



**Audit & Assessment of Quality of Service
of
Cellular Mobile Telephone Service
Basic Telephone (Wire line) Service
&
Broadband Service
For
Telecom Regulatory Authority Of India
West Zone – Maharashtra & Goa Service Area
(January 2015 – March 2015)**

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PREFACE

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

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

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **Maharashtra & Goa 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

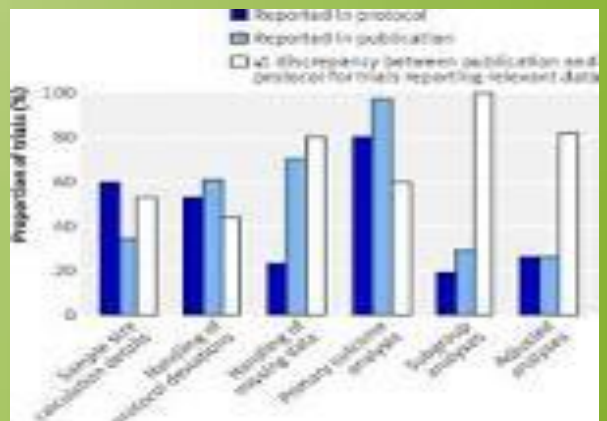
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 Himanchal Pradesh, J&K and Maharashtra & Goa circles during the quarter January 2015 – March 2015.**

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

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

3. SAMPLE SIZE



3) SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS.

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

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
		January-15	February -15	March-15	
GSM Operators					
1	AIRCEL	12 to14th Jan 15	10 to 12th Feb 15	12 to 14 th Mar 15	Aircel Ltd. , Commer Zone, Building no-2,6 Floor,Yerwada Jail Road,Yerwada,Pune-1
2	AIRTEL	5 to 7th Jan 15	2 to 4th Feb 15	2 to 4th Mar 15	D Building, Vega Center, Near Swargate Bus Stand, Pune
3	BSNL	5 to 7th Jan 15	2 to 4th Feb 15	2 to 4th Mar 15	2nd Floor, Telephone Bhawan, Near C'lai Shop, Bajirao Road, Pune 411002
4	UNINOR	21 to 23rd Jan 15	23 to 25th Feb 15	12 to 13 & 16th Mar 15	Telewings Communications Services Pvt Ltd. (Uninor) Welldone Technology Park Sec-48 Sohana Road Gurgaon
5	TATA GSM	12 to14th Jan 15	8 to 10th Feb 15	12 to 14th Mar 15	TATA Tel. Ltd., A1-Aqmar Building,5,Ganesh Kindh Road, Shivaji Nagar , Pune-5
6	IDEA	12 to14th Jan 15	8 to 10th Feb 15	13 to 15th Mar 15	IDEA Cellular Ltd. Sharada Centre, 11/1, Erandwane,Pune - 411 004.
7	RCOM GSM	5 to 7th Jan 15	2 to 4th Feb 15	2 to 4th Mar 15	Reliance Communications, 7th floor,Kumar cerebrum IT Park, B bldg, above standard chartered bank,near d-mart,kalyani nagar, Pune.
8	VODAFONE	5 to 7th Jan 15	2 to 4th Feb 15	2 to 4th Mar 15	Vodafone Cellular Limited, Metropolitan, Old Mumbai -Pune Highway, Wakdewadi, Shivajinagar, Pune 411003
CDMA Operators					
9	RCOM CDMA	5 to 7th Jan 15	2 to 4th Feb 15	2 to 4th Mar 15	Reliance Communications, 7th floor,Kumar cerebrum IT Park, B bldg, above standard chartered bank,near d-mart,kalyani nagar, Pune.
10	TATA CDMA	12 to14th Jan 15	8 to 10th Feb 15	12 to 14th Mar 15	TATA Tel. Ltd., A1-Aqmar Building,5,Ganesh Kindh Road, Shivaji Nagar , Pune-5

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

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

3.2 SAMPLING FOR BASIC (WIRELIN) SERVICES

- The QoS audit for basic (wireline) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. **The following Basic Service providers in MH&G circle were audited in quarter ended March 2015.**

Sl. No.	Name of Basic (Wireline)Service Provider
1	BHARTI AIRTEL
2	BSNL
3	TTL
4	VODAFONE
5	RCL

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV-SUD South Asia had to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who were having broadband subscriber base of more than 10,000 subscribers in their licensed service area. The following Service providers in MH&G Circle, providing broadband service were audited for their quality of service assessment.

SL. NO.	NAME OF BROADBAND SERVICE PROVIDERS
1	BHARTI AIRTEL
2	BSNL
3	D-VOIS
4	FIVE NETWORK
5	HAHWAY
6	INDUS
7	NSTPL
8	PACENET
9	RCL
10	SYSCON INFOWAY
11	TCL
12	TIKONA
13	TTL
14	YOU BROADBAND

4. EXECUTIVE SUMMARY



4) EXECUTIVE SUMMARY

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

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

(1) Cellular Mobile

(i) From monthly audit , it was concluded that on an average, performance of the operators in the Maharashtra & Goa service area was satisfactory as most of the operators were found to have largely met the benchmarks of **Network Parameters** except for one parameter namely **‘Worst affected cells having > 3% TCH drop’** which could not be met by **Aircel, Tata (GSM) and Tata(CDMA)** as they remained non-complied in all the three months of the quarter with their average performance of **4.25%, 5.50% and 5.72%** respectively.

(ii) From three days live measurement / assessment, it was revealed that the operators were largely meeting the benchmarks except for the parameter **“Worst affected cells> 3 % TCH drops”**. The benchmark for this parameter was not met by **Aircel, Tata (GSM) and Tata (CDMA)** with their average performance as **4.40%, 5.45% and 5.70%** respectively.

Similar non-compliance in respect of this parameter was also observed for these service providers during monthly audit.

(iii) With regard to the **Customer Service Quality Parameters**, it is revealed that most of the operators are in well compliance of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds. All service providers are in compliance with respect to the parameter **‘Accessibility of call center’**. However, **Airtel, Idea, RCOM (GSM), Tata (GSM) and RCOM (CDMA)** have not met the benchmark for the parameter **“% calls answered by**

Operators (voice to voice) within 90 seconds. They have achieved their performance as **93.04%, 92.26%, 83.03%, 94.65% and 83.98%** respectively. The performance of **RCOM (GSM) and RCOM (CDMA)** was way below the benchmark of >95%.

The results for **three days live measurements** reveal that all operators have met the benchmarks for the parameters 'Accessibility to call center' except **Idea** with its performance as **92.26%**. However, with regard to the parameter '**Calls connection to operators (Voice to voice) within 90 seconds**', performance of **Airtel, RCOM GSM and RCOM CDMA** was **84.93%, 92.72%** and **91.47%** respectively.

(iv) The analysis of Drive tests revealed that Service providers namely **BSNL, RCOM (GSM), Airtel and Uninor** remained non-complied and need to improve their network performance with respect to the parameters **Voice Quality, Call Drop rate and Call setup success rate / Blocked Call Rate** at different locations of the Ahmednagar, Amravati and Nasik SSAs, where the drive tests were conducted.

(2) Basic (Wireline) service:

The performance of the service providers was largely in compliance with the benchmarks of the parameters. However, the performance of **BSNL, Bharti Airtel and TTL** remained non-complied with in respect of the parameters **Fault Repair / Restoration Time and Calls answered by the operators (Voice to voice) within 90 seconds**. Hence, the concern operators need to improve their services for these parameters

(3) Broadband service:

From the audit of Broadband Service, it was concluded that **Indus media, TCL, Hathway and BSNL** failed to meet the benchmark of **Service provisioning**. **TTL, TCL, You Broadband and BSNL** also remained short of bench mark of parameter **Fault Repairs/Restoration within 3 working days** and operators namely **You Broadband, BSNL, NSTPL and Tikona** failed to meet benchmark of parameters **Refund within 60 days, Call answered by operators within 90 seconds, Bandwidth utilization and Connection speed** respectively.

5. PMR AUDIT REPORT



5) PMR AUDIT REPORTS:

5.1 MONTHLY PMR:

5.1.1 BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM OPERATORS			
1	AIRCEL	March-15	20 Hrs-21 Hrs
2	AIRTEL	March-15	19 Hrs-20 Hrs
3	BSNL	March-15	19 Hrs-20 Hrs
4	IDEA	March-15	19 Hrs-20 Hrs
5	TATA GSM	March-15	19 Hrs-20 Hrs
6	RCOM GSM	March-15	19 Hrs-20 Hrs
7	UNINOR	March-15	20 Hrs-21 Hrs
8	VODAFONE	March-15	20 Hrs-21 Hrs
CDMA OPERATORS			
9	RCOM CDMA	March-15	19 Hrs-20 Hrs
10	TATA CDMA	March-15	19 Hrs-20 Hrs

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

5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM OPERATORS						
1	AIRCEL	3	13	1895	Huawei	Huawei
2	AIRTEL	25	167	10709	NSN	NSN
3	BSNL	18	144	6880	Alcatel	Alcatel
4	IDEA	42	94	10729	Ericsson	Ericsson
5	TATA GSM	4	30	4392	Huawei	Huawei
6	RCOM GSM	5	23	2761	Huawei	Huawei
7	UNINOR	10	25	4502	NSN+Huawei	NSN+Huawei
8	VODAFONE	16	121	10658	NSN	NSN
CDMA OPERATORS						
9	RCOM CDMA	10	8	1754	ZTE,Lucent	ZTE,Lucent
10	TATA CDMA	12	18	2263	Huawei, ZTE, Ericsson	Huawei, ZTE, Ericsson

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

CELLULAR MOBILE TELEPHONE SERVICES MAHARASHTRA & GOA CIRCLE - JANUARY 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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%	Jan-15	0.06%	0.01%	1.89%	0.06%	0.02%	0.23%	0.15%	0.07%	0.18%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Jan-15	0.11%	0.00%	1.79%	0.25%	0.00%	0.83%	0.69%	0.21%	0.40%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	99.61%	99.87%	95.90%	98.45%	99.58%	99.61%	97.78%	99.50%	98.23%	98.38%
	b) SDCCH/PAGING Channel congestion	<=1%	Jan-15	0.05%	0.04%	0.59%	0.88%	0.11%	0.02%	0.45%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.07%	0.08%	1.58%	1.06%	0.27%	0.05%	1.49%	0.50%	0.02%	0.35%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Jan-15	0.85%	0.45%	1.43%	1.02%	0.64%	0.31%	0.53%	0.73%	0.18%	0.79%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jan-15	4.27%	0.12%	2.17%	1.05%	5.38%	0.04%	1.24%	2.77%	0.74%	5.67%
	c) Connections with good voice quality	>=95%	Jan-15	96.97%	98.97%	96.39%	97.37%	97.30%	98.78%	97.63%	97.33%	99.80%	99.85%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Jan-15	0	0	0	0	0	0	0	0	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES MAHARASHTRA & GOA CIRCLE - FEBRUARY 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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%	Feb-15	0.06%	0.01%	1.98%	0.06%	0.02%	0.29%	0.17%	0.07%	0.42%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Feb-15	0.11%	0.00%	1.70%	0.16%	0.00%	0.87%	0.69%	0.19%	1.43%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	99.50%	99.87%	95.95%	98.19%	99.58%	99.48%	97.63%	99.41%	98.07%	98.39%
	b) SDCCH/PAGING Channel congestion	<=1%	Feb-15	0.05%	0.04%	0.58%	0.89%	0.12%	0.03%	0.45%	0.41%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-15	0.09%	0.08%	1.58%	1.29%	0.24%	0.05%	1.40%	0.59%	0.02%	0.34%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Feb-15	0.92%	0.45%	1.38%	0.95%	0.64%	0.28%	0.55%	0.72%	0.21%	0.71%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Feb-15	4.40%	0.11%	2.09%	0.91%	5.51%	0.04%	1.23%	2.75%	0.86%	5.12%
	c) Connections with good voice quality	>=95%	Feb-15	96.56%	98.81%	96.58%	97.49%	97.31%	98.77%	97.91%	97.28%	99.79%	99.94%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Feb-15	0	0	0	0	0	0	0	0	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES MAHARASHTRA & GOA CIRCLE- MARCH 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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%	Mar-15	0.12%	0.01%	1.90%	0.07%	0.02%	0.28%	0.27%	0.12%	0.40%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Mar-15	0.26%	0.00%	1.83%	0.22%	0.00%	0.76%	1.49%	0.50%	1.25%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	99.32%	99.87%	95.78%	98.26%	99.56%	99.51%	97.72%	99.28%	98.29%	98.17%
	b) SDCCH/PAGING Channel congestion	<=1%	Mar-15	0.07%	0.04%	0.59%	0.89%	0.14%	0.03%	0.38%	0.39%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-15	0.07%	0.08%	1.63%	1.21%	0.24%	0.06%	1.24%	0.72%	0.01%	0.47%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Mar-15	0.82%	0.45%	1.29%	0.97%	0.66%	0.27%	0.55%	0.74%	0.24%	0.77%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Mar-15	4.09%	0.11%	2.30%	1.08%	5.62%	0.01%	1.33%	2.78%	0.93%	6.36%
	c) Connections with good voice quality	>=95%	Mar-15	97.18%	98.96%	96.97%	97.44%	97.33%	98.75%	97.94%	97.24%	99.79%	99.16%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Mar-15	0	0	0	0	0	0	0	0	0	0

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- MARCH-15 (JANUARY TO MARCH 2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF THREE MONTHS) - MAHARASHTRA & GOA CIRCLE													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	0.08%	0.01%	1.92%	0.06%	0.02%	0.27%	0.20%	0.09%	0.33%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.16%	0.00%	1.77%	0.21%	0.00%	0.82%	0.96%	0.30%	1.03%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.48%	99.87%	95.88%	98.30%	99.57%	99.53%	97.71%	99.40%	98.20%	98.31%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.06%	0.04%	0.59%	0.89%	0.12%	0.03%	0.43%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.08%	0.08%	1.60%	1.19%	0.25%	0.05%	1.38%	0.60%	0.02%	0.39%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.86%	0.45%	1.37%	0.98%	0.65%	0.29%	0.54%	0.73%	0.21%	0.76%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	4.25%	0.11%	2.19%	1.01%	5.50%	0.03%	1.27%	2.76%	0.84%	5.72%
	c) Connections with good voice quality	>=95%	Quarterly	96.90%	98.91%	96.65%	97.43%	97.31%	98.77%	97.83%	97.28%	99.79%	99.65%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit of network related parameters for cellular mobile service providers was conducted at their respective MSCs in the circle.

TUV conducted audit for cellular mobile operators based on **three stage audit / verification viz audit of the records, live measurements and drive tests. This exercise has been repeated every month for CMSPs.**

Network Service Quality Parameters:

- **Network Availability**

- i. BTS Accumulated Downtime (Not Available for Service):
- ii. Worst affected BTSs due to downtime

For measuring the performance against the benchmark for this parameter, down time of each BTS lasting for more than 1 hour at a time in a day during the period of a month has been taken for computation.

In MH&G circle, **all the operators were found meeting benchmark** on the above parameters 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter.

- **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 the operators were comfortably meeting the benchmark of this parameter.

- **Parameters related to Network Congestion:**

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

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

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

- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

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

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, **all the service providers were found to be meeting the TRAI specified benchmark**. The lowest call drop rate (average 0.21 %) was for RCOM (CDMA) during the quarter.

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

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

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter except **Aircel, Tata (GSM) and Tata (CDMA)**. **Aircel, Tata GSM & CDMA** remained non-complied in all the three months of the quarter with their average performance as **4.25%, 5.50% and 5.72% respectively**.

- iii. Connections with good voice quality:

The audit results for this parameter indicates that **all operators have met the benchmark** during the quarter.

- iv. POI congestion

There was no congestion on individual POI links between a service provider vis-à-vis other service providers.

**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) – JANUARY15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES MAHARASHTRA & GOA CIRCLE- JANUARY 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	0.14%	0.01%	1.98%	0.06%	0.00%	0.27%	0.19%	0.04%	0.26%	0.02%
	b) Worst affected BTSS due to downtime	<=2%	Live Data	0.00%	0.00%	0.06%	0.02%	0.00%	0.00%	0.04%	0.01%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live Data	99.53%	99.87%	95.31%	98.66%	99.53%	99.61%	97.73%	99.53%	98.39%	98.31%
	b) SDCCH/PAGING Channel congestion	<=1%	Live Data	0.02%	0.03%	0.56%	0.68%	0.10%	0.02%	0.29%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Live Data	0.11%	0.08%	1.84%	0.86%	0.26%	0.04%	1.17%	0.47%	0.01%	0.46%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live Data	0.87%	0.44%	1.66%	1.03%	0.63%	0.33%	0.55%	0.73%	0.16%	0.83%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live Data	4.11%	0.11%	2.23%	1.01%	5.25%	0.01%	1.34%	2.78%	0.72%	6.07%
	c) Connections with good voice quality	>=95%	Live Data	97.00%	98.75%	95.85%	97.35%	97.35%	98.80%	97.63%	97.33%	99.80%	NP
4	No. of POI having >=0.5% congestion	<0.5%	Live Data	0	0	0	0	0	0	0	0	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES MAHARASHTRA & GOA CIRCLE- FEBRUARY 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	0.08%	0.01%	1.86%	0.07%	0.01%	0.26%	0.14%	0.06%	0.42%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.04%	0.02%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.46%	99.87%	95.88%	98.25%	99.59%	97.47%	97.73%	99.53%	98.00%	98.35%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.05%	0.04%	0.64%	0.77%	0.09%	0.03%	0.44%	0.38%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.10%	0.08%	1.59%	1.28%	0.23%	0.05%	1.50%	0.47%	0.03%	0.17%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.94%	0.45%	1.31%	0.96%	0.62%	0.27%	0.54%	0.73%	0.19%	0.73%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	4.60%	0.10%	2.05%	0.95%	5.49%	0.01%	1.23%	2.74%	0.72%	5.08%
	c) Connections with good voice quality	>=95%	Live data	96.47%	98.90%	96.66%	97.49%	97.29%	98.79%	97.24%	97.32%	99.80%	99.94%
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	0	0	0

5.2.3 LIVE MEASUREMENT DATA (3-DAYS) – MARCH 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES MAHARASHTRA & GOA CIRCLE- MARCH 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	0.06%	0.01%	1.93%	0.06%	0.02%	0.34%	0.25%	0.13%	0.47%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.45%	99.87%	96.05%	97.61%	99.57%	99.26%	97.50%	99.43%	97.93%	98.31%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.06%	0.04%	0.54%	0.82%	0.12%	0.03%	0.38%	0.27%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.06%	0.08%	1.55%	1.34%	0.27%	0.05%	1.15%	0.57%	0.01%	0.29%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.86%	0.45%	1.20%	1.05%	0.66%	0.27%	0.55%	0.82%	0.20%	0.78%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	4.48%	0.10%	2.35%	1.38%	5.61%	0.03%	1.26%	2.80%	0.80%	5.95%
	c) Connections with good voice quality	>=95%	Live data	97.23%	99.51%	96.87%	97.37%	97.34%	98.76%	97.89%	97.25%	99.80%	99.97%
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	0	0	0

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

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – MH&G CIRCLE													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	0.09%	0.01%	1.92%	0.06%	0.01%	0.29%	0.19%	0.08%	0.38%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.05%	0.01%	0.00%	0.00%	0.02%	0.01%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.15%	99.87%	95.75%	98.17%	99.56%	98.78%	97.65%	99.50%	98.11%	98.32%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.04%	0.04%	0.58%	0.76%	0.10%	0.03%	0.37%	0.35%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.09%	0.08%	1.66%	1.16%	0.25%	0.05%	1.27%	0.50%	0.02%	0.31%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.89%	0.45%	1.39%	1.01%	0.64%	0.29%	0.55%	0.76%	0.18%	0.78%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	4.40%	0.10%	2.21%	1.11%	5.45%	0.02%	1.28%	2.77%	0.75%	5.70%
	c) Connections with good voice quality	>=95%	Quarterly	96.90%	99.05%	96.46%	97.40%	97.33%	98.78%	97.59%	97.30%	99.80%	99.96%
4	No. of POI having >=0.5% congestion	<0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days live measurement assessment, it was revealed that the operators were largely meeting the benchmarks except for the parameter “**Worst affected cells> 3 % TCH drops**”. The benchmark for this parameter was not met by **Aircel, Tata (GSM) and Tata (CDMA)** with their average performance as **4.40%, 5.45% and 5.70%** respectively.

Similar non-compliance in respect of this parameter was also observed for these service providers during monthly audit.

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MH&G Circle - Jan 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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		Jan-15	1861	10597	6880	10643	4392	2764	4491	10273	1755	2239
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jan-15	857	531	96821	4469	721	4666	5134	5052	2377	274
	c) BTS Accumulated Downtime	<=2%	Jan-15	0.06%	0.01%	1.89%	0.06%	0.02%	0.23%	0.15%	0.07%	0.18%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jan-15	2	0	123	27	0	23	31	22	7	0
	e) Worst affected BTSs due to downtime	<=2%	Jan-15	0.11%	0.00%	1.79%	0.25%	0.00%	0.83%	0.69%	0.21%	0.40%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	99.61%	99.87%	95.90%	98.45%	99.58%	99.61%	97.78%	99.50%	98.23%	98.38%
	b) SDCCH/PAGING Congestion	<=1%	Jan-15	0.05%	0.04%	0.59%	0.88%	0.11%	0.02%	0.45%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.07%	0.08%	1.58%	1.06%	0.27%	0.05%	1.49%	0.50%	0.02%	0.35%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Jan-15	0.85%	0.45%	1.43%	1.02%	0.64%	0.31%	0.53%	0.73%	0.18%	0.79%
	b) Worst affected cells>3% TCH drop	<=3%	Jan-15	4.27%	0.12%	2.17%	1.05%	5.38%	0.04%	1.24%	2.77%	0.74%	5.67%
	c) % of connections with good voice quality	>=95%	Jan-15	96.97%	98.97%	96.39%	97.37%	97.30%	98.78%	97.63%	97.33%	99.80%	99.85%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jan-15	239	38	438	335	691	3	168	846	39	369
	e) Total no. of cells (Sector) in the licensed service area		Jan-15	5594	32291	20217	31974	12838	8253	13504	30582	5262	6511
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Jan-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jan-15	0	0	0	0	0	0	0	0	0	0
Network Data													
5	a) Equipped Capacity of Network in Erlang		Jan-15	52554	362949	259355	530207	202270	144000	173193	384249	230000	400470
	b) Total traffic in TCBH in erlang (Avg.)		Jan-15	28383	271278	101758	468118	71873	111396	191766	341263	56430	81147
	c) Total no. of customers served (as per VLR) on last day of the month		Jan-15	1112926	10910954	4412819	22087141	3585997	3125713	5402083	16590533	1614807	1331515

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MH&G Circle - Jan 15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	1843	10552	6880	10616	4392	2767	4491	10173	1756	2239
	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	189	52	9792	440	11	546	613	320	328	35
	c) BTS Accumulated Downtime	<=2%	Live data	0.14%	0.01%	1.98%	0.06%	0.00%	0.27%	0.19%	0.04%	0.26%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	4	2	0	0	2	1	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.02%	0.00%	0.00%	0.04%	0.01%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.53%	99.87%	95.31%	98.66%	99.53%	99.61%	97.73%	99.53%	98.39%	98.31%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.03%	0.56%	0.68%	0.10%	0.02%	0.29%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.11%	0.08%	1.84%	0.86%	0.26%	0.04%	1.17%	0.47%	0.01%	0.46%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.87%	0.44%	1.66%	1.03%	0.63%	0.33%	0.55%	0.73%	0.16%	0.83%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	4.11%	0.11%	2.23%	1.01%	5.25%	0.01%	1.34%	2.78%	0.72%	6.07%
	c) % of connections with good voice quality	>=95%	Live data	97.00%	98.75%	95.85%	97.35%	97.35%	98.80%	97.63%	97.33%	99.80%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	229	37	450	322	674	1	182	851	38	395
	e) Total no. of cells (Sector) in the licensed service area		Live data	5567	32251	20217	31978	12847	8254	13604	30571	5262	6511
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
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MH&G Circle – Feb 15 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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		Feb-15	1867	10619	6880	10706	4392	2761	4496	10473	1754	2243
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Feb-15	784	469	91511	4458	633	5447	5066	5096	4945	275
	c) BTS Accumulated Downtime	<=2%	Feb-15	0.06%	0.01%	1.98%	0.06%	0.02%	0.29%	0.17%	0.07%	0.42%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Feb-15	2	0	117	17	0	24	31	20	25	0
e) Worst affected BTSs due to downtime	<=2%	Feb-15	0.11%	0.00%	1.70%	0.16%	0.00%	0.87%	0.69%	0.19%	1.43%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	99.50%	99.87%	95.95%	98.19%	99.58%	99.48%	97.63%	99.41%	98.07%	98.39%
	b) SDCCH/PAGING Congestion	<=1%	Feb-15	0.05%	0.04%	0.58%	0.89%	0.12%	0.03%	0.45%	0.41%	0.00%	0.00%
c) TCH congestion	<=2%	Feb-15	0.09%	0.08%	1.58%	1.29%	0.24%	0.05%	1.40%	0.59%	0.02%	0.34%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Feb-15	0.92%	0.45%	1.38%	0.95%	0.64%	0.28%	0.55%	0.72%	0.21%	0.71%
	b) Worst affected cells>3% TCH drop	<=3%	Feb-15	4.40%	0.11%	2.09%	0.91%	5.51%	0.04%	1.23%	2.75%	0.86%	5.12%
	c) % of connections with good voice quality	>=95%	Feb-15	96.56%	98.81%	96.58%	97.49%	97.31%	98.77%	97.91%	97.28%	99.79%	99.94%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Feb-15	248	36	422	292	707	3	168	850	45	334
e) Total no. of cells (Sector) in the licensed service area		Feb-15	5633	32435	20217	32108	12838	8238	13607	30922	5256	6519	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Feb-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Feb-15	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Feb-15	55244	363163	259355	532576	202915	144000	175485	385420	230000	400962
	b) Total traffic in TCBH in erlang (Avg.)		Feb-15	32309	273545	101172	479782	72498	116407	198609	351726	61073	80610
c) Total no. of customers served (as per VLR) on last day of the month		Feb-15	1193772	11057923	4375628	22338977	3581756	3116689	5452972	16867249	1598893	1313222	

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MH&G Circle- Feb-15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	1862	10606	6880	10643	4392	2764	4496	10273	1755	2239
	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	108	52	9227	539	34	512	465	415	525	3
	c) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.01%	1.86%	0.07%	0.01%	0.26%	0.14%	0.06%	0.42%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	3	2	0	0	1	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.04%	0.02%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.46%	99.87%	95.88%	98.25%	99.59%	97.47%	97.73%	99.53%	98.00%	98.35%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.05%	0.04%	0.64%	0.77%	0.09%	0.03%	0.44%	0.38%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.10%	0.08%	1.59%	1.28%	0.23%	0.05%	1.50%	0.47%	0.03%	0.17%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.94%	0.45%	1.31%	0.96%	0.62%	0.27%	0.54%	0.73%	0.19%	0.73%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	4.60%	0.10%	2.05%	0.95%	5.49%	0.01%	1.23%	2.74%	0.72%	5.08%
	c) % of connections with good voice quality	>=95%	Live data	96.47%	98.90%	96.66%	97.49%	97.29%	98.79%	97.24%	97.32%	99.80%	99.94%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	259	34	414	305	706	1	167	848	38	331
e) Total no. of cells (Sector) in the licensed service area		Live data	5631	32409	20217	32115	12856	8247	13619	30901	5259	6511	
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
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- MH&G Circle - Mar 15 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA Cellular	TATA GSM	RCOM GSM	UNINOR	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		Mar-15	1895	10709	6880	10729	4392	2761	4502	10658	1754	2263
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Mar-15	1675	519	97063	5694	694	5820	9021	9600	5232	582
	c) BTS Accumulated Downtime	<=2%	Mar-15	0.12%	0.01%	1.90%	0.07%	0.02%	0.28%	0.27%	0.12%	0.40%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Mar-15	5	0	126	24	0	21	67	53	22	0
e) Worst affected BTSs due to downtime	<=2%	Mar-15	0.26%	0.00%	1.83%	0.22%	0.00%	0.76%	1.49%	0.50%	1.25%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	99.32%	99.87%	95.78%	98.26%	99.56%	99.51%	97.72%	99.28%	98.29%	98.17%
	b) SDCCH/PAGING Congestion	<=1%	Mar-15	0.07%	0.04%	0.59%	0.89%	0.14%	0.03%	0.38%	0.39%	0.00%	0.00%
c) TCH congestion	<=2%	Mar-15	0.07%	0.08%	1.63%	1.21%	0.24%	0.06%	1.24%	0.72%	0.01%	0.47%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Mar-15	0.82%	0.45%	1.29%	0.97%	0.66%	0.27%	0.55%	0.74%	0.24%	0.77%
	b) Worst affected cells>3% TCH drop	<=3%	Mar-15	4.09%	0.11%	2.30%	1.08%	5.62%	0.01%	1.33%	2.73%	0.93%	6.36%
	c) % of connections with good voice quality	>=95%	Mar-15	97.18%	98.96%	96.97%	97.44%	97.33%	98.75%	97.94%	97.24%	99.79%	99.16%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Mar-15	7184	36	464	347	725	1	181	875	49	416
e) Total no. of cells (Sector) in the licensed service area		Mar-15	175720	32515	20217	32268	12908	8238	13623	31519	5256	6536	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Mar-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Mar-15	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Mar-15	57088	366694	259355	534498	204405	144000	177632	396884	230000	401926
	b) Total traffic in TCBH in erlang (Avg.)		Mar-15	32968	278516	98927	475919	70123	117983	199241	354415	60376	77533
c) Total no. of customers served (as per VLR) on last day of the month		Mar-15	1213172	11205549	4350613	22561750	3589668	3181573	5462140	16953842	1619971	1297918	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- MH&G Circle - Mar 15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	TATA GSM	RCOM GSM	UNINOR	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	1868	10608	6880	10706	4392	2761	4501	10473	1754	2243
	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	85.2	52.2	9557	490	52.96	679	812	1009	588	53.52
	c) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.01%	1.93%	0.06%	0.02%	0.34%	0.25%	0.13%	0.47%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	4	0	0	0	0	2	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%	0.00%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.45%	99.87%	96.05%	97.61%	99.57%	99.26%	97.50%	99.43%	97.93%	98.31%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.06%	0.04%	0.54%	0.82%	0.12%	0.03%	0.38%	0.27%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.06%	0.08%	1.55%	1.34%	0.27%	0.05%	1.15%	0.57%	0.01%	0.29%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.86%	0.45%	1.20%	1.05%	0.66%	0.27%	0.55%	0.82%	0.20%	0.78%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	4.48%	0.10%	2.35%	1.38%	5.61%	0.03%	1.26%	2.80%	0.80%	5.95%
	c) % of connections with good voice quality	>=95%	Live data	97.23%	99.51%	96.87%	97.37%	97.34%	98.76%	97.89%	97.25%	99.80%	99.97%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	253	34	475	446	725	2	172	882	42	388
e) Total no. of cells (Sector) in the licensed service area		Live data	5646	32431	20217	32272	12918	8238	13622	31501	5256	6523	
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
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS:

5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JANUARY TO MARCH 2015 MONTHS AUDITED DATA):

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES													
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators								CDMA Operators	
Customer Service Quality Parameters													
Metering & Billing Credibility -Post Paid													
1	A) No. of bills issued during the quarter		MHG	6546	1526571	1049327	4412137	149888	338904	NA	3142425	618336	89356
	B) No. of bills disputed including billing complaints during the quarter		MHG	0	342	11	3638	132	1	NA	1793	515	0
	C) % of billing complaints during the quarter	<= 0.1%	MHG	0.00%	0.02%	0.00%	0.08%	0.09%	0.00%	NA	0.06%	0.08%	0.00%
Metering & Billing Credibility -Pre Paid													
2	A) Total No. of Pre-paid customers at the end of the quarter		MHG	1888065	10803882	4570934	59900850	3182741	4970315	7332138	16388287	1594857	1623389
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		MHG	145	50	2387	2301	2762	0	2308	10583	1048	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	MHG	0.01%	0.00%	0.05%	0.004%	0.09%	0.00%	0.03%	0.06%	0.07%	0.00%
Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints													
3	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		MHG	145	392	2398	41296	2894	3006	2308	12376	1563	158
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		MHG	145	392	2398	41296	2894	3006	2308	12376	1563	158
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		MHG	145	392	2398	41296	2894	3006	2308	12376	1563	158
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	MHG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators							CDMA Operators		
	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	MHG	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	MHG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Response time to customers for assistance													
	A) Total no of calls attempted to customer care/Call center		MHG	6537283	3616716	428802	62158140	5164052	1053534	18884266	31464938	1946486	187917
	B) Total no. of calls successfully established to customer care/Call center		MHG	6428925	3616716	428802	61660347	5119694	1034665	18703566	31459497	1933075	186206
4	C) % Accessibility of Call centre /customer Care (Total call successfully established*100/ Total call attempt)	>=95%	MHG	98.34%	100.00%	100.00%	99.20%	99.14%	98.21%	99.04%	99.98%	99.31%	99.09%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		MHG	1125885	6148443	1636881	14961448	1011990	1705647	5241621	9411001	264155	155565
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		MHG	1077441	5720454	1636881	13802786	840222	1614320	5216006	9289594	221832	152079
	F) % age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempts)	>=95%	MHG	95.70%	93.04%	100.00%	92.26%	83.03%	94.65%	99.51%	98.71%	83.98%	97.76%
Termination/closure of service													
5	A) Total No. of requests for Termination / Closure of service received during the quarter		MHG	9	3808	7568	26312	617	4091	NA	15457	5207	1934
	B) No. of requests for Termination /Closure of service complied within 7 days during the quarter		MHG	9	3808	7568	26312	617	4091	NA	15457	5207	1934
	C) % of Termination/ Closure of service within 7 days	<=7days	MHG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
Time taken for refunds of deposits after closures.													
6	A) No. of Payments/ Refunds due during the quarter		MHG	8	2642	1458	5090	1198	650	NA	9987	2054	337
	B) No. of Payments/ Refunds Cleared during the quarter		MHG	8	2642	1458	5090	1198	650	NA	9987	2054	337
	C)Time taken for refunds of deposits after closures.	100% within 60 days	MHG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

NA: Not Applicable, Uninor have no post-paid customers, so data for parameters related to post-paid bills not applicable for them.

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE – MARCH 15													
3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	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		MHG	208356	131404	25283	2140392	60349	394992	591198	990815	158070	71076
	Total no. of calls successfully established to customer care/Call center		MHG	204799	131404	25283	1974710	58972	390140	588497	988523	155172	70537
	% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempts)	>=95%	MHG	98.29%	100.00%	100.00%	92.26%	97.72%	98.77%	99.54%	99.77%	98.17%	99.24%
2	Total Calls reached to operator for Voice to Voice (Total call attempt)		MHG	36210	210800	69201	461129	8989	51957	167426	291233	32795	4742
	Total number of calls answered by the operator (Voice to voice) within 90 seconds.		MHG	35255	179031	69201	446183	8335	51153	167227	289734	29996	4582
	% age of calls answered by operator (voice to voice) (Total call successfully established within 90 Sec. *100/ Total call attempts)	>=95%	MHG	97.36%	84.93%	100.00%	96.76%	92.72%	98.45%	99.88%	99.49%	91.47%	96.63%

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid is well within the prescribed bench mark of $\leq 0.1\%$. UNINOR has no post-paid customers, so not provided the data for billing related parameters applicable for post-paid subscribers.

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 have 100 % resolved the billing complaints within stipulated period of 4/6 weeks. Apart from this, all service providers also have met the benchmark of 100 % cases of credit in one week, where customers were due for credit / adjustment.

3. Response Time to the Customer for assistance

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

All service providers are in compliance with respect to the parameter 'Accessibility of call center'. However, **Airtel, Idea, RCOM (GSM), Tata (GSM) and RCOM (CDMA)** have not met the benchmark for the parameter "**% calls answered by Operators (voice to voice) within 90 seconds**". They have achieved their performance as **93.04%, 92.26%, 83.03%, 94.65% and 83.98%** respectively. The performance of **RCOM (GSM) and RCOM (CDMA)** was way below the benchmark of $>95\%$.

4. Termination/Closure of Service

In case of this parameter all service providers have settled 100% 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 have met the benchmarks for the parameters 'Accessibility to call center' except **Idea** with its performance as **92.26%**. However, with regard to the parameter '**Calls connection to operators (Voice to voice) within 90 seconds**', performance of **Airtel, RCOM GSM and RCOM CDMA** was **84.93%, 92.72% and 91.47%** 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 Maharashtra & Goa service area during the time 1100 to 1400 Hrs and 1600 to 1900 was carried out by TUV auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators. While doing this exercise, the radio part, the switch part and POI in between the two operators are involved. Congestion in any of these network elements could result in congestion in the network.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT											
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
AIRCEL	MHG	--	100%	100%	100%	99%	99%	100%	99%	100%	100%
AIRTEL	MHG	99%	--	99%	100%	100%	100%	100%	100%	100%	98%
BSNL	MHG	98%	98%	--	99%	97%	99%	98%	99%	98%	100%
IDEA	MHG	99%	100%	100%	--	100%	100%	100%	100%	100%	99%
RCOM GSM	MHG	100%	100%	99%	98%	--	98%	98%	99%	99%	100%
TATA GSM	MHG	98%	99%	100%	100%	100%	--	100%	100%	100%	100%
UNINOR	MHG	100%	100%	98%	100%	98%	100%	--	100%	98%	98%
VODAFONE	MHG	100%	98%	100%	98%	100%	98%	99%	--	100%	100%
RCOM CDMA	MHG	100%	100%	99%	100%	99%	100%	100%	98%	--	100%
TATA CDMA	MHG	100%	100%	100%	100%	100%	100%	99%	100%	100%	--

The result of the testing revealed that the inter connection performance among the operators was satisfactory. However, in some cases where calls attempted from one operator to other, successful calls interconnection were in variation of 97% to 100% respectively. Thus there was no remarkable problem in interconnection from one operator to other operators.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	UNINOR	RCOM (CDMA)	TATA (CDMA)
Total no of calls attempted to customer care/Call center	MHG	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	MHG	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total calls successfully established*100 / Total call attempts)	MHG	100	100	100	100	100	100	100	100	100	100
Total Calls reached to agent desk for Voice to Voice (Total call attempts)	MHG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total number of calls answered by the operator (Voice to voice) within 90 seconds	MHG	100	100	100	100	100	100	100	100	100	100
% age of calls answered by operator(voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	MHG	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, all service providers were found to have 100% of call access and answered from the call center operators within 90 Seconds.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	UNINOR	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	MHG	100	100	100	100	100	100	100	100	100	100
Total No. of calls Answered	MHG	90	95	98	99	98	95	98	95	90	98
Cases resolved within 4 weeks	MHG	90	94	96	98	97	95	97	95	89	98
%age of cases resolved	MHG	100.00%	98.95%	97.96%	98.99%	98.98%	100.00%	98.98%	100.00%	98.89%	100.00%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. During live calling, some of the customers did not attend the calls while some others reported that there complaints have been resolved but not sure of duration of their resolution. %age of resolution of billing complaints was 97.96% to 100%.

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING																
Emergency no.	Month of Drive Test	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	UNINOR	VODAFONE	RCOM (CDMA)	TATA (CDMA)		
100, 101, 102,1098	JAN'15	Ahmednagar	Rahuri	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
			Shrirampur	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Newasa	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Sangamner	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Akole	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Kopargaon	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Ahmednagar	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Pamer	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Shrigonda	8	NC	✓	✓	✓	✓	NC	✓	✓	✓	✓	NC	✓
	FEB'15	Amravati	Tiwsa	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Chandur-Railway	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Nandgaon	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Chandur-Bazar	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Morshi	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Warud	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
			Amravati	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	MAR'15	Nashik	Nandgoan	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Manmad	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Yeola	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Niphad	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Malegoan	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Satana	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
			Kalwan	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	NC	✓
			Dindori	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nashik City	8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			

NC: No Coverage

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various mobile service providers, the calls were made from mobile phones provided by the service providers during the drive tests. In these SDCAs of MH&G service areas, the emergency services as mentioned in the above table were found functional in the networks of all the service providers except Aircel, RCOM (GSM & CDMA) at Shrigonda SDCA and RCOM CDMA at Kalwan SDCA, where there was no coverage of these operators.

7. DRIVE TEST



7) OPERATOR ASSISTED DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three SSA's namely **Ahmednagar, Amravati and Nasik** in the months of January, February and March 2015 respectively. The total route Kms covered during drive tests in respective SSAs was **335 Kms, 320 Kms and 308 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.

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

DRIVE TEST TABLE-1

OPERATOR ASSISTED DRIVE TEST AT AHMEDNAGAR SSA IN JANUARY 15 MONTH- MAHARSTRA & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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	187	25	144	29	133	25	160	25	222	25	114	25	171	25	185	25	194	25	194	25
Major Roads	82	10			121	10	125	10	100	25	131	10	79	25	65	10	106	10	91	25	91	25			
Within City	114	25			141	25	171	25	135	25	145	25	105	25	124	25	133	25	139	25	139	25			
Overall SSA	383	60			406	64	429	60	395	75	498	60	298	75	360	60	424	60	424	75	424	75			
2	Blocked Call Rate	Highways	0.53%	0.00%	0.00%	0.00%	3.01%	0.00%	3.75%	0.00%	0.45%	0.00%	7.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
		Major Roads	0.00%	0.00%	0.00%	0.00%	5.84%	0.00%	1.00%	0.00%	0.00%	0.00%	1.27%	0.00%	0.00%	0.00%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%			
		Within City	0.00%	0.00%	0.00%	0.00%	4.68%	8.00%	0.00%	0.00%	0.69%	0.00%	0.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
		Overall SSA	0.26%	0.00%	0.00%	0.00%	4.54%	3.33%	1.77%	0.00%	0.40%	0.00%	3.40%	0.00%	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%			
3	Dropped Call Rate (<=2%)	Highways	0.54%	0.00%	0.00%	0.00%	2.33%	0.00%	0.65%	0.00%	0.00%	0.00%	0.94%	0.00%	0.00%	0.00%	0.54%	0.00%	0.52%	0.00%	0.52%	0.00%			
		Major Roads	0.00%	0.00%	0.00%	0.00%	1.55%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
		Within City	0.88%	0.00%	0.00%	0.00%	1.84%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			
		Overall SSA	0.53%	0.00%	0.00%	0.00%	1.90%	0.00%	0.26%	0.00%	0.00%	0.00%	5.21%	0.00%	0.28%	0.00%	0.24%	0.00%	0.24%	0.00%	0.24%	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	97.86%	99.54%	97.86%	99.54%		
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.52%	99.34%	98.52%	99.34%		
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.79%	99.28%	98.79%	99.28%		

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

OPERATOR ASSISTED DRIVE TEST AT AHMEDNAGAR SSA IN JANUARY 15 MONTH- MAHARSTRA & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Operators)																			
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.30%	99.39%	98.30%	99.39%
	(b) 0-5 (with frequency hopping for GSM Operators)	Highways	97.11%	98.90%	96.03%	98.25%	92.18%	100%	95.75%	99.86%	95.89%	99.69%	92.13%	99.88%	95.71%	99.59%	94.58%	98.73%	NA	NA	NA	NA
		Major Roads	96.12%	99.60%	97.00%	99.60%	93.11%	100%	96.57%	99.95%	96.51%	99.65%	94.28%	99.77%	94.67%	98.72%	95.19%	94.59%	NA	NA	NA	NA
		Within City	96.58%	98.35%	97.78%	97.80%	93.94%	100%	96.13%	100%	96.98%	99.60%	97.11%	98.99%	95.74%	99.11%	96.27%	93.77%	NA	NA	NA	NA
		Overall SSA	96.74%	98.79%	96.84%	98.27%	92.98%	100%	96.07%	99.94%	96.34%	99.65%	94.45%	99.48%	95.56%	99.25%	95.27%	95.96%	NA	NA	NA	NA
	Service Coverage																					
	In door (>= - 75dBm)	Highways	62.79%	30.01%	64.42%	99.09%	19.21%	68.77%	92.46%	95.18%	71.19%	100%	36.82%	38.40%	52.81%	1.54%	91.15%	12.38%	99.94%	100%	99.94%	100%
		Major Roads	59.36%	100%	61.74%	99.70%	30.13%	50.78%	91.59%	99.38%	71.39%	100%	50.20%	85.12%	73.75%	85.05%	85.34%	41.24%	99.99%	100%	99.99%	100%
		Within City	68.53%	100%	60.80%	96.91%	36.46%	10.56%	91.58%	94.70%	82.86%	92.84%	54.38%	100%	77.61%	90.17%	93.40%	61.44%	99.99%	100%	99.99%	100%
		Overall SSA	63.75%	70.84%	62.58%	98.25%	27.66%	41.38%	91.97%	96.47%	74.51%	98.07%	46.38%	72.61%	61.68%	97.32%	90.36%	37.81%	99.97%	100%	99.97%	100%
5	In-vehicle (>= - 85dBm)	Highways	87.16%	99.61%	91.13%	99.13%	40.58%	99.69%	99.48%	97.42%	91.93%	100%	67.44%	97.55%	69.29%	70.64%	98.66%	92.04%	100%	100%	100%	100%
		Major Roads	81.60%	100%	81.20%	100%	55.98%	99.22%	98.33%	99.98%	91.80%	100%	77.71%	100%	91.23%	98.80%	96.82%	99.03%	100%	100%	100%	100%
		Within City	89.38%	100%	88.08%	100%	58.00%	100.15%	98.26%	99.55%	97.58%	99.71%	84.46%	100%	96.31%	99.22%	99.40%	98.94%	100%	100%	100%	100%
		Overall SSA	86.62%	99.84%	86.89%	99.64%	50.64%	99.78%	98.82%	99.00%	93.48%	99.92%	76.00%	99.03%	78.83%	100%	98.42%	96.10%	100%	100%	100%	100%
	Outdoor-in city (>= - 95dBm)	Highways	98.89%	100%	99.12%	100%	100%	100%	100%	100%	99.37%	100%	92.35%	100%	99.34%	98.66%	99.56%	100%	100%	100%	100%	100%
		Major Roads	96.42%	100%	95.87%	100%	100%	100%	100%	100%	99.74%	100%	93.66%	100%	99.21%	100%	99.89%	100%	100%	100%	100%	100%
		Within City	97.97%	100%	98.89%	100%	100%	100%	100%	100%	99.91%	100%	98.66%	100%	99.81%	100%	99.99%	100%	100%	100%	100%	100%
		Overall SSA	98.08%	100%	97.99%	100%	100%	100%	100%	100%	99.61%	100%	94.83%	100%	99.43%	100%	99.77%	100%	100%	100%	100%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



OPERATOR ASSISTED DRIVE TEST AT AHMEDNAGAR SSA IN JANUARY 15 MONTH- MAHARSTR & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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	
			6	Call Setup Success Rate (>=95%)	Highways	98.93%	100%	100%	100%	91.73%	100%	96.25%	100%	97.75%	100%	92.98%	100%	98.25%	100%	100%	100%	100%	100%
Major Roads	100%	100%			100%	100%	86.40%	100%	99.00%	100%	99.24%	100%	98.73%	100%	98.46%	100%	99.06%	100%	100%	100%	100%	100%	100%
Within City	99.12%	100%			100%	100%	75.44%	92.00%	100%	100%	99.31%	100%	99.05%	100%	99.19%	100%	100%	100%	100%	100%	100%	100%	100%
Overall SSA	99.22%	100%			100%	100%	83.68%	96.67%	98.23%	100%	98.59%	100%	96.64%	100%	98.61%	100%	99.76%	100%	100%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Highways	99.59%	100%	100%	100%	85.39%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Major Roads	100%	100%	100%	100%	99.43%	100%	100%	100%	99.53%	100%	97.80%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	95.98%	100%	100%	100%	99.24%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	99.77%	100%	100%	100%	93.77%	100%	100%	100%	99.64%	100%	99.41%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

NA: Not Applicable

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

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

DRIVE TEST TABLE-2

OPERATOR ASSISTED DRIVE TEST AT AMRAVATI SSA IN FEBRUARY 15 MONTH - MAHARSTR & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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	157	25	156	25	180	25	148	25	147	25	121	25	119	26	156	23	178	25	121	25		
		Major Roads	109	25	118	25	122	24	115	25	126	25	120	25	111	24	118	29	128	25	118	25		
		Within City	191	25	213	26	188	25	186	25	198	25	208	25	172	25	196	26	202	25	209	25		
		Overall SSA	457	75	487	76	490	74	449	75	471	75	449	76	402	75	470	78	508	75	448	76		
2	Blocked Call Rate	Highways	1.27%	12.00%	0.00%	0.00%	4.44%	4.00%	1.35%	0.00%	0.68%	0.00%	0.00%	0.00%	1.68%	0.00%	1.92%	0.00%	1.12%	0.00%	0.00%	0.00%		
		Major Roads	0.92%	8.00%	0.00%	0.00%	4.10%	4.17%	0.00%	0.00%	1.59%	0.00%	2.50%	0.00%	2.70%	0.00%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Within City	1.57%	0.00%	0.00%	0.00%	2.66%	8.00%	1.08%	0.00%	0.00%	0.00%	0.48%	0.00%	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.96%	0.00%		
		Overall SSA	1.31%	6.67%	0.00%	0.00%	3.67%	5.41%	0.89%	0.00%	0.64%	0.00%	0.89%	0.00%	1.74%	0.00%	0.85%	0.00%	0.39%	0.00%	0.45%	0.00%		
3	Dropped Call Rate (<=2%)	Highways	1.29%	0.00%	0.00%	0.00%	1.74%	0.00%	0.68%	0.00%	0.00%	0.00%	0.83%	0.00%	0.00%	0.00%	0.00%	0.00%	0.57%	0.00%	0.00%	0.00%		
		Major Roads	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	0.00%	1.63%	0.00%	0.00%	0.00%	1.87%	0.00%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%		
		Within City	0.00%	0.00%	0.00%	0.00%	1.64%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	0.58%	0.00%	0.00%	0.00%	0.50%	0.00%	0.48%	0.00%		
		Overall SSA	0.44%	0.00%	0.00%	0.00%	1.91%	0.00%	0.22%	0.00%	0.65%	0.00%	0.22%	0.00%	0.76%	0.00%	0.21%	0.00%	0.40%	0.00%	0.22%	0.00%		
4	(a) 0-4 (w/o frequency hopping for CDMA)	Percentage connections with good voice quality (=>95%)																						
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.70%	99.61%	97.06%	100%	
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.33%	99.93%	99.44%	100%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.20%	99.28%	99.62%	99.80%	

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



OPERATOR ASSISTED DRIVE TEST AT AMRAVATI SSA IN FEBRUARY 15 MONTH - MAHARSTR & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Operators)																			
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.06%	99.61%	98.84%	99.89%
	(b) 0-5 (with frequency hopping for GSM Operators)	Highways	94.26%	99.56%	98.52%	99.62%	93.54%	100%	97.99%	97.73%	96.62%	99.68%	93.31%	100%	95.67%	98.26%	94.45%	98.88%	NA	NA	NA	NA
		Major Roads	93.73%	94.87%	97.38%	99.16%	93.89%	100%	97.63%	98.11%	96.50%	99.23%	94.75%	99.26%	94.73%	99.07%	94.22%	90.29%	NA	NA	NA	NA
		Within City	95.87%	98.91%	97.39%	99.27%	92.96%	99.93%	97.76%	97.08%	97.17%	98.83%	96.81%	99.80%	94.80%	81.16%	95.93%	99.58%	NA	NA	NA	NA
		Overall SSA	94.81%	97.97%	97.72%	99.35%	93.40%	99.98%	97.80%	97.64%	96.82%	99.24%	95.30%	99.77%	95.04%	92.99%	95.05%	96.04%	NA	NA	NA	NA
	Service Coverage																					
5	In door (>= -75dBm)	Highways	50.04%	31.61%	70.59%	62.65%	55.42%	13.73%	91.74%	96.01%	62.08%	56.30%	32.70%	100%	45.87%	56.28%	50.25%	99.80%	100%	100%	42.87%	100%
		Major Roads	55.68%	50.75%	58.29%	99.55%	66.04%	28.88%	92.34%	96.74%	74.52%	25.05%	49.06%	25.79%	63.78%	99.55%	65.35%	78.58%	100%	100%	54.13%	98.74%
		Within City	64.06%	95.38%	77.61%	100%	59.39%	49.91%	90.84%	96.59%	87.68%	98.82%	60.66%	100%	67.31%	1.51%	85.10%	98.64%	100%	100%	55.05%	88.39%
		Overall SSA	57.21%	56.72%	68.99%	87.04%	60.28%	30.84%	91.53%	96.42%	76.40%	59.98%	49.84%	75.26%	60.04%	52.62%	65.11%	9153.00%	100%	100%	51.31%	95.71%
	In-vehicle (>= -85dBm)	Highways	67.59%	47.57%	92.22%	99.43%	96.12%	100%	96.70%	97.90%	91.41%	99.79%	64.80%	100%	77.08%	99.78%	81.83%	100%	100%	100%	69.01%	100%
		Major Roads	75.47%	92.02%	84.13%	100%	96.70%	100%	96.31%	97.85%	93.51%	98.39%	78.59%	99.37%	91.28%	100%	93.17%	99.88%	100%	100%	88.78%	100%
		Within City	85.20%	99.51%	96.07%	100%	95.34%	100%	98.76%	97.73%	99.11%	100%	88.73%	100%	89.35%	89.62%	96.44%	100%	100%	100%	87.99%	100%
		Overall SSA	76.78%	76.57%	90.87%	99.81%	96.05%	100%	97.43%	98.95%	95.30%	99.39%	79.42%	100%	86.25%	96.49	90.50%	9991.00%	100%	100%	82.69%	100%
	Outdoor-in city (>= -95dBm)	Highways	87.88%	99.87%	98.87%	100%	99.97%	100%	100%	100%	99.04%	100%	87.86%	100%	96.38%	100%	98.56%	100%	100%	100%	96.83%	100%
		Major Roads	92.11%	99.54%	97.81%	100%	100%	100%	100%	100%	99.47%	99.99%	93.98%	100%	98.99%	100%	99.05%	100%	100%	100%	99.11%	100%
		Within City	97.77%	99.89%	99.72%	100%	99.82%	100%	100%	100%	99.97%	100%	97.98%	100%	97.87%	99.34%	99.71%	100%	100%	100%	99.51%	100%
		Overall SSA	92.99%	99.78%	98.83%	100%	99.93%	100%	100%	99.95%	99.56%	100%	94.11%	100%	97.73%	99.78%	99.14%	100%	100%	100%	98.64%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



OPERATOR ASSISTED DRIVE TEST AT AMRAVATI SSA IN FEBRUARY 15 MONTH - MAHARSTR & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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
			6	Call Setup Success Rate (>=95%)	Highways	98.73%	88.00%	100%	100%	95.56%	96.00%	98.65%	100%	97.28%	100%	100%	100%	97.48%	96.15%	98.08%	100%	98.88%
Major Roads	99.08%	92.00%			100%	100%	95.90%	95.83%	100%	100%	97.62%	100%	97.50%	100%	96.40%	100%	99.15%	100%	100%	100%	100%	104.00%
Within City	98.43%	100%			100%	100%	97.34%	92.00%	98.92%	100%	98.99%	100%	99.52%	100%	99.42%	100%	100%	100%	100%	100%	99.04%	104.00%
Overall SSA	98.69%	93.33%			100%	100%	96.33%	94.59%	99.11%	100%	98.09%	100%	99.11%	100%	98.01%	98.67%	99.15%	100%	99.61%	100%	99.55%	104.00%
7	Hand Over Success Rate (HOSR)	Highways	98.86%	100%	100%	100%	99.38%	100%	100%	100%	99.19%	100%	100%	100%	99.09%	95.24%	100%	100%	100%	100%	100%	100%
		Major Roads	99.24%	97.78%	100%	100%	99.34%	100%	100%	100%	100%	100%	100%	100%	98.24%	100%	100%	100%	100%	100%	100%	100%
		Within City	99.07%	98.18%	100%	100%	99.30%	100%	100%	100%	99.39%	100%	100%	100%	94.49%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	99.08%	98.00%	100%	100%	99.33%	100%	100%	100%	99.50%	100%	100%	100%	96.56%	94.44%	100%	100%	100%	100%	100%	100%

NA: Not Applicable

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

DRIVE TEST TABLE-3

OPERATOR ASSISTED DRIVE TEST AT NASIK SSA IN MARCH 15 MONTH- MAHARSTRA & GOA CIRCLE																						
S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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	114	25	129	25	113	30	132	25	134	25	49	407	152	25	113	26	133	25	112	26
		Major Roads	133	25	161	25	144	26	158	25	166	25	113	26	196	25	151	25	149	25	135	26
		Within City	158	25	166	25	143	25	163	25	175	25	138	26	230	25	156	25	166	25	150	26
		Overall SSA	405	75	456	75	400	81	453	75	475	75	156	25	578	75	420	76	448	75	397	78
2	Blocked Call Rate	Highways	0.00%	0.00%	0.00%	0.00%	2.65%	0.00%	2.27%	0.00%	0.00%	0.00%	2.04%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Major Roads	0.00%	0.00%	0.00%	0.00%	5.56%	0.00%	1.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.63%	0.00%	0.00%	0.00%	0.00%	0.00%	1.84%	0.00%	0.00%	0.00%	0.72%	3.85%	0.87%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%
		Overall SSA	0.25%	0.00%	0.00%	0.00%	2.75%	0.00%	1.77%	0.00%	0.00%	0.00%	1.28%	0.00%	0.52%	0.00%	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Highways	0.00%	0.00%	0.00%	0.00%	3.64%	0.00%	0.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Major Roads	0.00%	0.00%	0.00%	0.00%	1.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	3.50%	0.00%	0.63%	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%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	2.83%	0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency)	Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.92%	95.59%	98.61%	100%
		Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.20%	95.08%	99.55%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



OPERATOR ASSISTED DRIVE TEST AT NASIK SSA IN MARCH 15 MONTH- MAHARSTR & GOA CIRCLE

S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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
			hopping for CDMA Operators)	Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.54%	99.34%
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.24%	96.67%	99.14%	100%	
(b) 0-5 (with frequency hopping for GSM Operators)	Highways	95.94%	99.55%	96.57%	97.85%	90.82%	96.81%	97.08%	99.97%	95.57%	92.03%	87.64%	94.08%	94.18%	98.59%	96.15%	99.37%	NA	NA	NA	NA	
	Major Roads	96.17%	99.14%	96.82%	97.18%	92.95%	92.24%	97.43%	99.93%	96.17%	98.36%	94.22%	99.62%	94.92%	99.36%	94.16%	98.37%	NA	NA	NA	NA	
	Within City	96.27%	99.32%	96.59%	98.08%	90.29%	96.66%	97.59%	99.97%	96.10%	94.60%	94.58%	100%	95.20%	98.18%	96.02%	96.93%	NA	NA	NA	NA	
	Overall SSA	96.15%	99.35%	96.68%	97.72%	91.38%	95.30%	97.39%	99.96%	95.96%	95.01%	92.73%	96.50%	94.87%	98.71%	95.36%	98.20%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Highways	48.02%	94.62%	53.93%	98.55%	34.35%	27.45%	91.89%	100%	59.91%	58.52%	58.70%	60.15%	72.01%	100%	65.31%	100%	99.98%	99.97%	55.53%	38.74%
		Major Roads	56.46%	81.31%	58.52%	97.59%	42.96%	17.74%	93.08%	92.35%	61.40%	81.41%	55.04%	100%	82.82%	100%	75.69%	99.47%	99.97%	100%	52.43%	95.61%
		Within City	60.47%	6.27%	54.56%	100%	48.01%	97.49%	93.54%	99.62%	62.52%	51.45%	60.07%	89.63%	82.57%	97.20%	82.12%	100%	99.97%	100%	76.58%	81.91%
		Overall SSA	55.78%	59.40%	55.92%	98.68%	42.43%	45.90%	92.92%	97.24%	61.28%	63.79%	65.76%	96.53%	79.85%	99.05%	75.33%	99.83%	99.97%	99.99%	58.84%	0.00%
5	In-vehicle (>= - 85dBm)	Highways	78.28%	100%	80.06%	99.96%	87.31%	98.28%	98.49%	100%	89.01%	98.37%	87.60%	87.48%	90.30%	100%	91.03%	100%	100%	100%	84.15%	97.78%
		Major Roads	82.79%	99.93%	83.30%	99.85%	94.54%	99.85%	98.99%	99.96%	89.59%	99.26%	81.00%	100%	96.21%	100%	94.98%	100%	100%	100%	85.14%	100%
		Within City	88.30%	99.89%	87.61%	100%	93.80%	100%	98.92%	100%	92.60%	96.16%	90.77%	100%	96.80%	100%	96.47%	100%	100%	100%	97.47%	99.78%
		Overall SSA	83.76%	99.94%	83.98%	99.93%	92.26%	99.31%	98.82%	99.98%	90.40%	97.93%	91.89%	100%	94.86%	100%	94.49%	100%	100%	100%	87.52%	0.00%
5	Outdoor-in city (>= - 95dBm)	Highways	96.12%	100%	97.77%	100%	99.50%	100%	100%	100%	99.65%	100%	98.46%	98.50%	98.27%	100%	99.36%	100%	100%	100%	97.86%	100%
		Major Roads	99.06%	100%	97.79%	100%	94.54%	100%	100%	100%	99.55%	100%	97.04%	100%	99.42%	100%	99.52%	100%	100%	100%	99.75%	0.00%
		Within City	99.43%	100%	98.55%	100%	99.66%	100%	100%	100%	99.73%	99.99%	99.39%	100%	99.74%	100%	99.37%	100%	100%	100%	99.99%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

OPERATOR ASSISTED DRIVE TEST AT NASIK SSA IN MARCH 15 MONTH- MAHARASHTRA & GOA CIRCLE																							
S/N	Parameter	Days of drive test	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		UNINOR		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	98.42%	100%	98.05%	100%	97.80%	100%	100%	100%	99.64%	100%	99.36%	100%	99.23%	100%	99.42%	100%	100%	100%	99.08%	0.00%
6	Call Setup Success Rate (>=95%)	Highways	100%	100%	100%	100%	97.35%	100%	97.73%	100%	100%	100%	97.96%	99.26%	100%	100%	100%	100%	100%	100%	96.43%	100%	
		Major Roads	100%	100%	100%	100%	94.44%	100%	98.73%	100%	99.40%	100%	100%	100%	99.49%	100%	100%	100%	100%	100%	100%	100%	
		Within City	99.37%	100%	100%	100%	100%	100%	98.16%	100%	100%	100%	99.28%	96.15%	97.83%	100%	100%	100%	99.40%	100%	99.33%	100%	
		Overall SSA	99.75%	100%	100%	100%	97.25%	100%	98.23%	100%	99.79%	100%	98.72%	100%	98.96%	100%	100%	100%	99.78%	100%	98.74%	100%	
7	Hand Over Success Rate (HOSR)	Highways	94.85%	100%	100%	100%	98.15	100%	100%	100%	99.55%	100%	96.85%	98.73%	97.64%	100%	100%	100%	100%	100%	100%	100%	
		Major Roads	97.01%	100%	100%	100%	98.78	100%	100%	100%	100%	100%	97.89%	100%	99.47%	100%	100%	100%	100%	100%	100%	100%	
		Within City	99.42%	100%	100%	100%	98.59	100%	100%	100%	100%	100%	99.61%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Overall SSA	97.29%	100%	100%	100%	98.51	100%	100%	100%	99.87%	100%	98.63%	100%	99.18%	100%	100%	100%	100%	100%	100%	100%	

NA: Not Applicable

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

7.1 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

DRIVE TEST ROUTE OF JANUARY TO MARCH 15 – MH&G 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
AHMEDNAGAR	Jan-15	Rahuri , Shrirampur & Newasa / 110 KM	<p>Rahuri :MSEB power sation, Rajeshwar colony, Kanif Nath Chouk, Shivaji Chouk, Saraf Bazar, Nagar Palika, Civil Hospital, Bus Stand, Mahavir Wadi, Station Road, Navi Peth, Krishi Utpana Bazar Samiti, Sonai Road, MSEB Sub-Station Road, Shani Singanapur Road.</p> <p>Shrirampur : Kochole Highschool, Rampur, Laxmi Nagar, BSNL Tele. Exchange, Subhash Colony, Ogle Hospital, S.T. Coloy, Bus Stand, Railway Station, Saraf Bazar, Main Road, Girme Chouk, Shivaji Path, Sawta Road, Gajanan Nagar, Sahakar Bhavan, Bhanganr Market, Nagar Parishhd, Morge Wasti, Gandhi Gondhawani Road, Vijay Bafna Path, Shivaji Chouk, Bhabhaleshwar Road, VIP Guest House, Shayadri Chouk, Sangamner Road, Datta Nagar, MIDC Area, Govt. ITI college, Mule Road.</p> <p>Newasa : Civil Court, Rohan Colony, Deshpande Nagar, Bus Stand, Bazar Peth, Ganga Nagar, Dyaneshwar Mandir, Masjit Road, Momin Wada, Saraf Bazar, Main Peth, Ahmednagar Road.</p> <p>Indoor: Krishi Utpanna Bazasr Samiti Complex , Newasa</p>	Sangaamner , Akole , Kopargaon / 108 KM	<p>Sangamner : Bus Stand, Maldad Road, Kalpataru Colony, Bapusaheb Colony, Gunjal Wadi, Ganesh Nagar, Anand Colony, Chaitanya Nagar, Indira Nagar, Main Road, Ganga Sagar Colony, Shivagi Nagar, Vidya Nagar, New Ahmadnagar Road, Olb BSNL Tele. Exchange, Kuran Road, Karim Nagar, Sawta Mali Nagar, Akole Road. Thorat Engineering College, Rajhans Dairy, Chulewadi Road, Sangamner college Road, Krishi Utpanna Bazar Samiti, Bus Stand Road.</p> <p>Akole : Nawle Wadi, Bazar Peth, Setu Karyalay, Tahasil Karyalay, Panchyat Samiti, Police Sation, Naik Wadi, BSNL Tele. Exchange, Raigarh Nagar, Sambhji Nagar, Dhupal Wadi, Nawle Chouk, Pravara Corner. Sugaon Fata, Tajne Road, Shekai Wadi, Khatpat Naka,</p>	Ahmednagar , Parner , Shrigonda / 117 KM	<p>Ahmednagar : Amardeep Chouk, MIDC Police Station, MIDC Area, Jakat Naka, Indraprastha Colony, Sawedi, Dhanagi Nagar, Sarda College, Sarje Pura, Maim Market Road, Tele Galli, Old Civil Hospital, Bhador Galli, Nevi Peth, Ghumre Galli, Wadiya Park, Krida Sankul, Swastik Chouk, Bus Stand, Kinetik Chouk, Railway Station Road, Shivneri Chouk, Arban Colony, Anand Vihar, Shirdi Road, New Tilak Road, Nepti Naka, Delhi Gate, Satbhai Mala, Police Head Quarters, Sathe Chouk, Civil</p> <p>Parner : PWD office, Shivaji Road, Bhairavnath Chouk, Padmavati Chouk, Main Road, Saraf Bazar, Rahul Nagar, Jamgaon Road, Market Yard, Bus Stand. Ganpati Fata, Supa Road, Govt. Animal Hospital, Bus Stand, ITI College, Govt. Guest House.</p> <p>Shrigonda : Shani Chouk, Ganesh Nagar,</p>

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DRIVE TEST ROUTE OF JANUARY TO MARCH 15 – MH&G 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
					Bus Stand, Civil Hospital Road, Civil Court, Govt. Guest House, MIDC Area, Nawle Wadi. Kopargaon : Shivaji Chouk, Bus Stand, Main Road, Bank Road, Shivaji Udyan, Radhika Nagar, Ahmdnagar Road, Sangivani Nagar, Bhim Nagar, Kalindi Nagar, MIDC Area, Sangivani College, Station Road, MSEB Sub-Station, Railwat Station, Engineering College. Sai Chouk, Yeola Naka,Market Yard Road, Takali Road, Indira Path, Siddhivinayak Colony, Gulmohar Colony, Ram-Mandir Road, Sambhaji Chouk, Indira Nagar, Ambika Chouk. Indoor: Sanjivani college of Engineering Kopargaon & Hotel Gourav INN		Vadali Road, Civil Court, Main Road, Ravivar Peth, Honorao Chouk, Saraf Bazar, Bus Stand. Major road - Mandavgaon Road, Bus Stand, SBI Chouk, Vijay Chouk, Krishi Utppana Bazar Samiti, Guest House, Kashti Road, Shivaji College, M.B. Corner, Shivaji Nagar, Mahatma Fule Udyan, Shani Chouk, Hanuman Nagar, Civil Hospital. Indoor: Shrigonda Telephone Exchanges
AMRAVATI	Feb-15	Tiwsa, Chandur-Railway, Nandgaon / 96 KM	Tiwsa : Vidut, Colony, Holkar, Chouk, Azad, Chouk, Ganesh Colony, Civil, Court, Tahasi, Karyalay, Tiwsa ,BSNL, Police Station, Panchayat Samiti, Bus Stand, Tiwsa ,Akola - Nagpur HW NHCommerse college, Chandur Road, Main Road, SBI , Dhanashri Colony, Tiwsa - Kurha HW . Chandur Railway: Rajur Road, Shivaji School, Govt. Guest House, Bus Stand, Nagar Parishad, Virul Road, Indira Nagar, ITI college,	Chandur-Bazar, Morshi, Warud./ 119 KM	Chandur-Bazar: Rasikpur Mandir, Timbar Market, Main Road, Jai Stambha Chouk, Maharana Pratap Chouk, Gadge Nagar, Mali pura, Mahavir Chouk, Bus Stand, Police Station, Jamir Colony, Nangaliya Nagar, Kitkule Hospital, Indira Nagar, Kabra School, Bazar Peth, Nagar Parishad, Suyog Colony,	Amravati / 105 KM	Amarawati : Sham Chouk, Post Office, Jawahar Gate, Saraf Lane, Bartan Bazar, Nagpuri Gate, Bhatukali Road, Nurani Chouk, Kholapuri Gate, Bazhi Bazar, Gandhi Chouk, Amba Gate, Pannalal Nagar, Gorakshan Chouk, Ambadivi Road, Parshi Hospital, Railwa Station, Malviya Chouk, Jay Shambha , Jawahar Road,

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DRIVE TEST ROUTE OF JANUARY TO MARCH 15 – MH&G 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>Shahu College, Dhamangaon Road, Sainath Society, BSNL , Main Market Area, Saraf Bazar, Panchayat Samiti, Civil Court, Police Station, Yadav Nagar, Balasaheb Thakare Chouk, Shivaji Highschool, Bus Stand, Balaji Chouk, Sardar Chuok,Nandgaon Road.</p> <p>NandGaon : Krishi Vidyalay, Nangaon Amrawati Road, Ganesh Nagar, Bazar Lane, Police Station road, Aonkar Kheda, Durga Vihar Colony, ITI College area, Vardhaman Nagarn ,Chandur Road, Vivekanand Colony, Market Yard, BSNL office, Main Road, Saraf Lane, Urdu Highschool, Budwar Chouk, Masjid Road, Post Office.</p> <p>Indoor: Thershil Kargalay Campus Nandgao</p>		<p>Tompe Nagar, Morshi Road, Siddhartha Nagar, Kasab Pura, Bus Stand.</p> <p>Morshi: Salbardi Road, Biyani Bag, Civil Hospital, Main Road, BSNL office, Ambedkar Chouk, Gujari Bazar, Sabji Market, Dostana Chouk, Manik Chouk, Mali Wada, Gedam Pura, Sarafa Lane, SBI, Ashirwad Hospital, Madina Chouk , BOI, Sabji mandi, Tele Pura, Tej Colony, Peth Pura, Krishshi Colony, Abdul Hamid Chouk, Vivekanad Colony, Samartha Colony, Ravi Nagar, Shimbhora Road, Shivaji Nagar, Vidharbha Colony, Balaji Dham, Deep Colony, Police Station, Post Office, Bus Stand, Warud Road.</p> <p>Warud:BSNL Exchange, Sawta Chouk, warud police station, Mahatma Fule Chouk, Main Road, Saraf Lane, Bhavani Chouk, Rajura Naka, Rajura Road, Mahesh Colony, Budwara Bazar, Kedar Talikes, Pandurna Chouk, Ring Road, Gurudev Colony, Natraj colony, Chakradhar Chouk, Bus Stand, PWD Office.</p> <p>Indoor: P.W.D Office warud</p>		<p>Itwara Bazar, Chitra Chouk , Dafrin Hospital, Gutam Nagar, Walgaon Road, Raja Peth, Shankar Nagar, Congrace Nagar, Badnera Road, Yeshoda Nagar, Telephone Nagar, Gopal Nagar, Sai Nagar, Ravi Nagar, Vilas Nagar, Rampuri, Market Yard, Navsari, Kathora Chouk, Gadge Nagar, Arjun Nagar.</p> <p>Indoor: D- Mart Amaravati</p>

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DRIVE TEST ROUTE OF JANUARY TO MARCH 15 – MH&G 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
NASIK	Mar-15	Nandgoan, Manmad, Yeola, Niphad / 102 KM	<p>Nandgoan : Chajjed School Road, Devi Gali, Shivaji Chowk, Exchange Road, Manmad Road Bus Stand Road, Malegoan Road, Staion Road, Post office road, Ambedkar chowk, Ahilya Chowk, Gulzarwadi, teligali, Gurukrupa nagar nandgoan road, Kacheri Road, New Tahsil office, Nandgoan Bypass, Malegoan Road.</p> <p>Manmad : FCI ,Nandgoan-MMR road,Bus stand Road, Road,Shivaji chowk, Gurudwara road, Shivajinagar,Subhash Road, MMR - Yeola Road.</p> <p>Yeola : Shani Mandir, Theatre Road, Kacheri road and Bus stand.</p> <p>Indoor: Novelty Plaza Manmad</p>	Malegoan, Satana, Kalwan, Dindori / 105 KM	<p>Malegaon: Mahatma phule chowk,Camp,Soygoan, Vynkteshnagar, Aambika colony, ravalgoan naka, Satana Road., Juna Agra road, Devika Malla,Islah hospital road,Golden nagar, Bus stand Road,Shivaji chowk,Post office ,Duttnagar,Mausam Pull.</p> <p>Satana : Malhar road,TDA Road, Deola Road , Naampur road, Krantinagar, Shrikrishna nagar, Maharaj Chowk, Bus stand Road, Vishwas colony.</p> <p>Kalwan : Market yard, ganeshnagar, Bus stand Road, outer road, Samarth nagar, Shivajinagar,Kalwan-Nashik Road.</p> <p>Kalwan road,Bhej road Dindori : Panchayat samati,palkhed road , Bus stand road, Nashik road, Dindori -Kalwan road, Dindori road.</p> <p>Indoor: Ashirwad Hotel Premises</p>	Nashik / 101 KM	<p>Nashik : Canada Corner, Sharanpur road, Police ground,Mela stand,Thakkar bus stand,Trimbhak naka, Gadkari chowk, Sarda circle, Dwarka Chowk, ramkund, Sadugram Tapovan,Bhabha nagar, Mumbai Naka, Chandak chowk,Mico Circle,City center mall, ABB chowk, Mahatama nagar, pipdeve road, Satpur MIDC, Mahindra plant, Shramiknagar , Trimbak road, Satpur Ambad link road, XLO point, Nashik Bombay HW, Willoli, NH-3, Dindori road.</p> <p>Indoor: Railway Station Premises Nasik</p>

7.2 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF AHMEDNAGAR SSA (JAN-15)

S. NO	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Rahuri , Shrirampur , Newasa	Rahuri SDCA : Poor coverage observed at Rahauri-Newasa road / Nawasa SDCA : Poor quality observed at Madhameswar road	Sangamner , Akole , Kopargaon	Akole SDCA : Poor coverage observed at Newalewadi and Rajnigandha Colony & Poor voice quality at NH44 / Sangmner SDCA : Poor voice quality observed at Akole by pass & Near pune nasik highway.	Ahmednagar , Parner , Shrigonda	Ahamdnagar SDCA : Poor quality observed in Nalegaon & Junabazar area
2	AIRTEL		Nawasa SDCA : Poor quality observed at Madhameswar road		---		Ahmednagar SDCA : Poor quality observed near by Gokul nagar area.
3	BSNL		Worst level & Quality observed all over SDCA		Worst level & Quality observed all over SDCA		Worst level & Quality observed all over SDCA
4	IDEA		---		---		---
5	UNINOR		---		Akole SDCA : Poor quality observed at Khana Road		---
6	VODAFONE		Rahuri SDCA : Poor quality observed at Rahuri- Sangamner road		Kopargaon SDCA : Poor quality observed at KJ College area		Ahmednagar SDCA : Poor quality observed at Nalegaon road ,Kedgaon industrial area,Penta colony
7	TATA GSM		---		---		---
8	TATA CDMA		---		---		---
9	RCOM GSM		Shrirampur SDCA : Poor coverage & Quality observed at At Sakar Kamgar hospital area & Sanjay Nagar / Nawasa SDCA Poor coverage & Quality observed at Madhameswar road / Rahuri SDCA : At outer area of Newasa & Krishi Vidyapith area.		Kopargaon SDCA : Poor Rx level & Quality observed at Pune - Nasik Highway,Kopargaon Engg. College area / Sangamner :Poor Rx level & Quality observed at sangmner market area		Ahmednagar SDCA : Poor Rx quality observed at Mukund Nagar & Ekvira Chouk area & connecting raord.
10	RCOM CDMA		Shrirampur SDCA : Poor coverage & Quality observed at At Sakar Kamgar hospital area & Sanjay Nagar / Nawasa SDCA Poor coverage & Quality observed at Madhameswar road / Rahuri SDCA : At outer area of Newasa & Krishi Vidyapith area.		---		---

Common Troublesome Areas: Nawasa SDCA : Madhameswar road; Rahuri SDCA : Krishi Vidyapith area and Ahmednagar SDCA : Nalegaon road

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF AMRAVATI SSA (FEBRUARY-15)

S NO	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Tiwsa, Chandur-Railway, Nandgaon	Tiwsa SDCA : Poor coverage observed at shendurraja / Chandurrailway SDCA: Observed poor coverage at Mangalmurti nagar & Rajana road / Nandgaon SDCA : Week coverage observed on Wardha road.	Chandur-Bazar, Morshi, Warud.	Chandurbazar SDCA : Poor coverage observed on Afjalpur Road & Prahadpur road / Morshi SDCA: Poor coverage observed Durgawada Road / Warud SDCA: Poor coverage observed Milanpur Road.	Amravati	Amravati SDCA: Poor coverage found at Shri MAA Colony
2	AIRTEL		Chandurrail SDCA : Poor coverage observed at Dhamangaon & Kurha highwat outer area / Nandgaon SDCA : Observed poor coverage at Dhamangaon Road .		Morshi SDCA : Week Rx level observed on Achalpur road		Amravati SDCA : Poor coverage observed on Amravati-Nagpur NH 6 Highway.
3	BSNL		Nandgaon SDCA : Poor coverage observed at Chandurrailway road		Warud SDCA : Week Rx level observed at Budwara Bazar & Kedar Talkies area		Amravati SDCA : Poor coverage observed on Amravati-Nagpur Highway & Amravati-Chandurrailway highway.
4	IDEA		Nandgaon SDCA : Week coverage observed at Wardha road/ .Chandurrailway SDCA : Poor Rx level observed at Chandur Railway-Kurha highway and Chandur Railway-Jahangirpur highwat / Tiwsa SDCA : Poor quality observed at Tiwsa - Talegaon highway.		---		Amravati SDCA : Poor Voice quality observed at Doctor Colony, Panchavati Nagar, MIDC Area & Shivshakti colony area.
5	UNINOR		Tiwsa SDCA : Poor Rx-level observed at Kurha Road / Chandurrailway SDCA : Poor Rx-level observed at Kurha road .		Chandurbazar SDCA : Poor Rx-level observed at Chandur Bazar-Bramhanwada Road & Chandur Bazar- Morshi Road / Morshi SDCA : Poor quality observed at main Bazar Road , Benoda Road & Nandgaon Peth Road .		---
6	VODAFONE		Chandurrailway SDCA : Poor voice quality observed at Tiwsa road, Dhamangaon road & Fulgaon road.		Chandurbazari SDCA : Poor voice quality observed at Valgaon road / Morshi SDCA : Poor voice quality observed at Simbora Dam area .		Amravati SDCA : Poor coverage observed at Amravati-Nagpur & Chandurrailway highway. Poor voice quality observed at Govt. Engg. College area & Gadge Nagar area .

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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
7	TATA GSM		Tiwsa SDCA : Poor coverage observed at Tiwsa-Kurha highway.		Warud SDCA : Poor coverage observed at Warud-Morshi road.		Amravati SDCA : Week Rx quality found at Bus stand area, Radha Nagar ,MIDC area .
8	TATA CDMA		---		Chandurbazar SDCA : Week coverage observed at Praladpur road .		Amravati SDCA " Week Rx quality observed at Bus stand area, Radha Nagar .
9	RCOM GSM		Chandurrailway SDCA : Poor coverage observed at Kurha-Chandur, Chandur-Amravati, Chandur-Dhamangaon highways / Tiwsa SDCA : Poor coverage observed at Tiwsa-Kurha highway & at Dhamangaon Road.		Chandurbazar SDCA : Poor coverage observed at Afjalpur Road & Prahadpur road / Morshi SDCA : Poor coverage observed at Durgawada Road / Warud SDCA : Poor coverage observed at Milanpur Road		Amravati SDCA : Poor Rx quality observed at Radha Nagar, Kathora Naka , Yashoda Nagar Area .
10	RCOM CDMA		Chandurrailway SDCA : Poor coverage observed at Mangalmurti nagar & Rajana road / Nandgaon SDCA : Week coverage observed at Wardha road.		Chandurbazar SDCA : Poor coverage observed at Afjalpur Road & Prahadpur road / Morshi SDCA : Poor coverage observed at Durgawada Road / Warud SDCA : Poor coverage observed at Milanpur Road		---

Common Troublesome Areas: Tiwsa SDCA: Kurha Road; Chandurbazar : Afjalpur Road and Amravati SDCA : Radha Nagar & Yashoda Nagar sub areas.

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DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF NASIK SSA (MARCH-15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRCEL	Nandgoan, Manmad, Yeola, Niphad	Nandgoan SDCA : Poor voice quality observed at Nandgao-Manmad highway, Towerds malharwadi / Niphed SDCA : Niphed-ozar road	Malegoan, Satana, Kalwan, Dindori	Malegaon SDCA : Poor voice quality observed at Malegaon main circle, Malegaon-manmad highway, Dyaneswar nagar. / Dindori SDCA : Dindori Nashik highway	Nashik	Nashik SDCA : Poor voice quality observed at Kathe gali shankar nagar, Nashik road, Satpur MIDC, Ras bihari school, Ashok nagar, Link road,
2	AIRTEL		Niphed SDCA : Poor voice quality observed at NH-30		Malegaon SDCA : Poor voice quality observed at By pass road chandan puri		Nashik SDCA : Poor voice quality observed at Shekhawadi, Pragati nagar
3	BSNL		Nandgoan SDCA : Poor voice quality observed at Nandgao-Manmad highway / Manmad SDCA : Manmad-Malegaon highway / Niphed SDCA : Niphed-ozar road		Malegaon SDCA : Poor voice quality observed at By pass road chandan puri, Vardhaman nagar, Dyaneswar nagar, Satana naka. / Satana SDCA : Satana malegaon road / Kalwan SDCA: Kalwan dhola highway, Bus stand / Dindori : Dindori-Nashik highway,		Nashik SDCA: Poor voice quality observed at Ras bihari school, Khathe gali, Bhaba nagar, Lonk road, MIDC Area, Mum naka, Kabitr nagar.
4	IDEA		Nandgoan SDCA : Poor voice quality observed at Yeola road, / Niphed SDCA: Vinchur road		---		---
5	UNINOR		Nandgoan SDCA : Poor voice quality observed at Nagarsul Road / Manmad SDCA : Malegaon Road / Yeola SDCA : Manmad road		Dindori SDCA : Poor voice quality observed at Nashik Road		Nashik SDCA: Poor voice quality observed at Nearby Aurangabad Naka
6	VODAFONE		Niphed SDCA : Poor voice quality observed at NH-30, Saikheda road		Dindori SDCA : Poor voice quality observed at Saputara-Nashik road / Malegaon SDCA : By pass road chandan puri, Nayapuri / Satana : NH-33		Nashik SDCA : Poor voice quality observed at Ayodhya nagari
7	TATA GSM		---		Malegaon SDCA : Poor voice quality observed at Malegaon-manmad highway, Near dyaneswar nagar.		Nashik SDCA: Poor voice quality observed at Khathe gali, Kabitr nagar.
8	TATA CDMA		---		---		Nashik SDCA : Poor voice quality observed at Ambedkar road, Ashok nagar, Collage road, Kabir nagar.

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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
9	RCOM GSM		Nandgoan SDCA :Poor voice quality observed at Yeola road / Niphed SDCA : Niphed-Yeola highway,		Malegaon SDCA: Poor voice quality observed at By pass road chandan puri, Vardhaman nagar, Dyaneswar nagar, Satana naka,Soyagaon, Golden plaza./ Satana : Satana malegaon road./ Dindori SDCA :Dindori-Imrle HW, Dindori Nashik Highway.		Nashik: Poor voice quality observed at Satpur, Kidko gama,Talathi colony,Ambad MIDC,Uphar city,Lam road.
10	RCOM CDMA		---		---		---

Common Troublesome Areas: Niphed SDCA : Niphed-ozar road , NH-30; Nandgoan SDCA : Nandgao-Manmad highway; Dindori SDCA: By pass road.

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DRIVE TEST TABLE: 8

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

S No	Month of Drive Test	Operator	SSA	Total SDCA Covered	Status of no network coverage area (SDCA Name)	ICR Status (SDCA Name)
1	Jan-15	Aircel	Ahmednagar	Rahuri , Shrirampur , Newasa, Sangaamner , Akole , Kopargaon, Ahmednagar , Parner and Shrigonda	Shrigonda SDCA	Aircel is on ICR with RCOM GSM at Parner SDCA only
		Airtel			--	NO
		BSNL			--	NO
		Idea			--	NO
		Uninor			--	NO
		Vodafone			--	NO
		Tata GSM			--	NO
		Tata CDMA			--	NO
		RCOM GSM			Shrigonda SDCA	NO
		RCOM CDMA			Shrigonda SDCA	NO
2	Feb-15	Aircel	Amravati	Tiwsa, Chandurrailway, Nandgaon, Chandurbazar, Morshi, Warud and Amravati	--	Aircel is on ICR with RCOM GSM at all over SSA/SDCA
		Airtel			--	NO
		BSNL			--	NO
		Idea			--	NO
		Uninor			--	NO
		Vodafone			--	NO
		Tata GSM			--	NO
		Tata CDMA			--	NO
		RCOM GSM			--	NO
		RCOM CDMA			--	NO
3	Mar-15	Aircel	Nashik	Nandgoan, Manmad, Yeola, Niphad, Malegoan, Satana, Kalwan, Dindori, Nashik	--	Aircel is on ICR with RCOM GSM at Nandgoan, Niphad, Satana, Kalwan,Dindori
		Airtel			--	NO
		BSNL			--	NO
		Idea			--	NO
		Uninor			--	NO
		Vodafone			--	NO
		Tata GSM			--	NO
		Tata CDMA			--	NO
		RCOM GSM			--	NO
		RCOM CDMA			Kalwan SDCA	NO

7.3 KEY FINDINGS ON DRIVE TEST:

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

- (i) **In the Month of January-15**, drive tests were conducted across **Ahmednagar** SSA, covering Rahuri, Shirrampur, Newasa, Sangaamner, Akola, Kopargaon, Ahmednagar, Parner and Shrigonda SDCAs (Total 335 Kms). The performance of the service providers was satisfactory from bench mark compliance point of view for most of the parameters. However, **BSNL** lagged behind its performance for parameter **Voice Quality, CSSR and Blocked Call Rate** with its achieved values as **92.98%, 83.68% (Outdoor) and 4.54% (Outdoor)** respectively on overall SSA basis. The performance of **RCOM GSM** also remained under performed for parameters **Call Drop rate (5.21%), Voice Quality (94.45% - Outdoor) and Blocked Call Rate (3.40% - Outdoor)** respectively.
- (ii) **In the Month of February-15**, drive tests were conducted across **Amravati** SSA covering Tiwsa, Chandur Rly Stn, Nandgaon, Chandur Bazar, Morshi, Warud and Amravati SDCAs (Total 320Kms). The results of the drive test exposed that **BSNL** could not comply with the benchmark of the parameters **Voice Quality and Blocked Call Rate** with its overall achievement as **93.40% (Outdoor) and 3.67% (Outdoor) / 5.41% (Indoor)** respectively on SSA level. Further, **Aircel and Uninor** also lagged behind the benchmark of parameters **Voice quality** with their performance as **94.81% (Outdoor) and 92.99% (Indoor)** respectively. The poor performance of **Aircel** in respect of **CSSR / Blocked call rate** indicates high congestion in their **Indoor locations** where Drive tests were conducted.
- (iii) **In the month of March -15**, drive test was conducted across **Nasik** SSA covering Nandgaon, Manmad, Yeola, Niphad, Malegaon, satna, Kalwan, Dindori and Nasik SDCAs (Total 308 Kms). The performance of **BSNL** with respect to the parameters **Voice quality and Call Drop rate remained** under performed with their achieved level as **91.38% (Outdoor) and 2.83% (Outdoor)** respectively. Whereas, **RCOM (GSM) and Uninor** failed to meet the benchmark of **Voice Quality (92.73% and 94.87%** respectively.

The deficiencies with respect to adequate coverage and poor voice quality, encountered by different Service providers at the various places, shown in the drive tests plots, are detailed in the above table-5, table-6 and table-7 for Ahmednagar, Amravati and Nasik SSAs respectively.

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

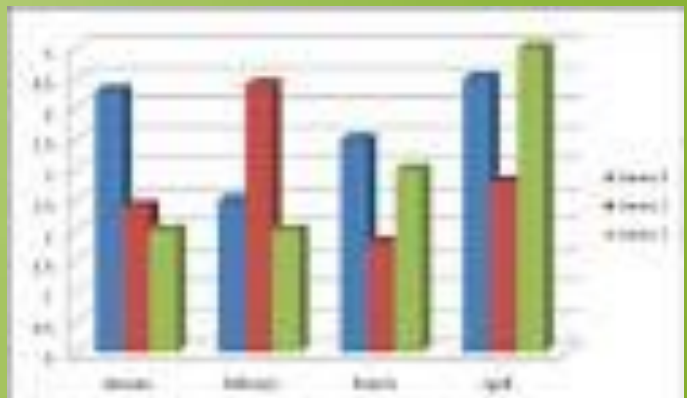
*Thus the analysis of Drive tests revealed that Service providers namely **BSNL, RCOM (GSM), Aircel and Uninor** remained non-complied and need to improve their network performance with respect to the parameters **Voice Quality, Call Drop rate and Call setup success rate / Blocked Call Rate** at different locations of the above SSAs, where the drive tests were conducted.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

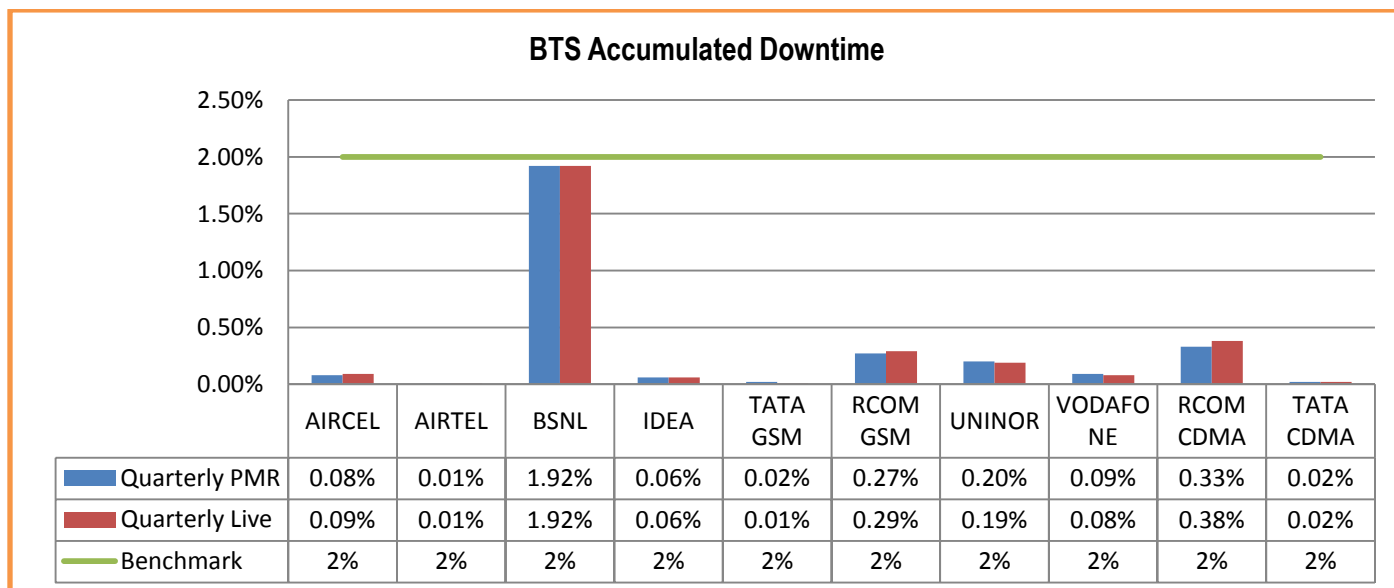
AVERAGED QUARTERLY 3-DAYs LIVE MEASUREMENT



8) GRAPHICAL REPRESENTATION (CMTS):

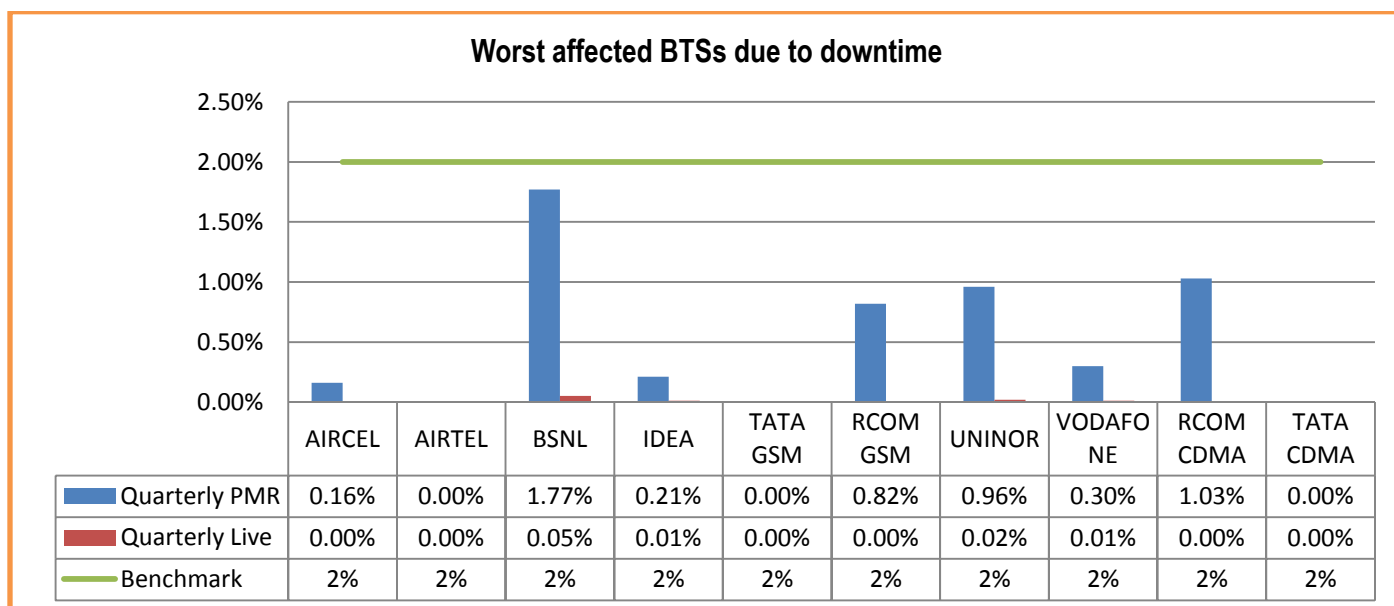
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME:



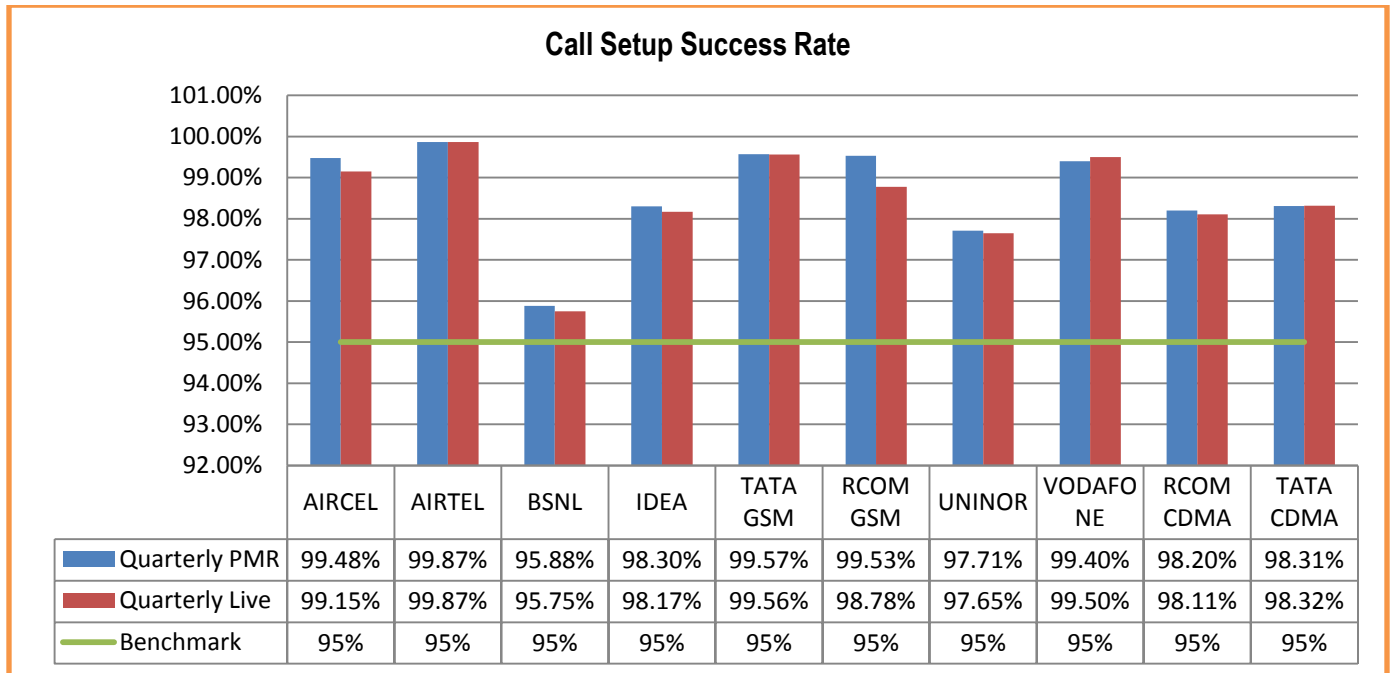
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSS DUE TO DOWNTIME:



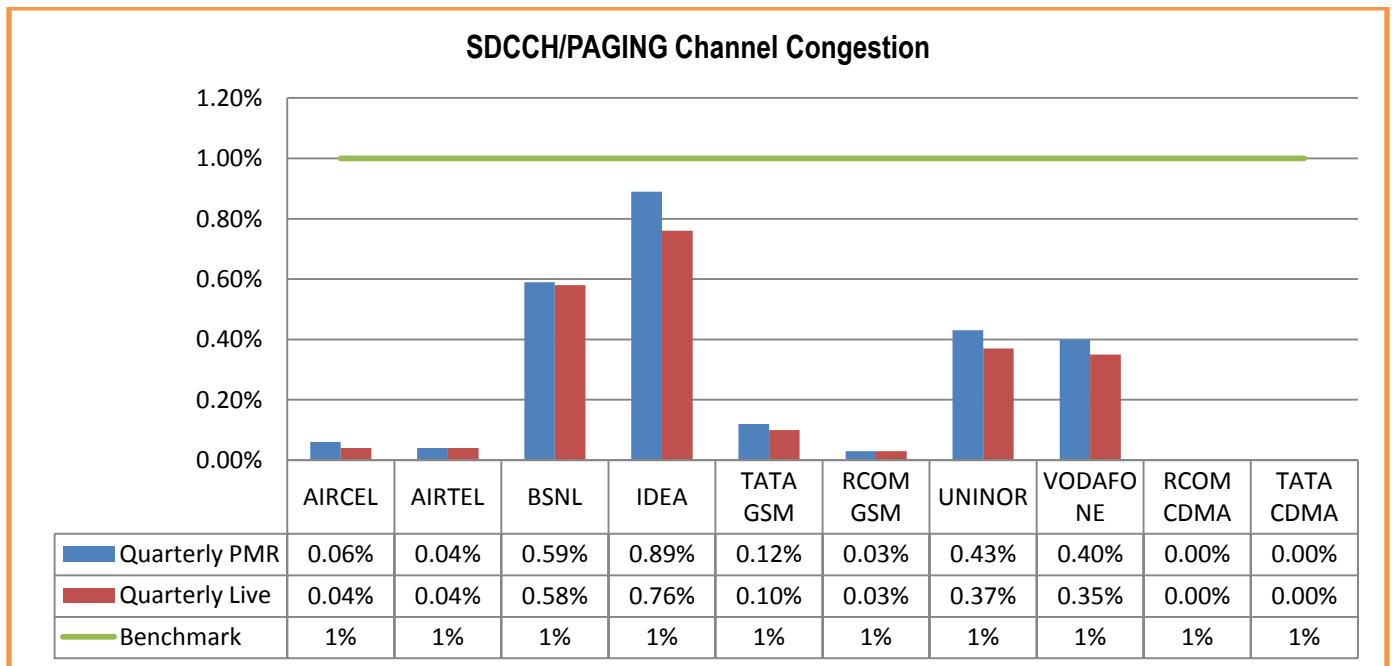
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE :



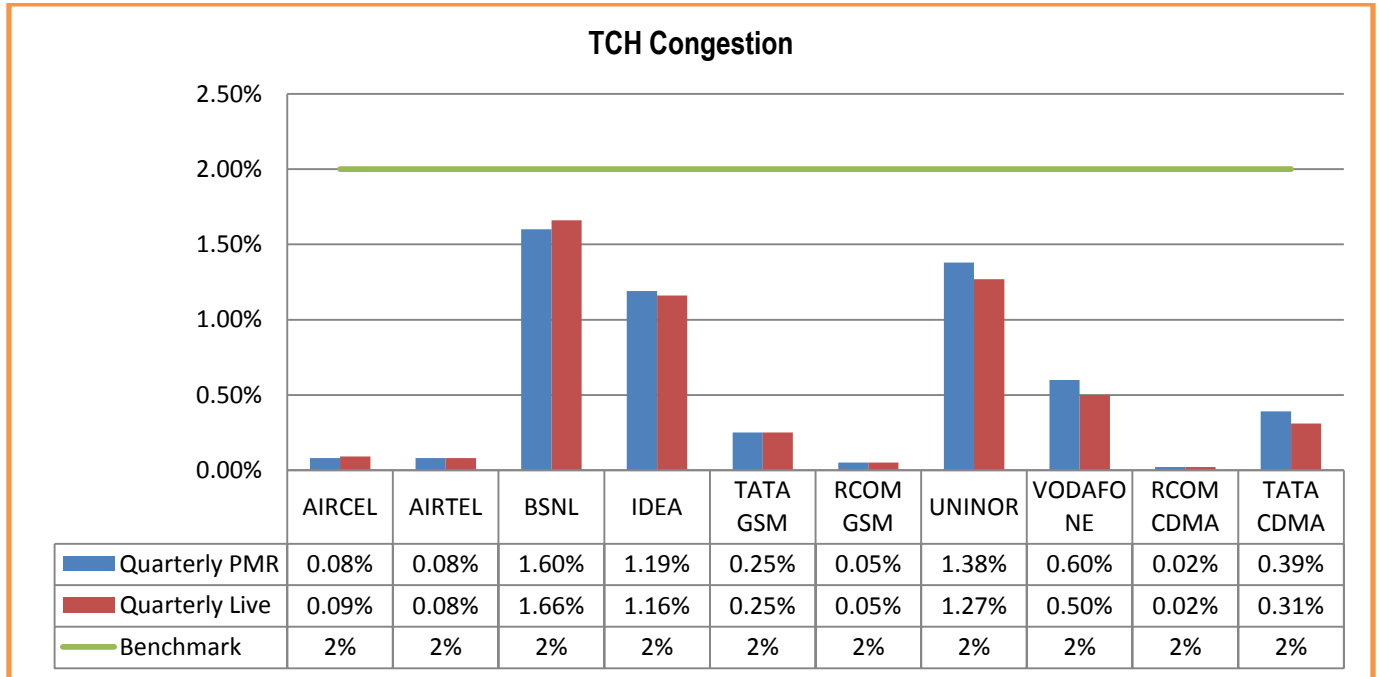
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION :



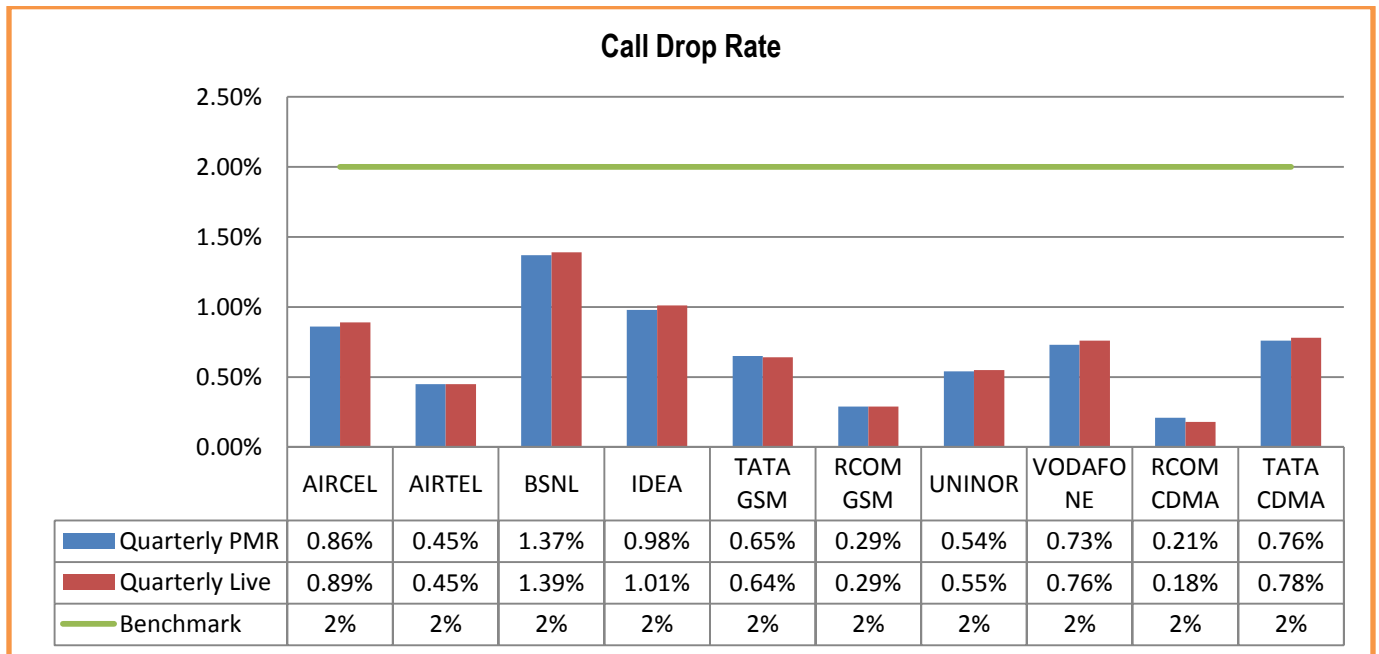
All operators are meeting the benchmarks.

5) TCH CONGESTION:



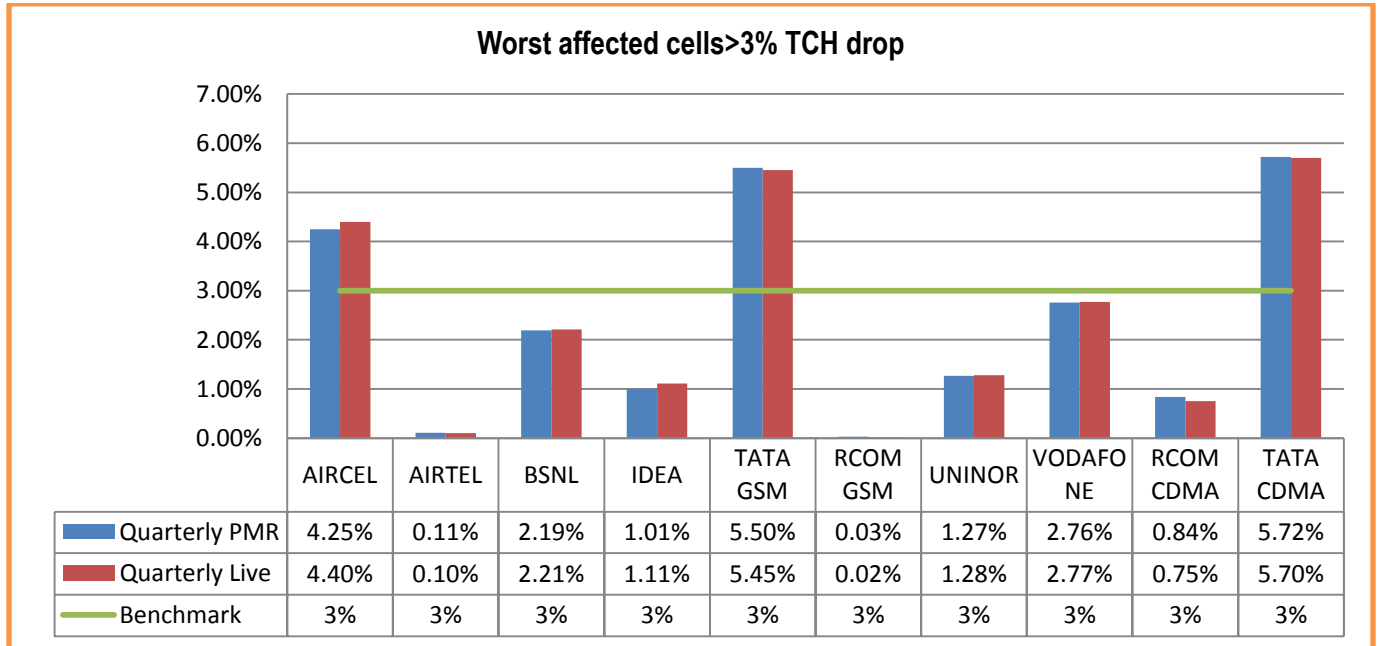
All operators are meeting the benchmarks.

6) CALL DROP RATE:



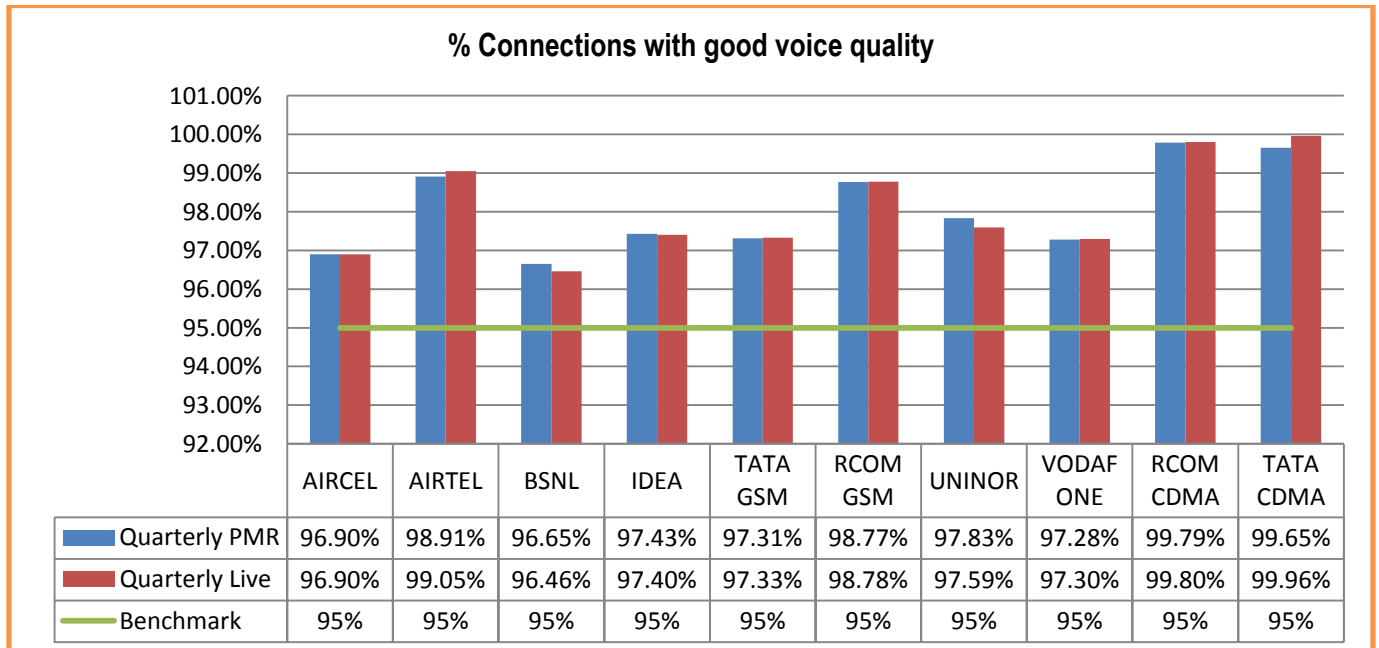
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP:



All operators except Aircel, Tata GSM and Tata (CDMA) are meeting the benchmarks.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks.

9. QOS AUDIT OF BASIC (WIRELINER) SERVICE PROVIDERS



9) QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRES)

The QoS audit for basic (wire line) service was to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. Out of **4576** in MH&G (present no. of BSNL exchanges), audit was done for **273** sampled (33-Urban and 240 Rural) exchanges. In case of Private Service provider's two exchanges of TTL and one exchange each of Bharti Airtel, RCL & Vodafone were covered for audit. (**List of exchanges undertaken for QoS audit attached as Annex-1**)

Sr. No	Service Provider	Circle	Urban Exchange	Rural Exchange	Total Exchange	No. of Urban Exchanges Covered for audit	No. of Rural Exchanges Covered for audit
1	Bharti-Airtel	MH&G	1	0	1	1	0
2	RCL	MH&G	2	0	2	1	0
3	TTL	MH&G	4	0	4	2	0
4	Vodafone	MH&G	2	0	2	1	0
5	BSNL	MH&G	674	3902	4576	33	240
Total Exchanges			683	3902	4585	38	240

For BSNL exchanges, performance against each parameter has been evaluated by taking average of performance value of each parameter for all the audited exchanges. The average value of each parameter has been given in the Table below.

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

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

AVERAGED QUARTERLY (JAN TO MAR 15) AUDIT DATA FOR WIRELINE (BASIC) SERVICES MH&G CIRCLE								
Wireline Audit Data		Benchmark	Audit Period	BHARTI AIRTEL	RCL	TTL	VODAFONE	BSNL
S/ N	Name of Parameter			WIRELINE SERVICE PROVIDERS				
1	Fault incidences							
	% of (No. of faults/100 subscribers /month)	< 7%	Quarterly	0.97%	0.10%	0.90%	0.22%	4.11%
2	Faults Repair/Restoration Time							
	% of fault repair by next working day (Urban Area)	>85%	Quarterly	96.27%	100.00%	97.00%	100.00%	90.38%
	% of fault repair Within 5 days (Urban Area)	100%	Quarterly	100.00%	100.00%	99.00%	100.00%	98.81%
	% of fault repair by next working day (Rural & hilly Area)	>75%	Quarterly	NA	NA	NA	NA	90.72%
	% of fault repair Within 5 days (Rural & hilly Area)	100%	Quarterly	NA	NA	NA	NA	99.14%
	Mean time to Repair(MTTR)	≤10 Hrs	Quarterly	4.08	4.26	NP	4.77	5.83
3	Rent Rebate							
	Fault pending > 3 days & <7 days	<i>Rebate for 7 days</i>	Quarterly	0	0	0	0	29
	Fault Pending > 7 days & < 15 days	<i>Rebate for 15 days</i>	Quarterly	0	0	0	0	92
	Fault pending > 15 days	<i>Rebate for 1 month</i>	Quarterly	0	0	0	0	132
4	Metering & Billing Credibility							
	% of disputed Bills over bills issued (Post Paid)	< 0.1%	Quarterly	0.01%	0.00%	0.02%	0.00%	0.023%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA	NA	NA	NA
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	98% within 4 weeks	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%
Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	≤1 week	Quarterly	Within 1 Week	Within 1 Week	Within 1 Week	Within 1 Week	Within 1 Week	
5	POI Congestion							
	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0	0
6	Response Time to customer for assistance							
	% Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Quarterly	100.00%	97.37%	100.00%	97.05%	95.64%
	% age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	>=95%	Quarterly	93.65%	95.98%	93.65%	100.00%	83.09%
7	Customer care(promptness in attending to customers request)							
	Termination / Closures	100%	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%
	Time taken for refunds of deposit after closures	100%	Quarterly	NP	100.00%	100.00%	100.00%	100.00%

NA-Not Applicable

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

3 DAYS LIVE DATA FOR WIRELINE (BASIC) SERVICES – MH&G CIRCLE								
3 days live Wireline Audit Data		Benchmark	Audit Period	BHARTI AIRTEL	RCL	TTL	VODAFONE	BSNL
S/ N	Name of Parameter			WIRELINE SERVICE PROVIDERS				
1	POI Congestion							
	No. of POI's having congestion >0.5%		Live	0	0	0	0	0
2	Response Time to customer for assistance							
	% Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Live	100.00%	95.27%	100.00%	99.01%	95.33%
	% age of calls answered by the operators (voice to voice) within 90 seconds	>=95%	Live	98.69%	95.52%	97.06%	100.00%	81.15%

NA-Not Applicable

9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRESLINE)

Fault Incidences: The audit of the service providers revealed that the performance of all service providers was well within the benchmark.

Fault Repair/Restoration Time: BSNL could not meet the benchmark of Fault repaired within 5 days (Urban area) / (Rural area) with their performance as **98.81% and 99.14%** respectively. TTL also failed to meet the benchmark of this parameter for urban area with its performance as **99.00%**.

Mean Time to Repair: All operators met the benchmark for MTTR.

Metering and Billing performance: For this parameter also, the performance of the service providers was found well within the compliance benchmarks.

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

Response Time to Customer for assistance: For percentage of calls getting connected to call center, the performance of all service providers was within the benchmark of >95%.

With respect to the parameter of **calls answered by operator (voice to voice)**, BSNL, Airtel and TTL could not meet the benchmark with their performance as **83.09%, 93.65% and 93.65%** respectively against the benchmark of >= 95%. BSNL also failed to comply with the benchmark for this parameter during 3 days live measurements as **81.15%**.

Termination/Closures: For this parameter, the performance of all the service providers was within the prescribed benchmark.

Time taken for refund of deposit: In respect of this parameter, all operators complied with the benchmark.

*Thus, from the above findings that, it was concluded that the performance of **BSNL, Bharti Airtel and TTL** was remained non-complied with in respect of the parameters **Fault Repair / Restoration Time and Calls answered by the operators (Voice to voice)**. Hence, the concern operators need to improve their services for these parameters.*

9.4 INTER OPERATOR CALL ASSESSMENT (WIRELINER)

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in Mumbai Circle during the time 1000 to 1300 Hrs and 1500 to 1700 was carried out by TUV auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT							
Calling Operators	Circle Name	Total No. of calls Made	BSNL	TTL	BHARTI AIRTEL	RCL	VODAFONE
BSNL	MH&G	100	--	100%	99%	99%	100%
TTL	MH&G	100	100%	--	99%	100%	100%
BHARTI AIRTEL	MH&G	100	99%	100%	--	98%	99%
RCL	MH&G	100	98%	99%	100%	--	100%
VODAFONE	MH&G	100	98%	98%	100%	99%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. However, in case where calls attempted from BSNL to Bharti Airtel and RCL, successful interconnection was 99%, TTL to Bharti was 99%, Bharti to BSNL, RCL was 99% and 98%, RCL to BSNL, TTL was 98% and 99%, Vodafone to BSNL, TTL and RCL 98%, was 99%. Thus there was no remarkable problem in interconnection from one operator to other operators except in few cases where Service providers could not achieve 100% marks.

9.5 LEVEL-1 LIVE CALLING (WIRELINER)

LEVEL 1 LIVE CALLING							
Emergency no.	Circle Name	No. of calls made	BHARTI AIRTEL	RCL	TTL	VODAFONE	BSNL
100	MH&G	10	√	√	√	√	√
101	MH&G	10	√	√	√	√	√
108	MH&G	10	√	√	√	√	√
1091	MH&G	10	√	√	√	√	√
1098	MH&G	10	√	√	√	√	√

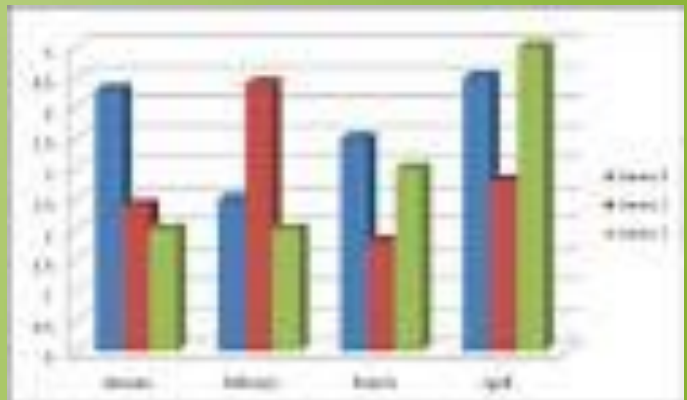
To assess the availability and efficiency of level 1 service such as police, fire, ambulance (emergency services) offered by BSNL, Bharti Airtel, Reliance, TTL and Vodafone, the calls were made from telephone provided by service providers, these services were found functional in the networks of all the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

9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)

LIVE CALLING TO CALL CENTRE							
Parameters	Benchmark	Circle Name	BHARTI AIRTEL	RCL	TTL	VODAFONE	BSNL
Total No. of calls Attempted		MH&G	100	100	100	100	100
A) Total no of calls attempted to customer care/Call center		MH&G	100	100	100	100	100
B) Total no. of calls successfully established to customer care/Call center		MH&G	100	100	100	100	100
C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	MH&G	100.00%	100.00%	100.00%	100.00%	100.00%
D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		MH&G	100	100	100	100	Agent Desk Not Working
E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		MH&G	100	100	100	100	Agent Desk Not Working
F) % age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	>=95%	MH&G	100.00%	100.00%	100.00%	100.00%	Agent Desk Not Working

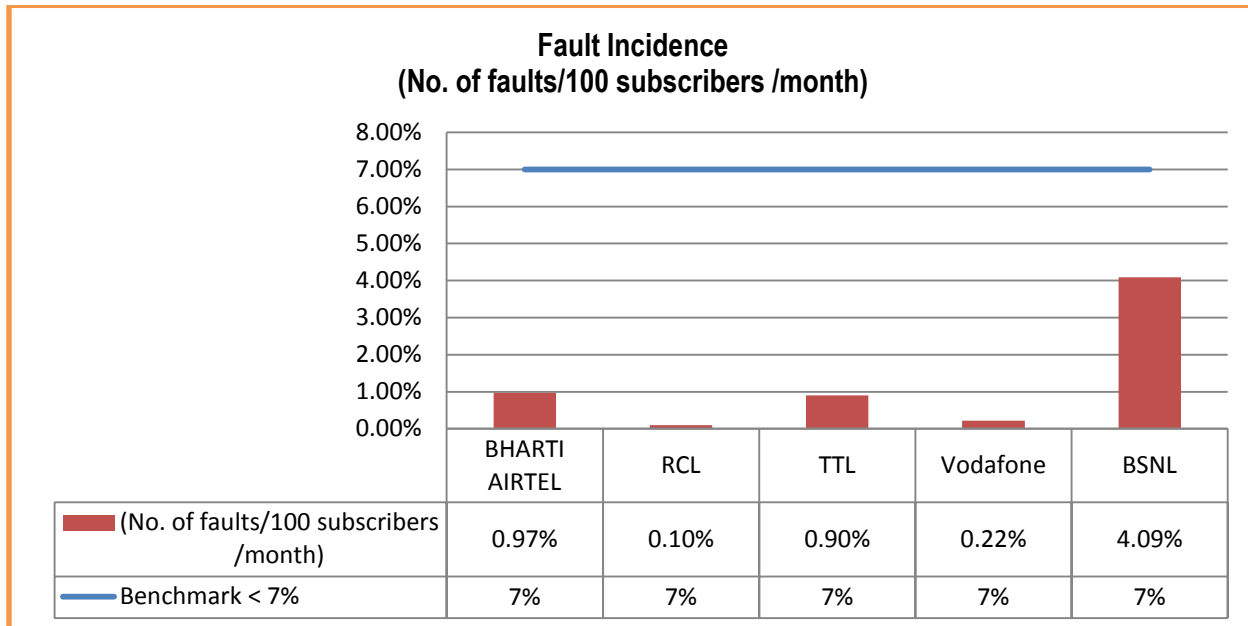
In case of calls answered by operators (voice to voice), when test calls were made to the call centers of different service providers, 100% of calls were answered by the call center operators within stipulated time in the network of Airtel, RCL, Vodafone and TTL respectively. For BSNL, call is not going to operator for voice to voice. Only IVR is functional.

GRAPHICAL REPRESENTATION OF BASIC (WIRELINE) SERVICES



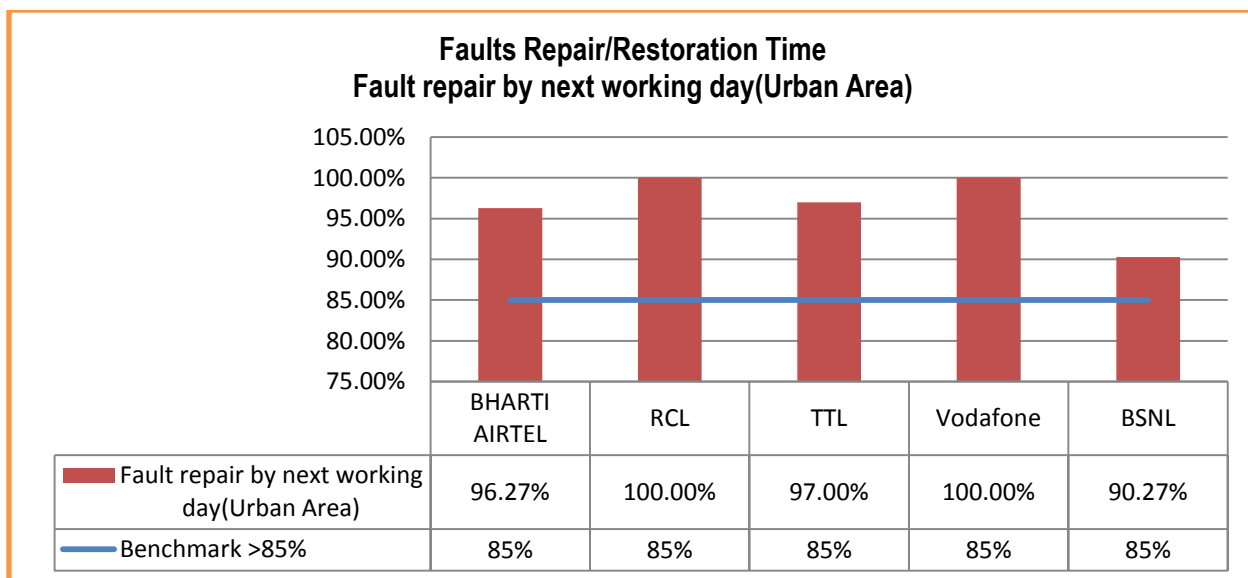
9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINER) PROVIDERS:

1) FAULT INCIDENCE:



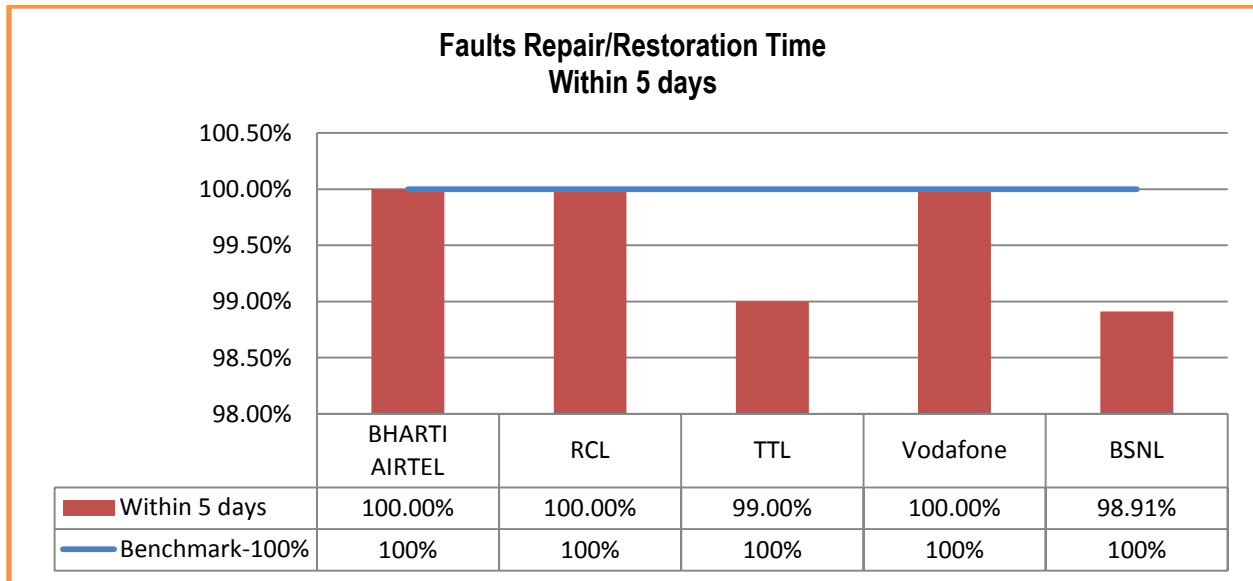
All Operators are meeting the benchmarks.

2) FAULTS REPAIR/RESTORATION TIME:



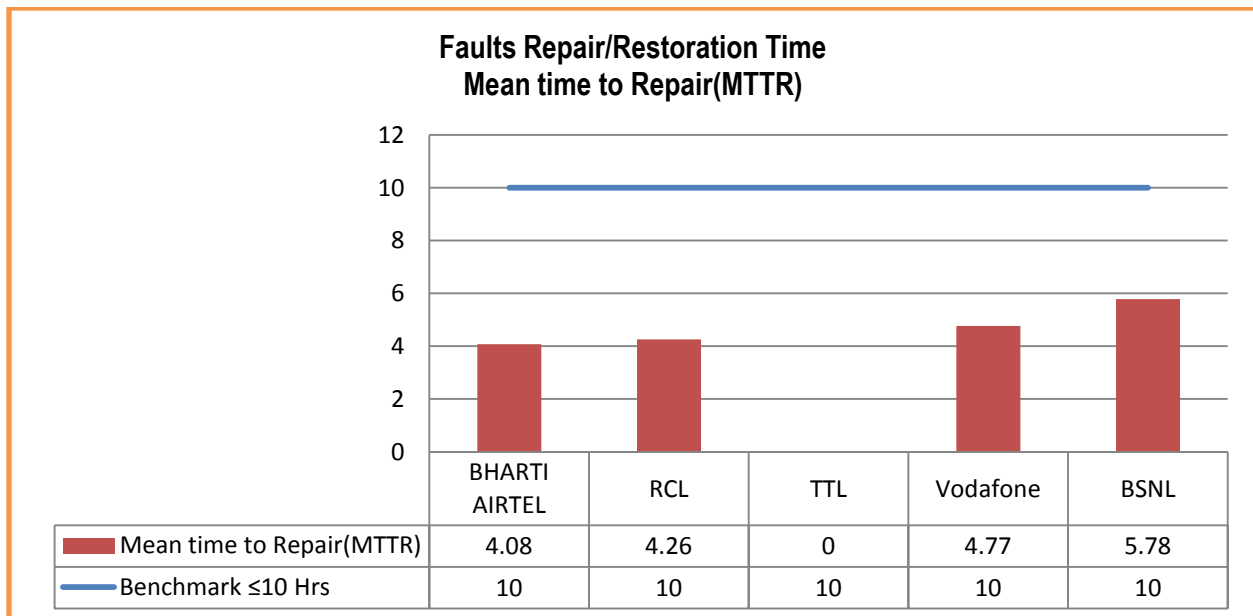
All Operators are meeting the benchmarks.

3) FAULTS REPAIR/RESTORATION TIME WITHIN 5 DAYS:



All Operators are meeting the benchmarks except TTL & BSNL.

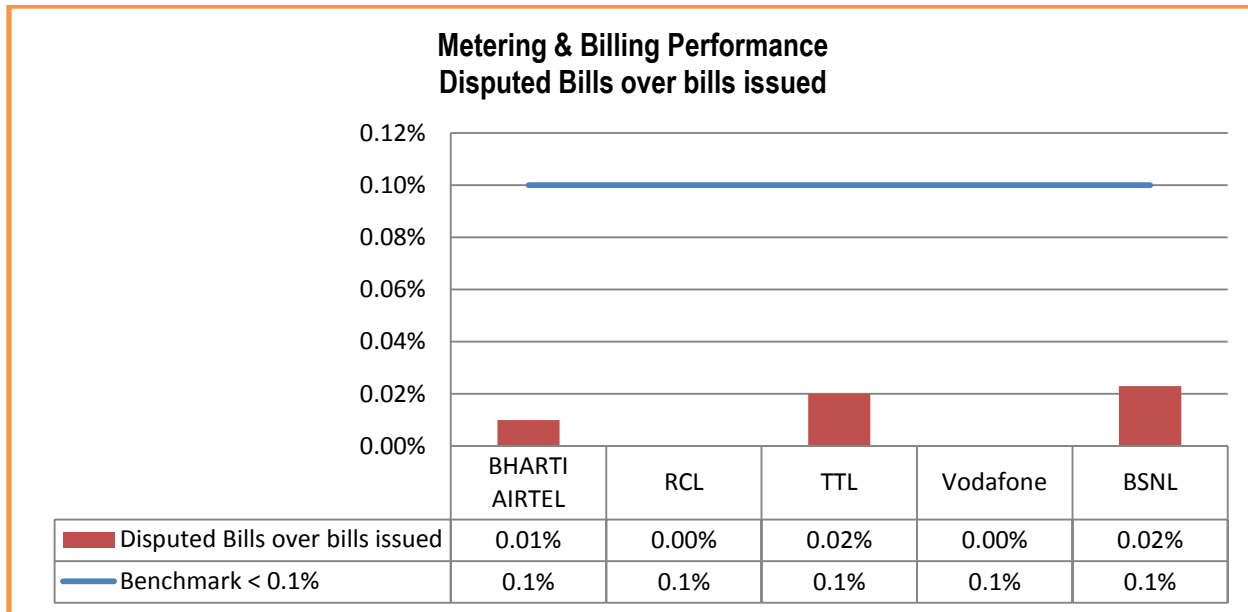
4) MEAN TIME TO REPAIR (MTTR):



All Operators are meeting the benchmarks.

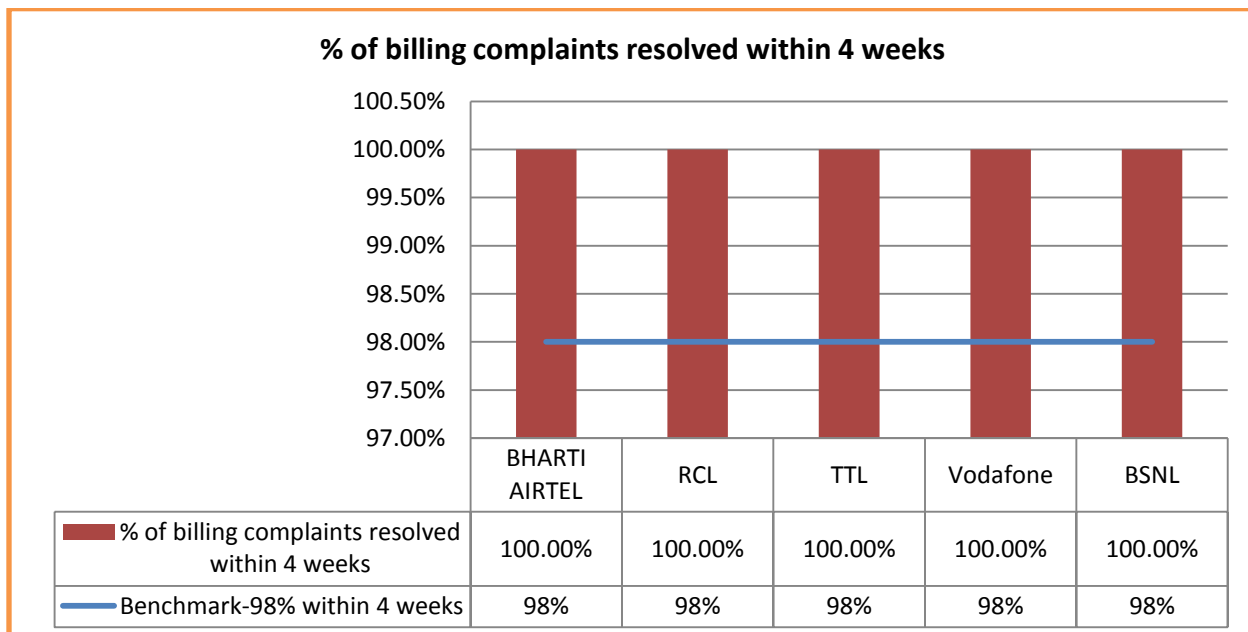
5) METERING & BILLING PERFORMANCE:

1. DISPUTED BILLS OVER BILL ISSUED :



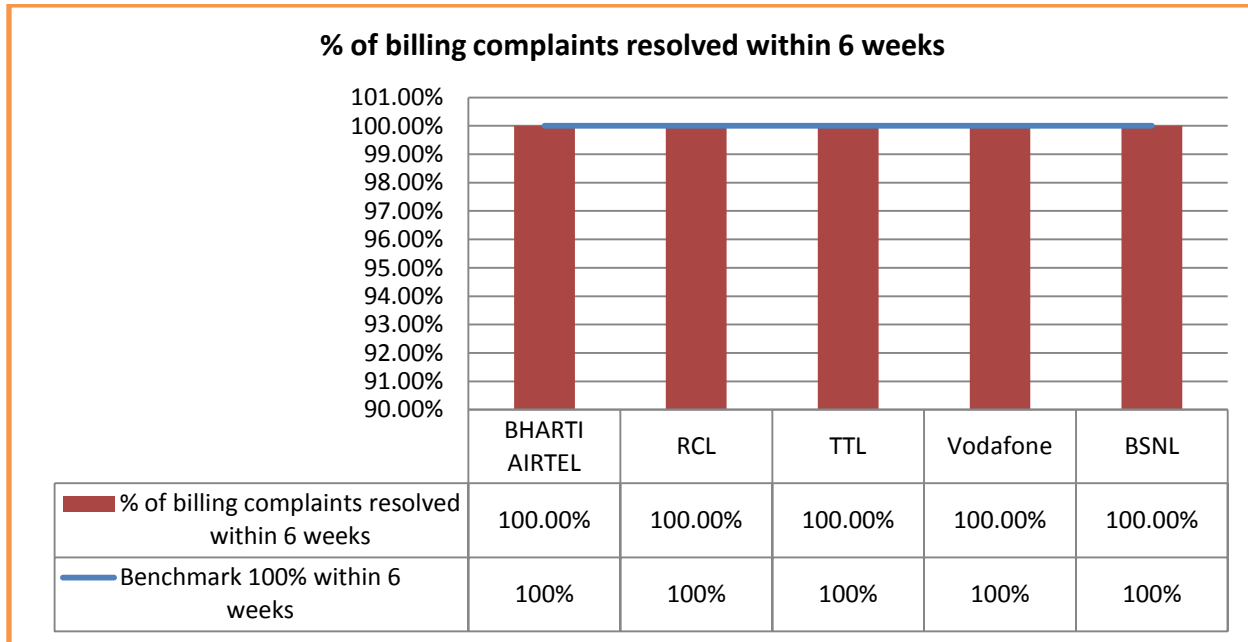
All Operators are meeting the benchmarks.

2. BILLING COMPLAINT RESOLUTION WITHIN 4 WEEKS:



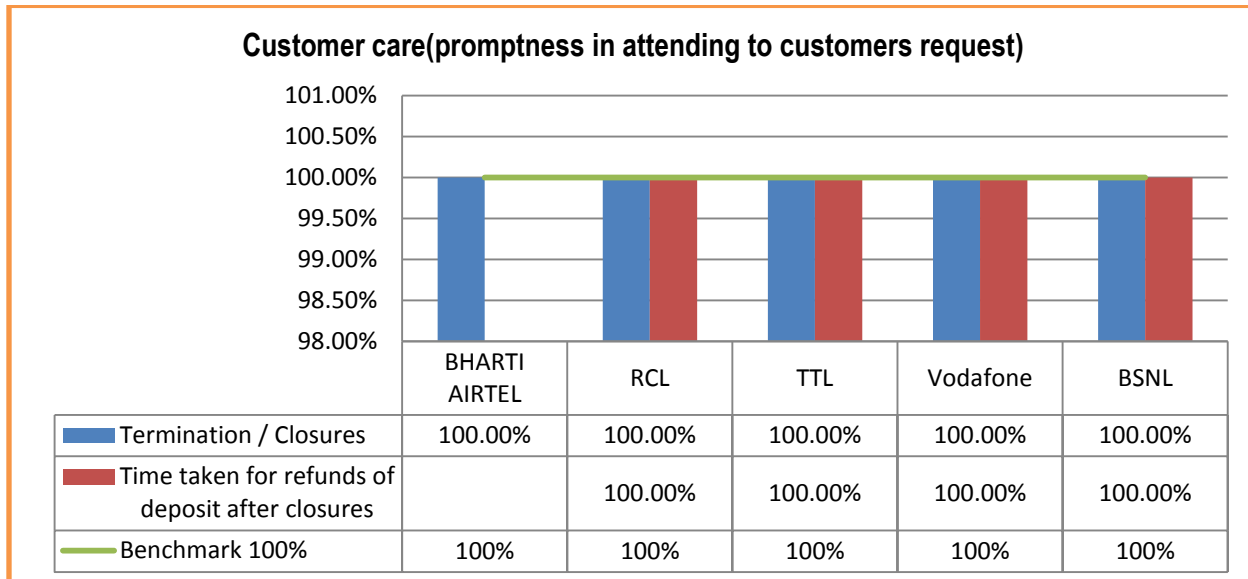
All Operators are meeting the benchmarks.

3. BILLING COMPLAINT RESOLUTION WITHIN 6 WEEKS:



All Operators are meeting the benchmarks.

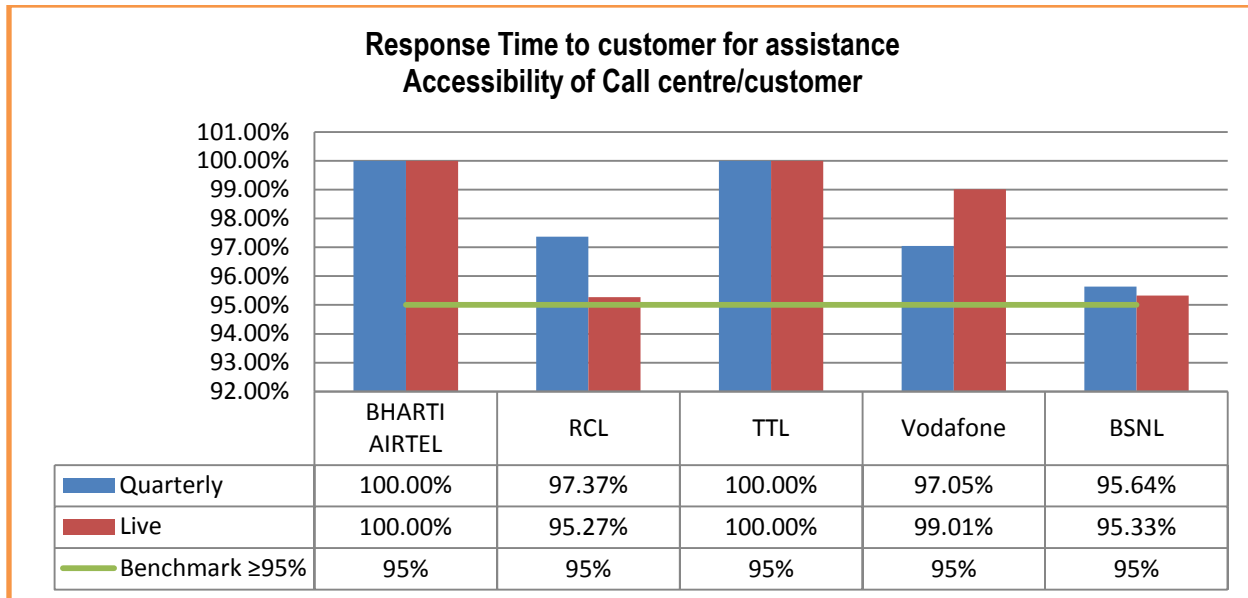
6) TERMINATION & CLOSURES:



All Operators are meeting the benchmarks and Airtel has not provided the data for the parameter 'refund of deposit after closure'.

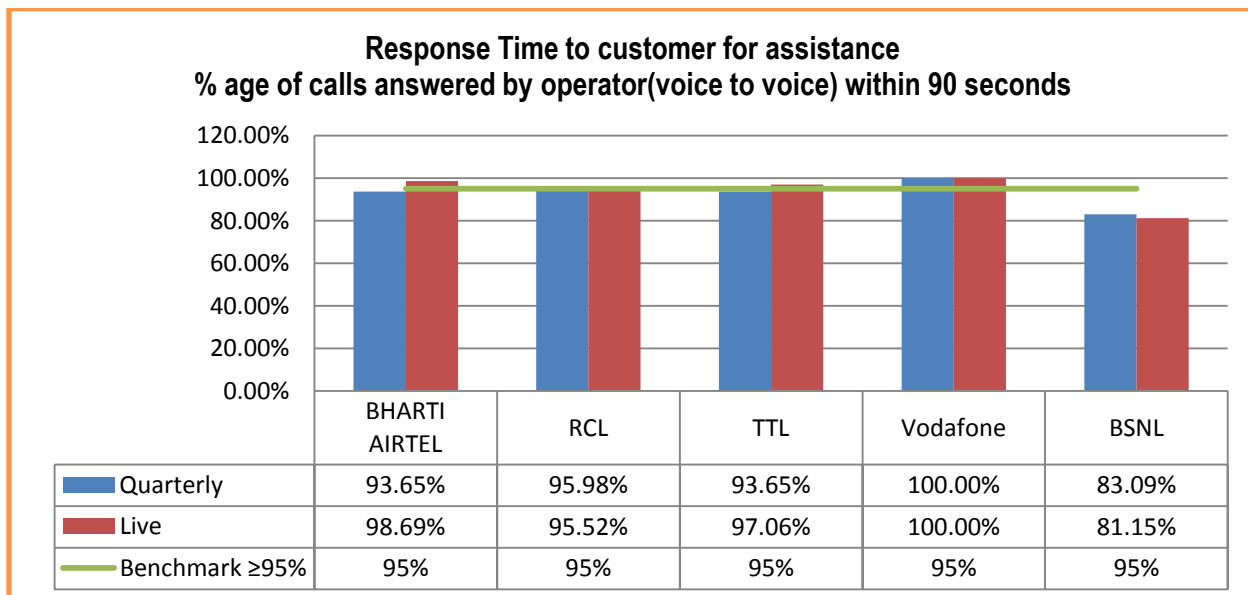
9.8 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINER) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE (ACCESSIBILITY OF CALL CENTRE/CUSTOMER CARE):



All Operators are meeting the benchmarks.

2) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE (CALL ANSWERED BY OPERATOR):



All Operators are meeting the benchmarks except Bharti Airtel, TTL & BSNL.

10. QOS AUDIT OF BROADBAND SERVICE PROVIDERS



10) QUALITY OF SERVICE AUDIT OF BROADBAND SERVICE PROVIDERS

TUV–SUD South Asia was required to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who were 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. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

Discussion with the broadband service providers revealed that they are maintaining their networks data on centralized basis so audit has been done for the centralized data.

SL. NO.	NAME OF BROADBAND SERVICE PROVIDERS	LOCATION OF AUDIT
1	AIRTEL BHARTI	BHARTI AIRTEL LIMITED,7TH FLOOR,INTERFACE BLDG NO -7, MINDSPACE, LINK ROAD, MALAD (W),MUMBAI - 400064, MAHARASHTRA
2	BSNL	ALL SELECTED EXCHANGE/POP IN MAHARSHATRA CIRCLE (GIVEN IN SAPERATE SHEET)
3	D-VOIS	D-VOIS BROADBAND PVT. LTD. 10/11 ARENJA TOWER, SECTOR 11, CBD BELAPUR , NAVI MUMBAI 400614
4	FIVE NETWORK	22/2, PLOT NO.275-B, NEAR GURU NANAK SCHOOL, SION (W), MUMBAI-400022
5	HATHWAY	HATHWAY CABLE & DATACOM LTD. , 3 RD-FLOOR,STERLING PLAZA,ABOVE AXIX BANK,DECCAN. PUNE-4,MAHARAHTRA
6	INDUS	IN CENTRE, 49/50,MIDC, 12TH ROAD, ANDHERI(E),OPP: TUNGA PARADISE HOTEL MUMBAI-400 093
7	NSTPL	POLICE LINE TAKLI, SAMADHAN NAGAR, NAGPUR,MAHARASHTRA
8	PACENET	B/8,MAROL INDUSTRIAL AREA, NEXT TO MIDC POLICE STATION,ANDHERI(EAST),MUMBAI 400093
9	RCL	DAKC KOPARKHAIRNE NAVI MUMBAI
10	SYSCON INFOWAY	SYSCON INFOWAY PVT.LTD., 136, SHIV SHAKTI IND. PREMISES, ANDHERI KURLA ROAD, ANDHERI EAST, MUMBAI 400059
11	TCL	A1 AQMAR BUILDING 5 GANESH KHIND RD, SHIVAJI NAGAR PUNE 411005
12	TIKONA	TIKONA DIGITAL NETWORKS PVT.LTD. , ARENA,PLOT NO 10,1 ST FLOOR , VIMAN NAGAR, PUNE-411014 , MHAHARAHTRA
13	TTL	A1 AQMAR BUILDING 5 GANESH KHIND RD, SHIVAJI NAGAR PUNE 411005
14	YOU BROADBAND	YOU BROADBAND INDIA PVT. LTD., OFFICE NO. 107, ZENITH COMPLEX OPP KRISHI BHAVAN, TANAJIWADI ROAD, SHIVAJI NAGAR, PUNE - 411005

10.1 QUARTERLY MEASUREMENT DATA FOR BROADBAND SERVICE PROVIDERS

AVERAGED QUARTERLY (JAN TO MAR 15) AUDIT DATA FOR BROADBAND SERVICES - MH&G CIRCLE																		
Broadband Audit Data		Benchmark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL	
S/ N	Name of Parameter	BROADBAND SERVICE PROVIDERS																
Service Provisioning/Activation Time																		
1	A) No of connections registered during the period		MH&G	333	1405	2945	602	1508	445	1779	3286	954	649	5378	2885	3897	2631	
	B) Total number of connections provided within 15 days of registration on demand during the period		MH&G	333	1405	2945	574	1508	445	1779	3286	941	649	5378	2885	3869	2622	
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	<15 days	MH&G	100.00%	100.00%	100.00%	95.35%	100.00%	100.00%	100.00%	100.00%	100.00%	98.64%	100.00%	100.00%	100.00%	99.28%	99.66%
	D) Total number of connections provided after 15 days of registration on demand		MH&G	0	0	0	28	0	0	0	0	13	0	0	0	0	0	9
	E) %age of connections provided after 15 days of registration on demand		MH&G	0.00%	0.00%	0.00%	4.65%	0.00%	0.00%	0.00%	0.00%	0.00%	1.36%	0.00%	0.00%	0.00%	0.00%	0.34%
	F) In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/ per day.	MH&G	0	0	0	28	0	0	0	0	0	0	0	0	0	0	0
Fault Repair/Restoration Time																		
2	A) Total number of faults registered during the period		MH&G	381	295	NP	1544	2584	1834	20085	17813	9060	236	9304	12192	38509	12618	
	B) Total number of faults repaired by next working day		MH&G	381	295	NP	1544	2488	1834	19454	16078	8365	236	8434	11426	37840	11442	
	C) % age of faults repaired by next working day	>90%	MH&G	100.00%	100.00%	NP	100.00%	96.28%	100.00%	96.86%	90.26%	92.33%	100.00%	90.65%	93.72%	98.26%	90.68%	
	D) Total number of faults repaired within three working days		MH&G	381	295	NP	1544	2569	1834	20039	17504	8874	236	9222	12061	38357	12461	
	E) % age of faults repaired within three working days	≥99%	MH&G	100.00%	100.00%	NP	100.00%	99.42%	100.00%	99.77%	98.27%	97.95%	100.00%	99.12%	98.93%	99.61%	98.76%	

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



AVERAGED QUARTERLY (JAN TO MAR 15) AUDIT DATA FOR BROADBAND SERVICES - MH&G CIRCLE

Broadband Audit Data		Bench-mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter	BROADBAND SERVICE PROVIDERS															
Rent Rebate																	
3	A) Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		MH&G	0	0	0	0	NP	0	1	NP	NP	0	14	109	109	NP
	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		MH&G	0	0	0	0	NP	0	0	NP	NP	0	14	25	27	NP
	C) Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		MH&G	0	0	0	0	NP	0	0	NP	NP	0	9	1	0	NP
Billing Performance																	
4	A) Total bills generated during period		MH&G	5729	16621	0	4974	67282	39397	18989	122214	44466	5899	71875	226	38255	376114
	B) Total complaints received from customers/ Bills disputed		MH&G	NA	NA	NA	NA	5	44	NA	60	23	NA	213	0	89	337
	C) Billing complaints per 100 bills issued	<2%	MH&G	NA	NA	NA	NA	0.01%	0.11%	NA	0.05%	0.05%	NA	0.30%	0.00%	0.23%	0.09%
	D) Total number of complaints resolved in 4 weeks from date of receipt		MH&G	NA	NA	NA	NA	5	44	NA	60	23	NA	213	0	89	337
	E) %age billing complaints resolved in 4 weeks	100%	MH&G	NA	NA	NA	NA	100.00%	100.00%	NA	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%
	F) Total number of cases requiring refund of deposits after closure		MH&G	NA	NA	NA	NA	27	3	NA	55	11	NA	31	207	146	NP
	G) Total number of cases where refund was made in <60 days		MH&G	NA	NA	NA	NA	27	3	NA	55	11	NA	31	191	146	NP

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



AVERAGED QUARTERLY (JAN TO MAR 15) AUDIT DATA FOR BROADBAND SERVICES - MH&G CIRCLE																	
Broadband Audit Data		Bench- mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS													
	H) Percentage cases in which refund received within 60 days	100%	MH&G	NA	NA	NA	NA	100.00%	100.00%	NA	100.00%	100.00%	NA	100.00%	92.27%	100.00%	NP
Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)																	
5	A) Total number of calls received by the operator		MH&G	371	295	NP	1544	26546	90304	189448	10333	99572	236	133819	52387	105112	47612
	B) Total number of calls answered by the operator within 60 seconds		MH&G	371	NP	NP	NP	22973	81386	186533	9920	84849	208	86652	46501	95141	32731
	C) % age calls answered by the operator in 60 seconds	>60%	MH&G	100%	NP	NP	NP	86.54%	90.12%	98.46%	96.00%	85.21%	88.14%	64.75%	88.76%	90.51%	68.75%
	D) Total number of calls answered by the operator within 90 seconds		MH&G	371	NP	NP	NP	23910	82412	189448	10079	87208	236	110157	47001	97230	37659
	E) % age calls answered by the operator within 90 seconds	>80%	MH&G	100.00%	NP	NP	NP	90.07%	91.26%	100.00%	97.54%	87.58%	100.00%	82.32%	89.72%	92.50%	79.10%
6	Bandwidth Utilization/ Throughput:																
POP to ISP Gateway Node [Intra-network] Link(s)																	
6.1	A) Total Bandwidth Available at the link for the period days		MH&G	1299	30000	13485	849	34376	18000	30870	22200	135168	1081	5090.67	1263	NP	49621
	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)		MH&G	951.3	4044.07	8882	673	12122.53	7393	4583	17014.82	11673.6	970	3416.91	960	NP	14177
	C) % age Bandwidth utilized during the period	<80%	MH&G	73.23%	13.48%	65.87%	79.27%	35.26%	41.07%	14.85%	76.64%	8.64%	89.73%	67.12%	76.01%	NP	28.57%
ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity																	
6.2	A) Total number of upstream links for International connectivity		MH&G	6	9	NP	NP	NP	11	5	23	33	NP	4	4	6	NP
	B) Number of Links having Bandwidth utilization > 90% during TCBH		MH&G	0	0	NP	NP	NP	0	0	0	0	NP	0	0	0	NP
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		MH&G	1289	3565	NP	NP	NP	314000	30870	56545	21000	NP	2392	1263	8925	NP

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



AVERAGED QUARTERLY (JAN TO MAR 15) AUDIT DATA FOR BROADBAND SERVICES - MH&G CIRCLE

Broadband Audit Data		Bench- mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS													
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		MH&G	950.5	1856.63	NP	NP	NP	176040.6	4583	43171.82	6501	NP	1740	960	5800	NP
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	MH&G	73.74%	52.08%	NP	NP	NP	56.06%	14.85%	76.35%	30.96%	NP	72.76%	76.01%	64.99%	NP
Broadband Connection Speed (download) - from ISP Node to User																	
6.3	A) Total committed download speed to the sample subscribers (In mpbs)		MH&G	4.1	12	NP	NP	6	6	3	NP	0.5	2	4	1.6	4	70
	B) Total average download speed observed for the sample subscribers during TCBH (In Mbps)		MH&G	3.55	11.29	NP	NP	6.18	5.93	2.51	NP	0.46	1.93	2.8	1.72	3.71	60
	C) % age subscribed speed available to the subscriber during TCBH	>80%	MH&G	86.72%	94.08%	NP	NP	103.00%	98.83%	83.67%	NP	91.00%	96.50%	70.00%	107.50%	92.75%	85.59%
Service Availability/Uptime																	
7	A) Total operational Hours		MH&G	2160	2160	NP	2160	48440976	2160	2160	2840400	4820616	2160	1992	14163280	2244000	73440
	B) Total downtime (In hours)		MH&G	0	0.083	NP	0	36791.23	0	0	25396.33	49483	0	2.33	21494.66	20158	456
	C) Total time when the service was available (In Hrs)		MH&G	2160	2159.917	NP	2160	48404184.77	2160	2160	2815003.67	4771133	2160	1989.67	14141785	2223842	72984
	D) % age of Service availability uptime	>98%	MH&G	100.00%	100.00%	NP	100.00%	99.92%	100.00%	100.00%	99.11%	98.97%	100.00%	99.88%	99.85%	99.10%	99.38%
Packet Loss																	
8	A) Total number of ping packets transmitted		MH&G	90000	3000	NP	NP	90000	90000	3000	30000	30000	3000	3000	3000	90000	9000
	B) Total number of ping packets lost		MH&G	60	18	NP	NP	1	418	8	30	0	29	0	5	104	45.75
	C) % age packet loss	<1%	MH&G	0.07%	0.60%	NP	NP	0.00%	0.46%	0.27%	0.10%	0.00%	0.97%	0.00%	0.17%	0.12%	0.51%
9	Network Latency																
9.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway																
	A) Total number of ping packets		MH&G	90000	9000	NP	NP	90000	3000	3000	17280	30000	3000	NP	3000	90000	18000

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



AVERAGED QUARTERLY (JAN TO MAR 15) AUDIT DATA FOR BROADBAND SERVICES - MH&G CIRCLE																	
Broadband Audit Data		Bench- mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS													
	transmitted																
	B) Total round trip time for all the ping packets transmitted during the period		MH&G	7144	131	NP	NP	3497	31	17	2057	90	2190	NP	120000	1322	676
	C) Average round trip tip time for all the ping transmitted	<120 ms	MH&G	79	15	NP	NP	39	31	17	69	3	73	NP	119	43	75
Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)																	
9.2	A) Total number of ping packets transmitted		MH&G	90000	NP	NP	NP	61000	3000	NP	17280	30000	NP	NP	3000	90000	12000
	B) Total round trip time for all the ping packets transmitted during the period		MH&G	5336	NP	NP	NP	3757	3404	NP	5986	7620	NP	NP	268267	14631	1286
	C) Average round trip tip time for all the ping transmitted	<350 ms	MH&G	59	NP	NP	NP	62	37	NP	200	254	NP	NP	268	163	214
Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)																	
9.3	A) Total number of ping packets transmitted		MH&G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		MH&G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	MH&G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NA- Not Applicable

NP-Not Provided- Monthly Data Not Monitored by ISPs

Pacenet, Syscon, Five Network, Indus, D-Vois & NSTPL are providing their services with Pre-paid model. Hence, no billing complaints.

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

3 DAYS LIVE DATA FOR BROADBAND SERVICES - MH&G CIRCLE																	
3 days live Broadband Audit Data		Bench- mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS													
Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)																	
1	A) Total number of calls received by the operator		MH&G	6	9	NP	NP	1151	3649	6386	389	4056	28	5631	2003	2567	2072
	B) Total number of calls answered by the operator within 60 seconds		MH&G	6	9	NP	NP	989	3460	6257	385	3075	28	3599	1845	2511	1529
	C) % age calls answered by the operator in 60 seconds	>60%	MH&G	100.00%	100.00%	NP	NP	85.93%	94.82%	97.98%	98.97%	75.81%	100.00%	64%	92.11%	97.82%	73.79%
	D) Total number of calls answered by the operator within 90 seconds		MH&G	6	9	NP	NP	1054	3477	6386	388	3218	28	4591	1867	2528	1708
	E) % age calls answered by the operator within 90 seconds	>80%	MH&G	100.00%	100.00%	NP	NP	91.57%	95.29%	100.00%	99.74%	79.34%	100.00%	81.51%	93.21%	98.48%	82.43%
2	Bandwidth Utilization/ Throughput:																
POP to ISP Gateway Node [Intra-network] Link(s)																	
2.1	A) Total Bandwidth Available at the link for the period days		MH&G	433	10000	13020	265	34824	18000	30870	22200	135168	NP	5165	1350	NP	44250
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		MH&G	336	832.07	11644	248.67	12898.12	10625.8	4157	16872	11980.8	NP	3326.46	1007.66	NP	20253
	C) % age Bandwidth utilized during the period	<80%	MH&G	77.60%	8.32%	89.43%	93.84%	37.04%	59.03%	13.47%	76.00%	8.86%	NP	64.40%	74.64%	NP	45.77%
ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity																	
2.2	A) Total number of upstream links for International connectivity		MH&G	6	9	NP	NP	NP	10	5	23	33	NP	4	4	6	NP
	B) Number of Links having Bandwidth utilization > 90% during TCBH		MH&G	0	0	NP	NP	NP	0	0	0	0	NP	0	0	0	NP

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE



3 DAYS LIVE DATA FOR BROADBAND SERVICES - MH&G CIRCLE																	
3 days live Broadband Audit Data		Bench- mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS													
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		MH&G	433	3255	NP	NP	NP	288000	30870	64545	21000	NP	2495	1350	3085	NP
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		MH&G	336	1472.31	NP	NP	NP	201459	4157	47315.8	12798	NP	NP	1007.66	1718	NP
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	MH&G	77.60%	45.23%	NP	NP	NP	69.95%	13.47%	73.31%	60.94%	NP	NP	74.64%	55.69%	NP
Broadband Connection Speed (download) - from ISP Node to User																	
2.3	A) Total committed download speed to the sample subscribers (In mpbs)		MH&G	4.1	12	NP	8	8	4.5	3	6	1.5	3	1	NP	4	212
	B) Total average download speed observed for the sample subscribers during TCBH (In Mbps)		MH&G	3.55	11.79	NP	7.26	8.04	4.36	2.62	5.95	1.37	3	0.88	NP	3.81	181
	C) % age subscribed speed available to the subscriber during TCBH	>80%	MH&G	86.72%	98.25%	NP	90.75%	100.50%	96.89%	87.33%	99.17%	91.00%	100.00%	88.00%	NP	95.25%	85.38%
Packet Loss																	
3	A) Total number of ping packets transmitted		MH&G	3000	3000	NP	3000	3000	3000	3000	1000	1000	1000	3000	3000	3000	20000
	B) Total number of ping packets lost		MH&G	2	23	NP	4	3	0	0	2	0	5	0	5	7	49
	C) % age packet loss	<1%	MH&G	0.07%	0.77%	NP	0.13%	0.10%	0.00%	0.00%	0.20%	0.00%	0.50%	0.00%	0.17%	0.23%	0.24%
4	Network latency (for wired broadband access)																
Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway																	
4.1	A) Total number of ping packets transmitted		MH&G	3000	3000	NP	3000	3000	3000	3000	192	1000	1000	NP	3000	3000	10000
	B) Total round trip time for all the ping packets transmitted during the period		MH&G	275	13	NP	230	120	5	15	69	9	220	NP	343	33	713

3 DAYS LIVE DATA FOR BROADBAND SERVICES - MH&G CIRCLE																	
3 days live Broadband Audit Data		Bench- mark	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS													
	C) Average round trip tip time for all the ping transmitted	<120 ms	MH&G	92	4	NP	77	40	2	5	23	3	73	NP	114	12	40
Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)																	
4.2	A) Total number of ping packets transmitted		MH&G	3000	NP	NP	NP	3000	3000	NP	192	1000	1000	NP	3000	3000	11000
	B) Total round trip time for all the ping packets transmitted during the period		MH&G	102	NP	NP	NP	199	2	NP	657	770	324	NP	772	276	2088
	C) Average round trip tip time for all the ping transmitted	<350 ms	MH&G	34	NP	NP	NP	66	1	NP	219	257	108	NP	257	92	137
Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)																	
4.3	A) Total number of ping packets transmitted		MH&G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		MH&G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	MH&G	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Service Availability/Uptime																	
5	A) Total operational Hours		MH&G	72	72	NA	72	1616832	72	72	31560	157320	72	72	72	72	72
	B) Total downtime (In hours)		MH&G	0	0	NA	0	3905	0	0	308	1569	0	0	2	0	0
	C) Total time when the service was available (In Hrs)		MH&G	72	72	NA	72	1612927	72	72	31252	155751	72	72	71	71	72
	D) % age of Service availability uptime	>98%	MH&G	100.00%	100.00%	NA	100.00%	99.76%	100.00%	100.00%	99.02%	99.00%	100.00%	100.00%	97.92%	99.54%	100.00%

NA: Not Applicable
NP: Data not provided

10.3 KEY FINDINGS: BROADBAND SERVICES

Service Provisioning / Activation Time: The audit of the service providers revealed that Broadband service providers namely **Indus Media, TCL, Hathway and BSNL** failed to meet the benchmark with their performance as **95.35%, 98.64%, 99.28 and 99.66%** respectively against the benchmark of 100% within 15 days.

Fault Repair/Restoration Time: With regards to this parameter, the performances of **TTL, TCL, You Broadband and BSNL** failed to meet the benchmark of parameter **Fault repaired 3 working days** with their performance level as **98.27%, 97.95%, 98.93 % and 98.76%** respectively against the benchmark of >99%.

Billing Performance: For this parameter the performance of the service providers was well within the compliance benchmarks. **Pacenet, Syscon, 5-Network, Indus Media, D-Vois and NSTPL** are providing their services with Pre-paid model of Billing, hence no billing complaints. In case of the parameter 'Refund within 60 days', **You Broadband** failed to meet the benchmark with its achieved level as **92.27%** against the benchmark of 100%.

Response Time to Customer for assistance by operator (Voice to Voice): For percentage of calls getting connected to call center and answered, all service providers were found meeting the benchmark for this parameter except **BSNL** which could achieve the performance as **79.10%** for parameter calls answered by the operator.

During live measurements, **only TCL** failed to meet the benchmark of parameter **Calls answered by operator within 90 seconds (79.34%)**

Bandwidth Utilization/ Throughput: All the service providers were found using Multiple Router Traffic Grapher (MRTG) and also it was observed that all service providers were reporting combined bandwidth utilization for corporate customers and household customers.

The performance of service providers with respect of these parameters was found satisfactory i.e. within benchmark except the operator **NSTPL** could not meet the benchmark of parameter **Bandwidth Utilisation/Throughput – POP to ISP Gateway Node** with its performance as **89.73%**. For **ISP Gateway Node to IGSP/NIXI Node upstream links**, all operators were well within the benchmark.

During live measurements also **5-Networks and Indus** could not meet the benchmark of the above parameters.

Broadband Connection Speed: Only **Tikona** failed to meet the benchmark with its performance as **70.00%** against the benchmark of >80%.

Service Availability/Uptime: All service providers were found meeting the benchmark for this parameter.

Packet Loss and Network Latency: It was observed that almost all operators were measuring packet loss and latency by conducting ping test on random basis for their internal assessment. All operators were meeting the benchmark.. **Five Network and Indus Media are** not monitoring the packet loss so they did not provide any data for audit.

However, the ping test conducted during live measurement revealed that all service providers were meeting the benchmark prescribed by TRAI.

From the above analysis, it was concluded that Indus media, TCL, Hathway and BSNL failed to meet the benchmark of Service provisioning. TTL, TCL, You Broadband and BSNL also remained short of bench mark of parameter Fault Repairs/Restoration within 3 working days and operators namely You Broadband, BSNL, NSTPL and Tikona failed to meet benchmark of parameters Refund within 60 days, Call answered by operators within 90 seconds, Bandwidth utilization and Connection speed respectively.

10.4 CUSTOMER CARE / HELPLINE ASSESSMENT

Parameters	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
Total No. of calls Attempted	MH&G	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator within 60 seconds	MH&G	80	89	93	93	97	96	80	95	92	87	82	89	90	Agent Desk Not Working
% age calls answered by the operator in 60 seconds	MH&G	80%	89%	93%	93%	97%	96%	80%	95%	92%	87%	82%	89%	90%	Agent Desk Not Working
Total number of calls answered by the operator within 90 seconds	MH&G	100	100	100	100	100	100	100	100	100	100	100	100	100	Agent Desk Not Working
% age calls answered by the operator within 90 seconds	MH&G	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	Agent Desk Not Working

In case of calls answered by operators (voice to voice) within 60 seconds and 90 seconds, when test calls were made to the call centers, all broadband service providers were found meeting the TRAI prescribed benchmark. For BSNL, call is not going to operator for voice to voice. Only IVR is functional

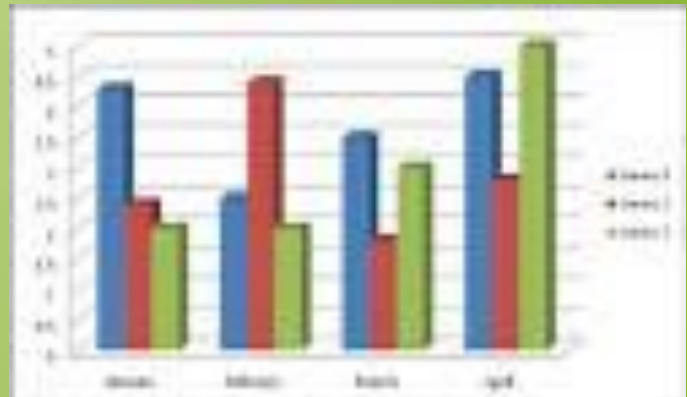
10.5 LIVE CALLING FOR BILLING COMPLIANTS

Parameters	Circle Name	PACENET	SYSCON	FIVE NETWORK	INDUS	BHARTI AIRTEL	RCL	D-VOIS	TTL	TCL	NSTPL	TIKONA	YOU BROADBAND	HATHWAY	BSNL
Total No. of calls Attempted	MH&G	NA	NA	NA	NA	5	44	NA	60	23	NA	200	NA	89	220
Total No. of calls Answered	MH&G	NA	NA	NA	NA	5	39	NA	45	18	NA	100	NA	80	173
Cases resolved within 4 weeks	MH&G	NA	NA	NA	NA	5	39	NA	45	18	NA	100	NA	80	171
%age of cases resolved	MH&G	NA	NA	NA	NA	100%	100%	NA	100%	100%	NA	100%	NA	100%	98.84%

NB: Pacenet, Syscon, Five Network, Indus, D-Vois & NSTPL are providing their services with Pre-paid model. Hence, no billing complaints.

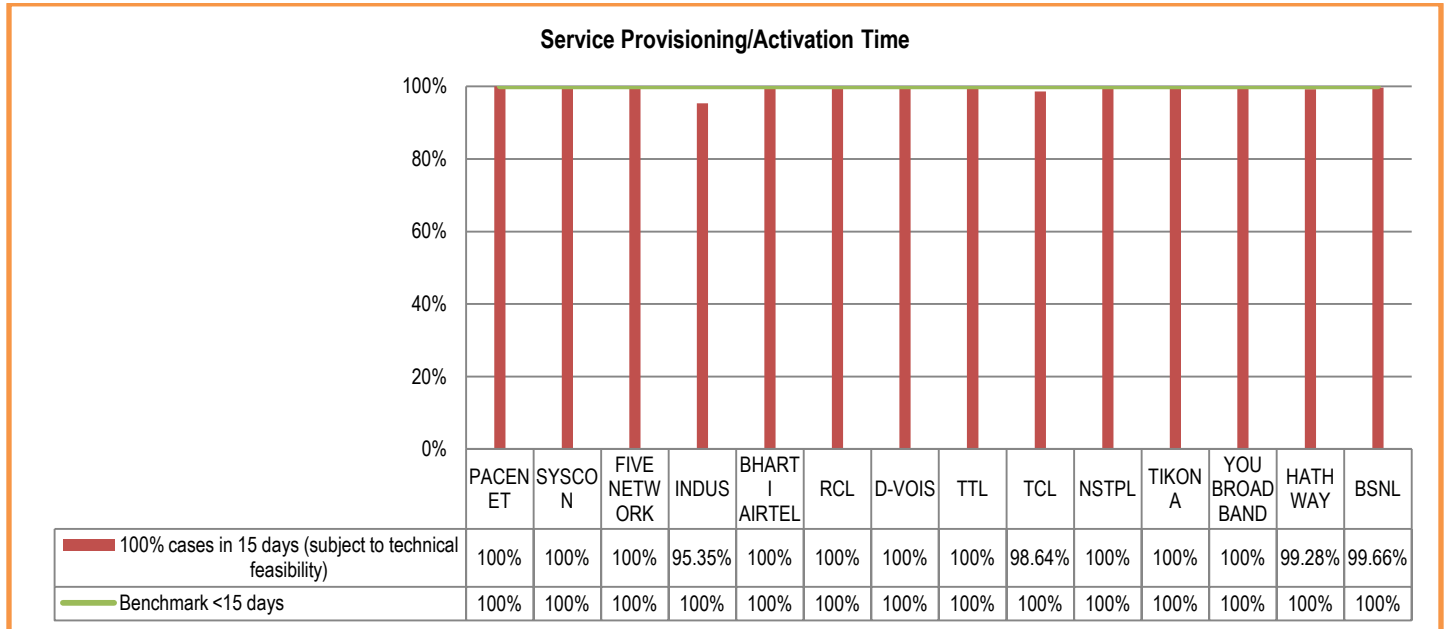
To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling the effected customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. Most of the customers reported their satisfaction on resolution of the billing complaints.

GRAPHICAL REPRESENTATION OF BROADBAND SERVICES



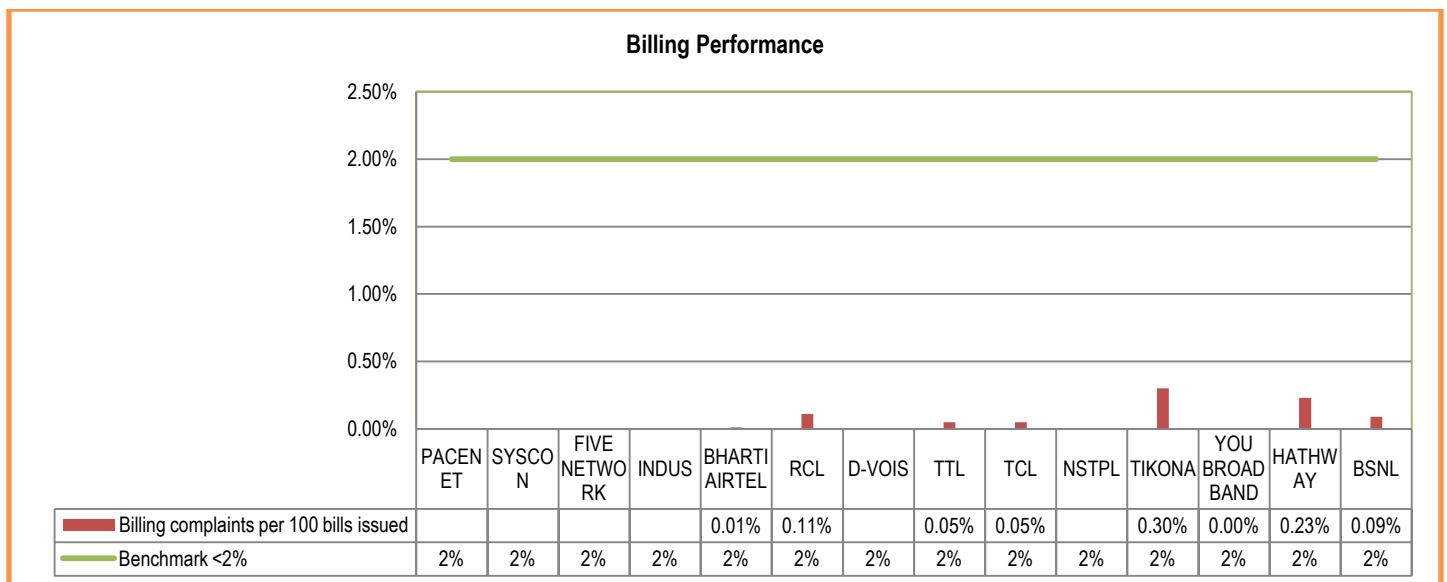
10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:

1. SERVICE PROVISIONING/ACTIVATION TIME:



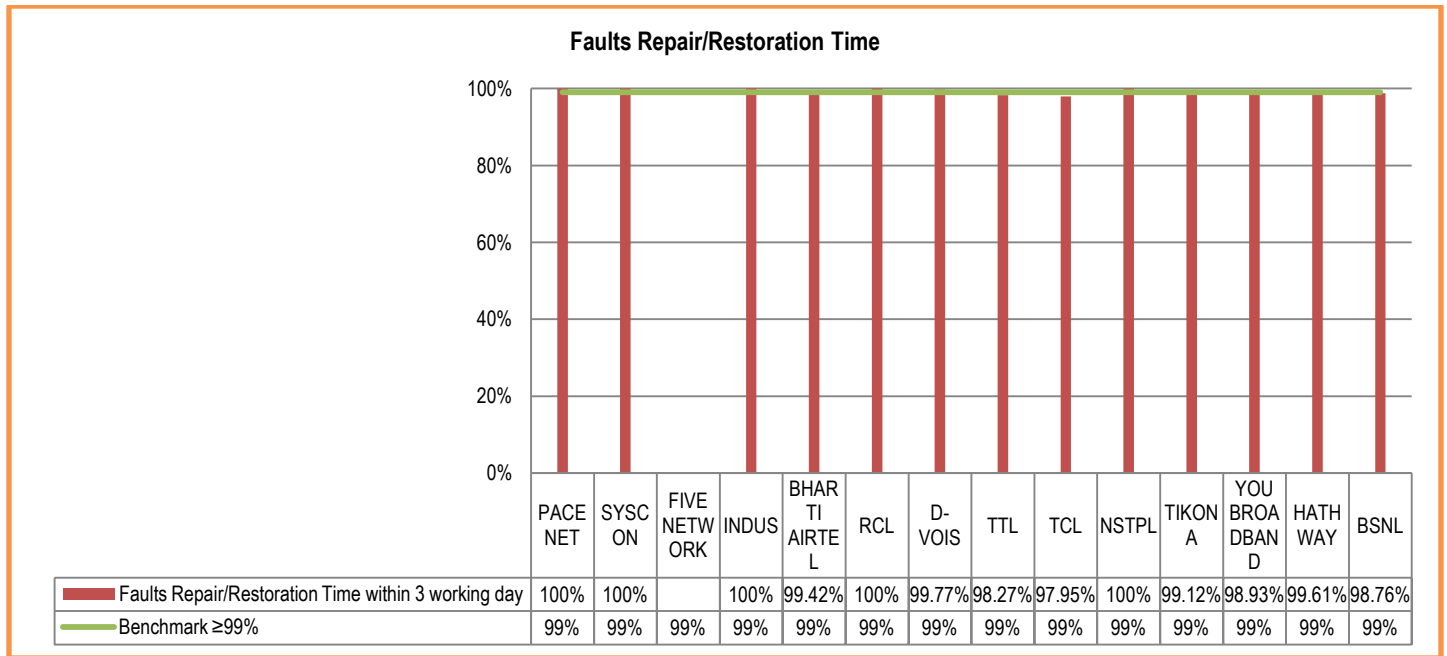
All Operators are meeting the benchmarks except Indus, TCL, Hathway & BSNL.

2. BILLING PERFORMANCE:



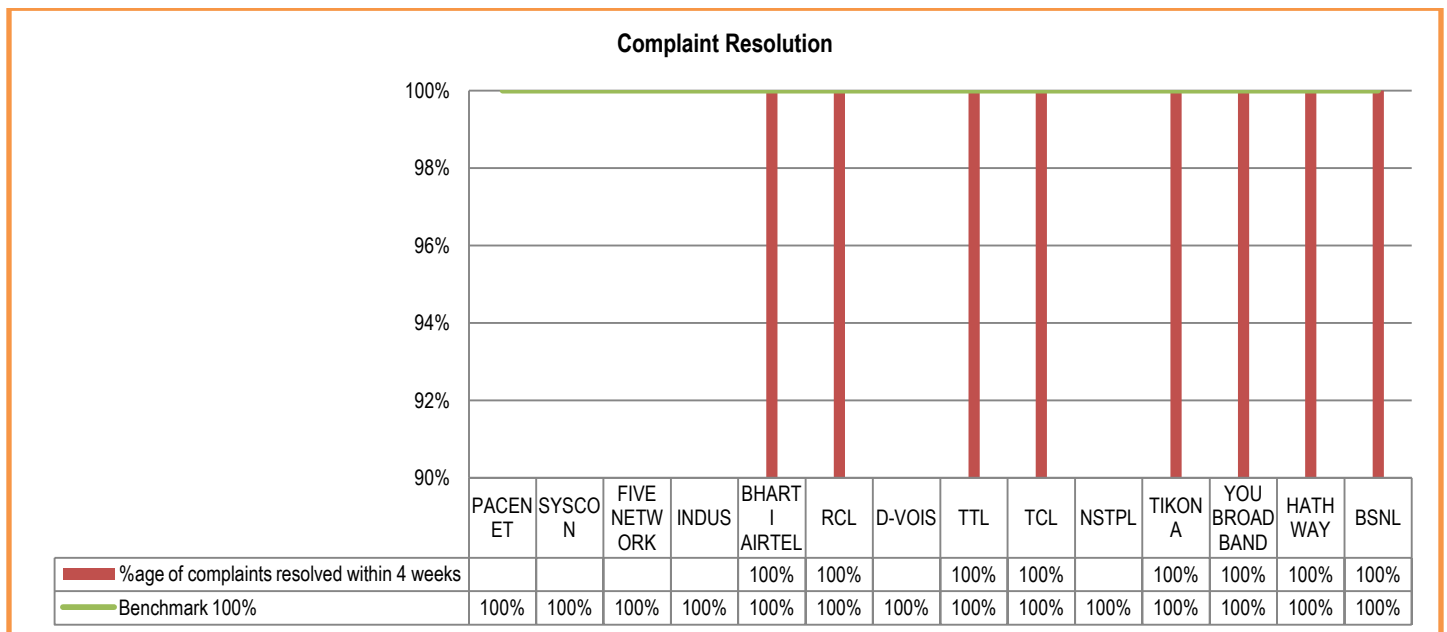
All Operators are meeting the benchmarks. Pacenet, Syscon, Five Network, Indus, D-Vois & NSTPL are providing their services with Pre-paid model. Hence no billing complaints.

3. FAULTS REPAIR/RESTORATION TIME:



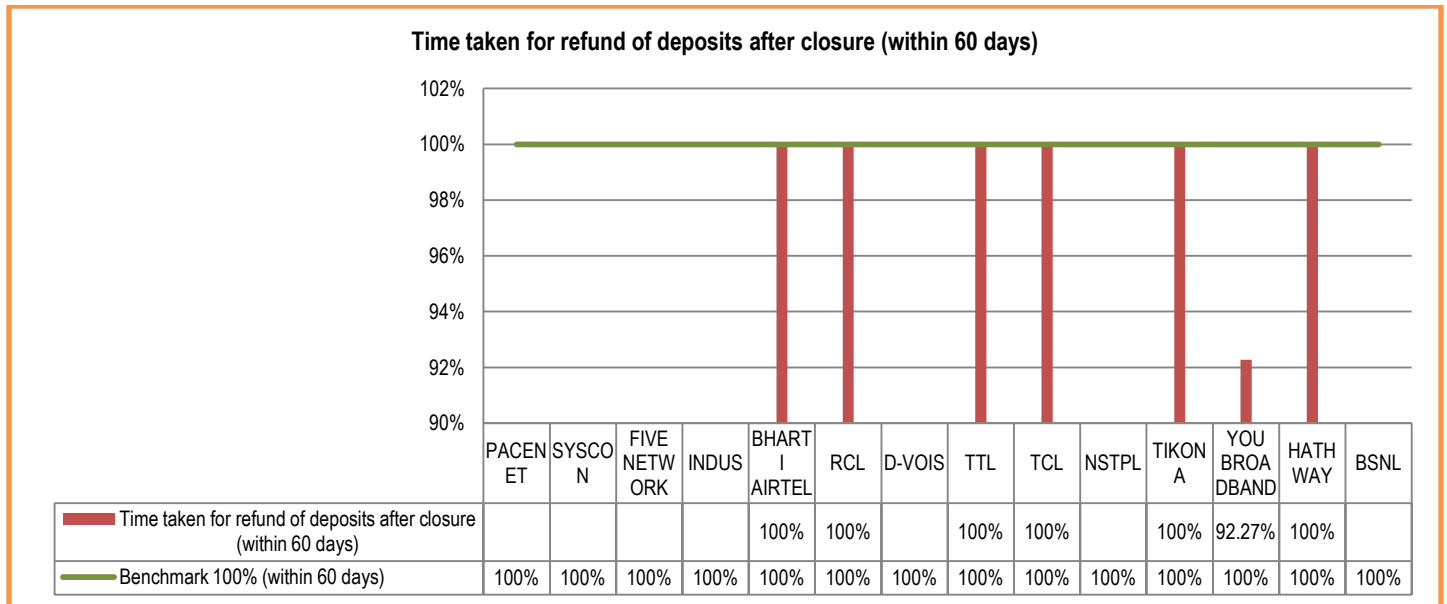
All Operators are meeting the benchmarks except TTL, TCL, You Broadband & BSNL.

4. COMPLAINT RESOLUTION:



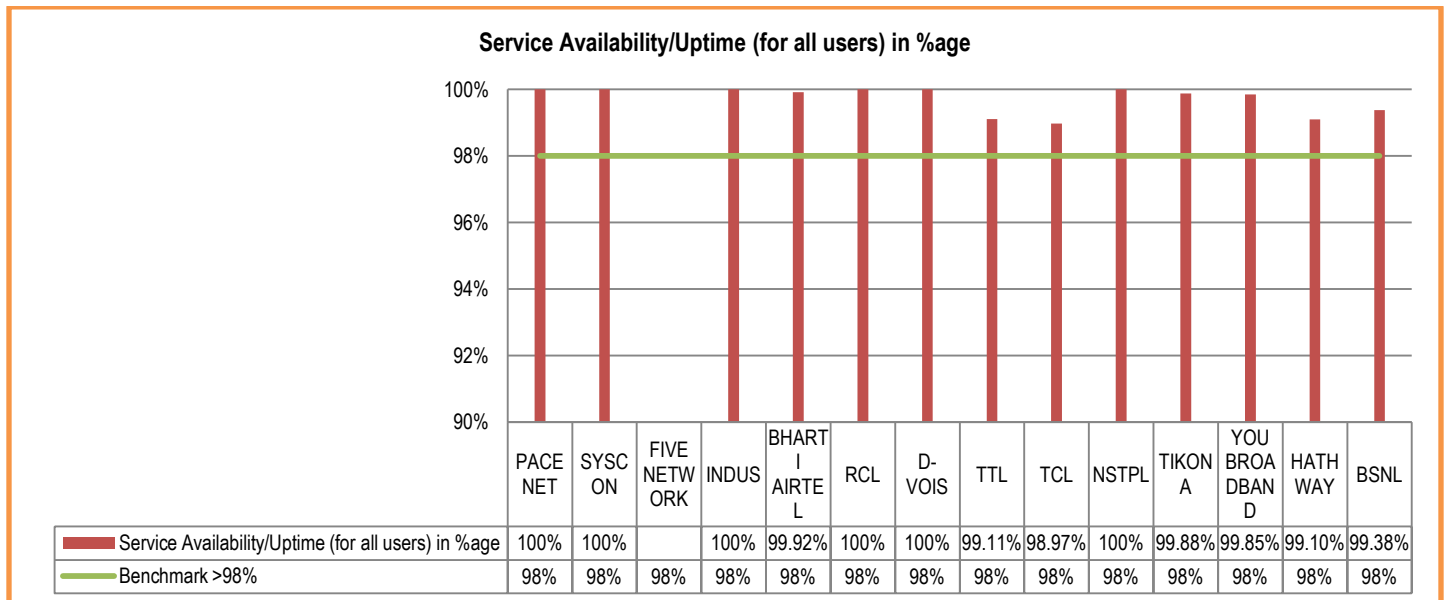
All Operators are meeting the benchmarks.

5. REFUND:



All Operators are meeting the benchmarks except You Broadband. Pacenet, Syscon, Five Network, Indus, D-Vois & NSTPL are providing their services with Pre-paid model. Hence, no refund cases. BSNL has not provided data of refund cases.

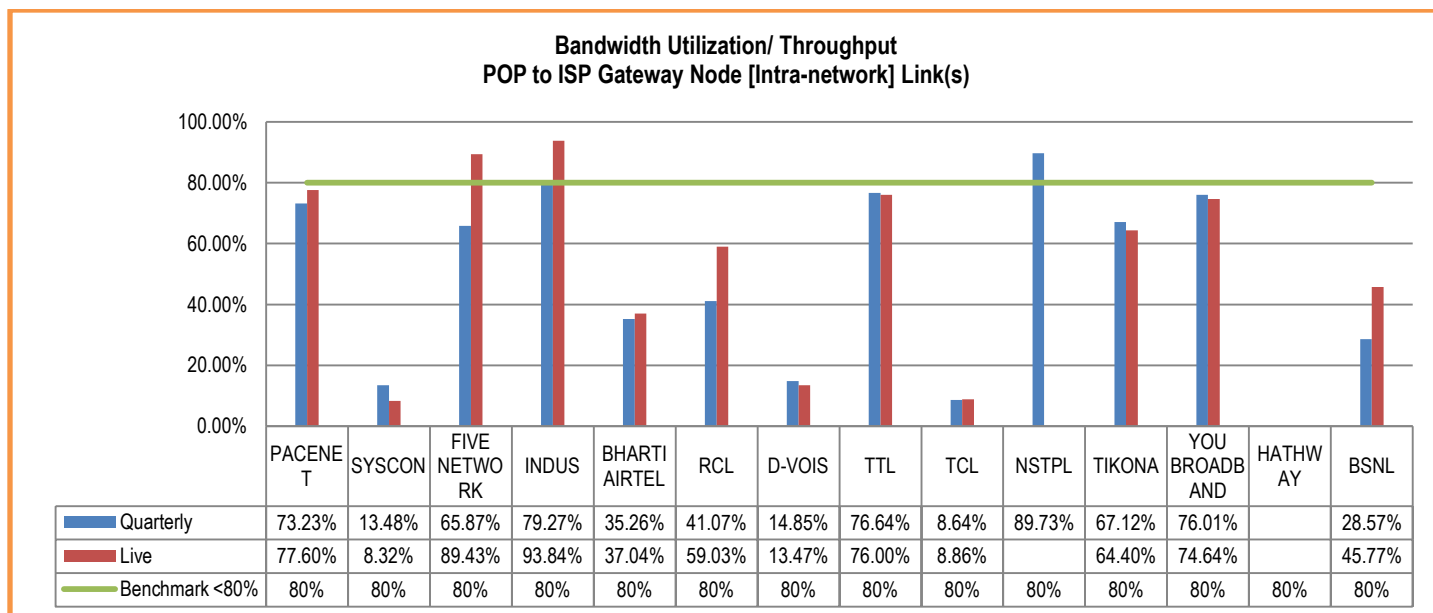
6. SERVICE AVAILABILITY/UPTIME:



All Operators are meeting the benchmarks. 5-Networks has not provided data for this parameter.

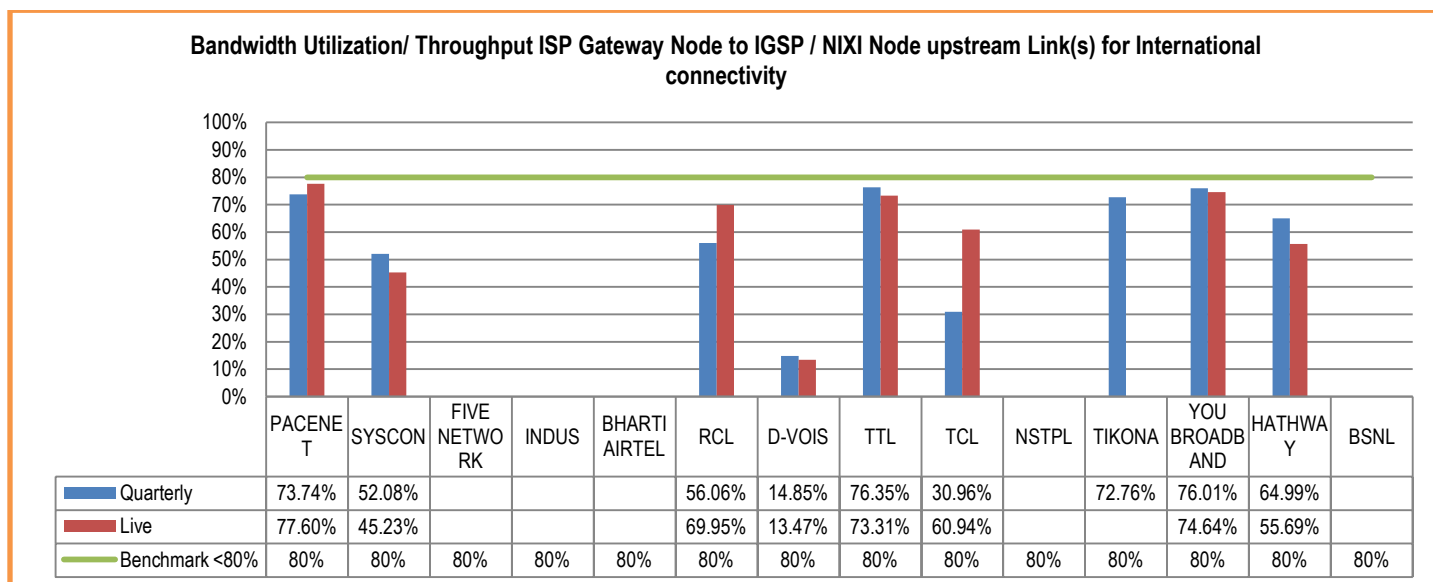
10.7 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BROADBAND SERVICE PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1. BANDWIDTH UTILIZATION/THROUGHPUT POP TO ISP GATEWAY NODE:



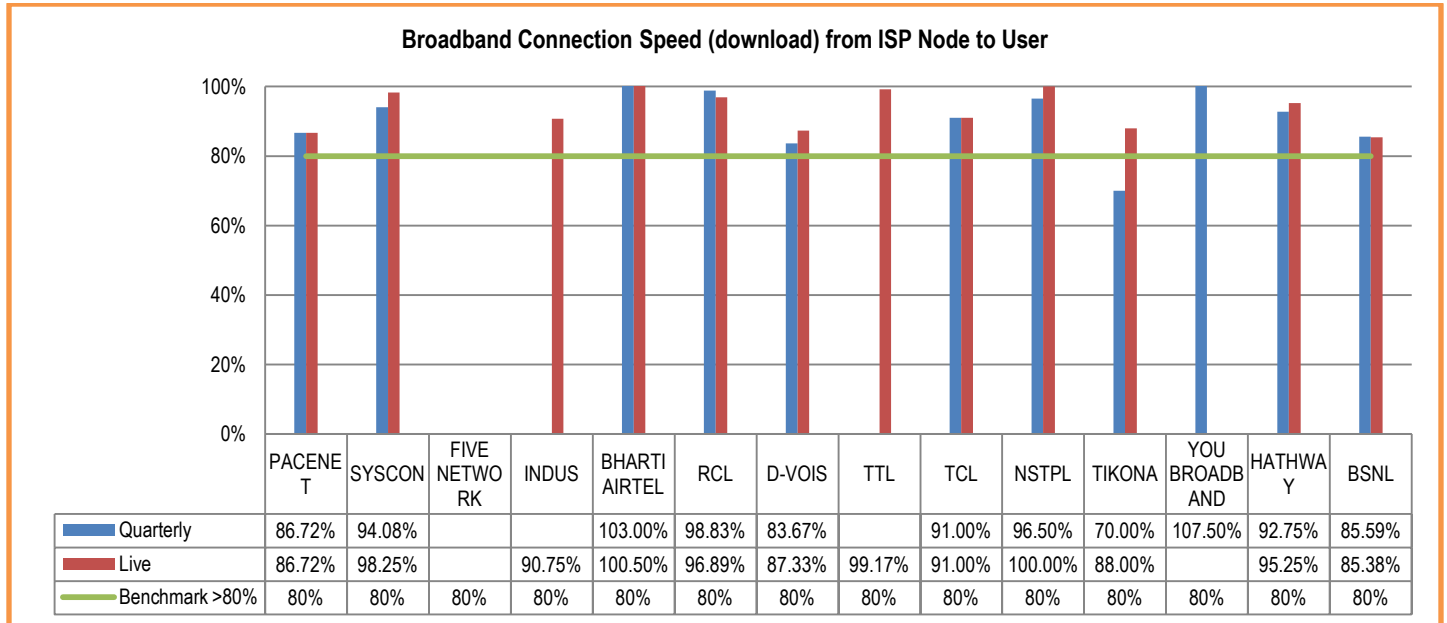
All Operators are meeting the benchmarks except Five Network, Indus (3 days live), and NSTPL. Hathway has not provided data for this parameter.

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



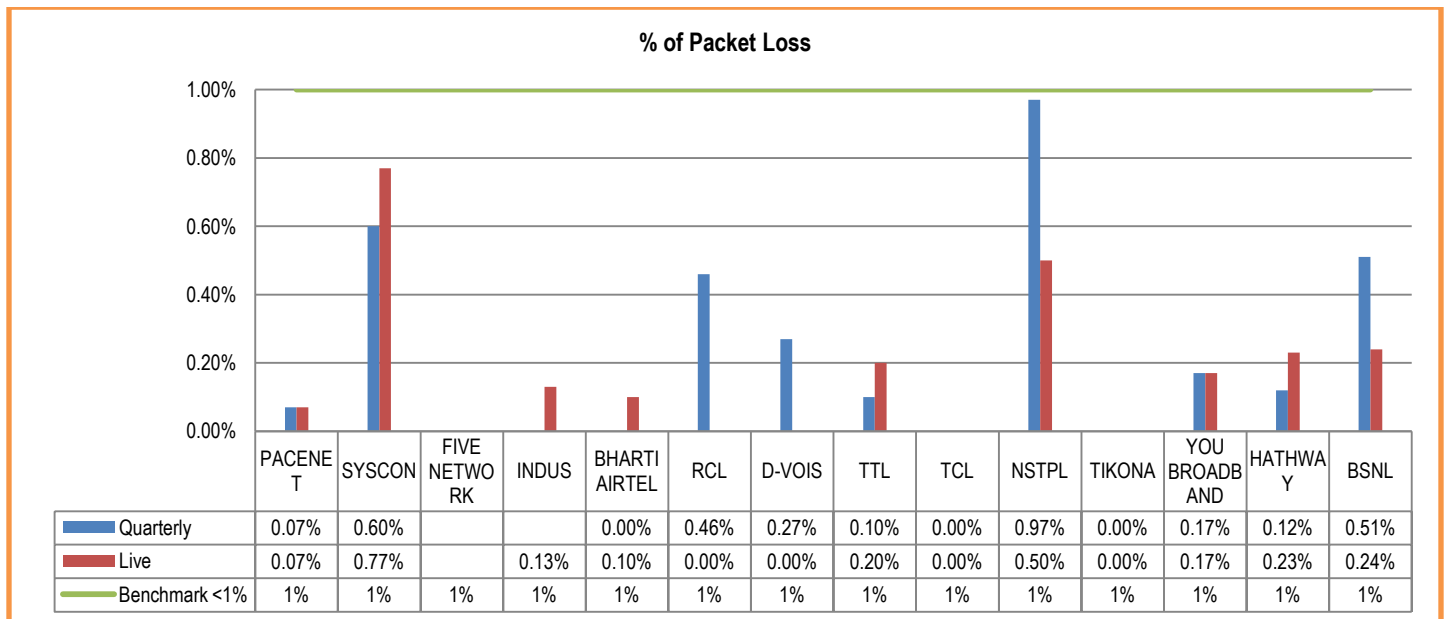
All Operators are meeting the benchmarks and Five Networks, Indus, Bharti Airtel, NSTPL & BSNL have not provided this data because this parameter.

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



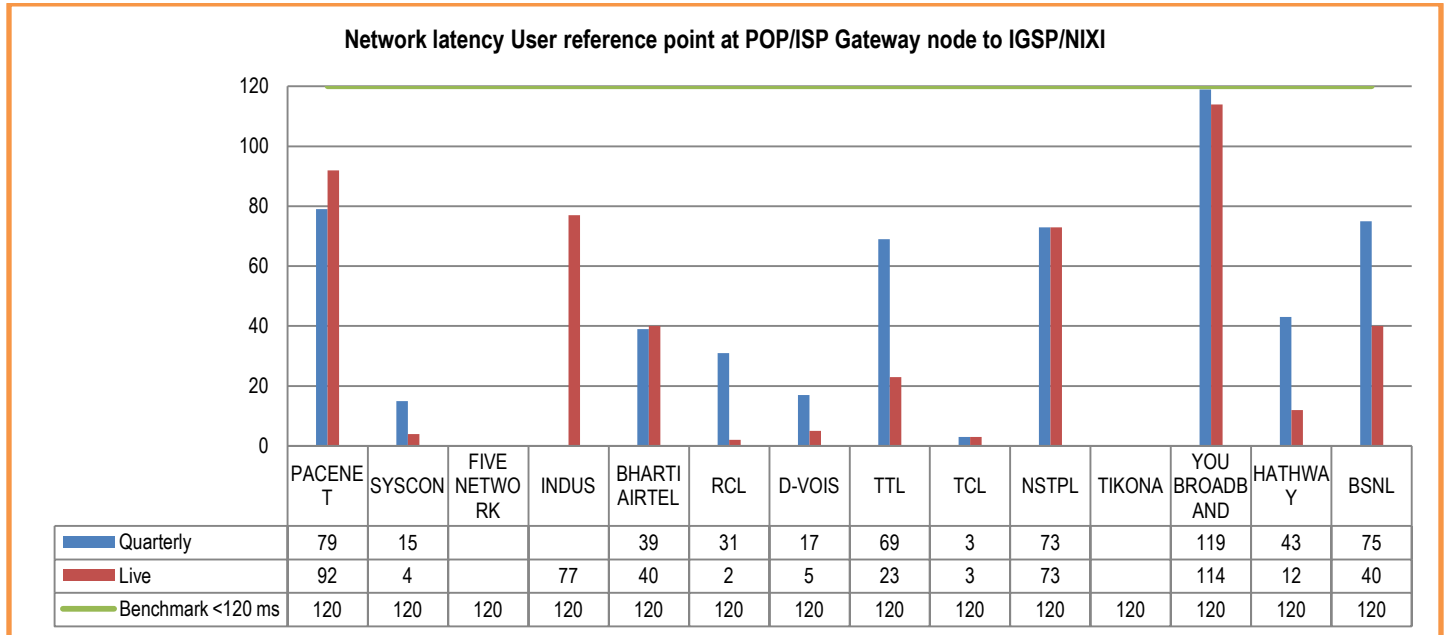
All Operators are meeting the benchmarks except Tikona whereas Five Network, Indus, TTL & You Broadband (3 days live) have not provided data for this Parameter.

4. PACKET LOSS:



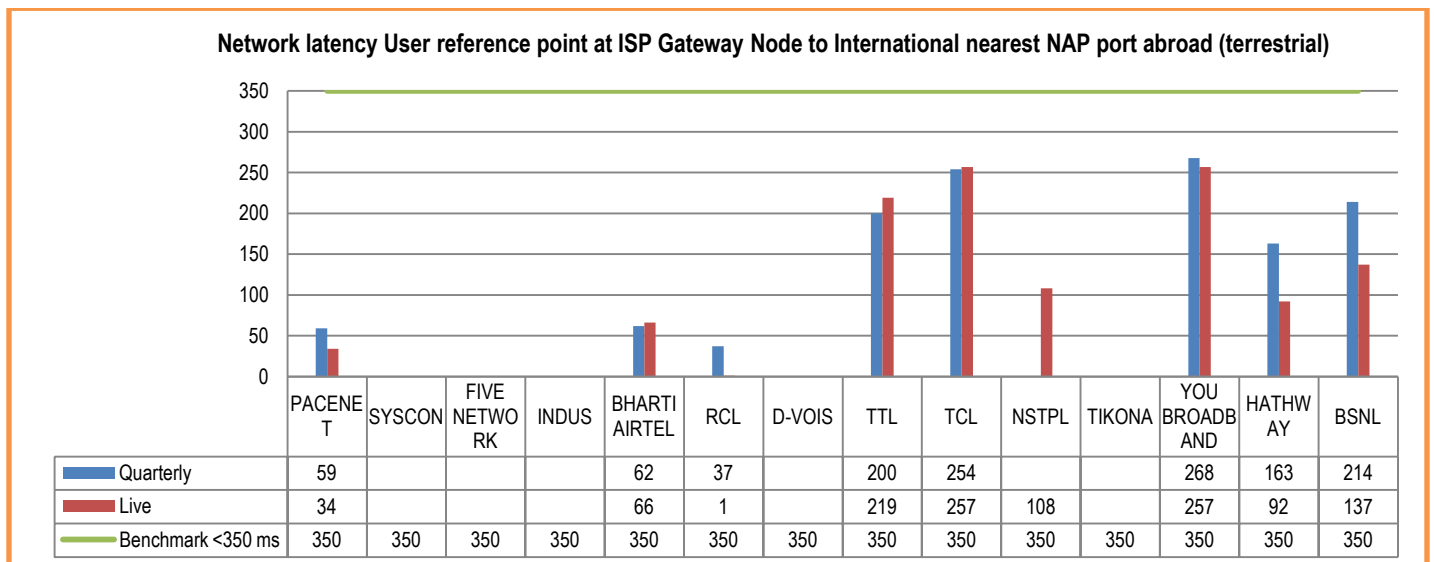
All Operators are meeting the benchmarks whereas Five Network and Indus have not provided data for this Parameter.

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



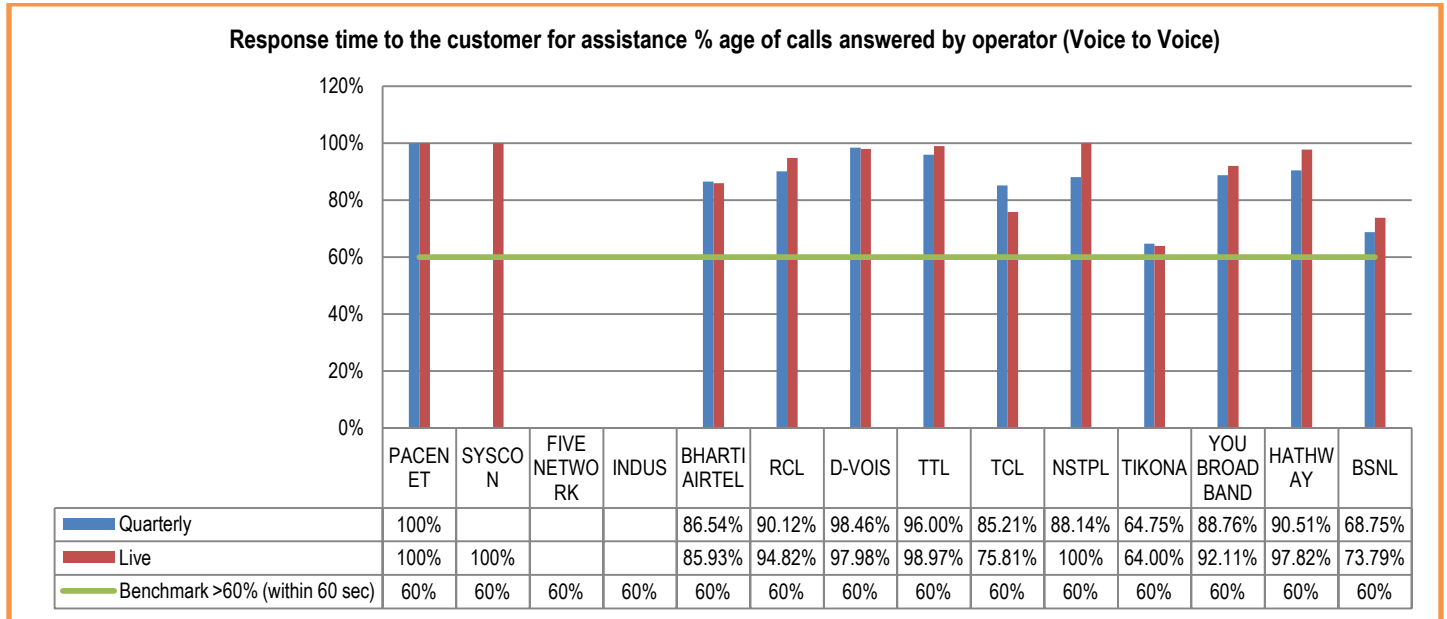
All Operators are meeting the benchmarks whereas Five Networks, Indus and Tikona have not provided data for this parameter.

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



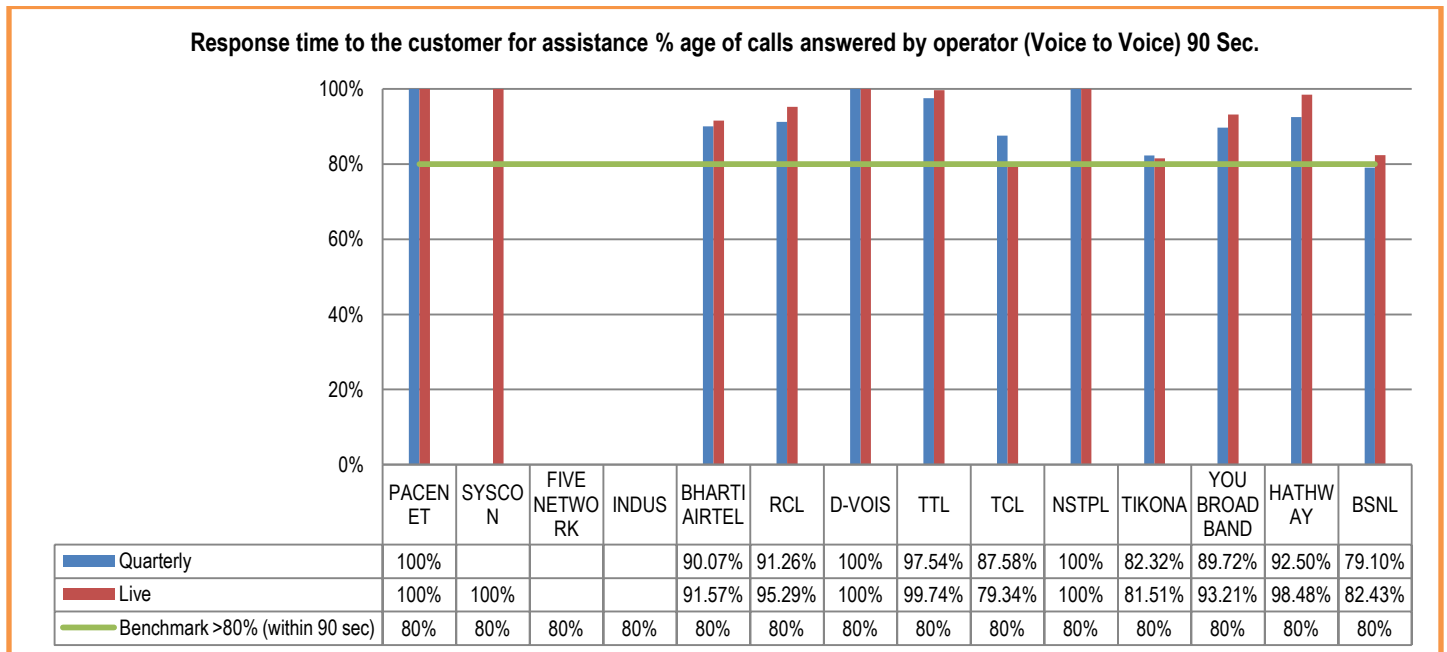
All Operators are meeting the benchmarks whereas Syscon, Five Network, Indus, D-Vois, NSTPL and Tikona have not provided data for this parameter.

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



All Operators are meeting the benchmarks whereas Five Network and Indus have not provided data for this Parameter.

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



All Operators are meeting the benchmarks whereas Five Network and Indus media have not provided data for this Parameter.

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

Annex-1

S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
1	BSNL	PUNE	PUNE	CITY OCB	URBAN	PUNCTY
2	BSNL	PUNE	PUNE	MHS - III (MAIN+RSM)	URBAN	PUNMHS
3	BSNL	PUNE	LONAWALA	LONAWALA	URBAN	PUNLNV
4	BSNL	PUNE	LONAWALA	CHANDKHED	RURAL	PUNCKD
5	BSNL	PUNE	LONAWALA	INDORI RSU	RURAL	PUNIND
6	BSNL	PUNE	LONAWALA	INS SHIVAJI	RURAL	PUNINS
7	BSNL	PUNE	LONAWALA	KAMSHET RSU	RURAL	PUNKMT
8	BSNL	PUNE	LONAWALA	KANHE PHATA	RURAL	PUNKNP
9	BSNL	PUNE	LONAWALA	KARLA	RURAL	PUNKRL
10	BSNL	PUNE	LONAWALA	PARANDWADI	RURAL	PUNPWM
11	BSNL	PUNE	LONAWALA	PAVANANAGAR	RURAL	PUNPVN
12	BSNL	PUNE	LONAWALA	TAKAWE BUDRUK	RURAL	PUNTKV
13	BSNL	PUNE	MANCHAR	AWASARI BUDRUK	RURAL	PUNAVB
14	BSNL	PUNE	MANCHAR	GHODEGAON	RURAL	PUNGHO
15	BSNL	PUNE	MANCHAR	KALAMB	RURAL	PUNKMB
16	BSNL	PUNE	MANCHAR	LANDEWADI	RURAL	PUNLWD
17	BSNL	PUNE	MANCHAR	LONI DHAMANI	RURAL	PUNLDM
18	BSNL	PUNE	MANCHAR	MALUNGE PADVAL	RURAL	PUNMPD
19	BSNL	PUNE	MANCHAR	MANCHAR	RURAL	PUNMCX
20	BSNL	PUNE	MANCHAR	NIRGUDSAR	RURAL	PUNNGR
21	BSNL	PUNE	MANCHAR	PETH	RURAL	PUNPET
22	BSNL	PUNE	DAUND	DAUND	URBAN	PUNDND
23	BSNL	PUNE	DAUND	DEOLGAON RAJE	RURAL	PUNDGR
24	BSNL	PUNE	DAUND	GAR	RURAL	PUNGAR
25	BSNL	PUNE	DAUND	KANGAON	RURAL	PUNKAN
26	BSNL	PUNE	DAUND	KHADKI	RURAL	PUNKAD
27	BSNL	PUNE	DAUND	KURKHUMBH	RURAL	PUNKKB
28	BSNL	PUNE	DAUND	PATAS	RURAL	PUNPTS
29	BSNL	PUNE	DAUND	RAVANGAON	RURAL	PUNRVN
30	BSNL	PUNE	INDAPUR	INDAPUR	URBAN	PUNINP
31	BSNL	PUNE	INDAPUR	BAVADA CDOT	RURAL	PUNBDA
32	BSNL	PUNE	INDAPUR	BIJEWADI	RURAL	PUNBJD
33	BSNL	PUNE	INDAPUR	KATI	RURAL	PUNKDG
34	BSNL	PUNE	INDAPUR	LONI DEOKAR	RURAL	PUNLND
35	BSNL	PUNE	INDAPUR	NIMGAON KETKI	RURAL	NNGK
36	BSNL	PUNE	INDAPUR	PALASDEO	RURAL	PUNPLV
37	BSNL	PUNE	INDAPUR	REDNI	RURAL	PUNRDN
38	BSNL	PUNE	INDAPUR	SHELGAON	RURAL	PUNSLG

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
39	BSNL	PUNE	INDAPUR	WADAPURI	RURAL	PUNWPR
40	BSNL	PUNE	KEDGAON	KADETHAN	RURAL	PUNKTN
41	BSNL	PUNE	KEDGAON	KEDGAON	RURAL	PUNKEN
42	BSNL	PUNE	KEDGAON	KHUTBHAV	RURAL	PUNKTB
43	BSNL	PUNE	KEDGAON	PADVI	RURAL	PUNPDV
44	BSNL	PUNE	KEDGAON	PARGAON(SM)-SALU-MALU	RURAL	PUNPSM
45	BSNL	PUNE	KEDGAON	PIMPALGAON	RURAL	PUNPGN
46	BSNL	PUNE	KEDGAON	RAHU	RURAL	PUNRHU
47	BSNL	PUNE	KEDGAON	SAHAJPUR	RURAL	PUNSJP
48	BSNL	PUNE	KEDGAON	WARVAND	RURAL	PUNWWD
49	BSNL	PUNE	PIRANGUT	BAVDHAN	URBAN	PUNBDN
50	BSNL	PUNE	PIRANGUT	HINJEWADI	RURAL	PUNHJD
51	BSNL	PUNE	PIRANGUT	MALE	RURAL	PUNMLE
52	BSNL	PUNE	PIRANGUT	PAUD	RURAL	PUNPUX
53	BSNL	PUNE	PIRANGUT	PIRANGUT	RURAL	PUNPGT
54	BSNL	PUNE	PIRANGUT	SAHARA INDIA (AMBYS)	RURAL	PUNAMS
55	BSNL	PUNE	SASWAD	SASWAD	URBAN	PUNSSV
56	BSNL	PUNE	SASWAD	BELSAR	RURAL	PUNBLS
57	BSNL	PUNE	SASWAD	BOPGAON	RURAL	PUNBPG
58	BSNL	NASIK	NASIK	CANADA CORNER	URBAN	NSKNSK
59	BSNL	NASIK	NASIK	LAHAVIT	RURAL	NSKLVN
60	BSNL	NASIK	NASIK	LAKHALGAON	RURAL	NSKLLG
61	BSNL	NASIK	NASIK	MADSANGVI	RURAL	NSKMDS
62	BSNL	NASIK	NASIK	MATORI	RURAL	NSKMAT
63	BSNL	NASIK	NASIK	SAYYADPIMPRI	RURAL	NSKPPS
64	BSNL	NASIK	NASIK	SHINDE	RURAL	NSKSND
65	BSNL	NASIK	NASIK	VANJARWADI	RURAL	NSKVNJ
66	BSNL	NASIK	DINDORI	JANORI	RURAL	NSKJNR
67	BSNL	NASIK	DINDORI	JAULAKE (DII)	RURAL	NSKJAU
68	BSNL	NASIK	DINDORI	KHEDGAON	RURAL	NSKKDG
69	BSNL	NASIK	DINDORI	LAKHMAPUR (DII)	RURAL	NSKLLD
70	BSNL	NASIK	DINDORI	MOHADI	RURAL	NSKMHD
71	BSNL	NASIK	DINDORI	PIMPALNARE	RURAL	NSKPNR
72	BSNL	NASIK	DINDORI	RAJARAMNAGAR	RURAL	NSKRNG
73	BSNL	NASIK	CHANDWAD	ASARKHEDA	RURAL	NSKASR
74	BSNL	NASIK	CHANDWAD	BHATGAON	RURAL	NSKBTG
75	BSNL	NASIK	CHANDWAD	BHOYEGAON	RURAL	NSKBHG
76	BSNL	NASIK	CHANDWAD	DHODAMBE	RURAL	NSKDDB
77	BSNL	NASIK	CHANDWAD	KAZISANGVI	RURAL	NSKKSU

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
78	BSNL	NASIK	CHANDWAD	VADALIBHOI	RURAL	NSKVDB
79	BSNL	NASIK	MANMAD	BHALUR	RURAL	NSKBLR
80	BSNL	NASIK	MANMAD	MANMAD	URBAN	NSKMAN
81	BSNL	NASIK	MANMAD	PANZANDEO	RURAL	NSKPDZ
82	BSNL	NASIK	YEOLA	ANDARSUL	RURAL	NSKADS
83	BSNL	NASIK	YEOLA	ANKAI	RURAL	NSKANK
84	BSNL	NASIK	YEOLA	BABHULGAON	RURAL	NSKBBN
85	BSNL	NASIK	YEOLA	DHULGAON	RURAL	NSKDLG
86	BSNL	NASIK	YEOLA	JALGAON NEUR	RURAL	NSKJGN
87	BSNL	NASIK	YEOLA	PATODA	RURAL	NSKPTD
88	BSNL	NASIK	YEOLA	RAJAPUR	RURAL	NSKRJP
89	BSNL	NASIK	YEOLA	SAIGAON	RURAL	NSKSYG
90	BSNL	NASIK	YEOLA	SAVARGAON	RURAL	NSKSRV
91	BSNL	NASIK	YEOLA	YEOLA	URBAN	NSKYLA
92	BSNL	NASIK	NIPHED	LASALGAON	URBAN	NSKLSG
93	BSNL	NASIK	NIPHED	OZAR	URBAN	NSKOZR
94	BSNL	NASIK	NIPHED	BHAUSAHEBNAGAR	RURAL	NSKBNG
95	BSNL	NASIK	NIPHED	BHENDALI	RURAL	NSKBND
96	BSNL	NASIK	NIPHED	CHITEGAON	RURAL	NSKCTG
97	BSNL	NASIK	NIPHED	DARANA SANGVI	RURAL	NSKDSV
98	BSNL	NASIK	NIPHED	DAWACHWADI	RURAL	NSKDWC
99	BSNL	NASIK	NIPHED	DEOGAON	RURAL	NSKDGN
100	BSNL	NASIK	NIPHED	KAKASAHEBNAGAR	RURAL	NSKKNG
101	BSNL	NASIK	SINNAR	PATHRE	RURAL	NSKPHA
102	BSNL	NASIK	SINNAR	SINNAR	URBAN	NSKSNN
103	BSNL	NASIK	SINNAR	SOMTHANE	RURAL	NSKSMT
104	BSNL	NASIK	SINNAR	SONEWADI	RURAL	NSKSNW
105	BSNL	NASIK	SINNAR	SULTANPUR	RURAL	NSKSLT
106	BSNL	NASIK	SINNAR	THANGAON	RURAL	NSKTGN
107	BSNL	NASIK	SINNAR	WADANGALI	RURAL	NSKWDG
108	BSNL	NASIK	SINNAR	WAVI	RURAL	NSKWAV
109	BSNL	NASIK	IGATPURI	DHAMANGAON	RURAL	NSKDMG
110	BSNL	NASIK	IGATPURI	GHOTI	URBAN	NSKGOI
111	BSNL	NASIK	IGATPURI	GONDE	RURAL	NSKGN
112	BSNL	NASIK	IGATPURI	IGATPURI	RURAL	NSKIGP
113	BSNL	NASIK	IGATPURI	MUNDEGAON	RURAL	NSKMMDG
114	BSNL	NASIK	IGATPURI	NANDUR VAIDYA	RURAL	NSKASW
115	BSNL	AURANGABAD	AURANGABAD	AURANGABAD	URBAN	AGDAGD
116	BSNL	AURANGABAD	AURANGABAD	BHALGAON	RURAL	AGDBLG

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S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
117	BSNL	AURANGABAD	AURANGABAD	CHITTE-PIMPALGAON	RURAL	AGDCTG
118	BSNL	AURANGABAD	AURANGABAD	DAULATABAD	RURAL	AGDDL B
119	BSNL	AURANGABAD	AURANGABAD	DHONGARGAON (K)	RURAL	AGDDGN
120	BSNL	AURANGABAD	AURANGABAD	GEVRAI	RURAL	AGD GVR
121	BSNL	AURANGABAD	AURANGABAD	JATEGAON	RURAL	AGDJAT
122	BSNL	AURANGABAD	AURANGABAD	JATWADA	RURAL	AGDJTW
123	BSNL	AURANGABAD	AURANGABAD	KACHNER	RURAL	AGDKCN
124	BSNL	AURANGABAD	AURANGABAD	KARMAD	RURAL	AGDKMD
125	BSNL	AURANGABAD	KHULTABAD	KHULTABAD	URBAN	AGDKLD
126	BSNL	AURANGABAD	KHULTABAD	BAZARSAVANGI	RURAL	AGDBZS
127	BSNL	AURANGABAD	KHULTABAD	ELLORA	RURAL	AGDEL R
128	BSNL	AURANGABAD	KHULTABAD	GALLEBORGAON	RURAL	AGDBOR
129	BSNL	AURANGABAD	KHULTABAD	KASABKHEDA	RURAL	AGDKSB
130	BSNL	AURANGABAD	KHULTABAD	SULTANPUR	RURAL	AGDSL P
131	BSNL	AURANGABAD	KHULTABAD	TAKLI	RURAL	AGDTKL
132	BSNL	AURANGABAD	VAIJAPUR	VAIJAPUR	URBAN	AGDVPU
133	BSNL	AURANGABAD	VAIJAPUR	DHONDALGAON	RURAL	AGDDL G
134	BSNL	AURANGABAD	VAIJAPUR	GARAJ	RURAL	AGDGRJ
135	BSNL	AURANGABAD	VAIJAPUR	KHANDALA	RURAL	AGDKDL
136	BSNL	AURANGABAD	VAIJAPUR	LONI	RURAL	AGDLON
137	BSNL	AURANGABAD	VAIJAPUR	MAHALGAON	RURAL	AGDMLG
138	BSNL	AURANGABAD	VAIJAPUR	MALI GHOGARGAON	RURAL	AGDGOG
139	BSNL	AURANGABAD	VAIJAPUR	MANUR	RURAL	AGDMNR
140	BSNL	AURANGABAD	PAITHAN	PAITHAN	URBAN	AGDPTH
141	BSNL	AURANGABAD	PAITHAN	ADUL	RURAL	AGDADL
142	BSNL	AURANGABAD	PAITHAN	BALANAGAR	RURAL	AGDBNR
143	BSNL	AURANGABAD	PAITHAN	BIDKIN	RURAL	AGDBDK
144	BSNL	AURANGABAD	PAITHAN	CHITEGAON	RURAL	AGDCTN
145	BSNL	AURANGABAD	PAITHAN	DAWARWADI	RURAL	AGDDWD
146	BSNL	AURANGABAD	PAITHAN	DHAKEPHAL	RURAL	AGDDFL
147	BSNL	AURANGABAD	PAITHAN	DHORKIN	RURAL	AGDDKN
148	BSNL	JALNA	JALNA	JALNA MAIN	URBAN	JLNJLN
149	BSNL	JALNA	JALNA	BADNAPUR	RURAL	JLNBPR
150	BSNL	JALNA	JALNA	BAWNE PANGRI	RURAL	JLNBPG
151	BSNL	JALNA	JALNA	DABHADI	RURAL	JLNDBD
152	BSNL	JALNA	JALNA	GOLAPANGRI	RURAL	JLNGPR
153	BSNL	JALNA	JALNA	REVGAON	RURAL	JLNRVG
154	BSNL	JALNA	JALNA	SHELGAON	RURAL	JLNSLG
155	BSNL	JALNA	BHOKARDAN	BHOKARDAN	URBAN	JLNBKD

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
156	BSNL	JALNA	BHOKARDAN	ANWA	RURAL	JLNANW
157	BSNL	JALNA	BHOKARDAN	AVHANA	RURAL	JLNAVN
158	BSNL	JALNA	BHOKARDAN	DANAPUR	RURAL	JLNDNP
159	BSNL	JALNA	BHOKARDAN	DHAWADA	RURAL	JLNDWD
160	BSNL	JALNA	BHOKARDAN	HASNABAD	RURAL	JLNHSB
161	BSNL	JALNA	BHOKARDAN	JAFRABAD	RURAL	JLNJFD
162	BSNL	JALNA	BHOKARDAN	JALGAON SAPKAL	RURAL	JLNJGS
163	BSNL	JALNA	BHOKARDAN	KEDARKHEDA	RURAL	JLNKDR
164	BSNL	JALNA	BHOKARDAN	MAHORA(JFD)	RURAL	JLNMHJ
165	BSNL	JALNA	PARTUR	PARTUR	URBAN	JLNPTR
166	BSNL	JALNA	PARTUR	ASHTI	RURAL	JLNAST
167	BSNL	JALNA	PARTUR	MANTHA	RURAL	JLNMNT
168	BSNL	JALNA	PARTUR	PATODA	RURAL	JLNPTD
169	BSNL	JALNA	PARTUR	SATONA	RURAL	JLNSTO
170	BSNL	JALNA	PARTUR	TALNI	RURAL	JLNTLN
171	BSNL	JALNA	PARTUR	WATUR	RURAL	JLWTR
172	BSNL	NAGPUR	NAGPUR	SITABULDI(MAIN)	URBAN	NGPSBD
173	BSNL	NAGPUR	NAGPUR	NARI (MAIN)	URBAN	NGPNAR
174	BSNL	NAGPUR	NAGPUR	SAKKARDARA (MAIN)	URBAN	NGPSKD
175	BSNL	NAGPUR	KALMESHWAR	BAZARGAON	RURAL	NGPBZG
176	BSNL	NAGPUR	KALMESHWAR	DHAPEWADA	RURAL	NGPDWD
177	BSNL	NAGPUR	KALMESHWAR	GONDKHAIRI	RURAL	NGPGDK
178	BSNL	NAGPUR	KALMESHWAR	KALMESHWAR	RURAL	NGPKLR
179	BSNL	NAGPUR	KALMESHWAR	MOHPA	RURAL	NGPMOH
180	BSNL	NAGPUR	KAMPTEE	BHUGAON	RURAL	NGPBHG
181	BSNL	NAGPUR	KAMPTEE	GUMTHALA	RURAL	NGPGMT
182	BSNL	NAGPUR	KAMPTEE	KAMPTEE	RURAL	NGPKMT
183	BSNL	NAGPUR	KAMPTEE	KAPSI	RURAL	NGPKPS
184	BSNL	NAGPUR	KAMPTEE	KORADI (K)	RURAL	NGPKDR
185	BSNL	NAGPUR	KAMPTEE	WADODA	RURAL	NGPVDA
186	BSNL	NAGPUR	HINGANA	DEOLI	RURAL	NGPDEO
187	BSNL	NAGPUR	HINGANA	GUMGAON	RURAL	NGPGMG
188	BSNL	NAGPUR	HINGANA	HINGNA	RURAL	NGPHGR
189	BSNL	NAGPUR	HINGANA	HINGNA(MIDC)	RURAL	NGPHGU
190	BSNL	NAGPUR	HINGANA	KANOLIBARA	RURAL	NGPKNL
191	BSNL	NAGPUR	HINGANA	TAKALGHAT	RURAL	NGPTKG
192	BSNL	NAGPUR	HINGANA	WADDHAMNA	RURAL	NGPWDM
193	BSNL	NAGPUR	HINGANA	WADI (H)	RURAL	NGPWDR
194	BSNL	NAGPUR	MOUDA	AROLI	RURAL	NGPARL

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2015-MAHARASHTRA & GOA CIRCLE

S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
195	BSNL	NAGPUR	MOUDA	CHACHER	RURAL	NGPCCH
196	BSNL	NAGPUR	MOUDA	DHANLA	RURAL	NGPDNL
197	BSNL	NAGPUR	MOUDA	KODAMEDHI	RURAL	NGPKDM
198	BSNL	NAGPUR	MOUDA	MOUDA	RURAL	NGPMOU
199	BSNL	NAGPUR	MOUDA	NIMKHEDA	RURAL	NGPNMK
200	BSNL	NAGPUR	MOUDA	REWARAL	RURAL	NGPRWR
201	BSNL	BHANDARA	BHANDARA	BHANDARA	URBAN	BNR
202	BSNL	BHANDARA	BHANDARA	BHANDARA MIDC	RURAL	MIB
203	BSNL	BHANDARA	BHANDARA	JAWAHARNAGAR	URBAN	JNR
204	BSNL	BHANDARA	BHANDARA	KHAMARI - BUTTI	RURAL	KMR
205	BSNL	BHANDARA	BHANDARA	KOTHURNA	RURAL	KTN
206	BSNL	BHANDARA	BHANDARA	PAHELA	RURAL	PHL
207	BSNL	BHANDARA	BHANDARA	SATONA (B)	RURAL	SAT
208	BSNL	BHANDARA	BHANDARA	SHAHAPUR	RURAL	SPR
209	BSNL	BHANDARA	BHANDARA	SILLI	RURAL	SLI
210	BSNL	BHANDARA	BHANDARA	WARTHI	RURAL	WRT
211	BSNL	BHANDARA	TIRORA	KACHEWANI	RURAL	KCH
212	BSNL	BHANDARA	TIRORA	MUNDIKOTA	RURAL	MKT
213	BSNL	BHANDARA	TIRORA	NAVEZARI	RURAL	NVZ
214	BSNL	BHANDARA	TIRORA	PARASWADA	RURAL	PRS
215	BSNL	BHANDARA	TIRORA	SUKALI	RURAL	SUK
216	BSNL	BHANDARA	TIRORA	TIRODA	URBAN	TIA
217	BSNL	BHANDARA	TIRORA	WADEGAON	RURAL	WDG
218	BSNL	BHANDARA	GONDIA	ADASI	RURAL	ADA
219	BSNL	BHANDARA	GONDIA	ASOLI	RURAL	ASO
220	BSNL	BHANDARA	GONDIA	DASGAON	RURAL	DSG
221	BSNL	BHANDARA	GONDIA	DAWANIWADA	RURAL	DNW
222	BSNL	BHANDARA	GONDIA	GANGAJHARI	RURAL	GGJ
223	BSNL	BHANDARA	GONDIA	GONDIA	URBAN	GNB
224	BSNL	BHANDARA	GONDIA	RAWANWADI	RURAL	RWD
225	BSNL	BHANDARA	GONDIA	GONDIA MIDC	RURAL	MIG
226	BSNL	BHANDARA	GONDIA	KAMTHA	RURAL	KMT
227	BSNL	BHANDARA	GONDIA	KATIBIRSOLA	RURAL	KTB
228	BSNL	BHANDARA	GONDIA	PANDRABODI	RURAL	PBD
229	BSNL	GOA	MADGAON	MADGAON	URBAN	MRG
230	BSNL	GOA	MADGAON	VASCO	URBAN	VSC
231	BSNL	GOA	MADGAON	BETALBATIM	RURAL	BBT
232	BSNL	GOA	MADGAON	CANSAULIM	RURAL	CNS
233	BSNL	GOA	MADGAON	CHANDUR	RURAL	CND

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S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
234	BSNL	GOA	MADGAON	COLVA	RURAL	COL
235	BSNL	GOA	MADGAON	CORTALIM	RURAL	CRT
236	BSNL	GOA	MADGAON	CURTORIM	RURAL	CRM
237	BSNL	GOA	MADGAON	LOTULIM	RURAL	LTM
238	BSNL	GOA	MADGAON	MOBOR	RURAL	MBR
239	BSNL	GOA	MADGAON	NUVEM	RURAL	NUV
240	BSNL	GOA	MADGAON	VELIM	RURAL	VLI
241	BSNL	GOA	CANACONA	CANACONA	URBAN	CCO
242	BSNL	GOA	CANACONA	CURCHOREM	URBAN	CCH
243	BSNL	GOA	CANACONA	AGONDA	RURAL	AGD
244	BSNL	GOA	CANACONA	BALI	RURAL	BAL
245	BSNL	GOA	CANACONA	GAODONGARI	RURAL	GDN
246	BSNL	GOA	CANACONA	KHANAGINI	RURAL	KNG
247	BSNL	GOA	CANACONA	LOLIEM	RURAL	LLM
248	BSNL	GOA	CANACONA	MALKARNEM	RURAL	MLK
249	BSNL	GOA	CANACONA	PADI	RURAL	PAD
250	BSNL	GOA	CANACONA	PAINGUINIM	RURAL	PGM
251	BSNL	GOA	CANACONA	TALPONA	RURAL	TLP
252	BSNL	GOA	PANAJI	PANAJI	URBAN	PJM
253	BSNL	GOA	PANAJI	ANJUNA	RURAL	ANJ
254	BSNL	GOA	PANAJI	ARAMBOL	RURAL	ARB
255	BSNL	GOA	PANAJI	ASAGAO	RURAL	ASG
256	BSNL	GOA	PANAJI	BASTORA	RURAL	BST
257	BSNL	GOA	PANAJI	CAMURLIM	RURAL	CML
258	BSNL	GOA	PANAJI	CHANDEL	RURAL	CHD
259	BSNL	GOA	PANAJI	CHORAO	RURAL	CDN
260	BSNL	GOA	PANAJI	DHARGAL	RURAL	DRG
261	BSNL	GOA	PANAJI	DIWAR	RURAL	DWR
262	BSNL	GOA	PANAJI	IBRAMPUR	RURAL	IBR
263	BSNL	GOA	PANAJI	KERI(PERNEM)	RURAL	KEP
264	BSNL	GOA	PANAJI	KORGAON	RURAL	KOR
265	BSNL	GOA	PANAJI	MANDREM	RURAL	MAN
266	BSNL	GOA	PANAJI	MANDUR	RURAL	MND
267	BSNL	GOA	PANAJI	MOIRA	RURAL	MRA
268	BSNL	GOA	PANAJI	MORGIM	RURAL	MOR
269	BSNL	GOA	PANAJI	NADORA	RURAL	NDR
270	BSNL	GOA	PANAJI	PIRNA	RURAL	PIR
271	BSNL	GOA	PANAJI	POMBURPA	RURAL	POM
272	BSNL	GOA	PANAJI	TAMBOSEM	RURAL	TBX

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S. No.	SERVICE PROVIDER	SSA	SDCA	EXCHANGE NAME	EXCHANGE TYPE	EXCHANGE CODE/LEVEL
273	BSNL	GOA	PANAJI	TIVIM(VILLAGE)	RURAL	TVI
274	BHARTI-AIRTEL	---	---	PUNE	URBAN	---
275	RCL	---	---	PUNE	URBAN	---
276	TTL	---	---	PUNE	URBAN	---
277	VODAFONE	---	---	PUNE	URBAN	---

Annex-2

S N	CIRCLE	SERVICE PROVIDERS	LOCATION OF POP	ACTIVITY
1	MH&G	PACENET	PUNE	BB AUDIT
2	MH&G	SYSCON	PUNE	BB AUDIT
3	MH&G	FIVE NETWORK	PUNE	BB AUDIT
4	MH&G	INDUS	PUNE	BB AUDIT
5	MH&G	AIRTEL BHARTI	PUNE	BB AUDIT
6	MH&G	RCL	PUNE	BB AUDIT
7	MH&G	D-VOIS	PUNE	BB AUDIT
8	MH&G	TTL	PUNE	BB AUDIT
9	MH&G	TCL	PUNE	BB AUDIT
10	MH&G	NSTPL	NAGPUR	BB AUDIT
11	MH&G	TIKONA	PUNE	BB AUDIT
12	MH&G	YOU-BROADBAND	PUNE	BB AUDIT
13	MH&G	HATHWAY	PUNE	BB AUDIT
14	MH&G	BSNL	PUNE, NASHIK, AURANGABAD, JALNA, NAGPUR, BHANDARA, GOA SSA	BB AUDIT