Audit & Assessment of Quality of Service

Of

Cellular Mobile Telephone Service

Basic Telephone Service (Wire line)

&

Broadband Service

For

Telecom Regulatory Authority of India

North Zone – Haryana Service Area

(October 2014 – December 2014)

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 **Haryana 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 6thOctober, 2006 on zonal basis for **North Zone and West Zone** comprising of the following Telecom Circles/Metro Service Areas:

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

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

The Audit exercise would assess the Quality of Service of telecom operators providing Basic (Wire line), Cellular Mobile (Wireless) and Broadband services by auditing the relevant QoS records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI. The audit would be carried out by **TUV-SUD South Asia** every quarter across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. However, in respect of Basic telephone service (wireline) and Broadband service, a circle would be audited once in a year.

2. OBJECTIVES AND METHODOLOGY

2. OBJECTIVES AND METHODOLOGY

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

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

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

i)   Preparation of Performance Monitoring reports (PMRs) and uploading in the system.

ii)   Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days during each audit.

iii)   Monthly audit based on one month data of the SPs.

iv)   Drive test of the RF networks.

v)   Audit of the performance of call centers with respect to their accessibility and percentage of calls answered by the operators and random customer feedback by calling the customers to get feedback of the services provided by the service providers.

vi)   Transfer of data generated by the RF drive test/Live measurements / PMR/ monthly audit to the server located at TRAI premises on real time basis.

3. SAMPLE SIZE
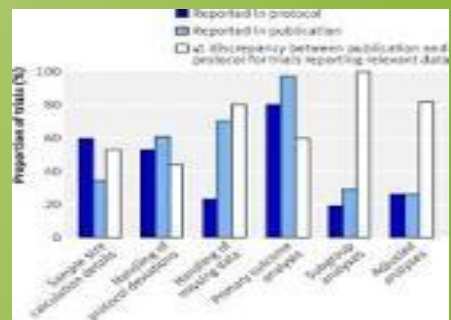
3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

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

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
	GSM Operators	**October-14**	**November-14**	**December-14**	
1	**AIRCEL**	13 to 15 Oct-14	12 to 14 Nov-14	5, 8 & 9 Dec-14	Green Buleward Building, NSN office, Sector-62, Noida (UP)
2	**AIRTEL**	13 to 15 Oct-14	12 to 14 Nov-14	8 to 10 Dec-14	Bharti Airtel Ltd, Plot No. 21, Rajiv Gandhi Chandigarh Technology Park, Chandigarh.
3	**BSNL**	24, 25 & 27 Oct-14	19 to 21 Nov-14	18 to 10 Dec-14	AGM (PG) Cum Nodal Officer (TRAI) O/o CGMT Haryana, Ambala (HR)
4	**VIDEOCON**	24, 25 & 27 Oct-14	11 to 13 Nov-14	9 to 11 Dec-14	Videocon Telecommunication Ltd,Golden Palace,Near Vita Milk Plant,Jasmeet Nagar,Ambala City-134007
5	**TATA GSM**	15 to 17 Oct-14	11 to 13 Nov-14	17 to 19 Dec-14	Tata Teleservices Limited, 5 - Jasmeet Nagar,Near Vita Milk Plant Gt Road,Ambala, Ambala-134001, India
6	**IDEA**	15 to 17 Oct-14	11 to 13 Nov-14	18, 19 & 22 Dec-14	Idea Cellular Limited, E-5, Sector-63, Noida (UP)
7	**RCOM GSM**	14 to 16 Oct-14	19 to 21 Nov-14	8 to 10 Dec-14	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
8	**VODAFONE**	14 to 16 Oct-14	12 to 14 Nov-14	8 to 10 Dec-14	Vodafone Digilink Limited, 173 HSIDC Industrial Area, Sector-3, Karnal (Har.)
	CDMA Operators				
9	**RCOM CDMA**	14 to 16 Oct-14	19 to 21 Nov-14	8 to 10 Dec-14	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
10	**TATA CDMA**	15 to 17 Oct-14	11 to 13 Nov-14	17 to 19 Dec-14	Tata Teleservices Limited, 5, Jasmeet Nagar,Near Vita Milk Plant Gt Road,Ambala, Ambala-134001, India

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

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

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

. The QoS audit for basic (wire line) service 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 1073 (present no. of BSNL exchanges), audit was done for **65** sampled (**19-Urban and 46-Rural**) exchanges, 1 exchange each of Bharti, TTL and RCL. As Haryana Circle is having 54 SDCAs, so 65 BSNL exchanges spread over 6 SDCAs (10% of total 54 SDCAs) have been taken for audit. (List of exchanges undertaken for QoS audit attached as Annex-1)

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

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

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

4. EXECUTIVE SUMMARY

4. EXECUTIVE SUMMARY

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

- *"Service provider performance report"* for Cellular mobile, Basic (wire line) and Broadband services , which gives a foretaste of the performance of various operators against the benchmark specified by TRAI, during the months in which the Audit was carried out by TUV-SUD Auditors.

- *"Parameter wise critical findings"* for Cellular mobile, Basic (wire line) and Broadband services: This indicates key observations and findings from different activities carried out during the Audit process.

- TUV-SUD conducted audit involved a 3 stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. On the basis of the three days live measurement, the auditors checked the busy hour of the day for the service provider and collected the data for this busy hour for the month in which the audit was conducted Finally, the performance of the service providers was also gauged by conducting drive tests in three select SSAs per service provider per quarter.

- The three stage audit / verification viz audit of the records, live measurements and drive tests of all the cellular mobile operators was repeated every month. In case of Basic (Wire line) and Broadband, this exercise is required to be carried out on quarterly basis.

- **Essence of compliance report of service providers with respect to the QoS:**

1. Cellular Mobile:

(i) Based on monthly audit, it was concluded that the performance of the service providers was fairly satisfactory for **Network Parameters** in Haryana service area as they were found to have largely met the benchmarks of the parameters during the quarter. However, **Aircel** failed to meet the benchmark of **CDR** with its quarterly average performance as **5.17%. Whereas, Aircel, Tata (GSM) and Tata (CDMA)** remained non-complied for the parameters '**Worst affected Cells > 3% TCH drops'** with their average performance as **6.09%, 3.80% and 5.32%** respectively.

(ii) From three days assessment, it is found that the performance of all operators is satisfactory as they have largely met the benchmarks except the parameter '**Worst affected cells> 3 % TCH drops**", which could not be complied with by **Aircel, Tata (GSM) and Tata (CDMA)** in all the three months of the quarter. The average performance of **Aircel, Tata (GSM)** and **Tata (CDMA)** for parameter '**Worst affected cells> 3 % TCH drops**" was **4.89%, 3.85% and 5.12%** respectively. **The similar non-compliance of Tata (GSM) and Tata (CDMA) for this parameter was also observed for monthly audit of the quarter.**

(iii) With regard to the **Customer Service Quality Parameters,** the service providers were found in well compliance of most of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds. Only **Idea** failed to meet the benchmark of the parameter '% **Billing Complaints – Post-paid'** with its performance as **0.15%.**

BSNL and RCOM GSM have not met the benchmark of parameter **calls answered by Operators (voice to voice) within 90 seconds with their performance as 61.77% and 93.09%** against the benchmark of >=95%. The performance of BSNL was way below the benchmark.

(iv) With regard to **Drive Tests***, **BSNL , RCOM (CDMA), Idea and Tata CDMA** were **non-compliants** with respect to the parameter 'Call Drop Rate', 'Voice Quality', 'CSSR' in Hissar, Narnaul and Rohtak SSAs. The underperformed operators need to improve their network performance in respect of highlighted parameters.*

2. Basic (Wire line) Service:

(v) The audit of Basic (Wire line) Service revealed that the performance of **BSNL** was not satisfactory in respect of the parameters, **Fault Repair/Restoration Time, MTTR and Termination/Closure. RCL** and **TTSL** also failed to meet the benchmark of the parameters **Accessibility of Call center** and **Calls answered by Operators (Voice to Voice**). Hence, BSNL, RCL and TTSL need to improve their services in respect of these parameters

3. Broadband Service:

(vi) The audit of Broadband Service revealed that **TCL, TTSL, Pacenet and You Broadband** could not meet the benchmarks for parameters **Fault repairs / Restoration Time. Whereas, Pacenet** failed to meet the benchmark of parameter **Call answered by Operator**. For rest of the parameters, the services providers were meeting the benchmarks

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	Dec-14	18:00 - 19:00
2	AIRTEL	Dec-14	20:00 - 21:00
3	BSNL	Dec-14	19:00 - 20:00
4	VIDEOCON	Dec-14	19:00 - 20:00
5	TATA GSM	Dec-14	11:00 - 12:00
6	IDEA	Dec-14	19:00 - 20:00
7	RCOM GSM	Dec-14	19:00 - 20:00
8	VODAFONE	Dec-14	19:00 - 20:00
CDMA Operators			
9	RCOM CDMA	Dec-14	20:00 - 21:00
10	TATA CDMA	Dec-14	19:00 - 20:00

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the Haryana 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	NA*	1	28	NSN	NSN
2	AIRTEL	4	24	2795	Ericsson	Ericsson
3	BSNL	9	28	1981	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	6	30	3067	NSN	NSN
5	RCOM GSM	1	8	901	Huawei	Huawei
6	TATA GSM	2	12	1499	NSN	NSN
7	VIDEOCON	1	8	1357	Huawei	Huawei
8	VODAFONE	7	46	2885	NSN	NSN
CDMA Operators						
9	RCOM CDMA	3	NA	552	Lucent & ZTE	Lucent
10	TATA CDMA	4	6	417	Ericsson & Huawei	ZTE & Motorola

NA*: Aircel is having one MSC at Gurgaon (NCR)

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

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - OCTOBER 14 MONTH													
PMR Generation Data		**Bench- mark**	**Audit Period**	**AIRCEL**	**AIRTEL**	**BSNL**	**VIDECON**	**TATA GSM**	**IDEA**	**RCOM GSM**	**VODAFONE**	**RCOM CDMA**	**TATA CDMA**
S/N	**Name of Parameter**			**GSM Operators**								**CDMA Operators**	
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Oct-14	0.11%	0.05%	0.94%	0.07%	0.01%	0.01%	0.34%	0.02%	0.21%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Oct-14	0.00%	0.07%	1.34%	0.15%	0.00%	0.00%	0.55%	0.00%	0.18%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-14	99.27%	99.24%	96.91%	98.78%	98.80%	99.99%	99.77%	99.84%	98.43%	98.76%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-14	0.00%	0.11%	0.25%	0.08%	0.05%	0.28%	0.01%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-14	0.00%	0.18%	1.06%	0.08%	0.25%	0.38%	0.02%	0.16%	0.14%	0.03%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Oct-14	**5.42%**	0.33%	1.37%	0.56%	0.72%	0.53%	0.33%	0.68%	0.05%	0.41%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-14	**7.37%**	0.68%	1.55%	0.75%	**3.90%**	1.31%	0.00%	1.60%	0.17%	**5.28%**
	c) Connections with good voice quality	>=95%	Oct-14	99.11%	99.05%	NP	97.57%	96.98%	98.02%	99.23%	97.81%	99.74%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Oct-14	0	0	**1**	0	0	0	0	0	0	0

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

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

S/N	PMR Generation Data / Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	VIDECON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators	
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Nov-14	0.16%	0.05%	0.99%	0.11%	0.02%	0.00%	0.34%	0.03%	0.27%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Nov-14	0.00%	0.04%	1.42%	0.38%	0.00%	0.00%	0.44%	0.03%	0.72%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-14	99.05%	99.34%	97.12%	98.91%	98.74%	99.98%	99.75%	99.81%	97.95%	98.56%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-14	0.89%	0.13%	0.24%	0.08%	0.08%	0.34%	0.01%	0.19%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-14	0.00%	0.13%	0.95%	0.05%	0.30%	0.36%	0.03%	0.19%	0.27%	0.11%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Nov-14	**8.01%**	0.32%	1.28%	0.53%	0.65%	0.53%	0.30%	0.68%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-14	**6.90%**	0.66%	1.15%	0.67%	**3.66%**	1.20%	0.01%	1.52%	0.17%	**6.05%**
	c) Connections with good voice quality	>=95%	Nov-14	98.50%	99.07%	NP	97.63%	96.99%	98.08%	99.24%	97.86%	99.76%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Nov-14	0	0	**1**	0	0	0	0	0	0	0

Table title: CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - NOVEMBER 14 MONTH

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – DECEMBER 14 MONTH:

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	VIDECON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
	CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - DECEMBER 14 MONTH												
	PMR Generation Data							GSM Operators				CDMA Operators	
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Dec-14	0.29%	0.05%	1.12%	0.15%	0.02%	0.01%	0.45%	0.03%	0.28%	0.13%
	b) Worst affected BTSs due to downtime	<=2%	Dec-14	0.00%	0.11%	1.41%	0.66%	0.00%	0.00%	1.55%	0.00%	1.09%	0.24%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-14	99.23%	99.38%	97.43%	98.97%	98.62%	99.99%	99.79%	99.84%	98.61%	98.02%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-14	0.18%	0.07%	0.21%	0.11%	0.09%	0.34%	0.01%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-14	0.00%	0.13%	0.90%	0.05%	0.33%	0.30%	0.02%	0.16%	0.10%	0.46%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Dec-14	**2.07%**	0.34%	1.32%	0.55%	0.70%	0.57%	0.24%	0.75%	0.04%	0.20%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-14	**3.99%**	0.78%	1.66%	0.79%	**3.85%**	1.87%	0.03%	2.25%	0.09%	**4.62%**
	c) Connections with good voice quality	>=95%	Dec-14	99.09%	99.10%	NP	97.63%	97.19%	98.04%	99.24%	97.79%	99.75%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Dec-14	0	0	**1**	0	0	0	0	0	0	0

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- DECEMBER-14 (OCT– NOV – DEC- 2014 MONTHS AUDITED DATA)

	QUARTERLY QOS PERFORMANCE (AVERAGE OF QE - DECEMBER 14) OF HARYANA CIRCLE												
	PMR Generation Data	**Bench- mark**	**Audit Period**	**AIRCEL**	**AIRTEL**	**BSNL**	**VIDEON**	**TATA GSM**	**IDEA**	**RCOM GSM**	**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	0.19%	0.05%	1.02%	0.11%	0.02%	0.01%	0.38%	0.03%	0.25%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.07%	1.39%	0.40%	0.00%	0.00%	0.85%	0.01%	0.66%	0.08%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.18%	99.32%	97.15%	98.89%	98.72%	99.99%	99.77%	99.83%	98.33%	98.45%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.36%	0.10%	0.23%	0.09%	0.07%	0.32%	0.01%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.00%	0.15%	0.97%	0.06%	0.29%	0.35%	0.02%	0.17%	0.17%	0.20%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	**5.17%**	0.33%	1.32%	0.55%	0.69%	0.54%	0.29%	0.70%	0.05%	0.36%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	**6.09%**	0.71%	1.45%	0.74%	**3.80%**	1.46%	0.01%	1.79%	0.14%	**5.32%**
	c) Connections with good voice quality	>=95%	Quarterly	98.90%	99.07%	NP	97.61%	97.05%	98.05%	99.24%	97.82%	99.75%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	**1**	0	0	0	0	0	0	0

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit 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 Haryana circle, **all the operators found meeting benchmark on the above parameters** i.e. '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 well performed on 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 <u>Paging Channel Occupancy Ratio</u> (**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 pegging channel in CDMA system.

With respect to this parameter, the performance of the operators is quite satisfactory as **all operators have met the TRAI specified benchmarks on TCH congestion parameters.**

- **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 with respect to this parameter revealed that all the operators (except **Aircel**) met the benchmark for this parameter. **Aircel** failed to meet the benchmark with its quarterly average performance as **5.17%.**

  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 and Tata Tele Services (TTSL). Aircel, Tata GSM** and **CDMA** failed to meet the benchmark in all the three months of the quarter with their quarterly average performance as **6.09%, 3.80%** and **5.32%** respectively.

  iii. Connections with good voice quality:

Most of the Operators were measuring this parameter through the system generated data at their switches. BSNL & Tata CDMA have not provided the data for this parameter. **The audit results for this parameter indicate that all operators have met the bench mark during the quarter.**

  iv. POI's having >=0.5% POI congestion

BSNL was having congestion more than 0.5% on only **One** POI.

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 MEASURMENT DATA (3-DAYS) – OCT- 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - HARYANA CIRCLE - OCT 14 MONTH													
	Live measurement Data	**Bench- mark**	**Average of 3 Days**	**AIRCEL**	**AIRTEL**	**BSNL**	**VIDEOCON**	**TATA GSM**	**IDEA**	**RCOM GSM**	**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	0.18%	0.01%	1.09%	0.03%	0.02%	0.01%	0.22%	0.02%	0.16%	0.10%
	b) Worst affected BTSs due to downtime	**<=2%**	Live data	0.00%	0.00%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	**>=95%**	Live data	99.62%	99.29%	96.82%	98.86%	98.89%	99.99%	99.80%	99.85%	98.72%	98.80%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Live data	0.00%	0.10%	0.24%	0.09%	0.01%	0.09%	0.01%	0.04%	0.00%	0.00%
	c) TCH congestion	**<=2%**	Live data	0.00%	0.15%	1.02%	0.05%	0.14%	0.32%	0.01%	0.15%	0.08%	0.00%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	**<=2%**	Live data	0.77%	0.34%	1.39%	0.55%	0.75%	0.58%	0.33%	0.62%	0.05%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Live data	**5.95%**	0.63%	1.56%	0.71%	**4.19%**	1.60%	0.00%	1.51%	0.06%	**5.15%**
	c) Connections with good voice quality	**>=95%**	Live data	98.53%	99.04%	NP	97.54%	96.88%	97.96%	99.25%	97.94%	99.73%	NP
4	No. of POI having >=0.5% congestion	**<0.5%**	Live data	0	0	0	0	0	0	0	0	0	0

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

5.2.2 LIVE MEASURMENT DATA (3-DAYS) – NOVEMBER 14 MONTH:

				GSM Operators								**CDMA Operators**	
S/N	**Name of Parameter**	**Bench-mark**	**Average of 3 Days**	**AIRCEL**	**AIRTEL**	**BSNL**	**VIDEOCON**	**TATA GSM**	**IDEA**	**RCOM GSM**	**VODAFONE**	**RCOM CDMA**	**TATA CDMA**
	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Live data	0.32%	0.01%	1.53%	0.09%	0.10%	0.00%	0.42%	0.03%	0.30%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.60%	99.38%	97.01%	98.93%	98.82%	99.98%	99.81%	99.84%	97.69%	98..76%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.08%	0.17%	0.10%	0.16%	0.23%	0.01%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.14%	0.98%	0.04%	0.20%	0.39%	0.01%	0.16%	0.31%	0.01%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.59%	0.32%	1.31%	0.54%	0.62%	0.52%	0.29%	0.69%	0.05%	0.52%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	5.16%	0.60%	1.20%	0.74%	3.39%	1.26%	0.01%	1.55%	0.16%	5.10%
	c) Connections with good voice quality	>=95%	Live data	99.30%	99.07%	NP	97.61%	96.91%	98.05%	99.26%	97.88%	99.76%	NP
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	0	0	0

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided the data for this parameter.

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

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE- DECEMBER 14 MONTH														
Live measurement Data		**Bench- mark**	**Average of 3 Days**	**AIRCEL**	**AIRTEL**	**BSNL**	**VIDEOCON**	**TATA GSM**	**IDEA**	**RCOM GSM**	**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	0.11%	0.01%	1.48%	0.11%	0.01%	0.01%	0.37%	0.03%	0.29%	0.06%
	b) Worst affected BTSs due to downtime	**<=2%**	Live data	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	**>=95%**	Live data	99.62%	99.40%	97.46%	99.02%	98.78%	99.98%	99.81%	99.84%	98.63%	96.90%
	b) SDCCH/PAGING Channel congestion	**<=1%**	Live data	0.00%	0.10%	0.44%	0.03%	0.06%	0.36%	0.01%	0.07%	0.00%	0.00%
	c) TCH congestion	**<=2%**	Live data	0.00%	0.10%	0.94%	0.02%	0.20%	0.33%	0.02%	0.16%	0.12%	1.55%
	Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	**<=2%**	Live data	1.13%	0.33%	1.34%	0.51%	0.69%	0.65%	0.23%	0.70%	0.03%	0.67%
	b) Worst affected cells>3% TCH drop (Call drop) rate	**<=3%**	Live data	**3.57%**	0.87%	1.69%	0.66%	**3.97%**	2.53%	0.00%	2.00%	0.02%	**5.10%**
	c) Connections with good voice quality	**>=95%**	Live data	99.65%	99.10%	NP	97.76%	97.30%	97.98%	99.27%	97.81%	99.77%	NP
4	No. of POI having >=0.5% congestion	**<0.5%**	Live data	0	0	0	0	0	0	0	0	0	0

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided by data for this parameter.

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF OCT – NOV – DEC 2014 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – HARYANA CIRCLE													
Live measurement Data		**Bench-mark**	**Average of 3 Days**	**AIRCEL**	**AIRTEL**	**BSNL**	**VIDEOCON**	**TATA GSM**	**IDEA**	**RCOM GSM**	**VODAFONE**	**RCOM CDMA**	**TATA CDMA**
S/N	**Name of Parameter**			GSM Operators								CDMA Operators	
1	Network Service Quality Parameter												
	Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.20%	0.01%	1.37%	0.08%	0.04%	0.01%	0.34%	0.03%	0.25%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.61%	99.36%	97.10%	98.94%	98.83%	99.98%	99.81%	99.84%	98.35%	97.85%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.00%	0.09%	0.28%	0.07%	0.08%	0.23%	0.01%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.00%	0.13%	0.98%	0.04%	0.18%	0.35%	0.01%	0.16%	0.17%	0.52%
3	**Connection maintenance (Retainability)**												
	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.16%	0.33%	1.35%	0.53%	0.69%	0.58%	0.28%	0.67%	0.04%	0.59%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	4.89%	0.70%	1.48%	0.70%	3.85%	1.80%	0.00%	1.69%	0.08%	5.12%
	c) Connections with good voice quality	>=95%	Quarterly	99.16%	99.07%	NP	97.64%	97.03%	98.00%	99.26%	97.88%	99.75%	NP
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 assessment, the performance of all operators was found satisfactory as they were largely meeting the benchmarks except the parameter **'Worst affected cells> 3 % TCH drops**", which could not be complied with by **Aircel, Tata (GSM), Tata (CDMA)** in all the three months of the quarter. The average performance of **Aircel, Tata (GSM)** and **Tata (CDMA)** for parameter **'Worst affected cells> 3 % TCH drops**" was **4.89%, 3.85%** and **5.12%** respectively. **The similar non-compliance of Tata (GSM) and Tata (CDMA) for this parameter was also observed for monthly audit of the quarter.**

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
							GSM Operators					CDMA Operators	
Network Service Quality Parameter													
	Network Availability												
1	a) Total no. of BTSs in the licensed service area		Oct-14	28	2787	1945	1309	1500	3065	901	2847	552	417
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Oct-14	23.10	935.56	13618.44	701.09	134.55	138.78	2268.07	402.21	880.07	134.70
	c) BTS Accumulated Downtime	<=2%	Oct-14	0.11%	0.05%	0.94%	0.07%	0.01%	0.01%	0.34%	0.02%	0.21%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-14	0	2	26	2	0	0	5	0	1	0
	e) Worst affected BTSs due to downtime	<=2%	Oct-14	0.00%	0.07%	1.34%	0.15%	0.00%	0.00%	0.55%	0.00%	0.18%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-14	99.27%	99.24%	96.91%	98.78%	98.80%	99.99%	99.77%	99.84%	98.43%	98.76%
	b) SDCCH/PAGING Congestion	<=1%	Oct-14	0.00%	0.11%	0.25%	0.08%	0.05%	0.28%	0.01%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-14	0.00%	0.18%	1.06%	0.08%	0.25%	0.38%	0.02%	0.16%	0.14%	0.03%
	Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Oct-14	5.42%	0.33%	1.37%	0.56%	0.72%	0.53%	0.33%	0.68%	0.05%	0.41%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-14	7.37%	0.68%	1.55%	0.75%	3.90%	1.31%	0.00%	1.60%	0.17%	5.28%
	c) % of connections with good voice quality	>=95%	Oct-14	99.11%	99.05%	NP	97.57%	96.98%	98.02%	99.23%	97.81%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-14	6	57	88	30	172	121	0	138	3	66
	e) Total no. of cells (Sector) in the licensed service area		Oct-14	84	8352	5713	4019	4410	9240	2695	8628	1656	1249
	No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Oct-14	0	0	1	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Oct-14	0	0	IDEA MOBILE	0	0	0	0	0	0	0
	Network Data												
5	a) Equipped Capacity of Network in Erlang		Oct-14	212	79361	240000	59362	95372	104416	50000	137523	56000	69630
	b) Total traffic in TCBH in erlang (Avg.)		Oct-14	2	64562	84167	25906	39521	107221	33152	125196	11359	9689
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-14	4707	2387668	1609743	874200	1823621	4239038	1538214	4733860	364190	193741

TABLE: 2

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	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	28	2781	1944	1309	1500	3039	900	2840	552	417
	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	3.54	17.93	1528.73	31.80	24.97	11.74	145.48	45.86	64.15	29.82
	c) BTS Accumulated Downtime	<=2%	Live data	0.18%	0.01%	1.09%	0.03%	0.02%	0.01%	0.22%	0.02%	0.16%	0.10%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	6	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.62%	99.29%	96.82%	98.86%	98.89%	99.99%	99.80%	99.85%	98.72%	98.80%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.10%	0.24%	0.09%	0.01%	0.09%	0.01%	0.04%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.15%	1.02%	0.05%	0.14%	0.32%	0.01%	0.15%	0.08%	0.00%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.77%	0.34%	1.39%	0.55%	0.75%	0.58%	0.33%	0.62%	0.05%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	5.95%	0.63%	1.56%	0.71%	4.19%	1.60%	0.00%	1.51%	0.06%	5.15%
	c) % of connections with good voice quality	>=95%	Live data	98.53%	99.04%	NP	97.54%	96.88%	97.96%	99.25%	97.94%	99.73%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	5	53	91	28	185	147	0	130	1	64
	e) Total no. of cells (Sector) in the licensed service area		Live data	84	8319	5821	4016	4420	9208	2694	8601	1656	1249
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

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- October 14 month

TABLE: 3

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
							GSM Operators					CDMA Operators	
Network Service Quality Parameter													
	Network Availability												
1	a) Total no. of BTSs in the licensed service area		Nov-14	28	2789	1968	1329	1499	3065	901	2858	552	417
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Nov-14	32.49	973.45	14000.26	1010.47	162.78	85.30	2182.55	544.17	1081.83	212.28
	c) BTS Accumulated Downtime	<=2%	Nov-14	0.16%	0.05%	0.99%	0.11%	0.02%	0.00%	0.34%	0.03%	0.27%	0.07%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-14	0	1	28	5	0	0	4	1	4	0
	e) Worst affected BTSs due to downtime	<=2%	Nov-14	0.00%	0.04%	1.42%	0.38%	0.00%	0.00%	0.44%	0.03%	0.72%	0.00%
	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-14	99.05%	99.34%	97.12%	98.91%	98.74%	99.98%	99.75%	99.81%	97.95%	98.56%
	b) SDCCH/PAGING Congestion	<=1%	Nov-14	0.89%	0.13%	0.24%	0.08%	0.08%	0.34%	0.01%	0.19%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-14	0.00%	0.13%	0.95%	0.05%	0.30%	0.36%	0.03%	0.19%	0.27%	0.11%
	Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Nov-14	**8.01%**	0.32%	1.28%	0.53%	0.65%	0.53%	0.30%	0.68%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-14	**6.90%**	0.66%	1.15%	0.67%	**3.66%**	1.20%	0.01%	1.52%	0.17%	**6.05%**
	c) % of connections with good voice quality	>=95%	Nov-14	98.50%	99.07%	NP	97.63%	96.99%	98.08%	99.24%	97.86%	99.76%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-14	6	55	67	27	161	111	0	132	3	76
	e) Total no. of cells (Sector) in the licensed service area		Nov-14	84	8360	5819	4033	4410	9288	2697	8661	1656	1249
	No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Nov-14	0	0	**1**	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Nov-14	0	0	**IDEA MOBILE**	0	0	0	0	0	0	0
	Network Data												
5	a) Equipped Capacity of Network in Erlang		Nov-14	212	76644	240000	60695	95130	104413	50000	137301	56000	68570
	b) Total traffic in TCBH in erlang (Avg.)		Nov-14	2	64703	84467	26748	41464	108309	32374	128493	11568	9775
	c) Total no. of customers served (as per VLR) on last day of the month		Nov-14	335	2453223	1589204	899284	1821872	4302214	1517905	4796710	357990	189325

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- November 14 month

TABLE: 4

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	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	28	2794	1965	1310	1500	3065	901	2847	552	417
	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	6.50	18.47	2171.48	84.64	10.32	3.57	273.47	64.62	121.22	6.19
	c) BTS Accumulated Downtime	<=2%	Live data	0.32%	0.01%	1.53%	0.09%	0.10%	0.00%	0.42%	0.03%	0.30%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.60%	99.38%	97.01%	98.93%	98.82%	99.98%	99.81%	99.84%	97.69%	98..76%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.08%	0.17%	0.10%	0.16%	0.23%	0.01%	0.06%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.14%	0.98%	0.04%	0.20%	0.39%	0.01%	0.16%	0.31%	0.01%
3	**Connection Maintenance (Retainability)**												
	a) Call Drop Rate (CDR)	<=2%	Live data	1.59%	0.32%	1.31%	0.54%	0.62%	0.52%	0.29%	0.69%	0.05%	0.52%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	5.16%	0.60%	1.20%	0.74%	3.39%	1.26%	0.01%	1.55%	0.16%	5.10%
	c) % of connections with good voice quality	>=95%	Live data	99.30%	99.07%	NP	97.61%	96.91%	98.05%	99.26%	97.88%	99.76%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	4	50	70	30	150	117	0	134	3	64
	e) Total no. of cells (Sector) in the licensed service area		Live data	84	8374	5874	4025	4410	9277	2697	8629	1656	1249
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

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Nov 14 month

TABLE: 5

S/N	Name of Parameter	Bench-mark	Audit Period	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
						GSM Operators						CDMA Operators	
Network Service Quality Parameter													
1	**Network Availability**												
	a) Total no. of BTSs in the licensed service area		Dec-14	28	2795	1981	1357	1499	3067	901	2885	552	417
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Dec-14	61.09	1058.94	16641.30	1535.34	249.48	142.13	3046.85	671.65	1164.78	406.66
	c) BTS Accumulated Downtime	<=2%	Dec-14	0.29%	0.05%	1.12%	0.15%	0.02%	0.01%	0.45%	0.03%	0.28%	0.13%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-14	0	3	28	9	0	0	14	0	6	1
	e) Worst affected BTSs due to downtime	<=2%	Dec-14	0.00%	0.11%	1.41%	0.66%	0.00%	0.00%	1.55%	0.00%	1.09%	0.24%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	>=95%	Dec-14	99.23%	99.38%	97.43%	98.97%	98.62%	99.99%	99.79%	99.84%	98.61%	98.02%
	b) SDCCH/PAGING Congestion	<=1%	Dec-14	0.18%	0.07%	0.21%	0.11%	0.09%	0.34%	0.01%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-14	0.00%	0.13%	0.90%	0.05%	0.33%	0.30%	0.02%	0.16%	0.10%	0.46%
3	**Connection Maintenance (Retainability)**												
	a) Call Drop Rate (CDR)	<=2%	Dec-14	**2.07%**	0.34%	1.32%	0.55%	0.70%	0.57%	0.24%	0.75%	0.04%	0.20%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-14	**3.99%**	0.78%	1.66%	0.79%	**3.85%**	1.87%	0.03%	2.25%	0.09%	**4.62%**
	c) % of connections with good voice quality	>=95%	Dec-14	99.09%	99.10%	NP	97.63%	97.19%	98.04%	99.24%	97.79%	99.75%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-14	3	66	98	33	170	180	1	197	2	58
	e) Total no. of cells (Sector) in the licensed service area		Dec-14	84	8385	5895	4123	4406	9599	2697	8744	1656	1249
4	**No. of POI's having >=0.5% POI congestion**												
	No. of POI's having >=0.5% POI congestion		Dec-14	0	0	**1**	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Dec-14	0	0	IDEA MOBILE	0	0	0	0	0	0	0
5	**Network Data**												
	a) Equipped Capacity of Network in Erlang		Dec-14	212	75431	240000	61732	94246	105158	50000	138251	56000	71910
	b) Total traffic in TCBH in erlang (Avg.)		Dec-14	1	61045	79688	26335	40453	105213	30450	126357	10783	15063
	c) Total no. of customers served (as per VLR) on last day of the month		Dec-14	208	2403569	1562582	957114	1659930	4388677	1493615	4825979	348906	178281

TABLE: 6

S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
							GSM Operators					CDMA Operators	
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Dec 14 month												
Network Service Quality Parameter												
1	**Network Availability**												
	a) Total no. of BTSs in the licensed service area		Live data	28	2791	1974	1340	1499	3065	901	2857	552	417
	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	2.19	25.34	2096.89	103.26	14.34	15.56	237.93	68.95	114.53	19.44
	c) BTS Accumulated Downtime	<=2%	Live data	0.11%	0.01%	1.48%	0.11%	0.01%	0.01%	0.37%	0.03%	0.29%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	7	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.62%	99.40%	97.46%	99.02%	98.78%	99.98%	99.81%	99.84%	98.63%	96.90%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.10%	0.44%	0.03%	0.06%	0.36%	0.01%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.10%	0.94%	0.02%	0.20%	0.33%	0.02%	0.16%	0.12%	1.55%
3	**Connection Maintenance (Retainability)**												
	a) Call Drop Rate (CDR)	<=2%	Live data	1.13%	0.33%	1.34%	0.51%	0.69%	0.65%	0.23%	0.70%	0.03%	0.67%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	**3.57%**	0.87%	1.69%	0.66%	**3.97%**	2.53%	0.00%	2.00%	0.02%	**5.10%**
	c) % of connections with good voice quality	>=95%	Live data	99.65%	99.10%	NP	97.76%	97.30%	97.98%	99.27%	97.81%	99.77%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	3	73	100	27	175	243	0	173	0	64
	e) Total no. of cells (Sector) in the licensed service area		Live data	84	8392	5905	4105	4409	9603	2697	8653	1656	1249
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- QE DEC-14:

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

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE DECEMBER 14												
Quarterly Averaged CSD Audit Data	Bench-mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N — Name of Parameter			GSM Operators								CDMA Operators	
Customer Service Quality Parameters												
Metering & Billing Credibility -Post Paid												
1 A) No. of bills issued during the quarter		Haryana	12	280605	57803	517775	52667	154780	NA	468139	107159	77772
B) No. of bills disputed including billing complaints during the quarter		Haryana	0	162	40	760	14	0	NA	309	29	6
C)% of billing complaints during the quarter	<= 0.1%	Haryana	**0.00%**	**0.06%**	**0.07%**	**0.15%**	**0.03%**	**0.00%**	**NA**	**0.07%**	**0.03%**	**0.01%**
Metering & Billing Credibility -Pre Paid												
2 A) Total No. of Pre-paid customers at the end of the quarter		Haryana	3046	2308132	8826994	4197031	1585119	2473152	1840080	4910543	360231	368220
B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Haryana	0	20	544	2695	1406	6	6	692	179	0
C) % of Pre-paid Charging Complaints	<= 0.1%	Haryana	**0.00%**	**0.001%**	**0.01%**	**0.06%**	**0.09%**	**0.0002%**	**0.0003%**	**0.01%**	**0.05%**	**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		Haryana	0	182	584	8232	1420	5196	6	1001	208	247
B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		Haryana	0	182	584	8232	1420	5196	6	1001	208	247
C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		Haryana	0	182	584	8232	1420	5196	6	1001	208	247
D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	Haryana	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	Haryana	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Quarterly Averaged CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE DECEMBER 14													
S/N	Name of Parameter						GSM Operators					CDMA Operators	
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
4	**Response time to customers for assistance**												
	A) Total no of calls attempted to customer care/Call center		Haryana	3981	763920	246126	11268128	3278982	852842	469814	12151903	381599	51454
	B) Total no. of calls successfully established to customer care/Call center.		Haryana	3820	763920	246126	11267912	3246003	846756	469814	12151857	378886	49509
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	Haryana	95.96%	100.00%	100.00%	100.00%	98.99%	99.29%	100.00%	100.00%	99.29%	96.22%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		Haryana	783	1601028	1030839	3089306	301689	1369983	1488539	3514611	66973	68726
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Haryana	776	1549851	636748	3052339	280845	1324730	1428395	3493531	63914	68038
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	Haryana	99.11%	96.80%	61.77%	98.80%	93.09%	96.70%	95.96%	99.40%	95.43%	99.00%
5	**Termination/closure of service**												
	A) Total No. of requests for Termination / Closure of service received during the quarter		Haryana	0	596	216	6143	463	1708	NA	1262	1143	725
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		Haryana	0	596	216	6143	463	1708	NA	1262	1143	725
	C) % of Termination/ Closure of service within 7 days	<=7days	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
6	**Time taken for refunds of deposits after closures.**												
	A) No. of Payments/ Refunds due during the quarter		Haryana	0	229	284	1513	685	149	NA	288	818	172
	B) No. of Payments/ Refunds Cleared during the quarter		Haryana	0	229	284	1513	685	149	NA	288	818	172
	C)Time taken for refunds of deposits after closures.	100% within 60 days	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

NA* Videocon has no post paid subscribers, so no billing complaints.

5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-DEC 2014):

	CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE - DECEMBER 14											
3 days live CSD Audit Data		**Bench-mark**	**Circle Name**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM (GSM)**	**TATA (GSM)**	**VIDEOCON**	**VODAFONE**	**RCOM (CDMA)**	**TATA (CDMA)**
S/N	**Name of Parameter**			**GSM Operators**								**CDMA Operators**	
Response time to customers for assistance													
1	A) Total no of calls attempted to customer care/Call center		Haryana	99	24952	12594	388245	59117	28969	14237	417320	9416	1816
	B) Total no. of calls successfully established to customer care/Call center.		Haryana	99	24952	12594	388238	58746	28756	14237	417320	9341	1788
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	Haryana	100.00%	100.00%	100.00%	100.00%	99.37%	99.26%	100.00%	100.00%	99.20%	98.46%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		Haryana	14	51240	25778	103375	7984	54640	49692	127588	2057	2397
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Haryana	14	48536	25062	102892	7951	40217	48632	126544	1999	2375
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	Haryana	100.00%	94.72%	97.22%	99.53%	99.59%	73.60%	97.87%	99.18%	97.18%	99.08%

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 <=0.1%. Only **Idea** failed to meet the benchmark of the parameter **'% Billing Complaints – Post-paid'** with its performance as **0.15%.** Videocon is not having the post-paid customer in Haryana circle.

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 weeks and 6 weeks. In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % refund in one week.

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 were in compliance with respect to the parameter 'Accessibility of call center' and '% Calls answered by operator (voice to voice)' except **BSNL and RCOM GSM. BSNL and RCOM GSM** have not met the benchmark of parameter **calls answered by Operators (voice to voice) within 90 seconds with their performance as 61.77% and 93.09%** against the benchmark of >=95%. The performance of BSNL was way below the benchmark.

4. *Termination/Closure of Service*

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

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

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

Live Measurements

The results for three days live measurements reveal that all operators have met the benchmarks for the parameters 'Accessibility to call center' and call connection to operators (Voice to voice) within 60 seconds. Only **Airtel and Tata GSM** failed to meet the benchmark of **Call answered by operator (Voice to Voice)** with their performance of **94.72% and 73.60%** 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 Haryana 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	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VIDEOCON	VODAFONE
AIRTEL	Haryana	----	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	Haryana	100%	----	100%	100%	100%	100%	100%	100%	100%
IDEA	Haryana	100%	100%	----	100%	100%	100%	100%	100%	100%
RCOM GSM	Haryana	100%	100%	100%	----	100%	100%	100%	100%	100%
RCOM CDMA	Haryana	100%	100%	100%	100%	----	100%	100%	100%	100%
TATA GSM	Haryana	100%	100%	100%	100%	100%	----	100%	100%	100%
TATA CDMA	Haryana	100%	100%	100%	100%	100%	100%	----	100%	100%
VIDEOCON	Haryana	100%	100%	100%	100%	100%	100%	100%	----	100%
VODAFONE	Haryana	100%	100%	100%	100%	100%	100%	100%	100%	----

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. Thus there was no problem in interconnection from one operator to other operators.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
LIVE CALLING TO CALL CENTRE											
Total No. of calls Attempted	Haryana	100	100	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	Haryana	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	Haryana	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total calls successfully established * 100 / Total call attempts)	Haryana	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	Haryana	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	Haryana	98	96	96	100	100	100	98	100	100	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total calls attempts)	Haryana	**98.00%**	**96.00%**	**96.00%**	**100.00%**	**100.00%**	**100.00%**	**98.00%**	**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 Aircel, Airtel, BSNL and Videocon could connect 98%, 96%, 96% and 98% of calls to the operator.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:

Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS											
Total No. of calls Attempted	Haryana	0	100	100	100	100	100	6	100	100	100
Total No. of calls Answered	Haryana	0	75	49	62	41	57	4	47	55	69
Cases resolved within 4 weeks	Haryana	0	75	49	62	41	57	4	47	55	69
%age of cases resolved	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. For some operators, the call made were very less due to less number of billing complaints, During live calling, some of the customers did not attend the calls while few others reported that they don't exactly remember about the resolution of complaints. However, Majority of the customers reported that the billing complaints were resolved to their satisfaction.

6.4 LEVEL -1 CALLING ASSESSMENT:

								LEVEL 1 LIVE CALLING					
Emergency no.	SSA Name	SDCA Name	No. of calls made	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
1091,100,101,102/108	Hisar	Hisar	8	√	√	√	√	√	√	√	√	√
		Sirsa	8	√	√	√	√	√	√	√	√	√
		Fateabad	8	√	√	√	√	√	√	√	√	√
		Adampur Mandi	8	√	√	√	√	√	√	√	√	√
		Hansi	8	√	√	√	√	√	√	√	√	√
		Ratia	8	√	√	√	√	√	√	√	√	√
		Dabwali	8	√	√	√	√	√	√	√	√	√
		Ellenabad	8	√	√	√	√	√	√	√	√	√
100,101,102/108,1091	Narnaul	Narnaul	8	√	√	√	√	√	√	√	√	√
		Rewari	8	√	√	√	√	√	√	√	√	√
		Bawal	8	√	√	√	√	√	√	√	√	√
		Jatusana	8	√	√	√	√	√	√	√	√	√
		Kosli	8	√	√	√	√	√	√	√	√	√
		Mahendergarh	8	√	√	√	√	√	√	√	√	√
100,101,1091,102/108	Rohtak	Bahadurgarh	8	√	√	√	√	√	√	√	√	√
		Bhiwani	8	√	√	√	√	√	√	√	√	√
		Charkhidadri	8	√	√	√	√	√	√	√	√	√
		Jhajjar	8	√	√	√	√	√	√	√	√	√
		Kalanaur	8	√	√	√	√	√	√	√	√	√
		Loharu	8	√	√	√	√	√	√	√	√	√
		Meham	8	√	√	√	√	√	√	√	√	√
		Rohtak	8	√	√	√	√	√	√	√	√	√

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. In Haryana service area, these services were found functional in the networks of all the service providers.

7. DRIVE TEST

7. OPERATOR ASSESTID DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three SSA's namely **Hissar, Narnaul and Rohtak** in the months of October, November and December 2014 respectively. The total route Kms covered during the drive tests in respective SSAs was **523 Kms, 542 Kms and 583 Kms**. The performance of the operators has been highlighted below in the tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour.

For measuring voice quality, Rx Qual samples on a scale from 0 to 7 for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. As per the QoS norms, Rx Qual between 0- 5 for GSM operators and between 0-4% FER value for CDMA operators is considered to be good, where as Rx Qual beyond this benchmark is considered to be bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in dBm at street level with strength $\geq$ -75 dBm for in-door coverage and $\geq$ -85 dBm for in-vehicle.

DRIVE TEST TABLE – 1
OPERATOR ASSISTED DRIVE TEST AT HISSAR SSA IN OCTOBER 14 MONTH- HARYANA CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL OUTDOOR	AIRCEL INDOOR	AIRTEL OUTDOOR	AIRTEL INDOOR	BSNL OUTDOOR	BSNL INDOOR	TATA GSM OUTDOOR	TATA GSM INDOOR	IDEA OUTDOOR	IDEA INDOOR	RCOM GSM OUTDOOR	RCOM GSM INDOOR	VIDEOCON OUTDOOR	VIDEOCON INDOOR	VODAFONE OUTDOOR	VODAFONE INDOOR	TATA CDMA OUTDOOR	TATA CDMA INDOOR	RCOM CDMA OUTDOOR	RCOM CDMA INDOOR
1	Call Attempts	Major Roads	NC	NC	151	25	199	25	90	25	146	25	115	26	104	25	153	25	110	25	117	25
		Highways	NC	NC	144	28	178	25	138	25	134	25	136	25	136	25	153	25	142	25	136	25
		Within City	NC	NC	169	25	207	27	185	25	187	25	222	26	182	25	183	25	185	25	222	26
		Overall SSA	**NC**	**NC**	**464**	**78**	**584**	**77**	**413**	**75**	**467**	**75**	**473**	**77**	**422**	**75**	**489**	**75**	**437**	**75**	**475**	**76**
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	8.54%	4.00%	1.11%	0.00%	1.37%	0.00%	0.00%	3.85%	0.96%	0.00%	0.00%	0.00%	0.91%	0.00%	0.00%	0.00%
		Highways	NC	NC	0.69%	0.00%	2.81%	0.00%	0.72%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	1.31%	0.00%	0.70%	0.00%	0.00%	0.00%
		Within City	NC	NC	0.00%	0.00%	6.28%	25.93%	0.00%	0.00%	1.07%	0.00%	0.00%	0.00%	1.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	**NC**	**NC**	**0.22%**	**0.00%**	**5.99%**	**10.39%**	**0.48%**	**0.00%**	**0.86%**	**0.00%**	**0.21%**	**1.30%**	**0.71%**	**0.00%**	**0.41%**	**0.00%**	**0.46%**	**0.00%**	**0.00%**	**0.00%**
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	4.40%	0.00%	3.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.75%	0.00%	0.00%	0.00%
		Highways	NC	NC	0.00%	0.00%	4.62%	0.00%	1.46%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	2.13%	0.00%	0.74%	0.00%
		Within City	NC	NC	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.69%
		Overall SSA	**NC**	**NC**	**0.00%**	**0.00%**	**2.91%**	**1.45%**	**1.22%**	**0.00%**	**0.00%**	**0.00%**	**0.42%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**1.38%**	**0.00%**	**0.21%**	**2.63%**
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.30%	99.44%	99.63%	100%
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.60%	98.81%	99.89%	100%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.49%	96.75%	99.98%	99.98%
		Overall SSA	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**95.48%**	**98.36%**	**99.89%**	**99.99%**
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	NC	NC	95.52%	98.77%	74.26%	98.27%	96.16%	96.74%	93.52%	97.20%	97.07%	93.28%	96.45%	95.74%	96.01%	98.33%	NA	NA	NA	NA
		Highways	NC	NC	95.95%	98.33%	78.95%	98.44%	95.73%	99.61%	93.50%	97.21%	98.39%	99.35%	97.29%	99.03%	96.26%	98.02%	NA	NA	NA	NA
		Within City	NC	NC	95.72%	97.65%	83.51%	87.73%	96.25%	97.74%	95.29%	89.62%	98.13%	99.90%	96.26%	99.80%	95.73%	97.83%	NA	NA	NA	NA
		Overall SSA	**NC**	**NC**	**95.70%**	**98.26%**	**79.46%**	**95.55%**	**96.08%**	**97.92%**	**94.32%**	**94.53%**	**97.98%**	**97.67%**	**96.62%**	**98.22%**	**95.99%**	**98.08%**	**NA**	**NA**	**NA**	**NA**
5	Service Coverage																					
	In door	Major Roads	NC	NC	67.08%	84.84%	24.10%	78.52%	56.25%	99.23%	96.69%	100%	42.01%	0.08%	81.97%	93.34%	80.03%	100%	22.62%	99.58%	95.80%	99.99%

DRIVE TEST TABLE – 1

OPERATOR ASSISTED DRIVE TEST AT HISSAR SSA IN OCTOBER 14 MONTH- HARYANA CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
	(>= -75dBm)	Highways	NC	NC	75.74%	99.88%	45.76%	96.11%	66.55%	100%	96.64%	100%	51.00%	0.03%	86.00%	100%	95.22%	100%	42.70%	99.79%	96.65%	100%
		Within City	NC	NC	84.64%	72.93%	51.48%	64.31%	91.66%	88.75%	99.70%	100%	73.90%	100%	95.81%	97.39%	98.92%	99.96%	59.44%	0.18%	99.39%	100%
		Overall SSA	**NC**	**NC**	**76.04%**	**85.37%**	**40.44%**	**80.56%**	**77.42%**	**95.67%**	**98.05%**	**100%**	**61.37%**	**34.83%**	**89.31%**	**96.94%**	**92.27%**	**99.99%**	**47.14%**	**64.14%**	**98.07%**	**100%**
	In-vehicle (>= -85dBm)	Major Roads	NC	NC	90.09%	99.36%	73.87%	20.20%	86.01%	100%	99.42%	100%	67.11%	87.12%	93.11%	99.85%	98.61%	100%	57.62%	100%	98.32%	100%
		Highways	NC	NC	96.95%	100%	96.17%	3.53%	88.91%	100%	99.86%	100%	79.32%	90.48%	94.47%	100%	99.22%	100%	76.59%	100%	99.13%	100%
		Within City	NC	NC	97.23%	99.39%	86.13%	34.83%	97.80%	99.98%	100%	100%	92.80%	100%	99.56%	100%	99.88%	100%	86.01%	34.72%	99.94%	100%
		Overall SSA	**NC**	**NC**	**94.62%**	**99.56%**	**84.50%**	**18.57%**	**92.89%**	**99.99%**	**99.79%**	**100%**	**83.99%**	**92.76%**	**96.37%**	**99.95%**	**99.28%**	**100%**	**77.47%**	**76.68%**	**99.45%**	**100%**
	Outdoor-in city (>= -95dBm)	Major Roads	NC	NC	99.36%	100%	97.08%	1.28%	99.72%	100%	99.99%	100%	91.85%	100%	99.45%	99.98%	99.88%	100%	95.84%	100%	99.97%	100%
		Highways	NC	NC	99.97%	100%	98.82%	0.36%	98.63%	100%	100%	100%	94.05%	99.59%	99.21%	100%	99.78%	100%	96.25%	100%	100%	100%
		Within City	NC	NC	99.93%	100%	98.31%	0.36%	99.50%	100%	100%	100%	98.63%	99.59%	99.95%	100%	99.98%	100%	96.68%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.74%**	**100%**	**98.01%**	**0.87%**	**99.25%**	**100%**	**100%**	**100%**	**96.04%**	**99.86%**	**99.60%**	**99.99%**	**99.88%**	**100%**	**96.39%**	**99.94%**	**99.99%**	**100%**
6	Call Setup Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	91.46%	96.00%	98.89%	100%	98.63%	100%	100%	96.15%	99.04%	100%	100%	100%	99.09%	100%	100%	100%
		Highways	NC	NC	99.31%	100%	97.19%	100%	99.28%	100%	100%	100%	99.26%	100%	100%	100%	98.69%	100%	99.30%	100%	100%	100%
		Within City	NC	NC	100%	100%	93.72%	74.07%	100%	100%	98.93%	100%	100%	100%	98.90%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.78%**	**100%**	**94.01%**	**89.61%**	**99.52%**	**100%**	**99.14%**	**100%**	**99.79%**	**98.70%**	**99.29%**	**100%**	**99.59%**	**100%**	**99.54%**	**100%**	**100%**	**100%**
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.71%	100%	91.69%	100%	100%	100%	98.92%	100%	98.57%	100%	100%	98.41%	99.52%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.75%	100%	92.20%	100%	100%	100%	99.75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.36%	100%	98.98%	100%	99.47%	100%	99.83%	100%	100%	100%	99.29%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.56%**	**100%**	**95.74%**	**100%**	**99.70%**	**100%**	**99.52%**	**100%**	**99.80%**	**100%**	**99.61%**	**98.91%**	**99.82%**	**100%**	**100%**	**100%**	**100%**	**100%**

- **NC-No Coverage**

- **NA-Not Applicable**

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

DRIVE TEST TABLE – 2

OPERATOR ASSISTED DRIVE TEST AT NARNAUL SSA IN NOVEMBER 14 MONTH- HARYANA CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL OUTDOOR	AIRCEL INDOOR	AIRTEL OUTDOOR	AIRTEL INDOOR	BSNL OUTDOOR	BSNL INDOOR	TATA GSM OUTDOOR	TATA GSM INDOOR	IDEA OUTDOOR	IDEA INDOOR	RCOM GSM OUTDOOR	RCOM GSM INDOOR	VIDEOCON OUTDOOR	VIDEOCON INDOOR	VODAFONE OUTDOOR	VODAFONE INDOOR	TATA CDMA OUTDOOR	TATA CDMA INDOOR	RCOM CDMA OUTDOOR	RCOM CDMA INDOOR
1	Call Attempts	Major Roads	NC	NC	171	25	178	27	54	25	172	25	78	25	70	25	157	24	96	25	78	25
		Highways	NC	NC	190	25	199	25	122	25	185	25	145	24	120	25	172	25	108	25	145	24
		Within City	NC	NC	142	25	143	25	164	25	141	25	167	25	154	25	144	25	116	25	167	25
		Overall SSA	NC	NC	503	75	520	77	340	75	498	75	390	74	344	75	473	74	320	75	390	74
2	Blocked Call Rate	Major Roads	NC	NC	0.58%	0.00%	3.93%	0.00%	0.00%	0.00%	0.00%	0.00%	1.28%	0.00%	0.00%	0.00%	0.64%	0.00%	1.04%	0.00%	0.00%	0.00%
		Highways	NC	NC	1.05%	0.00%	1.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.16%	0.00%	1.85%	0.00%	0.00%	0.00%
		Within City	NC	NC	0.00%	0.00%	0.00%	0.00%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%	0.65%	0.00%	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	NC	NC	0.60%	0.00%	1.92%	0.00%	0.29%	0.00%	0.00%	0.00%	0.26%	0.00%	0.29%	0.00%	0.85%	0.00%	0.94%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	1.18%	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%	1.28%	0.00%
		Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.59%	0.00%	0.94%	0.00%	0.00%	0.00%
		Within City	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.65%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	4.00%
		Overall SSA	NC	NC	0.00%	0.00%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.26%	0.00%	0.29%	0.00%	0.43%	0.00%	0.32%	0.00%	0.26%	1.35%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.52%	98.66%	99.95%	100%
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.74%	99.60%	99.94%	100%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.75%	98.87%	99.99%	99.97%
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.00%	99.05%	99.97%	99.99%
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	NC	NC	96.62%	98.06%	92.19%	95.13%	96.28%	96.74%	95.28%	96.33%	98.72%	98.34%	97.18%	98.34%	95.57%	97.73%	NA	NA	NA	NA
		Highways	NC	NC	96.02%	97.05%	92.00%	97.56%	95.76%	99.61%	93.22%	98.34%	98.33%	100%	97.77%	99.68%	95.64%	99.15%	NA	NA	NA	NA
		Within City	NC	NC	96.32%	97.97%	92.70%	96.83%	98.04%	97.74%	95.07%	97.94%	98.80%	96.69%	97.79%	99.32%	96.02%	95.62%	NA	NA	NA	NA
		Overall SSA	NC	NC	96.32%	97.67%	92.27%	96.37%	96.79%	97.92%	94.66%	97.47%	98.63%	98.45%	97.67%	99.05%	95.72%	97.64%	NA	NA	NA	NA
5	Service Coverage																					
	In door	Major Roads	NC	NC	83.40%	88.99%	57.72%	64.58%	51.87%	99.70%	98.37%	100%	34.03%	13.40%	76.39%	97.19%	81.08%	94.73%	17.71%	24.42%	98.04%	98.99%

DRIVE TEST TABLE – 2
OPERATOR ASSISTED DRIVE TEST AT NARNAUL SSA IN NOVEMBER 14 MONTH- HARYANA CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
	(>= -75dBm)	Highways	NC	NC	77.38%	92.03%	63.46%	98.98%	57.59%	100%	97.06%	100%	44.60%	99.78%	76.67%	100%	82.78%	99.71%	34.56%	99.97%	97.24%	100%
		Within City	NC	NC	86.96%	97.93%	70.45%	96.06%	78.03%	100%	99.52%	99.99%	61.22%	29.81%	89.68%	75.65%	89.19%	46.73%	80.34%	59.49%	98.36%	99.80%
		Overall SSA	**NC**	**NC**	**82.20%**	**92.50%**	**63.62%**	**78.06%**	**63.42%**	**99.89%**	**98.45%**	**100%**	**51.76%**	**48.76%**	**82.92%**	**92.66%**	**83.87%**	**81.70%**	**41.62%**	**60.83%**	**97.92%**	**99.64%**
	In-vehicle (>= -85dBm)	Major Roads	NC	NC	96.25%	99.97%	88.39%	96.97%	95.48%	99.96%	99.83%	100%	79.06%	89.09%	90.28%	100%	97.60%	100%	54.61%	43.49%	99.62%	100%
		Highways	NC	NC	96.64%	99.97%	93.00%	99.88%	90.52%	100%	99.87%	100%	78.17%	100%	90.00%	100%	98.19%	100%	76.65%	100%	99.41%	100%
		Within City	NC	NC	98.51%	99.99%	95.05%	100%	97.63%	100%	99.98%	100%	91.55%	39.97%	97.95%	97.99%	99.41%	97.23%	94.61%	100%	99.38%	100%
		Overall SSA	**NC**	**NC**	**97.01%**	**99.98%**	**92.09%**	**98.18%**	**94.75%**	**99.98%**	**99.89%**	**100%**	**85.32%**	**78.83%**	**93.90%**	**99.49%**	**98.31%**	**99.13%**	**72.53%**	**80.76%**	**99.43%**	**100%**
	Outdoor-in city (>= -95dBm)	Major Roads	NC	NC	99.82%	100%	99.05%	100%	99.87%	100%	99.99%	100%	99.59%	100%	97.30%	100%	99.89%	100%	97.12%	100%	99.98%	100%
		Highways	NC	NC	99.90%	100%	99.60%	100%	99.61%	100%	99.98%	100%	99.17%	100%	98.62%	100%	99.90%	100%	97.34%	100%	99.73%	100%
		Within City	NC	NC	99.97%	100%	99.46%	100%	99.70%	100%	100%	100%	99.90%	100%	99.64%	100%	99.90%	100%	98.81%	100%	99.95%	100%
		Overall SSA	**NC**	**NC**	**99.89%**	**100%**	**99.38%**	**100%**	**99.73%**	**100%**	**99.99%**	**100%**	**99.61%**	**98.30%**	**98.88%**	**100%**	**99.90%**	**99.78%**	**97.71%**	**100%**	**99.88%**	**100%**
6	Call Setup Success Rate (>=95%)	Major Roads	NC	NC	99.42%	100%	95.51%	96.30%	100%	100%	100%	100%	98.72%	100%	100%	100%	99.36%	100%	98.96%	100%	100%	100%
		Highways	NC	NC	98.95%	100%	96.98%	96.00%	100%	100%	100%	100%	100%	100%	100%	100%	98.84%	100%	98.15%	100%	100%	100%
		Within City	NC	NC	100%	100%	97.20%	100%	99.39%	100%	100%	100%	100%	100%	99.35%	100%	99.31%	100%	100%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.40%**	**100%**	**96.54%**	**97.40%**	**99.71%**	**100%**	**100%**	**100%**	**99.74%**	**100%**	**99.71%**	**100%**	**99.15%**	**100%**	**99.06%**	**100%**	**100%**	**100%**
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.45%	100%	97.08%	97.67%	100%	100%	100%	100%	98.39%	100%	100%	100%	99.40%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.79%	100%	95.64%	100%	100%	100%	100%	100%	98.92%	100%	100%	100%	99.40%	100%	100%	100%	100%	100%
		Within City	NC	NC	100%	100%	99.37%	100%	99.48%	100%	100%	100%	98.93%	100%	99.29%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.76%**	**100%**	**97.45%**	**98.04%**	**99.73%**	**100%**	**100%**	**100%**	**98.83%**	**100%**	**99.62%**	**100%**	**99.61%**	**100%**	**100%**	**100%**	**100%**	**100%**

NC-No Coverage; 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 ROHTAK SSA IN DECEMBER 14 MONTH- HARYANA CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Roads	NC	NC	179	29	165	26	115	25	176	25	135	25	146	25	175	25	86	25	135	25
		Highways	NC	NC	117	25	128	25	105	25	117	25	77	24	112	25	131	25	96	25	77	24
		Within City	NC	NC	225	25	294	26	214	25	226	25	223	25	208	25	196	25	162	25	223	25
		Overall SSA	**NC**	**NC**	**521**	**79**	**587**	**77**	**434**	**75**	**519**	**75**	**435**	**74**	**466**	**75**	**502**	**75**	**344**	**75**	**435**	**74**
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	3.64%	0.00%	0.87%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highways	NC	NC	0.00%	0.00%	3.13%	0.00%	0.95%	0.00%	0.85%	0.00%	0.00%	0.00%	0.89%	0.00%	0.76%	0.00%	2.08%	0.00%	0.00%	0.00%
		Within City	NC	NC	0.44%	0.00%	0.00%	0.00%	0.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.48%	0.00%	0.00%	0.00%	0.62%	0.00%	0.00%	0.00%
		Overall SSA	**NC**	**NC**	**0.19%**	**0.00%**	**1.70%**	**0.00%**	**0.69%**	**0.00%**	**0.19%**	**0.00%**	**0.23%**	**0.00%**	**0.43%**	**0.00%**	**0.20%**	**0.00%**	**0.87%**	**0.00%**	**0.00%**	**0.00%**
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	5.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.33%	0.00%	0.00%	0.00%
		Highways	NC	NC	0.00%	0.00%	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	0.00%	0.00%	0.00%	0.00%	0.00%	1.06%	0.00%	0.00%	0.00%
		Within City	NC	NC	0.00%	0.00%	0.68%	0.00%	1.41%	0.00%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.51%	0.00%	0.00%	0.00%	0.45%	0.00%
		Overall SSA	**NC**	**NC**	**0.00%**	**0.00%**	**2.43%**	**0.00%**	**0.70%**	**0.00%**	**0.00%**	**0.00%**	**0.69%**	**0.00%**	**0.00%**	**0.00%**	**0.20%**	**0.00%**	**0.88%**	**0.00%**	**0.23%**	**0.00%**
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94.24%	98.46%	99.89%	100%
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.08%	99.42%	99.92%	97.99%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	92.95%	99.37%	99.99%	100%
		Overall SSA	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**94.71%**	**99.22%**	**99.96%**	**99.74%**
	(b) 0-5 (with frequency	Major Roads	NC	NC	95.51%	96.91%	72.91%	63.54%	96.17%	95.88%	91.85%	98.68%	97.68%	99.88%	95.79%	99.46%	95.27%	97.70%	NA	NA	NA	NA
		Highways	NC	NC	97.01%	97.66%	79.23%	99.69%	96.29%	99.57%	92.24%	98.93%	98.78%	98.34%	95.89%	99.99%	95.28%	98.93%	NA	NA	NA	NA

DRIVE TEST TABLE – 3
OPERATOR ASSISTED DRIVE TEST AT ROHTAK SSA IN DECEMBER 14 MONTH- HARYANA CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL OUTDOOR	AIRCEL INDOOR	AIRTEL OUTDOOR	AIRTEL INDOOR	BSNL OUTDOOR	BSNL INDOOR	TATA GSM OUTDOOR	TATA GSM INDOOR	IDEA OUTDOOR	IDEA INDOOR	RCOM GSM OUTDOOR	RCOM GSM INDOOR	VIDEOCON OUTDOOR	VIDEOCON INDOOR	VODAFONE OUTDOOR	VODAFONE INDOOR	TATA CDMA OUTDOOR	TATA CDMA INDOOR	RCOM CDMA OUTDOOR	RCOM CDMA INDOOR
	hopping for GSM Operators)	Within City	NC	NC	96.29%	99.81%	85.44%	100%	95.17%	99.04%	96.60%	96.71%	97.73%	99.89%	95.52%	99.46%	95.42%	97.19%	NA	NA	NA	NA
		Overall SSA	**NC**	**NC**	**96.18%**	**98.07%**	**80.07%**	**79.97%**	**95.67%**	**98.58%**	**95.10%**	**97.97%**	**97.88%**	**99.60%**	**95.70%**	**99.67%**	**95.32%**	**97.95%**	**NA**	**NA**	**NA**	**NA**
	Service Coverage																					
	In door (>= -75dBm)	Major Roads	NC	NC	77.79%	72.64%	47.26%	0.00%	76.97%	2.18%	96.00%	100%	50.36%	0.00%	83.06%	63.02%	89.48%	100%	64.92%	26.65%	97.05%	98.83%
		Highways	NC	NC	81.27%	52.81%	54.21%	0.00%	80.19%	79.25%	97.79%	98.03%	53.56%	2.05%	84.89%	92.83%	96.97%	100%	59.98%	96.21%	96.89%	90.44%
		Within City	NC	NC	89.72%	100%	75.56%	100%	93.42%	100%	99.90%	100%	75.00%	80.88%	91.62%	87.66%	95.25%	100%	73.73%	98.66%	99.37%	100%
		Overall SSA	**NC**	**NC**	**83.66%**	**72.17%**	**63.04%**	**42.62%**	**86.36%**	**67.86%**	**98.86%**	**99.25%**	**65.75%**	**41.56%**	**87.28%**	**84.77%**	**93.84%**	**100%**	**67.51%**	**81.22%**	**98.58%**	**98.35%**
5	In-vehicle (>= -85dBm)	Major Roads	NC	NC	92.53%	99.31%	69.30%	84.56%	94.20%	93.53%	99.63%	100%	81.40%	11.97%	91.78%	97.66%	99.61%	100%	87.20%	98.26%	99.63%	100%
		Highways	NC	NC	94.70%	86.18%	81.66%	0.00%	94.22%	99.56%	99.81%	99.97%	84.08%	97.17%	94.56%	99.65%	99.81%	100%	91.65%	99.97%	99.20%	95.82%
		Within City	NC	NC	98.65%	100%	67.90%	0.00%	98.61%	100%	99.98%	100%	94.60%	100%	98.23%	99.91%	99.53%	100%	96.88%	99.49%	99.98%	100%
		Overall SSA	**NC**	**NC**	**95.63%**	**93.94%**	**71.47%**	**16.82%**	**96.53%**	**98.24%**	**99.89%**	**99.99%**	**89.80%**	**72.74%**	**95.29%**	**99.36%**	**99.66%**	**100%**	**92.49%**	**99.40%**	**99.81%**	**99.45%**
	Outdoor- in city (>= -95dBm)	Major Roads	NC	NC	98.67%	100%	100%	100%	99.18%	100%	99.92%	100%	98.81%	98.13%	97.68%	99.81%	99.98%	100%	98.77%	99.54%	100%	100%
		Highways	NC	NC	99.30%	99.75%	100%	100%	99.58%	100%	99.95%	100%	99.31%	99.41%	98.45%	100%	99.99%	100%	97.95%	100%	99.93%	98.28%
		Within City	NC	NC	99.98%	99.75%	100%	100%	99.76%	100%	100%	100%	99.75%	99.41%	99.76%	100%	99.94%	100%	99.49%	100%	100%	98.28%
		Overall SSA	**NC**	**NC**	**99.37%**	**99.90%**	**100%**	**100%**	**99.58%**	**100%**	**99.97%**	**100%**	**99.46%**	**99.32%**	**98.78%**	**99.96%**	**99.97%**	**100%**	**98.88%**	**99.87%**	**99.99%**	**99.78%**
6	Call Setup Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	96.36%	100%	99.13%	100%	100%	100%	99.26%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	NC	NC	100%	100%	96.88%	100%	99.05%	100%	99.15%	100%	100%	100%	99.11%	100%	99.24%	100%	97.92%	100%	100%	100%
		Within City	NC	NC	99.56%	100%	100%	100%	99.53%	100%	100%	100%	100%	100%	99.52%	100%	100%	100%	99.38%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.81%**	**100%**	**98.30%**	**100%**	**99.31%**	**100%**	**99.81%**	**100%**	**99.77%**	**100%**	**99.57%**	**100%**	**99.80%**	**100%**	**99.13%**	**100%**	**100%**	**100%**

<table>
<tr><td colspan="29" align="center">DRIVE TEST TABLE – 3
OPERATOR ASSISTED DRIVE TEST AT ROHTAK SSA IN DECEMBER 14 MONTH- HARYANA CIRCLE</td></tr>
</table>

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		TATA GSM		IDEA		RCOM GSM		VIDEOCON		VODAFONE		TATA CDMA		RCOM CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
7	**Hand Over Success Rate (HOSR)**	Major Roads	NC	NC	99.73%	100%	96.48%	100%	99.42%	100%	100%	100%	98.08%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.30%	100%	99.26%	100%	98.77%	100%	100%	100%	100%	100%	99.29%	100%	99.46%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.70%	100%	99.79%	100%	99.71%	100%	100%	100%	99.36%	100%	100%	100%	99.70%	100%	100%	100%	100%	100%
		Overall SSA	**NC**	**NC**	**99.62%**	**100%**	**99.07%**	**100%**	**99.41%**	**100%**	**100%**	**100%**	**99.31%**	**100%**	**99.86%**	**100%**	**99.72%**	**100%**	**100%**	**100%**	**100%**	**100%**

NC-No Coverage; 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

Name of SSA	Month of Drive Test	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
HISSAR	Oct-14	SIRSA, ALINABAD, RATIA, KALANWALI, & FATEHABAD / **220KM**	**WITHIN CITY**- BSNL EXCHANGE SIRSA,JAGDEV SINGH CHOWK, KESHUPURA, RANIA,DABWALI CIVIL HOSPITAL, ANAG MANDI, JIWAN NAGAR **MAJOR ROAD**-CHUNGI, BHAMBOORI, MANGLA(ICR), ELENABAD, DHUDHIAN WALI, SADE WALA,GORI WALA(ICR) **HIGHWAY**:- MAUJ GARH,ALIKA, SAWANT KHERA,MITHDI(ICR), NAURANG, SAHUWALA, SIRSA(ICR) **INDOOR:** CIVIL HOSPITAL,SIRSA	FATEHABAD, TOHANA & BARWALA / **155KM**	**WITHIN CITY**- FATEHABAD-MODEL TOWN,BHATU ROAD,PARTAP MARKET,HISAR ROAD(ICR), HISAR SECTOR 15,13,16 & 17 VIDUT NAGAR **MAJOR ROAD**- AYALKI,AHARWAN,HAMZA PUR,RATIA,NATHWAN,CHIMUN,NA NHERI KHURD,ZABTEWALA,DHARSOL,AKK ANWALI(ICR) **HIGHWAY**-TOHANA, KANHERI,SAMAIN, GABIPUR(ICR), BITHMARA, BARWALA, SARSOND, TALWANDI RANA **INDOOR:** MINI SECRETARIAT,HISAR	ADAMPUR MANDI, HISAR & HANSI / **148KM**	**WITHIN CITY** :-SEC-14,CIVIL HOSPITAL,SREC-23,DEFENCE COLONY,JAWAHAR NAGAR,SEC-16,17,DABRA CHOWK,SHIV COLONY **HIGHWAY**- WAT, KABREL, MINGNIKHERA, MATRSYAM, NYOLI KALAN, HISSAR **MAJOR ROAD**-JINDAL STEEL,SATROD KHURD,MEYAD,HANSI,DHANA,G ARHI,SOORKI,MUNDHAL **INDOOR:** CIVIL HOSPITAL,HANSI
NARNAUL	Nov-14	NARNAUL/ **190KM**	**MAJOR ROAD**- REWARI, KHOLI, ATELI, KHUND, NARNAUL, NANGAL CHAUDHARY **WITHIN CITY**-NANGAL DARGU, NIZAMPUR, HODIANA DONGRA, AHIR **HIGHWAY**-BEWAL, BHOJAWAS, JAMALPUR **NDOOR:** POLICE LINE NARNAUL	NARNAUL, JATUSANA, MAHEDRAGARH & REWARI / **182KM**	**WITHIN CITY**- SECTOR- 3 **MAJOR ROAD**- REWARI,CHANDUWAS, BUDHPUR,BONDIA, BERLI KALAN, JATUSANA, GODAN **HIGHWAY**-KOSLI,NAHAR KANNINA, MOHINDERGARH,DAINA,NANGL, MUDI,ROLIAWAS, REWARI **INDOOR:** CIVIL HOSPITAL MAHENDERGARH	REWARI & BAWAL / **170KM**	**WITHIN CITY**- REWARI CIRCULLAR ROAD,AMBEDKAR CHOWK,BRASS MARKET,UTAM NAGAR,MEERPUR UNIVERSITY,JOHANAWAS,KALI AWAS **MAJOR ROAD**-DARU HERA,DUNGERWAS,NIKHRI,BOL NI,BAWAL LND AREA **HIGHWAY**:- BITWANA,REWARI **INDOOR:** IGU,SEC 3 MARKET

ROHTAK	Dec-14	ROHTAK/ **190KM**	**WITHIN CITY**- SEC 14,,D-PARK,QUILLA ROAD INDUSTRIAL AREA,CIVIL HOSPITA,ANAJ MANDI,ROHTAK BUS STAND,SEC 1,2,3,4,SHIVAJI COLONY, MODEL TOWN, RAM NAGAR **MAJOR ROAD-** MEHAM,BHIWANI,,ROHTAK CHOWK **HIGHWAY**-CHARKHI DADRI, KALANAUR, LAHLI. **INDOOR**: MD UNIVERSITY	ROHTAK/BHIWANI/ **225KM**	**HIGHWAY**-NINAN, KHARAK, KALANAUR **WITHIN CITY**-JUI, LOHANI, BHIWANI, OBRA, LOHARU **MAJOR ROAD-** BHIWANI KHERA, TOSHAM, ISHARWAL **INDOOR:** POLYTECHNIC COLLEGE LOHARU	ROHTAK/JHAJAR/ **168KM**	**WITHIN CITY**- SEC 14,MODEL TOWN,PDIMS,SEC 1,2,3,14, SEC 6,SEC 7,SABZI MANDI,DIGHAL **MAJOR ROAD**- INDUSTRIAL AREA **HIGHWAY:-**SAMPLA, JHAJHAR, BAHADURGARH, **INDOOR:** AGRO MALL ROHTAK

7.2 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF HISSAR SSA (OCT-14)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Sirsa, Ellenabad, Ratia, Kalanwali, & Fatehabad	Poor Lavel & Quality near Ellenabad, Dhudianwali, Goriwala	Fatehabad, Tohana & Barwala	Poor Level & Quality near Ratia, Fatehabad outer	Adampur Mandi, Hisar & Hansi	Poor Level & Quality near Siswal
2	BSNL		Poor Level & Quality at Ellenabad outer, Dabwali outer		Poor Quality near Ratia, Tohana		Poor Level & Quality at Adampur outer, Hansi Outer
3	TATA GSM		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
4	TATA CDMA		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
5	IDEA		---		Poor Quality near Ratia		Poor Quality near Adampur Mandi, Hansi outer
6	RCOM GSM		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
7	RCOM CDMA		They have coverage only in SDCA or Major towns		They have coverage only in SDCA or Major towns		They have coverage only in SDCA or Major towns
8	VIDEOCON		Poor Quality at Sirsa outer, No coverage between Ellenabad to sant nagar, Mahena Kheri, Ramnagar to Chak Quasban, Lambi , Alika, Jiwan nagar, Moonawali, Puniuana		No coverage at Hamzapur, Fatehabad to Ahrwan, Nahuwan, AkkanwaliTalwandi Rana, Poor Quality at Fatehabad outer, Hisar outer		Poor Level & Quality near Adampur Mandi outer, Agroha, No coverage between Mayyar to Hansi
9	VODAFONE		Poor Levele & Quality near Maujgarh, Sikandarpur, Burretwala		Poor Quality at Fatehabad outer, near Bitmara, Gju		Poor Quality near Siswal, Mayyar
10	AIRCEL		No Coverage		No Coverage		No Coverage

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF NARNAUL SSA (NOV 14)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Narnaul	Poor Level near Nizampur, Nangal Chaudhary, Ateli, Poor Quality at Narnaul outer, near Bhojawas, Nangal Sirohi	Narnaul, Jatusana, Mahedragarh & Rewari	Poor Level & Quality near Jatusana, Nangal Mundi	Rewari & Bawal	Poor Level & Quality near Mohanpur, Nikhri, Dharuhera
2	BSNL		Poor Level & Quality near Bhojawas, Seehma, Poor Quality near Kund, Jamalpur, Neerpur		Poor Level & Quality near Kanina, Dahina, Jhagdoli, Poor Quality near Guriyani		Poor Quality near Karnawas, Masani, Banipur
3	TATA GSM		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
4	TATA CDMA		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
5	IDEA		Poor Quality at Narnaul outer, Nangal Chaudhary		---		Poor Quality near Bolni Chowk, Dharuhera outer
6	RCOM GSM		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
7	RCOM CDMA		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality		They have coverage only in SDCA or Major towns with Poor Level & Quality
8	VIDEOCON		No coverage at Govindpuri, Kathuwas, Jamalpur, Basduda, between Sahpur Awal to Amalpur, Hadia to Uncha Majra		Poor Level at Kosli outer, Rewari outer, No coverage between Rewari to Bareli kalan, Lookhi to Kanina, Gudda to Mahendragarh, Kanina to Rewari		Poor Level near Bawal, Bhudani, No coverage between Ramgarh to Turkiawas
9	VODAFONE		Poor Level & Quality near Chandrapur, Nangal Jamalpur, Dhani Bhatota		Poor Level & Quality near Lookhi, Gudiani, Poor Quality near Sharanwas		Poor Level & Quality near Meerpur, Kasola Chowk, Jaisinghpur, Bawal Ind Area
10	AIRCEL		No Coverage		No Coverage		No Coverage

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF ROHTAK SSA (DECEMBER 14)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Rohtak, Bhiwani, Charkhi Dadri, Meham & Kalanaur	Poor Level & Quality near Bond Kalan, Poor Quality near Chang, Sanjerwas	Bhiwani, Loharu & Tosham	Poor Level & Quality near Miran, Obra, Jui Kalan	Rohtak, Bahadurgarh & Jhajhar	Poor Level & Quality near Mandoti, Jhajhar Bypass
2	BSNL		Poor Level & Quality near Dobh, Kalwas, Bahu, Madina, Devsar, Sanwar		Poor Level & Quality near Devrala, Jhaveri, Digawa , Bharwas, Lohani, Loharu Jatu		Poor Quality near MTE Jhajjar & Chipiyan Mohalla
3	TATA GSM		No coverage between Chang to Meham, Charkhi to Sanwer, Poor Level & Quality near Meham, Band Akbarpur, Janta Colony, Charkhi outer		No coverage between Rogha to Kharkhai Makhwan, Devrala, Dighawa to Loharu, Poor Level & Quality near Lali Banyali, Loharu outer, Jui Kalan, Tosham outer, Prem Nagar		Poor Level & Quality near Sonari, Bahadurgarh outer, Dulhera, Sekhupur
4	TATA CDMA		They have coverage only in SDCA's & Major Towns with Poor Level at outers		No coverage between Rogha to Kharkhai Makhwan, Devrala, Dighawa to Loharu, Poor Level & Quality near Lali Banyali, Loharu outer, Jui Kalan, Tosham outer, Prem Nagar		---
5	IDEA		---		Poor Quality at Rohtak outer		---
6	RCOM GSM		They have coverage only in SDCA's & Major Towns with Poor Level at outers		They have coverage only in SDCA's & Major Towns with Poor Level at outers		They have coverage only in SDCA's & Major Towns with Poor Level at outers
7	RCOM CDMA		They have coverage only in SDCA's & Major Towns with Poor Level at outers		They have coverage only in SDCA's & Major Towns with Poor Level at outers		They have coverage only in SDCA's & Major Towns with Poor Level at outers
8	VIDEOCON		No coverage at between Kharkhara to Meham, Pahladgarh, Paintawas Kalan, Charkhi		No coverage between Lohani to Dharu Brahmnan, Jhanjara Sheoran to Pahari , Salempur to Mansarwas, Khaparbas,Ladianwali,Indiwali,Saral		No coverage at Tandaheri, Poor Quality near Jhajhar outer
9	VODAFONE		Poor Quality near Chang, Sanwer		Poor Quality near Obra, Kharkhari Makwan		Poor Quality near Maina
10	AIRCEL		No Coverage		No Coverage		No Coverage

DRIVE TEST TABLE: 8

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

Sr. No	Month	Name of Operators	SSA	SDCA Covered	Status of No Network Coverage Area	ICR Status
1	Oct'14	RCOM GSM	Hissar	Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	Kalirawan to Bheed, Gorwala to oddan, Madho Singhana to Ellenabad, Dharsul Kalan to Jamalpur Sekhan, Aherwan to Ratia, Ratia to Dharsul Kalan, Jakhod Khera to Adampur Mandi, Hansi and Mayyer.	Agroha to Beed on Agroha-Hissar road, Bhudha Khera to Barwala, Jevra, Talwandi Rana, Bithmara to Barwala, **ICR with TATA GSM**
		RCOM CDMA		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	Kalirawan to Bheed, Gorwala to oddan, Madho Singhana to Ellenabad, Dharsul Kalan to Jamalpur Sekhan, Aherwan to Ratia, Ratia to Dharsul Kalan, Jakhod Khera to Adampur Mandi, Hansi and Mayyer	NO
		TATA GSM		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	Dhudhian Wali to Alika,Elenabad To Jiwan Nagar (8km), Ayalki to Hamza Pur, Nathwan to Akkanwali, Kanheri to Samain, Mangla Village	Anandpur Mandi, Fatehbad, Sirsa, Dabwali, Ellanabad, **ICR With Videocon**
		TATA CDMA		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	Dhudhian Wali to Alika,Elenabad To Jiwan Nagar (8km),Ayalki to Hamza Pur, Nathwan to Akkanwali, Kanheri To Samain, Mangla Village	NO
		Videocon		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	Talwandi rana to Hisar outer, Kanheri to Bithmara Partial ,Ellenabad to Jiwannagar 8 km, Dhudianwali, Sadewala,Mauj garh,panjumana , Alika not covered, Ayalki, Hamzapur village	NO
		Vodafone		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	-----	No
		Airtel		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	-----	No
		Idea		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar, Kalanwali, Ratia, Sirsa, Tohana	-----	No
		BSNL		Adampur Mandi, Barwala, Dabwali, Ellenabad, Fatehabad, Hansi, Hissar,	-----	No

Sr. No	Month	Name of Operators	SSA	SDCA Covered	Status of No Network Coverage Area	ICR Status
				Kalanwali, Ratia, Sirsa, Tohana		
2	Nov'14	Reliance GSM	Narnaul	Bawal, Jatusana, Kosli, Mahendergarh, Narnaul, Rewari	Dharuhera to Molhawas, Bawal & Chanduwas,Gokulgarh to Kosli, Kosli to Kanina road, Ateli to Rewari, Kanina to Mahendergarh, Kanina to Mahendergar, Rewari to Dharuhera	Gokulgarh to Kosli, Mudlana, Ateli to Rewari, Rewari to Dharuhera, ICR with TATA GSM
		Reliance CDMA		Bawal, Jatusana, Kosli, Mahendergarh, Narnaul, Rewari	Dharuhera to Molhawas, Bawal & Chanduwas, Gokulgarh to Kosli, Kosli to Kanina road, Ateli to Rewari, Kanina to Mahendergarh, Kanina to Mahendergar, Rewari to Dharuhera	NO
		Tata GSM		Bawal, Jatusana, Kosli, Mahendergarh, Narnaul, Rewari	Reedpur to Mahendergarh,Narnaul to Mahindergarh, Bhagwanpur, Mirpur, Turkiwas, Budana Village,	NO
		Tata CDMA		Bawal, Jatusana, Kosli, Mahendergarh, Narnaul, Rewari	Reedpur to Mahendergarh,Narnaul to Mahindergarh, Bhagwanpur, Mirpur, Turkiwas, Budana Village,	NO
		Videocon		Bawal, Jatusana, Kosli, Mahendergarh, Narnaul, Rewari	Rewari to Berli kalan, Mohendergarh to Kanina and Kanina to Rewari, Lukhi to Kanina and Gudha to Mohedergarh, Ramgarh to Turkiawas not covered, Karnawas to Rewari, Hudina to Jamalpur, Shahpur awal to Amarpur	Gokulgarh to Kosli, ICR with TATA GSM
		Airtel			-----	No
		BSNL		Bawal, Jatusana, Kosli, Mahendergarh, Narnaul, Rewari	-----	No
		Idea			-----	No
		Vodafone			-----	No
3	Dec'14	Reliance GSM	Rohtak	Bahadurgarh, Bhiwanikhera, Bhiwani, Charkhidadri, Jhajjar, Kalanaur, Loharu, Meham, Rohtak, Tosham	Bahadurgarh - Rohtak road,Bhiwani - Loharu road, Loharu - Tosham road, Charkhidadri - Kalanaur road, Rohtak - Kalanaur road, Bhiwani - Kalanaur road,Jhajjar - Rohtak road,Meham Bhiwani road, Bahu Jamalput to Bahu Akbarpur	Bhiwani - Kalanaur road; Charkhidadri - Kalanaur road, Rohtak - Kalanaur road, Kharkhari Makhanwala, Lohani, Jui Kalan, Dangar, ICR with TATA GSM

Sr. No	Month	Name of Operators	SSA	SDCA Covered	Status of No Network Coverage Area	ICR Status
		Reliance CDMA		Bahadurgarh, Bhiwanikhera, Bhiwani, Charkhidadri, Jhajjar, Kalanaur, Loharu, Meham, Rohtak, Tosham	Bahadurgarh - Rohtak road, Bhiwani - Loharu road, Loharu - Tosham road, Charkhidadri - Kalanaur road, Rohtak - Kalanaur road,Bhiwani - Kalanaur road, Jhajjar - Rohtak road, Meham Bhiwani road,Bahu Jamalput to Bahu Akbarpur	NO
		Tata GSM		Bahadurgarh, Bhiwanikhera, Bhiwani, Charkhidadri, Jhajjar, Kalanaur, Loharu, Meham, Rohtak, Tosham	Dhani Shankar to Pokar Was, Kuda to Gignau, Singhani to Miran, Gadhi Khere to Bicharin Village	NO
		Tata CDMA		Bahadurgarh, Bhiwanikhera, Bhiwani, Charkhidadri, Jhajjar, Kalanaur, Loharu, Meham, Rohtak, Tosham	Dhani Shankar to Pokar Was, Kuda to Gignau, Singhani to Miran, Gadhi Khere to Bicharin Village	NO
		Videocon		Bahadurgarh, Bhiwanikhera, Bhiwani, Charkhidadri, Jhajjar, Kalanaur, Loharu, Meham, Rohtak, Tosham	Jhanjara Sheoran to Pahari road, Salempur to Mansarwas road, Khaparbas, Ladianwali, khakara to meham, Paintawas kalan to charkhi, pahladgarh & saral village	Nakipur to Obra , Isharwal , kharkhri makhwa, ICR with TATA GSM
		Airtel		Bahadurgarh, Bhiwanikhera, Bhiwani, Charkhidadri, Jhajjar, Kalanaur, Loharu, Meham, Rohtak, Tosham	-----	No
		Idea			-----	No
		BSNL			-----	No
		Vodafone			-----	No

7.3 KEY FINDINGS ON DRIVE TEST:

The key observations that could be derived from the results of the drive tests are as under –

(i) Aircel has no coverage in all the SSAs where drive tests were conducted during the quarter. In fact, Aircel is having its very limited presence in Haryana circle with only 28 BTSs in entire Haryana service area.

(i) **In the Month of October -14** drive tests were conducted across **Hissar SSA** covering Sirsa, Ellenabad, Ratia, Kalanwali, Fatehabad, Tohana ,Barwala, Adampur Mandi, Hisar & Hansi SDCAs during three consecutive days. The overall performance of **BSNL** with regard to the parameters **Call Drop Rate, Voice quality, CSSR and Blocked Call rate** remained non-complied with its performance as **2.91%, 79.46%, 94.01%(Outdoor) / 89.61%(Indoor) and 5.99%(Outdoor) / 10.39%(Indoor)** respectively. The performance of **RCOM (CDMA)** and **Idea** also lagged behind the benchmarks for parameter **Call Drop Rate (2.63%-Indoor) and Voice Quality (94.32%-Outdoor / 94.53%-Indoor) respectively.**

(ii) **In the Month of November-14,** drive tests were conducted across **Narnaul SSA** covering Narnaul, Jatusana, Mahedragarh, Rewari, & Bawal SDCAs during three consecutive days of drive test. In this SSA, the overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. Only **BSNL** and **Idea** remained short of benchmark for parameter **Good Voice Quality** with their achieved value of **92.27% and 94.66%** respectively.

(iii) **In the month of December-14,** drive tests were conducted across **Rohtak SSA** covering Rohtak, Bhiwani, Charkhi Dadri, Meham, Kalanaur, Loharu, Tosham, Bahadurgarh & Jhajhar SDCAs. In Rohtak SSA, **BSNL** lagged behind the benchmarks for parameters **Call Drop Rate (2.43%) and Voice Quality (80.07% Outdoor / 79.97% Indoor). Tata CDMA** also failed to meet the benchmark of parameter **Voice Quality (94.71%).** Other service providers were well within the compliance range of the benchmarks.

The deficiencies with respect to adequate coverage and voice quality, observed on the drive tests plots, at the various places are summarized in the table-5, table-6 and table -7 (above) respectively for three SSAs.

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 **BSNL , RCOM (CDMA), Idea and Tata CDMA** were **non-compliants** with respect to the parameter '**Call Drop Rate', 'Voice Quality', 'CSSR'** in Hissar, Narnaul and Rohtak SSAs. The underperformed operators need to improve their network performance in respect of highlighted parameters.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT
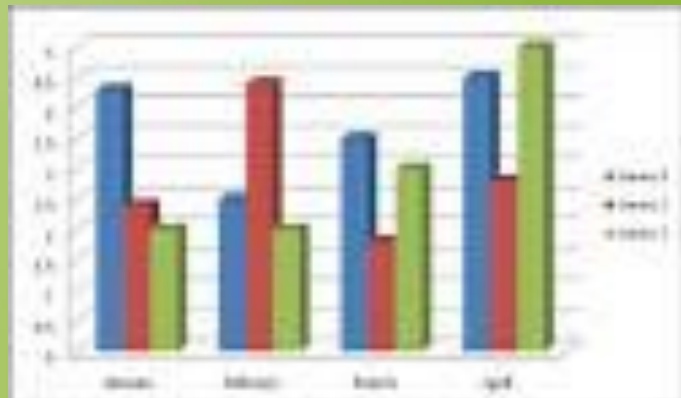
8. GRAPHICAL REPRESENTATION:

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

1) **BTS ACCUMULATED DOWNTIME:**

BTS Accumulated Downtime

	AIRCEL	AIRTEL	BSNL	VIDEOC ON	TATA GSM	IDEA	RCOM GSM	VODAF ONE	RCOM CDMA	TATA CDMA
Quarterly PMR	0.19%	0.05%	1.02%	0.11%	0.02%	0.01%	0.38%	0.03%	0.25%	0.08%
Quarterly Live	0.20%	0.01%	1.37%	0.08%	0.04%	0.01%	0.34%	0.03%	0.25%	0.06%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
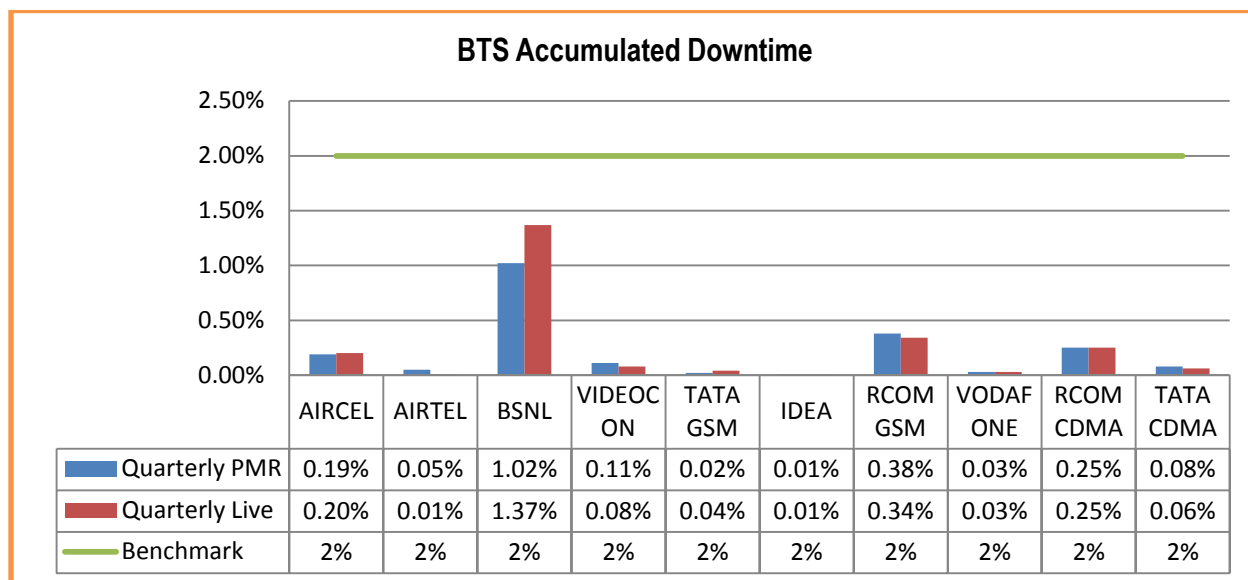
All operators are meeting the benchmarks.

2) **WORST AFFECTED BTSS DUE TO DOWNTIME:**

Worst affected BTSs due to downtime

	AIRCEL	AIRTEL	BSNL	VIDEOC ON	TATA GSM	IDEA	RCOM GSM	VODAF ONE	RCOM CDMA	TATA CDMA
Quarterly PMR	0.00%	0.07%	1.39%	0.40%	0.00%	0.00%	0.85%	0.01%	0.66%	0.08%
Quarterly Live	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
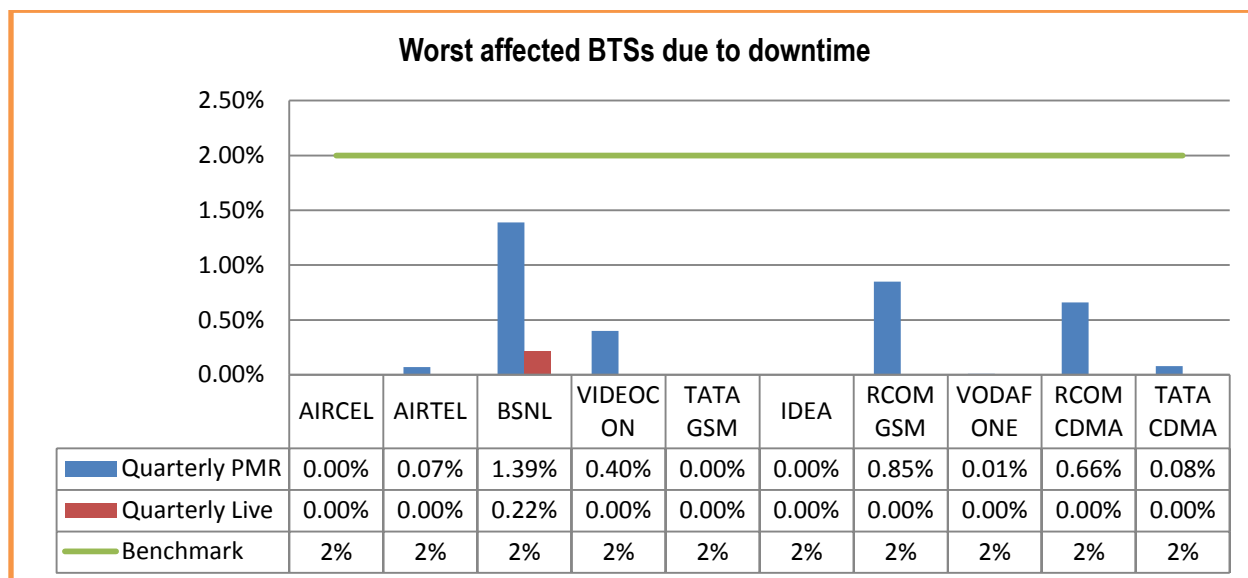
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE:

Call Setup Success Rate

	AIRCEL	AIRTEL	BSNL	VIDEO CON	TATA GSM	IDEA	RCOM GSM	VODAF ONE	RCOM CDMA	TATA CDMA
Quarterly PMR	99.18%	99.32%	97.15%	98.89%	98.72%	99.99%	99.77%	99.83%	98.33%	98.45%
Quarterly Live	99.61%	99.36%	97.10%	98.94%	98.83%	99.98%	99.81%	99.84%	98.35%	97.85%
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
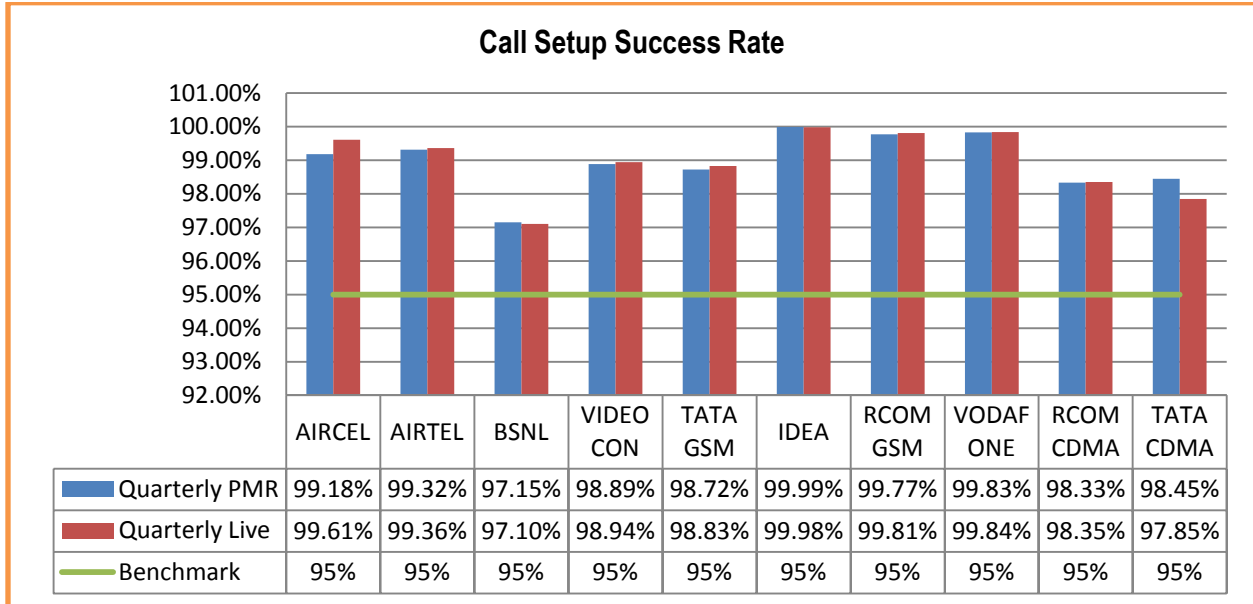
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:

SDCCH/PAGING Channel Congestion

	AIRCEL	AIRTEL	BSNL	VIDEOC ON	TATA GSM	IDEA	RCOM GSM	VODAF ONE	RCOM CDMA	TATA CDMA
Quarterly PMR	0.36%	0.10%	0.23%	0.09%	0.07%	0.32%	0.01%	0.12%	0.00%	0.00%
Quarterly Live	0.00%	0.09%	0.28%	0.07%	0.08%	0.23%	0.01%	0.06%	0.00%	0.00%
Benchmark	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
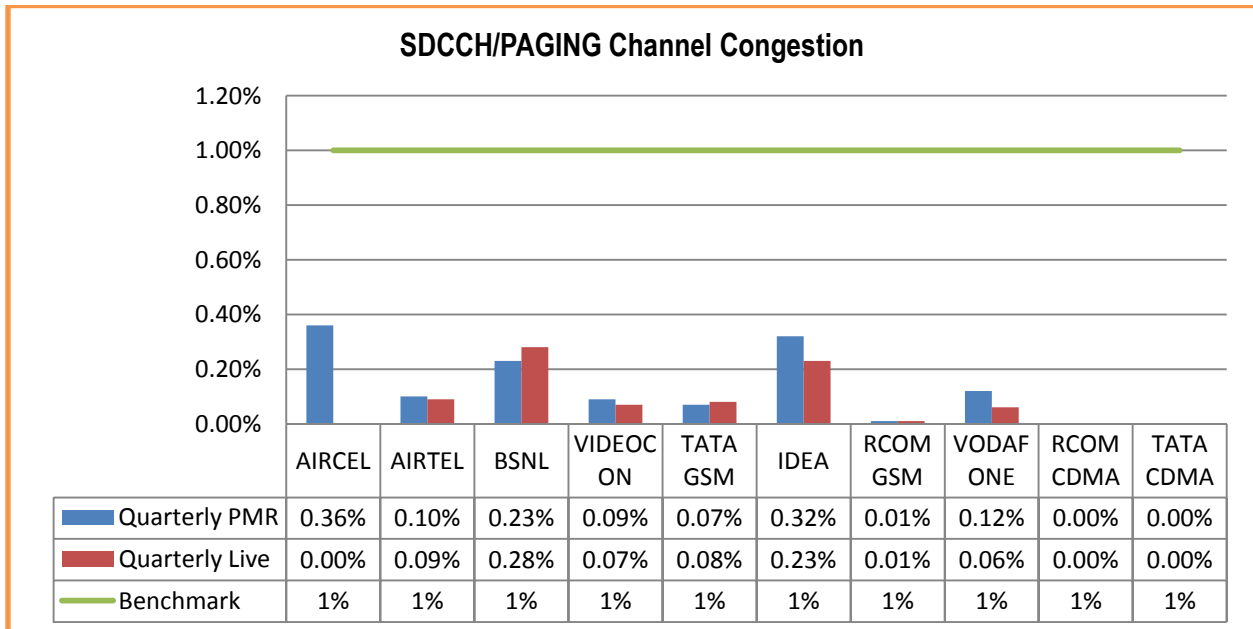
All operators are meeting the benchmarks.

5) TCH CONGESTION:

TCH Congestion

	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
Quarterly PMR	0.00%	0.15%	0.97%	0.06%	0.29%	0.35%	0.02%	0.17%	0.17%	0.20%
Quarterly Live	0.00%	0.13%	0.98%	0.04%	0.18%	0.35%	0.01%	0.16%	0.17%	0.52%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
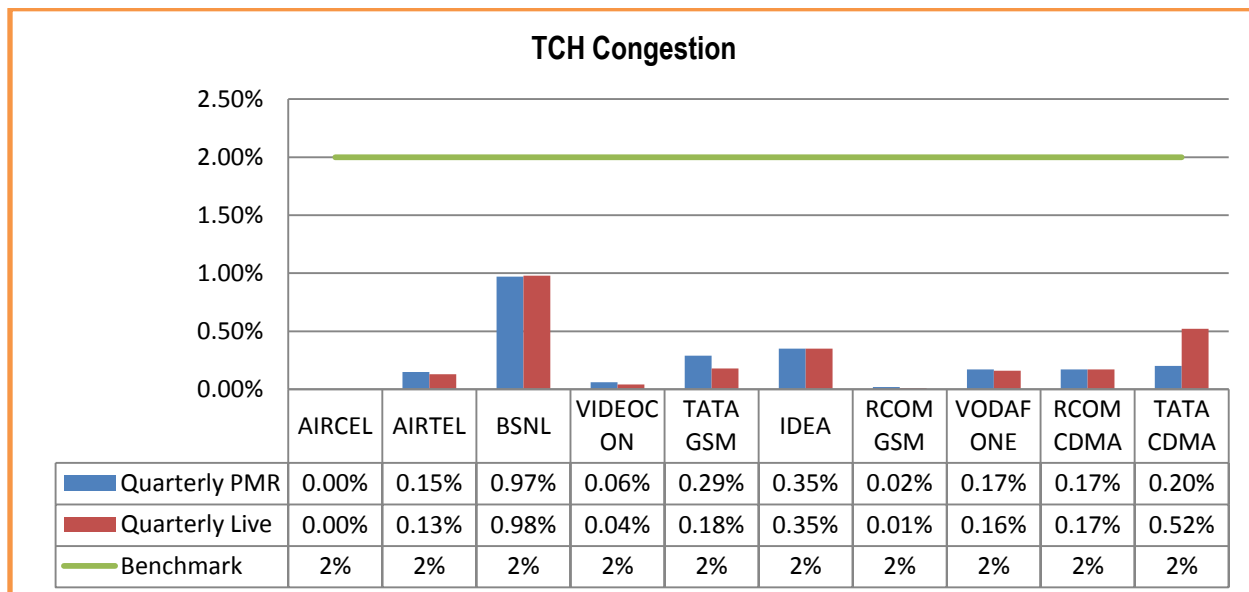
All operators are meeting the benchmarks.

6) CALL DROP RATE:

Call Drop Rate

	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
Quarterly PMR	5.17%	0.33%	1.32%	0.55%	0.69%	0.54%	0.29%	0.70%	0.05%	0.36%
Quarterly Live	1.16%	0.33%	1.35%	0.53%	0.69%	0.58%	0.28%	0.67%	0.04%	0.59%
Benchmark	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
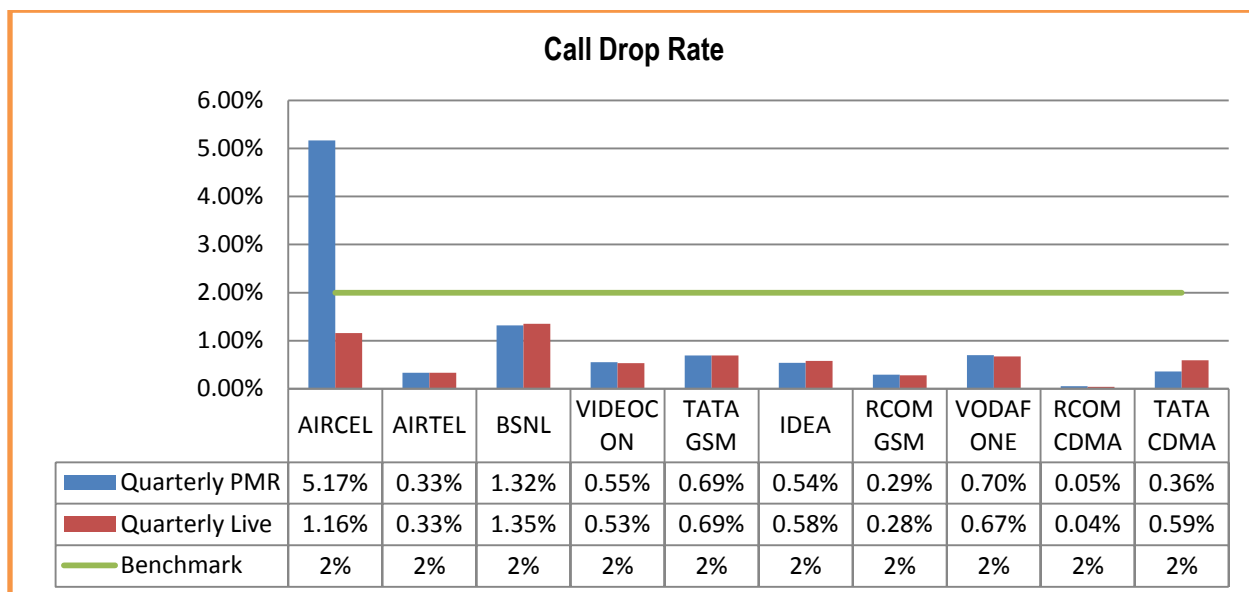
All operators are meeting the benchmarks except Aircel.

7) WORST AFFECTED CELLS>3% TCH DROP:

Worst affected cells>3% TCH drop

	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
Quarterly PMR	6.09%	0.71%	1.45%	0.74%	3.80%	1.46%	0.01%	1.79%	0.14%	5.32%
Quarterly Live	4.89%	0.70%	1.48%	0.70%	3.85%	1.80%	0.00%	1.69%	0.08%	5.12%
Benchmark	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
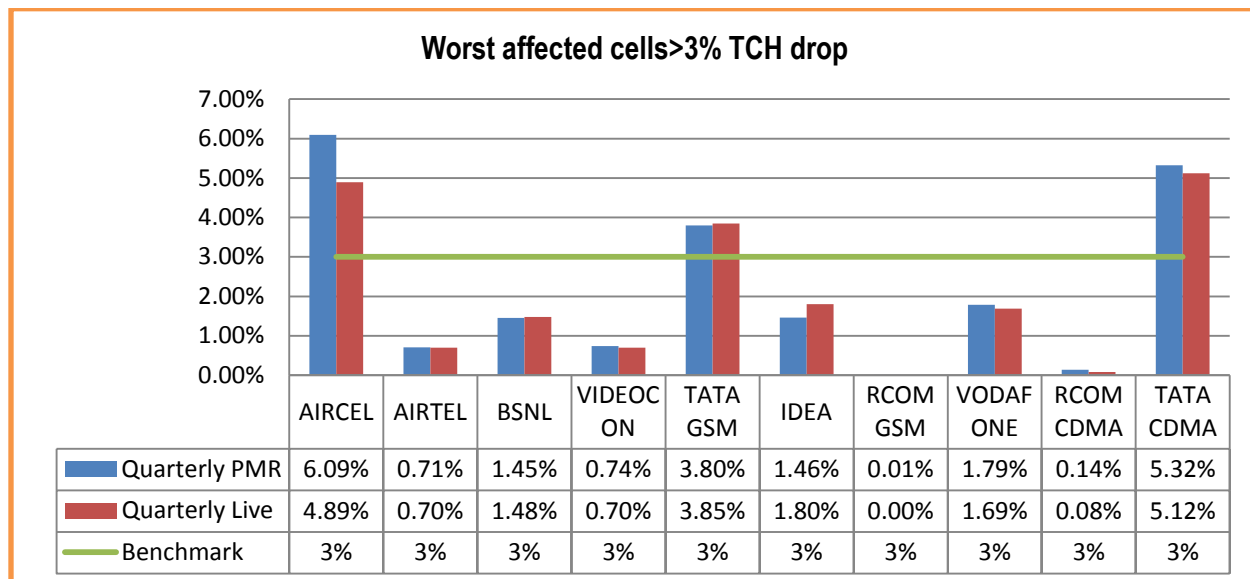
All operators are meeting the benchmarks except Aircel, Tata GSM & Tata CDMA.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:

% Connections with good voice quality

	AIRCEL	AIRTEL	BSNL	VIDEO CON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
Quarterly PMR	98.90%	99.07%		97.61%	97.05%	98.05%	99.24%	97.82%	99.75%	
Quarterly Live	99.16%	99.07%		97.64%	97.03%	98.00%	99.26%	97.88%	99.75%	
Benchmark	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
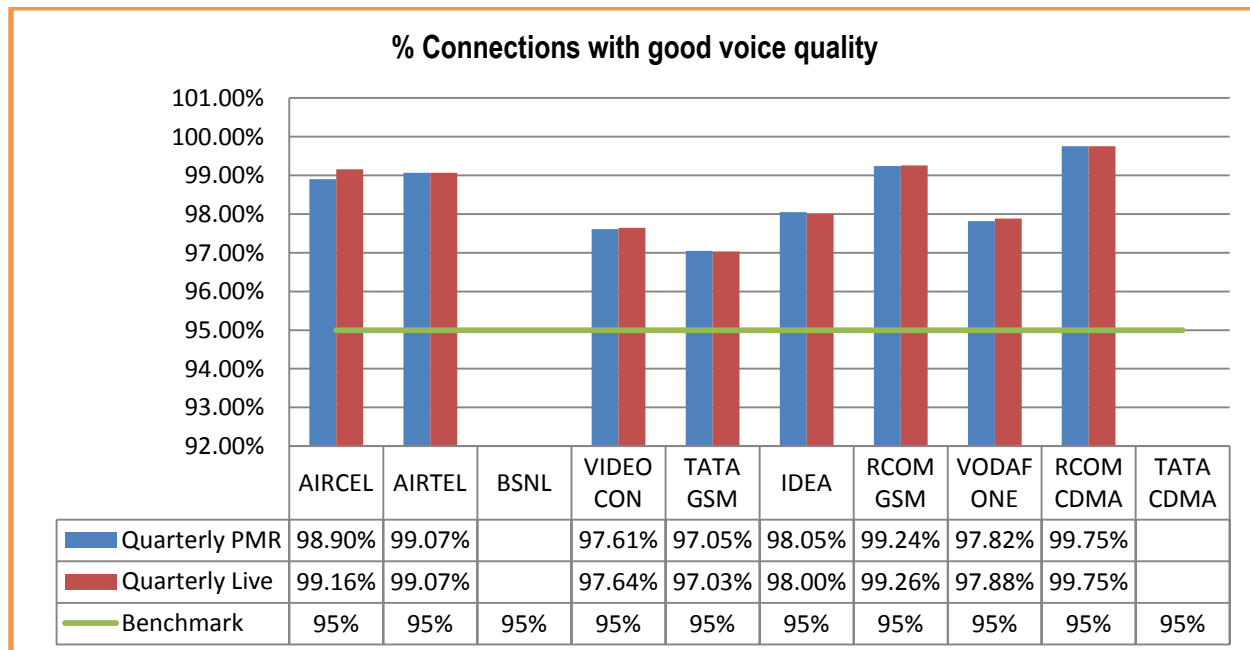
All operators are meeting the benchmarks. BSNL and Tata CDMA are not having the system generated data for VQ, so not provided the data.

9) POI CONGESTION:

No. of POI's having >=0.5% POI congestion

	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
Quarterly PMR	0	0	1	0	0	0	0	0	0	0
Quarterly Live	0	0	0	0	0	0	0	0	0	0
Benchmark										
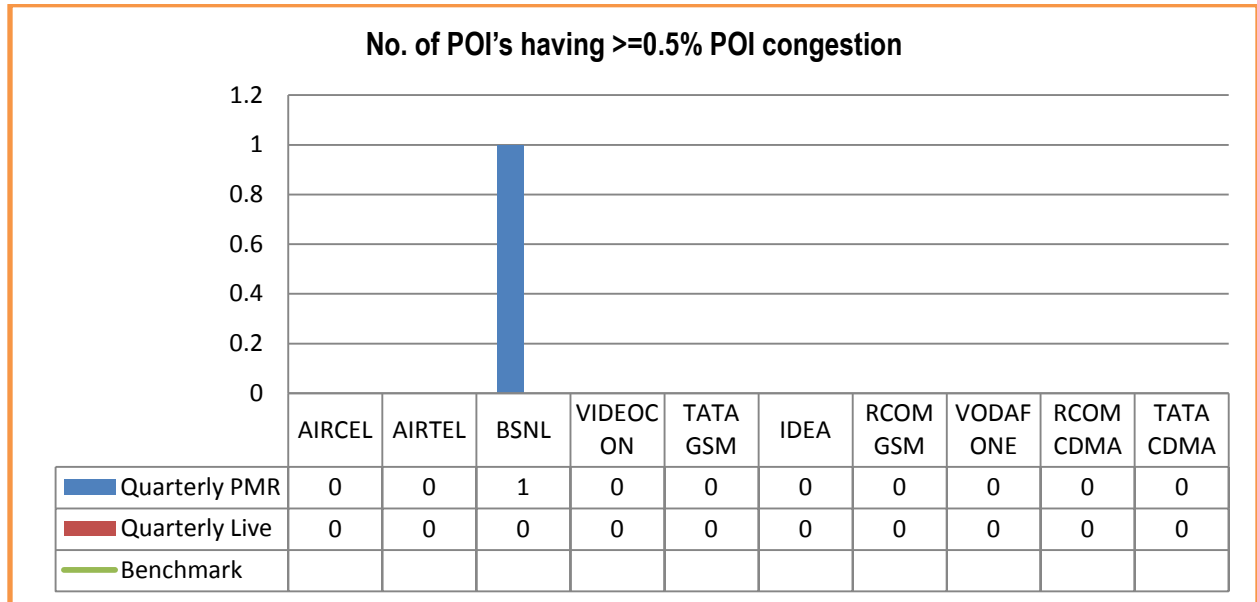
All operators are meeting the benchmarks except BSNL.

9. QOS AUDIT OF BASIC (WIRELINE) SERVICE PROVIDERS

9. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINE)

The QoS audit for basic (wire line) service was to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. Out of 1073 in Haryana (present no. of BSNL exchanges), audit was done for 65 sampled (19-Urban and 46-Rural) exchanges. In case of Private Service provider's one exchange each of Bharti, TTSL and RCL were covered for audit. As Haryana Circle is having 54 SDCAs, so total 65 sampled BSNL exchanges spread over 6 SDCAs, (10% of 54 SDCAs in Haryana) have been taken 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	BSNL	Haryana	380	693	1073	19	46
2	BHARTI-AIRTEL	Haryana	2	0	2	1	0
3	RCL	Haryana	1	0	1	1	0
4	TTL	Haryana	1	0	1	1	0
Total Exchanges at present			**384**	**693**	**1077**	**22**	**46**

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

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

SI. No.	Parameters	Benchmark	Period	BHARTI AIRTEL	BSNL	RCL	TTL
	AVERAGED QUARTERLY (OCT TO DEC 14) AUDIT DATA FOR WIRELINE (BASIC) SERVICES HARYANA CIRCLE						
1	**Fault incidences**						
	(No. of faults/100 subscribers /month)	< 7%	Quarterly	4.32%	6.06%	0.00%	0.38%
2	**Faults Repair/Restoration Time**						
	Fault repair by next working day(Urban Area)	>85%	Quarterly	95.55%	**59.02%**	NA	92.79%
	Within 5 days day	100%	Quarterly	100.00%	**85.99%**	NA	100.00%
	Fault repair by next working day(Rural & hilly Area)	>75%	Quarterly	NA	**59.21%**	NA	NA
	Within 5 days	100%	Quarterly	NA	**92.64%**	NA	NA
	Mean time to Repair(MTTR)	≤10 Hrs	Quarterly	3.21	**11.13**	NA	9.33
3	**Rent Rebate**						
	Fault pending > 3 days & <7 days	Rebate for 7 days	Quarterly	0	1	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Quarterly	0	5	0	0
	Fault pending > 15 days	Rebate for 1 month	Quarterly	0	1	0	0
5	**Metering & Billing Performance**						
	Disputed Bills over bills issued (Post Paid)	< 0.1%	Quarterly	0.04%	0.02%	0.00%	0.00%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA	NA	NA
	% of billing complaints resolved within 4 weeks	*98% within 4 weeks*	Quarterly	100.00%	100.00%	100.00%	100.00%
	% of billing complaints resolved within 6 weeks	*100% within 6 weeks*	Quarterly	100.00%	100.00%	100.00%	100.00%
	Period of applying credit/Waiver/Adjustment to customers	*<=1 week*	Quarterly	Within 1 Week	Within 1 Week	Within 1 Week	Within 1 Week
6	**POI Congestion**						
	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0
7	**Response Time to customer for assistance**						
	Accessibility of Call centre/customer Care	>=95%	Quarterly	100.00%	95.64%	**93.75%**	96.14%
	% age of calls answered by operator(voice to voice) within 90 seconds	>=95%	Quarterly	98.62%	96.51%	95.20%	**93.43%**
8	**Customer care(promptness in attending to customers request)**						
	Termination / Closures	100%	Quarterly	100.00%	**95.08%**	NA	NA
	Time taken for refunds of deposit after closures	100%	Quarterly	NA	100.00%	NA	NA

NA-Not Applicable

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

SI No.	Parameters	Benchmark	Period	BHARTI AIRTEL	BSNL	RCL	TTL
	3 DAYS LIVE DATA FOR WIRELINE (BASIC) SERVICES						
1	**POI Congestion**						
	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0
2	**Response Time to customer for assistance**						
	Accessibility of Call centre/customer Care	≥95%	Quarterly	100.00%	100.00%	98.45%	100.00%
	% age of calls answered by operator(voice to voice) within 90 seconds	≥95%	Quarterly	100.00%	100.00%	98.92%	100.00%

During Live measurements, the service providers were found meeting the benchmarks of the parameters Accessibility of Call center and Calls answered by operator (voice to voice).

9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINE)

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

Fault Repair/Restoration Time: Only BSNL could not meet the benchmark of Fault repaired by next working day and within 5 days with its performance as **59.02% and 85.99%** respectively.
In case of Rural and hilly areas also **BSNL** remained under performed for fault repaired by next working day and within 5 days having its performance **59.21% and 92.64%** respectively.

Mean Time to Repair: Only **BSNL** failed to meet the benchmark for MTTR with its performance as **11.13 Hrs** against the benchmark of ≤8 Hrs.

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: With respect to the parameter **Accessibility of Call centre/customer Care**, the performance of **RCL** only was found below the benchmark with its performance level as **93.75%** against the benchmark of >95%.
With respect to the parameter of **calls answered by operator (voice to voice),** only **TTL** could not meet the benchmark with its performance as **93.43%.**

Termination/Closures: All operators (**except BSNL**) were found meeting the benchmark on this parameter. **BSNL** could close **95.08%** connections against the benchmark of 100%.

Time taken for refund of deposit: All operators met the benchmark for this parameter.

*Thus, from the above findings that, it was concluded that the performance of **BSNL** was not satisfactory in respect of the parameters, **Fault Repair/Restoration Time, MTTR and Termination/Closure. RCL** and **TTSL** also failed to meet the benchmark of the parameters **Accessibility of Call center** and **Calls answered by Operators (Voice to Voice**). Hence, **BSNL, RCL** and **TTL** need to improve their services in respect of these parameters*

9.4 INTER OPERATOR CALL ASSESSMENT (WIRELINE)

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

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT						
Calling Operators	Circle Name	Total No. of calls Made	BHARTI AIRTEL	BSNL	RCL	TTL
BHARTI AIRTEL	Haryana	100	--	100%	100%	100%
BSNL	Haryana	100	100%	--	100%	**98%**
RCL	Haryana	100	100%	100%	--	100%
TTSL	Haryana	100	100%	**99%**	**96%**	--

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 TTL, successful interconnection was 98%. TTL to BSNL and RCL, successful connections were 99% and 96% respectively. 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 (WIRELINE)

LEVEL 1 LIVE CALLING						
Emergency no.	Circle Name	No. of calls made	BHARTI AIRTEL	BSNL	RCL	TTL
100	Haryana	25	√	√	√	√
101	Haryana	25	√	√	√	√
102	Haryana	25	√	√	√	√
1091	Haryana	25	√	√	√	√

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

9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)

LIVE CALLING TO CALL CENTRE					
	Circle	BHARTI AIRTEL	BSNL	RCL	TTL
Total No. of calls Attempted	Haryana	100	100	100	100
A) Total no of calls attempted to customer care/Call center	Haryana	100	100	100	100
B) Total no. of calls successfully established to customer care/Call center	Haryana	100	100	100	100
C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	Haryana	100.00%	100.00%	100.00%	100.00%
D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)	Haryana	100	98	100	97
E) Total number of calls answered by the operator (Voice to voice) within 90 seconds	Haryana	100	98	100	97
F) % age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	Haryana	100.00%	**98.00%**	100.00%	**97.00%**

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 of Bharti Airtel and RCL , whereas BSNL and TTL could connect 98% and 97% of calls within stipulated time.

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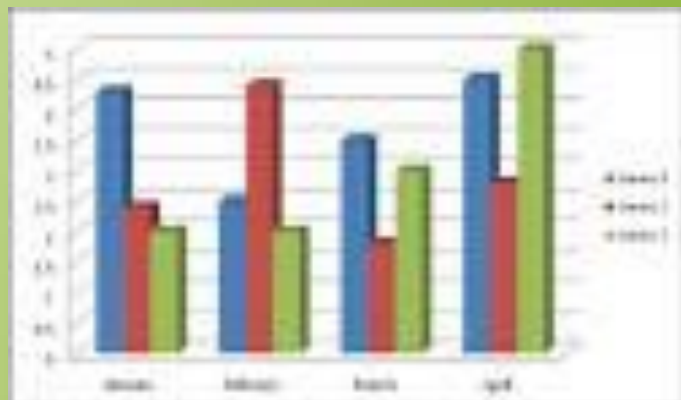
9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:

1) FAULT INCIDENCE:

Fault Incidence
(No. of faults/100 subscribers /month)

	BHARTI AIRTEL	BSNL	RCL	TTL
(No. of faults/100 subscribers /month)	4.32%	6.06%	0.00%	0.38%
Benchmark < 7%	7%	7%	7%	7%
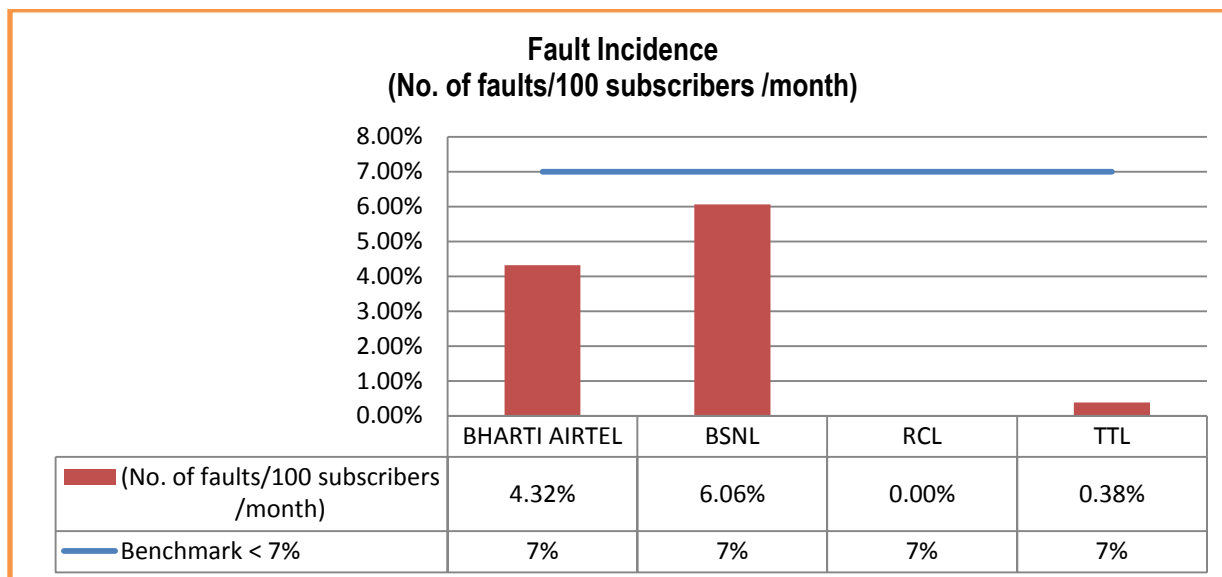
All Operators are meeting the benchmarks.

2) FAULTS REPAIR/RESTORATION TIME:

Faults Repair/Restoration Time
Fault repair by next working day(Urban Area)

	BHARTI AIRTEL	BSNL	RCL	TTL
Fault repair by next working day(Urban Area)	95.55%	59.02%	100.00%	92.79%
Benchmark >85%	85%	85%	85%	85%
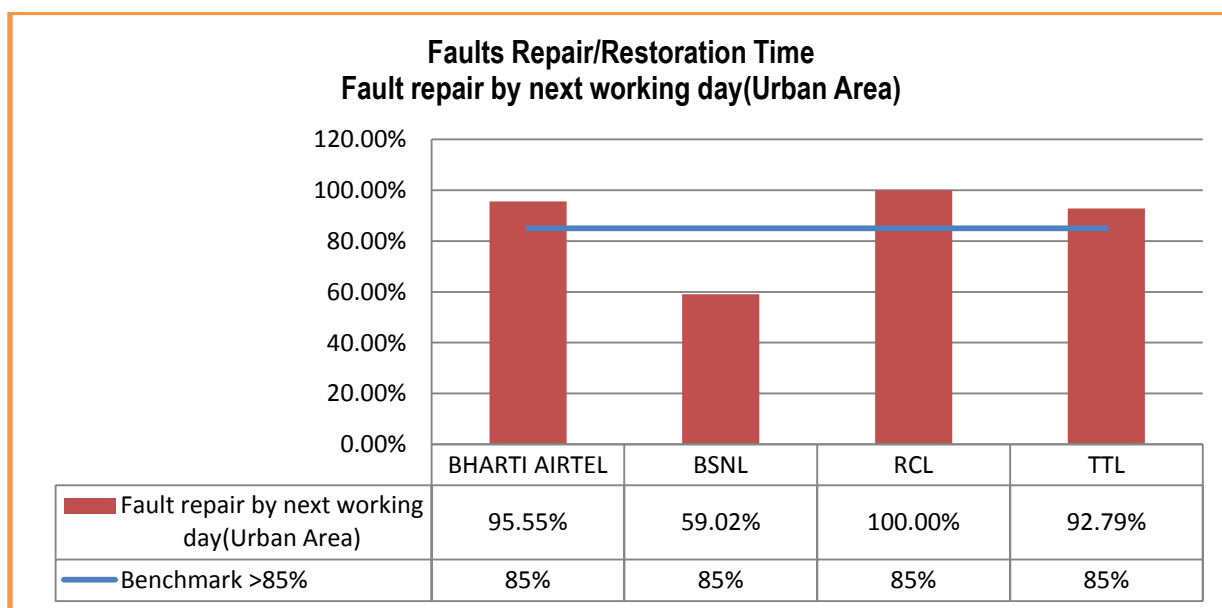
All Operators are meeting the benchmarks except BSNL.

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

**Faults Repair/Restoration Time
Within 5 days**

	BHARTI AIRTEL	BSNL	RCL	TTL
Within 5 days	100.00%	85.99%	100.00%	100.00%
Benchmark-100%	100.00%	100.00%	100.00%	100.00%
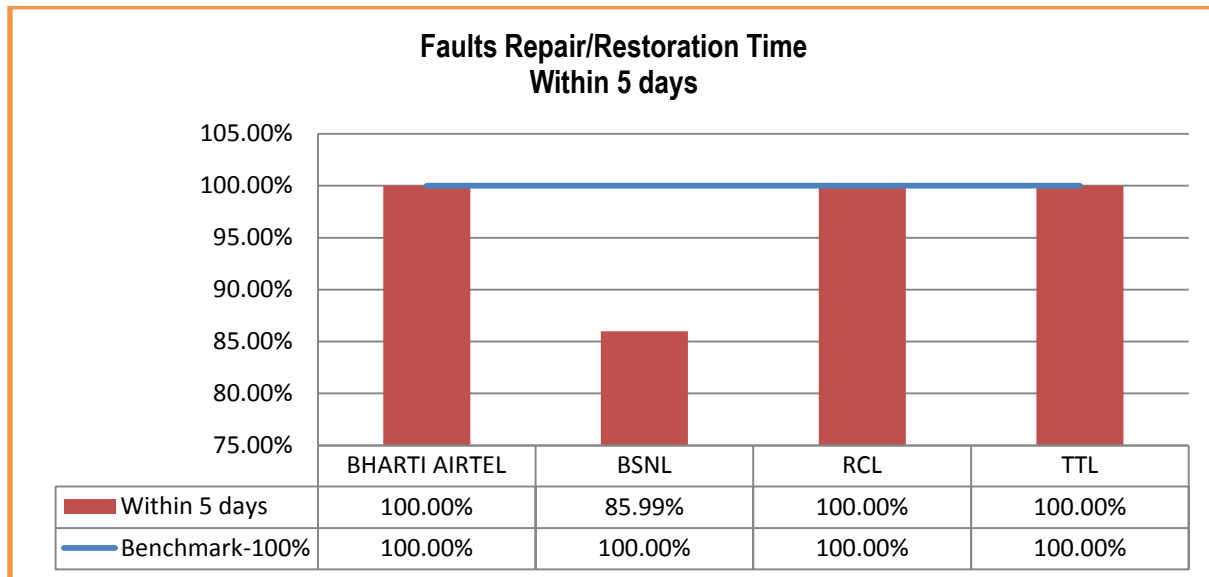
All Operators are meeting the benchmarks except BSNL.

4) **MEAN TIME TO REPAIR (MTTR):**

**Faults Repair/Restoration Time
Mean time to Repair(MTTR)**

	BHARTI AIRTEL	BSNL	RCL	TTL
Mean time to Repair(MTTR)	3.21	11.13		9.33
Benchmark ≤10 Hrs	10	10	10	10
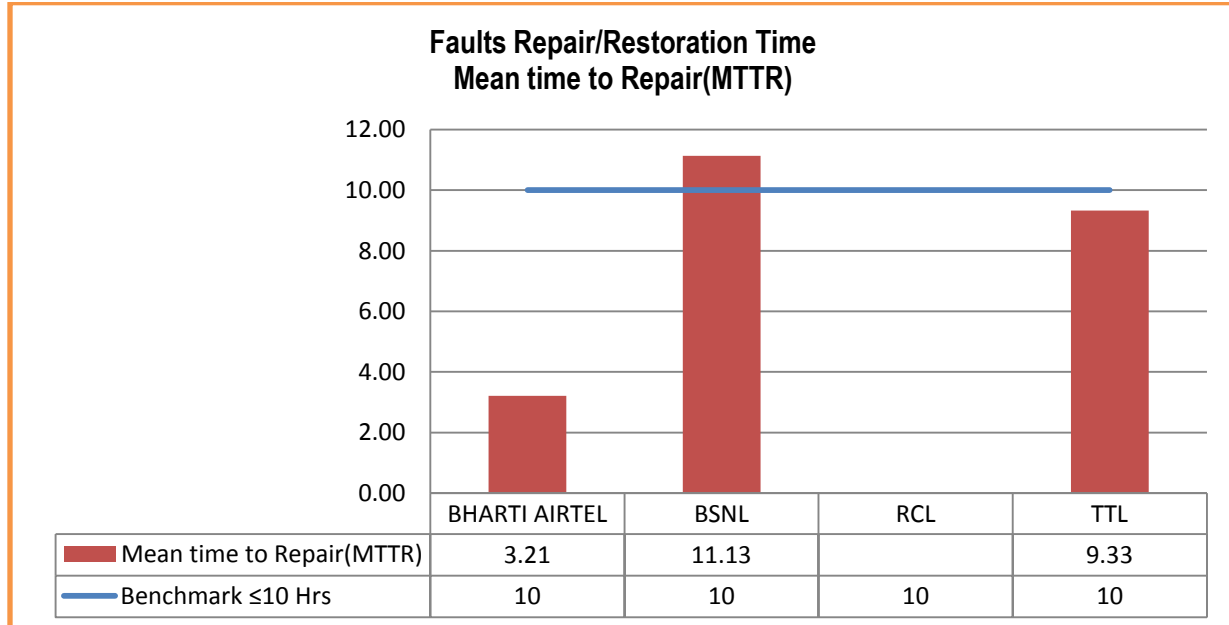
All Operators are meeting the benchmarks except BSNL and RCL do not any fault during this quarter.

5) METERING & BILLING PERFORMANCE:

a) DISPUTED BILLS OVER BILL ISSUED :

Metering & Billing Performance
Disputed Bills over bills issued

	BHARTI AIRTEL	BSNL	RCL	TTL
Disputed Bills over bills issued	0.04%	0.02%	0.00%	0.00%
Benchmark < 0.1%	0.1%	0.1%	0.1%	0.1%
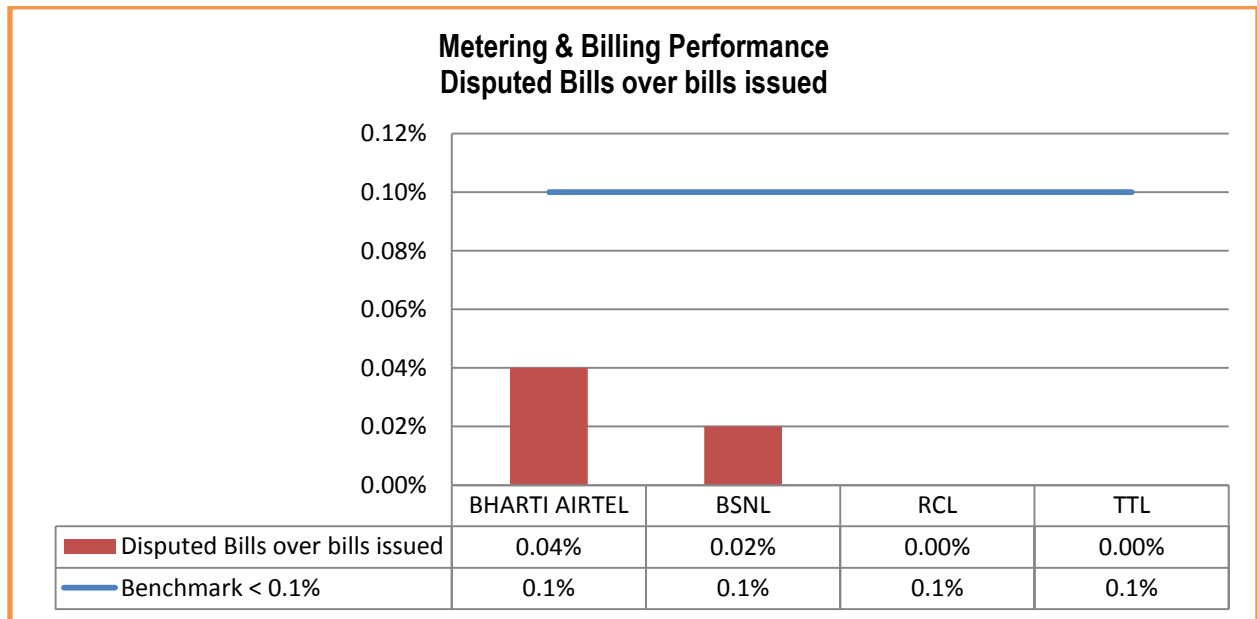
All Operators are meeting the benchmarks.

b) BILLING COMPLAINT RESOLUTION WITHIN 4 WEEKS:

% of billing complaints resolved within 4 weeks

	BHARTI AIRTEL	BSNL	RCL	TTL
% of billing complaints resolved within 4 weeks	100.00%	100.00%	100.00%	100.00%
Benchmark-98% within 4 weeks	98%	98%	98%	98%
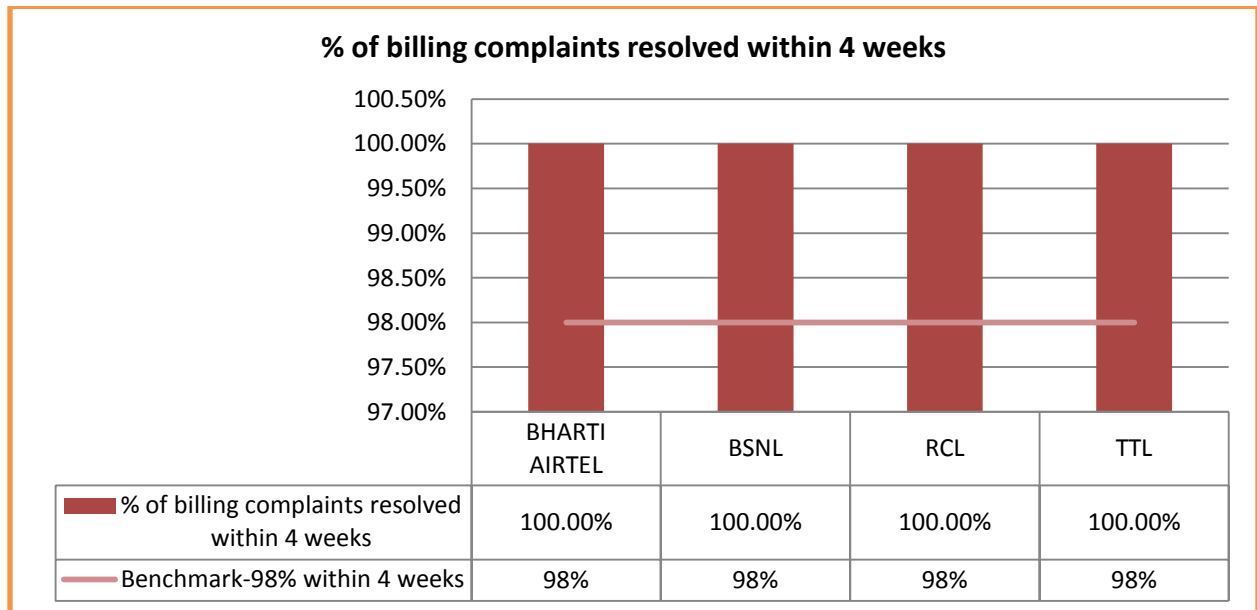
All Operators are meeting the benchmarks.

c) **BILLING COMPLAINT RESOLUTION WITHIN 6 WEEKS:**

% of billing complaints resolved within 4 weeks

	BHARTI AIRTEL	BSNL	RCL	TTL
% of billing complaints resolved within 4 weeks	100.00%	100.00%	100.00%	100.00%
Benchmark-98% within 4 weeks	98%	98%	98%	98%
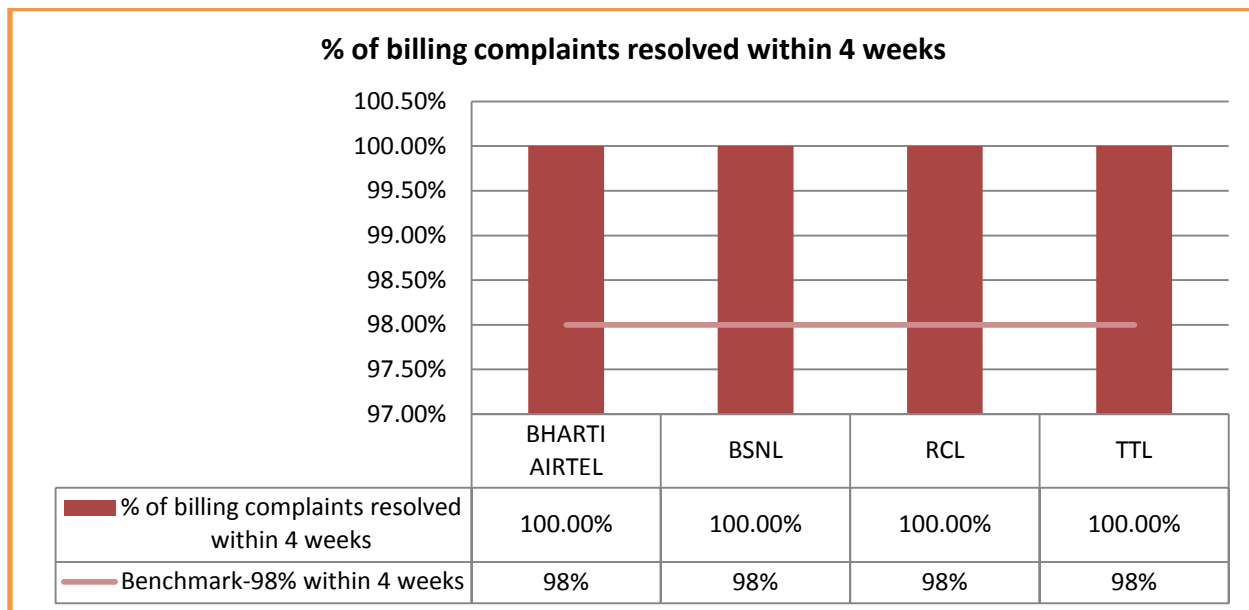
All Operators are meeting the benchmarks.

6) TERMINATION & CLOSURES:

Customer care(promptness in attending to customers request)

	BHARTI AIRTEL	BSNL	RCL	TTL
Termination / Closures	100.00%	95.08%	100.00%	100.00%
Time taken for refunds of deposit after closures	100.00%	100.00%	100.00%	100.00%
Benchmark 100%	100.00%	100.00%	100.00%	100.00%
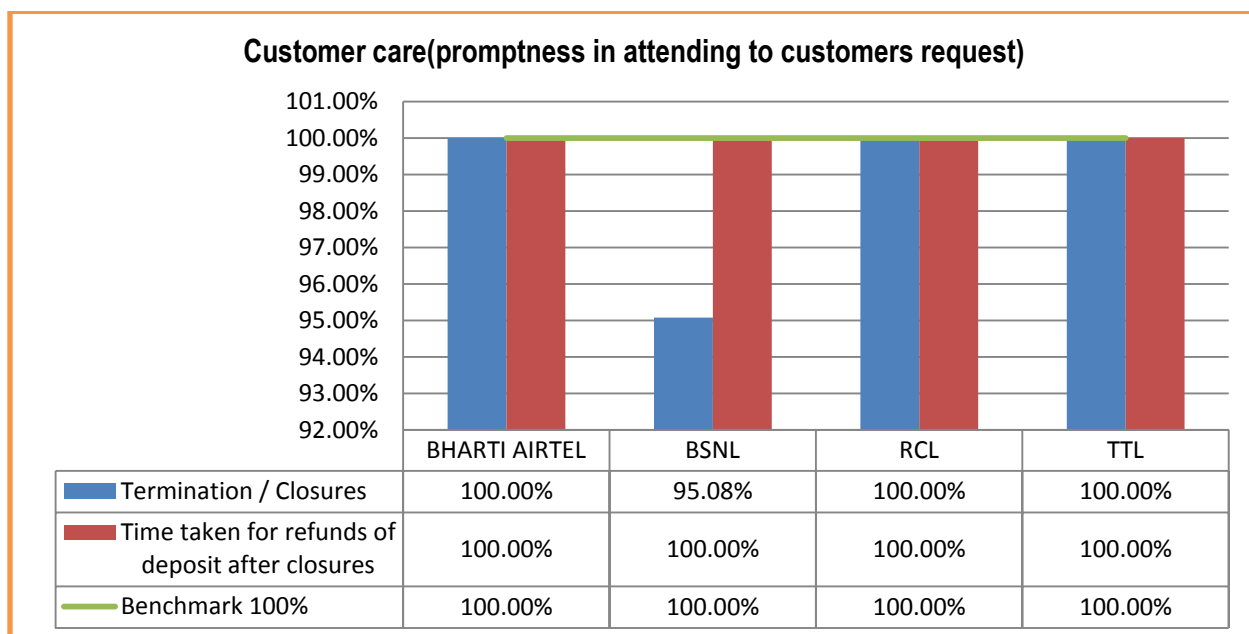
All Operators are meeting the benchmarks except BSNL for the parameter Termination/Closure.

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

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

Response Time to customer for assistance Accessibility of Call centre/customer

	BHARTI AIRTEL	BSNL	RCL	TTL
Quarterly	100.00%	95.64%	93.75%	96.14%
Live	100.00%	100.00%	98.45%	100.00%
Benchmark ≥95%	95%	95%	95%	95%
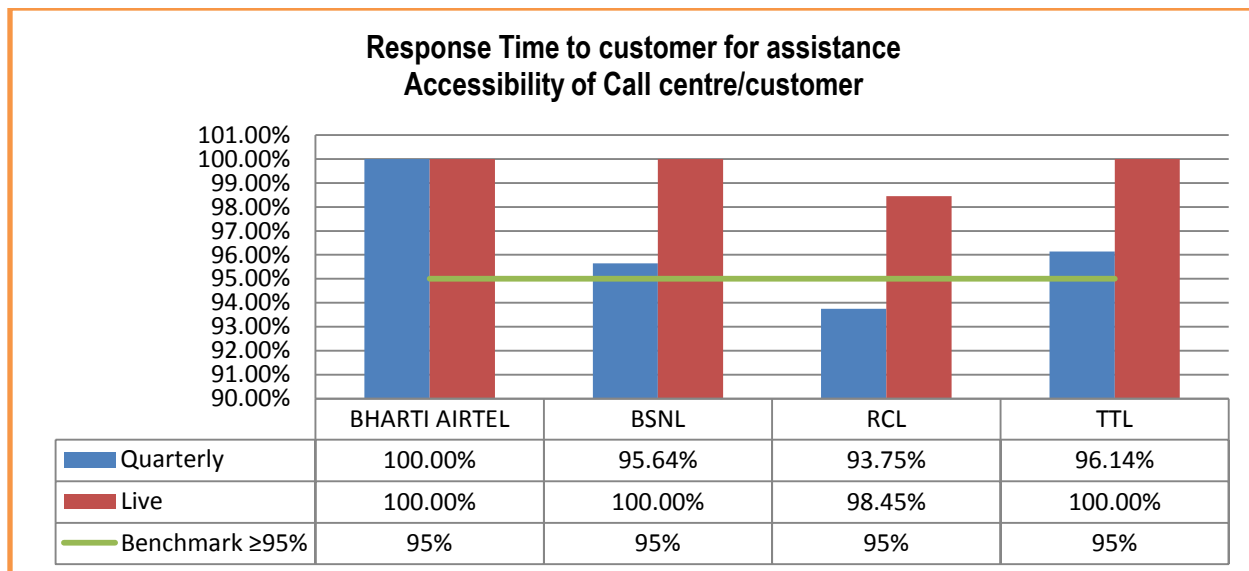
All Operators are meeting the benchmarks except RCL.

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

Response Time to customer for assistance % age of calls answered by operator(voice to voice) within 60 seconds

	BHARTI AIRTEL	BSNL	RCL	TTL
Quarterly	98.62%	96.51%	95.20%	93.43%
Live	100.00%	100.00%	98.92%	100.00%
Benchmark ≥95%	95%	95%	95%	95%
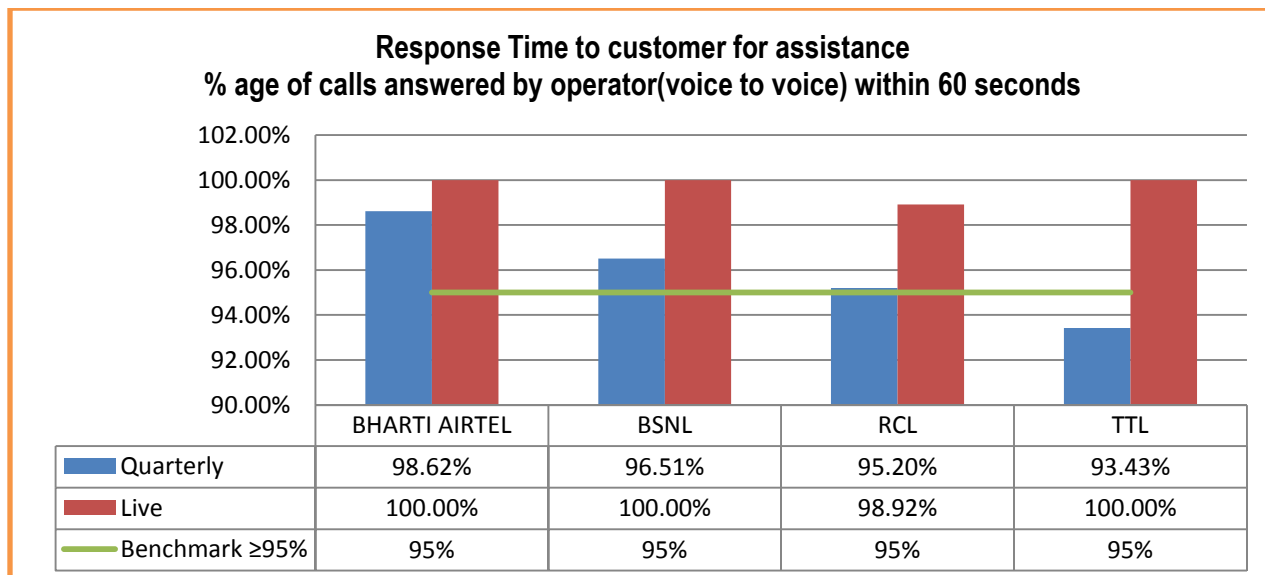
All Operators are meeting the benchmarks except TTL.

10. QOS AUDIT OF BROADBAND SERVICE PROVIDERS

10. QUALITY OF SERVICE AUDIT OF BROADBAND SERVICE PROVIDERS

TUV–SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

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

Audit was done for the following Broadband service Providers:

SL. NO.	NAME OF BROADBAND SERVICE PROVIDERS	LOCATION OF AUDIT
1	BSNL	BSNL GMTD OFFICE, AMBALA, HARYANA
2	BHARTI-AIRTEL	AIRTEL BHARTI, IT PARK, MOHALI
3	FIVE NETWORK	FIVE NETWORK, BHATINDA, PUNJAB
4	TCL	TTSL OFFICE, PUNE, MAHARASHTRA
5	TTL	TTSL OFFICE, PUNE, MAHARASHTRA
6	RCL	DAKC, MUMBAI
7	PACENET	BROADBAND PACNET INDIA PVT LTD, SUBHASH NAGAR, NEW DELHI
8	YOU BROADBAND	YOU BROADBAND, GURGAON, HARYANA

10.1 QUARTERLY MEASURMENT DATA FOR BROADBAND SERVICE PROVIDERS

AVERAGED QUARTERLY (OCT to DEC 14) AUDIT DATA FOR BROADBAND SERVICES – HARYANA CIRCLE											
Broadband Audit Data		**Bench-mark**	**Circle Name**	**BHARTI AIRTEL**	**BSNL**	**FIVE NETWORK**	**RCL**	**TCL**	**TTL**	**PACENET**	**YOU BROADBAND**
S/ N	**Name of Parameter**			**BROADBAND SERVICE PROVIDERS**							
1	**Service Provisioning/Activation Time**										
	A) No of connections registered during the period		Haryana	758	470	47	60	0	51	197	428
	B) Total number of connections provided within 15 days of registration on demand during the period		Haryana	758	470	47	60	0	51	197	415
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	<15 days	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	**96.96%**
	D)Total number of connections provided after 15 days of registration on demand		Haryana	0	0	0	0	0	0	0	13
	E) %age of connections provided after 15 days of registration on demand		Haryana	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	**3.04%**
	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.*	Haryana	0	0	0	0	0	0	0	0
2	**Fault Repair/Restoration Time**										
	A) Total number of faults registered during the period		Haryana	1344	674	84	0	134	99	87	4910
	B) Total number of faults repaired by next working day		Haryana	1248	616	84	0	125	82	74	4236
	C) % age of faults repaired by next working day	>90%	Haryana	92.86%	91.39%	100.00%	100.00%	93.28%	**82.83%**	**85.06%**	**86.27%**
	D) Total number of faults repaired within three working days		Haryana	1339	674	84	0	131	96	87	4607
	E)% age of faults repaired within three working days	≥99%	Haryana	99.63%	100.00%	100.00%	100.00%	**97.76%**	**96.97%**	100.00%	**93.83%**
3	**Rent Rebate**										
	A) Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		Haryana	0	0	0	0	0	0	0	126

AVERAGED QUARTERLY (OCT to DEC 14) AUDIT DATA FOR BROADBAND SERVICES – HARYANA CIRCLE											
Broadband Audit Data		**Bench-mark**	**Circle Name**	**BHARTI AIRTEL**	**BSNL**	**FIVE NETWORK**	**RCL**	**TCL**	**TTL**	**PACENET**	**YOU BROADBAND**
S/ N	**Name of Parameter**			**BROADBAND SERVICE PROVIDERS**							
	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		Haryana	0	0	0	0	0	0	0	180
	C) Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		Haryana	0	0	0	0	0	0	0	0
4	**Billing Performance**										
	A) Total bills generated during period		Haryana	34553	16268	NA	8	12	1026	6642	14
	B) Total complaints received from customers/ Bills disputed		Haryana	9	0	NA	0	0	5	0	0
	C) Billing complaints per 100 bills issued	<2%	Haryana	0.03%	0.00%	NA	0.00%	0.00%	0.49%	0.00%	0.00%
	D) Total number of complaints resolved in 4 weeks from date of receipt		Haryana	9	0	NA	0	0	5	0	0
	E) %age billing complaints resolved in 4 weeks	100%	Haryana	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%	100.00%
	F) Total number of cases requiring refund of deposits after closure		Haryana	0	0	NA	0	0	0	0	10
	G) Total number of cases where refund was made in <60 days		Haryana	0	0	NA	0	0	0	0	9
	H) Percentage cases in which refund received within 60 days	100%	Haryana	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%	**90.00%**
5	**Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)**										
	A) Total number of calls received by the operator		Haryana	5444	47078	28	38705	124656	113	139	16350
	B) Total number of calls answered by the operator within 60 seconds		Haryana	5243	42514	28	36780	108921	97	122	15574
	C) % age calls answered by the operator in 60 seconds	>60%	Haryana	96.31%	90.31%	100.00%	95.03%	87.38%	85.84%	87.77%	95.25%
	D) Total number of calls answered by the operator within 90 seconds		Haryana	5308	43463	28	37000	110810	98	139	15913
	E) % age calls answered by the operator within 90 seconds	>80%	Haryana	97.50%	92.32%	100.00%	95.59%	88.89%	86.73%	100.00%	97.33%
6	**Bandwidth Utilization/ Throughput:**										
6.1	**POP to ISP Gateway Node [Intra-network] Link(s)**										

	AVERAGED QUARTERLY (OCT to DEC 14) AUDIT DATA FOR BROADBAND SERVICES – HARYANA CIRCLE									
Broadband Audit Data		**Bench-mark**	**Circle Name**	**BHARTI AIRTEL**	**BSNL**	**FIVE NETWORK**	**RCL**	**TCL**	**TTL**	**PACENET**	**YOU BROADBAND**
S/ N	**Name of Parameter**			**BROADBAND SERVICE PROVIDERS**							
	A) Total Bandwidth Available at the link for the period days		Haryana	5670	9216	60	27000	455978	NA	2040	NA
	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)		Haryana	3290.64	3285	36.17	3279	1095048	NA	1230	NA
	C) % age Bandwidth utilized during the period	<80%	Haryana	58.04%	35.64%	60.28%	12.14%	41.64%	NA	60.29%	NA
6.2	**A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity**										
	A) Total number of upstream links for International connectivity		Haryana	NA	15	NA	11	16	3	NA	3
	B) Number of Links having Bandwidth utilization > 90% during TCBH		Haryana	NA	0	NA	0	0	0	NA	0
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		Haryana	NA	38400	NA	312000	955392	21700	NA	1090
	D) Total international bandwidth utilization during peak hours (TCBH) in Mpbs		Haryana	NA	10566.50	NA	156087.14	456000	16646	NA	815
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	Haryana	NA	27.52%	NA	50.03%	47.73%	76.71%	NA	74.77%
6.3	**Broadband Connection Speed (download) - from ISP Node to User**										
	A) Total committed download speed to the sample subscribers (In mpbs)		Haryana	6.00	30.00	9.00	300.00	0.75	9.02	NP	6.00
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		Haryana	6.00	40.20	7.90	281.26	0.72	7.85	NP	5.28
	C) % age subscribed speed available to the subscriber during TCBH	>80%	Haryana	100.00%	134.00%	87.78%	93.75%	96.00%	87.03%	NP	88.00%
7	**Service Availability/Uptime**										
	A) Total operational Hours		Haryana	25431360	2208	2208	2208	57408	24288	2160	7233912
	B) Total downtime (In hours)		Haryana	185	0	0	0	40	118	26	37382
	C) Total time when the service was available (In Hrs)		Haryana	25431175	2208	2208	2208	57368	24170	2134	7196530
	D) % age of Service availability uptime	>98%	Haryana	99.999%	100.00%	100.00%	100.00%	99.93%	99.51%	98.80%	99.48%
8	**Packet Loss**										
	A) Total number of ping packets transmitted		Haryana	3000	12000	92000	92000	92000	9375	NP	3000
	B) Total number of ping packets lost		Haryana	0	33	7	502	0	33	NP	0
	C) % age packet loss	<1%	Haryana	0.00%	0.28%	0.01%	0.55%	0.00%	0.35%	NP	0.00%

AVERAGED QUARTERLY (OCT to DEC 14) AUDIT DATA FOR BROADBAND SERVICES – HARYANA CIRCLE										
Broadband Audit Data		**Bench-mark**	**Circle Name**	**BHARTI AIRTEL**	**BSNL**	**FIVE NETWORK**	**RCL**	**TCL**	**TTL**	**PACENET**	**YOU BROADBAND**
S/ N	**Name of Parameter**			**BROADBAND SERVICE PROVIDERS**							
9	**Network latency (for wired broadband access)**										
	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway										
9.1	A) Total number of ping packets transmitted		Haryana	3000	12000	92000	3000	3000	9375	NA	3000
	B) Total round trip time for all the ping packets transmitted during the period		Haryana	2915	55.25	1552000	48	46	907500	NA	24489
	C) Average round trip tip time for all the ping transmitted	<120 ms	Haryana	31.60	11.25	16.86	16.00	70.00	97.33	NA	8.16
	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)										
9.2	A) Total number of ping packets transmitted		Haryana	3000	12000	92000	3000	3000	3600	NP	3000
	B) Total round trip time for all the ping packets transmitted during the period		Haryana	4914.30	109.75	9446690	48	806	257760	NP	838356
	C) Average round trip tip time for all the ping transmitted	<350 ms	Haryana	246.39	25.00	102.68	16.00	90.00	71.60	NP	279.50
	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)										
9.3	A) Total number of ping packets transmitted		Haryana	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		Haryana	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	Haryana	NA	NA	NA	NA	NA	NA	NA	NA

NA- Not Applicable
NP-Not Provided- Monthly Data Not Monitored by ISPs

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

S/ N	3 days live Broadband Audit Data / Name of Parameter	Bench-mark	Circle Name	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
				BROADBAND SERVICE PROVIDERS							
1	Response time to the customer for assistance % age of calls answered by the operator (Voice to Voice)										
	A) Total number of calls received by the operator		Haryana	168	NP	3	1397	4077	1	18	60
	B) Total number of calls answered by the operator within 60 seconds		Haryana	165	NP	3	1381	3717	1	10	60
	C) % age calls answered by the operator in 60 seconds	>60%	Haryana	98.21%	NP	100.00%	98.85%	91.17%	100.00%	55.56%	100.00%
	D) Total number of calls answered by the operator within 90 seconds		Haryana	165	NP	3	1388	3781	1	10	0
	E) % age calls answered by the operator within 90 seconds	>80%	Haryana	98.21%	NP	100.00%	99.36%	92.74%	100.00%	55.56%	100.00%
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		Haryana	5670	9216	60	9000	1095948	NA	2130	NA
	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)		Haryana	3150.99	3639	35.43	5398	554000	NA	1050	NA
	C) % age Bandwidth utilized during the period	<80%	Haryana	55.57%	39.49%	59.05%	59.98%	50.59%	NA	49.30%	NA
2.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity										
	A) Total number of upstream links for International connectivity		Haryana	NA	15	NA	30	16	3	NA	9
	B) Number of Links having Bandwidth utilization > 90% during TCBH		Haryana	NA	0	NA	0	0	0	NA	0
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		Haryana	NA	38400	NA	282000	955392	24180	NA	1185
	D) Total international bandwidth utilization during peak hours (TCBH) in Mpbs		Haryana	NA	9009	NA	186072	603136	17393	NA	893
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	Haryana	NA	23.46%	NA	65.98%	63.13%	71.93%	NA	75.36%
2.3	Broadband Connection Speed (download) - from ISP Node to User										
	A) Total committed download speed to the sample subscribers (In mpbs)		Haryana	6.00	30.00	9.00	3.60	0.75	NP	7.00	4.80

3 DAYS LIVE DATA FOR BROADBAND SERVICES - HARYANA CIRCLE										
3 days live Broadband Audit Data		Bench-mark	Circle Name	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS							
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		Haryana	6.00	33.50	7.73	3.20	0.73	NP	6.93	7.00
	C) % age subscribed speed available to the subscriber during TCBH	>80%	Haryana	100.00%	111.67%	85.89%	88.89%	97.33%	NP	99.00%	145.83%
3	**Packet Loss**										
	A) Total number of ping packets transmitted		Haryana	3000	3000	3000	3000	3000	15000	3000	3000
	B) Total number of ping packets lost		Haryana	1	0	1	0	0	11	0	0
	C) % age packet loss	<1%	Haryana	0.03%	0.00%	0.03%	0.00%	0.00%	0.07%	0.00%	0.00%
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		Haryana	3000	3000	3000	3000	3000	15000	3000	3000
	B) Total round trip time for all the ping packets transmitted during the period		Haryana	2999	3000	205000	3000	3000	14989	3000	3000
	C) Average round trip tip time for all the ping transmitted	<120 ms	Haryana	34.57	2.00	68.33	4.60	21.00	70.00	45.66	3.33
	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)										
4.2	A) Total number of ping packets transmitted		Haryana	3000	9000	9000	9000	6000	3600	9000	9000
	B) Total round trip time for all the ping packets transmitted during the period		Haryana	3000	9000	866000	9000	6000	2598	8997	9000
	C) Average round trip tip time for all the ping transmitted	<350 ms	Haryana	77.37	10.00	96.22	76.00	77.00	80.50	91.33	289.33
	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)										
4.3	A) Total number of ping packets transmitted		Haryana	NA	NA	NA	NA	NA	NA	9000	NA
	B) Total round trip time for all the ping packets transmitted during the period		Haryana	NA	NA	NA	NA	NA	NA	8981	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	Haryana	NA	NA	NA	NA	NA	NA	105.89	NA
5	**Service Availability/Uptime**										
	A) Total operational Hours		Haryana	NA	72	72	72	1872	792	72	234640
	B) Total downtime (In hours)		Haryana	NA	0	0	0	0.42	0	0	0
	C) Total time when the service was available (In Hrs)		Haryana	NA	72	72	72	1871.58	792	72	234640
	D) % age of Service availability uptime	>98%	Haryana	NA	100.00%	100.00%	100.00%	99.98%	100.00%	100.00%	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 all Broadband service providers were well within the benchmark. Only **You Broadband** remained under performed with its performance as **96.96%.**

Fault Repair/Restoration Time: With regards to this parameter, the performances of majority of Broadband service providers were within TRAI norms. However, **TTL , Pacenet and You Broadband** failed to meet the benchmark of parameter **Fault repaired by next working day** with their performance level as **82.83%, 85.06% and 86.27%** respectively against the benchmark of >90%. Apart from this**, TCL, TTL and You Broadband** also lagged behind the benchmark of parameter **Fault repaired within 3 days**. They could achieve the performance level as **97.76%, 96.97% and 93.83%** respectively against the benchmark of > 99%.

Billing Performance: For this parameter also the performance of the service providers was well within the compliance benchmarks. However, only **You Broadband** failed to meet the benchmark of parameter 'Refund of deposit after closure' with its performance as **90.00%** 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. **During live measurement**, only **Pacenet** remained short of benchmark with its performance of **55.56%** of calls answered by operator.

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

The performance of service providers with respect of these parameters was found satisfactory i.e. within benchmark during quarterly audit as well as 3 days live measurement.

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. **Pacenet** is not monitoring the packet loss so 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 **TCL, TTSL, Pacenet and You Broadband** could not meet the benchmarks for parameters **Fault repairs / Restoration Time. Whereas, Pacenet failed to meet the benchmark of parameter Call answered by Operator**. For rest of the parameters other services providers were meeting the benchmarks.*

10.4 CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE FOR BROADBAND SERVICES									
Parameter	Circle Name	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Total No. of calls Attempted	Haryana	100	100	100	100	100	100	100	100
Total number of calls answered by the operator within 60 seconds	Haryana	100	86	100	100	100	100	64	88
% age calls answered by the operator in 60 seconds	Haryana	100.00%	**86.00%**	100.00%	100.00%	100.00%	100.00%	**64.00%**	**88.00%**
Total number of calls answered by the operator within 90 seconds	Haryana	100	100	100	100	100	100	84	100
% age calls answered by the operator within 90 seconds	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	**84.00%**	100.00%

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. However, BSNL, Pacenet & You Broadband could connect 86%, 64% and 88% of calls within 60 seconds and Pacenet could connect 84% of calls within 90 sec.

10.5 LIVE CALLING FOR BILLING COMPLIANTS

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS									
Parameter	Circle Name	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Total No. of calls Attempted	Haryana	9	0	0	0	0	5	0	0
Total No. of calls Answered	Haryana	9	0	0	0	0	5	0	0
Cases resolved within 4 weeks	Haryana	9	0	0	0	0	5	0	0
%age of cases resolved	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Note: BSNL, RCL, TCL, Pacenet, NSTPL & Tikona have no billing complaints for these operators and Five Network have Prepaid model.

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 and in other cases the billing complaints were Zero. In case of the operators having billing complaints, the customers reported their satisfaction on resolution of the billing complaints.

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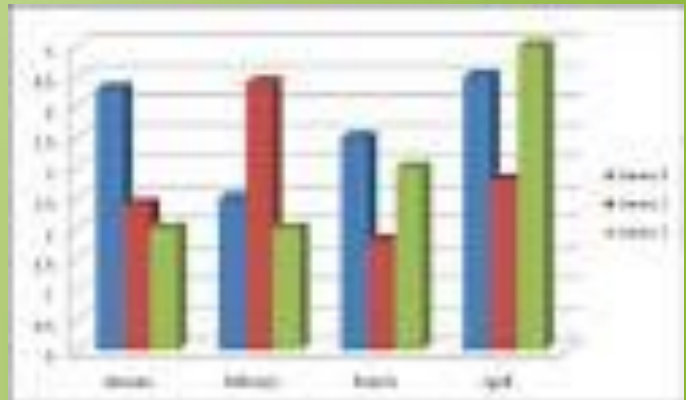
10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:

1. SERVICE PROVISIONING/ACTIVATION TIME:

Service Provisioning/Activation Time

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROAD BAND
100% cases in 15 days (subject to technical feasibility)	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.96%
Benchmark <15 days	100%	100%	100%	100%	100%	100%	100%	100%
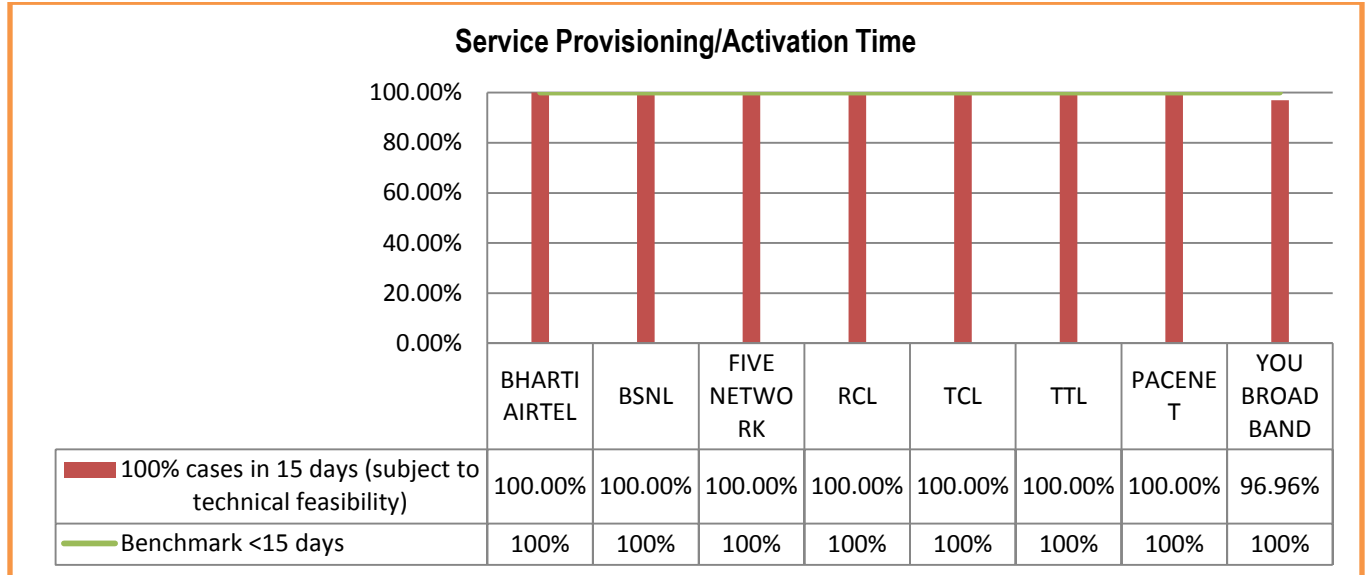
All Operators are meeting the benchmarks except You Broadband.

2. BILLING PERFORMANCE:

Billing Performance

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Billing complaints per 100 bills issued	0.03%	0.00%		0.00%	0.00%	0.49%	0.00%	0.00%
Benchmark <2%	2%	2%	2%	2%	2%	2%	2%	2%
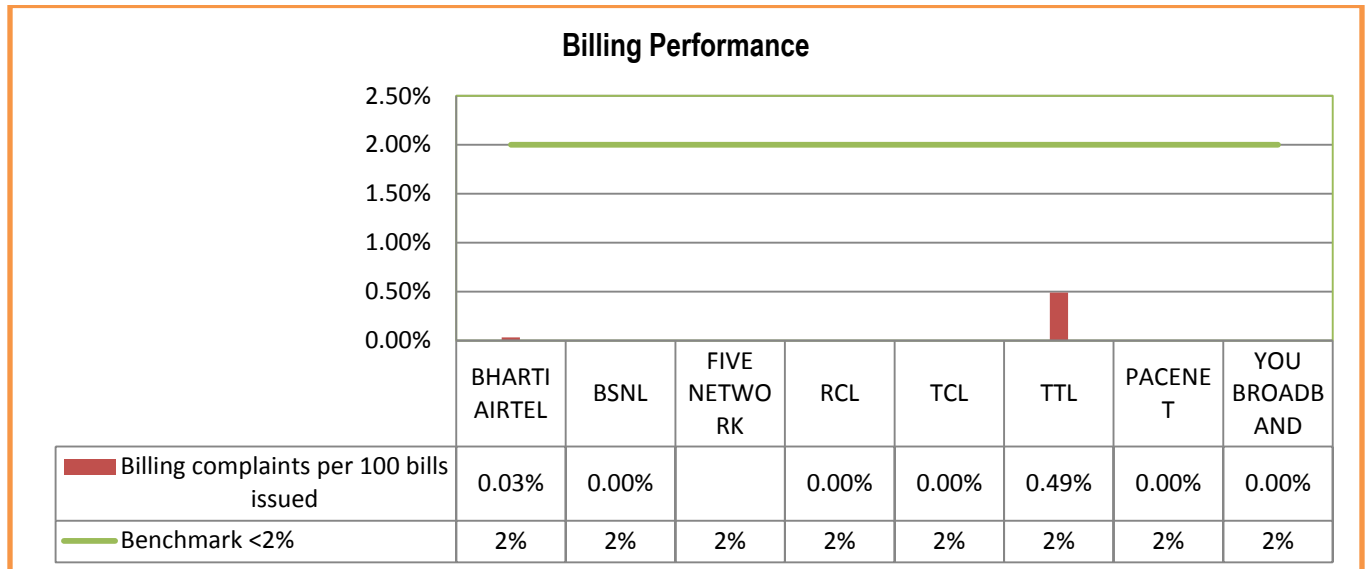
All Operators are meeting the benchmarks.

3. FAULTS REPAIR/RESTORATION TIME:

Faults Repair/Restoration Time

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Faults Repair/Restoration Time within 3 working day	99.63%	100.00%	100.00%	100.00%	97.76%	96.97%	100.00%	93.83%
Benchmark ≥99%	99%	99%	99%	99%	99%	99%	99%	99%
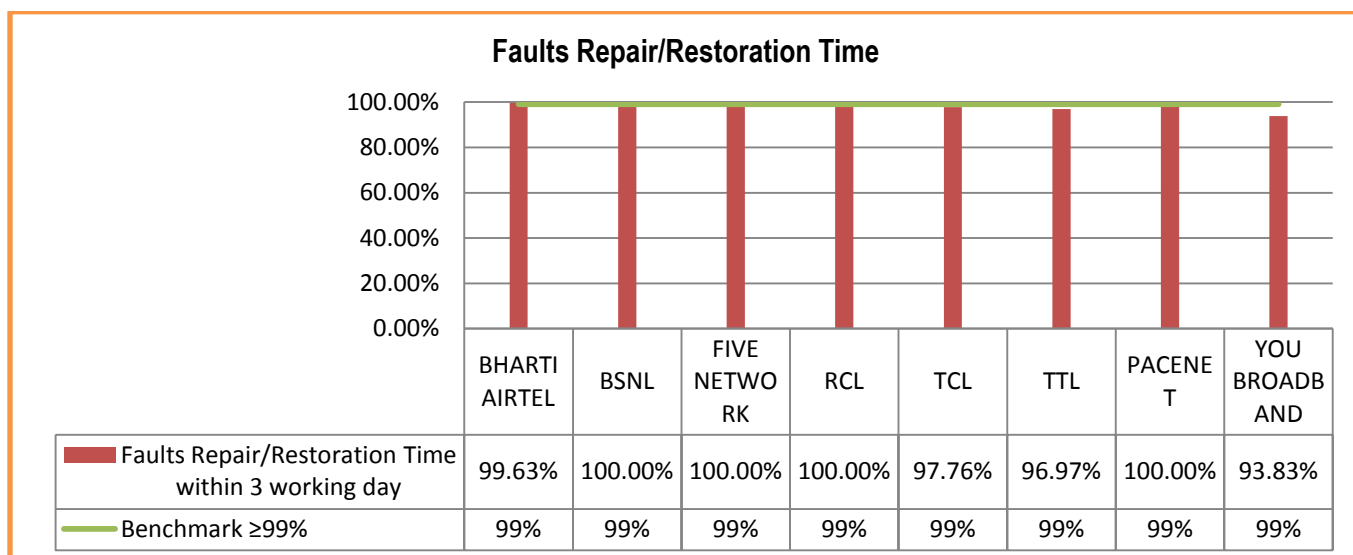
All Operators are meeting the benchmarks except TCL, TTL & You Broadband.

4. COMPLAINT RESOLUTION:

Complaint Resolution

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
%age of complaints resolved within 4 weeks	100.00%	100.00%		100.00%	100.00%	100.00%	100.00%	100.00%
Benchmark 100%	100%	100%	100%	100%	100%	100%	100%	100%
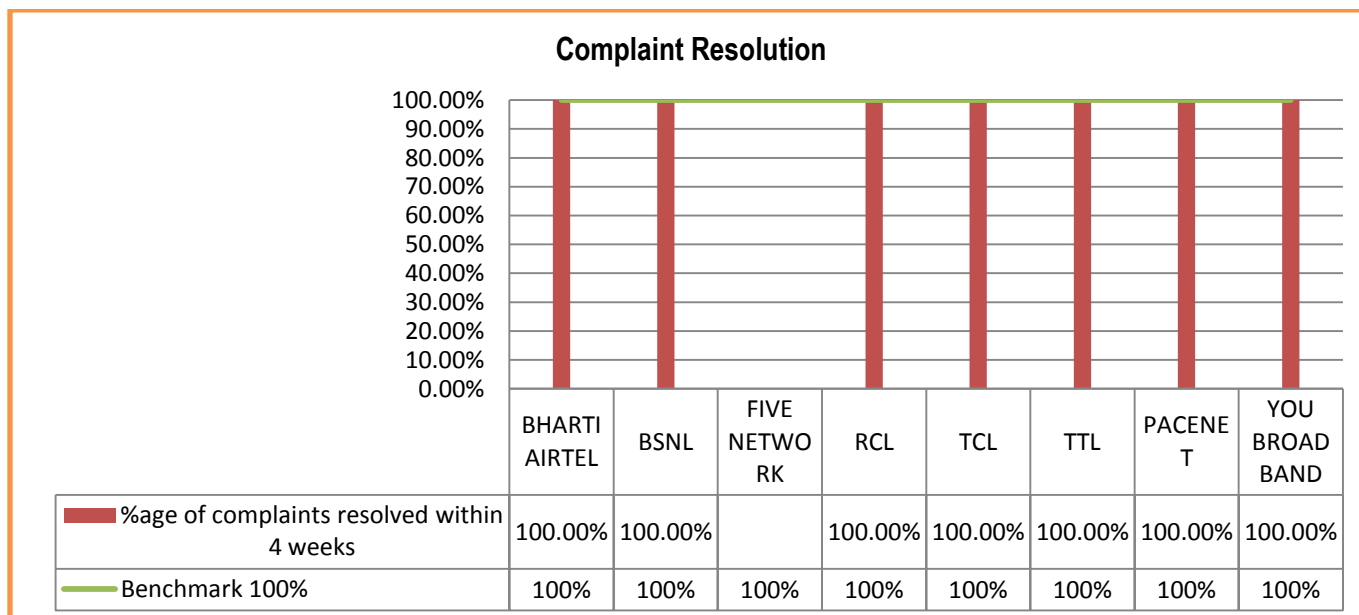
All Operators are meeting the benchmarks.

5. REFUND:

Time taken for refund of deposits after closure (within 60 days)

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROAD BAND
Time taken for refund of deposits after closure (within 60 days)	100.00%	100.00%		100.00%	100.00%	100.00%	100.00%	90.00%
Benchmark 100% (within 60 days)	100%	100%	100%	100%	100%	100%	100%	100%
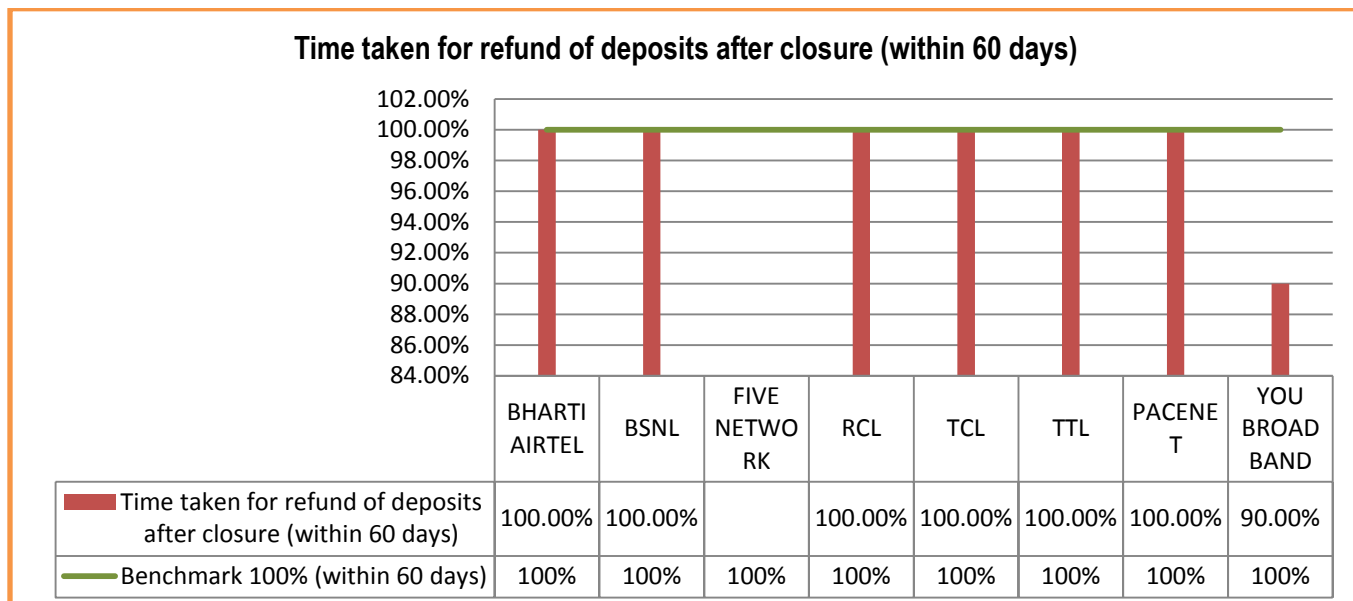
All Operators are meeting the benchmarks except You Broadband.

6. SERVICE AVAILABILITY/UPTIME:

Service Availability/Uptime (for all users) in %age

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROAD BAND
Service Availability/Uptime (for all users) in %age	99.999%	100.00%	100.00%	100.00%	99.93%	99.51%	98.80%	99.48%
Benchmark >98%	98%	98%	98%	98%	98%	98%	98%	98%
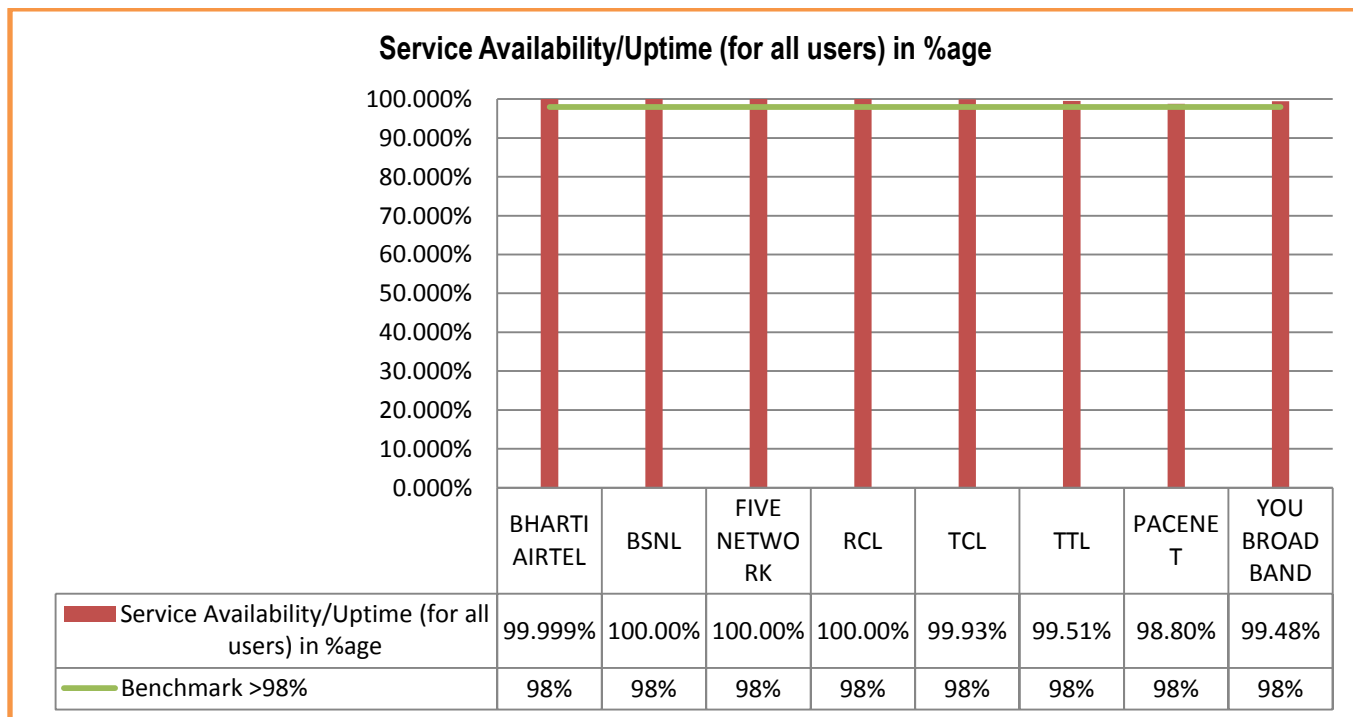
All Operators are meeting the benchmarks.

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

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

Bandwidth Utilization/ Throughput POP to ISP Gateway Node [Intra-network] Link(s)

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Quarterly	58.04%	35.64%	60.28%	12.14%	41.64%		60.29%	
Live	55.57%	39.49%	59.05%	59.98%	50.59%		49.30%	
Benchmark <80%	80%	80%	80%	80%	80%	80%	80%	80%
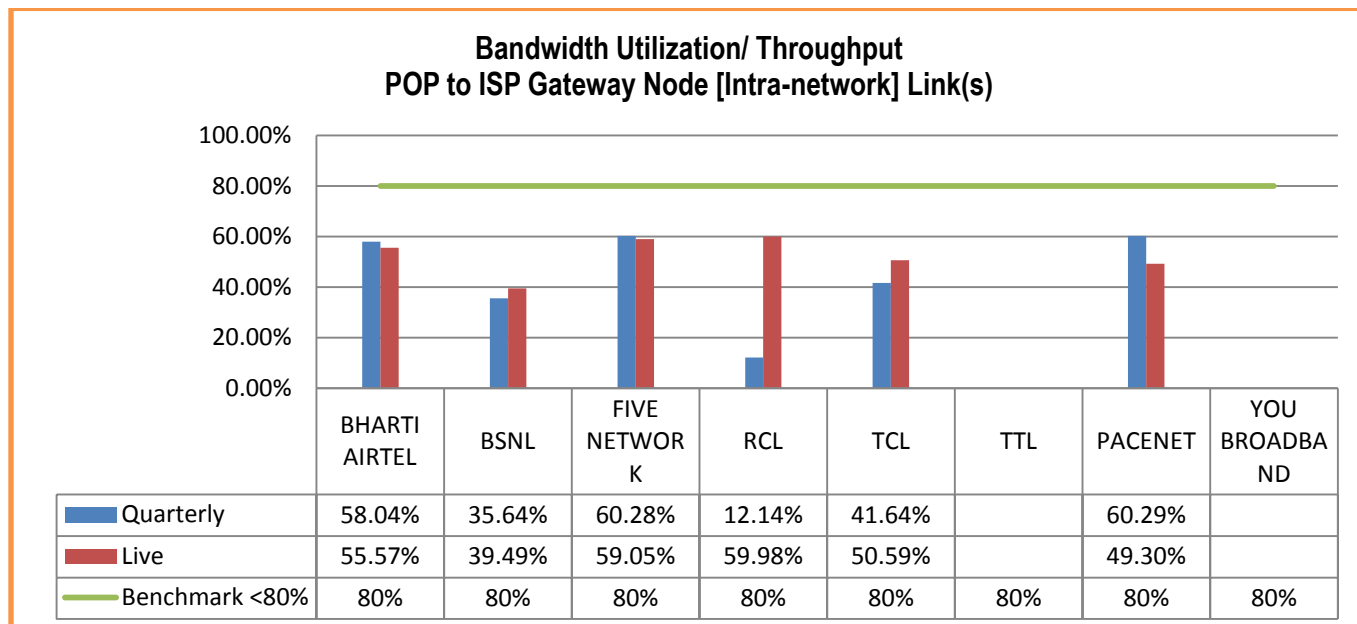
All Operators are meeting the benchmarks.

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

Bandwidth Utilization/ Throughput ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Quarterly		27.52%		50.03%	47.73%	76.71%		74.77%
Live		23.46%		65.98%	63.13%	71.93%		75.36%
Benchmark <80%	80%	80%	80%	80%	80%	80%	80%	80%
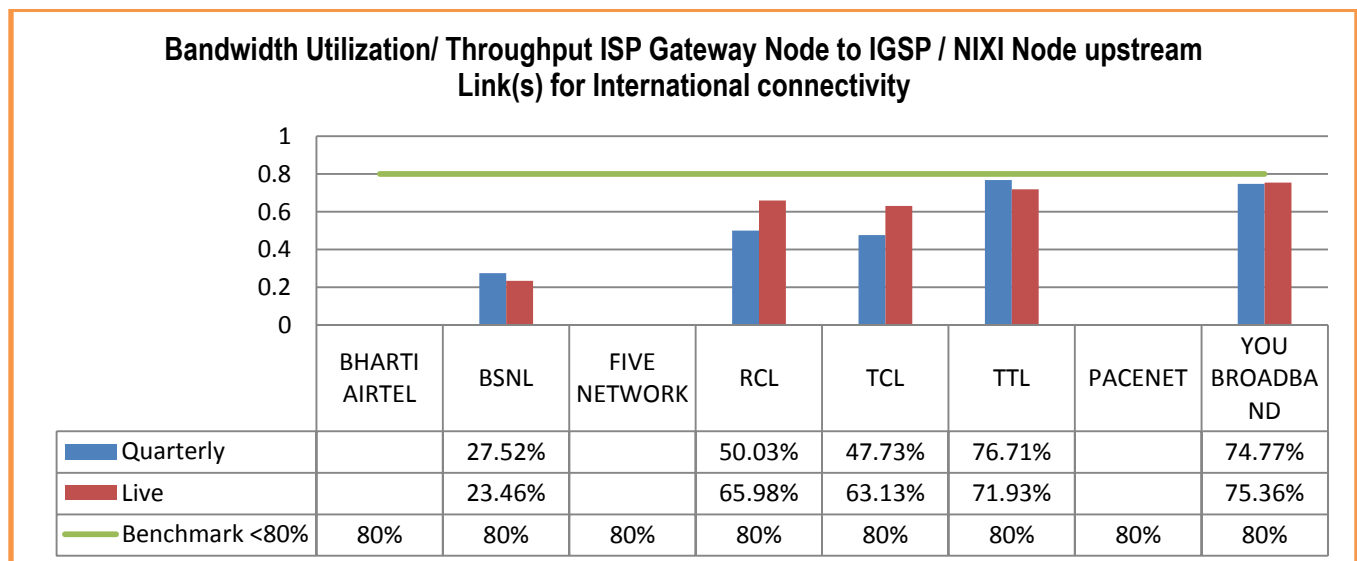
All Operators are meeting the benchmarks.

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

Broadband Connection Speed (download) from ISP Node to User

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Quarterly	100.00%	134.00%	87.78%	93.75%	96.00%	87.03%		88.00%
Live	100.00%	111.67%	85.89%	88.89%	97.33%		99.00%	145.83%
Benchmark >80%	80%	80%	80%	80%	80%	80%	80%	80%
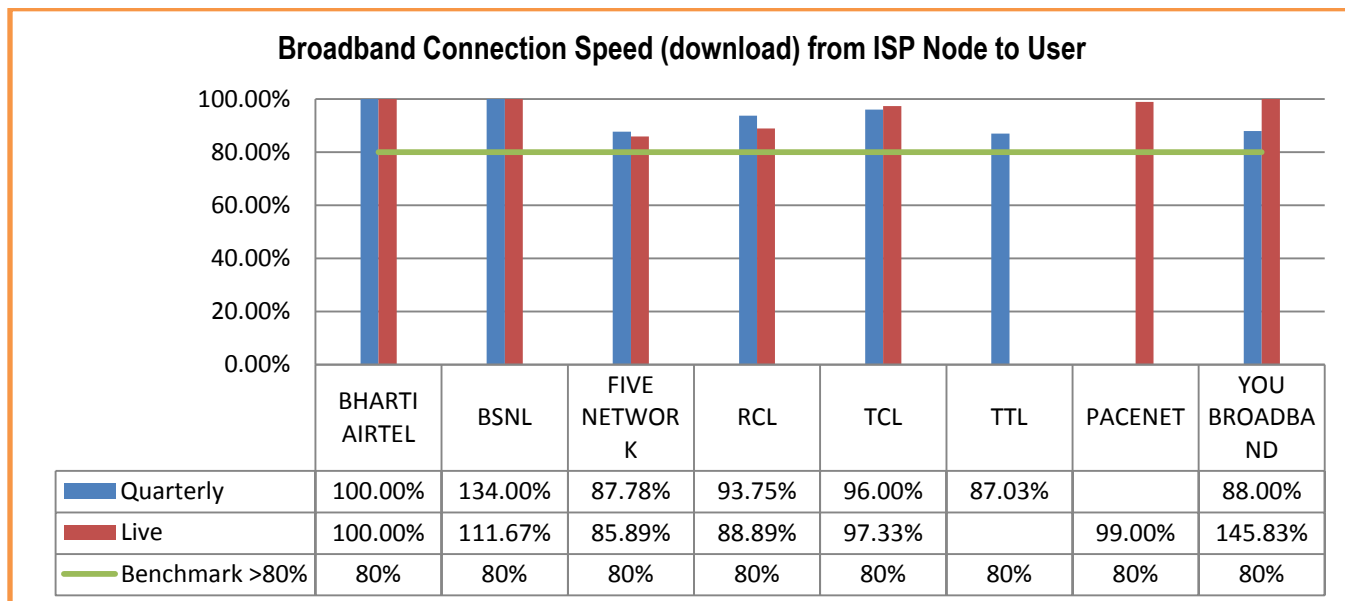
All Operators are meeting the benchmarks.

4. PACKET LOSS:

% of Packet Loss

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Quarterly	0.00%	0.28%	0.01%	0.55%	0.00%	0.35%		0.00%
Live	0.03%	0.00%	0.03%	0.00%	0.00%	0.07%	0.00%	0.00%
Benchmark <1%	1%	1%	1%	1%	1%	1%	1%	1%
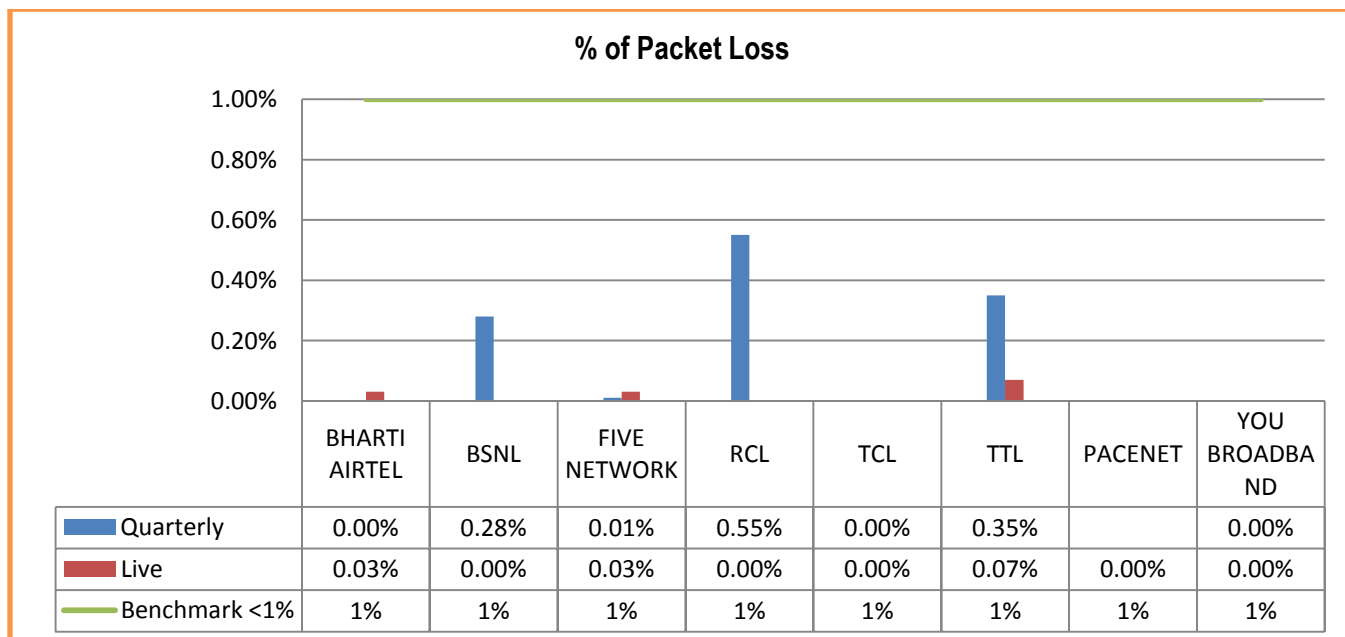
All Operators are meeting the benchmarks.

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

Network latency User reference point at POP/ISP Gateway node to IGSP/NIXI

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Quarterly	31.60	11.25	16.86	16.00	70.00	97.33		8.16
Live	34.57	2.00	68.33	4.60	21.00	70.00	45.66	3.33
Benchmark <120 ms	120	120	120	120	120	120	120	120
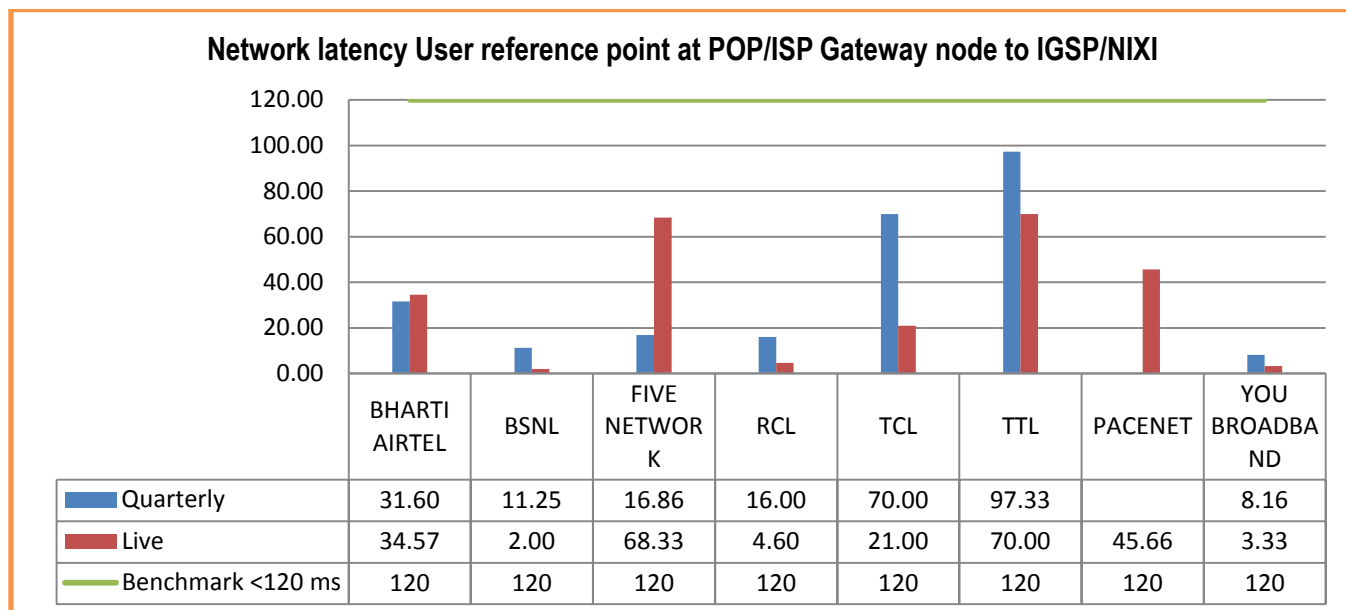
All Operators are meeting the benchmarks.

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

Network latency User reference point at ISP Gateway Node to International nearest NAP port abroad (terrestrial)

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROADBAND
Quarterly	246.39	25.00	102.68	16.00	90.00	71.60		279.50
Live	77.37	10.00	96.22	76.00	77.00	80.50	91.33	289.33
Benchmark <350 ms	350	350	350	350	350	350	350	350
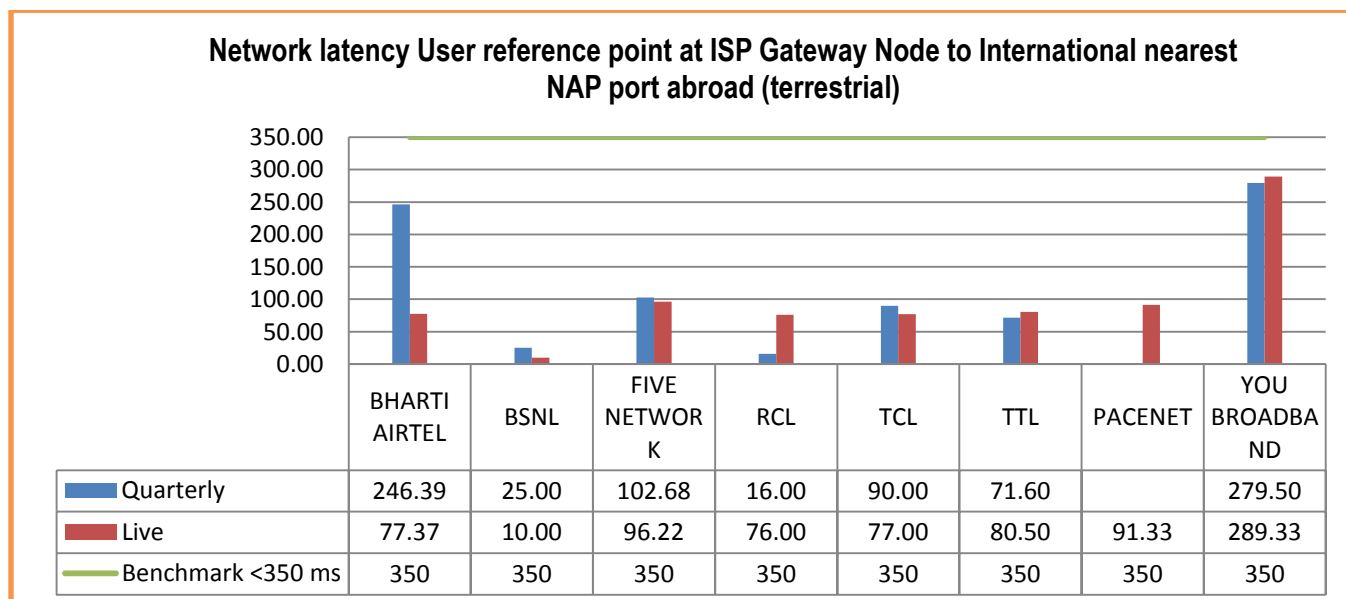
All Operators are meeting the benchmarks.

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

Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)

	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROAD BAND
Quarterly	96.31%	90.31%	100.00%	95.03%	87.38%	85.84%	87.77%	95.25%
Live	98.21%		100.00%	98.85%	91.17%	100.00%	55.56%	100.00%
Benchmark >60% (within 60 sec)	60%	60%	60%	60%	60%	60%	60%	60%
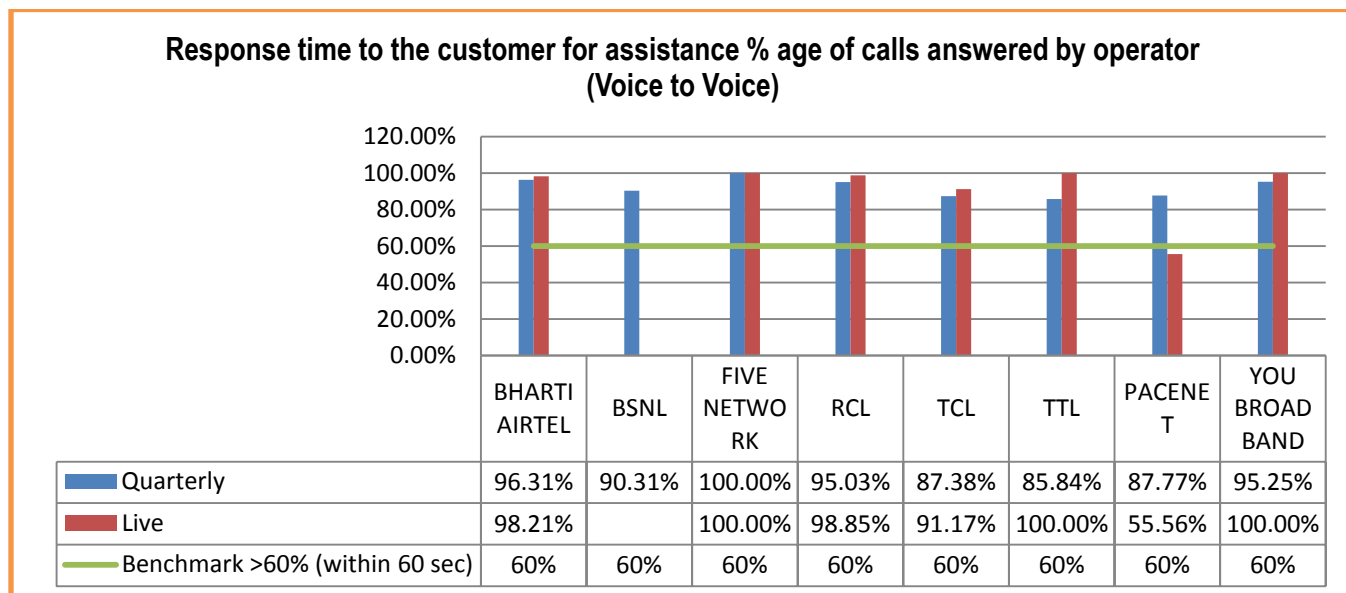
All Operators are meeting the benchmarks except Pacenet (3 day live).

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

Response time to the customer for assistance % age of calls answered by operator (Voice to Voice) 90 Sec.

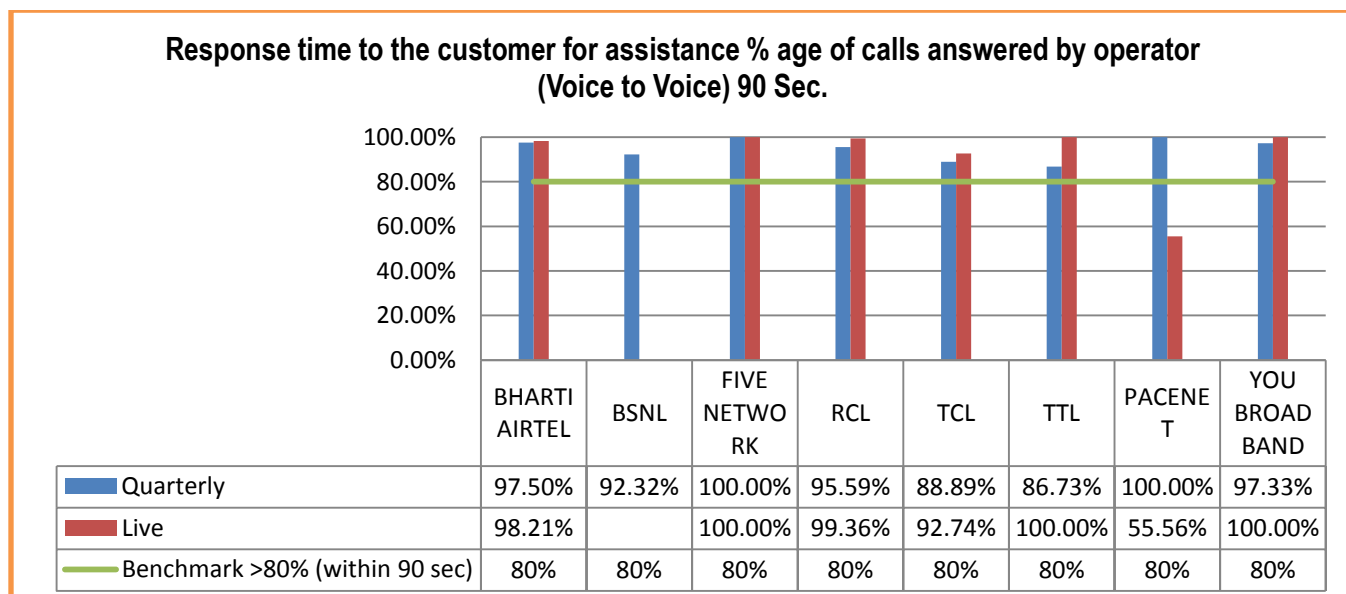|	BHARTI AIRTEL	BSNL	FIVE NETWORK	RCL	TCL	TTL	PACENET	YOU BROAD BAND
Quarterly	97.50%	92.32%	100.00%	95.59%	88.89%	86.73%	100.00%	97.33%
Live	98.21%		100.00%	99.36%	92.74%	100.00%	55.56%	100.00%
Benchmark >80% (within 90 sec)	80%	80%	80%	80%	80%	80%	80%	80%

All Operators are meeting the benchmarks except Pacenet (3 day live).

Annex-1

S.N.	SERVICE PROVIDER	SSA NAME	SDCA NAME	EXCHANGE NAME	EXCHANGE TYPE
1	BSNL	AMBALA	AMBALA	AMBALA CANTT-DAYAL BAGH	URBAN
2	BSNL			AMBALA CANTT-GOVIND NAGAR	URBAN
3	BSNL			AMBALA CANTT-PALAM VIHAR	URBAN
4	BSNL			AMBALA CANTT-INDUSTRIAL AREA	URBAN
5	BSNL			SAHA	RURAL
6	BSNL			BULLANA	RURAL
7	BSNL			DANIPUR	RURAL
8	BSNL			BOH	RURAL
9	BSNL			SAMALKHA	RURAL
10	BSNL			KAULAN	RURAL
11	BSNL			NIHONI	RURAL
12	BSNL			BAROULA	RURAL
13	BSNL			KHANNA MAJRA	RURAL
14	BSNL			BIHTA	RURAL
15	BSNL		YAMUNANAGAR	YAMUNANAGAR-MAIN	URBAN
16	BSNL			YAMUNANAGAR- INDUSTRIAL AREA	URBAN
17	BSNL			YAMUNANAGAR- INDUSTRIAL AREA-II	URBAN
18	BSNL			ALAHAR	RURAL
19	BSNL			BAMBHOLI	RURAL
20	BSNL			BHOGPUR	RURAL
21	BSNL			CHAMRAURI	RURAL
22	BSNL			DAMLA	RURAL
23	BSNL			GILLOUR	RURAL
24	BSNL	KARNAL	KARNAL	KARNAL SEC 7	URBAN
25	BSNL			KARNAL SEC 6	URBAN
26	BSNL			KARNAL-SEC3	URBAN
27	BSNL			SAMORA	RURAL
28	BSNL			DHANAURA JAGIR	RURAL
29	BSNL			GHEER	RURAL
30	BSNL			JHANJHARI	RURAL
31	BSNL			LANDHORA	RURAL
32	BSNL			KACHHWA	RURAL
33	BSNL			KHANPUR	RURAL

34	BSNL			KUNJPURA	RURAL
35	BSNL			KKR-MAIN	URBAN
36	BSNL			KKR-UNIVERSITY	URBAN
37	BSNL			KKR-RSM	URBAN
38	BSNL			BAGTHALA	RURAL
39	BSNL		KURUKSHETRA	DAMLI	RURAL
40	BSNL			GAZLANA	RURAL
41	BSNL			JALKHERI	RURAL
42	BSNL			KHAIRA	RURAL
43	BSNL			KALYANA	RURAL
44	BSNL			LAKHMARI	RURAL
45	BSNL			MODEL TOWN ROHTAK	URBAN
46	BSNL			ANAJ MANDI ROHTAK	URBAN
47	BSNL			MATA DARWAJA ROHTAK	URBAN
48	BSNL			BOHAR	RURAL
49	BSNL			BAHU JAMALPUR	RURAL
50	BSNL		ROHTAK	BHALOUT	RURAL
51	BSNL			CHIRI	RURAL
52	BSNL			HASSANGARH	RURAL
53	BSNL			JASIA	RURAL
54	BSNL			KILOI	RURAL
55	BSNL	ROHTAK		KHARAWAR	RURAL
56	BSNL			MEHAM	URBAN
57	BSNL			MADINA	URBAN
58	BSNL			LAKHAN MAJRA	URBAN
59	BSNL			AJAIB	RURAL
60	BSNL			BEHLBA	RURAL
61	BSNL		MAHEM	BAINSI	RURAL
62	BSNL			FARMANA	RURAL
63	BSNL			KHARKHERA	RURAL
64	BSNL			NINDANA	RURAL
65	BSNL			SAMAN	RURAL
66	BHARTI-AIRTEL	CHANDIGARH	---	CHANDIGARH	URBAN
67	TTL	PUNE	---	AMBALA	URBAN
68	RCL	DAKC, MUMBAI	---	AMBALA	URBAN

Annex-2

S.N.	CIRCLE	SERVICE PROVIDER	POPS LOCATION	ACTIVITY
1	HARYANA	BSNL	AMBALA	BB AUDIT
2	HARYANA	BHARTI-AIRTEL	MOHALI	BB AUDIT
3	HARYANA	FIVE NETWORK	DABWALI	BB AUDIT
4	HARYANA	TCL	CHANDIGARH	BB AUDIT
5	HARYANA	TTL	CHANDIGARH	BB AUDIT
6	HARYANA	RCL	AMBALA	BB AUDIT
7	HARYANA	PACENET	AMBALA	BB AUDIT
8	HARYANA	YOU BROADBAND	AMBALA	BB AUDIT