%	100%	96.39%	99.56%	95.90%	99.25%	NA	NA	NA	NA	
	Overall SSA	98.41%	98.84%	96.64%	97.66%	94.60%	95.46%	98.06%	99.86%	95.72%	96.78%	92.83%	97.25%	96.60%	99.61%	96.11%	96.72%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Highways	49.07%	NC	60.82%	100%	81.45%	100%	76.40%	100%	91.81%	100%	68.03%	99.61%	86.53%	97.46%	89.96%	100%	61.17%	15.37%	53.11%	99.61%
		Major Roads	83.70%	NC	75.16%	100%	83.80%	100%	88.17%	92.20%	93.15%	93.96%	82.78%	98.34%	91.49%	89.54%	98.27%	100%	81.04%	NC	66.65%	98.34%
		Within City	78.90%	60.28%	65.78%	5.54%	80.20%	99.60%	83.50%	99.56%	95.31%	99.24%	80.08%	100%	88.23%	99.93%	97.56%	100%	66.48%	NC	65.13%	100%
		Overall SSA	70.56%	60.28%	66.42%	68.19%	81.24%	99.86%	85.60%	97.26%	93.66%	98.46%	77.17%	99.41%	88.75%	95.64%	95.54%	100%	69.00%	15.37%	61.63%	99.41%
5	In-vehicle (>= - 85dBm)	Highways	70.12%	NC	90.44%	100%	96.00%	100%	94.71%	100%	99.07%	100%	90.70%	100%	95.34%	98.97%	97.31%	100%	96.92%	100%	86.80%	100%
		Major Roads	96.72%	NC	95.16%	100%	95.27%	100%	97.90%	100%	99.54%	100%	94.63%	100%	98.23%	99.63%	99.86%	100%	98.39%	NC	93.31%	100%
		Within City	97.63%	98.81%	92.36%	95.50%	97.59%	100%	99.01%	100%	99.82%	100%	97.99%	100%	98.31%	100%	99.80%	100%	97.32%	NC	94.01%	100%
		Overall SSA	88.17%	98.81%	92.42%	98.49%	96.68%	100%	97.62%	100%	99.51%	100%	95.18%	100%	97.29%	99.53%	99.10%	100%	97.50%	100%	91.37%	100%
5	Outdoor-in city (>= - 95dBm)	Highways	96.58%	NC	98.87%	100%	99.78%	100%	99.82%	100%	99.98%	100%	99.71%	100%	99.36%	100%	99.96%	100%	99.85%	100%	99.65%	100%
		Major Roads	97.25%	NC	99.42%	100%	99.98%	100%	99.98%	100%	100%	100%	99.35%	100%	99.67%	100%	100%	100%	99.93%	NC	100%	100%
		Within City	99.95%	99.98%	99.49%	100%	99.85%	100%	99.99%	100%	99.98%	100%	99.99%	100%	99.95%	100%	100%	100%	99.96%	NC	100%	100%
		Overall	97.93%	99.98%	99.29%	100%	99.85%	100%	99.94%	100%	99.98%	100%	99.77%	100%	99.66%	100%	99.99%	100%	99.92%	100%	99.88%	100%

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			SSA																			
6	Call Setup Success Rate (>=95%)	Highways	100%	NC	100%	100%	91.37%	100%	100%	100%	100%	100%	98.54%	100%	100%	100%	99.31%	100%	100%	100%	99.28%	100%
		Major Roads	100%	NC	100%	100%	98.89%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.18%	100%	99.11%	NC	95.69%	100%
		Within City	100%	100%	100%	100%	95.62%	100%	100%	100%	100%	100%	100%	99.60%	100%	100%	99.59%	100%	100%	NC	100%	100%
		Overall SSA	100%	100%	100%	100%	95.00%	100%	100%	100%	100%	100%	100%	99.40%	100%	100%	100%	99.41%	100%	99.78%	100%	98.80%
7	Hand Over Success Rate (HOSR)	Highways	100%	NC	100%	100%	99.50%	100%	99.28%	100%	99.00%	100%	97.73%	100%	99.53%	100%	98.87%	100%	100%	100%	97.73%	100%
		Major Roads	100%	NC	98.22%	100%	98.47%	100%	100%	100%	98.67%	100%	99.53%	100%	99.40%	100%	98.44%	100%	100%	NC	99.53%	100%
		Within City	100%	100%	99.79%	100%	99.09%	100%	98.76%	100%	98.49%	100%	98.73%	100%	99.74%	100%	99.64%	100%	99.85%	NC	98.73%	100%
		Overall SSA	100%	100%	99.57%	100%	99.09%	100%	99.13%	100%	98.66%	100%	98.63%	100%	99.61%	100%	99.14%	100%	99.92%	100%	98.63%	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: UJJAIN SSA (DECEMBER-14)

DRIVE TEST TABLE: 3

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA			
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Highways	NA	NC	88	25	85	26	85	27	111	25	80	27	92	25	79	26	46	25	79	27		
		Major Roads	15	30	85	25	88	23	80	27	124	25	83	28	84	25	91	26	36	NC	92	26		
		Within City	55	NC	224	30	236	26	178	31	228	25	214	32	212	30	208	30	85	NC	209	32		
		Overall SSA	70	30	397	80	409	75	343	85	463	75	377	87	388	80	378	82	167	25	380	85		
2	Blocked Call Rate	Highways	NA	NC	0.00%	0.00%	1.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Major Roads	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.38%	0.00%	0.00%	0.00%	0.00%	0.00%	1.09%	0.00%		
		Within City	0.00%	NC	0.45%	0.00%	0.85%	3.85%	0.56%	0.00%	0.00%	0.00%	1.40%	0.00%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	1.44%	0.00%		
		Overall SSA	0.00%	0.00%	0.00%	0.00%	0.73%	1.33%	0.29%	0.00%	0.00%	0.00%	0.80%	0.00%	1.29%	0.00%	0.00%	0.00%	0.00%	0.00%	1.05%	0.00%		
3	Dropped Call Rate (<=2%)	Highways	NA	NC	0.00%	0.00%	1.19%	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%		
		Major Roads	0.00%	0.00%	0.00%	0.00%	1.14%	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%	0.00%	0.00%		
		Within City	0.00%	NC	0.00%	0.00%	0.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.47%	0.00%	0.49%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Overall SSA	0.00%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.27%	0.00%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
4	(a) 0-4 (w/o frequency hopping for CDMA)	Percentage connections with good voice quality (=>95%)																						
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.02%	99.67%	99.82%	100%	
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.46%	NC	99.73%	100%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.04%	NC	99.75%	100%	

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Operators)	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.85%
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	NA	NC	97.09%	98.26%	90.04%	99.88%	97.60%	99.20%	92.65%	99.04%	93.38%	87.12%	97.62%	99.29%	96.54%	98.49%	NA	NA	NA	NA	
	Major Roads	98.92%	98.20%	96.51%	99.66%	92.12%	95.63%	98.38%	99.95%	93.65%	98.58%	94.94%	98.66%	96.83%	99.25%	96.33%	98.71%	NA	NA	NA	NA	
	Within City	98.81%	NC	97.68%	99.58%	94.33%	98.51%	98.88%	99.96%	92.94%	99.38%	95.70%	99.41%	97.27%	99.28%	96.50%	99.35%	NA	NA	NA	NA	
	Overall SSA	98.84%	98.20%	97.28%	99.20%	92.90%	98.18	98.49%	99.78%	93.06%	99.00%	95.01%	95.25%	97.25%	99.28%	96.47%	98.89%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Highways	NA	NC	80.11%	82.24%	82.99%	96.32%	53.41%	98.05%	99.33%	100%	88.13%	84.73%	85.49%	90.19%	87.77%	100%	59.77%	97.82%	56.12%	100%
		Major Roads	72.37%	78.49%	84.25%	92.39%	84.30%	73.82%	64.97%	96.72%	99.26%	99.12%	85.46%	100%	80.68%	98.75%	93.09%	98.20%	86.96%	NC	56.85%	90.45%
		Within City	73.07%	NC	84.72%	100%	61.78%	83.19%	66.38%	76.31%	99.70%	100%	86.55%	92.39%	83.61%	99.95%	94.67%	96.22%	81.53%	NC	53.87%	100%
		Overall SSA	72.72%	78.49%	83.03%	91.54%	79.29%	85.06%	63.37%	88.41%	99.49%	99.70%	86.71%	92.37%	84.05%	96.65%	92.65%	97.94%	76.70%	97.82%	55.61%	96.82%
5	In-vehicle (>= - 85dBm)	Highways	NA	NC	95.97%	92.52%	99.03%	99.93%	87.07%	100%	99.80%	100%	98.22%	100%	98.55%	99.66%	98.53%	100%	94.18%	98.40%	90.23%	100%
		Major Roads	92.48%	98.38%	97.18%	99.69%	98.72%	99.59%	91.81%	99.40%	99.94%	100%	97.15%	100%	95.98%	99.90%	99.04%	99.98%	98.64%	NC	94.87%	100%
		Within City	97.04%	NC	97.50%	100%	94.67%	93.06%	88.53%	94.90%	99.94%	100%	99.16%	100%	98.55%	100%	99.72%	100%	97.82%	NC	90.31%	100%
		Overall SSA	94.76%	98.38%	96.88%	97.40%	98.08%	97.45%	89.03%	97.64%	99.90%	100%	98.18%	100%	98.48%	99.86%	99.21%	99.99%	96.99%	98.40%	91.80%	100%
5	Outdoor-in city (>= - 95dBm)	Highways	NA	NC	99.71%	97.29%	99.99%	100%	98.34%	100%	99.92%	100%	100%	100%	99.96%	100%	99.83%	100%	98.71%	99.42%	99.96%	100%
		Major Roads	99.95%	99.98%	99.66%	99.81%	100%	99.72%	99.22%	99.99%	99.99%	100%	99.95%	100%	99.50%	100%	99.97%	100%	98.99%	NC	99.93%	100%
		Within City	100%	NC	99.60%	100%	99.44%	100%	98.92%	99.86%	99.99%	100%	100%	100%	99.90%	100%	99.99%	100%	98.97%	NC	99.64%	100%
		Overall SSA	99.98%	99.98%	99.65%	99.03%	99.88%	99.92%	98.87%	99.94%	99.97%	100%	99.98%	100%	99.93%	100%	99.95%	100%	98.90%	99.42%	99.84%	100%
6	Call Setup	Highways	NA	NC	100%	100%	98.82%	100%	100%	100%	100%	100%	100%	100%	95.65%	100%	98.73%	100%	100%	100%	100%	100%

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Success Rate (>=95%)	Major Roads	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.62%	100%	98.90%	100%	100%	100%
	Within City	100%	NC	99.55%	100%	99.15%	96.15%	99.44%	100%	100%	100%	98.60%	100%	96.23%	100%	99.52%	100%	100%	100%	100%	98.56%	100%	
	Overall SSA	100%	100%	99.75%	100%	99.27%	98.67%	99.71%	100%	100%	100%	99.20%	100%	96.39%	100%	99.21%	100%	100%	100%	100%	98.95%	100%	
7	Hand Over Success Rate (HOSR)	Highways	NA	NC	98.50%	100%	98.97%	100%	99.17%	100%	99.71%	100%	99.39%	100%	99.02%	100%	100%	100%	100%	100%	100%	100%	100%
		Major Roads	100%	100%	98.25%	100%	99.21%	100%	100%	100%	100%	100%	100%	100%	99.10%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	NC	98.62%	100%	99.05%	100%	99.58%	100%	99.51%	100%	100%	100%	99.65%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	98.51%	100%	99.08%	100%	99.58%	100%	99.72%	100%	99.83%	100%	99.40%	100%	100%	100%	100%	100%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

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

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

DRIVE TEST ROUTE OF OCTOBER TO DECEMBER 14 – 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
DURG	Oct-14	Durg, Dhamdha/ 110 KM	<p>Durg: Malviya nagar, Bus stand, Indra Market, Ganjpara, Dhamdha Road, Shankar nagar, Raipur Naka, Civil Line, Pulgaon,.</p> <p>Dhamdha : Dhamdha mandi, Market Congested areas, balidan chauk, bada kua area.</p> <p>Indoor: Malviya Complex Durg</p>	Khairagarh, Chhuikhadan / 101 KM	<p>Khairagarh : Music University, Bus stand, Market areas, Shyam nagar, Civil line, Highways, Main market, Kawardha Highways.</p> <p>Chhuikhadan: Market areas, Bus stand areas, Chhuikhadan Basti , Shyampur , Gopalpur Road, Laxmanpur , Rampur, Ward 2, 9 & 7, Birutola , Bhulatola.</p> <p>Indoor: Opp. Khairagarh Bus Stand.</p>	Rajnandgaon, Dongargarh / 105 KM	<p>Rajnand Gaon : Dental College, Lakholi Road, Kailash Nagar, Gunj Line, Kamptee Line, Sadar market, Baspaipar, Ranisagar Lake, Gol Bazar , Hockey Stadium.</p> <p>Dongargarh : Rajnand gao Road, Dongargarh Rly Station, Railway Colony, Gol Bazar , Indira Nagar, Sai Marg , Kedar Badi , New Bus stand, Police station, Mandir Road.</p> <p>Indoor: New Bus Stand- Rajnandgaon</p>
JABALPUR	Nov-14	Jabalpur / 151 KM	<p>Jabalpur : CIVIC Center Mall to MahrajPur Bypass, Mandla Road, CIVIC Center Mall to Katni Higway, Bhopal Highway, Nagpur Higway, Nagpur Highway, Katangi Road.</p> <p>Indoor: Sindwadiya Mall</p>	Katni & Vijay Raghavgarh / 120 KM	<p>Katni: Katni Distt. Court to Rewa Road, Shadeol Road, Railway Station, Ghanta Ghar, New Katani Junction, Hospital, Police Station, Bus Stand, sadar Market .</p> <p>Vijayradhogarh : Vijayrahogarh to Kaymore Road, Barhi Road, Katni Road, subhas chauk, nehropark, market area.</p> <p>Indoor: Nagar Panchyat Vijayraogarh.</p>	Sihora & Kundam / 80 KM	<p>Sihora : Reliance Petrol Pump area, Sihora to Katni Road, Majholi Road, Major Road of Sihora, Sihora Main Mkt, Railway Station, Anaaj Mandi, BusStand.</p> <p>Kundam: Jahora mandi, police chauki, kewadi naka, mama ka bag.</p> <p>Indoor: Busstand of Sihora</p>
UJJAIN	Dec-14	Ujjain / 140 KM	<p>Ujjain town, 3 batti chowk, bsnl office, bus stand badnagar, bus stand Ujjain, civil hospital, emali chowk, hero showroom, hospital, satyam, ITI college, koyla f atsk, saint paul school, lok seva Kendra badnagar, mahakal temple, mangla nath road, petrol pump, pipali naka, rishi nagar, tower chowk.</p> <p>Indoor: Railway station_ujjain</p>	Mahidpur, Ghattiya, Tarana / 100 KM	<p>Mahidpur : Aagar road, Patwari Coloni, Shatri Coloni, Mahidpur town, bus stand, govt hospital, govt school, Tarana, Ujjain road, Tejpura, NayaPura, Old City,</p> <p>Tarana: Tarana town, tarana bus stand, hospital,</p> <p>Ghatiya : Rudrakeda Road, Ghattiya town, Ghattiya railway station.</p> <p>Indoor: SDM office mahidpur.</p>	Badnagar / 80 KM	<p>Badnagar : Mandi area (railway station), Shikshak colony badnagar, Main Market.</p> <p>Indoor: Nagar parishad Badnagar.</p>

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF DURG SSA (OCT-14)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL BHARTI	Durg, Dhamdha	---	Khairagarh, Chhuikhadan	---	Rajnandgaon, Dongargarh	---
2	AIRCEL		No Coverage		No Coverage		---
3	BSNL		Poor voice quality observed at : Durg: Market area, Damda milk factory area, Jail area		---		Poor voice quality observed at : Dongargarh : Main market area, Primary school ,Rajnandgaon bas stand area
4	IDEA CELLULAR		Poor voice quality observed at : Durg : Jail area		---		---
5	VODAFONE		Poor voice quality observed at : Arya nagar, New Durg		---		---
6	VIDEOCON		---		Poor voice quality observed at : Poor Rx Level observed at : Khairagarh Hajarafundan village		---
7	TATA GSM		Poor voice quality observed at : Durg : Shivnath bridge		---		---
8	TATA CDMA		---		No Coverage		---
9	RCOM GSM		Poor voice quality observed at : Durg : Old bus stand, Malviyanagar		---		Poor voice quality observed at : Rajnandgaon : Gunline, Basant pur
10	RCOM CDMA		---		---		---

Common Troublesome Areas: Jail Area & Durg Bus stand in Durg.

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF JABALPUR SSA (NOV-14)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL BHARTI	Jabalpur	---	Katni, Vijayrahogarah	Poor voice quality observed at : deori village road (Vijayrahogarah)	Sehora, Kundam	---
2	AIRCEL		No Coverage		No Coverage		Poor voice quality observed at : Katni Highway (Sihora)
3	BSNL		Poor voice quality founs all over SSA but worst patches at Milono ganj, Sanjeevani nagar, Ratancoly, Hawa bag, Civil line		Poor voice quality observed at : Near by Katni railway station		---
4	IDEA CELLULAR		Poor voice quality observed at : near baldev bag dence area, near russel chauk, Near Pren nagar		---		---
5	VODAFONE		Poor voice quality observed at : Ranital chauk, MCN Jabalpur		---		---
6	VIDEOCON		Poor voice quality observed at : Katangi Bypass road area		---		---
7	TATA GSM		Poor voice quality observed at : By pass road, Bus stand, Civil line, Chhoti line phatak		Poor voice quality observed at : Dube colony, Gayatri Nagar (Katni)		---
8	TATA CDMA		Poor voice quality observed at : Under Bridge Road , Military Dairy Farm		---		---
9	RCOM GSM		Poor voice quality observed at : MCN Jabalpur, Dhanwantari Nagar, Madical college, New ramnagar, Mandla road		Poor voice quality observed at : Housingboard, Kothala road (Katni)		---
10	RCOM CDMA		Poor voice quality observed at : Sadar bazar area		---		---

Common Troublesome Areas: Pram Nagar, Sadar bazar, MCN Jabalpur, Medical college, By pass road, Bus stand & Civil line in Jabalpur.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF UJJAIN SSA (DECEMBER-14)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL BHARTI	Ujjain	Poor voice quality observed at : Kothi road Near Vikram University	Mahidpur, Ghatiya & Tarana	---	Badnagar	---
2	AIRCEL		No Coverage		---		No Coverage
3	BSNL		Poor voice quality observed at : Bherugarh, Geeta colony, Govt Engineering collage, Industrial area, Sati gate, Lal Bai Phool Bai		Poor voice quality observed at : Mahidpur : Ghosala Road & Main Road Market Mahidpur		Poor voice quality observed at : Main Market Thana, Ujjain Badnagar By-pass & Badnagar Bus stand
4	IDEA CELLULAR		Poor voice quality observed at : Sai dham colony		---		Poor voice quality observed at : Badnagar: Sahid nagar
5	VODAFONE		---		---		---
6	VIDEOCON		Poor voice quality observed at : Ramghat-Chintaman area		Poor voice quality observed at : Mahidpur--Ghosla road		---
7	TATA GSM		Poor voice quality observed at : Near Sudama Nagar & Rishi nagar		---		---
8	TATA CDMA		---		No Coverage		No Coverage
9	RCOM GSM		Poor voice quality observed at : Jaisinghpura area		---		---
10	RCOM CDMA		---		---		---

Common Troublesome Areas: Mahidpur SDCA--Ghosla road.

DRIVE TEST TABLE: 8

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

S. No	Month of Drive Test	Operator	SSA	Total SDCA Covered	Status of no network coverage area (SDCA Name)	ICR Status (SDCA Name)
1	Oct-14	Aircel	Durg	Durg, Dhamdha, Khairagarh, Chhuikhadan, Rajnandgaon & Dongargarh	All SSA includes Durg, Dhamdha, Khairagarh, Chhuikhadan, Rajnandgaon SDCA	No
		Airtel			--	No
		BSNL			--	No
		Idea			--	No
		Videocon			--	On ICR with TATA GSM at Dhamdha, Kharagarh, Chhuikhada, Rajnandgaon.
		Vodafone			--	No
		Tata GSM			--	No
		Tata CDMA			Dhamdha, Khairagarh, Chhuikhadan, Dongargarh	No
		Reliance GSM			--	No
		Reliance CDMA			--	No
2	Nov-14	Aircel	Jabalpur	Jabalpur, Katni, Vijay Raghavgarh, Sihora & Kundam	Jabalpur, Katni, Vijay Raghavgarh & Kundam	No
		Airtel			--	No
		BSNL			--	No
		Idea			--	No
		Videocon			--	Videocon is on ICR with TATA GSM at Katni, Vijay Raghavgarh & Sihora SDCA
		Vodafone			--	No
		Tata GSM			--	No
		Tata CDMA			Vijay Raghavgarh, Sihora & Kundam	No
		Reliance GSM			--	No
		Reliance CDMA			--	No
3	Dec-14	Aircel	Ujjain	Ujjain, Tarana, Ghatia, Mahidpur, Badnagar & Khachrod	Ujjain, Tarana, Ghatia, Badnagar, Khachrod	No
		Airtel			--	No
		BSNL			--	No
		Idea			--	No
		Videocon			--	Videocon is on ICR With TATA GSM at Tarana, Ghatia, Mahidpur, Khachrod SDCA, At Ujjain & Badnagar are Spider Town

S. No	Month of Drive Test	Operator	SSA	Total SDCA Covered	Status of no network coverage area (SDCA Name)	ICR Status (SDCA Name)
		Vodafone			--	No
		Tata GSM			--	No
		Tata CDMA			Tarana, Ghatia, Mahidpur, Badnagar, Khachrod	No
		Reliance GSM			--	No
		Reliance CDMA			--	No

7.6 KEY FINDINGS ON DRIVE TEST:

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

October -2014: Durg SSA

- (i) Drive test conducted across **Durg SSA** covering Durg, Dhamdha, Khairagarh, Chhuikhadan, Rajnandgaon, & Dongargarh SDCAs (316 Kms).

Drive Test Results: The drive test results revealed that performance of the service providers in general, was satisfactory. However, **RCOM (GSM) and BSNL** were not able to perform within benchmark for parameters '**Call Drop rate**' and '**Voice Quality**'. The performance of **RCOM (GSM)** for parameters **CDR and Voice Quality** was **2.52% (Outdoor)** and **93.96% (Outdoor)** respectively. Whereas, the performance of **BSNL** for parameter **Voice Quality** remained under performed with its achieved level as **94.65% (Outdoor)**.

November-2014: Jabalpur SSA

- (i) Drive test conducted across **Jabalpur SSA** covering Jabalpur, Katni, Vijayrahogarh, Sehora, and Kundam SDCAs. (351 Kms)

Drive Test Results: In this SSA also, the performance of the service providers was satisfactory except for a few cases of non compliance. **RCOM (GSM)** could not do well in respect of parameters **Call Drop rate and Voice Quality** with its achieved level as **3.04% (Outdoor)** and **92.83% (Outdoor)** respectively on overall SSA basis. **BSNL** also remained under performed for parameter **Voice Quality (94.60%)**.

December-2014 : Ujjain SSA

- (i) Drive test conducted across **Ujjain SSA** covering Ujjain, Mahidpur, Ghatiya, Tarana and Badnagar SDCAs (320 Kms).

Drive Test Results: As per the drive test outcome, **BSNL** and **Idea** lagged behind in meeting the benchmarks of parameter **Voice Quality** with their performance as **92.90% (Outdoor)** and **93.06% (Outdoor)** respectively. The performance of other operators for rest of the parameters was satisfactory.

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

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.

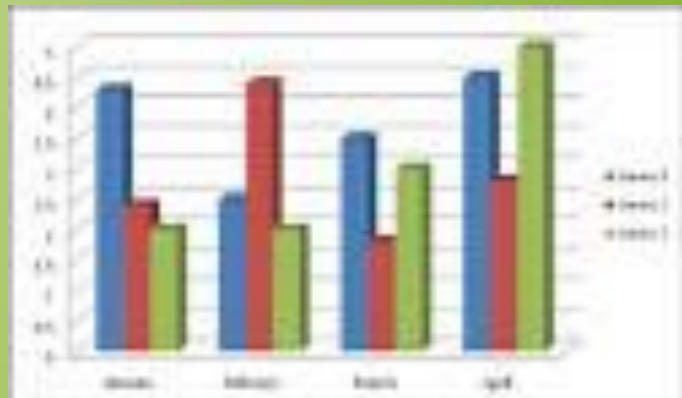
*Thus, on analyzing the overall performance of service providers on the basis of Drive tests, it was concluded that the service providers namely **BSNL, RCOM (GSM) and Idea** could not perform well on the parameter '**Good Voice Quality**', '**Call Drop rate**'. These service providers need to improve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

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

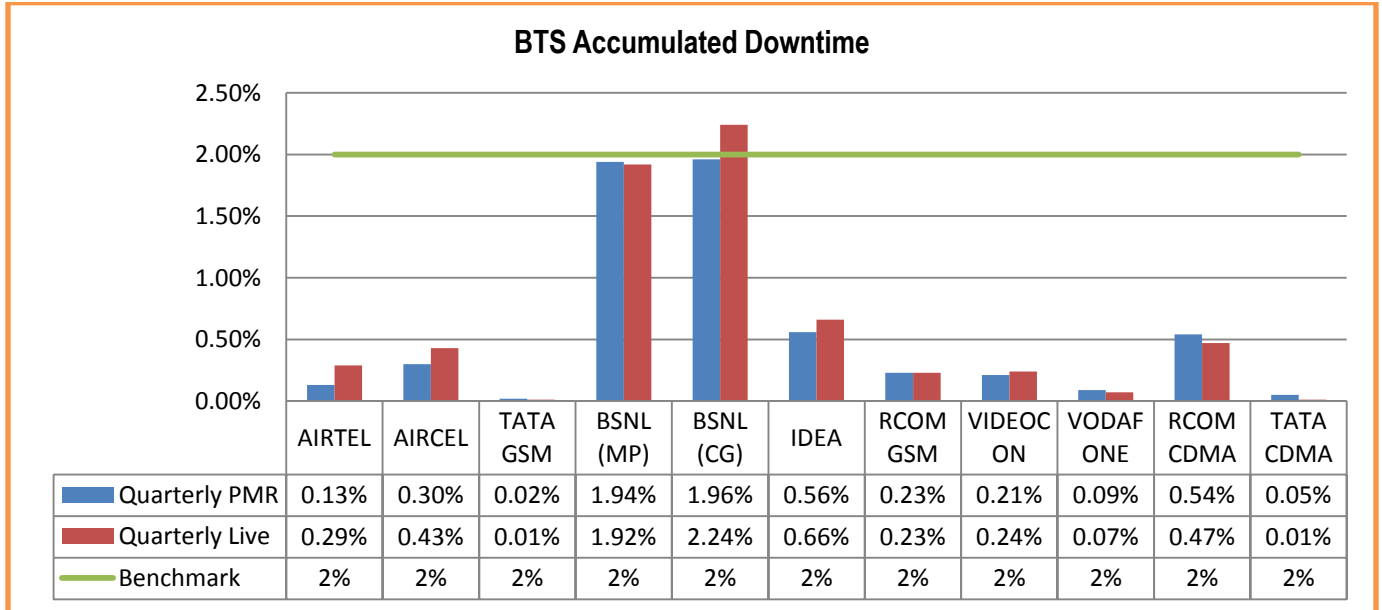
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION:

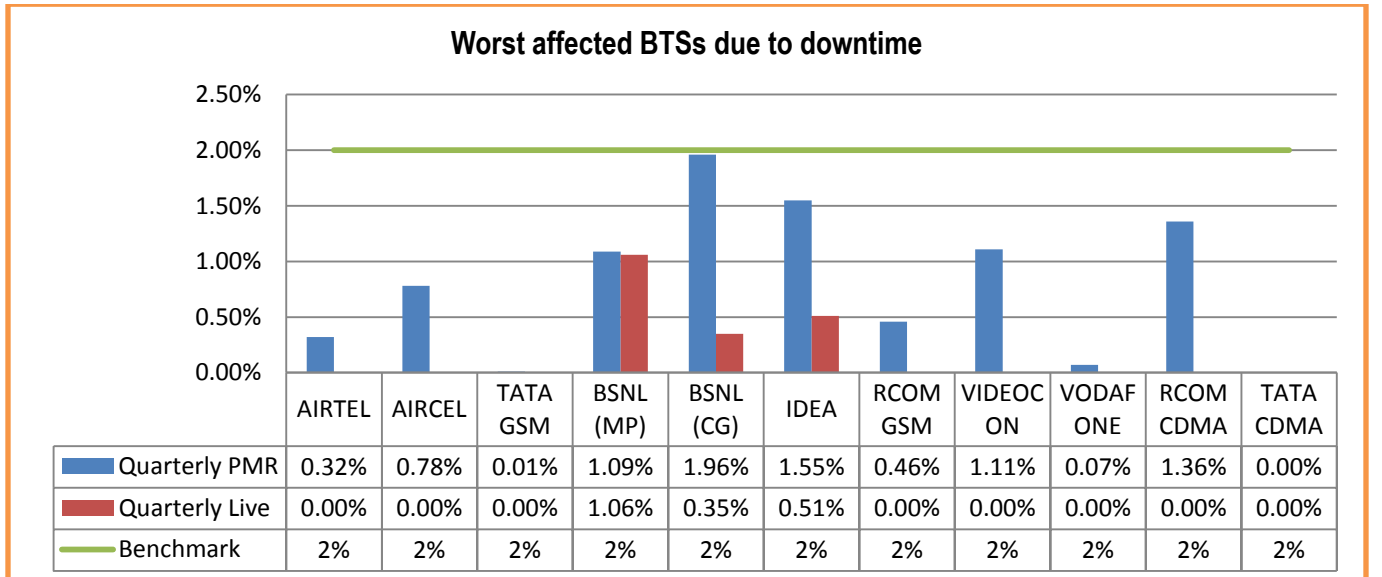
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1. BTS ACCUMULATED DOWNTIME :



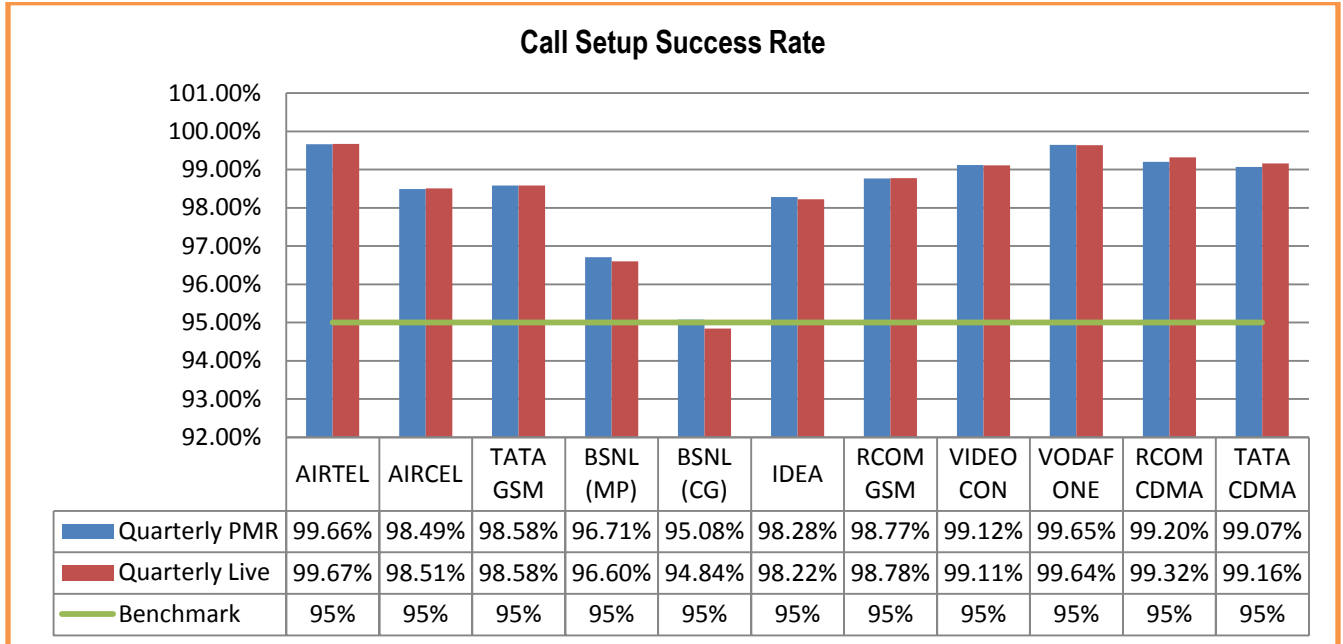
All operators are meeting the benchmarks except BSNL (CG) during 3 days live measurement.

2. WORST AFFECTED BTS DUE TO DOWNTIME:



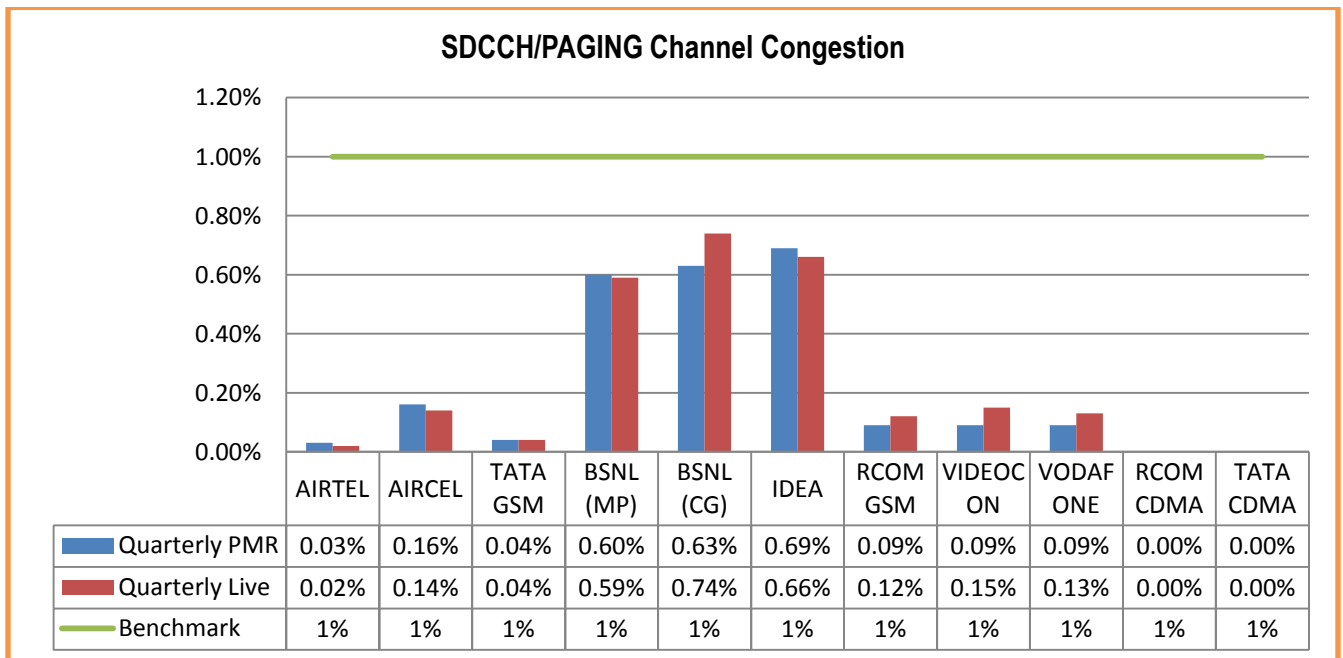
All operators are meeting the benchmarks.

3. CALL SETUP SUCCESS RATE :



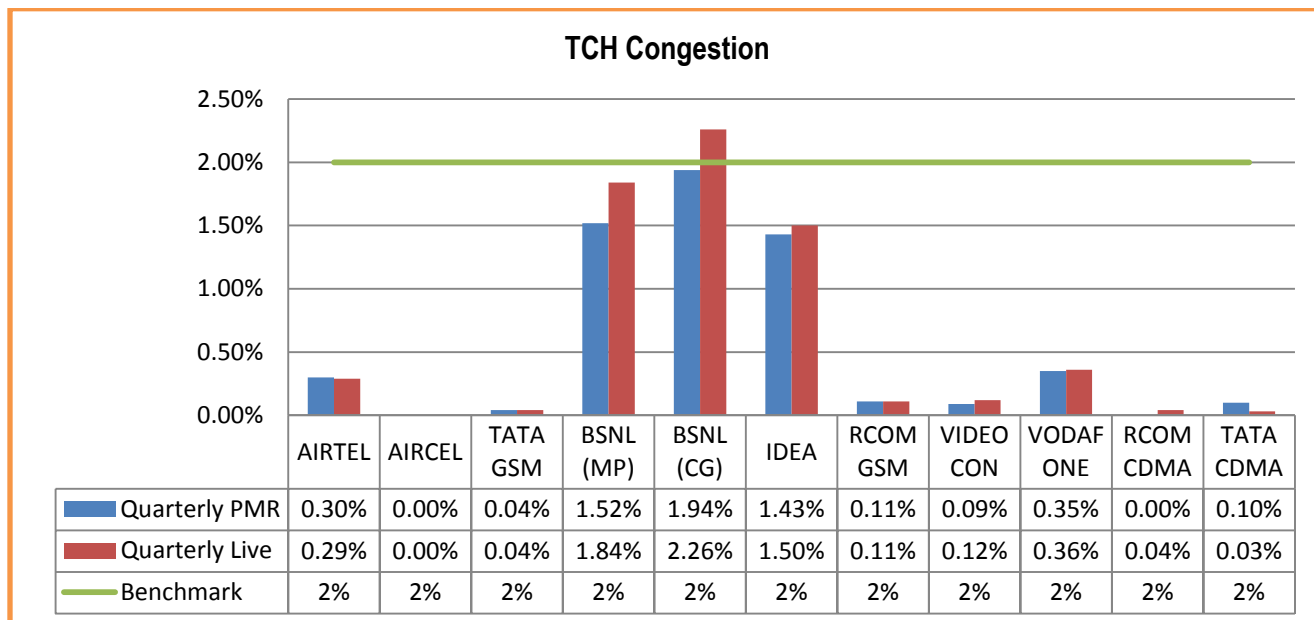
All operators are meeting the benchmarks except BSNL (CG) during 3 days live measurement.

4. SDCCH/PAGING CHANNEL CONGESTION:



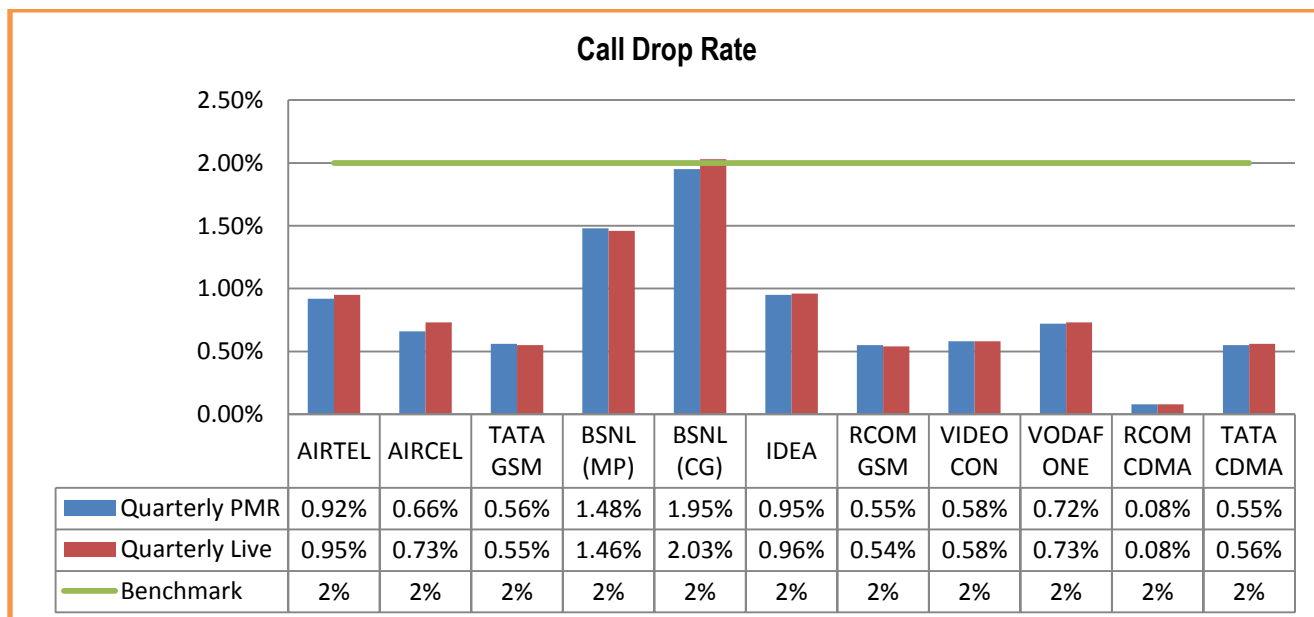
All operators are meeting the benchmarks.

5. TCH CONGESTION :



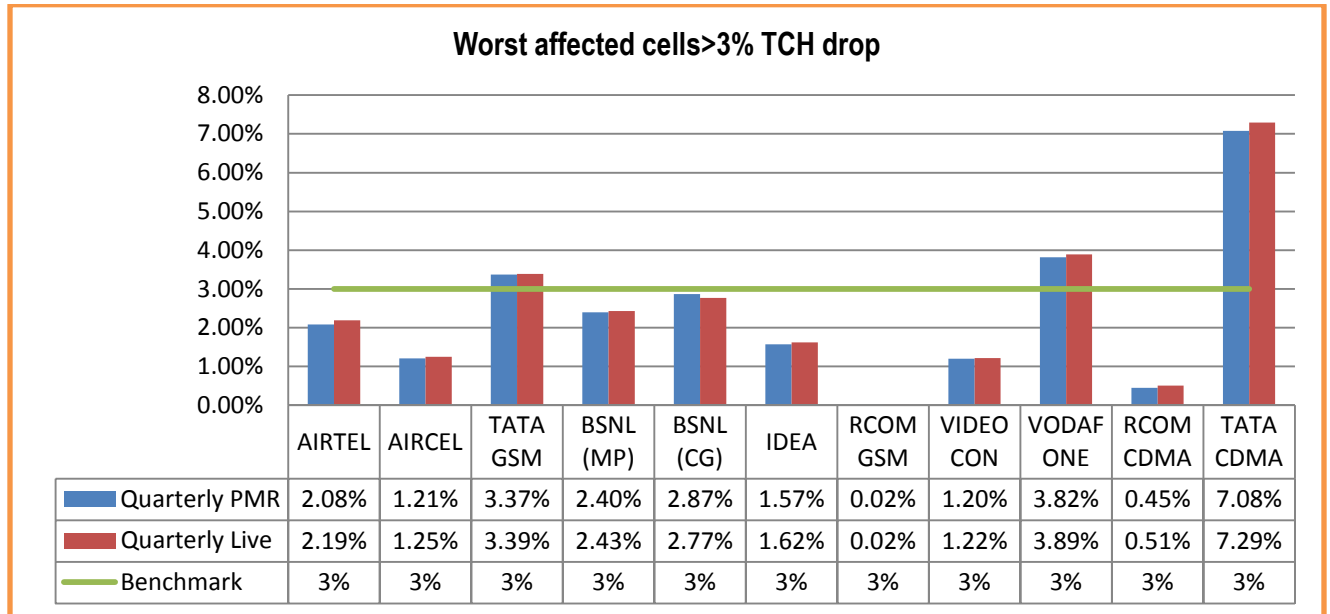
All operators are meeting the benchmarks except BSNL (CG) during 3 days live measurement.

6. CALL DROP RATE :



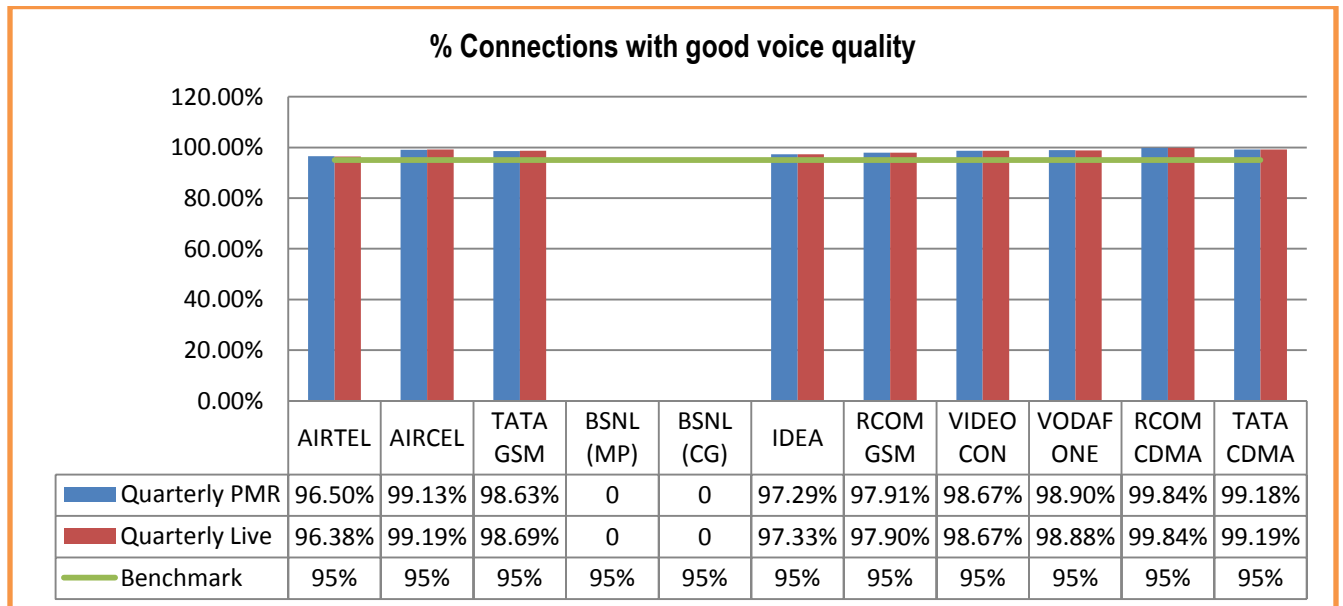
All operators are meeting the benchmarks except BSNL (CG) during 3 days live measurement.

7. WORST AFFECTED CELLS>3% TCH DROP :



All operators are meeting the benchmarks except Tata GSM, Vodafone 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.