REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
WIRELINE BASIC SERVICE
&
BROADBAND SERVICE

FOR

MADHYA PRADESH - CHHATTISGARH CIRCLE
(WEST ZONE)

Report Period: OCTOBER 2011 – DECEMBER 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 MP-CG 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, Cactii 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, Wireline Services & Broadband Services in MP-CG Circle in 4th quarter (Oct-Dec 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period Apr-Jun 2011.

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

Sl.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	Nov-2011	1900-2000
2	Airtel Ltd	Nov-2011	1900-2000
3	BSNL	Nov-2011	1800-1900
4	Etisalat	Nov-2011	2000-2100
5	Idea	Nov-2011	1900-2000
6	Loop	Nov-2011	1900-2000
7	Reliance Communications	Nov-2011	2000-2100
8	Tata Communications	Nov-2011	1900-2000
9	Videocon	Nov-2011	2000-2100
10	Vodafone	Nov-2011	2000-2100
CDMA Operators			
11	Reliance Communications	Nov-2011	2000-2100
12	Tata Communications	Nov-2011	1900-2000

All the NSS and BSS systems were considered for audit and assessment for the TCBH hours of individual operators.

II. Findings from Quality of Service Audit (Operator wise for each parameter)
(A) Cellular Mobile Telephone Services

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
3 days Live Data Audit			**GSM Operators**											**CDMA Operators**	
1	**Network Availability**														
	a) BTS Accumulated Downtime	<=2%	0.05%	0.14%	0.32%	1.87%	0.37%	0.86%	0.23%	0.27%	0.03%	0.14%	0.17%	0.48%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.06%	0.18%	0.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**														
	a) CSSR (Call Setup Success Rate)	>=95%	99.35%	99.10%	94.10%	95.88%	99.69%	99.06%	100.00%	98.65%	99.09%	99.13%	98.17%	99.51%	99.61%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.12%	0.12%	0.62%	0.03%	0.10%	0.00%	0.19%	0.27%	0.02%	0.24%	0.00%	0.00%
	c) TCH congestion	<=2%	0.27%	0.07%	2.35%	1.68%	0.00%	0.24%	0.00%	1.18%	0.38%	0.06%	0.71%	0.18%	0.00%
3	**Connection maintenance (retainability)**														
	a) CDR	<=2%	0.76%	1.32%	1.44%	1.89%	0.79%	0.63%	1.81%	0.72%	0.98%	0.67%	1.03%	0.57%	0.60%
	b) Worst affected cells>3% TCH drop	<=3%	3.56%	1.72%	17.25%	2.83%	1.48%	2.31%	3.03%	0.41%	4.40%	1.02%	2.94%	0.72%	0.72%
	c) Good voice quality	>=95%	99.09%	95.81%	NP	NP	97.37%	99.10%	98.30%	97.81%	98.05%	98.05%	97.91%	98.50%	NP
4	**No of POI having congestion**	>=0.5%	0	0	0	0	0	0	0	0	0	0	0	0	0
5	**Response time to customers for assistance**														
	a) Accessibility of call centre/Customer Care	>=95%	100%	NP	99.10%	99.30%	100%	98.25%	100%	98.97%	100%	100%	100%	98.90%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	90.59%	NP	99.52%	97.35%	99.47%	94.61%	100%	99.88%	94.07%	98.08%	94.50%	97.83%	95.09%

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that most of the operators are meeting the network parameters. Deviation is found in case of BSNL-CG for high TCH congestion & low CSSR. Deviations are also found in case of Aircel, BSNL-CG, Loop & Tata GSM for high %age of cells having >3% TCH drop. BSNL & Tata CDMA have declared that the KPI "%age of connections with good voice quality" is not system generated.

One Month Data Audit		Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
S/N	Name of Parameter		GSM Operators											CDMA	
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.05%	0.14%	0.32%	1.87%	0.37%	0.86%	0.23%	0.27%	0.03%	0.14%	0.17%	0.48%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.06%	0.18%	0.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.44%	99.00%	94.09%	95.67%	99.63%	99.00%	99.42%	98.53%	99.03%	99.20%	98.11%	99.12%	99.60%
	b) SDCCH/PAGING congestion	<=1%	0.03%	0.18%	0.11%	0.76%	0.06%	0.12%	0.00%	0.18%	0.27%	0.03%	0.26%	0.00%	0.00%
	c) TCH congestion	<=2%	0.96%	0.11%	2.34%	1.77%	0.01%	0.26%	0.00%	1.20%	0.42%	0.05%	1.30%	0.23%	0.00%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.73%	1.27%	1.44%	1.74%	1.13%	0.65%	1.98%	0.72%	0.97%	0.66%	0.99%	0.61%	0.62%
	b) Worst affected cells>3% TCH drop	<=3%	3.77%	1.65%	17.25%	2.75%	2.15%	2.35%	3.03%	0.41%	4.65%	1.09%	2.88%	0.75%	0.75%
	c) Good voice quality	>=95%	99.05%	96.00%	NP	NP	97.27%	99.02%	97.74%	97.83%	98.05%	98.05%	97.88%	98.50%	NP
4	No of POI having congestion	>=0.5%	0	0	0	NP	0	0	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	<= 0.1%	0.00%	0.01%	NP	0.04%	NA	0.04%	NA	0.03%	0.00%	NA	0.03%	0.06%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.04%	0.01%	NP	0.01%	0.00%	0.00%	0.00%	0.01%	0.00%	0.02%	0.01%	0.05%	0.02%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	NP	100%	NA	100%	NA	100%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	100%	98.01%	NP	100%	NA	100%	NA	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	>=95%	100%	NP	99.24%	99.51%	NP	95.32%	100%	98.95%	99.20%	96.73%	100%	98.93%	99.13%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	91.30%	NP	99.33%	NP	NP	65.13%	100%	99.67%	95.51%	96.47%	89.35%	96.13%	97.82%
9	Termination/closure of service	<=7days	100%	NP	NP	62.36%	NA	100%	NA	100%	100%	NA	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	NA	NP	NP	49%	NA	100%	NA	100%	100%	NA	NA	100%	100%

NA: Not Applicable, NP: Data Not Provided

From the month data assessment, it is found that most of the operators are meeting the network parameters. Deviation is found in case of BSNL-CG for high TCH congestion & low CSSR. Deviations are also found in case of Aircel, BSNL-CG, Tata GSM & Loop for having high %age of cells with >3% TCH drop. BSNL & Tata CDMA have declared that the KPI "%age of connections with good voice quality" is not system generated.

Idea & Vodafone are not meeting the benchmark for "calls answered by operators within 60sec".

Airtel has taken more than 1 week for adjustment of credit/waiver in customers' account in a few cases. BSNL-MP has taken more than 7 days for termination of a few connections and more than 60 days for refund of deposits in some cases.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted in MP-CG circle all the operators. Route covered was about around 65-100Km and for all the operators the same route was followed. The speed limit of 30-35Km/hr was maintained throughout the Drive Test. Zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Tata GSM	Idea	Voda fone	Video con	Rcom GSM	Tata CDMA	Rcom CDMA
1.1	Blocked Call Rate (<=3%)	Bhopal	0.51	0.00	0.50	0.51	1.00	3.40	0.00	0.00	0.00	0.00
		Indore	0.00	0.00	4.00	0.00	0.00	3.40	0.00	0.80	0.00	0.00
		Bhillai	0.00	3.33	1.50	0.00	1.40	0.00	0.00	0.87	0.00	0.00
1.2	Dropped Call Rate (<=2%)	Bhopal	0.51	0.70	1.00	0.51	1.00	1.00	5.00	0.50	0.00	0.55
		Indore	0.00	0.00	1.70	0.00	0.00	0.00	0.00	0.80	0.00	0.80
		Bhillai	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.3	Percentage of connections with good voice quality (=>95%)											
	(i) 0-4 (w/o frequency hopping)	Bhopal									99.50	98.15
		Indore									98.17	98.26
		Bhillai									99.01	95.07
	(ii) 0-5 (with frequency hopping)	Bhopal	95.04	95.92	77.90	95.04	96.00	89.73	95.67	97.20		
		Indore	95.15	97.98	86.70	95.15	90.34	88.00	99.62	96.87		
		Bhillai	95.36	95.21	98.60	95.36	94.22	92.00	95.12	96.51		
1.4	Call Setup Success Rate (>=95%)	Bhopal	99.49	100	99.50	99.49	99.00	96.60	100	100	100	100
		Indore	100	100	96.00	100	100	96.60	100	99.20	100	100
		Bhillai	100	96.67	98.50	100	98.60	100	100	99.13	100	100

Key observations as could be derived from the table are as under:
- "Blocked call rate" is not met by Airtel in Bhillai, BSNL in Indore and Vodafone in Bhopal & Indore.
- "Dropped call rate" is not met by Videocon in Bhopal.
- For the parameter 'Percentage of connections with good voice quality,' it is found that Vodafone is not meeting the benchmark in any of the cities. Idea is having below benchmark value in Indore & Bhillai and BSNL in Bhopal & Indore.

Independent Drive Test

Sl	Parameter	Airtel Shivpuri	Airtel Durg	BSNL Guna	Idea Bilaspur	RTL Hoshan-gabad	RTL Ratlam	RTL Korba	Tata GSM Bilaspur	Videocon Shivpuri	Vodafone Shahdol	Rcom CDMA Hoshan-gabad	Rcom CDMA Ratlam	Rcom CDMA Korba	Tata CDMA Bilaspur	Tata CDMA Guna
1.1	Blocked Call Rate (<=3%)	0.00	0.00	0.80	1.00	0.00	0.00	5.66	2.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.2	Dropped Call Rate (<=2%)	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00
1.3	Percentage of connections with good voice quality (=>95%)															
	(i) 0-4 (w/o frequency hopping)											98.20	98.96	98.32	98.60	99.64
	(ii) 0-5 (with frequency hopping)	95.42	95.03	96.21	93.60	96.29	98.54	91.43	95.41	99.02	93.00					
1.4	Call Setup Success Rate (>=95%)	100	100	99.20	99.00	100	100	94.34	97.88	100	100	100	100	100	100	100

Key observations as could be derived from the table are as under:
- "Blocked call rate" is not met by RTL GSM in Korba.
- For the parameter 'Percentage of connections with good voice quality,' below benchmark values are found for Idea in Bilaspur, RTL GSM in Korba and Vodafone in Shahdol.
- CSSR benchmark of 95% is not met by RTL GSM in Korba.

(B) Basic Telephone Service (Wireline) Providers

3 Days Live Data Audit

S/N	Name of Parameter	Bench mark	Airtel	BSNL	Rcom	Tata
1	No. of faults/100 subscribers /month	*<=5%*	0.08%	4.58%	0.21%	0.00%
2	Call Completion Ratio (CCR) & Answer to Seizure Ratio (ASR)	*>=55% (CCR) & >=75% (ASR)*	85.25%	67.32%	87.49%	100%
3	POI Congestion	*<= 0.5%*	0	3	0	0
4	Response Time to customer for assistance					
a	Accessibility of Call centre within 40 sec.	*>= 95%*	98.95%	95.24%	98%	99.45%
b	% age of calls answered by operator (voice to voice) within 60 sec.	*>= 90%*	96.80%	91.85%	97%	94.25%

From the 3 days live data audit, it was observed that all the basic telephone service providers meet the benchmarks for all the parameters. The call completion rate is good for all the operators. The customer care parameters also indicate above benchmark performance for the operators. BSNL shows 3 POIs with congestion >=0.5%.

One Month Data Audit

S/N	Name of Parameter	Bench mark	Airtel	BSNL	Rcom	Tata
1	No. of faults/100 subscribers /month	<=5%	4.79%	4.14%	0.82%	0.01%
2	Fault repair (Urban Area)					
a	By next working day	>=90%	95.94%	97.12%	100%	100%
b	Within 3 days	100%	99.05%	100%	100%	100%
3	Fault repair (Rural & Hilly Area)					
a	By next working day	>=90%	NA	96.98%	NA	NA
b	Within 5 days	100%	NA	100%	NA	NA
4	Rent rebate					
a	Fault pending > 3 days & <7 days	Rebate for 7 days	0	57	0	0
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	0	4279	0	0
c	Fault pending > 15 days	Rebate for one month	0	8679	0	0
5	Mean time to Repair (MTTR)	<= 8 Hrs	4.2	4.82	2.32	5.86
6	Call Completion Ratio (CCR) & Answer to Seizure Ratio (ASR)	>=55% (CCR) & >=75% (ASR)	86.76%	67.79%	86.09%	100%
7	Metering and billing credibility (Post-paid)					
a	Disputed Bills over bills issued	< 0.1%	0.48%	0.17%	0.07%	0.00%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	100%	100%	100%	NA
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 week	55.12%	92.67%	100%	NA
9	POI Congestion	<= 0.5%	0	10	0	0
10	Response Time to customer for assistance					
a	Accessibility of Call centre within 40 sec.	>= 95%	99.99%	92.77%	97.90%	97.41%
b	% age of calls answered by operator (voice to voice) within 60 sec.	>= 90%	97.25%	93.87%	93.87%	96.29%
11	Customer care (promptness in attending to customers' requests)					
a	Termination / Closures	<= 7 Days	NA	85.83%	100%	NA
b	Time taken refunds deposit after closures	100% within 60 days	NA	96.86%	100%	NA

From the Month data table, it can be observed that most of the operators are meeting the parameters. There was no congestion found on POIs except in case of BSNL with 10 congested POIs.

Airtel & BSNL are having deviation in "period of refunds after resolution of complaints within 1 week". While Airtel made refunds in 468 cases out of 849 refund cases in the stipulated time of 1 week, BSNL made refunds in 607 out of 655 cases. Airtel & BSNL are also having a low billing credibility, i.e. high %age of disputed bills.

BSNL has 85.83% connection terminations in 1 week and 96.86% refunds after closure within 60 days.

Airtel & Tata had no termination and refund of deposits after closure cases. Tata had no disputed bills also.

(C) Broadband Service Providers

3 Days Live Data Audit

S/N	Parameters	Bench-marks	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
1	*Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)*								
	within 60 sec	*>60%*	92.45%	97.10%	60%	100%	99.46%	75.20%	92%
	within 90 sec	*>80%*	97.95%	98.90%	80%	100%	98.99%	81.84%	100%
2	*Bandwidth Utilization/ Throughput*								
2.1	POP to ISP Gateway Node [Intra-network] Link(s)	*< 90%*	30.52%	18.47%	90%	47.30%	39.68%	46.85%	NP
2.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	*< 90%*	60.46%	52.64%	90%	NA	0.00%	72.48%	NP
2.3	Broadband Connection Speed (download) - from ISP Node to User	*> 80%*	99.0%	100%	100%	100%	100%	100%	100%
3	*Service Availability/Uptime (for all users)*								
	Service Availability(%)	*>98%*	99.98%	100%	99.99%	100%	100%	100%	100%
4	*Packet loss*								
	% of Packet loss	*<1%*	0.10%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%
5	*Network latency (for wired broadband access)*								
5.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	*<120 ms*	69.4	22	98.25	91.4	0	13.67	NP
5.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	*<350 ms*	68.4	266	312	54.8	0	294	NP

NA – Not Applicable, **NP** – Data Not Provided

All the broadband service providers meet the prescribed benchmarks.

One Month Data Audit

S/N	Parameters	Bench-marks	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
1	*Service Provisioning/Activation Time*								
1.1	in 15 days	*<15 days*	100%	100%	100%	NA	100%	99.05%	100%
1.2	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	*credit @ Rs.10/ per day.*	NA	NA	NA	NA	NA	0.00%	NA
2	*Faults Repair/Restoration Time*								
	By next working day	*≥90%*	99.15%	96.12%	99%	100%	78%	98.75%	95.42%
	within 3 working day	*≥99%*	99.77%	100%	99%	100%	100%	99.26%	100%
2.1	*Rebate*								
	Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		0	1	0	0	0	0	3
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		0	0	0	0	0	0	24
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		0	0	0	0	0	0	84
3	*Billing Performance*								
	Billing complaints per 100 bills issued	*<2%*	0.88%	0.66%	0.00%	0.21%	0.00%	0.32%	0.08%
	%age of Billing Complaints resolved within 4 weeks	*100%*	100%	100%	NA	100%	NA	100%	100%
	Time taken for refund of deposits after closure (within 60 days)	*100%*	NA	100%	NA	100%	NA	100%	100%
4	*Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)*								
	within 60 sec	*>60%*	96.06%	91%	60.00%	96%	99.23%	73.27%	82%
	within 90 sec	*>80%*	98.11%	93.60%	80.00%	97%	81.64%	77.33%	93%
5	*Bandwidth Utilization/ Throughput:*								
5.1	POP to ISP Gateway Node [Intra-network] Link(s)	*< 90%*	31.30%	16.32%	NP	50.44%	46.42%	45.16%	NP
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	*< 90%*	62.14%	55.00%	NP	NA	0.00%	70.69%	NP
5.3	Broadband Connection Speed (download) - from ISP Node to User	*> 80%*	99.00%	100%	100%	100%	100%	100%	100%
6	*Service Availability/Uptime (for all users)*								
	Service Availability(%)	*>98%*	99.79%	99.90%	99.99%	99.99%	100%	100%	100%
7	*Packet loss*								
	% of Packet loss	*<1%*	0.06%	0.00%	0.16%	0.13%	0.00%	0.00%	0.00%
8	*Network latency (for wired broadband access)*								
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	*<120 ms*	72	18.2	98.25	85.2	0	13.67	NP
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	*<350 ms*	69.2	267.3	312	45.1	0	289	NP
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	*<800 ms*	NA	NA	NA	NA	NA	NA	NA

NA – Not Applicable, **NP** – Data Not Provided

Most the operators are found to be meeting the benchmarks for all the parameters. Deviations are found in case of Sify for not meeting the Fault repair by next working day and Tikona for not meeting service provisioning in 15 days & response time to customers within 90 sec.

CHAPTER-3: AUDIT-PMR DATA VERIFICATION

I. Cellular Mobile Telephone Service

PMR S/N	Name of Parameter	Bench-mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
(A)	**Network Service Quality Parameter**														
1	**Network Availability**														
	BTS Accumulated Downtime	*<=2%*	Reported	0.00%	0.43%	1.44%	0.10%	0.96%	0.00%	0.00%	0.01%	0.28%	0.05%	0.00%	0.02%
			Verified	0.00%	0.43%	1.44%	0.10%	0.96%	0.00%	0.00%	0.01%	0.28%	0.05%	0.00%	0.02%
	Worst affected BTSs due to downtime	*<=2%*	Reported	0.00%	1.97%	2.11%	0.57%	1.58%	0.00%	0.00%	0.00%	0.74%	0.03%	0.00%	0.00%
			Verified	0.00%	1.97%	2.11%	0.57%	1.58%	0.00%	0.00%	0.00%	0.74%	0.03%	0.00%	0.00%
2	**Connection Establishment (Accessibility)**														
	CSSR (Call Setup Success Rate)	*>=95%*	Reported	100%	99%	96%	99%	97%	98%	100%	98%	99%	98%	100%	100%
			Verified	100%	99%	96%	99%	97%	98%	100%	98%	99%	98%	100%	100%
	SDCCH/PAGING congestion	*<=1%*	Reported	0.00%	0.35%	0.98%	0.10%	0.57%	0.01%	0.00%	0.34%	0.04%	0.00%	0.00%	0.00%
			Verified	0.00%	0.35%	0.98%	0.10%	0.57%	0.01%	0.00%	0.34%	0.04%	0.00%	0.00%	0.00%
	TCH congestion	*<=2%*	Reported	0.00%	0.29%	2.57%	0.01%	0.72%	0.00%	0.00%	0.32%	0.21%	0.01%	0.00%	0.00%
			Verified	0.00%	0.29%	2.57%	0.01%	0.72%	0.00%	0.00%	0.32%	0.21%	0.01%	0.00%	0.00%
3	**Connection maintenance (retainability)**														
	CDR	*<=2%*	Reported	0.00%	1.19%	2.07%	0.62%	1.15%	0.01%	0.00%	0.92%	0.72%	0.01%	0.00%	0.38%
			Verified	0.00%	1.19%	2.07%	0.62%	1.15%	0.01%	0.00%	0.92%	0.72%	0.01%	0.00%	0.38%
	Worst affected cells>3% TCH drop	*<=5%*	Reported	0.00%	0.01%	5.05%	4.68%	2.68%	0.01%	0.00%	1.64%	0.73%	0.03%	0.01%	0.36%
			Verified	0.00%	0.01%	5.05%	4.68%	2.68%	0.01%	0.00%	1.64%	0.73%	0.03%	0.01%	0.36%
	Good voice quality	*>=95%*	Reported	100%	96%	98%	98%	98%	98%	99%	98%	99%	98%	99%	99%
			Verified	100%	96%	98%	98%	98%	98%	99%	98%	99%	98%	99%	99%
4	**No. of POI having congestion (avg over quarter period)**	*<=0.5%*	Reported	0.33	0.01	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Verified	0.33	0.01	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
(B)	**Customer Service Quality Parameters**														
5	**Metering/billing credibility-Post paid**	*<= 0.1%*	Reported	0.30%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Verified	0.30%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
6	**Metering /billing credibility-Pre paid**	*<= 0.1%*	Reported	0.16%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Verified	0.16%	0.00%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
7	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	Reported	100%	100%	100%	100%	100%	93%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	93%	100%	100%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	*<=1 week*	Reported	100%	100%	100%	0%	100%	0%	100%	100%	100%	100%	100%	84%
			Verified	100%	100%	100%	NA	100%	0%	100%	100%	100%	100%	100%	84%

PMR S/N	Name of Parameter	Bench-mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
8	Response time to customers for assistance														
	Accessibility of call centre/Customer Care	>=95%	Reported	100%	100%	100%	100%	99%	100%	46%	99%	95%	100%	99%	98%
			Verified	100%	100%	100%	100%	99%	100%	46%	99%	95%	100%	99%	98%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	81%	90%	82%	100%	96%	100%	65%	87%	93%	79%	91%	84%
			Verified	81%	90%	82%	100%	96%	100%	65%	87%	93%	79%	91%	84%
9	Termination/closure of service														
	No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100%	100%	100%	0%	100%	0%	100%	99%	0%	100%	100%	100%
			Verified	100%	100%	100%	NA	100%	NA	100%	99%	NA	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	100%	0%	100%	0%	100%	63%	0%	100%	100%	99%
			Verified	100%	100%	100%	NA	100%	NA	100%	63%	NA	100%	100%	99%

The figures provided by all the operators match the figures obtained on verification in most of the cases.

II. Basic Telephone (Wireline) Service

S/N	PMR / Name of Parameter	Bench-mark	Audit	Airtel	BSNL	Rcom	TTSL
1	No. of faults/100 subscribers /month	<=5%	Reported	6.52%	3.20%	0.86%	0.26%
			Verified	6.52%	3.20%	0.86%	0.26%
2	Fault repair (Urban Area)						
a	By next working day	>=90%	Reported	95.77%	96.12%	100%	100%
			Verified	95.77%	96.12%	100%	100%
b	Within 3 days	100%	Reported	98.45%	100%	100%	100%
			Verified	98.45%	100%	100%	100%
3	Fault repair (Rural & Hilly Area)						
a	Within 5 days	100%	Reported	NA	100%	NA	100%
			Verified	NA	100%	NA	100%
4	Rent rebate		Reported	Nil	Nil	Nil	Nil
			Verified	Nil	Nil	Nil	Nil
5	Mean Time to Repair (MTTR)	<=8 Hrs	Reported	4.18	4.41	2:16	7.46
			Verified	4.18	4.41	3:16	8.46
6	Call Completion Ratio (CCR)	>=55%	Reported	86.38%	73.56%	NR	100%
			Verified	86.38%	73.56%	NR	100%
7	Answer to Seizure Ratio (ASR)	>=75%	Reported	NA	NR	87%	NA
			Verified	NA	NA	187%	NA
8	POI Congestion	<= 0.5%	Reported	0.67%	NR	Nil	Nil
			Verified	0.67%	NP	Nil	Nil
9	Metering and billing						
a	Metering and billing credibility (Post-paid)	< 0.1%	Reported	0.03%	0.02%	0.03%	0.04%
			Verified	0.03%	0.02%	0.03%	0.04%
b	Metering and billing credibility (Pre-paid)	< 0.1%	Reported	NA	NR	NR	NA
			Verified	NA	NA	NA	NA
c	% of billing/charging/validity complaints resolved within 4 weeks	Within 4 weeks	Reported	100%	NR	100%	100%
			Verified	100%	NR	100%	100%
d	Period of applying credit/waiver/adjustment to customer's account from the date of resolution of complaints	Within 1 week	Reported	100%	NR	100%	NR
			Verified	100%	NR	100%	NR
10	Response Time to customer for assistance						
a	Accessibility of Call centre	>= 95%	Reported	99.54%	93.35%	96%	97.90%
			Verified	99.54%	93.35%	96%	97.90%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	Reported	77.49%	92.67%	91%	93.17%
			Verified	77.49%	92.67%	91%	93.17%
11	Termination / Closures of service						
a	%age requests for Termination / Closure of service complied within 7 days	<= 7 Days	Reported	NR	NR	100%	NR
			Verified	NR	NR	100%	NR
b	Time taken refund of deposit after closures	100% within 60 days	Reported	100%	100%	100%	Nil
			Verified	100%	100%	100%	Nil

The figures provided by all the operators match the figures obtained on verification.

III. Broadband Service

S/N	Parameters	Bench-marks	Audit	Airtel	Tata	BSNL
1	*Service Provisioning/Activation Time*					
1.1	%age of connections provided within 15 days of registration of demand	*100%*	Reported	100%	100%	100%
			Verified	100%	100%	100%
2	*Faults Repair/Restoraion Time*					
2.1	% of faults repaired by next working day	*>90%*	Reported	96.09%	95.00%	96.90%
			Verified	96.09%	95.00%	96.90%
2.2	% of faults repaired within 3 working day	*≥99%*	Reported	97.20%	99.00%	100%
			Verified	97.20%	99.00%	100%
2.3	Rent Rebate		Reported	0		0
			Verified	0		0
3	*Billing Performance*					
3.1	%age of bills disputed	*<2%*	Reported	0.01%	0.00%	0.10%
			Verified	0.01%	0.00%	0.10%
3.2	%age of complaints resolved within 4 weeks	*100%*	Reported	100%	100%	100%
			Verified	100%	100%	100%
3.3	%age of cases to whom refund of deposits is made within 60 days of closures	*100%*	Reported	100%	100%	100%
			Verified	100%	100%	100%
4	*Response Time to the Customer for assistance*					
4.1	%age of calls answered by operator (Voice to voice) within 60 sec	*>60%*	Reported	94.86%		91.90%
			Verified	94.86%		91.90%
4.2	%age of calls answered by operator (Voice to voice) within 90 sec	*>80%*	Reported	97.18%		97%
			Verified	97.18%		97%
5	*Bandwidth utilization/throughput*					
5.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		Reported	0		
			Verified	0		
5.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		Reported	0		
			Verified	0		
5.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	*<90%*	Reported	0.82%		
			Verified	0.82%		
5.4	Broadband Connection Speed available (download) from ISP node to user	*>80%*	Reported	99%		93.40%
			Verified	99%		93.40%
6	*Service Availability/Uptime (for all users) in %age*					
6.1	Service availability /uptime (for all users) in %age	*>98%*	Reported	99.88%	100%	99.90%
			Verified	99.88%	100%	99.90%
7	*Packet loss*					
7.1	% of Packet loss	*<1%*	Reported	0.00%		
			Verified	0.00%		
8	*Network latency (for wired broadband access)*					
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	*<120 ms*	Reported	77		
			Verified	77		
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	*<350 ms*	Reported	80		
			Verified	80		
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	*<800 ms*	Reported	NA		0
			Verified	NA		NA

Observations:

a. The figures provided by all the operators match the figures obtained on verification
b. Rcom, Tikona, Sify & IndusInd Media have filed PMR on All India basis.
c. Tata has filed PMR for Sl. 4, 5, 7 & 8 on All India basis.
d. BSNL has filed PMR for Sl. 5, 7 & 8 on All India basis.

CHAPTER-4: DETAILED FINDINGS & ANALYSIS

I. Cellular Mobile Telephone Service
(A) MSC Audit

(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
			GSM Operators											CDMA Operators	
A	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.05%	0.14%	0.32%	1.87%	0.37%	0.86%	0.23%	0.27%	0.03%	0.14%	0.17%	0.48%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.06%	0.18%	0.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		128	7921	2279	3992	60	7341	11	2766	2563	1410	4250	1455	709
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		4.58	795	521	5377	15.8	4567.5	1.83	1024	59.84	140.28	508.61	502	15.83
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	5	4	32	0	0	0	0	0	0	2	0	0
1	Connection Establishment (Accessibility)														
	a) CSSR	>=95%	99.35%	99.10%	94.10%	95.88%	99.69%	99.06%	100.00%	98.65%	99.09%	99.13%	98.17%	99.51%	99.61%
	b) SDCCH/PAGING congestion	<=1%	0.01%	0.12%	0.12%	0.62%	0.03%	0.10%	0.00%	0.19%	0.27%	0.02%	0.24%	0.00%	0.00%
	c) TCH congestion	<=2%	0.27%	0.07%	2.35%	1.68%	0.00%	0.24%	0.00%	1.18%	0.38%	0.06%	0.71%	0.18%	0.00%
2	Connection maintenance														
	a) CDR	<=2%	0.76%	1.32%	1.44%	1.89%	0.79%	0.63%	1.81%	0.72%	0.98%	0.67%	1.03%	0.57%	0.60%
	b) Cells having > 3% TCH drop	<=3%	3.56%	1.72%	17.25%	2.83%	1.48%	2.31%	3.03%	0.41%	4.40%	1.02%	2.94%	0.72%	0.72%
	c) Good voice quality	>=95%	99.09%	95.81%	NP	NP	97.37%	99.10%	98.30%	97.81%	98.05%	98.05%	97.91%	98.50%	NP
	d) No. of cells > 3% TCH drop		14	416	888	273	3	509	1	221	339	43	371	8	5
	e) Total no. of cells in the network		384	24,157	5,148	9,662	180	22,043	33	8,298	7,704	4,219	12,600	4,365	2,099
3	No of POI having >=0.5% congestion	<0.5%	0	0	0	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
			GSM Operators											**CDMA Operators**	
	b) Total No. of call attempts on POI (Avg.)		213,605	3,026,692	237,519	334,073	5,084	8,161,298	624	879,455	317,787	4,955	1,603,392	683,963	247,178
	c) Total traffic served on POI (Erlang) (Avg.)		3,628.92	109,008.49	7,599.01	5,880	141	122,907.69	0.06	27,023.70	7,681.98	118	29,719.20	24,567.90	7,698.30
	d) Total No. of circuits on POI		6,810	191,364	9,094	9,335	434	199,823	434	36,801	30,754	8,559	48,371	57,617	25,607
	e) Total number of working POI Service Area wise		19	74	8	10	14	293	14	48	32	36	56	95	187
	f) Equipped Capacity of Network in respect of Traffic in erlang		1,969	314,011.26	128,400	204,000	1,476	310,684	5,935.30	137,000	118,188	55,462	94,967	234,000	121,934
	g) Total traffic handled in TCBH in erlang		393	179,368.04	25,463	44,457.30	131.51	287,113.25	1.05	NP	57,493.82	14,198.21	62,024	NP	44,664
B	**Customer Service Quality Parameters**														
4	**Response time to customers for assistance**														
	a) Accessibility of call centre	*>=95%*	100%	NP	99.10%	99.30%	100%	98.25%	100%	98.97%	100%	100%	100%	98.90%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	*>=90%*	90.59%	NP	99.52%	97.35%	99.47%	94.61%	100%	99.88%	94.07%	98.08%	94.50%	97.83%	95.09%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		28,549	NP	5,218	18,482	249	32,455	1	5,801	50,846	52	49,971	7,285	11,534
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		25,863	NP	5,193	17,992	248	30,705	1	5,794	47,832	51	47,222	7,127	10,968

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Live Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in Gujarat Service Area are as given below:-

➢ **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark with values lying between 0.03% and 1.87%.

➢ **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0% and 0.8%.

➢ **Call setup success rate (benchmark >= 95%):** All operators, except BSNL-CG, are meeting the benchmark with values lying between 95.88% and 100%.

➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.62%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.

➢ **TCH congestion (benchmark <= 2%):** All operators, except BSNL-CG, are meeting the benchmark with values lying between 0% to 1.68%.

➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.57% and 1.89%.

➢ **Cell exceeding 3% TCH drop (benchmark <= 3%):** All the operators are meeting the benchmark except Aircel, BSNL-CG, Tata GSM & Loop.

➢ **Connections with good voice quality (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 95.81% and 99.1%. Tata CDMA & BSNL have declared that this parameter is not system generated.

➢ **POI Congestion (benchmark <= 0.5%):** No operator is having any POI with more than 0.5% congestion.. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage, causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.

➢ **%age of call answered by operator (electronically) (benchmark >95%):** All operators are meeting the benchmark in the range of 98.25% to 100%.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%):** All other operators are meeting the benchmark with values lying between 90.59% and 100%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
			GSM Operators											CDMA Operators	
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.05%	0.14%	0.32%	1.87%	0.37%	0.86%	0.23%	0.27%	0.03%	0.14%	0.17%	0.48%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.06%	0.18%	0.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		128	7,921	2,279	3,992	60	7,341	11	2,766	2,563	1,410	4,250	1,455	709
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		55	8,041.94	5,836	57,069	85	35,170	19.57	5,214	613.32	1,659.90	3,197	5,851	76.58
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	40	45	75	0	43	0	30	2	5	13	11	0
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.44%	99.00%	94.09%	95.67%	99.63%	99.00%	99.42%	98.53%	99.03%	99.20%	98.11%	99.12%	99.60%
	b) SDCCH/PAGING congestion	<=1%	0.03%	0.18%	0.11%	0.76%	0.06%	0.12%	0.00%	0.18%	0.27%	0.03%	0.26%	0.00%	0.00%
	c) TCH congestion	<=2%	0.96%	0.11%	2.34%	1.77%	0.01%	0.26%	0.00%	1.20%	0.42%	0.05%	1.30%	0.23%	0.00%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.73%	1.27%	1.44%	1.74%	1.13%	0.65%	1.98%	0.72%	0.97%	0.66%	0.99%	0.61%	0.62%
	b) Worst affected cells>3% TCH drop	<=3%	3.77%	1.65%	17.25%	2.75%	2.15%	2.35%	3.03%	0.41%	4.65%	1.09%	2.88%	0.75%	0.75%
	c) Good voice quality	>=95%	99.05%	96.00%	NP	NP	97.27%	99.02%	97.74%	97.83%	98.05%	98.05%	97.88%	98.50%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		14	398	888	266	4	519	1	218	358	46	363	8	7
	e) Total no. of cells in the network		384	24,157	5,148	9,662	180	22,043	33	8,298	7,704	4,219	12,600	4,365	2,099

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
			GSM Operators											**CDMA Operators**	
4	No of POI having >=0.5% congestion	*<0.5%*	0	0	0	NP	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	Nil	Nil	NP	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	b) Total No. of call attempts on POI (Avg.)		220,109	3,181,842	244,272	NP	4,920	8,117,400	471	876,391	322,281	5,077	1,603,379	552,227	278,677
	c) Total traffic served on POI (Erlang) (Avg.)		3,475.89	111,199.69	7,580.37	NP	140.70	121,706.89	0.06	26,405.53	7,721.79	119	29,675.09	21,196.86	8,659.57
	d) Total No. of circuits on POI		6,810	191,364	9,094	NP	434	199,823	434	37,389	30,754	8,559	48,371	36,136	25,607
	e) Total number of working POI Service Area wise		19	74	8	NP	14	293	14	48	32	36	56	95	187
5	Network Data														
	a) Equipped Capacity of Network Erlang		1,969	314,011.26	128,400	204,000	1,476	310,684	5,935.30	137,000	118,188	55,462	94,967	234,000	121,934
	b) Total traffic in TCBH in erlang (Avg.)		393	176,472.84	23,137	45,249.33	134.20	283,190.76	0.77	124,359.42	57,493.82	13,703.42	62,024	120,437.26	44,664
	c) Total no. of customers served (as per VLR) on last day of the month		459,355	8,489,268	702,067	1,692,214	9,379	12,733,440	60	5,685,548	2,166,833	427,145	2,577,679	2,590,559	438,828
(B)	Customer Service Quality Parameters														
6	Metering/billing credibility-Post paid	*<= 0.1%*	0.00%	0.01%	NP	0.04%	NA	0.04%	NA	0.03%	0.00%	NA	0.03%	0.06%	0.00%
	a) No. of bills issued during the period		1,975	102,662	NP	97,045	NA	213,836	NA	60,967	23,237	NA	25,831	129,433	45,607
	b) No. of bills disputed including billing complaints during the period		0	13	NP	39	NA	82	NA	15	0	NA	8	79	2
7	Metering /billing credibility-Pre paid	*<= 0.1%*	0.04%	0.01%	NP	0.01%	0.00%	0.00%	0.00%	0.01%	0.00%	0.02%	0.01%	0.05%	0.02%
	a) No. of charging / credit / validity complaints during the quarter		270	1,442	NP	265	0	198	0	523	7	197	186	1,954	153
	b) Total no. of pre-paid customers at the end of the quarter		732,751	11,260,721	NP	2,192,839	70,512	14,691,501	172	7,684,266	4,274,174	1,078,374	3,492,195	4,198,403	739,210

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
			GSM Operators											CDMA Operators	
8	**Resolution of billing/ charging complaints**	*100% within 4 weeks*	100%	100%	NP	100%	NA	100%	NA	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		488	6,369	NP	396	0	9,918	0	2,090	7,689	197	303	3,303	3,832
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		488	6,369	NP	396	0	9,918	0	2,090	7,689	197	303	3,303	3,832
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		270	1,455	NP	304	0	280	0	538	7	197	194	2,033	155
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		218	4,914	NP	92	0	9,638	0	1,552	7,682	0	109	1,270	3,677
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	*<=1 week*	100%	98.01%	NP	100%	NA	100%	NA	100%	100%	100%	100%	100%	100%
9	**Response time to customers for assistance**														
	a) Accessibility of call centre/Customer Care	*>=95%*	100%	NP	99.24%	99.51%	NP	95.32%	100%	98.95%	99.20%	96.73%	100%	98.93%	99.13%
	b) % call answered by operators(voice to voice) within 60 sec.	*>=90%*	91.30%	NP	99.33%	NP	NP	65.13%	100%	99.67%	95.51%	96.47%	89.35%	96.13%	97.82%

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
			GSM Operators											CDMA Operators	
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		36,113	NP	4,949	NP	NP	20,091	1	2,119	46,454	397	14,399	6,934	8,269
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		32,972	NP	4,916	NP	NP	13,085	1	2,112	44,366	383	12,865	6,666	8,089
10	Termination/closure of service	<=7days	100%	NP	NP	62.36%	NA	100%	NA	100%	100%	NA	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		20	NP	NP	1,121	NA	1,231	NA	96	307	NA	56	441	1,002
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		20	NP	NP	699	NA	1,231	NA	96	307	NA	56	441	1,002
11	Time taken for refunds of deposits after closures.	100% within 60 days	NA	NP	NP	49%	NA	100%	NA	100%	100%	NA	NA	100%	100%

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Month Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in Gujarat Service Area are as given below:-

- **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark with values lying between 0.03% and 1.87%.
- **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0% and 0.8%.
- **Call setup success rate (benchmark >= 95%):** All operators, except BSNL-CG, are meeting the benchmark with values lying between 95.67% and 99.63%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.76%.
  Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark <= 2%):** All operators, except BSNL-CG, are meeting the benchmark with values lying between 0% and 1.77%..
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.61% and 1.98%.
- **Cell exceeding 3% TCH drop (benchmark <= 3%):** All the operators are meeting the benchmark except Aircel, BSNL-CG, Loop & Tata GSM.
- **Connections with good voice quality (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 96% and 99.05%. Tata CDMA & BSNL have declared that this KPI is not system generated.
- **POI Congestion (benchmark <= 0.5%):** No operator is having any POI with more than 0.5% congestion. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage, causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark >95%):** All operators are meeting the benchmark in the range of 95.32 to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark >90%):** Except for Idea & Vodafone, all other operators are meeting the benchmark with values lying between 91.3% and 100%.
- **Metering and billing credibility-Post paid (benchmark <= 0.1%):** All operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** All operators are meeting the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark <= 7 days):** All operators, except BSNL-MP, have satisfied the benchmark. It terminated 699 connections within the stipulated time of 7 days out of 1121 requests received.
- **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):** All operators, except BSNL-MP, have satisfied the benchmark. It made refunds in 122 cases out of total 249 cases within the prescribed time of 60 days.

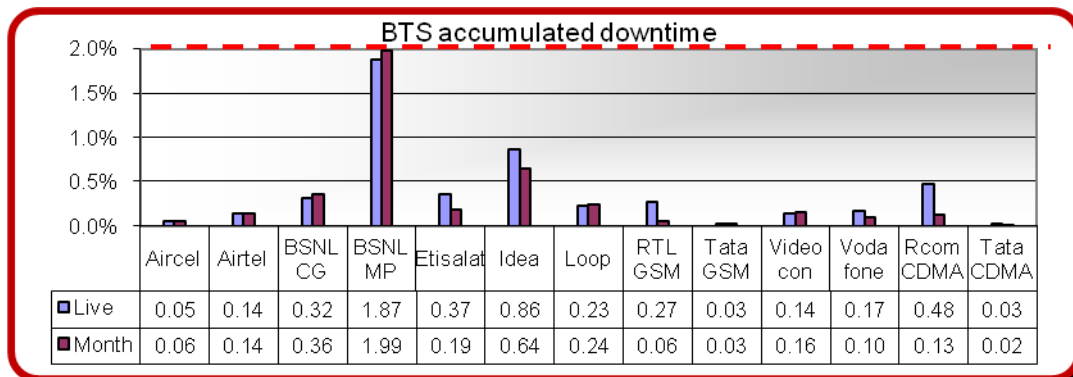**(3) Sample Coverage**

Switches/BSC/BTS details of operators:

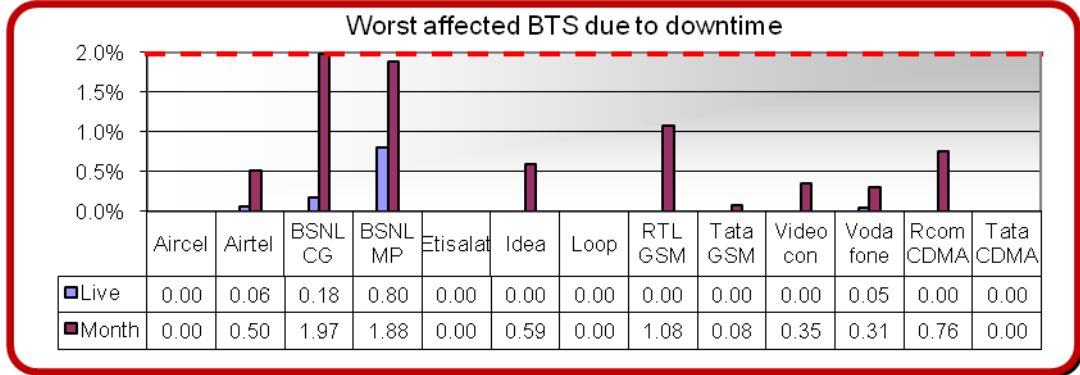| Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd (ICR with Tata)	1	2	128
2	Airtel Ltd	18	141	7921
3	BSNL CG	3	44	2279
4	BSNL MP	9	88	4010
5	Idea	30	55	7341
6	Tata Communications	4	24	2563
7	Reliance Communications	9	60	2766
8	Etisalat	1	1	60
9	Videocon	1	9	1410
10	Vodafone	4	41	4250
11	Loop	1	1	11
CDMA Operators				
12	Tata Communications	4	7	709
13	Reliance Communications	7	8	1455

(4) Performance (Graphical Representation)

Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services
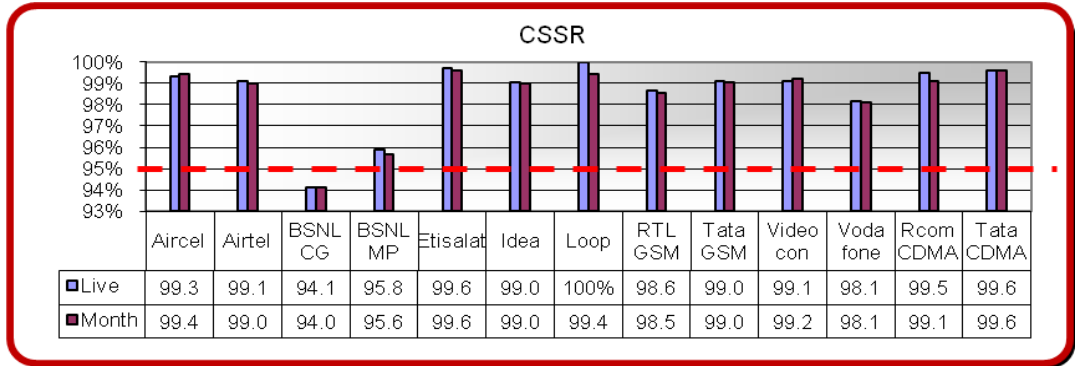
A)   NETWORK PERFORMANCE

BTS accumulated downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	0.05	0.14	0.32	1.87	0.37	0.86	0.23	0.27	0.03	0.14	0.17	0.48	0.03
Month	0.06	0.14	0.36	1.99	0.19	0.64	0.24	0.06	0.03	0.16	0.10	0.13	0.02

Worst affected BTSs due to downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.

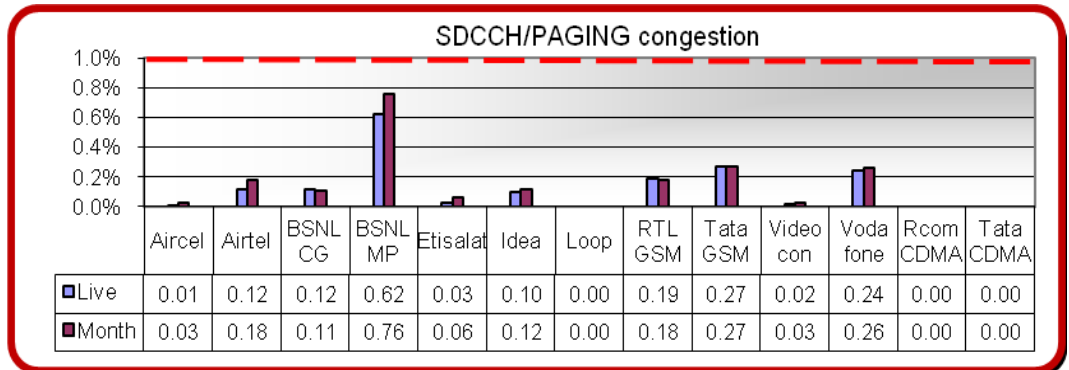|	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	0.00	0.06	0.18	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
Month	0.00	0.50	1.97	1.88	0.00	0.59	0.00	1.08	0.08	0.35	0.31	0.76	0.00

Call Setup Success Rate (CSSR): All operators are meeting the TRAI benchmarks (>= 95 %) for both one month data and 3 days live data taken in the month of audit except for BSNL-CG.
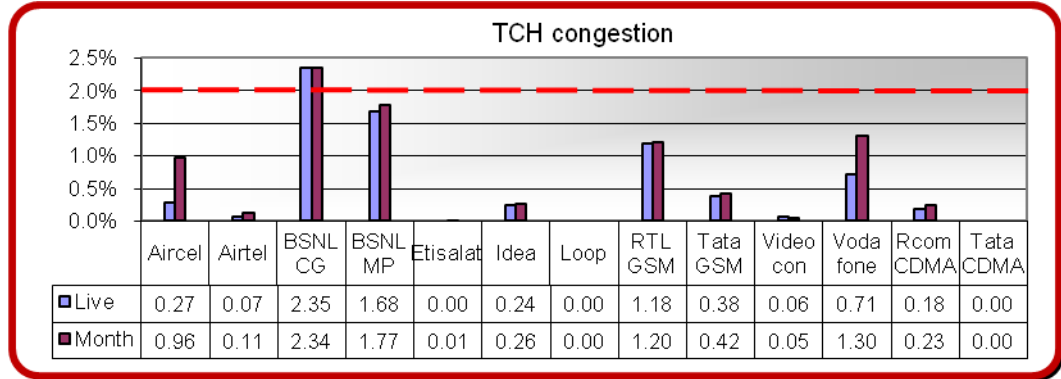

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	99.3	99.1	94.1	95.8	99.6	99.0	100%	98.6	99.0	99.1	98.1	99.5	99.6
Month	99.4	99.0	94.0	95.6	99.6	99.0	99.4	98.5	99.0	99.2	98.1	99.1	99.6

Blocked call rate:

SDCCH congestion (%): All operators are meeting the TRAI benchmarks (<= 1 %) for both one month data and 3 days live data taken in the month of audit.
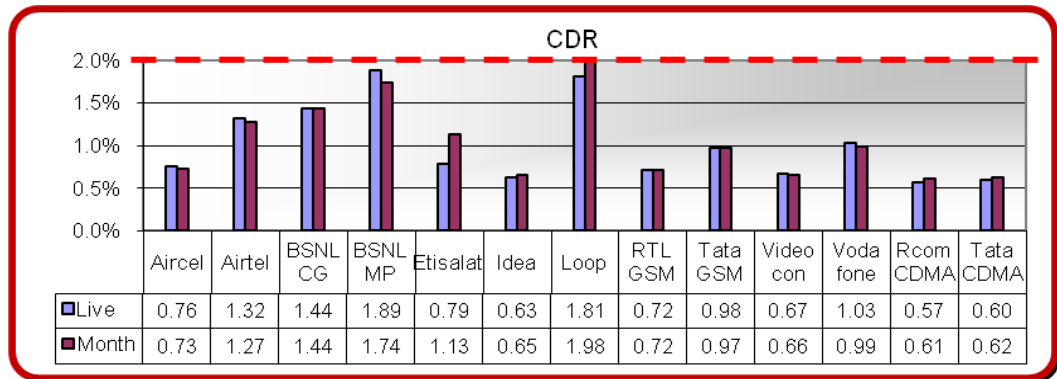

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	0.01	0.12	0.12	0.62	0.03	0.10	0.00	0.19	0.27	0.02	0.24	0.00	0.00
Month	0.03	0.18	0.11	0.76	0.06	0.12	0.00	0.18	0.27	0.03	0.26	0.00	0.00

TCH congestion (%): All operators are meeting the TRAI benchmarks (<= 2%) for both one month data and 3 days live data taken in the month of audit except for BSNL-CG.
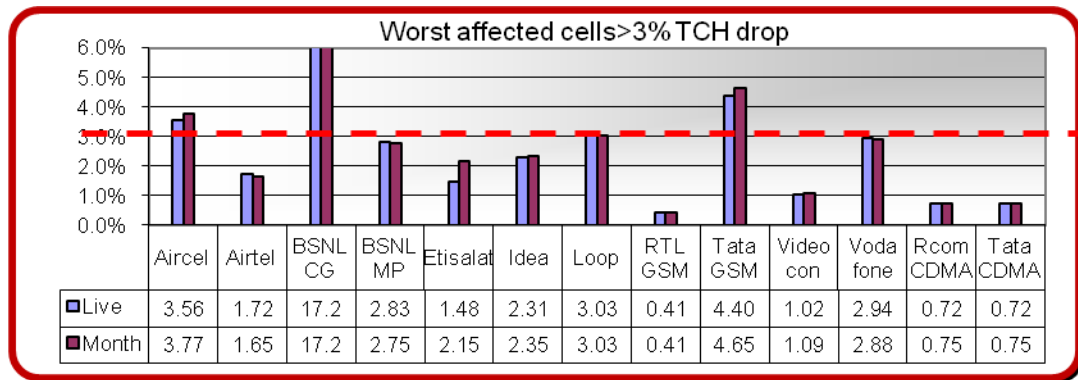

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	0.27	0.07	2.35	1.68	0.00	0.24	0.00	1.18	0.38	0.06	0.71	0.18	0.00
Month	0.96	0.11	2.34	1.77	0.01	0.26	0.00	1.20	0.42	0.05	1.30	0.23	0.00

Connection Maintainability (Retainability):

Call Drop Rate (CDR) (%): All operators are meeting the TRAI benchmarks (<=2%) for both one month data and 3 days live data taken in the month of audit.

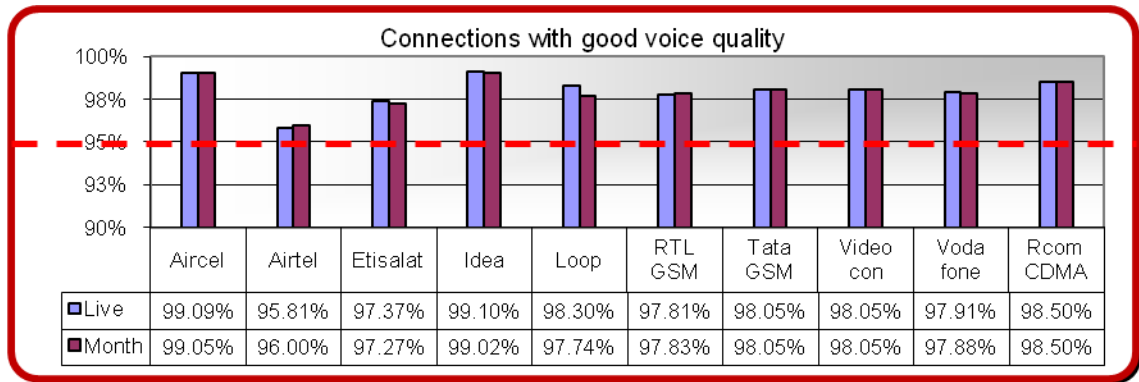|	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	0.76	1.32	1.44	1.89	0.79	0.63	1.81	0.72	0.98	0.67	1.03	0.57	0.60
Month	0.73	1.27	1.44	1.74	1.13	0.65	1.98	0.72	0.97	0.66	0.99	0.61	0.62

Worst affected Cell exceeding 3% TCH Drop: BM 3%.
Aircel, BSNL-CG, Loop & Tata GSM do not meet the Benchmark while others comply with the Bench Mark**.**

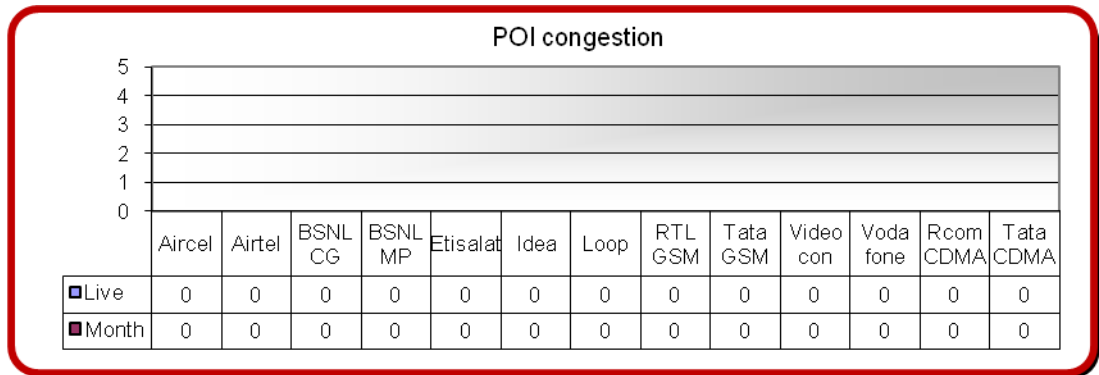|	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	3.56	1.72	17.2	2.83	1.48	2.31	3.03	0.41	4.40	1.02	2.94	0.72	0.72
Month	3.77	1.65	17.2	2.75	2.15	2.35	3.03	0.41	4.65	1.09	2.88	0.75	0.75

Percentage of connections with good voice quality (benchmark >= 95%):

BSNL & Tata CDMA have declared that this KPI is not system generated. All other operators meet the BM requirement.
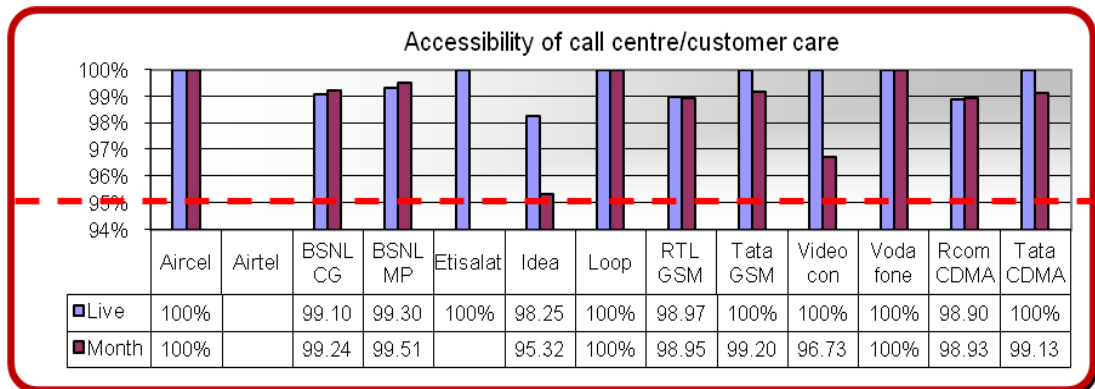

	Aircel	Airtel	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA
Live	99.09%	95.81%	97.37%	99.10%	98.30%	97.81%	98.05%	98.05%	97.91%	98.50%
Month	99.05%	96.00%	97.27%	99.02%	97.74%	97.83%	98.05%	98.05%	97.88%	98.50%

POI Congestion: There is no congestion found on any POI for any operator.

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	0	0	0	0	0	0	0	0	0	0	0	0	0
Month	0	0	0	0	0	0	0	0	0	0	0	0	0

B)   CUSTOMER SERVICE QUALITY PARAMETERS

Response time to the customer for assistance:
Percentage of call answered (Electronically): BM:>=95% : All the operators meet the BM requirements.

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	100%		99.10	99.30	100%	98.25	100%	98.97	100%	100%	100%	98.90	100%
Month	100%		99.24	99.51		95.32	100%	98.95	99.20	96.73	100%	98.93	99.13

Percentage of call answered by operators (Voice to voice) within 60 sec.BM >=90%

Idea & Vodafone do not meet the Bench mark for month data.

% of call answered by operators(voice to voice) within 60 sec.

	Aircel	Airtel	BSNL CG	BSNL MP	Etisalat	Idea	Loop	RTL GSM	Tata GSM	Video con	Voda fone	Rcom CDMA	Tata CDMA
Live	90.5		99.5	97.3	99.4	94.6	100%	99.8	94.0	98.0	94.5	97.8	95.0
Month	91.3		99.3			65.1	100%	99.6	95.5	96.4	89.3	96.1	97.8
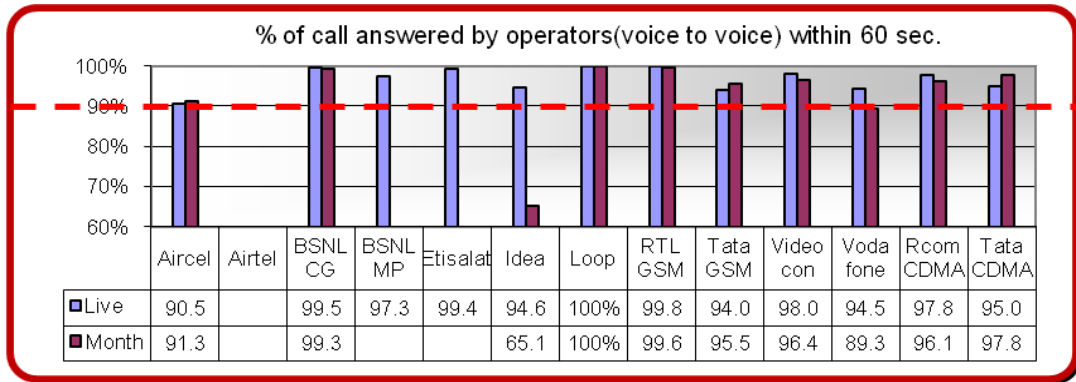
Critical Analysis

The above comparative study between live data & month data shows similar trends & consistency in both the cases except for BSNL in "worst affected BTSs due to downtime" and for Vodafone & Idea for "calls answered by operators".

BSNL-CG has fared worst among all the operators in the MP-CG circle for network parameters. It has high TCH congestion and exceptionally high cells with >3% TCH drop. Aircel, Loop & Tata GSM too have greater than benchmark value for such worst affected cells.
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(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 based on live calling for billing complaints

	Aircel	Airtel	BSNL	Idea	RTL GSM	Tata GSM	Videocon	Vodafone	Tata CDMA	Rcom CDMA
Total No. of Calls Attempted	100	100	100	100	100	7	100	100	100	100
Total No. of calls	34	40	40	32	50	4	47	48	45	47
Cases resolved with 4 weeks	34	40	40	32	50	4	47	48	45	47
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Live Calling to Call Centre

	Aircel	Airtel	BSNL	Etisalat	Idea	RTL GSM	Loop	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
Calls Attempted	100	100	100	100	100	100	100	100	100	100	100	100
Calls connected to IVR	99	100	98	99	100	99	95	100	98	100	98	100
Calls got connected to agent within 60 Sec	94	96	94	95	98	94	94	97	93	97	95	98
%age of calls got answered by agent in 60 sec.	94.95%	96%	95.92%	95.96%	98%	94.95%	98.95%	97%	94.90%	97%	96.94%	98%

(4) Level-1 Live Calling

Emergency no.	Calls Attempted	Aircel	Airtel	BSNL	Etisalat	Idea	RTL GSM	Loop	Tata GSM	Videocon	Vodafone	Rcom CDMA	Tata CDMA
						Bhopal							
100 (Police)	1	1	1	1	1	1	1	1	1	1	1	1	1
101 (Fire)	1	1	0	1	1	1	1	1	1	1	0	1	1
108/102 (ambulance)	1	1	0	1	1	1	1	1	1	1	0	1	1
139 (IR)	2	3	3	3	3	3	3	3	3	3	3	3	3
						Indore							
100 (Police)	1	1	1	1	1	1	1	1	1	1	1	1	1
101 (Fire)	1	1	0	1	1	1	1	1	1	1	0	1	1
108/102 (ambulance)	1	1	0	1	1	1	1	1	1	1	0	1	1
139 (IR)	2	3	3	3	3	3	3	3	3	3	3	3	3
						Bhillai							
100 (Police)	1	1	1	1	1	1	1	1	1	1	1	1	1
101 (Fire)	1	1	1	1	1	1	1	1	1	1	1	1	1
139 (IR)	2	3	3	3	3	3	3	3	3	3	3	3	3

(5) Critical Analysis

Random numbers were selected from the operators' available database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. No proper response could be obtained in many of the call attempts made (no answer, number not reachable, customer busy, customer not available on phone, customer does not remember about the complaint redressal etc.). However, there was a congruence found in customer feedback and the operators' records wherever a proper response was obtained.

Good results were found for all the operators during live calling to their respective call centers.

Satisfactory results were found in case of Level-1 calling for emergency nos. 100, 101 & 102 except in case of Airtel & Vodafone (in Bhopal and Indore) where 101/102 could not be reached as indicated in the table above. The calls were found to land in the neighboring areas from where the calls were being made. The testing was performed at Bhopal, Indore and Bhillai.

(C) Inter operator call assessment

(1) Sample coverage

A sample of 2x50 test calls per Service Providers with in the licensed service area (Gujarat Circle) were made between 1900 to 2000 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL MP	Docomo	Idea	BSNL CG	V-fone	LOOP	Etisalat	Videocon	RCOM GSM	TTSL (CDMA)	RCOM (CDMA)
Aircel	-	100%	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 MP	99%	98%	-	100%	99%	98%	98%	100%	100%	100%	99%	100%	99%
Docomo	100%	100%	99%	-	100%	100%	100%	100%	98%	100%	100%	100%	100%
Idea	100%	100%	100%	100%	-	99%	100%	100%	100%	100%	100%	100%	100%
BSNL CG	99%	100%	100%	99%	98%	-	99%	100%	100%	100%	98%	99%	100%
V-fone	100%	100%	98%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
LOOP	100%	100%	99%	100%	100%	98%	100%	-	100%	100%	100%	100%	100%
Etisalat	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	98%	100%	100%
Videocon	100%	100%	100%	100%	100%	98%	100%	100%	98%	-	100%	100%	100%
RCOM GSM	100%	99%	98%	100%	99%	100%	100%	100%	100%	100%	-	98%	100%
TTSL (CDMA)	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%	100%	-	100%
RCOM (CDMA)	100%	100%	99%	100%	100%	99%	100%	99%	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 no 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 Bhopal, Indore & Bhillai for all the operators. Route covered was about around 65-110Km depending on city areas within the speed limit of 30-35Km/hr.

DRIVE TEST LOCATIONS

BHOPAL   **High dense**: Old Bhopal, Railway station, Maglawala, Budhawad, Shahjahanabad, Peer gate

Medium dense: MP nagar, VIP road, Center point, New Market, Kothal sultanabad, Gulmohar colony.

Low dense: Airport area, Hoshangabad road, Rohit nagar, Ayodhya By-pass, Badpada road.

INDORE   **High dense:** Palasia, Rajwada, Railway station, MG road, Jawahar road, Subhash marg, Saket nagar, Sapna- sangeeta road, Sindhi colony

Medium dense:Vijay nagar, Tilak nagar, Sukhalia, A B Road, Dar road, Usha nagar, Patnipura, Pardeshipura

Low dense: Silver spring, Magalia, Norani nagar, Ring road, Bal ganga road, Sadar bazaar.

BHILLAI   **High dense:** BSP, Power house, BSP colony, Supela, Risali sector, Bhillai sector, Hudco.

Medium dense: Ram nagar Nehru nagar (East & West), Vaishali nagar, Raipur-Nagpur road, Talpuri

Low dense: Pushkar nagar, Smriti nagar, Junwani road, Ashish nagar, Boria gate,

2) Performance (for the respective cities) - Operator Assisted Drive Test

Sl	Parameter	City Name	Aircel	Airtel	BSNL	Tata GSM	Idea	Voda fone	Video con	RTL GSM	Tata CDMA	Rcom CDMA
1.1	Call Attempts	Bhopal	194	131	209	194	160	116	172	181	96	183
		Indore	95	103	174	95	119	116	120	121	97	121
		Bhillai	85	60	133	85	69	109	147	114	61	111
1.2	Blocked Call Rate (<=3%)	Bhopal	0.51	0.00	0.50	0.51	1.00	3.40	0.00	0.00	0.00	0.00
		Indore	0.00	0.00	4.00	0.00	0.00	3.40	0.00	0.80	0.00	0.00
		Bhillai	0.00	3.33	1.50	0.00	1.40	0.00	0.00	0.87	0.00	0.00
1.3	Dropped Call Rate (<=2%)	Bhopal	0.51	0.70	1.00	0.51	1.00	1.00	5.00	0.50	0.00	0.55
		Indore	0.00	0.00	1.70	0.00	0.00	0.00	0.00	0.80	0.00	0.80
		Bhillai	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.4	Percentage of connections with good voice quality (=>95%)											
	(i) 0-4 (w/o frequency hopping)	Bhopal									99.50	98.15
		Indore									98.17	98.26
		Bhillai									99.01	95.07
	(ii) 0-5 (with frequency hopping)	Bhopal	95.04	95.92	77.90	95.04	96.00	89.73	95.67	97.20		
		Indore	95.15	97.98	86.70	95.15	90.34	88.00	99.62	96.87		
		Bhillai	95.36	95.21	98.60	95.36	94.22	92.00	95.12	96.51		
1,5	Service Coverage											
	In door (>= -75dBm)	Bhopal	89.30	57.00	66.00	89.30	99.22	57.00	64.00	71.50	97.39	91.02
		Indore	76.39	98.00	65.80	76.39	96.10	65.00	84.82	82.64	97.04	75.76
		Bhillai	70.52	79.00	72.70	70.52	87.00	54.00	80.84	96.00	95.46	76.72
	In-vehicle (>= -85dBm)	Bhopal	99.31	91.00	97.00	99.31	99.95	95.00	96.00	96.10	99.12	99.86
		Indore	97.90	100	96.3	97.90	99.60	97.00	99.85	98.97	100	97.87
		Bhillai	98.82	95.00	96.70	98.82	98.15	95.00	99.36	100	98.93	99.46
	Out door- in city (>= -95dBm)	Bhopal	99.96	100	100	99.96	100	100	100	99.90	100	100
		Indore	100	100	100	100	99.97	100	99.99	100	100	100
		Bhillai	100	100	100	100	99.90	100	99.92	0.00	100	100
1.6	Call Setup Success Rate (>=95%)	Bhopal	99.49	100	99.50	99.49	99.00	96.60	100	100	100	100
		Indore	100	100	96.00	100	100	96.60	100	99.20	100	100
		Bhillai	100	96.67	98.50	100	98.60	100	100	99.13	100	100

Graphical Representation
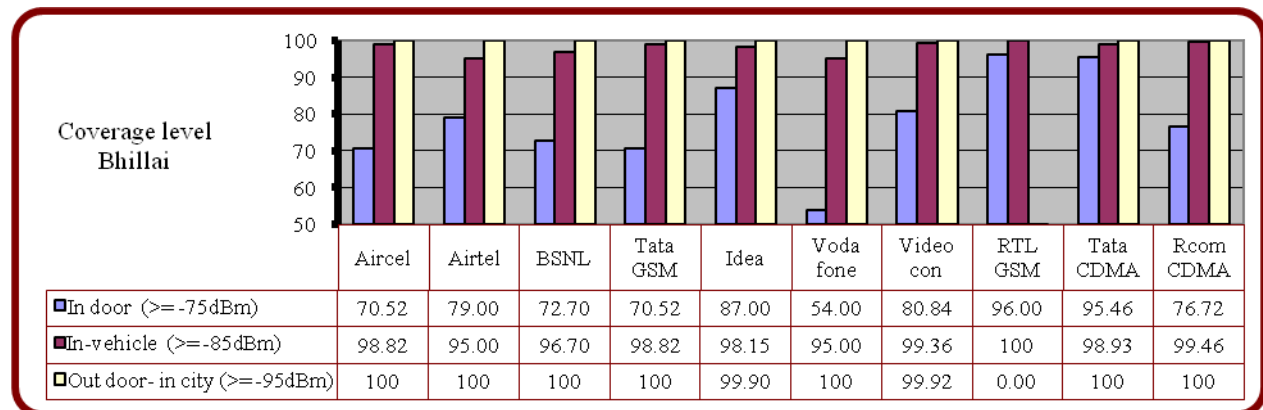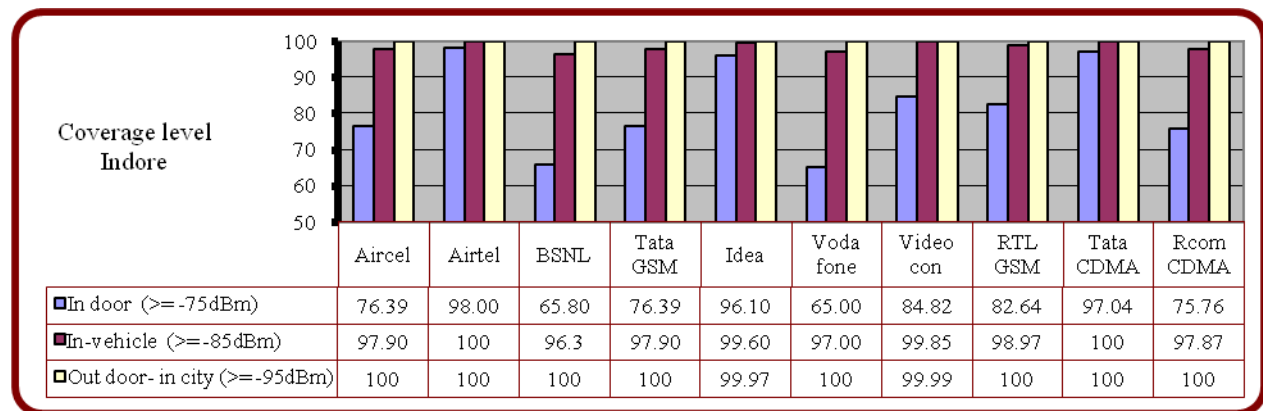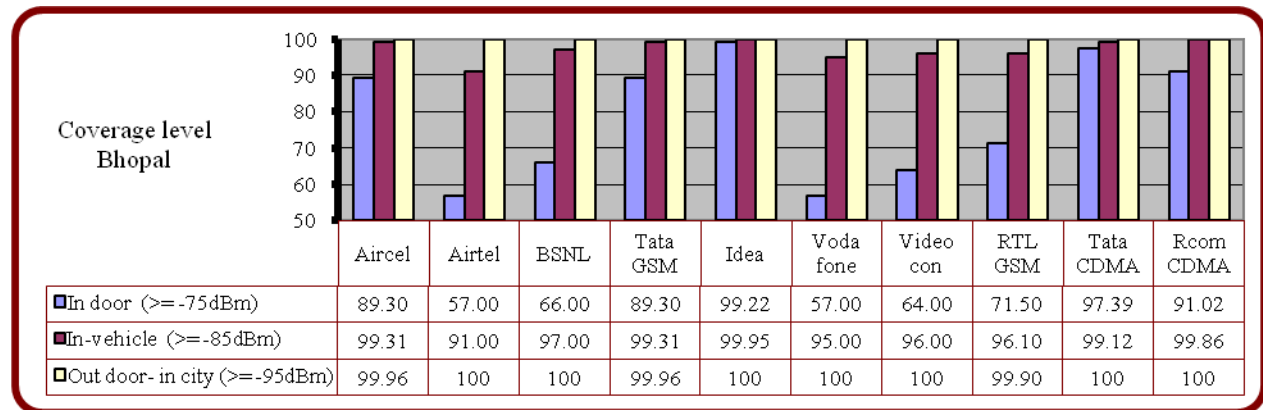
Coverage level Bhopal	Aircel	Airtel	BSNL	Tata GSM	Idea	Voda fone	Video con	RTL GSM	Tata CDMA	Rcom CDMA
In door (>=-75dBm)	89.30	57.00	66.00	89.30	99.22	57.00	64.00	71.50	97.39	91.02
In-vehicle (>=-85dBm)	99.31	91.00	97.00	99.31	99.95	95.00	96.00	96.10	99.12	99.86
Out door- in city (>=-95dBm)	99.96	100	100	99.96	100	100	100	99.90	100	100

Coverage level Indore	Aircel	Airtel	BSNL	Tata GSM	Idea	Voda fone	Video con	RTL GSM	Tata CDMA	Rcom CDMA
In door (>=-75dBm)	76.39	98.00	65.80	76.39	96.10	65.00	84.82	82.64	97.04	75.76
In-vehicle (>=-85dBm)	97.90	100	96.3	97.90	99.60	97.00	99.85	98.97	100	97.87
Out door- in city (>=-95dBm)	100	100	100	100	99.97	100	99.99	100	100	100

Coverage level Bhillai	Aircel	Airtel	BSNL	Tata GSM	Idea	Voda fone	Video con	RTL GSM	Tata CDMA	Rcom CDMA
In door (>=-75dBm)	70.52	79.00	72.70	70.52	87.00	54.00	80.84	96.00	95.46	76.72
In-vehicle (>=-85dBm)	98.82	95.00	96.70	98.82	98.15	95.00	99.36	100	98.93	99.46
Out door- in city (>=-95dBm)	100	100	100	100	99.90	100	99.92	0.00	100	100

(3) Critical Analysis

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

- "Blocked call rate" is not met by Airtel in Bhillai, BSNL in Indore and Vodafone in Bhopal & Indore.
- "Dropped call rate" is not met by Videocon in Bhopal.
- For the parameter 'Percentage of connections with good voice quality,' it is found that Vodafone is not meeting the benchmark in any of the cities. Idea is having below benchmark value in Indore & Bhillai and BSNL in Bhopal & Indore.

E) Independent Drive Test

(1) Sample Coverage

Independent drive tests were conducted in cities/towns for the operators listed by TRAI. Route covered was about around 40-60 Km depending on city areas within the speed limit of 30-35Km/hr.

DRIVE TEST LOCATIONS

Guna   Cantonment, Shiv colony, railway station, BG road, Bhullanpura, Sadar Bajar, Sarafa bajar, Subhash Marg, Sisodia colony, Jagdish colony, Karnal ganj, Kollupura,Shivajinagar, Nai mandi, Nanakhedi, Gallamandi, Tallaiya mohollah.

Shahdol   Pandav nagar, Mohan nam talab, green city, housing board colony, Doctor colony, Patel nagar, Sohagpur, Balpura, Panchvati Mandir, Sindhi market, Dharala Mohollah, Gurunanak colony, Shor chowk, Old Gandhi chowk.

Shivpuri   AB road, Kamala Ganj, Gandhi nagar, Bada bajar, Gurudwar road, Gandhi chowk, Kotwali road, Kamala bhag, Shani nagar, Shivshakti nagar, Katara mahoallah, Ring road,Chhatri road, Fatehpur road, Paryatak gram, Zhashi road, Physical road

Ratlam   Station road, Do batti, Power house road, Sajjan mill road, Chandani chowk,Tripolia road, Palace road, Bajaj Khana, Goushala road, Jawahar nagar, Indira nagar, Gandhi nagar, Hat road, Rajendra nagar, Din-dayal nagar, Rajwada, Mahu road, Chhatripur, Civil lines, Kazipura, Anand colony

Korba   Railway station, Bus stand, Power house road, Indira Vihar, TP nagar, Ghanta ghar, Niharika road, Kosabadi, Indira chowk, Jain mandir, Shukla nagar, Kaliwadi, ram nagar, Industrial area.

Hoshagabad   Tiwari colony, Adarsh nagar, Sadar Bajar, Ankita nagar, Gwaltoli, Ganesh Ganj, Bala Ganj, Shantinagar, Kaimak colony

Bilaspur   Tifra, Raipur Road, Maharanapratap chowk, Vypar Vihar, CBD chowk, Bus stand, Minocha colony, Sarkanda, Magala Naka, Sadar Bajar, Gol Bajar, Shanichari market, Link road, Agrasen chowk.

Durg   Saket colony, Ganj pura, Lakshmi nagar, Sadar bajar, Pulgoan naka, Malavia nagar, Smriti nagar, Anand nagar, Mahavir nagar, Adarsh nagar, Aryan agar, Asa nagar , Borshi colony, Kelabadi.

2)   Performance (for the respective cities) – Independent Drive Test

Sl	Parameter	Shivpuri		Durg	Guna		Bilaspur			Hoshangabad		Ratlam		Korba		Shahdol
		Airtel	Video con	Airtel	BSNL	Tata CDMA	Idea	Tata GSM	Tata CDMA	RTL	Rcom CDMA	RTL	Rcom CDMA	RTL	Rcom CDMA	Voda fone
1.1	Call Attempts	59	62	39	132	38	99	94	68	60	60	46	47	53	100	67
1.2	Blocked Call Rate (<=3%)	0.00	0.00	0.00	0.80	0.00	1.00	2.12	0.00	0.00	0.00	0.00	0.00	5.66	0.00	0.00
1.3	Dropped Call Rate (<=2%)	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00
1.4	Percentage of connections with good voice quality (=>95%)															
	(i) 0-4 (w/o frequency hopping)					99.64			98.60		98.20		98.96		98.32	
	(ii) 0-5 (with frequency hopping)	95.42	99.02	95.03	96.21		93.60	95.41		96.29		98.54		91.43		93.00
1,5	Service Coverage															
	In door (>= -75dBm)	90.00	77.52	99.00	19.70	88.82	75.00	78.81	96.02	88.55	67.81	71.45	65.00	80.91	79.10	88.00
	In-vehicle (>= -85dBm)	98.00	99.60	100	73.50	98.00	93.00	98.94	98.89	99.84	99.78	98.82	97.00	97.65	98.80	99.00
	Out door- in city (>= -95dBm)	100	100	100	96.20	100	99.00	100	100	100	100	99.96	100	100	99.95	100
1.6	Call Setup Success Rate (>=95%)	100	100	100	99.20	100	99.00	97.88	100	100	100	100	100	94.34	100	100

Graphical representation of coverage level:
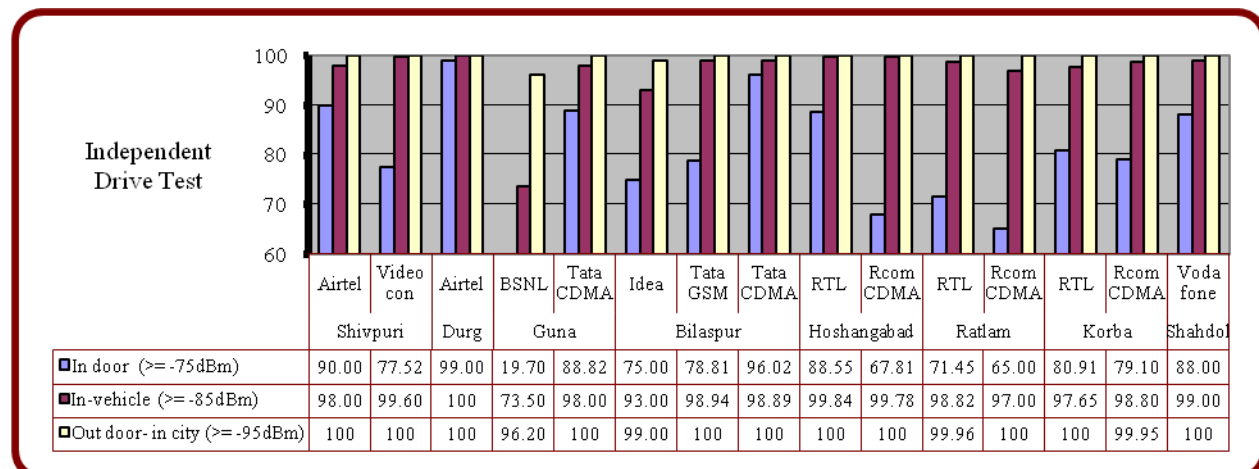
	Airtel	Video con	Airtel	BSNL	Tata CDMA	Idea	Tata GSM	Tata CDMA	RTL	Rcom CDMA	RTL	Rcom CDMA	RTL	Rcom CDMA	Voda fone
	Shivpuri		Durg	Guna		Bilaspur			Hoshangabad		Ratlam		Korba		Shahdol
In door (>=-75dBm)	90.00	77.52	99.00	19.70	88.82	75.00	78.81	96.02	88.55	67.81	71.45	65.00	80.91	79.10	88.00
In-vehicle (>=-85dBm)	98.00	99.60	100	73.50	98.00	93.00	98.94	98.89	99.84	99.78	98.82	97.00	97.65	98.80	99.00
Out door- in city (>=-95dBm)	100	100	100	96.20	100	99.00	100	100	100	100	99.96	100	100	99.95	100

(3)   Critical Analysis

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

- "Blocked call rate" is not met by RTL GSM in Korba.
- For the parameter 'Percentage of connections with good voice quality,' below benchmark values are found for Idea in Bilaspur, RTL GSM in Korba and Vodafone in Shahdol.
- CSSR benchmark of 95% is not met by RTL GSM in Korba.
- Extremely low indoor coverage is found for BSNL in Guna.

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

From live & month findings, it can be concluded that the performance of the operators in MP-CG is satisfactory for **Network Parameters**. BSNL-CG is having high TCH congestion & very high %age of cells with >3% TCH drop. Aircel, Loop & Tata GSM too have high %age of cells with >3% TCH drop.

POI congestion is found to be satisfying for all the operators for both month and live measurement.

Under **Customer Service Quality** section, benchmark for the parameter "operator answered calls (voice-to-voice) within 60 seconds" is found not satisfied by Idea & Vodafone. BSNL-MP has not fared well in termination & refunds cases and Airtel has slight deviation in applying credit/waiver to customers' account within 1 week.

During **Drive Tests**, high blocked call rates are observed for Airtel in Bhillai, BSNL in Indore, Vodafone in Bhopal & Indore and RTL GSM in Korba. High CDR is observed for Videocon in Bhopal. Extremely low indoor coverage is found for BSNL in Guna.

II. Basic Telephone Service (Wireline) Providers

(A) Exchange Audit

1) 3 days live data & One Month Audit Comparative Table

S/N	Name of Parameter	Bench mark	Audit	Airtel	BSNL	Rcom	Tata
1	No. of faults/100 subscribers /month	<=5%	Live	0.08%	4.58%	0.21%	0.00%
			Month	4.79%	4.14%	0.82%	0.01%
2	Fault repair (Urban Area)						
a	By next working day	>=90%	Month	95.94%	97.12%	100%	100%
b	Within 3 days	100%	Month	99.05%	100%	100%	100%
3	Fault repair (Rural & Hilly Area)						
a	By next working day	>=90%	Month	NA	96.98%	NA	NA
b	Within 5 days	100%	Month	NA	100%	NA	NA
4	Rent rebate						
a	Fault pending > 3 days & <7 days	Rebate for 7 days	Month	0	57	0	0
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Month	0	4279	0	0
c	Fault pending > 15 days	Rebate for one month	Month	0	8679	0	0
5	Mean time to Repair (MTTR)	<= 8 Hrs	Month	4.2	4.82	2.32	5.86
6	Call Completion Ratio (CCR) & Answer to Seizure Ratio (ASR)	>=55% (CCR) & >=75% (ASR)	Live	85.25%	67.32%	87.49%	100%
			Month	86.76%	67.79%	86.09%	100%
7	Metering and billing credibility (Post-paid)						
a	Disputed Bills over bills issued	< 0.1%	Month	0.48%	0.17%	0.07%	0.00%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	Month	100%	99.78%	100%	NA
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 week	Month	55.12%	92.67%	100%	NA
9	POI Congestion	<= 0.5%	Live	0	3	0	0
			Month	0	10	0	0
10	Response Time to customer for assistance						
a	Accessibility of Call centre within 40 sec.	>= 95%	Live	98.95%	95.24%	98%	99.45%
			Month	99.99%	92.77%	97.90%	97.41%
b	% age of calls answered by operator (voice to voice) within 60 sec.	>= 90%	LIve	96.80%	91.85%	97%	94.25%
			Month	97.25%	93.87%	93.87%	96.29%
11	Customer care (promptness in attending to customers' requests)						
a	Termination / Closures	<= 7 Days	Month	NA	85.83%	100%	NA
b	Time taken refunds deposit after closures	100% within 60 days	Month	NA	96.86%	100%	NA

2) Performance (Graphical representation)

Fault incidences (No of faults/100 subscribers/month (<= 5%): All operators are meeting the benchmarks of 5% in live as well as month data audit.

Fault Incidence

	Airtel	BSNL	Rcom	Tata
■ Live	0.08%	4.58%	0.21%	0.00%
■ Month	4.79%	4.14%	0.82%	0.01%
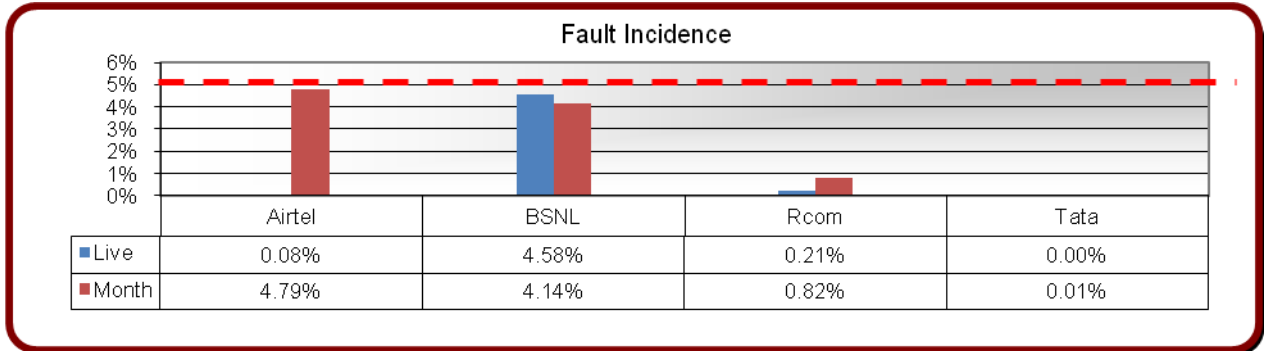
Fault Repair (Urban Area):
- **By next working day** (>90%): All the operators comply with the TRAI benchmark of 90%.
- **Within 3 days (100%):** All the operators comply with the TRAI benchmark of 100%.

Fault Repair (Urban)

	Airtel	BSNL	Rcom	Tata
■ By next working day	95.94%	97.12%	100%	100%
■ Within 3 days	99.05%	100%	100%	100%
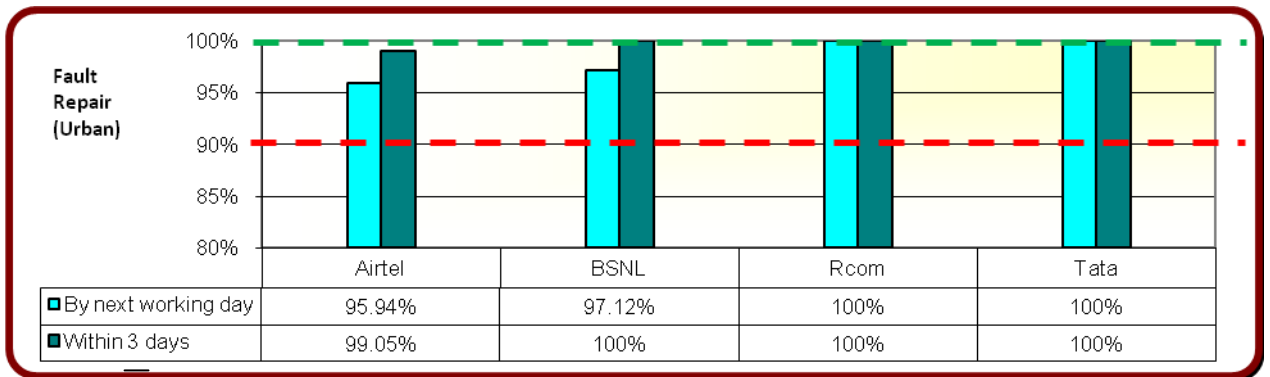
Fault Repair (Rural & Hilly Area): This parameter is applicable to BSNL only and it is meeting the benchmarks.

Fault Repair (Rural)

	Airtel	BSNL	Rcom	Tata
■ By next working day		96.98%		
■ Within 5 days		100%		
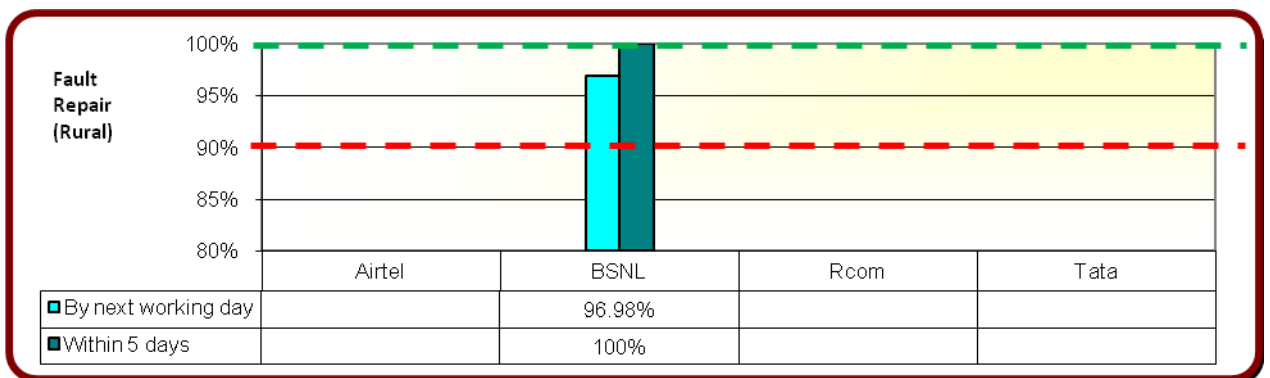
Mean Time to Repair (MTTR) (<= 8 Hrs): All the operators comply with the TRAI benchmark.

	Airtel	BSNL	Rcom	Tata
☐ Mean time to Repair (MTTR)	4.2	4.82	2.32	5.86
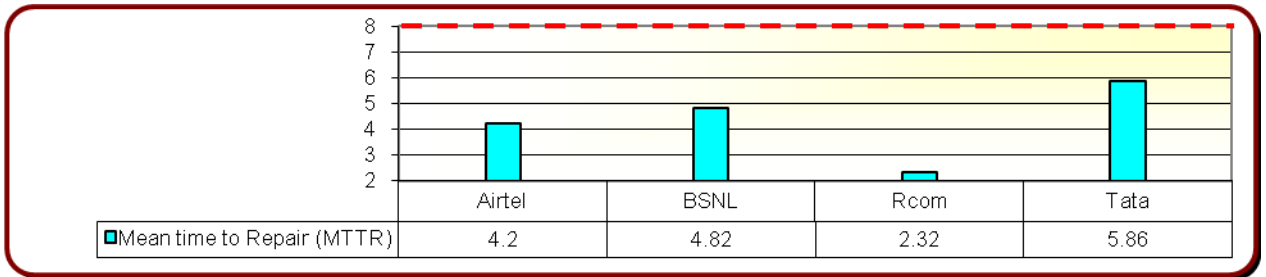
Metering and Billing Credibility (< 0.1%): Disputed Bills over Bills issued: - Airtel & BSNL are not complying with the TRAI standard.

Billing Credibility

	Airtel	BSNL	Rcom	Tata
☐ Disputed Bills over bills issued	0.48%	0.17%	0.07%	0.00%
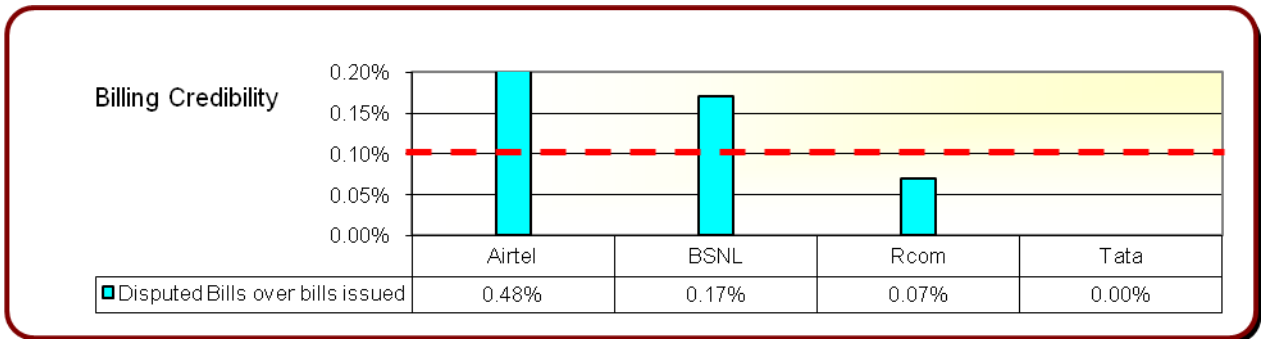
Call Completion Rate (>55%) & Answer to Seizure (>75%): The performance based on live measurement as well as One-Month Data is above the respective benchmarks for all the operators. Here, except Rcom, all the operators measure CCR while Rcom measures ASR.

CCR / ASR

	Airtel	BSNL	Rcom	Tata
■ Live	85.25%	67.32%	87.49%	100%
■ Month	86.76%	67.79%	86.09%	100%
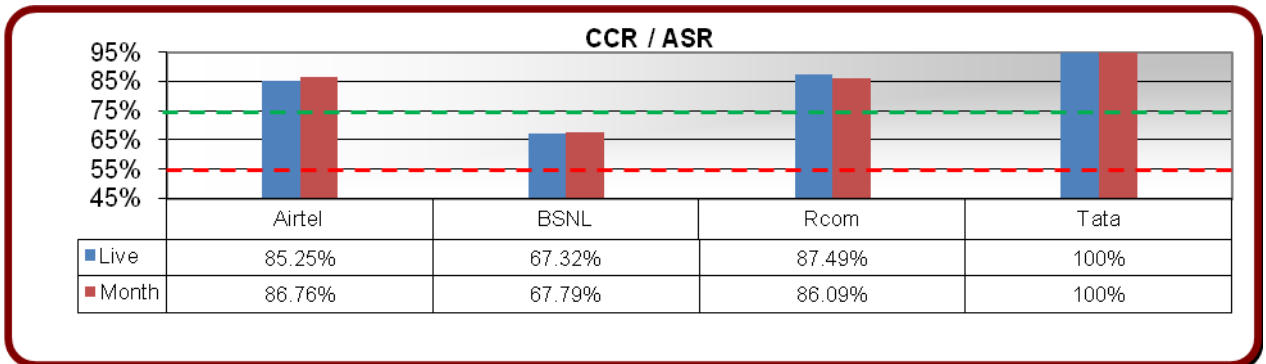
Response time to the customer for assistance:

    Accessibility of Call Centre / Customer Care 40 sec (> 95 %.): All the operators meet the benchmark for both live and month data except for BSNL in month data.

Accessibility of Call Centre / Customer Care 40 sec	Airtel	BSNL	Rcom	Tata
Live	98.95%	95.24%	98%	99.45%
Month	99.99%	92.77%	97.90%	97.41%
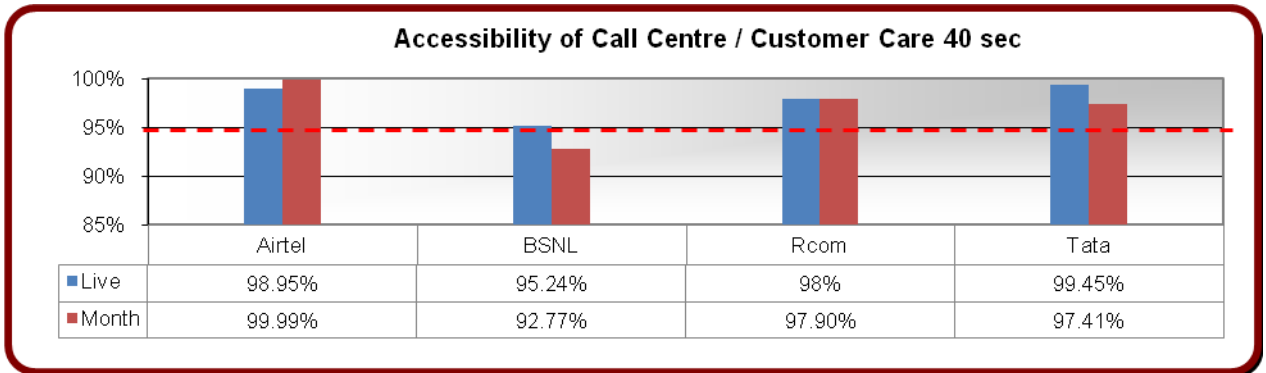
    Calls Answered by operator within 60 seconds (>90%) (Voice to Voice): The performance based on live measurement as well as One-Month data are matching and all the operators are meeting the benchmark.

Calls Answered by operator (voice to voice)	Airtel	BSNL	Rcom	Tata
Live	96.80%	91.85%	97%	94.25%
Month	97.25%	93.87%	93.87%	96.29%
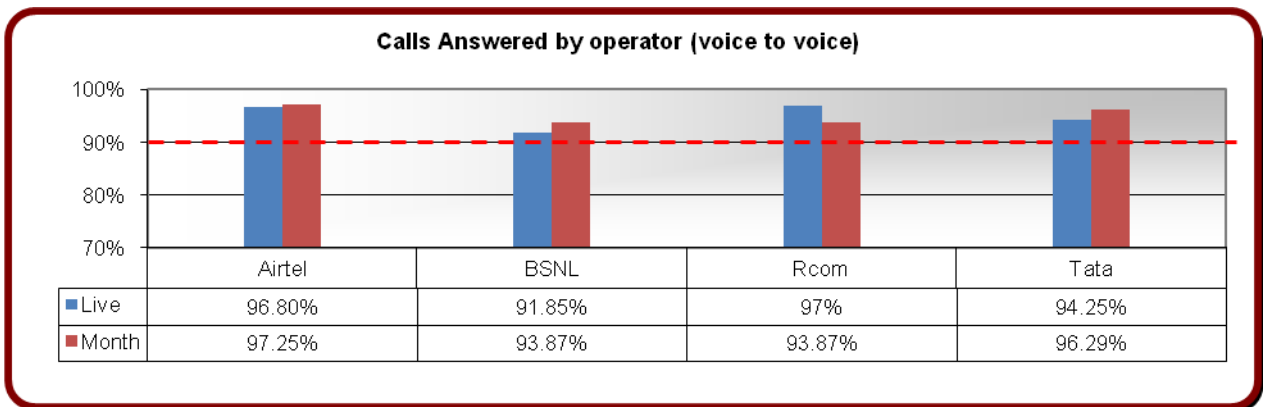
POI Congestion   (< 0.5%): The performance based on Live measurement as well as One-Month Data are similar for all the operators and meeting the benchmark. Only BSNL shows POIs with congestion. 3 such POIs were observed during live audit and 10 in month data. .

POI congestion	Airtel	BSNL	Rcom	Tata
Live	0	3	0	0
Month	0	10	0	0
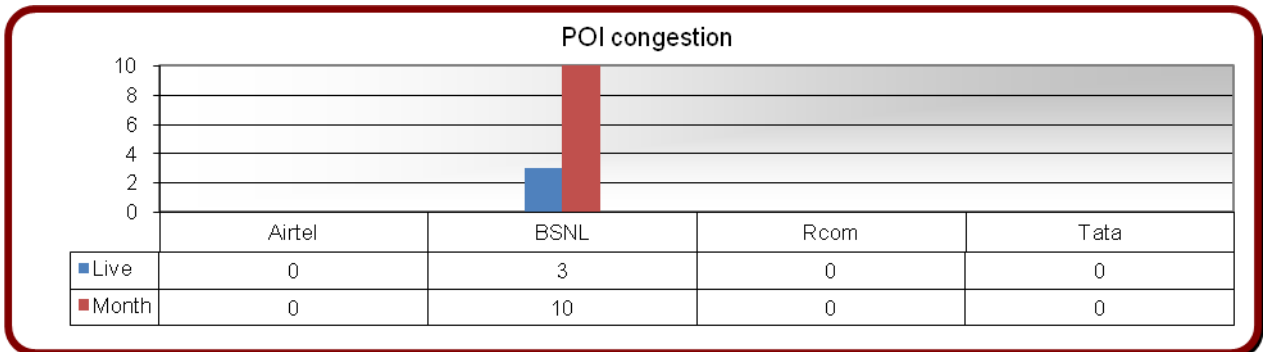
3) Customer Care & Grievances Redressal

S.N.	Parameters	Airtel	TTSL	Rcom
1	Total no of complaints received in the call centre (Tech+ Non Tech)	48049	1	297
2	**Nodal Officer**			
2.1	Total no of complaints received by the nodal officers	400	0	0
2.2	Percentage of complaints with reference to total no of complaints received at the call centre	0.83%	0.00%	0.00%
3	**Appellate Authority**			
3.1	Total no of appeals received by the appellate authority	149	0	0
3.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	37.25%	0.00%	0.00%

It is found that complaints are being handled at each level. However, there were a few instances where customers directly approach to Nodal Officer without approaching to Call Center for redressal. Similarly there are also a few instances where customers directly approach to Appellate Authority without approaching to Nodal Officer for their grievances redressal.

4) Live Calling to Call Centers

	Airtel	Rcom	Tata	BSNL
Total No. of Calls Attempted	100	100	100	100
Total No. of calls connected to IVR	94	97	99	95
Calls got connected to agent within 60 Sec	92	94	96	90
%age of calls got answered	97.87%	96.91%	96.97%	90%

Good results were obtained for all the operators for call centre accessibility as tabulated.

5) Performance based on live calling for fault repair

	Airtel	Rcom	BSNL	Tata
Total No. of Fault Complaints	11453	288	35819	1
Total No. of Calls Attempted	30	28	30	1
Total No. of calls Answered	11	13	17	0
Cases resolved within 3 days	11	13	17	NA
%age of complain resolved	100%	100%	100%	NA

6) **Performance based on live calling for billing complaints**

	Airtel	Rcom	BSNL	Tata
Total Billing Complaints	126	9	779	0
Total No. of Calls Attempted	100	9	100	NA
Total No. of calls Answered	42	3	51	NA
Cases resolved with 4 weeks	42	3	51	NA
%age of cases resolved	100%	100%	100%	NA

Random numbers were selected from the operators' available database of billing & fault complaints and calls were made to the customers to get their feedback for complaint redressal. No proper response could be obtained in many of the call attempts made (no answer, number not reachable, customer busy, customer not available on phone, customer does not remember about the complaint redressal etc.). However, there was a congruence found in customer feedback and the operators' records wherever a proper response was obtained.

7) **Level 1 Live Calling**

Emergency no.		Calls attempted	Airtel	Rcom	BSNL	Tata
100	Police	2	2	2	2	2
101	Fire	2	2	2	2	2
102/108	Ambulance	2	2	2	2	2
139	Railways	5	5	5	5	5

Good results were found in case of Level-1 calling for emergency nos. 100, 101 & 102. The calls were found to land in the neighboring areas from where the calls were being made. The testing was performed at Bhopal.

8) Critical Analysis

The parameter wise key takeouts for the Basic (Wireline) Service providers for the Rajasthan Circle are as under:-

Fault incidence: All the operators are meeting the benchmarks of 5% in both live & Month data.

Fault Repair (Urban Area): It is found that all the operators are meeting the benchmarks of >=90% set by TRAI for faults repair by the next working day & within next 3 days.

Fault Repair (Rural & Hilly Area): Only BSNL has services in these areas. It is found that BSNL meets the specified benchmarks for fault repair within time.

Mean Time to Repair (MTTR): All the operators are meeting the benchmark of <8hrs fixed by TRAI during one month audit.

Call Completion Rate (CCR)/ Answer to Seizure (ASR): All the service providers are found to be meeting TRAI benchmark of >55% for Call Completion Rate (CCR). Rcom measures ASR and meets the specified benchmark of 75%.

Metering and billing credibility: Airtel (0.48%) & BSNL (0.17%) have a higher %age of disputed bills and hence do not meet the benchmark.

% of Billing complaints Resolved Within 4 Weeks: As per the findings for one-month data audit, all the operators resolved 100% of complaints within 4 weeks except BSNL.

Period of all refunds/Payments from the date of resolution within 1 Week: As per the findings for one-month data audit, Airtel & BSNL are not meeting the benchmark with refunds made in only 55.12% & 92.67% cases respectively within the stipulated time.

POI Congestion: BSNL is having 3 and 10 POIs in live & month data respectively with congestion more than the benchmark value of 0.5%.

Response Time to Customer for Assistance:
2. Accessibility of Call Centre/ Customer care within 40 seconds (Electronically): All the operators are meeting the benchmarks of >=95% except for BSNL in month data.
3. % of Call answered by operators within 60 seconds (Voice to Voice): All the operators are meeting the benchmark of >= 90% fixed by TRAI.

Customer care (Promptness of attending customer request):
(i) Termination / Closure: - Airtel & Tata have no termination cases and thus this parameter is not applicable to them. Rcom had 14 such requests, all of which were completed successfully within the time limit of 7 days. BSNL had 7439 cases and it terminated 6385 connections within 7 days.
(ii) Time taken for refund of deposits after closure: This parameter is also applicable to Rcom & BSNL only. Rcom has made refunds in all the eligible cases within the time prescribed by TRAI. However, BSNL has an exception in this parameter also.

(B) 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 that there is consistency in the values of the parameters. Also, for each parameter trends can be analyzed comparing both type of data, i.e. live & month. This may help out the operators in making decision in view of their network performance so as to give customer satisfaction to its highest level and also helping out TRAI to achieve its goal.

AIRTEL:
In the Network Section, Airtel is having a good CCR (86.76%) and having no POI with more than 0.5% congestion. Response time of call centers to assist customers is also found to be within limits prescribed by TRAI. Performance related to Fault repair/restoration is satisfactory. However, Airtel has deviations in the billing credibility & period of refund after complaint resolution.

Tata
In the Network Section, Tata is having a good CCR (100%) and having no POI with more than 0.5% congestion. It is also meeting the benchmarks for 'Response Time to Customer for Assistance' parameters. Regarding Urban Fault repair by next working day and within 3 days also, the operator is having very good performance. It had no disputed bills in the month of audit and hence has very good billing credibility. It also had only one fault registered in the month.

BSNL:
In the Network Section, BSNL is having a good CCR (67.79%) and having no POI with more than 0.5% congestion. It had low accessibility of call centers to assist customers. Performance related to Fault repair/restoration is satisfactory for both urban & rural areas. It has deviations in complaints resolved within 4 weeks, period of refund after complaint resolution and promptness in attending to customers' requests for termination of service. It also has a low billing credibility.

Rcom
In the Network Section, Rcom is meeting the benchmark for Answer to Seizure (ASR) Ratio and POI congestion within the local network. It is also meeting the benchmarks for 'Response Time to Customer for Assistance' parameters. Regarding Urban Fault repair by next working day and within 3 days also, the operator is having very good performance.

III. Broadband Service Providers

(A) POP Audit

1) 3 days Live Data & One Month Audit Comparative Table

S/N	Parameters	Bench-marks	Audit	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
1	*Service Provisioning/Activation Time*									
1.1	in 15 days	*<15 days*	Month	100%	100%	100%	NA	100%	99.05%	100%
1.2	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	*credit @ Rs.10/ per day.*	Month	NA	NA	NA	NA	NA	0	NA
2	*Faults Repair/Restoration Time*									
	By next working day	*≥90%*	Month	99.15%	96.12%	99%	100%	78%	98.75%	95.42%
	within 3 working day	*≥99%*	Month	99.77%	100%	99%	100%	100%	99.26%	100%
2.1	*Rebate*									
	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	1	0	0	0	0	3
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		Month	0	0	0	0	0	0	24
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		Month	0	0	0	0	0	0	84
3	*Billing Performance*									
	Billing complaints per 100 bills issued	*<2%*	Month	0.88%	0.66%	0.00%	0.21%	0.00%	0.32%	0.08%
	%age of Billing Complaints resolved within 4 weeks	*100%*	Month	100%	100%	NA	100%	NA	100%	100%
	Time taken for refund of deposits after closure (within 60 days)	*100%*	Month	NA	100%	NA	100%	NA	100%	100%
4	*Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)*									
	within 60 sec	*>60%*	Live	92.45%	97.10%	60%	100%	99.46%	75.20%	92%
			Month	96.06%	91.00%	60%	96%	99.23%	73.27%	82%
	within 90 sec	*>80%*	Live	97.95%	98.90%	80%	100%	98.99%	81.84%	100%
			Month	98.11%	93.60%	80%	97%	81.64%	77.33%	93%

S/N	Parameters	Bench-marks	Audit	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
5	*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).*									
5.1	POP to ISP Gateway Node [Intra-network] Link(s)	*< 90%*	Live	30.52%	18.47%	90%	47.30%	39.68%	46.85%	NP
			Month	31.30%	16.32%	NP	50.44%	46.42%	45.16%	NP
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	*< 90%*	Live	60.46%	52.64%	90%	NA	0%	72.48%	NP
			Month	62.14%	55.00%	NP	NA	0%	70.69%	NP
5.3	Broadband Connection Speed (download) - from ISP Node to User	*> 80%*	Live	99%	100%	100%	100%	100%	100%	100%
			Month	99%	100%	100%	100%	100%	100%	100%
6	*Service Availability/Uptime (for all users)*									
	Service Availability (%)	*>98%*	Live	99.98%	100%	99.99%	100%	100%	100%	100%
			Month	99.79%	99.90%	99.99%	99.99%	100%	100%	100%
7	*Packet loss*									
	% of Packet loss	*<1%*	Live	0.10%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%
			Month	0.06%	0.00%	0.16%	0.13%	0.002%	0.00%	0.00%
8	*Network latency (for wired broadband access)*									
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	*<120 ms*	Live	69.4	22	98.25	91.4	0	13.67	NP
			Month	72	18.2	98.25	85.2	0	13.67	NP
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	*<350 ms*	Live	68.4	266	312	54.8	0	294	NP
			Month	69.2	267.3	312	45.1	0	289	NP
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	*<800 ms*	Month	NA	NA	NA	NA	NA	NA	NA

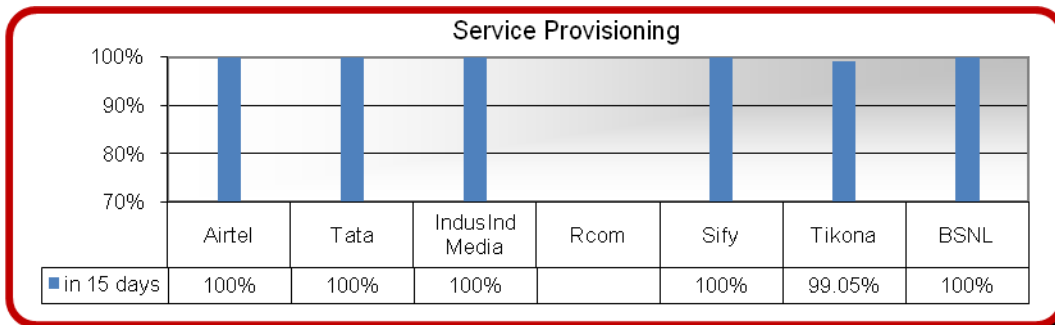**NA** – Not Applicable, **NP** – Data Not Provided

Note:
a) For S/N 8.3 none of the operator having satellite connectivity.
b) For S/N 5.2, Rcom is NA because ISP gateway is in MUMBAI, DELHI, CHENNAI & CALCUTTA. Hence No Upstream Link for MP-CG Circle.
c) For S/N 8.1, Rcom: NIXI gateway is in MUMBAI, DELHI, CHENNAI, CALCUTTA. No direct Upstream Link for MP-CG Circle. Hence Latency is taken from nearest Gateway to POP (CHENNAI)
d) For S/N 8.2, Rcom: NAP gateway is in MUMBAI, DELHI, CHENNAI, CALCUTTA. No direct Upstream Link for MP-CG Circle. Hence Latency is taken from nearest Gateway to POP (CHENNAI)
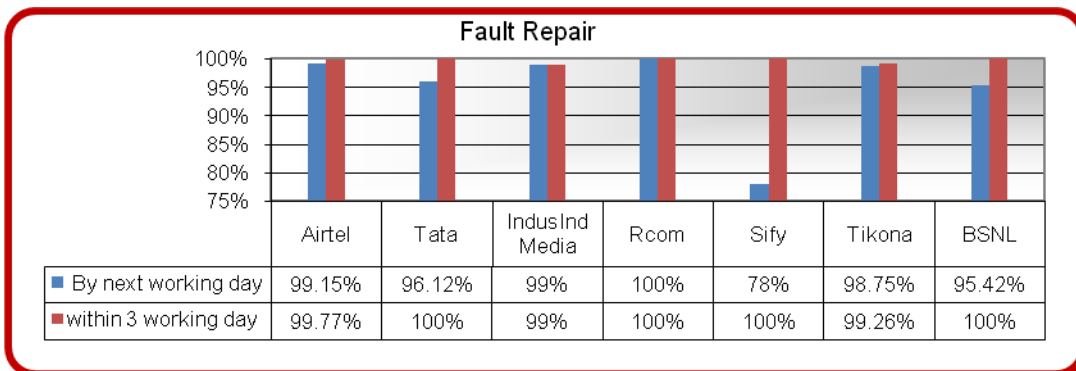
2) Performance (Graphical representation)

Service provisioning/activation Time (100% in 15 days)

All the operators meet the BM except Tikona. Rcom had no new connection during the month of audit and hence this parameter is not applicable to it.
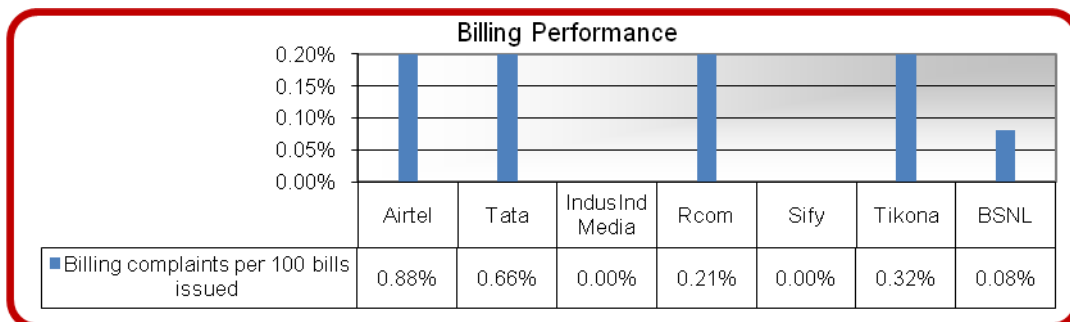
Service Provisioning	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
in 15 days	100%	100%	100%		100%	99.05%	100%

Fault Repair / Restoration Time:

- o By next working day (>90%): All the operators are complying with the TRAI benchmark of 90% except Sify.
- o Within 3 working days (>99%): All the operators are complying with the TRAI benchmark.
- o Rebate: Only Tata had one eligible rebate case and rebate was given to it.

Fault Repair	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
By next working day	99.15%	96.12%	99%	100%	78%	98.75%	95.42%
within 3 working day	99.77%	100%	99%	100%	100%	99.26%	100%

Billing Performance: (Benchmark <2%)

All the operators are complying with the TRAI standards.

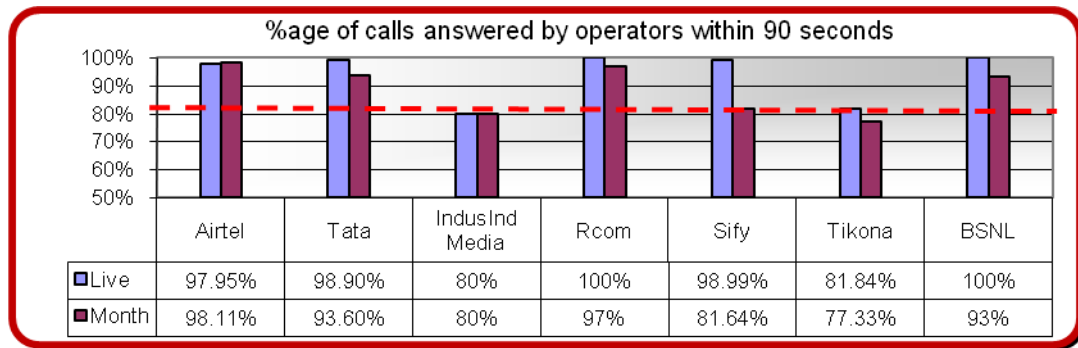| Billing Performance	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
Billing complaints per 100 bills issued	0.88%	0.66%	0.00%	0.21%	0.00%	0.32%	0.08%

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 except IndusInd with a value of 51% calls being answered within the benchmark time of 60 sec.
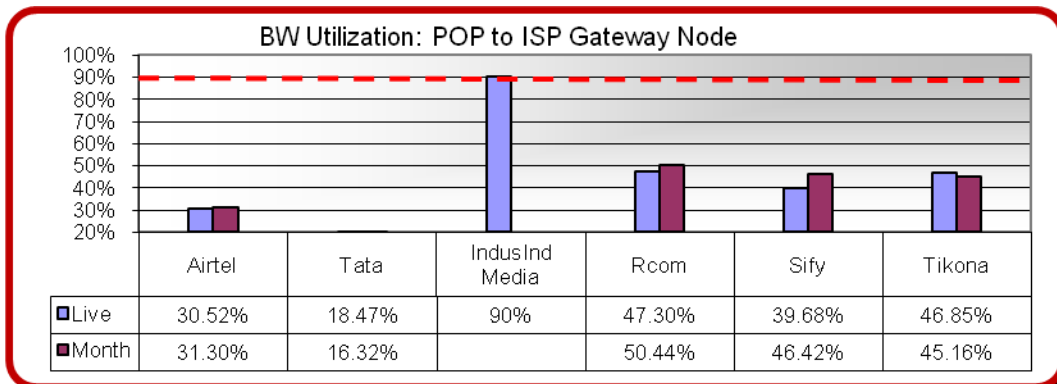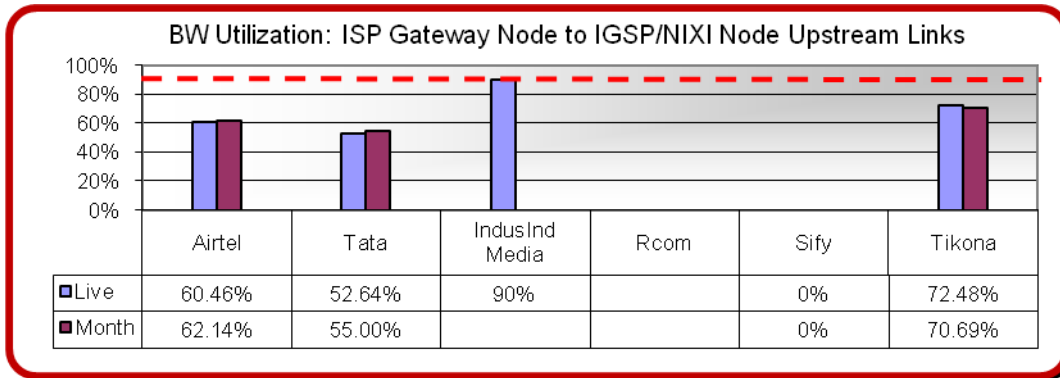

%age of calls answered by operators within 60 seconds	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
Live	92.45%	97.10%	60%	100%	99.46%	75.20%	92%
Month	96.06%	91.00%	60%	96%	99.23%	73.27%	82%
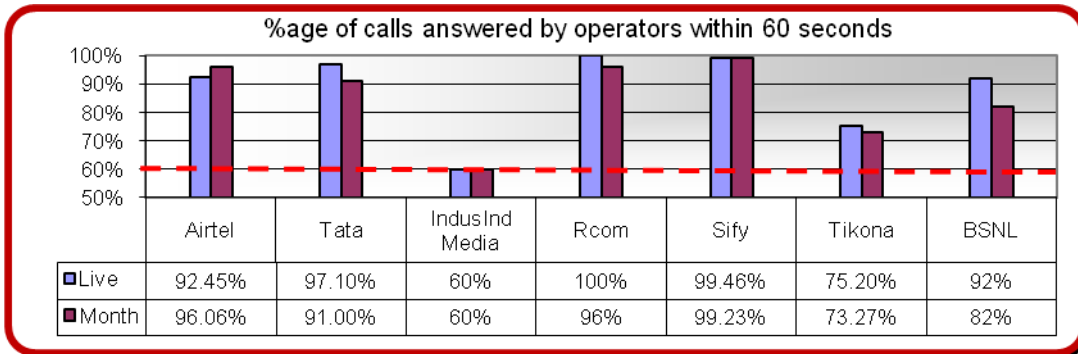
- **Within 90 seconds (>80%):** All the operators are meeting the benchmark in both live and one month data verification except for Tikona in Month data.

%age of calls answered by operators within 90 seconds	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
Live	97.95%	98.90%	80%	100%	98.99%	81.84%	100%
Month	98.11%	93.60%	80%	97%	81.64%	77.33%	93%

Bandwidth Utilization/ Throughput:

- **POP to ISP Gateway Node [Intra-network] Link(s): (Benchmark <80%):** All the operators are meeting the benchmarks in both live and one-month data verification. BSNL has not provided data.
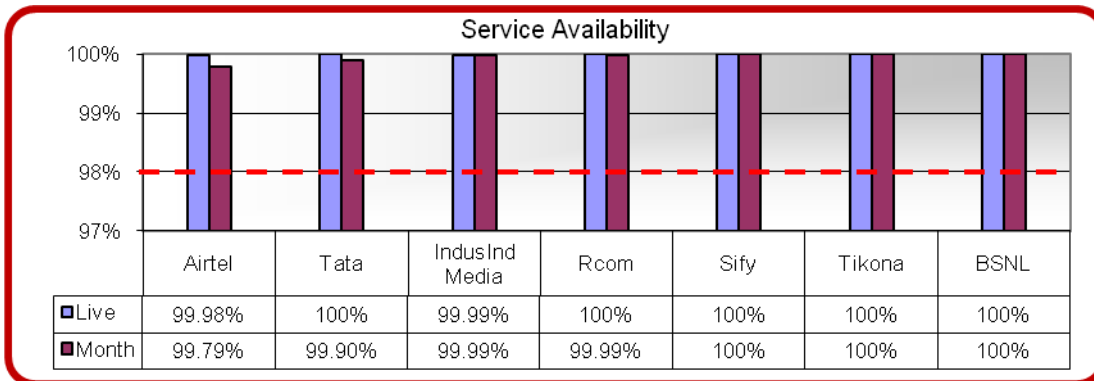

BW Utilization: POP to ISP Gateway Node	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona
Live	30.52%	18.47%	90%	47.30%	39.68%	46.85%
Month	31.30%	16.32%		50.44%	46.42%	45.16%

- **ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: (Benchmark <80%):** All the operators are meeting the benchmarks in both live and one-month data verification. BSNL has not provided data.

BW Utilization: ISP Gateway Node to IGSP/NIXI Node Upstream Links

	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona
Live	60.46%	52.64%	90%		0%	72.48%
Month	62.14%	55.00%			0%	70.69%

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

Download Speed

	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
Live	99%	100%	100%	100%	100%	100%	100%
Month	99%	100%	100%	100%	100%	100%	100%
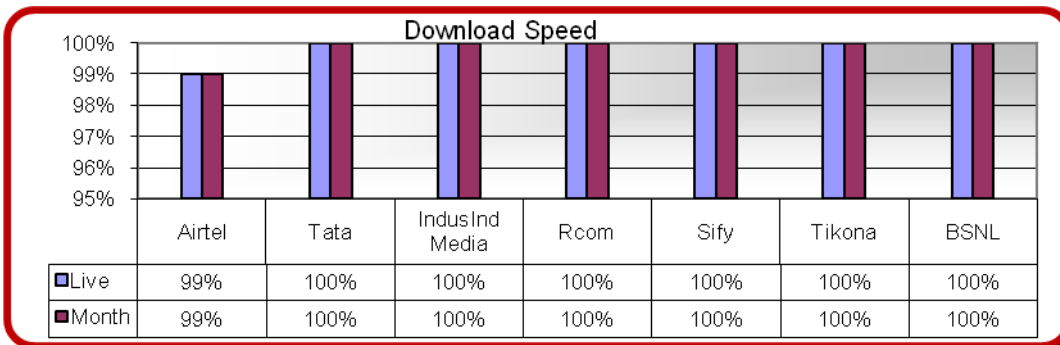
Service Availability / Uptime (for all users better than 98%): All the operators are meeting the TRAI benchmark of greater than 98% during one-month data verification.

Service Availability

	Airtel	Tata	IndusInd Media	Rcom	Sify	Tikona	BSNL
Live	99.98%	100%	99.99%	100%	100%	100%	100%
Month	99.79%	99.90%	99.99%	99.99%	100%	100%	100%

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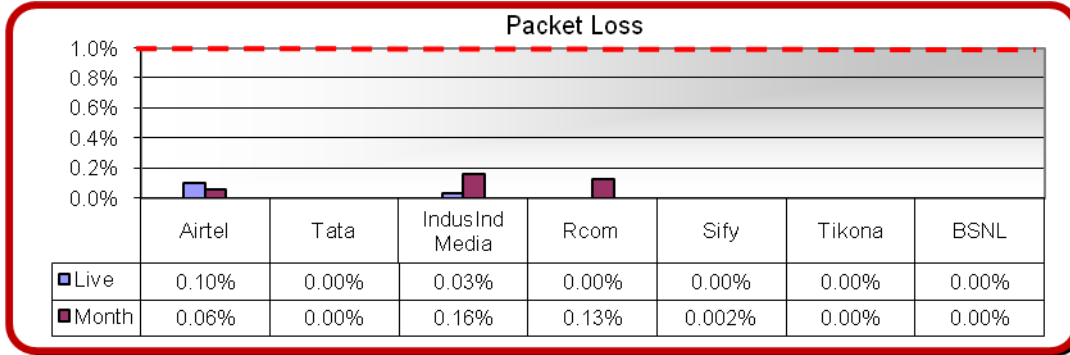

Network Latency:

- **User reference point at POP/ISP gateway node to international gateway (IGSP/NIXI) <120 ms:** All operators are meeting the benchmark in both live and one-month data verification. BSNL has not provided data.
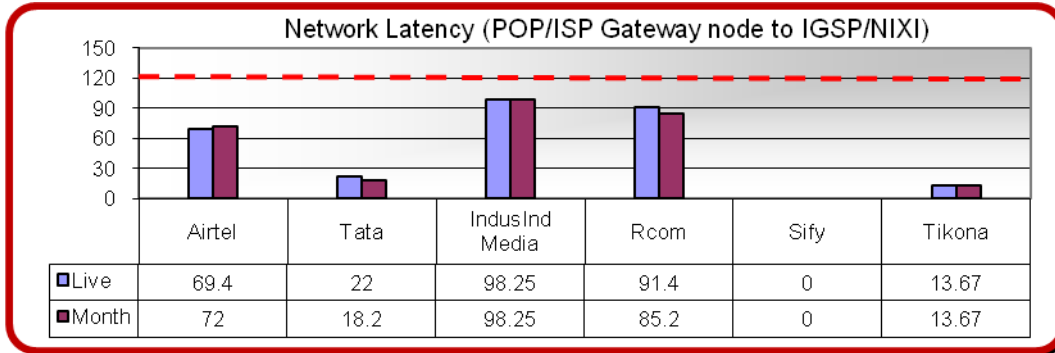
- **User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <350 ms:** All operators are meeting the benchmark in both live and one-month data verification. BSNL has not provided data.
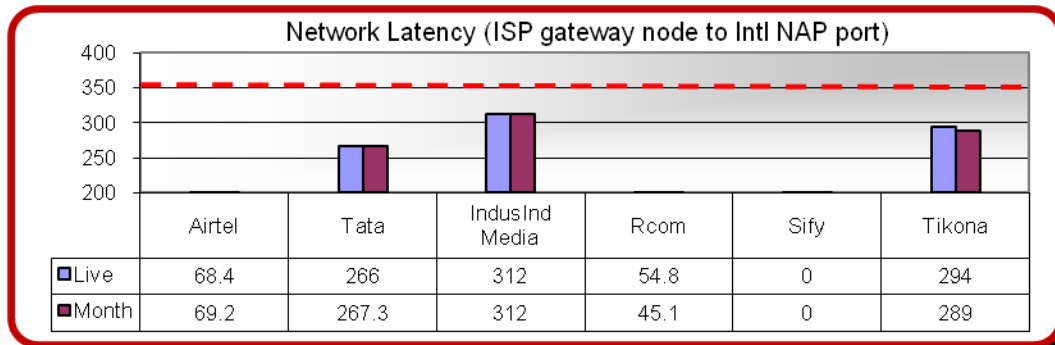
- **User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) <850 ms:** The Satellite link does not exist with any of the operator, hence the parameter is not applicable to any operator.

3) Customer Care & Grievances Redressal

	Airtel	InsdusInd Media	Tikona	Rcom	Tata	Sify
Total complaints received in Call centre	13160	169	2267	125	236	9
Total complaints received by nodal officers	181	0	46	0	7	0
% age of complaints received by Nodal officer w.r.t. to total complaints at call centre	1.38%	0.00%	2.03%	0.00%	2.97%	0.00%
Total appeals received by appellate authority	49	0	0	0	0	0
Percentage of appeal received with reference to total no of complaints received by the nodal officers	27.07%	0.00%	0.00%	0.00%	0.00%	0.00%

It is found that complaints are being handled at each level. However, there were a few instances where customers directly approach to Nodal Officer without approaching to Call Center for redressal. Similarly there are also a few instances where customers directly approach to Appellate Authority without approaching to Nodal Officer for their grievances redressal.

4) Live Calling to Call Centre

	Airtel	BSNL	Rcom	Sify	Tata	Indusind Media	Tikona
Total No. of Calls Attempted	100	100	100	100	100	100	100
Total No. of calls connected to IVR	94	95	97	96	99	98	94
Calls got connected to agent within 60 Sec	92	92	94	95	96	94	90
%age of calls got answered	97.87%	96.84%	96.91%	98.96%	96.97%	95.92%	95.74%

Good results were obtained for all the operators for call centre accessibility as tabulated.

5) Performance based on live calling for new connections

	Airtel	BSNL	Rcom	Sify	Tata	Indusind Media	Tikona
New Connections	3777	3556	0	27	30	1	1175
Total No. of Calls Attempted	30	30	0	3	3	1	12
Total No. of calls Answered	16	18	NA	1	2	0	5
Connection provided within 15 days	16	18	NA	1	2	NA	5
%age of successful connection	100%	100%	NA	100%	100%	NA	100%

6) Performance based on live calling for fault repair

	Airtel	BSNL	Rcom	Sify	Tata	Indusind Media	Tikona
Total No. of Fault Complaints	11463	4426	109	9	3	169	978
Total No. of Calls Attempted	30	30	11	1	1	17	10
Total No. of calls Answered	14	15	6	0	0	9	5
Cases resolved within 3 days	14	15	6	NA	NA	9	5
%age of complain resolved	100%	100%	100%	NA	NA	100%	100%

7) Performance based on live calling for billing complaints

	Airtel	BSNL	Rcom	Sify	Tata	Indusind Media	Tikona
Total Billing Complaints	277	177	16	0	20	0	37
Total No. of Calls Attempted	100	100	16	NA	20	NA	4
Total No. of calls Answered	35	41	7	NA	4	NA	2
Cases resolved with 4 weeks	35	41	7	NA	4	NA	2
%age of cases resolved	100%	100%	100%	NA	100%	NA	100%

Random numbers were selected from the operators' available database of billing & fault complaints and new connection. Calls were made to the customers to get their feedback. No proper response could be obtained in many of the call attempts made (no answer, number not reachable, customer busy, customer not available on phone, customer does not remember about the complaint redressal etc.). However, there was a congruence found in customer feedback and the operators' records wherever a proper response was obtained.

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: All the operators, except Tikona, are performing well and meeting the benchmarks for service activation. This parameter is not applicable for Rcom since they had not new connection in the month of audit.

Fault Repair/Restoration time & Rebate: All the operators are meeting benchmark, except Sify which had repaired 78% faults by next day.

Billing performance: All the operators are meeting the benchmark of less than 2% for billing complaints. IndusInd Media & Sify had no billing complaints during the month of audit and therefore, the parameters "billing complaint resolution" "refund of deposits after complaint resolution" are not applicable to them. The latter parameter is also not applicable to Airtel which had no cases of refunds. Tata, Rcom & Tikona meet the benchmarks.

Customer Care/Helpline Assessment: All the operators meet the benchmark for the parameters response time to the customer for assistance within 60 and 90 seconds in both live and one-month data verifications, except Tikona, ehich is having deviation in response within 90 sec for month data.

Bandwidth Utilization:

- **POP to ISP Gateway Node (intra-network) links:** All the operators are meeting all the benchmark during measurements of both live & one-month data Verification.
- **ISP Gateway Node to IGSP/ NIXI Node upstream links for International connectivity:** All the operators are meeting the benchmark during measurements of both live & one-month data Verification.
- **Broadband Connection speed:** All the operators are meeting the benchmark 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:** All the operators are meeting the benchmark in both live and one-month data verification.
- **User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <350 ms:** All the operators are meeting the benchmark in both live and one-month data verification.
- **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, hence the

parameter "User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)" is not applicable to any operator.

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

Airtel: Meets all the QOS parameters. The parameter "refunds/adjustment in customer's account within 1 week" is not applicable as there were no refund cases in its case.

Tata: Meets all the QOS parameters

BSNL: Meets all the QOS parameters. It has not provided data for a few parameters related to BW Utilization and Network Latency.

IndusInd Media: Meets all the QOS parameters. It had no disputed bills and therefore, the parameters "billing complaints resolved within 4 weeks" and "refunds/adjustment in customer's account within 1 week" are not applicable. It has not provided month data for BW utilization parameters.

Rcom: Meets all the QOS parameters. There were no new connection in its case, and hence the parameter "Service provisioning within 15 days" is not applicable. Also, BW Utilization (ISP GW-NAP/NIXI Node) is not applicable since its ISP gateway is in Mumbai, Delhi, Kolkata & Chennai and there is Direct Upstream Link for MP-CG Circle. Similarly, Rcom has NIXI gateway in Mumbai, Delhi, Kolkata & Chennai and NAP gateway in Mumbai & Chennai. Since there is no direct Upstream Link for MP-CG Circle, Latency has been taken from nearest Gateway to POP (Chennai).

Sify: Meets all the QOS parameters except fault repair by next working day. It had no disputed bills and therefore, the parameters "billing complaints resolved within 4 weeks" and refunds/adjustment in customer's account within 1 week" are not applicable.

Tikona: Meets all the QOS parameters except "service activation within 15 days" and month data of "response to customer within 90 sec".