

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

BASIC WIRELINE SERVICES,

CELLULAR MOBILE TELEPHONE SERVICES

AND

BROADBAND SERVICES

FOR

ANDHRA PRADESH CIRCLE
(SOUTH ZONE)

Report Period: July 2011 – Sept 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) Level 1 (Emergency nos.) calling

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 Andhra Pradesh 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.
- ✓ 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 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 Andhra Pradesh Circle in 3rd quarter (July – Sept 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period Jan – Mar 2011.

Following are the various operators covered in Andhra Pradesh circle (South 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	July-2011	1900-2000 Hrs
2	Airtel Ltd	July-2011	1900-2000 Hrs
3	BSNL	July-2011	1900-2000 Hrs
4	Etisalat	July-2011	1900-2000 Hrs
5	Idea	July-2011	1900-2000 Hrs
6	Reliance Communication (GSM)	July-2011	1900-2000 Hrs
7	Tata Communications (GSM)	July-2011	1900-2000 Hrs
8	Uninor	July-2011	1900-2000 Hrs
9	Videocon	July-2011	1900-2000 Hrs
10	Vodafone	July-2011	1900-2000 Hrs
CDMA Operators			
11	MTS (CDMA)	July-2011	1900-2000 Hrs
12	Reliance Communication (CDMA)	July-2011	1900-2000 Hrs
13	Tata Communications (CDMA)	July-2011	1900-2000 Hrs

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

(A) Cellular Mobile Telephone Services

3 days Live Data Audit

<u>3 days Live Data Audit</u>		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS	
S/N	Name of Parameter		GSM Operators										CDMA			
1	Network Availability															
	a) BTS Accumulated Downtime	<=2%	0.01%	0.10%	1.11%	0.00%	0.02%	0.03%	0.02%	0.01%	0.00%	0.01%	0.05%	0.01%	0.19%	
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)															
	a) CSSR (Call Setup Success Rate)	>=95%	99.36%	99.68%	95.81%	99.51%	99.97%	99.73%	98.60%	99.02%	99.63%	99.99%	99.15%	99.13%	98.23%	
	b) SDCCH/PAGING congestion	<=1%	0.03%	0.17%	0.21%	0.05%	0.32%	0.06%	0.05%	0.09%	0.00%	0.13%	0.00%	0.00%	0.00%	
	c) TCH congestion	<=2%	0.03%	0.10%	1.20%	0.00%	0.39%	0.04%	0.12%	0.14%	0.00%	0.54%	0.09%	0.00%	0.00%	
3	Connection maintenance (retainability)															
	a) CDR	<=2%	0.40%	0.48%	1.30%	0.33%	0.80%	0.34%	0.74%	0.63%	0.15%	0.56%	0.07%	0.42%	0.86%	
	b) Worst affected cells>3% TCH drop	<=3%	2.77%	1.17%	3.35%	1.92%	2.93%	0.94%	5.91%	2.88%	0.00%	2.96%	0.33%	0.00%	0.90%	
	c) Good voice quality	>=95%	98.61%	99.13%	NP	98.69%	97.45%	99.50%	97.60%	98.96%	100%	98.81%	NP	NP	NP	
4	No. of POI having >=0.5% congestion	<0.5%	0	0	0	0	0	0	5	2	0	0	0	0	10	
5	Response time to customers for assistance															
	a) Accessibility of call centre/Customer Care	>=95%	100%	97%	100%	100%	98%	99.4%	100%	95.40%	100%	100%	99.12%	96%	98%	
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	96.5%	93%	67.34%	100%	93%	41.37%	96.00%	41.35%	99%	90.00%	32.07%	95%	92%	

NA: Not Applicable, NP: Not Provided

Observations:

From the 3 days live data assessment, it is found that the operators are meeting most of the network parameters, except the following:

- For the parameter "Worst affected cells>3% TCH drop" BSNL and TATA GSM are found not meeting the benchmark
- For the parameter "% of call answered by operator (Voice to voice)" BSNL, Rcom GSM, Uninor and Rcom CDMA are found not meeting the benchmark.
- In case of POI parameter TATA GSM, Uninor and MTS are found to have individual POIs with congestions as shown in the table.
- Good voice quality data was not system generated for BSNL & CDMA operators.

Month data Assessment:

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videoc on	Vodafone	Rcom CDMA	Tata CDMA	MTS
S/N	Name of Parameter														
			GSM Operators									CDMA			
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.02%	0.12%	1.06%	0.20%	0.02%	0.10%	0.03%	0.05%	0.05%	0.02%	0.05%	0.02%	0.12%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.03%	0.00%	0.00%	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.37%	99.68%	95.30%	99.48%	99.88%	99.65%	98.61%	99.14%	98.93%	99.99%	99.15%	99.15%	98.20%
	b) SDCCH/PAGING congestion	<=1%	0.06%	0.16%	0.19%	0.01%	0.42%	0.10%	0.07%	0.12%	0.00%	0.12%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.02%	0.10%	1.37%	0.00%	0.54%	0.05%	0.14%	0.11%	0.50%	0.65%	0.12%	0.00%	0.00%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.36%	0.49%	1.45%	0.36%	0.81%	0.34%	0.80%	0.59%	1.67%	0.57%	0.08%	0.44%	0.82%
	b) Worst affected cells>3% TCH drop	<=3%	0.40%	1.17%	3.47%	4.38%	2.97%	0.96%	3.98%	2.67%	0.00%	2.93%	0.36%	0.18%	1.10%
	c) Good voice quality	>=95%	98.66%	99.13%	NP	98.68%	97.47%	99.48%	97.40%	99.01%	99.46%	98.80%	NA	NA	NA
4	POI congestion	<=0.5%	0	0	0	0	0	0	5	9	0	0	0	0	13
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	<= 0.1%	0.04%	0.02%	0.00%	NA	0.08%	0.1%	0.53%	NA	NA	0.03%	0.04%	0.01%	NA
6	Metering /billing credibility-Pre paid	<= 0.1%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.03%	0.00%	0.01%	0.02%	0.01%	0.01%
7	Resolution of billing/charging complaints	100% within 4 weeks	100%	100%	100%	100%	86%	100%	99%	100%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	100%	100%	NP	100%	100%	100%	98.7%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	>=95%	100%	95%	97%	98.94%	98.29%	99.15%	100%	97.40%	97.8%	100%	99.09%	96.00%	95.49%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	95.67%	90.30%	66.39%	100%	70.93%	48.97%	87.80%	43.74%	96.5%	85.67%	53.8%	94.30%	96.60%

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videoc on	Vodafone	Rcom CDMA	Tata CDMA	MTS
S/N	Name of Parameter														
			GSM Operators									CDMA			
9	Termination/closure of service	100% in 7 days	100%	100%	100%	NA	100%	100%	48.5%	NA	NA	100%	100%	100%	NA
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	NA	100%	100%	90.84%	NA	NA	100%	100%	100%	NA

NA: Not Applicable, NR: Not Received

Observations:

From the month data assessment, it is found that the operators are meeting most of the parameters with some exceptional cases as given below:

For the parameter "Worst affected cells having >3% TCH drop" it is found that BSNL, Etisalat & Tata GSM are not meeting the benchmark with a values of 3.47%, 4.38% and 3.98% respectively.

POIs with congestion were found in case of operators like Tata GSM, Uninor and MTS for month data audit. Among the 3 operators, MTS was found to have highest nos. (13) of POI under congestion $\geq 0.5\%$. For rest of the operators there was no congestion found overall on the POIs. Here Reliance has reported that their POI is common to both CDMA and GSM.

Performance related to customer care data is not found to be satisfactory for the parameter "calls answered by operators (voice-to-voice)" for BSNL, Idea, Tata GSM, Uninor, Vodafone, Rcom GSM & Rcom CDMA are below benchmark. The "Metering/billing credibility -postpaid" benchmark is not meeting by Tata GSM with a value of 0.53%. The benchmark "Resolution of billing/ charging complaints" is not meeting by Idea with a value of 86% and Tata GSM with a value of 99% . In case of parameters "period of applying credit/waiver/ adjustment to customers", "time taken for refunds of deposits after closures" and "termination/closure of service", Tata GSM is having below benchmark performance.

Operator-Assisted Drive Test

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators						CDMA Operators				
1.1	Blocked Call Rate (<=3%)	Hyderabad	1.74%	0.00%	2.04%	0%	2%	2.33%	0.00%	0.00%	0.66%	0.00%	0.00%
		Guntur	0.00%	0.00%	3.45%	1%	1%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Warangal	0.00%	0.88%	2.10%	0%	2%	1.40%	0.00%	0.77%	0.00%	0.00%	1.83%
1.2	Dropped Call Rate (<=2%)	Hyderabad	0.00%	0.00%	4.08%	0.69%	0.69%	0.00%	0.00%	0.00%	0.00%	0.78%	0.82%
		Guntur	0.87%	0.00%	1.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Warangal	0.00%	0.00%	0.70%	0.00%	0.57%	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)	Hyderabad									99.02%	98.88%	98.53%
		Guntur									98.55%	99.61%	99.64%
		Warangal									98.13%	99.27%	99.73%
	(ii) 0-5 (with frequency hopping)	Hyderabad	93.05%	97.35%	90.01%	96.30%	95.50%	90.34%	95.02%	96.00%			
		Guntur	95.45%	96.20%	94.55%	96.10%	96.91%	96.18%	95.22%	98.24%			
Warangal		95.15%	97.10%	93.03%	95.20%	96.20%	94.95%	95.47%	96.40%				
1.4	Call Setup Success Rate (>=95%)	Hyderabad	98.26%	100%	97.96%	100%	97.93%	97.67%	100%	100%	99.34%	100%	100%
		Guntur	100%	100%	96.55%	99%	99.15%	100%	100%	100%	100%	100%	100%
		Warangal	100%	99.12%	97.9%	100%	98.3%	98.6%	100%	99.23%	100%	100%	98.17%

Observations:

- BSNL is not meeting the benchmark of "Blocked call rate" in Guntur city & "Drop call rate" in Hyderabad city.
- "Percentage of connection with good voice quality" benchmark is not met by AIRCEL (Hyderabad), BSNL (Hyderabad, Guntur and Warangal), TATA GSM (Hyderabad & Warangal).
- Etisalat & Videocon have no BTS in the cities where drive test was conducted.

Independent Drive Test:

--- Submitted as separate report

(B) Basic Telephone Service (Wireline) Providers

3 Days Live Data Audit

S/N	Name of Parameter	Bench mark	AIRTEL	BSNL	RCOM	TTSL
1	Network Parameters					
a	Call Completion Rate	$\geq 55\%$ (CCR) & $\geq 75\%$ (ASR)	91.48%	45.77%	88.06%	97.88%
b	POI Congestion	$\leq 0.5\%$	0	0	0	0
2	Response Time to the customer for assistance					
a	Accessibility of Call Centre/Customer Care					
	within 40 seconds	$\geq 95\%$	100.00%	99.00%	97.60%	99.00%
b	% age of calls answered by operator(voice to voice):					
	within 60 seconds	$\geq 90\%$	90.00%	99.00%	91.00%	91.00%

From the 3 days live data audit, it was observed that all the four basic telephone service providers meet the benchmarks for most of the parameters. While there is no congestion found on any network, the call completion rate is found satisfactory except for BSNL.

One Month Data Audit

S/N	Name of Parameter	Bench mark	AIRTEL	BSNL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	< 5%	2.90%	3.58%	0.44%	0.73%
2	Fault repair by next working day(Urban Area)					
a	By next working day	>90%	97.00%	75.91%	100.00%	96.37%
b	Within 3 days	100%	99.20%	88.85%	100.00%	99.73%
3	Fault repair by next working day(Rural & hilly Area)					
a	By next working day	>90%	NA	94.67%	NA	NA
b	Within 5 days	100%	NA	97.33%	NA	NA
4	Rent rebate					
a	Fault pending > 3 days & <7 days	Rebate for 7 days	0	0	0	3
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	0	2	0	0
c	Fault pending > 15 days	Rebate for one month	0	1	0	0
5	Mean time to Repair(MTTR)	<= 8 Hrs	3.35	17.96	2.22	6.22
6	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55%(CCR) & > 75%(ASR)	90.81%	55.14%	88.86%	98.81%
7	Metering and billing credibility(post paid)					
a	Disputed Bills over bills issued	< 0.1%	0.50%	0.03%	0.01%	0.04%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	100%	100.00%	100%	100%
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 weeks	100%	100%	100%	100%
9	POI Congestion	<= 0.5%	0	0	0	0
10	Response Time to customer for assistance					
a	Accessibility of Call centre within 40 sec.	>= 95%	99%	98.48%	96.00%	97.76%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	90.00%	98.48%	90.00%	92.64%
11	Customer care(promptness in attending to customers request)					
a	Termination / Closures	<= 7 Days	NP	88%	100%	100%
b	Time taken refunds deposit after closures	100% within 60 days	NP	NP	100%	100%

From the Month data table, it can be observed that BSNL is not meeting the benchmark for "fault repair", "MTTR" & "Termination/Closures" parameters. Airtel is not meeting "metering & billing credibility (Postpaid)" with a value of 0.5%

**(C) Broadband Service Providers
3 days Live Data Audit:**

S/N	Name of Parameter	Bench mark	Airtel	BSNL	Hathway	Rcom	Sify	TCISL	Tikona	You telecom
1	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)									
	Within 60 seconds	>60%	80.00%	80.00%	69.00%	87.00%	99.00%	95.00%	NP	90.00%
	Within 90 seconds	>80%	84.00%	91.00%	77.00%	90.00%	98.00%	100%	NP	88.00%
2	Bandwidth Utilization/ Throughput:	<80%								
	i) POP to ISP Gateway Node [Intra-network] Link(s)		2.55%	NP	7.00%	46.56%	45.00%	46.67%	24.05%	NA
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity		24.74%	NP	93.00%	NP	86.00%	76.67%	84.97%	76.10%
	Broadband Connection Speed (download)	>80%	100%	NP	85.00%	100%	93.02%	89.06%	NP	90.25%
3	Packet Loss	<1%	0.00%	NP	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%
4	Service Availability (%)	>98%	100%	99.70%	100%	100%	100%	99%	99.31%	100%
5	Network Latency (for wired broadband access)									
	Network Latency at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	<120ms	72.3	NP	17	NP	2.67	15	1.2	2
	Network Latency at ISP Gateway Node to International nearest NAP port abroad	<350ms	284	NP	292.3	NP	58.67	248.67	235	246
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	<800ms	NA							

Response time to customers (within 90 seconds) is low in case of Hathway. Similarly BW utilization is below the benchmark in case of Hathway, Sify & Tikona.

One Month Data Audit (Broadband):

S/N	Name of Parameter	Benchmark	Airtel	BSNL	Hathway	Rcom	Sify	TCISL	Tikona	You telecom
1	Service Provisioning /Activation Time									
	100% cases in 15 days (subject to technical feasibility)	<15 days	100%	99.7%	100%	100%	100%	99%	100%	100%
	Fault Repair / Restoration Time									
	By next working day:	>90%	95.05%	98.00%	91.10%	100%	59.30%	NP	92.56%	87.82%
2	within 3 working days:	>99%	100%	100%	97.68%	100%	98.50%	NP	98.85%	96.49%
	Rebate:									
	Faults Pending for > 3 working days and < 7 working days:		0	0	89	0	77	17	0	97
	Faults Pending for > 7 working days and < 15 working days:		0	0	13	0	13	0	0	30
3	Faults Pending for > 15 working days:		0	11	119	0	3	0	0	2
	Billing Performance									
	Billing complaints per 100 bills issued	<2%	NP	0.00%	1.98%	0.06%	NA	NP	NP	1.37%
	%age of Billing Complaints resolved	100%	NP	100%	100%	100%	NA	NP	NP	100%
4	Time taken for refund of deposits after closure:	100%	NP	100%	100%	100%	NA	NP	NP	100%
	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)									
5	Within 60 seconds	>60%	88.00%	80.00%	88.00%	93.00%	98.97%	97.00%	NP	82.00%
	Within 90 seconds	>80%	92.00%	91.00%	93.00%	95.00%	90.28%	98.00%	NP	86.00%
	Bandwidth Utilization/ Throughput	<80%								
	i) POP to ISP Gateway Node [Intra-network] Link(s)		NP	NP	7.00%	17.97%	48.00%	44.00%	35.21%	NA
6	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity		NP	NP	78.00%	NP	87.00%	75.00%	87.43%	78.40%
7	Broadband Connection Speed	>80%	NP	NP	NP	NP	NP	94.50%	100%	92.80%
8	Service Availability / Uptime (for all users)									
	Service Availability / Uptime	100% within 60 days	99.99%	100%	100%	99.99%	100%	NP	99.20%	98.27%

S/N	Name of Parameter	Benchmark	Airtel	BSNL	Hathway	Rcom	Sify	TCISL	Tikona	You telecom
9	Packet Loss	<1%	0%	NP	0%	0.15%	0%	0%	0%	0%
10	Network Latency (for wired broadband access)									
	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	<120ms	74	NP	17	0	4	0	1.3	9
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	<350ms	309	NP	290	0	58	0	235	276
	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	<800ms	NA							

Service provisioning benchmark is not met by BSNL & TCISL. Fault repair is below the benchmark for Sify & You Telecom. Similar performance is noticed for fault repair within 3 days for Tikona & Hathway. Sify & Tikona are also showing high BW utilization for ISP GW – IGSP/NIXI node.

CHAPTER-3: PMR Verification

I. Cellular Mobile Telephone Service (PMR Period: Jan 2011 - Mar 2011)

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
S/N	Name of Parameter			GSM Operators									CDMA Operators			
(A)	Network Service Quality Parameter															
1	Network Availability															
	BTS Accumulated Downtime	<=2%	Reported	0.01	0.14	1.1	0.14	0.01	0.03	0.04	0.04	0.27	0.06	0.03	0.01	0.09
			Verified	0.01	0.14	1.1	0.14	0.01	0.03	0.04	0.04	0.27	0.06	0.03	0.01	0.09
	Worst affected BTSs due to downtime	<=2%	Reported	0.02	0.03	0	0	0	0	0.03	0.01	0	0.01	0	0	0
Verified			0.02	0.03	0	0	0	0	0.03	0.01	0	0.01	0	0	0	
2	Connection Establishment (Accessibility)															
	CSSR (Call Setup Success Rate)	>=95%	Reported	99.2	99.66	96	99.49	99.92	99.7	98.04	99.04	97.93	99.64	99.52	99.88	98.83
			Verified	99.2	99.66	96	99.49	99.85	99.7	98.04	99.04	97.93	99.64	99.52	99.88	98.83
	SDCCH/PAGING congestion	<=1%	Reported	0.03	0.12	0.42	0.12	0.41	0.12	0.11	0.06	0.7	0.1	0	0	0
			Verified	0.03	0.12	0.42	0.12	0.39	0.12	0.11	0.06	0.7	0.1	0	0	0
	TCH congestion	<=2%	Reported	0.03	0.13	1.19	0.02	0.55	0.04	0.27	0.04	0.61	0.29	0.06	0.01	0
Verified			0.03	0.13	1.19	0.02	0.55	0.04	0.27	0.04	0.61	0.29	0.06	0.01	0	
3	Connection maintenance (retainability)															
	CDR	<=2%	Reported	0.45	0.56	1.36	0.33	0.75	0.41	0.97	0.44	1.3	0.54	0.5	0.15	1.29
			Verified	0.45	0.56	1.36	0.33	0.75	0.41	0.97	0.44	1.3	0.54	0.5	0.15	1.29
	Worst affected cells>3% TCH drop	<=5%	Reported	1.22	1.25	3.52	3.66	4.79	3.11	4.66	0.53	0	2.64	1.83	0.03	2.55
			Verified	1.22	1.25	3.52	3.66	4.84	3.11	4.66	0.53	0	2.64	1.83	0.03	2.55
	Good voice quality	>=95%	Reported	97.98	99.13	97.73	98.87	96.46	98.7	96.91	98.31	98.43	98.87	98.58	99.71	100
Verified			97.98	99.13	97.73	98.87	96.78	98.7	96.91	98.31	98.43	98.87	98.58	99.71	100	
4	No. of POI's having congestion >0.5%	Reported	1	0	0	0	0	0	0	3	5	0	0	0	0	
		Verified	1	0	0	0	0	0	0	3	5	0	0	0	0	
(B)	Customer Service Quality Parameters															

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
S/N	Name of Parameter			GSM Operators										CDMA Operators		
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.18	0.02	0	NA	NR	0	0.06	NA	NA	0.05	0	0	0
			Verified	0.18	0.02	0	NA	NR	0	0.06	NA	NA	0.05	0	0	0
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.12	0	0	0.1	NR	0.03	0	0	0.04	0	0.03	0.05	0.09
			Verified	0.12	0	0	0.1	NR	0.03	0	0	0.04	0	0.03	0.05	0.09
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100	100	100	100	NR	100	100	100	100	100	100	100	100
			Verified	100	100	100	100	NR	100	100	100	100	100	100	100	100
	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	Reported	100	100	100	NA	NR	100	100	NA	100	100	100	100	100
			Verified	100	100	100	NA	NR	100	100	NA	100	100	100	100	100
8	Response time to customers for assistance															
	Verified	100	97	100	99.15	NR	100	100	97.37	100	100	100	97	99		
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	87.84	80	85	99.01	NR	91	90	93.01	100	96	94	94	92.59
Verified			87.84	80	85	99.01	NR	91	90	93.01	100	96	94	94	92.59	
9	Termination/closure of service															
Verified	100	100	100	NA	NR	100	100	NA	NA	100	100	100	0			
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100	100	100	NA	NR	100	76	NA	NA	100	100	96	0
			Verified	100	100	100	NA	NR	100	76	NA	NA	100	100	96	0

Most of the operator's data is almost matching with the PMR data. Idea is showing variation in network parameters like "CSSR", "SDCCH congestion", "Worst affected cells >3% TCH drop" and "Connections with good quality". MTS is on ICR with TATA CDMA during Jan, Feb of 2011.

II. Basic Service (Wire Line) Service (PMR Period: Jan 2011 - Mar 2011)

S/N	Parameters	Bench-marks	Audit	AIRTEL	BSNL	RCOM	TTSL
1	<i>Fault incidences</i>						
	(No. of faults/100 subscribers /month) BM <5%	< 5%	Reported	2.44%	3.26%	0.56%	1.70%
			Verified	2.44%	NR	0.56%	1.70%
2	<i>Faults Repair/Restoraion Time</i>						
	Fault repair by next working day(Urban Area) BM >90%	>90%	Reported	99.88%	93.73%	100%	96.75%
			Verified	99.88%	NR	100%	96.75%
	Within 3 days.BM 100%	100%	Reported	100%	96.79%	100%	100%
			Verified	100%	NR	100%	100%
	Within 5 days (Hilly & Rural Area) BM 100%	100%	Reported	NA	92.82%	NA	100%
			Verified	NA	NR	NA	100%
	Mean time to Repair(MTTR).BM <=8 hrs	≤8 Hrs	Reported	2.11	9.39	2.17	6.11
			Verified	2.11	NR	2.17	6.11
3	<i>Rent Rebate</i>						
	Rent Rebate		Reported	Nil	Nil	Nil	Nil
			Verified	Nil	NR	Nil	Nil
4	<i>Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)</i>						
	CCR & ASR. BM >55% & >75%	> 55%(CCR) & > 75%(ASR)	Reported	90.80%	68.56%	NA	98.75%
			Verified	90.80%	NR	NA	98.75%
5	<i>Metering & Billing Performance</i>						
	Metering & Billing Credibility-Post paid.BM 0.1%	< 0.1%	Reported	0.00%	NR	0.01%	0.18%
			Verified	0.00%	NR	0.01%	0.18%
	Metering & Billing Credibility-Pre paid BM 0.1%	100%	Reported	NA	NR	NIL	NA
			Verified	NA	NR	NIL	NA
	Resolution of billing charging/validity/Complaints within 4 weeks BM 100%	100%	Reported	100%	NR	100%	100%
			Verified	100%	NR	100%	100%
	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	Reported	100%	NR	100%	100%
			Verified	100%	NR	100%	100%
6	<i>POI Congestion</i>						
	POI Congestion (%)	≤ 0.5%	Reported	0	NIL	0	0
			Verified	0	NR	0	0
7	<i>Response Time to customer for assistance</i>						

S/N	Parameters	Bench-marks	Audit	AIRTEL	BSNL	RCOM	TTSL
	Accessibility of Call centre/customer Care within 40 seconds.BM >95%	≥95%	Reported	99.33%	89.08%	97.99%	95.48%
			Verified	99.33%	NR	97.99%	95.48%
	% age of calls answered by operator(voice to voice) within 60 seconds. BM >90%	≥90%	Reported	90.44%	85.53%	95.99%	90.46%
			Verified	90.44%	NR	95.99%	90.46%
8	<i>Customer care(promptness in attending to customers request</i>						
	Termination / Closures.BM <=7 days	100%	Reported	100%	99%	100%	100%
			Verified	100%	NR	100%	100%
	Time taken for refunds of deposit after closures. BM 100% with in 60 days.	100%	Reported	100.00%	NR	100%	100%
			Verified	100.00%	NR	100%	100%

NA – Not Applicable NR – Data Not Received

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

III. Broadband Service (PMR Period : Jan 2011 - Mar 2011)

S/N	Parameters	Benchmarks	Audit Period	Airtel	Beam tele	BSNL	Hathway	Rcom	Sify	Spectra net	TCISL	Tikona	You telecom
1	Service Provisioning/Activation Time												
1.2	%age of connections provided within 15 days of registration of demand	100%	Reported	100%	98%	96%	100%	100%	100%	99%	100%	100%	100%
			Verified	100%	98%	96%	100%	100%	100%	99%	100%	100%	100%
2	Faults Repair/Restoraion Time												
2.1	% of faults repaired by next working day	>90%	Reported	100%	90%	94%	96%	100%	90.00%	99%	99%	87%	85%
			Verified	100%	90%	94%	96%	100%	90.00%	99%	99%	87%	85%
2.2	% of faults repaired within 3 working day	≥99%	Reported	100%	99%	100%	100%	100%	99.00%	100%	100%	92%	96%
			Verified	100%	99%	100%	100%	100%	99.00%	100%	100%	92%	96%
3	Rent Rebate												
3.1	Rent Rebate(nos)		Reported	0	403	1	33	0	206	0	741	7150	234
			Verified	0	403	1	33	0	206	0	741	7150	234
4	Billing Performance												
4.1	%age of bills disputed	<2%	Reported	0.00%	1.53%	0.20%	1.85%	0.09%	NA	0%	0%	5.51%	0.40%
			Verified	0.00%	1.53%	0.20%	1.85%	0.09%	NA	0%	0%	5.51%	0.40%
4.2	%age of complaints resolved within 4 weeks	100%	Reported	100%	100%	99%	100%	100%	NA	NA	100%	99%	100%
			Verified	100%	100%	99%	100%	100%	NA	NA	100%	99%	100%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	Reported	100%	NA	100%	100%	100%	0%	NA	100%	100%	100%
			Verified	100%	NA	100%	100%	100%	0%	NA	100%	100%	100%
5	Response Time to the Customer for assistance												
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	Reported	79.00%	63%	88%	90.00%	96%	85.00%	100%	94%	81%	60%
			Verified	79.00%	63%	88%	90.00%	96%	85.00%	100%	94%	81%	60%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	Reported	85.00%	82.00%	95%	93.00%	98%	92.00%	100%	95%	83%	67%
			Verified	85.00%	82.00%	95%	93.00%	98%	92.00%	100%	95%	83%	67%
6	Bandwidth utilisation/throughput												
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		Reported	0	0	NR	0	0	0	0	0	19	NA
			Verified	0	0	NR	0	0	0	0	0	19	NA

S/N	Parameters	Benchm arks	Audit Period	Airtel	Beam tele	BSNL	Hathwa y	Rcom	Sify	Spectra net	TCISL	Tikon a	You telec om
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		Reported	0	0	NR	0.00%	0	0	0	0	4	0
			Verified	0	0	NR	0.00%	0	0	0	0	4	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	Reported	30.10%	55.66%	NR	88.00%	43.34%	87.00%	73%	39.51%	75%	71.65%
			Verified	30.10%	55.66%	NR	88.00%	43.34%	87.00%	73%	39.51%	75%	71.65%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	Reported	100%	C/DNF	94%	90%	92.00%	95%	C/DNF	91%	97%	85.87%
			Verified	100%	C/DNF	94%	90%	92.00%	95%	C/DNF	91%	97%	85.87%
7	Service Availability/Uptime (for all users) in %age												
7.1	Service availability /uptime (for all users) in %age	>98%	Reported	99.99%	98.66%	99.90%	100%	99.71%	100%	DNF	100%	98%	98.28%
			Verified	99.99%	98.66%	99.90%	100%	99.71%	98.46%	NP	100%	98%	98.28%
8	Packet loss												
8.1	% of Packet loss	<1%	Reported	0%	C/DNF	NR	0.99%	C/DNF	C/DNF	C/DNF	0.49%	NR	0%
			Verified	0%	C/DNF	NR	0.99%	C/DNF	C/DNF	C/DNF	0.49%	NR	0%
9	Network latency (for wired broadband access)												
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	Reported	99	C/DNF	NR	80	DNF	C/DNF	C/DNF	50	NR	12
			Verified	99	C/DNF	NR	80	DNF	C/DNF	C/DNF	50	NR	12
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	Reported	296	C/DNF	NR	310	DNF	C/DNF	C/DNF	267	NR	257
			Verified	296	C/DNF	NR	310	DNF	C/DNF	C/DNF	267	NR	257
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 ms	Reported	NA	NA	NR	NA	NA	NR	NA	NA	NR	NA
			Verified	NA	NA	NR	NA	NA	NR	NA	NA	NR	NA

On PMR data verification no inconsistency was found between the record maintained by the operator and data reported by the operator at TRAI except for Sify for “Service availability”.

Chapter -4: Detailed Findings & Analysis

I. Cellular Mobile Telephone Service

(A) MSC Audit

(i) 3 days Live measurement data assessment & summarized findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocoin	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA		
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.01%	0.10%	1.11%	0.00%	0.02%	0.03%	0.02%	0.01%	0.00%	0.01%	0.05%	0.01%	0.19%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		2830	10155	5426	29	6728	3854	3994	2589	25	8090	2517	1298	364
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during the 3days		15.954	731	4338.6	0	90	83	50	26.66	0	59	91	12.66	49.39
	e) No. of BTSs having accumulated downtime of >24 hours in 3days		0	0	0	0	0	0	0	0	0	0	0	0	0
2	Connection Establishment (Accessibility)														
	a) CSSR	>=95%	99.36%	99.68%	95.81%	99.51%	99.97%	99.73%	98.60%	99.02%	99.63%	99.99%	99.15%	99.13%	98.23%
	b) SDCCH/PAGING congestion	<=1%	0.03%	0.17%	0.21%	0.05%	0.32%	0.06%	0.05%	0.09%	0.00%	0.13%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.03%	0.10%	1.20%	0.00%	0.39%	0.04%	0.12%	0.14%	0.00%	0.54%	0.09%	0.00%	0.00%
3	Connection maintenance														
	a) CDR	<=2%	0.40%	0.48%	1.30%	0.33%	0.80%	0.34%	0.74%	0.63%	0.15%	0.56%	0.07%	0.42%	0.86%
	b) Cells having > 3% TCH drop	<=3%	2.77%	1.17%	3.35%	1.92%	2.93%	0.94%	5.91%	2.88%	0.00%	2.96%	0.33%	0.00%	0.90%
	c) Good voice quality	>=95%	98.61%	99.13%	NP	98.69%	97.45%	99.50%	97.60%	98.96%	100.00%	98.81%	NP	NP	NP
	d) No. of cells > 3% TCH drop		228	337	544	2	586	109	682	215	0	721	8	0	10
	e) Total no. of cells in the network		8,229	28,791	16,238	87	19,959	11,562	11,545	7,628	75	24,327	2,517	3,960	1,092
4	No. of POI with >=0.5% congestion	<0.5%	0	0	0	0	0	0	5	2	0	0	0	0	10

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocoin	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA		
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL	Unitech, Cellone, Reliance, BSNL	BSNL, VODAFONE	NIL	NIL	NIL	NIL	BSNL, Vodafone, Airtel, Reliance, TTSL,
	b) Total No. of circuits on POI		4580	7051	35174	1525	138326	61817	21403	31124	1429	157122	61817	58816	9359
	c) Avg No. of call attempts on POI		137166.7	8220941	1517699	6313	NR	597149.8	946958	11367773	959	5351591.33	597149.8	1401251	608233
	d) Avg traffic served on POI (Erlang)		2926.65	126565	25634.98	157.94	NR	30147.22	5608.36	27688.7	301.373	90886.31	30147.22	27404	15676
	e) Total number of working POI Service Area wise		7	18	29	27	118	76	32	65	25	56	76	155	52
	f) Equipped Capacity of Network in respect of Traffic in erlang		89520.66	669983	269212	643.9	270035	316000	197578	82434.1	475	151343.9	316000	303428	27300
	g) Total traffic handled in TCBH in erlang		26811.92	513136	150345	70.92	222655	111427.2	75481	50435	114.65	126730	111427.2	74601	4004.6
(B)	Customer Service Quality Parameters														
5	Response time to customers for assistance														
	a) Accessibility of call centre	>=95%	100%	97%	100%	100%	98%	99.4%	100%	95.40%	100%	100%	99.12%	96%	98%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	96.50%	93%	67.34%	100%	93%	41.37%	96%	41.35%	99%	90%	32.07%	95%	92%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		45,620	490,609	1,378,678	208	213,854	566797	1604632	868,659	31	112,220	424622	798,021	8,034
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		43,646	443,018	915,318	208	151,679	277603	1408848	379,961	30	96,140	228616	752,894	7,761
NA: Not Applicable, NP: Not Provided															

Parameter-wise Findings (Live Data Assessment):

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

- **BTS Accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0% and 1.11%
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All the operators are meeting the benchmark specified by TRAI.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values laying between 95.81% and 99.99%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values laying between 0% and 0.42%.
Note: CDMA operators are providing the data for Paging Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0% and 0.65%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0.07% and 1.67%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** Except for BSNL, Tata GSM with a values of 3.35% ,5.91% rest of the operators are satisfying the benchmark with value in between 0% and 2.96%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** CDMA operators & BSNL has declared that the parameter is not system generated. Rest of the operators are meeting the benchmark with values laying between 97.45% and 100%.
- **POI Congestion (benchmark $\leq 0.5\%$):** POI congestion was found in case of operators like Tata GSM, Uninor and MTS for 3 days live data audit. Among the 3 operators, MTS was found to have highest nos. (10 nos.) of POI under congestion $> 0.5\%$. for rest of the operators there was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage though 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. Here Reliance has reported that their POI is common to both CDMA and GSM.
- **%age of call answered by operator (electronically) (benchmark $> 95\%$):** All operators are meeting the benchmark with values in between 95.4% and 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $> 90\%$): %):** Except for BSNL, Uninor, Rcom GSM, Rcom CDMA with a values of 67.34%, 41.35%, 41.37% and 32.07% respectively, rest of the operators are satisfying the benchmark with value in between 90% and 100%.

2) One Month audit data report & summarized findings:

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA Operators		
(A)	Network Service Quality Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	0.02%	0.12%	1.06%	0.20%	0.02%	0.10%	0.03%	0.05%	0.05%	0.02%	0.05%	0.02%	0.12%
	b) Worst affected BTSs due to downtime	<=2%	0.00%	0.03%	0.00%	0.00%	0.00%	0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		2830	10155	5426	29	6728	3854	3994	2589	25	8090	2517	1298	364
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		430	9358	42755.8	44	1117	2780	853	875.82	9.05	1348	1011	146.17	317.84
	e) No. of BTSs having accumulated downtime of >24 hours in a month		0	3	0	0	0	3	0	0	0	0	0	0	0
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	99.37%	99.68%	95.30%	99.48%	99.88%	99.65%	98.61%	99.14%	98.93%	99.99%	99.15%	99.15%	98.20%
	b) SDCCH/PAGING congestion	<=1%	0.06%	0.16%	0.19%	0.01%	0.42%	0.10%	0.07%	0.12%	0.00%	0.12%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.02%	0.10%	1.37%	0.00%	0.54%	0.05%	0.14%	0.11%	0.50%	0.65%	0.12%	0.00%	0.00%
3	Connection maintenance (retainability)														
	a) CDR	<=2%	0.36%	0.49%	1.45%	0.36%	0.81%	0.34%	0.80%	0.59%	1.67%	0.57%	0.08%	0.44%	0.82%
	b) Worst affected cells>3% TCH drop	<=3%	0.40%	1.17%	3.47%	4.38%	2.97%	0.96%	3.98%	2.67%	0.00%	2.93%	0.36%	0.18%	1.10%

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA Operators		
	c) Good voice quality	>=95%	98.66%	99.13%	NP	98.68%	97.47%	99.48%	97.40%	99.01%	99.46%	98.80%	NP	NP	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		33	337	564	3.81	593	111.13	459	198	0	713	9.09	7	11.742
	e) Total no. of cells in the network		8229	28791	16238	87	19959	11562	11545	7628	75	24327	2517	3960	1092
4	No. of POI having >=0.5% congestion	<0.5%	0	0	0	0	0	0	5	9	0	0	0	0	13
	a) Name of POI not meeting the benchmark		NIL	NIL	Nil	NIL	NIL	NIL	Unitech, Cellone, Reliance, BSNL	BSNL, Idea, HYD-GMSC, Cellone	NIL	NIL	NIL	NIL	Airtel, Etisalat, Videocon, Reliance, TTSI, Vodafone, BSNL
	b) Total No. of call attempts on POI (Avg.)		176,342	8,556,597	1,485,826	81,773	4,043,071	651,905	299,888	951,127	23,118	5,445,585	651,905	1,385,185	6,157,739
	c) Total traffic served on POI (Erlang) (Avg.)		3,725	120,232	28,599	199.8	88,847	30,957	5,331	23,671	38	88,847	30,957	26,443	16,448.8
	d) Total No. of circuits on POI		4,580	7,051	35,174	1,525	138,326	61,817	21,403	31,124	1,429	157,122	61,817	58,816	9,359
	e) Total number of working POI Service Area wise		7	18	29	27	118	76	32	65	25	56	76	155	52
	f) Capacity of POI		4,511	211,442	35,174	1,177	135,034	57,885	18,896	28,563	1,102	155,079	57,885	54,161	8,370
5	Network Data														
	a) Equipped Capacity of Network Erlang		89520.66	669983	269212	643.9	270034.98	316000	197578.39	82434.09	475	151343.9	316000	303428	27300
	b) Total traffic in TCBH in erlang (Avg.)		26811.92	513136	150345	70.92	222654.84	111427.2	75481	50435.01	114.65	126730	111427.2	74601	4004.6

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA Operators		
	c) Total no. of customers served (as per VLR) on last day of the month		885304	NR	NR	4402	7895534	NR	2835509	1483475	259	4233526	NR	1795672	297485
(B)	Customer Service Quality Parameters														
6	Metering/billing credibility- Post paid	$\leq 0.1\%$	0.04%	0.02%	0.00%	NA	0.08%	0.1%	0.53%	NA	NA	0.03%	0.04%	0.01%	NA
	a) No. of bills issued during the period		13189	580480	139464	NA	145225	24694	32347	NA	NA	287700	253918	164257	NA
	b) No. of bills disputed including billing complaints during the period		5	90	0	NA	119	24	172	NA	NA	84	110	17	NA
7	Metering /billing credibility- Pre paid	$\leq 0.1\%$	0.01%	0.00%	0.00%	0.00%	0.00%	0.1%	0.01%	0.03%	0.00%	0.01%	0.02%	0.01%	0.01%
	a) No. of charging / credit / validity complaints during the quarter		118	1	NP	1	73	3676	839	910	0	716	1053	85	37
	b) Total no. of pre-paid customers at the end of the quarter		1656209	22240979	NP	25701	8279664	3676710	6095718	2656230	10777	7064704	4515490	890005	489430
8	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	86%	100%	99%	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		123	91	NP	1	13764	3700	998	910	0	800	1163	6082	37
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		123	18046	NP	1	15929	3700	1011	910	0	800	1163	6107	37

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA Operators		
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		16	91	NP	0	13759	595	841	910	0	545	419	102	20
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		107	17955	NP	0	0	3105	169	0	0	255	744	3200	17
	e) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	100%	100%	NP	100%	100%	100%	98.7%	100%	100%	100%	100%	100%	100%
9	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	>=95%	100%	95%	97%	98.94%	98.29%	99.15%	100%	97.40%	97.80%	100%	99.09%	96%	95.49%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	95.67%	90.30%	66.39%	100%	70.93%	48.97%	87.80%	43.74%	96.50%	85.67%	53.8%	94.30%	96.60%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		45620	490609	1378678	208	213854	566797	1604632	868659	31	112220	424622	798021	8034
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		43646	443018	915318	208	151679	277603	1408848	379961	30	96140	228616	752894	7761
10	Termination/closure of service	<=7days	100%	100%	100%	NA	100%	100%	48.5%	NA	NA	100%	100%	100%	NA
	a) Total No. of requests for Termination / Closure of service received during the quarter		125	3016	4371	NA	1900	188	402	NA	NA	1792	965	3884	NA

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators										CDMA Operators		
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		125	3016	4371	NA	1900	188	195	NA	NA	1792	965	3884	NA
11	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	100%	100%	100%	NA	100%	100%	90.84%	NA	NA	100%	100%	100%	NA
NA: Not Applicable, NR: Not Received															

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0.02% and 1.06%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0% and 0.08%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values laying between 95.3% and 99.99%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values laying between 0% and 0.42%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0% and 1.37%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values laying between 0.08% and 1.67%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** Except for BSNL, Etisalat, Tata GSM with a values of 3.47%, 4.38% and 3.98% all the operators are satisfying the benchmark with value in between 0% and 2.97%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** All CDMA operators & BSNL have declared that the parameter is not system generated. Rest of the operators are meeting the benchmark with values laying between 97.4% and 99.48%.
- **POI Congestion (benchmark $\leq 0.5\%$):** POI congestion was found in case of operators like Tata GSM, Uninor and MTS for month data audit. Among the 3 operators, MTS was found to have highest nos. (13 nos.) of POI under congestion $\geq 0.5\%$. for rest of the operators there was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage though 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. Reliance has reported that their POI is common to both CDMA and GSM.
- **%age of call answered by operator (electronically) (benchmark >95):** All operators are meeting the benchmark with values laying between 95% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for BSNL, Idea, Tata GSM, Uninor, Vodafone, Rcom GSM, Rcom CDMA with a values of 66.39%, 70.93%, 87.8%, 43.74%, 85.67%, 48.97% and 53.8% respectively. All operators are meeting the benchmark with values laying between 90.03% to 100%.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** Except for TATA GSM with a value of 0.53%, all operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** All the operators are meeting the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** Except for Idea, Tata GSM with a value of 86% and 99% remaining all operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark ≤ 7 days):** Except Tata GSM, all operators have satisfied the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** Except for Tata GSM, all operators have satisfied the benchmark.

(1) Sample Coverage

Switches/BSC/BTS details of operators:

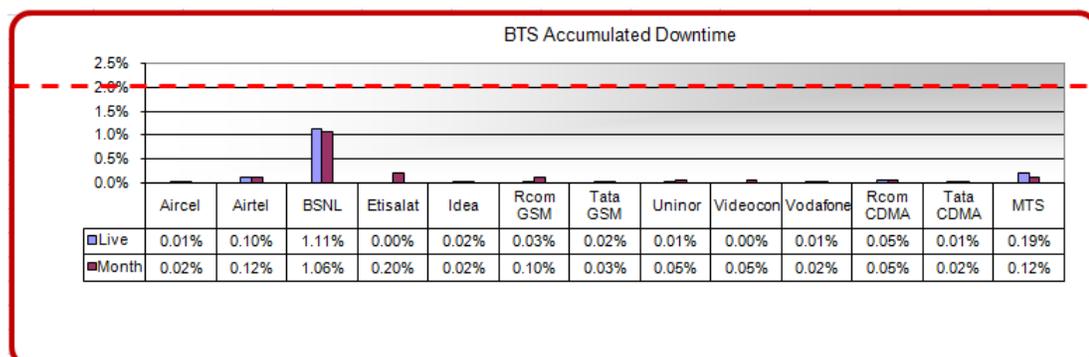
Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	2	21	2830
2	Airtel Ltd	52	118	10155
3	BSNL	18	76	5320
4	Etisalat	3	1	29
5	Idea	13	75	6728
6	Reliance Communication (GSM)	5	21	3854
7	Tata Communications (GSM)	7	30	3994
8	Uninor	2	17	2589
9	Videocon	2	2	25
10	Vodafone	7	94	8090
CDMA Operators				
11	MTS (CDMA)	1	2	364
12	Reliance Communication (CDMA)	12	1	2517
13	Tata Communications (CDMA)	13	5	1298

(2) Performance (Graphical Representation)

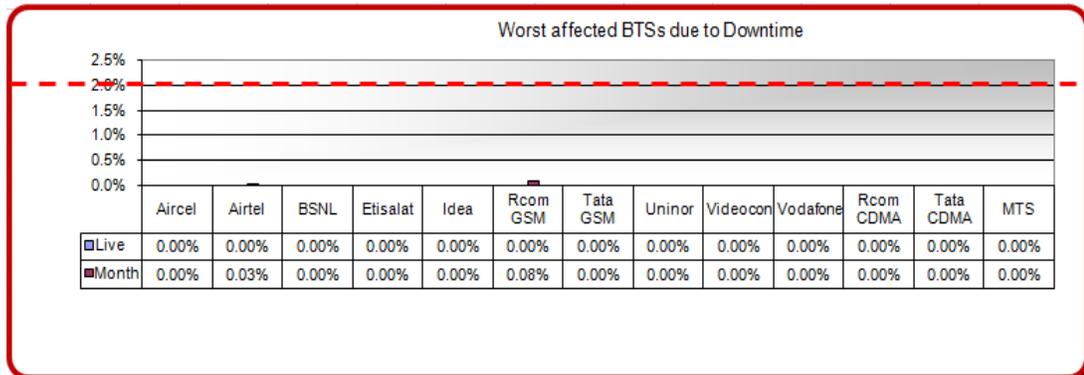
Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services

A) NETWORK PERFORMANCE

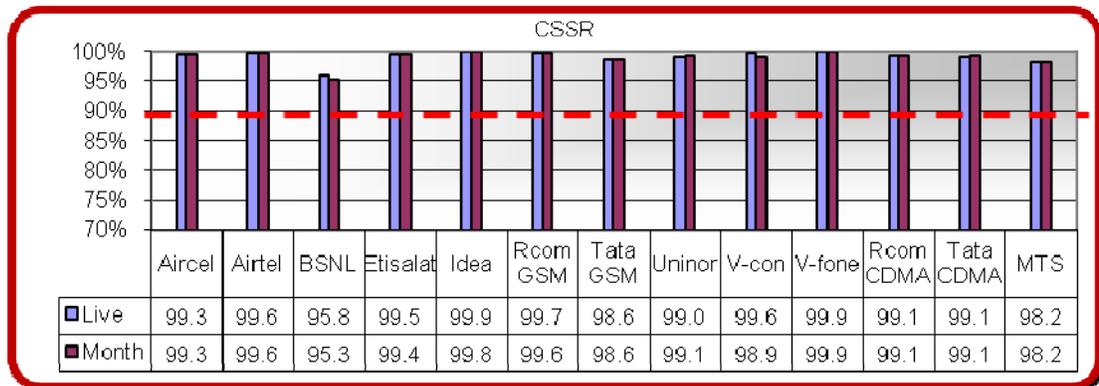
BTS accumulated downtime: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



Worst affected BTSs due to downtime: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

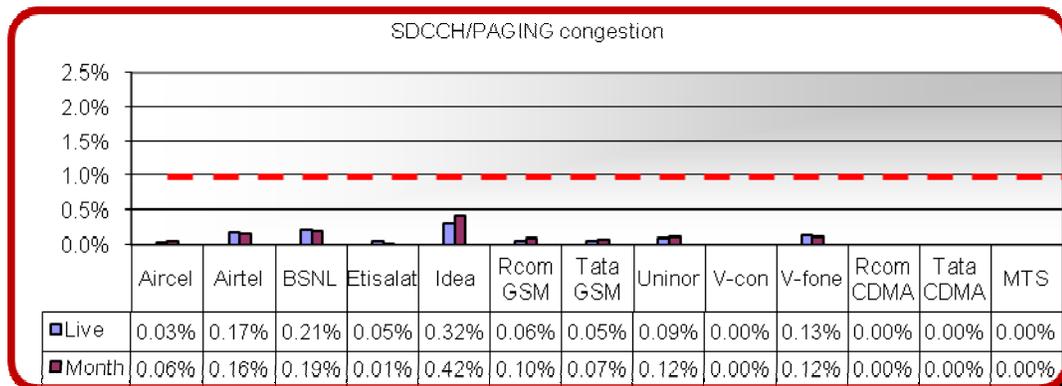


Call setup success rate: All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit.

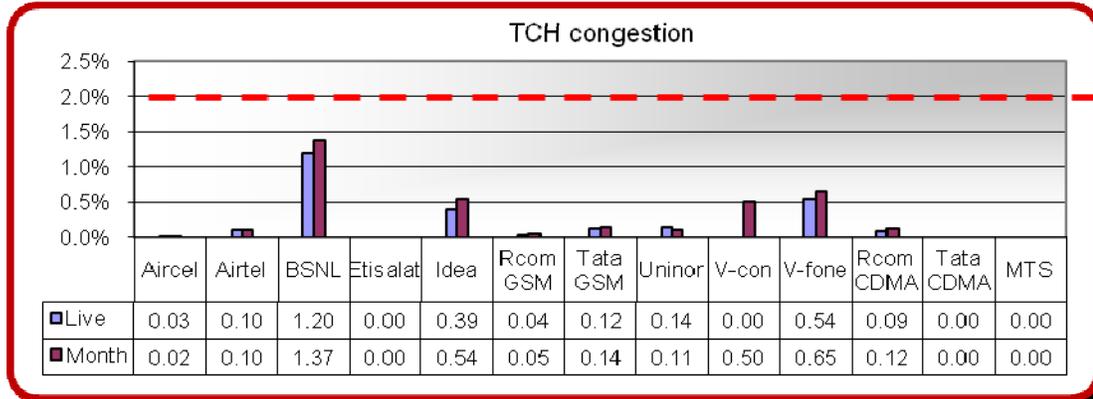


Blocked call rate:

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

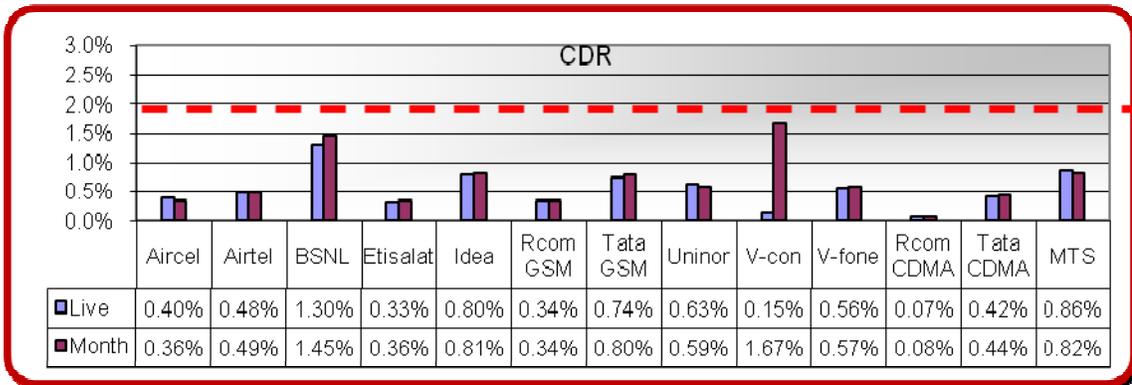


TCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

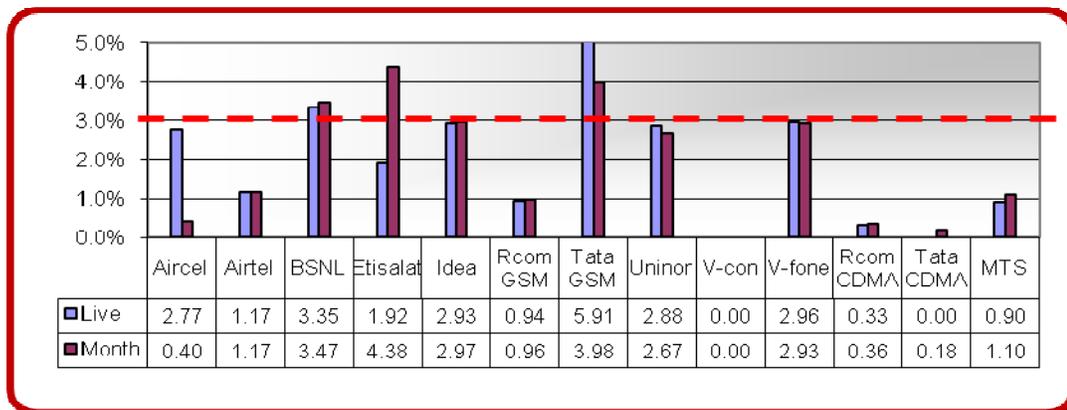


Connection Maintainability (Retainability):

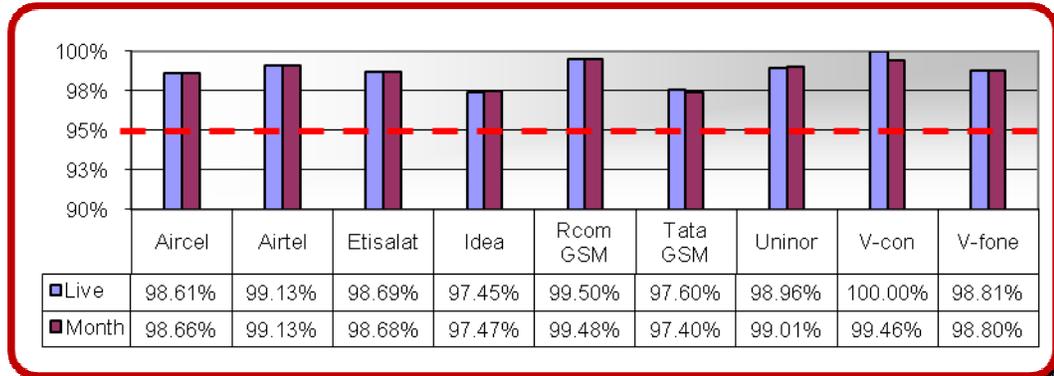
Call drop rate (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



Worst affected Cell exceeding 3% TCH Drop: BSNL and Tata GSM are not meeting the benchmark in live data & month audit data Rest of the operators are meeting the benchmark for both the cases. Etisalat found not meeting for month data.

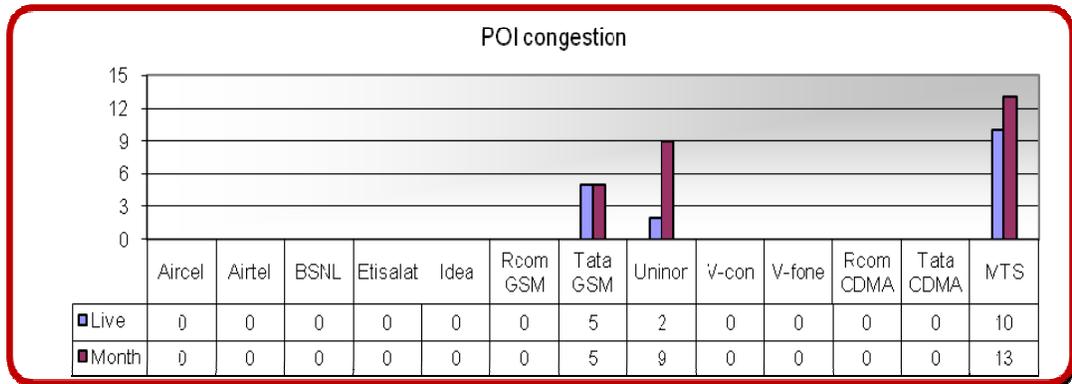


Percentage of connections with good voice quality (benchmark $\geq 95\%$): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit. The CDMA operators & BSNL has declared that this parameter is not system generated.



No. of POI having $> 0.5\%$ Congestion:

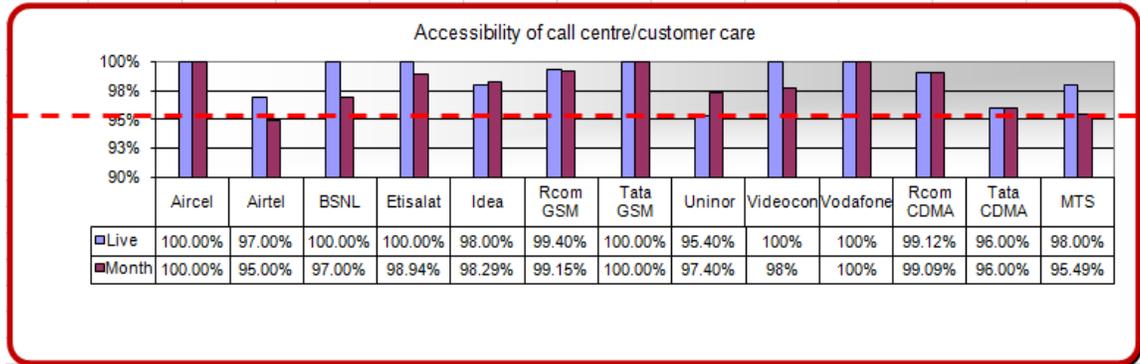
POI congestion was found in case of operators like Tata GSM, Uninor and MTS. The trend was found to be similar for both live and month data audit. Among the 3 operators, MTS was found to have highest nos. of POI under congestion $> 0.5\%$. For rest of the operators there was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage though 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.



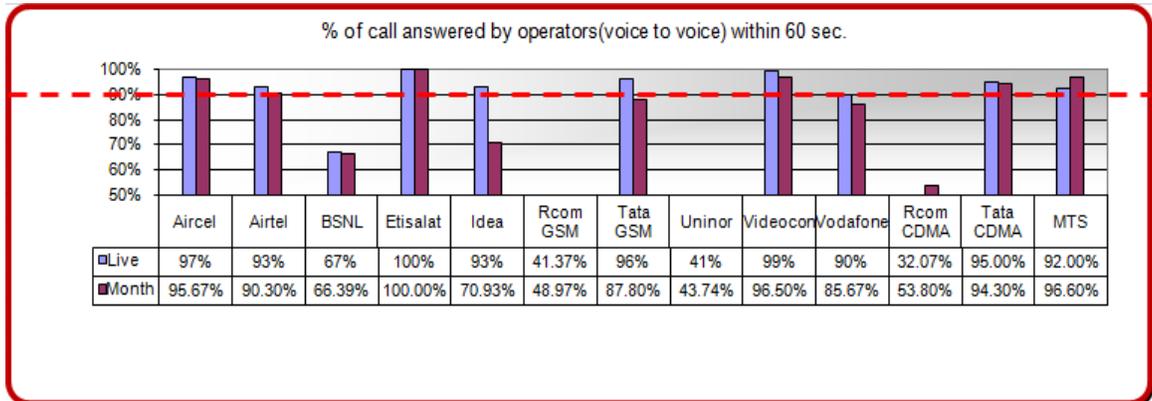
B) CUSTOMER SERVICE QUALITY PARAMETERS

Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit with a values in between 95% to 100%



Percentage of call answered by operators (Voice to voice) within 60 sec: BSNL, Uninor, Rcom GSM and Rcom CDMA are not meeting the benchmark for both live & month audit data. For month data, Idea, Tata GSM and Vodafone are not meeting the benchmark. Rest of the operators are meeting the benchmark.



(3) Critical Analysis

The above comparative study between live data & month data shows similar trends in both the cases. However, inconsistency in live & month data was found for parameters like for Vodafone in CDR, for Etisalat, Aircel & Tata CDMA in Cells with >3% TCH drop and for Idea & Tata GSM in %age of calls answered by operator with 60 seconds.

“Worst affected cells >3% TCH drop” benchmark is not meeting by Tata GSM, BSNL. “ POI congestion” benchmark is not meeting by Tata GSM, Uninor and Sistema-MTS for both Live and month audit. “Metering/billing credibility for postpaid” benchmark is not meeting by Tata GSM. “Resolution of billing/ charging complaints” benchmark is not meeting by Idea, Tata GSM. “%age of calls answered by operator” benchmark is not meeting by BSNL, Idea, Tata GSM, Uninor, Vodafone, Rcom GSM, Rcom CDMA. “Period of applying credit/waiver adjustment to the customers” benchmark is not meeting by Tata GSM. “Termination/ closure of service” and “time taken for refunds of deposits after closures” benchmark is not meeting by Tata GSM.

(B) Redressal

(1) Sample coverage

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

(2) Performance (live calling for billing complaints)

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
Calls Attempted	100	100	NP	1	100	100	100	100	No compliant s	100	100	100	37
Total No. of calls	96	91	NP	1	98	100	94	98		96	100	94	37
Cases resolved with 4 weeks	96	91	NP	1	98	100	94	98		96	100	94	37
%age of cases resolved	100%	100%	NP	100%	100%	100%	100%	100%		100%	100%	100%	100%

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

(3) Live calling to call centre

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Tata GSM	Uninor	Videocon	Vodafone	MTS	Tata CDMA
Total No. of Calls Attempted	100	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	100	97	100	100	98	100	95	100	100	98	96
Calls got connected to agent within 60 Sec	97	93	67	100	93	96	41	99	90	92	95
%age of calls got answered	97%	93%	67%	100%	93%	96%	41%	99%	90%	92%	95%

(4) Level 1 live calling

Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	Rcom CDMA	Tata CDMA	MTS
Hyderabad														
100 (Police)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
101 (Fire)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
102/108 (ambulance)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
139 (Rly. Inc.)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
Guntur														
100 (Police)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
101 (Fire)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
102/108 (ambulance)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
139 (Rly. Inc.)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
Warangal														
100 (Police)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
101 (Fire)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
102/108 (ambulance)	2	2	2	2	0	2	2	2	2	0	2	2	2	2
139 (Rly. Inc.)	2	2	2	2	0	2	2	2	2	0	2	2	2	2

(5) Critical Analysis

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

In case of Call center live calling all operators IVR calls are mostly get connected. However congestion is found for BSNL and Uninor after the IVR level, that is when the call are routed to the call center agent.

For emergency, Level 1 calling all the operators are found to be functional in Hyderabad.

(C) Inter operator call assessment

(1) Sample coverage

A sample of 2x50 test calls per Service Providers with in the licensed service area (Andhra Pradesh Circle) were made between 1100 to 1400 hrs and between 1600 to 1900 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL	Etisalat	Idea	Reliance (GSM)	Tata (GSM)	Uninor	Videocon	Vodafone	Reliance (CDMA)	Tata (CDMA)	Sistema (MTS)
Aircel	-	100%	98%	100%	99%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	97%	-	98%	100%	98%	98%	99%	100%	100%	99%	100%	100%	99%
BSNL	100%	99%	-	100%	100%	98%	97%	100%	100%	98%	100%	100%	100%
Etisalat	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	97%	100%	100%
Idea	100%	98%	99%	100%	-	100%	97%	99%	100%	100%	100%	100%	99%
Reliance (GSM)	100%	98%	96%	100%	97%	-	100%	100%	100%	100%	99%	100%	93%
Tata (GSM)	100%	99%	98%	100%	100%	99%	-	99%	100%	100%	100%	99%	100%
Uninor	100%	99%	99%	100%	100%	100%	100%	-	100%	97%	100%	100%	100%
Videocon	100%	100%	97%	100%	100%	99%	100%	100%	-	98%	100%	100%	100%
Vodafone	100%	98%	98%	100%	99%	100%	97%	100%	100%	-	100%	100%	100%
Reliance (CDMA)	100%	97%	99%	100%	100%	100%	100%	99%	100%	100%	-	99%	100%
Tata (CDMA)	100%	100%	99%	100%	98%	100%	100%	98%	100%	98%	100%	-	100%
Sistema (MTS)	100%	98%	96%	97%	97%	98%	99%	98%	100%	99%	99%	100%	-

(3) Critical Analysis

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

(D) Drive test of the mobile network of service providers

(1) Sample Coverage

The Operator Assisted Drive Test was conducted at Andhra Pradesh for all the operators. Route covered was about around 80-100Km depending on city areas within the speed limit of 30Km/hr.

Drive Test Locations

HYDERABAD

LOW DENSE: Krishna nagar, Old malakpet, mallapur road, Narsimha colny, Kanchan bagh
MEDIUM DENSE: NH9 road, Moosarambagh,, Shivam road, Osmania university, Tarnaka, Moula Ali
HIGH DENSE: Midhani Quarters, Hasthinapuram, Vanasthalipuram, Arundoya colony, LB nagar, RTC colony, SBI colony, Amberpet.

GUNTUR

LOW DENSE: Guntur sathenapalli road, Nalla cheruvu, sri brahma rambica cold storeges & industries, sangadigunta
MEDIUM DENSE: Sitaram nagar, manipuram colony, saradha colony, Guntur railway station
HIGH DENSE: Auto nagar, Bus stand, Muncipal complex, Brodipet, Kuritipadu, Mirchiyard, Amaravthi road

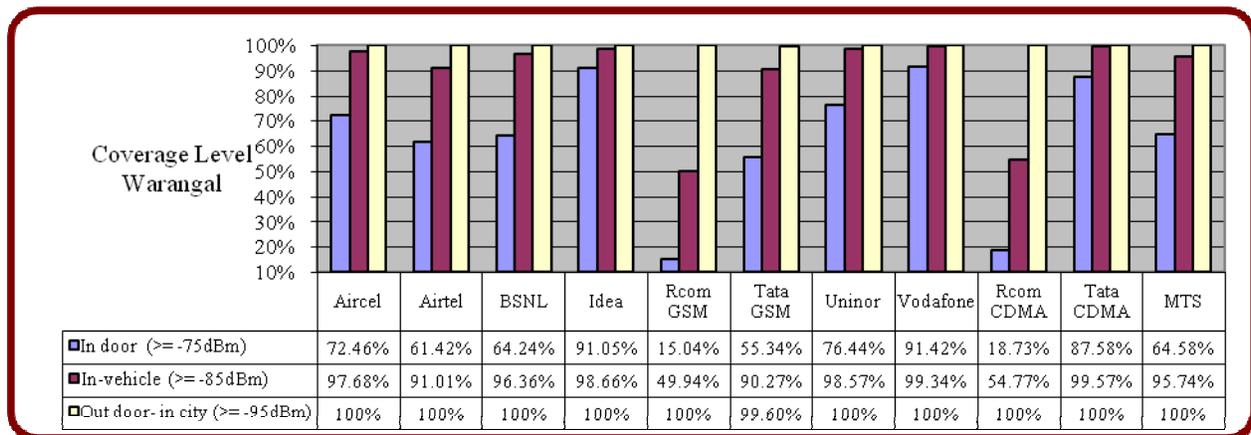
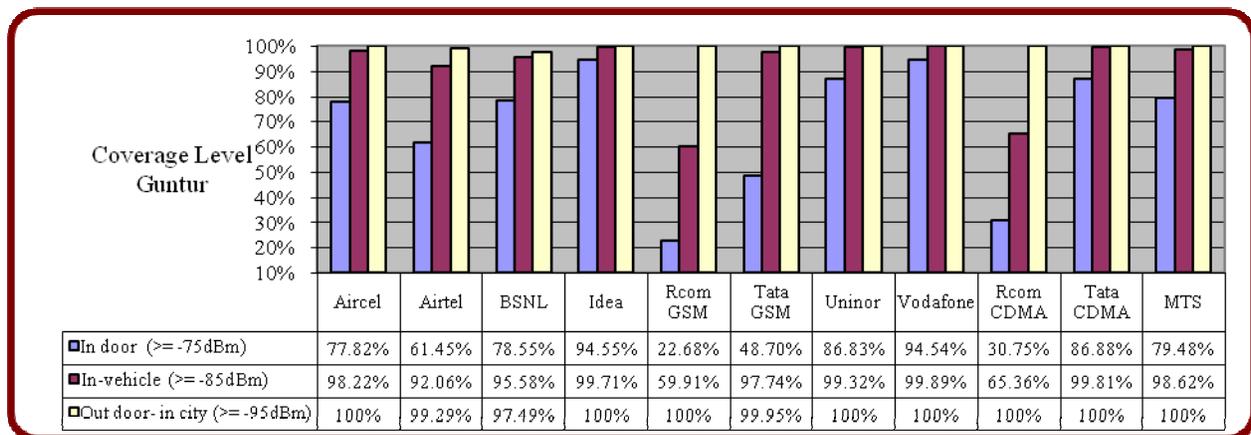
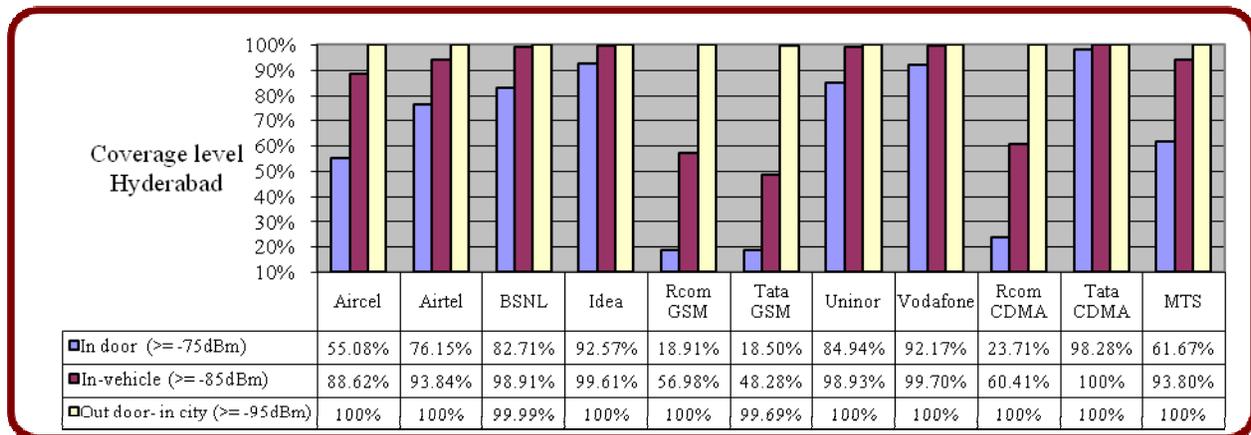
WARANGAL

LOW DENSE: Hasanparthy road, Nakkala gutta, Alluri PG college, Kareemabad
MEDIUM DENSE: Warangal fort area, kushal mahal, Warangal railway station, Girmajipeta, shiv nagar, Mulugu road
HIGH DENSE: Kazipet railway station, Sri kakathiya university, Kumarpally market, Hanmakonda chowrastha, NGOs Colony, Hanmakonda bus stand, Huntur road, Kashibugga, Pochamma maiden, JPN road, Battala bazar

Drive test measurements:

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vodafone	Rcom CDMA	Tata CDMA	MTS
			GSM Operators						CDMA Operators				
1.1	Call Attempts	Hyderabad	115	130	98	144	145	129	159	112	151	128	121
		Guntur	114	220	116	148	118	111	121	90	108	103	101
		Warangal	142	267	143	163	176	143	164	130	180	154	167
1.2	Blocked Call Rate (<=3%)	Hyderabad	1.74%	0.00%	2.04%	0%	2.07%	2.33%	0.00%	0.00%	0.66%	0.00%	0.00%
		Guntur	0.00%	0.00%	3.45%	1.00%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Warangal	0%	0.88%	2.10%	0.00%	1.70%	1.40%	0.00%	0.77%	0.00%	0.00%	1.83%
1.3	Dropped Call Rate (<=2%)	Hyderabad	0.00%	0.00%	4.08%	0.69%	0.69%	0.00%	0.00%	0.00%	0%	0.78%	0.82%
		Guntur	1%	0.00%	1.72%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Warangal	0%	0.00%	0.70%	0.00%	0.57%	0.00%	0.00%	0.00%	0.00%	0%	0.00%
1.4	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	Hyderabad									99.02%	98.88%	98.53%
		Guntur									98.55%	99.61%	99.64%
		Warangal									98.13%	99.27%	99.73%
	(ii) 0-5 (with frequency hopping)	Hyderabad	93.05%	97%	90.01%	96.30%	95.50%	90.34%	95.02%	96%			
		Guntur	95.45%	96.20%	94.55%	96.10%	96.91%	96.18%	95.22%	98.24%			
Warangal		95.15%	97.10%	93.03%	95.20%	96.20%	94.95%	95.47%	96.40%				
1.5	Service Coverage												
	In door (>= -75dBm)	Hyderabad	55.08%	76.15%	82.71%	92.57%	18.91%	18.50%	84.94%	92.17%	23.71%	98.28%	61.67%
		Guntur	77.82%	61.45%	78.55%	94.55%	22.68%	48.70%	86.83%	94.54%	30.75%	86.88%	79.48%
		Warangal	72.46%	61.42%	64.24%	91.05%	15.04%	55.34%	76.44%	91.42%	18.73%	87.58%	64.58%
	In-vehicle (>= -85dBm)	Hyderabad	88.62%	93.84%	98.91%	99.61%	56.98%	48.28%	98.93%	99.7%	60.41%	100%	93.80%
		Guntur	98.22%	92.06%	95.58%	99.71%	59.91%	97.74%	99.32%	99.89%	65.36%	99.81%	98.62%
		Warangal	97.68%	91.01%	96.36%	98.66%	49.94%	90.27%	98.57%	99.34%	54.77%	99.57%	95.74%
	Out door- in city (>= -95dBm)	Hyderabad	100%	100%	99.99%	100%	100%	99.69%	100%	100%	100%	100%	100%
		Guntur	100%	99.29%	97.49%	100%	100%	99.95%	100%	100%	100%	100%	100%
Warangal		100%	100%	100%	100%	100%	99.60%	100%	100%	100%	100%	100%	
1.6	Call Setup Success Rate (>=95%)	Hyderabad	98.26%	100%	97.96%	100%	97.93%	97.67%	100%	100%	99.34%	100%	100%
		Guntur	100%	100%	96.55%	99%	99.15%	100%	100%	100%	100%	100%	100%
		Warangal	100%	99.12%	97.9%	100%	98.3%	98.6%	100%	99.23%	100%	100%	98.17%

Graphical Representation:



(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:

- Aircel is showing deviation in “Connections with good quality” (93.05%) in Hyderabad.
- BSNL is showing deviation in “Block call rate” (3.45%) parameter in Guntur city and “drop call rate” (4.08%) parameter in Hyderabad city.
- BSNL is showing deviation in “Connections with good quality” parameter for all 3 cities.
- Tata GSM is showing deviation in “connections with good voice quality” (90.34%) in Hyderabad and (94.95%) in Warangal.

(E) Independent Drive Test

-- Submitted as a separate report

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

From live, month, PMR and Drive Tests findings, it can be concluded that on an average, performance of the operators in the service area (Andhra Pradesh) is satisfactory for **Network Parameters**. However, the benchmark of $\leq 5\%$ for “worst affected cells $> 3\%$ TCH drop” is not met by BSNL (3.35% for live audit data, 3.47% for month audit data), Etisalat (4.38% for live data) and Tata GSM (5.91% for live audit data, 3.98% for month audit data).

Regarding the POI Congestion, operators like Tata GSM, Uninor and Sistema (MTS) is not meeting the benchmark for live measurement & month of audit, remaining all operators are meeting the benchmark.

Under **Customer Service Quality Parameter**, “operator answered calls (voice-to-voice) within 60 seconds” parameter it is found that most of the operators are not fulfilling TRAI benchmark of $\geq 90\%$.

Regarding **Metering/Billing Credibility** issues, Tata GSM shows below benchmark value for Post-paid connections.

Regarding **Resolution of billing/charging complaints**, the idea & Tata GSM are showing the value below benchmark.

Regarding **period of credit/waiver adjustment to customers**, the Tata GSM is showing the below benchmark value.

Regarding **Termination/Closure of Service** issues, Tata GSM shows below benchmark with a value of 48.5% i.e., beyond 7days.

Regarding **Time taken for refund of deposits after closures** issues, Tata GSM shows below benchmark value.

During **Drive Tests**, the BSNL is showing below benchmark for “blocked call rate” & “drop call rate” Most of the GSM operators have below benchmark %age of connections with good voice quality.

II. Basic Telephone Service (Wireline) Providers

(A) Exchange Audit

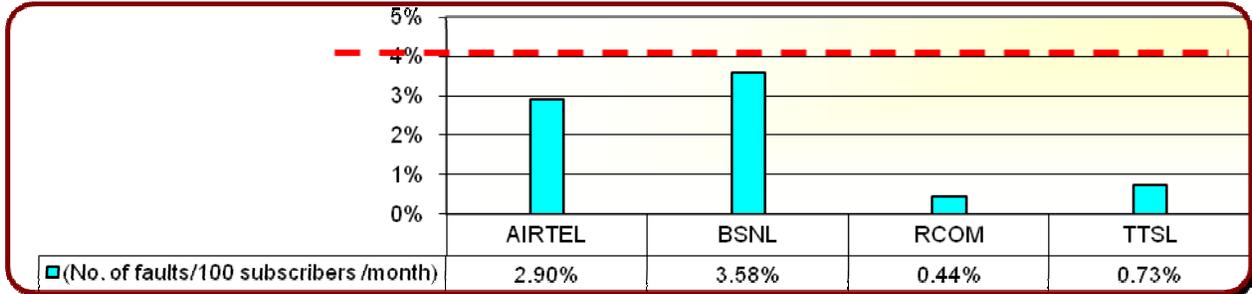
1) 3 days live data & One month audit comparative table

S/N	Name of Parameter	Bench mark	Audit	AIRTEL	BSNL	RCOM	TTSL
1	(No. of faults/100 subscribers /month)	< 5%	Month	2.90%	3.58%	0.44%	0.73%
2	Fault repair by next working day(Urban Area)						
a	By next working day	>90%	Month	97.00%	75.91%	100%	96.37%
b	Within 3 days	100%	Month	99%	88.85%	100%	99.73%
3	Fault repair by next working day(Rural & hilly Area)						
a	By next working day	>90%	Month	NA	94.67%	NA	NA
b	Within 5 days	100%	Month	NA	97.33%	NA	NA
4	Rent rebate						
a	Fault pending > 3 days & <7 days	Rebate for 7 days	Month	0	0	0	3
b	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Month	0	2	0	0
c	Fault pending > 15 days	Rebate for one month	Month	0	1	0	0
5	Mean time to Repair(MTTR)	<= 8 Hrs	Month	3.35	17.96	2.22	6.22
6	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55%(CCR) & > 75%(ASR)	Live	91.48%	45.77%	88.06%	97.88%
			Month	90.81%	55.14%	88.86%	98.81%
7	Metering and billing credibility(post paid)						
a	Disputed Bills over bills issued	< 0.1%	Month	0.50%	0.03%	0.01%	0.04%
8	% of billing complaints resolved within 4 weeks	Within 4 weeks	Month	100%	100%	100%	100%
a	Period of refunds after resolution of complaints within 1 weeks	Within 1 weeks	Month	100%	100%	100%	100%
9	POI Congestion	<= 0.5%	Live	0	0	0	0
			Month	0	0	0	0
10	Response Time to customer for assistance		Month				
a	Accessibility of Call centre within 40 sec.	>= 95%	Live	100%	99.00%	97.60%	99.00%
			Month	99.24%	98.48%	96.00%	97.76%
b	% age of calls answered by operator(voice to voice) within 60 sec.	>= 90%	Live	90.00%	99.00%	91.00%	91.00%
			Month	90.00%	98.48%	90.00%	92.64%
11	Customer care(promptness in attending to customers request		Month				
a	Termination / Closures	<= 7 Days	Month	NR	88%	100%	100%
b	Time taken refunds deposit after closures	100% within 60 days	Month	NR	NR	100%	100%

NA: Not Applicable, NR: Not Received

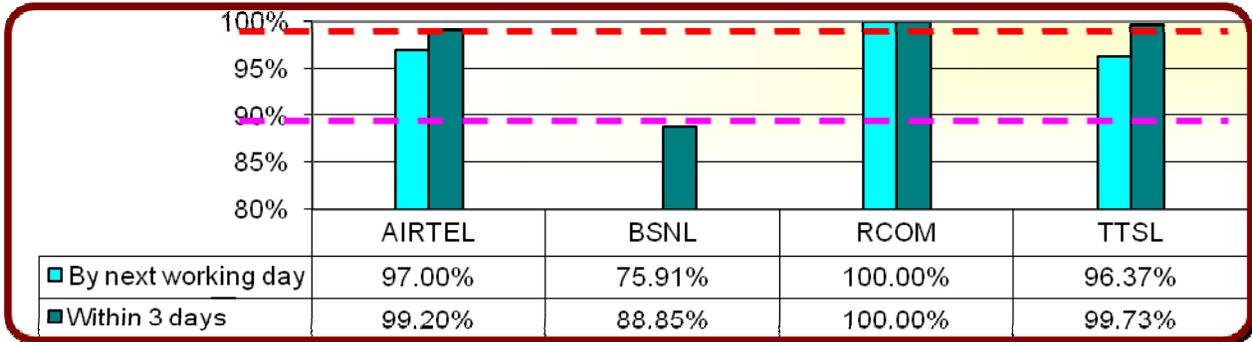
2) Performance (Graphical representation)

Fault incidences (No of faults/100 subscribers/month (<= 5): All the operators are meeting the benchmarks of 5%.



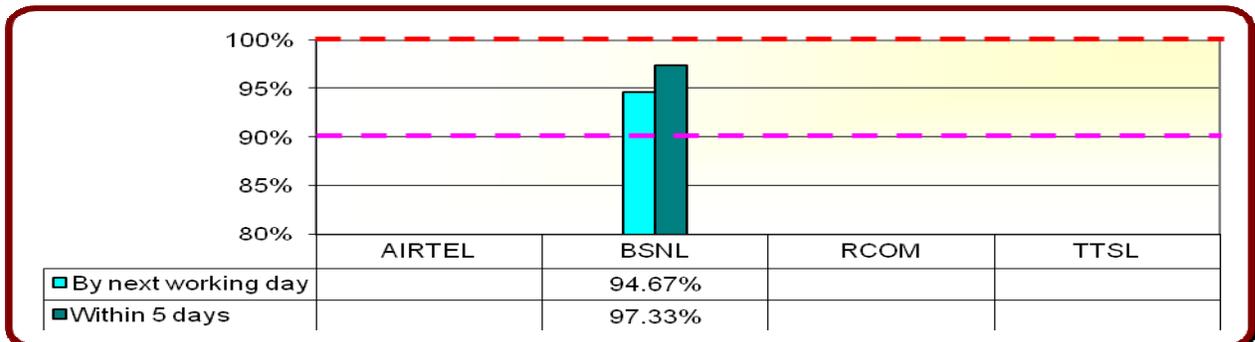
Fault Repair (Urban Area):

- **By next working day (>90%):** Except BSNL, All the operators comply with the TRAI benchmark of 90%.
- **Within 3 days (100%):** Except BSNL, All the operators comply with the TRAI benchmark of 100%.



Fault Repair (Rural & Hilly Area):

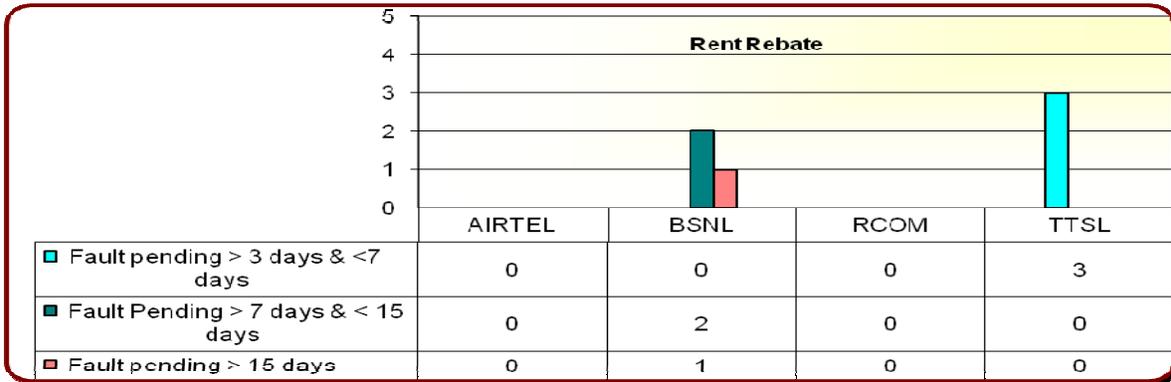
- **By next working day (>90%):** BSNL is meeting the benchmarks in Andhra Pradesh circle.
- **Within 5 days (100%):** BSNL is not meeting the benchmarks in Andhra Pradesh circle. Rest of the Operators reported has this parameter is not applicable.



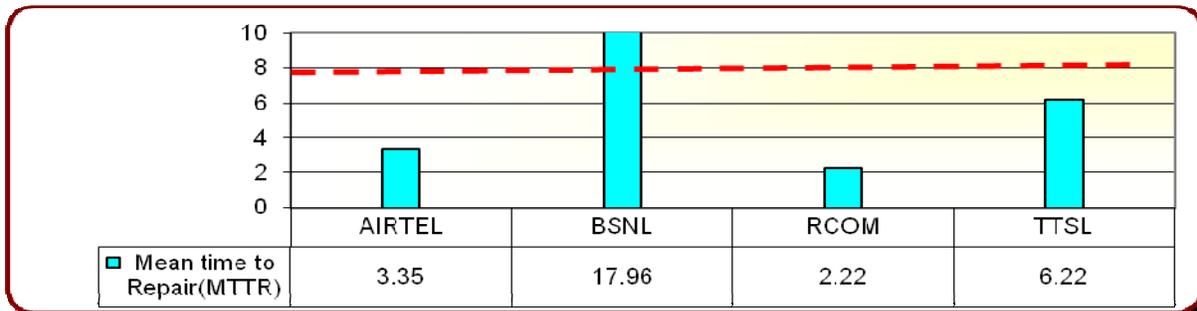
Rent Rebate

- Faults pending for > 3 days & < 7 days (Rebate 7 days): As far as rebate is concerned, TTSL has given rebate for 3 customers. BSNL, Airtel & RCOM do not have any rebate case.

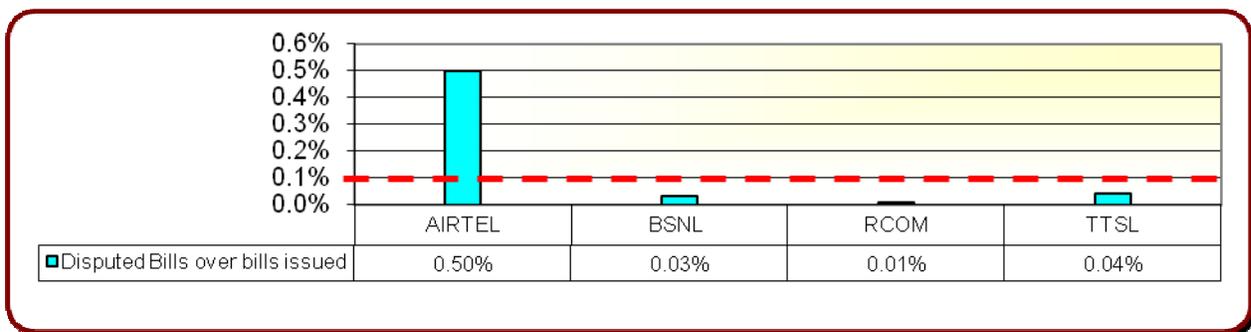
- b) Faults pending for > 7 days & < 15 days (Rebate 15 days): As far as rebate is concerned, BSNL has given rebate to 2 customers. Airtel, RCOM & TTSL do not have any rebate case.
- c) Faults pending for > 15 days (Rebate one month): As far as rebate is concerned, BSNL has given rebate to 1 customer. Airtel, RCOM & TTSL do not have any rebate case.



Mean Time to Repair (MTTR) (<= 8 Hrs): Except BSNL, all the operators comply with the TRAI benchmark.

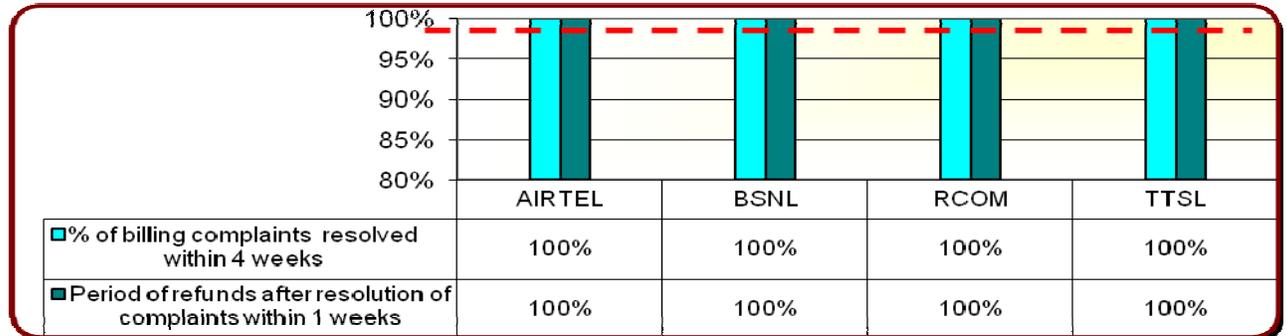


Metering and Billing Credibility (< 0.1%): Disputed Bills over Bills issued: - Except Airtel, All the operators comply with the TRAI standard.



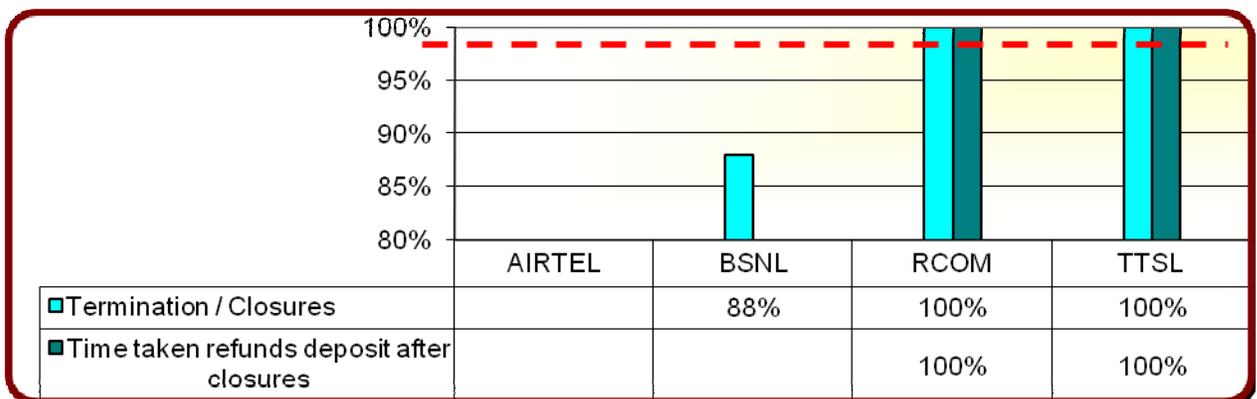
% of Billing Complaints resolved within 4 Weeks: All the operators have resolved billing complaints 100% (benchmark) within 4 weeks.

Period of All refunds / Payments from the date of Complaints Within 1 week: As far as period of refunds from the date of complaints within 1 week, all the operators are meeting the benchmark of 100%.

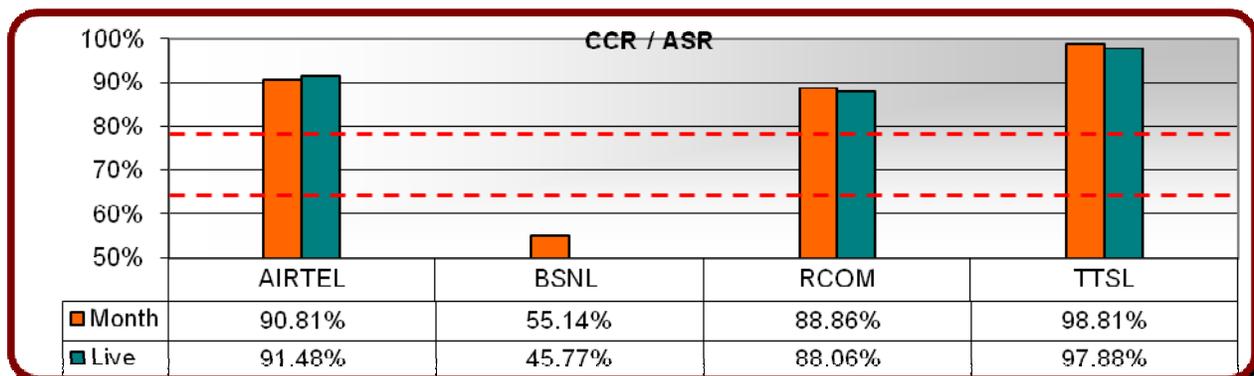


Customer Care Promptness in Attending Customer Request:

Termination / Closures :(<= 7 Days): All the operators are meeting the benchmarks except BSNL (88%) for “termination/closure of services” provided by TRAI within 7 Days.

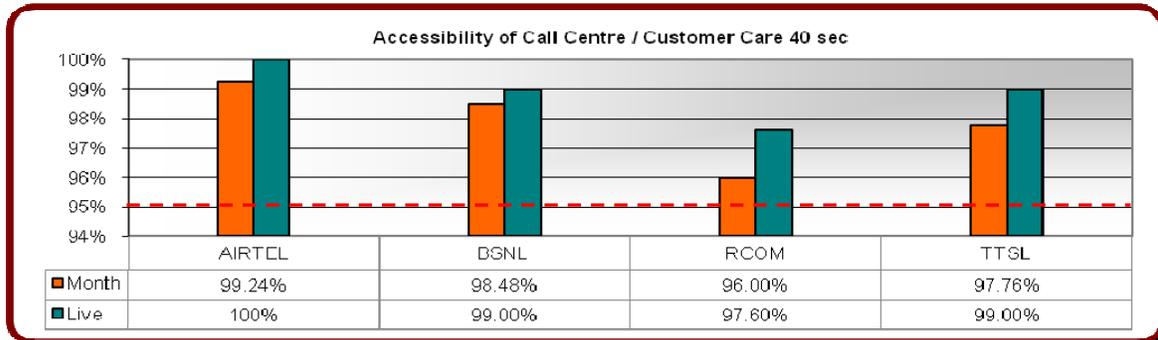


Call Completion Rate (>55%) & Answer to Seizure (>75%): The performance based on live measurement as well as One-Month Data match for all operators and they meet the benchmarks except BSNL.

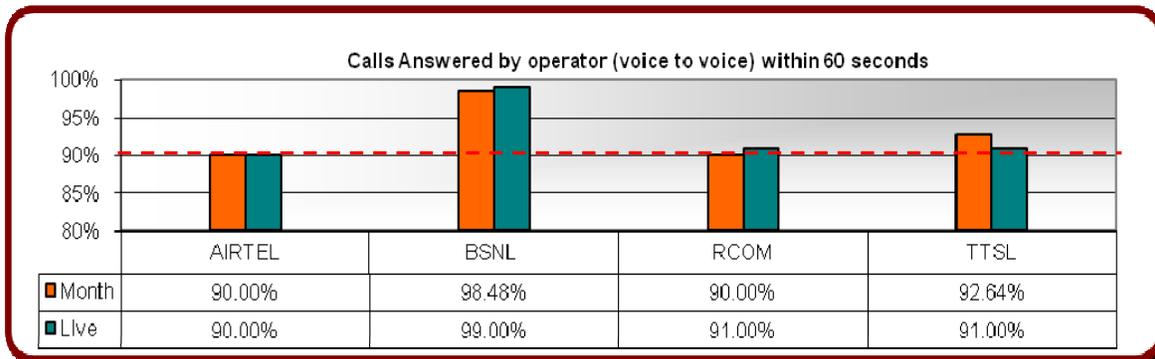


Response time to the customer for assistance:

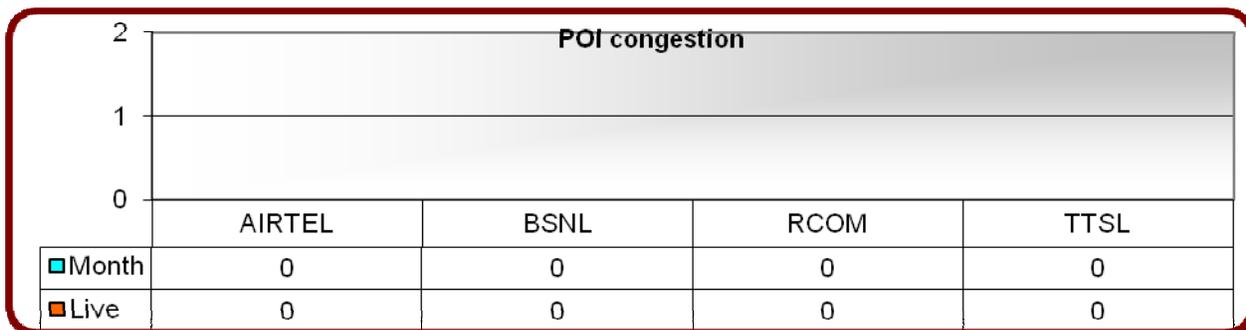
- Accessibility of Call Centre / Customer Care 40 sec (> 95 %):** All the operators are meeting the benchmark in live audit.



- (ii) 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.



POI Congestion (< 0.5%): All operators are meeting the benchmark value for both live audit & month audit data.



3) Customer Care & Grievances Redressal

S.N.	Parameters	AIRTEL	RCOM	TTSL
1	Total no of complaints received in the call centre (Tech+ Non Tech)	4175	386	1198
2	Nodal Officer			
2.1	Total no of complaints received by the nodal officers	19	0	0
2.2	Percentage of complaints with reference to total no of complaints received at the call centre	0%	0	0
3	Appellate Authority			
3.1	Total no of appeals received by the appellate authority	27	0	0
3.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	142%	0	0

4) Level 1 live calling

Emergency no.	No. of calls made	HYDERABAD				WARANGAL				VISAKHAPATNAM			
		BSNL	AIRTEL	RCOM	TATA	BSNL	AIRTEL	RCOM	TATA	BSNL	AIRTEL	RCOM	TATA
100	4	4	4	4	4	4	4	4	4	4	4	4	4
101	5	5	5	5	5	5	5	5	5	5	5	5	5
102/108	4	4	4	4	4	4	4	4	4	4	4	4	4

Calls made on Emergency no's were connected for all the operators.

5) Critical Analysis:

Fault incidence:

All the four operators are meeting the benchmarks of 5%.

Fault Repair (Urban Area): It is found that, all the operators are meeting the benchmarks of $\geq 90\%$ set for faults repair by the next working day except BSNL with a value of 75.91% and similarly except BSNL with a value of 88.85% all operators are meeting the benchmarks of $\geq 100\%$ for faults repair within 3 working days. Through live calling the fault repair within 24 hours data was verified and found that almost all the operators are better than 95% in customer satisfaction. While verification of records of service providers it was found that all the service providers are providing rebates as per TRAI norms.

Fault Repair (Rural & Hilly Area): All the four operators are meeting the benchmark.

Rent Rebate: Only BSNL, TTSL are providing Rent Rebate and for AIRTEL and RCOM having no rebate cases in the month of audit.

Mean Time to Repair (MTTR): It is found that, except the BSNL with a value of (17.96hrs) all the operators are meeting the benchmark of < 8 hrs fixed by TRAI during one month audit.

Call Completion Rate (CCR): Except BSNL, all the service providers are found to be meeting TRAI benchmark of $> 55\%$ for Call Completion Rate (CCR) and $> 75\%$ for Answer to Seizure Ratio for the month of audit data verification. However in the case of Reliance, the Answer Seizure Ratio (ASR) is measured in place of Call Completion Rate (CCR) and the firm claims that the same is a better indicator for the kind of network owned by the Reliance.

Metering and billing credibility: Except the Airtel with a value of 0.5%, remaining all three operators are meeting the benchmark of less than 0.1% billing complaints over the total number of bills issued.

% of Billing complaints Resolved Within 4 Weeks: As per the findings for one-month data audit, all the operators were found 100% resolution of complain within 4 weeks.

Period of All refunds/Payments from the date of resolution within 1 Week: As per the findings for one-month data audit, all the operators were found 100% refunds from the date of resolution within 1 week respectively.

POI Congestion: All the operators are meeting the benchmarks in POI Congestion set by TRAI ($< 0.5\%$) in one month data Audit.

Response Time to Customer for Assistance:

1. **Accessibility of Call Centre/ Customer care within 40 seconds (Electronically):** All the operators are meeting the benchmarks of $\geq 95\%$.
2. **% 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:** Except for BSNL with a value of 88%, all the operators are meeting the TRAI benchmarks of 100% within ≤ 7 days for closure requests and for Airtel, no such cases of terminations found during the 1month audit.
- ii. **Time taken for refund of deposits after closure:** All the operators are providing the refund to the customers within the benchmark time limit.

(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 there is consistency in the parameters. Also for each parameter trend's can be analysis comparing both type of data. 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, thus helping out TRAI to achieve its goal.

AIRTEL

In the Network Section, both the network parameters of AIRTEL are meeting the benchmark with a value of 90.81% and 0% for Call Completion Ratio and POI congestion respectively within the local network. AIRTEL is also meeting the benchmark for 'Response Time to Customer for Assistance' for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement. But for "metering and credibility (post paid)" parameter, the Airtel is not meeting the benchmark with a value of 0.5%.

BSNL

BSNL is not meeting the benchmarks set for Fault Repair/Restoration by next day/within 3 days for Urban areas and within 5 days for Rural/Hilly areas. Its MTTR is very high (17.96 hrs) and CCR is low (live audit: 45.77%). It has terminated 88% connections in 7 days' stipulated time.

RCOM

In the Network Section, both the network parameters of Reliance are meeting the benchmark with a value of 88.86% and 0% for Call Completion Ratio and POI congestion respectively within the local network. Please note that Reliance have provided with ASR (Answer to Seizure ratio) value in case of call completion ratio. Reliance is meeting the benchmark for Response Time to Customer for Assistance for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement.

TTSL

In the Network Section, both the network parameters of TTSL are meeting the benchmark with a value of 98.81% and 0% for Call Completion Ratio and POI congestion respectively within the local network. TTSL is also meeting the benchmark for 'Response Time to Customer for Assistance' for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement.

III. Broadband Service Providers

(A) POP Audit

1. 3 days live and One month audit comparative table

S/N	Parameters	B-marks	Audit	Airtel	BSNL	Hathway	Rcom	Sify	TCISL	Tikona	You telecom	
1	<i>Service Provisioning / Activation Time</i>											
	100% cases in 15 days (subject to technical feasibility)	<15 days	Month	100%	99.7%	100%	100%	100%	99%	100%	99.79%	
	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/day.		0	0	0	0	0	0	0	0	
2	<i>Faults Repair/Restoration Time</i>											
	By next working day	>90%	Month	95.05%	98.00%	91%	100%	59.30%	NP	93%	87.82%	
	within 3 working day	≥99%		100%	100%	98%	100%	98.50%	NP	99%	96%	
2.1	<i>Rebate</i>											
	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	0	89	0	77	17	NP	97	
	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	13	0	13	0	NP	30	
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)			0	11	119	0	3	0	NP	2	
3	<i>Billing Performance</i>											
	Billing complaints per 100 bills issued	<2%	Month	0.00%	0.00%	1.98%	0.06%	NA	NP	NP	1%	
	%age of complaints resolved within 4 weeks	100%		100%	100%	100%	100%	100%	NA	NP	NP	100%
	Time taken for refund of deposits after closure (within 60 days)	100%		NP	100%	100%	100%	100%	NA	NP	NP	100%
4	<i>Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)</i>											
	within 60 sec	>60%	Live	80.00%	80.00%	69.00%	87%	99.00%	95%	NP	90.00%	
			Month	88.00%	80.00%	88.00%	93.00%	98.97%	97%	NP	82.00%	
	within 90 sec	>80%	Live	84%	91.00%	77%	90%	98.00%	100%	NP	88.00%	

S/N	Parameters	B-marks	Audit	Airtel	BSNL	Hathway	Rcom	Sify	TCISL	Tikona	You telecom
			Month	92.00%	91.00%	93.00%	95.00%	90.28%	98%	NP	86.00%
5	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this addition 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)	< 80%	Live	2.55%	NP	7.00%	46.56%	45.00%	46.67%	24.05%	NA
			Month	NP	NP	7.00%	17.97%	48%	44.00%	35.21%	NA
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	Live	24.74%	NP	93.00%	NP	86.00%	76.67%	84.97%	76.1%
			Month	NP	NP	78.00%	NP	87.00%	75.00%	87.43%	78.4%
5.3	Broadband Connection Speed (download) - from ISP Node to User	> 80%	Live	100%	NP	85.00%	100%	93.02%	89%	NP	90.25%
			Month	100%	NP	86.00%	NP	94.06%	NP	NP	86.38%
6	Service Availability/Uptime (for all users)										
6.1	Service Availability(%)	>98%	Live	100%	100%	100%	100%	100%	NP	99.31%	100%
6.2			Month	99.99%	100%	100%	100%	100%	NP	99.20%	98.27%
7	Packet loss										
	% of Packet loss	<1%	Live	0.00%	NP	0%	0%	0%	0.00%	0%	0%
			Month	0.00%	NP	0%	0.15%	0%	0%	0%	0%
8	Network latency (for wired broadband access)										
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	Live	72.3	NP	17	NP	2.7	15	1.2	2.0
			Month	74	NP	17	NP	4.0	NP	1.3	9.0
8.2	User reference point at ISP Gateway node to Intertiol nearest P port abroad (terrestrial)	<350 ms	Live	284	NP	292.3	NA	58.67	248.67	235	246
			Month	309	NP	290	NA	58	NP	235	276
8.3	User reference point at ISP Gateway node to Intertiol nearest P port abroad (satellite)** See note below	<800 ms	Month	NA							

NA: Not Applicable, NP: Not Provided

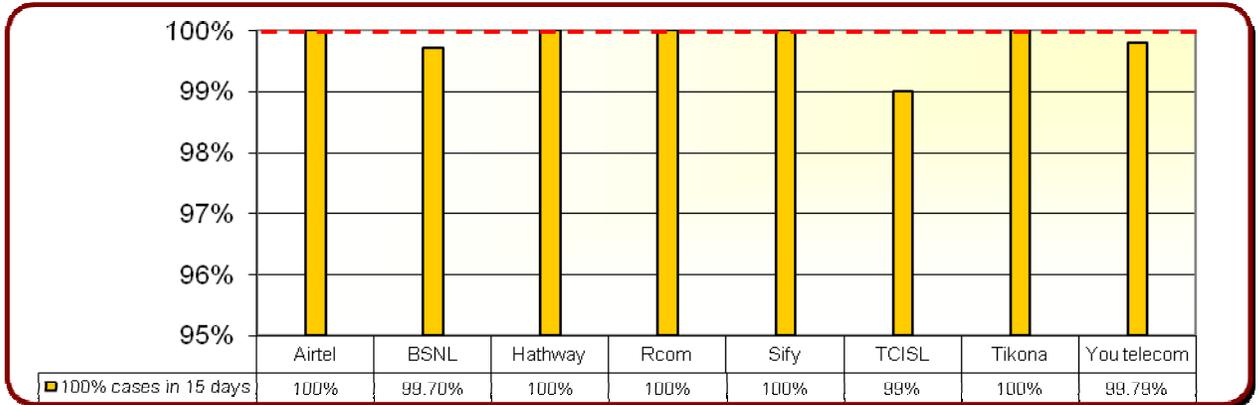
Note:

- Sl. 3 is Not Applicable for Sify since it has only pre-paid customers.
- Sl. 5.1 is Not Applicable for You telecom since its POP & ISP GW are co-located.
- Sl. 8.3 is Not Applicable to all the operators since no operator has satellite connectivity.
- Sl. 8.2 is Not Applicable for Rcom since its ISP gateway is in Mumbai, Delhi, Chennai & Calcutta and hence, there is no direct upstream link for AP circle.
- Beam Telecom & Spectranet didn't respond to our audit requests.

2) Performance (Graphical representation)

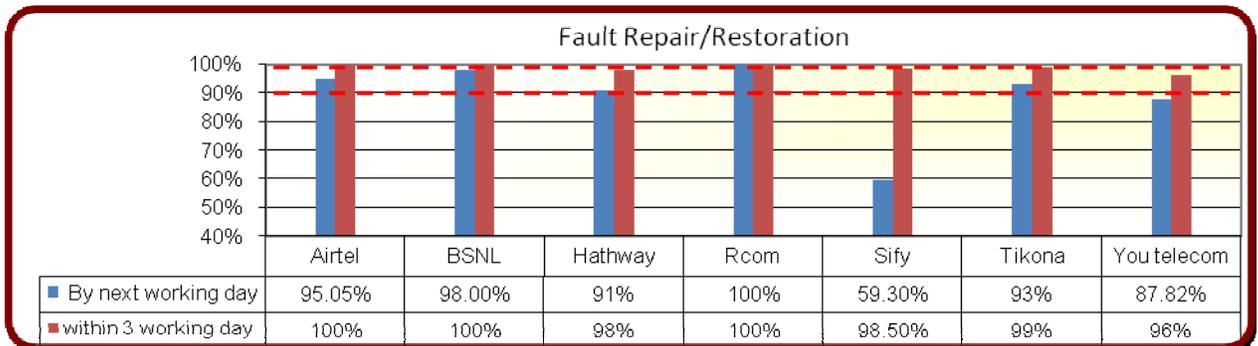
Service Provisioning /Activation Time: (Should be 100%)

All the operators are complying with the TRAI benchmark of 100% except TCISL, You Telecom & BSNL.



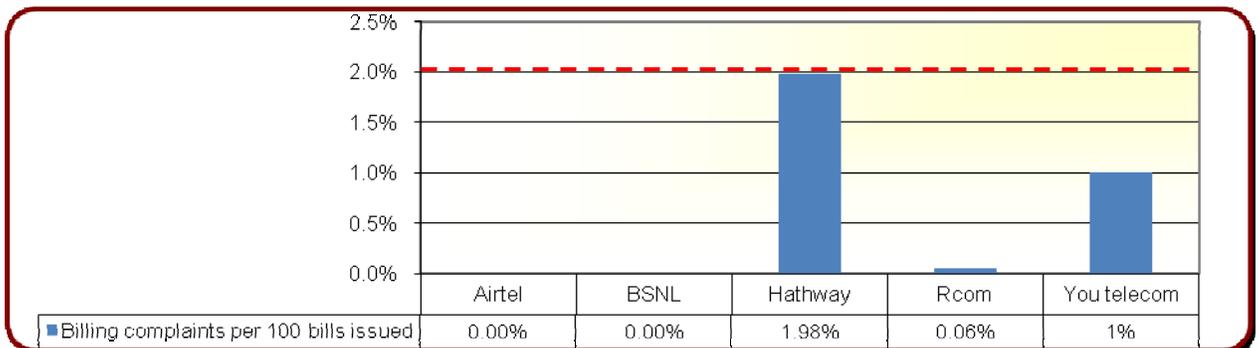
Fault Repair / Restoration Time:

- **By next working day (>90%):** Except Sify & You telecom, all the operators are complying with the TRAI benchmark of 90%.
- **Within 3 working days (>99%):** Hathway, Sify & You telecom are not meeting the benchmarks with values of 97.68%, 98.5%, 98.85%, 96.49% respectively.
- **Rebate:** All the operators are giving rebate to the eligible customers.



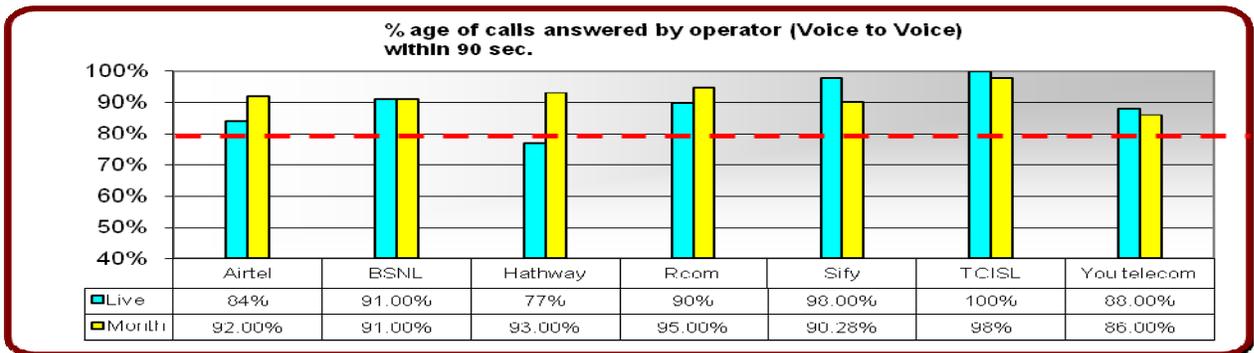
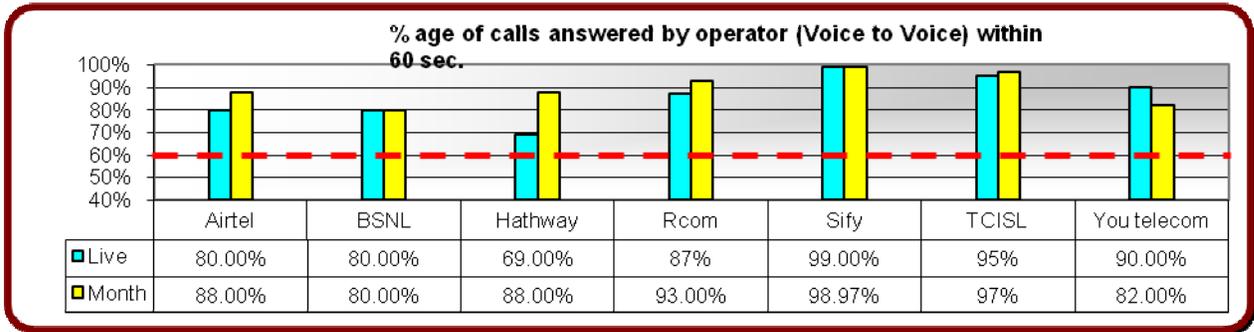
Billing Performance: (Benchmark <2%)

All the operators are meeting the value within the TRAI benchmark



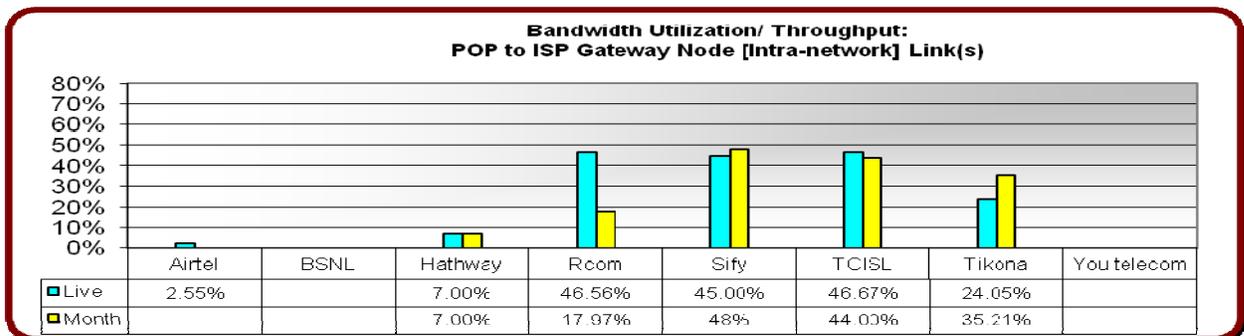
Response time to the customer for assistance: % age of calls answered by operator (Voice to Voice)

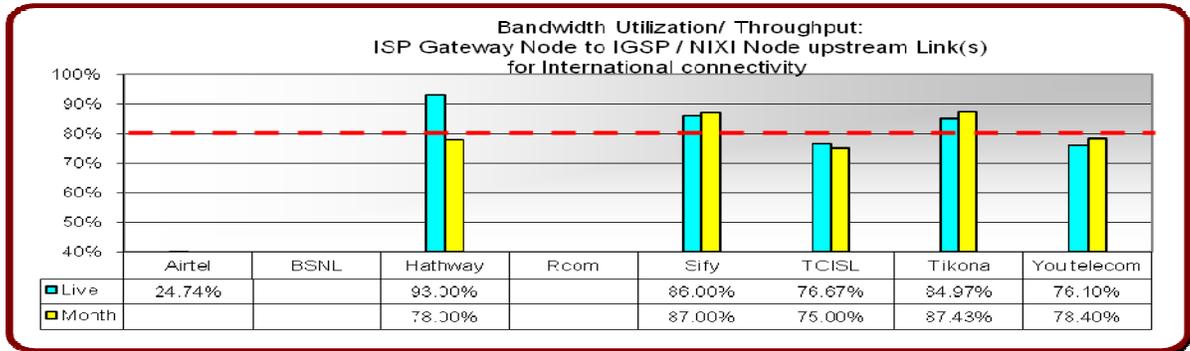
- **Within 60 seconds (>60%):** All the operators are meeting the benchmark in both live and one month data verification.
- **Within 90 seconds (>80%):** Except Hathway for live audit, all the operators are meeting the benchmark in both live and one month data verification.



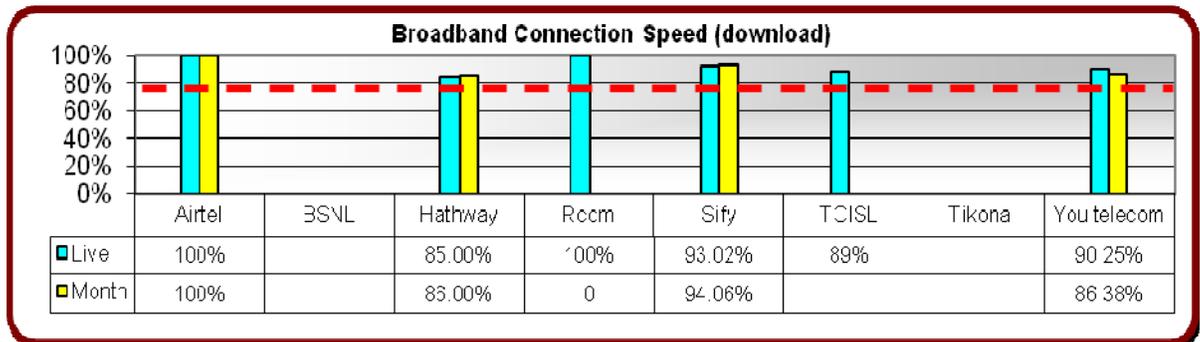
Bandwidth Utilization/ Throughput:

- **POP to ISP Gateway Node [Intra-network] Link(s): (Benchmark <80%):** All the operators are meeting the benchmarks in both live and one-month data verification.
- **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 except Sify, Tikona for both month & live audit data and Hathway for live audit data.

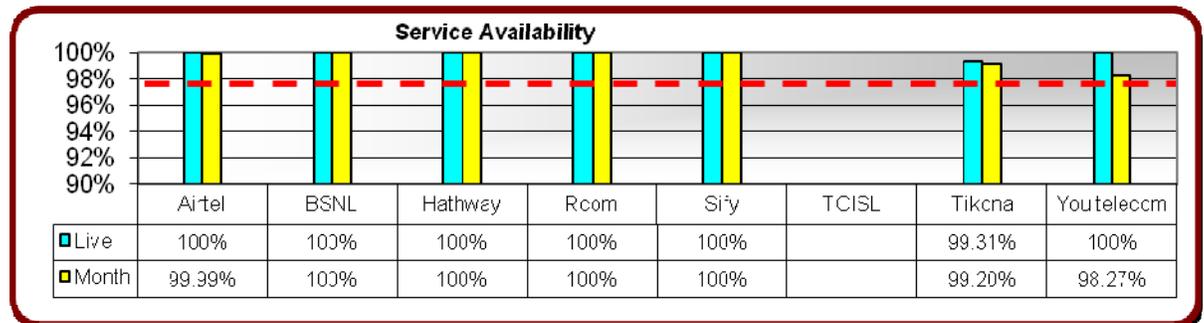




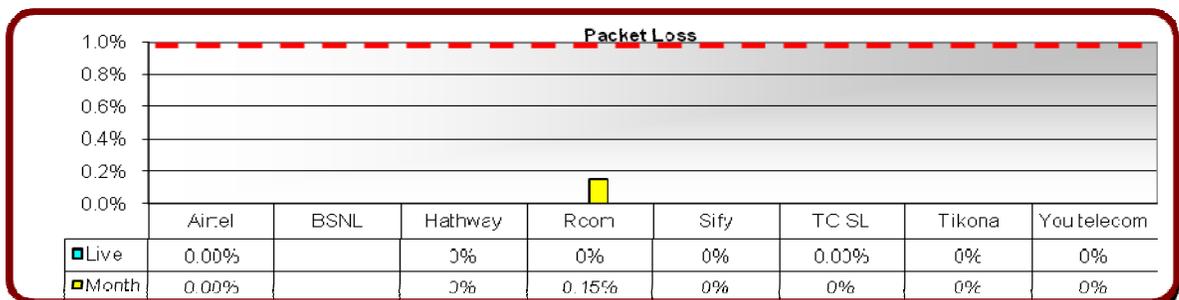
Broadband Connection Speed (download) (>80%): All the operators are meeting the TRAI benchmark of greater than 80% connection in both live and one-month data verification



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

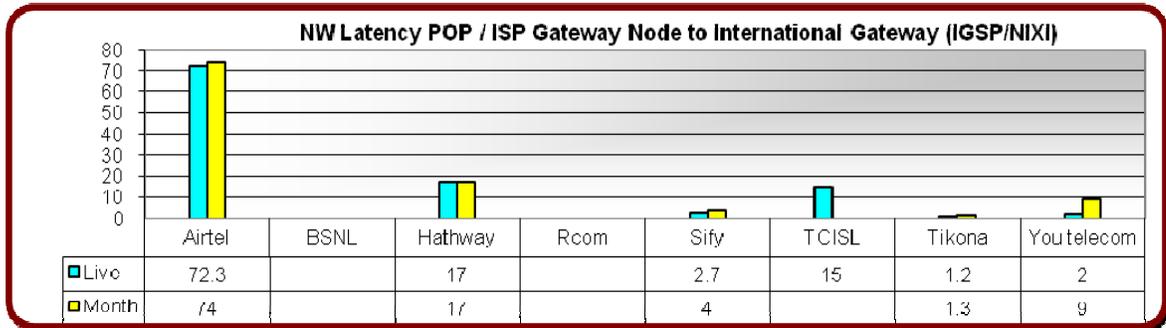


Packet Loss (Should be less than 1%): All operators are meeting the benchmark in both live and one-month data verification.

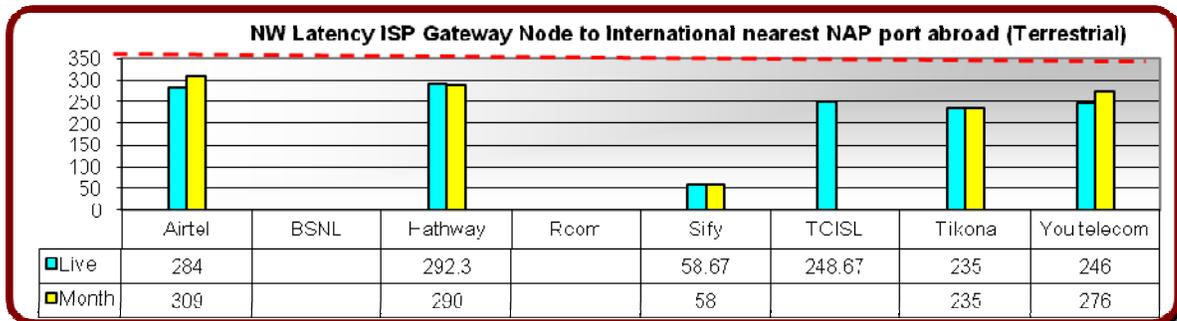


Network Latency:

- **User reference point at POP/ISP gateway node to international gateway (IGSP/NIXI) <120 ms:** All 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 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 (Satellite) <850 ms:** The Satellite link does not exist with any of the operator, hence the parameter “User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)” is not applicable to the operators.

3) Customer Care & Grievances Redressal

Call centre	Airtel	Hathway	Rcom	Sify	TCISL	You telecom
Total complaints received in Call centre	3349	42539	536	205	2100	3679
Total complaints received by nodal officers	11	91	0	0	14	30
% tage of complaints receivd by Nodal officer w.r.t to total complaints at call centre	0.33%	0.21%	0	0	1.00%	0.82
Total complaints redressed with in specified time limit, by Nodal officer	NP	NA	0	NA	NP	0
Total appeals received by appellate authority	8	11	0	4	0	11
Percentage of appeal received with referene to total no of complaints received by the nodal officers	0.24%	0.02%	0	0.04	0%	0.3
Total no of appeals decided within 3months	NP	NA	0	NA	NP	NA

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

4) 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 service providers are performing well and meeting the benchmarks for service provisioning except TCISL, BSNL & You Telecom.

Fault Repair/Restoration time & Rebate: All the operators are meeting benchmark of more than 90% fault repair by next working day except Sify & You Telecom. The benchmark of >99% is also met by all the operators except Sify, You Telecom & Hathway.

Billing performance: All the operators are meeting the benchmark of less than 2% for billing complaints. Also all the operators are meeting the benchmark of 100% for “billing complaint resolution” & “time taken for refund of deposits after closure.

Customer Care/Helpline Assessment: Except for Hathway with a value of 77% in live audit (operator assistance within 90sec), all the service providers are meeting the benchmark for the parameters response time to the customer for assistance (Voice to Voice).

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 live audit except Sify, Tikona & Hathway. For the month data verification, all the operators were found to be meeting the benchmark.

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

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 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 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 all the operators.

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

AIRTEL

Airtel is meeting all the benchmarks but has not provided data for a few parameters like “time taken for refunds after closure”, “BW utilization for POP-ISP GW and ISP GW – IGSP/NIXI”.

BSNL

BSNL is found to be meeting all the benchmarks but has not provided data for a few parameters like “BW Utilization”, “broadband connection speed”, “Packet loss” & “Network latency”.

Hathway

Hathway is meeting all the benchmarks except Fault repair within 3 days, Response time to customer for assistance within 90sec. (live audit) and BW Utilization for ISP GW - IGSP/ NIXI Node upstream links (Live audit).

RCom

Reliance is meeting all the benchmark but has not provided data for a few parameters like “BW Utilization for ISP GW - IGSP/ NIXI Node upstream links”, “Broadband connection speed (month)” and “Network latency”.

SIFY

Sify is meeting all the benchmarks except “ISP Gateway Node to IGSP/ NIXI Node upstream links for International connectivity”. Billing performance related parameters are not applicable to Sify since it has all its customers under pre-paid module.

TCISL

TCISL is meeting all the benchmarks except “Service Provisioning/activation time”. It has not provided data for a few parameters like “Fault Repair”, “billing performance”, “Service availability”, “Broadband connection n speed (month)”, “service availability” & “Network latency (month)”.

TIKONA

Tikona is not provided the data for “Rebate”, “billing performance”, “response time to customer for assistance” and “ISP Gateway Node to IGSP/ NIXI Node upstream links for International connectivity”.

You telecom

You telecom is meeting all the benchmarks except “service provisioning” and “fault repair”. The parameter “BW Utilization for POP-ISP GW” is not applicable to it since its POP and ISP GW are co-located.