

REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
WEST ZONE
MADHYA PRADESH & CHHATISGARH CIRCLE

Report Period: APRIL 2011 – JUNE 2011

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- Not conducted for this quarter

III. Broadband Service Providers

- Not conducted for this quarter

CHAPTER-1: INTRODUCTION

I. Background

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

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

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

The purpose of laying down Quality of Service Parameters is to:

- i) Create conditions for consumer satisfaction by making known the quality of service, which the service provider is required to provide, and the user has a right to expect.
- ii) Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.
- iii) Generally protect the interests of consumers of telecommunication services.

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

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

II. Objectives and Methodology

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

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

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

Systems audited:-

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

Facilities audited:-

1. Billing documents.
2. Customer Care records.

Field data collections carried out:-

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

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

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

CHAPTER-2: EXECUTIVE SUMMARY

I. Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in Madhya Pradesh & CG Circle in 2nd quarter (April – June 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period Oct – Dec 2010.

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

Sl.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	June-2011	2000-2100
2	Airtel Ltd	June-2011	1900-2000
3	BSNL	June-2011	1900-2000
4	Idea	June-2011	2000-2100
5	Reliance Communication (GSM)	June-2011	1900-2000
6	Tata Communications (GSM)	June-2011	1900-2000
7	Videocon	June-2011	1900-2000
8	Etisalat	June-2011	1900-2000
9	Loop	June-2011	1900-2000
10	Vodafone	June-2011	2000-2100
CDMA Operators			
10	Reliance Communication (CDMA)	June-2011	1900-2000
11	Tata Communications (CDMA)	June2011	1900-2000

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

(A) Cellular Mobile Telephone Services

3 days Live Data Audit		Bench-mark	Aircel	Airtel	BSNL MP	TATA GSM	Idea	BSNL CG	VODAF ONE	LOOP	ETISAL AT	VIDEOCON	RCOM GSM	TTSL CDMA	RCOM CDMA
S/N	Name of Parameter		GSM Operators										CDMA Operators		
1	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	ICR with TATA	98.52%	96.22%	99.05%	98.99%	94.64%	98.64%	99.87%	99.74%	99.10%	99.28%	99.16%	99.79%
	b) SDCCH/PAGING congestion	<=1%		0.48%	0.88%	0.24%	0.23%	0.17%	0.37%	0.00%	0.11%	0.04%	0.45%	0.00%	0.00%
c) TCH congestion	<=2%	0.19%		1.76%	0.41%	0.42%	2.78%	1.35%	0.00%	0.01%	0.17%	1.09%	0.00%	0.32%	
2	Connection maintenance (retainability)														
	a) CDR	<=2%	1.20%	1.22%	0.94%	0.65%	3.11%	1.05%	1.14%	1.73%	0.71%	0.94%	0.57%	0.52%	
	b) Worst affected cells>3% TCH drop	<=3%	3.92%	4.68%	4.80%	2.73%	25.70%	3.47%	3.03%	3.52%	7.31%	0.15%	0.41%	0.22%	
	c) Good voice quality	>=95%	95.33%	NA	98.09%	98.93%	NA	97.78%	95.53%	97.55%	98.83%	97.96%	NA	NA	
3	No. of POI having congestion >0.5%		8	0	0	0	0	0	0	0	0	1	0	0	0
4	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	>=95%	100%	100%	100%	100%	100%	NA	100%	NA	100%	100%	100%	100%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	85.6%	99.20%	98.00%	100%	97.19%	NA	100%	NA	99.43%	100%	20.74%	100%	91.87%

NA: Not Applicable, NR: Not Received

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters by and large, except for BSNL CG for CSSR, TCH congestion & CDR. Videocon & Aircel have POIs with more than 0.5% congestion.

AIRTEL , BSNL MP, TATA GSM , BSNL CG , VODAFONE , LOOP, ETISALAT , VIDEOCON are not meeting the benchmark for “Worst affected cells>3% TCH drop”. Aircel & RCOM GSM have below benchmark performance for %age of call answered by operator(voice to voice) within 60sec.

One Month Data Audit		Bench-mark	Aircel	Airtel	BSNL MP	TATA GSM	Idea	BSNL CG	V-FONE	LOOP	ETISAL AT	VIDEO CON	RCOM GSM	TATA CDMA	RCOM CDMA	
S/N	Name of Parameter		GSM Operators										CDMA Operators			
(A)	Network Service Quality Parameter															
1	Network Availability															
	a) BTS Accumulated Downtime	<=2%		0.59%	1.80%	0.02%	0.67%	1.04%	0.06%	0.07%	0.25%	0.25%	0.08%	0.00%	0.32%	
	b) Worst affected BTSs due to downtime	<=2%		1.96%	1.96%	0.00%	0.70%	2.89%	0.05%	0.00%	0.00%	0.58%	0.31%	0.07%	0.51%	
2	Connection Establishment (Accessibility)															
	a) CSSR (Call Setup Success Rate)	>=95%	ICR with TATA	98.67%	96.48%	99.10%	98.98%	94.60%	98.29%	99.93%	98.81%	99.10%	99.34%	99.78%	99.86%	
	b) SDCCH/PAGING congestion	<=1%		0.33%	0.81%	0.38%	0.20%	0.17%	0.35%	0.00%	0.31%	0.06%	0.47%	0.00%	0.00%	
	c) TCH congestion	<=2%		0.16%	1.74%	0.41%	0.39%	2.78%	1.70%	0.00%	0.20%	0.21%	1.08%	0.00%	0.31%	
3	Connection maintenance (retainability)															
	a) CDR	<=2%		1.27%	1.30%	1.10%	0.71%	3.11%	1.04%	0.59%	1.43%	0.73%	0.95%	0.00%	0.56%	
	b) Worst affected cells>3% TCH drop	<=3%		1.17%	4.59%	5.56%	2.48%	25.67%	2.90%	3.03%	3.33%	7.84%	1.28%	0.33%	0.29%	
	c) Good voice quality	>=95%		95.67%	NA	97.91%	98.86%	NA	97.64%	98.15%	97.26%	98.72%	98.16%	NA	NA	
4	No. of POI having congestion>0.5%		8	0	0	0	0	0	0	0	0	1	0	0	0	
(B)	Customer Service Quality Parameters															
5	Metering/billing credibility-Post paid	<= 0.1%	0.30%	0.02%	NP	0.37%	0.07%	0.00%	0.16%	NA	NA	NA	0.09%	0.00%	0.08%	
6	Metering /billing credibility-Pre paid	<= 0.1%	0.15%	0.01%	NP	0.07%	0.01%	0.03%	0.01%	0.00%	0.10%	0.02%	0.01%	0.05%	0.01%	
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	NP	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	
	a) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	<1 week	<1 week	NP	<1 week	<1 week	NA	<1 week	0%	<1 week	<1 week	<1 week	<1 week	<1 week	
8	Response time to customers for assistance															
	a) Accessibility of call centre/Customer Care	>=95%	100%	100%	100%	100%	99.25%	NA	NA	NA	100%	95%	100%	75%	100%	
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	81.49%	92.28%	98.00%	90.02%	96.90%	NA	95.62%	NA	98.90%	95.43%	26.09%	79.63%	94.57%	
9	Termination/closure of service	<=7days	89.29%	100%	100%	100%	100%	NA	100%	NA	NA	NA	100%	100%	100%	
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	NA	100%	NA	NA	NA	100%	100%	100%	

NA: Not Applicable, NR: Not Received

Parameters not meeting bench mark are as follows with the operators name:

BSNL CG is not meeting the benchmark for "Worst affected BTSs due to downtime", CSSR, TCH congestion & CDR.

Metering/billing credibility-Post paid Parameter's benchmark is not met by Aircel, Tata GSM & Vodafone.

Metering/billing credibility-Pre- paid Parameter's benchmark is not met by Aircel Only.

% call answered by operators (voice to voice) within 60 sec. Parameter's benchmark is not met by Aircel, Reliance GSM & Tata CDMA.

Worst affected cells>3% TCH drop Parameter's benchmark is not met by BSNL MP, Tata GSM, BSNL CG, Loop, Etisalat,& Videocon.

Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted at MP & CG for all the operators. Route covered was about around 80-100Km depending on city areas within the speed limit of 30Km/hr. The cities covered were Bhopal, Raipur & Indore.

SN	Parameter	City Name	Aircel	Airtel	BSNL	TATA GSM	IDEA	VODAFONE	VIDEOCON	RCOM GSM	TTSL CDMA	RCOM CDMA	
			GSM Operators									CDMA Operators	
1.1	Blocked Call Rate (<=3%)	BHOPAL	0.00%	1.07%	2.43%	0.00%	0.02%	3.46%	0.00%	1.22%	0.00%	1.21%	
		INDORE	0.00%	0.68%	0.75%	0.00%	0.95%	4.20%	0.00%	0.80%	0.00%	1.58%	
		RAIPUR	0.00%	2.46%	1.78%	0.00%	0.78%	0.55%	0.62%	1.80%	0.00%	0.00%	
1.2	Dropped Call Rate (<=2%)	BHOPAL	0.00%	0.53%	1.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.98%	1.22%	
		INDORE	0.00%	2.04%	0.75%	0.00%	0.00%	1.68%	3.61%	0.81%	0.00%	1.61%	
		RAIPUR	0.00%	0.00%	1.78%	0.00%	0.79%	0.00%	0.62%	0.50%	0.00%	0.00%	
1.3	Percentage of connections with good voice quality (=>95%)												
		(i) 0-4 (w/o frequency hopping)	BHOPAL	NA	NA	NA	NA	NA	NA	NA	NA	97%	97.44%
			INDORE	NA	NA	NA	NA	NA	NA	NA	NA	97.86%	94.60%
			RAIPUR	NA	NA	NA	NA	NA	NA	NA	NA	97.68%	98.62%
		(ii) 0-5 (with frequency hopping)	BHOPAL	95%	96%	89%	95%	91%	88%	96.01%	96.30%	NA	NA
			INDORE	95.39%	95.10%	84.40%	95.39%	93.47%	89.00%	95.00%	96.80%	NA	NA
RAIPUR	95.10%		95.60%	96.70%	95.10%	79.85%	92.58%	97.08%	93.00%	NA	NA		
1.4	Call Setup Success Rate (>=95%)	BHOPAL	100%	95.16%	95.73%	100%	97.50%	95.38%	100%	98.78%	100%	98.79%	
		INDORE	100%	97.53%	99.30%	100%	99.05%	95.80%	95.18%	99.20%	100%	98.42%	
		RAIPUR	100%	95.91%	98.21%	100%	98.43%	98.90%	98.00%	96.00%	100%	100%	
<p>Key observations as could be derived from the table are as under:</p> <ul style="list-style-type: none"> - Blocked Call Rate benchmark is not met by Vodafone in Bhopal & Indore respectively. - Drop call rate benchmark is not met by Airtel & Videocon in Indore. - Percentage of connections with good voice quality (=>95%) benchmark is not met by BSNL (Bhopal & Indore), IDEA (Bhopal, Indore & Raipur), Vodafone (Bhopal, Indore & Raipur), Reliance GSM (Raipur) & Reliance CDMA (Indore). 													

Independent Drive Test													
The Independent Drive Test was conducted at MP & CG circle in BHOPAL, INDORE & RAIPUR. Here again, zones were selected for covering different density areas (High, Medium & Low dense areas).													
SN	Parameter	City Name	Aircel	Airtel	BSNL	TATA GSM	IDEA	V-FONE	VIDEO-CON	RCOM GSM	TTSL CDMA	RCOM CDMA	
			GSM Operators									CDMA Operators	
1.1	Blocked Call Rate (<=3%)	INDORE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		BHOPAL	0.00%	0.70%	0.75%	0.00%	0.98%	7.37%	0.00%	1.54%	0.00%	0.77%	
		RAIPUR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1.2	Dropped Call Rate (<=2%)	INDORE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		BHOPAL	0.00%	1.32%	0.75%	0.00%	0.00%	1.64%	0.50%	0.00%	0.82%	0.78%	
		RAIPUR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
1.3	Percentage of connections with good voice quality (=>95%)												
		(i) 0-4 (w/o frequency hopping)	INDORE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
			BHOPAL	NA	NA	NA	NA	NA	NA	NA	NA	97.92%	96%
		RAIPUR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	(ii) 0-5 (with frequency hopping)	INDORE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		BHOPAL	95.69%	95.70%	84.40%	95.69%	99.02%	89.00%	98.71%	96.70%	NA	NA	
	RAIPUR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
1.4	Call Setup Success Rate (>=95%)	INDORE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
		BHOPAL	100.00%	95.85%	99.30%	100%	99.02%	97.05%	99%	98.46%	99.17%	99.23%	
		RAIPUR	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

Key observations as could be derived from the table are as under:
Blocked Call Rate Parameter's benchmark is not met by Vodafone Only.
Percentage of connections with good voice quality (=>95%) Parameters Benchmark is not met by BSNL & Vodafone only in Bhopal.

CHAPTER-3: AUDIT-PMR VERIFICATION

I. Cellular Mobile Telephone Service

PMR Report Verification			Audit	Aircel	Airtel	BSNL	Docomo	Idea	RTL	ETISAL AT	V- fone	LOO P	videoc on	TTSL	Rcom	
S/N	Name of Parameter	Benchmark														
(A)	Network Service Quality Parameter			GSM Operators										CDMA Operators		
	1	Network Availability														
	BTS Accumulated Downtime	<=2%	Reported		0%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%
			Verified		0%	1%	0%	1%	0%	0%	0%	0%	0%	1%	0%	0%
	Worst affected BTSs due to downtime	<=2%	Reported		1%	4%	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%
			Verified		1%	4%	0%	2%	0%	0%	0%	0%	0%	1%	0%	0%
2	Connection Establishment (Accessibility)															
	CSSR (Call Setup Success Rate)	>=95%	Reported		99%	96%	99%	97%	97%	98%	99%	97%	99%	99%	100%	100%
			Verified		99%	96%	99%	97%	97%	98%	99%	97%	99%	99%	100%	100%
	SDCCH/PAGING congestion	<=1%	Reported		0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
			Verified		0%	1%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
	TCH congestion	<=2%	Reported		0%	5%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%
		Verified		0%	5%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	
3	Connection maintenance (retainability)															
	CDR	<=2%	Reported		1%	2%	1%	1%	1%	1%	1%	0%	1%	0%	1%	
			Verified		1%	2%	1%	1%	1%	1%	1%	0%	1%	0%	1%	
	Worst affected cells>3% TCH drop	<=5%	Reported		1%	15%	1%	10%	3%	16%	5%	0%	2%	0%	0%	
			Verified		1%	15%	1%	10%	3%	16%	5%	0%	2%	0%	0%	
	Good voice quality	>=95%	Reported		97%	98%	99%	96%	97%	98%	98%	99%	98%	98%	100%	99%
		Verified		97%	98%	99%	96%	97%	98%	98%	99%	98%	98%	100%	99%	
4	POI congestion	<=0.5%	Reported	1	0	0	0	0	0	1	0	0	2	0	0	
			Verified	1	0	0	0	0	0	1	0	0	2	0	0	

PMR Report Verification			Audit	Aircel	Airtel	BSNL	Docomo	Idea	RTL	ETISALAT	V-fone	LOO P	videoc on	TTSL	Rcom		
S/N	Name of Parameter	Benchmark															
(B)	Customer Service Quality Parameters																
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	2%	0%	0%	0%	0%	0%	0%	NA	0%	NA	NA	0%	0%	
			Verified	2%	0%	0%	0%	0%	0%	0%	NA	0%	NA	NA	0%	0%	
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
			Verified	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100%	100%	100%	NR	100%	100%	100%		
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	NR	100%	100%	100%		
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	Reported	100%	100%	100%	100%	100%	100%	100%	100%	NR	100%	100%	100%		
			Verified	100%	100%	100%	100%	100%	100%	100%	100%	NR	100%	100%	100%		
8	Response time to customers for assistance																
			Accessibility of call centre/Customer Care	>=95%	Reported	100%	100%	100%	99%	99%	55%	98%	100%	100%	100%	99%	96%
					Verified	100%	100%	100%	99%	99%	55%	98%	100%	100%	100%	99%	96%
			% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	65%	91%	90%	90%	97%	56%	97%	93%	100%	100%	93%	95%
Verified	65%	91%			90%	90%	97%	56%	97%	93%	100%	100%	93%	95%			
9	Termination/closure of service																
			No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100%	100%	100%	100%	100%	100%	NA	100%	NA	NA	100%	100%
Verified	100%	100%			100%	100%	100%	100%	100%	NA	100%	NA	NA	100%	100%		
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	100%	NR	98%	100%	NA	100%	NA	NA	86%	100%		
			Verified	100%	100%	100%	NR	98%	100%	NA	100%	NA	NA	86%	100%		
<p>Critical Analysis (PMR Verification):</p> <ul style="list-style-type: none"> • Worst affected BTSs due to downtime parameter is not meeting benchmark by BSNL. • SDCCH/PAGING congestion parameter is not meeting benchmark by BSNL. • TCH congestion & CDR parameter is not meeting benchmark by BSNL. • Worst affected cells>3% TCH drop parameter is not meeting benchmark by BSNL, Idea & Etisalat. • POI Congestion parameter is not meeting benchmark by Aircel, Etisalat & Videocon. • Metering/billing credibility-Post paid parameter is not meeting benchmark by Aircel & Vodafone; and for PrePaid parameter is not meeting benchmark by BSNL, Vodafone & TTSL. • Accessibility of call centre/Customer Care parameter is not meeting benchmark by RTL Only. • % call answered by operators(voice to voice) within 60 sec. parameter is not meeting benchmark by Aircel & RTL. • Time taken for refunds of deposits after closures parameter is not meeting benchmark by Idea & TTSL. 																	

CHAPTER-4: DETAILED FINDINGS & ANALYSIS

I. Cellular Mobile Telephone Service

(A) MSC Audit

(1) 3 Days Live Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL MP	Docomo	Idea	BSNL CG	V-fone	LOOP	Etisalat	Videocon	RCOM GSM	TTSL	RCOM	
			GSM Operators											CDMA Operators		
A	Network Service Quality Parameter															
1	Connection Establishment (Accessibility)															
	a) CSSR	>=95%		98.52%	96.22%	99.05%	98.99%	94.64%	98.64%	99.87%	99.74%	99.10%	99.28%	99.16%	99.79%	
	b) SDCC/PAGING congestion	<=1%		0.48%	0.88%	0.24%	0.23%	0.17%	0.37%	0.00%	0.11%	0.04%	0.45%	0.00%	0.00%	
	c) TCH congestion	<=2%		0.19%	1.76%	0.41%	0.42%	2.78%	1.35%	0.00%	0.01%	0.17%	1.09%	0.00%	0.32%	
2	Connection maintenance															
	a) CDR	<=2%	ICR with TATA	1.20%	1.22%	0.94%	0.65%	3.11%	1.05%	1.14%	1.73%	0.71%	0.94%	0.57%	0.52%	
	b) Cells having > 3% TCH drop	<=3%		3.92%	4.68%	4.80%	2.73%	25.70%	3.47%	3.03%	3.52%	7.31%	0.15%	0.41%	0.22%	
	c) Good voice quality	>=95%		95.33%	NA	98.09%	98.93%	NA	97.78%	95.53%	97.55%	98.83%	97.96%	NA	NA	
	d) No. of cells > 3% TCH drop			933	537	356	560	1,261	411	1	6	303	12	9	5	
	e) Total no. of cells in the network			23798	11461	7428	20533	4912	11845	33	180	4143	7788	2102	2127	
3	No. of POI having congestion>0.5%		8	0	0	0	0	0	0	0	0	1	0	0	0	
	a) Name of POI not meeting the benchmark		BSNL, Airtel, Loop									BSNL				
	b) Total No. of circuits on POI		14,619	523,915	27,690	34,266	182,644	8,598	35,090	31	1,296	29,588	56,408	24,973	56,408	
	c) Avg No. of call attempts on POI		451,513	7,210,992	448,693	446,063	7,926,427	160,272	1,270,263	492	5,092	340,591	#REF!	280,026	830,946	
	d) Avg traffic served on POI (Erlang)		11,586	108,263	7,294	11,809	105,073	5,383	21,204	13	142	11,048	27,505	8,035	27,505	
	e) Total number of working POI Service Area wise		46	74	16	98	294	6	53	14	30	59	110	188	110	
	f) Equipped Capacity of Network in respect of Traffic in erlang		113,454	307,276	179,998	113,454	14,474	NA	84,547	180	1,332	97,500	137,000	138,785	290,000	
	g) Total traffic handled in TCBH in erlang		54,880	209,154	36,801	54,880	275,822	22,025	50,325	1	2,160	10,784	115,979	21,315	95,700	

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL MP	Docomo	Idea	BSNL CG	V-fone	LOOP	Etisalat	Videocon	RCOM GSM	TTSL	RCOM	
			GSM Operators											CDMA Operators		
(B)	Customer Service Quality Parameters															
4	Response time to customers for assistance															
	a) Accessibility of call centre	>=95%	100%	100%	100%	100%	100%	NA	100%	NA	100%	100%	100%	100%	100%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	85.6%	99.20%	98.00%	100%	97.19%	NA	100%	NA	9943%	100%	20.74%	100%	91.87%	
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		2883443	3050493	141216	251849	34965	NA	NA	NA	15668	6580.7	2367092	251849	739009	
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		2883443	3050493	138644	188765	34702	NA	NA	NA	15496	6253	617679	188765	739009	
NA: Not Applicable, NR: Not Received																

Parameter-wise Findings (Live Data Assessment):

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

- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 96.22% and 99.87%, except for BSNL CG with value 94.64% .
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 0.88%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.00% and 1.76% , except BSNL CG with value 2.78%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.52% and 1.73% except BSNL CG with value 3.11%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$) :** Most of the operators are not meeting the benchmark namely BSNL CG ,BSNL MP,AIRTEL,DOCOMO,VODAFONE, LOOP, ETISALAT, VIDEOCON with the values 25.7%, 4.68%, 3.92%, 4.80%, 3.47%, 3.03%, 3.52%, 7.31% respectively .
- **Connections with good voice quality (benchmark $\geq 95\%$):** All the operators are meeting the benchmark with values lying between 95.33% and 98.93%. BSNL & CDMA operators have submitted that the data is not system generated.
- **POI Congestion (benchmark $\leq 0.5\%$):** Aircel & Videocon have 8 & 1 POI respectively with more than 0.5% congestion. There was no congestion found overall on the POI for other cases, 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.
- **%age of call answered by operator (electronically) (benchmark $>95\%$):** All operators are meeting the benchmark with values lying between 95% to 100%. But BSNL CG and LOOP are not provided the data.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$): %):** All operators are meeting the benchmark with values lying between 91.87% and 99.43% except for Aircel & RCOM GSM (20.74).

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench-mark	Aircel	Airtel	BSNL MP	TATA GSM	Idea	BSNL CG	V-FONE	LOOP	ETISAL AT	VIDEO CON	RCOM GSM	TATA CDMA	RCOM CDMA		
			GSM Operators											CDMA Operators			
(A)	Network Service Quality Parameter																
1	Network Availability		ICR with TATA														
	a) BTS Accumulated Downtime	<=2%		0.59%	1.80%	0.02%	0.67%	1.04%	0.06%	0.07%	0.25%	0.25%	0.08%	0.00%	0.32%		
	b) Worst affected BTSs due to downtime	<=2%		1.96%	1.96%	0.00%	0.70%	2.89%	0.05%	0.00%	0.00%	0.58%	0.31%	0.07%	0.51%		
2	Connection Establishment (Accessibility)																
	a) CSSR (Call Setup Success Rate)	>=95%		98.67%	96.48%	99.10%	98.98%	94.60%	98.29%	99.93%	98.81%	99.10%	99.34%	99.78%	99.86%		
	b) SDCCH/PAGING congestion	<=1%		0.33%	0.81%	0.38%	0.20%	0.17%	0.35%	0.00%	0.31%	0.06%	0.47%	NA	NA		
	c) TCH congestion	<=2%		0.16%	1.74%	0.41%	0.39%	2.78%	1.70%	0.00%	0.20%	0.21%	1.08%	0.00%	0.31%		
3	Connection maintenance (retainability)																
	a) CDR	<=2%		1.27%	1.30%	1.10%	0.71%	3.11%	1.04%	0.59%	1.43%	0.73%	0.95%	0.00%	0.56%		
	b) Worst affected cells>3% TCH drop	<=3%		1.17%	4.59%	5.56%	2.48%	25.67%	2.90%	3.03%	3.33%	7.84%	1.28%	0.33%	0.29%		
	c) Good voice quality	>=95%	95.67%	NA	97.91%	98.86%	NA	97.64%	98.15%	97.26%	98.72%	98.16%	NA	NA			
4	No. of POI having congestion>0.5%		8	0	0	0	0	0	0	0	0	1	0	0	0		
(B)	Customer Service Quality Parameters		BSNL, Airtel, Loop								BSNL						
5	Metering/billing credibility-Post paid	<= 0.1%	0.30%	0.02%	NP	0.37%	0.07%	NP	0.16%	NA	NA	NA	0.09%	0.00%	0.08%		
6	Metering /billing credibility-Pre paid	<= 0.1%	0.15%	0.01%	NP	0.07%	0.01%	NP	0.01%	0.00%	0.10%	0.02%	0.01%	0.05%	0.01%		
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	NP	100%	100%	NP	100%	100%	100%	100%	100%	100%	100%		
	a) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	<1 week	<1 week	NP	<1 week	<1 week	NP	<1 week	0%	<1 week	<1 week	<1 week	<1 week	<1 week		
8	Response time to customers for assistance																
	a) Accessibility of call centre/Customer Care	>=95%	100%	100%	100%	100%	99.25%	NP	NA	NA	100%	95%	100%	75%	100%		
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	81.49%	92.28%	98.00%	90.02%	96.90%	NP	95.62%	NA	98.90%	95.43%	26.09%	79.63%	94.57%		
9	Termination/closure of service	<=7days	89.29%	100%	100%	100%	100%	NP	100%	NA	NA	NA	100%	100%	100%		
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100%	100%	100%	100%	NP	100%	NA	NA	NA	100%	100%	100%		
NA: Not Applicable, NR: Not Received																	

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.8%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.96%, except BSNL-CG with value 2.78%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 96.48% and 99.98%. except BSNL-CG 94.60%
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and .81%.
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% and 1.74% except for BSNL CG 2.78%.
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.00% and 1.43% except for BSNL CG 3.11%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except for BSNL CG ,& VIDEOCON with a value of 25.67% , 7.84%, respectively, rest of the operators are satisfying the benchmark with value in between 0.29% and 4.59%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** BSNL CG has not provided the data. Rest of the GSM operators are meeting the benchmark with values lying between 95.67% and 98.86%. CDMA operators have submitted that the data is not system generated.
- **POI Congestion (benchmark $\leq 0.5\%$):** Aircel & Videocon have 8 & 1 POI respectively with more than 0.5% congestion. There was no congestion found overall on the POI for other cases, 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.
- **%age of call answered by operator (electronically) (benchmark >95):** Except for BSNL CG & LOOP with values not provided. TTSL CDMA values not meeting the benchmark having value 75%. All operators are meeting the benchmark with values lying between 95.00% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for Aircel, Reliance GSM, & TTSL CDMA , with values of 81.49% & 26.09% , & 79.63% respectively. All operators are meeting the benchmark with values lying between 90.02% and 98.90%. the operators BSNL CG & LOOP had not provided the data.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** All operators are meeting the benchmark with values lying between 0.00% & 0.09%. Except AIRCEL & VODAFONE having values 0.3% & 0.16% respectively. The operators BSNL MP had not provided the data &, LOOP, ETISALAT & VIDEOCON had n post paid subscribers.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** Except for Aircel with value 0.15%, all other operators are meeting the benchmark with values lying between 0.00% & 0.07%.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark ≤ 7 days):** All operators have satisfied the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** All operators have satisfied the benchmark. BSNL has not provided the data.

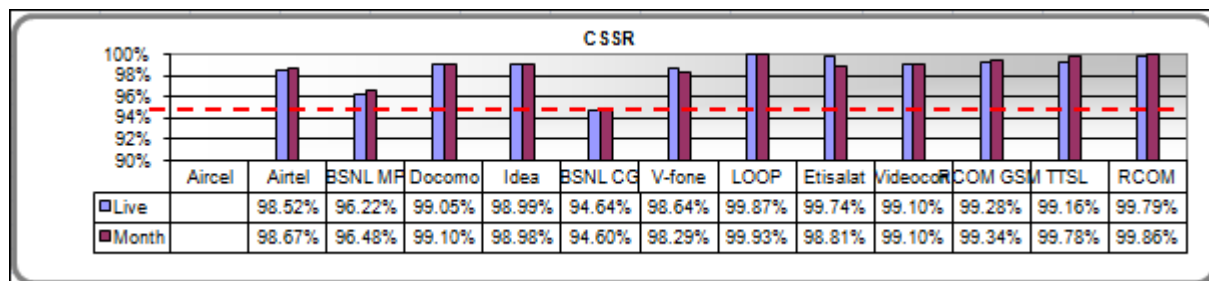
(1) Sample Coverage

Switches/BSC/BTS details of operators:

Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	1	2	128
2	Airtel Ltd	18	139	7841
3	BSNL CG	2	43	2177
4	BSNL MP	9	89	4046
5	Idea	27	51	6961
6	Reliance Communication (GSM)	6	110	2596
7	Tata Communications (GSM)	4	24	2474
8	Etisalat	1	4	60
9	Videocon	0	8	1238
10	Vodafone	4	40	4000
11	Loop telecom	1	1	11
CDMA Operators				
12	Reliance Communication (CDMA)	4	79	2127
13	Tata Communications (CDMA)	4	8	708

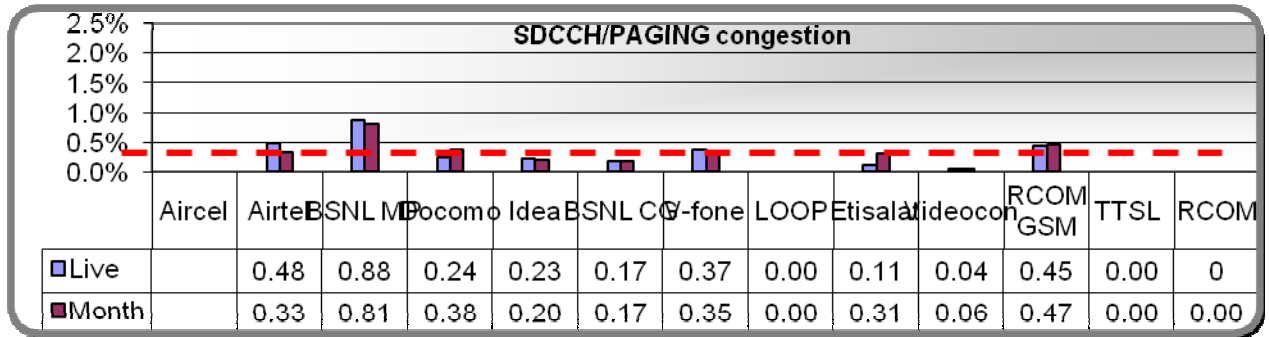
(2) Performance (Graphical Representation)**Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services****A) NETWORK PERFORMANCE**

- I. Call setup success rate:** All operators are meeting the TRAI benchmarks ($\geq 95\%$) with values lying between 96.48 and 99.93% except BSNL CG (94.60%).

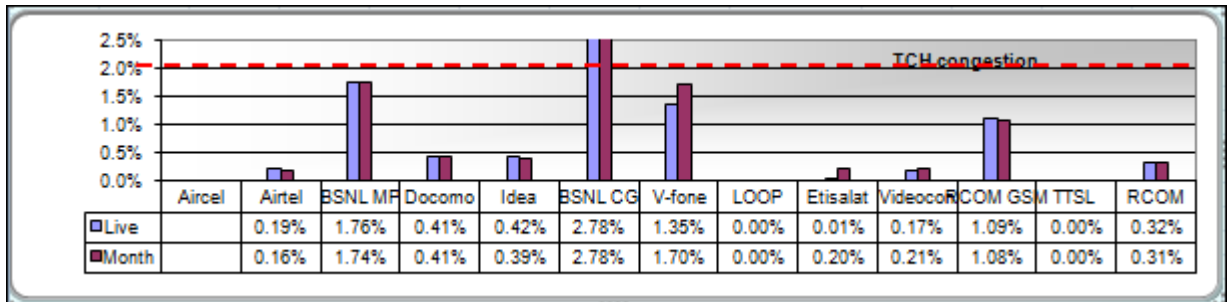


II. Blocked call rate:

SDCCH/PAGING Channel congestion (benchmark <= 1%): All operators are meeting the benchmark with values lying between 0% and 0.81%. Aircel has not provided data.

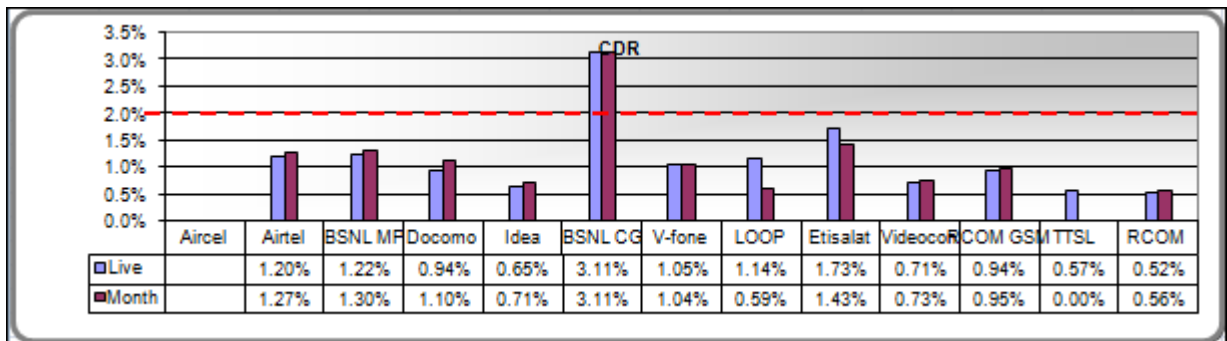


TCH congestion (benchmark <= 2%): All operators are meeting the benchmark with values lying between 0% and 1.74% except BSNL CG

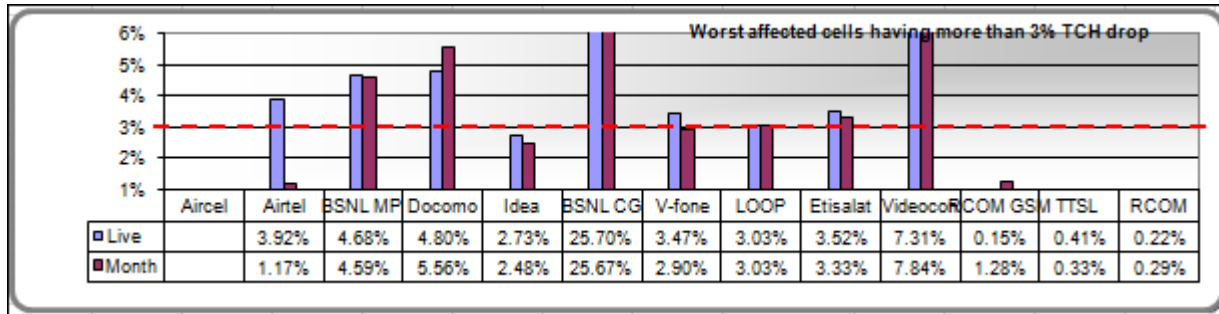


III. Connection Maintainability (Retainability):

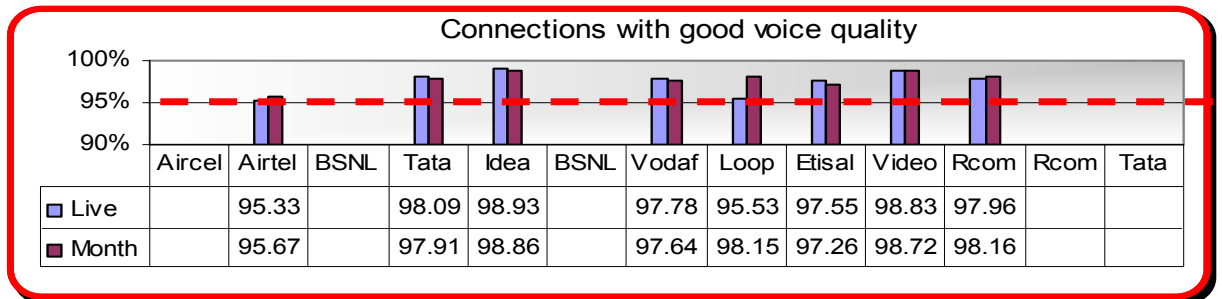
Call drop rate (benchmark <= 2%): All operators are meeting the benchmark with values lying between 0.00% and 1.30% except BSNL CG.



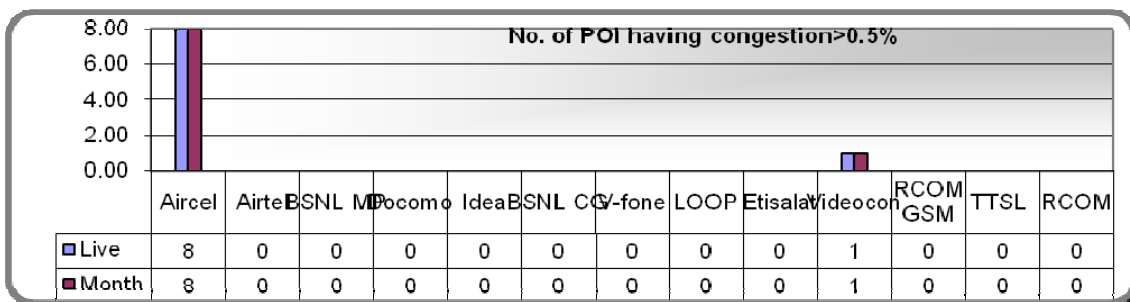
Cell exceeding 3% TCH drop (benchmark $\leq 3\%$): It is found that most of the operators failed to meet the benchmark in both live & month data.



%age of connections with good voice quality (benchmark $\geq 95\%$): It is found that all operators are meeting the benchmark. BSNL & CDMA operators have not provided data, as data is not generated from the system.



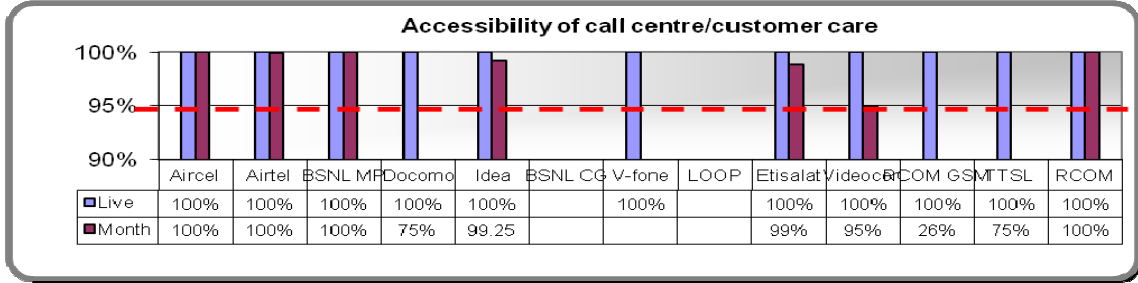
No. of POI having Congestion > 0.5%: Aircel & Videocon were found to have POIs having congestion. Rest of the operators are meeting the benchmark.



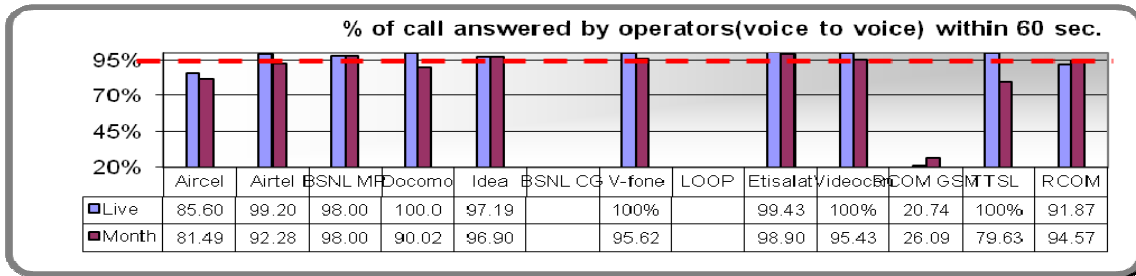
B) CUSTOMER SERVICE QUALITY PARAMETERS

(A) Response time to the customer for assistance:

%age of call answered by operator (electronically) (benchmark >95): BSNL CG & LOOP have not provided data. Except for Tata (GSM & CDMA) & Rcom GSM, all operators are meeting the benchmark with values lying between 95% to 100%.



%age of call answered by operator (Voice to voice) (benchmark >90%): Except for Aircel, Reliance GSM, & TTSL CDMA, all operators are meeting the benchmark. BSNL CG & LOOP had not provided data for live & month.



(3) Critical Analysis

The above comparative study between live data & month data shows similar trends in both the cases. However, inconsistency in live & month data was found for parameters like “POI congestion (BSNL)”, “accessibility of call centre” (BSNL & Tata-GSM) and “%age of calls answered by operator” (Reliance GSM).

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

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

(2) Performance (live calling for billing complaints)

Calling Operator	Aircel	Airtel	BSNL	Idea	Reliance (GSM)	Tata GSM	Etisalat	Videocon	Vodafone	Tata (CDMA)	LOOP	Reliance (CDMA)
Total No. of calls	4	5	-	4	8	11	5	7	6	5	2	8
Cases resolved with 4 weeks	4	5	-	4	8	11	5	7	6	5	2	8
%age of cases resolved	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Live calling to Call center:

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

	OPERATORS NAME										
	Aircel	Airtel	BSNL	Idea	Etisalat	Loop	Rcom	Tata	Videocon	Rcom	Tata
	GSM									CDMA	
	1ST HALF (10AM to 01 PM)	45	47	47	47	47	45	30	32	44	41
2ND HALF (04PM to 07 PM)	40	39	42	40	41	46	12	33	40	38	38
In % age	85.00	86.00	89.00	87.00	88.00	91.00	42.00	65.00	84.00	79.00	68.00

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

(5) Critical Analysis

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

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

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

(2) Performance based on live measurement

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

(3) Critical Analysis

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

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

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

Drive Test Locations***BHOPAL***

LOW DENSE: Airport area, Hoshanga rd, Rohit nagar, Ayodhya by pass, Badpada rd,
 MEDIUM DENSE: MPNAGAR, Vip rd, Centre point, New market, Gulmohar, kothal
 sultanabad,
 HIGH DENSE: OLD BHOPAL ,RAILWAY STATION , Mangalwada, Budhawada,
 Shahajahanabad, peer gate

INDORE

LOW DENSE: Silver spring , Mangliya , Nuraninagar ,
 MEDIUM DENSE: Vijaynagar , Tilaknagar , Sukhalia ,
 HIGH DENSE: Palashia,Rajwada,Railwaystation , Saketnagar ,

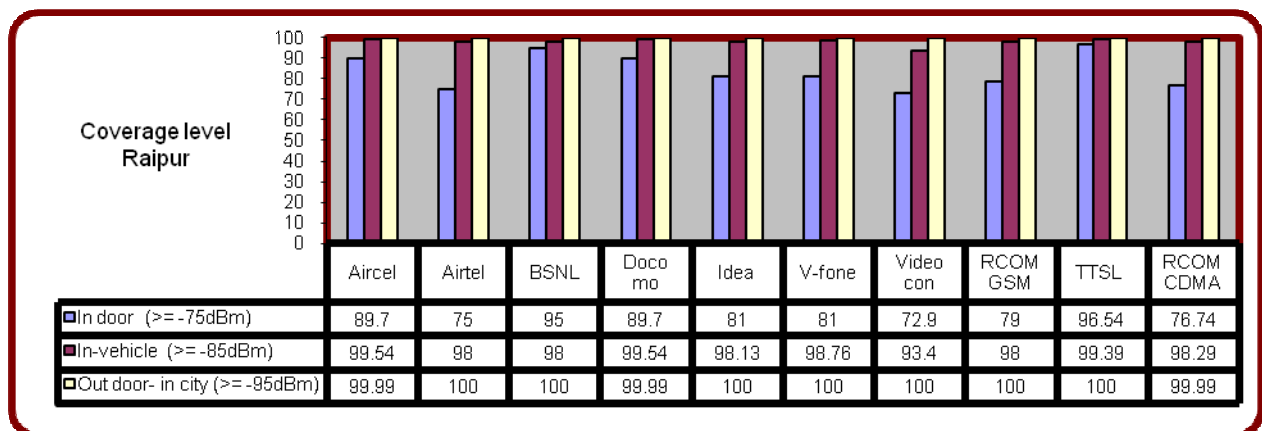
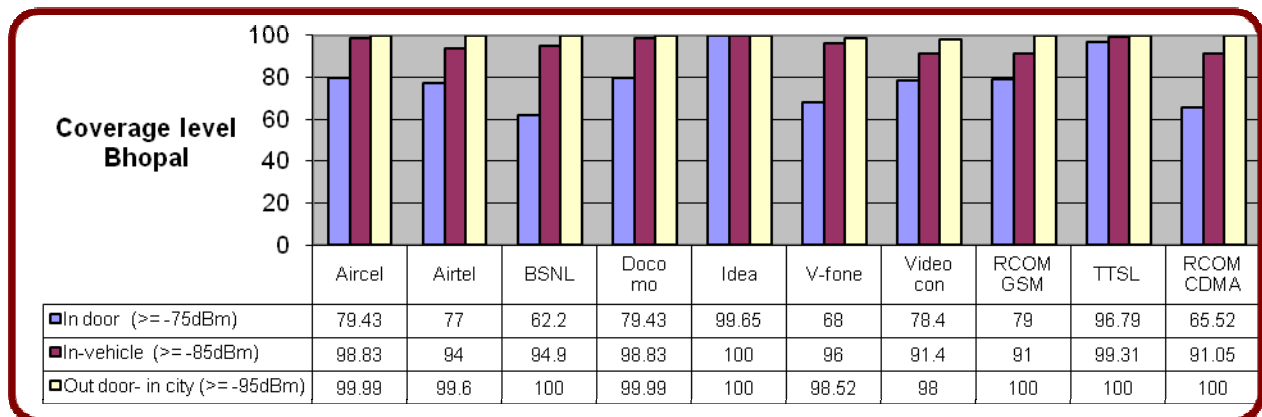
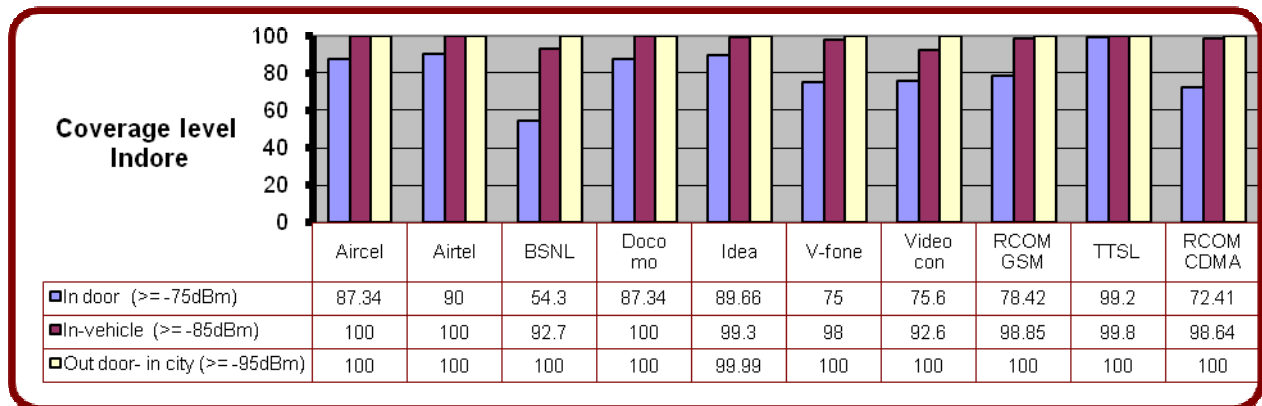
RAIPUR

LOW DENSE: Gayatrinagar , Khamardih , Saddu , Tatibandh , Telibandha,
 MEDIUM DENSE: Newpur , Santoshinagar , Rajendernagar, Amlibih ,
 HIGH DENSE: Phapati , Ramsagarpara , Civilline , Gudiyari,

Operator assistant Drive test for MP & CG Circle

S.No.	Drive test Operator assistant for City- 1	City Name	Aircel	Airtel	BSNL	Docomo	Idea	V-fone	Videocon	RCOM GSM	TTSL (CDMA)	RCOM CDMA
1.1	Call Attempts	Indore	129	186	164	129	120	173	211	165	102	166
		Bhopal	110	147	134	110	105	119	83	124	119	126
		Raipur	232	162	112	232	128	181	159	220	68	155
1.2	Blocked Call Rate (<=3%)	Indore	0%	1.07%	2.43%	0%	0.0002	3%	0%	1.22%	0%	1.21%
		Bhopal	0%	0.68%	0.75%	0%	0.95%	4.20%	0%	0.80%	0%	1.58%
		Raipur	0%	2.46%	1.78%	0%	0.78%	0.55%	0.62%	1.80%	0%	0%
1.3	Dropped Call Rate (<=2%)	Indore	0%	0.53%	1.21%	0%	0.00%	0%	0%	0%	0.98%	1.22%
		Bhopal	0%	2.04%	0.75%	0%	0.00%	1.68%	3.61%	0.81%	0%	1.61%
		Raipur	0%	0%	1.78%	0%	0.79%	0%	0.62%	0.50%	0%	0%
1.4	Percentage of connections with good voice quality (=>95%) (i) 0-4 (w/o frequency hopping)	Indore									97.49%	97.44%
		Bhopal									97.86%	94.60%
		Raipur									97.68%	98.62%
	(ii) 0-5 (with frequency hopping)	Indore	95.10%	95.60%	88.60%	95.10%	91%	88%	96.01%	96%		
		Bhopal	95.39%	95.10%	84.40%	95.39%	93.47%	89%	95%	97%		
		Raipur	95.10%	95.60%	96.70%	95.10%	79.85%	92.58%	97.08%	93%		
1.5	Service Coverage In door (>= -75dBm)	Indore	87.34	90	54.3	87.34	89.66	75	75.6	78.42	99.2	72.41
		Bhopal	79.43	77	62.2	79.43	99.65	68	78.4	79	96.79	65.52
		Raipur	89.7	75	95	89.7	81	81	72.9	79	96.54	76.74
	In-vehicle (>= -85dBm)	Indore	100	100	92.7	100	99.3	98	92.6	98.85	99.8	98.64
		Bhopal	98.83	94	94.9	98.83	100	96	91.4	91	99.31	91.05
		Raipur	99.54	98	98	99.54	98.13	98.76	93.4	98	99.39	98.29
	Out door- in city (>= -95dBm)	Indore	100	100	100	100	99.99	100	100	100	100	100
		Bhopal	99.99	99.6	100	99.99	100	98.52	98	100	100	100
		Raipur	99.99	100	100	99.99	100	100	100	100	100	99.99
1.6	Call Setup Success Rate (>=95%)	Indore	100	95.16	95.73	100	97.5	0.9538	100	98.78	100	98.79
		Bhopal	100	97.53	99.3	100	99.05	0.958	95.18	99.2	100	98.42
		Raipur	100	95.91	98.21	100	98.43	0.989	98	96	100	100

Graphical Representation



(3) Critical Analysis

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

- Blocked Call Rate benchmark is not met by Vodafone in Bhopal.
- Drop call Rate benchmark is not met by Airtel & Videocon.
- Good voice quality parameter is not met by BSNL for Indore & Bhopal, Idea & Vodafone in all 3 cities, Rcom GSM in Raipur & Rcom CDMA in Bhopal.

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

The Independent Drive Test was conducted at MP & CG 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.

Drive Test Locations**BHOPAL**

HIGH DENSE: OLO BHOPAL, Railway Station, Mangalwara, Shahajanabad,,Peergate.
 MEDIUM DENSE: Mpnagar, VIPRoad, Center point, New market, Gulmohar.
 LOW DENSE: AIRPORT Area, Hoshangabad Road, Rohitnagar Ayodhya bypass.

INDORE

HIGH DENSE: Palashiya, Rajwada Saketnagar, Railway Station
 MEDIUM DENSE: Vijaynagar, Tilaknagar Sukhalia.
 LOW DENSE: silver Spring, Mangliya Nuraninagar.

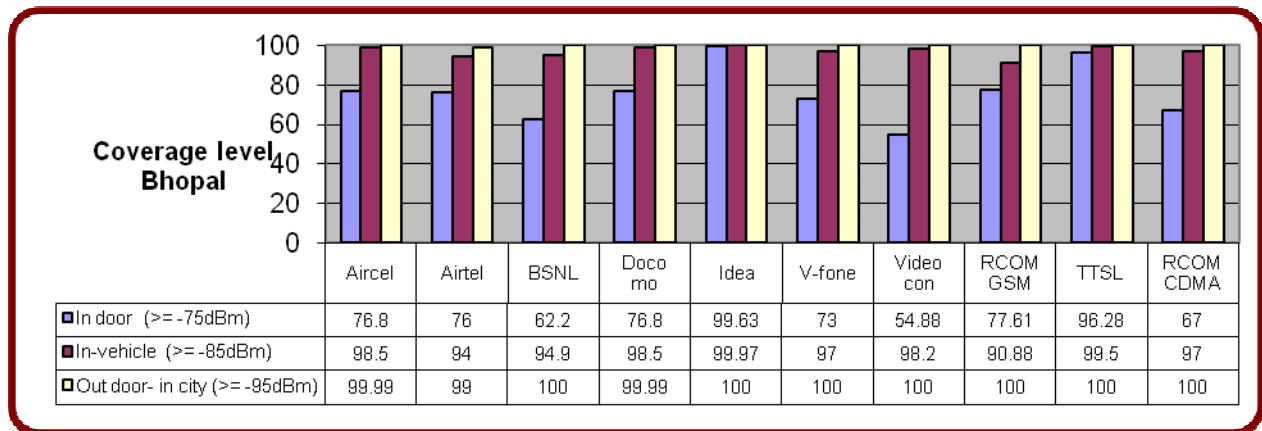
RAIPUR

HIGH DENSE: Fafati, Ramsagarpara, Civil line, Gudiyari
 MEDIUM DENSE: Newpur, Santoshinagar,Rajendranagar, Amlibih .Shankarnagar.
 LOW DENSE: Gayatrinagar,,Khamardiha,Saddu,Tatibandha,Telibanda.

Independent Drive Test for MP CG Circle

S.NO.	Drive test Operator assistant for City- 1	City Name	Aircel	Airtel	BSNL	Docomo	Idea	V-fone	Videocon	RCOM GSM	TTSL (CDMA)	RCOM CDMA
1.1	Call Attempts	Bhopal	111	151	134	111	102	122	199	130	121	130
1.2	Blocked Call Rate (<=3%)	Bhopal	0%	0.70%	0.75%	0%	0.98%	7.37%	0%	1.54%	0%	0.77%
1.3	Dropped Call Rate (<=2%)	Bhopal	0%	1.32%	0.75%	0%	0%	1.64%	0.50%	0%	0.82%	0.78%
1.4	Percentage of connections with good voice quality (=>95%)											
	(i) 0-4 (w/o frequency hopping)	Bhopal									97.92%	96%
	(ii) 0-5 (with frequency hopping)	Bhopal	95.69%	95.70%	84.40%	95.69%	99.02%	89%	98.71%	96.70%		
1.5	Service Coverage											
	In door (>= -75dBm)	Bhopal	76.8	76	62.2	76.8	99.63	73	54.88	77.61	96.28	67
	In-vehicle (>= -85dBm)	Bhopal	98.5	94	94.9	98.5	99.97	97	98.2	90.88	99.5	97
	Out door- in city (>= -95dBm)	Bhopal	99.99	99	100	99.99	100	100	100	100	100	100
1.6	Call Setup Success Rate (>=95%)	Bhopal	100%	95.85%	99.30%	100%	99.02%	97.05%	99%	98.46%	99.17%	99.23%

Graphical Representation



(3) Critical Analysis

- Good Voice Quality parameter is not met by BSNL & Vodafone.
- Blocked Call Rate is not met by Vodafone.

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

From live, month, PMR and Drive Tests findings, it can be concluded that on an average, performance of the operators in the service area (MP) is by and large satisfactory for **Network Parameters**. However, the benchmark of $\leq 3\%$ for “worst affected cells $> 3\%$ TCH drop” is not met by BSNL MP (4.68% & 4.59% for month & live data respectively), Tata Docomo (4.80% & 5.56% for month & live data respectively), BSNL CG (25.70% & 25.67% for month & live data respectively), Loop(3.03% & 3.03% for month & live data respectively), Etisalat(3.52% & 3.33% for month & live data respectively) Videocon(7.31% & 7.84% for month & live data respectively), Vodafone(3.47% for Live data) & Airtel(3.92% for Live data).

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

Regarding **Metering/Billing Credibility** issues, Airtel, and Tata CDMA shows below benchmark value for Pre-paid connections.

During **Drive Tests**, Blocked Call Rate benchmark is not met by Vodafone in Bhopal. Drop call Rate benchmark is not met by Airtel & Videocon. Good voice quality parameter is not met by BSNL for Indore & Bhopal, Idea & Vodafone in all 3 cities, Rcom GSM in Raipur & Rcom CDMA in Bhopal.

III. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

IV. Broadband Service Providers

.....Audit not done for this quarter