



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

**West Zone – Madhya Pradesh & Chhattisgarh
Service Area
(April 2015 – June 2015)**

**Prepared by
TÜV SÜD SOUTH ASIA PVT. LTD,
C-153/1, Okhla Industrial Estate,
Phase-1, New Delhi – 110020
Telephone 011- 30889611
Fax: 011-30889595**

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

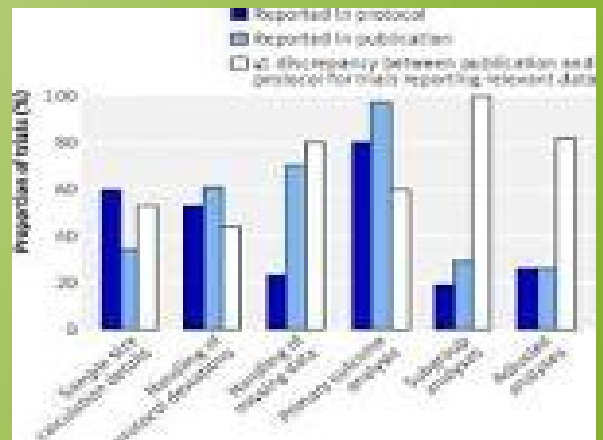
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 Punjab, Rajasthan and Gujarat circles during the quarter April 2015 – June 2015.**

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

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

3. SAMPLE SIZE



3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

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

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
		April-15	May-15	June -15	
GSM Operators					
1	AIRCEL	22th to 24th Apr'15	13th to 15th May'15	12th to 14th June'15	Dishnet Wireless LTD.Office No. 2 ,Ground Floor Chinnar Incube Business Center, Hoshangabad Road Bhopal M.P. 462023
2	AIRTEL	17th to 19th Apr'15	17th to 19th May'15	7th to 9th June'15	47-49 Electronics Complex, Pardeshipura, Indore(M.P.) 452010
3	BSNL(MP)	14th to 16th Apr'15	15th to 17th May'15	16th to 18th June'15	BSNL Bhawan,Near paryawas bhawan Bhopal
4	BSNL(CG)	14th to 16th Apr'15	21st to 23rd May'15	16th to 18th June'15	SDE QoS CM, 2nd floor Auto exchange BSNL Exchange near Lala Ganga Complex GE Road Raipur.
5	VIDEOCON	28th to 30th Apr'15	16th to 18th May'15	14th to 16th June'15	Videocon Telecommunication Ltd. 2nd Floor Chinar Fortune City, Hoshangabad Road Bhopal (MP)
6	TATA GSM	20th to 22th Apr'15	16th to 18th May'15	13th to 15th June'15	3rd floor, Chinaar Business center, Chinaar Fortune City, Hoshangabad Road,Bhopal M.P. 462023
7	IDEA	18th to 20th Apr'15	18th to 20th May'15	9th to 11th June'15	139-140, Electronics Complex, Pardeshi Pura, Indore(M.P.) 452010
8	RCOM GSM	15th to 17th Apr'15	18th to 20th May'15	--	7th floor, Industry House, AB Road, Indore
9	VODAFONE	13th to 15th Apr'15	19th to 21st May'15	15th to 17th June'15	Vodafone Spacetel Ltd, 2nd Floor Center Point New Market TT Nagr , Bhopal 462001
CDMA Operators					
10	RCOM CDMA	15th to 17th Apr'15	27th to 29th May'15	--	Reliance communication ltd, MCN Suvindh Vihar, Asharam Tiraha, Gandhi nagar, Narsing garh Bypass Road, Bhopal (M.P.) 462036
11	TATA CDMA	20th to 22th Apr'15	16th to 18th May'15	13th to 15th June'15	3rd floor, Chinaar Business center, Chinaar Fortune City, Hoshangabad Road,Bhopal M.P. 462023

For all the above operators, audit was conducted in all the three months of the Quarter ended June 2015.

NB: 3 days live audit was not done for RCOM (GSM & CDMA) in the month of June-15 due to TTI server issue.

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

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

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

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

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

4. EXECUTIVE SUMMARY



4. EXECUTIVE SUMMARY

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

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

Cellular Mobile Service

(i) From **monthly audit**, it was concluded that on an average, performance of the operators in the MP&CG Service area was satisfactory for **Network Parameters**. However, the audit with respect to the parameter **‘Worst affected cells having > 3% TCH drop’** revealed that **Tata (GSM)** and **Tata (CDMA)** failed to meet the benchmark of this parameter with their quarterly average performance as **3.21% and 7.36%** 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) and Tata (CDMA)** in all the three months of the quarter. Their average performance for the quarter was **3.24% and 8.76 %** respectively. The similar non-complied performance of these operators was also observed during the monthly PMR audit.

(iii) With regard to the **Customer Service Quality Parameters**, it is revealed that all operators are in well compliance of the parameters on Metering and Billing Credibility, Termination of Service and Time taken for refunds. However, **only Vodafone** failed to meet the benchmark of billing complaints (for pre-paid) with its performance as **0.13%**.

In regard to the parameter 'Response Time to the Customer for assistance', all service providers are in compliance with respect to the parameter **Accessibility of call center** and **'calls answered by Operators (voice to voice) within 90 seconds** except **RCOM (GSM)** remained under performed for parameter **'Calls answered by Operators (Voice to voice) having its achieved level as 91.68%**.

The results for **three days live measurements** reveal that only **Airtel and RCOM (GSM)** have not met the benchmark of **'Call answered by operators (Voice to voice)'** with their performance as **91.88% and 91.46% respectively**.

(iv) On analyzing the overall performance of service providers on the basis of Drive tests, it was concluded that the service providers namely **Idea, BSNL and RCOM (GSM) / (CDMA)** could not perform well on the parameter **'Good Voice Quality'**. 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	June-15	19 Hrs-20 Hrs
2	AIRCEL	June-15	18 Hrs-19 Hrs
3	TATA GSM	June-15	20 Hrs-21 Hrs
4	BSNL (MP)	June-15	19 Hrs-20 Hrs
5	BSNL (CG)	June-15	19 Hrs-20 Hrs
6	IDEA CELLULAR	June-15	20 Hrs-21 Hrs
7	RCOM GSM	June-15	20 Hrs-21 Hrs
8	VIDEOCON	June-15	20 Hrs-21 Hrs
9	VODAFONE	June-15	20 Hrs-21 Hrs
CDMA Operators			
10	RCOM CDMA	June-15	20 Hrs-21 Hrs
11	TATA CDMA	June-15	20 Hrs-21 Hrs

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the MP&CG circle.

5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRTEL	18	145	9517	NSN	NSN
2	AIRCEL	1	1	128	Huawei	Huawei
3	TATA GSM	4	26	2927	Huawei	Huawei
4	BSNL (MP)	9	83	3519	Alcatel	Alcatel
5	BSNL (CG)	5	46	1859	Alcatel	Alcatel
6	IDEA CELLULAR	34	76	9844	Ericsson	Ericsson
7	RCOM GSM	12	49	3975	Huawei, Ericsson	ZTE, Alcatel Lucent
8	VIDEOCON	1	10	1656	Huawei	Huawei
9	VODAFONE	8	50	5710	NSN	NSN
CDMA Operators						
10	RCOM CDMA	8	8	1814	Huawei, ZTE, Lucent	Lucent, Huawei
11	TATA CDMA	3	5	428	Huawei & Ericsson	Motorola & Huawei

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

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE – APRIL 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter	GSM Operators									CDMA Operators			
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Apr-15	0.12%	0.26%	0.04%	1.93%	1.94%	0.57%	0.23%	0.23%	0.22%	0.45%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Apr-15	0.17%	0.78%	0.00%	1.10%	1.96%	1.47%	0.48%	1.16%	0.71%	1.16%	0.23%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-15	99.59%	98.67%	98.64%	96.14%	95.38%	97.86%	98.94%	98.85%	99.42%	99.15%	99.26%
	b) SDCCCH/PAGING Channel congestion	<=1%	Apr-15	0.06%	0.42%	0.04%	0.61%	0.77%	0.80%	0.02%	0.12%	0.14%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	0.47%	0.00%	0.03%	1.80%	1.75%	1.56%	0.17%	0.17%	0.58%	0.00%	0.03%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Apr-15	0.61%	0.64%	0.56%	1.48%	1.85%	0.79%	0.52%	0.54%	0.70%	0.10%	0.33%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Apr-15	1.51%	1.11%	3.21%	2.28%	2.62%	1.90%	0.04%	1.14%	2.60%	0.59%	7.81%
	c) Connections with good voice quality	>=95%	Apr-15	97.67%	99.63%	98.90%	NP	NP	97.18%	97.85%	98.55%	98.94%	99.85%	99.19%
4	No. of POI's having >=0.5% POI congestion		Apr-15	0	0	0	0	0	0	0	0	0	0	0

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

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – MAY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE – MAY 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators		
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	May-15	0.16%	0.33%	0.03%	1.98%	1.92%	0.58%	0.20%	0.29%	0.21%	0.52%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	May-15	0.37%	1.56%	0.00%	1.14%	1.94%	1.47%	0.48%	1.33%	0.63%	0.00%	0.23%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	May-15	99.61%	98.81%	98.48%	96.01%	95.28%	97.74%	98.91%	99.05%	99.31%	99.36%	98.29%
	b) SDCCH/PAGING Channel congestion	<=1%	May-15	0.06%	0.24%	0.04%	0.66%	0.90%	0.79%	0.03%	0.13%	0.21%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	0.40%	0.00%	0.08%	1.81%	1.78%	1.74%	0.19%	0.11%	0.69%	0.00%	0.79%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	May-15	0.58%	0.76%	0.60%	1.65%	1.82%	0.73%	0.48%	0.50%	0.65%	0.10%	0.40%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	May-15	1.35%	1.04%	3.28%	2.55%	2.64%	1.38%	0.03%	1.02%	2.41%	0.70%	7.12%
	c) Connections with good voice quality	>=95%	May-15	97.82%	99.02%	98.78%	NP	NP	97.22%	97.89%	98.50%	98.98%	99.84%	99.29%
4	No. of POI's having >=0.5% POI congestion		May-15	0	0	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE – JUNE 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators		
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Jun-15	0.21%	0.82%	0.03%	1.93%	1.85%	0.55%	**NP	0.37%	0.32%	**NP	0.11%
	b) Worst affected BTSs due to downtime	<=2%	Jun-15	0.19%	0.00%	0.00%	1.14%	1.94%	1.48%	**NP	1.27%	1.05%	**NP	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	99.59%	98.09%	98.56%	96.21%	95.38%	97.97%	**NP	98.58%	99.28%	**NP	98.08%
	b) SDCCH/PAGING Channel congestion	<=1%	Jun-15	0.08%	0.46%	0.06%	0.65%	0.76%	0.68%	**NP	0.21%	0.16%	**NP	0.00%
	c) TCH congestion	<=2%	Jun-15	0.39%	0.00%	0.05%	1.73%	1.85%	1.32%	**NP	0.33%	0.72%	**NP	1.04%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Jun-15	0.65%	0.46%	0.62%	1.59%	1.69%	0.84%	**NP	0.57%	0.74%	**NP	0.45%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jun-15	1.72%	1.04%	3.13%	2.54%	2.55%	2.37%	**NP	1.88%	2.89%	**NP	7.16%
	c) Connections with good voice quality	>=95%	Jun-15	97.63%	99.33%	98.75%	*NP	*NP	97.07%	**NP	98.26%	98.94%	**NP	99.26%
4	No. of POI's having >=0.5% POI congestion		Jun-15	0	0	0	0	0	0	**NP	0	0	**NP	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.

**NP: Data not provided by RCOM (GSM & CDMA) due to TTI sever issue.

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR-AVERAGE OF QE- JUNE- 15 (APRIL-MAY-JUNE-2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF THREE MONTHS) OF MP&CG CIRCLE														
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.16%	0.47%	0.03%	1.95%	1.90%	0.57%	0.22%	0.30%	0.25%	0.49%	0.09%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.24%	0.78%	0.00%	1.13%	1.95%	1.47%	0.48%	1.25%	0.80%	0.58%	0.15%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.60%	98.52%	98.56%	96.12%	95.35%	97.86%	98.93%	98.83%	99.34%	99.26%	98.54%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.07%	0.37%	0.05%	0.64%	0.81%	0.76%	0.03%	0.15%	0.17%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.42%	0.00%	0.05%	1.78%	1.79%	1.54%	0.18%	0.20%	0.66%	0.00%	0.62%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.61%	0.62%	0.59%	1.57%	1.79%	0.79%	0.50%	0.54%	0.70%	0.10%	0.39%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	1.53%	1.06%	3.21%	2.46%	2.60%	1.88%	0.04%	1.35%	2.63%	0.65%	7.36%
	c) Connections with good voice quality	>=95%	Quarterly	97.71%	99.33%	98.81%	NP	NP	97.16%	97.87%	98.44%	98.95%	99.85%	99.25%
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.

NB: Calculation for RCOM (GSM & CDMA) is done on the basis of two months (April & May 15) average data.

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.**

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

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

The audit with respect to this parameter revealed that all operators except **Tata (GSM) and Tata (CDMA)** met the benchmark for this parameter. The quarterly average performance of **Tata (GSM) and Tata (CDMA)** for this parameter was **3.21% and 7.36%** 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) – APRIL 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE - APRIL 15 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators	
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.25%	0.03%	1.93%	1.15%	0.59%	0.15%	0.20%	0.25%	0.46%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.88%	0.27%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.58%	99.62%	98.69%	96.45%	95.88%	97.45%	98.21%	99.13%	99.49%	99.36%	99.21%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.06%	0.01%	0.02%	0.54%	0.86%	0.64%	0.02%	0.13%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.50%	0.00%	0.03%	1.68%	1.45%	1.32%	0.14%	0.09%	0.51%	0.00%	0.01%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.62%	0.32%	0.55%	1.55%	1.73%	0.78%	0.50%	0.47%	0.74%	0.09%	0.30%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.60%	1.13%	2.69%	2.18%	2.73%	1.84%	0.03%	0.76%	2.69%	0.53%	9.59%
	c) Connections with good voice quality	>=95%	Live data	97.66%	99.72%	98.79%	NP	NP	97.11%	97.90%	98.59%	98.87%	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.

5.2.2 LIVE MEASUREMENT DATA (3-DAYS) – MAY-15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - MP&CG CIRCLE - MAY 15 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators	
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.20%	0.45%	0.06%	1.98%	0.94%	0.67%	0.25%	0.29%	0.39%	0.52%	0.09%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.99%	0.05%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.63%	99.31%	98.60%	96.42%	95.32%	97.64%	98.92%	99.08%	99.20%	99.32%	97.96%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.04%	0.12%	0.03%	0.62%	0.86%	0.62%	0.02%	0.11%	0.70%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.44%	0.00%	0.05%	1.75%	1.71%	1.70%	0.21%	0.13%	0.80%	0.00%	1.14%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.57%	0.35%	0.60%	1.61%	1.72%	0.79%	0.31%	0.51%	0.70%	0.09%	0.39%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.34%	1.04%	3.31%	2.40%	2.55%	1.63%	0.03%	0.89%	2.56%	0.70%	7.81%
	c) Connections with good voice quality	>=95%	Live data	97.83%	99.01%	98.78%	NP	NP	97.21%	97.87%	98.50%	98.98%	99.83%	99.28%
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) – JUNE 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES MP&CG CIRCLE - JUNE 15 MONTH														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.12%	1.09%	0.02%	1.98%	1.41%	0.57%	NP	0.44%	0.28%	NP	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.02%	0.38%	0.25%	NP	0.00%	0.00%	NP	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.63%	96.05%	98.58%	96.02%	95.60%	98.02%	NP	98.55%	99.30%	NP	97.83%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.05%	0.33%	0.05%	0.72%	0.78%	0.82%	NP	0.35%	0.21%	NP	0.00%
	c) TCH congestion	<=2%	Live data	0.36%	0.00%	0.04%	1.91%	1.57%	0.94%	NP	0.46%	0.70%	NP	1.36%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.57%	0.31%	0.66%	1.61%	1.82%	0.78%	NP	0.59%	0.84%	NP	0.50%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.33%	1.48%	3.72%	2.51%	2.62%	2.27%	NP	1.33%	3.23%	NP	8.89%
	c) Connections with good voice quality	>=95%	Live data	97.85%	99.86%	98.75%	NP	NP	97.18%	NP	98.17%	98.91%	NP	99.13%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0

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

**NP: Data not provided by RCOM (GSM & CDMA) due to TTI sever issue.

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF APRIL TO JUNE 2015 MONTHS)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – MP&CG CIRCLE														
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators		
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.15%	0.60%	0.04%	1.96%	1.17%	0.61%	0.20%	0.31%	0.31%	0.49%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.00%	0.96%	0.23%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.61%	98.33%	98.62%	96.30%	95.60%	97.70%	98.57%	98.92%	99.33%	99.34%	98.33%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.05%	0.15%	0.03%	0.63%	0.83%	0.69%	0.02%	0.20%	0.34%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.43%	0.00%	0.04%	1.78%	1.58%	1.32%	0.18%	0.23%	0.67%	0.00%	0.84%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.59%	0.33%	0.60%	1.59%	1.76%	0.78%	0.41%	0.52%	0.76%	0.09%	0.40%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	1.42%	1.22%	3.24%	2.36%	2.63%	1.91%	0.03%	0.99%	2.83%	0.62%	8.76%
	c) Connections with good voice quality	>=95%	Quarterly	97.78%	99.53%	98.77%	NP	NP	97.17%	97.89%	98.42%	98.92%	99.84%	99.20%
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.

NB: Calculation for RCOM (GSM & CDMA) is done on the basis of two months (April & May 15) average data.

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) and Tata (CDMA)** in all the three months of the quarter. Their average performance for the quarter was **3.24%**, and **8.76 %** respectively. The similar non-complied performance of **Tata GSM / Tata CDMA** was also observed during the monthly PMR audit.

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

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MP&CG Circle- April 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Apr-15	9480	128	2875	3623	1840	9779	3973	1644	5671	1814	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Apr-15	8146	240	779	50276	25725	40011	6625	2770	8892	5815	216
	c) BTS Accumulated Downtime	<=2%	Apr-15	0.12%	0.26%	0.04%	1.93%	1.94%	0.57%	0.23%	0.23%	0.22%	0.45%	0.07%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Apr-15	16	1	0	40	36	144	19	19	40	21	1
	e) Worst affected BTSs due to downtime	<=2%	Apr-15	0.17%	0.78%	0.00%	1.10%	1.96%	1.47%	0.48%	1.16%	0.71%	1.16%	0.23%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	<=2%	Apr-15	99.59%	98.67%	98.64%	96.14%	95.38%	97.86%	98.94%	98.85%	99.42%	99.15%	99.26%
	b) SDCCH/PAGING Congestion	<=3%	Apr-15	0.06%	0.42%	0.04%	0.61%	0.77%	0.80%	0.02%	0.12%	0.14%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	0.47%	0.00%	0.03%	1.80%	1.75%	1.56%	0.17%	0.17%	0.58%	0.00%	0.03%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Apr-15	0.61%	0.64%	0.56%	1.48%	1.85%	0.79%	0.52%	0.54%	0.70%	0.10%	0.33%
	b) Worst affected cells>3% TCH drop	<=3%	Apr-15	1.51%	1.11%	3.21%	2.28%	2.62%	1.90%	0.04%	1.14%	2.60%	0.59%	7.81%
	c) % of connections with good voice quality	>=95%	Apr-15	97.67%	99.63%	98.90%	NP	NP	97.18%	97.85%	98.55%	98.94%	99.85%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Apr-15	439	4	277	261	142	558	5	57	444	32	101
	e) Total no. of cells (Sector) in the licensed service area		Apr-15	29138	384	8632	11437	5430	29380	11757	4984	17065	5460	1293
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		Apr-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Apr-15	0	0	0	0	0	0	0	0	0	0	0
Network Data														
5	a) Equipped Capacity of Network in Erlang		Apr-15	287204	617	138776	224500	130000	483064	295000	69289	122716	146000	103443
	b) Total traffic in TCBH in erlang (Avg.)		Apr-15	237409	2	63323	61222	53179	417631	166380	33825	114872	62676	12804
	c) Total no. of customers served (as per VLR) on last day of the month		Apr-15	11038453	393	2956429	1921052	899019	21017956	9130262	1518647	5212912	1930024	188665

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - Apr 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Live data	9417	128	2876	3623	1840	9768	3973	1644	5667	1814	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	878	23	69	5022	1530	4143	418	241	1013	595	1
	c) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.25%	0.03%	1.93%	1.15%	0.59%	0.15%	0.20%	0.25%	0.46%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	32	5	22	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.88%	0.27%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.58%	99.62%	98.69%	96.45%	95.88%	97.45%	98.21%	99.13%	99.49%	99.36%	99.21%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.06%	0.01%	0.02%	0.54%	0.86%	0.64%	0.02%	0.13%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.50%	0.00%	0.03%	1.68%	1.45%	1.32%	0.14%	0.09%	0.51%	0.00%	0.01%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.62%	0.32%	0.55%	1.55%	1.73%	0.78%	0.50%	0.47%	0.74%	0.09%	0.30%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.60%	1.13%	2.69%	2.18%	2.73%	1.84%	0.03%	0.76%	2.69%	0.53%	9.59%
	c) % of connections with good voice quality	>=95%	Live data	97.66%	99.72%	98.79%	NP	NP	97.11%	97.90%	98.59%	98.87%	99.84%	99.20%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	464	4	232	249	148	541	4	38	459	29	124
	e) Total no. of cells (Sector) in the licensed service area		Live data	29048	384	8632	11437	5430	29411	11758	5000	17072	5460	1293
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 – May 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		May-15	9500	128	2916	3519	1859	9804	3975	1654	5690	1814	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		May-15	11345	314	675	51866	26610	42150	5999	3555	8759	7014	253
	c) BTS Accumulated Downtime	<=2%	May-15	0.16%	0.33%	0.03%	1.98%	1.92%	0.58%	0.20%	0.29%	0.21%	0.52%	0.08%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		May-15	35	2	0	40	36	144	19	22	36	0	1
	e) Worst affected BTSs due to downtime	<=2%	May-15	0.37%	1.56%	0.00%	1.14%	1.94%	1.47%	0.48%	1.33%	0.63%	0.00%	0.23%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	<=2%	May-15	99.61%	98.81%	98.48%	96.01%	95.28%	97.74%	98.91%	99.05%	99.31%	99.36%	98.29%
	b) SDCC/PAGING Congestion	<=3%	May-15	0.06%	0.24%	0.04%	0.66%	0.90%	0.79%	0.03%	0.13%	0.21%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	0.40%	0.00%	0.08%	1.81%	1.78%	1.74%	0.19%	0.11%	0.69%	0.00%	0.79%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	May-15	0.58%	0.76%	0.60%	1.65%	1.82%	0.73%	0.48%	0.50%	0.65%	0.10%	0.40%
	b) Worst affected cells>3% TCH drop	<=3%	May-15	1.35%	1.04%	3.28%	2.55%	2.64%	1.38%	0.03%	1.02%	2.41%	0.70%	7.12%
	c) % of connections with good voice quality	>=95%	May-15	97.82%	99.02%	98.78%	NP	NP	97.22%	97.89%	98.50%	98.98%	99.84%	99.29%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		May-15	394	4	286	286	145	406	4	51	411	38	92
	e) Total no. of cells (Sector) in the licensed service area		May-15	29234	384	8727	11213	5487	29406	11735	5022	17083	5457	1293
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		May-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		May-15	0	0	0	0	0	0	0	0	0	0	0
Network Data														
5	a) Equipped Capacity of Network in Erlang		May-15	292159	614	140294	218200	130000	486976	295000	69670	122477	146000	103443
	b) Total traffic in TCBH in erlang (Avg.)		May-15	219147	2	65950	59685	51537	440704	160245	35275	116678	60099	15079
	c) Total no. of customers served (as per VLR) on last day of the month		May-15	11010259	380	2933949	1895256	905644	20969608	9164744	1559435	5161360	1930603	173107

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - May 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	9482	128	2897	3519	1859	9779	3973	1653	5676	1814	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	1348	41	134	5022	1260	4703	712	348	1582	685	29
	c) BTS Accumulated Downtime	<=2%	Live data	0.20%	0.45%	0.06%	1.98%	0.94%	0.67%	0.25%	0.29%	0.39%	0.52%	0.09%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	35	1	23	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.99%	0.05%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.63%	99.31%	98.60%	96.42%	95.32%	97.64%	98.92%	99.08%	99.20%	99.32%	97.96%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.04%	0.12%	0.03%	0.62%	0.86%	0.62%	0.02%	0.11%	0.70%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.44%	0.00%	0.05%	1.75%	1.71%	1.70%	0.21%	0.13%	0.80%	0.00%	1.14%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.57%	0.35%	0.60%	1.61%	1.72%	0.79%	0.31%	0.51%	0.70%	0.09%	0.39%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.34%	1.04%	3.31%	2.40%	2.55%	1.63%	0.03%	0.89%	2.56%	0.70%	7.81%
	c) % of connections with good voice quality	>=95%	Live data	97.83%	99.01%	98.78%	NP	NP	97.21%	97.87%	98.50%	98.98%	99.83%	99.28%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	392	4	288	269	139	479	4	45	437	38	101
	e) Total no. of cells (Sector) in the licensed service area		Live data	29218	384	8700	11213	5457	29322	11758	5029	17095	5457	1293
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 - June 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Jun-15	9517	128	2927	3519	1859	9844	NP	1656	5710	NP	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jun-15	14142	758	582	48949	24804	38849	NP	4398	12973	NP	338
	c) BTS Accumulated Downtime	<=2%	Jun-15	0.21%	0.82%	0.03%	1.93%	1.85%	0.55%	NP	0.37%	0.32%	NP	0.11%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jun-15	18	0	0	40	36	146	NP	21	60	NP	0
e) Worst affected BTSs due to downtime	<=2%	Jun-15	0.19%	0.00%	0.00%	1.14%	1.94%	1.48%	NP	1.27%	1.05%	NP	0.00%	
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	<=2%	Jun-15	99.59%	98.09%	98.56%	96.21%	95.38%	97.97%	NP	98.58%	99.28%	NP	98.08%
	b) SDCC/PAGING Congestion	<=3%	Jun-15	0.08%	0.46%	0.06%	0.65%	0.76%	0.68%	NP	0.21%	0.16%	NP	0.00%
c) TCH congestion	<=2%	Jun-15	0.39%	0.00%	0.05%	1.73%	1.85%	1.32%	NP	0.33%	0.72%	NP	1.04%	
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Jun-15	0.65%	0.46%	0.62%	1.59%	1.69%	0.84%	NP	0.57%	0.74%	NP	0.45%
	b) Worst affected cells>3% TCH drop	<=3%	Jun-15	1.72%	1.04%	3.13%	2.54%	2.55%	2.37%	NP	1.88%	2.89%	NP	7.16%
	c) % of connections with good voice quality	>=95%	Jun-15	97.63%	99.33%	98.75%	NP	NP	97.07%	NP	98.26%	98.94%	NP	99.26%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jun-15	503	4	275	285	140	701	NP	95	494	NP	93
e) Total no. of cells (Sector) in the licensed service area		Jun-15	29234	384	8776	11213	5487	29551	NP	5040	17118	NP	1293	
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Jun-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jun-15	0	0	0	0	0	0	0	0	0	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang		Jun-15	292297	615	141524	224500	130000	488633	NP	70228	123014	NP	103443
	b) Total traffic in TCBH in erlang (Avg.)		Jun-15	207825	2	64768	60539	51160	417761	NP	36249	112846	NP	14366
c) Total no. of customers served (as per VLR) on last day of the month		Jun-15	11029596	359	3002772	1907491	920764	21162615	NP	1645703	5036351	NP	182332	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MP&CG Circle - June 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL (MP)	BSNL (CG)	IDEA CELLULAR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Live data	9484	128	2927	3519	1859	9804	NP	1655	5690	NP	428
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	791	101	42	5018	1890	4058	NP	529	1167	NP	14
	c) BTS Accumulated Downtime	<=2%	Live data	0.12%	1.09%	0.02%	1.98%	1.41%	0.57%	NP	0.44%	0.28%	NP	0.05%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	36	7	25	NP	0	0	NP	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	1.02%	0.38%	0.25%	NP	0.00%	0.00%	NP	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.63%	96.05%	98.58%	96.02%	95.60%	98.02%	NP	98.55%	99.30%	NP	97.83%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.05%	0.33%	0.05%	0.72%	0.78%	0.82%	NP	0.35%	0.21%	NP	0.00%
	c) TCH congestion	<=2%	Live data	0.36%	0.00%	0.04%	1.91%	1.57%	0.94%	NP	0.46%	0.70%	NP	1.36%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.57%	0.31%	0.66%	1.61%	1.82%	0.78%	NP	0.59%	0.84%	NP	0.50%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.33%	1.48%	3.72%	2.51%	2.62%	2.27%	NP	1.33%	3.23%	NP	8.89%
	c) % of connections with good voice quality	>=95%	Live data	97.85%	99.86%	98.75%	NP	NP	97.18%	NP	98.17%	98.91%	NP	99.13%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	388	6	327	281	144	669	NP	67	553	NP	115
	e) Total no. of cells (Sector) in the licensed service area		Live data	29252	384	8786	11213	5487	29523	NP	5042	17126	NP	1293
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 (APRIL TO JUNE 2015 MONTHS AUDITED DATA):

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/N	Name of Parameter			GSM Operators									CDMA Operators
Customer Service Quality Parameters													
1 Metering & Billing Credibility -Post Paid													
	A) No. Of bills issued during the quarter		MP&CG	9	663468	405505	1487961	366994	132011	NA	391275	254277	18688
	B) No. of bills disputed including billing complaints during the quarter		MP&CG	0	133	17	475	329	1	NA	327	229	0
	C)% of billing complaints during the quarter	<= 0.1%	MP&CG	0.00%	0.02%	0.004%	0.03%	0.09%	0.001%	NA	0.08%	0.09%	0.00%
2 Metering & Billing Credibility -Pre Paid													
	A) Total No. of Pre-paid customers at the end of the quarter		MP&CG	21191	11308724	3202497	19394423	10224089	4957969	3126004	6243493	1966729	209004
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		MP&CG	0	197	1254	8349	9112	0	17	8375	1380	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	MP&CG	0.00%	0.002%	0.04%	0.04%	0.09%	0.00%	0.001%	0.13%	0.07%	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	330	1270	37855	9441	1	17	8702	1609	0
	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	330	1270	37855	9441	1	17	8702	1609	0

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	330	1270	37855	9441	1	17	8702	1609	0
	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	4386	2676328	3272004	61635910	13271414	1059530	600917	17894931	1392974	51884
	B) Total no. of calls successfully established to customer care/Call center		MP&CG	4299	2676244	3260418	60382387	13129962	1043897	600917	17894931	1374174	50894
	C) % Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	98.02%	100.00%	99.65%	97.97%	98.93%	98.52%	100.00%	100.00%	98.65%	98.09%
	D) Total Calls reached to operator for Voice to Voice (Total call attempt)		MP&CG	675	3866965	1647687	11563855	4634526	1839445	2038117	4858868	416287	57315
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		MP&CG	659	3755150	1629878	10838939	4249093	1814777	1953194	4827311	412750	56540

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	97.63%	97.11%	98.92%	98.02%	91.68%	98.66%	95.83%	99.35%	99.15%	98.65%
5	Termination/closure of service												
	A) Total No. of requests for Termination / Closure of service received during the quarter		MP&CG	0	2033	1517	21469	832	1982	NA	5694	646	387
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		MP&CG	0	2033	1517	21469	832	1982	NA	5694	646	387
	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	265	626	1824	1081	811	NA	4053	686	181
	B) No. of Payments/ Refunds Cleared during the quarter		MP&CG	0	265	626	1824	1081	811	NA	4053	686	181
	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.

NB: Accessibility of call center / Customer care data of RCOM (GSM & CDMA) are based on average of two months' data i.e. April & May 15, June-15 month data has not provided by RCOM (GSM & CDMA) due to TTI server issue.

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	125	86950	125918	2193248	NP	35295	18255	580040	NP	1628
	Total no. of calls successfully established to customer care/Call center		MP&CG	123	86950	125359	2155206	NP	34623	18255	580040	NP	1589
	% Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt)	>=95%	MP&CG	98.40%	100.00%	99.56%	98.27%	NP	98.10%	100.00%	100.00%	NP	97.60%
2	Total Calls reached to operator for Voice to Voice (Total call attempt)		MP&CG	22	133231	53301	365046	152606	57117	75172	160400	12640	1721
	Total number of calls answered by the operator (Voice to voice) within 90 seconds		MP&CG	22	122407	52906	355470	139569	56439	72185	159874	12592	1700
	% 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%	91.88%	99.26%	97.38%	91.46%	98.81%	96.03%	99.67%	99.62%	98.78%

NP: RCOM (GSM & CDMA) has not provided data for the parameter "Accessibility of call center / Customer care" due to TTI server issue.

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid was within the prescribed bench mark against the benchmark of $\leq 0.1\%$. However, **only Vodafone** failed to meet the benchmark of Billing complaints (for pre-paid) with its performance as **0.13%**.

2. Resolution of Billing complaints and applying credits -

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

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

3. Response Time to the Customer for assistance

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

All service providers are in compliance with respect to the parameter **Accessibility of call center** and **'calls answered by Operators (voice to voice) within 90 seconds** except **RCOM (GSM)** remained under performed for parameter **'Calls answered by Operators (Voice to voice) having its achieved level as 91.68%**.

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 Airtel), have met the benchmarks for the parameters **'Accessibility to call center'** and **'Call answered by operators (Voice to voice)'**. **Only Airtel and RCOM(GSM)** have failed to meet the benchmark of the parameter **'Call answered by operators (Voice to voice)'** with their performance as **91.88% and 91.46%** 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	VIDEOCON	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE
AIRCEL	MP & CG	Nil	-	-	-	-	-	-	-	-	-
AIRTEL		Nil	-	100%	96%	100%	100%	100%	100%	98%	100%
VIDEOCON		Nil	100%	-	100%	100%	99%	98%	99%	100%	98%
BSNL		Nil	100%	99%	-	97%	100%	100%	100%	99%	100%
IDEA		Nil	98%	100%	100%	-	100%	100%	100%	100%	98%
RCOM GSM		Nil	100%	100%	96%	100%	-	98%	98%	100%	100%
RCOM CDMA		Nil	100%	100%	100%	100%	100%	-	100%	98%	99%
TATA GSM		Nil	100%	100%	100%	98%	98%	100%	-	100%	100%
TATA CDMA		Nil	100%	98%	100%	100%	100%	100%	100%	-	100%
VODAFONE		Nil	99%	100%	99%	100%	99%	99%	99%	100%	-

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. Thus there was no remarkable problem in interconnection from one operator to other operators. Call inter connections were ranging from 96 % to 100%.

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

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE										
Parameter	Circle Name	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total no of calls attempted to customer care/Call center	MP&CG	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	MP&CG	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total call successfully established * 100/ Total call attempts)	MP&CG	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Calls reached to agent desk for Voice to Voice (Total call attempts)	MP&CG	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	MP&CG	100	100	100	100	100	100	100	100	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100/Total call attempts)	MP&CG	100%	100%	100%	100%	100%	100%	100%	100%	100%

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 found to have 100% of call access and answered from the call center operators 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	1	17	100	100	NA
Total No. of calls Answered	MP&CG	100	100	100	100	1	17	100	100	NA
Resolution of Billing complaints	MP&CG	100	100	100	100	1	17	100	100	NA
%age of cases resolved	MP&CG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, some of the customers did not attend the calls, so shortfall was made good by taking other complaints to make verification of 100 Complaints. Some of the complainants reported that they didn't exactly remember about the resolution of complaints. However, majority of the customers reported that the billing complaints were resolved to their satisfaction.

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING																	
Emergency no.	Circle Name	Month of Drive Test	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VIDEOCON	VODAFONE		
100 /108 /1091 / 1098	MP & CG	Apr'15	Raigarh SSA	Sarangarh	14	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓		
				Ghargoda	12	NC	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓	
				Pathalgaon	12	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Raigarh	12	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100 /108 /1091 / 1098	MP & CG	May'15	Raipur SSA	Bhaatapara	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
				Balodabazaar	7	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
				Tilda Neora	7	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Aarang	7	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Bagbahera	7	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Kurud	7	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Raipur	7	NC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100 /108 /1091 / 1098	MP & CG	June'15	Sagar SSA	Bina	9	NC	✓	✓	✓	✓	✓	✓	NC	✓	✓		
				Khurai	9	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓	
				Banda	8	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Rehli	8	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Deori	8	NC	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓	✓
				Sagar	8	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 **Raigarh, Raipur and Sagar** in the months of April, May and June 2015 respectively. The total route Km covered during drive tests in respective SSAs was **306 KMs, 325 KMs and 300 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: RAIGARH SSA (APRIL-15)

DRIVE TEST TABLE: 1

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA			
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR		
1	Call Attempts	Highways	NC	NC	121	25	184	25	134	25	119	25	193	25	89	25	113	25	34	NC	117	25		
		Major Roads	NC	NC	99	25	176	25	142	25	96	25	104	25	90	25	98	26	38	NC	103	26		
		Within City	NC	NC	216	20	316	20	221	20	219	20	263	22	184	20	212	22	129	20	369	19		
		Overall SSA	NC	NC	436	70	676	70	497	70	434	70	560	72	363	70	423	73	201	20	589	70		
2	Blocked Call Rate	Highways	NC	NC	0.83%	0.00%	2.17%	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%		
		Major Roads	NC	NC	0.00%	0.00%	1.70%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.85%	0.00%	NC	0.00%	0.00%		
		Within City	NC	NC	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	0.46%	0.00%	0.00%	0.00%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.54%	0.00%		
		Overall SSA	NC	NC	0.23%	0.00%	1.92%	1.37%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.28%	0.00%	0.00%	1.37%	0.00%	0.00%	0.34%	0.00%		
3	Dropped Call Rate (<=2%)	Highways	NC	NC	2.56%	0.00%	2.25%	0.00%	0.00%	0.00%	0.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%		
		Major Roads	NC	NC	1.02%	0.00%	2.35%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%		
		Within City	NC	NC	1.89%	0.00%	1.63%	0.00%	0.00%	0.00%	1.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Overall SSA	NC	NC	1.87%	0.00%	1.99%	1.49%	0.00%	0.00%	0.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%		
4	(a) 0-4 (w/o frequency hopping for CDMA)	Percentage connections with good voice quality (=>95%)																						
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.69%	NC	100%	100%	
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.85%	NC	100%	100%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.82%	100%	100%	100%	

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2015-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.80%	100%	100%	100%
Operators)	(b) 0-5 (with frequency hopping for GSM Operators)	Highways	NC	NC	96.11%	99.65%	99.13%	99.61%	98.44%	99.95%	92.85%	99.80%	91.04%	93.86%	98.94%	100%	99.39%	99.75%	NA	NA	NA	NA	
		Major Roads	NC	NC	96.20%	98.05%	98.62%	98.56%	98.90%	99.92%	95.16%	95.05%	92.69%	98.48%	98.86%	99.90%	98.55%	99.73%	NA	NA	NA	NA	
		Within City	NC	NC	95.53%	94.98%	96.94%	98.41%	98.40%	96.27%	90.91%	97.65%	90.71%	97.03%	98.61%	99.65%	97.43%	97.55%	NA	NA	NA	NA	
		Overall SSA	NC	NC	95.84%	97.37%	97.98%	98.91%	98.55%	98.81%	92.34%	96.29%	91.25%	96.74%	98.76%	99.86%	98.59%	99.24%	NA	NA	NA	NA	
5	Service Coverage	In door (>= - 75dBm)	Highways	NC	NC	64.54%	79.31%	20.76%	14.56%	89.38%	99.99%	42.63%	56.59%	69.83%	99.42%	73.57%	49.32%	90.28%	99.60%	44.83%	NC	50.53%	100%
			Major Roads	NC	NC	70.99%	76.77%	21.63%	24.99%	89.64%	99.99%	43.94%	99.88%	75.53%	100%	79.56%	83.01%	93.52%	58.12%	59.37%	NS	56.99%	100%
			Within City	NC	NC	68.61%	18.73%	15.62%	18.93%	87.66%	99.39%	60.97%	80.46%	77.58%	100%	75.64%	72.99%	95.63%	52.93%	42.78%	21.61%	47.35%	100%
			Overall SSA	NC	NC	68.05%	58.27%	18.52%	19.44%	88.89%	99.79%	52.10%	79.29%	74.42%	99.82%	76.26%	68.44%	93.87%	70.13%	48.99%	21.61%	51.62%	100%
	In-vehicle (>= - 85dBm)	Highways	NC	NC	87.00%	99.57%	74.82%	91.58%	97.25%	100%	80.39%	99.22%	95.21%	100%	85.32%	97.76%	98.37%	99.74%	88.79%	NC	83.78%	100%	
		Major Roads	NC	NC	90.16%	99.72%	75.89%	91.57%	97.32%	100%	79.17%	100%	97.12%	100%	89.94%	98.95%	98.32%	97.02%	95.86%	NC	88.21%	100%	
		Within City	NC	NC	91.29%	98.48%	66.92%	95.58%	96.82%	99.92%	90.12%	100%	97.58%	100%	87.55%	98.31%	99.16%	94.19%	93.08%	96.76%	81.58%	100%	
		Overall SSA	NC	NC	89.49%	99.26%	71.30%	92.78%	97.13%	99.97%	84.99%	99.73%	96.65%	100%	87.60%	98.34%	98.77%	97.12%	92.57%	96.76%	84.52%	100%	
	Outdoor-in city (>= - 95dBm)	Highways	NC	NC	97.87%	99.95%	100%	100%	99.72%	100%	98.69%	100%	98.87%	100%	94.05%	99.55%	99.99%	99.76%	99.83%	NC	98.83%	100%	
		Major Roads	NC	NC	99.24%	100%	100%	100%	99.82%	100%	99.20%	100%	99.91%	100%	96.85%	99.20%	99.98%	99.42%	100%	NC	98.90%	100%	
		Within City	NC	NC	99.07%	100%	100%	100%	99.67%	100%	99.68%	100%	99.95%	100%	96.36%	100%	99.98%	99.91%	99.99%	100%	98.76%	100%	
		Overall SSA	NC	NC	98.73%	99.98%	100%	100%	99.74%	100%	99.30%	100%	99.56%	100%	95.75%	99.58%	99.99%	99.66%	99.94%	100%	98.83%	100%	
	6	Call Setup	Highways	NC	NC	96.69%	100%	96.74%	96.00%	100%	100%	100%	100%	100%	100%	100%	100%	98.23%	96.00%	100%	NC	100%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2015-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Success Rate (>=95%)	Major Roads	NC	NC	98.99%	100%	96.59%	92.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.96%	96.15%	100%	NC
Within City	NC	NC		98.15%	100%	96.84%	95.00%	100%	100%	99.54%	100%	100%	100%	99.46%	100%	98.58%	100%	100%	100%	99.46%	100%		
Overall SSA	NC	NC		97.94%	100%	96.75%	94.29%	100%	100%	99.77%	100%	100%	100%	99.72%	100%	98.35%	97.26%	100%	100%	99.66%	100%		
Highways	NC	NC		93.75%	100%	99.14%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC	100%	100%	
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	98.39%	100%	92.39%	100%	100%	100%	99.19%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC	100%	100%
		Within City	NC	NC	99.78%	100%	97.75%	100%	100%	100%	98.16%	100%	100%	100%	99.44%	100%	100%	100%	100%	100%	100%	100%	
		Overall SSA	NC	NC	97.63%	100%	97.11%	100%	100%	100%	98.81%	100%	100%	100%	99.72%	100%	100%	100%	100%	100%	100%	100%	
		Highways	NC	NC	93.75%	100%	99.14%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC	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: RAIPUR SSA (MAY-15)

DRIVE TEST TABLE: 2

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
1	Call Attempts	Highways	NA	24	107	25	136	25	127	25	118	25	130	25	125	25	117	25	68	25	152	25	
		Major Roads	NA	NC	137	25	152	25	135	25	130	25	165	30	131	25	120	25	84	NC	171	29	
		Within City	36	NC	175	25	197	20	195	25	190	25	230	30	195	25	184	25	144	25	216	30	
		Overall SSA	36	24	419	75	485	70	457	75	438	75	525	85	451	75	421	75	296	50	539	84	
2	Blocked Call Rate	Highways	NA	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%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Major Roads	NA	NC	0.73%	0.00%	2.13%	4.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	2.78%	NC	0.57%	0.00%	0.51%	0.00%	0.00%	0.00%	0.53%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Overall SSA	2.78%	0.00%	0.48%	0.00%	0.84%	1.37%	0.00%	0.00%	0.23%	1.33%	0.00%	0.00%	0.22%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Highways	NA	0.00%	0.00%	0.00%	0.75%	0.00%	0.79%	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	NA	NC	0.00%	0.00%	2.70%	4.17%	0.00%	0.00%	0.77%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%	
		Within City	0.00%	NC	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.53%	0.00%	0.43%	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%	1.91%	1.49%	0.22%	0.00%	0.46%	0.00%	0.38%	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	99.55%	99.97%	93.20%	100%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.49%	NC	95.24%	100%
Within		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.61%	99.97%	95.25%	97.75%	

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2015-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
Operators)	City																					
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.56%	99.97%	94.60%	98.65%
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	NA	99.42%	97.01%	98.21%	99.11%	99.61%	98.82%	99.97%	92.23%	86.37%	94.87%	96.41%	99.24%	99.98%	97.96%	100%	NA	NA	NA	NA	
	Major Roads	NA	NC	97.37%	99.45%	98.96%	98.56%	98.70%	99.94%	94.65%	98.53%	92.58%	100%	99.28%	99.98%	98.11%	99.72%	NA	NA	NA	NA	
	Within City	98.23%	NC	98.22%	99.07%	97.15%	98.41%	99.59%	99.98%	95.09%	97.79%	93.92%	100%	99.08%	99.94%	98.55%	99.32%	NA	NA	NA	NA	
	Overall SSA	98.23%	99.42%	97.68%	98.70%	98.03%	98.91%	99.10%	99.96%	94.22%	92.84%	93.82%	98.57%	99.18%	99.97%	98.26%	99.68%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Highways	NA	74.32%	70.61%	14.34%	77.95%	14.56%	90.71%	83.64%	85.14%	100%	60.55%	95.80%	84.93%	90.77%	90.88%	100%	92.45%	100%	85.53%	95.70%
		Major Roads	NA	NC	79.21%	95.45%	46.79%	24.99%	88.71%	82.03%	90.12%	99.84%	68.67%	82.69%	86.29%	78.90%	97.30%	100%	85.94%	NC	85.14%	100%
		Within City	68.59%	NC	79.26%	99.90%	23.02%	18.93%	88.28%	99.89%	95.92%	100%	79.03%	100%	86.80%	99.96%	95.92%	100%	90.02%	100%	77.57%	100%
		Overall SSA	68.59%	74.32%	76.36%	69.89%	44.24%	19.44%	86.22%	88.48%	91.24%	99.93%	71.62%	97.61%	86.00%	89.88%	94.64%	100%	89.45%	100%	82.38%	99.01%
5	In-vehicle (>= - 85dBm)	Highways	NA	98.98%	77.12%	96.52%	77.95%	91.58%	98.30%	99.37%	99.05%	100%	94.10%	100%	97.10%	99.90%	99.00%	100%	100%	100%	98.36%	97.13%
		Major Roads	NA	NC	89.29%	99.92%	73.05%	91.57%	98.53%	98.43%	98.59%	100%	96.36%	100%	97.96%	98.11%	99.73%	100%	98.89%	NC	98.17%	100%
		Within City	96.63%	NC	92.56%	100%	66.69%	95.58%	97.13%	100%	99.96%	100%	97.83%	100%	96.99%	100%	99.92%	100%	99.81%	100%	94.66%	100%
		Overall SSA	96.63%	98.98%	86.32%	98.81%	71.38%	92.78%	96.48%	99.27%	99.28%	100%	96.53%	100%	97.35%	99.34%	99.49%	100%	99.60%	100%	96.89%	99.34%
5	Outdoor-in city (>= - 95dBm)	Highways	NA	100%	99.88%	99.96%	100%	100%	99.84%	100%	100%	100%	99.53%	100%	99.71%	99.99%	99.99%	100%	100%	100%	99.98%	97.85%
		Major Roads	NA	NC	99.83%	100%	100%	100%	99.93%	99.96%	100%	100%	99.76%	100%	99.90%	100%	99.99%	100%	100%	NC	99.99%	100%
		Within City	99.96%	NC	99.96%	100%	92.80%	100%	99.81%	100%	100%	100%	99.95%	100%	99.78%	100%	100%	100%	100%	100%	99.91%	100%
		Overall	99.96%	100%	99.89%	99.99%	96.51%	100%	99.77%	99.99%	100%	100%	99.80%	100%	99.80%	100%	100%	100%	100%	100%	99.96%	99.51%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2015-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			SSA																				
6	Call Setup Success Rate (>=95%)	Highways	NA	100%	100%	100%	97.79%	96.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.15%	100%	100%	100%	100%	100%
		Major Roads	NA	NC	99.27%	100%	97.37%	92.00%	100%	100%	100%	96.00%	100%	100%	100%	100%	100%	100%	100%	100%	NC	100%	100%
		Within City	97.22%	NC	99.43%	100%	96.45%	95.00%	100%	100%	99.47%	100%	100%	100%	99.49%	100%	99.46%	100%	100%	100%	100%	100%	100%
		Overall SSA	97.22%	100%	99.52%	100%	97.11%	94.29%	100%	100%	99.77%	98.67%	100%	100%	99.78%	100%	99.52%	100%	100%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Highways	NA	100%	99.54%	100%	99.21%	100%	99.51%	100%	100%	100%	99.60%	100%	99.47%	100%	100%	100%	100%	100%	100%	100%	100%
		Major Roads	NA	NC	99.62%	100%	92.13%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC	100%	100%
		Within City	100%	NC	100%	100%	97.51%	100%	100%	100%	100%	100%	99.57%	100%	99.65%	100%	100%	100%	99.88%	100%	100%	100%	100%
		Overall SSA	100%	100%	99.73%	100%	97.02%	100%	99.86%	100%	100%	100%	99.70%	100%	99.69%	100%	100%	100%	99.95%	100%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

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

7.3 OPERATOR ASSISTED DRIVE TEST: SAGAR SSA (JUNE-15)

DRIVE TEST TABLE: 3

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			1	Call Attempts	Highways	16	25	66	25	102	20	90	20	78	25	69	35	127	25	99	27	90
Major Roads	10	NC			131	25	140	25	139	21	139	24	117	21	141	25	157	24	139	21	116	15
Within City	6	NC			178	25	195	25	201	20	181	20	124	20	200	20	200	20	201	20	123	20
Overall SSA	32	25			375	75	437	70	430	61	398	69	310	76	468	70	456	71	430	61	302	70
2	Blocked Call Rate	Highways	0.00%	0.00%	0.00%	0.00%	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	2.90%	0.00%	0.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Major Roads	0.00%	NC	0.00%	0.00%	0.71%	0.00%	0.00%	0.00%	0.72%	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%	2.05%	0.00%	1.00%	0.00%	0.00%	0.00%	1.61%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	1.37%	0.00%	0.47%	0.00%	0.25%	0.00%	0.00%	0.00%	0.21%	0.00%	0.00%	0.00%	0.47%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Highways	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Major Roads	0.00%	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	NC	0.00%	0.00%	0.52%	0.00%	0.00%	0.00%	0.00%	0.00%	2.46%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.33%	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	98.70%	95.42%	98.64%	100%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.29%	98.75%	98.63%	97.95%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.96%	99.74%	97.98%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2015-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.05%	98.14%	98.41%
5	Operators)	Highways	98.78%	99.57%	97.04%	97.42%	93.44%	99.67%	98.70%	95.42%	96.77%	96.05%	93.43%	98.60%	96.48%	99.86%	98.03%	99.56%	NA	NA	NA	NA
		Major Roads	98.46%	NC	97.35%	98.12%	91.94%	99.78%	99.29%	98.75%	97.27%	99.90%	92.67%	98.43%	96.68%	99.91%	97.43%	96.83%	NA	NA	NA	NA
		Within City	98.81%	NC	97.24%	98.33%	91.27%	100%	98.96%	99.74%	97.59%	99.29%	92.76%	100%	96.31%	99.63%	97.33%	97.73%	NA	NA	NA	NA
		Overall SSA	98.69%	99.57%	97.24%	97.92%	91.99%	99.83%	99.05%	98.14%	97.32%	98.16%	92.86%	98.73%	96.45%	99.81%	97.49%	98.12%	NA	NA	NA	NA
5	Service Coverage	Highways	92.32%	95.71%	44.44%	12.30%	60.58%	45.39%	62.33%	96.73%	77.52%	76.74%	48.75%	99.42%	62.19%	17.29%	91.47%	100%	62.33%	96.73%	64.41%	98.64%
		Major Roads	94.32%	NC	62.02%	100%	66.25%	99.04%	78.96%	100%	86.03%	100%	55.99%	88.63%	79.41%	84.41%	92.33%	100%	78.96%	100%	60.01%	100%
		Within City	87.21%	NC	64.85%	79.87%	62.89%	99.97%	87.95%	100%	87.53%	100%	57.45%	100%	73.41%	68.05%	90.45%	97.09%	87.95%	100%	68.82%	100%
		Overall SSA	91.28%	95.71%	57.10%	64.06%	63.44%	84.02%	76.41%	98.91%	85.00%	91.75%	55.20%	79.49%	71.67%	56.58%	91.24%	99.05%	76.41%	98.91%	63.55%	98.91%
	In-door (>= - 75dBm)	Highways	98.79%	99.95%	77.69%	30.26%	89.90%	97.22%	88.43%	100%	98.74%	99.64%	94.20%	100%	90.86%	87.24%	98.37%	100%	88.43%	100%	94.06%	100%
		Major Roads	99.69%	NC	90.45%	100%	96.35%	99.04%	95.38%	100%	99.01%	100%	95.16%	99.62%	95.99%	90.43%	99.56%	100%	95.38%	100%	89.45%	100%
		Within City	97.87%	NC	89.66%	99.66%	91.11%	100%	98.56%	100%	99.20%	100%	94.65%	100%	95.68%	93.88%	97.95%	100%	98.56%	100%	93.09%	100%
		Overall SSA	98.78%	99.95%	85.93%	76.64%	92.52%	98.86%	94.12%	100%	99.04%	99.87%	94.75%	96.18%	94.18%	90.52%	98.54%	100%	94.12%	100%	91.31%	100%
	In-vehicle (>= - 85dBm)	Highways	100%	100%	97.56%	96.40%	99.35%	99.97%	98.91%	100%	99.97%	100%	100%	100%	99.64%	93.60%	99.23%	100%	98.91%	100%	99.98%	100%
		Major Roads	100%	NC	98.92%	100%	99.89%	99.90%	99.83%	100%	99.97%	100%	99.98%	100%	99.77%	96.20%	99.88%	100%	99.83%	100%	99.73%	100%
		Within City	100%	NC	99.26%	100%	99.15%	100%	99.99%	100%	100%	100%	99.85%	100%	99.48%	100%	99.26%	100%	99.99%	100%	99.75%	100%
		Overall SSA	100%	100%	98.58%	98.80%	99.43%	99.96%	99.58%	100%	99.99%	100%	99.93%	100%	99.63%	96.60%	99.45%	100%	99.58%	100%	99.77%	100%
Outdoor-in city (>= - 95dBm)	Highways	100%	100%	97.56%	96.40%	99.35%	99.97%	98.91%	100%	99.97%	100%	100%	100%	99.64%	93.60%	99.23%	100%	98.91%	100%	99.98%	100%	
	Major Roads	100%	NC	98.92%	100%	99.89%	99.90%	99.83%	100%	99.97%	100%	99.98%	100%	99.77%	96.20%	99.88%	100%	99.83%	100%	99.73%	100%	
	Within City	100%	NC	99.26%	100%	99.15%	100%	99.99%	100%	100%	100%	99.85%	100%	99.48%	100%	99.26%	100%	99.99%	100%	99.75%	100%	
	Overall SSA	100%	100%	98.58%	98.80%	99.43%	99.96%	99.58%	100%	99.99%	100%	99.93%	100%	99.63%	96.60%	99.45%	100%	99.58%	100%	99.77%	100%	
6	Call Setup	Highways	100%	100%	100%	100%	99.02%	100%	100%	100%	100%	100%	97.10%	100%	99.21%	100%	100%	100%	100%	100%	100%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2015-MP&CG CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA			
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR		
	Success Rate (>=95%)	Major Roads	100%	NC	100%	100%	99.29%	100%	100%	100%	99.28%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Within City	100%	NC	99.44%	100%	97.95%	100%	99.00%	100%	100%	100%	98.39%	100%	100%	100%	100%	100%	100%	99.00%	100%	100%	100%	
		Overall SSA	100%	100%	99.73%	100%	98.63%	100%	99.53%	100%	99.75%	100%	98.71%	100%	99.79%	100%	100%	100%	99.53%	100%	100%	100%	100%	
		Highways	100%	100%	100%	100%	98.80%	100%	100%	100%	100%	97.06%	100%	100%	100%	100%	100%	98.17%	100%	100%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	100%	NC	100%	100%	97.01%	100%	100%	100%	98.48%	100%	100%	100%	100%	100%	99.56%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	NC	100%	100%	97.06%	100%	99.40%	100%	99.32%	100%	100%	100%	100%	100%	99.12%	100%	99.40%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	97.42%	100%	99.74%	100%	99.10%	97.47%	100%	100%	100%	100%	99.11%	100%	99.74%	100%	100%	100%	100%	100%
		Highways	100%	100%	100%	100%	98.80%	100%	100%	100%	100%	97.06%	100%	100%	100%	100%	100%	98.17%	100%	100%	100%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

DRIVE TEST ROUTE OF APRIL TO JUNE 15 – MP&CG CIRCLE

Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
Raigarh	Apr-15	Sarangarh / 61 KM	<p>Sarangarh SDCA :-Raipur Marg to Bharat Mata Chowk to Sarangarh Bus Stand to Raigarh Marg to Mona School Chowk.,Sarangarh Bus Stand to Bilaspur Road (NH 200),Bharat mata chowk to Bilspur road to Bajrangbali Temple to Kosir Jashpur Road,Sarangarh Town (Bharat mata chowk to Maa Gayatri Temple to Muncipal School Sarangarh to Palipara to rajapara to Samleswari temple to Turki Talab to Phuljhariapara).</p> <p>Indoor: Sarangarh Bus Stand</p>	Ghargoda & Pathalgaon / 64 KM	<p>Ghargoda SDCA- Lailunga Road , Ambikapur Highway,Chal Road ,Raigarh Road Highway, Jashpur Nagar Highway , Ambikapur High way,Gharghora Highway.</p> <p>Pathalgaon SDCA :- New bus stand , Mission primary school , High school Ghargoda , Nawapara, Pathalgaon Busstand , Govt High school.</p> <p>Indoor: Patthalgaon Bus Stand</p>	Raigarh / 181 KM	<p>Raigarh SDCA:-Sai petrol Pump to Maharsi School to Krishna Velly to Shalini School to Raigarh Statidum to Chidipal Colony to Krishan Vatika Colony to Panchvati Colony to Housing Board Colony to Chiranjeev Das Nagar to Dindayal Awas to JMJ Hospital to Kelo Vihar Colony to Forest Colony to Dindayal Puram to Chandra Nagar to SDM Office to collectorate to District court to TV Tower road to AGRO Office to Raigarh District Jail ,Suvriti Nagar to Kabir Chowk to Sarangarh Marg to Kabadi Godawn (NH 216).Bilaspur Marg to Transport Nagar to Rukmani Vihar to CSEB Colony to Gajanand puram Colony to Shri Hari Cmplx to Bhagwanpur to Gorkha to Patrapali on Jindal road to Kokaditarai to Jindal Plant to Jindal Hospital.</p> <p>Indoor: Raigarh Railway Station</p>
Raipur	May-15	Bhatapara , Balodabazaar & Tilda Neora / 110 KM	<p>Bhatapara - Baloda bazar road,Bajrang ward area,station ward,bajrang ward market area,neal bhatapara area,railwat station,Subhash bazar,telgana road, ramsaptaah chowk,Link road ,Raipur Highway.</p> <p>Balodabazaar- Bhilai garh highway,near bpcl petrol pump,near secrate high school,lavan road, dashera Maidan, garden</p>	Arang , Baghbahara & Kurud / 75 KM	<p>Arang:- Within City- Sabji (Krushi) Mandi, Near Laxmi Vihaar Area, Janpat Nagar. Major Road- Shankar Rice mill Road, Indira Chowk, Polytechnic Road, arang Bus stand Area, Primary School Road. Highway- Raipur Arang highway, Kharora Road.</p> <p>Baghbahara:- Within City- Zalap Chowk,</p>	Raipur / 140 KM	<p>Raipur Within City:- CM Nivas Road, Tiranga Chowk, G.E Road, K.K Road, station Road, Subhash Road, Badhaipara, Purani Basti Area, sadar Bazaar, Mahatma Gandhi Road, Pandhari Market, Devendra Nagar Sec-2, Fafadih, Bilaspur Road, Jail Road, Malviya Rd, Budhapara, Tikrapara, Vivekanand Nagar, Akashwani chowk,</p>

DRIVE TEST ROUTE OF APRIL TO JUNE 15 – MP&CG CIRCLE

Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
			<p>Chowk, shiva goldan chowk, callectrate office,paand road.</p> <p>Tilda Neora- Neora raipur road,pt dindayal chowk,karora raod,simga road,ghasi das chowk,tahsil kalyan road, Khapri Road, Kuthrel Road.</p> <p>Indoor: Railway Station Bhatapara</p>		<p>Carmel convent High school, Zalap road, Tahsil Karyalaya, Town Hall, Nagar Panchayat Road, Bus Stand Road/Area. Major Road- Behind Railway Station Baghbahara. Highway- Khariya Road, Pithora Highway</p> <p>Kurud:- Within City- Bus Stand Area, Teachers Colony, Megha Road, Karyalaya Panchayat, Krushi Mandi, Main Market, Main Bazaar, Indira Nagar, sarojini chowk. Major Road- Industrial Area Road, Bypass Road, JNV Road. Highway- dhamtari Road, Raipur Highway.</p> <p>Indoor: Kurud Bus Stand</p>		<p>Telibandha, Shankar Nagar Area, Anupam Nagar, Gitanjali Nagar, Avanti Vihaar.</p> <p>Raipur Major Road:- From Hotel Babylon to Ghadi Chowk, Sharda Chowk, Amaparaa, Near Gautam Nagar, Mahadev Ghat Road, Sunder Nagar, Dangniya, D.D Nagar Sec-2, NIT Road, G.E Road, TatiBandh, Sarvodaya Nagar, Kabir Nagar, Hirapara Road, Mahoba Bazaar, Gudhiyari Road, Ramnagar, Kota Road, Samta Colony, Choubey Colony, Purani Basti, aminpara, Tikrapara</p> <p>Raipur Highway:- Santoshi Nagar, Ring Road No:1, Dhamteri to Durg Highway, Ring Road No:2 towards Bilaspur, Bhanpuri, Khamtari, Lodhipura, Mova, Kharora Highway, Baghbahara Highway, Bhimtari Highway, Devpuri.</p> <p>Indoor: Hotel Babylon, Raipur</p>
Sagar	Jun-15	Bina & Khurai / 108 KM	<p>Bina:- Within City: Cinema Tiraha, Maalgodam Road, Nai Basti, Nanak Ward, Pathak Ward, Itwara Bazaar, Agasaud Road, Khimlasa Rd, Khurai road, Nagarpalika Road. Major Road: Rajiv Gandhi Ward, BRCC Karyalaya, Niramal Jyoti public School, Ganesh Ward, Railway Residency, Choti Bajroya, Chaitanya Dham Colony. Highway: Pushpwihear Colony, Jawahar Ward, Station Road, Sarvodaya Square, Khurai Road.</p>	Bandha , Rehli & Deori / 88 KM	<p>Banda: Major Road: Nyayalaya Road, Nagar Parishad Road, Market area Banda. Within City: Behind Main Market area, sansad Nivas Road Banda. Highway: Sagar Road, Main Road, Shantinagar Road, Baraa Road, Jail Road./</p> <p>Rehli: Major Road: Chandpur Road, Ward No:10, Nyayalaya Road, Gadhakota Road. Within City:- Tahasil Karyalaya Road, Near Rehli Bus stand area, Main Market</p>	Sagat / 104 KM	<p>Sagar:- Major Road: Indraprasta Colony, Tiligaon, Tiliward, Gopalganj Rd, Kachahri Road, Jail Road, Police Colony, Banda Road, Near Hotel Paradise, Makronia Railway Station, dindayal Nagar, Maanas Nagar, Neha Nagar, Shakti Nagar, Narsingpur Road, Rajakhedi. Within City: Bada Bazaar, Sarafa Bazaar, Neelknth Colony, Laxmipura, Teen Batti tiraaha, Vijay Talkies Rd, Bhuteshwar Marg, Krushi Mandi Road, Mominpura, Bhagwaan Ganj,</p>

DRIVE TEST ROUTE OF APRIL TO JUNE 15 – MP&CG CIRCLE

Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
			<p>/ Khurai:- Major Road: Holy Family convent road, Police station Road, Kabir Ward, Zanda Chowk, SONI Market, Hemant Talkies rd, Ambedkar Ward. Within City: Shivaji Chowk, Pathaaar, Laxmi Ghat talaav Road, Polytechnic Rd. Highway: Bina Highway, Rahatgarh Highway, Sagar Highway.</p> <p>Indoor: Khurai Railway-Station</p>		<p>Rehli. Deori: Major Road: Police Station Rd, Bus stand Road, Main road Deori, Maharajpur Road, Shajpur Rd. Within City: Sahu Seva Samiti Road, Silari Road, Civil Line, Market Area, Nagar Palika Parishad Rd, Baildhaana Road. Highway: Outer Road Deori.</p> <p>Indoor: Deori Bus-Stand</p>		<p>Sagar Railway Station Rd, Gujarat Bazaar, Warni Colony, Civil Lines, Bus Stand Road, Parkota, Tilakganj, Maal Godam Road, Namak Mandi. Highway:- Banda Highway, Teen Batti Road, Bhagwaan Ganj Road, Bhopal Road.</p> <p>Indoor: Sagar, Markroniaya Circle</p>

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF RAIGARH SSA (APRIL-15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Sarangarh	---	Ghargoda & Pathalgaon	---	Raigarh	Poor voice quality observed at - Juit Mill area, Kabi chauk, Lochan Nagar
2	AIRCEL		No Coverage		No Coverage		No Coverage
3	BSNL		Poor Rx Level & voice quality observed at - Nearby Pailpara area		Ghargoda SDCA : Poor Rx Level & voice quality observed at - Nagipara Area		Poor Rx Level & voice quality observed at : Darogamuda, Juit Mill area, Kabi chauk, Lochan Nagar, Sailandra nagar, Ketra road & Gujarati para area.
4	IDEA		---		---		Poor voice quality observed at Bhatta Road & Patelpali Road
5	VODAFONE		---		---		Poor voice quality observed at Kabi chauk & Lochan Nagar
6	VIDEOCON		Poor Rx Level observed at : katgpali koshalmiree area & Jaspur road		Poor Rx Level observed at : Gharaghoda SDCA - Lailunga road, Chhal road, Ambikapur highway & Pathalgaon SDCA: Ambikapur Highway Near Madanpur area		---
7	TATA GSM		---		---		---
8	TATA CDMA		No Coverage		No Coverage		---
9	RCOM GSM		---		---		Poor voice quality observed at : Darogamuda, Juit Mill area, Kabi chauk, Lochan Nagar, Sailandra nagar, Ketra road & Gujarati para area.
10	RCOM CDMA		---		---		---

Common Troublesome Areas: Raigarh SSA:- Kabi chauk ,Lochan Nagar.

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF RAIPUR SSA (MAY-15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Bhatapara, Balodabazar, Tilda Neora	---	Arang, Bagbahera, Kurud	---	Raipur	---
2	AIRCEL		---		---		
3	BSNL		Poor voice quality & Level observed at : Anand Theatre Road (Balodabazaar), Link Road (Bhatapara)		Poor Rx level observed all over Aarang , Bagbahera & kurud area		Poor Rx Level & Quality observed near Tatibandh Colony, Ring Road, Raipur
4	IDEA		---		---		Poor Quality observed at Lodhipara Kapa (Raipur)
5	VODAFONE		---		---		---
6	VIDEOCON		---		---		---
7	TATA GSM		---		---		---
8	TATA CDMA		---		---		---
9	RCOM GSM		---		---		---
10	RCOM CDMA		---		---		Poor Quality Observed near Pachpedi Naaka (Raipur)

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF SAGAR SSA (JUNE-15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Bina, Khurai	---	Banda, Rehli, Deori	---	Sagar	---
2	AIRCEL		---		---		
3	BSNL		Poor Level observed nera Khimlasa Rd (Bina), Poor Quality observed near Government Hospital on NH26A Highway.		Poor Level & Qulity observed near Rajghat Tiraha & Various parts (Sagar)		
4	IDEA		---		---		
5	VODAFONE		---		---		
6	VIDEOCON		---		Poor Level & voice quality observed at : Jhanda Chowk (Banda)		
7	TATA GSM		---		---		
8	TATA CDMA		No Coverage		No Coverage		
9	RCOM GSM		---		Poor Level & Voice Quality observed near Bus Stand (Rehli)		Poor Level & Voice Quality oberved Near Tilak Ganj area & St Pauls Church (Rehli)
10	RCOM CDMA		---		---		

DRIVE TEST TABLE: 8

NO NETWORK COVERAGE STATUS OF DRIVE TEST – APRIL TO JUNE 15

S. No	Month of Drive Test	Operator	SSA	Total SDCA Covered	Status of no network coverage area (SDCA Name)	ICR Status (SDCA Name)
1	Apr-15	Aircel	Raigarh (CG)	Sarangarh , Ghargoda , Pathalgaon & Raigarh	Sarangarh , Ghargoda , Pathalgaon & Raigarh (All SDCA)	No
		Airtel			No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Idea			No Coverage Issue	No
		Videocon			No Coverage Issue	Videocon is on ICR with TATA GSM at Sarangarh, Pathalgaon & Raigarh
		Vodafone			No Coverage Issue	No
		Tata GSM			No Coverage Issue	No
		Tata CDMA			Sarangarh , Ghargoda & Pathalgaon	No
		RCOM GSM			No Coverage Issue	No
		RCOM CDMA			No Coverage Issue	No
2	May-15	Aircel	Raipur (CG)	Raipur ,Bhatapara, Balodabazar, Tilda Neora, Arang, Baghbahara & Kurud	Raipur ,Balodabazaar, Tilda Neora, Arang, Baghbahara & Kurud	No
		Airtel			No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Idea			No Coverage Issue	No
		Videocon			No Coverage Issue	Videocon is on ICR with TATA GSM at Bhatapara, Balodabazaar, Tilda Neora, Arang, Baghbahara & Kurud SDCA
		Vodafone			No Coverage Issue	No
		Tata GSM			No Coverage Issue	TATA GSM is on ICR with RCOM GSM at Kurud SDCA
		Tata CDMA			Tilda Neora, Arang, Baghbahara & Kurud	No
		RCOM GSM			No Coverage Issue	No
		RCOM CDMA			No Coverage Issue	No
3	Jun-15	Aircel	Sagar	Bina, Khurai, Banda, Rehli, Deori & Sagar	Bina, Banda, Rehli, Deori & Sagar SDCA	No
		Airtel			No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Idea			No Coverage Issue	No
		Videocon			No Coverage Issue	Videocon is on ICR With TATA GSM at Bina, Banda & Rehli SDCA
		Vodafone			No Coverage Issue	No
		Tata GSM			No Coverage Issue	No
		Tata CDMA			Bina, Banda, Rehli ,Deori & Khurai SDCA	No
		RCOM GSM			No Coverage Issue	No
		RCOM CDMA			No Coverage Issue	No

7.6 KEY FINDINGS ON DRIVE TEST:

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

April -2015: Raigarh SSA

- (i) Drive test was conducted across **Raigarh SSA** covering Sarangarh, Ghargoda , Pathalgaon & Raigarh (306 Kms).
- (ii) Aircel was not having its coverage in entire Raigarh SSA.
- (iii) Tata (CDMA) was not having its coverage in Sarangarh , Ghargoda & Pathalgaon SDCAs.

Drive Test Results: The drive test results revealed that performance of the service providers in general, was satisfactory. However, **Idea and RCOM (GSM)** were not able to meet the benchmark of parameter '**Voice Quality**' with their achieved level as **92.34% (outdoor)** and **91.25 % (outdoor)** respectively.

May -2015: Raipur SSA

- (i) Drive test was conducted across **Raipur SSA** covering Raipur ,Bhatapara, Balodabazar,Tilda Neora,Arang, Baghbahara & Kurud SDCAs (325 Kms).
- (ii) Aircel was not having its coverage in Raipur ,Balodabazaar,Tilda Neora, Arang, Baghbahara &Kurud SDCAs.
- (iii) Tata (CDMA) was not having its coverage in Tilda Neora,Arang,Baghbahara & Kurud SDCAs.

Drive Test Results: In this SSA also, the performance of the service providers was satisfactory except for a few cases of non compliance. **Idea, RCOM(GSM)** and **RCOM (CDMA)** could not do well in respect of parameters **Voice Quality** with their performance as **94.22% (outdoor) / 92.84 (indoor), 93.82% (outdoor) and 94.60% (outdoor) respectfully** on overall SSA basis. **Further, BSNL** could not meet the benchmark of parameter **CSSR (94.29%) also** in indoor drive test.

June -2015 : Sagar SSA

- (i) Drive test conducted across **Sagar SSA** covering Bina, Khurai, Banda, Rehli, Deori & Sagar SDCAs (300 Kms).
- (ii) Aircel was not having its coverage in Bina, Banda, Rehli, Deori & Sagar SDCA.
- (iii) Tata (CDMA) was not having its coverage in Bina, Banda, Rehli ,Deori & Khurai SDCA

Drive Test Results: The drive test results revealed that performance of the service providers in general, was satisfactory. However, **BSNL, RCOM (GSM)** were not able to meet the benchmark of parameter '**Voice Quality**' with their achieved level as **91.99% (outdoor)** and **92.86 % (outdoor)** respectively

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.

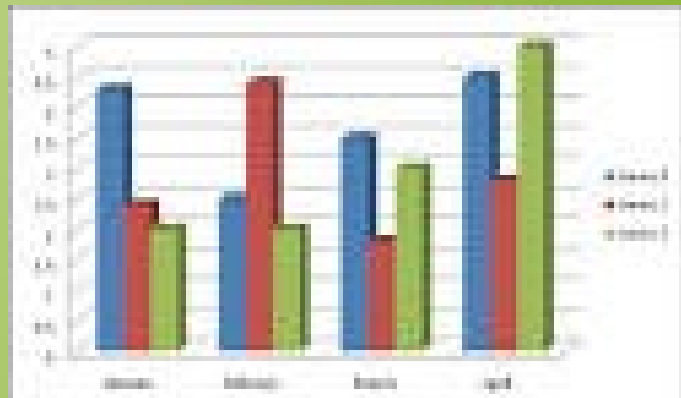
*Thus, on analyzing the overall performance of service providers on the basis of Drive tests, it was concluded that the service providers namely **Idea, BSNL and RCOM (GSM) / (CDMA)** could not perform well on the parameter '**Good Voice Quality**'. These service providers need to improve their networks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

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

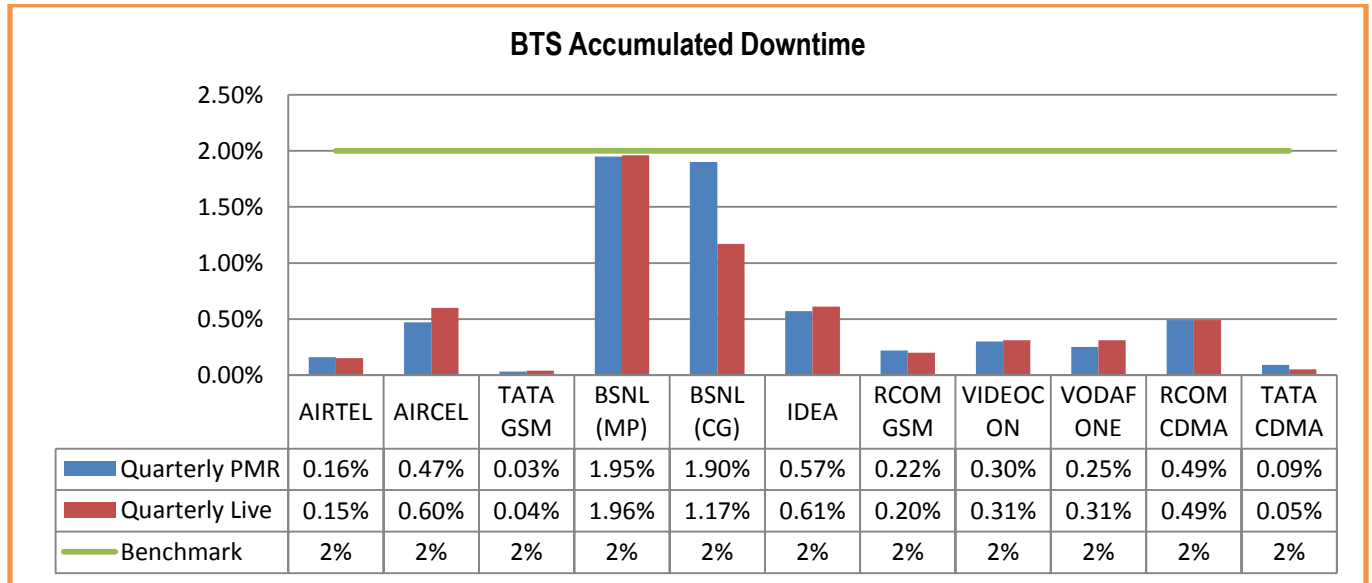
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION (CMTS):

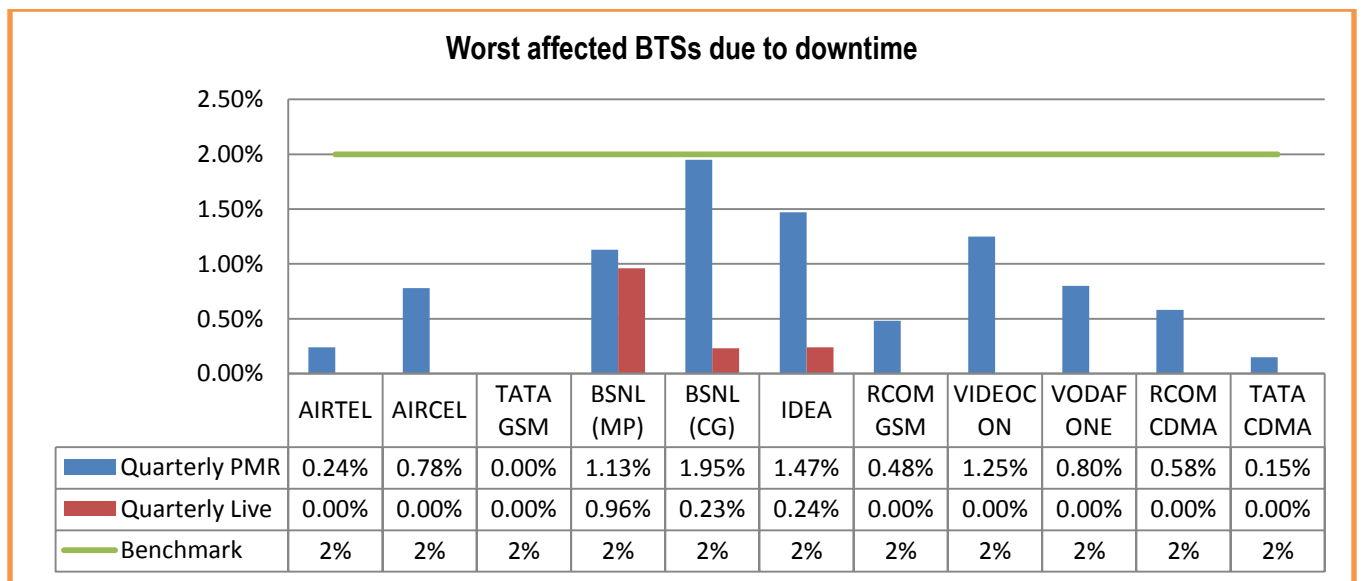
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1. BTS ACCUMULATED DOWNTIME :



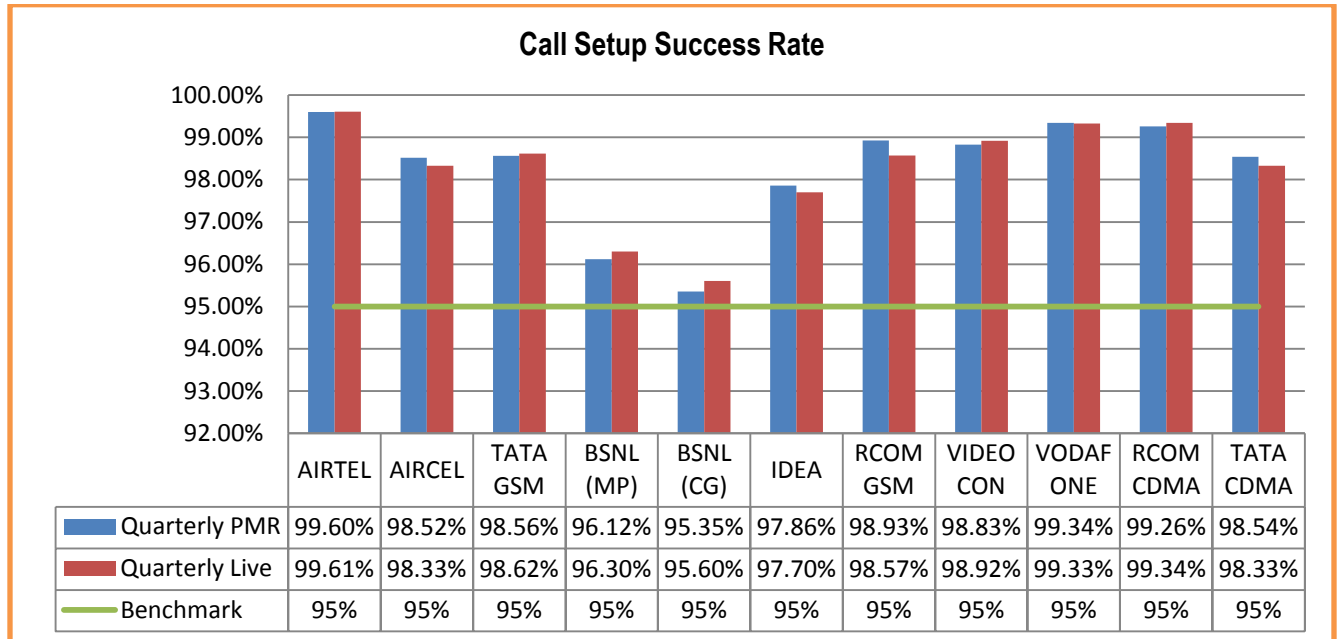
All operators are meeting the benchmarks.

2. WORST AFFECTED BTS DUE TO DOWNTIME:



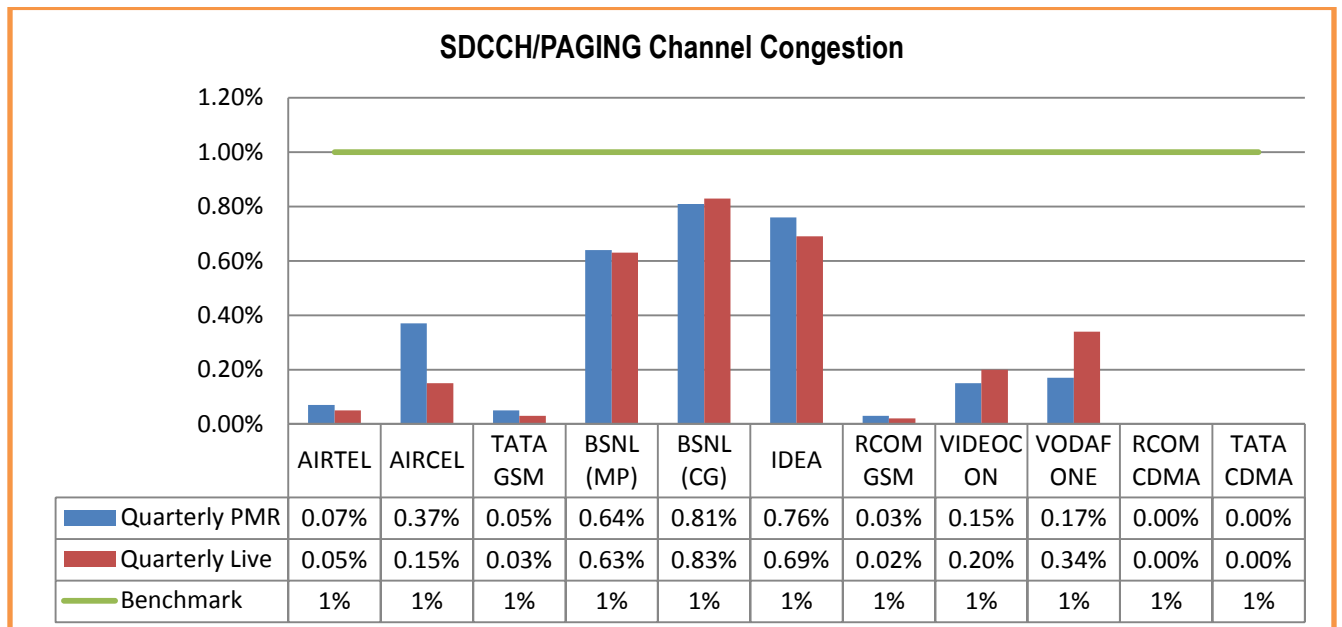
All operators are meeting the benchmarks.

3. CALL SETUP SUCCESS RATE :



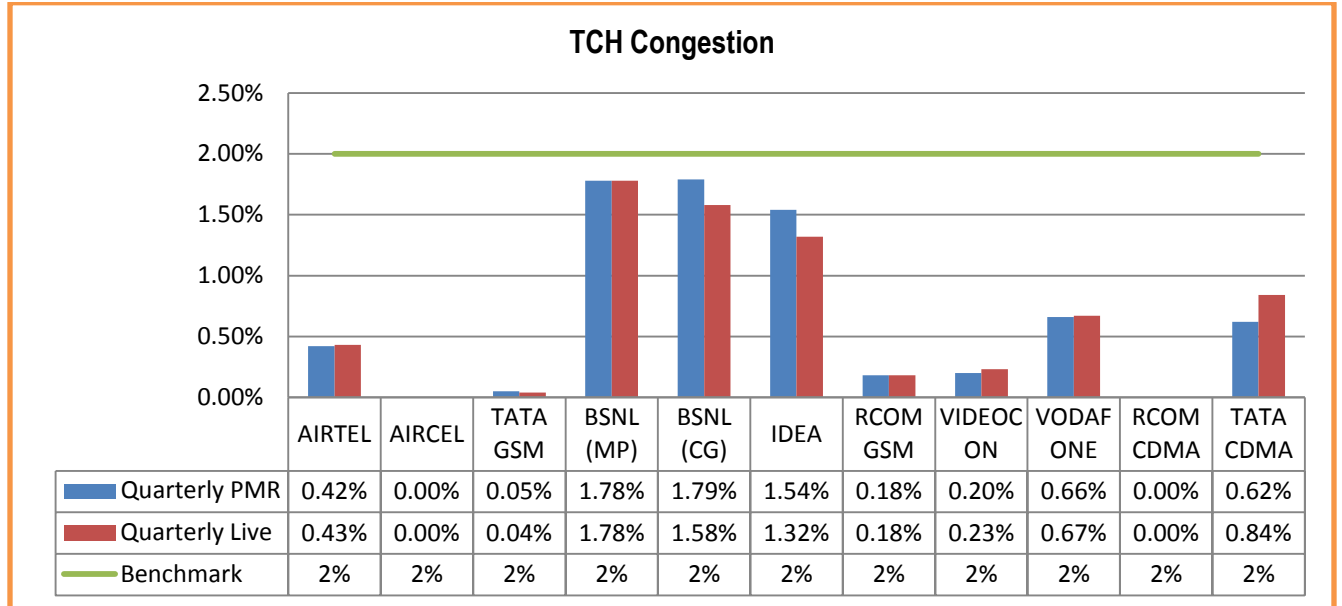
All operators are meeting the benchmarks.

4. SDCCH/PAGING CHANNEL CONGESTION:



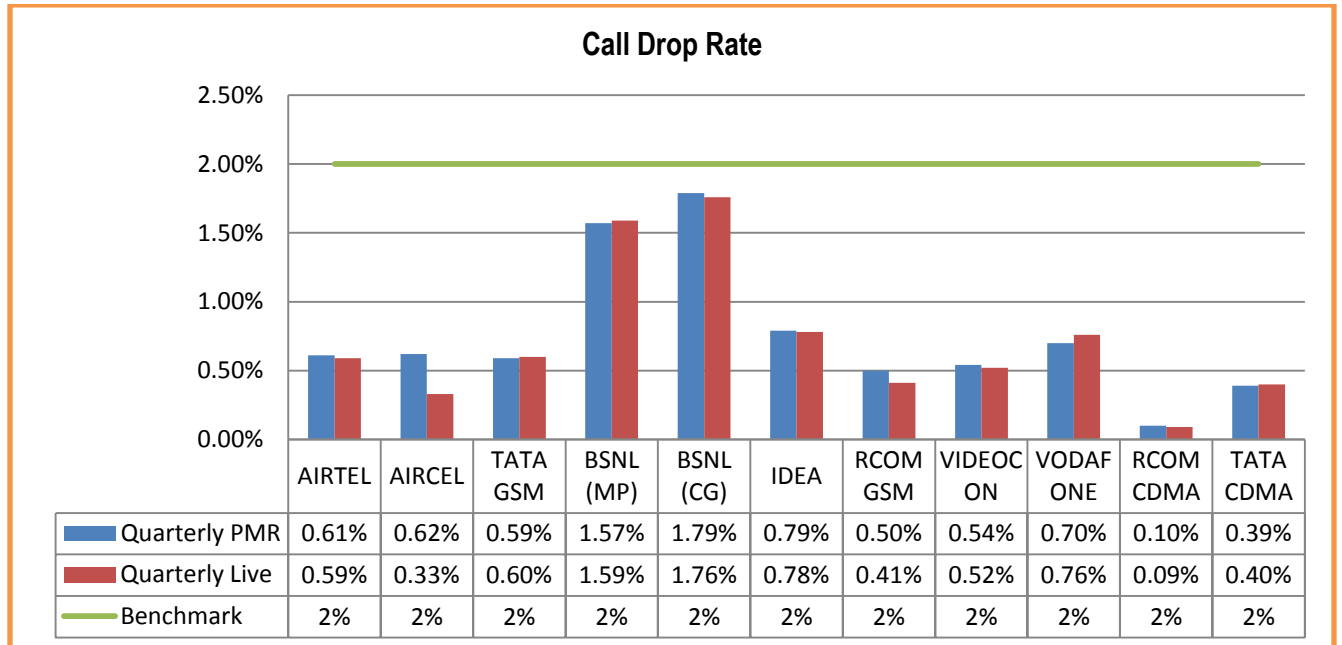
All operators are meeting the benchmarks.

5. TCH CONGESTION :



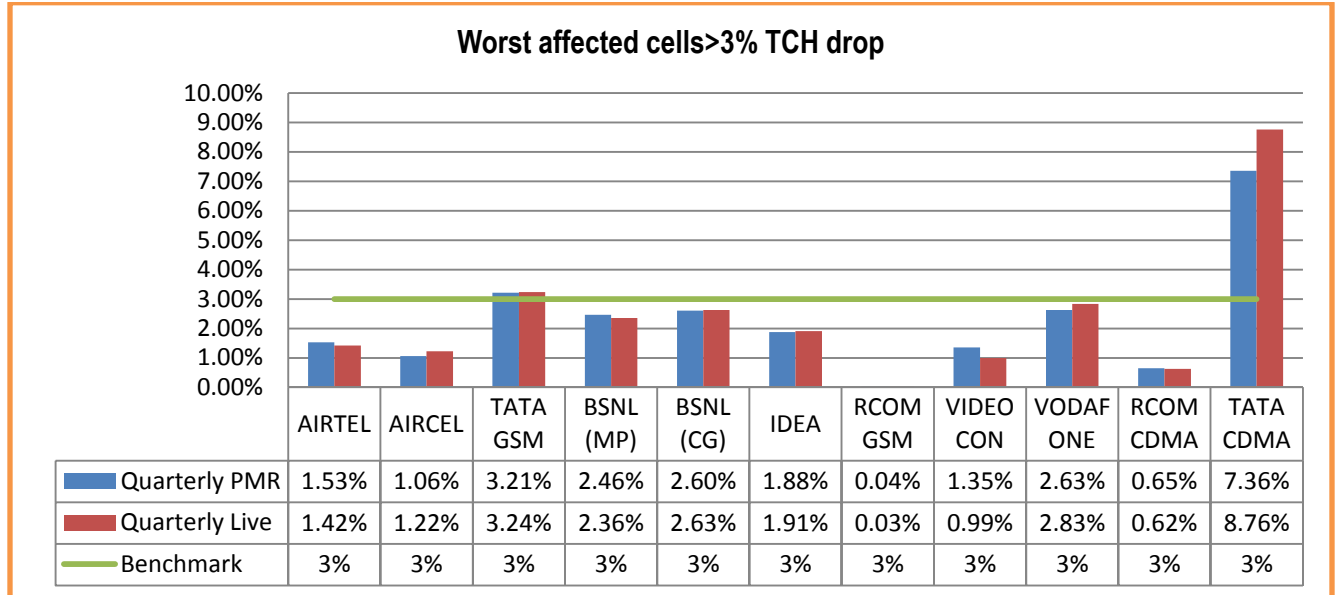
All operators are meeting the benchmarks.

6. CALL DROP RATE :



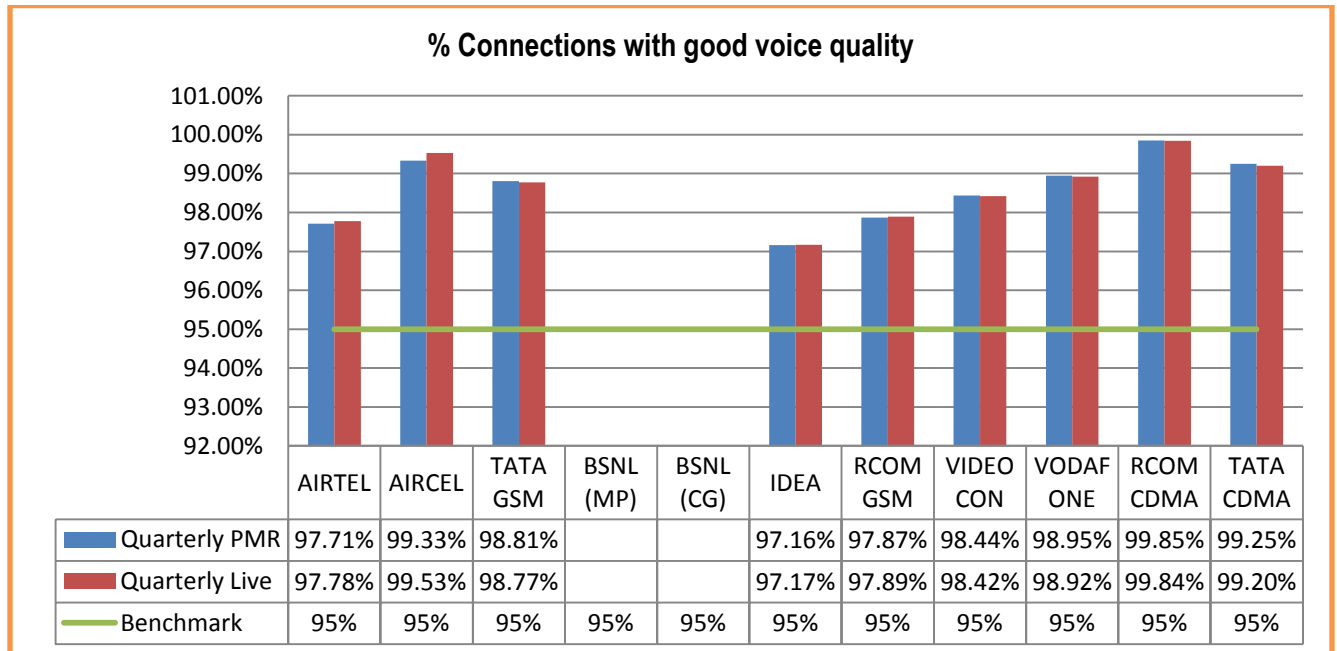
All operators are meeting the benchmarks.

7. WORST AFFECTED CELLS>3% TCH DROP :



All operators are meeting the benchmarks except Tata GSM 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.