

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

BASIC (WIRELINER) SERVICE,

CELLULAR MOBILE TELEPHONE SERVICE

&

BROADBAND SERVICE

FOR

NORTH ZONE – DELHI NCR CIRCLE

Report Period: Jan 2011 – March 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.

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 Delhi NCR circle. But for parameters such as ‘Worst affected cell exceeding 3% TCH drop’ and ‘BTSs accumulated down time’ CBBH (Cell Bouncing Busy Hour) was taken instead of TCBH (Time Consistent Busy Hours) as per the TRAI new regulation 2009. This has resulted in high value for ‘Cell exceeding 3% TCH drop’ parameter for some of the service providers.
- ✓ For Basic Wireline Service, the Network parameter of the QoS TRAI regulations is observed / verified for the 3 days for nearly 5% of the telephone exchanges covering 10% of the SDCA in a Service area.
- ✓ Also, for Broadband Services, 5% of the POPs (Point Of Presence) in 10% of the SDCA were audited for the relevant details from the centralized NOC or through a remote access to the NOC. The network parameter was also checked from the centralized NOC. 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 in Delhi NCR Circle in 1st quarter (January – March 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period July – September 2010.

Following are the various operators covered in Delhi NCR circle (North 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	Feb	1800 - 1900 hrs
2	Airtel Ltd	Mar	1900 - 2000 hrs
3	Etisalat	Mar	2000 - 2100 hrs
4	Idea Cellular	Feb	1900 - 2000 hrs
5	MTNL	Mar	1900 - 2000 hrs
6	RTL(GSM)	Jan	1900 - 2000 hrs
7	Vodafone	Feb	1900 - 2000 hrs
CDMA Operators			
8	Reliance Communication (CDMA)	Jan	1900 - 2000 hrs
9	Tata Communications (CDMA)	Mar	2000 - 2100 hrs
10	MTS	Feb	1900 - 2000 hrs

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

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

3 days Live Data Audit		Bench- mark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
S/N	Name of Parameter											
1	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	97.93%	99.87%	96.64%	97.50%	99.69%	99.67%	98.90%	98.20%	99.29%	99.03%
	b) SDCCH/PAGING congestion	<=1%	0.05%	0.04%	0.56%	0.16%	0.40%	0.10%	0.53%	0.00%	0.02%	0.00%
	c) TCH congestion	<=2%	0.02%	0.03%	0.09%	0.64%	0.84%	0.36%	0.92%	0.19%	0.00%	0.50%
2	Connection maintenance (retainability)											
	a) CDR	<=2%	0.90%	0.60%	1.23%	2.71%	0.76%	0.39%	1.26%	1.14%	0.22%	0.80%
	b) Worst affected cells>3% TCH drop	<=5%	2.94%	0.92%	4.92%	25.65%	1.95%	1.02%	4.68%	2.85%	0.77%	2.74%
	c) Good voice quality	>=95%	97.08%	99.13%	NA	96.77%	98.27%	98.20%	97.89%	NA	99.11%	NA
3	No of POIs not meeting benchmark	<=0.5%	0	3	0	3	0	0	0	0	0	0
4	Response time to customers for assistance											
	a) Accessibility of call centre/Customer Care	>=95%	98.0%	99.9%	100%	99.0%	99.0%	100%	100%	94.8%	96.4%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	98.0%	55.3%	99.6%	99.3%	95.4%	94.0%	94.2%	73.7%	86.0%	92.0%

NA: Not Applicable, NR: Not Received

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters by and large. In case of Network parameters Etisalat is not meeting the benchmark for “call drop rate” & “Worst affected cells>3% TCH drop” with the value of 2.71% & 25.65% respectively. MTNL, Rcom CDMA & Tata CDMA did not submit the value as the same is not system generated. Airtel & Etisalat were found to have 3 POIs each with more than 0.5% congestion.

Performance related to customer care data is not found to be satisfactory for Airtel, Tata CDMA & MTS for the parameter “calls answered by operators (voice-to-voice)”. They have scored the respective values of 55.3%, 73.7% & 86% which are quite low as compared to the benchmark of 90% and thus immediate attention is required for improvement. “Accessibility of call centre” is not met by Tata CDMA.

One Month Data Audit		Bench- mark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
S/N	Name of Parameter		GSM Operators							CDMA Operators		
(A)	Network Service Quality Parameter											
1	Network Availability											
	a) BTS Accumulated Downtime	<=2%	0.12%	0.00%	1.97%	2.15%	0.00%	0.60%	0.00%	0.01%	0.11%	0.25%
	b) Worst affected BTSs due to downtime	<=2%	0.33%	0.01%	0.30%	13.74%	0.07%	0.36%	0.05%	0.00%	0.14%	0.12%
2	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	98.03%	99.88%	97.21%	97.06%	99.69%	99.68%	98.45%	98.31%	99.29%	98.78%
	b) SDCCH/PAGING congestion	<=1%	0.06%	0.03%	0.10%	0.39%	0.55%	0.17%	0.65%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.06%	0.03%	0.03%	0.74%	0.97%	0.62%	1.30%	0.12%	0.00%	0.76%
3	Connection maintenance (retainability)											
	a) CDR	<=2%	0.91%	0.58%	1.60%	2.65%	0.76%	0.38%	1.21%	0.89%	0.22%	0.81%
	b) Worst affected cells>3% TCH drop	<=5%	2.67%	0.87%	4.66%	25.05%	2.03%	0.93%	4.82%	1.93%	0.94%	2.83%
	c) Good voice quality	>=95%	96.95%	99.08%	NA	96.71%	98.27%	98.25%	97.91%	NA	98.9%	NA
4	No of POIs not meeting benchmark	<=0.5%	0	3	0	3	0	0	0	0	0	0
(B)	Customer Service Quality Parameters											
5	Metering/billing credibility-Post paid	<= 0.1%	0.09%	0.02%	N/P	N/A	0.00%	0.09%	0.01%	0.01%	N/A	0.08%
6	Metering/billing credibility-Pre paid	<= 0.1%	0.04%	0.08%	0.03%	1.60%	0.00%	0.10%	0.03%	0.12%	0.41%	0.10%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	88%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance											
	a) Accessibility of call centre/Customer Care	>=95%	98.00%	99.99%	100.00%	97.00%	99.00%	100%	100%	94.83%	99.27%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	98.00%	55.33%	99.59%	99.00%	80.88%	69.00%	99.10%	73.65%	91%	88.00%
9	Termination/closure of service	<=7days	100%	100%	100%	N/A	100%	100%	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	59%	100%	N/A	100%	100%	100%	96%	100%	100%

NA: Not Applicable, NR: Not Received

From the month data assessment, it is found that all the operators are meeting the network parameters by and large. Deviations are found under the Network Parameter for the parameters like 'BTS Accumulated Downtime', 'Worst affected BTSs due to downtime', 'Call Drop Rate' and 'Worst affected cells>3% TCH drop' for Etisalat only. Airtel & Etisalat were found to have 3 POIs each with more than 0.5% congestion.

Performance related to customer care data is not found to be satisfactory for most of the operators especially for the parameter “calls answered by operators (voice-to-voice)”, with only Aircel, MTNL, Vodafone and MTS meeting the 90% benchmark.

For 'Resolution of billing/ charging complaints', Idea is found not meeting the benchmark of 100% and in case of 'Time taken for refund after closures' Airtel and Tata are falling short of benchmark of 100%. Metering credibility for Pre-paid connections is low for Etisalat, MTS & Tata CDMA.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted in and around Delhi for all the operators. Route covered was about around 200Km and for all the operators the same route was followed. The speed limit of 30Km/hr was maintained through out the Drive Test. In Delhi NCR, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
1.1	Blocked Call Rate (<=3%)	Delhi NCR	0.00%	0.01%	7.73%	1.08%	1.2%	0.02%	1.8%	0.012%	0%	0%
1.2	Dropped Call Rate (<=2%)	Delhi NCR	0.003%	0%	6.36%	0.81%	1.21%	0%	0.98%	0.012%	1.71%	0%
1.3	Percentage of connections with good voice quality (>=95%)											
	(i) 0-4 (w/o frequency hopping)	Delhi NCR								95.59	100	98.3
	(ii) 0-5 (with frequency hopping)	Delhi NCR	96.95	89.44	81.19	89.68	95.77	97.92	97.35			
1.4	Call Setup Success Rate (>=95%)	Delhi NCR	100	99.99	92.27	98.92	98.8	99.98	98.2	99.99	100	100

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

- 'Blocked Call Rate' and 'Drop Call rate' benchmarks are not met by MTNL.
- For the parameter 'Percentage of connections with good voice quality ' it is found that Airtel, MTNL and Etisalat are not meeting the benchmark.
- CSSR is not met by MTNL with value of 92.27%.

Independent Drive Test

The Independent Drive Test was conducted in and around Delhi. Here again, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	Etisalat	Idea	V-fone	TTML CDMA	MTS
1.1	Blocked Call Rate (<=3%)	Delhi NCR	0.006	0.01	0.01	0.3	1.66	0.011	0
1.2	Dropped Call Rate (<=2%)	Delhi NCR	0.003	0.003	0.01	2.38	0.33	0.015	1.76
1.3	Percentage of connections with good voice quality (>=95%)								
	(i) 0-4 (w/o frequency hopping)	Delhi NCR						94.2	100
	(ii) 0-5 (with frequency hopping)	Delhi NCR	97.03	88.91	89.48	95	97.1		
1.4	Call Setup Success Rate (>=95%)	Delhi NCR	98.65	96.83	99.17	97	98.34	98.41	95.3

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

- Dropped call rate is not met by Idea.
- “%age of connections with good voice quality” is not met by Airtel, Etisalat & Tata CDMA.

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

S/N	Parameters	Benchmarks	MTNL	Airtel	TTSL	RCom
1	<i>Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)</i>					
	CCR & ASR	> 55%(CCR) & > 75%(ASR)	57.43%	96.80%	99.10%	92.53%
2	<i>POI Congestion</i>					
	POI Congestion (%)	≤ 0.5%	0	0	0	0
3	<i>Response Time to customer for assistance</i>					
	Accessibility of Call centre/customer Care within 40 seconds	≥95%	98.32%	100%	95%	99%
	% age of calls answered by operator(voice to voice) within 60 seconds	≥90%	98.13%	100%	74%	98%

NA – Not Applicable, NP – Not Provided.

All the operators are meeting the prescribed benchmarks. However, TTSL's performance in case of "%age of calls answered by operator" is found to be below the benchmark.

- One Month Data Audit

S/N	Parameters	Benchmarks	MTNL	Airtel	TTSL	RCom
1	<i>Fault incidences</i>					
	(No. of faults/100 subscribers /month)	< 5%	5.73%	2.34%	0.11%	0.25%
2	<i>Faults Repair/Restoration Time</i>					
	Fault repair by next working day(Urban Area)	>90%	86.68%	98.37%	100%	100%
	Within 3 days	100%	93.26%	100%	100%	100%
	fault repair by next working day(Rural & hilly Area)	>90%	NA	NA	NA	NA
	Within 5 days	100%	NA	NA	NA	NA
	Mean time to Repair(MTTR)	≤8 Hrs	8.44 Hrs	4.27 Hrs	6.21 Hrs	2.19 Hrs
3	<i>Rent Rebate</i>					
	Fault pending > 3 days & <7 days	Rebate for 7 days	5134	2619	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	3236	746	0	0
	Fault pending > 15 days	Rebate for 1 month	1623	200	0	0
4	<i>Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)</i>					
	CCR & ASR	> 55%(CCR) & > 75%(ASR)	56.46%	95.74%	99%	92.01%
5	<i>Metering & Billing Performance</i>					
	Disputed Bills over bills issued	< 0.1%	0.18%	0%	0%	0.04%
	% of billing complaints resolved within 4 weeks	100%	94.75%	100%	100%	100%
	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	97%	15.14%	100%	100%
6	<i>POI Congestion</i>					
	POI Congestion (%)	≤ 0.5%	0	0	0	0
7	<i>Response Time to customer for assistance</i>					
	Accessibility of Call centre/customer Care within 40 seconds	≥95%	98.23%	95.21%	95.62%	99%
	% age of calls answered by operator(voice to voice) within 60 seconds	≥90%	97.31%	91.94%	89.72%	98%
8	<i>Customer care(promptness in attending to customers request</i>					
	Termination / Closures	100%	90.57%	100%	100%	100%
	Time taken for refunds of deposit after closures	100%	100%	100%	100%	100%

NA – Not Applicable, NP – Not Provided.

MTNL is not meeting the benchmarks for “Fault restoration time” parameters, “%age of billing complaints resolved within 4 weeks”, “%age of call answered by operator (voice to voice)” and “termination”. Airtel is found to be below the benchmark for “period of refund”.

(C) Broadband Service
- 3 Days Live Data Audit

S/N	Parameters	Benchmarks	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet
1	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)								
	within 60 sec	> 60%	99.17%	100%	100%	75%	100%	83.59%	100%
	within 90 sec	> 80%	99.36%	100%	100%	100%	100%	100%	100%
2	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).								
2.1	POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	85.46%	67.02%	34.55%	31.2%	69.68%	35%	77.79%
2.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	57.37%	44.90%	30.53%	46.91%	55.52%	67%	NA
2.3	Broadband Connection Speed (download) - from ISP Node to User	> 80%	94.12%	100%	100%	96.35%	93.23%	90.94%	89.43%
4	Packet loss								
	% of Packet loss	< 1%	0.001%	0.3%	0%	0%	0%	3%	0%
5	Network latency (for wired broadband access)								
5.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	< 120 ms	1 ms	10 ms	70.3 ms	22 ms	11.56 ms	39 ms	4 ms
5.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	< 350 ms	266.7 ms	317.2 ms	56.05 ms	286 ms	287.7 ms	284 ms	224 ms

Sify is not meeting the benchmark for “packet loss”.

- Month Audit

S/N	Parameters	Benchmarks	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet
1	Service Provisioning/Activation Time								
1.1	100% cases in 15 days (subject to technical feasibility)	<15 days	82.15%	100%	100%	100%	100%	97.72%	99.68%
1.2	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/ per day.	100%	100%	100%	100%	100%	100%	100%
2	Faults Repair/Restoraion Time								
	By next working day	>90%	68.29%	99.07%	100%	98.14%	98.70%	91.37%	98.66%
	within 3 working day	≥99%	86.32%	99.78%	100%	99.51%	99.57%	100%	100%
2.1	Rebate								
	Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		3071	766	0	284	25	23	0
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		1046	269	0	22	3	17	0
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		563	36	0	7	1	0	0
3	Billing Performance								
	Billing complaints per 100 bills issued	<2%	0.27%	0.20%	0.13%	0.14%	0.54%	NA	0%
	%age of complaints resolved within 4 weeks	100%	98%	100%	100%	100%	100%		100%
	Time taken for refund of deposits after closure (within 60 days)	100%	100%	100%	100%	100%	100%		100%
4	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)								
	within 60 sec	>60%	99.24%	81.84%	96.26%	97.94%	90.67%	92.52%	60.05%
	within 90 sec	>80%	99.03%	89.13%	97.23%	98.79%	93.67%	100%	60.05%
5	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).								
5.1	POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	79.8%	16.09%	14.64%	30.9%	65.20%	35%	79.50%
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	60.12%	44.94%	7.55%	43.03%	85%	67%	NA
5.3	Broadband Connection Speed (download) - from ISP Node to User	> 80%	93.43%	100%	98.81%	93.75%	83%	91.25%	86.8%

S/N	Parameters	Benchmarks	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet
6	Service Availability/Uptime (for all users) in %age								
	Service Availability(%)	>98%	99.76%	99.93%	99.99%	100%	98.37%	100%	99.99%
7	Packet loss								
	% of Packet loss	<1%	0.004%	0.4%	0.16%	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	1.8 ms	22.2 ms	98.6 ms	23.3 ms	8.67 ms	49 ms	4.6 ms
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	262.9 ms	28.9 ms	84.8 ms	284.9 ms	296 ms	322 ms	228 ms
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)** See note below	<800 ms	NA	NA	NA	NA	NA	NA	NA

MTNL is not meeting the benchmarks for “activation time” & “complaints resolved within 4 weeks”. Sify & Spectranet are also not meeting the “activation time” benchmark.

CHAPTER-3 PMR Verification

(A) Cellular Mobile Telephone Services

PMR		Bench-mark	Audit	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom	
S/N	Name of Parameter			GSM Operators						CDMA Operators				
(A)	Network Service Quality Parameter													
1	Network Availability													
	BTS Accumulated Downtime	<=2%	Reported	0.09%	0.01%	7.15%	0.05%	0.01%	0.40%	0.03%	0.02%	0.20%	0.21%	
			Verified	0.09%	0.01%	7.15%	0.05%	0.01%	0.40%	0.03%	0.02%	0.20%	0.21%	
	Worst affected BTSs due to downtime	<=2%	Reported	0.21%	0.00%	23.11%	0.04%	0.05%	0.83%	N/A	0.00%	0.00%	0.00%	
Verified			0.21%	0.00%	23.11%	0.04%	0.05%	0.83%	N/A	0.00%	0.00%	0.00%		
2	Connection Establishment (Accessibility)													
	CSSR (Call Setup Success Rate)	>=95%	Reported	97.27%	99.88%	98.00%	99.79%	96.47%	99.59%	99.14%	99.77%	98.91%	99.00%	
			Verified	97.27%	99.88%	98.00%	99.79%	96.47%	99.59%	99.14%	99.77%	98.91%	99.00%	
	SDCCH/PAGING congestion	<=1%	Reported	0.07%	0.05%	0.20%	0.12%	0.26%	0.21%	0.25%	0.00%	0.00%	0.00%	
			Verified	0.07%	0.05%	0.20%	0.12%	0.26%	0.21%	0.25%	0.00%	0.00%	0.00%	
	TCH congestion	<=2%	Reported	0.19%	0.05%	0.05%	0.77%	0.03%	0.51%	0.63%	0.02%	0.00%	0.54%	
Verified			0.19%	0.05%	0.05%	0.77%	0.03%	0.51%	0.63%	0.02%	0.00%	0.54%		
3	Connection maintenance (retainability)													
	CDR	<=2%	Reported	1.15%	0.60%	2.33%	0.84%	1.40%	0.47%	1.19%	0.39%	0.27%	0.89%	
			Verified	1.15%	0.60%	2.33%	0.84%	1.40%	0.47%	1.19%	0.39%	0.27%	0.89%	
	Worst affected cells>3% TCH drop	<=5%	Reported	4.65%	0.87%	0.84%	2.35%	4.79%	0.67%	4.64%	0.17%	1.84%	2.67%	
			Verified	4.65%	0.87%	0.84%	2.35%	4.79%	0.67%	4.64%	0.17%	1.84%	2.67%	
	Good voice quality	>=95%	Reported	96.96%	99.12%	98.19%	98.04%	98.00%	98.34%	98.09%	99.60%	98.91%	98.66%	
Verified			96.96%	99.12%	98.19%	98.04%	98.00%	98.34%	98.09%	99.60%	98.91%	98.66%		
4	No of POIs not meeting benchmark	<=0.5%	Reported	0	0	0	0	0	0	0	0	0	0	
			Verified	0	0	0	0	0	0	0	0	0	0	

PMR		Bench- mark	Audit	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
S/N	Name of Parameter			GSM Operators						CDMA Operators			
(B)	Customer Service Quality Parameters												
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.19%	0.06%	N/A	0.05%	0.05%	0.09%	0.02%	0.24%	N/A	0.07%
			Verified	0.19%	0.06%	N/A	0.05%	0.05%	0.09%	0.02%	0.24%	N/A	0.07%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.10%	0.08%	0.09%	0.01%	0.02%	0.05%	0.01%	0.05%	0.41%	0.03%
			Verified	0.10%	0.08%	0.09%	0.01%	0.02%	0.05%	0.01%	0.05%	0.41%	0.03%
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100.0%	100.0%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100.0%	100.0%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	Reported	100%	100%	N/A	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	N/A	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance	>=95%	Reported	100.00%	100.00%	98.37%	98.00%	100%	92%	100%	98.00 %	100.00 %	100.00%
			Verified	100.00%	100.00%	98.37%	98.00%	100%	92%	100%	98.00 %	100.00 %	100.00%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	86.58%	88.10%	99.06%	95.54%	98.86%	91.00%	95.47%	89.62 %	90.50%	93.00%
			Verified	86.58%	88.10%	99.06%	95.54%	98.86%	91.00%	95.47%	89.62 %	90.50%	93.00%
9	Termination/closure of service	<=7days	Reported	100.00%	100.00%	N/A	100.00%	100.00%	100.00%	100.00%	100.00 %	100.00%	100.00%
			Verified	100.00%	100.00%	N/A	100.00%	100.00%	100.00%	100.00%	100.00 %	100.00%	100.00%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	N/A	100%	100%	100%	100%	93%	100%	100%
			Verified	100%	100%	N/A	100%	100%	100%	100%	93%	100%	100%

Critical Analysis (PMR Verification):

- The figures proved by all the operators match the figures obtained on verification hence there is no discrepancy found.
- Under Network Parameter Section only Etisalat is found not meeting the benchmark for 'BTS Accumulated Downtime', 'Worst affected BTSs due to downtime' and 'Call Drop Rate'.
- Aircel and Tata are found not meeting the benchmark for "Metering/Billing Credibility-Postpaid", while MTS is not meeting the benchmark for "Metering/Billing Credibility-Prepaid".
- Accessibility of Reliance GSM to Accessibility of call centre/Customer Care parameter do not meet the benchmark.
- "% call answered by operators (voice to voice) within 60 sec." benchmark is not met by Aircel, Airtel and Tata.
- Tata is found not meeting the 60 days' benchmark for "Refund of deposits after closure of connection".

(B) Wireline Services

S/N	Parameters	Benchmarks	Audit	MTNL	Airtel	TTSL	RCom
1	Fault incidences						
	(No. of faults/100 subscribers /month)	< 5%	Reported	10.71%	3.37%	0.47%	0.45%
			Verified	10.71%	3.37%	0.47%	0.45%
2	Faults Repair/Restoraion Time						
	Fault repair by next working day(Urban Area)	>90%	Reported	73.78%	95.88%	93.53%	100%
			Verified	73.78%	95.88%	93.53%	100%
	Within 3 days	100%	Reported	86.15%	99.91%	100%	100%
			Verified	86.15%	99.91%	100%	100%
	Within 5 days (Hilly & Rural Area)	100%	Reported	NA	NA	NA	NA
			Verified	NA	NA	NA	NA
	Mean time to Repair(MTTR)	≤8 Hrs	Reported	15.07	7.69 Hrs	7.37 Hrs	2.30 Hrs
			Verified	15.07	7.69 Hrs	7.37 Hrs	2.30 Hrs
3	Rent Rebate						
	Rent Rebate		Reported	60387	3629	0	0
			Verified	60387	3629	0	0
4	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)						
	CCR & ASR	> 55%(CCR) & > 75%(ASR)	Reported	52.71%	94.05%	99.07%	88.89%
			Verified	52.71%	94.05%	99.07%	88.89%
5	Metering & Billing Performance						
	Metering & Billing Credibility-Post paid	< 0.1%	Reported	0.18%	0.05%	0.09%	0.04%
			Verified	0.18%	0.05%	0.09%	0.04%
	Metering & Billing Credibility-Pre paid	100%	Reported	NA	NA	NA	NA
			Verified	NA	NA	NA	NA
	Resolution of billing charging/validity/Complaints within 4 weeks	100%	Reported	89.50%	100%	100%	100%
			Verified	89.50%	100%	100%	100%
	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	Reported	NP	100%	100%	100%
			Verified	NP	100%	100%	100%
6	POI Congestion						
	POI Congestion (%)	≤ 0.5%	Reported	0	0	0	0
			Verified	0	0	0	0
7	Response Time to customer for assistance						
	Accessibility of Call centre/customer Care within 40 seconds	≥95%	Reported	99.64%	98.90%	94.86%	96%
			Verified	99.64%	98.90%	94.86%	96%
	% age of calls answered by operator(voice to voice) within 60 seconds	≥90%	Reported	99.37%	84.68%	86.03%	92%
			Verified	99.37%	84.68%	86.03%	92%
8	Customer care(promptness in attending to customers request						
	Termination / Closures	100%	Reported	100%	100%	100%	100%
			Verified	100%	100%	100%	100%
	Time taken for refunds of deposit after closures	100%	Reported	100%	100%	100%	100%
			Verified	100%	100%	100%	100%

(C) Broadband Services

S/N	Parameters	Benchmarks	Audit Period	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet
1	<i>Service Provisioning/Activation Time</i>									
1.2	%age of connections provided within 15 days of registration of demand	100%	Reported	88.41%	100%	100%	100%	100%	100%	98.47%
			Verified	88.41%	100%	100%	100%	100%	100%	98.47%
2	<i>Faults Repair/Restoraion Time</i>									
2.2	% of faults repaired by next working day	>90%	Reported	58%	96.93%	100%	98%	97%	90%	99%
			Verified	58%	96.93%	100%	98%	97%	90%	99%
2.3	% of faults repaired within 3 working day	≥99%	Reported	76.30%	99.68%	100%	100%	99%	100%	100%
			Verified	76.30%	99.68%	100%	100%	99%	100%	100%
3	<i>Rent Rebate</i>									
3.1	Rent Rebate		Reported	31721	1665	0	3365	46	223	0
			Verified	31721	1665	0	3365	46	223	0
4	<i>Billing Performance</i>									
4.1	%age of bills disputed	<2%	Reported	0.13%	0.03%	1.12%	0.30%	1.26%	NA	0%
			Verified	0.13%	0.03%	1.12%	0.30%	1.26%		0%
4.2	%age of complaints resolved within 4 weeks	100%	Reported	97.83%	100%	100%	100%	100%		0%
			Verified	97.83%	100%	100%	100%	100%		0%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	Reported	100%	100%	100%	100%	100%		0%
			Verified	100%	100%	100%	100%	100%	0%	
5	<i>Response Time to the Customer for assistance</i>									
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	Reported	99.60%	87.31%	74%	97.88%	76%	99%	100%
			Verified	99.60%	87.31%	74%	97.88%	76%	99%	100%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	Reported	99.83%	92.47%	82%	97.97%	81%	100%	100%
			Verified	99.83%	92.47%	82%	97.97%	81%	100%	100%
6	<i>Bandwidth utilisation/throughput</i>									
6.1	No. of Intra network links having Bandwidth utilisation >90% during peak hours (TCBH)		Reported	0	0	0	0	0	0	0
			Verified	0	0	0	0	0	0	0
6.2	No. of Upstream links for International connectivity having BW utilisation >90% Peak Hrs.(TCBH)		Reported	1	0	0	0	0	0	0
			Verified	1	0	0	0	0	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	Reported	83.35%	84.49%	38.03%	51.42%	85%	85%	76%
			Verified	83.35%	84.49%	38.03%	51.42%	85%	85%	76%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	Reported	95%	100%	NP	-	85%	95%	-
			Verified	95%	100%	NP	-	85%	95%	-

S/N	Parameters	Benchmarks	Audit Period	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet	
7	<i>Service Availability/Uptime (for all users) in %age</i>										
7.1	Service availability /uptime (for all users) in %age	>98%	Reported	99.66%	99.95%	99.70%	99%	100%	100%	99%	
			Verified	99.66%	99.95%	99.70%	99%	100%	100%	99%	
8	<i>Packet loss</i>										
8.1	% of Packet loss	<1%	Reported	-	0%	-	0%	0.98%	-	-	
			Verified	-	0%	-	0%	0.98%	-	-	
9	<i>Network latency (for wired broadband access)</i>										
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	Reported	-	22 ms	-	-	80 ms	-	-	
			Verified	-	22 ms	-	-	80 ms	-	-	
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	Reported	-	2 ms	-	-	300 ms	-	-	
			Verified	-	2 ms	-	-	300 ms	-	-	
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 ms	Reported	NA							
			Verified	NA							

CHAPTER – 4: DETAILED FINDINGS & ANALYSIS

I. Cellular Mobile Telephone Service

(A) MSC Audit

(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
			GSM Operators						CDMA Operators			
A	Network Service Quality Parameter											
1	Connection Establishment (Accessibility)											
	a) CSSR	>=95%	97.93%	99.87%	96.64%	97.50%	99.69%	99.67%	98.90%	98.20%	99.29%	99.03%
	b) SDCCH/PAGING congestion	<=1%	0.05%	0.04%	0.56%	0.16%	0.40%	0.10%	0.53%	0.00%	0.02%	0.00%
	c) TCH congestion	<=2%	0.02%	0.03%	0.09%	0.64%	0.84%	0.36%	0.92%	0.19%	0.00%	0.50%
2	Connection maintenance											
	a) CDR	<=2%	0.90%	0.60%	1.23%	2.71%	0.76%	0.39%	1.26%	1.14%	0.22%	0.80%
	b) Cells having > 3% TCH drop	<=5%	2.94%	0.92%	4.92%	25.65%	1.95%	1.02%	4.68%	2.85%	0.77%	2.74%
	c) Good voice quality	>=95%	97.08%	99.13%	NA	96.77%	98.27%	98.20%	97.89%	NA	99.11%	NA
	d) No. of cells > 3% TCH drop		224	99	149	2,671	159	56	508	103	16	22
	e) Total no. of cells in the network		7,773	10,753	1,522	10,413	8,146	5,580	10,879	3,760	2,159	830
3	No of POIs not meeting benchmark	<=0.5%	0	3	0	3	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	GMSC5, GMSC3 and DLMSCS7	Nil	Rcom, Airtel, MTNL	Nil	Nil	Nil	Nil	Nil	Nil
	b) Total No. of circuits on POI		32,327	208,948	40,085	9,457	80,100	53,943	231,818	264,758	12,246	53,943
	c) Avg No. of call attempts on POI		563,552	4,701,329	343,183	193,907	18,927	1,135,132	4,484,135	1,770,432	98,310	1,135,132
	d) Avg traffic served on POI (Erlang)		10,083	138,157	10,295	3,563	500	32,330	164,191	83,703	1,784	32,330
	e) Total number of working POI Service Area wise		100	216	48	45	78	121	29	236	47	121
	f) Equipped Capacity of Network in respect of Traffic in erlang		101,273	326,993	NP	28,600	119,542	66,745	255,920	175,000	33,600	191,628
(B)	Customer Service Quality Parameters											

S/N	Name of Parameter	Benchmark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
			GSM Operators						CDMA Operators			
4	Response time to customers for assistance											
	a) Accessibility of call centre	>=95%	98.00%	99.91%	99.97%	99.00%	99.00%	100.00%	100.00%	94.83%	96.39%	100.00%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	98.00%	55.30%	99.59%	99.25%	95.39%	94.00%	94.20%	73.65%	86.00%	92.00%

NA: Not Applicable, NR: Not Received

Parameter-wise Findings (Live Data Assessment):

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

- **Call Setup Success Rate (CSSR) (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 96.64% and 99.87%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0.04% and 0.56%.
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 lying between 0.00% and 0.92%.
- **Call Drop Rate (CDR) (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.22% and 1.26%, except Etisalat DB Telecom (2.71%).
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except Etisalat DB Telecom rest of the operators are satisfying the benchmark with value in between 0.77% and 4.92%. While for Etisalat value is 25.65% respectively. Similar trend have been observed in live data audit report also.
- **Connections with good voice quality (benchmark $\geq 95\%$):** CDMA operators have declared that the parameter is not system generated. Rest of the GSM operators are meeting the benchmark with values lying between 96.77% and 99.13%.
- **POI Congestion (benchmark $\leq 0.5\%$):** Airtel & Etisalat were found 3 nos. of POIs having congestion for both live and month data. Here POI congestion indicates that there were call failure greater than 0.5% on that particular POI. The call here indicates only those calls which have been already being seized by the switch and processed. But cases were found where individual POIs are showing high utilization/usage which is managed by overflow technique i.e. extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark $>95\%$):** Except for TATA CDMA (94.83%), all operators are meeting the benchmark with values lying between 96.39% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for Airtel, Tata CDMA and MTS with values 55.3%, 73.65% and 86% respectively, all other operators are meeting the benchmark with values 92% to 99.59%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
			GSM Operators						CDMA Operators			
(A)	Network Service Quality Parameter											
1	Network Availability											
	a) BTS Accumulated Downtime	<=2%	0.12%	0.00%	1.97%	2.15%	0.00%	0.60%	0.00%	0.01%	0.11%	0.25%
	b) Worst affected BTSs due to downtime	<=2%	0.33%	0.01%	0.30%	13.74%	0.07%	0.36%	0.05%	0.00%	0.14%	0.12%
	c) Total no. of BTSs in the licensed service area		2,705	4,568	1,064	1,157	3,167	1,860	4,476	1,011	719	830
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		2,153	422	99	18,540	1,722	4,931	1,364	84	529	1,387
	e) No. of BTSs having accumulated downtime of >24 hours in a month		9	0	21	159	0	11	0	0	1	1
2	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	98.03%	99.88%	97.21%	97.06%	99.69%	99.68%	98.45%	98.31%	99.29%	98.78%
	b) SDCCH/PAGING congestion	<=1%	0.06%	0.03%	0.10%	0.39%	0.55%	0.17%	0.65%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.06%	0.03%	0.03%	0.74%	0.97%	0.62%	1.30%	0.12%	0.00%	0.76%
3	Connection maintenance (retainability)											
	a) CDR	<=2%	0.91%	0.58%	1.60%	2.65%	0.76%	0.38%	1.21%	0.89%	0.22%	0.81%
	b) Worst affected cells>3% TCH drop	<=5%	2.67%	0.87%	4.66%	25.05%	2.03%	0.93%	4.82%	1.93%	0.94%	2.83%
	c) Good voice quality	>=95%	96.95%	99.08%	NA	96.71%	98.27%	98.25%	97.91%	NA	98.9%	NA
	d) Total No. of cells exceeding 3% TCH drop (call drop)		202	93	142	869	166	51	521	69	20	23
	e) Total no. of cells in the network		7,773	10,753	1,522	10,413	8,146	5,580	10,879	3,760	2,159	830
4	No of POIs not meeting benchmark	<=0.5%	0	3	0	3	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	GMSC5 GMSC3 and DLMSC S7	Nil	Rcom, Airtel, MTNL	Nil	Nil	Nil	Nil	Nil	Nil

S/N	Name of Parameter	Benchmark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
			GSM Operators							CDMA Operators		
	b) Total No. of call attempts on POI (Avg.)		668,640	4,625,414	332,469	209,627	20,704	1,069,510	4,616,338	3,318,854	99,143	1,069,510
	c) Total traffic served on POI (Erlang) (Avg.)		11,340	175,881	9,974	3,633	498	29,748	170,840	154,288	1,803	29,748
	d) Total No. of circuits on POI		32,327	208,948	40,085	9,457	80,100	53,943	231,818	264,758	12,246	53,943
	e) Total number of working POI Service Area wise		100	216	48	45	78	121	29	236	47	121
	f) Capacity of POI		31,041	203,170	40,085	8,660	77,738	49,457	N/P	264,758	11,708	49,457
5	Network Data											
	a) Equipped Capacity of Network Erlang		101,273	326,993	N/P	28,600	119,542	66,745	255,920	175,000	33,600	191,628
	b) Total traffic in TCBH in erlang (Avg.)		28,596	216,755	N/P	6,356	98,682	47,541	211,204	155,370	4,047	86,396
	c) Total no. of customers served (as per VLR) on last day of the month		N/P	6,258,087	514,258	213,730	3,355,414	N/P	6,597,647	2,291,909	175,478	N/P
(B)	Customer Service Quality Parameters											
6	Metering/billing credibility-Post paid	$\leq 0.1\%$	0.09%	0.02%	N/P	N/A	0.00%	0.09%	0.01%	0.01%	N/A	0.08%
	a) No. of bills issued during the period		34,964	1,021,481	N/P	N/A	442,741	31,875	768,045	513,453	N/A	506,568
	b) No. of bills disputed including billing complaints during the period		33	240	N/P	N/A	304	29	96	61	N/A	381
7	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.04%	0.08%	0.03%	1.60%	0.00%	0.10%	0.03%	0.12%	0.41%	0.10%
	a) No. of charging / credit / validity complaints during the quarter		696	5,648	693	8,925	2,876	349	154	6,205	2,395	327
	b) Total no. of pre-paid customers at the end of the quarter		1,970,000	7,483,101	2,156,100	549,815	3,294,907	3,570,800	57,708,190	5,255,160	579,467	3,389,410
8	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	88%	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		761	15,569	218	8,925	2,812	0	250	7,487	2,395	0

S/N	Name of Parameter	Benchm ark	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
			GSM Operators							CDMA Operators		
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		761	15,569	218	8,925	3,180	0	250	7,487	2,395	0
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		551	5,888	N/P	21	3,106	171	142	6,266	1,479	448
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		177	9,681	N/P	8,904	4,903	207	108	1,222	879	260
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<i><=1 week</i>	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
9	Response time to customers for assistance											
	a) Accessibility of call centre/Customer Care	<i>>=95%</i>	98.00%	99.99%	100.00%	97.00%	99.00%	100.00%	100.00%	94.83%	99.27%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	<i>>=90%</i>	98.00%	55.33%	99.59%	99.00%	80.88%	69.00%	99.10%	73.65%	91.00%	88.00%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		58,877	15,310,915	35,163	24,213	3,106,455	1,350,876	15,726	526,439	33,799	564,117
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		57,912	15,309,185	35,020	24,031	2,512,628	945,444	15,613	499,220	31,002	493,995
10	Termination/closure of service	<i><=7days</i>	100%	100%	100%	N/A	100%	100%	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		712	5,905	4,205	N/A	879	452	3,829	4,849	45	3,083
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		712	5,905	4,205	N/A	879	452	3,829	4,849	45	3,083
11	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	100%	59.05%	100%	N/A	100%	100%	100%	96%	100%	100%

NA: Not Applicable, NR: Not Received

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

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.00% and 1.97%, except Etisalat DB Telecom (2.15%).
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 0.36%, except Etisalat DB Telecom (13.74%).
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 97.06% and 99.88%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0.03% and 0.65%.
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 lying between 0.00% and 1.30%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.22% and 1.60%, except Etisalat DB Telecom (2.65%).
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except Etisalat DB Telecom rests of the operators are satisfying the benchmark with value in between 0.87% and 4.82%. While for Etisalat value is 25.05% respectively. Similar trend have been observed in live data audit report also.
- **Connections with good voice quality (benchmark $\geq 95\%$):** MTNL, Tata CDMA & Rcom CDMA service providers have declared that the parameter is not system generated. Rest of the operators are meeting the benchmark with values lying between 96.71% and 99.08%.
- **POI Congestion (benchmark $\leq 0.5\%$):** Airtel & Etisalat were found 3 nos. of POIs having congestion for live and month both. Here POI congestion indicates that there were call failure greater than 0.5% on that particular POI. The call here indicates only those calls which have been already being seized by the switch and processed. But cases were found where individual POIs are showing high utilization/usage which is managed by overflow technique i.e. extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark $>95\%$):** All operators are meeting the benchmark except for TTML.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** It is found that Airtel, RTL, TTML, Idea & RCom fail to meet the benchmark. Rests of the operators are meeting the benchmark with values lying between 91.00% and 99.59%.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** All operators are meeting the benchmark. While Etisalat and MTS not having the post-paid customers and MTNL Not provided the data.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** Except for TTML, MTS & Etisalat with value of 0.12%, 0.41% and 1.60% respectively, all operators are meeting the benchmark with values lying between 0.00% and 0.1%.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark except for Idea with value of 88.00%.
- **Termination/Closure of service (Benchmark ≤ 7 days):** All operators have satisfied the benchmark while Etisalat not have such cases.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** All operators have satisfied the benchmark except for TTML with value of 96.00% and Etisalat not have such Cases.

(1) Sample Coverage

Switches/BSC/BTS details of operators:

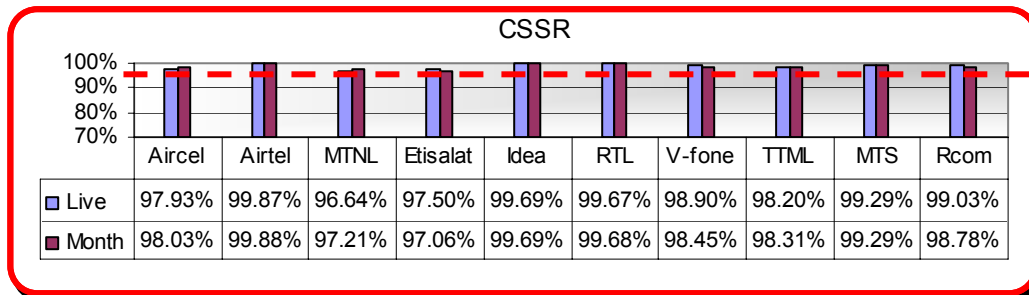
Sl.	Name of Service Provider	No. of MSC/GMSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel	3	23	2705
2	Airtel Ltd	28	51	4568
3	Etisalat	1	8	1157
4	Idea Cellular	8	35	3167
5	MTNL	4	31	1064
6	RTL(GSM)	4	12	1860
7	Vodafone	22	50	4476
CDMA Operators				
11	Reliance Communication (CDMA)	10	-	830
12	Tata Communications (CDMA)	8	-	1011
13	MTS	1	-	719

(2) Performance (Graphical Representation)

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

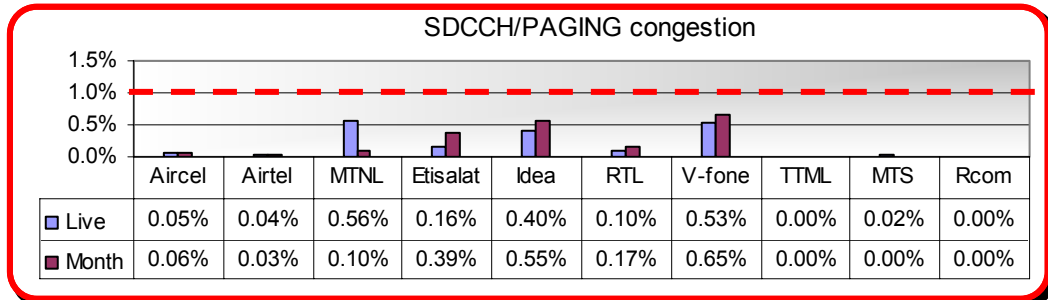
A) NETWORK PERFORMANCE

- I. Call Setup Success Rate (CSSR):** All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data.

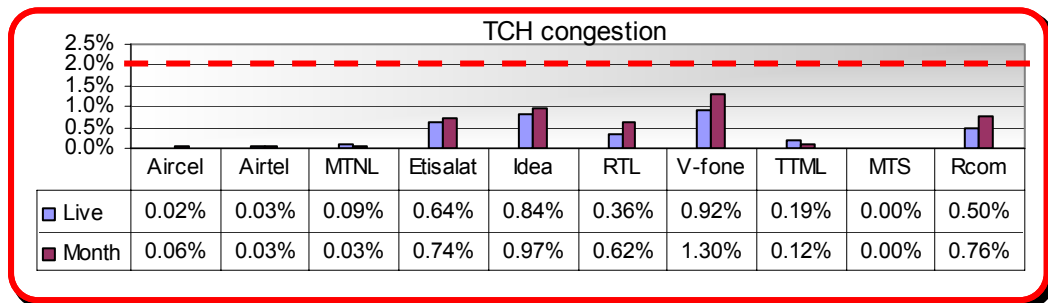


II. Blocked call rate:

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

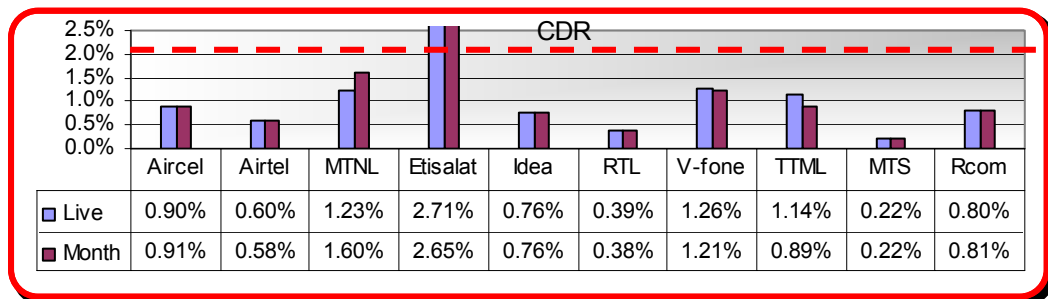


TCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data.

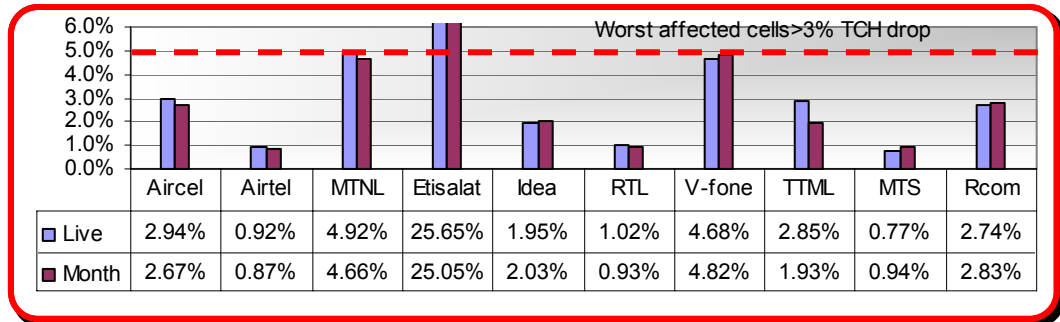


III. Connection Maintainability (Retainability):

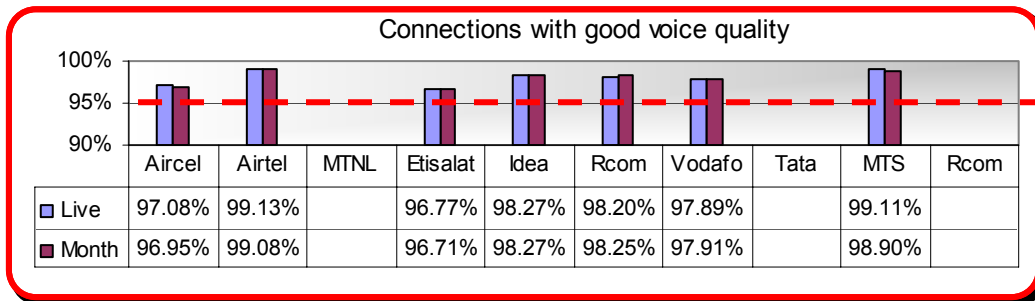
Call Drop Rate (CDR) (%): Except for Etisalat, all operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data.



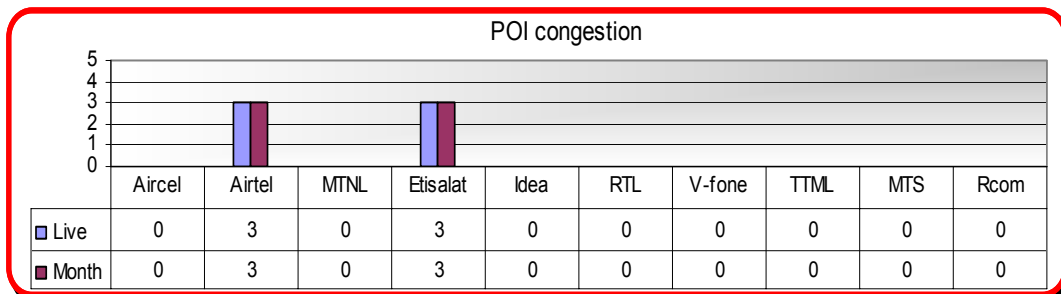
Worst affected Cell exceeding 3% TCH Drop: It is found that Etisalat fails to meet the benchmark for both live and month data. Rest of the operators are meeting the benchmark for both cases. In all cases data shows consistency for both live measurement and month data audit.



Percentage of connections with good voice quality (benchmark >= 95%): All operators are meeting the TRAI benchmarks (\Rightarrow 95%) for both one month data and 3 days live data. CDMA operators like Tata and RCom do not have a system generated data.



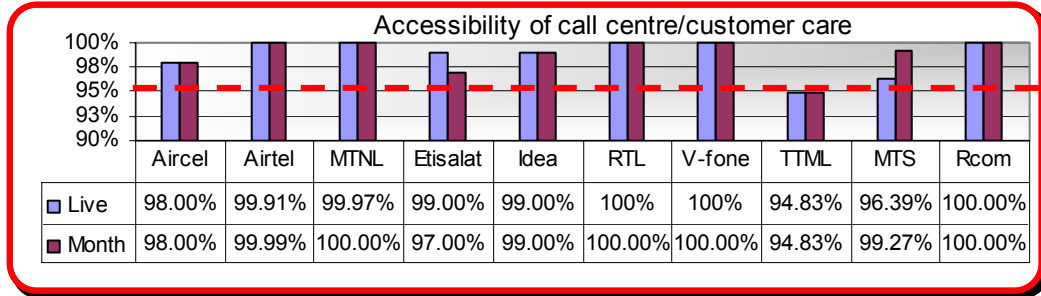
POI Congestion: Airtel & Etisalat were found 3 nos. of POIs having congestion.



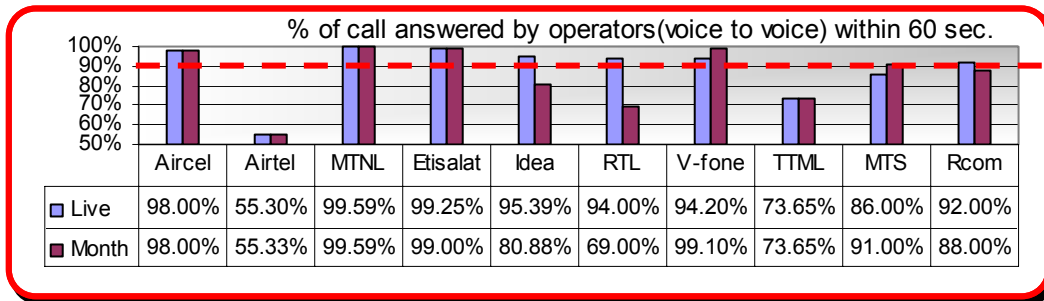
B) CUSTOMER SERVICE QUALITY PARAMETERS

Response time to the customer for assistance:

Percentage of call answered (Electronically): Except for TTML, All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data.



Percentage of call answered by operators (Voice to voice) within 60 sec: For access to Call center voice to voice, its found that a lot of operators are not meeting the benchmark.



(3) Critical Analysis

From the data table it can be seen that only Etisalat is not meeting the benchmark for the parameter of ‘Worst affected cells have more than 3% TCH drop rate’ with high margins. This may have happened due to mainly in the change adopted for calculating the parameter considering CBBH instead of TCBH, which reflects more practical way of calculating TCH drop keeping in view customer satisfaction. It is found that all the CDMA operators are satisfying the benchmark for the same thus reflecting better performance in terms of Connection maintenance (retain ability) for CDMA technology.

Regarding %age of connections with good voice quality all the operators are found to be performing quite well in terms of meeting the benchmark ($\leq 95\%$).

In case of POI congestion, most of the operators are found to be performing quite well in terms of meeting the benchmark ($\leq 0.5\%$). It is noticed that most of the operators are having individual POI satisfying the benchmark. But in some case overflows on individual POI are noticed causing traffic diversions to obtain the net result for POI congestion.

(A) 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	MTNL	Etisalat	Idea	RTL GSM	V- Fone	TATA CDMA	MTS	RCom CDMA
Total No. of calls	10	7	8	5	11	6	8	4	4	11
Cases resolved with 4 weeks	10	7	8	5	11	6	8	4	4	11
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Live calling to Call center:

Fifty nos. of calls were made in each half and below given no. of calls got connected to the call center within 60 Sec.

	CALLS MADE	OPERATORS NAME									
		Aircel	Airtel	Etisalat	Idea	MTNL	RCOM	Vodafone	MTS	RCOM	TATA
		GSM							CDMA		
1ST HALF (10AM TO 01 PM)	50	47	48	45	48	48	49	48	48	49	44
2ND HALF (04PM TO 07 PM)	50	49	32	47	40	45	37	44	41	42	40
In % age		96.00	80.00	92.00	88.00	93.00	86.00	92.00	89.00	91.00	84.00

(4) Level 1 Calling: Level 1 calling such as calling at emergency no. (Police, Fire, Hospital), Railway enquiry system etc were made so as to check the service of such short codes. In Delhi it was found to be functional.

(5) Critical Analysis

Random numbers were selected (for whom refund were given) 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.

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

A sample of 2x50 test calls per Service Providers with in the licensed service area (Delhi NCR Circle) were made between 1900 to 2000 hrs and between 2000 to 2100 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V- Fone	TATA CDMA	MTS	RCom CDMA
Aircel	-	97%	98%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%
MTNL	100%	100%	-	100%	100%	100%	100%	100%	100%	100%
Etisalat	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Idea	100%	100%	100%	100%	-	100%	100%	100%	98%	100%
RTL GSM	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
V- Fone	100%	100%	96%	100%	100%	100%	-	100%	100%	100%
TATA CDMA	99%	100%	100%	100%	100%	100%	100%	-	100%	100%
MTS	100%	100%	100%	100%	100%	100%	100%	100%	-	100%
RCom CDMA	100%	100%	100%	100%	100%	100%	98%	100%	100%	-

(3) Critical Analysis

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

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

(1) Sample Coverage

The Operator Assisted Drive Test was conducted at Delhi NCR for all the operators. Route covered was about around 200Km depending on city areas within the speed limit of 30Km/hr.

DRIVE TEST LOCATIONS

DELHI CIRCLE :

Dense: NH-24-Pandav Nagar, Patel Chowk, Shadhara, Geeta-Colony, Iffco Chowk, Naya gaon, Rajiv Chowk-Sec 14, Mahipalpur, Rajouri Garden, Tilak Nagar, Rajghat, New Delhi Rly. Station.

Medium Dense: Badarpur, Sarita vihar, Noida Sec 52, NH24-Ghaziabad, Dhaula-kuan, Naraina.

Low Dense: Greater Kailash, Faridabad, Noida sec22, ITO, IIT-Arunvart Marg, Outer ring Road, NH1 Bypass, Wazirabad.

2)

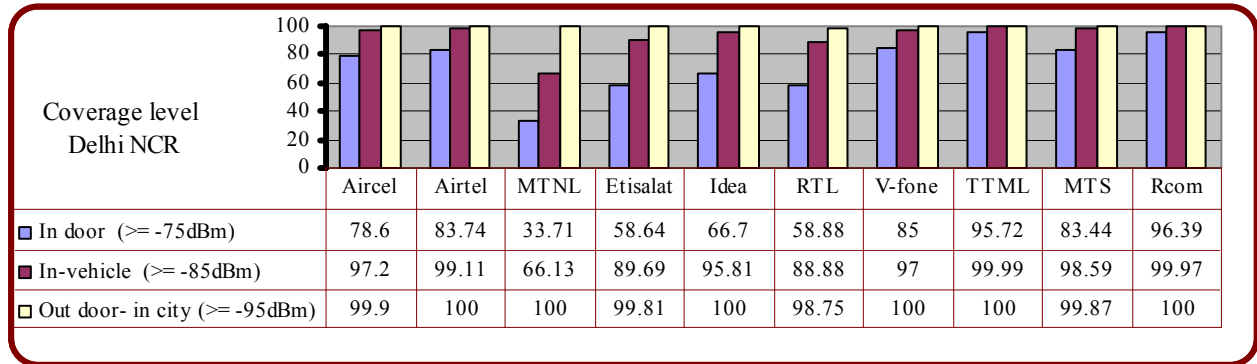
Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	MTNL	Etisalat	Idea	RTL GSM	V-fone	TTML CDMA	MTS	Rcom
			GSM Operators						CDMA Operators			
1.1	Call Attempts	Delhi NCR	295	271	220	370	247	144	304	250	239	147
1.2	Blocked Call Rate (<=3%)	Delhi NCR	0	0.01	7.73	1.08	1.2	0.02	1.8	0.012	0	0
1.3	Dropped Call Rate (<=2%)	Delhi NCR	0.003	0	6.36	0.81	1.21	0	0.98	0.012	1.71	0
1.4	Percentage of connections with good voice quality (=>95%)	Delhi NCR										
	(i) 0-4 (w/o frequency hopping)	Delhi NCR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	95.59	100	98.3
	(ii) 0-5 (with frequency hopping)	Delhi NCR	96.95	89.44	81.19	89.68	95.77	97.92	97.35	NA	NA	N/A
1.5	Service Coverage											
	In door (>= -75dBm)	Delhi NCR	78.6	83.74	33.71	58.64	66.7	58.88	85	95.72	83.44	96.39
	In-vehicle (>= -85dBm)	Delhi NCR	97.2	99.11	66.13	89.69	95.81	88.88	97	99.99	98.59	99.97
	Out door- in city (>= -95dBm)	Delhi NCR	99.9	100	100	99.81	100	98.75	100	100	99.87	100
1.6	Call Setup Success Rate (>=95%)	Delhi NCR	100	99.99	92.27	98.92	98.8	99.98	98.2	99.988	100	100

3)

Graphical Representation

The Radio coverage level as was found in the operator assisted drive test result is shown graphical below:



(3) Critical Analysis

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

- Blocked Call Rate and Dropped Call Rate benchmark is not met by MTNL with 7.73% and 6.36% values.
- For "%age of connections with good voice quality" Airtel (89.44%), MTNL (81.19%) and Etisalat (89.68%) are not meeting the benchmark.
- Below benchmark performance for CSSR is found for MTNL only with 92.27%.

(D) Independent Drive Test

(1) Sample Coverage

The Independent Drive Test was conducted at Delhi NCR after operators assisted drive test was over for respective operators. Route cover was about around 200 Km depending on city areas within the speed limit of 30Km/hr.

DRIVE TEST LOCATIONS

DELHI CIRCLE:

Dense: NH-24-Pandav Nagar, Patel Chowk, Shadhara, Geeta-Colony, Iffco Chowk, Naya gaon, Rajiv Chowk-Sec 14, Mahipalpur, Rajouri Garden, Tilak Nagar, Rajghat, New Delhi Rly. Station.

Medium Dense: Badarpur, Sarita vihar, Noida Sec 52, NH24-Ghaziabad, Dhaula-kuan, Naraina.

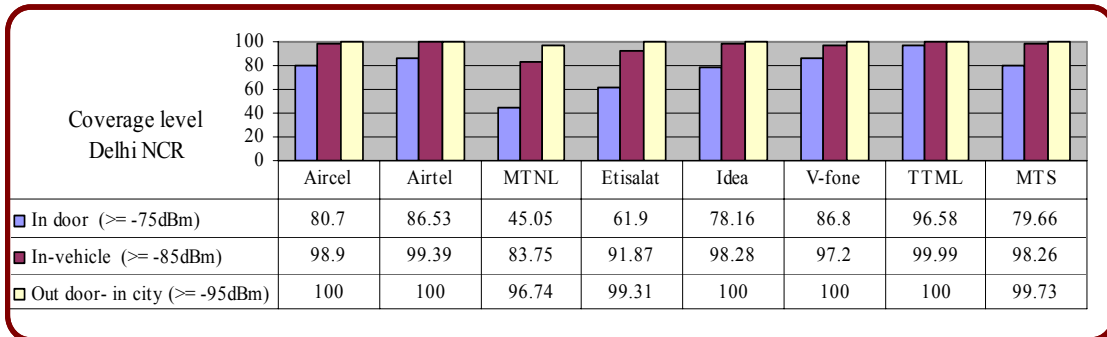
Low Dense: Greater Kailash, Faridabad, Noida sec22, ITO, IIT-Arunvart Marg, Outer ring Road, NH1 Bypass, Wazirabad.

(A) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	Etisalat	Idea	V-fone	TTML CDMA	MTS
			GSM Operators					CDMA Operators	
1.1	Call Attempts	Delhi NCR	297	284	363	252	301	253	234
1.2	Blocked Call Rate (<=3%)	Delhi NCR	0.006	0.01	0.01	0.3	1.66	0.011	0
1.3	Dropped Call Rate (<=2%)	Delhi NCR	0.003	0.003	0.01	2.38	0.33	0.015	1.76
1.4	Percentage of connections with good voice quality (=>95%)	Delhi NCR							
	(i) 0-4 (w/o frequency hopping)	Delhi NCR						94.2	100
	(ii) 0-5 (with frequency hopping)	Delhi NCR	97.03	88.91	89.48	95	97.1		
1.5	Service Coverage	Delhi NCR							
	In door (>= -75dBm)	Delhi NCR	80.7	86.53	61.9	78.16	86.8	96.58	79.66
	In-vehicle (>= -85dBm)	Delhi NCR	98.9	99.39	91.87	98.28	97.2	99.99	98.26
	Out door- in city (>= -95dBm)	Delhi NCR	100	100	99.31	100	100	100	99.73
1.6	Call Setup Success Rate (>=95%)	Delhi NCR	98.65	96.83	99.17	97	98.34	98.41	95.3

Graphical Representation:

The Radio coverage level as was found in the independent drive test result is shown graphical below:



(3) Critical Analysis

- Drop call rate is not met by Idea.
- Only major observation found is that a few operators are not meeting "% connections with Good Voice Quality" parameters. The operators are Airtel (88.91%), Etisalat (89.48%) and TATA CDMA (94.20%).

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

From live, month and PMR findings, it can be concluded that on an average, performance of the operators in the service area (Delhi NCR) is by and large satisfactory for **Network Parameters**. However, Etisalat is found to be below benchmark standard for quite a few parameters namely for 'BTS Accumulated Downtime', 'Worst affected BTSs due to downtime', 'Call Drop Rate' and 'worst affected cells >3% TCH drop'. The above said results hold true for both live and month data

Under **Customer Service Quality** section, benchmark for the parameter "operator answered calls (voice-to-voice) within 60 seconds" it is found not satisfying for a no. of operators. Airtel, Idea, Reliance and Tata needed to take care so that there is positive improvement in this regard.

Regarding **Metering/Billing Credibility** issues, only Etisalat is found not meeting the benchmark for Pre-paid services. For 'Resolution of billing/ charging complaints' parameters Idea is found to be lagging with a value of 88% complaints resolution against 100% benchmark within 4 weeks. Also for the parameter 'Time taken for refunds of deposits after closures' Airtel and Tata are found not meeting the benchmark of 100% within 60 days.

During **Drive Tests**, high Blocked Call Rates and Drop Call Rates were found for MTNL in and around Delhi. Whereas for Airtel, MTNL and Etisalat performance against 'Good voice quality' was found not to be of much satisfaction.

II. Basic Telephone Service (Wireline) Providers

(A) Exchange Audit

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

S/N	Parameters	Benchmarks	Audit Period	MTNL	Airtel	TTSL	RCom
1	Fault incidences						
	(No. of faults/100 subscribers /month)	< 5%	Month	5.73%	2.34%	0.11%	0.25%
2	Faults Repair/Restoraion Time						
	Fault repair by next working day(Urban Area)	>90%	Month	86.68%	98.37%	100%	100%
	Within 3 daysday	100%		93.26%	100%	100%	100%
	Fault repair by next working day(Rural & hilly Area)	>90%		NA	NA	NA	NA
	Within 5 days	100%		NA	NA	NA	NA
	Mean time to Repair(MTTR)	≤8 Hrs		8.44 Hrs	4.27 Hrs	6.21 Hrs	2.19 Hrs
3	Rent Rebate						
	Fault pending > 3 days & <7 days	Rebate for 7 days	Month	5134	2619	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days		3236	746	0	0
	Fault pending > 15 days	Rebate for 1 month		1623	200	0	0
4	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)						
	CCR & ASR	> 55%(CCR) & > 75%(ASR)	Live	57.43%	96.80%	99.10%	92.53%
			Month	56.46%	95.74%	99%	92.01%
5	Metering & Billing Performance						
	Disputed Bills over bills issued	< 0.1%	Month	0.18%	0%	0%	0.04%
	% of billing complaints resolved within 4 weeks	100%		94.75%	100%	100%	100%
	Period of all refunds/payments from the date of resolution of complaints within 1weeks	100%		97%	15.14%	100%	100%
6	POI Congestion						
	No of POIs not meeting benchmark	≤0.5%	Live	0	0	0	0
			Month	0	0	0	0
7	Response Time to customer for assistance						
	Accessibility of Call centre/customer Care within 40 seconds	≥95%	Live	98.32%	100%	95%	99%
			Month	98.23%	95.21%	95.62%	99%
	% age of calls answered by operator(voice to voice) within 60 seconds	≥90%	Live	98.13%	100%	74%	98%
			Month	97.31%	91.94%	89.72%	98%
8	Customer care(promptness in attending to customers request						
	Termination / Closures	100%	Month	90.57%	100%	100%	100%
	Time taken for refunds of deposit after closures	100%		100%	100%	100%	100%

NA – Not Applicable, NP – Not Provided.

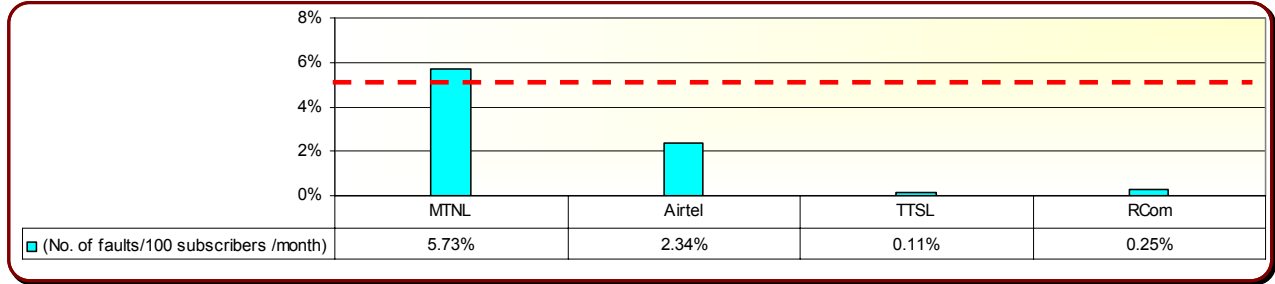
Note:

a) For S/N 4 Reliance filed ASR instead of CCR rest of operators filed CCR.

2. Performance (Graphical representation)

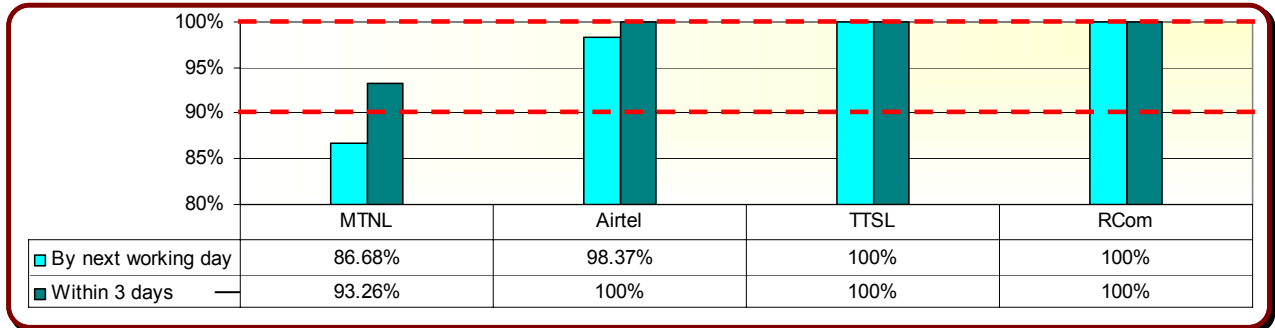
Parameter wise Data Analysis & Graphical Representations – Basic Service (Wireline)

Fault incidences (No of faults/100 subscribers/month (≤ 5): Except for MTNL, All the operator are meeting the benchmark set by TRAI.



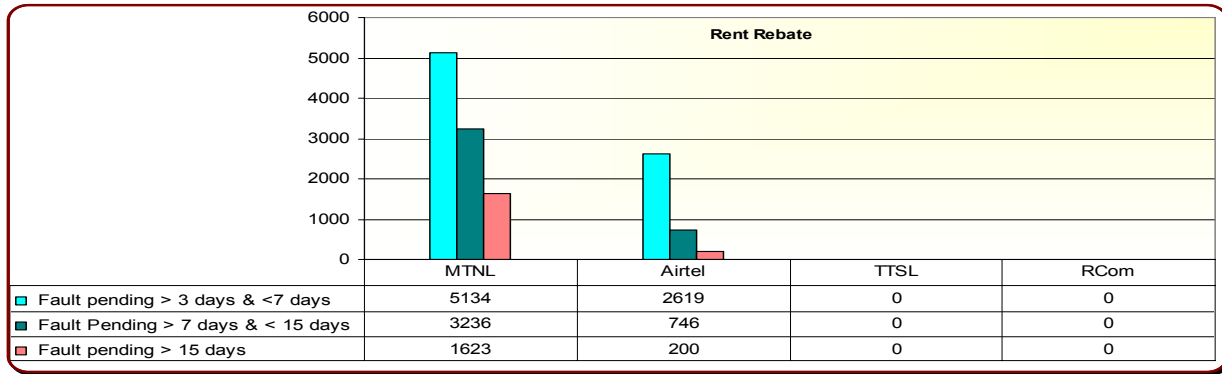
Fault Repair (Urban Area):

- **By next working day (>90%):** All the operators comply with the TRAI benchmark of 90% except for MTNL with the value of 86.68%.
- **Within 3 days (100%):** All the operators comply with the TRAI benchmark of 100% except for MTNL with the value of 93.26%.

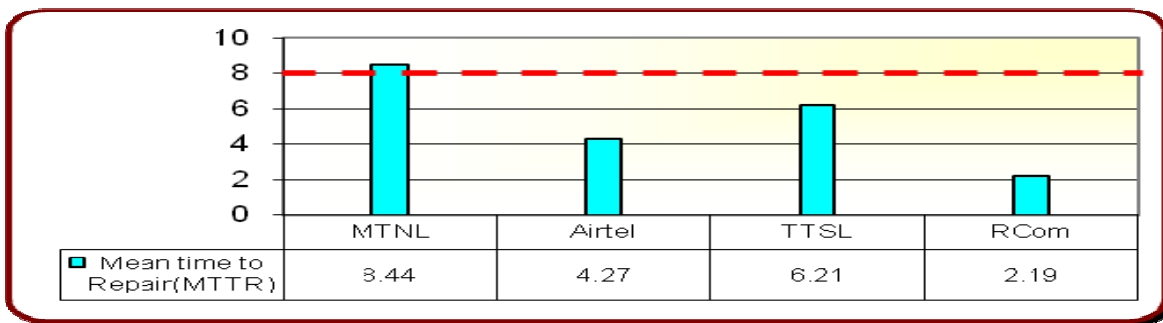


Rent Rebate

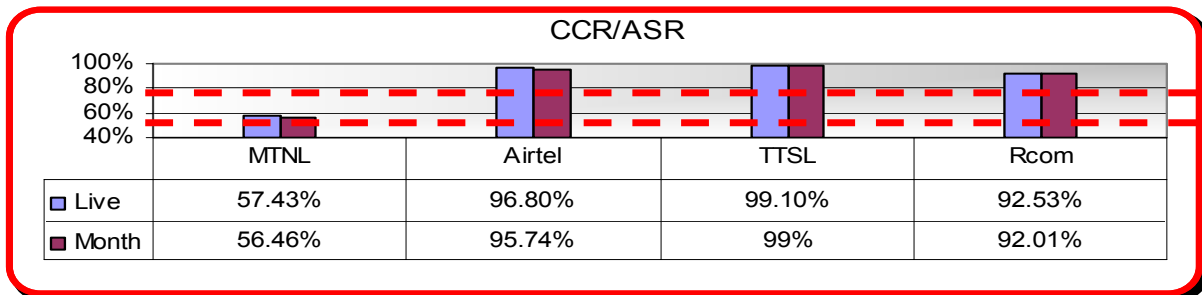
- Faults pending for > 3 days & < 7 days (Rebate 7 days)—As far as rebate is concerned Airtel and MTNL has given rebate of 2619 & 5134 respectively. RCom. & TTSL do not have any rebate case.
- Faults pending for > 7 days & < 15 days (Rebate 15 days) — As far as rebate is concerned Airtel and MTNL has given rebate of 746 & 3236 respectively. RCom. & TTSL do not have any rebate case.
- Faults pending for > 15 days (Rebate one month)--. As far as rebate is concerned Airtel and MTNL has given rebate of 200 & 1623 respectively. RCom. & TTSL do not have any rebate case.



Mean Time to Repair (MTTR) (<= 8 Hrs): All the operators comply with the TRAI benchmarks except for MTNL with the value of 8.44 Hrs.

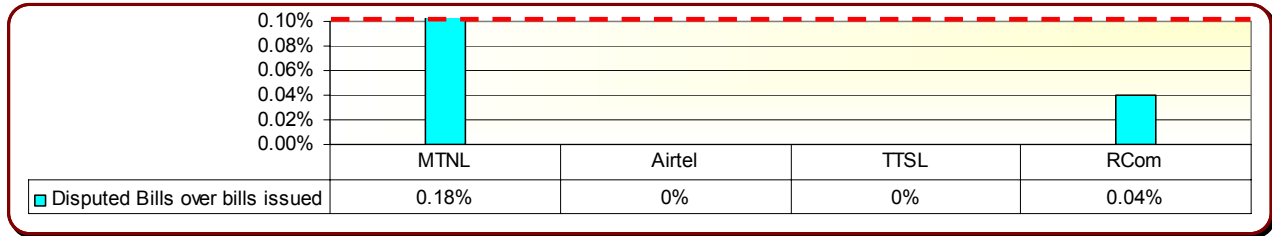


Call Completion Rate (CCR)/ Answer to Seizure Ratio (ASR) (>55% & > 75%): All the operators comply with the TRAI standards in both live and one-month data verification. Other than RCom, which have given ASR, rest of the operators gave CCR value.



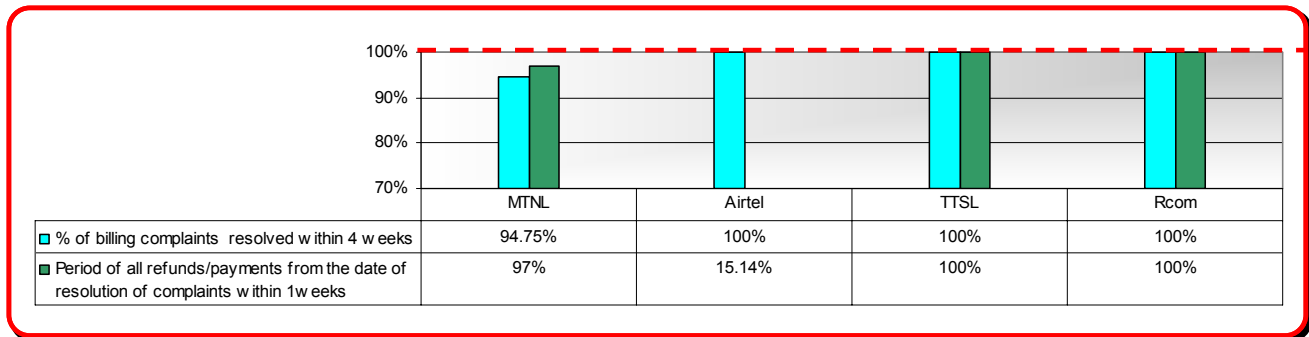
Metering and Billing Credibility (< 0.1%):

Disputed Bills over Bills issued: - Except for MTNL with value of 0.18%, rest of the operators comply with the TRAI standards.



% of Billing Complaints resolved within 4 Weeks: All the operators have resolved billing complaints 100% (benchmark) within 4 weeks except for MTNL with the value of 94.75% in one-month data verification.

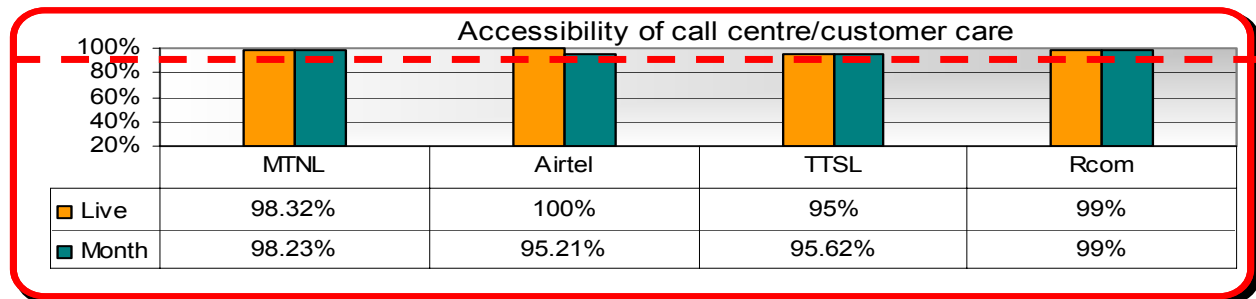
Period of All refunds / Payments from the date of Complaints Within 1 week: As far as period of refunds from the date of complaints within 1 week, all the operators are meeting the benchmark of 100% except for MTNL & Airtel with the value of 97% & 15.14% respectively in one-month data verification.



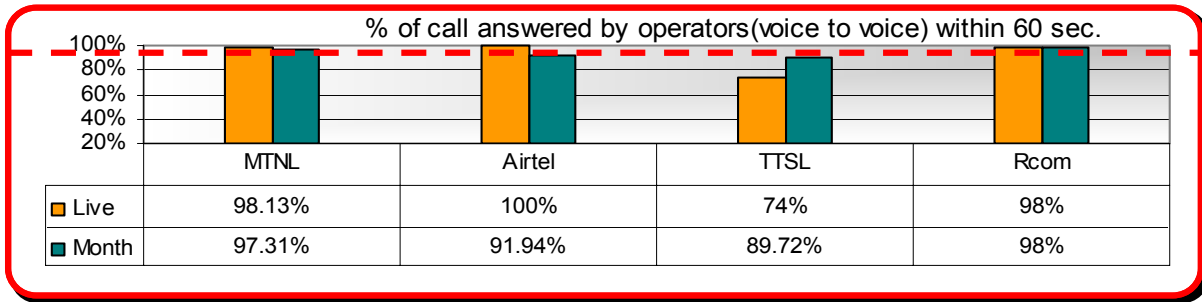
POI Congestion: No operator is having any POI with more than 0.5% congestion.

Response Time to Customer for Assistance:

Accessibility of Call centre / customer care (Electronically) within 40 sec (>95%): All the operators meeting the benchmark set by TRAI in both live and one-month data verification. All the operators are meeting the benchmark in both live measurement and one month data verification.



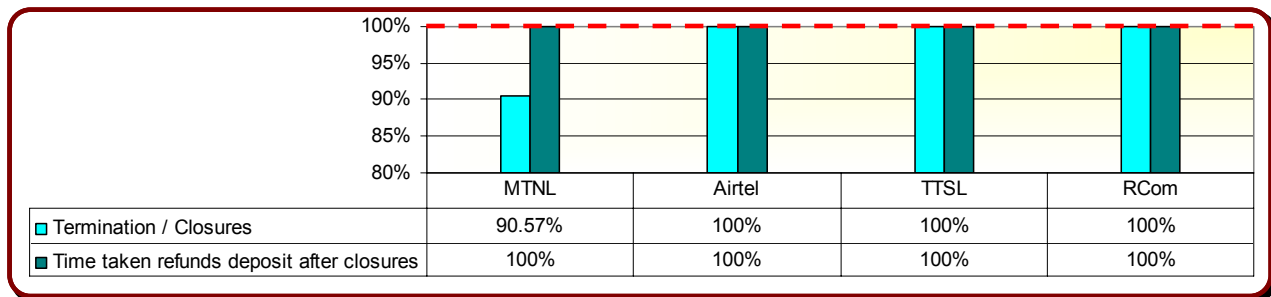
% age of calls answered by operator (Voice to Voice) within 60 sec (>90%): Except to TTSL, rest of the operators meeting the benchmark in both live measurement and one month data verification.



Customer Care Promptness in Attending Customer Request:

(i) Termination/Closure: All the operators are meeting the TRAI benchmarks of 100% within ≤ 7 days for closure requests except for MTNL with the value of 90.57% in one-month data verification.

ii) Time taken for refund of deposits after closure: The audit finding on ‘time taken for refund of deposit after closure’ is that all the operators are providing the refund to the customers within the benchmark.



3. Customer Care & Grievances Redressal

Basic Service (Wireline)

S.N.	Parameters	Airtel	MTNL	TTSL	RCom.
1	Total no of complaints received in the call centre (Tech+ Non Tech)	128335	NP	90	452
3	Nodal Officer				
3.1	Total no of complaints received by the nodal officers	1571	NP	0	0
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	1%	NP	0%	0%
4	Appellate Authority				
4.1	Total no of appeals received by the appellate authority	25	NP	0	0
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	1.59%	NP	0%	0%

Note:

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

4. Live calling to Call center:

Fifty nos. of calls were made in each half and below given nos. of call got connected to the call center within 60 Sec (Voice to Voice).

	CALLS MADE	OPERATORS NAME			
		Airtel	MTNL	RCom	TTSL
1ST HALF (10AM TO 01 PM)	50	48	46	48	47
2ND HALF (04PM TO 07 PM)	50	47	45	46	40
In % age		95.00	91.00	94.00	87.00

5. Level 1 Calling:

Level 1 calling such as calling at emergency no. (Police, Fire, Hospital), Railway enquiry system etc were made so as to check the service of such short codes. In Delhi it was found to be functional.

6. Critical Analysis

Critical findings and Key take outs for Basic service (Wireline) are as follows: The parameter wise key takeouts for the Basic (Wireline) Service providers for the Delhi Circle are as under:-

Fault incidence:

All operators are meeting the benchmark.

Fault Repair (Urban Area):

All the operators are meeting the benchmarks set by TRAI except for MTNL for the parameters “faults repair by the next working day” and “fault repair within 3 working days” with the value of 86.68% and 93.26% respectively.

For the parameter Mean time to Repair (MTTR) all the operators are meeting the benchmark except for MTNL with the value of 8.44 Hrs.

Rent Rebate:

All the operators are providing Rebate except for TTSL and RCOM. having no rebate cases in the month of audit. Airtel is having 2619 rebate cases for 7 days, 746 days for 15 days and 200 cases in one month data category. For MTNL rebate cases are 5134, 3236 and 1623 respectively for each type of rebate cases.

Call Completion Rate (CCR):

All the service providers are found to be meeting TRAI benchmark of $\geq 55\%$ for the parameters Call Completion Rate (CCR) and $\geq 75\%$ and Answer to Seizure Ratio in both live and one- month data verification.

Metering and billing credibility:

All the operators are complying the benchmark of less than 0.1% billing complaints over the total number of bills issued.

% of Billing complaints Resolved Within 4 Weeks:

As per the findings for one-month data audit, all the operators were found 100% resolution of complain within 4 weeks except for MTNL with the value of 94.75%.

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 except Airtel with the value of 15.14%.

POI Congestion:

All the operators are meeting the benchmarks in POI Congestion set by TRAI ($< 0.5\%$) in both live and one-month data verification.

Response Time to Customer for Assistance:

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

For accessibility of call centre i.e. call answered electronic through IVR menu parameter all the operators are meeting the benchmarks of $\geq 95\%$ in both live and one- month data verification.

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

For the parameter “%age of calls answered by operators within 60 Seconds” all the operators are meeting the benchmark of 90% fixed by TRAI except for TTSL with the value of 74% in live data verification.

Customer care (Promptness of attending customer request):

(i) Termination/Closure: -

All the operators are meeting the TRAI benchmarks of 100% within ≤ 7 days for closure requests except for TTSL with the value of 90.57% in one-month data verification..

ii) Time taken for refund of deposits after closure:

The audit finding on 'time taken for refund of deposit after closure' is that all the operators are providing the refund to the customers within the benchmark.

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.

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

AIRTEL

Under the Network Section, both the network parameters of Airtel are meeting the benchmark in both live and one-month data verification for Call Completion Ratio and POI congestion respectively within the local network.

Airtel is also meeting all the benchmark except for parameters "Period of all refunds/payments from the date of "resolution of complaints within one week's" with the value of 15.14% in one month data verification.

MTNL

MTNL is also meeting the benchmark except for parameters "Fault repair by next working day (Urban Area)", "Fault repaired within 3 days", "Mean time to Repair(MTTR)", "% of billing complaints resolved within 4 weeks" and Termination / Closures" with the value of 86.68%, 93.26%, 8.44 Hrs 94.75% and 90.57% respectively in one month data verification.

TTSL

In the Network Section, both of the network parameters of TTSL are meeting the benchmark in both live and one-month data verification for Call Completion Ratio and POI congestion respectively within the local network.

TTSL is also meeting the benchmarks in both live and one-month data verification except for parameter "%age Calls answered Voice to Voice within 60 Seconds" with the value of 74% in live data verification.

RCom.

Reliance is meeting the benchmark in both live and one-month data verification

In the Network Section, both of the network parameters of Reliance are meeting the benchmark in both live and one-month data verification for Call Completion Ratio and POI congestion respectively within the local network. Please note that Reliance has provided ASR (Answer to Seizure ratio) value instead of CCR (call completion ratio).

III. Broadband Service Providers

(A) POP Audit

(1) 3 days live data & One month audit comparative table (Jan 2011 – March 2011).

S/N	Parameters	Benchmarks	Audit Period	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet
1	Service Provisioning/Activation Time									
1.1	100% cases in 15 days (subject to technical feasibility)	<15 days	Month	82.15%	100%	100%	100%	100%	97.72%	99.68%
1.2	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/ per day.		100%	100%	100%	100%	100%	100%	100%
2	Faults Repair/Restoration Time									
	By next working day	>90%	Month	68.29%	99.07%	100%	98.14%	98.70%	91.37%	98.66%
	within 3 working day	≥99%		86.32%	99.78%	100%	99.51%	99.57%	100%	100%
2.1	Rebate									
	Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		Month	3071	766	0	284	25	23	0
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)			1046	269	0	22	3	17	0
	Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)			563	36	0	7	1	0	0
3	Billing Performance									
	Billing complaints per 100 bills issued	<2%	Month	0.27%	0.20%	0.13%	0.14%	0.54%	NA	0%
	%age of complaints resolved within 4 weeks	100%		98%	100%	100%	100%	100%		100%
	Time taken for refund of deposits after closure (within 60 days)	100%		100%	100%	100%	100%	100%		100%
4	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)									
	within 60 sec	>60%	Live	99.17%	100%	100%	75%	100%	83.59%	100%
			Month	99.24%	81.84%	96.26%	97.94%	90.67%	92.52%	60.05%
	within 90 sec	>80%	Live	99.36%	100%	100%	100%	100%	100%	100%
			Month	99.03%	89.13%	97.23%	98.79%	93.67%	100%	60.05%

S/N	Parameters	Benchmarks	Audit Period	MTNL	Airtel	RCom	TCISL	Hathway	Sify	Spectranet
5	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).									
5.1	POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	Live	85.46%	67.02%	34.55%	31.2%	69.68%	35%	77.79%
			Month	79.8%	16.09%	14.64%	30.9%	65.20%	35%	79.50%
5.2	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	Live	57.37%	44.90%	30.53%	46.91%	55.52%	67%	NA
			Month	60.12%	44.94%	7.55%	43.03%	85%	67%	NA
5.3	Broadband Connection Speed (download) - from ISP Node to User	> 80%	Live	94.12%	100%	100%	96.35%	93.23%	90.94%	89.43%
			Month	93.43%	100%	98.81%	93.75%	83%	91.25%	86.8%
6	Service Availability/Uptime (for all users) in %age									
	Service Availability(%)	>98%	Month	99.76%	99.93%	99.99%	100%	98.37%	100%	99.99%
7	Packet loss									
	% of Packet loss	<1%	Live	0.001%	0.3%	0%	0%	0%	3%	0%
			Month	0.004%	0.4%	0.16%	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	1 ms	10 ms	70.3 ms	22 ms	11.56 ms	39 ms	4 ms
			Month	1.8 ms	22.2 ms	98.6 ms	23.3 ms	8.67 ms	49 ms	4.6 ms
8.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 ms	Live	266.7 ms	317.2 ms	56.05 ms	286 ms	287.7 ms	284 ms	224 ms
			Month	262.9 ms	28.9 ms	84.8 ms	284.9 ms	296 ms	322 ms	228 ms
8.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)** See note below	<800 ms		NA	NA	NA	NA	NA	NA	NA

NA – Not Applicable,

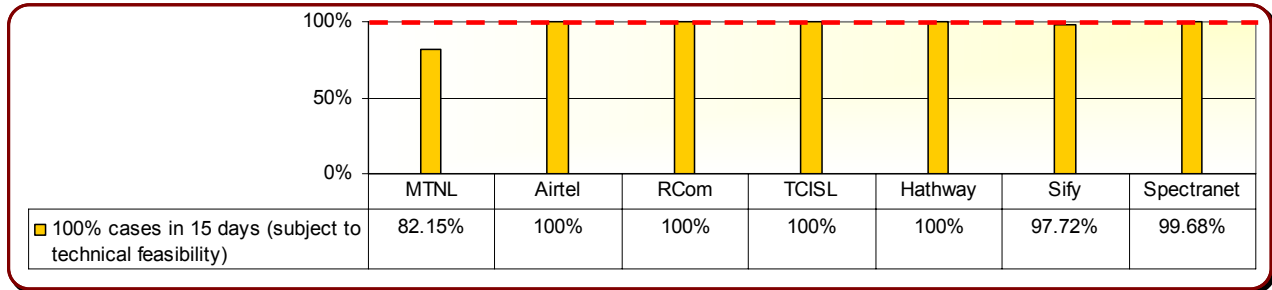
Note:

- S/N 8.3 None of the operator having satellite Connectivity.
- S/N 5.2 For Spectranet not applicable because no Upstream Links for International Connectivity.
- S/N 3 For Sify not applicable because operator under in prepaid module.

1. Performance (Graphical representation)

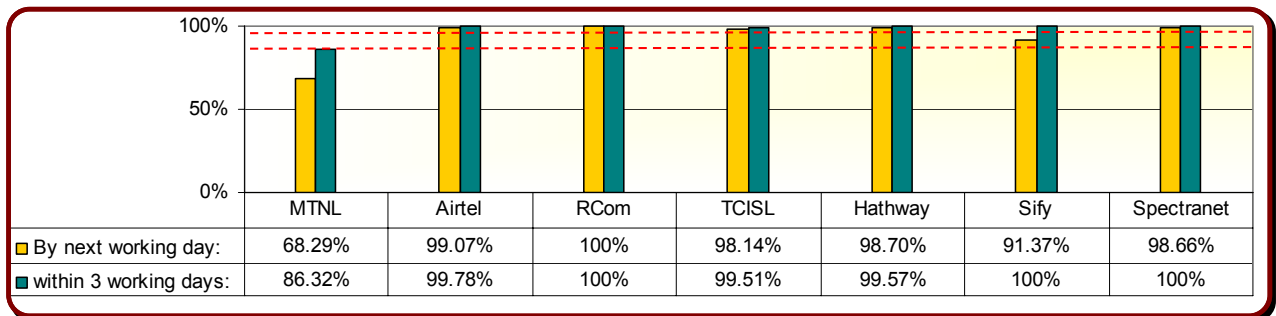
Service Provisioning /Activation Time: (Should be 100%)

All the operators are complying with the TRAI benchmark of 100% except for MTNL, SIFY and SPECTRANET with the value of 82.15%, 97.72% and 99.68% respectively in one-month data verification.



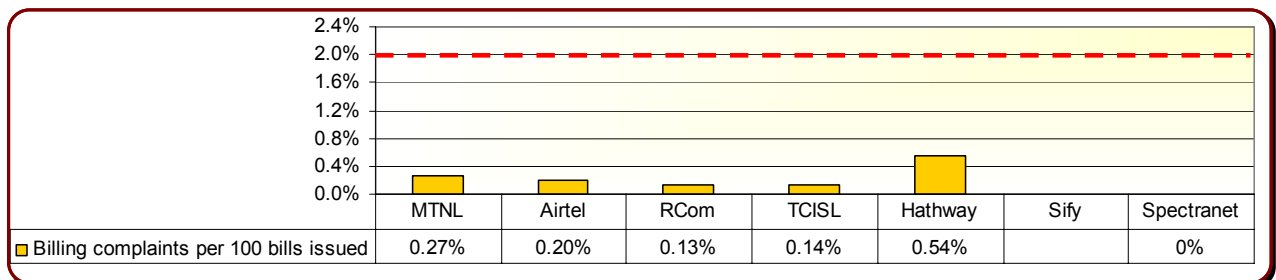
Fault Repair / Restoration Time:

- **By next working day (>90%):** Except MTNL, All the operators are complying with the TRAI benchmark of 90% in one-month data verification
- **Within 3 working days (>99%):** Except MTNL, All the operators are complying with the TRAI benchmark of 99% in one-month data verification.
- **Rebate:** All the operators are giving rebate to the eligible customers.



Billing Performance: (Benchmark <2%)

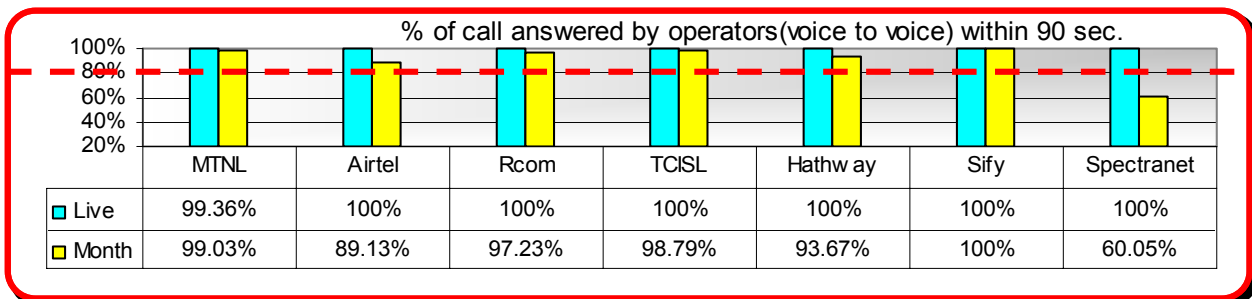
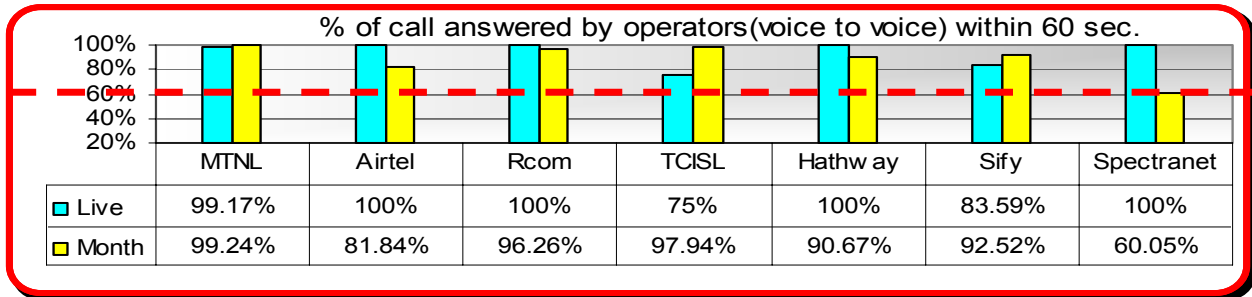
All the operators are complying with the TRAI standards except for MTNL for the parameter “%age of complaints resolved within 4 weeks” with the value of 98% in one-month data verification. In the case of Sify which has only prepaid module.



Response time to the customer for assistance:

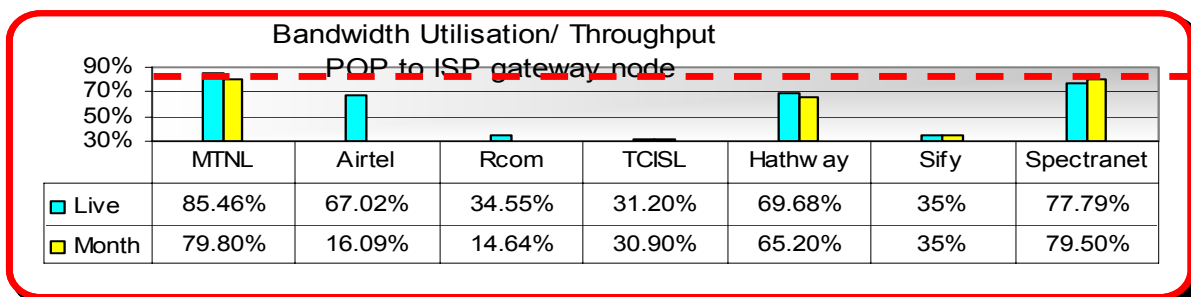
% age of calls answered by operator (Voice to Voice)

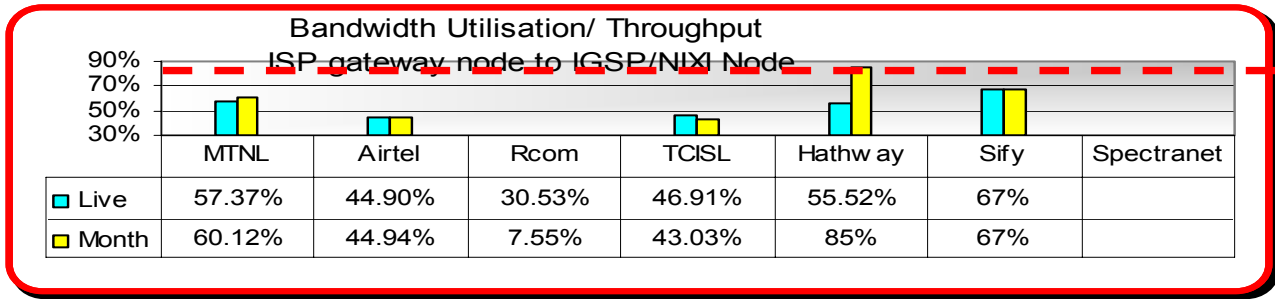
- **Within 60 seconds (>60%):** All the operators are meeting the benchmark in both live and one- month data verification.
- **Within 90 seconds (>80%):** All the operators are meeting the benchmark in both live and one- month data verification except for Spectranet.



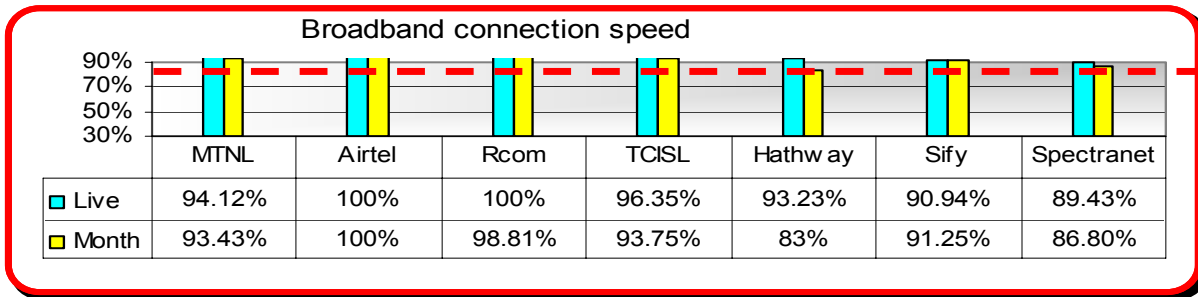
Bandwidth Utilization/ Throughput:

- **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 except MTNL with the value 85.46% in live 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 Hathway with the value of 85% for month verification.

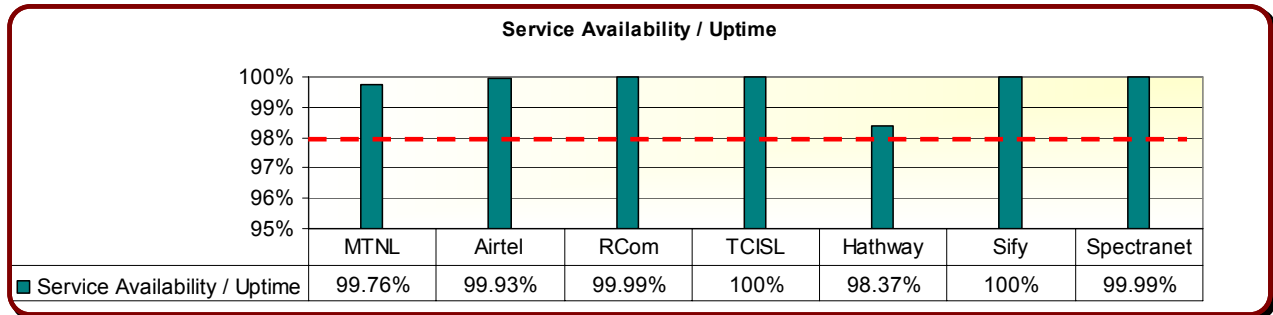




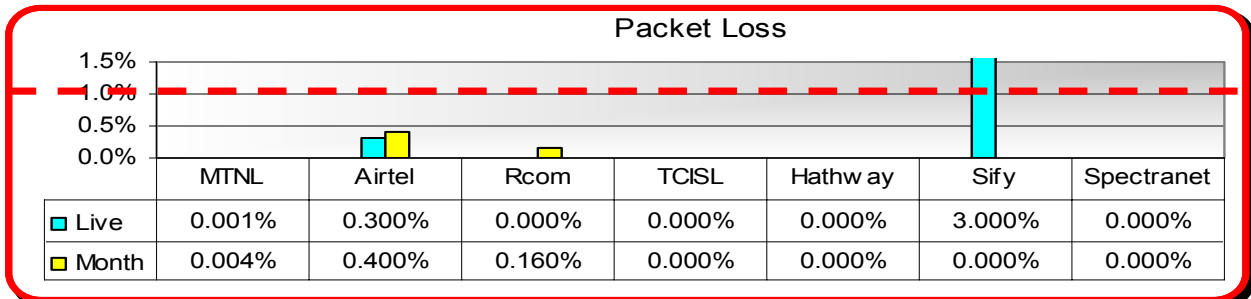
Broadband Connection Speed (download) (>80%): All the operators are meeting the benchmarks in both live and one-month data verification.



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.

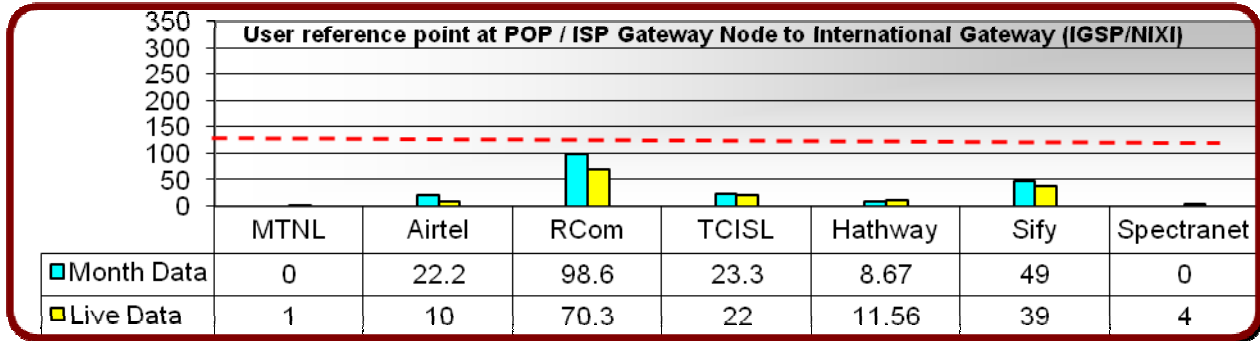


Packet Loss (Should be less than 1%): All operators are meeting the benchmark in both live and one-month data verification except for Sify with the value of 3% in live data verification.

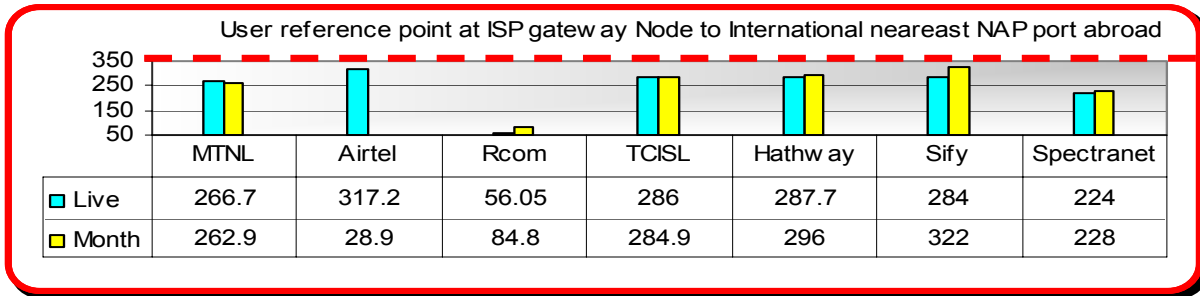


Network Latency:

- **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

2. Customer Care & Grievances Redressal

S.N.	Parameters	Airtel	TCISL	RCom.	Hathway	Sify	Spectra net
1	Call Centre						
1.1	Total no of complaints received in the call centre	128335	1030	181	7234	2303	970
1.2	Complaints per 100 customers per months	0.20%	0.14%	0.13%	0.54%	NA	0%
2	Nodal Officer						
2.1	Total no of complaints received by the nodal officers	1571	20	0	5	4	0
2.2	Percentage of complaints with reference to total no of complaints received at the call centre	1%	2%	0%	0.06%	0.001%	0%
3	Appellate Authority						
3.1	Total no of appeals received by the appellate authority	25	0	0	17	2	0
3.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	1.59%	0%	0%	0.23%	0.09%	0%

Note:

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

4) Live calling to Call Center:

Fifty nos. of calls were made in each half and below given nos. of call got connected to the call center within 60 Sec (Voice to Voice).

	CALLS MADE	OPERATORS NAME						
		Airtel	MTNL	Hathway	RCOM	Sify	Spectranet	TCISL
1ST HALF (10AM TO 01 PM)	50	40	38	41	47	41	29	46
2ND HALF (04PM TO 07 PM)	50	45	40	46	44	47	31	44
In % age		85.00	78.00	87.00	91.00	88.00	60.00	90.00

3. Critical Analysis

Critical findings and Key take outs for Broadband service are as follows:

- ◆ Reliance, Spectranet and Sify are submitting the PMR on all India bases; hence data is verified on all India basis and not for Delhi Circle only.
- ◆ The Satellite link do 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 the Operator.

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/Activation time except for MTNL, SIFY and SPECTRANET with the value of 82.15%, 97.72% and 99.68% respectively in one-month data verification.

Fault Repair/Restoration time & Rebate:

All the operators are meeting benchmark of more than 90% in one-month data verification. All the service providers are found to provide Rebate as per the guide lines set by TRAI.

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% cases 4 weeks” for billing complaint resolution except MTNL with the value of 98% for on-month data verifications. Also all the operators are providing the refund of deposits after closure as per the benchmark of “100% cases within 60 days” .Sify claims that all its broadband customers are under in prepaid module and hence there are no bills issued.

Customer Care/Helpline Assessment:

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

Bandwidth Utilization:

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

All the operators are meeting all the benchmark during measurements of both live & one-month data Verification except MTNL with the value 85.46% in live data verification.

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

All the operators are meeting all the benchmark during measurements of both live & one-month data Verification except MTNL with the value of 57.37% in live data verification.

Broadband Connection speed:

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

Service Availability/Uptime:

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

Packet Loss:

All the operators are meeting the TRAI benchmark of less than 1% during measurements of both live and one-month data verification except for Sify with the value of 3% in live data. MTNL & Spectranet had not provided the data for month audit.

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)

MTNL

MTNL is meeting all the benchmarks in both live and one-month data verification except for parameters “Service Provisioning/Activation Time 100% cases in 15 days (subject to technical feasibility)” & “%age of complaints resolved within 4 weeks” with the value of 82.15% and 98% respectively in one-month data verification.

In network section also MTNL is not meeting the benchmark for the parameter “Bandwidth Utilization POP to ISP Gateway Node [Intra-network] Link(s)” and “ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity” with the value 85.46% and 57.37% respectively in live data verification.

AIRTEL

Airtel is meeting all the benchmarks in both live and one-month data verification

R Com

Reliance is meeting all the benchmark in both live and one-month data verification.

Reliance submits the PMR on all India bases; hence data is verified on All India basis not for Delhi Circle particularly.

TCISL

TTSL is meeting all of the benchmark in both live and one-month data verification.

HATHWAY

Hathway is meeting the benchmarks for all the parameters in both live and one-month data verification.

SIFY

Sify is meeting benchmarks for all the parameters in both live and one-month data verification except for parameter “Service Provisioning/Activation Time 100% cases in 15 days (subject to technical feasibility)” with the value of 97.72% in one-month data verification.

In network section also SIFY is not meeting the benchmark for the parameter “Packet Loss” with the value 3% in live data verification.

SPECTRANET

Spectranet is meeting benchmarks for all the parameters in both live and one-month data verification except for parameter “Service Provisioning/Activation Time 100% cases in 15 days (subject to technical feasibility)” with the value of 99.68% in one-month data verification.

Note:

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