

**REPORT**

**ON**

**AUDIT & ASSESSMENT OF QUALITY OF SERVICE**

**OF**

**CELLULAR MOBILE TELEPHONE SERVICE,**

**WIRELINE BASIC SERVICE**

**&**

**BROADBAND SERVICE**

**FOR**

**NORTH ZONE – UP (WEST) CIRCLE**

***Report Period: Oct 2011 - Dec 2011***

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## CHAPTER-1: INTRODUCTION

### I. Background

TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in a manner and at a pace, which will enable India to play a leading role in emerging global information society. One of the main objectives of Telecom Regulatory Authority of India (TRAI) is to provide a fair and transparent policy environment, which promotes a level playing field and facilitates fair competition.

In pursuance of above objective TRAI has issued from time to time a large number of regulations, orders and directives to deal with issues coming before it and provided the required direction to the evolution of Indian telecom market from a Government owned monopoly to a multi-operator multi service open competitive market.

The directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection and quality of service as well as governance of the Authority.

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 has been carrying out regular reviews of the status of quality of service of the networks of all operators. In continuation to these efforts, TRAI has selected through bidding process TCIL as the Audit Agency to audit and assess the Quality of Service rendered by the service providers' namely Basic (Wireline) Services, Cellular Mobile Telephone (Wireless) Services and Broadband Services. The Audit for various telecom circles within the Zones has been distributed across four quarterly periods.

The parameters that need to be measured for Basic and Cellular Mobile Services have been specified in the TRAI notification on Quality of Service of Basic (Wireline) and Cellular Mobile (wireless) Services, 2009. The parameters for Broadband Services have been specified in the TRAI notification for Quality of Services of Broadband Service Regulation, 2006.

## II. Objectives and Methodology

The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband services against the parameters notified by TRAI. The audit and assessment of Quality of Service is conducted for all the basic service providers, unified access service providers, cellular mobile service providers and ISPs (Internet Service Provider) for basic wireline, Cellular Mobile Telephone Services and broadband service. TCIL has undertaken the following audit works as per the Terms of Reference (TOR):

- i) Verification of the data submitted by the service providers to TRAI as part of QoS monitoring reports i.e. Quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnection (POI) Congestion Reports with reference to the records maintained by the service provider.
- ii) Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using live measurement for 3 days during the month in which the audit and assessment is carried out.
- iii) Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.
- iv) Drive tests of the mobile networks both operators assisted and independent drive test (as and where required).
- v) Billing and call center's data verification.
- vi) Live testing of the efficiency of the call center / customer care help line.
- vii) Emergency (Level-1) call testing

To fulfill the above mentioned Scope of Work audit was performed on different Systems, Facilities and Field data collection.

### Systems audited:-

1. Network Switching Centre (NSS)
2. Base Station Subsystem(BSS)
3. Billing Applications
4. Customer Care applications

### Facilities audited:-

1. Billing documents.
2. Customer Care records.

### Field data collections carried out:-

1. RF network coverage including KPIs (Key Performance Index)
2. Inter Operator Call Assessment
3. Checking of Customer Billing/Refund Complaints (Random sample)
4. Customer Care efficiency
5. The live calling was made to assess the quality of services for Inter Operator Call Assessment, Customer Billing/Refund Complaints and Customer Care efficiency.

In order to carry out the above scope of work:-

- ✓ TCIL auditors visited all the NSS (Network Sub System) and BSS (Base-station Sub System) to check data for all the operators in their respective service area.
- ✓ All the NSS and BSS data for the relevant details were collected either directly from the centralized NOC or through a remote access to the NOC.
- ✓ The Radio parameters were audited/verified from the data collected from OMC-R (Operation and Maintenance Center – Radio, as part of BSS data).
- ✓ The Drive test was conducted in high, low and medium dense areas including highways, commercial complex and residential areas and special attention was paid for the areas for which TRAI has received complaints.
- ✓ The POI and other network related parameters were audited/verified from the data collected from the OMC-S (Operation and Maintenance Center – Switch as part of NSS data).
- ✓ The data related to Billing and Customer care was checked for the previous month and verified with the customers by calling them on random basis. The process of registration and handling of the complaints was also studied for the various operators. Call centre number were called for measuring the efficiency of the call centre.
- ✓ The inter operator call assessment test was carried out during the time period as is specified in the tender document. TCBH (Time Consistent Busy Hour) is taken after observation of the traffic consistently for 3 days prior to the audit activity.
- ✓ Data has been collected for busy hour of network in case of live assessment & month of audit for all service providers & verified that service providers are providing busy hour data only for QoS service. We found that TCBH hour is matching with network busy hour as provided by service providers for UP (West) circle. But for parameters such as 'Worst affected cell exceeding 3% TCH drop' and 'BTSs accumulated down time' CBBH (Cell Bouncing Busy Hour) was taken instead of TCBH (Time Consistent Busy Hours) as per the TRAI new regulation 2009. This has resulted in high value for 'Cell exceeding 3% TCH drop' parameter for some of the service providers.
- ✓ For Basic Wireline Service, the Network parameter of the QoS TRAI regulations is observed / verified for the 3 days for nearly 5% of the telephone exchanges covering 10% of the SDCA in a Service area.
- ✓ For Broadband Services, audit was conducted for only operators who have a subscriber base of more than 10,000 in the circle. Audit data were collected from the centralized NOC or through a remote access to the NOC. Network parameters were also checked from the centralized NOC with relevant details. MRTG, Cacti and Sandvine software were used for monitoring link utilization. Smoke Ping and Ping Test were used for monitoring Network Latency.

## CHAPTER-2: EXECUTIVE SUMMARY

### I. Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in UP (West) Circle in 4<sup>th</sup> quarter (Oct 2011 - Dec 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period April - June 2011.

Following are the various operators covered in UP (West) circle, North Zone for Cellular Mobile (Wireless) services QoS audit & assessment. The Month of audit & TCBH information is also given below:

S/N	Name of Service Provider	Month of Audit	TCBH Hour
<b>GSM Operators</b>			
1	Aircel Ltd	Nov-2011	1900 - 2000 Hrs
2	Airtel Ltd	Nov-2011	1900 - 2000 Hrs
3	BSNL	Nov-2011	1900 - 2000 Hrs
4	Idea	Nov-2011	1900 - 2000 Hrs
5	Tata Communications	Nov-2011	1900 - 2000 Hrs
6	Vodafone	Nov-2011	1900 - 2000 Hrs
7	Reliance Communications	Nov-2011	1900 - 2000 Hrs
8	Uninor	Nov-2011	1900 - 2000 Hrs
9	Etisalat	Nov-2011	1900 - 2000 Hrs
10	Videocon	Nov-2011	1900 - 2000 Hrs
<b>CDMA Operators</b>			
11	MTS	Nov-2011	1900 - 2000 Hrs
12	Reliance Communications	Nov-2011	1900 - 2000 Hrs
13	Tata Communications	Nov-2011	1900 - 2000 Hrs

## II. Findings from Quality of Service Audit (Operator wise for each parameter)

### (A) Cellular Mobile Telephone Services

3 days Live Data Audit		B-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videoc on	V-fone	MTS	Rcom CDMA	Tata CDMA	
S/N	Name of Parameter		GSM Operators										CDMA Operators			
1	<b>Network Availability</b>															
	a) BTS Accumulated Downtime	≤2%	0.85%	0.14%	1.59%	0.42%	0.07%	0.38%	0.03%	0.62%	0.82%	0.91%	0.07%	0.34%	0.03%	
	b) Worst affected BTSs due to downtime	≤2%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>															
	a) CSSR (Call Setup Success Rate)	≥95%	98.61%	98.39%	97.85%	98.93%	97.76%	99.06%	98.82%	96.83%	98.82%	97.52%	99.13%	98.49%	99.06%	
	b) SDCCH/PAGING congestion	≤1%	0.66%	0.20%	0.32%	0.01%	0.79%	0.43%	0.03%	0.30%	0.02%	0.61%	0.00%	0.00%	0.00%	
	c) TCH congestion	≤2%	0.30%	0.62%	0.80%	0.00%	1.41%	0.38%	0.19%	2.10%	0.00%	1.30%	0.03%	0.76%	0.02%	
3	<b>Connection maintenance (retainability)</b>															
	a) CDR	≤2%	0.54%	1.23%	1.22%	0.55%	1.05%	0.70%	0.89%	1.54%	0.67%	1.33%	0.87%	0.99%	0.62%	
	b) Worst affected cells>3% TCH drop	≤3%	2.57%	2.13%	5.02%	1.67%	2.79%	0.76%	6.95%	3.86%	2.32%	3.08%	0.37%	0.30%	0.75%	
	c) Good voice quality	≤95%	96.12%	97.12%	96.16%	98.50%	95.91%	98.97%	96.97%	95.96%	98.84%	96.82%	99.88%	NA	NA	
4	<b>Number of POI having ≥0.5% POI congestion</b>	≤0.5%	0	0	0	0	0	0	0	5	0	0	0	0	0	
5	<b>Response time to customers for assistance</b>															
	a) Accessibility of call centre/Customer Care	≤95%	96.02%	96.14%	98.08%	100.0%	99.08%	98.91%	99.47%	96.94%	100.0%	90.31%	99.87%	97.79%	99.09%	
	b) % call answered by operators(voice to voice) within 60 sec.	≤90%	93.21%	97.96%	99.71%	100.0%	93.41%	99.99%	97.30%	99.05%	100.0%	85.78%	98.99%	99.67%	96.76%	

NA: Not Applicable, NP: Not Provided

From the above 3 days live data assessment table, it is found that most of the operators are meeting network parameters. Exception is for “Worst affected cells >3% TCH drop” in case of BSNL, Tata (GSM), Uninor & V-fone. Among the Technical Parameters, it is also found that Uninor is having 5 nos. of POI with congestion > 0.5%. In case of “TCH Congestion”, benchmark is not met by Uninor and for “Good voice quality”, RCom (CDMA) & Tata (CDMA) have declared that the data is not system generated. Rest of the operators are satisfying the benchmark successfully.

In case of performance related to Customer Care data, it is seen that for the parameters “Accessibility of call centre/Customer Care” & “call answered by operators (voice to voice) within 60 sec” Vodafone performance are showing values below benchmark.



One Month Data Audit		B-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videoc on	V-fone	MTS	Rcom CDM A	Tata CDMA
S/N	Name of Parameter		GSM Operators										CDMA Operators		
(A)	<b>Network Service Quality Parameter</b>														
1	<b>Network Availability</b>														
	a) BTS Accumulated Downtime	≤2%	0.70%	0.14%	1.57%	1.31%	0.06%	0.46%	0.06%	0.65%	0.60%	0.34%	0.08%	0.36%	0.04%
	b) Worst affected BTSs due to downtime	≤2%	1.80%	0.30%	4.86%	0.00%	0.12%	1.66%	0.11%	1.66%	0.00%	1.56%	0.00%	0.38%	0.00%
2	<b>Connection Establishment (Accessibility)</b>														
	a) CSSR (Call Setup Success Rate)	≥95%	98.53%	98.10%	97.92%	98.95%	97.69%	99.41%	98.80%	96.98%	98.55%	97.34%	99.12%	98.65%	98.72%
	b) SDCCH/PAGING congestion	≤1%	0.23%	0.43%	0.50%	0.04%	0.82%	0.12%	0.15%	0.86%	0.13%	0.76%	0.00%	0.02%	0.01%
	c) TCH congestion	≤2%	0.31%	0.68%	0.87%	0.00%	1.43%	0.35%	0.34%	1.88%	0.27%	1.33%	0.02%	0.60%	0.01%
3	<b>Connection maintenance (retainability)</b>														
	a) CDR	≤2%	0.62%	1.23%	1.21%	0.38%	1.00%	0.76%	0.87%	1.19%	1.36%	1.32%	0.86%	1.05%	0.72%
	b) Worst affected cells>3% TCH drop	≤3%	2.69%	2.51%	5.40%	2.17%	2.82%	0.88%	6.80%	3.80%	1.33%	2.95%	0.75%	0.30%	0.07%
	c) Good voice quality	≥95%	96.92%	97.20%	95.84%	98.79%	96.16%	98.90%	96.85%	95.92%	97.25%	96.75%	99.15%	NA	NA
4	<b>Number of POI having ≥0.5% POI congestion</b>		0	0	0	0	0	0	0	5	0	0	0	0	0
(B)	<b>Customer Service Quality Parameters</b>														
5	Metering/billing credibility-Post paid	≤0.1%	0.11%	0.02%	0.04%	NA	0.07%	0.02%	0.02%	NA	NA	0.06%	0.08%	0.01%	0.01%
6	Metering /billing credibility-Pre paid	≤ 0.1%	0.004%	0.002%	0.01%	0.00%	0.001%	0.09%	0.001%	0.096%	0.00%	0.01%	0.001%	0.05%	0.04%
7	<b>Resolution of billing/charging complaints(within 4 weeks)</b>	100%	100%	100%	99.78%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints (≤1week)	100%	100%	100%	65.93%	100%	100%	100%	100%	100%	100%	61.42%	66.67%	100%	100%

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videoc on	V-fone	MTS	RCom CDMA	Tata CDMA	
S/N	Name of Parameter		GSM Operators										CDMA Operators			
8	Response time to customers for assistance															
	a) Accessibility of call centre/Customer Care	≥95%	93.07%	95.61%	97.13%	98.79%	99.07%	98.67%	99.44%	96.35%	100.0%	76.07%	100.0%	98.04%	96.34%	
	b) % call answered by operators(voice to voice) within 60 sec.	≥90%	89.18%	93.03%	91.52%	99.41%	68.30%	96.23%	90.33%	98.64%	98.44%	89.59%	95.33%	96.88%	94.77%	
9	Termination/closure of service	≤7days	100%	100%	100%	NA	100%	100%	99.06%	NA	NA	100%	100%	100%	98.16%	
10	Time taken for refunds of deposits after closures (within 60 days).	100%	100%	100%	NP	NA	100%	100%	100%	NA	NA	100%	100%	100%	95.05%	

**NA:** Not Applicable, **NP:** Not Provided

From the above month data assessment table, it is found that the operators are meeting most of the Network Parameters. Exceptions are found for the parameter “Worst affected BTSs due to downtime” by BSNL & in case of “Worst affected cells>3% TCH drop” by BSNL, Tata (GSM) & Uninor. Among the Technical Parameters, it is also found that Uninor is having congestion in 5 nos. of POIs. In case of “Good voice quality” RCom (CDMA) & Tata (CDMA) have not provide system generated data. Rest of the operators are satisfying the benchmark successfully.

In case of performance related to Customer Care data, it is found that for the parameters “Metering/billing credibility-Post paid”, Aircel is not satisfying the benchmark. For parameter “Resolution of billing/ charging complaints (within 4 weeks)”, benchmark is not met by BSNL.

For parameters “Accessibility of call centre/Customer Care” & “calls answered by operators (voice-to-voice) within 60 sec” it is found that Aircel, Idea & Vodafone are not satisfying the benchmark.

In case of “Termination/closure of service” & “Time taken for refunds of deposits after closures (within 60 days)” it is seen that Tata (GSM&CDMA) is not meeting the benchmark.

## Operator-Assisted Drive Test

The Operator assisted Drive Test was conducted at UP (West) for all the operators. Route covered was about around 80-100Km depending on city areas within the speed limit of 30Km/hr. The cities covered were Mathura, Roorkee & Saharanpur. In all the cities, zones were selected for covering different density areas (High, Medium & Low).

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	Rcom CDMA	Tata CDMA	
			GSM Operators										CDMA Operators	
1.1	Blocked Call Rate ( $\leq 3\%$ )	Mathura	2.53%	0.00%	0.00%	0.00%	1.72%	1.49%	0.00%	No service	1.14%	3.13%	0.00%	
		Roorkee	0.60%	0.00%	10.13%	0.00%	1.06%	0.68%	0.00%	0.00%	1.75%	0.00%	0.00%	
		Saharanpur	1.45%	0.00%	2.58%	0.00%	6.18%	0.29%	1.67%	No service	0.46%	0.00%	0.00%	
1.2	Dropped Call Rate ( $\leq 2\%$ )	Mathura	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	No service	0.00%	0.00%	0.00%	
		Roorkee	0.00%	0.00%	2.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.01%	0.00%	
		Saharanpur	0.00%	0.00%	0.00%	0.00%	0.56%	0.29%	0.00%	No service	0.00%	0.00%	0.00%	
1.3	% of connections with good voice quality ( $\geq 95\%$ )													
	(i) 0-4 (w/o frequency hopping)	Mathura	NA										99.67%	96.10%
		Roorkee	NA										95.33%	97.60%
		Saharanpur	NA										95.67%	97.50%
	(ii) 0-5 (with frequency hopping)	Mathura	97.00%	96.20%	96.11%	97.57%	87.33%	94.90%	91.90%	No service	96.97%	NA		
		Roorkee	97.80%	94.96%	91.63%	96.63%	93.00%	93.70%	91.93%	95.00%	93.77%	NA		
Saharanpur		96.10%	95.36%	94.50%	97.37%	82.00%	95.00%	91.23%	No service	96.33%	NA			
1.4	Call Setup Success Rate ( $\geq 95\%$ )	Mathura	97.47%	100.0%	100.0%	100.0%	98.28%	98.51%	100.0%	No service	98.86%	96.88%	100.0%	
		Roorkee	99.40%	100.0%	89.87%	100.0%	98.94%	99.32%	100.0%	100.0%	98.25%	100.0%	100.0%	
		Saharanpur	98.55%	100.0%	97.42%	100.0%	93.82%	99.71%	98.33%	No service	99.54%	100.0%	100.0%	

**Key observations as could be derived from the table are as under:**

- “Blocked Call Rate” benchmark is not met by RCom-CDMA (Mathura), BSNL (Roorkee) & RCom-GSM (Saharanpur).
- “Dropped Call Rate” benchmark is not met by BSNL (Roorkee).
- “% of connection with good voice quality” benchmark is not met by Airtel (Roorkee), BSNL (Roorkee & Saharanpur), RCom-GSM (all 3 cities), Tata-GSM (Mathura & Roorkee), Uninor (all 3 cities) & V-fone (Roorkee).
- “Call Setup Success Rate” benchmark is not met by BSNL (Roorkee) & RCom-GSM (Saharanpur).

**Note:** MTS has no service (Spectrum) in Mathura, Roorkee & Saharanpur and similarly Videocon has no service in Mathura & Saharanpur. Hence in case of MTS & Videocon drive test is not applicable in these cities.

## Independent Drive Test

The Independent Drive Test was conducted at UP (West) in Etawah, Muzzafarnagar & Pithoragarh cities. Route covered was about around 50 – 70 Km depending on city areas within the speed limit of 30Km/hr. Here again, zones were selected for covering different density areas (High, Medium & Low dense areas).

Operators Name	City	Blocked Call Rate ( $\leq 3\%$ )	Dropped Call Rate ( $\leq 2\%$ )	% of connections with good voice quality ( $\geq 95\%$ )		Call Setup Success Rate ( $\geq 95\%$ )
				(i) 0-4 (w/o frequency hopping)	(ii) 0-5 ( with frequency hopping)	
Idea	Etawah	0.00%	0.00%		98.57%	100.0%
Tata-GSM		0.00%	0.00%		92.00%	100.0%
Tata-CDMA		0.00%	0.00%	96.50%		100.0%
Uninor	Muzzafar nagar	2.04%	0.00%		92.50%	97.96%
Airtel	Pithoragarh	1.89%	0.00%		94.97%	98.11%

**Key observations as could be derived from the table are as under:**

- In case of “Blocked Call Rate” no deviation were found against all respective cities.
- In case of “Dropped Call Rate” no deviation were found against all respective cities.
- “% of connection with good voice quality” benchmark is not met by Tata-GSM (Etawah), Uninor (Muzzafarnagar) & Airtel (Pithoragarh).
- In case of “Call Setup Success Rate” it is found that there were no deviations against all respective cities.

**(B) Basic Telephone Service (Wireline) Providers****3 Days Live Data Audit**

S/N	Name of Parameter	Bench mark	BSNL	AIRTEL	RCOM	TTSL
<b>1</b>	<b>Network Parameters</b>					
<b>a</b>	Call Completion Rate	>= 55% (CCR) & >=75% (ASR)	51.67% (CCR)	60.1% (CCR)	88.39% (ASR)	100% (CCR)
<b>b</b>	No of POI having > 0.5% Congestion	>= 0.5%	1	0	0	0
<b>a</b>	Accessibility of Call Centre/Customer Care					
	within 40 seconds	>= 95%	100.00%	100.00%	100.00%	100.00%
<b>b</b>	% age of calls answered by operator(voice to voice):					
	within 60 seconds	>= 90%	96.13%	97.16%	99.75%	100.00%

From the 3 days live data audit, it was observed that except BSNL, all the basic telephone service providers meet the prescribed benchmark. BSNL is having low Call completion rate and also 1 POI with congestion >0.5%.

**One Month Data Audit (Basic Service):**

S/N	Name of Parameter	Bench mark	BSNL	AIRTEL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	< 5%	4.85%	0.62%	NA	0.13%
2	Fault repair by next working day(Urban Area)					
a	By next working day	>90%	95.08%	96.35%	NA	100%
b	Within 3 days	100%	99.42%	100%	NA	100%
3	Fault repair by next working day(Rural & hilly Area)					
a	By next working day	>90%	95.09%	NA	NA	NA
b	Within 5 days	100%	98.53%	NA	NA	NA
4	Rent rebate					
a	Fault pending > 3 days & <7 days	Rebate for 7 days	0	0	0	0
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	0	0	0	0
c	Fault pending > 15 days	Rebate for one month	0	0	0	0
5	Mean time to Repair(MTTR)	<= 8 Hrs	5.97	5.18	0	2.28
6	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55% (CCR) & > 75% (ASR)	44.30%	60.03%	88.53%	100%
7	Metering and billing credibility(post paid)					
a	Disputed Bills over bills issued	< 0.1%	0.03%	0.1%	0%	0%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	100%	100%	NA	NA
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 weeks	100%	86.11%	NA	NA
9	No of POI having > 0.5% Congestion	>= 0.5%	7	0	0	0
10 a	Accessibility of Call centre within 40 sec.	>= 95%	96.43%	100%	100%	98%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	88.00%	89.98%	98%	96%
11	Customer care(promptness in attending to customers request)					
a	Termination / Closures	<= 7 Days	100%	79%	NA	NA
b	Time taken refunds deposit after closures	100% within 60 days	100%	NA	NA	NA

From the Month data table, it can be observed that BSNL is not meeting the benchmark for Call completion Ratio (CCR) parameter and having 7 no's of POIs is having > 0.5% congestion. It is also having low %age of calls answered by operator within 60 sec. Airtel is having deviations for Period of Refunds & Customer care (voice to voice) parameter. RCOM has no cases of faults, Rebate, Billing dispute and Termination in that period of audit.

**II. Findings from Quality of Service Audit (Operator wise for each parameter)****(C) Broadband Service Providers****3 days Live Data Audit:**

S/N	Name of Parameter	Bench mark	AIRTEL	BSNL	RCOM
1	<b>Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)</b>				
	Within 60 seconds	>=60%	97.09%	77%	99.00%
	Within 90 seconds	>=80%	97.32%	86%	98.99%
	<b>Bandwidth Utilization/ Throughput:</b>	>=80%			
	i) POP to ISP Gateway Node [Intra-network] Link(s)		35.00%	48.00%	18.33%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity		NA	75.92%	NA
	Broadband Connection Speed (download)	>=80%	100%	97%	100%
	Packet Loss	<=1%	0.00%	0%	0%
	<b>Network Latency (for wired broadband access)</b>				
	Network Latency at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	<=120ms	37ms	16ms	NA
	Network Latency at ISP Gateway Node to International nearest NAP port abroad	<=350ms	16ms	231 ms	54.25ms
3	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	<=800ms	NA	NA	NA

**NOTE: --** RCOM has declared that there is no provision of capturing Network Latency live data from system due to security reasons.

**One Month Data Audit (Broadband):**

S/N	Name of Parameter	Benchmark	AIRTEL	BSNL	RCOM
1	<b>Service Provisioning /Activation Time</b>				
	100% cases in 15 days (subject to technical feasibility)		97.86%	100%	NA
	<b>Fault Repair / Restoration Time</b>				
	By next working day:	>90%	95.59%	93.48%	NA
	within 3 working days:	≥99%	99.22%	99.22%	NA
	<b>Rebate:</b>				
	Faults Pending for > 3 working days and < 7 working days:		0	22	0
	Faults Pending for > 7 working days and < 15 working days:		0	6	0
	Faults Pending for > 15 working days:		0	4	0
	<b>Billing Performance</b>				
	Billing complaints per 100 bills issued		0%	0.03%	0%
4	%age of Billing Complaints resolved		NA	100%	NA
5	Time taken for refund of deposits after closure:		NA	100%	NA
	<b>Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)</b>				
6	Within 60 seconds	≥60%	91.04%	75.70%	96%
7	Within 90 seconds	≥80%	93.11%	87.40%	97%
	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).				
	i) POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	35.00%	49.00%	14.74%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	NA	74.37%	NA
9	Broadband Connection Speed	≥80%	100.0%	98%	100%
	<b>Service Availability / Uptime (for all users)</b>				
10	Service Availability / Uptime	100% within 60 days	99.98%	99.90%	99.99%
	<b>Packet Loss</b>	≤1%	0.00%	0%	0.19%
	<b>Network Latency (for wired broadband access)</b>				
	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	≤120ms	36ms	21ms	54.25ms
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	≤350ms	14ms	227 ms	50.7ms
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	≤800ms	NA	NA	NA

NA – Not Applicable, NP – Not Provided.

NOTE:-

- Airtel is not meeting the Service Provisioning Parameters.
- RCOM has no cases of Service Activation, Fault repair, Rebate & Billing complaints in that month of Audit.
- Airtel & Rcom has not provided the data of ISP Gateway to IGSP Gateway Node, because of no upstream link of International Connectivity.
- None of the operators are having satellite connectivity.
- ISP Gateway is in Mumbai, Delhi, Chennai and Calcutta. Hence No direct upstream link for UP (W) Circle.



## CHAPTER-3: AUDIT-PMR VERIFICATION

### I. Cellular Mobile Telephone Service

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
S/N	Name of Parameter			GSM Operators										CDMA Operators			
(A)	<b>Network Service Quality Parameter</b>																
1	Network Availability																
	BTS Accumulated Downtime	≤2%	Reported	0.95%	0.20%	1.44%	0.31%	0.04%	0%	0.09%	1.06%	0.61%	0.19%	0.03%	0%	0.03%	
			Verified	0.95%	0.20%	1.44%	0.31%	0.04%	0%	0.09%	1.06%	0.61%	0.19%	0.03%	0%	0.03%	
	Worst affected BTSs due to downtime	≤2%	Reported	1.93%	0.38%	10.21%	0%	0.02%	0.01%	0.08%	1.22%	1.56%	0.75%	0%	0%	0%	
Verified			1.93%	0.38%	10.21%	0%	0.02%	0.01%	0.08%	1.22%	1.56%	0.75%	0%	0%	0%		
2	<b>Connection Establishment (Accessibility)</b>																
	CSSR (Call Setup Success Rate)	≥95%	Reported	98%	99%	96%	99%	100%	100%	98%	96%	98%	98%	99%	100%	100%	
			Verified	98%	99%	96%	99%	100%	100%	98%	96%	98%	98%	99%	100%	100%	
	SDCCH/PAGING congestion	≤1%	Reported	0.37%	0.43%	1.01%	0%	0.98%	0%	0.08%	0.29%	0.61%	0%	0%	0%	0%	
			Verified	0.37%	0.43%	1.01%	0%	0.98%	0%	0.08%	0.29%	0.61%	0%	0%	0%	0%	
	TCH congestion	≤2%	Reported	0.55%	0.77%	1.75%	0%	1.14%	0%	0.19%	1.86%	0.43%	0.01%	0%	0%	0%	
Verified			0.55%	0.77%	1.75%	0%	1.14%	0%	0.19%	1.86%	0.43%	0.01%	0%	0%	0%		
3	<b>Connection maintenance (retainability)</b>																
	CDR	≤2%	Reported	0.64%	0.92%	2.67%	0.01%	0.97%	0%	1.02%	1.39%	1.14%	0.01%	0.91%	0.01%	0.21%	
			Verified	0.64%	0.92%	2.67%	0.01%	0.97%	0%	1.02%	1.39%	1.14%	0.01%	0.91%	0.01%	0.21%	
	Worst affected cells>3% TCH drop	≤3%	Reported	0.02%	0.01%	14.51%	1.71%	2.98%	0%	3.37%	4.67%	1.13%	0.03%	2.86%	0.02%	0.47%	
			Verified	0.02%	0.01%	14.51%	1.71%	2.98%	0%	3.37%	4.67%	1.13%	0.03%	2.86%	0.02%	0.47%	
	Good voice quality	≥95%	Reported	97%	97%	97%	99%	100%	99%	97%	96%	96%	96%	98%	97%	99%	
Verified			97%	97%	97%	99%	100%	99%	97%	96%	96%	96%	98%	97%	99%		
4	Number of POI having ≥ 0.5% POI congestion	Reported	0	0	0	0	0	0	0	9	0	0	0	0	0		
		Verified	0	0	0	0	0	0	0	9	0	0	0	0	0		
(B)	<b>Customer Service Quality Parameters</b>																
5	Metering/billing credibility-Post paid	≤0.1%	Reported	0.06%	0%	0%	NA	0%	1%	0%	NA	NA	0%	0%	0%	0%	
			Verified	0.06%	0%	0%	NA	0%	1%	0%	NA	NA	0%	0%	0%	0%	
6	Metering /billing credibility-Pre paid	≤0.1%	Reported	0.02%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.01	0%	0%	
			Verified	0.02%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.01	0%	

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA		
S/N	Name of Parameter			GSM Operators										CDMA Operators				
7	Resolution of billing/ charging complaints (within 4 weeks)	100%	Reported	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customer's A/C from the date of resolutions of complaints	≤1 week	Reported	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	<b>Response time to customers for assistance</b>																	
	Accessibility of call centre/Customer Care	≥95%	Reported	100%	100%	100%	NR	99%	66%	99%	97%	97%	100%	99%	100%	99%		
			Verified	100%	100%	100%	NR	99%	66%	99%	97%	97%	100%	99%	100%	99%		
	% call answered by operators(voice to voice) within 60 sec.	≥90%	Reported	86%	84%	92%	NR	94%	86%	72%	97%	95%	92%	94%	91%	92%		
Verified			86%	84%	92%	NR	94%	86%	72%	97%	95%	92%	94%	91%	92%			
9	<b>Termination/closure of service</b>																	
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	≤7days	Reported	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	NR	100%	100%		
			Verified	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	NR	100%	100%		
10	Time taken for refunds of deposits after closures.(within 60 days	100%	Reported	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	NR	100%	100%		
			Verified	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%	NR	100%	100%		

The figures obtained on data verification match the figures provided in PMR.

## II. Basic Service (Wire Line) Service (PMR Period : April 2011 - June 2011)

S/N	Parameters	Bench-marks	Audit	BSNL	AIRTEL	RCOM	TTSL
<b>1</b>	<b><i>Fault incidences</i></b>						
	(No. of faults/100 subscribers /month)	< 5%	<b>Reported</b>	5.11%	2.45%	NIL	NIL
			<b>Verified</b>	5.11%	2.45%	NIL	NIL
<b>2</b>	<b><i>Faults Repair/Restoraion Time</i></b>						
	Fault repair by next working day(Urban Area)	>90%	<b>Reported</b>	94.33%	95.74%	NIL	NIL
			<b>Verified</b>	94.33%	95.74%	NIL	NIL
	Within 3 days	100%	<b>Reported</b>	99.50%	100.00%	NA	NR
			<b>Verified</b>	99.50%	100.00%	NA	NR
	Within 5 days (Hilly & Rural Area)	100%	<b>Reported</b>	99.95%	NA	NA	NR
			<b>Verified</b>	99.95%	NA	NA	NR
	Mean time to Repair(MTTR)	≤8 Hrs	<b>Reported</b>	6.30	5.83	NIL	NR
			<b>Verified</b>	6.30	5.83	NIL	NR
<b>3</b>	<b><i>Rent Rebate</i></b>						
	Rent Rebate		<b>Reported</b>	NIL	387	NIL	NIL
			<b>Verified</b>	NIL	387	NIL	NIL
<b>4</b>	<b><i>Call Completion Ratio(CCR) &amp; Answer to seizure Ratio(ASR)</i></b>						
	CCR & ASR	> 55%(CCR) & > 75%(ASR)	<b>Reported</b>	76.40%	91.38%	89.08%(ASR)	99.51%
			<b>Verified</b>	76.40%	91.38%	89.08%(ASR)	99.51%
<b>5</b>	<b><i>Metering &amp; Billing Performance</i></b>						
	Metering & Billing Credibility-Post paid	< 0.1%	<b>Reported</b>	0.05%	0.06%	NR	0.07%
			<b>Verified</b>	0.05%	0.06%	NR	0.07%
	Metering & Billing Credibility-Pre paid	100%	<b>Reported</b>	NR	NA	NA	NR
			<b>Verified</b>	NR	NA	NA	NR
	Resolution of billing charging/validity/Complaints within 4 weeks	100%	<b>Reported</b>	NR	100%	NA	100%
			<b>Verified</b>	NR	100%	NA	100%
	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	<b>Reported</b>	NR	100.00%	NA	100%
			<b>Verified</b>	NR	100.00%	NA	100.00%
<b>6</b>	<b><i>POI Congestion</i></b>						
	POI Congestion (%)	≤ 0.5%	<b>Reported</b>	NR	NIL	NIL	NIL
			<b>Verified</b>	NR	NIL	NIL	NIL

S/N	Parameters	Bench-marks	Audit	BSNL	AIRTEL	RCOM	TTSL
<b>7</b>	<b><i>Response Time to customer for assistance</i></b>						
	Accessibility of Call centre/customer Care within 40 seconds	$\geq 95\%$	<b>Reported</b>	96.17%	98.57%	96.00%	98.43%
			<b>Verified</b>	96.17%	98.57%	96.00%	98.43%
	% age of calls answered by operator(voice to voice) within 60 seconds	$\geq 90\%$	<b>Reported</b>	95.00%	93.92%	91.00%	95.16%
			<b>Verified</b>	95.00%	93.92%	91.00%	95.16%
<b>8</b>	<b><i>Customer care(promptness in attending to customers request</i></b>						
	Termination / Closures	<b>100%</b>	<b>Reported</b>	100%	NR	No termination	NR
			<b>Verified</b>	100%	NR	No termination	NR
	Time taken for refunds of deposit after closures	<b>100%</b>	<b>Reported</b>	100%	100%	100%	NIL
			<b>Verified</b>	100%	100%	100%	NIL

The figures obtained on data verification match the figures provided in PMR.

## III. Broadband Service (PMR Period Verification April 2011 - June 2011)

S/N	Parameters	Benchmarks	Audit Period	Airtel	BSNL	RCom	TCISL	SIFY	Hathway	Tikona
<b>1</b>	<b><i>Service Provisioning/Activation Time</i></b>									
1.2	%age of connections provided within 15 days of registration of demand	100%	<b>Reported</b>	100%	100%	100%	100%	99.79%	100%	100%
			<b>Verified</b>	100%	100%	100%	100%	99.79%	100%	100%
<b>2</b>	<b><i>Faults Repair/Restoraion Time</i></b>									
2.1	% of faults repaired by next working day	>90%	<b>Reported</b>	99.67%	94.80%	100%	99.50%	97.99%	97.00%	90%
			<b>Verified</b>	99.67%	94.80%	100%	99.50%	97.99%	97.00%	90%
2.2	% of faults repaired within 3 working day	≥99%	<b>Reported</b>	99.84%	99.50%	100%	100%	99.40%	99.00%	99%
			<b>Verified</b>	99.84%	99.50%	100%	100%	99.40%	99.00%	99%
<b>3</b>	<b><i>Rent Rebate</i></b>									
3.1	Rent Rebate		<b>Reported</b>	11	196	0	NA	48	8	195
			<b>Verified</b>	11	196	0	NA	48	8	195
<b>4</b>	<b><i>Billing Performance</i></b>									
4.1	%age of bills disputed	<2%	<b>Reported</b>	0.13%	0.10%	0.09%	NR	0.03%	1.20%	NA
			<b>Verified</b>	0.13%	0.10%	0.09%	NR	0.03%	1.20%	
4.2	%age of complaints resolved within 4 weeks	100%	<b>Reported</b>	100%	99.90%	100%	100%	100%	100.00%	
			<b>Verified</b>	100%	99.90%	100%	100%	100%	100.00%	
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	<b>Reported</b>	100%	100%	100%	100%	100%	100%	
			<b>Verified</b>	100%	100%	100%	100%	100%	100%	
<b>5</b>	<b><i>Response Time to the Customer for assistance</i></b>									
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	<b>Reported</b>	68.69%	81.40%	85%	NA	65%	99.00%	85%
			<b>Verified</b>	68.69%	81.40%	85%	Na	65%	99.00%	85%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	<b>Reported</b>	78.21%	91.50%	89%	NA	72%	NA	93%
			<b>Verified</b>	78.21%	91.50%	89%	NA	72%	NA	93%

S/N	Parameters	Benchmarks	Audit Period	Airtel	BSNL	RCom	TCISL	SIFY	Hathway	Tikona
<b>6</b>	<b><i>Bandwidth utilisation/throughput</i></b>									
6.1	No. of Intra network links having Bandwidth utilisation >90% during peak hours (TCBH)		Reported	0	3	0	12	0	NR	0
			Verified	0	0	0	12	0	NR	0
6.2	No. of Upstream links for International connectivity having BW utilisation >90% Peak Hrs.(TCBH)		Reported	0	0	0	12	0	0	0
			Verified	0	0	0	12	0	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	Reported	0.70%	78.10%	85.00%	NR	62%	88.00%	85%
			Verified	0.70%	78.10%	85.00%	NR	62%	88.00%	85%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	Reported	100%	88.40%	DNF	95%	100.00%	85%	DNF
			Verified	100%	88.40%	DNF	95%	100.00%	85%	DNF
<b>7</b>	<b><i>Service Availability/Uptime (for all users) in %age</i></b>									
7.1	Service availability /uptime (for all users) in %age	>98%	Reported	100%	99.70%	99.69%	98%	99.66%	99.45%	100%
			Verified	100%	99.70%	99.69%	98%	99.66%	99.45%	100%
<b>8</b>	<b><i>Packet loss</i></b>									
8.1	% of Packet loss	<1%	Reported	0%	0.04%	C/DNF	NR	0%	0.98%	C/DNF
			Verified	0%	0.04%	C/DNF	NR	0%	0.98%	C/DNF
<b>9</b>	<b><i>Network latency (for wired broadband access)</i></b>									
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	Reported	38 ms	26.3 ms	DNF	NR	49 ms	80ms	68ms
			Verified	38 ms	26.3 ms	DNF	NR	49 ms	80ms	68ms
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	Reported	10 ms	233.7 ms	DNF	NR	292 ms	300ms	295ms
			Verified	10 ms	233.7 ms	DNF	NR	292 ms	300ms	295ms
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 ms	Reported	NA						
			Verified	NA						

C/DNF—Complied the Parameter but data is not in required format DNF-- Data not as per format.

## CHAPTER-4: DETAILED FINDINGS &amp; ANALYSIS

## I. Cellular Mobile Telephone Service

## (A) MSC Audit

## (1) 3 Days Live Data Assessment &amp; Summarized Findings

S/ N	Name of Parameter	B- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA	
			GSM Operators										CDMA Operators			
A	<b>Network Service Quality Parameter</b>															
	<b>Network Availability</b>															
1	a) BTS Accumulated Downtime	≤2%	0.85%	0.14%	1.59%	0.42%	0.07%	0.38%	0.03%	0.62%	0.82%	0.91%	0.07%	0.34%	0.03%	
	b) Worst affected BTSs due to downtime	≤2%	0.00%	0.00%	1.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%	0.00%	
	c) Total no. of BTSs in the licensed service area		2556	6356	2863	20	5738	2286	1757	2649	91	6037	207	1313	816	
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1563	641	3287	6	301	633	39	1178	54	3957	10	324	20	
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	0	32	0	0	0	0	0	0	3	0	0	0	
2	<b>Connection Establishment (Accessibility)</b>															
	a) CSSR	≥95%	98.61%	98.39%	97.85%	98.93%	97.76%	99.06%	98.82%	96.83%	98.82%	97.52%	99.13%	98.49%	99.06%	
	b) SDCCH/PAGING congestion	≤1%	0.66%	0.20%	0.32%	0.01%	0.79%	0.43%	0.03%	0.30%	0.02%	0.61%	0.00%	0.00%	0.00%	
	c) TCH congestion	≤2%	0.30%	0.62%	0.80%	0.00%	1.41%	0.38%	0.19%	2.10%	0.00%	1.30%	0.03%	0.76%	0.02%	
3	<b>Connection maintenance</b>															
	a) CDR	≤2%	0.54%	1.23%	1.22%	0.55%	1.05%	0.70%	0.89%	1.54%	0.67%	1.33%	0.87%	0.99%	0.62%	
	b) Cells having > 3% TCH drop	≤3%	2.57%	2.13%	5.02%	1.67%	2.79%	0.76%	6.95%	3.86%	2.32%	3.08%	0.37%	0.30%	0.75%	
	c) Good voice quality	≥95%	96.12%	97.12%	96.16%	98.50%	95.91%	98.97%	96.97%	95.96%	98.84%	96.82%	99.88%	NA	NA	
	d) No. of cells > 3% TCH drop		589	1,219	1,286	3	1,444	156	1,094	916	19	1,675	7	36	57	
	e) Total no. of cells in the network		7647	19033	8535	60	17233	6858	5246	7917	273	18128	639	3939	2522	
4	<b>Number of POI having ≥0.5% POI congestion</b>		0	0	0	0	0	0	0	5	0	0	0	0	0	
	a) Name of POI not meeting the benchmark		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Idea, Bsnl, Airtel, tata, v-fone	Nil	Nil	Nil	Nil	Nil	
	b) Total No. of circuits on POI		21971	79969	87469	68	228755	784636	1081	55633	73	169078	8903	1053342	38606	

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
	c) Avg No. of call attempts on POI		457025	2153846	2289624	2074	3070130	268810	30084	1606103	32	17726264	149445	42615	70411
	d) Avg traffic served on POI (Erlang)		8578	70388	13295	44	54217	11781	534	38005	59	386818	2719	13738	1027540
	e) Total number of working POI Service Area wise		62	104	40	25	114	38	1006	8	26	103	40	29	130
	f) Equipped Capacity of Network in respect of Traffic in erlang		98000	220138	220990	444	226388	122000	100467	99550	3072	246263	10500	172000	248460
	g) Total traffic handled in TCBH in erlang		23941	122673	123446	74	247564	114783	382828	90858	43	214118	6533	59194.02	70411
(B)	<b>Customer Service Quality Parameters</b>														
	<b>Response time to customers for assistance</b>														
5	a) Accessibility of call centre	≥95%	96.02%	96.14%	98.08%	100.0%	99.08%	98.91%	99.47%	96.94%	100.0%	90.31%	99.87%	97.79%	99.09%
	b) % of call answered by operators(voice to voice) within 60 sec	≥90%	93.21%	97.96%	99.71%	100.0%	93.41%	99.99%	97.30%	99.05%	100.0%	85.78%	98.99%	99.67%	96.76%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		68202	168491	4863	26	418375	42989	121265	150912	11	347527	10211	26924	43205
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		63572	165057	4849	26	390797	42983	117992	149481	11	298102	10108	26834	41806

NA: Not Applicable, NP: Not Provided



## Parameter wise Findings (Live Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in UP (West) Service Area is as given below:-

- ***BTS accumulated downtime (benchmark  $\leq 2\%$ ):***  
All operators are satisfying the benchmark with values lying between 0.03% & 1.59%.
- ***Worst affected BTSs due to downtime (benchmark  $\leq 2\%$ ):***  
All operators are satisfying the benchmark with values lying between 0% & 1.12%.
- ***Call setup success rate (benchmark  $\geq 95\%$ ):*** All operators are satisfying the benchmark with values lying between 96.83% and 99.13%.
- ***SDCCH/PAGING Channel congestion (benchmark  $\leq 1\%$ ):*** All operators are satisfying the benchmark with values lying between 0% and 0.79%.  
*Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.*
- ***TCH congestion (benchmark  $\leq 2\%$ ):*** Except Uninor, all operators are satisfying the benchmark with values lying between 0% and 1.41%.
- ***Call drop rate (benchmark  $\leq 2\%$ ):*** All operators are satisfying the benchmark with values lying between 0.54% and 1.54%.
- ***Cell exceeding 3% TCH drop (benchmark  $\leq 3\%$ ):*** Except for BSNL, Tata (GSM), Uninor & Vodafone, rest of the operators are satisfying the benchmark with value in between 0.30% and 2.79%.
- ***Connections with good voice quality (benchmark  $\geq 95\%$ ):*** RCom CDMA & Tata (CDMA) service providers have declared that the parameter is not system generated. Rests of operators are satisfying the benchmark with values lying between 95.91% and 99.88%.
- ***Number of POI having  $\geq 0.5\%$  POI congestion:*** Most of the operators satisfying the benchmark except Uninor showing high POI congestion ( $>0.5\%$ ) in 5 nos. of POIs.
- ***%age of call answered by operator (electronically) (benchmark  $>95\%$ ):*** Except Vodafone, rest of the operators are satisfying the benchmark with values lying between 96.02% to 100%.
- ***%age of call answered by operator (Voice to voice) (benchmark  $>90\%$ ):*** Except Vodafone, rest of the operators are satisfying the benchmark with values lying between 93.21% to 100%.

## (2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
(A)	<b>Network Service Quality Parameter</b>														
1	<b>Network Availability</b>														
	a) BTS Accumulated Downtime	≤2%	0.70%	0.14%	1.57%	1.31%	0.06%	0.46%	0.06%	0.65%	0.60%	0.34%	0.08%	0.36%	0.04%
	b) Worst affected BTSs due to downtime	≤2%	1.80%	0.30%	4.86%	0.00%	0.12%	1.66%	0.11%	1.66%	0.00%	1.56%	0.00%	0.38%	0.00%
	c) Total no. of BTSs in the licensed service area		2556	6356	2863	20	5738	2286	1757	2649	91	6037	207	1313	816
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		12839	6350	32365	188	2549	7532	798	12424	392	14689	126	3415	251
	e) No. of BTSs having accumulated downtime of >24 hours in a month		46	19	139	0	7	38	2	44	0	94	0	5	0
2	<b>Connection Establishment (Accessibility)</b>														
	a) CSSR (Call Setup Success Rate)	≥95%	98.53%	98.10%	97.92%	98.95%	97.69%	99.41%	98.80%	96.98%	98.55%	97.34%	99.12%	98.65%	98.72%
	b) SDCCH/PAGING congestion	≤1%	0.23%	0.43%	0.50%	0.04%	0.82%	0.12%	0.15%	0.86%	0.13%	0.76%	0.00%	0.02%	0.01%
	c) TCH congestion	≤2%	0.31%	0.68%	0.87%	0.00%	1.43%	0.35%	0.34%	1.88%	0.27%	1.33%	0.02%	0.60%	0.01%
3	<b>Connection maintenance (retainability)</b>														
	a) CDR	≤2%	0.62%	1.23%	1.21%	0.38%	1.00%	0.76%	0.87%	1.19%	1.36%	1.32%	0.86%	1.05%	0.72%
	b) Worst affected cells>3% TCH drop	≤3%	2.69%	2.51%	5.40%	2.17%	2.82%	0.88%	6.80%	3.80%	1.33%	2.95%	0.75%	0.30%	0.07%
	c) Good voice quality	≤95%	96.92%	97.20%	95.84%	98.79%	96.16%	98.90%	96.85%	95.92%	97.25%	96.75%	99.15%	NA	NA
	d) Total No. of cells exceeding 3% TCH drop (call drop)		6,169	14,310	13,830	39	14,591	1,808	10,708	9,025	109	16,020	143	352	55
	e) Total no. of cells in the network		7647	19033	8535	60	17233	6858	5246	7917	273	18128	639	3939	2522
4	<b>Number of POI having ≥0.5% POI congestion</b>		0	0	0	0	0	0	0	5	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Idea, BSNL, Airtel, Tata, Vodafone	Nil	Nil	Nil	Nil	Nil
	b) Total No. of call attempts on POI (Avg.)		449545	2175778	2289466	2423	3065589	286808	30555	2330844	47	15808013	146214	433264	1027948
	c) Total traffic served on POI (Erlang) (Avg.)		8213	49954	13336	41	53746	11014	540	36676	68	360207	2600	15087	38851
	d) Total No. of circuits on POI		21971	79969	87469	68	228755	784636	1081	55633	73	169078	8903	1053342	38606
	e) Total number of working POI Service Area wise		62	104	40	25	114	38	1006	8	26	103	40	29	130
	f) Capacity of POI		20018	76436	87185	53	228578	737591	1004	51631	58	159605	9006	953027	88953

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA	
			GSM Operators										CDMA Operators			
5	<b>Network Data</b>															
	a) Equipped Capacity of Network Erlang		98000	220138	220990	444	226388	122000	100467	99550	3072	246263	10500	172000	248460	
	b) Total traffic in TCBH in erlang (Avg.)		23941	122673	123446	74	247564	114783	382828	90858	43	214118	6533	59194	70411	
	c) Total no. of customers served (as per VLR) on last day of the month		1110046	4829348	2058798	5208	8837296	3864677	1331315	1980434	457	7950771	199454	1835602	917231	
(B)	<b>Customer Service Quality Parameters</b>															
5	<b>Metering/billing credibility-Post paid</b>	≤0.1%	0.11%	0.02%	0.04%	NA	0.07%	0.02%	0.02%	NA	NA	0.06%	0.08%	0.01%	0.01%	
	a) No. of bills issued during the period		2800	100229	58150	NA	244382	8655	17980	NA	NA	120866	1206	94982	74115	
	b) No. of bills disputed including billing complaints during the period		3	16	26	NA	166	2	3	NA	NA	76	1	8	4	
6	<b>Metering /billing credibility-Pre paid</b>	≤0.1%	0.004%	0.002%	0.01%	0.00%	0.001%	0.09%	0.001%	0.096%	0.00%	0.01%	0.001%	0.05%	0.04%	
	a) No. of charging / credit / validity complaints during the quarter		88	137	429	0	50	5753	8	3,948	0	966	2	1635	242	
	b) Total no. of pre-paid customers at the end of the quarter		2054459	7465077	4417450	42954	9317138	6341943	1436736	4114460	9470	9213777	336898	3190223	578642	
7	<b>Resolution of billing/ charging complaints(within 4 weeks)</b>	100%	100%	100%	99.46%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	a) No. of billing/(post paid) and charging, credit/validity (pre paid) complaints resolved within 4 weeks during the quarter		2259	3541	454	2	2407	6349	1453	3948	0	1868	3	2404	3949	
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		2259	3541	455	2	2407	6349	1453	3948	0	1868	3	2404	3949	
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		91	153	455	0	216	5755	11	3948	0	1042	3	1643	246	
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		2168	3388	7	2	2191	594	1442	0	0	826	0	761	3703	
	e) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints (≤1week)		100%	100%	65.93%	100%	100%	100%	100%	100%	100%	100%	61.42%	66.67%	100%	100%

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
(B)	Customer Service Quality Parameters														
8	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	≥95%	93.07%	95.61%	97.13%	98.79%	99.07%	98.67%	99.44%	96.35%	100.0%	76.07%	100.0%	98.04%	96.34%
	b) % call answered by operators(voice to voice) within 60 sec.	≥90%	89.18%	93.03%	91.52%	99.41%	68.30%	96.23%	90.33%	98.64%	98.44%	89.59%	95.33%	96.88%	94.77%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		124742	1748860	39526	1366	3974764	468786	117839	1503472	64	3106947	13341	249404	78302
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		111249	1627037	36173	1358	2714945	451132	106444	1482962	63	2783555	12718	241625	74207
9	Termination/closure of service	≤7days	100%	100%	100%	NA	100%	100%	99.06%	NA	NA	100%	100%	100%	98.16%
	a) Total No. of requests for Termination / Closure of service received during the quarter		58	401	102		1462	43	430			537	8	291	1033
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		58	401	102		1462	43	426			537	8	291	1014
10	Time taken for refunds of deposits after closures.( within 60 days)	100%	100%	100%	NP		100%	100%	100%			100%	100%	100%	95.05%

NA: Not Applicable, NP: Not Provided

## Parameter-wise Findings (Month Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in UP (West) Service Area is as given below:-

### Network Parameters:

- **BTS accumulated downtime (benchmark  $\leq 2\%$ ):**  
All operators are satisfying the benchmark with values lying between 0.04% and 1.57%.
- **Worst affected BTSs due to downtime (benchmark  $\leq 2\%$ ):**  
Except BSNL, rest of the operators are satisfying the benchmark with values lying between 0% and 1.80%.
- **Call setup success rate (benchmark  $\geq 95\%$ ):**  
All operators are satisfying the benchmark with values lying between 96.98% and 99.41%.
- **SDCCH/PAGING Channel congestion (benchmark  $\leq 1\%$ ):**  
All operators are satisfying the benchmark with values lying between 0% and 0.86%.  
*Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.*
- **TCH congestion (benchmark  $\leq 2\%$ ):**  
All operators are satisfying the benchmark with values lying between 0% and 1.88%.
- **Call drop rate (benchmark  $\leq 2\%$ ):**  
All operators are satisfying the benchmark with values lying between 0.38% and 1.36%.
- **Cell exceeding 3% TCH drop (benchmark  $\leq 5\%$ ):**  
Except BSNL, TATA (GSM) & Uninor, rest of the the operators are satisfying the benchmark with value in between 0.07% and 2.95%.
- **Connections with good voice quality (benchmark  $\geq 95\%$ ):**  
RCom (CDMA) & Tata (CDMA) service providers have declared that the parameter is not system generated. Rest of operators are satisfying the benchmark with values lying between 95.84% and 99.15%.
- **Number of POI having  $\geq 0.5\%$  POI congestion:**  
All the operators satisfying the benchmark except Uninor show high POI congestion in 5 nos. of POIs

### Customer care and billing parameters:

- **%age of call answered by operator (electronically) (benchmark  $>95\%$ ):**  
Except Aircel & Vodafone, rest of the operators are satisfying the benchmark with values lying between 95.61% and 100%.
- **%age of call answered by operator (Voice to voice) (benchmark  $>90\%$ ):**  
Except Aircel, Idea & Vodafone, rest of the operators are satisfying the benchmark with values lying between 90.33% & 99.41%.
- **Metering and billing credibility-Post paid (benchmark  $\leq 0.1\%$ ):**  
Except Aircel, rest of the operators are satisfying the benchmark.
- **Metering and billing credibility-Pre paid (benchmark  $\leq 0.1\%$ ):**  
All the operators are satisfying the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):**  
Except BSNL, rest of the operators are satisfying the benchmark.
- **Termination/Closure of service (Benchmark  $\leq 7$  days):**  
Except Tata (GSM&CDMA), rest of the operators are satisfying the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within  $\leq 60$  days):**  
Except Tata (CDMA), rest of the operators are satisfying the benchmark.

## (1) Sample Coverage

*Switches/BSC/BTS details of operators:*

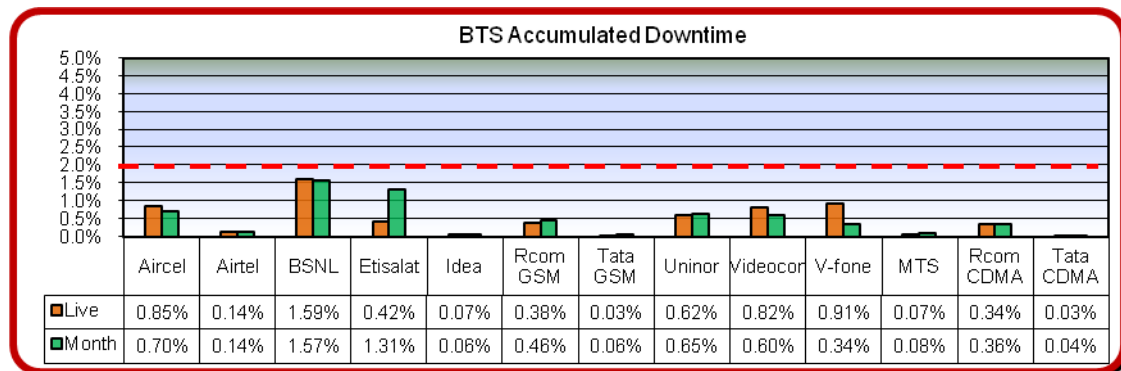
S/N	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
<b>GSM Operators</b>				
1	Aircel Ltd	3	23	2556
2	Airtel Ltd	18	64	6356
3	BSNL	21	45	2863
4	Etisalat	1	3	20
5	Idea	14	46	5806
6	Reliance Communication (GSM)	4	14	2286
7	Tata Communications (GSM)	3	18	1745
8	Vodafone	23	90	6037
9	Videocon	1	5	91
10	Uninor	6	16	2649
<b>CDMA Operators</b>				
11	MTS (CDMA)	1	1	207
12	Reliance Communication (CDMA)	7	4	1313
13	Tata Communications (CDMA)	6	6	816

## (2) Performance (Graphical Representation)

**Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services**

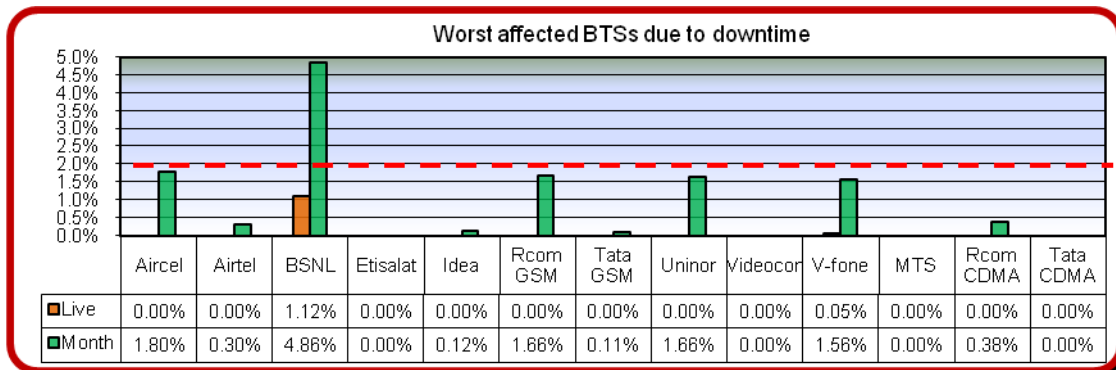
## A) NETWORK PERFORMANCE

**BTS Accumulated Downtime:** All operators are satisfying the TRAI benchmarks ( $\leq 2\%$ ) in both live & month of audit.

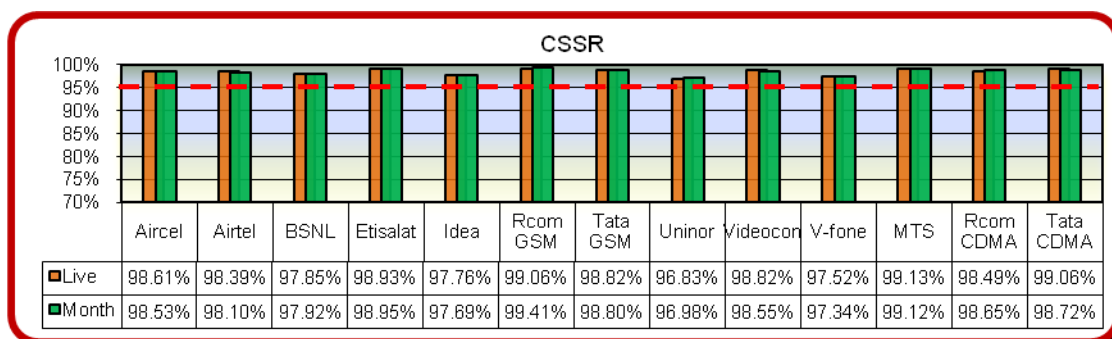


**Worst affected BTSs due to downtime (benchmark  $\leq 2\%$ ):**

Except BSNL, All operators are satisfying the TRAI benchmarks ( $\leq 2\%$ ) in both live & month of audit.

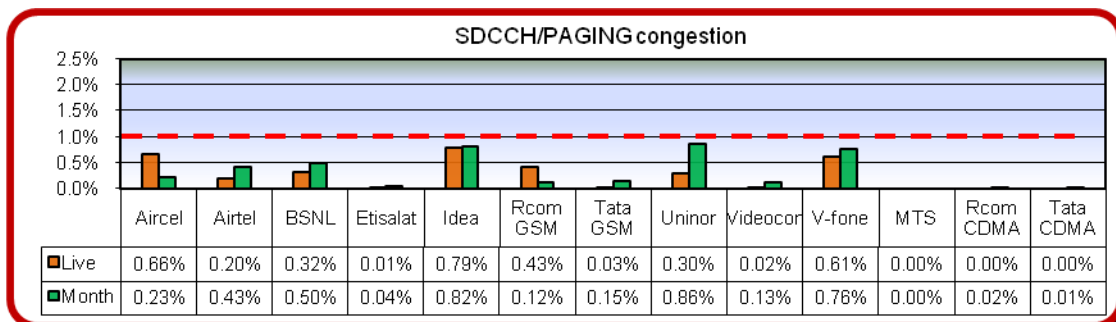


**Call setup success rate:** All operators are satisfying the TRAI benchmarks ( $\geq 95\%$ ) in both live & month of audit.

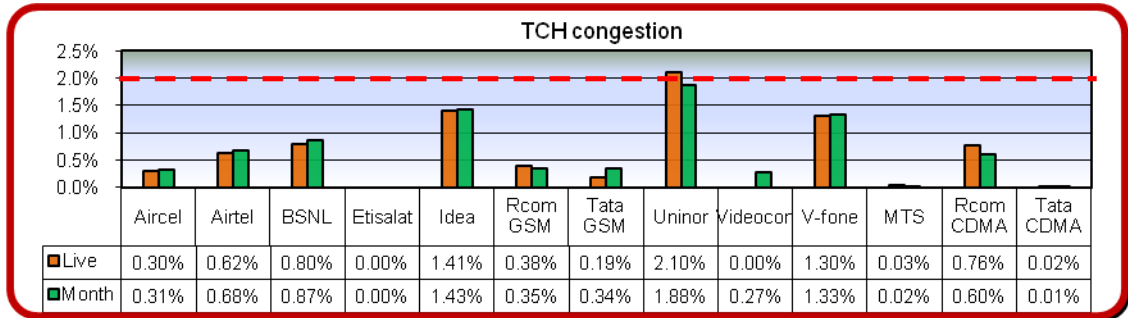


**Blocked call rate:**

**SDCCH congestion:** All operators are satisfying the TRAI benchmarks ( $\leq 1\%$ ) in both live & month of audit.

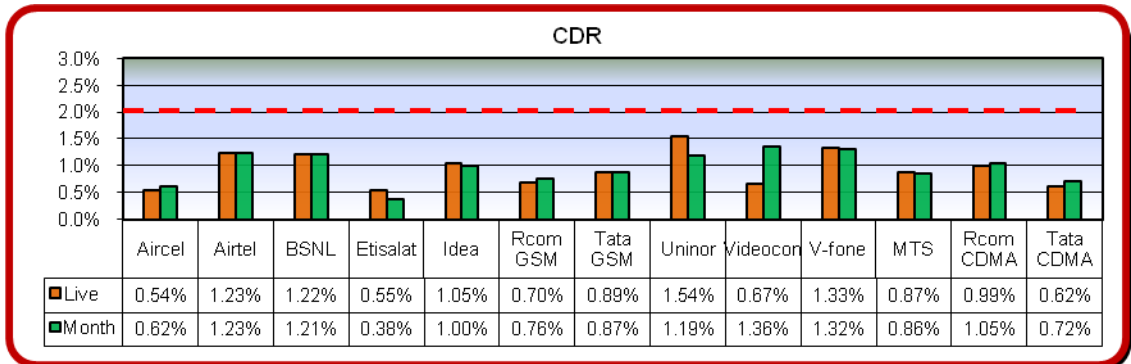


**TCH congestion:** All operators are satisfying the TRAI benchmarks ( $\leq 2\%$ ) in both live & month of audit except Uninor in case of live measurement data.

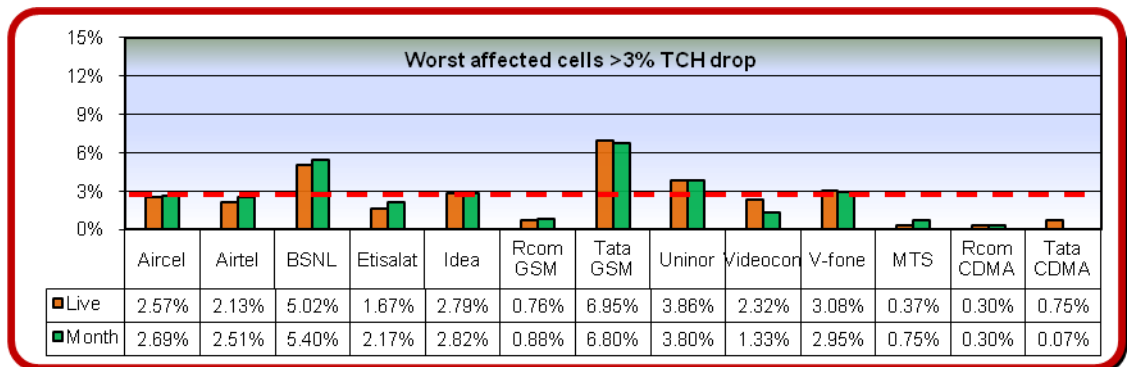


**Connection Maintainability (Retainability):**

**Call drop rate:** All operators are satisfying the TRAI benchmarks ( $\leq 2\%$ ) in both live & month of audit.

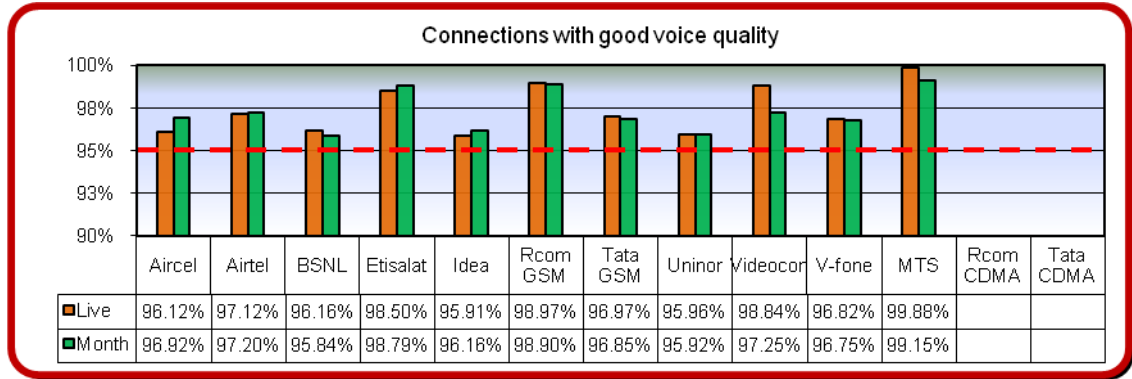


**Worst affected Cell exceeding 3% TCH Drop:** BSNL, Tata (GSM), Uninor & V-fone are found not satisfying the benchmark of  $\leq 3\%$ . Rests of the operators are satisfying the benchmark for both cases.

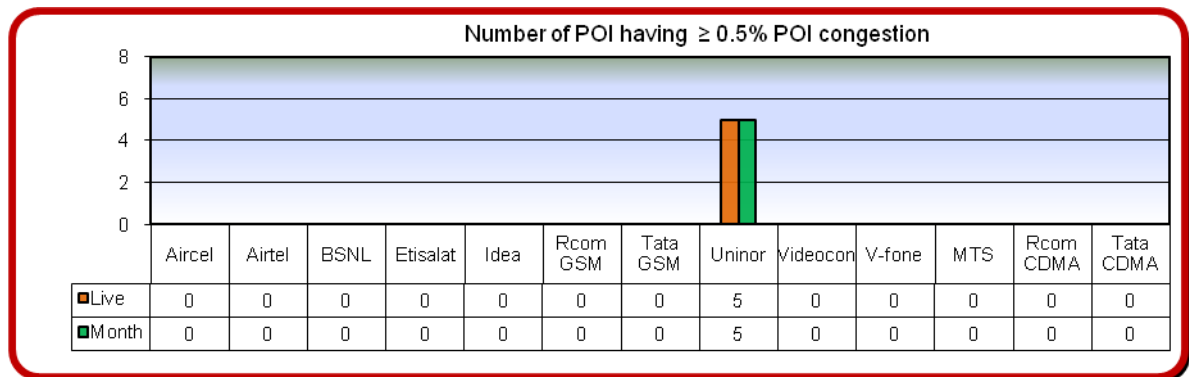




**Percentage of connections with good voice quality:** All operators are satisfying the TRAI benchmarks ( $\geq 95\%$ ) in both live & month of audit. RCom (CDMA) & Tata (CDMA) have not provide the system generated data.



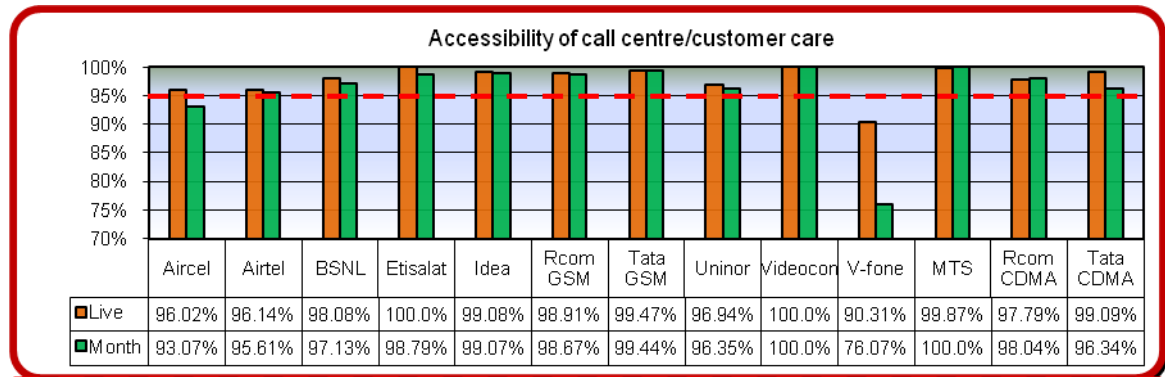
**Number of POI having  $\geq 0.5\%$  POI Congestion:** For both live and month data, 5 nos. of POI for, Uninor is found not satisfying the benchmark  $\geq 0.5\%$  congestion. Rests of the operators are satisfying the benchmark for both cases.



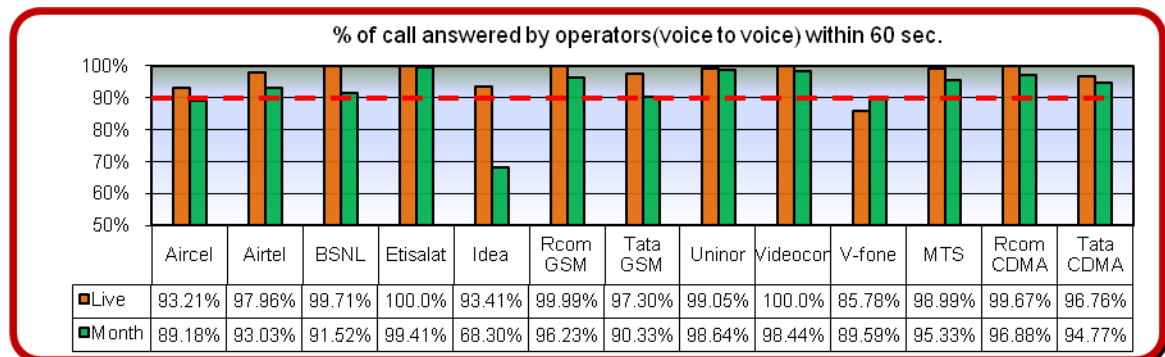
## B) CUSTOMER SERVICE QUALITY PARAMETERS

### Response time to the customer for assistance:

**Percentage of call answered (Electronically):** Except Aircel & Vodafone, all operators are satisfying the TRAI benchmarks ( $\geq 95\%$ ) in both live & month of audit.



**Percentage of call answered by operators (Voice to voice) within 60 sec:** Aircel, Idea & V-fone do not meet the 90% benchmark against this parameter.



### (3) Critical Analysis

The above comparative study between live data & month data shows mostly similar trends & consistency in live and month data. However, inconsistency in live & month data was found for parameter “*age of calls answered by operator*” for Aircel, Idea & Vodafone..

Under the network parameters except for the parameter “*Worst affected cells > 3% TCH drop*”, where it is found that BSNL, Tata (GSM), Uninor & Vodafone are not satisfying the benchmark, operators are found having satisfactory performance.

In case of “*Number of POI having  $\geq 0.5\%$  POI congestion*” it is found that 5 nos. of POIs of Uninor showing high POI congestion.

**(B) Redressal****(1) Sample coverage**

A sample of billing complaints was taken for each operator and calls were made for assessing the resolution of billing/charging complaints within 4 weeks as claimed by the respective operators.

**(2) Performance (live calling for billing complaints)**

Calling Operator	Aircel	Airtel	BSNL	Idea	RCom GSM	Tata GSM	Uninor	Vodafone	MTS	RCom CDMA	Tata CDMA
Total No. of Calls Attempted	9	15	45	21	100	2	100	100	3	100	24
Total No. of calls Answered	4	6	3	5	14	2	17	19	2	16	3
Cases resolved with 4 weeks	4	6	3	5	14	2	17	19	2	16	3
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: The difference between call attempts and call answer is because of either Number busy, No response, or out of reach in the Network.

**(3) Live calling to Call center**

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
Call Centre No.	121	121	1503	No service in Meerut	198/ 12345	333	121	198	No service in Meerut	111	155	*333	121	
Total No. of Calls Attempted	100	100	100		100	100	100	100		100	100	100	100	100
Total No. of calls connected to IVR	100	100	100		100	100	100	70		100	100	100	100	91
Calls got connected to agent within 60 Sec	92	75	88		100	70	98	70		78	100	85	91	91
%age of calls got answered	92.00%	75.00%	88.00%		100%	70.00%	98.00%	70.00%		78.00%	100%	85.00%	91.00%	91.00%

**(4) Level 1 live calling**

UP(West) Circle	Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
	Meerut															
	100	2	2	2	2	No service in Meerut	2	2	2	2	No service in Meerut	2	2	2	2	
	101	2	2	2	2		2	2	2	2		2	2	2	2	
	102	2	0	0	0		0	0	0	0		0	0	0	0	
	139	5	5	5	5		5	5	5	5		5	5	5	5	
	Mathura															
	100	2	2	2	2	No service in Mathura	2	2	2	2	No service in Mathura	2	2	2	2	
	101	2	2	2	2		2	2	2	2		2	2	2	2	
	102	2	0	0	0		0	0	0	0		0	0	0	0	
	139	5	5	5	5		5	5	5	5		5	5	5	5	
	Roorkee															
	100	2	2	2	2	No service in Roorkee	2	2	2	2	No service in Roorkee	2	2	2	2	
	101	2	2	2	2		2	2	2	2		2	2	2	2	
	102	2	2	2	2		2	2	2	2		2	2	2	2	
139	5	5	5	5	5		5	5	5	5		5	5	5		
Saharanpur																
100	2	2	2	2	No service in Saharanpur	2	2	2	2	No service in Saharanpur	2	2	2	2		
101	2	2	2	2		2	2	2	2		2	2	2	2		
102	2	2	2	2		2	2	2	2		2	2	2	2		
139	5	5	5	5		5	5	5	5		5	5	5	5		

**(5) Critical Analysis**

Random numbers were selected from the operators' database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. It was found that the operators had made refunds in 100% cases as claimed in their records.

As per test Call result of operator's Call Center it was found that Aircel, BSNL, RCom (GSM&CDMA), Uninor & Vodafone performance are not satisfactory.

Level 1 calling i.e. emergency call are getting connected in UP (West) circle, in Meerut, Mathura, Roorkee & Saharanpur cities but in case of Meerut & Mathura 102 Service port is open from operator's side but call not getting connected. As per information 102 service is open from operators end but due to nonpayment issues between BSNL & 102 service for the same is not available in Meerut & Mathura at present.

**(C) Inter operator call assessment****(1) Sample coverage**

A sample of 2x50 test calls per Service Providers with in the licensed service area (UP (West) Circle) were made between 1100 to 1400 hrs and between 1600 to 1900 hrs.

**(2) Performance based on live measurement**

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
Aircel	-	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	97%	-	96%	98%	99%	98%	99%	100%	100%	100%	99%	97%
Etisalat	92%	96%	96%	-	96%	90%	95%	95%	97%	100%	100%	98%	100%
Idea	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	100%
Reliance (GSM)	96%	98%	97%	100%	100%	-	98%	96%	100%	100%	100%	100%	100%
Tata (GSM)	99%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Uninor	97%	96%	95%	96%	95%	97%	96%	-	98%	98%	100%	97%	96%
Videocon	98%	100%	100%	96%	100%	97%	100%	100%	-	100%	100%	100%	97%
Vodafone	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%
MTS	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Reliance (CDMA)	97%	100%	96%	97%	100%	100%	98%	98%	97%	100%	100%	-	97%
Tata (CDMA)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-

**(3) Critical Analysis**

In the inter-operator call assessment test, calls were made from one operator to other operators so as to check congestion on both the operators' network. In such cases, the radio part, switch part & the POI in-between the operators are involved and hence if any congestion is found in the network, it may be due to any of these parts. The result shows that there is not much congestion on the operator networks.

**(D) Drive test of the mobile network of service providers****(1) Sample Coverage**

The Operator Assisted Drive Test was conducted at UP (West) for all the operators. Route covered was about around 100 Km depending on city areas within the speed limit of 40Km/hr.

**Drive Test Locations****Mathura**

HIGH DENSE: Dampier Ngr TE,Dampier NBSNL,Holigate,Bharatpur Gate,Mandi Ramdas,Akashwani

MEDIUM DENSE: Goverdhan road, Krishna ngr, krishna ngr Bsnl plot, Bhuteshwar, SBI crossing, Dampier ngr Nbsnl, Dhauli Piyau, Chandanvan

LOW DENSE: Radhapuram TE, Chaitanya vihar TE,chhatikara TE, Govind Ngr, Krishna Ngr, Goverdhan Road, Radhika Vihar, TP Ngr, Industrial Area,Chandanvan, Township TE

**Roorkee**

HIGH DENSE: Roorkee Town - Civil Lines, V.T. Ganj, Amber Talab,Adarshnagar, Railway Road, Station, Bus Station

MEDIUM DENSE: Khanjarpur, Sonalipuram, IIT, Dhandera, Cantonment, Ganeshpur, Ramnagar, Rajendranagar

LOW DENSE: Roorkee - Dehradun, Roorkee - Haridwar ^ Roorkee - Delhi Highways

**Saharanpur**

HIGH DENSE: Nehru market,partap market,Nawabgang,Matyamehal,Dalmandi,Chilkana bus stand, mundi road,gantaghar,court road,railway road, behat road

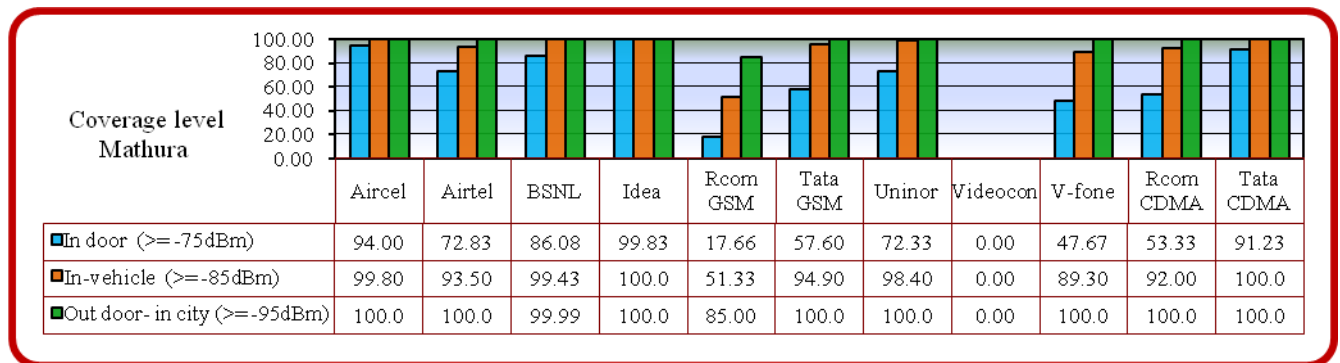
MEDIUM DENSE: Avasvikas,chanden nagar, DM colony, Hakikat nagar, Numayesh camp, Madho nagar, prafun nagar, ITC rod,Gil colony, Star paper mill,Railway station, bus station, Gadhi maluk.

LOW DENSE: Behat highway, Dehradun highway, Ambla higway, Delhi road highway.

## 2) Performance (for the respective cities)

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators	
1.1	Call Attempts	Mathura	79	74	55	96	58	67	43	NA	88	64	57
		Roorkee	168	86	79	95	94	147	87	60	114	99	66
		Saharanpur	207	152	155	194	178	349	180	NA	216	179	140
1.2	Blocked Call Rate ( $\leq 3\%$ )	Mathura	2.53%	0.00%	0.00%	0.00%	1.72%	1.49%	0.00%	NA	1.14%	3.13%	0.00%
		Roorkee	0.60%	0.00%	10.13%	0.00%	1.06%	0.68%	0.00%	0.00%	1.75%	0.00%	0.00%
		Saharanpur	1.45%	0.00%	2.58%	0.00%	6.18%	0.29%	1.67%	NA	0.46%	0.00%	0.00%
1.3	Dropped Call Rate ( $\leq 2\%$ )	Mathura	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%	0.00%
		Roorkee	0.00%	0.00%	2.53%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.01%	0.00%
		Saharanpur	0.00%	0.00%	0.00%	0.00%	0.56%	0.29%	0.00%	NA	0.00%	0.00%	0.00%
1.4	% of connections with good voice quality ( $\geq 95\%$ )												
	(i) 0-4 (w/o frequency hopping)	Mathura	NA									99.67%	96.10%
		Roorkee	NA									95.33%	97.60%
		Saharanpur	NA									95.67%	97.50%
	(ii) 0-5 (with frequency hopping)	Mathura	97.00%	96.20%	96.11%	97.57%	87.33%	94.90%	91.90%	NA	96.97%	NA	
		Roorkee	97.80%	94.96%	91.63%	96.63%	93.00%	93.70%	91.93%	95.00%	93.77%	NA	
Saharanpur		96.10%	95.36%	94.50%	97.37%	82.00%	95.00%	91.23%	NA	96.33%	NA		
1.5	Service Coverage												
	In door ( $\geq -75$ dBm)	Mathura	94.00	72.83	86.08	99.83	17.66	57.60	72.33	NA	47.67	53.33	91.23
		Roorkee	92.00	83.63	46.20	98.50	43.00	46.70	77.03	67.00	57.57	56.00	91.90
		Saharanpur	94.00	82.47	79.40	97.77	45.66	63.70	80.33	NA	73.40	84.66	97.80
	In-vehicle ( $\geq -85$ dBm)	Mathura	99.80	93.50	99.43	100.0	51.33	94.90	98.40	NA	89.30	92.00	100.0
		Roorkee	98.30	96.33	88.80	100.0	74.00	88.90	96.60	91.00	95.03	93.00	100.0
		Saharanpur	97.30	65.90	97.20	99.73	77.66	94.30	97.27	NA	98.13	97.66	100.0
	Outdoor- in city ( $\geq -95$ dBm)	Mathura	100.0	100.0	99.99	100.0	85.00	100.0	100.0	NA	100.0	100.0	100.0
		Roorkee	100.0	100.0	100.0	100.0	95.00	100.0	100.0	99.00	100.0	100.0	100.0
Saharanpur		100.0	99.93	100.0	100.0	93.00	100.0	99.97	NA	100.0	100.0	100.0	
1.6	CSSR ( $\geq 95\%$ )	Mathura	97.47%	100.0%	100.0%	100.0%	98.28%	98.51%	100.0%	NA	98.86%	96.88%	100.0%
		Roorkee	99.40%	100.0%	89.87%	100.0%	98.94%	99.32%	100.0%	100.0%	98.25%	100.0%	100.0%
		Saharanpur	98.55%	100.0%	97.42%	100.0%	93.82%	99.71%	98.33%	NA	99.54%	100.0%	100.0%

### Graphical Representation (Mathura):

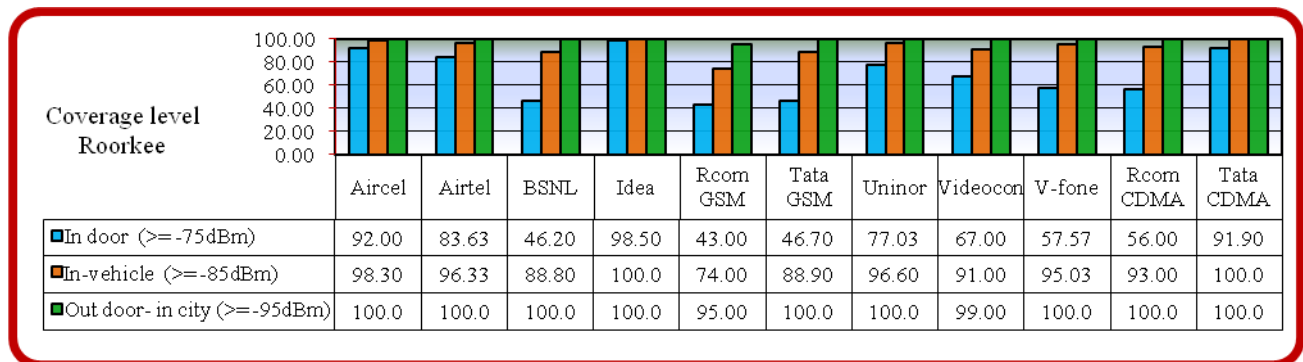


#### Critical Analysis

The drive test data was found to be satisfactory for most of the parameters. However, a few deviations found are listed below:

- For parameter “Blocked Call Rate” RCom-CDMA is not satisfying the benchmark.
- For parameter “Percentage of connections with good voice quality” RCom-GSM, Tata-GSM & Uninor are not satisfying the benchmark.

### Graphical Representation (Roorkee):



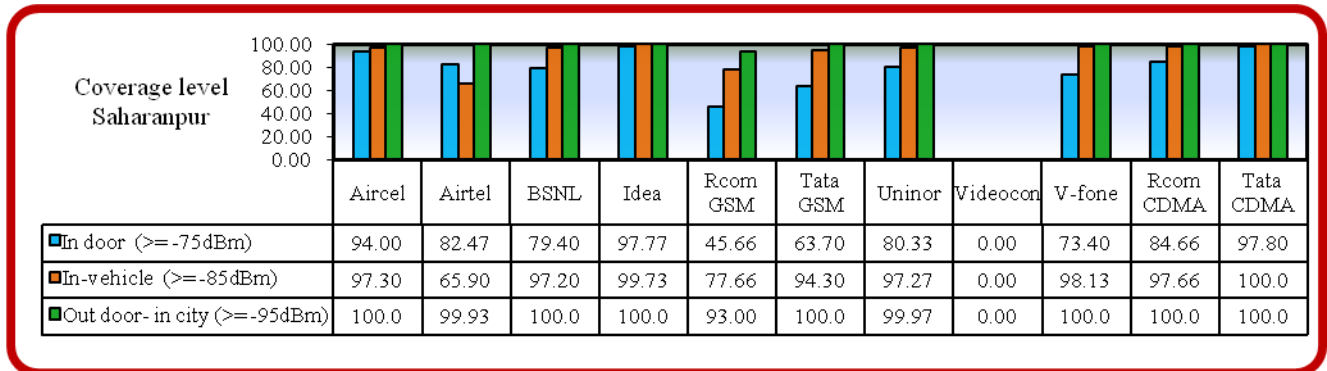
#### Critical Analysis

The drive test data was found to be satisfactory for most of the parameters. However, a few deviations found are listed below:

- For parameter “Blocked Call Rate” BSNL is not satisfying the benchmark.
- For parameter “Dropped Call Rate” BSNL is not satisfying benchmark.
- For parameter “Percentage of connections with good voice quality” Airtel, BSNL, RCom-GSM, Tata-GSM, Uninor & Vodafone are not satisfying benchmark.
- For parameter “CSSR” BSNL is not satisfying the benchmark.



**Graphical Representation (Saharanpur):**



**Critical Analysis**

The drive test data was found to be satisfactory for most of the parameters. However, a few deviations found are listed below:

- For parameter “Blocked Call Rate” RCom-GSM is not satisfying benchmark.
- For parameter “Percentage of connections with good voice quality” BSNL, RCom (GSM) & Uninor are not satisfying the benchmark.
- *Note: MTS has no service (Spectrum) in Mathura, Roorkee & Saharanpur and similarly Videocon has no service in Mathura & Saharanpur cities. Hence in case of MTS & Videocon drive test is not applicable in these cities.*

**(E) Independent Drive Test****(1) Sample Coverage**

The Operator Assisted Drive Test was conducted at UP (West) for all the operators. Route covered was about around 60-70 Km depending on city areas within the speed limit of 40Km/hr.

**Drive Test Locations****Etawah**

HIGH DENSE: Tvs Chowk,Ram Bazaer,Pakabag

MEDIUM DENSE: Saribhupat,Alampur House,Etwachowk,Bhartan House,Sunderpur

LOW DENSE: Mohanpur,Pakabag,Harsnager

**Muzzafarnagar**

HIGH DENSE: Bakra Market, Hanuman Chowk ,Eadgah Road, Khala Park, City Centre, Shiv Chowk, Laxmi Bai Chowk , Railway Station , Bus Stand

MEDIUM DENSE: Rampur Chowk, Main Market Chowk , Shiv Chowk , Hospital Chowk, Radha Chowk

LOW DENSE: Khatauli By Paas, Mohna Road, Bhopa Road, Jansath Road , Haridwar By Paas, Rampur Tiraha

**Pithoragarh**

HIGH DENSE: Market Area Pithoragarh, Pandey Gaon, Kumaun Bus Stand, Vikas Bhawan Road

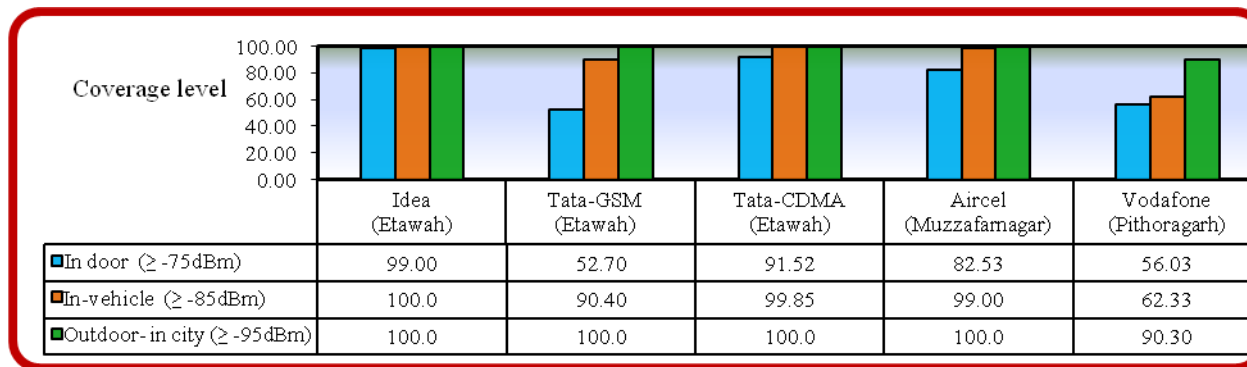
MEDIUM DENSE: Siltham, Jajarval, Jakhani-Kumar Road

LOW DENSE: Pithoragarh road, Aincholi to Gurna Mandir, Simal Gher to Bharkati, Bharkati to wadda, Cantt Road

## 2) Performance (for the Independent respective city)

Operators Name	City	Call Attempts	Blocked Call Rate ( $\leq 3\%$ )	Dropped Call Rate ( $\leq 2\%$ )	% of connections with good voice quality ( $\geq 95\%$ )		Service Coverage			CSSR ( $\geq 95\%$ )
					(i) 0-4 (w/o frequency hopping)	(ii) 0-5 (with frequency hopping)	In door ( $\geq -75\text{dBm}$ )	In-vehicle ( $\geq -85\text{dBm}$ )	Outdoor- in city ( $\geq -95\text{dBm}$ )	
Uninor	Etawah	53	0.00%	0.00%		98.57%	99.00	100.0	100.0	100.0%
Tata-GSM		52	0.00%	0.00%		92.00%	52.70	90.40	100.0	100.0%
Tata-CDMA		38	0.00%	0.00%	96.50%		91.52	99.85	100.0	100.0%
Aircel	Muzzafarnagar	98	2.04%	0.00%		92.50%	82.53	99.00	100.0	97.96%
Vodafone	Pithoragarh	53	1.89%	0.00%		94.97%	56.03	62.33	90.30	98.11%

### Graphical Representation



### Critical Analysis

The drive test data was found to be satisfactory for most of the parameters. However, a few deviations found are listed below:

- For parameter “Percentage of connections with good voice quality” Tata-GSM is not satisfying the benchmark.

## **(F) Compliance report (Status of service providers with respect to the QoS)**

From live & month findings, it can be concluded that on an average, performance of the operators in the service area, UP (West) is satisfactory for **Network Parameters**.

Only exception is found for the parameter "*Worst affected cells > 3% TCH drop*" as operators like BSNL, Tata (GSM), Uninor & Vodafone performance have below benchmark. Similar below benchmark performance is also observed for "*Worst affected BTSs due to downtime*" in case of BSNL.

In case of "*Number of POI having  $\geq 0.5\%$  POI congestion*" it is found that Uninor shows congestion of greater than 0.5% in 5 nos. of POIs.

Under **Customer Service Quality Parameter** "*operator answered calls (voice-to-voice) within 60 sec*" parameter Aircel, Idea & Vodafone are not fulfilling TRAI benchmark of  $\geq 90\%$ .

## II. Basic Telephone Service (Wire line) Providers

### (A) Exchange Audit

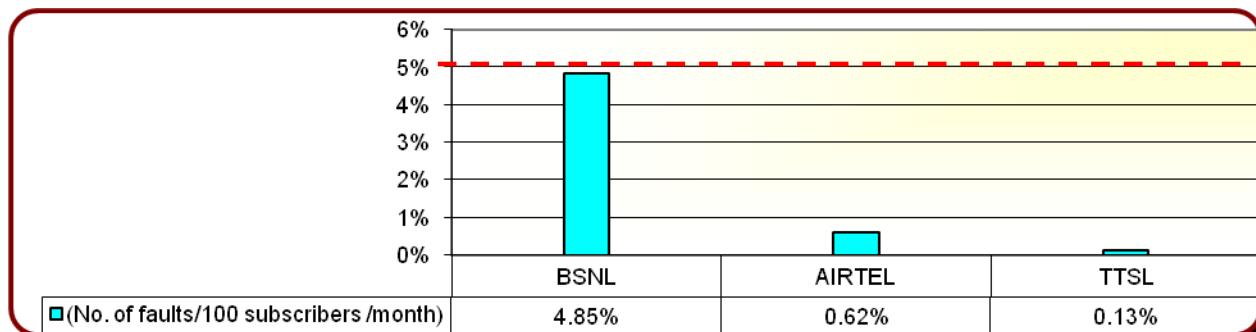
#### 1. 3 days live data & One month audit comparative table:

S/N	Name of Parameter	Bench mark	Audit	BSNL	AIRTEL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	< 5%	Month	4.85%	0.62%	0.00%	0.13%
2	Fault repair by next working day(Urban Area)		Month				
a	By next working day	>90%	Month	95.08%	96.35%	0.00%	100.00%
b	Within 3 days	100%	Month	99.42%	100.00%	0.00%	100.00%
3	Fault repair by next working day(Rural & hilly Area)		Month				
a	By next working day	>90%	Month	95.09%	NA	NA	NA
b	Within 5 days	100%	Month	98.53%	NA	NA	NA
4	Rent rebate		Month				
a	Fault pending > 3 days & <7 days	Rebate for 7 days	Month	0	0	0	0
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Month	0	0	0	0
c	Fault pending > 15 days	Rebate for one month	Month	0	0	0	0
5	Mean time to Repair(MTTR)	<= 8 Hrs	Month	5.97	5.18	0	2.28
6	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55%(CCR) & > 75%(ASR)	Live	51.67%	61.22%	88.39%	100.00%
			Month	44.30%	60.03%	88.53%	100.00%
7	Metering and billing credibility(post paid)		Month				
a	Disputed Bills over bills issued	< 0.1%	Month	0.03%	0.13%	0.00%	0.00%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	Month	100.00%	100%	NA	NA
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 weeks	Month	100%	86.11%	NA	NA
9	No of POI having > 0.5% Congestion	>= 0.5%	Live	1	0	0	0
			Month	7	0	0	0
10	Response Time to customer for assistance		Month				
a	Accessibility of Call centre within 40 sec.	>= 95%	Live	100.00%	100%	100.00%	100.00%
			Month	96.43%	100%	100.00%	98.00%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	Live	98%	97.16%	99.75%	100.00%
			Month	96.00%	89.98%	98.00%	96.00%
11	Customer care(promptness in attending to customers request)		Month				
a	Termination / Closures	<= 7 Days	Month	100%	79%	NA	NA
b	Time taken refunds deposit after closures	100% within 60 days	Month	100%	NA	NA	NA

## 2. Performance (Graphical representation)

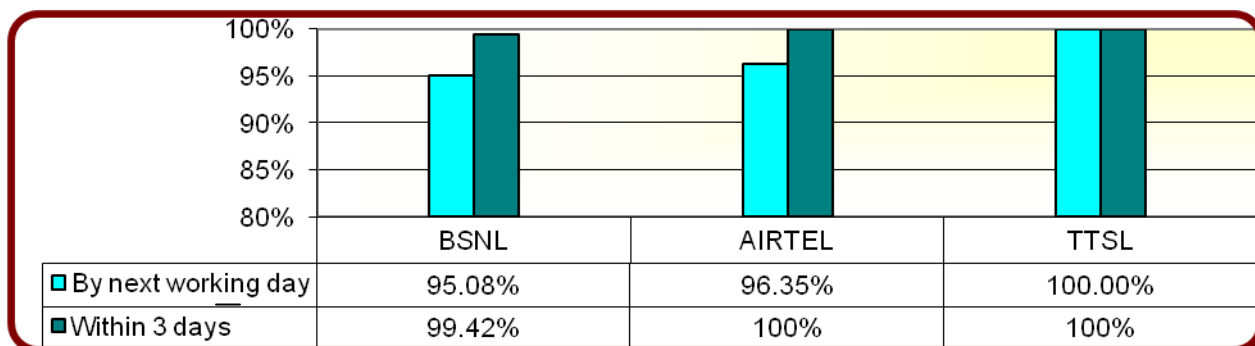
Parameter wise Data Analysis & Graphical Representations – Basic Service (Wireline)

**Fault incidences (No of faults/100 subscribers/month ( $\leq 5\%$ ):** All the operators are meeting the TRAI benchmark. RCOM has no cases of fault in that month.

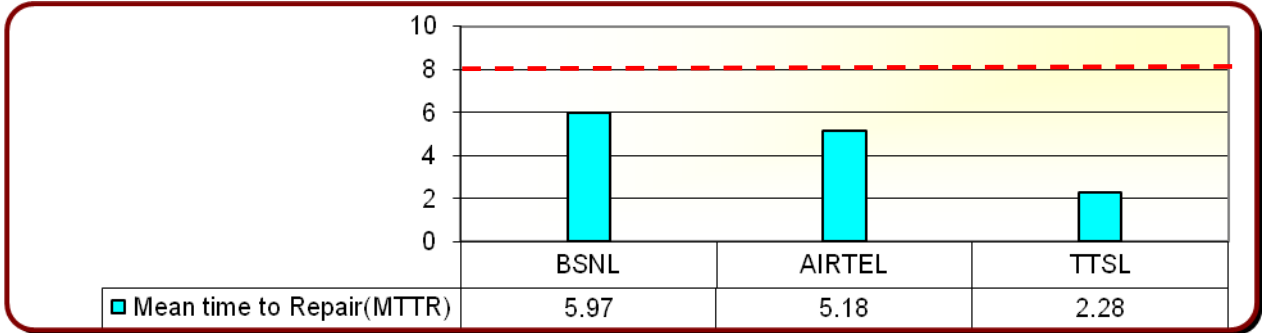


### Fault Repair (Urban Area):

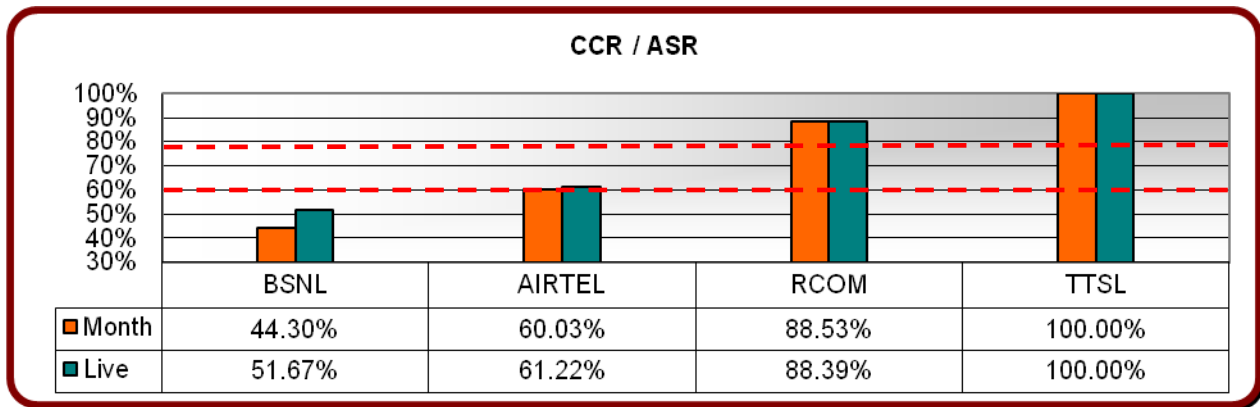
- **By next working day (>90%):** All the operators are Satisfying with the TRAI benchmark.
- **Within 3 days (100%):** All the operators are complying the benchmark, except BSNL. RCOM has no cases of fault in the month of audit in UP (w).
- **Rent Rebate:** No rebate cases of any operators in that month.



**Mean Time to Repair (MTTR) (<= 8 Hrs):** All the operators comply with the TRAI benchmarks.

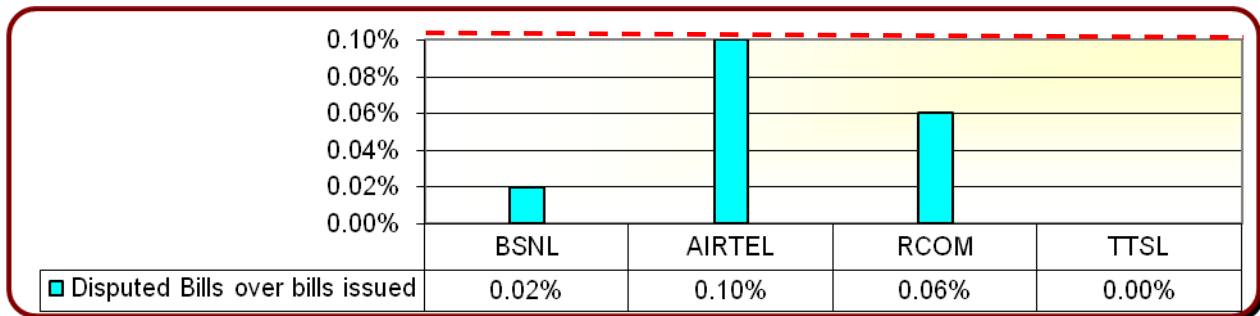


**Call Completion Rate (CCR)/ Answer to Seizure Ratio (ASR) (>55% & > 75%):** BSNL is deviating from the benchmark in Live & month, rest of the operators are complying the benchmark. RCOM has given ASR instead of CCR.



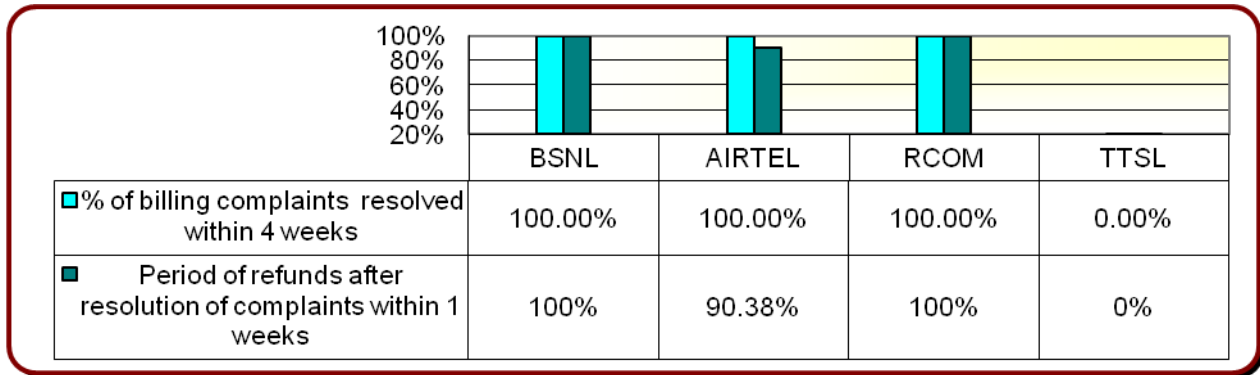
**Metering and Billing Credibility (< 0.1%):**

**Disputed Bills over Bills issued:** - All the operators comply with the TRAI standards for one-month data verification. Except Airtel which is deviating with a value of 0.13%.

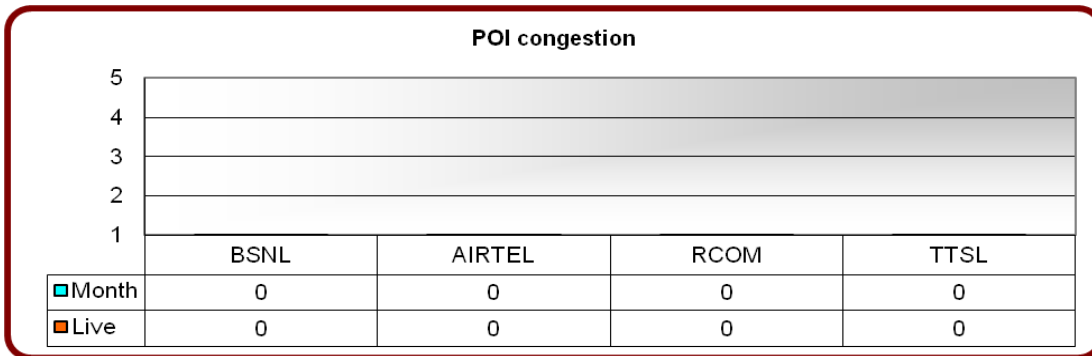


**% of Billing Complaints resolved within 4 Weeks:** All the operators have resolved billing complaints 100% (benchmark) within 4 weeks in one-month data verification.

**Period of All refunds / Payments from the date of Complaints Within 1 week:** As far as period of refunds from the date of complaints within 1 week, only Airtel is deviating in this parameter, rest of the operators are satisfying the benchmark set by TRAI in one-month data verification.

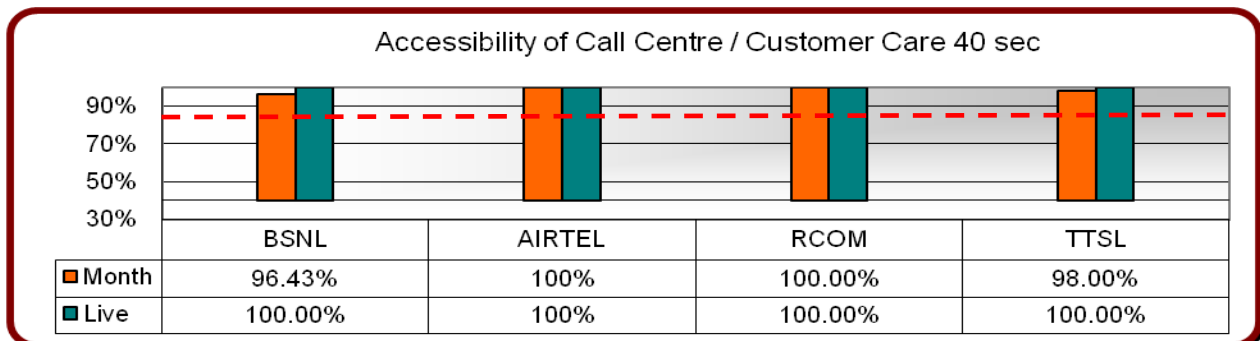


**No of POI having > 0.5% Congestion:** None of the operators are having POIs above 0.5% congestion complying with the TRAI benchmark ( $\geq 0.5\%$ ).



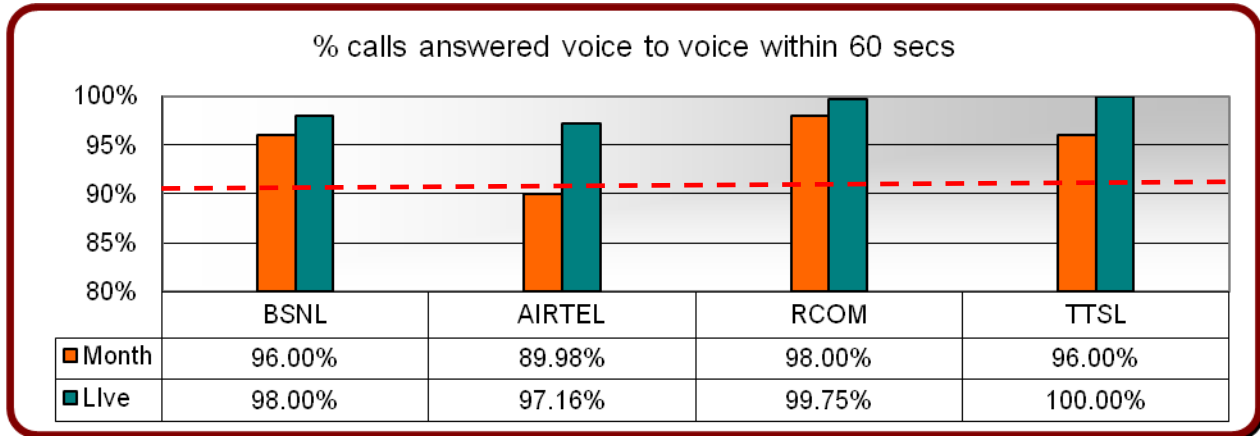
**Response Time to Customer for Assistance:**

**Accessibility of Call centre / customer care (Electronically) within 40 sec (>95%):** All the Operators are meeting the benchmark set by TRAI in one-month data.





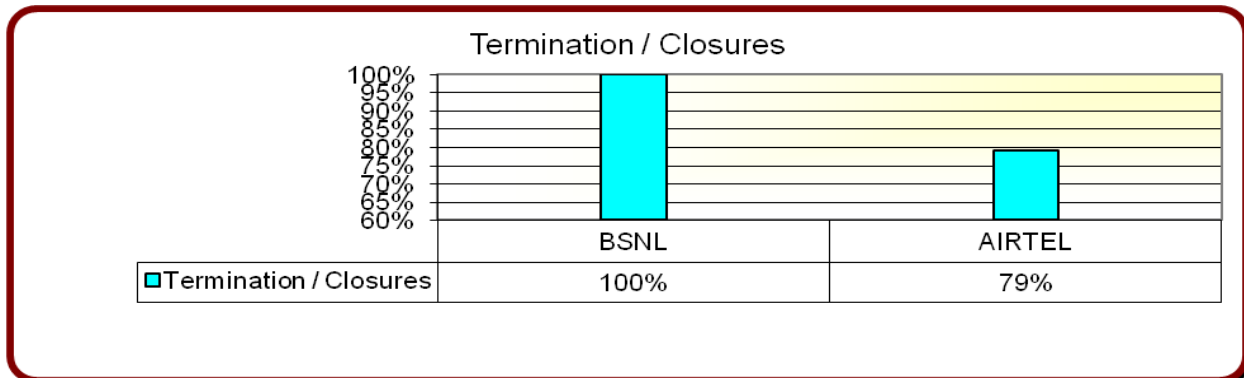
**% age of calls answered by operator (Voice to Voice) within 60 sec (>90%):** Only Airtel is found not meeting the benchmark rest of the operators are complying the Benchmark set by TRAI.



**Customer Care Promptness in Attending Customer Request:**

(i) Termination/Closure: In Termination only Airtel is having termination cases, while other operators have no termination cases in the month of audit.

ii) Time taken for refund of deposits after closure: Only BSNL are having refunds cases, rest, of the operators have no cases for refunds in the month of audit.



### 3. Customer Care & Grievances Redressal

S.N.	Parameters	BSNL	AIRTEL	RCOM	TTSL
1	Total no of complaints received in the call centre (Tech+ Non Tech)	33864	2270	0	10
3	<b>Nodal Officer</b>				
3.1	Total no of complaints received by the nodal officers	109	23	0	0
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	0.32%	1.01%	0%	0%
4	<b>Appellate Authority</b>				
4.1	Total no of appeals received by the appellate authority	0	20	0	0
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	0%	86.95%	0%	0%

**Note:**

It is found that there are many instances where customers directly approach to Nodal Officer without approaching to Call Center for redressal. Similarly there are many instances where Airtel customers directly approach to Appellate Authority without approaching to Nodal Officer for their grievances redressal respectively.

### 4. Live calling to call centre

Calling Operator	BSNL	AIRTEL	TTSL	RCOM
Call Centre No.	1500	121/198	1515	*377
Total No. of Calls Attempted	100	100	100	100
Total No. of calls connected to IVR	100	100	100	100
Calls got connected to agent within 60 Sec	96	98	95	97
%age of calls got answered	96%	98%	95%	97%

Satisfactory results are found for all the operators for accessibility of call centre for assistance.

### 5. Performance based on live calling for fault repair

	AIRTEL	BSNL	TTSL
<b>Total No. of Calls Attempted</b>	100	100	10
<b>Total No. of calls Answered</b>	92	86	9
<b>Cases resolved within 3 days</b>	92	86	9
<b>%age of complain resolved</b>	100%	100%	100%

**NOTE:** TTSL has only few faults cases in that month and RCOM has no fault cases. The difference between calls answered and call attempts is due to line busy and no response to the customer.

### 6. Performance based on live calling for billing complaints

	AIRTEL	BSNL
<b>Total No. of Calls Attempted</b>	36	84
<b>Total No. of calls Answered</b>	32	62
<b>Cases resolved with 4 weeks</b>	32	62
<b>%age of cases resolved</b>	100%	100%

**NOTE:** RCOM & TTSL has no disputed bills cases in the month of audit. The difference between calls answered and call attempts is due to line busy and no response to the customer.

### 7. Level 1 live calling

Emergency no.	No. of calls made	Airtel	BSNL(SSA)		TTSL	RCOM
		Meerut & Agra	Meerut	Bijnor	Meerut	Meerut
100	1	1	1	1	1	1
101	1	1	1	1	1	1
102/108	1	1	1	1	1	1
139	2	2	2	2	2	2

**NOTE:-** For Level 1 services calling in 2 SSA covering 7 SDCA of Meerut and Bijnor in UP (W) circle.

## 8. Critical Analysis

The parameter wise key takeouts for the Basic (Wire line) Service providers for the UP (W) Circle are as under:-

### **Fault incidence:**

All the operator are meeting the benchmark for fault incidence cases in that month. RCOM has no faults cases in that month.

### **Fault Repair (Urban Area):**

All operators are meeting the benchmarks set by TRAI for the parameters “faults repair by the next working day” but as far as “fault repair within 3 working days” and within 5 days is concerned it is not met by BSNL respectively.

### **Rent Rebate:**

None of the operators are having any rebate cases in the month of audit.

### **Call Completion Rate (CCR):**

All the operators are found meeting TRAI benchmark of  $\geq 55\%$  for the parameters Call Completion Rate (CCR) & Answer to Seizure Ratio (ASR). Except BSNL which is not meeting the benchmark for this parameter. Rcom provides ASR while BSNL provides CCR in both live and one- month data verification..

### **Metering and billing credibility:**

Airtel is not complying in this parameter, rest of the operators are complying the benchmark of less than 0.1% billing complaints over the total number of bills issued.

### **% of Billing complaints Resolved Within 4 Weeks:**

As per the findings for one-month data audit, all the operators are found 100% resolution of complain within 4 weeks.

### **Period of All refunds/Payments from the date of resolution within 1 Week:**

As per the findings for one-month data audit, Airtel is found 86.11% refunds from the date of resolution within 1 week., rest of the operators are complying with the benchmark.

**POI Congestion:**

All the operators are meeting the benchmarks having POI below 0.5% congestion set by TRAI ( $\geq 0.5\%$ ) for both live and one- month data verification.

**Response Time to Customer for Assistance:**

**(i) Accessibility of Call Centre/ Customer care within 40 seconds (Electronically)**

For accessibility of call centre i.e. call answered electronic through IVR menu parameter all the Operators are complying in both Live & Month part.

**(ii) % of Call answered by operators within 60 seconds (Voice to Voice):**

For the parameter “%age of calls answered by operators within 60 Seconds” all the operators are complying the benchmarks of  $\geq 90\%$  in Live & month, except Airtel which is deviating in Month data.

**Customer care (Promptness of attending customer request):**

**(i) Termination/Closure:**

Only BSNL & Airtel are having Termination cases and in that cases Airtel is not meeting the benchmark set by TRAI, rest RCOM & TTSL has no Termination cases in the month of audit.

**ii) Time taken for refund of deposits after closure:**

Only BSNL is having eligible cases of refunds, rests of the operators are not having any refunds cases.

## 1. Compliance Report (Status of service providers with respect to the QoS)

It can be seen from the table and graphical method that in both cases of live performance and month data verification there is deviation in values of the parameters.

Observation & Findings for the Live and One-Month data measurement for Basic Service (Wire line) are as given below:

- Under the Network Section, parameters like Faults repair by next working days and within 3 days, it has been observed that all the operators are complying the benchmark except BSNL which is deviating for faults repaired within 3 days.
- As far as faults registered in Hilly areas and Rural area is concerned, only BSNL is having some base in such areas. The parameters are not met by BSNL in these areas.
- For POI congestion parameter, no POI is having more than 0.5% congestion within the local network for any operator in the month of audit.
- Airtel is having a high %age of disputed bills.
- For “Period of refunds after resolution of complaints within 1 week”, Airtel is having deviation.
- For “Response Time to customer” parameters, all operators are satisfying the benchmark set by TRAI in Live & one month data except Airtel which is not meeting in month data.
- All the operators are meeting CCR/ASR. Reliance has provided ASR (Answer to Seizure ratio) value instead of CCR (call completion ratio).
- For Termination & Closures cases, all of the operators are satisfying the benchmark except Airtel with a value of 79%.

## II. Broadband Service Providers

### 3 days live and One month audit comparative table

S/N	Parameters	B-marks	Audit	Airtel	BSNL	RCom
<b>1</b>	<b><i>Service Provisioning/Activation Time</i></b>					
	100% cases in 15 days (subject to technical feasibility)	<15 days	Month	97.86%	100%	NA
	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/day.		100%	100%	NA
<b>2</b>	<b><i>Faults Repair/Restoraion Time</i></b>					
	By next working day	>90%	Month	95.59%	93.48%	NA
	within 3 working day	≥99%		99.22%	99.22%	NA
<b>2.1</b>	<b><i>Rebate</i></b>					
	Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		Month	0	22	0
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)			0	6	0
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)			0	4	0
<b>3</b>	<b><i>Billing Performance</i></b>					
	Billing complaints per 100 bills issued	<2%	Month	0.00%	0.03%	NA
	%age of complaints resolved within 4 weeks	100%		NA	100%	NA
	Time taken for refund of deposits after closure (within 60 days)	100%		NA	100%	NA
<b>4</b>	<b><i>Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)</i></b>					
	within 60 sec	>60%	Live	97.09%	77%	99.00%
			Month	91.04%	75.70%	96%
	within 90 sec	>80%	Live	97.32%	86%	98.99%
			Month	93.11%	87.40%	97%
<b>5</b>	<b><i>Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later</i></b>					

S/N	Parameters	B-marks	Audit	Airtel	BSNL	RCom
	<i>than one month, is mandated.) &lt; 80% link(s) / route bandwidth utilization during peak hours (TCBH).</i>					
5.1	POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	Live	35.00%	48.00%	18.33%
			Month	35.00%	49.00%	14.74%
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	Live	NA	75.92%	NA
			Month	NA	74.37%	NA
5.3	Broadband Connection Speed (download) - from ISP Node to User	> 80%	Live	100%	97%	100%
			Month	100.0%	98%	100%
<b>6</b>	<b><i>Service Availability/Uptime (for all users)</i></b>					
	Service Availability (%)	>98%	Month	99.98%	99.90%	99.99%
<b>7</b>	<b><i>Packet loss</i></b>					
	% of Packet loss	<1%	Live	0.00%	0%	0%
			Month	0.00%	0%	0.19%
<b>8</b>	<b><i>Network latency (for wired broadband access)</i></b>					
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	Live	37ms	16ms	NA
			Month	36ms	21ms	54.25ms
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	Live	16ms	231 ms	54.25ms
			Month	14ms	227 ms	50.7ms
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)** See note below	<800 ms	Month	NA		

NA – Not Applicable, NP – Not Provided.

**Note:--**

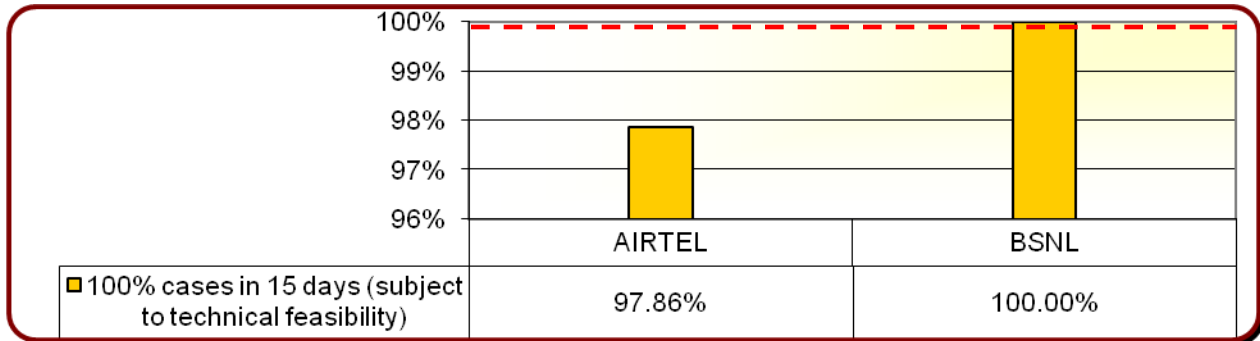
- Airtel is not meeting the benchmark for the parameters Service Provisioning.
- None of the operators are having satellite connectivity.
- RCOM has no cases registered in Service activation, Fault repair & billing complaints in the month of audit.
- RCOM has no provision of capturing live latency due to some security reasons.



## 2. Performance (Graphical representation)

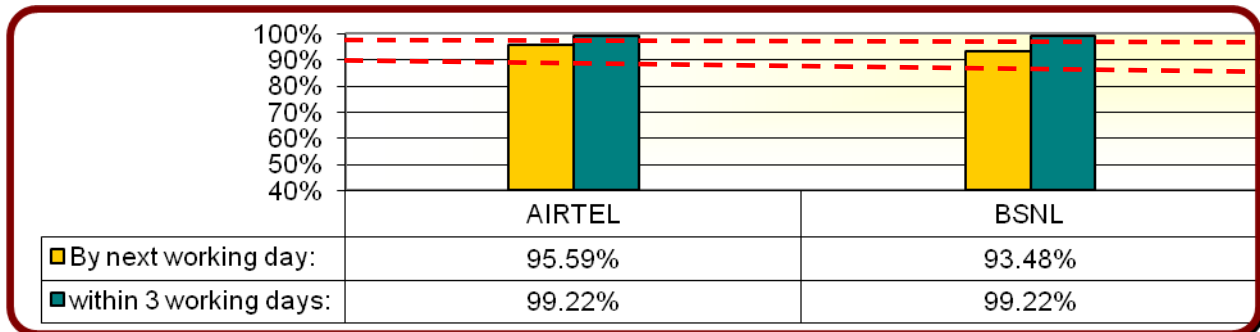
### Service Provisioning /Activation Time: (Benchmark 100%)

All the operators are complying with the TRAI benchmark of 100% in the month of audit, Rcom has no new connections registered in the month.



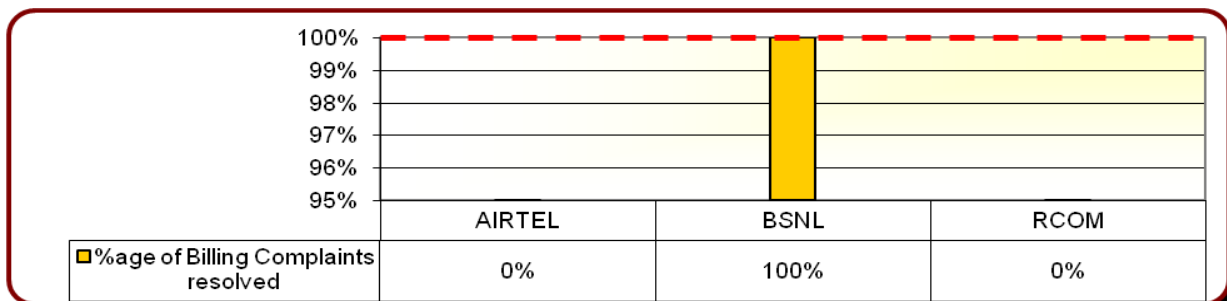
### Fault Repair / Restoration Time:

- **By next working day (>90%):** All operators are complying with the TRAI benchmark of 90% in one-month data verification. Rcom has no fault cases in that month.
- **Within 3 working days (>99%):** All operators are complying with the TRAI benchmark of 99% in one-month data verification. Rcom has no fault cases in that month.



### Billing Performance: (Benchmark <2%)

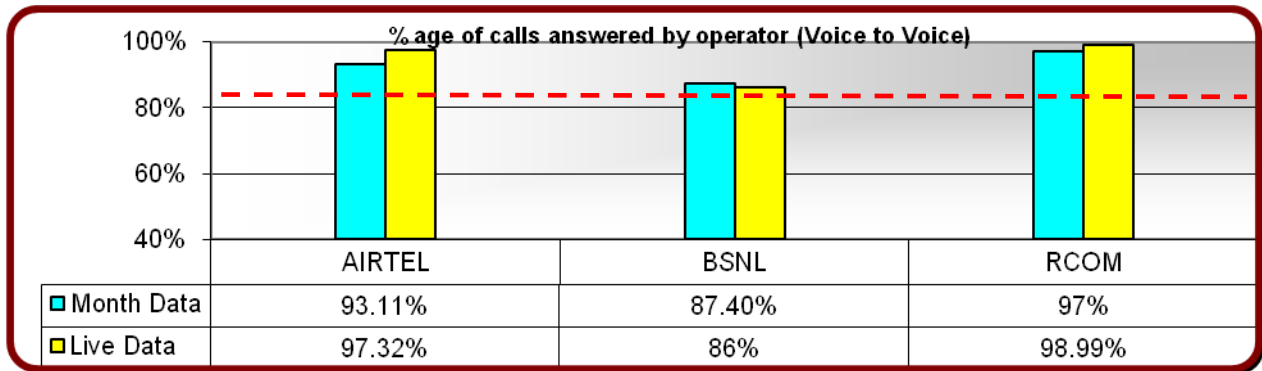
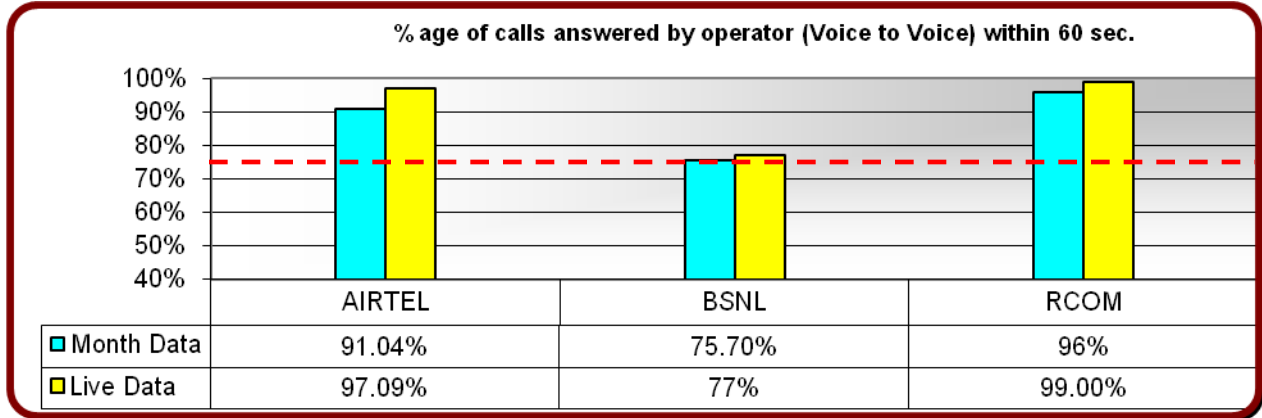
All operators are complying with the TRAI standards for the parameter “Billing complaints per 100 bills issued” in one-month data verification. Airtel & Rcom have no billing dispute cases. BSNL has also resolved 100% complaints within 4 weeks.



**Response time to the customer for assistance:**

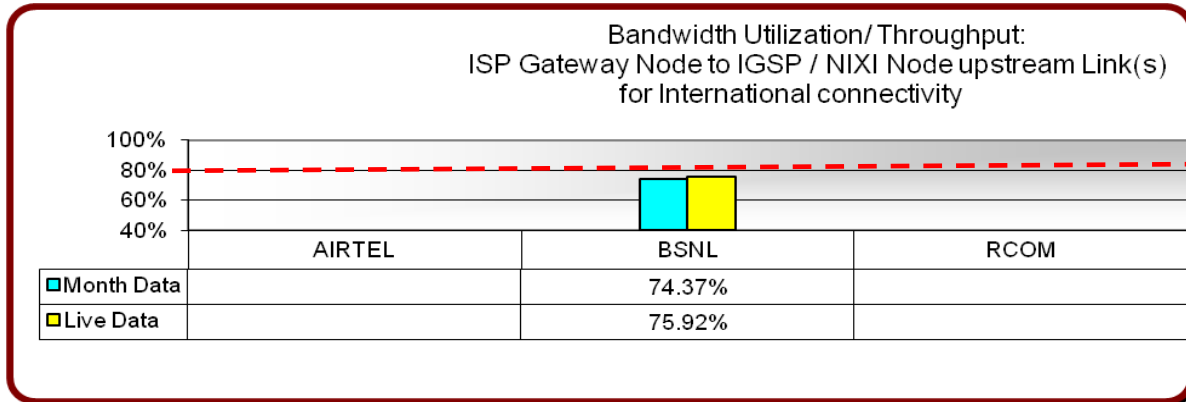
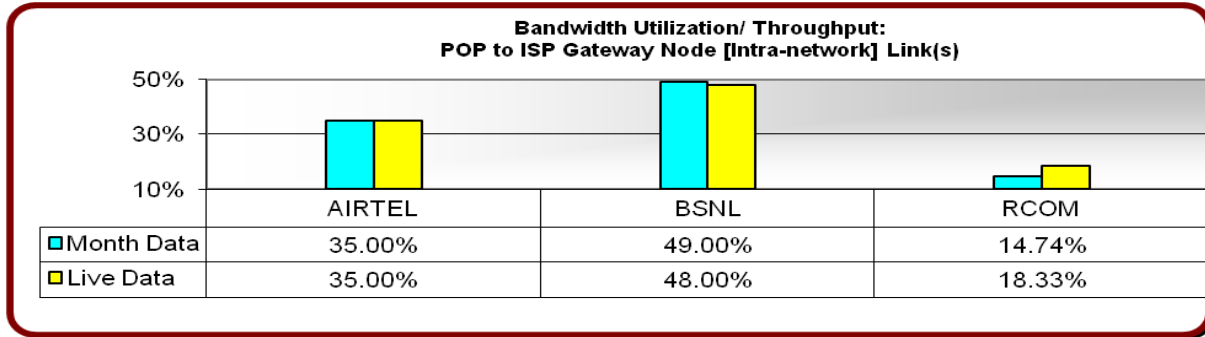
% age of calls answered by operator (Voice to Voice)

- **Within 60 seconds (>60%):** All the operators are meeting the benchmark in both live and one- month data verification.
- **Within 90 seconds (>80%):** All the operators are meeting the benchmark in both live and one- month data verification.

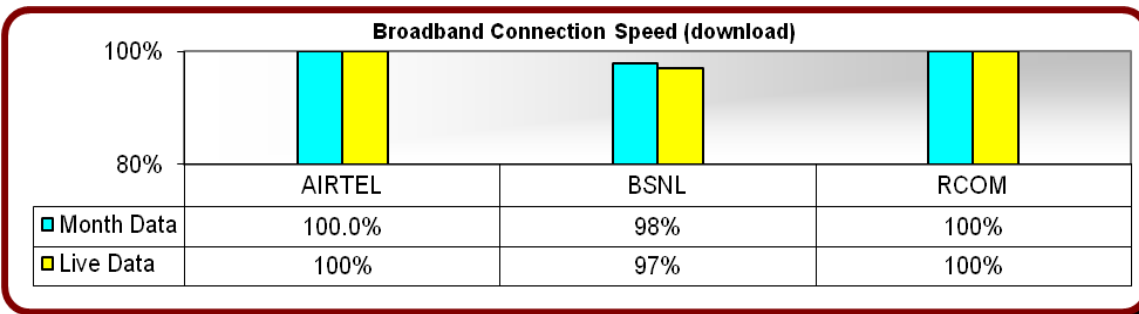


**Bandwidth Utilization/ Throughput:**

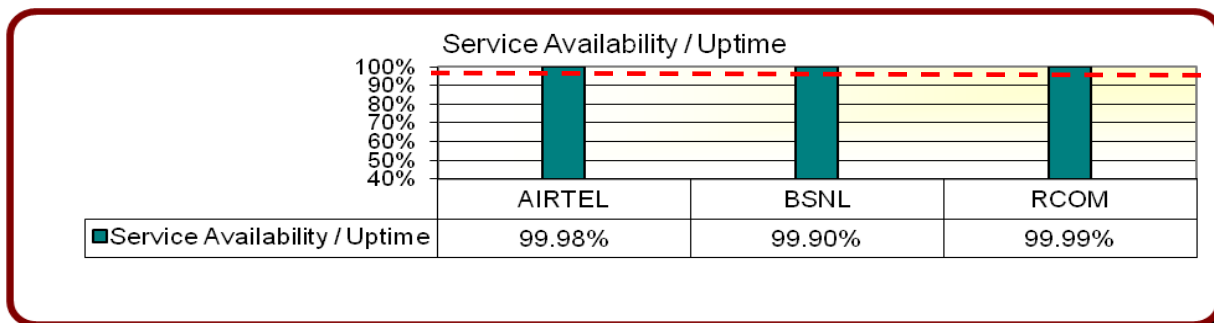
- **POP to ISP Gateway Node [Intra-network] Link(s): (Benchmark <80%):** All the 3 operators are meeting the TRAI benchmarks.
- **ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: (Benchmark <80%):** BSNL is complying the parameter and Airtel & RCOM have no provision of generating the data from the system.



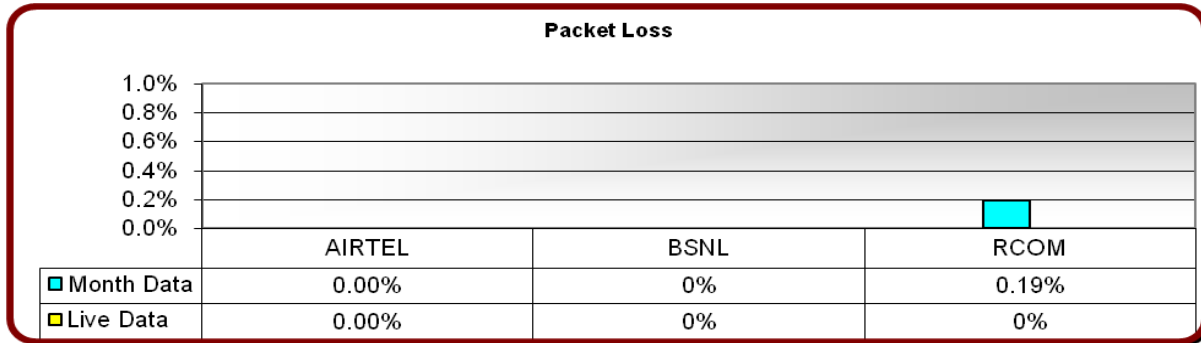
**Broadband Connection Speed (download) (>80%):** All the operators are meeting the TRAI benchmark of greater than 80% connection in both live and one-month data verification.



**Service Availability / Uptime (for all users) (better than 98%):** All the operators are meeting the TRAI benchmark of greater than 98% during one-month data verification.

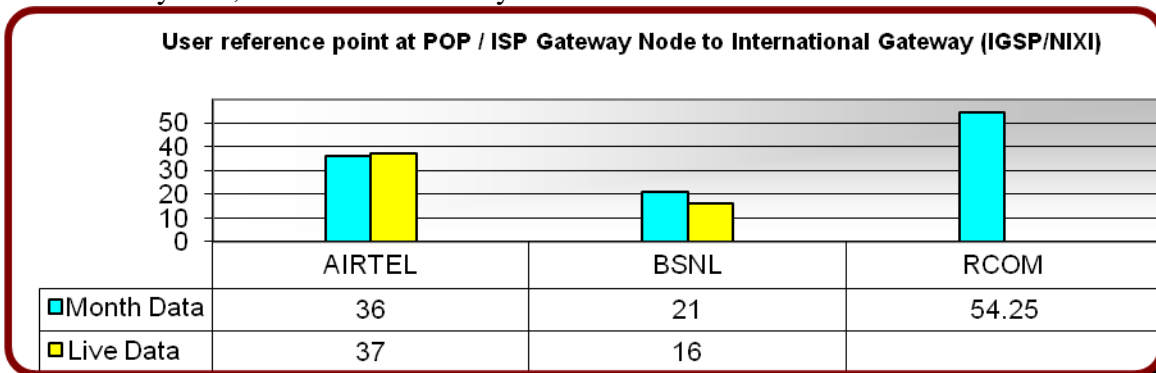


**Packet Loss (Should be less than 1%):** All operators are meeting the benchmark in both live and one-month data verification.

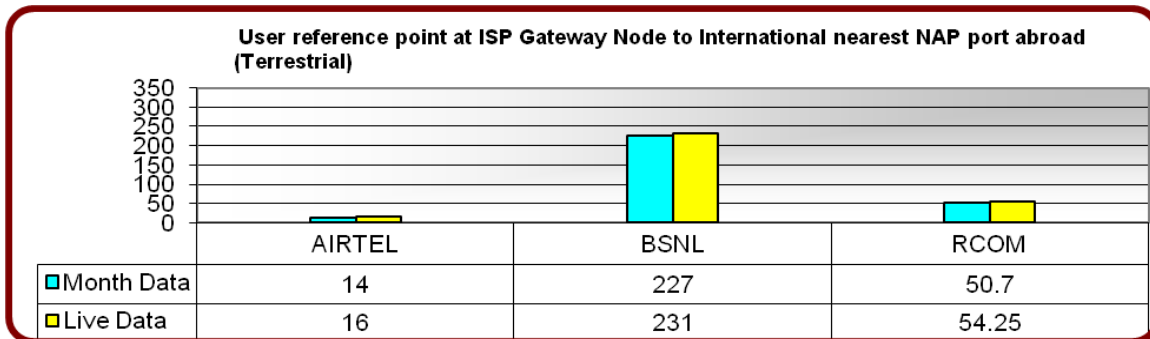


**Network Latency:**

- **User reference point at POP/ISP gateway node to international gateway (IGSP/NIXI) <120 ms:** All the operators are satisfying the benchmark in live & month part both respectively. RCOM has no provision of capturing live Latency in system, due to some security reason.



- **User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <350 ms:** All the operators are meeting the benchmarks in Live & Month data audit .



- **User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) <850 ms:** The Satellite link does not exist with any of the Operator.

### 3. Customer Care & Grievances Redressal

S.N.	Parameters	BSNL	AIRTEL	RCOM.
1	Call Centre			
1.1	Total no of complaints received in the call centre	4759	1705	0
1.2	Complaints per 100 customers per months	0%	0%	0%
2	Nodal Officer			
2.1	Total no of complaints received by the nodal officers	0	41	0
2.2	Percentage of complaints with reference to total no of complaints received at the call centre	0%	2.40%	0%
3	Appellate Authority			
3.1	Total no of appeals received by the appellate authority	0	15	0
3.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	0%	36.58%	0%

**Note:**

It is found that there are many instances where customers directly approach to Nodal Officer without approaching to Call Center for redressal. Similarly there are many Airtel customers directly approach to Appellate Authority without approaching to Nodal Officer for their grievances redressal. RCOM has no complaints in call centre.

### 4. Live calling to call centre

Calling Operator	BSNL	RCOM	AIRTEL
Call Centre No.	1500	*377	121/198
Total No. of Calls Attempted	100	100	100
Total No. of calls connected to IVR	100	100	100
Calls got connected to agent within 60 Sec	95	96	98
%age of calls got answered	95%	97%	98%

**5. Performance based on live calling for new connection.**

	<b>Airtel</b>	<b>BSNL</b>
<b>Total No. of Calls Attempted</b>	100	100
<b>Total No. of calls Answered</b>	93	85
<b>Connection provided within 15 days</b>	90	85
<b>%age of successful connection</b>	97%	100%

**NOTE**—Rcom has no new connection in the month of audit. The difference between the call answered and call attempts are mainly due to line busy .

**6. Performance based on live calling for Fault Repair Complaints**

	<b>Airtel</b>	<b>BSNL</b>
<b>Total No. of Calls Attempted</b>	100	100
<b>Total No. of calls Answered</b>	92	86
<b>Cases resolved within 3 days</b>	92	84
<b>%age of complain resolved</b>	100%	99%

**NOTE**—Rcom has no fault in that month. The difference between the call answered and call attempts are mainly due to line busy and no reply.

**7. Performance based on live calling for Billing Complaints.**

	<b>BSNL</b>
<b>Total No. of Calls Attempted</b>	33
<b>Total No. of calls Answered</b>	29
<b>Cases resolved with 4 weeks</b>	29
<b>%age of cases resolved</b>	100%

**NOTE**— Airtel & Rcom has no billing complaints registered in that month . The difference between the call answered and call attempts are mainly due to line busy and no reply

## 8. Critical Analysis

The key conclusions (Parameter wise) emerging out from the Audit exercise of Broadband service providers are mentioned below

### **Service provisioning/Activation time:**

BSNL is complying the benchmark set by TRAI. Airtel is deviating from benchmark in that month of audit. Rcom has no new activation in the month.

### **Fault Repair/Restoration time & Rebate:**

All operators are meeting the benchmark of more than 90% in one-month data verification. As far as Rebate is concerned, only BSNL is having rebate cases in that period.

### **Billing performance:**

Airtel & Rcom have no billing complaints in that month. BSNL is complying with the set benchmarks.

### **Customer Care/Helpline Assessment:**

All the service providers are meeting the benchmark for the parameters response time to the customer for assistance (Voice to Voice) within 60 and 90 seconds in both live and one-month data verifications.

### **Bandwidth Utilization:**

#### **POP to ISP Gateway Node (intra-network) links:**

All the service providers are meeting the benchmarks for both live & one-month data Verification.

#### **ISP Gateway Node to IGSP/ NIXI Node upstream links for International connectivity:**

Airtel & RCom have no provision of fetching this data because of there is no gateway in UP (w).

### **Broadband Connection speed:**

All the operators are meeting the TRAI benchmark of greater than 80% connection speed during measurements of both live & one-month data Verification.

### **Service Availability/Uptime:**

All the operators are meeting the TRAI benchmark of greater than 98% during one-month data verification.

### **Packet Loss:**

All the operators are meeting the TRAI benchmark of less than 1% during measurements of both live and one-month data verification.

**Network Latency:**

**User reference point at POP/ISP gateway node to international gateway (IGSP/NIXI)  
<120 ms:**

Both Rcom & BSNL are meeting the benchmarks in both Live & Month data. Rcom has no provision of capturing Latency of 3 days from the system due to some security reason. It meets the benchmark in month data.

**User reference point at ISP gateway node to international nearest NAP Port abroad  
(Terrestrial) <350 ms:**

All the operators are meeting the benchmarks in both Live & Month data.

**User reference point at ISP gateway node to international nearest NAP Port abroad  
(Terrestrial) <850 ms:**

The Satellite link does not exist with any of the operators.

**B) Compliance report (Status of service providers with respect to the QoS)**

**BSNL**

BSNL is meeting service provisioning as well as Fault repair. BSNL is having some rebate case in that month. As far as response time to customer for assistance & Service availability are concerned, it is complying with the respective benchmarks. For Technical parameters like Bandwidth Utilization, Network Latency etc. BSNL has no deviation.

**RCOM**

Reliance has no new Activation/ service, Fault cases. It meets all parameters are met by RCOM. In Technical Parameter like Network Latency, the system has no provision of capturing live data due to some security reason.

**AIRTEL**

Airtel is not meeting the benchmark in Service provisioning. It meets all other parameters. However, it has no cases for billing complaints. Also, it has no provision of fetching this data because there is gateway in the circle.

***Note:***

For all the operators the parameter User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) is not applicable because they do not have any NAP (Satellite) connectivity.