



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
BASIC (WIRELINE) SERVICE
&
BROADBAND SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
NORTH ZONE – HARYANA CIRCLE
(OCTOBER 2013 – DECEMBER 2013)

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PREFACE

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

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

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **Haryana circle** against the QoS bench marks laid down by TRAI in the respective regulations.



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1. BACKGROUND

Telecom Regulatory Authority of India has been entrusted to “lay down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical survey of such service provided by the service providers so as to protect interest of the consumers of telecommunication services” vide sub-clause (v) of clause (b) of sub-section (1) of section 11 of the Telecom Regulatory Authority of India Act, 1997 (24 of 1997).

The purpose of laying down Quality of Service Parameters is to:

- i) Create conditions for consumer satisfaction by making known the quality of service, which the Service provider is required to provide, and the user has a right to expect.
- ii) Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.
- iii) Generally protect the interests of consumers of telecommunication services.

TRAI, the regulatory watch dog for the Quality of Service for the telecom services – Basic (Wire line), Cellular Mobile (Wireless) and Broadband has commissioned **M/s TUV-SUD South Asia Pvt. Ltd.** for conducting audit and assessment of quality of service of service providers, in terms of the benchmarks specified in the “The Standards of Quality of Service of Basic Telephone Service (Wire line) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated 20th March, 2009 and the Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6th October, 2006 on zonal basis for **North Zone and West Zone** comprising of the following Telecom Circles/Metro Service Areas:

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

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

The Audit exercise would assess the Quality of Service of telecom operators providing Basic (Wire line), Cellular Mobile (Wireless) and Broadband services by auditing the relevant QoS records maintained by the



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

2. OBJECTIVES AND METHODOLOGY

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 is 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, Delhi, Haryana & Maharashtra Circles also include audit for Basic (Wire line) and Broadband services as mandated by TRAI, during the quarter October- December 2013.**

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

3.1 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
		Oct-13	Nov-13	Dec-13	
GSM Operators					
1	AIRCEL	22 to 24 Oct-13	21 to 23 Nov-13	12 to 14 Dec-13	Green Buleward Building, NSN office, Sector-62, Noida (UP)
2	AIRTEL	29 to 31 Oct-13	12 to 14 Nov-13	8 to 10 Dec-13	Bharti Airtel Ltd, Plot No. 21, Rajiv Gandhi Chandigarh Technology Park, Chandigarh.
3	BSNL	25 to 27 Oct-13	20 to 22 Nov-13	9 to 11 Dec-13	AGM (PG) Cum Nodal Officer (TRAI) O/o CGMT Haryana, Ambala (HR)
4	VIDEOCON	18 to 21 Oct-13	11 to 13 Nov-13	7 to 9 Dec-13	Videocon Telecommunication Ltd, Golden Palace, Near Vita Milk Plant, Jasmeet Nagar, Ambala City-134007
5	TATA GSM	28 to 30 Oct-13	12 to 14 Nov-13	6 to 9 Dec-13	Tata Teleservices Limited, 5 - Jasmeet Nagar, Near Vita Milk Plant Gt Road, Ambala, Ambala-134001, India
6	IDEA	15 to 17 Oct-13	19 to 21 Nov-13	10 to 12 Dec-13	Idea Cellular Limited, E-5, Sector-63, Noida (UP)
7	RCOM GSM	19 to 21 Oct-13	23 to 26 Nov-13	6 to 10 Dec-13	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
8	VODAFONE	18 to 22 Oct-13	21 to 23 Nov-13	4 to 6 Dec-13	Videocon Telecommunication Ltd, Golden Palace, Near Vita Milk Plant, Jasmeet Nagar, Ambala City-134007
CDMA Operators					
9	RCOM CDMA	19 to 21 Oct-13	23 to 26 Nov-13	6 to 10 Dec-13	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
10	TATA CDMA	28 to 30 Oct-13	12 to 14 Nov-13	6 to 9 Dec-13	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 December 2013.

Transfer of data generated by monthly PMR and 3-days live measurements audit for the period Oct-2013 to Dec-2013 has been successfully uploaded to the server located at TRAI premises.

3.2 SAMPLING FOR BASIC (WIRELINE) SERVICES

- The QoS audit for basic (wireline) service was to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. As per the tender document **Annexure - 2C** (attached as annex-1 in the end of the report) **out of 1306 exchanges of BSNL, audit was done for sampled 19 (Urban) and 46 (Rural) exchanges** (List of BSNL exchanges undertaken for



QoS audit attached as annex-2 in the end of the report), 1 exchanges of Bharti-Airtel, 1 exchange of TTSL and 1 exchange of RCOM. The following Service providers, providing the Basic (Wireline) service were audited for their quality of service assessment in Haryana circle.

Sl. No.	Name of Wireline Service Provider
1	BHARTI AIRTEL
2	BSNL
3	RCOM
4	TATA (TTL)

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.



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 3 drive tests in different cities of a circle/service area per service provider per month. Thus total 90 (3x10x3) drive tests in three months of quarter ended December 2013 were carried out in **Haryana circle.**

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.



a) SERVICE PROVIDER PERFORMANCE REPORT BASED ON MONTHLY DATA VERIFICATION: NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES.

BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	AIRCEL	Dec-13	19:00 - 20:00
2	AIRTEL	Dec-13	20:00 - 21:00
3	BSNL	Dec-13	20:00 - 21:00
4	IDEA	Dec-13	19:00 - 20:00
5	RCOM GSM	Dec-13	19:00 - 20:00
6	TATA GSM	Dec-13	19:00 - 20:00
7	VIDEOCON	Dec-13	20:00 - 21:00
8	VODAFONE	Dec-13	19:00 - 20:00
CDMA Operators			
9	RCOM CDMA	Dec-13	20:00 - 21:00
10	TATA CDMA	Dec-13	20:00 - 21:00

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

SWITCHES/BSC/BTS DETAILS OF OPERATORS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRCEL	1	1	28	NSN	NSN
2	AIRTEL	7	23	2806	Ericsson	Ericsson
3	BSNL	8	26	1686	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	5	29	2775	NSN	NSN
5	RCOM GSM	1	8	1194	Huawei	Huawei
6	TATA GSM	2	12	1468	M 14.5	S15 MP4
7	VIDEOCON	1	8	1267	Huawei	Huawei
8	VODAFONE	7	47	2738	NSN	NSN
CDMA Operators						
9	RCOM CDMA	3	NA	770	Lucent & ZTE	Lucent
10	TATA CDMA	4	7	454	Ericsson & Huawei	ZTE & Motorola



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

Cellular Mobile Telephone Services Haryana Circle- Oct-13 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-13	0.53%	0.06%	1.44%	0.09%	0.08%	0.01%	0.17%	0.05%	0.12%	0.04%
	b) Worst affected BTSS due to downtime	<=2%	Oct-13	3.57%	0.04%	1.72%	0.16%	0.41%	0.00%	0.00%	0.11%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	97.21%	99.15%	96.53%	98.18%	98.16%	99.97%	99.70%	99.81%	98.94%	97.61%
	b) SDCCH/PAGING Channel congestion	<=1%	Oct-13	0.93%	0.20%	0.28%	0.09%	0.08%	0.48%	0.02%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.00%	0.14%	1.52%	0.17%	0.91%	0.36%	0.02%	0.19%	0.02%	0.80%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Oct-13	1.65%	0.41%	1.63%	0.64%	0.64%	0.69%	0.25%	0.65%	0.05%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Oct-13	7.14%	1.40%	2.48%	1.00%	0.52%	2.46%	0.14%	0.42%	0.13%	1.39%
	c) Connections with good voice quality	>=95%	Oct-13	99.34%	99.32%	NP	98.19%	97.58%	97.80%	99.14%	97.73%	99.74%	96.34%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Oct-13	0	0	0	0	0	0	0	0	0	0

• NP-Not Provided



TABLE: 2

Cellular Mobile Telephone Services Haryana Circle- Nov-13 month													
PMR Generation Data		Bench- mark	Audit Period	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%	Nov-13	0.44%	0.06%	1.04%	0.08%	0.05%	0.14%	0.12%	0.02%	0.10%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Nov-13	0.00%	0.07%	2.17%	0.24%	0.07%	0.00%	0.08%	0.04%	0.13%	0.22%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	99.31%	98.96%	96.88%	98.42%	98.70%	99.98%	99.67%	99.82%	98.82%	98.55%
	b) SDCCH/PAGING Channel congestion	<=1%	Nov-13	0.00%	0.35%	0.26%	0.05%	0.03%	0.43%	0.02%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Nov-13	0.00%	0.16%	1.27%	0.16%	0.50%	0.43%	0.01%	0.18%	0.03%	0.21%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Nov-13	0.66%	0.40%	1.20%	0.57%	0.58%	0.61%	0.23%	0.60%	0.05%	0.51%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Nov-13	7.14%	1.02%	1.60%	1.00%	0.78%	1.57%	0.03%	0.29%	0.10%	0.66%
	c) Connections with good voice quality	>=95%	Nov-13	99.39%	99.15%	NP	98.40%	97.72%	97.97%	99.19%	97.96%	99.76%	97.90%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Nov-13	0	0	4	0	0	0	0	1	0	0

• NP-Not Provided



TABLE: 3

Cellular Mobile Telephone Services Haryana Circle- Dec-13 month													
PMR Generation Data		Bench- mark	Audit Period	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%	Dec-13	0.25%	0.09%	0.99%	0.10%	0.11%	0.01%	0.13%	0.04%	0.11%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Dec-13	0.00%	0.07%	1.39%	0.00%	0.00%	0.00%	0.25%	0.00%	0.26%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	99.33%	99.31%	97.65%	98.57%	98.44%	99.83%	99.62%	99.71%	98.96%	98.57%
	b) SDCCH/PAGING Channel congestion	<=1%	Dec-13	0.79%	0.09%	0.26%	0.06%	0.05%	0.51%	0.02%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Dec-13	0.00%	0.14%	0.98%	0.12%	0.66%	0.37%	0.02%	0.29%	0.02%	0.22%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Dec-13	1.62%	0.42%	0.92%	0.57%	0.53%	0.63%	0.23%	0.67%	0.04%	0.49%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Dec-13	10.71%	1.13%	1.54%	0.71%	0.36%	1.72%	0.03%	0.62%	0.09%	0.59%
	c) Connections with good voice quality	>=95%	Dec-13	99.21%	99.15%	NP	98.35%	97.79%	97.96%	99.17%	97.85%	99.76%	96.67%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Dec-13	0	0	6	0	0	0	0	0	0	0

- NP-Not Provided

KEY FINDINGS: CELLULAR MOBILE SERVICES

The audit for cellular mobile service providers was conducted at their respective MSCs in the circle, however in case Reliance Communication, the audit of CSD related parameters was conducted at their central NOC at DAKK Mumbai.

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 except BSNL and Aircel were found meeting benchmark on the above parameters 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter. **BSNL and Aircel lagged behind in meeting the benchmark for parameter 'worst affected BTSs due to down time' with its performance as 2.17% (Nov.) marginally beyond the benchmark of $\leq 2\%$ and 3.57% (Oct.) respectively.**

▪ **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 Paging Channel Occupancy Ratio (**PCH Average Using Ratio**) which is used to determine the Paging Channel Occupancy which on an average is $< 50\%$ on all sites in the network. When the value of this parameter is less than 100%, it is counted as 0% congestion. Thus, there is no congestion on the paging channel in CDMA system.

With respect to this parameter, the performance of the operators is quite satisfactory as all operators met the TRAI specified benchmarks on the congestion parameters. There was no congestion on individual POI links between a service provider vis-à-vis other service providers except for BSNL and Vodafone. **BSNL was found having congestion on 4 POIs and on 6 POIs in the months of November and December-13, whereas, Vodafone was having congestion on one POI in month of November-13.**



- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

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

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, **all the service providers were found to be meeting the TRAI specified benchmark**. The lowest call drop rate (average 0.05 %) was for RCOM (CDMA) during the quarter.

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

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

The audit with respect to this parameter revealed that all operators met the benchmark for this parameter except Aircel. **Aircel failed to meet the benchmark in all the three months of the quarter ended December 2013 with its performance as 7.14 %, 3.37% and 10.71 % in the respective months of the quarter**. Thus the performance of Aircel remained way beyond the benchmark. In fact, Aircel was having its very limited presence in Haryana circle with only 28 BTSs in entire Haryana service area.

- iii. Connections with good voice quality:

Most of the Operators were measuring this parameter through the system generated data at their switches whereas BSNL was measuring through their periodic drive tests. **The audit results for this parameter indicate that all operators have met the bench mark successfully during the quarter.**



b) CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT-QE DEC-13:

CSD Data for Cellular Mobile Telephone Services-QE Dec-13

<u>Quarterly CSD Audit Data</u>		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators								CDMA Operators	
Customer Service Quality Parameters													
1	Metering & Billing Credibility -Post Paid												
	A) No. of bills issued during the quarter		Haryana	NA	140321	20774	188523	14410	36414	NA	128280	47902	37317
	B) No. of bills disputed including billing complaints during the quarter		Haryana	NA	47	11	163	11	0	NA	17	44	0
	C)% of billing complaints during the quarter	<= 0.1%	Haryana	NA	0.03%	0.05%	0.09%	0.08%	0.00%	NA	0.01%	0.09%	0.00%
2	Metering & Billing Credibility -Pre Paid												
	A) Total No. of Pre-paid customers at the end of the quarter		Haryana	113832	2203603	3133595	3787544	1625087	3264373	1265934	4742828	446685	3264373
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Haryana	0	418	230	1010	1611	0	36	35	413	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	Haryana	0.00%	0.02%	0.01%	0.03%	0.10%	0.00%	0.00%	0.00%	0.09%	0.00%
3	Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints												
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		Haryana	0	465	241	1173	1622	0	36	52	457	0
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		Haryana	0	465	241	1173	1622	0	36	52	457	0
	C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100 % within 4 week	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	D) % 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) Accessibility of call centre/Customer Care	>=95%	Haryana	93.22%	100.00%	100.00%	100.00%	98.89%	99.24%	100.00%	100.00%	99.19%	97.65%

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	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	Haryana	93.44%	95.00%	65.46%	100.00%	80.99%	99.20%	92.67%	96.00%	83.81%	96.70%
	C) Total no. of call attempts to call centre & customer care nos. during TCBH during the quarter		Haryana	369	284282	123579	261704	1922575	2738126	42945	4233062	202343	310108
	D) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH during the quarter		Haryana	344	284282	123579	261704	1901234	2717447	42945	4233062	200704	302829
5	Termination/closure of service												
	A) Total No. of requests for Termination / Closure of service received during the quarter		Haryana	NA	761	83	521	36	138	NA	275	106	232
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		Haryana	NA	761	83	521	36	138	NA	275	106	232
	C) % of Termination/ Closure of service within 7 days	<=7days	Haryana	NA	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	NA	98	107	203	156	62	NA	287	254	53
	B) No. of Payments/ Refunds Cleared during the quarter		Haryana	NA	98	107	203	156	62	NA	276	254	53
	C)Time taken for refunds of deposits after closures.	100% within 60 days	Haryana	NA	100.00%	100.00%	100.00%	100.00%	100.00%	NA	96.17%	100.00%	100.00%

NA-Not Applicable; Aircel and Videocon are not having the postpaid customers.



KEY FINDINGS: CUSTOMER SERVICE DELIVERY 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 %. Aircel and Videocon are 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. 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 except Aircel, were in compliance with respect to the parameter accessibility of call center. **Aircel was found having shortfall in meeting the benchmark with its performance as 93.22% against benchmark of ≥ 95 %.**

With regard to the parameter '% Calls answered by operator (voice to voice)', the performance of **BSNL, RCOM(GSM) and RCOM(CDMA)** remained way below the benchmark with their performance as 65.46%, 80.99% and 83.81% respectively, against the benchmark of ≥ 90 %.

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, except Vodafone were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure. **Only Vodafone failed to comply with TRAI norms as its achievement was 96.17 % only.**



c) SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3-DAYS LIVE MEASUREMENT DATA VERIFICATION CONDUCTED IN EACH MONTH OF THE QUARTER:

1) NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

TABLE: 1

Cellular Mobile Telephone Services Haryana Circle- Oct-13 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	0.00%	0.09%	1.25%	0.16%	0.06%	0.00%	0.18%	0.01%	0.14%	0.06%
	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	99.03%	99.16%	96.34%	98.16%	98.51%	99.99%	99.81%	99.84%	99.05%	98.32%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	5.60%	0.16%	0.05%	0.06%	0.04%	0.54%	0.01%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.14%	0.61%	0.16%	0.68%	0.33%	0.01%	0.16%	0.00%	0.27%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.50%	0.42%	0.52%	0.68%	0.56%	0.73%	0.23%	0.69%	0.05%	0.43%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.78%	1.03%	1.80%	1.38%	0.00%	2.68%	0.00%	1.00%	0.13%	4.42%
	c) Connections with good voice quality	>=95%	Live data	99.79%	99.51%	NP	98.18%	97.63%	97.56%	99.17%	97.67%	99.74%	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



TABLE: 2

Cellular Mobile Telephone Services Haryana Circle- Nov-13 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	0.54%	0.04%	1.37%	0.05%	0.04%	0.00%	0.10%	0.02%	0.08%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.02%	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	100.00%	98.92%	95.47%	98.48%	98.68%	99.99%	99.82%	99.86%	98.52%	98.36%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.38%	0.24%	0.02%	0.02%	0.26%	0.01%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.18%	1.46%	0.16%	0.52%	0.33%	0.02%	0.14%	0.06%	0.35%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.50%	0.41%	1.19%	0.58%	0.50%	0.59%	0.23%	0.62%	0.06%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.59%	1.04%	1.79%	0.78%	2.81%	1.45%	0.01%	0.37%	0.10%	4.52%
	c) Connections with good voice quality	>=95%	Live data	99.19%	99.14%	NP	98.37%	97.70%	98.01%	99.19%	97.94%	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



TABLE: 3

Cellular Mobile Telephone Services Haryana Circle- Dec-13 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	0.00%	0.05%	1.23%	0.08%	0.05%	0.01%	0.08%	0.02%	0.20%	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	100.00%	99.36%	97.88%	98.37%	98.83%	99.99%	99.41%	99.72%	99.16%	98.83%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.05%	0.29%	0.03%	0.02%	0.62%	0.04%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.13%	0.94%	0.15%	0.38%	0.33%	0.01%	0.28%	0.01%	0.02%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.92%	0.43%	0.80%	0.58%	0.49%	0.60%	0.23%	0.67%	0.03%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	5.95%	1.12%	1.20%	0.65%	NP	1.44%	0.00%	0.85%	0.09%	NP
	c) Connections with good voice quality	>=95%	Live data	98.80%	99.13%	NP	98.38%	97.83%	97.97%	99.15%	97.77%	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

KEY FINDING: 3 DAYS LIVE MEASUREMENTS AUDIT

From three days live measurement assessment, it was found that the performance of all operators was somewhat satisfactory as they are largely meeting the benchmarks except the parameters ‘Worst affected cells> 3 % TCH drops’ and SDCCH congestion. The benchmark of parameter ‘Worst affected cells’ could not be met by **Tata (CDMA) in the months of October & November with its performance as 4.42 % & 4.52 % respectively and the performance of Aircel was 5.95% in the month of December-13.**

Aircel was also non-compliant for parameter ‘SDCCH congestion’ with its performance as **5.60%** in the month of October-13 against the benchmark of <= 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	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
AIRCEL	Haryana	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
AIRTEL	Haryana	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
BSNL	Haryana	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
IDEA	Haryana	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
RCOM GSM	Haryana	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%	100.00%
TATA GSM	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%	100.00%
VIDEOCON	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%	100.00%
VODAFONE	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%	100.00%
RCOM CDMA	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--	100.00%
TATA CDMA	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory as there was hardly any problem in interconnection from one operator to other operators which indicated there was no congestion on the individual POIs of the service providers..



2) CUSTOMER SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

CSD 3 days live data for Cellular Mobile Telephone Services-QE-Dec-13													
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) Accessibility of call centre/Customer Care	>=95%	Haryana	100.00%	100.00%	100.00%	100.00%	98.92%	99.23%	100.00%	100.00%	99.59%	99.74%
	B) % call answered by operators(voice to voice) within 60 sec.	>=90%	Haryana	97.00%	93.00%	25.10%	100.00%	99.84%	99.30%	91.75%	98.50%	97.37%	94.00%

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE												
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
Total No. of calls Attempted	Haryana	100	100	100	100	100	100	100	100	100	100	
Total No. of calls connected to IVR	Haryana	100	100	100	100	100	100	100	100	100	100	
Calls got connected to agent within 60 Sec	Haryana	100	100	100	100	100	100	100	100	100	100	
%age of calls got answered	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

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) except **BSNL which has performed with 25.10% of calls connected to operator within 60 seconds, which is way below the benchmark of >= 90 %.**

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, all operators could connect 100% of calls to the operator within 60 Seconds.



LEVEL-1 LIVE CALLING

LEVEL 1 LIVE CALLING												
Emergency no.	Circle Name	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
100	HARYANA	30	30	30	30	30	30	30	30	30	30	30
101	HARYANA	40	40	40	40	40	40	40	40	40	40	40
102	HARYANA	40	40	40	40	40	40	40	40	40	40	40
1091	HARYANA	40	40	40	40	40	40	40	40	40	40	40

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.

5. DRIVE TEST

5.1 OPERATOR ASSISTED DRIVE TEST:

In Haryana Service area, total **90 drive tests** in three months of the quarter ended December 2013 @ of 3 drive tests per operator per month (total 3x10x3=90 drive tests) were required to be conducted across Ambala, Kurukshetra and Sonapat during the month of October-13, Karnal, Jind and Panipat during November -13 and Rohtak, Rewari and Jhajjar during December-2013. The performance of the operators has been highlighted below in the Tables. The drive tests were conducted simultaneously for all the operators following the same routes of drive tests. A sample of about 120 - 150 test calls were made during a drive tests covering about a distance of 100 K.M. 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. The routes were so selected that the drive tests could cover the congested areas/commercial areas/peripherals of the above 09 cities in Haryana circle.

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 FERs is considered to be good, where as Rx Qual beyond this benchmark is considered to be bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in dBm at street level with strength ≥ -75 dBm for in-door coverage and ≥ -85 dBm for in-vehicle.



DRIVE TEST TABLE: 1

Operator-Assisted Drive Test- Haryana Circle-Oct-13 Month														
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
				GSM Operators								CDMA Operators		
1	Blocked Call Rate (<=3%)	Ambala	Oct-13	NS	0.00%	3.30%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Kurukshetra	Oct-13	NS	0.00%	7.02%	0.66%	0.00%	0.00%	0.66%	0.88%	0.00%	0.00%	
		Sonipat	Oct-13	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.88%	0.78%	0.00%	0.00%	
2	Dropped Call Rate (<=2%)	Ambala	Oct-13	NS	0.00%	1.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Kurukshetra	Oct-13	NS	0.00%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Sonipat	Oct-13	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.57%	0.03%	0.00%	
3	Percentage connections with good voice quality (=>95%)													
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Ambala	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.92%	95.88%
		Kurukshetra	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.91%	93.56%
		Sonipat	Oct-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.47%	94.27%
	(b) 0-5 (with frequency hopping for GSM Operators)	Ambala	Oct-13	NS	95.82%	92.44%	96.41%	99.24%	95.75%	96.46%	95.56%	NA	NA	
		Kurukshetra	Oct-13	NS	96.29%	91.11%	97.33%	97.34%	97.07%	97.81%	96.26%	NA	NA	
Sonipat		Oct-13	NS	95.48%	97.10%	96.27%	97.63%	97.10%	96.57%	96.62%	NA	NA		
4	Service Coverage													
	In door (>= - 75dBm)	Ambala	Oct-13	NS	89.37%	48.05%	99.11%	37.94%	88.54%	95.48%	85.02%	91.04%	33.46%	
		Kurukshetra	Oct-13	NS	73.82%	84.38%	99.13%	44.06%	88.46%	96.45%	50.82%	86.94%	57.96%	
		Sonipat	Oct-13	NS	78.57%	95.46%	98.29%	48.61%	80.22%	92.90%	97.97%	88.32%	84.91%	
	In-vehicle (>= - 85dBm)	Ambala	Oct-13	NS	99.83%	86.24%	99.96%	72.39%	98.27%	99.71%	99.40%	99.38%	69.15%	
		Kurukshetra	Oct-13	NS	98.05%	99.06%	99.95%	81.49%	98.89%	99.76%	93.65%	99.07%	97.14%	
		Sonipat	Oct-13	NS	98.31%	99.37%	99.81%	86.38%	96.79%	99.16%	99.96%	98.01%	99.47%	
	Outdoor- in city (>= - 95dBm)	Ambala	Oct-13	NS	100.00%	97.77%	99.99%	94.73%	99.96%	99.97%	100.00%	100.00%	95.82%	
		Kurukshetra	Oct-13	NS	100.00%	100.00%	99.99%	98.15%	99.84%	100.00%	100.00%	100.00%	99.79%	
Sonipat		Oct-13	NS	100.00%	99.99%	99.98%	98.86%	99.81%	99.99%	100.00%	99.95%	99.97%		
5	Call Setup Success Rate (>=95%)	Ambala	Oct-13	NS	100.00%	96.70%	100.00%	99.24%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Kurukshetra	Oct-13	NS	100.00%	92.98%	100.00%	100.00%	100.00%	99.34%	99.12%	100.00%	100.00%	
		Sonipat	Oct-13	NS	100.00%	100.00%	100.00%	100.00%	100.00%	99.12%	99.22%	100.00%	100.00%	

- NS-No Service
- NA-Not Applicable



DRIVE TEST TABLE: 2

Operator-Assisted Drive Test-Haryana Circle-Nov-13 Month														
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
				GSM Operators						CDMA Operators				
1	Blocked Call Rate (<=3%)	Karnal	Nov-13	NS	0.00%	9.68%	0.00%	0.64%	0.00%	0.94%	1.45%	0.00%	0.00%	
		Jind	Nov-13	NS	0.00%	4.88%	0.00%	0.78%	0.00%	0.97%	1.08%	0.00%	0.00%	
		Panipat	Nov-13	NS	0.00%	3.60%	0.00%	0.84%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Dropped Call Rate (<=2%)	Karnal	Nov-13	NS	0.00%	1.92%	0.00%	1.29%	0.67%	0.00%	0.00%	1.93%	0.00%	
		Jind	Nov-13	NS	0.00%	0.00%	0.00%	0.79%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Panipat	Nov-13	NS	0.00%	0.78%	0.00%	0.00%	1.17%	0.00%	0.00%	0.00%	0.58%	
3	Percentage connections with good voice quality (=>95%)													
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Karnal	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.22%	96.84%
		Jind	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.84%	97.12%
		Panipat	Nov-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.67%	97.19%
	(b) 0-5 (with frequency hopping for GSM Operators)	Karnal	Nov-13	NS	95.26%	92.53%	96.77%	98.04%	96.81%	96.94%	95.59%	NA	NA	
		Jind	Nov-13	NS	95.50%	91.51%	97.43%	93.93%	98.19%	96.57%	96.59%	NA	NA	
Panipat		Nov-13	NS	95.48%	93.92%	97.25%	98.29%	95.83%	96.53%	96.43%	NA	NA		
4	Service Coverage													
	In door (>= - 75dBm)	Karnal	Nov-13	NS	97.68%	63.08%	91.33%	62.33%	98.05%	98.42%	86.98%	95.44%	98.51%	
		Jind	Nov-13	NS	74.07%	63.84%	88.30%	36.49%	84.63%	97.78%	88.58%	87.07%	81.74%	
		Panipat	Nov-13	NS	92.63%	94.49%	97.17%	46.97%	98.56%	97.91%	94.37%	88.32%	89.05%	
	In-vehicle (>= - 85dBm)	Karnal	Nov-13	NS	99.98%	95.65%	99.15%	93.69%	100.00%	99.81%	99.40%	99.98%	100.00%	
		Jind	Nov-13	NS	98.21%	95.05%	98.56%	75.14%	99.13%	99.88%	99.64%	99.82%	100.00%	
		Panipat	Nov-13	NS	99.73%	99.93%	99.69%	87.60%	99.96%	99.98%	99.42%	98.41%	99.80%	
	Outdoor- in city (>= - 95dBm)	Karnal	Nov-13	NS	100.00%	99.90%	99.92%	99.56%	100.00%	99.97%	100.00%	100.00%	100.00%	
		Jind	Nov-13	NS	100.00%	99.49%	99.93%	97.86%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Panipat	Nov-13	NS	100.00%	100.00%	99.98%	99.51%	100.00%	100.00%	100.00%	100.00%	99.98%	
	5	Call Setup Success Rate (>=95%)	Karnal	Nov-13	NS	100.00%	83.87%	100.00%	99.36%	99.40%	99.05%	98.55%	100.00%	100.00%
			Jind	Nov-13	NS	100.00%	95.12%	100.00%	99.22%	100.00%	99.03%	98.92%	100.00%	100.00%
Panipat			Nov-13	NS	100.00%	92.80%	100.00%	99.52%	100.00%	100.00%	100.00%	100.00%	100.00%	

- NS-No Service
- NA-Not Applicable



DRIVE TEST TABLE: 3

Operator-Assisted Drive Test- Haryana Circle-Dec-13 Month														
S/N	Parameter	City Name	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VIDEOCON	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
1	Blocked Call Rate (<=3%)	Rohtak	Dec-13	NS	0.00%	3.35%	0.00%	0.00%	0.00%	1.29%	0.00%	2.53%	0.00%	0.00%
		Rewari	Dec-13	NS	0.00%	5.45%	0.00%	0.00%	0.00%	NS	0.00%	0.00%	0.00%	0.00%
		Jhajjar	Dec-13	NS	0.00%	1.23%	0.00%	1.65%	0.86%	1.11%	0.86%	0.00%	0.00%	0.00%
2	Dropped Call Rate (<=2%)	Rohtak	Dec-13	NS	0.00%	0.00%	0.00%	0.63%	0.68%	0.00%	0.68%	0.65%	0.63%	0.75%
		Rewari	Dec-13	NS	0.00%	1.98%	0.00%	2.24%	0.00%	NS	0.00%	0.00%	4.03%	0.00%
		Jhajjar	Dec-13	NS	0.00%	2.46%	0.00%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%	0.00%
Percentage connections with good voice quality (=>95%)														
3	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Rohtak	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.98%	97.95%
		Rewari	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.92%	95.64%
		Jhajjar	Dec-13	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.99%	96.67%
	(b) 0-5 (with frequency hopping for GSM Operators)	Rohtak	Dec-13	NS	95.92%	100.00%	95.93%	94.94%	95.51%	97.07%	95.51%	96.28%	NA	NA
		Rewari	Dec-13	NS	95.99%	89.51%	96.17%	97.61%	96.90%	NS	96.90%	98.87%	NA	NA
		Jhajjar	Dec-13	NS	96.38%	94.42%	96.11%	95.19%	95.70%	96.91%	95.70%	98.68%	NA	NA
Service Coverage														
4	In door (>= - 75dBm)	Rohtak	Dec-13	NS	79.45%	98.22%	99.89%	39.24%	90.78%	92.93%	90.78%	72.44%	98.95%	54.84%
		Rewari	Dec-13	NS	78.07%	75.83%	99.70%	40.20%	85.61%	NS	85.61%	95.87%	99.27%	38.18%
		Jhajjar	Dec-13	NS	76.02%	65.72%	99.66%	41.72%	75.91%	93.42%	75.91%	86.57%	98.29%	59.15%
	In-vehicle (>= - 85dBm)	Rohtak	Dec-13	NS	97.78%	100.00%	99.98%	74.81%	98.33%	99.18%	98.33%	97.89%	99.57%	84.56%
		Rewari	Dec-13	NS	93.81%	96.67%	99.97%	74.85%	97.27%	NS	97.27%	100.00%	99.89%	75.37%
		Jhajjar	Dec-13	NS	95.81%	95.62%	99.95%	68.27%	94.28%	98.09%	94.28%	98.88%	99.94%	94.76%
	Outdoor- in city (>= - 95dBm)	Rohtak	Dec-13	NS	99.94%	100.00%	99.99%	91.44%	99.98%	99.87%	99.98%	100.00%	100.00%	99.70%
		Rewari	Dec-13	NS	99.50%	99.78%	99.98%	96.18%	99.77%	NS	99.77%	100.00%	100.00%	96.11%
		Jhajjar	Dec-13	NS	99.91%	100.00%	100.00%	86.14%	99.54%	99.89%	99.54%	100.00%	100.00%	99.91%
5	Call Setup Success Rate (>=95%)	Rohtak	Dec-13	NS	100.00%	96.64%	100.00%	100.00%	100.00%	98.70%	100.00%	97.47%	100.00%	100.00%
		Rewari	Dec-13	NS	100.00%	91.81%	100.00%	100.00%	100.00%	NS	100.00%	100.00%	100.00%	100.00%
		Jhajjar	Dec-13	NS	100.00%	98.77%	100.00%	98.34%	99.14%	98.88%	99.14%	100.00%	100.00%	100.00%

- NS-No Service
- NA-Not Applicable



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Detail of the routes covered during the drive tests - Haryana Circle Oct-13 to Dec-13						
Month/Year	City	Periphery-1	Periphery-2	Across the City	Congested	In Building
Oct-13	Ambala	Railway Station-Jandli-Model Town-Sec 1-Sec 7-Sec 9-Tau devi lal chowk-Galaxy Mall-Poly Technic Chowk	BSNL Exchange-Motor Market-Sadar Bazar-Bengali Mohala-Kacha Bazar-Batra Palace-Janta Sweets-Gandhi Ground-Tribune Colony-Mahesh Nagar-Rajender Nagar	Devi Lal Chowk-Sec 7-Poly technic Chowk-Gurdawara Manji Sahib-Geeta Colony-Sultan pur barier-Baldev Nagar-Dhul kot fly Over-Adarsh Nagar-Bus Stand & Railway Station-Kuldeep Nagar-Pooja Nagar	Geeta Gopal Chowk-HDFC Bank-Sadar Bazar-Big Bazar-Rai Market-Janta Sweets-Motor Market-Ambala Market	Galaxy mall-Big Bazar-Poly Technic-Railway Station
	Kurukshetra	Parkeet Resort-Pipli Chowk-Devi lala Park-Sec 5-Sec 3-Sec 2-Sec 7-Sec 8-Sec 13-Bus Stand	Pipli Bus Stand-Kalyan Nagar-Mohan Nagar-Sec 17 Market-Dharam Shala -Kuk University-Brham Sarover-Goshala Bazar-Civil hospital-Thanaser-Shekh Chili Makbara	N H 1 Pipli bus stand Oasis-Sec 5-Sec 13-BSNL Exchange-KUK University-Civil Hospital	Sec 17 Market-Vishnu Colony-Railway Station-Local Market-Rodra Cinema	Oasis Resort-Bus Stand-Railway Station-Kuk University-Oasis Resort
	Sonipat	Murthal-Bahalgarh-Sec 15-Civil Hospital-Model Town-ITI-Kabirpur, Sec 12-Sec 14-Sec 15	Sec 15-Shiv Coilony-Ganj Bazar-Jatwala,Kumahar Gate-Adarsh Nagar-Vikram Palace-Sec 14-Murthal	Murthal-Murthal University-Subham Garden-Sec 14-Bus Stand-Delhi Road-Civil Hospital	Civil Hospital Delhi Road-Geeta Gopal Chowk HDFC Bank-Model Town Atlas Road	Civil Hospital-Bus Stand-Atlas Factory-Murthal University
Nov-13	Karnal	Sector -9-Buda Khera-Sector -8-Sector -7-Residential Market-Sector-6 & Residential Market-Phusgarh Village-Normal Chowk	Nirmal Kutia-Sector-13-NDRI-District Court-Sector 12-Old District Jail-Sector-13 Market-Sector 14-Mall Road-Railway Station Road-Gandhi Nagar-Shanti Nagar	Namaste Chowk-Tau Devi Lal Chowk-Govt College Chowk-Nirmal Kutia-ITI Chowk-Liberty Chowk-NDRI Road	Hansi Chowk-Sadar Bazar-Ghanta Ghar-Sabji Mandi	BSNL Office-Civil Hospital-Bus Stand-Neo Fitness Zym
	Jind	BSNL Exchange-Ranitalab-Gohana Road-Bus Stand-Govt College-Civil Hospital-Urban Estate-DAV School-Sec 9-Sec 8-Safidon Road	Gohana Road-District Jail-Police Line-Safidon Road-Scheme No 5-Ranitalab-Bulbul turism complex-SD School-Suini Ramliila Ground-CR Colledge-Patiala Chowk-Railway Station-Railway colony-Apolo Road-Asand Road	Asandh Road-Patiala Chowk-Sabji Mandi-Saini Mahola-Tanya Chowk-Clock Tower-Sadar Thana-Rani Talab	Rani Talab-Gohana Road-Civil Hospital-Mini Sectriate-Chungi-Rohtak Bye Pass-Rohtak Road-Tau Devi lal Chowk-Old Grain Market-BSNL Exchange	Civil Hospital-Bulbul Tourist Complex-Tanga Chowk-BSNL Exchange-Mini Secretriare



	Panipat	Sec 13-17,Chungi Barsat Road, Yamuna Enclave-Vikas Nagar-Fatehpuri Chowk-Rshu Road-Devi Colony-Ward No 11-Sanoli Road Sec 25 Part 2-Industrial Area-Sec 29-Sec 25-Mital Mega Mall-Sec 12-NHBC-Angel Prima Mall	Gohana Road-Assand Road-Friends Colony-Police Post Gohana Road-Model Town-Ram Lal Chowk-Stadium Road-MKK Arya School-Railway Stadium-Ashram Road-Ind Area, DC Residence-Hali Park-Sec 6	Toll Tax-Fun city Mall-Bus Stand-Lal Bati Chowk-Railway Road-Income Tax Office-Sanjay Chowk-Khaudi Ashram Shiva	Sanoli Road Sec 11-12-Gunga Puri-Sanjay Chowk-Hotel Gold-New Grain Market-MC Office-Kishan pura-Khanna Road-Gohana Road	Mittal Mega Mall-Railway Station-Kishanpura-Bus stand-BSNL Office
Dec-13	Rohtak	Bsnl Exchange-Model School-Prem Nagar-Bus Stand-Sheela Bye Pass-M.D.U University-D Park-Ashoka Plaza-Anaj Mandi-Hisar Bye Pass-Jind Bye Pass-Civil Hospital	Tehsil-Kila Road-Old Bus Stand-Civil Road-Gohana Stand-Sonipat Stand,Kila Road-Old Bus Stand-Subash Nagar-Sector- 4,3,2,1-Dif,Jhajhar Road-Vaish College-Sunaria Chowk	Anaj Mandi-Kila Road-Chotu Ram Chowk-Model School-Mini Sectriate-D Park-Power House-M.D.U University	Power House-Medical Mode-D Park-Mini Sectriate	Bus Stand-Civil Hospital-Power House-Model School-Agro Mall
	Rewari	Sec-3 Bus Stand-Circular Road-Dharuhera Chungi-Railway Road-Post Office-Bawal Chowk-Civil Hospital-Jain School-Agersen Chowk-Jhajjar Chowk-Nai Basti Chowk-Led Chowk	Bharawas Chowk-Brass Market-Pialot Chowk-Bawal Chowk-Sec-1-Huda Gymkhana-Mini Sectriate-Sec-3-Kidzee School-Sainik School-Sec-4-Raj Inter School	Klp College-Huda Bye Pass-Delhi Road-Sec-4 Glp School-Somany College-Kasola Chowk-Golden Huts-Best Roadways-Haritage Haveli-Arawli Resort	Civil Hospital-Gokul Gate-Kath Mandi-Punjabi Market-Railway Road-Kanod Gate-Tula Ram\ Park-Nai Basti Chowk	Bus Stand-Huda Gymkhana-Civil Hospital-Klp College-Bmg Mall
	Jhajhar	Bus Stand-Naresh Hospital-Deshwal Hotel-Mohindra School-Sainik Rest House-Outer Bye Pass-Hotel Jupiter-Bus Stand-Sita Ram Gate-Indo-American School-Anaj Mandi-Officer's Colony	Civil Hospital-Bhagat Singh Chowk-Kheri Kumar-Khatiwass-Jaundhi-Rania Colony-Silani Gate-Silani Polytechnic	Silani-Silani Gate-Kosli Road-Shikara Chowk-ITI-Gudha	Syndicate Bank-Bus Stand-Bharat Petrol Pump-Bhola Complex-Sita Ram Gate-Circular Road	Bus Stand-Civil Hospital-Bharat Petrol Pump-ITI



KEY FINDINGS: DRIVE TEST

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

- (i) Aircel is not operating its service in all the cities 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.
- (ii) **In the Month of October-13**, drive tests were conducted at Ambala, Kurukshetra and Sonipat. **BSNL** was the only service provider that failed to meet the benchmarks of the parameters Blocked call rate and Good Voice quality at Ambala & Kurukshetra with their performance as 3.30% & 7.02% and 92.44% & 91.11% respectively. Apart from this, **BSNL** also failed to meet the benchmark of parameter CSSR at Kurukshetra with performance as 92.98%. **Tata (CDMA)** also could not meet the benchmark of parameter Voice Quality at Kurukshetra and Sonipat with performance as 93.56% & 94.27% respectively.
- (iii) **In the Month of November-13**, drive tests were conducted at Karnal, Jind and Panipat . In this month also, **BSNL** was the only service provider that failed to meet the benchmarks of the parameters Blocked call rate and Good Voice quality at Karnal, Jind and Panipat with their performance as 9.68%, 4.88% & 3.60% (for Blocked call rate) and 92.53%, 91.51% & 93.92 % (for voice quality). **BSNL** also remained non-compliant for parameter CSSR at Karnal and Panipat having achievement level as 83.87% and 92.80% respectively. The performance of **RCOM(GSM)** was also remained under performed for parameter Voice Quality at Jind with its performance as 93.93%
- (iv) **In the month of December-13**, drive tests were conducted at Rohtak, Rewari and Jhajjar. Like previous months, **BSNL** was the only service provider that failed to meet the benchmarks of the parameters Blocked call rate at Rohtak & Rewari with their performance as 3.35% & 5.45%, Voice Quality at Rewari & Jhajjar with performance as 89.51% & 94.42%, Dropped call rate (DCR) at Jhajjar with performance as 2.46% and CSSR at Rewari with performance as 91.81%. The performance of **RCOM (GSM) & CDMA** was also remained under performed for parameter DCR at Rewari with their performance as 2.24% & 4.03% respectively. **RCOM (GSM)** was also under performing for the parameter Voice Quality at Rohtak having achievement level as 94.94%.

Thus BSNL repeated its non-complied performance with respect to the parameters Blocked Call rate, Voice quality and CSSR in all the drive tests conducted in nine cities of Haryana Circle during the quarter ended December-13. BSNL needed to improve their network performance in respect of all prime network parameters. The performance of all other operators remained somewhat satisfactory.

5.2 INDEPENDENT DRIVE TEST:

The independent drive tests are to be carried out by M/s TUV for any service provider on receiving advice from TRAI, based on any complaint from subscribers, relating to poor network coverage in certain areas of the cities. As TUV was not advised by TRAI to conduct the drive test independently on the basis of Subscribers complaint or otherwise, the independent drive tests were not conducted by TUV in this quarter.



6. ESSENCE OF COMPLIANCE REPORT OF SERVICE PROVIDERS WITH RESPECT TO THE QOS

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 largely found to have met the benchmarks of most of the parameters during the quarter. Only Aircel failed to meet the benchmark of parameter 'Worst affected cells > 3 % TCH drop' in all the three months of the quarter ended December 2013 with its performance as 7.14 %, 3.37% and 10.71 % in the respective months of the quarter. Thus the performance of Aircel remained way beyond the benchmark. BSNL lagged behind in meeting the benchmark for parameter 'worst affected BTSs due to down time' with its performance as 2.17% marginally beyond the benchmark of ≤ 2 %.

During three days live measurements, the benchmark of parameter 'Worst affected cells' could not be met by Tata (CDMA) in the months of October & November with its performance as 4.42 % & 4.52 % respectively, whereas performance of Aircel was 5.95% in the month of December-13. Aircel was also non-compliant for parameter 'SDCCH congestion' with its performance as 5.60% against the benchmark of ≤ 1 %.

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. However, Aircel was found having shortfall in meeting the benchmark with its performance as 93.22% against benchmark of ≥ 95 %.

With regard to the parameter '% Calls answered by operator (voice to voice)', the performance of BSNL, RCOM(GSM) and RCOM(CDMA) remained way below the benchmark with their performance as 65.46%, 80.99% and 83.81% respectively, against the benchmark of ≥ 90 %.

With regard to **drive tests**, BSNL repeated its non-complied performance with respect to the parameters Blocked Call rate, Voice quality and CSSR in all the drive tests conducted in nine cities of Haryana during the quarter ended December-13. The performance of RCOM (GSM) & CDMA was also remained under performed for parameter DCR at Rewari with their performance as 2.24% & 4.03% respectively. BSNL needs to improve their network performance in respect of all prime network parameters. The performance of RCOM (GSM/CDMA) and Tata (CDMA) also require some improvement for the parameters which were under performed in few cities. The performance of other operators remained satisfactory.



7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- Oct-13 month													
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		Oct-13	28	2806	1686	1259	1468	2732	1206	2738	771	454
	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-13	109.70	1327	18036.46	799.44	897.20	134.77	1503	923	676	131.91
	c) BTS Accumulated Downtime	<=2%	Oct-13	0.53%	0.06%	1.44%	0.09%	0.08%	0.01%	0.17%	0.05%	0.12%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Oct-13	1	1	29	2	6	0	0	3	0	0
	e) Worst affected BTSs due to downtime	<=2%	Oct-13	3.57%	0.04%	1.72%	0.16%	0.41%	0.00%	0.00%	0.11%	0.00%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Oct-13	97.21%	99.15%	96.53%	98.18%	98.16%	99.97%	99.70%	99.81%	98.94%	97.61%
	b) SDCCH/PAGING Congestion	<=1%	Oct-13	0.93%	0.20%	0.28%	0.09%	0.08%	0.48%	0.02%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Oct-13	0.00%	0.14%	1.52%	0.17%	0.91%	0.36%	0.02%	0.19%	0.02%	0.80%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Oct-13	1.65%	0.41%	1.63%	0.64%	0.64%	0.69%	0.25%	0.65%	0.05%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Oct-13	7.14%	1.40%	2.48%	1.00%	0.52%	2.46%	0.14%	0.42%	0.13%	1.39%
	c) % of connections with good voice quality	>=95%	Oct-13	99.34%	99.32%	NP	98.19%	97.58%	97.80%	99.14%	97.73%	99.74%	96.34%

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	d) Total No. of cells exceeding 3% TCH drop (call drop)		Oct-13	6	119	125	38	23	202	5	35	3	19
	e) Total no. of cells (Sector) in the licensed service area		Oct-13	84	8354	5047	3816	4438	8206	3612	8301	2313	1364
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Oct-13	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Oct-13	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Oct-13	119.81	89330	200000	47148.40	98732.01	96641	50000	140540.7	56000	95038
	b) Total traffic in TCBH in erlang (Avg.)		Oct-13	2.62	57676.8	76635	19894.73	34672.08	100293	42071.57	129075.8	16697.97	22555.77
	c) Total no. of customers served (as per VLR) on last day of the month		Oct-13	811	2186278	1592555	648890	1412564	3794055	1536120	4514741	481933	267292

- NP-Not Provided



TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Oct-13 month													
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	2806	1683	1257	1466	2717	1196	2736	780	454
	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	0	184.22	1517.42	84.12	61.02	8.47	156	26.26	81	18.75
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.09%	1.25%	0.16%	0.06%	0.00%	0.18%	0.01%	0.14%	0.06%
	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	99.03%	99.16%	96.34%	98.16%	98.51%	99.99%	99.81%	99.84%	99.05%	98.32%
	b) SDCCH/PAGING Congestion	<=1%	Live data	5.60%	0.16%	0.05%	0.06%	0.04%	0.54%	0.01%	0.11%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.00%	0.14%	0.61%	0.16%	0.68%	0.33%	0.01%	0.16%	0.00%	0.27%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.50%	0.42%	0.52%	0.68%	0.56%	0.73%	0.23%	0.69%	0.05%	0.43%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.78%	1.03%	1.80%	1.38%	0.00%	2.68%	0.00%	1.00%	0.13%	4.42%
	c) % of connections with good voice quality	>=95%	Live data	99.79%	99.51%	NP	98.18%	97.63%	97.56%	99.17%	97.67%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	2	86	91	42	0	220	0	83	3	60
e) Total no. of cells (Sector) in the licensed service area		Live data	84	8354	5040	3809	4432	8211	3582	8294	2313	1364	
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

● NP-Not Provided



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- Nov-13 month													
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		Nov-13	28	2807	1706	1262	1483	2775	1194	2740	770	454
	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-13	88.60	1208.36	12798.96	731.51	528.95	89.74	1033	368.32	563	143.69
	c) BTS Accumulated Downtime	<=2%	Nov-13	0.44%	0.06%	1.04%	0.08%	0.05%	0.14%	0.12%	0.02%	0.10%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Nov-13	0	2	37	3	1	0	1	1	1	1
e) Worst affected BTSs due to downtime	<=2%	Nov-13	0.00%	0.07%	2.17%	0.24%	0.07%	0.00%	0.08%	0.04%	0.13%	0.22%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Nov-13	99.31%	98.96%	96.88%	98.42%	98.70%	99.98%	99.67%	99.82%	98.82%	98.55%
	b) SDCCH/PAGING Congestion	<=1%	Nov-13	0.00%	0.35%	0.26%	0.05%	0.03%	0.43%	0.02%	0.09%	0.00%	0.00%
c) TCH congestion	<=2%	Nov-13	0.00%	0.16%	1.27%	0.16%	0.50%	0.43%	0.01%	0.18%	0.03%	0.21%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Nov-13	0.66%	0.40%	1.20%	0.57%	0.58%	0.61%	0.23%	0.60%	0.05%	0.51%
	b) Worst affected cells>3% TCH drop	<=3%	Nov-13	7.14%	1.02%	1.60%	1.00%	0.78%	1.57%	0.03%	0.29%	0.10%	0.66%
	c) % of connections with good voice quality	>=95%	Nov-13	99.39%	99.15%	NP	98.40%	97.72%	97.97%	99.19%	97.96%	99.76%	97.90%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Nov-13	6	85	82	38	35	130	1	24	2	9
e) Total no. of cells (Sector) in the licensed service area		Nov-13	84	8366	5116	3816	4489	8306	3576	8308	2310	1364	

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4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Nov-13	0	0	4	0	0	0	0	0	1	0	0
	Name of POI not meeting the benchmark		Nov-13	0	0	Idea Mobile, RIL GSM,Tata GSM and Data Com	0	0	0	0	0	BSNL Rewari	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang		Nov-13	119.81	86713.30	200000	47521	99102.60	97389.64	50000	139903.30	56000	94136	
	b) Total traffic in TCBH in erlang (Avg.)		Nov-13	2.62	63895.59	78866	19445	37675.80	102129.46	45847.58	128821.20	17130.63	16978.17	
	c) Total no. of customers served (as per VLR) on last day of the month		Nov-13	762	2281195	1604984	667052	1390850	3837889	1590725	4552294	479046	266047	

- NP-Not Provided



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements - Haryana Circle- Nov-13 month

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	2806	1708	1259	1475	2761	1206	2738	771	454
	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	10.95	80.59	1690.49	41.82	47.67	5.06	83	39.48	47	4.74
	c) BTS Accumulated Downtime	<=2%	Live data	0.54%	0.04%	1.37%	0.05%	0.04%	0.00%	0.10%	0.02%	0.08%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	1	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.02%	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	100.00%	98.92%	95.47%	98.48%	98.68%	99.99%	99.82%	99.86%	98.52%	98.36%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.38%	0.24%	0.02%	0.02%	0.26%	0.01%	0.09%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.00%	0.18%	1.46%	0.16%	0.52%	0.33%	0.02%	0.14%	0.06%	0.35%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.50%	0.41%	1.19%	0.58%	0.50%	0.59%	0.23%	0.62%	0.06%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.59%	1.04%	1.79%	0.78%	2.81%	1.45%	0.01%	0.37%	0.10%	4.52%
	c) % of connections with good voice quality	>=95%	Live data	99.19%	99.14%	NP	98.37%	97.70%	98.01%	99.19%	97.94%	99.76%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	1	87	91	30	125	121	1	31	2	62
e) Total no. of cells (Sector) in the licensed service area		Live data	84	8354	5109	3816	4457	8345	3612	8302	2313	1364	
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

● NP-Not Provided



TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- Dec-13 month													
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-13	28	2806	1731	1267	1485	2799	1194	2746	770	456
	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-13	52.71	1898	12783.25	980.64	1163	196	1155	818.18	613	202.20
	c) BTS Accumulated Downtime	<=2%	Dec-13	0.25%	0.09%	0.99%	0.10%	0.11%	0.01%	0.13%	0.04%	0.11%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Dec-13	0	2	24	0	0	0	3	0	2	0
e) Worst affected BTSs due to downtime	<=2%	Dec-13	0.00%	0.07%	1.39%	0.00%	0.00%	0.00%	0.25%	0.00%	0.26%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Dec-13	99.33%	99.31%	97.65%	98.57%	98.44%	99.83%	99.62%	99.71%	98.96%	98.57%
	b) SDCCH/PAGING Congestion	<=1%	Dec-13	0.79%	0.09%	0.26%	0.06%	0.05%	0.51%	0.02%	0.10%	0.00%	0.00%
c) TCH congestion	<=2%	Dec-13	0.00%	0.14%	0.98%	0.12%	0.66%	0.37%	0.02%	0.29%	0.02%	0.22%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Dec-13	1.62%	0.42%	0.92%	0.57%	0.53%	0.63%	0.23%	0.67%	0.04%	0.49%
	b) Worst affected cells>3% TCH drop	<=3%	Dec-13	10.71%	1.13%	1.54%	0.71%	0.36%	1.72%	0.03%	0.62%	0.09%	0.59%
	c) % of connections with good voice quality	>=95%	Dec-13	99.21%	99.15%	NP	98.35%	97.79%	97.96%	99.17%	97.85%	99.76%	96.67%
d) Total No. of cells exceeding 3% TCH drop (call drop)		Dec-13	9	95	80	27	16	145	1	52	2	8	

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	e) Total no. of cells (Sector) in the licensed service area	Dec-13	84	8384	5181	3853	4496	8445	3576	8323	2310	1366
4	No. of POI's having >=0.5% POI congestion											
	No. of POI's having >=0.5% POI congestion	Dec-13	0	0	6	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark	Dec-13	0	0	Idea Mobile, RIL GSM,Airtel basic, RIL basic, Dishnet and Data Com	0	0	0	0	0	0	0
5	Network Data											
	a) Equipped Capacity of Network in Erlang	Dec-13	119.81	85317	200000	48655.66	98732.01	98604	50000	140540.7	56000	95038
	b) Total traffic in TCBH in erlang (Avg.)	Dec-13	2.62	62201	76635	20883.91	34672.08	103034.8	44719.75	129075.8	16180.97	22555.77
	c) Total no. of customers served (as per VLR) on last day of the month	Dec-13	811	2296825	1592555	707002	1412564	3837889	1595537	4514741	470722	279830

- NP-Not Provided



TABLE: 6

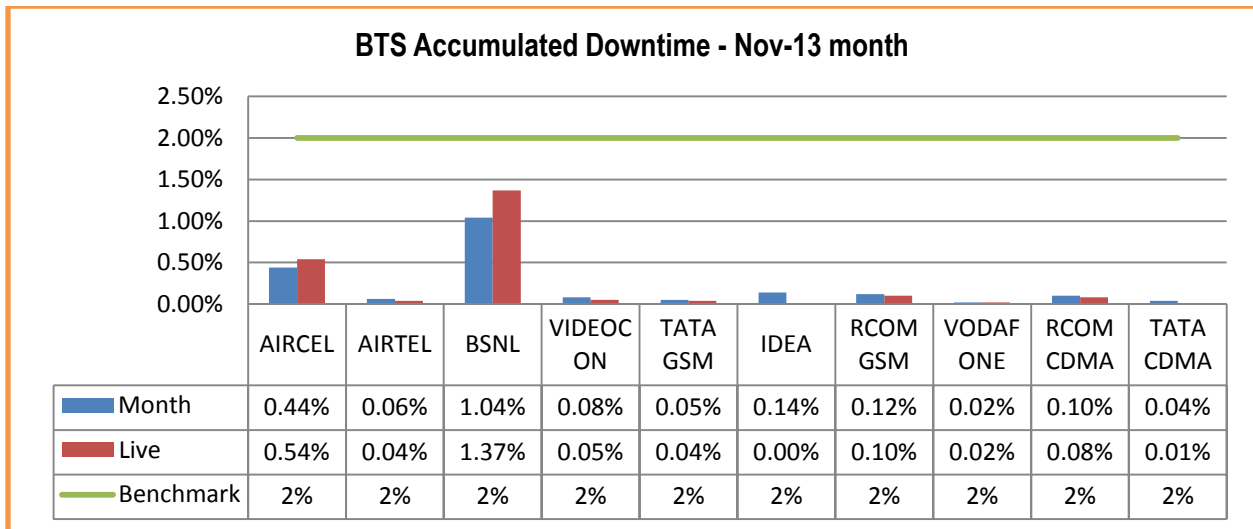
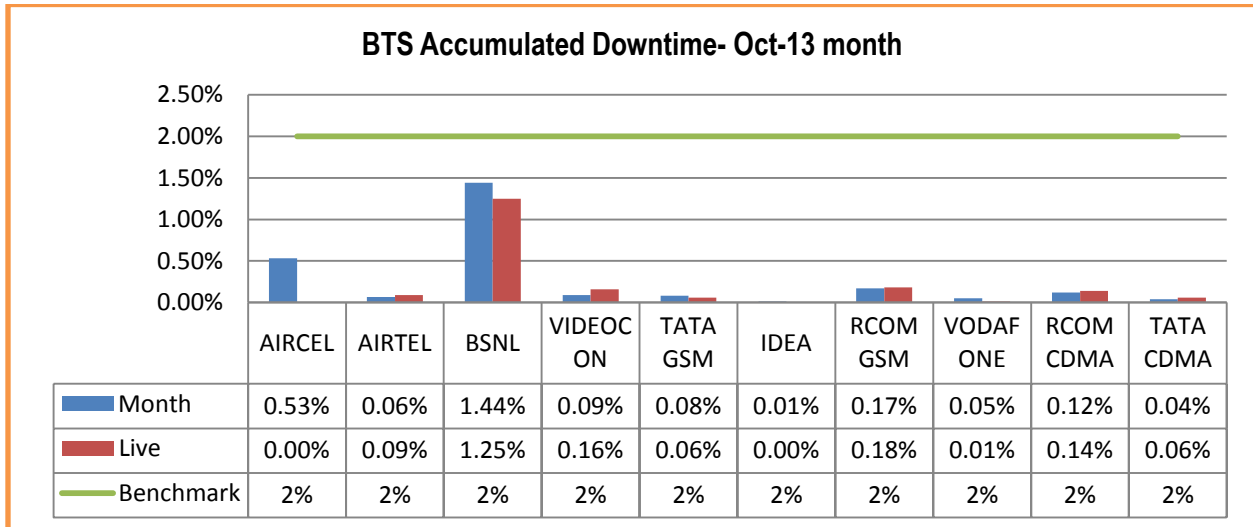
Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Dec-13 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VIDEOCON	TATA GSM	IDEA	RCOM GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators	
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Live data	28	2807	1710	1263	1484	2794	1194	2741	770	454
	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	0	96.50	1512.85	73.78	58.33	10.40	69	33.47	36	2.5
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.05%	1.23%	0.08%	0.05%	0.01%	0.08%	0.02%	0.20%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	1	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%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100.00%	99.36%	97.88%	98.37%	98.83%	99.99%	99.41%	99.72%	99.16%	98.83%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.05%	0.29%	0.03%	0.02%	0.62%	0.04%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.13%	0.94%	0.15%	0.38%	0.33%	0.01%	0.28%	0.01%	0.02%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.92%	0.43%	0.80%	0.58%	0.49%	0.60%	0.23%	0.67%	0.03%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	5.95%	1.12%	1.20%	0.65%	NP	1.44%	0.00%	0.85%	0.09%	NP
	c) % of connections with good voice quality	>=95%	Live data	98.80%	99.13%	NP	98.38%	97.83%	97.97%	99.15%	97.77%	99.76%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	5	93	62	25	NP	121	0	71	2	NP
	e) Total no. of cells (Sector) in the licensed service area		Live data	84	8366	5120	3847	NP	8422	3576	8308	2310	NP
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

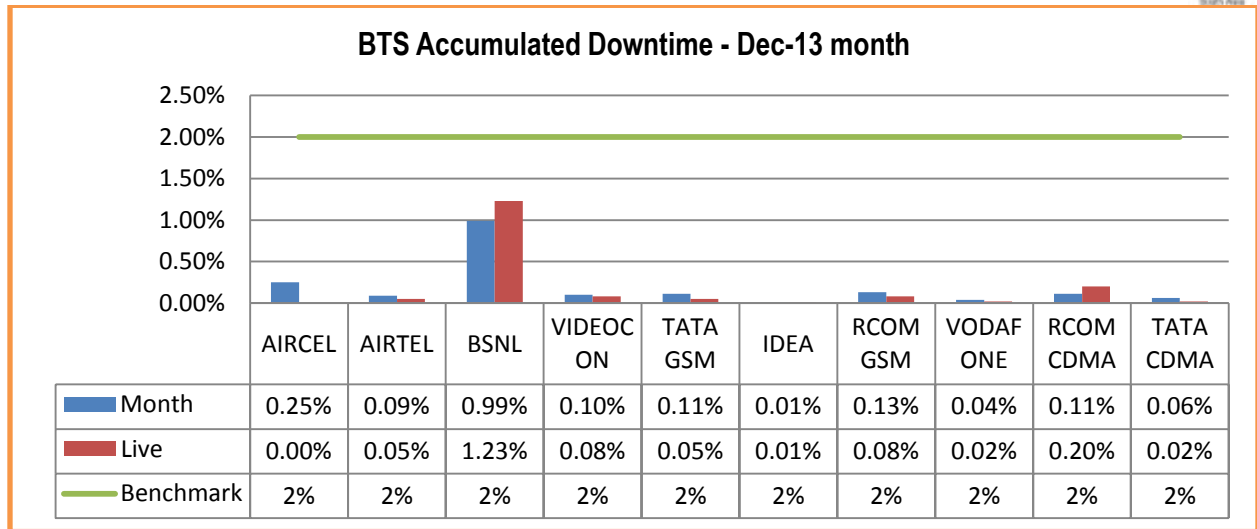
● NP-Not Provided



8. GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE CELLULAR MOBILE SERVICE PROVIDERS-MONTHLY V/S 3-DAYS LIVE MEASUREMENT:

1) BTS ACCUMULATED DOWNTIME:

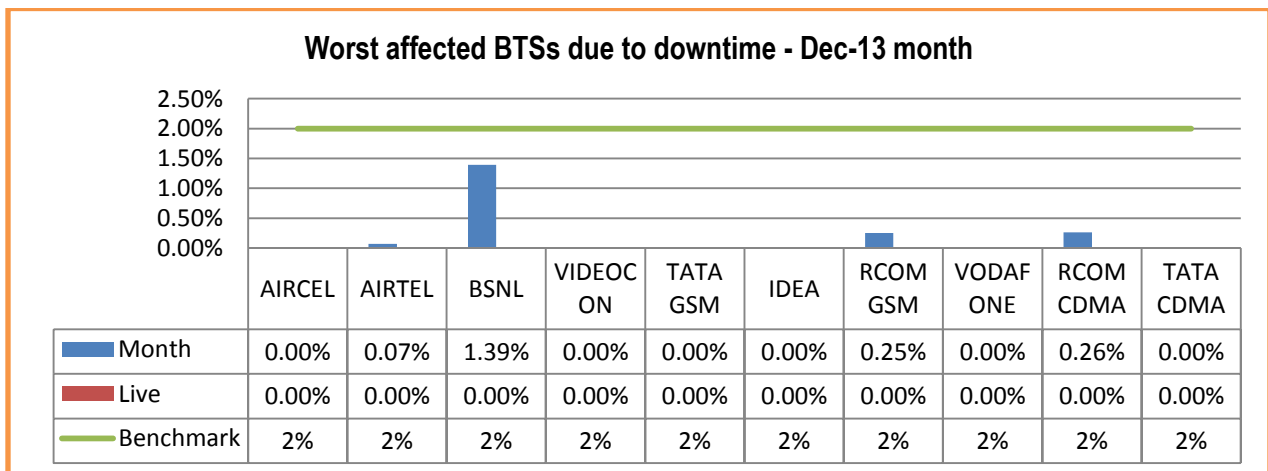
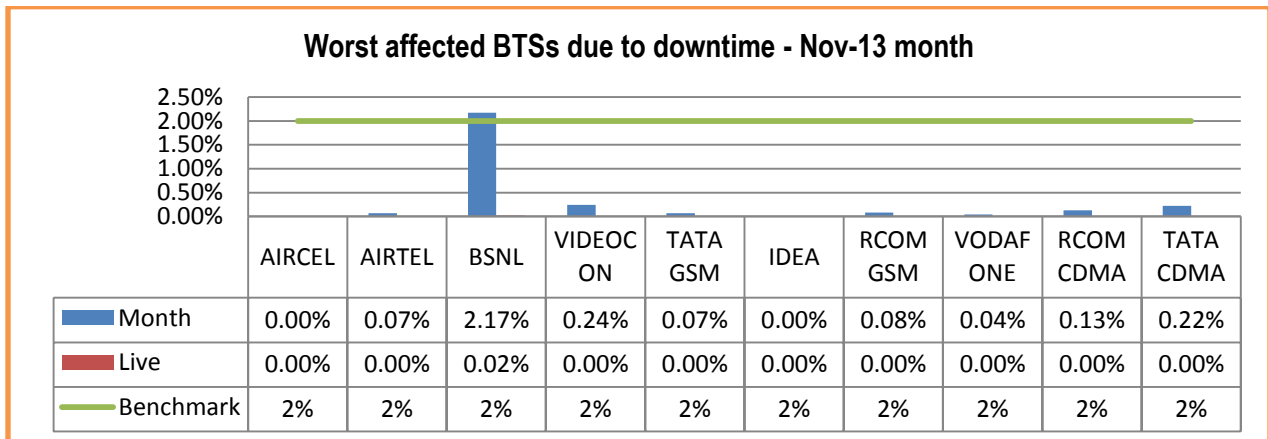
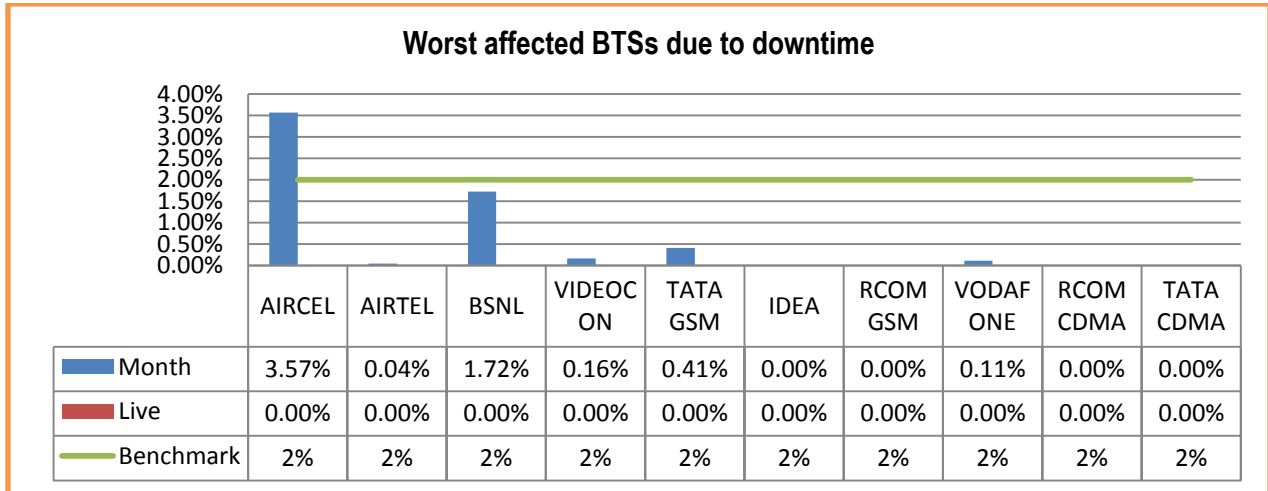




All operators are meeting the benchmarks.



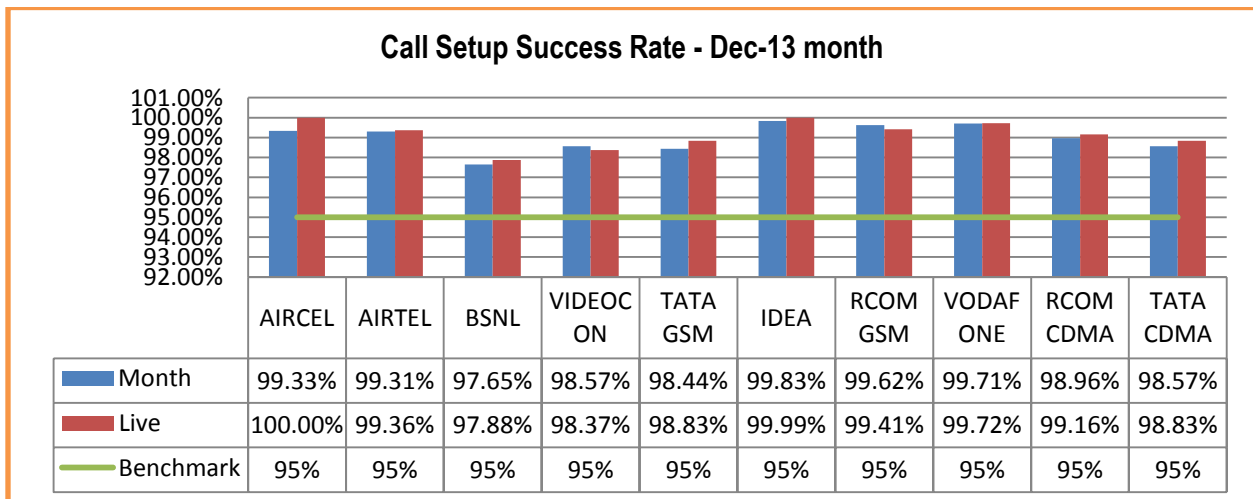
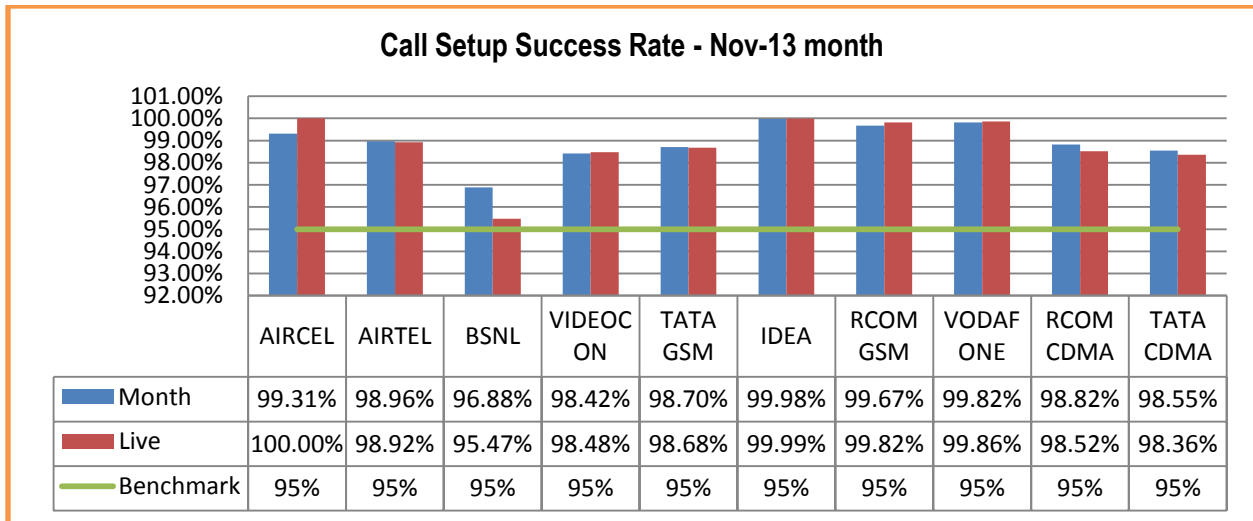
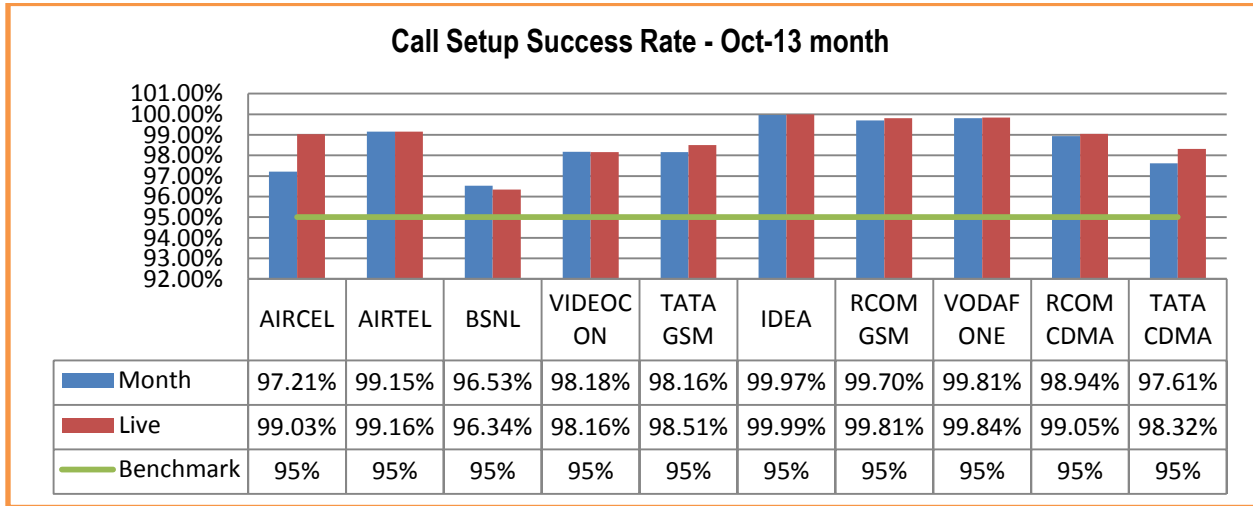
2) WORST AFFECTED BTSS DUE TO DOWNTIME:



All operators are meeting the benchmarks except BSNL in the month of November-2013.



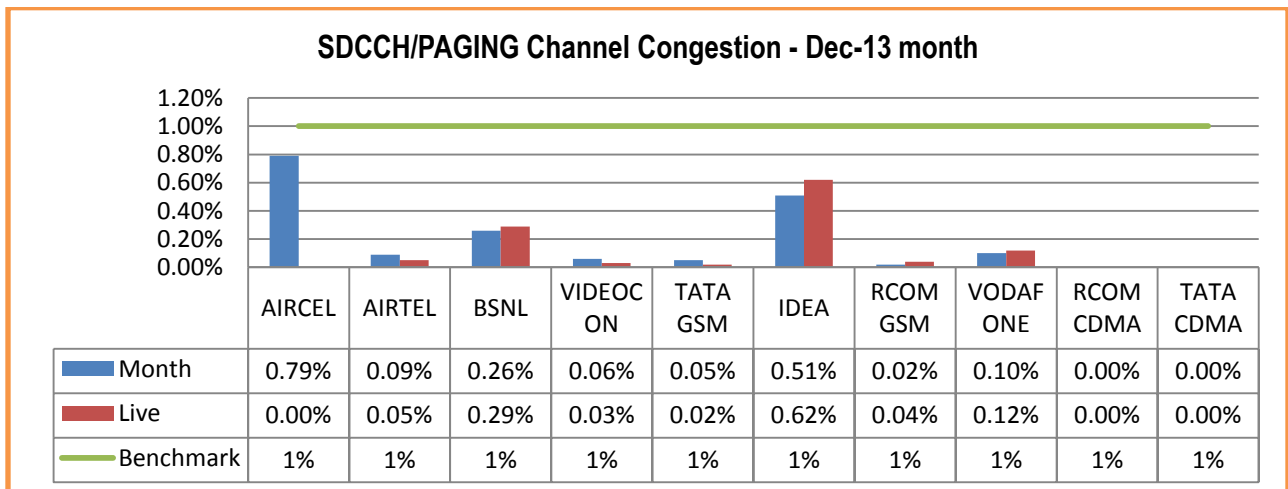
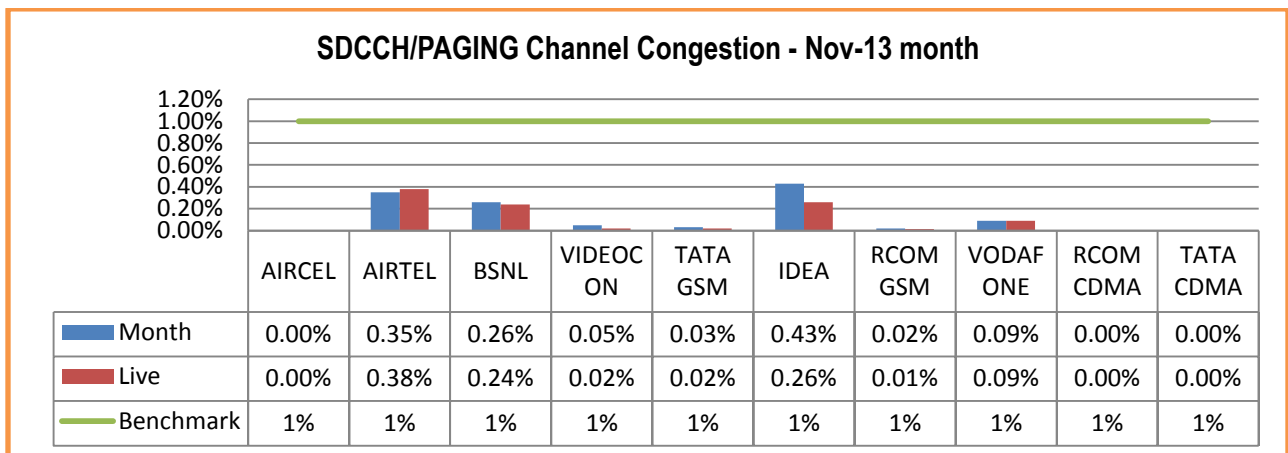
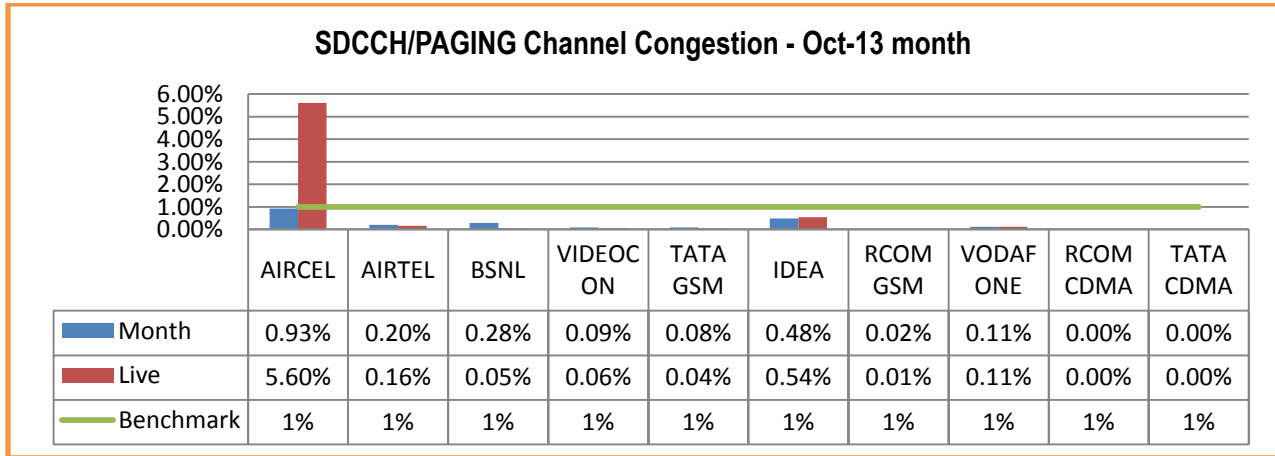
3) CALL SETUP SUCCESS RATE:



All operators are meeting the benchmarks.



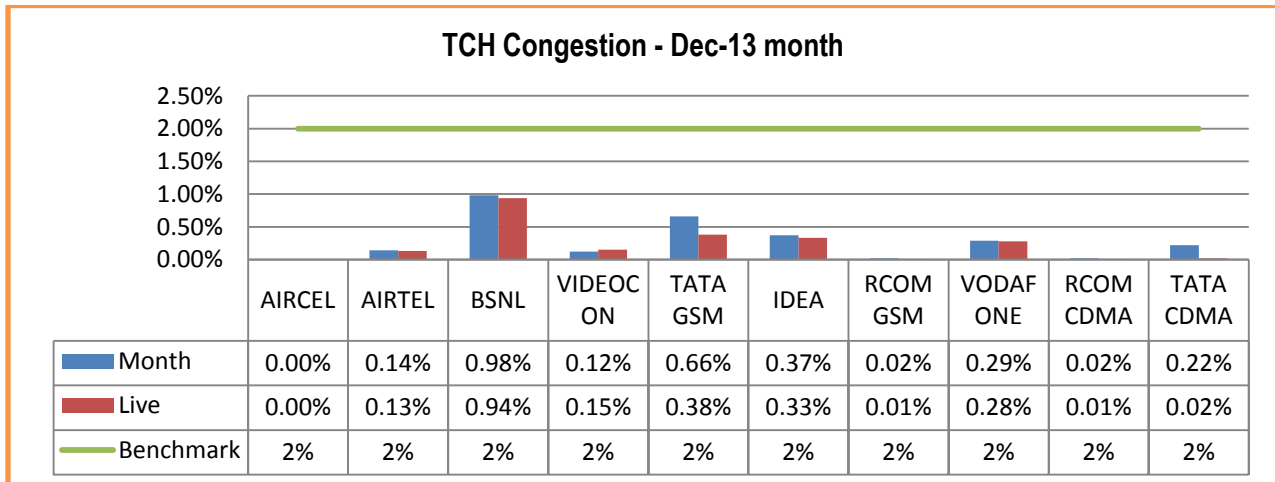
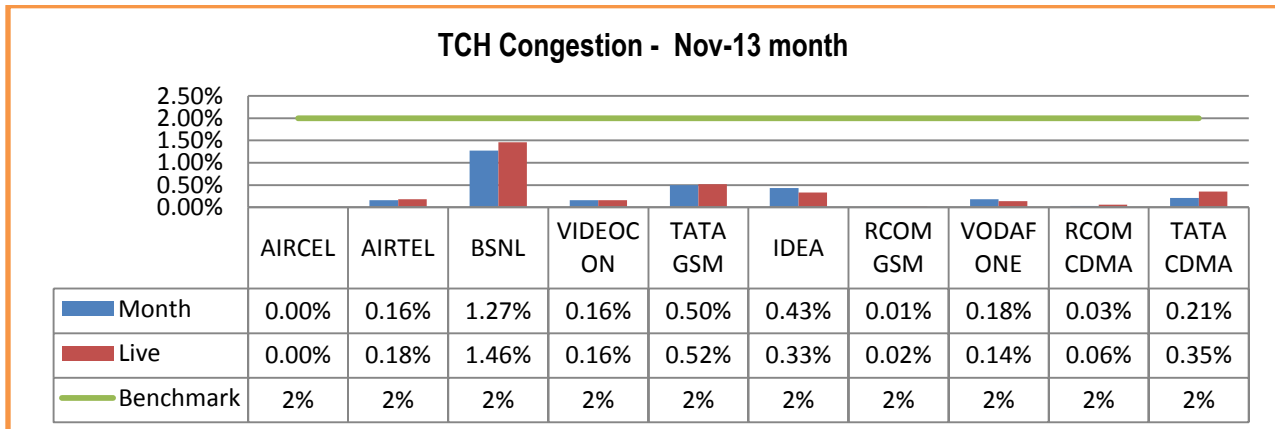
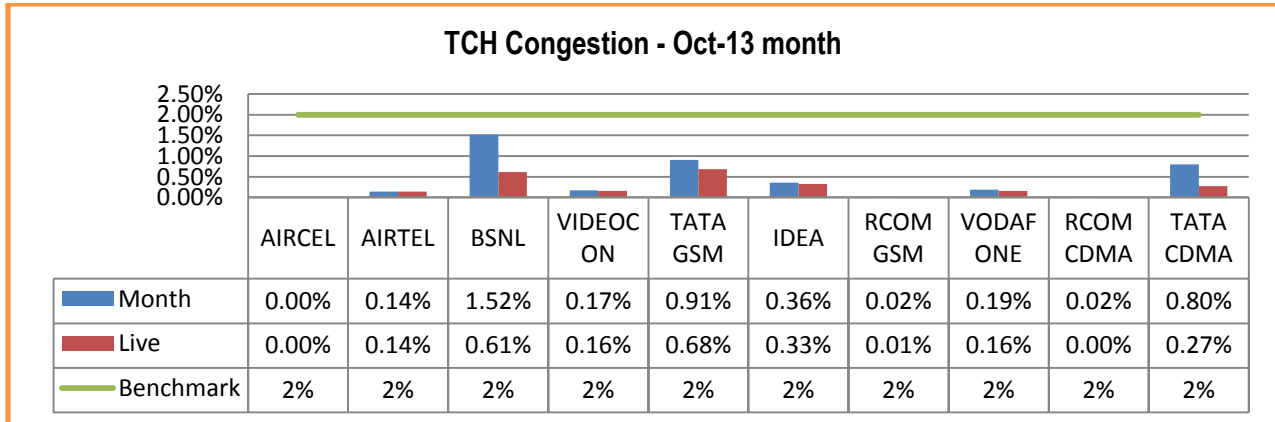
4) SDCCH/PAGING CHANNEL CONGESTION:



All operators are meeting the benchmarks except Aircel in 3 days live measurement in the month of Oct-13.



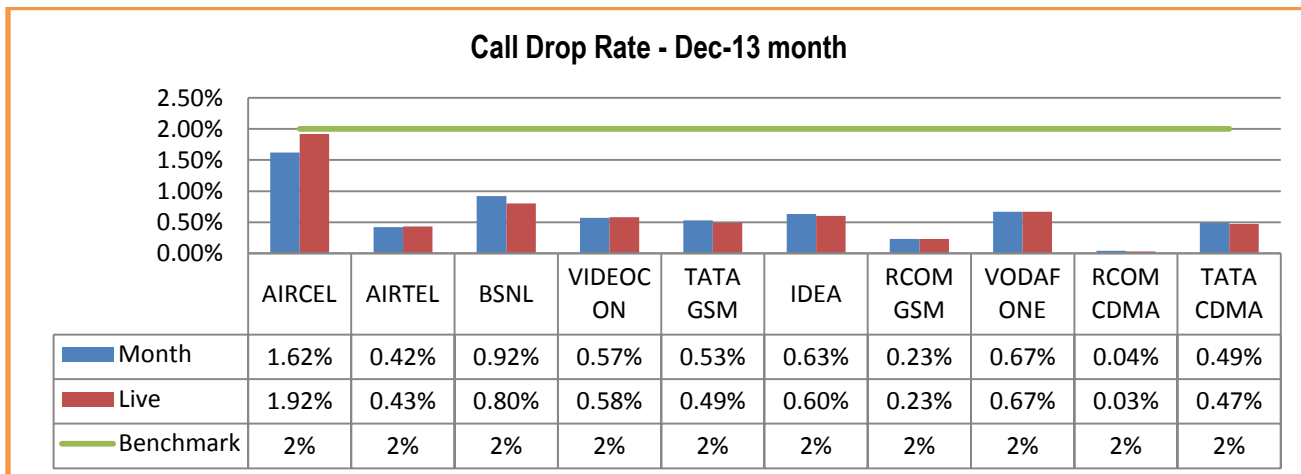
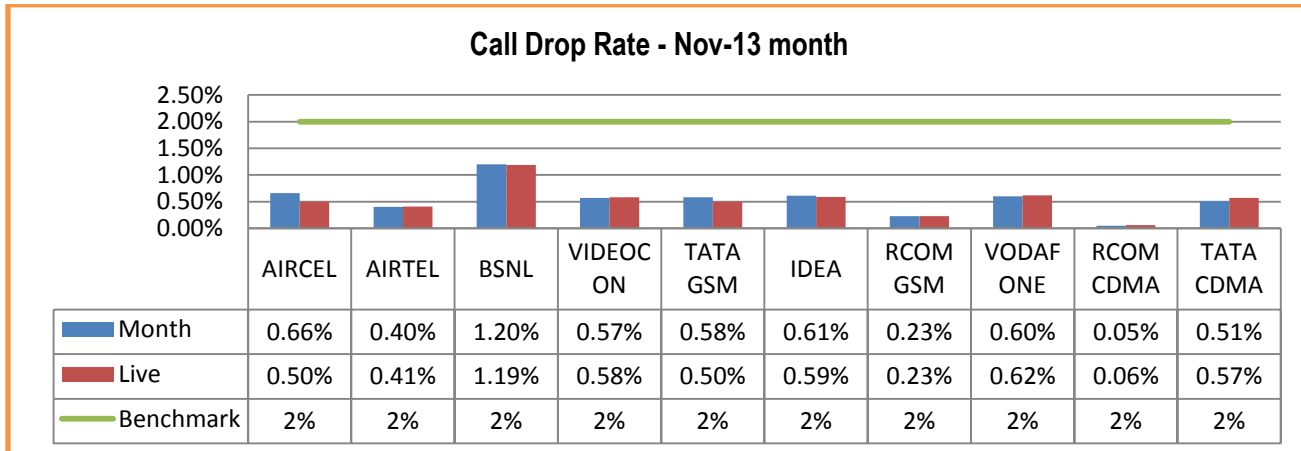
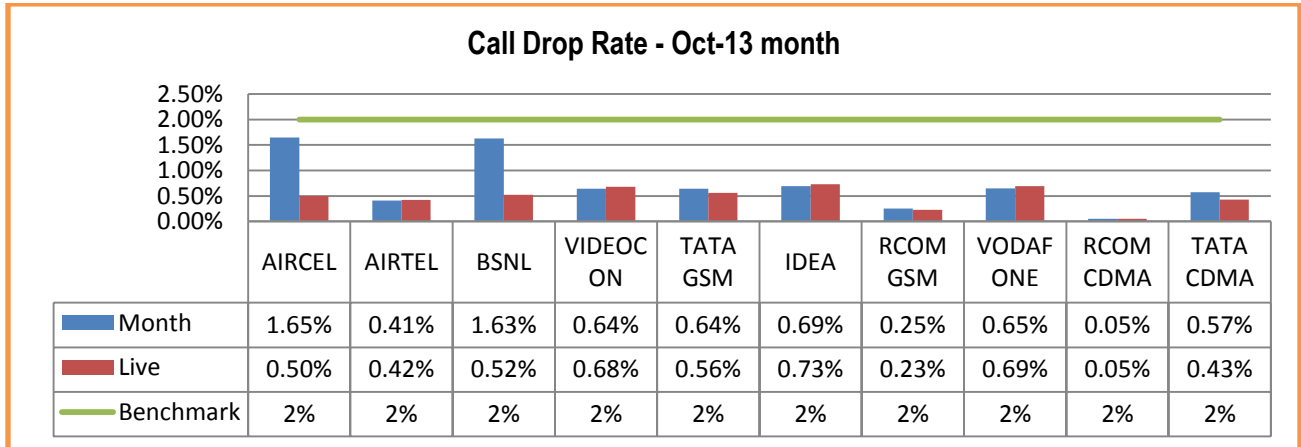
5) TCH CONGESTION:



All operators are meeting the benchmarks.



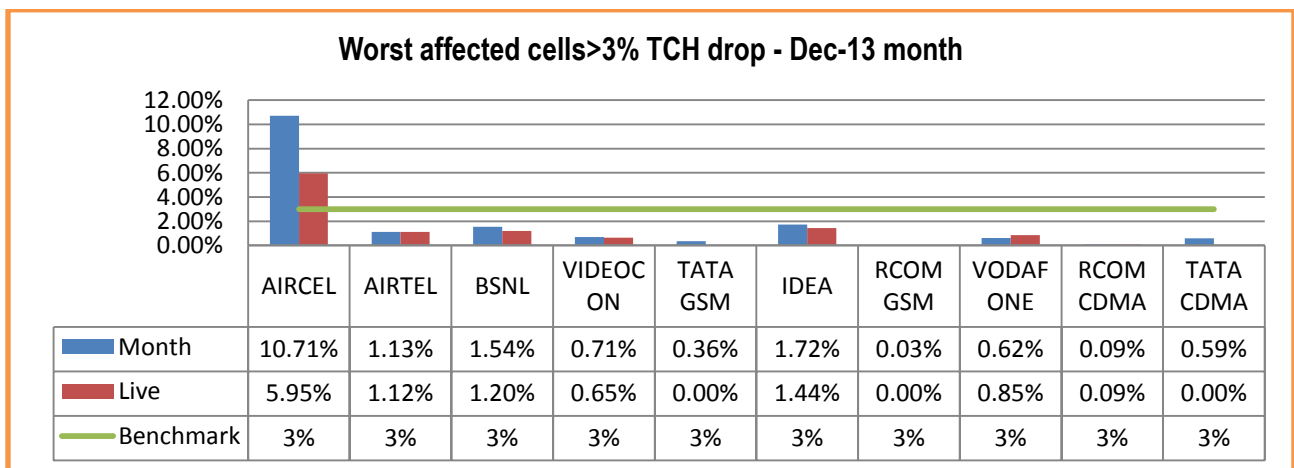
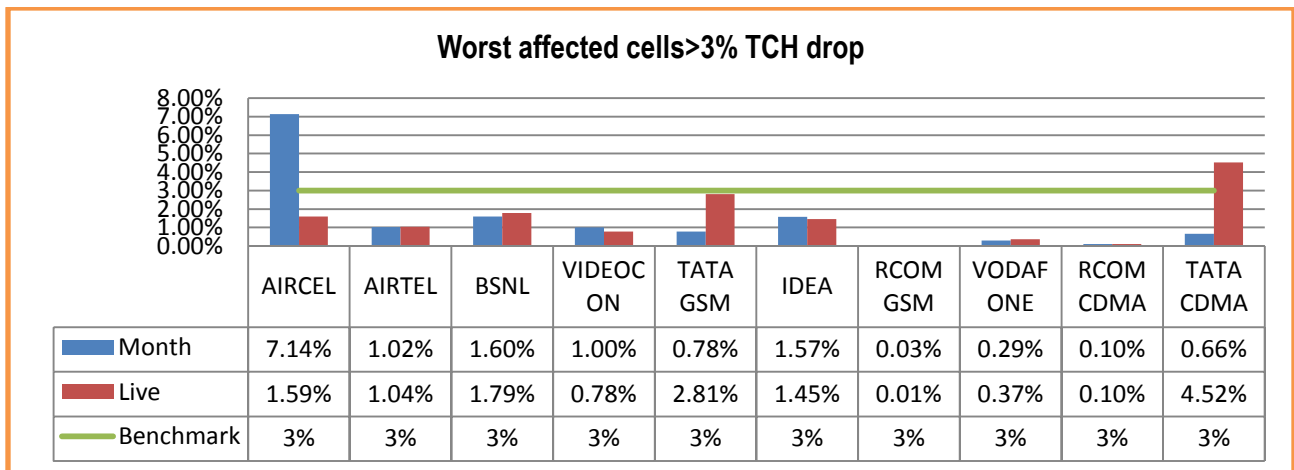
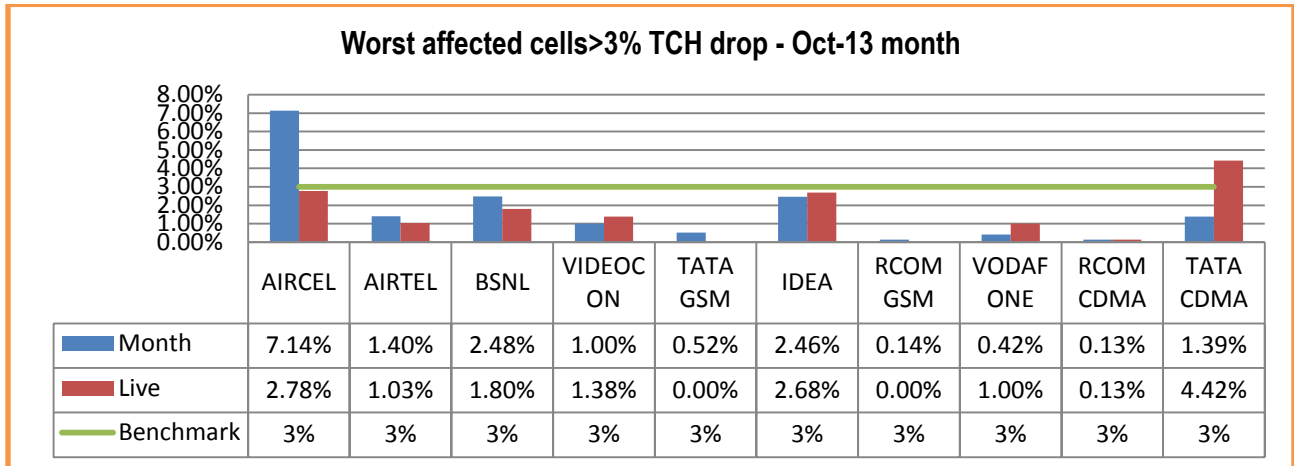
6) CALL DROP RATE:



All operators are meeting the benchmarks.



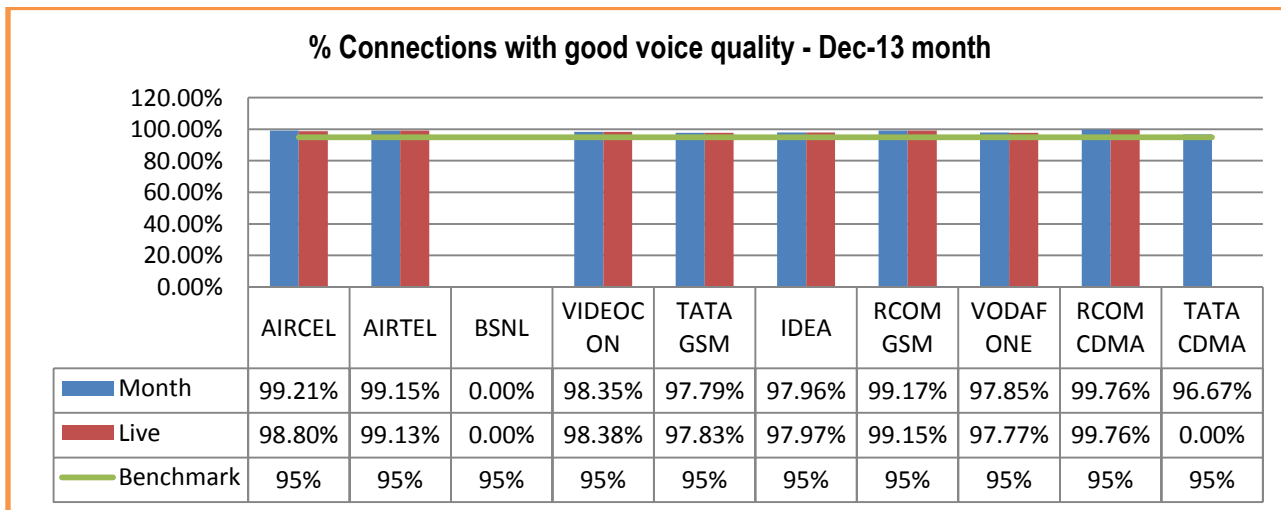
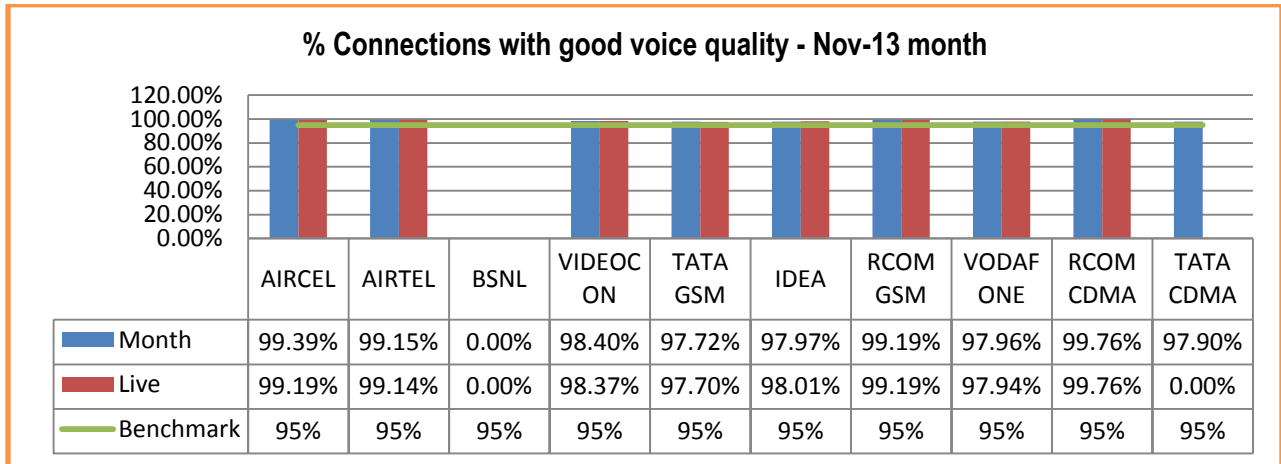
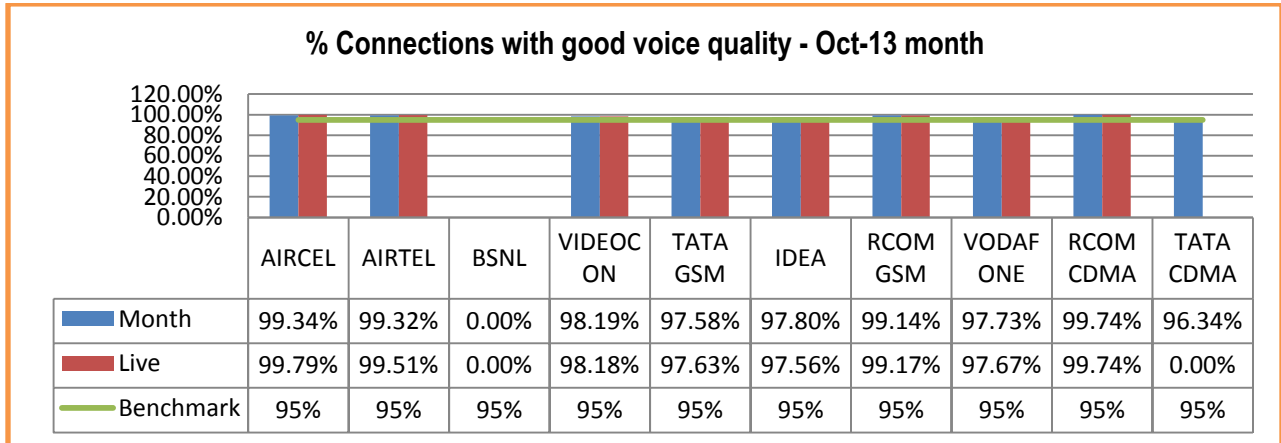
7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Aircel in all respective months and Tata (CDMA) in the month of October and November-13.



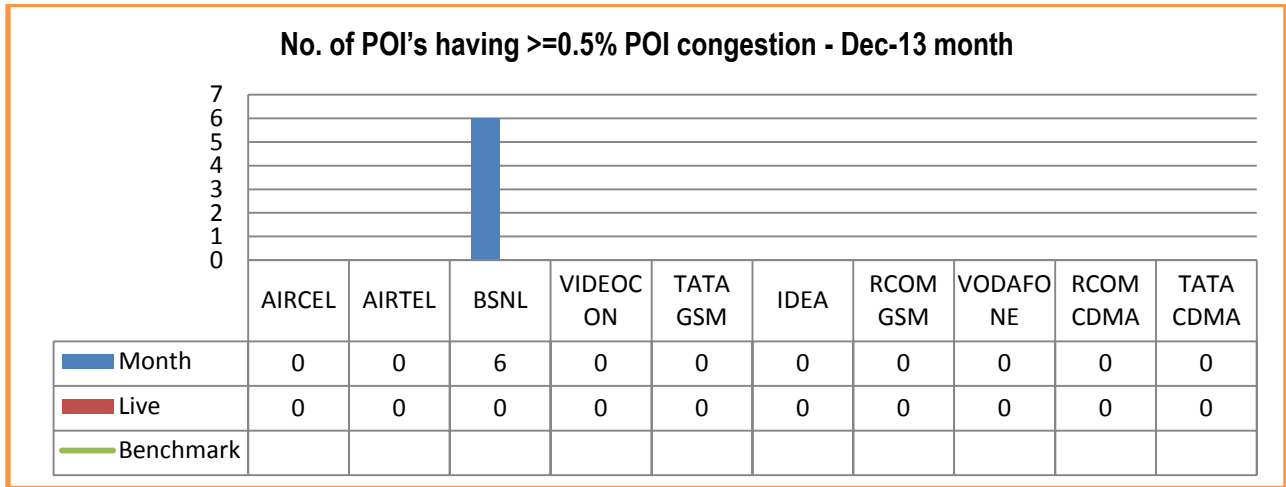
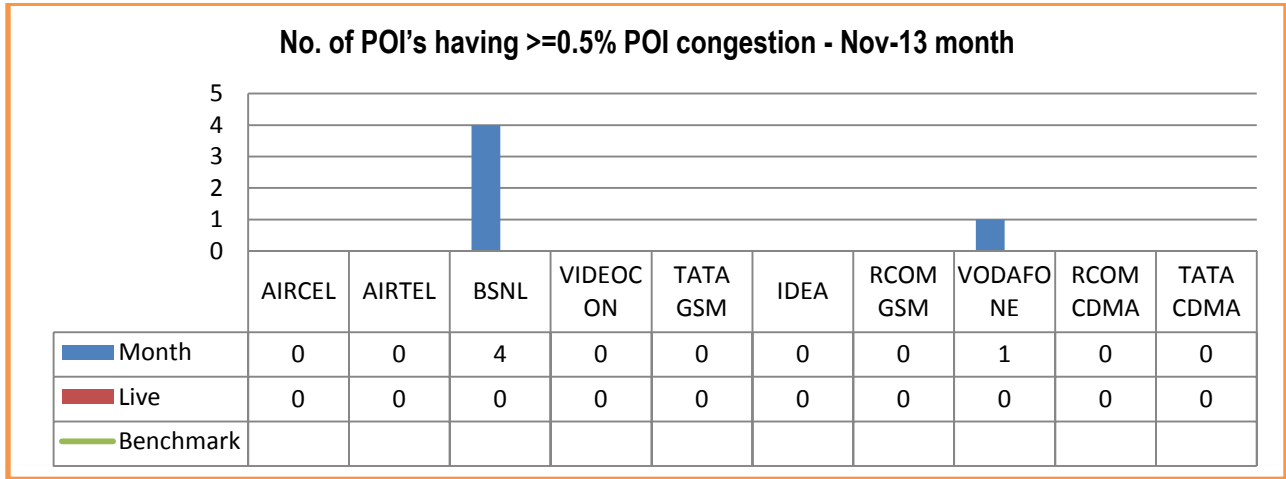
8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks. BSNL is not having the system generated data for VQ, so not provided the data.



9) NO. OF POI'S HAVING $\geq 0.5\%$ POI CONGESTION:



BSNL was having congestion on the individual POIs in the months of November and December -13 and Vodafone was having congestion in the month of November-13.



9. PMR VARIFICATION SHEET:

a) NETWORK RELATED PARAMETER:

Haryana Circle		BTS Accumulated Downtime	Worst affected BTSs due to downtime	CSSR (Call Setup Success Rate)	SDCCH/PAGING Channel congestion	TCH congestion	CDR (Call Drop Rate)	Worst affected cells>3% TCH drop (Call drop) rate	Connections with good voice quality	No. of POI's having >=0.5% POI congestion
Benchmark		≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.5%
AIRCEL	Reported	0.41	1.19	98.52	0.58	0.00	1.36	8.33	99.32	0
	Verified	0.41%	1.19%	98.62%	0.57%	0.00%	1.31%	8.33%	99.31%	0
AIRTEL	Reported	0.07	0.06	99.14	0.21	0.15	0.41	1.19	99.21	0
	Verified	0.07%	0.06%	99.14%	0.21%	0.15%	0.41%	1.18%	99.21%	0
BSNL	Reported	1.13	1.77	97.33	0.30	1.27	1.23	1.87	97.20	2
	Verified	1.16%	1.76%	97.02%	0.27%	1.26%	1.25%	1.87%	NP	3
VIDEOCON	Reported	0.09	0.13	98.39	0.07	0.15	0.59	0.81	98.31	0
	Verified	0.09%	0.13%	98.39%	0.07%	0.15%	0.59%	0.90%	98.31%	0
TATA GSM	Reported	0.06	0.16	98.43	0.05	0.69	0.58	0.37	97.70	0
	Verified	0.08%	0.16%	98.43%	0.05%	0.69%	0.58%	0.55%	97.70%	0
IDEA	Reported	0.01	0.00	99.93	0.47	0.39	0.64	1.91	97.91	0
	Verified	0.05%	0.00%	99.93%	0.47%	0.39%	0.64%	1.92%	97.91%	0
RCOM GSM	Reported	0.14	0.11	99.67	0.02	0.02	0.24	0.06	99.17	0
	Verified	0.14%	0.11%	99.66%	0.02%	0.02%	0.24%	0.07%	99.17%	0
VODAFONE	Reported	0.04	0.05	99.78	0.10	0.22	0.64	0.44	97.85	0
	Verified	0.04%	0.05%	99.78%	0.10%	0.22%	0.64%	0.44%	97.85%	0
RCOM CDMA	Reported	0.11	0.13	98.91	0.00	0.02	0.05	0.11	99.75	0
	Verified	0.11%	0.13%	98.91%	0.00%	0.02%	0.05%	0.11%	99.75%	0
TATA CDMA	Reported	0.05	0.00	98.24	0.00	0.41	0.53	0.88	96.96	0
	Verified	0.05%	0.07%	98.24%	0.00%	0.41%	0.52%	0.88%	96.97%	0

- I. The above data is averaged for three months of the quarter ending December-2013.
- II. The PMR data provided by the service providers is largely matching with verified (audited) data. However in some cases there is a little variation between the reported and verified data.
- III. Aircel has not met the benchmark for the parameter "Worst affected cells>3% TCH drop".



b) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

Haryana Circle		% of billing complaints during the quarter	% of Pre-paid Charging Complaints	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	% of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	Accessibility of call centre/Customer Care	% call answered by operators(voice to voice) within 60 sec.	% of Termination/ Closure of service within 7 days	Time taken for refunds of deposits after closures.
Benchmark		<= 0.1%	<= 0.1%	100 % within 4 week	<=1 week	>=95%	>=90%	100% within <=7days	100% within 60 days
AIRCEL	Reported	0.00	0.00	100.00	100.00	93.08	94.11	100.00	100.00
	Verified	NA	0.00%	100.00%	100.00%	93.22%	93.44%	NA	NA
AIRTEL	Reported	0.05	0.02	100.00	100.00	100.00	96.00	100.00	100.00
	Verified	0.03%	0.02%	100.00%	100.00%	100.00%	95.00%	100.00%	100.00%
BSNL	Reported	0.10	0.00	100.00	100.00	100.00	65.00	100.00	100.00
	Verified	0.05%	0.01%	100.00%	100.00%	100.00%	65.46%	100.00%	100.00%
IDEA	Reported	0.08	0.03	100.00	100.00	100.00	98.17	100.00	100.00
	Verified	0.09%	0.03%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
RCOM (GSM)	Reported	0.08	0.10	100.00	100.00	98.89	81.31	100.00	100.00
	Verified	0.08%	0.10%	100.00%	100.00%	98.89%	80.99%	100.00%	100.00%
TATA (GSM)	Reported	0.00	0.00	100.00	100.00	99.25	88.58	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	99.24%	99.20%	100.00%	100.00%
VIDEOCON	Reported	NA	0.01	100.00	100.00	95.92	92.60	NA	NA
	Verified	NA	0.00%	100.00%	100.00%	100.00%	92.67%	NA	NA
VODAFONE	Reported	0.01	0.00	100.00	100.00	100.00	98.13	100.00	100.00
	Verified	0.01%	0.00%	100.00%	100.00%	100.00%	96.00%	100.00%	96.17%
RCOM (CDMA)	Reported	0.09	0.09	100.00	100.00	99.18	73.84	100.00	100.00
	Verified	0.09%	0.09%	100.00%	100.00%	99.19%	83.81%	100.00%	100.00%
TATA (CDMA)	Reported	0.01	0.00	100.00	100.00	96.71	97.30	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	97.65%	96.70%	100.00%	100.00%

- i. The above data is averaged for three months of the quarter ending December-2013.
- ii. The PMR data provided by the service providers is largely matching with verified (audited) data.
- iii. Aircel has not met the benchmark for the parameter "Accessibility of call centre/Customer Care".
- iv. BSNL, RCOM GSM and RCOM CDMA have not met the benchmark for the parameter "% call answered by operators (voice to voice) within 60 sec."
- v. Vodafone has not met the benchmark for the parameter "Time taken for refunds of deposits after closures."



10. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINER)

The QoS audit for basic (wire line) service was undertaken for assessment of quarterly performance of the service providers for quarter ended December-2013. As per the tender document **Annexure - 2C** (attached as annex-1 in the end of the report) **out of 1306 exchanges of BSNL, audit was done for sampled 19 (Urban) and 46 (Rural) exchanges** (List of BSNL exchanges undertaken for QoS audit attached as annex-2 in the end of the report), 1 exchanges of Bharti-Airtel, 1 exchange of TTSL and 1 exchange of RCOM. The performance of the Service providers against each parameter has been evaluated by taking average of performance value of each parameter for all the exchanges of the respective service providers. The averaged value of each parameter has been tabulated as follows:

Averaged Audited data for Wireline (Basic) Services – Haryana circle							
Sl. No.	Parameters	Bench-Mark	Period	BHARTI AIRTEL	BSNL	RELIANCE	TTL
1	Fault incidences						
	(No. of faults/100 subscribers /month)	< 5%	Quarterly	4.37%	3.61%	0.00%	0.17%
2	Faults Repair/Restoration Time						
	Fault repair by next working day(Urban Area)	>90%	Quarterly	97.40%	79.75%	100.00%	100.00%
	Within 3 days day	100%	Quarterly	100.00%	89.94%	100.00%	100.00%
	Fault repair by next working day(Rural & hilly Area)	>90%	Quarterly	NA	80.86%	NA	NA
	Within 5 days	100%	Quarterly	NA	94.31%	NA	NA
	Mean time to Repair(MTTR)	≤8 Hrs	Quarterly	2.76	8.13	0	5.12
3	Rent Rebate						
	Fault pending > 3 days & <7 days	Rebate for 7 days	Quarterly	0	0	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Quarterly	0	1	0	0
	Fault pending > 15 days	Rebate for 1 month	Quarterly	0	1	0	0
4	Call Completion Ratio (CCR) & Answer to seizure Ratio(ASR)						
	CCR	> 55%	Quarterly	88.78%	64.68%	-	99.99%
	ASR	> 75%	Quarterly	-	-	82.80%	-
5	Metering & Billing Performance						
	% of disputed Bills over bills issued (Post Paid)	< 0.1%	Quarterly	0.01%	0.02%	0.00%	0.05%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA	NA	NA
	% of billing complaints resolved within 4 weeks	100%	Quarterly	100.00%	100.00%	100.00%	100.00%



	Period of all refunds/payments from the date of resolution of complaints within 1weeks	100%	Quarterly	100.00%	100.00%	100.00%	100.00%
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%	100.00%	94.00%	100.00%
	% age of calls answered by operator(voice to voice) within 60 seconds	>=90%	Quarterly	95.00%	75.66%	95.00%	94.50%
8	Customer care(promptness in attending to customers request)						
	Termination / Closures	100%	Quarterly	100.00%	88.60%	100.00%	100.00%
	Time taken for refunds of deposit after closures	100%	Quarterly	100.00%	99.24%	100.00%	100.00%

- NA-Not Applicable and NP-Not Provided
- Reliance has provided the data for ASR and other operators have provided the data for CCR.

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

3 days live measurement data for Wireline (Basic) Services- Haryana Circle							
Sl. No.	Parameters	Benchmark	Period	BHARTI AIRTEL	BSNL	RELIANCE	TTL
1	Call Completion Ratio (CCR) & Answer to seizure Ratio(ASR)						
	CCR	> 55%	Live	94.59%	53.88%	-	100.00%
	ASR	> 75%	Live	-	-	82.32%	-
2	POI Congestion						
	No. of POI's having congestion >0.5%		Live	0	0	0	0
3	Response Time to customer for assistance						
	Accessibility of Call centre/customer Care	≥95%	Live	100.00%	100.00%	93.00%	100.00%
	% age of calls answered by operator(voice to voice) within 60 seconds	≥90%	Live	95.00%	92.53%	96.00%	100.00%



- Reliance has provided the data for ASR and other operators have provided the data for CCR.

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.

Fault Repair/Restoration Time: For this parameter, **Only BSNL failed to meet the benchmark of fault repair by next working day and restoration time both in urban & rural areas.** The performance of BSNL was 79.75% for 'Fault repaired by next working day' and 89.94% for fault repaired within 3 days in urban areas whereas their performance for the same parameters was 80.86% & 94.3% respectively in rural areas.

Mean Time to Repair: BSNL was also failed to meet the benchmark for MTTR with their performance as 8.13 hrs. against the benchmark of ≤ 8 Hrs.

Call Completion Rate/Answer to seizure ratio: All the operators were found to be comfortably meeting the benchmark on this parameter at various exchanges.

However, during 3 days live measurement, BSNL was found short of benchmark with their performance level as 53.88%.

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

Response Time to Customer for assistance: For percentage of calls getting connected to call center and answered, all operators except RCOM managed to meet the TRAI benchmark. **RCOM could connect 94.00 % of calls to its call center against the benchmark of 95%.** With respect to the parameter of calls answered by operator (voice to voice), BSNL could not meet the benchmark with their performance as 75.66% against the benchmark of $\geq 90\%$.

RCOM was also found non compliant during 3 days live measurement for parameter accessibility of call center with performance level of 93% against the benchmark of $>95\%$.

Termination/Closures: All operators except BSNL were found meeting the benchmark for this parameter. **BSNL remained under performed for this parameter with its performance as 88.60% against the benchmark of 100%** and for the parameter 'Time taken for refunds of deposit of after closer' their performance was 99.24%, very marginally below the benchmark of 100%.

Thus, from the above findings that, it was concluded that the performance of BSNL was not satisfactory in respect of the parameters Fault Repairs/Restoration Time, Response time to customer for assistance, Terminations/Closers and refunds. Hence, BSNL needed to improve their services in respect of these parameters.



INTER OPERATOR CALL ASSESSMENT

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in Haryana Circle service area 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	BHARTI AIRTEL	BSNL	RELIANCE	TTL
BHARTI AIRTEL	Haryana	--	100.00%	100.00%	100.00%
BSNL	Haryana	100.00%	--	100.00%	100.00%
RELIANCE	Haryana	100.00%	100.00%	--	100.00%
TTL	Haryana	100.00%	100.00%	100.00%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory as there was hardly any problem in interconnection from one operator to other operators.

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE					
	Circle Name	BHARTI AIRTEL	BSNL	RELIANCE	TTL
Total No. of calls Attempted	Haryana	100	100	100	100
Total No. of calls connected to IVR	Haryana	100	100	100	100
Calls got connected to agent within 60 Sec	Haryana	100	100	100	100
%age of calls got answered	Haryana	100.00%	100.00%	100.00%	100.00%

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, all service providers managed to connect 100% calls to their respective call center.



LEVEL-1 LIVE CALLING

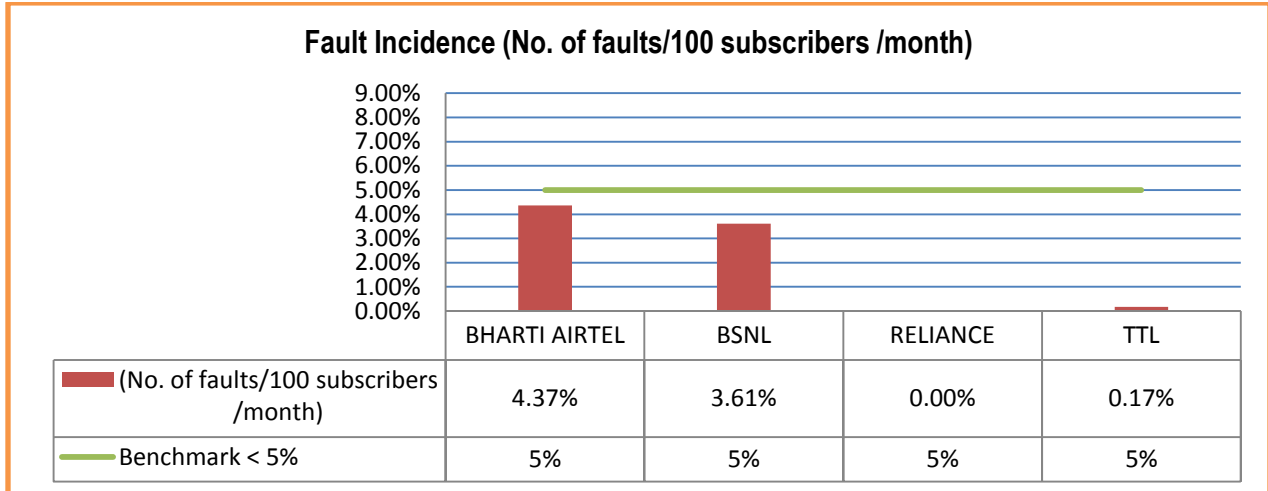
LEVEL 1 LIVE CALLING						
Emergency no.	Circle Name	No. of calls made	BHARTI AIRTEL	BSNL	RELIANCE	TTL
100	HARYANA	30	100.00%	100.00%	100.00%	100.00%
101	HARYANA	40	100.00%	100.00%	100.00%	100.00%
102	HARYANA	40	100.00%	100.00%	100.00%	100.00%
1091	HARYANA	40	100.00%	100.00%	100.00%	100.00%

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various service providers, the calls were made from telephone provided by the service providers. In Haryana circle, these services were found functional in the networks of all the service providers.



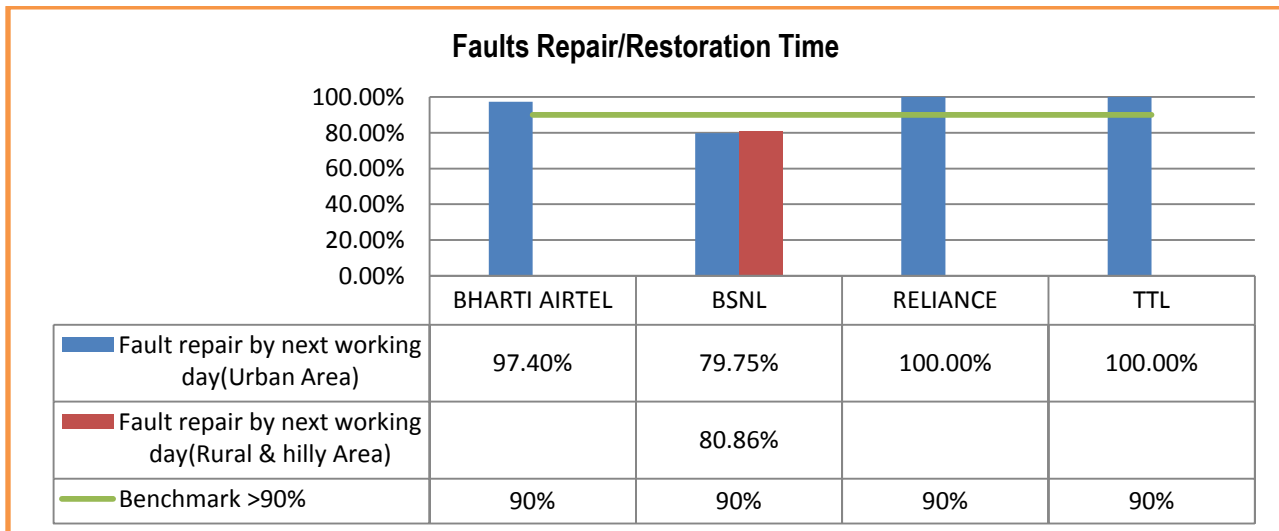
12. GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:

1) FAULT INCIDENCE:



All Operators are meeting the benchmarks.

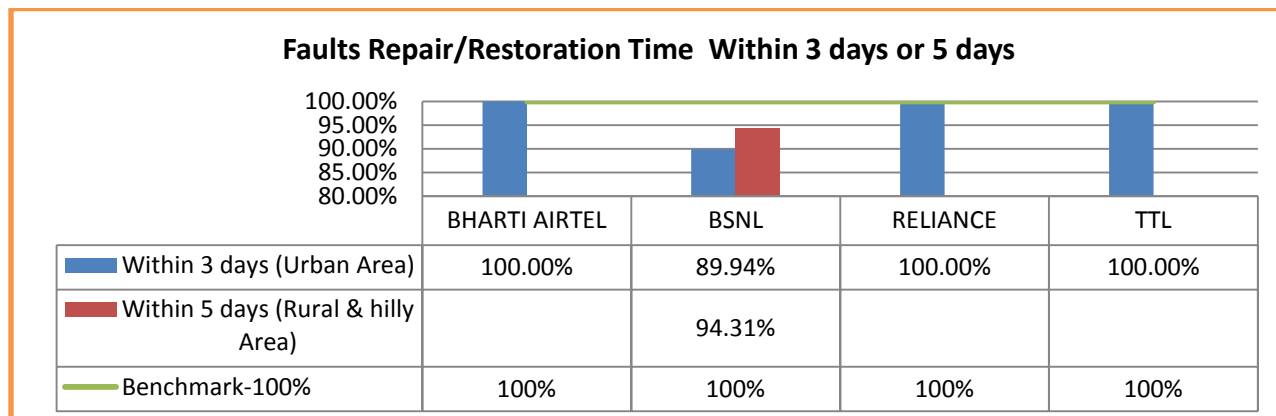
2) FAULTS REPAIR/RESTORATION TIME:



All Operators are meeting the benchmarks except BSNL against the benchmark > 90 %.

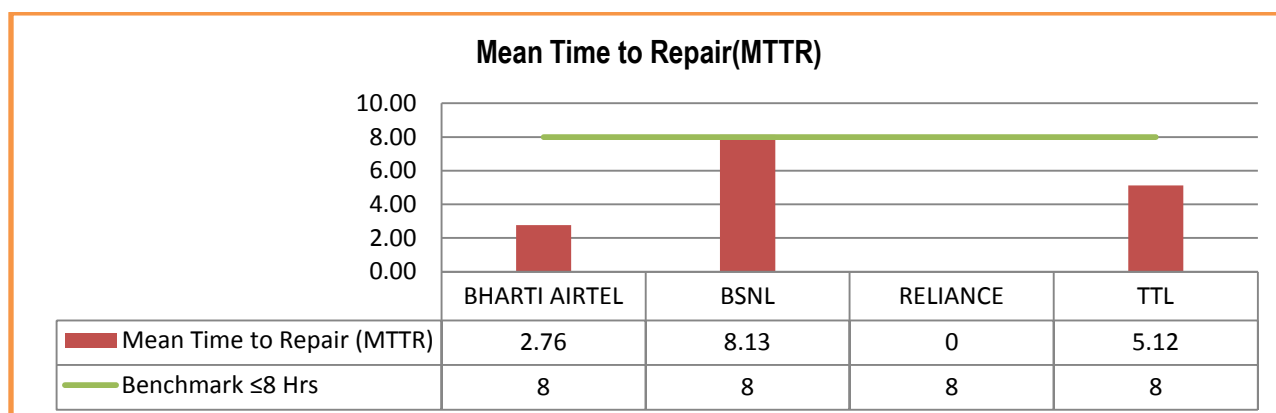


3) FAULTS REPAIR/RESTORATION TIME WITHIN 3 DAYS:



All Operators are meeting the benchmarks except BSNL against the benchmark of 100 %.

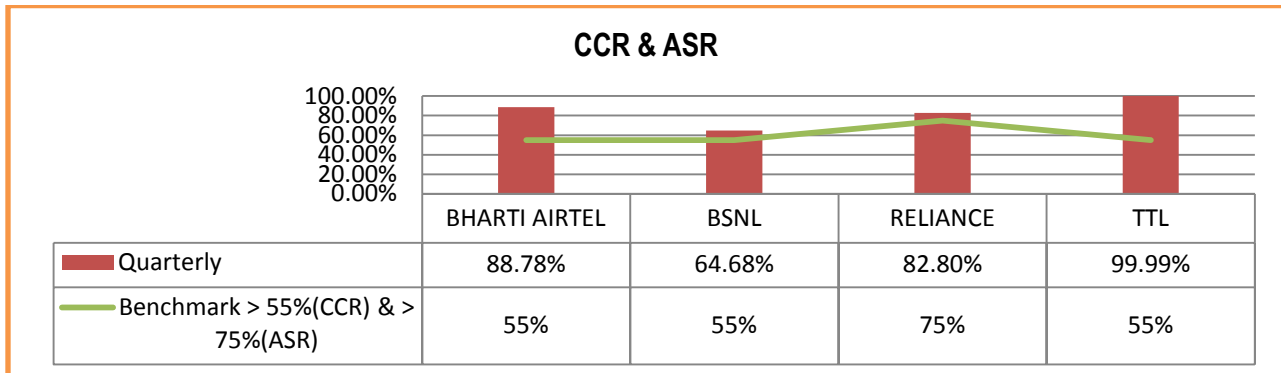
4) MEAN TIME TO REPAIR (MTTR):



All Operators are meeting the benchmarks except BSNL against the benchmark of <8 hrs. %.



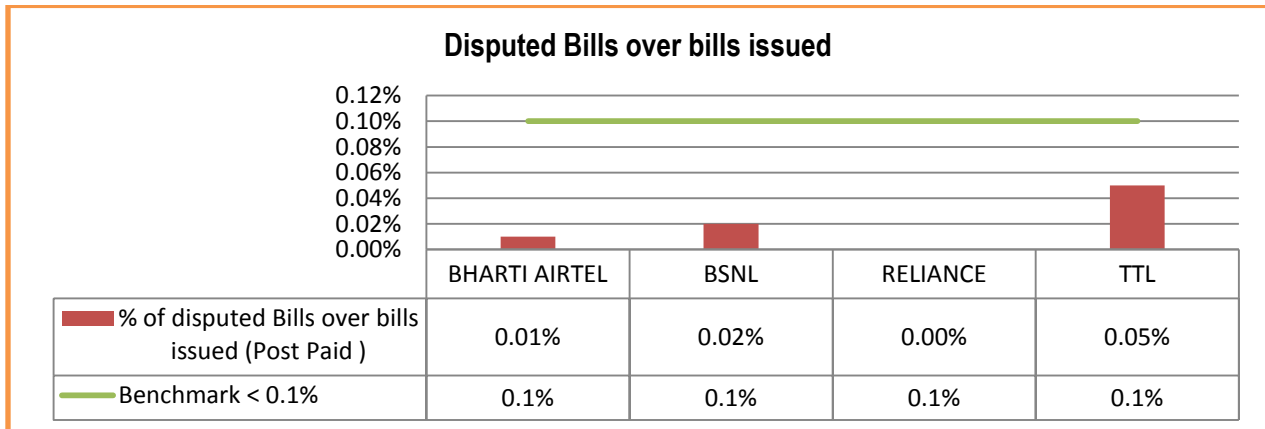
5) CALL COMPLETION RATIO (CCR) & ANSWER TO SEIZURE RATIO(ASR):



All Operators are meeting the benchmarks. Only Reliance has provided ASR instead of CCR.

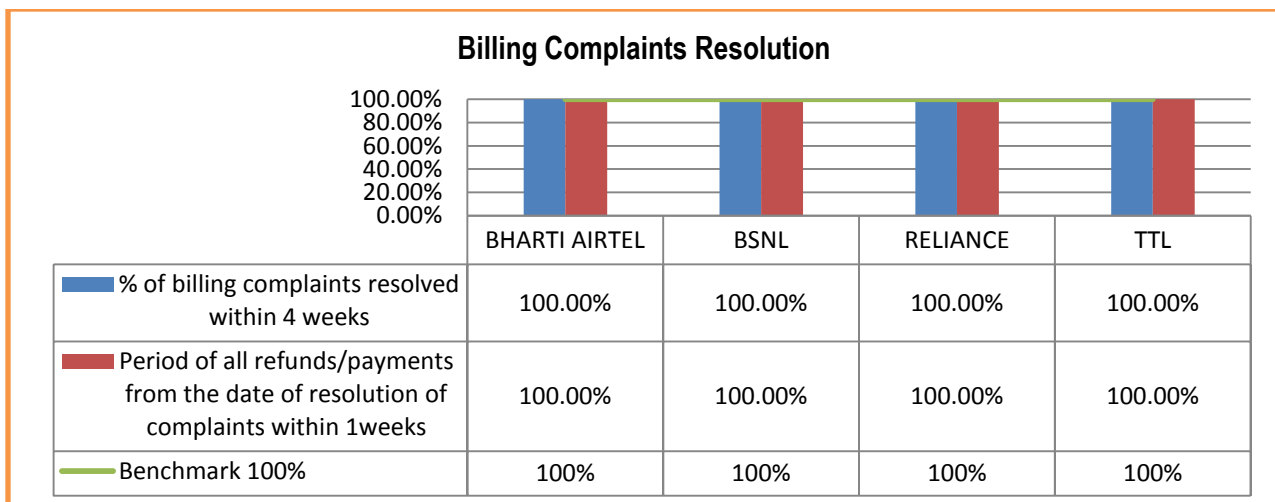
6) METERING & BILLING PERFORMANCE:

a) DISPUTED BILLS OVER BILL ISSUED :



All Operators are meeting the benchmarks.

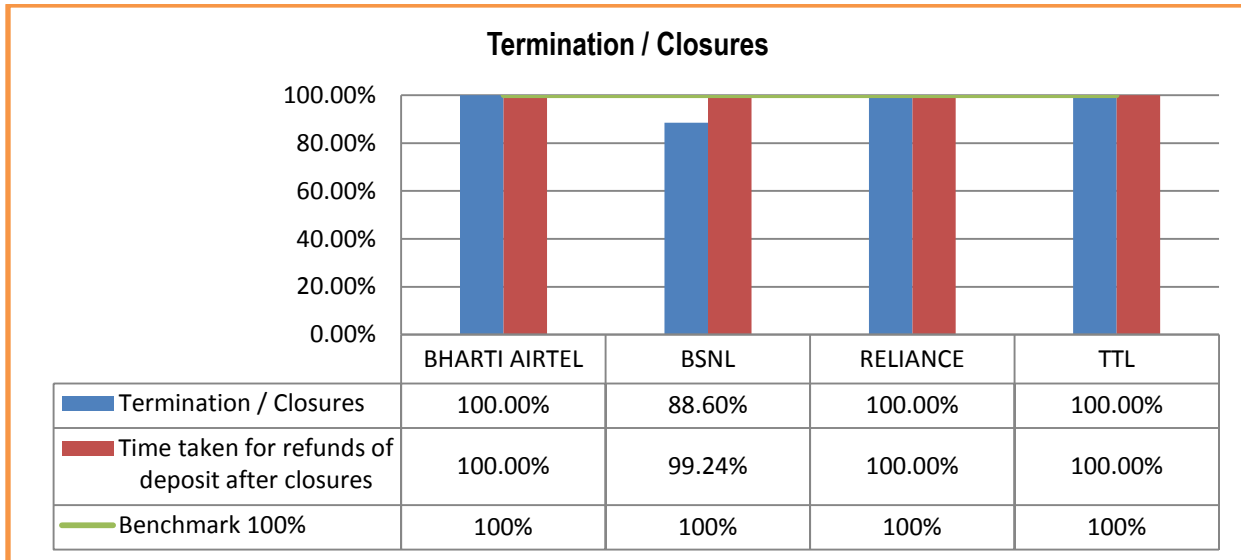
b) BILLING COMPLAINT RESOLUTION:



All Operators are meeting the benchmarks.



7) **TERMINATION & CLOSURES:**

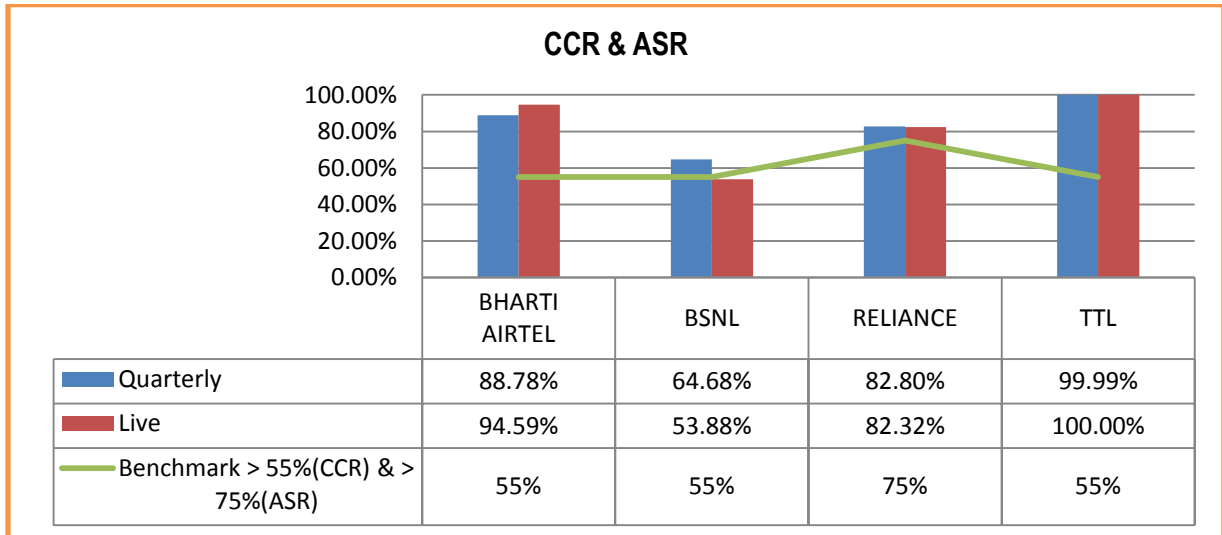


All Operators are meeting the benchmarks except BSNL against the benchmark of 100 %.



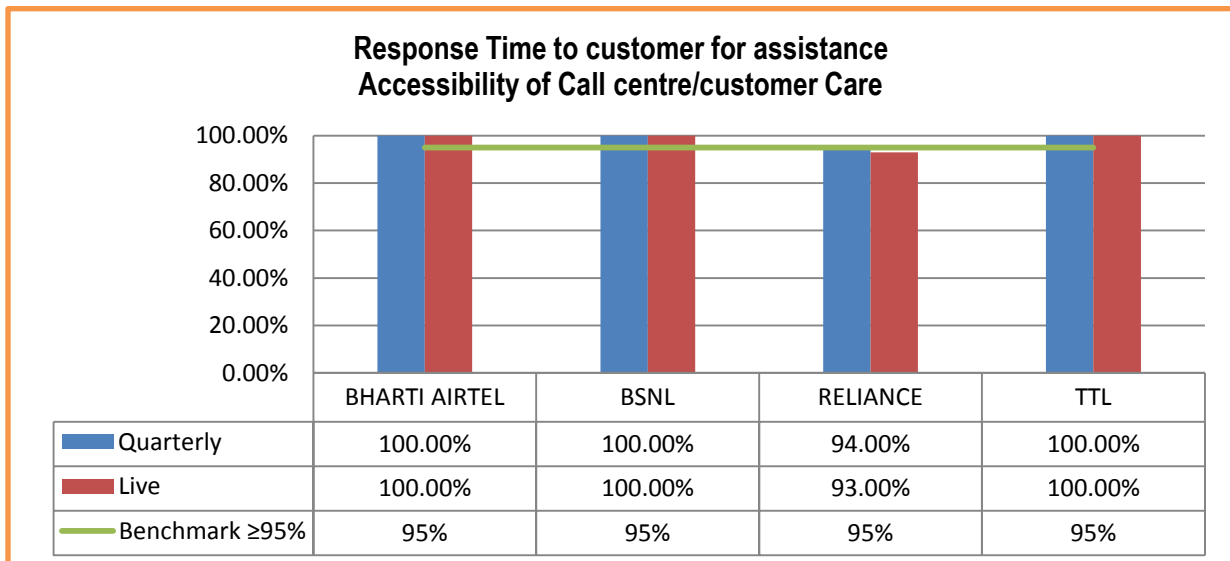
13. GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1) CALL COMPLETION RATIO (CCR) & ANSWER TO SEIZURE RATIO(ASR):



All Operators except BSNL (3 days live), are meeting the benchmarks.

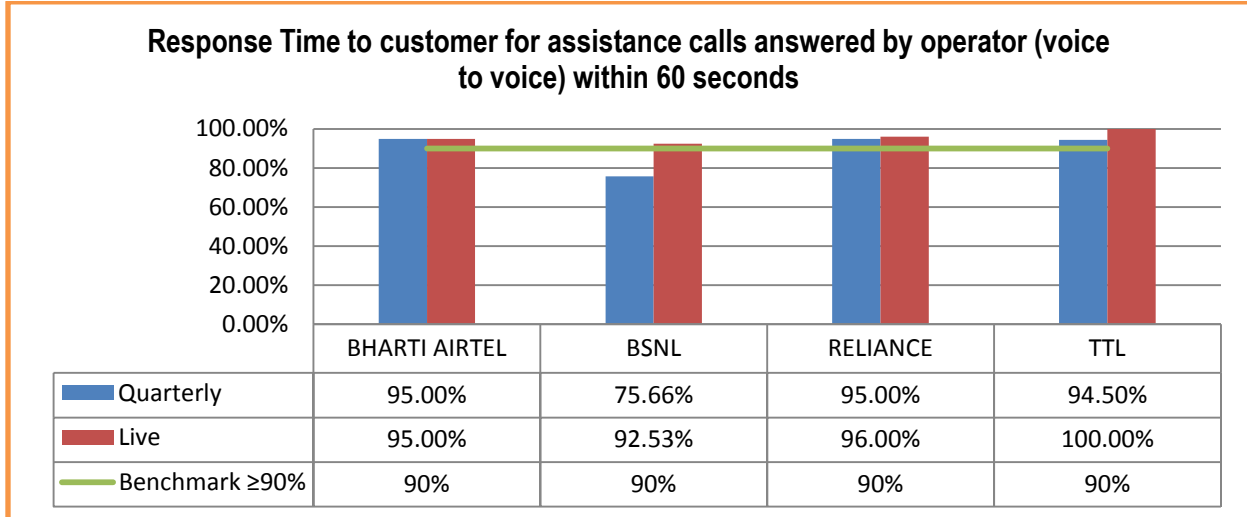
2) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE ACCESSIBILITY OF CALL CENTRE/CUSTOMER CARE:



All Operators except Reliance, are meeting the benchmarks.



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



All Operators are meeting the benchmarks except BSNL against the benchmark of >90%.



14. RECOMMENDATION WITH RESPECT TO QUALITY OF SERVICE:

Cellular Mobile Service:

From the findings of QoS audit, It was observed that the some of the service providers were not complying with the benchmarks of the parameters '**Worst affected cells having > 3% TCH drop**' , '**worst affected BTSs due to down time**' , '**SDCCH congestion**' and '**% of calls answered by operators (voice to voice)**'.

The results of drive tests revealed that the performance of service providers remained non- compliant with respect to the parameters namely **Block Call Rate, Voice Quality and Call Setup Success Rate (CSSR)** in some of the cities where the drive tests were conducted.

The drive test measurement is true assessment of Quality of Service of individual service provider which indicates the areas of concern where the benchmark of the network related parameter are not complied with. The subscribers are suffering with deficiencies in the network of their service providers in certain areas / pockets where they are residing/ working .The respective service providers need to take corrective actions in the affected areas in a time bound manner.

Basic Telephone Service (Wireline):

The audit result reveal that the performance with respect to the parameters 'Fault Repair/Restoration Time', 'Fault repaired by next working day' , ' fault repaired within 3 days in urban areas', 'Mean Time to Repair ' , 'Time taken for refunds of deposit of after closer' , 'Accessibility of Call Centers', and ' % of calls answered by operator (voice to voice)' was not as per the TRAI norms, in case of the incumbent operator. TRAI may take up the matter with the concern service providers.

TRAI may convene a meeting with the concerned service providers and advice them for corrective actions in time bound manner to remove the deficiency in their network, In the interest of their subscribers.