

REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
BASIC SERVICE (WIRELIN),
BASIC SERVICE (WIRELESS) &
CELLULAR MOBILE TELEPHONE SERVICE
AND
BROADBAND SERVICE
FOR
WEST ZONE – MUMBAI CIRCLE

Report Period: January 2010- March 2010

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PREFACE

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 for 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 industry in a multi operator, multi service open competitive market. In continuation to that efforts, TRAI has selected through bidding process Audit Agency to audit and assess the Quality of Service (QoS) rendered by the service providers namely Basic Wireline, Cellular Mobile Telephone and Broadband Services.

The Audit would assess the Quality of Service of telecom operators by auditing the service level records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI.

The Audit for various circles within the Zone has been distributed across various quarterly periods. TCIL auditors have carried out audits in Mumbai Circle, West Zone in the period from January 2010- March 2010. This report details the performance of various service providers in Mumbai Circle against Quality of Services benchmarks for various parameters laid down by TRAI in respective regulations, 2009 for Basic Wireline, Cellular Mobile Telephone and Broadband Services.

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CHAPTER – 1

BACKGROUND

1.1 Introduction

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 Audit Agency to audit and assess the Quality of Service rendered by the service providers' namely basic wireline, Cellular Mobile Telephone Services and broadband service.

The objective of assessment for the Quality of Services (QoS) has been carried out by TCIL for all the basic wireline, Cellular Mobile Telephone Services and broadband service Providers during the period starting from January 2010 to March 2010 in Mumbai Circles. The report provides the critical findings of the Audit by providing: -

- "Service provider performance report" based on quarterly Performance Monthly Report (PMR), 3-days live assessment and one month data audited for the basic wireline, Cellular Mobile Telephone Services and broadband service, which highlights the performance of various operators against the benchmark specified by TRAI, during the month in which the Audit was carried out by TCIL.
- "Parameter wise critical findings" for the basic wireline, Cellular Mobile Telephone Services and broadband service. This indicates parameter wise observations and findings from different activities carried out during the Audit process by TCIL.

1.2 Scope of Work

The audit and assessment of Quality of Service is conducted for MTNL, private basic service providers, unified access service providers, cellular mobile service providers and ISPs (Internet Service Provider) in Mumbai Service areas in the Western Zone for basic wireline, Cellular Mobile Telephone Services and broadband service.

The detailed scope of work is given below:-

- 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 service providers both operator assistant and independent drive test.
- v) Billing and Call center's data verification.
- vi) Live testing of the efficiency of the call center / customer care help line.

1.3 Methodology

1.3.1 Basic Wireline Service:

The Network parameter of the QoS TRAI regulations is observed / verified for the 3 days for nearly 5% of the telephone exchanges covering 10% of the SDCA in a Service area. For details of exchanges see annexure 1: List of exchanges/switches/POP. The network parameter for the entire month is also collected from the operator as per the requirement. There are operators who have unified NMS/NOC from where the entire data can be seen. At the same time on several occasions the data had to be collected from the respective exchange as the centralized monitoring is not available. The data related to Billing and Customer care is checked for the previous month and verified with the customer by calling the customer by the auditing officers in presence of operator. The process of registration and handling of the complaints was also studied for the various operators. Call centre number was called for measuring the efficiency of the call centre in two sessions (morning/evening), 50 calls in each session at Network/Call center busy hours.

1.3.2 Basic Service (Wireless) and Cellular Mobile Telephone Services:

All the NSS (Network Sub System) and BSS (Base-station Sub System) data for the relevant details were collected either directly from the centralized NOC or through a remote access to the NOC. For details of switches see annexure 1: List of exchanges/switches/POP. The Radio parameters of the QoS TRAI Regulations were audited/observed/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 inclusive of 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 parameters were audited/observed/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 is checked for the previous month and verified with the customer by calling the customer by the auditing officers in presence of operator. 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 congestion was checked by calling the operators during the time

specified in the tender. TCBH (Time Consistent Busy Hour) is taken as 11:00 Hrs and 19:00 Hrs as per the maximum traffic being observed for three consecutive days.

1.3.3 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. For details of POPs refer annexure 1: List of exchanges/switches/POP. The network parameter was also checked from the centralized NOC. MRTG, Cacti and Sandvine software were used for monitoring link utilization. Smoke Ping and Ping Test were used for monitoring Network Latency. The data related to Billing and Customer care was checked for the previous month and verified with sample of customers by calling them and taking their feedback. The process of registration and handling of the complaints was also studied for the various operators. Test Calls were made to the Helpline number of the Call Centre of different ISPs for measuring the efficiency of the call centre during the peak hours as per the TRAI benchmark.

CHAPTER – 2

REFERENCE DOCUMENTS / SOFTWARE / TOOLS USED

The following documents shall be followed and consulted while conducting the Audit and Assessment of Quality of Services for basic Wireline, Cellular Mobile Telephone Services and broadband service:

1. TRAI Regulations documents
 - a. Regulations on Quality of Service of Basic and Cellular Mobile Telephone Services, 2009
 - b. Quality of Service of Broadband Service Regulations 2006.
2. Quarterly Performance Monitoring Report (PMR) for the quarter ending Sep 2009, provided by TRAI.
3. TRAI Tender document no. II (Audit)
4. Manufacturer's operating and configuration manual where ever made available.
5. The following Systems /Tools were used while conducting the Audit and Assessment of QoS of Basic (Wireless) and Cellular Mobile Services.
 - a. Drive Test Tools.
 - b. OMC-R
 - c. OMC-S
6. The following Software /Tools were used while conducting the Audit and Assessment of QoS of Broadband Services.
 - MRTG, Cacti and Sand vine for link utilisation.
 - Smoke Ping and Ping Test for Latency calculations.
 - Internet Explorer and Speed test tools for testing download speed.
 - FTP and PING Test for packet loss.

CHAPTER – 3

OPERATORS AUDITED

3.1 BASIC WIRELINE SERVICE

Sl.	Service Provider	Zone	Circle/ Service Area
1	MTNL	West	Mumbai
2	Airtel Ltd	West	Mumbai
3	TTML	West	Mumbai
4	Reliance Communications Ltd	West	Mumbai

3.2 CELLULAR MOBILE TELEPHONE SERVICES

Sl.	Name of service Provider	Zone	Circle/ Service Area
1	Airtel Ltd	West	Mumbai
2	Loop telecom	West	Mumbai
3	Vodafone	West	Mumbai
4	MTNL(GSM)	West	Mumbai
5	Docomo	West	Mumbai
6	RTL(GSM)	West	Mumbai
7	Aircel	West	Mumbai
8	Idea Cellular	West	Mumbai
9	MTS	West	Mumbai
10	MTNL (CDMA)	West	Mumbai
11	TATA Teleservices (TTML)	West	Mumbai
12	RCom.(CDMA)	West	Mumbai

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

3.3 BROADBAND SERVICES

Sl.	Name of service Provider	Zone	Circle/ Service Area
1	MTNL	West	Mumbai
2	Airtel Ltd.	West	Mumbai
3	TTML	West	Mumbai
4	Sify Limited	West	Mumbai
5	Reliance Communications Ltd.	West	Mumbai
6	You Telecom	West	Mumbai
7	Hathway	West	Mumbai
8	Spectra-net	West	Mumbai

More than 5% of the POPs of ISP spread over in 10% of SDCA were covered in specified service area.

CHAPTER – 4

SERVICES / SYSTEMS AUDITED

The following **Services** were audited as per the documents under reference in chapter – 2.

1. Basic Wireline Service
2. Basic Service (Wireless) and Cellular Mobile Telephone Services
3. Broadband Service

The following **Systems** were audited as per the documents under reference in chapter – 2.

1. PSTN Exchanges
2. Mobile Switching Centre (NSS)
3. Base Station (BSS)
4. Broadband Pops
5. Billing Applications
6. Customer Care applications

The following **Facilities** that were audited as per the documents under reference in chapter – 2

1. Billing documents.
2. Customer Care records.

The following **field verifications** were conducted as per the documents under reference in chapter – 2.

1. RF network coverage including KPIs (Key Parameter Index)
2. Inter Operator Congestion (POI)
3. Billing Complaints
4. Network Complaints
5. Customer Care efficiency

The live calling was made to assess the quality of services for Inter Operator Congestion, Billing Complaints, Network Complaints and Customer Care efficiency.

CHAPTER – 5

PMR DATA VERIFICATION REPORT
PERIOD: JULY 2009 – SEP 2009

Verification of quarterly Performance Monitoring (PMR) Report submitted by the operators to TRAI for Quality of Services (QoS) records maintained by each Operator.

5.1 Basic Service (Wireline) (PMR Period : July 2009 – Sep 2009)

	Parameters	Benchmarks	AIRTEL		MTNL		T'TML		Reliance	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
1	Fault incidences(No. of faults/100 subscribers /month)	<= 5	1.66%	1.66%	10.26%	10.26%	1.06%	1.06%	0.98%	0.98%
	% of fault repaired by next working day	>90%	92.86%	92.86%	86.38%	86.38%	96.16%	96.16%	100%	100%
2.	Total no of faults registered during quarter		4697	4697	833560	833560	4693	4693	5092	5092
	No of faults repaired by next working day during quarter		4359	4359	716805	716805	4513	4513	5092	5092
	No of faults repaired within 3 days during quarter	For Urban Areas	5773	5773	782346	782346	180	180	5092	5092
2.1	% of faults repaired within 3 days.	For Urban Areas:>100%	94.3%	94.3%	94.01%	94.01%	100%	100%	100%	100%
	No of faults repaired within 5 days during quarter.	For Rural & Hilly areas	NA	NA	NA	NA	NA	NA	NA	NA
	%of faults repaired within 5 days	For rural & hilly areas:>100%	NA	NA	NA	NA	NA	NA	NA	NA
3.	Rent rebate		52	52	82362	82362	0	0	4	4
3.1	Fault pending > 3 days & <7 days	Rebate for 7 days	46	46	60681	60681	0	0	1	1
3.2	Fault Pending > 7 days & < 15 days	Rebate for 15 days	5	5	16842	16842	0	0	2	2
3.3	Fault pending > 15 days	Rebate for one months	1	1	4839	4839	0	0	1	1
4.	Mean time to Repair(MTTR)	< 8Hrs	12.8hrs	12.8hrs	18.34hrs	18.34hrs	4.26hrs	4.26hrs	3.17hrs	3.17hrs
5.	Call Completion Ratio(CCR)	> 55%	65.36%	65.36%	56.89%	56.89%	56.51%	56.51%	NA	NA
	Total no of successful local calls		3556098	3556098	6881944	6881944	601407	601407	NA	NA
	Total local attempts.		5442372	5442372	12122520	12122520	1064240	1064240	NA	NA

	Parameters	Benchmarks	AIRTEL		MTNL		TTML		Reliance	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
5.1	Answer to seizure Ratio(ASR)	> 75%	NA	NA	62.71%	62.71%	NA	NA	89.48%	89.48%
	Total I/C seizure.		NA	NA	5083154	5083154	NA	NA	10524182	10524182
	No of answered calls.		NA	NA	9411514	9411514	NA	NA	9416593	9416593
6.	POI(No of POI not meeting the benchmarks)	<= 0.5%	0	0	0.51%	0.51%	0%	0%	0	0
6.1	Total no of working POI service area wise		68	68	237	237	297	297	25	25
7.	Metering and Billing credibility- Post paid	< 0.1%	0.005%	0.005%	0.05%	0.05%	0.01%	0.01%	0.05%	0.05%
7.1	No of bills issued during the period		74094	74094	3850948	3850948	1251767	1251767	99951	99951
7.2	No of bills disputed including billing complaints during the quarter.		4	4	2124	2124	122	122	51	51
8.	Metering and Billing credibility- Prepaid	< 0.1%	No Pre Paid Module							
9.	Resolution of billing/charging/validity complaints	100% within 4 weeks.	100%	100%	100%	100%	91%	91%	100%	100%
9.1	No of billing (post paid) and charging, credit/ validity (prepaid) complaints resolved within 4 weeks during the quarter.		67	67	2124	2124	564	564	NIL	NIL
9.2.	Total no of billing (post paid) and charging, credit/validity (prepaid) complaints received during the quarter.		67	67	2124	2124	618	618	NIL	NIL
9.3	Total no of billing (post paid) and charging, credit/validity(prepaid) complaints resolved in favour of customer during the quarter		4	4	2124	2124	122	122	51	51

	Parameters	Benchmarks	AIRTEL		MTNL		TTML		Reliance	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
9.4.	No of complaints disposed on account of not considered as valid complaints during the quarter.		113	113	0	0	496	496	NIL	NIL
9.5	Period of applying credit/waiver/adjustment to customers account from the date of resolution of complaints	Within 1 week of resolution of complaints	100%	100%	100%	100%	60%	60%	100%	100%
10	Response time to customer for assistance									
10.1	Accessibility of call centre/customer care.	>95%	92.64%	92.64%	91.25%	91.25%	100%	100%	96%	96%
10.2	Total no of call attempts to call centre/customer care nos.during TCBH.		95222	95222	645413	645413	244686	244686	480405	480405
10.3	No of calls connected successfully to call centre during TCBH .		326723	326723	588976	588976	237715	237715	460381	460381
10.4	Percentage of calls answered by the operators(voice to voice) within 60 seconds.	> 90%	93.78%	93.78%	83.91%	83.91%	90%	90%	92%	92%
11.	Termination/ closure of service.	< 7days								
11.1	% age requests for Termination/closure of service complied within 7 days.		100%	100%	99.41%	99.41%	100%	100%	100%	100%
11.2	Total no of requests for termination/closure of service received during the quarter.		6167	6167	25062	25062	9471	9471	772	772
11.3	Total no of requests for termination/closure of service complied within 7 days during the quarter		6167	6167	24914	24914	9471	9471	772	772
12.	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	100%	100%	100%

■ Indicates deviation from benchmark of TRAI.

■ Discrepancy found

The PMR data was verified with the data provided by the operators. The data was found to be as per the detail provided in the table above.

Observation:

Airtel:

Airtel is not meeting the benchmarks for the parameter like faults repaired within 3 working days, accessibility in customer care and MTTR.

MTNL

MTNL is not meeting the benchmarks for fault repaired by next and 3 working days, MTTR and accessibility in customer care. POI parameter for MTNL just crosses the benchmark with the value of 0.51%.

TTML

TTML is meeting all the benchmarks except resolution of billing/charging/validity complaints.

Reliance

Instead of CCR parameter Reliance has filed for ASR parameter in PMR report for Sep 2009. Rest RCOM. is meeting all the benchmarks.

5.2 Cellular Mobile Telephone Services (PMR Period : July 2009 – Sep 2009)

S.N	Parameters	Benchmarks	GSM OPERATORS												CDMA OPERATOR					
			Airtel		Idea		Vodafone		MTNL		LOOP		AIRCELL		RCom.		MTNL		T'TML	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	PMR	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
1	Network Performance																			
1.1	(a) BTS Accumulated Downtime (not available for service)	<=2 %	0.40%	0.40%	0.05%	0.05%	0.037 %	0.037 %	1.36%	1.36%	0.23%	0.23%	1.16%	0.06%	0.06%	0.16%	0.340 %	0.340 %	0.06%	0.06%
	(b) Worst affected BTSs due to downtime (%)	<=2 %	1.19%	1.19%	0.18%	0.18%	0.127 %	0.127 %	1.92%	1.92%	1.20%	1.20%	0.78%	0.00%	0.00%	0.27%	0.120 %	0.120 %	0.00%	0.00%
1.2	Call set-up Success Rate (within licensee's own network) (%)	> 95%	97.84%	97.84 %	99.15 %	99.15 %	98.92 %	98.92 %	96.39 %	96.39 %	99.99 %	99.99 %	97.29 %	98.51 %	98.51 %	99.49 %	98.60 %	98.60 %	98.51 %	98.51 %
1.3	Blocked Call Rate																			
	(i) SDCCH Congestion (%)	< 1%	0.11%	0.11%	0.07%	0.07%	0.17%	0.17%	0.99%	0.99%	0.45%	0.45%	0.01%	0.00%	0.00%	0.00%	0.75%	0.75%	0.00%	0.00%
	(ii) TCH Congestion (%)	< 2%	0.23%	0.23%	0.20%	0.20%	0.42%	0.42%	1.97%	1.97%	0.27%	0.27%	0.14%	0.32%	0.32%	0.13%	0.05%	0.05%	0.32%	0.32%
1.4	Call Drop Rate (%)	< 2%	0.99%	0.99%	0.89%	0.89%	0.793 %	0.793 %	1.96%	1.96%	1.56%	1.56%	0.86%	0.57%	0.57%	0.60%	1.08%	1.08%	0.57%	0.57%
1.5	Worst affected cells having more than 3% TCH drop(call drop)rate	<=5 %	5.29%	5.29%	8.94%	8.94%	2.75%	2.75%	3.80%	3.80%	1.75%	1.75%	1.51%	0.00%	0.00%	0.35%	0.15%	0.15%	0.00%	0.00%

S.N	Parameters	Benchmarks	GSM OPERATORS												CDMA OPERATOR					
			Airtel		Idea		Vodafone		MTNL		LOOP		AIRCELL		RCom.		MTNL		TTML	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	PMR	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
1.6	Percentage of connections with good voice quality (%)	> 95%	97.50%	97.50 %	97.80 %	97.80 %	98.607 %	98.607 %	96.68 %	96.68 %	96.98 %	96.98 %	98.19 %	98.19 %	98.92 %	98.92 %	98.46 %	98.46 %	96.97 %	96.97 %
1.8	POI Congestion (%)	< 0.5%	0.00%	0.00%	0.00%	0.00%	0%	0%	0.00%	0.00%	0.67%	0.67%	0.00%	0.00%	0.00%	0.00%	0.36%	0.36%	0.00%	0.00%
2.1	Response time to the customer for assistance																			
	(a) Accessibility of call centre/customer care	>=95 %	98.52%	98.52 %	98.3%	98.3%	100%	100%	97.50 %	97.50 %	95.03 %	95.03 %	100%	100%	92%	92%	100%	100%	100%	100%
	(b) Percentage of call answered by operators(voice to voice) within 60 seconds	>=90 %	79%	79%	83.00 %	83.00 %	97%	97%	97%	97%	90.86 %	90.86 %	35.00 %	35.00 %	88.00 %	88.00 %	91.99 %	91.99 %	97%	97%
3	Customer Service Quality Parameters																			
3.1	Metering and billing credibility-Post paid	<= 0.1%	0.070%	0.070%	0.11%	0.11%	0.016 %	0.016 %	0.115 %	0.115 %	0.06%	0.06%	3.00%	3.00%	0.10%	0.10%	0.28%	0.28%	0%	0%
3.2	Metering and billing credibility-Pre paid	<= 0.1%	0.000%	0.000%	0.08%	0.08%	0.009 %	0.009 %	0.134 %	0.134 %	0.03%	0.03%	2.30%	2.30%	0.04%	0.04%	0.02%	0.02%	0%	0%
3.3	(a) Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	100%	100%	74.86 %	74.86 %	100%	100%	100%	100%	100%	100%	83.44 %	83.44 %	100%	100%
	(b) period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	<=1 week	NP	NP	>1 week	>1 week

S.N	Parameters	Benchmarks	GSM OPERATORS												CDMA OPERATOR					
			Airtel		Idea		Vodafone		MTNL		LOOP		AIRCELL		RCom.		MTNL		TTML	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	PMR	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
3.4	(a) Termination/ closure of service	100% <=7days	89%	89%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	(b) Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

█ Indicates deviation from benchmark of TRAI.

█ Discrepancy found

NA – Not Applicable
 NP – Data Not Provided

Observation:

The above data was verified with the data provided by the operators. The data were found to be as per the detail provided above in the table.

Airtel

Airtel is meeting all the benchmarks except for Worst affected cells having more than 3% TCH drop, Percentage of call answered by operators(voice to voice) within 60 seconds & Termination/ closure of service.

Idea

Idea is meeting all the benchmarks except for worst affected cells having more than 3% TCH drop, Percentage of call answered by operators (voice to voice) and Metering and billing credibility-Post paid (marginally).

Vodafone

Vodafone is meeting all the benchmarks.

MTNL GSM

MTNL is meeting all the benchmarks of network except for metering and billing credibility for both post paid & prepaid and resolution of billing/charging complaints.

LOOP Telecom

Loop is meeting all the benchmarks except to POI congestion.

Aircel

Aircel is meeting all the benchmarks of network except for %age of call answered by operators (voice to voice) and metering/billing credibility for both post paid & prepaid.

Reliance Communications (RCOM.)

Reliance Communication is meeting all the benchmarks except response time to the customer for assistance for both electronically and Voice to Voice data.

MTNL CDMA

MTNL is meeting all the benchmarks except for metering/billing credibility-Post paid and resolution of complaints within 4 weeks data.

TTML

TTML is meeting all the benchmarks except period of applying credit/waiver/adjustment to the customers account from the date of resolution of complaints.

5.3 Broadband Service (PMR Period : July 2009 – Sep 2009)

s/n	Parameters	Benchmark	MTNL		HATHWAY		YOU TELECOM		SIFY		Airtel		TTML		Reliance Comm.		SPECTRA-NET	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
1	Service Provisioning/ Activation Time	100% in =<15 working days																
1.1	No. of connections registered		30833	30833	19687	19687	2190	2190	3783	3783	5,379	5,379	14,103	14,103	2808	2808	4756	4756
1.2	%age of connections provided within 15 days of registration of demand		65.63%	65.63%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.31%	99.31%
1.3	%age of connections provided after 15 days of registration of demand		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
1.4	No. of customers to whom credit is given for delayed connections		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5	Total no. of connections provided during the period		30833	30833	18957	18957	2190	2190	3783	3783	5,181	5,181	14,691	14,691	361940	361940	4819	4819
1.6	Total no. of working connections at the period		386919	386919	171090	171090	2190	2190	3783	3783	113,638	113,638	180,307	180,307	NP	NP	46902	46902

s/n	Parameters	Benchmark	MTNL		HATHWAY		YOU TELECOM		SIFY		Airtel		TTML		Reliance Comm.		SPECTRA-NET	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
2	Faults repair/restoration time																	
2.1	Total no. of faults registered		196508	196508	182448	182448	10812	10812	7481	7481	11,647	11,647	8,196	8,196	2713	2713	6133	6133
2.2	%age of faults repaired by next working day	>90%	66.19%	66.19%	90.23%	90.23%	94.00%	94.00%	89.33%	89.33%	92%	92%	92.17%	92.17%	100%	100%	99.33%	99.33%
2.3	%age of faults repaired within 3 working days	=>99%	79.64%	79.64%	99%	99%	99.69%	99.69%	99%	99%	99%	99%	100%	100%	100%	100%	100%	100%
2.4	No. of customers to whom rent rebate is given in minimum monthly charges or equivalent usage allowance for delay in fault repair		0	0	16381	16381	33	33	31	31	5	5	0	0	NA	NA	0	0
	a. Rent Rebate of 7 days		0	0	15128	15128	23	23	31	31	3	3	0	0			0	0
	b. Rent Rebate of 15 days		0	0	1173	1173	10	10	0	0	2	2	0	0			0	0
	c. Rent Rebate of One Month		0	0	80	80	0	0	0	0	0	0	0	0			0	0
3	Billing Performance																	
3.1	Total no. of bills issued		1194444	1194444	192052	192052	50898	50898	NA	NA	222280	222280	132,759	132,759	NP	NP	3137	3137
3.2	No. of bills disputed		248	248	2883	2883	470	470			2223	2223	386	386	NP	NP	0	0

s/n	Parameters	Bench mark	MTNL		HATHWAY		YOU TELECOM		SIFY		Airtel		TTML		Reliance Comm.		SPECTRA-NET	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
3.3	%age of bills disputed	<2%	0.0199%	0.0199%*	1.50%	1.50%	0.92%	0.92%	NA	NA	0%	0%	0.29%	0.29%	NP	NP	0%	0%
3.4	%age of complaints resolved within 4 weeks	100% within 4 weeks	100%	100%	100%	100%	100%	100%			67%	67%	98%	98%	NP	NP	100%	100%
3.5	%age of cases to whom refund of deposits is made within 60 days of closures	100% within 60 days	No deposit no refund	No deposit no refund	100%	100%	65.51%	65.51%			100%	100%	100%	100%	100%	100%	100%	100%
4	Response Time to the Customer for assistance																	
4.1	Total no. of calls received by operators (Voice to voice)		946395	946395	219035	219035	120631	120631	12122	12122	263,299	263,299	238,527	238,527	NP	NP	11111	11111
4.2	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	42.54%	42.54%	67%	67%	82%	82%	100%	100%	94%	94%	80.32%	80.32%	NP	NP	100%	100%
4.3	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	47.73%	47.73%	92%	92%	87%	87%	100%	100%	97%	97%	86.41%	86.41%	NP	NP	100%	100%
5	Bandwidth utilisation/throughout																	
5.1	No. of intra network links (POP to ISP Gateway nodes)		20	20	19	19	4	4	120	120	NA	NA	279	279	73	73	10	10
5.2	No. of intra network links having Bandwidth utilisation >90% during peak hours (TCBH)		0	0	0	0	0	0	0	0	NA	NA	0	0	0	0	0	0

s/n	Parameters	Benchmark	MTNL		HATHWAY		YOU TELECOM		SIFY		Airtel		TTML		Reliance Comm.		SPECTRA-NET	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
5.3	No. of Upstream links for International connectivity (ISP Gateway nodes to IGSP/NIXI node/NAP)		10	10	18	18	4	4	01	01	2	2	9	9	50	50	3	3
5.4	No. of Upstream links for International connectivity having bandwidth utilisation >90% during peak hours (TCBH)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5.5	Total International bandwidth available from ISP Node to IGSP/NIXI/NAP in Mbps		2950 Mbps	2950 Mbps	1390.5 Mbps	1390.5 Mbps	262 Mbps	262 Mbps	310 Mbps	310 Mbps	3072 Mbps	3072 Mbps	1395 Mbps	1395 Mbps	61277 Mbps	61277 Mbps	122 Mbps	122 Mbps
5.6	Total International bandwidth during peak hours (TCBH) in Mbps (Enclose MRTG)		2337.83 Mbps	2337.83 Mbps	1119 Mbps	1119 Mbps	206 Mbps	206 Mbps	110 Mbps	110 Mbps	2509 Mbps	2509 Mbps	1036 Mbps	1036 Mbps	21096	21096	776	776
5.7	%age International bandwidth utilisation during peak hours (TCBH) in Mbps (enclose MRTG)	<80%	73.68%	73.68%	85.89%	85.89%	78.63%	78.63%	35%	35%	82%	82%	75%	75%	34%	34%	89%	89%
5.8	Broadband Connection Speed available (download) from ISP node to user	>80%	>80%	>80%	85%	85%	85%	85%	96.87%	96.87%	99%	99%	85%	85%	90%	90%	85%	85%

s/n	Parameters	Benc hmar k	MTNL		HATHWAY		YOU TELECOM		SIFY		Airtel		TTML		Reliance Comm.		SPECTRA- NET	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verif ied by TCI L	PMR	Verifie d by TCIL	PMR	Verified by TCIL	PMR	Verifie d by TCIL	PMR	Verifie d by TCIL
6	Service Availability / Uptime (for all users) in %age benchmark >98% w.e.f. quarter ending.																	
6.1	Total Operational Hours		2208 Hrs	2208 Hrs	468424 848	46842484 8	56,641,464	56,641,464	904	904	27,21 0,176	27,210, 176	6,431,4 96	6,431,49 6	NP	NP	2870400	2870400
6.2	Total downtime in hours		0	0	546904 8	5469048	614,557	614,557	0	0	1173 6.53	11736. 53	2219.5 0	2219.50	NP	NP	15201	15201
6.3	Service availability/uptim e (for all users) in %age	>98 %	> 98 %	> 98 %	98.77 %	98.77%	98.92%	98.92%	100%	100%	100%	100%	99.96%	99.96%	NP	NP	99%	99%
7	Packet loss (for wired broadband access) in %age	<1%	0%	0%	0%	0%	0.65%	0.65%	0%	0%	0%	0%	0.59%	0.59%	NP	NP	NP	NP

s/n	Parameters	Bench mark	MTNL		HATHWAY		YOU TELECOM		SIFY		Airtel		TTML		Reliance Comm.		SPECTRA-NET	
			PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL	PMR	Verified by TCIL
8	Network latency (for wired broadband access)																	
8.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 ms	69 ms	69 ms	80 ms	80 ms	21 ms	21 ms	11 ms	11 ms	27.33 ms	27.33 ms	92.33 ms	92.33 ms	43.67 ms	43.67 ms	NP	NP
8.2	User reference point at ISP Gateway node to IGSP/NIXI	<350 ms	349 ms	349 ms	325.33 ms	325.33	267 ms	267 ms	251 ms	251 ms	26.33 ms	26.33 ms	265 ms	265 ms	90.25 ms	90.25 ms		
8.3	User reference point at ISP Gateway node to international nearest NAP port abroad (satellite) ***(See note below)	<800 ms	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Indicates deviation from benchmark of TRAI.

Discrepancy found

NA – Not Applicable NP – Not Provided

Observation:

The above data was verified with the data provided by the operators. The data was found to be as per the detail provided above.

MTNL

MTNL is meeting all the benchmarks except for parameter %age of connections provided within 15 days of registration of demand with the value of 65.63%, parameter %age of faults repaired by next working day with the value of 66.19%, parameter %age of faults repaired within 3 working days with the value of 79.64%, parameter %age of calls answered by operator(Voice to voice) within 60 sec with the value of 42.54% and %age of calls answered by operator(Voice to voice) within 90 sec with the value of 47.73%.

HATHWAY

HATHWAY is meeting all the benchmarks except for parameter %age international BW utilization during peak hours (TCBH) in Mbps (enclose MRTG) with the value of 85.89%.

YOU TELECOM

YOU TELECOM is meeting all the benchmark except for parameter %age of cases to whom refund of deposits is made within 60 days of closures with the value of 65.51%

R Com

Reliance is meeting all the benchmark.

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

SIFY

Sify is meeting all the benchmarks except for parameter %age of faults repaired by next working day with the value of 89.33%.

AIRTEL

Airtel is meeting all the benchmarks except for parameter %age of complaints resolved within 4 weeks with the value of 67% and parameter %age international BW utilization during peak hours (TCBH) in Mbps (enclose MRTG) with the value of 82%.

TTML

TTML is meeting all of the benchmark except for parameter %age of complaints resolved within 4 weeks with the value of 98%.

SPECTRA-NET

SPECTRA-NET is meeting all of the benchmark except for parameter %age of connections provided within 15 days of registration of demand with the value of 99.31% and parameter %age international BW utilization during peak hours (TCBH) in Mbps (enclose MRTG) with the value of 89%.

CHAPTER -6

LIVE ASSESSMENT OF QoS OF DIFFERENT SERVICES
3 DAYS DATA

6.1 LIVE ASSESSMENT : BASIC SERVICE (WIRESLINE)

Service Provider Performance Report based on 3-days live measurement data collected during the month of Jan 2010 to March 2010 for the audit period Jan 2010 – March 2010.

S.N.	Parameters	Bench marks	AIRTEL	MTNL	T'TML	R COMM.
1	Call Completion Rate within a local network Should be better than 55% & ASR should be better than 75%.	>= 55% & >=75%	65.33% (CCR)	57.41% (CCR)	71.66% (CCR)	88.82% (ASR)
2	POI Congestion	<= 0.5%	0%	0%	0%	0%
3	Response Time to the customer for assistance					
3.1	Accessibility of Call Centre/Customer Care					
	within 40 seconds	>= 95%	100%	100%	100%	97%
3.2	% age of calls answered by operator(voice to voice):					
	within 60 seconds	>= 90%	99%	99%	92%	96%

Indicates deviation from benchmark of TRAI.

NA – Not Applicable

6.1.1 Observation & Findings : Live Measurement – Basic Service (Wireline)

AIRTEL

Under the Network Section, both of the network parameters of Airtel are meeting the benchmark with a value of 65.33% and 0% for Call Completion Ratio and POI congestion respectively within the local network.

Airtel is also meeting the benchmark under section Response Time to Customer for Assistance for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement.

MTNL

For MTNL, there are 300 Exchanges covering Mumbai. MTNL is meeting the benchmarks provided by TRAI during the live assessment for Call Completion Rate (CCR) as well as for POI congestion under Network section parameters

MTNL is also meeting the benchmark for Response Time to Customer for Assistance for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement.

TTML

In the Network Section, both of the network parameters of TTML are meeting the benchmark with a value of 71.66% and 0% for Call Completion Ratio and POI congestion respectively within the local network.

TTML is also meeting the benchmark for 'Response Time to Customer for Assistance' for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement.

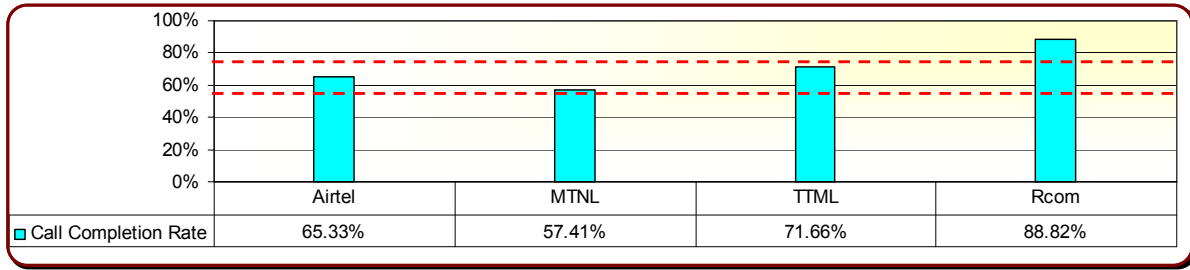
RELIANCE COMM.

In the Network Section, both of the network parameters of Reliance are meeting the benchmark with a value of 88.82% and 0% for Call Completion Ratio and POI congestion respectively within the local network. Please note that Reliance have provided with ASR (Answer to Seizure ratio) value in case of call completion ratio.

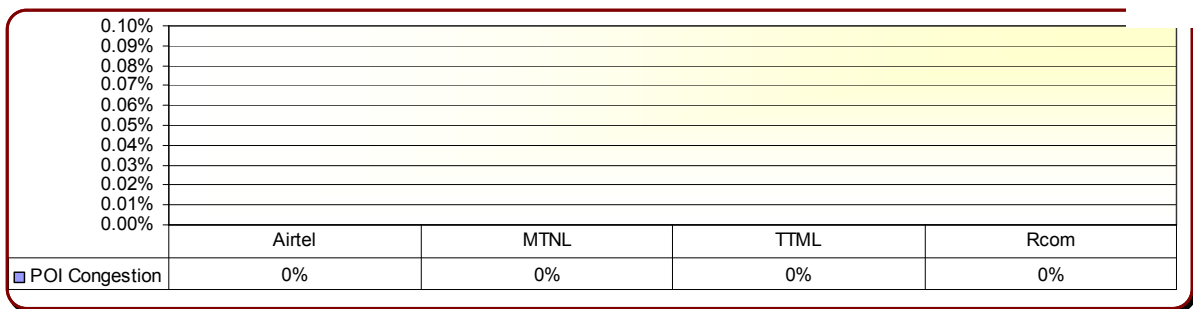
Also Reliance is meeting the benchmark for Response Time to Customer for Assistance for the parameters %age Calls answered electronically within 40 Seconds and %age Calls answered Voice to Voice within 60 Seconds during the live measurement.

6.1.2 Data Analysis & Graphical Representations (3 Days Live Assessment) Basic Service (Wireline)

1.0 CCR/ ASR within a local network (>= 55%/>=75%): All the operators are meeting the benchmark.



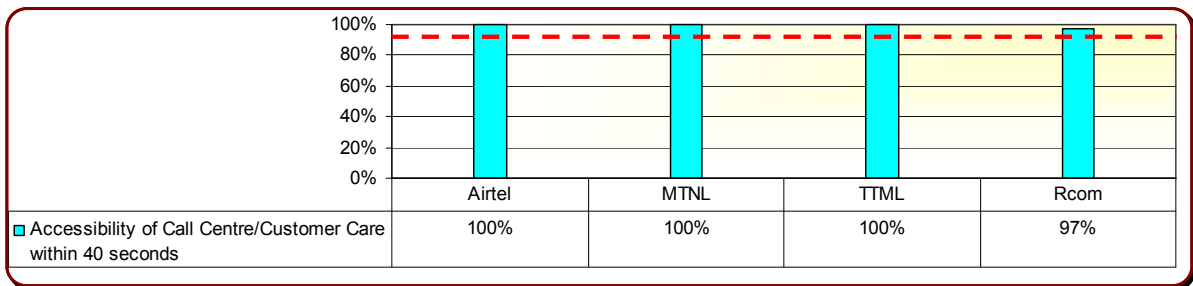
2.0 POI Congestion (<= 0.5%): All the operators are complying with the benchmarks set by TRAI.



3.0 Response time to the customer for assistance:

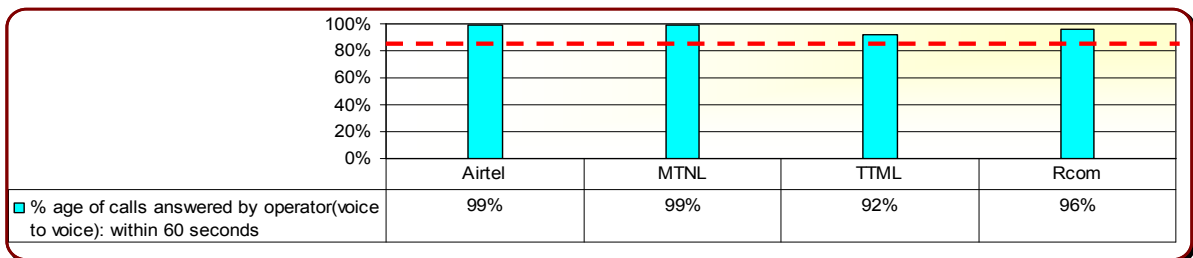
(i) Accessibility of call centre/ customer care within 40 sec. (>=95%) (Electronically):

All the operators are meeting the benchmark.



(ii) % age of calls answered by operator (Voice to Voice) within 60 sec. (>=90%):

All the operators are meeting the benchmark.



6.2 LIVE ASSESSMENT : CELLULAR MOBILE TELEPHONE SERVICES

Service Provider Performance Report based on 3-days live measurement data done in between Jan 2010 to March 2010 for the audit period Jan 2010- March 2010.

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafo ne	MTNL	DOCO MO	RTL (GSM)	Aircel	Idea	MTS	MTNL	TTML	RCOM
(A)	Network Service Quality Parameter		GSM Operators								CDMA Operators			
1	Connection Establishment (Accessibility)													
	(a) Call Set-up Success rate (Within licensee's own network)	>=95 %	99.38 %	99.16 %	99.18 %	96.3%	98.31 %	99.21 %	98.60 %	99.27 %	99.17 %	98.65 %	99.07 %	99.17 %
	(b) SDCCH/PAGING channel congestion	<=1%	0.08%	0.48%	0.18%	0.85%	0.71%	0.19%	0.03%	0.11%	0%	0.77%	0%	NP
	(c)TCH congestion	<=2%	0.15%	0.26%	0.21%	1.86%	1.69%	0.33%	0.01%	0.23%	0%	0.12%	0.002 %	0.22%
2	Connection maintenance(retainability)													
	(a) call drop rate	<=2%	0.88%	1.28%	0.72%	1.95%	1.31%	0.55%	0.01%	1.27%	0.19%	1.14%	0.70%	0.61%
	(b) Worst affected cells having more than 3% TCH drop(call drop)rate	<=5%	1.48%	1.52%	2.96%	4.68%	2.64%	0.06%	2.72%	8.23%	0.24%	0.14%	1.29%	0.05%
	(c) connections with good voice quality	>=95 %	97.59 %	98.31 %	98.72%	93.5%	97.03 %	96.67 %	98.41 %	99.45 %	98.49 %	93.07 %	96.8%	96.6%
	(d) Total No. of cells exceeding 3% TCH drop (call drop)		102	70	230	70	113	3	134	451	3	3	28	1
	(e) Total no. of cells in the network		6931	4620	7768	1495	4281	4665	4942	5486	1269	2196	2163	2173
3	a) Point of Interconnections(POI) congestion(on individual POI)	<=0.5 %	0%	0.02%	0%	0.22%	0%	0%	0%	0%	0%	0.35%	0%	0%

S/N	Name of Parameter	Bench mark	GSM Operators								CDMA Operators			
			Airtel	LOOP	Vodafo ne	MTNL	DOCO MO	RTL (GSM)	Aircel	Idea	MTS	MTNL	TTML	RCOM
	b) Total No. of circuits on POI		94888	50348	115472	27913	87001	7553	15991	57997	151.31	1226	87001	7553
	c) Total No. of call attempts on POI		197921 7	95993 6	269291 3	322176	133546 7	117261 .54	305887	157781 1	549	13563	133546 7	117261 .54
	d) Total traffic served on POI (Erlang)		52564. 07	18312. 33	58655. 79	3923.3 2	21182	103254 .65	4722	34346. 62	7.35	238.5	31697	103254 .65
	e) Total number of working POI Service Area wise		253	128	233	96	61	80	55	182	32	11	61	80
4	Network Parameters													
	a) Equipped Capacity of Network in respect of Traffic in erlang		161885	90,484	189,45 1	50247. 6	121875	NP	54970	45804	25200	36000	110000	196000
	b) Total traffic handled in TCBH in erlang		77381	65,942	143268	18857. 9	31697	NP	10611. 63	37722	313.04	2163.3 3	89282	97649

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafone	MTNL	TTML	RTL (GSM)	Aircel	Idea	MTS	MTNL	TTML	RCOM
(B)	Customer Service Quality Parameters													
5	Response time to customers for assistance													
	(a) Accessibility of call centre/customer care	>=95 %	100%	100%	100%	100%	96%	100%	100%	100%	100%	100%	100%	100%
	(b) Percentage of call answered by operators(voice to voice) within 60 seconds	>=90 %	100%	100%	99%	96%	97%	99%	91%	98%	100%	95%	99%	99%
	c) Total no. of call attempts to call centre / customer care nos. during TCBH (Note)		100	100	100	100	100	100	100	100	100	100	100	100
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Note)		100	100	99	96	97	99	91	98	100	95	99	99

6.2.1 Observation & Findings : Live Measurement – Cellular Mobile Telephone Services

Airtel

All the parameters are within the benchmarks as specified by TRAI. As far as POI is concerned only 5 nos. of POIs are having more than 100% utilization. Those POIs are of Airtel, MTNL & IDEA. But due to overflow technique the extra traffic was carried out by secondary POIs, designed to do so. Average traffic on 3 days live data observation was found to be 52564 Erlang with system capacity of 87636 Erlang having 94888 nos. of circuits.

LOOP TELECOM

All the parameters are within the benchmarks as specified by TRAI. With 128 nos. of POIs, congestion was found only in one no. of POI namely MUMDOLPHIN5_A having utilization over 100.62%. Average traffic on 3 days live data observation was found to be 18312.33 Erlang for a system capacity (GoS) of 46333 Erlang with 50348 nos. of circuits. To be noted that though there was no congestion but 3 nos. of POI were found to have utilization in between 85% & 97.27%.

VODAFONE

All the parameters are within the benchmarks as specified by TRAI. For Vodafone with 233 nos. of POI, no congestion was found on the POI on totality. But in case of individual POI it is found that some of the POIs are having more than 90% traffic utilization, such cases are found on MTNL, Airtel, Idea, and Reliance POI. Average traffic on live data observation was found to be 58655.79 Erlang while system capacity (GoS) was found to be 109698 Erlang with 115472 nos. of circuits.

MTNL GSM

All the parameters are within the benchmarks as specified by TRAI except %age with good voice quality with 93.5%. For MTNL with 96 nos. of POI, 0.22% congestion was found on the POI as a whole. Traffic failure was observed on BKC MSC & MSC 3, Orange 2, TTML GMSC 1, BTVL MSC 3 and Idea Mumbai GSM POIs. Average traffic on live data observation was found to be 3923 Erlang with system capacity (GoS) 24867.2 Erlang having 27913 nos. of circuits.

DOCOMO

All the parameters are within the benchmarks as specified by TRAI. With 61 nos. of POIs, no congestion was found on individual POI. Average traffic on 3 days live data observation was found to be 31697 Erlang for a system capacity (GoS) of 92226.27 Erlang with 87001 nos. of circuits. To be noted that though there was no congestion with overflow technique a single POI was found to have utilization over 100%.

Airtel

All the parameters are within the benchmarks as specified by TRAI. 2 nos. of POIs, for Airtel, were found to have more than 95% utilization. Average traffic on 3 days live data observation was found to be 4722 Erlang for a system capacity (GoS) of 15202 Erlang with 15991 nos. of circuits.

IDEA

All the parameters are within the benchmarks as specified by TRAI. As far as POI is concerned 120 nos. of POIs are having more than 95% utilization and those POIs belong to RCOM., MTNL & Airtel. So in near future there may be overflow on those POIs. Average traffic on 3 days live data observation is found to be 34346 Erlang while system capacity is 52491 Erlang with 57997 nos. of circuits.

TTML

All the parameters are within the benchmarks as specified by TRAI. With 61 nos. of POIs, no congestion was found on individual POIs. Average traffic on 3 days live data observation was found to be 31697 Erlang for a system capacity (GoS) of 92226.27 Erlang with 87001 nos. of circuits. To be noted that though there was no congestion but one single POI was found to have utilization over 100%.

MTNL CDMA

All the parameters are within the benchmarks as specified by TRAI except %age with good voice quality with 93.07%. For MTNL CDMA with 11 nos. of POI, 0.35% congestion was found overall on the POI. TTML, Reliance, and Idea Mumbai GSM POI were found to have traffic failure on it. Average traffic on live data observation was found to be 238.5 Erlang while system capacity (GoS) was found to be 980.8 Erlang with 1226 nos. of circuits.

RTL GSM

All the parameters are within the benchmarks as specified by TRAI. 2 nos. of POIs, for RCom are found to have more than 95% utilization and such cases are for Idea & Aircel operators. Average traffic on 3 days live data observation was found to be 5576 Erlang with 69564 nos. of circuits.

MTS

All the parameters are within the benchmarks as specified by TRAI. No congestion was found on individual POI. Average traffic on 3 days live data observation was found to be 6 Erlang only with a system capacity of 123.85 Erlang having 153 nos. of circuits.

RCOM CDMA

All the parameters are within the benchmarks as specified by TRAI. 2 nos. of POIs, for RCom are found to have more than 95% utilization and such cases are for Idea & Aircel operators. Average traffic on 3 days live data observation was found to be 5576 Erlang with 69564 nos. of circuits

Auditors comment:

From the data table it can be seen that Idea is not meeting the benchmark for the parameter of 'Worst affected cells having 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. To be noted that all GSM & CDMA operators are satisfying the benchmark for the same thus reflecting better performance in terms of Connection maintenance (retain ability).

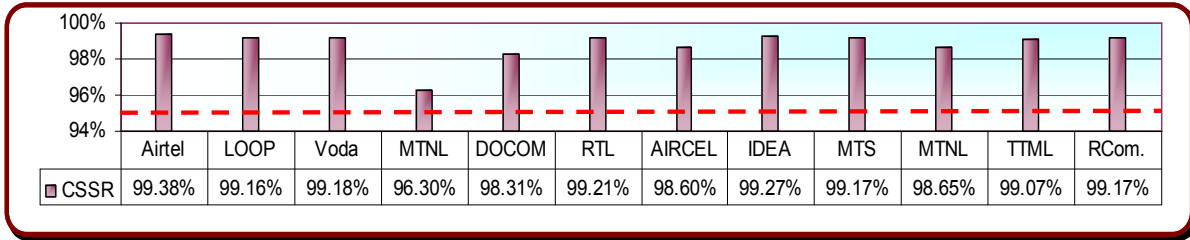
Regarding %age of connections with good voice quality except for MTNL (GSM & CDMA) all the operators are found to be performing quite well in terms of meeting the benchmark ($\leq 95\%$).

In case of POI congestion except for MTNL(GSM), all 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. However it is seen that traffic utilization on POI is much less than the Grade of Service designed by each of the operators resulting fewer failures on POIs.

6.2.2 Data Analysis & Graphical Representations – 3 Days Live Assessment for Cellular Mobile Telephone Services

B) NETWORK SERVICE QUALITY PARAMETERS

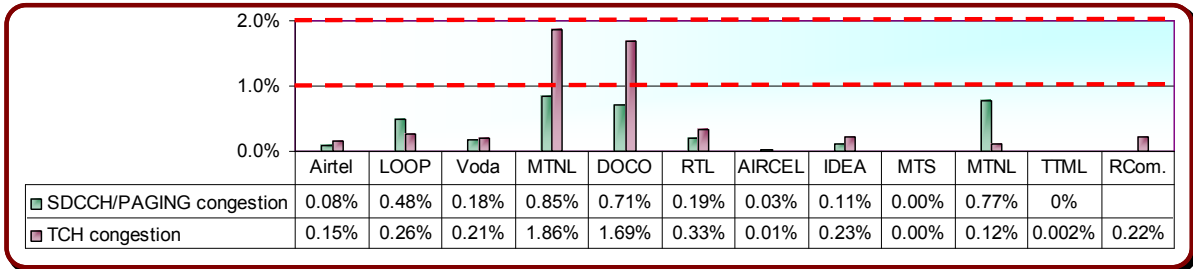
I. **Call setup success rate:** All operators are meeting the TRAI benchmarks ($\geq 95\%$) with value lying between 96.3% and 99.38%.



II. **Blocked call rate:**

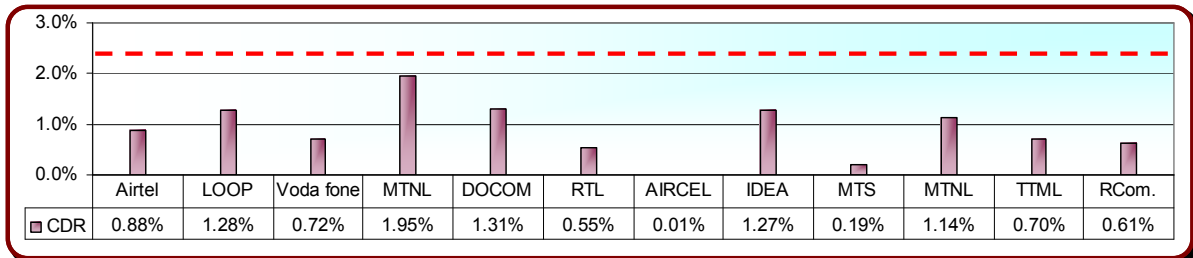
(1) **SDCCH/PAGING Channel congestion (%)**: All operators are meeting the TRAI benchmark ($<1\%$) with value lying between 0% and 0.85%. To be noted that GSM operators provides SDCCH congestion while a CDMA operators provides PAGING channel congestion.

(2) **TCH congestion (%)**: All operators are meeting the benchmark ($\leq 2\%$) with value lying between 0% and 1.86%.

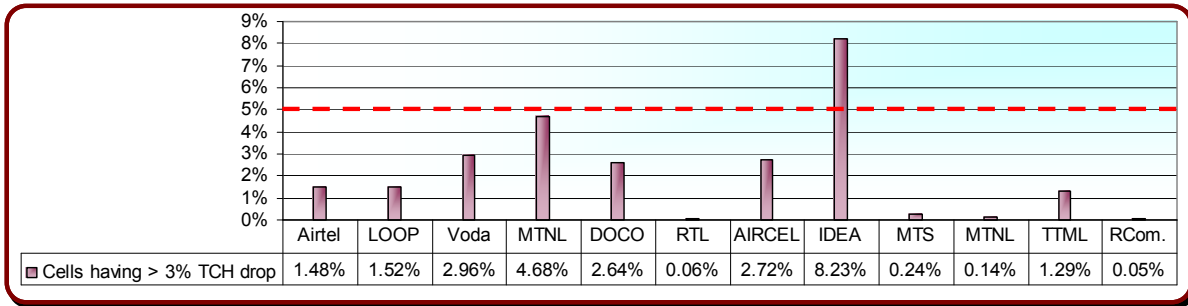


III) **Connection maintenance (retainability):**

1) **Call drop rate (%)**: All operators are meeting the benchmark ($\leq 2\%$) with value lying between 0.01% and 1.9%. But it can be seen that MTNL is at a higher side with value of 1.95%.

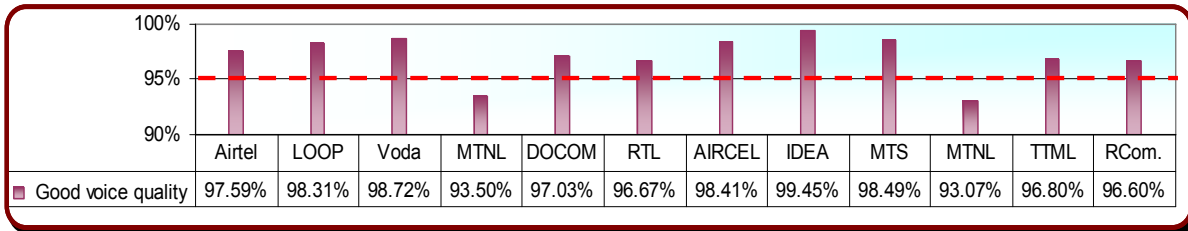


2) **Worst affected cell exceeding 3% TCH Drop** (benchmark $\leq 5\%$): The parameter value lies between 0.08% and 8.23%. It is seen from the data table that Idea is not meeting the benchmark, having large deviation.



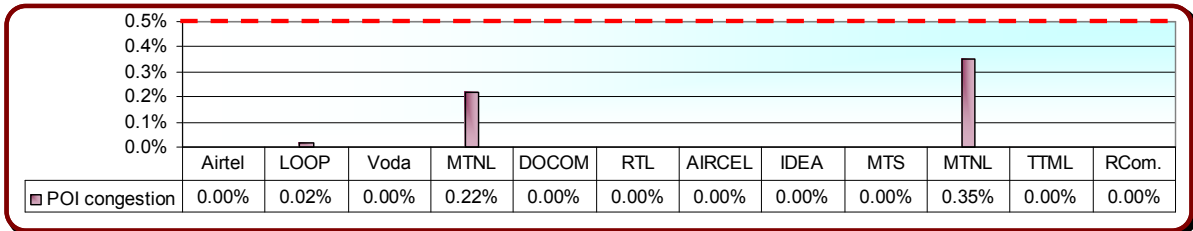
3) **Percentage of connections with good voice quality** (benchmark $\geq 95\%$): The parameter value for all the operators lies between 93.0% and 99.4%. For MTNL-GSM & MTNL- CDMA having values of 93.5% & 93.0% respectively are below the benchmark.

Note: For MTS, TTML and RCOM. drive test data was taken for comparison purpose as because CDMA systems do not support such data from OMC-R.



III. POI Congestion (%):

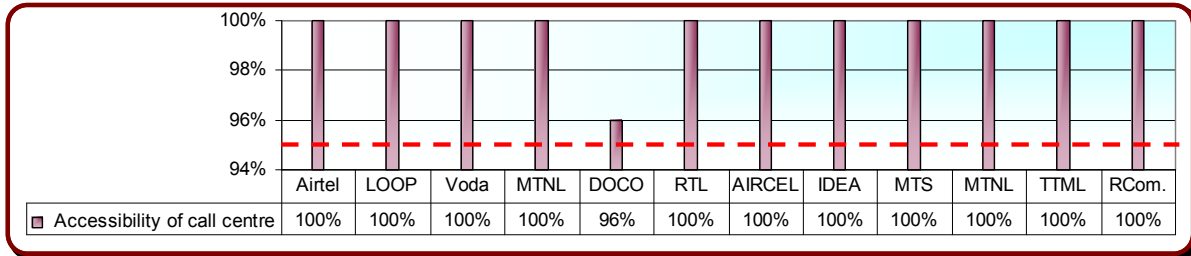
All operators are found to be meeting the benchmark ($\leq 0.5\%$) for POI congestion. It is noticed that all operators are having individual POI satisfying the benchmark. But in some cases overflows on individual POI are noticed causing traffic diversions so as to obtain the net result for POI congestion.



C) CUSTOMER SERVICE QUALITY PARAMETERS

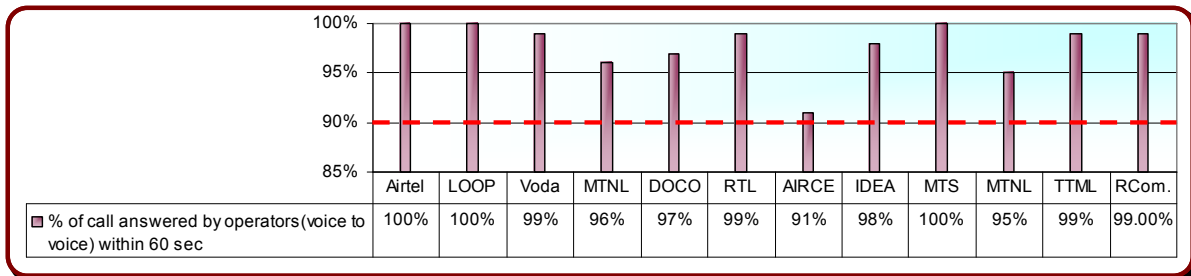
Response time to the customer for assistance:

I. Percentage of call answered (Electronically) benchmark (>= 95%): All operators are meeting the benchmark.



II. Percentage of call answered by operators (Voice to voice) within 60 Sec.;


All operators are meeting the benchmark (>= 90%) with values lying between 91% and 100%. However Aircel is seen to have met the benchmark with a narrow margin.



6.3 LIVE ASSESSMENT : BROADBAND SERVICE

Service Provider Performance Report based on 3-days live measurement data collected during audit period
(JAN 2010- MARCH 2010).

S/N	Parameters	Benchmark	MTNL	HATHWAY	YOU TELECOM	SIFY	AIRTEL	TTML	R Comm.	SPECTRA-NET
1	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)									
	Within 60 seconds	>60 %	94%	100%	80%	100%	97.62%	100%	100%	100%
	Within 90 seconds	>80 %	100%	100%	86.67%	100%	98.41%	100%	100%	100%
2	Bandwidth Utilization/ Throughput:	<80 %								
	i) POP to ISP Gateway Node [Intra-network] Link(s)		49.14%	57.95%	64.85%	74.67%	80.98%	69.76%	23.72%	40.68%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity		81.75%	72.40%	70.64%	36.67%	27.27%	47.54%	44.15%	No connectivity
	Broadband Connection Speed (download)	>80 %	81.65%	93.75%	86%	94.27%	100%	86.50%	15.66%	91.78%
3	Packet Loss	<1%	0%	0%	0%	0%	0%	0%	0%	0%
4	Network Latency (for wired broadband access)									
4.1	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	< 120ms	165.67 ms	2 ms	52 ms	8.33 ms	47 ms	42.22 ms	NP	3 ms
4.2	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	< 350ms	256 ms	252.33 ms	289.33 ms	272.33 ms	326 ms	245.88 ms	1.84 ms	252 ms
4.3	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) ** see note below	< 800ms	NA	NA	NA	NA	NA	NA	NA	NA

 Indicates deviation from benchmark of TRAI.

NA – Not Applicable,

NP – Not provided

Note:

- S/N 4.3 None of the operator having satellite connectivity.
- S/N (ii) For SPECTRA-NET not applicable because no Upstream Links for International Connectivity.

6.3.1 Observation & Findings : Live Measurement – Broadband Services

MTNL

MTNL is meeting all the benchmark except for parameter ISP Gateway nodes to IGSP/NIXI node upstream links for international connectivity with a value of 81.75% & for parameter user reference point at POP/ISP Gateway node to international gateway (IGSP/NIXI) with a value of 165.67 ms.

HATHWAY

Hathway is meeting the benchmarks for all the parameters for live measurement.

YOU TELECOM

You telecom is meeting the benchmarks for all the parameters for live measurement.

SIFY

Sify is meeting benchmarks for all the parameters for live measurement.

AIRTEL

Airtel is meeting all the benchmark except for parameter Bandwidth utilization POP to ISP Gateway node [Intra-network] links with a value of 80.98%.

TTML

TTML is meeting the benchmarks for all the parameters for live measurement.

Reliance Comm.

Reliance is meeting all the benchmark except for parameter Broadband connection speed with the value of with the value of 15.66%.

SPECTRA-NET

Spectra-net is meeting all the benchmarks for all the parameters for live measurement.

For Spectra-net parameter ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity) is not applicable also because Spectra-net is not having ISP Gateway nodes to IGSP/NIXI node upstream links for international connectivity.

Note:

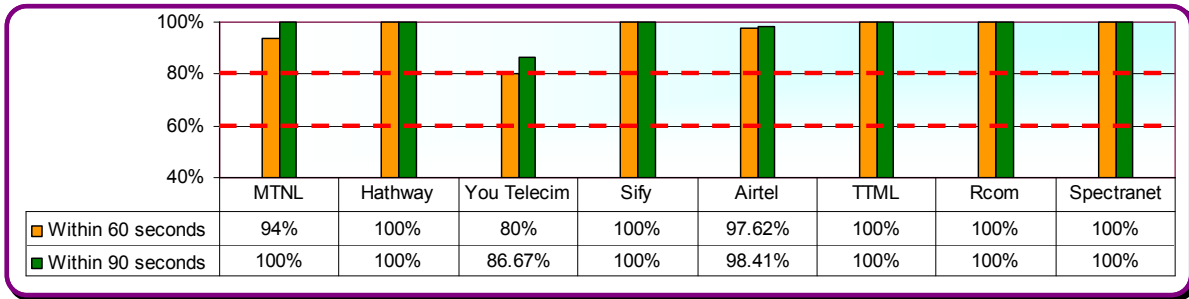
For all the operators the parameter User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) is not applicable because they do not have any NAP (Satellite) connectivity.

Data Analysis & Graphical Representations – 3 Days Live Assessment – Broadband Services

1.0 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 benchmarks.
- **Within 90 seconds (>80%):** All the operators are meeting the benchmarks.



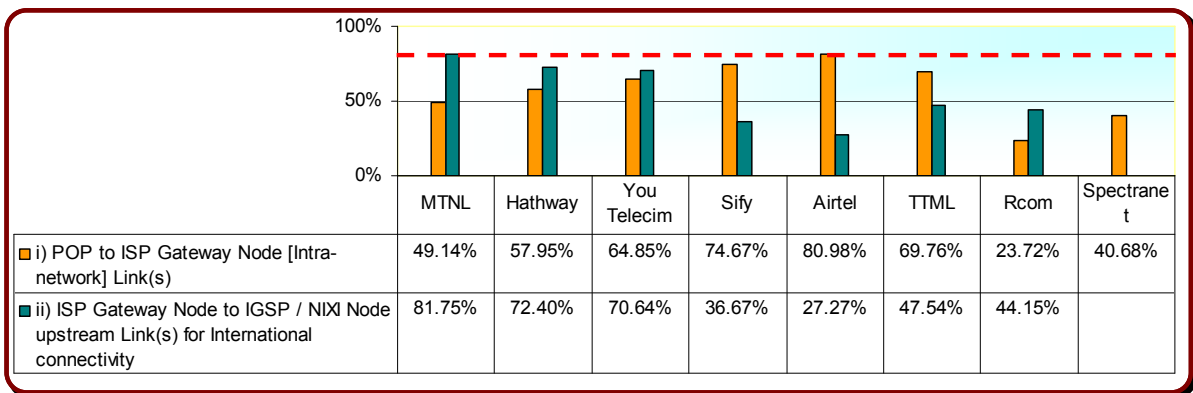
2.0 Bandwidth Utilization/ Throughput:

(I) POP to ISP Gateway Node [Intra-network] Link(s): (Benchmark <80%):

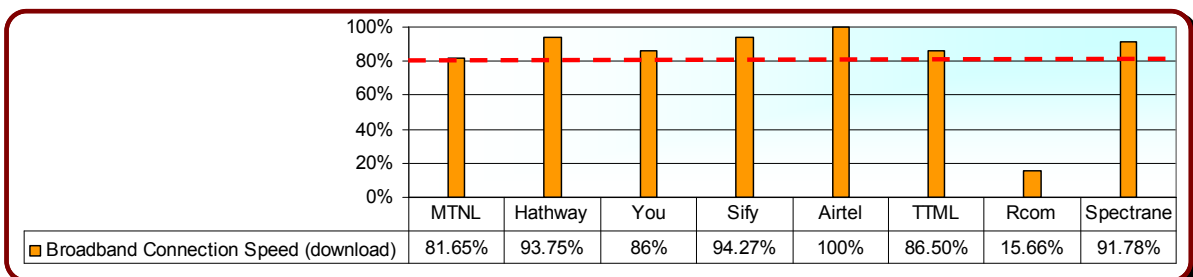
All the operators meet the benchmark except Airtel with a value of 80.98%.

(II) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: (Benchmark <80%):

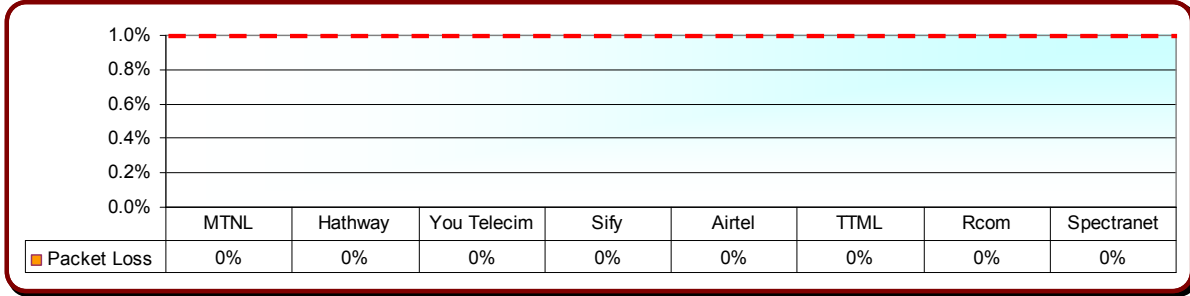
All the operators are meeting the benchmarks except for MTNL with a value of 81.75%.



2. (III) Broadband Connection Speed (download) (>80%): All the operators are meeting the benchmark except RCom. with a value of 15.66%.

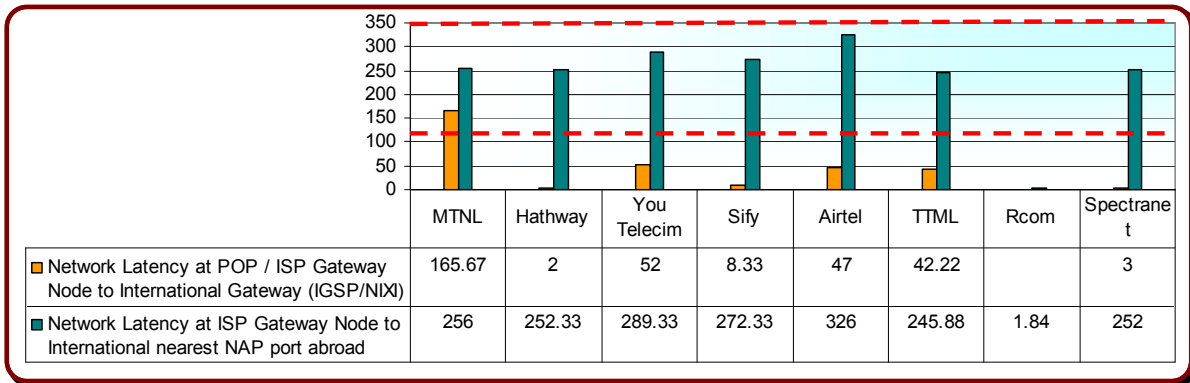


3. Packet Loss: (Benchmark <1%): All the operators are meeting the benchmark.



4. Network Latency:

- **User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI): (Benchmark <120ms):** All the operators are meeting the benchmark except MTNL with a value of 165.67 ms.
- **User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial): (Benchmark <350ms):** All the operators are meeting the benchmark.
- **User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite):** Link does not exist for any of the operators.



CHAPTER – 7

PERFORMANCE REPORT OF OPERATORS

7.1 QUALITY OF SERVICE ASSESSMENT : BASIC SERVICE (WIRELINE)

7.1.1 Service Provider Performance Report based on One Month Data Verification in which audit was conducted (Jan 2010 – Mar 2010).

S.N.	Parameters	Bench mark	AIRTEL	MTNL	TTML	RCOM.
1	Fault incidences					
	(No. of faults/100 subscribers /month)	< 5%	1.28%	6.73%	0.87%	0.68%
2.	Fault repair by next working day(Urban Area)					
	By next working day	>90%	97.2%	94.69%	98%	99%
	Within 3 days	100%	98.6%	97.95%	100%	100%
2.1	Fault repair by next working day(Rural & hilly Area)					
	By next working day	>90%	NA	NA	NA	NA
	Within 5 days	100%	NA	NA	NA	NA
3.	Rent rebate					
3.1	Fault pending > 3 days & <7 days	Rebate for 7 days	20	9280	No eligible case	No eligible case
3.2	Fault Pending > 7 days & < 15 days	Rebate for 15 days	2	1293	No eligible case	No eligible case
3.3	Fault pending > 15 days	Rebate for one month	3	119	No eligible case	No eligible case
4.	Mean time to Repair(MTTR)	<= 8 Hrs	7.3 Hrs	10.52 Hrs	4.59Hrs	3.43Hrs
5.	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)	> 55%(CCR) & > 75%(ASR)	66.48% (CCR)	59.70% (CCR)	70.8% (CCR)	87.28% (ASR)
6.	Metering and billing credibility(post paid)					
6.1	Disputed Bills over bills issued	< 0.1%	0.01%	0.05%	0.02%	0.03%
7.	% of billing complaints resolved within 4 weeks	Within 4 weeks	100%	100%	99%	100%
8.	Period of all refunds/payments from the date of resolution of complaints within one weeks	Within 1 weeks	100%	100%	96.43%	100%
9.	POI Congestion	<= 0.5%	0.0%	0%	0%	0.0%
10.	Response Time to customer for assistance					
10.1	Accessibility of Call centre/customer Care within 40 seconds	>= 95%	95.35%	74.16%	100%	95.46%
10.2	% age of calls answered by operator(voice to voice) within 60 seconds	>= 90%	94.58%	71.66%	90.06%	91.0%
11	Customer care(promptness in attending to customers request					
11.1	Termination / Closures	<= 7 Days	100%	83.3%	100%	100%
12.	Time taken for refunds of deposit after closures	100% within 60 days	100%	100%	100%	100%

RED Indicates deviation from benchmark.

Critical findings and Key take outs**7.1.2 Basic service (Wireline)**

- ◆ The Basic service (Wireline) audit for Mumbai Circle broadly indicates that almost all the service providers are meeting the benchmarks fixed by Telecom Regulatory Authority of India (TRAI) with exceptions in some areas as described in the report. In cases where benchmarks are not met by the operators, the short fall are found to be marginal only.
- ◆ The live calling results of call center for response time to the customer for assistance are found to be similar for the one month data audited and three-days live measurement for all the operators.
- ◆ In the live measurements conducted to assess Call Completion Rate (CCR), it was found that all the operators are meeting the benchmark. The results of three-day live measurement and one month data audited are found to be almost similar.
- ◆ The testing of the efficiency of level 1 service (Police, Fire brigade, Ambulance, Trunk booking, Child helpline, Women helpline, Airline booking, etc.) provided by the service providers in Mumbai Circle has been conducted by TCIL auditors. To test the same, 300 calls were made to different numbers provided by service providers and answered call was recorded. The efficiency of level 1 service of all the operators was found to be excellent with 100% successful calls rate.
- ◆ To test the Service Providers performance on Technical (Network related complains) & Non-Technical (Provisioning, Billing, Refund etc.) complaint TCIL auditors have conducted a customer feedback calling for random 100 nos. of customers in each segment. It was found that more than 96% customers are satisfied with services provided by the operators.
- ◆ The MTNL has a decentralised system for Book keeping, and data has been verified only for sample 5% of exchanges spread over 10% of Short Distance Charging Area (SDCA's) in Mumbai Circle. Details of the exchanges are given in Annexure-I

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

Fault incidence:

Except for MTNL with a value of 6.73%, showing deviation from the bench mark of $\leq 5\%$ rest of the operators are within the benchmark value.

Fault Repair (Urban Area):

It is found that all the operators are meeting the benchmarks of $\geq 90\%$ set by TRAI for faults repair by the next working day and in case of fault repair within 3 working days Airtel and MTNL are found to miss the benchmark of 100% marginally. Through live calling the fault repair within 24 hours data was verified and found that almost all the operators are better than 95% in customer satisfaction. While verification of records of service providers it was found that all the service providers are providing rebates as per TRAI norms.

Fault Repair (Rural & Hilly Area):

Mumbai Circle do not have any Rural & hilly area.

Rent Rebate:

All the operators are providing Rebate except TTSL and RCOM. having no rebate cases in the month of audit. Airtel is having only 20 rebate case for 7 days and 2 cases for 15 days and 3 cases for one month data category. For MTNL rebate cases are 22, 36 and 64 respectively for each type of refund cases.

Mean Time to Repair (MTTR):

All the operators are meeting the benchmark of <8hrs fixed by TRAI during one month data audit except MTNL, is having MTTR (10.52 hrs) which is more than a benchmarks set by TRAI

Call Completion Rate (CCR):

All the service providers are found to be meeting TRAI benchmark of >55% for Call Completion Rate (CCR) and > 75% for Answer to Seizure Ratio for the month of audit data verification

However in the case of Reliance, the Answer Seizure Ratio (ASR) is measured in place of Call Completion Rate (CCR) and the firm claims that the same is a better indicator for the kind of network owned by the Reliance.

Metering and billing credibility:

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 TTSL with a value of 99%.

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 TTSL with a value of 96.43%.

POI Congestion:

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

Response Time to Customer for Assistance:

(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 >=95%.

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

For %age of calls answered by operators within 60 Seconds parameters, all the operators are meeting the benchmark of 90% fixed by TRAI.

Customer care (Promptness of attending customer request):

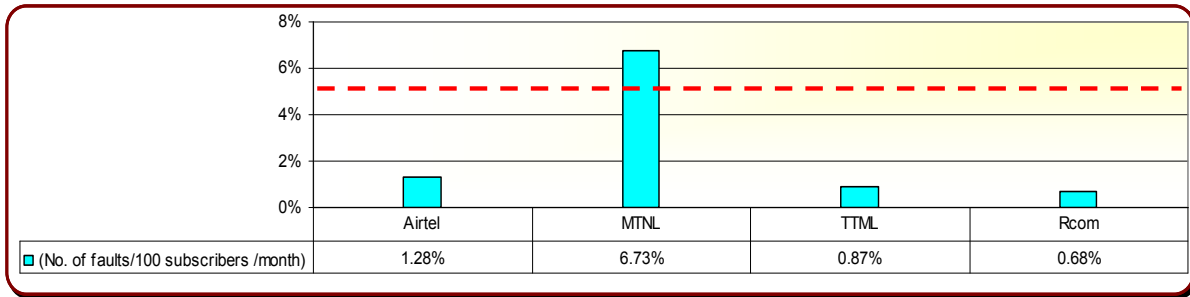
(i) Termination / Closure: - All the operators are meeting the TRAI benchmarks of 100% within <= 7 days for closure requests.

ii) Time taken for refund of deposits after closure:

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

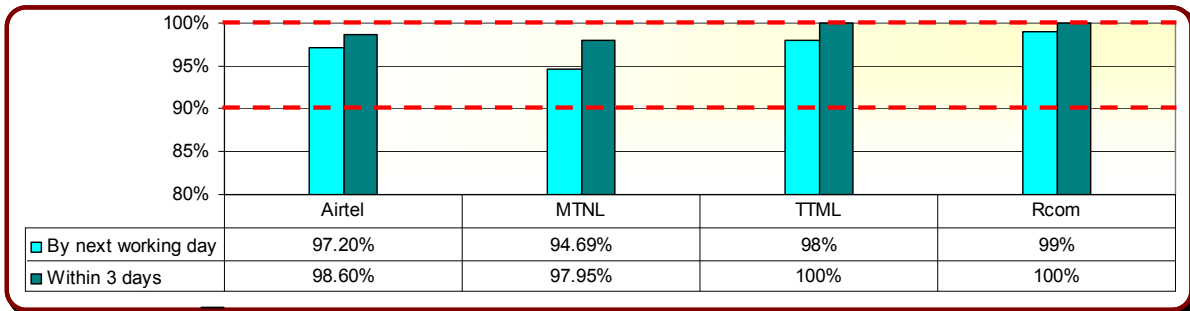
7.1.3 Parameter wise Data Analysis & Graphical Representations – Basic Service (Wireline)

1.0 Fault incidences (No of faults/100 subscribers/month (<= 5): Except for MTNL (6.73%) rest of the operator are meeting the benchmark set by TRAI.



2.0 Fault Repair (Urban Area):

- **By next working day (>90%):** All the operators comply with the TRAI benchmark of 90%.
- **Within 3 days (100%):** TTML & Reliance is complying with the TRAI benchmark of 100%. Airtel (98.6%) & MTNL (97.95%) show minor deviation in benchmark.

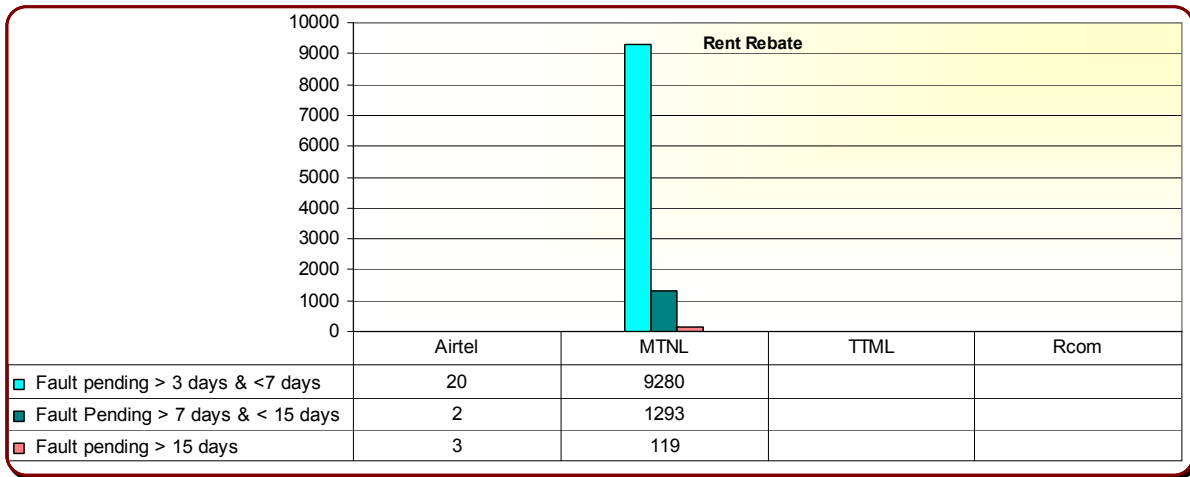


2.1 Fault Repair(Rural & Hilly Area):

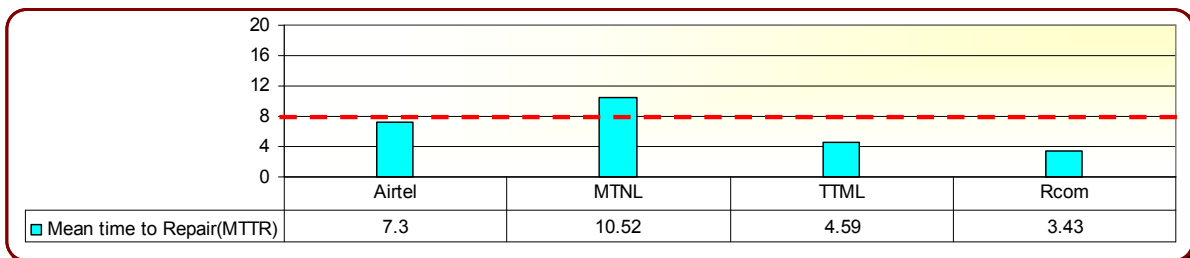
- **By next working day (>90%):** This parameter is not applicable for Mumbai circle.
- **Within 5 days (100%):** This parameter is not applicable for Mumbai circle.

3.0 Rent Rebate

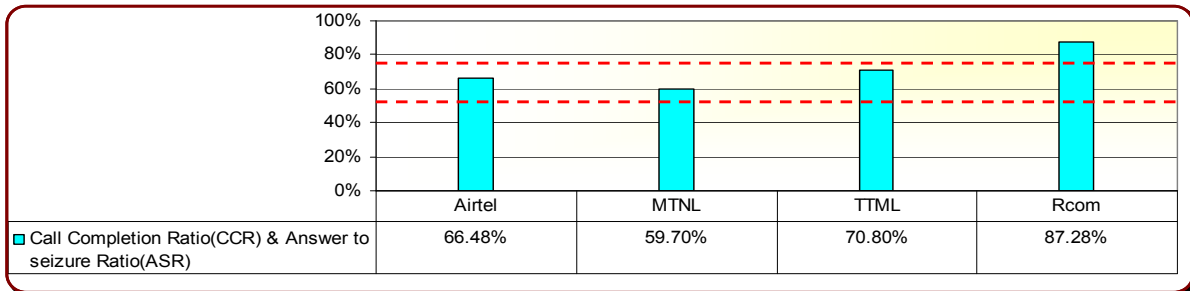
- Faults pending for > 3 days & < 7 days (Rebate 7 days)—As far as rebate is concerned Airtel and MTNL has given rebate 20 & 9280 respectively. RCom. & TTML do not have any rebate case.
- Faults pending for > 7 days & < 15 days (Rebate 15 days) — As far as rebate is concerned Airtel and MTNL has given rebate 2 & 1293 respectively. RCom. & TTML 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 3 & 119 respectively. RCom. & TTML do not have any rebate case.



4.0 Mean Time to Repair (MTTR) (<= 8 Hrs): All the operators comply with the TRAI benchmarks except for MTNL with value of 10.52hrs.

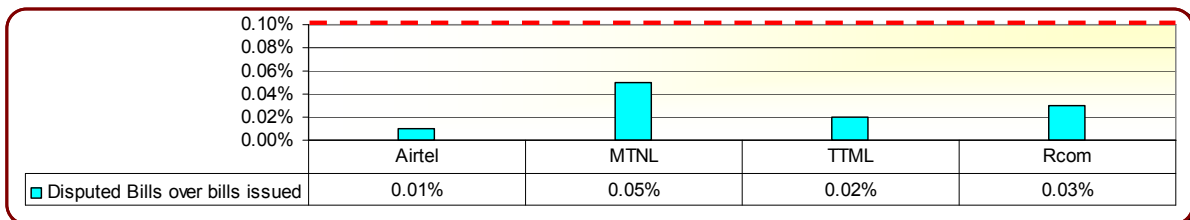


5.0 Call Completion Rate (CCR)/ Answer to Seizure Ratio (ASR) (>55% & > 75%): All the operators comply with the TRAI standards. Other than RCom, which have given ASR rest of the operators, gave CCR value.



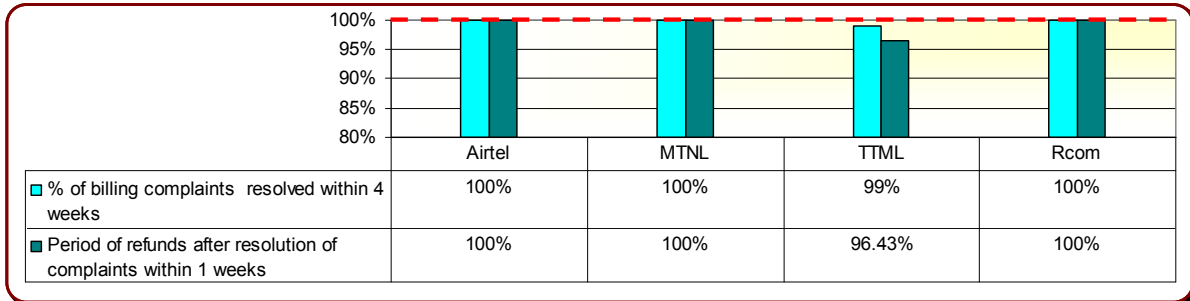
6.0 Metering and Billing Credibility (< 0.1%):

Disputed Bills over Bills issued: - All the operators comply with the TRAI standard.

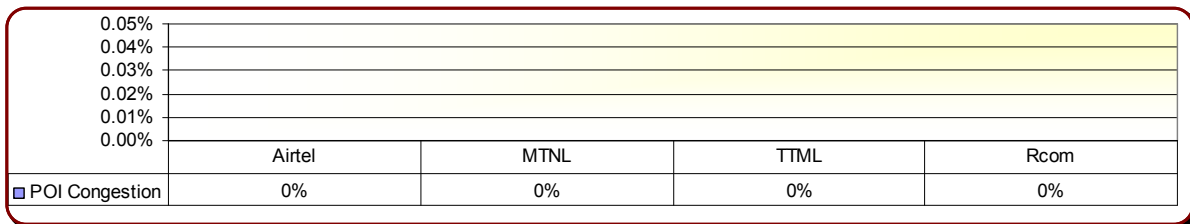


7.0 % of Billing Complaints resolved within 4 Weeks: All the operators has resolved billing complaints 100% (benchmark) within 4 weeks except for, TTML with a value of 99%.

8.0 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 TTML 96.43%.



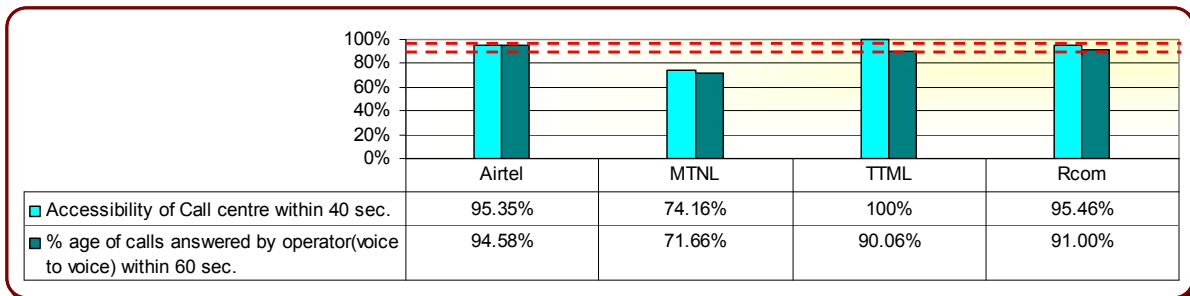
9.0 POI Congestion: All the operators are complying with the TRAI benchmark ($\leq 0.5\%$) by having 0% congestion.



10.0 Response Time to Customer for Assistance:

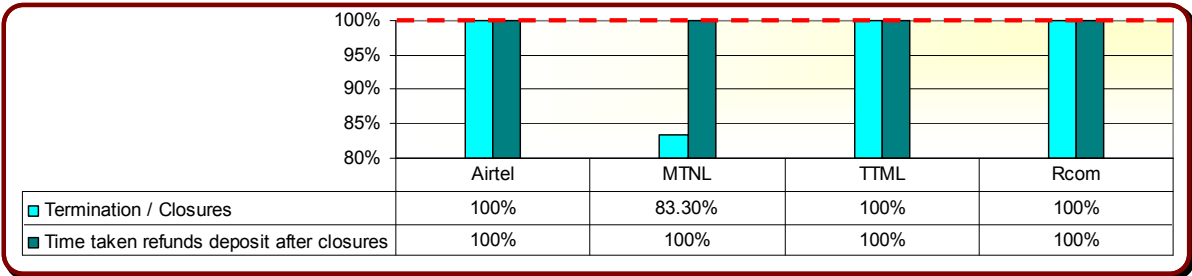
(10.1) Accessibility of Call centre / customer care (Electronically): Within 40 seconds ($>95\%$): All the operators meeting the benchmark set by TRAI except MTNL (74.16%).

(10.2) % age of calls answered by operator (Voice to Voice): Within 60 seconds ($>90\%$): All the operators meet the TRAI benchmark except MTNL (71.66%).



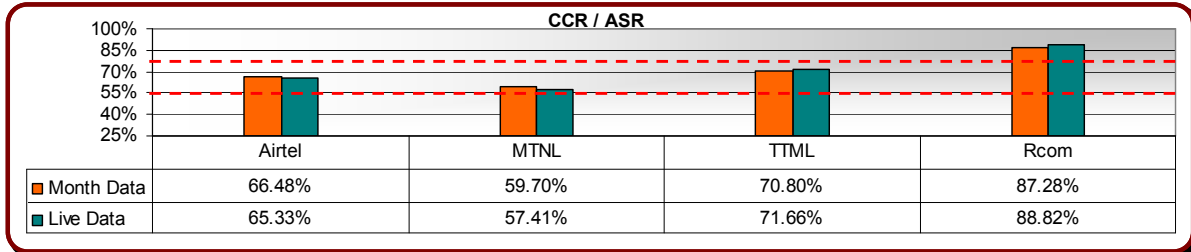
11.0 Customer Care Promptness in Attending Customer Request:

(11.1) Termination / Closures :(<= 7 Days): All the operators are meeting the benchmarks except MTNL (83.33%) provided by TRAI within 7 Days.



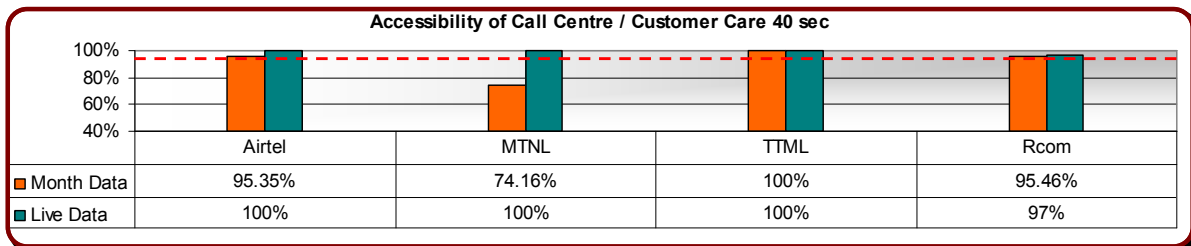
7.1.4 Comparison between Live measurements and One month data Audit – Basic Service (Wireline).

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

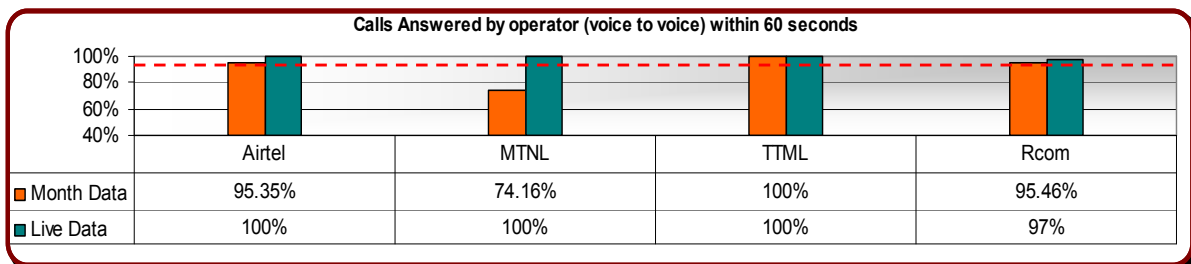


2.0 Response time to the customer for assistance:

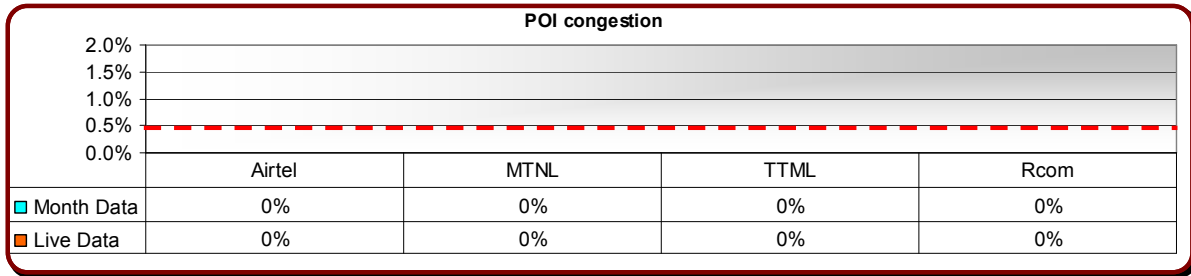
(ii) **Accessibility of Call Centre / Customer Care 40 sec (> 95 %):** All the operators are meeting the benchmark in live and one month data.



(ii) **Calls Answered by operator within 60 seconds (>90%) (Voice to Voice):** The performance based on live measurement as well as One-Month Data are matching and all the operators are meeting the benchmark.



3.0 POI Congestion (< 0.5%): The performance based on Live measurement as well as One-Month Data are similar for all the operators and meeting the benchmarks.



Auditor Comments:

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.

7.2 QUALITY OF SERVICE ASSESSMENT : CELLULAR MOBILE TELEPHONE SERVICES

7.2.1 Service Provider Performance Report based on FEB -2010 Month Data Verification in which Audit was conducted for the quarter (JAN 2010- MAR 2010).

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafone	MTNL	DOCOMO	RTL GSM	AIR CEL	IDE A	MTS	MTNL	TTML	RCOM
1	Network Availability		GSM Operators								CDMA Operators			
	(a) BTS Accumulated Downtime (not available for service)	<=2%	0.07%	0.20%	0.01%	1.19%	0.05%	0.1%	0.01%	0.03%	0.01%	0.36%	0.1%	0.15%
	(b) Worst affected BTSs due to downtime (%)	<=2%	0.32%	1.37%	0%	1.99%	0.05%	0.07%	0%	0.05%	0%	0.93%	0%	0.14%
	(c) Total no. of BTSs in the licensed service area		2789	1749	3200	552	1540	1555	1744	1934	423	216	721	768
	(d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1399	2308.45	249.43	4409	554.66	1012	114.2	454.75	42.58	527	75.33	745
	(e) No. of BTSs having accumulated downtime of >24 hours in a month		9	24	0	11	1	1	0	1	0	2	0	1
2	Connection Establishment (Accessibility)													
	(a) Call Set-up Success rate (Within licensee's own network)	>=95%	99.31%	99.24%	99.21%	95.8%	98.44%	98.88%	98.56	99.29%	99.21%	98.55%	99.02%	99.20%
	(b) SDCCH/PAGING channel congestion	<=1%	0.11%	0.30%	0.12%	0.92%	0.74%	0.11%	0.04%	0.11%	0%	0.79%	0%	0%
	(c)TCH congestion	<=2%	0.18%	0.18%	0.25%	1.94%	1.56%	0.51%	0.01%	0.27%	0.01%	0.074%	0.029%	0.24%
3	Connection maintenance (retainability)													
	(a) call drop rate	<=2%	0.85%	1.21%	0.69%	1.97%	1.26%	0.56%	0.85%	1.32%	0.15%	1.07%	0.73%	0.61%

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafone	MTNL	DOCOMO	RTL GSM	AIR CEL	IDE A	MTS	MTNL	TTML	RCOM	
			GSM Operators								CDMA Operators				
	(b) Worst affected cells having more than 3% TCH drop(call drop)rate	<=5%	1.62%	1.27%	2.51%	4.64%	2.55%	0.1%	2.57%	9.07%	0.25%	0.09%	1.51%	0.32%	
	(c) connections with good voice quality	>=95%	97.62%	98.35%	98.72%	95.16%	96.9%	98.65%	98.18%	98.40%	98.74%	NA	NA	NP	
	d) Total No. of cells exceeding 3% TCH drop (call drop)		112	58	195	69	110	4	127	493	3	2	33	2.35	
	e) Total no. of cells in the network		6910	4620	7768	1495	4330	4665	529	5486	1194	2196	2162	2173	
4	a) Point of Interconnections congestion(on individual OI)	<=0.5%	0%	0.02%	0%	0.53%	0%	0%	0%	0%	0%	0.37%	0%	0%	
	c) Total No. of circuits on POI		94888	50348	115472	27913	87001	69564	16386	57279	151.63	1226	87001	69564	
	d) Total No. of call attempts on POI		1959527	949207	2795713	457103	1588649	152640	355854.2	1721498	470	12939	1588649	152640	
	e) Total traffic served on POI (Erlang)		50799	18312.33	58103.10	4777.85	37554.9	5576.6	6165.07	34862	5.90	232.97	37554.9	5576.6	
	f) Total number of working POI Service Area wise		253	128	233	96	61	80	55	182	32	10	61	80	
	g) Capacity of POI in Erlang(GOS)		87636	46333	109698	24867.2	92226.27	NP	15202.72	52491.23	123.85	980.8	92226.27	NP	
5	Network Parameters														
	a) Equipped Capacity of Network in respect of Traffic in Erlang		161885	90,484	189,451	50247.6	121875	NP	54970	45804	25200	36000	110000	196000	

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafone	MTNL	DOCOMO	RTL GSM	AIR CEL	IDE A	MTS	MTNL	TTML	RCOM
			GSM Operators								CDMA Operators			
	b) Total traffic handled in TCBH in Erlang		77381	65,942	143268	18857.9	21182	NP	10611	37722	313.04	2163.33	89282	97649
	c) Total no. of customers served (as per VLR) on last day of the month		2349066	1394465	3499229	662054	787897	NP	460950	1032622	11292	65232	1274797	2860500
(B)	Customer Service Quality Parameters													
6	Metering and billing credibility-Post paid	<= 0.1%	0.03%	0.058	0.0029%	0.73%	0.97%	0.04	1.79%	0.09%	No Service	0.096%	0.14%	0.03%
	No. of bills issued during the period		748811	302923	1109037	164833	13232	17852	15006	67491	No service	27964	354032	450085
	No. of bills disputed including billing complaints during the period		220	176	32	1210	128	7	268	60	No service	27	511	136
	Metering and billing credibility-Pre paid	<= 0.1%	0.0%	0.016	0.0231%	0.0037%	0.039%	0.01%	0.06%	0.01%	0.01%	0.012%	0.02%	0.01%
	No. of charging / credit / validity complaints during the quarter		16	389	878	57	579	148	681	141	10	9	433	423
	Total no. of pre-paid customers at the end of the quarter		3975723	2390155	3799479	1528108	1484195	1759683	1100217	1261101	21614	72432	2138551	3166966
7	(a) Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	99.9%	99.9%	100%	100%	100%	100%	100%	100%	100%
	No. of billing/(post paid) and charging, credit/validity (pre paid) complaints resolved within 4 weeks during the quarter		236	565	910	1266	706	791	949	201	1319	36	944	3789

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafone	MTNL	DOCOMO	RTL GSM	AIR CEL	IDE A	MTS	MTNL	TTML	RCOM
			GSM Operators								CDMA Operators			
	Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		236	565	910	1267	707	791	949	201	1319	36	944	3789
	No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		32	467	905	90	65	155	88	0	10	36	569	559
	No. of complaints disposed on account of not considered as valid complaints during the quarter		0	98	5	1177	642	636	861	0	0	NA	375	3230
	(b) 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%	95.58%	100%
8	Response time to customers for assistance													
	(a) Accessibility of call centre/customer care	>=95%	98.56%	95.2%	99.7%	100%	100%	100%	66.66%	99.5%	99%	95%	100%	100%
	(b) Percentage of call answered by operators(voice to voice) within 60 seconds	>=90%	98.6%	97.5%	93.9%	96%	96.94%	92.46%	35.02%	81.05%	98%	95%	89.74%	95.88%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH		8289938	80939	120501	475440	26687	1065730	960000	225071	54216	21530	37940	1294334
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH		817107	78971	113159	456132	25871	1023248	492397	214190	53733	20369	34049	1272995
9	Termination/ closure of service	<=7days	100%	100%	100%	47.2%	100%	100%	68%	100%	NA	100%	100%	100%

S/N	Name of Parameter	Bench mark	Airtel	LOOP	Vodafone	MTNL	DOCOMO	RTL GSM	AIR CEL	IDE A	MTS	MTNL	TTML	RCOM
			GSM Operators								CDMA Operators			
	Total No. of requests for Termination / Closure of service received during the quarter		9390	1042	5597	379	98	231	343	535	NA	907	3623	2810
	No.of requests for Termination / Closure of service complied within 7 days during the quarter		9390	1042	5597	179	98	231	235	535	NA	907	3623	2810
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	70.1%	100%	100%	No refund	No refund	100%	NA	100%	100%	100%

RED Indicates deviation from benchmark

NP- Not Provided

NA- Not applicable

7.2.2 Critical findings and parameters wise key take outs - Cellular Mobile Telephone Services

- ◆ Audit has been done for all the MSC/VLR service areas of all the service providers, both GSM and CDMA operators in Mumbai circle. Audit activity has been done in three categories a) 3 days live assessment, b) one-month data audit & c) PMR validation. We have found all the service providers are meeting benchmark by and large.
- ◆ 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 Mumbai circle. But for parameters such as 'Worst affected cell exceeding 3% TCH drop' and 'BTSs accumulated down time' CBBH (Cell Busy Bounce 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 all the operators both 3 days live data and 1 month data shows consistency (having a common trend) with values being more or less similar.
- ◆ To test the Service Providers performance on Technical (Network related) & Non-Technical (Provisioning, Billing, Refund etc.) complaint, TCIL auditors have conducted a customer feedback calling for random 100 nos. of customers in each segment. It was found that more than 99% customers are satisfied with services provided by the operators.

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers for the Mumbai Circle are as under:-

BTS Accumulated downtime (benchmark $\leq 2\%$): All operators are meeting the benchmark with values lying between 0.01% and 1.19%.

Worst affected BTSs due to downtime (benchmark $\leq 2\%$): All operators are meeting the benchmark with values lying between 0% and 1.99%.

Call setup success rate (benchmark $\geq 95\%$): All operators are meeting the benchmark with values lying between 95.8% and 99.31%.

SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$): All operators are meeting the benchmark with values lying between 0% and 0.92%.

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 0.01% and 1.94%.

Call drop rate (benchmark $\leq 2\%$): All operators are meeting the benchmark with values lying between 0.15% and 1.97%.

Cell exceeding 3% TCH drop (benchmark $\leq 5\%$): Except for Idea rest of the operators are satisfying the benchmark with value in between 0.1% and 4.64%. While for Idea value is 9.07% respectively. Similar trend have been observed in live data audit report also.

Connections with good voice quality (benchmark $\geq 95\%$): MTNL-CDMA, TTML and RCom. Having CDMA services have declared that the parameter is not system generated. Rest of the GSM operators are meeting the benchmark with values lying between 95.16% and 98.74%. It can be noted that MTNL with 95.16% is on the margin.

POI Congestion (benchmark $\leq 0.5\%$): All the operators are meeting the benchmark. Except for MTNL (GSM). MTNL (GSM) is having POI congestion of 0.53%. In case of MTNL (GSM) it is observed that for BKC and MSC3 orange 2, TTML GMSC 1, BTVL MSC 3 & idea Mumbai Poi are having congestion thus causing traffic failure on those POIs. For rest of the operators there was no congestion found overall on the POI, but

cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.

Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$): Except for MTNL(GSM), Docomo, Aircel & TTML with values of 0.73%,0.97%, 1.79% & 0.14% respectively all other operators are meeting the benchmark.

Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$): All operators are meeting the benchmark with values lying between 0.0% and 0.06%.

Resolution of billing/ charging complaints (benchmark 100% within 4 weeks): All operators are meeting the benchmark except for MTNL (GSM) & DOCOMO with same value of 99.9%.

%age of call answered by operator (electronically) (benchmark >95): All operators are meeting the benchmark except for Aircel with a value of 66.66%.

%age of call answered by operator (Voice to voice) (benchmark $>90\%$): %): Except for Aircel, Idea & TTML with 35.02%, 81.05 & 89.74% respectively rest of the operators are meeting the benchmark with values lying between 92.46% and 98.6%.

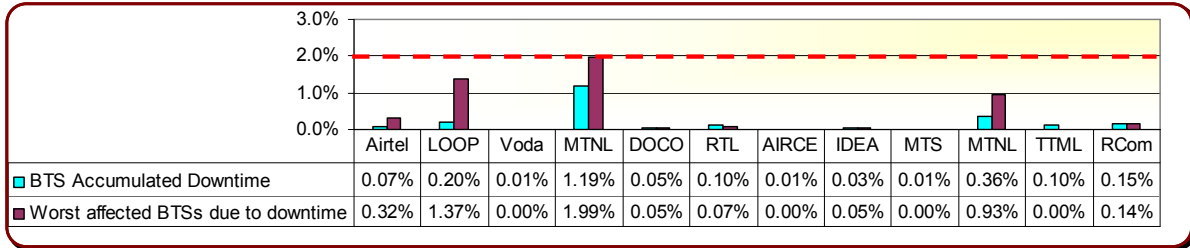
Termination/Closure of service (Benchmark ≤ 7 days): All operators have satisfied the benchmark except for MTNL (GSM) & Aircel with values of 47.2% & 68%.

Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days): All operators have satisfied the benchmark except for Vodafone with value of 70.1%.

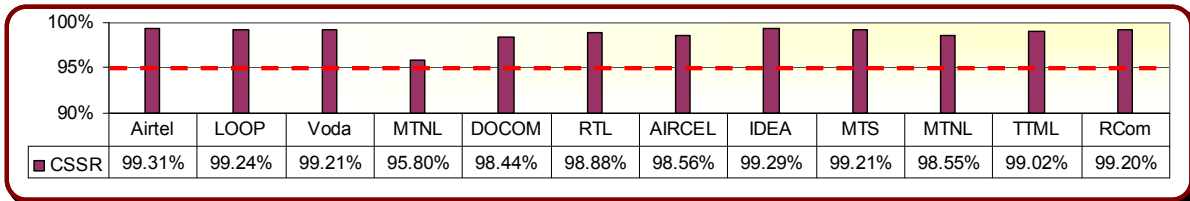
7.2.3 Parameter wise Data Analysis & Graphical Representations – Cellular Mobile Telephone Services

A) NETWORK PERFORMANCE

- 1) **BTS Accumulated down time (not available for service) (Benchmark <= 2%)**: All operators are meeting the benchmark with values lying between 0% and 1.99%.
- 2) **Worst affected BTSs due to downtime (benchmark <= 2%)**: All operators are meeting the benchmark with values lying between 0% and 1.99%.

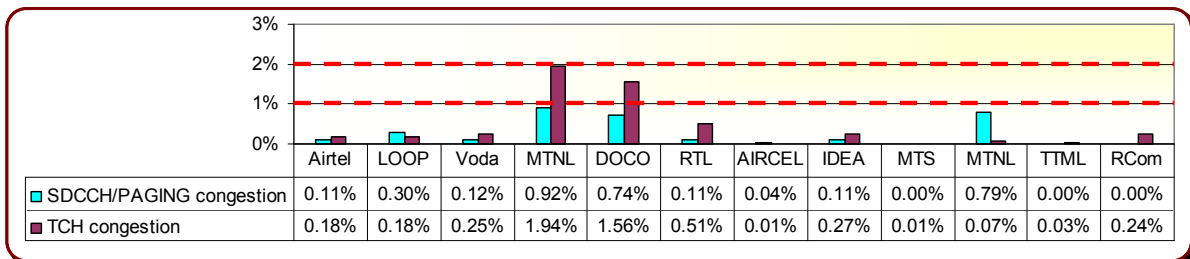


- 3) **Call setup success rate: (Benchmark >= 95)**: All operators are meeting the benchmark with values lying between 95.8% and 99.3%.

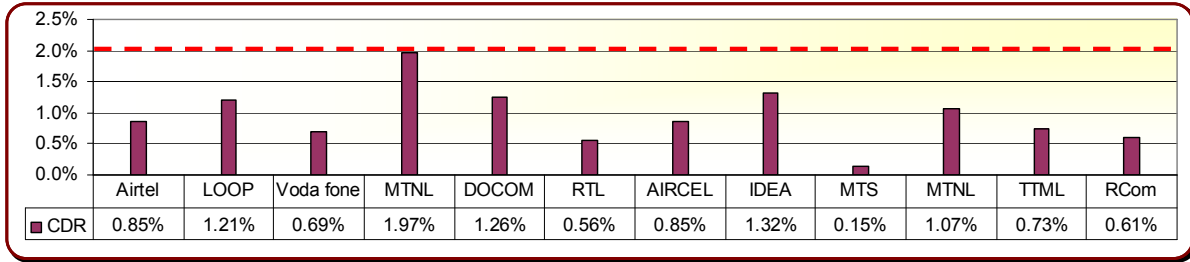


- 4) **SDCCH/PAGING Channel congestion (benchmark <= 1%)**: All operators are meeting the benchmark with values lying between 0% and 0.92%.
 Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators have given SDCCH Channel congestion.

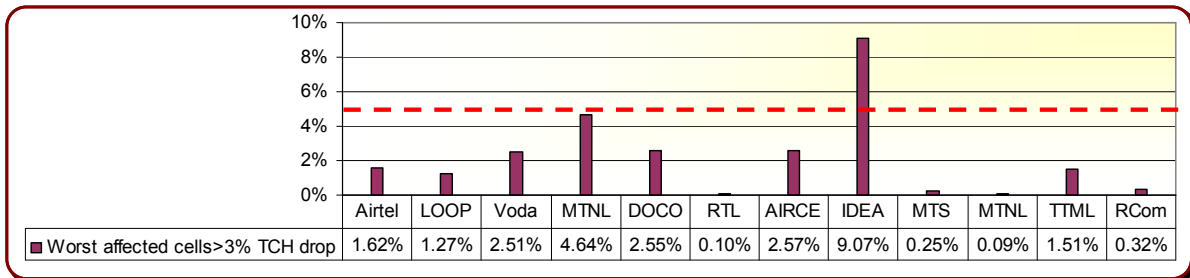
- 5) **TCH congestion (benchmark <= 2%)**: All operators are meeting the benchmark with values lying between 0.01% and 1.94%.



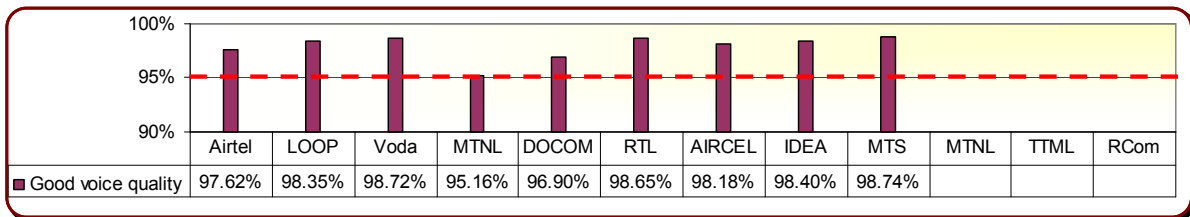
6) **Call drop rate (%) (Benchmark <= 2%)**: All operators are meeting the benchmark with values lying between 0.15% and 1.97%.



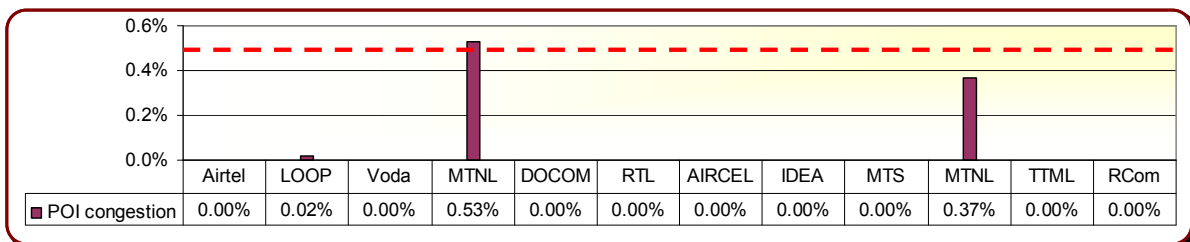
7) **Percentage of Cell exceeding 3% TCH drop (benchmark <= 5%)**: Except for Idea rest of the operators are satisfying the benchmark with values ranging in between 0.09% and 9.07%. For Idea the value is 9.07% showing overshoot against the benchmark. Similar trend have been observed for live data audit also.



8) **Percentage of connections with good voice quality (benchmark >= 95%)**: MTNL CDMA, TTML and RCOM. being CDMA operators have declared that the parameter is not system generated. Rest of the operators are meeting the benchmark with values lying between 95.16% and 98.74%. It can be noted that MTNL with 95.16% is on the margin.

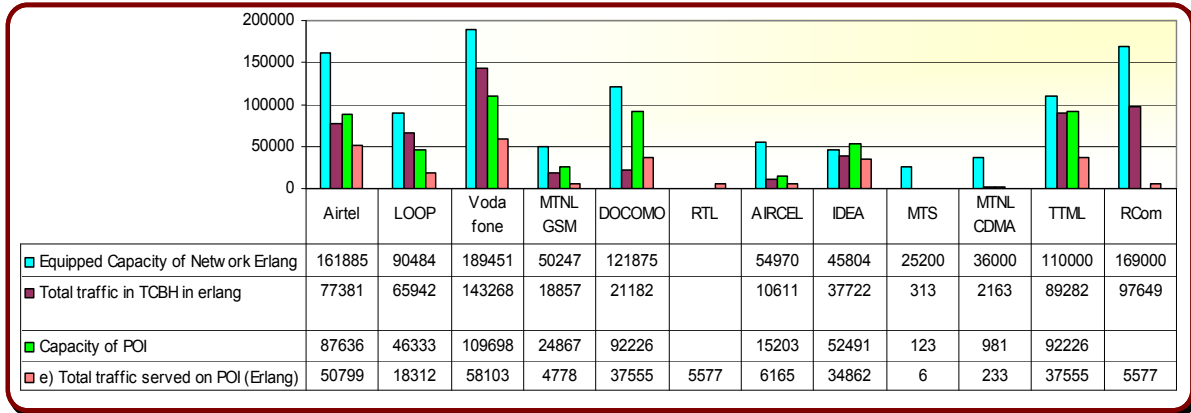


8) **POI Congestion: (<0.5%)**: Except for MTNL GSM (0.53%) rest of the operators are satisfying the benchmark with values in between 0% and 0.37%.



Erlang usage on POI for month data:

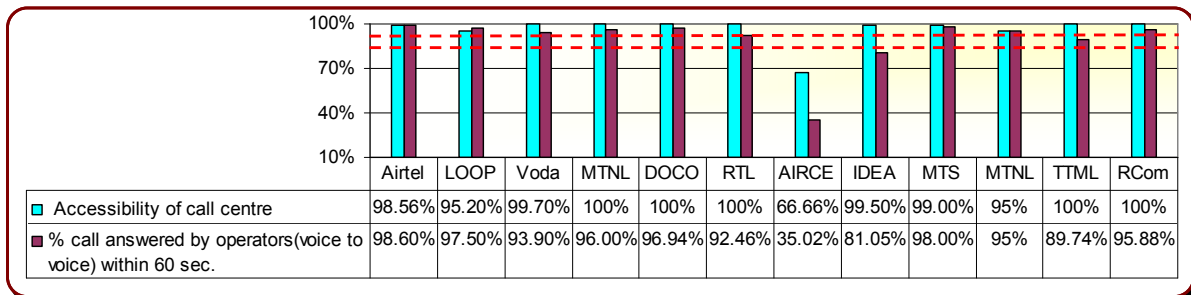
Form table it is found that Capacity for POIs and utilization in terms of Erlang for respective operators have huge differences and in addition with the advantage of overflow technique there seem to be no congestion on POIs of most of the operators. Table data also reflects that in case of TTML, Idea and Vodafone the total capacity of the equipment and the total traffic in the network are quite close and thus in future may require enhancement in network capacity in terms of Erlang.



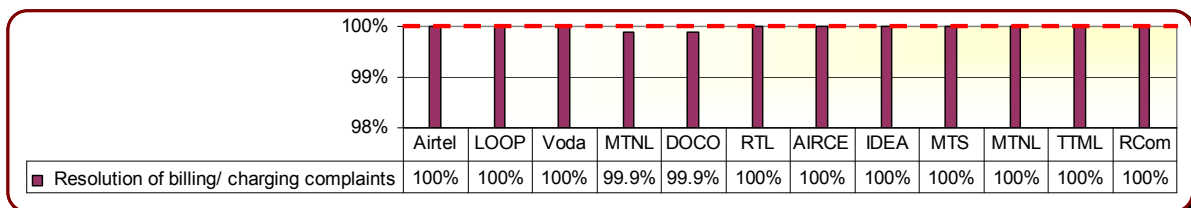
B) CUSTOMER SERVICE QUALITY PARAMETERS:

10) Percentage of call answered (Electronically) (benchmark >= 95%): All operators are meeting the benchmark except Airtel with value of 66.66%.

11) Percentage of call answered by operator (Voice to voice) (benchmark >= 90%): Except for Airtel, Idea & TTML with 35.02%, 81.05 & 89.74% rest of the operators are meeting the benchmark with values lying between 92.46% and 98.6%.

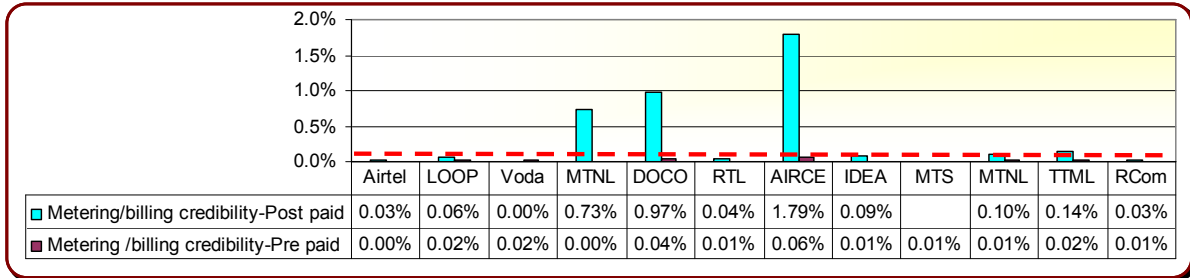


12) Percentage of Billing Complaints resolved within 4 weeks: (100%): All operators are meeting the benchmark except MTNL (GSM) & Docomo both with same value of 99.9%.

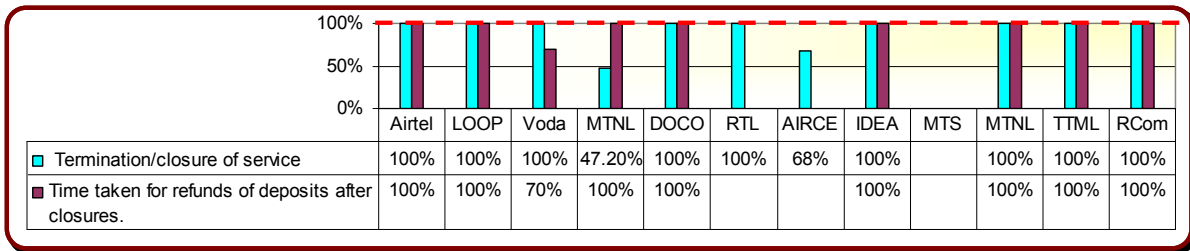


13) Metering and billing credibility-Post paid (benchmark <= 0.1%): All operators are meeting the benchmark except MTNL(GSM), Docomo, Aircel & TTML with values of 0.73%,0.97%, 1.79% & 0.14% respectively. It is to be noted that MTNL (CDMA) with 0.10% is just satisfying the benchmark.

14) Metering and billing credibility-Pre paid (benchmark <= 0.1%): All operators are meeting the benchmark with values lying in between 0.0% and 0.06%.



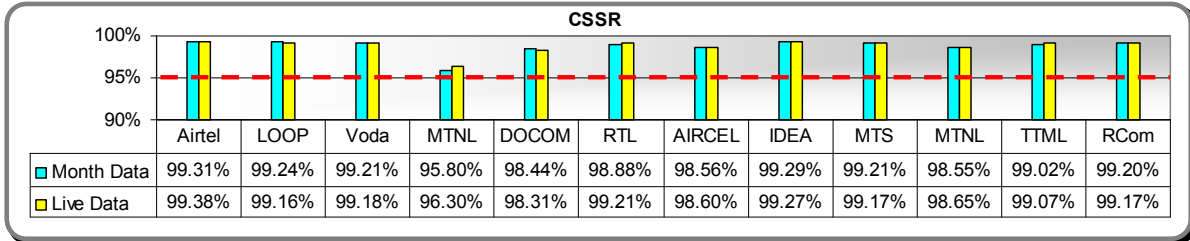
15) Time taken for refunds of deposits after closures (benchmark 100% in <= 60 days): Except for Vodafone with 70.1% rest of the operators are meeting the benchmark.



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

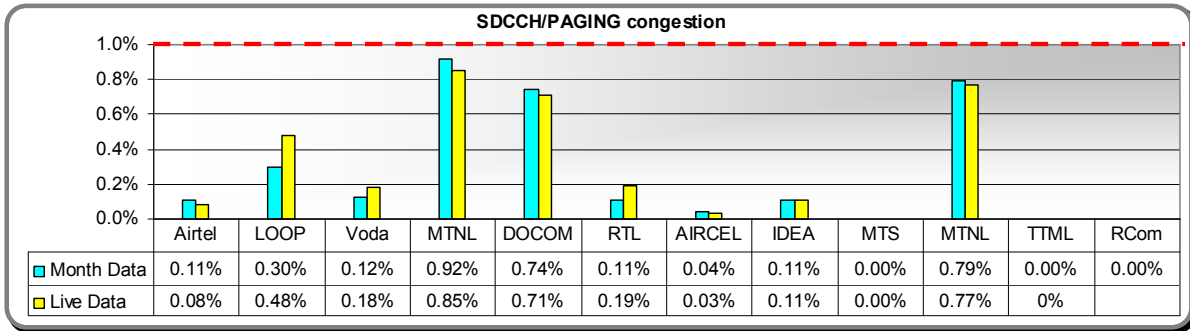
A) NETWORK PERFORMANCE

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

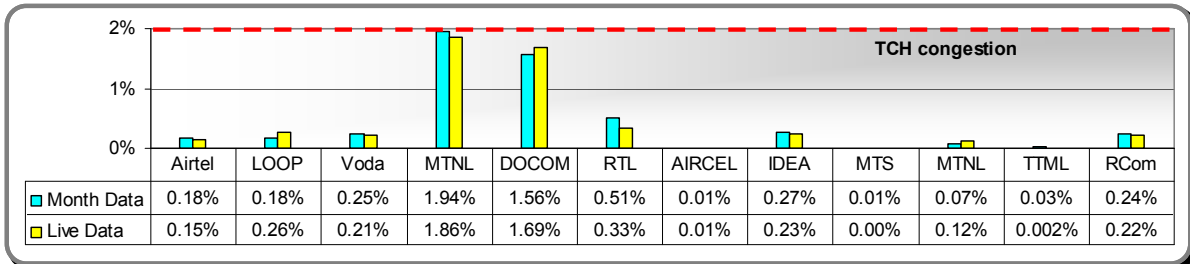


II. Blocked call rate:

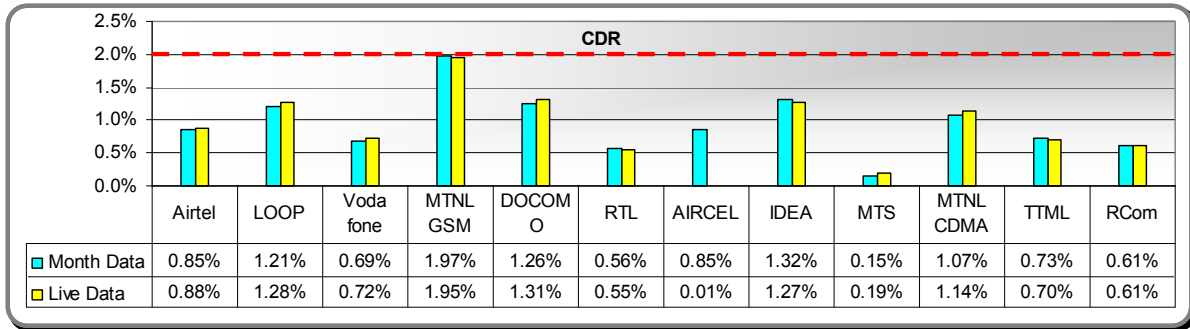
(1) **SDCCH congestion (%):** All operators are meeting the TRAI benchmarks ($\leq 1\%$) for both one month data and 3 days live data taken in the month of audit.



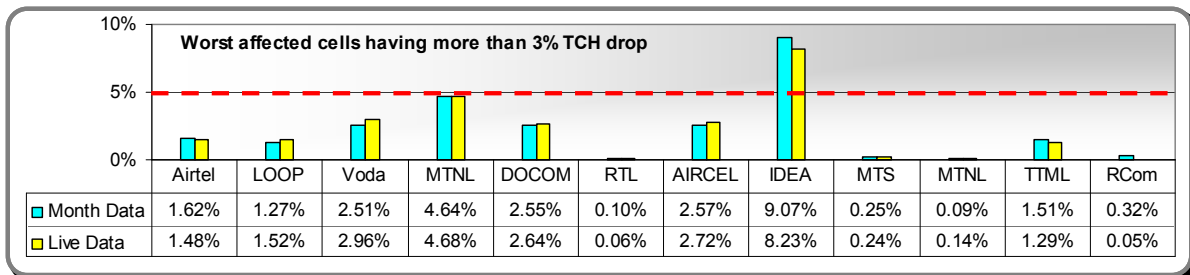
(2) **TCH congestion (%):** All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



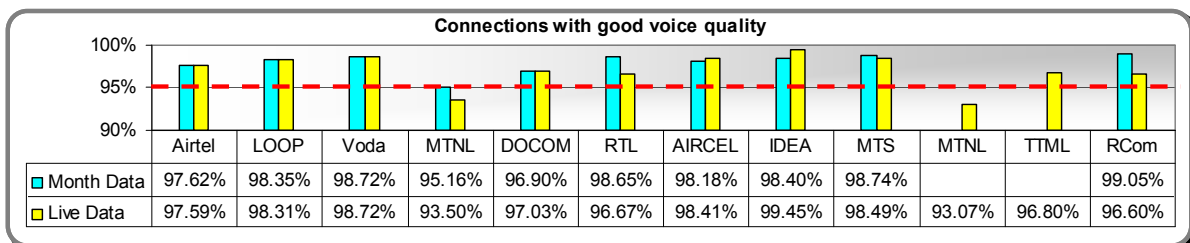
III. 1) **Call drop rate (%):** All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



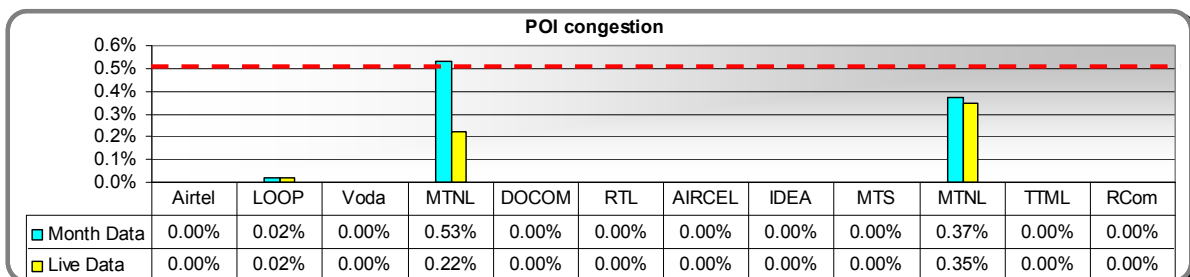
2) **Worst affected Cell exceeding 3% TCH Drop:** For both live and month data, Idea with a value of 8.23% and 9.07% respectively is found not meeting the benchmark of $\leq 5\%$. Rest of the operators are meeting the benchmark for both cases. In all cases data shows consistency for both live measurement and month data audit.



3) **Percentage of connections with good voice quality (benchmark $\Rightarrow 95\%$):** Except for MTNL (GSM & CDMA) with 93.5% & 93.07% value for live measurement all other operators are satisfying the benchmark.



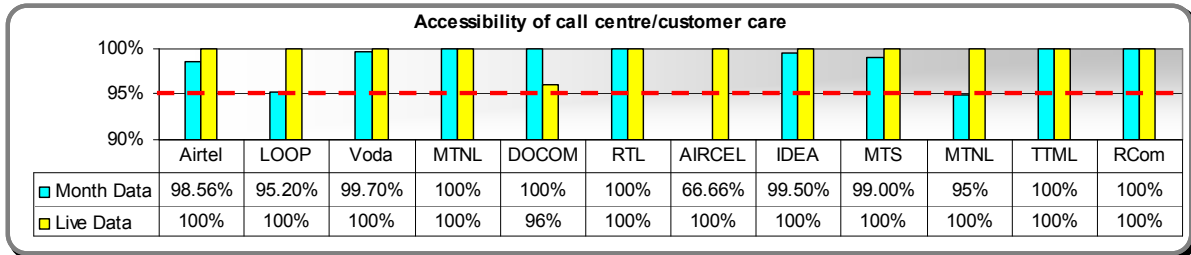
IV. **POI Congestion:** All operators are meeting the TRAI benchmarks ($\leq 0.5\%$) for both one month data and 3 days live data taken in the month of audit except MTNL(GSM) having 0.53% congestion for month of audit data.



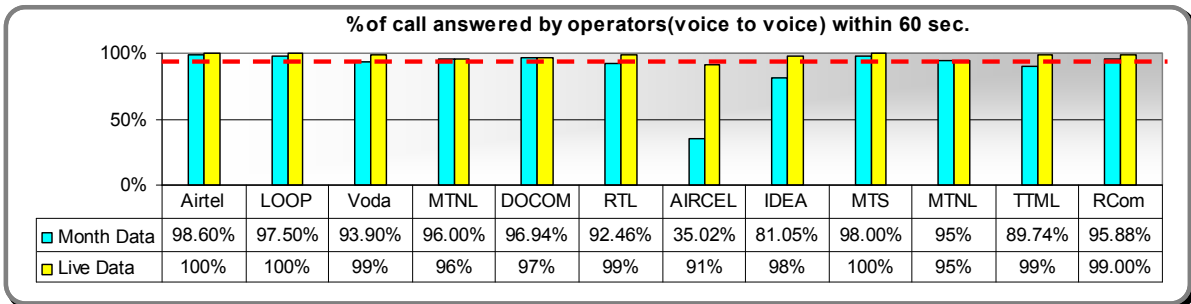
B) CUSTOMER SERVICE QUALITY PARAMETERS

III. Response time to the customer for assistance

(i) Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit except for Aircel with value 66.66% for month of audit data.



(ii) Percentage of call answered by operators (Voice to voice) within 60 sec: Except for Aircel(35.02%),Idea(81.05%) & TTML(89.74%) in case of month data rest of the operators are meeting the benchmark ($\geq 90\%$) for both one month data and 3 days live data taken in the month of audit. In case of MTNL-CDMA the value is just satisfying the benchmark, both for the month and live measurement.



7.3 QUALITY OF SERVICE ASSESSMENT : BROADBAND SERVICE

7.3.1 Service Provider Performance Report based on One Month Data Verification in which Audit was conducted (JAN 10 – MAR 10).

S. N.	Parameters	Benchmark	MTNL	HATHWAY	YOU TELECOM	SIFY	AIRTEL	TTML	RCom.	SPECTRANET
1	Service Provisioning / Activation Time									
1.1	100% cases in 15 days (subject to technical feasibility)	<15 days	93.65%	100%	100%	100%	100%	100%	100%	89.24%
1.2	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	A credit @ Rs.10 / per day.	96.53%	100%	100%	100%	100%	100%	100%	100%
2	Fault Repair / Restoration Time									
	By next working day:	> 90%	55.09%	90.40%	93%	92.45%	93.6%	96.52%	100%	100%
	within 3 working days:	99%	100%	99.24%	99%	99.79%	95.5%	100%	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)		2546	581	30	7	22	0	0	0
	Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		448	201	0	0	3	0	0	0
	Faults Pending for > 15 working days: (Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		22	17	0	0	2	0	0	0
3	Billing Performance									
	Billing complaints per 100 bills issued	< 2%	0.01%	1.41%	0.15%		0.01%	0.17%	0.23%	0%
	%age of Billing Complaints resolved	100% within 4 weeks	100%	100%	100%	Prepaid module	100%	100%	100%	100%
	Time taken for refund of deposits after closure:	100% within 60 days	100%	100%	43%		100%	100%	100%	100%
4	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)									
	Within 60 seconds	> 60%	80.48%	97.23%	85%	100%	94.97%	97.31%	82.35%	100%
	Within 90 seconds	> 80%	83.32%	98.32%	89%	100%	97.32%	97.96%	84.42%	100%
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).									

S/N	Parameters	Bench mark	MTNL	HATHWAY	YOU TELECOM	SIFY	AIRTEL	TTML	RCom.	SPECTRA-NET
	i) POP to ISP Gateway Node [Intra-network] Link(s)	< 80%	51.99%	56.81%	52%	38%	83.05%	44.54%	22.96%	35.29%
	ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity	< 80%	85.50%	71.21%	60.37%	22%	29.2%	45.81%	36.07%	No connectivity
	Broadband Connection Speed (download) - from ISP Node to User	> 80%	84.60%	85.94%	88.50%	*NA	100%	86.50%	*NA	*NA
6	Service Availability / Uptime (for all users)									
	With effect from quarter ending and onwards	> 98%	99.29%	98.89%	99.07%	100%	99.99%	99.94%	99.99%	100%
7	Packet Loss	< 1%	0%	0%	0.16%	*NA	0%	0%	0.02%	*NA
8	Network Latency (for wired broadband access)									
8.1	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	< 120 ms	*NA	2.33 ms	24.42 ms	*NA	5 ms	66.61 ms	*	*NA
8.2	User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)	< 350 ms	275.17 ms	303 ms	248.65 ms	*NA	317 ms	250.94 ms	13.25 ms	*NA
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



Indicates deviation from benchmark of TRAI.

NA – Not Applicable, *NA- System not generated, NP – Not Provided.

*To prevent denial of service attack from hackers, permission denied by NIXI router

Note:

- For Sr. no. 8.3 none of the operator having satellite connectivity.
- For Sr. no. 5.2 SPECTRA-NET not applicable because no Upstream Links for International Connectivity.
- For Sr. no. 3 SIFY not applicable because operator under in prepaid module.

Critical findings and Key take outs

7.3.2 Broadband service

- ◆ Reliance and Spectra-net are submitting the PMR on all India bases; hence data is verified on All India basis not for particularly for Mumbai Circle.
- ◆ 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.
- ◆ To test the Service Providers performance on Technical (Network related complains) & Non-Technical (Provisioning, Billing, Refund etc.) complaint handling TCIL auditors have conducted a customer feedback calling for random 100 nos. of customers in each segment. It was found that more than 95% customers are satisfied with services provided by the operators.

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

Service provisioning/Activation time:

All the service providers are performing well and meeting the benchmarks for service provisioning except MTNL with the value of 93.65% & Spectra-net with the value of 89.24%.

Fault Repair/Restoration time & Rebate:

All the operators are meeting benchmark of more than 90% except MTNL with the value of 55.09% (by next working day). All the service providers are found to provide Rebate as per the guide lines set by TRAI except Sify, have not any rebate because operator currently having only prepaid module.

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 for on-month data verifications. All the operators are providing the refund of deposits after closure as per the benchmark of “100% cases within 60 days” except You Telecom with a success value of 43%. 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 one month data verifications.

Bandwidth Utilisation:

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

All the operators are meeting all the benchmarks except Airtel with the value of 83.05% during measurements of one-month data verification.

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

All the operators are meeting the benchmark except MTNL with the value of 85.50% during measurements of one-month data verification. For Spectra-net, the operator is not having any NIXI upstream links.

Broadband Connection speed:

All the operators are meeting the TRAI benchmark of greater than 80% connection speed during measurements of 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 live measurements and one-month data verification except for Sify & Spectra-net, data is not systems generated.

Network Latency:

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

All operators are meeting the benchmark except for MTNL, Sify & Spectra-net, not providing the data because Operators can't capture this data from the system.

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

All operators are meeting the benchmark except for Sify & Spectra-net have not provided the data because Operators can't capture this data from the system.

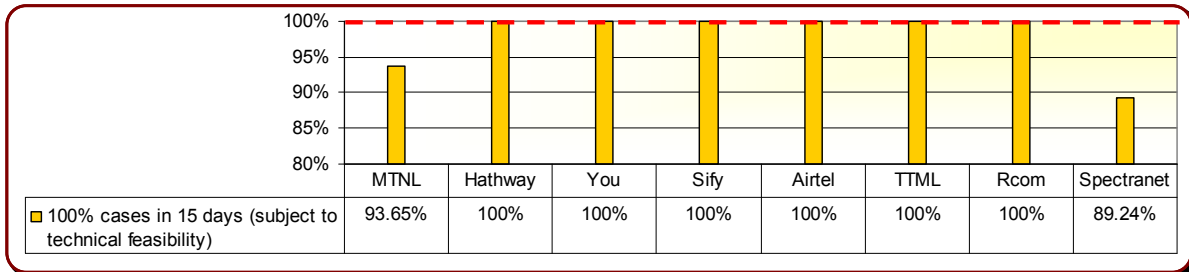
User reference point at ISP gateway node to international nearest NAP Port abroad (Terrestrial) <850 ms:

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.

7.3.3 Parameter wise Data Analysis & Graphical Representations – Broadband Service

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

All the operators are complying with the TRAI benchmark of 100% Except MTNL & SPECTRA-NET with the value of 93.65% & 89.24% respectively.

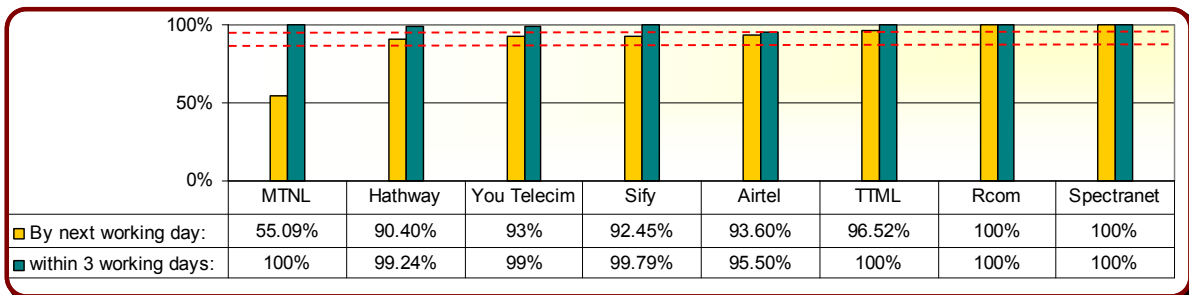


2.0 Fault Repair / Restoration Time:

By next working day (>90%): All the operators are complying with the TRAI benchmark of 90% Except MTNL with the value of 55.09%.

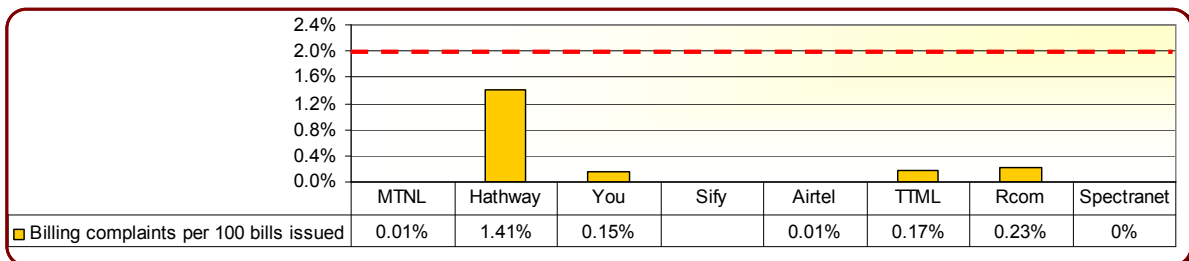
Within 3 working days (>99%): All the operators are complying with the TRAI benchmark except for Airtel with the value of 95.5%.

Rebate: All the operators are giving rebate to the eligible customers.



3.0 Billing Performance: (Benchmark <2%)

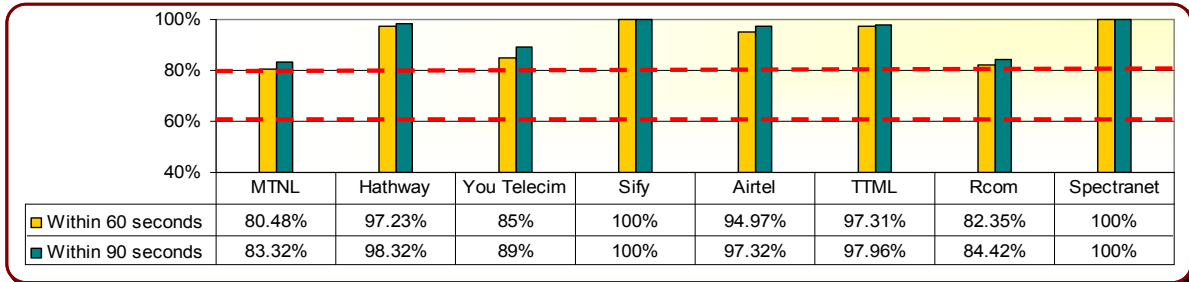
All the operators are complying with the TRAI standards, Except Sify which has only prepaid module.



4.0 Response time to the customer for assistance:

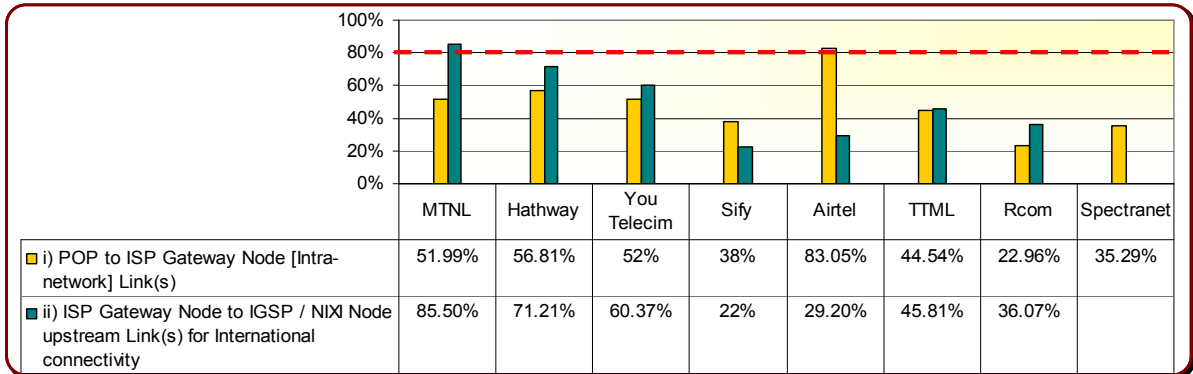
% age of calls answered by operator (Voice to Voice)

- **Within 60 seconds (>60%):** All the operators are meeting the benchmark.
- **Within 90 seconds (>80%):** All the operators are meeting the benchmark.



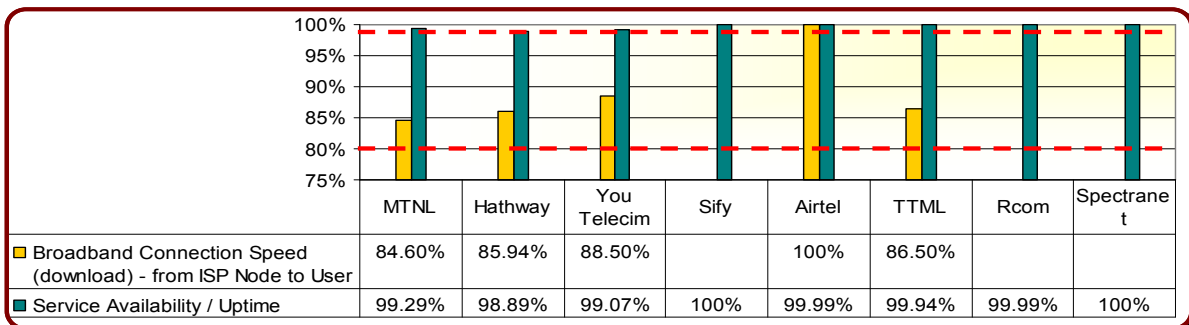
3.0 Bandwidth Utilization/ Throughput:

- **POP to ISP Gateway Node [Intra-network] Link(s): (Benchmark <80%):** All the operators are meeting the benchmarks except Airtel with a value of 83.05% for one-month data verification.
- **ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity: (Benchmark <80%):** All the operators are meeting the benchmarks except for MTNL with a value of 85.50% for Spectra-net; Operator is not having any NIXI upstream links. For Reliance comm., ISP gateway is in Mumbai, Delhi & Chennai. Hence No Upstream link for Mumbai Circle.

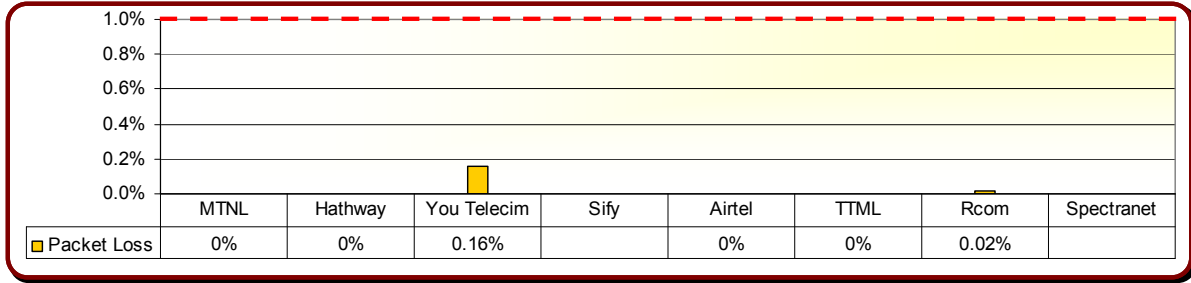


4.0 Broadband Connection Speed (download) (>80%): All the operators are meeting the TRAI benchmark of greater than 80% connection speed.

5.0 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.



6.0 Packet Loss (Should be less than 1%): All the operators comply with the TRAI benchmarks



7.0 Network Latency:

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

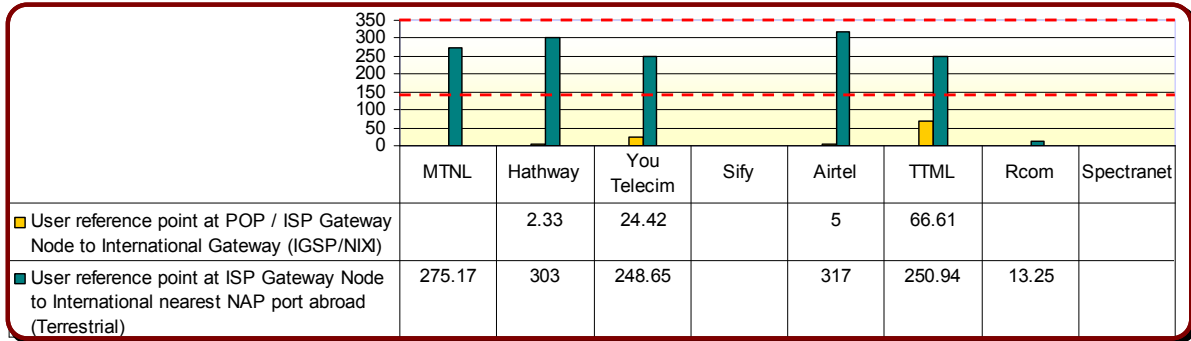
All operators are meeting the benchmark.

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

All operators are meeting the benchmark.

- **User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite) <850 ms:**

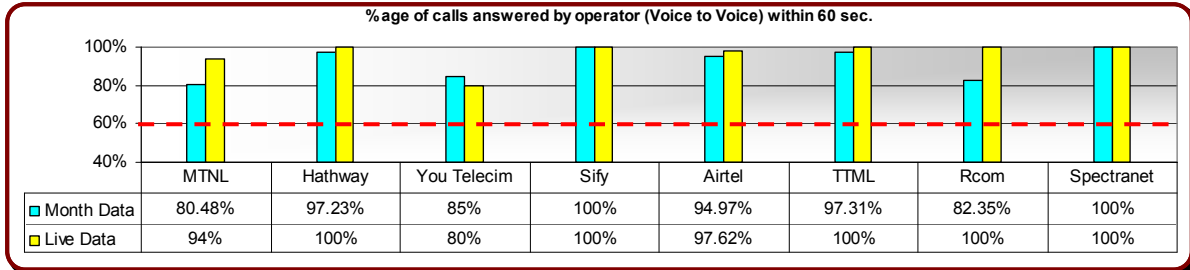
The Satellite link does not exist with any of the operator, hence the parameter “User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)” is not applicable to the operators.



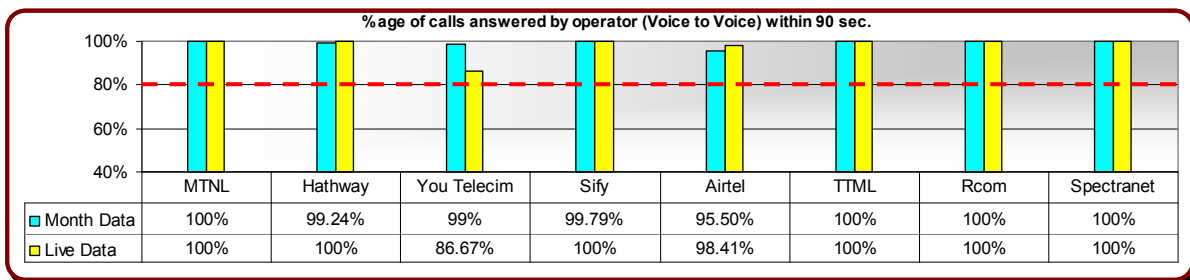
7.3.4 Comparison between Live measurements and One month data Audit – Broadband Service

1. Response time to the customer for assistance (Voice to Voice):

(i) Calls answered by operator within 60 seconds (>60%): All the operators are meeting the benchmark.

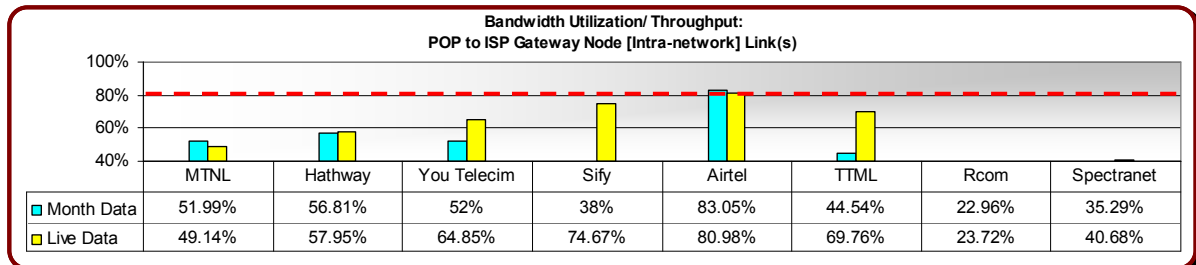


(iii) Calls answered by operator within 90 seconds (>80%): All the operators are meeting the benchmark.

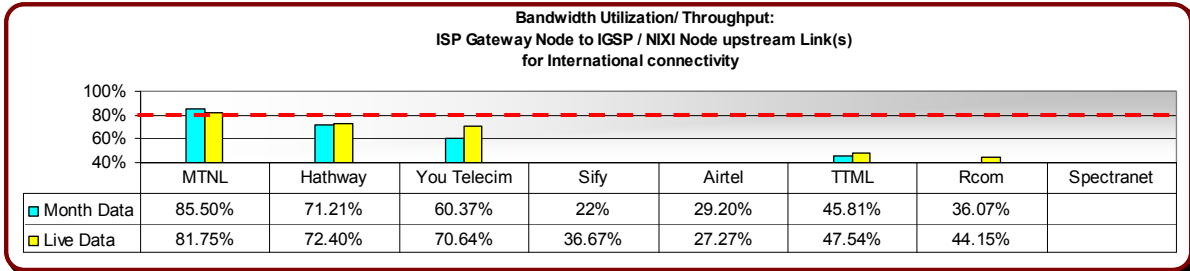


2. Bandwidth Utilization/ Throughput:

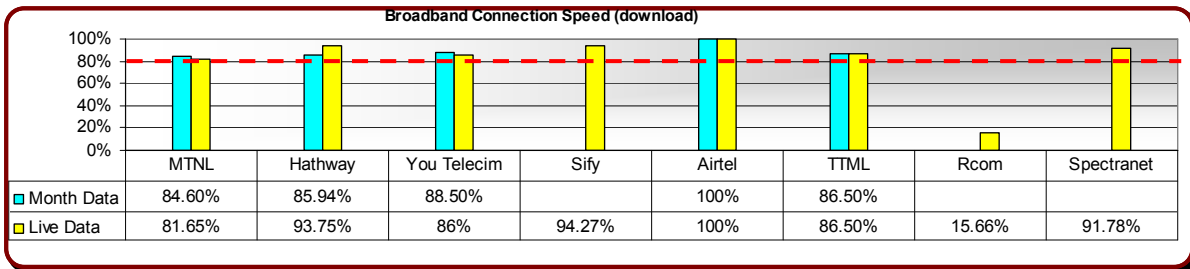
i) POP to ISP Gateway Node [Intra-network] Link(s) (<80%): All the operators are meeting the benchmark except for Airtel with a value of 80.98% for live performance & value of 83.05% in one month data.



i) **ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity (Should be less than 80%):** All the operators are meeting the benchmark except MTNL with a value of 81.75% showing deviation on the live performance audit data & with a value of 85.50% in one month data. However, the parameter is not applicable for Spectra-net.

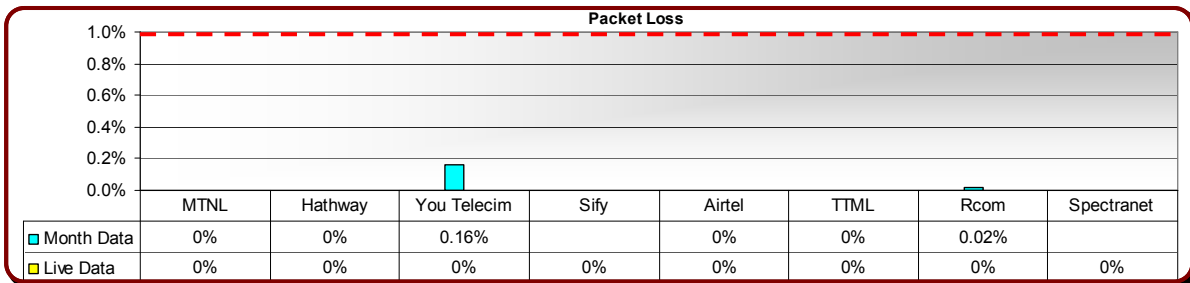


ii) **Broadband Connection Speed (download) (>80%):** All the operators are meeting the benchmark except RCom. with a value of 15.66% for 3-days live performance.



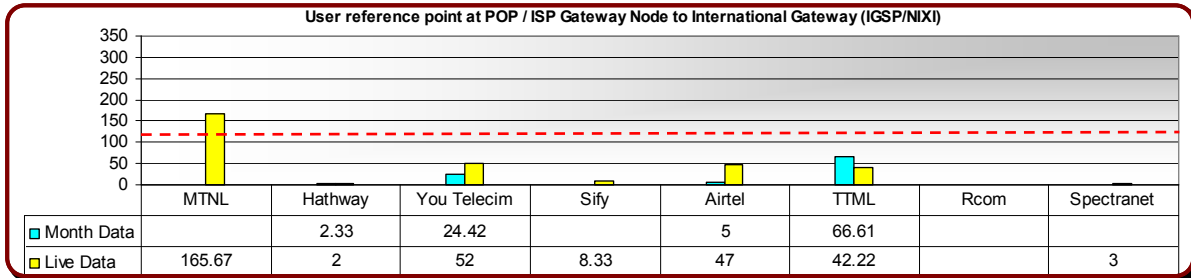
3. Packet Loss: (Benchmark <1%):

All the operators are meeting the benchmark in one month and 3 days comparison data.

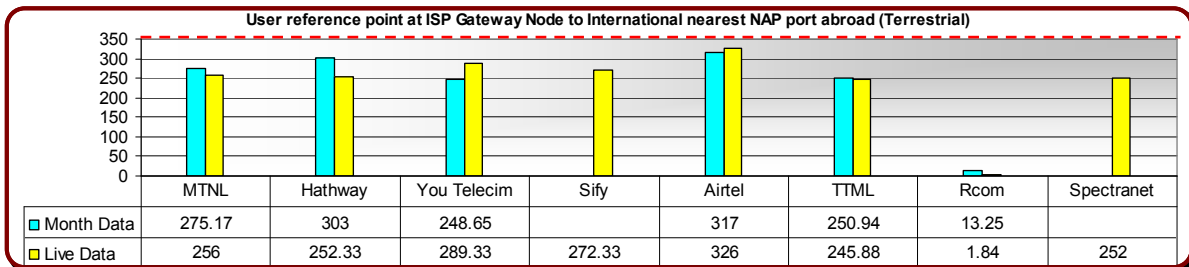


4. Network Latency:

i) User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI):
(Benchmark <120ms): All the operators are meeting the benchmark except MTNL with a value of 165.67ms showing deviation for the data collected in 3-days live performance.



ii) User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial):
(Benchmark <350ms): All the operators are meeting the benchmark



CHAPTER – 8

DRIVE TEST FINDING

8.1 Drive Test Procedure :

TCIL have conducted individual drive test for each service provider, both for GSM and CDMA operators. Drive test was conducted in 2 phases a) operator assisted and b) independent drive test. Operator assisted drive test is always precede by independent drive test and for both cases route were taken the same. As per TRAI norms 3 types of clutter in each city were made based on the population & geography of the city. The clutters were divided into dense population, medium population & low population. Auditors have covered 100 Kms. on drive test covering all the above mention clusters giving special focuses for areas where more complain are registered by the end users, the customers. For all the operators drive test routes were made to be same as far as possible.

During the drive test, auditors have taken short calls of 120 second call duration & 10 second waiting time after each call & covered maximum possible routes in the selected clutters. At the drive test moment, vehicle speed was maintained within 20- 30 km/hr. For route details see annexure II of the report.

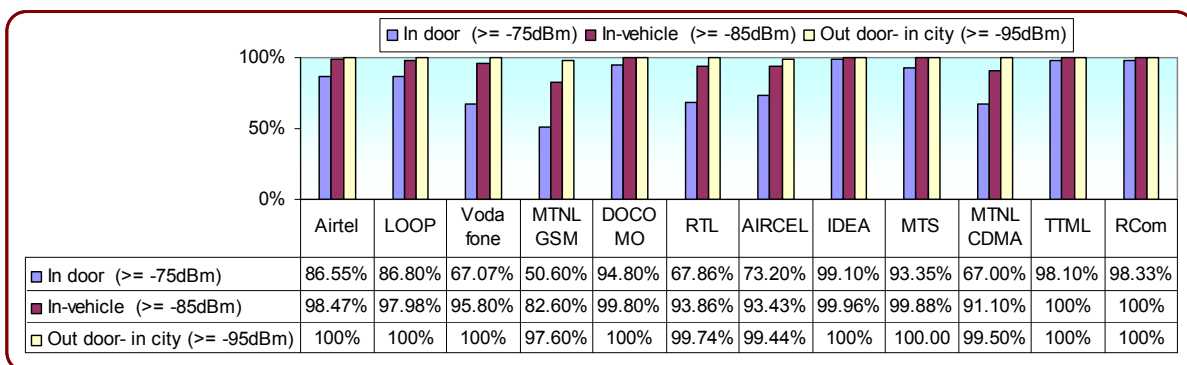
For GSM operators, auditors have taken Rx quality (Bit Error Rate) & in case of CDMA operators, FER (Frame Error Rate) was taken for measuring Rx quality. The range of Rx quality is scaled between 0-5 for system using frequency hopping & between 0-4 for system without frequency hopping. Other then this call drop and blocked call details were taken cluster wise to get a better picture of the QoS for a particular service provider.

8.2 Drive Test Data Analysis (Operator assisted Drive Test) for MUMBAI

S.N	Parameters	Airtel	LOOP Telecom	Vodafone	MTNL GSM	Docomo	RTL GSM	Aircel	IDEA	MTS	MTNL CDMA	TTML	RCo m.
1	Drive Test												
1.1	Call Attempts	167	116	169	150	224	119	149	209	182	310	177	128
1.2	Blocked Call Rate (<=3%)	0.81 %	0.8%	1.78 %	5.6%	0%	0.8%	0%	0%	0.75 %	0.3%	1.1%	0%
1.3	Dropped Call Rate (<=2%)	0%	1.7%	1.8%	3.5%	1.7%	0.8%	0.87%	0%	0%	1.2%	0.5%	0%
1.4	Percentage of connections with good voice quality (= >95%)												
	(i) 0-4 (w/o frequency hopping)									98.49%	93%	96.8%	96.6%
	(ii) 0-5 (with frequency hopping)	97.79 %	98.2 %	95.22 %	93.5 %	95.2 %	92.01 %	95.62 %	95.36 %				
1.5	Service Coverage												
	In door (>= -75dBm)	86.55 %	86.8 %	67.07 %	50.6 %	94.8 %	67.86 %	73.2%	99.10 %	93.35%	67%	98.1%	98.33%
	In-vehicle (>= -85dBm)	98.47 %	97.98 %	95.8 %	82.6 %	99.8 %	93.86 %	93.43 %	99.96 %	99.88%	91.1%	100%	100%
	Out door- in city (>= -95dBm)	100%	100%	100%	97.6 %	100%	99.74 %	99.44 %	100%	100%	99.5%	100%	100%
1.6	Call Setup Success Rate (>=95%)	97.63 %	99%	96.67 %	94.5 %	99.1 %	98.59 %	100%	100%	99.22%	99.7%	99.2%	100%

Indicates deviation from benchmark of TRAI.

Graphical presentation on Service Coverage



Observation (Operator assisted Drive Test):

The Operator Assisted Drive Test was conducted at Mumbai for all the operators. Route cover was about around 80-100Km depending on city areas within the speed limit of 30Km/hr. Details of route are given in Annexure II. The operator wise observations based on drive test are as follows:

AIRTEL

Airtel is meeting all the benchmarks in Mumbai.

LOOP TELECOM

Loop telecom is meeting all the benchmarks in Mumbai.

VODAFONE

Vodafone is meeting all the benchmarks in Mumbai.

MTNL GSM

MTNL is meeting none of the benchmarks for Mumbai circle. MTNL is showing deviation in ‘Block call rate (5.6%), Drop call rate (3.5%), percentage of connections with good voice quality’ with a value of 93.5% & CSSR with value of 94.5% from the benchmark.

DOCOMO

Docomo is meeting all the benchmarks in Mumbai.

RTL GSM

RCom. is meeting all the benchmarks in Mumbai except for ‘%age of connections with good voice quality’ with a value of 92.01%, deviates from the benchmark.

AIRCEL

Aircel is meeting all the benchmarks in Mumbai.

IDEA

Idea is meeting all the benchmarks in Mumbai.

MTS

MTS is meeting all the benchmarks in Mumbai.

MTNL CDMA

MTNL-CDMA is meeting all the benchmarks in Mumbai except for ‘%age of connections with good voice quality’ with a value of 93%.

TTML

TTML is meeting all the benchmarks in Mumbai.

RCOM. CDMA

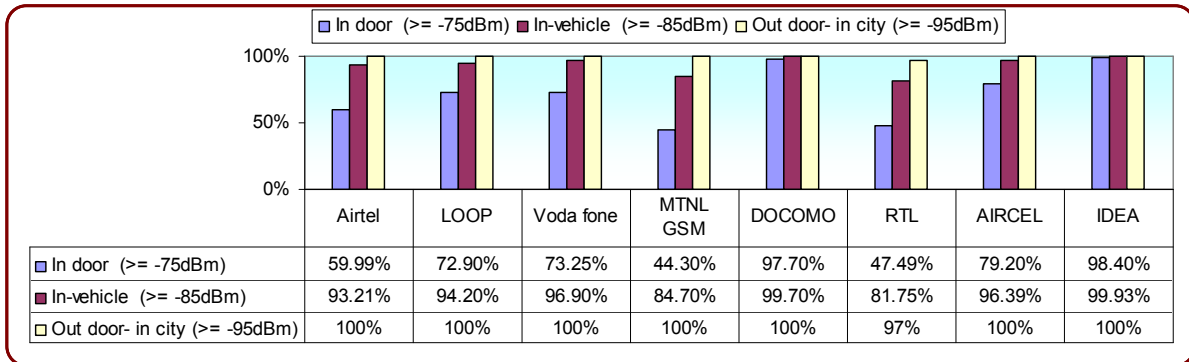
RCOM. is meeting all the benchmarks in Mumbai.

8.3 Drive Test Data Analysis (Independent Drive Test) for MUMBAI

S.N	Parameters	Airtel	LOOP Telecom	Voda fone	MTNL GSM	Docomo	RCOM. GSM	Aircel	IDEA
1	Drive Test								
1.1	Call Attempts	160	104	173	110	200	170	119	181
1.2	Blocked Call Rate (<=3%)	3%	2.9%	1.7%	3.6%	0%	9.52%	0%	0%
1.3	Dropped Call Rate (<=2%)	1.47%	0.99%	1.7%	6.6%	1.5%	5.70%	0%	0%
1.4	Percentage of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)								
	(ii) 0-5 (with frequency hopping)	95.78%	98.3%	95.83%	95.5%	95.5%	91.4%	95.16%	96.04%
1.5	Service Coverage								
	In door (>= -75dBm)	59.99%	72.9%	73.25%	44.3%	97.7%	47.49%	79.20%	98.40%
	In-vehicle (>= -85dBm)	93.21%	94.2%	96.9%	84.7%	99.7%	81.75%	96.39%	99.93%
	Out door- in city (>= -95dBm)	100%	100%	100%	100%	100%	96.82%	99.53%	100%
1.6	Call Setup Success Rate (>=95%)	96.90%	97.1%	98.1%	93.6%	99.5%	86.03%	100%	100%

Indicates deviation from benchmark of TRAI.

Graphical presentation on Service Coverage



Observation:

The Independent Drive Test was conducted at Mumbai after operators assisted drive test was over for respective operators. Route cover was about around 80-100Km depending on city areas within the speed limit of 30Km/hr. Details of route are given in Annexure II. The operator wise observations based on drive test are as follows:

Airtel

Airtel is meeting all the benchmarks in Mumbai. It can be noted that 'Blocked Call rate' with a value of 3% just meets the benchmark value.

Loop telecom

Loop telecom is meeting all the benchmarks in Mumbai.

Vodafone

Vodafone is meeting all the benchmarks in Mumbai.

MTNL GSM

MTNL-GSM is meeting only a single benchmark in Mumbai namely %age with good voice quality. Rest of the parameters shows deviation from the benchmark.

Docomo

Docomo is meeting all the benchmarks in Mumbai.

Aircel

Aircel is meeting all the benchmarks in Mumbai.

Idea

Idea is meeting all the benchmarks in Mumbai.

RTL GSM

RCOM. is meeting none of the benchmarks in Mumbai.

CHAPTER – 9

POI CONGESTION: VOICE CALL TEST

9.1 INTER OPERATOR CALL CONGESTION ASSESSMENT

9.1.1 Summary of Successful Calls

Calling Operator	Airtel	LOOP Telecom	Vodafone	MTNL GSM	Docomo	RCOM, GSM	Aircel	IDEA	MTS	MTNL CDMA	TTML	RCom.
Airtel	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LOOP	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Vodafone	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
MTNL, GSM	100%	100%	100%	-	100%	100%	100%	99%	100%	100%	100%	100%
DOCOMO	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%
RCOM, GSM	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Aircel	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%
Idea	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
MTS	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%
MTNL	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
TTML	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%
RCom, CDMA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-

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

CHAPTER – 10
CUSTOMER CARE & GRIEVANCES REDRESSAL

10.1 Basic Service (Wireline)

S.N.	Parameters	Airtel	MTNL	TTML	RCom.
1	Total no of complaints received in the call centre (Tech+ Non Tech)	64845	5128	3552	NP
2	Total no of complaints redressed by the call centre within the specified time limit	NA	NA	NA	NP
3	Nodal Officer				NP
3.1	Total no of complaints received by the nodal officers	35	1026	10	NP
3.2	Percentage of complaints with reference to total no of complaints received at the call centre	0.0005%	20%	0.002%	NP
3.3	Total no of complaints redressed within the specified time limit	100%	100%	100%	NP
4	Appellate Authority				NP
4.1	Total no of appeals received by the appellate authority	0	0	0	NP
4.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	0	0	0	NP

10.2 Cellular Mobile Telephone Services

S . N .	Parameters	Airtel	LOOP Telecom	Vodafone	MTNL	DOC OMO	RCom. GSM	Airtel	Idea	MTS	MTNL CDMA	TTML	RCOM
A	Call Centre Statistics												
1	Total no of complaints received in the call centre (Post paid)	1153	412	1390	4041	669	287	1407	1434	0	885	607	1003
2	Total no of complaints received in the call centre (Pre paid)	29034	746	1403	14135	4856	1786	5714	7600	1319	9	2764	1470
B	Nodal Officer												
1	Total no of complaints received by the nodal officers	88	100	98	5	82	22	20	16	1	894	40	161
2	Percentage of complaints with reference to total no of complaints received at the call centre	0.03%	8.63%	4%	0.028%	1.4%	1%	0.3%	0.18%	0%	100%	1.18%	7%
3	Total no of complaints redressed within the specified time limit	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
C	Appellate Authority												
1	Total no of appeals received by the appellate authority	76	10	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

10.3 Broadband Service

S.N.	Parameters	MTNL	HATHWAY	YOU TELECOM	Sify	AIRTEL	TTML	RCom	SP EC TR AN ET
1	Call Centre								
1.1	Total no of complaints received in the call centre	0	13255	10271	3497	118	564	349	25
1.2	Complaints per 100 customers per months	0	0.01%	0.15%	NA	0.01%	0.17%	0.23%	0%
1.3	Total no of complaints redressed by the call centre within the specified time limit	0	100%	100%	100%	100%	100%	100%	100%
2	Nodal Officer								
2.1	Total no of complaints received by the nodal officers	0	89	35	5	83	18	0	0
2.2	Percentage of complaints with reference to total no of complaints received at the call centre	0	0.67%	0.34%	0.14%	70.34%	3.19%	0%	0%
2.3	Total no of complaints redressed within the specified time limit	0	100%	100%	100%	100%	100%	100%	100%
3	Appellate Authority								
3.1	Total no of appeals received by the appellate authority	0	24	7	0	5	0	0	0
3.2	Percentage of appeal received with reference to total no of complaints received by the nodal officers	0	0.18%	0.07%	0%	4.24%	0%	0%	0%
3.3	Total no of appeals decided within 3 months	0	100%	100%	100%	100%	100%	100%	100%

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.

ANNEXURE - I**DRIVE TEST LOCATIONS****MUMBAI**

Dense : Prabhadevi, Worli, Hajiali, Peddar road, Marine drive, Mantralaya, VT, Crawford,
Market, Church gate

Medium Dense 1: Matunga, Mahim, Bandra, Khar, Santacruz, Andheri, Lokhandwala, S.V. Road

Low Dense: Chembur, Mankhurd, Vashi, Sanpada, Thane, Belapur road

MTNL exchanges for Mumbai circle.

Total no of exchanges- 212

SSA- 01

SDCA- 01

Total no of exchanges covered on audit- 30

Switches/BSC/BTS details of operators:

Operator's Name	No. of MSC	No. of BSC	No. of BTS
Airtel	7	61	2751
Idea	4	99	1934
Aircel	2	18	1744
Loop	2	38	1749
Vodafone	16	62	3200
MTNL(GSM)	5	20	552
RTL	3	13	1555
TATA Docomo(GSM)	3	15	1540
MTS	1	2	423
RCom.	7	-	768
TATA(CDMA)	3	5	720
MTNL(CDMA)	2	3	216