

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

Report Period: January 2012 –March 2012

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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 Madhya Pradesh - Chhattisgarh 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.

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 - Chhattisgarh Circle in 1st quarter (January-March 2012). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period July-September 2011.

Following are the various operators covered in Madhya Pradesh - Chhattisgarh 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	Feb-2012	1900-2000
2	Airtel Ltd	Feb-2012	2000-2100
3	BSNL	Feb-2012	1800-1900
4	Etisalat	Service Closed	
5	Idea	Feb-2012	1900-2000
6	Loop	Feb-2012	1900-2000
7	Reliance Communications	Feb-2012	1900-2000
8	Tata Communications	Feb-2012	1900-2000
9	Videocon	Feb-2012	2000-2100
10	Vodafone	Feb-2012	2000-2100
CDMA Operators			
11	Reliance Communications	Feb-2012	1900-2000
12	Tata Communications	Feb-2012	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	Docomo	Idea	BSNL CG	Voda fone	Loop	Video con	RCOM GSM	TISL	RCOM CDMA
S/N	Name of Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	0.82%	0.04%	1.67%	0.03%	0.51%	0.57%	0.02%	0.51%	0.01%	0.02%	0.01%	0.05%
	b) Worst affected BT Ss due to downtime	<=2%	0.78%	0.00%	0.44%	0.04%	0.05%	0.35%	0.00%	0.00%	0.14%	0.32%	0.00%	0.56%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	99.56%	98.86%	96.35%	96.36%	99.07%	94.70%	98.70%	98.18%	99.23%	98.82%	99.30%	99.34%
	b) SDCCH/PAGING congestion	<=1%	0.16%	0.24%	0.80%	0.16%	0.06%	0.25%	0.38%	0.00%	0.06%	0.02%	0.00%	0.00%
	c) TCH congestion	<=2%	0.06%	0.17%	1.81%	0.13%	0.18%	0.25%	0.88%	0.00%	0.06%	0.45%	0.01%	0.13%
3	Connection maintenance (retainability)													
	a) CDR	<=2%	0.54%	1.18%	1.30%	0.94%	0.59%	1.91%	0.92%	1.85%	1.06%	0.62%	0.67%	0.65%
	b) Worst affected cells>3% TCH drop	<=3%	1.99%	3.76%	2.15%	3.93%	2.26%	19.08%	2.00%	9.09%	1.67%	1.36%	0.54%	0.54%
	c) Good voice quality	>=95%	99.04%	96.04%	NA	97.80%	99.11%	NA	97.80%	97.85%	98.40%	97.90%	NA	98.66%
4	No of POI having congestion	<=0.5 %	0	0	0	0	0	0	0	0	0	0	0	0
5	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	100%	NP	98.51%	NP	98.98%	98.70%	100%	NP	100%	98.90%	NP	98.90%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	NP	NP	97.92%	96.14%	95.47%	97.92%	99.99%	NP	95.42%	97.18%	96.17%	98.12%

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that most of the operators are meeting the network parameters. Exceptions are found in case of Airtel, Docomo, BSNL-CG & Loop Telecom for not meeting "worst affected cells >3% TCH drop" and again in case of BSNL-CG for having a slightly lower CSSR. BSNL & Tata CDMA have declared the the KPI "%age of connections with Good Voice Quality" is not system generated.

Customer care data is found to be satisfactory for all the operators.

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL MP	Docomo	Idea	BSNL CG	Voda fone	Loop	Video con	RCOM GSM	TISL	RCOM CDMA
S/N	Name of Parameter		GSM O perators										CDMA O perators	
(A)	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	0.84%	0.06%	1.91%	0.02%	0.53%	0.37%	0.02%	0.20%	0.17%	0.25%	0.01%	0.45%
	b) Worst affected BT Ss due to downtime	<=2%	1.56%	0.06%	1.99%	0.04%	0.27%	1.90%	0.02%	0.00%	0.43%	0.84%	0.00%	1.47%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	99.57%	98.82%	96.37%	99.18%	99.08%	94.70%	98.06%	98.02%	99.16%	98.80%	99.30%	99.20%
	b) SDCCH/PAGING congestion	<=1%	0.09%	0.32%	0.81%	0.17%	0.09%	1.67%	0.32%	0.00%	0.07%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	0.04%	0.14%	1.69%	0.25%	0.20%	1.67%	1.26%	0.00%	0.12%	0.38%	0.00%	0.15%
3	Connection maintenance (retainability)													
	a) CDR	<=2%	0.53%	1.21%	1.30%	0.94%	0.59%	1.91%	0.88%	0.79%	1.10%	0.63%	0.67%	0.55%
	b) Worst affected cells>3% TCH drop	<=3%	1.59%	1.49%	2.11%	4.22%	2.25%	19.08%	1.93%	3.03%	1.60%	1.13%	0.81%	0.63%
	c) Good voice quality	>=95%	99.08%	96.02%	NA	97.90%	99.12%	NA	97.79%	99.20%	98.36%	97.89%	NA	98.63%
4	No of POI having congestion	>=0.5	0	0	0	0	0	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters													
5	Metering/billing credibility-Post paid	<=	0.16%	0.01%	0.03%	0.39%	0.04%	NP	0.17%	NA	NA	0.10%	0.39%	0.10%
6	Metering /billing credibility-Pre paid	<=	0.00%	0.00%	0.01%	0.33%	0.00%	NP	0.05%	0.00%	0.01%	0.06%	0.33%	0.07%
7	Resolution of billing/ charging complaints	100% within	100%	100%	100%	100%	100%	NP	100%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	100%	100%	100%	100%	100%	NP	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	100%	NP	99.55%	96.36%	96.69%	99.60%	100%	NP	96.28%	98.90%	96.36%	99.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	NP	NP	99.48%	96.36%	96.69%	99.48%	100%	NP	96.28%	98.95%	96.36%	98.95%
9	Termination/closure of service	<=7da	100%	NP	91.00%	100%	100%	NP	100%	NA	NA	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within	100%	NP	100%	100%	100%	NP	100%	NA	NA	100%	100%	100%

NA: Not Applicable, NP: Data Not Provided

From the month data assessment, it is found that most of the operators are meeting the network parameters. Exceptions are found in case of Docomo, BSNL-CG & Loop Telecom for not meeting "worst affected cells >3% TCH drop" and again in case of BSNL-CG for having a slightly lower CSSR. BSNL & Tata CDMA have declared the KPI "%age of connections with Good Voice Quality" is not system generated.

The Metering/billing credibility of Aircel (post-paid), Docomo (both pre & post-paid), Vodafone (post-paid) and TISL ((both pre & post-paid)) is found to be lower than the benchmark credibility.

Operator-Assisted Drive Test

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

Sl	Drive test Operator assistant	City	Aircel	Airtel	BSNL	Doco mo	Idea	Voda fone	Video con	RCO M	TTSL CDMA	RCO M	
1	Blocked Call Rate (<=3%)	Sagar	0.00%	1.00%	4.00%	0.00%	0.00%	1.00%	1.00%	0.00%	0.00%	0.00%	
		Chindwara	1.00%	1.00%	3.10%	1.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	
		Durg	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1	Dropped Call Rate (<=2%)	Sagar	0.00%	0.00%	3.00%	0.00%	0.00%	1.00%	0.00%	0.87%	0.00%	0.86%	
		Chindwara	0.00%	1.00%	1.58%	0.00%	0.00%	0.80%	0.00%	0.00%	0.00%	0.00%	
		Durg	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
1	Percentage of connections with good voice quality (=>95%)												
		(i) 0-4 (w/o frequency hopping)	Sagar									98.86%	98.70%
		Chindwara										99.28%	98.33%
		Durg										98.91%	95.45%
		(ii) 0-5 (with frequency hopping)	Sagar	95.34%	95.19%	88.90%	95.34%	96.64%	94.20%	98.27%	98.64%		
		Chindwara	95.18%	95.08%	90.93%	95.18%	96.34%	88.00%	99.32%	98.38%			
	Durg	95.11%	95.56%	98.60%	95.11%	95.26%	96.00%	98.84%	94.35%				
1	Call Setup Success Rate (>=95%)	Sagar	100%	99.00%	96.10%	100%	100%	99.26%	99.35%	100%	100%	100%	
		Chindwara	98.96%	99.00%	95.50%	98.96%	100%	99.19%	100%	100%	100%	100%	
		Durg	100%	100%	98.60%	100%	100%	98.64%	98.78%	100%	100%	100%	

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

- 'Blocked Call Rate' benchmark is not met by BSNL in Sagar & Chindwara.
- 'Dropped Call Rate' benchmark is not met by BSNL in Sagar.
- Below benchmark performance for the parameter '%age of connections with good voice quality', is found in case of BSNL & Vodafone in Sagar & Chindwara and in case of Rcom GSM in Durg.

Independent Drive Test**Independent Drive Test**

The Independent Drive Tests were conducted in MP-CG circle in the cities and for the operators given by TRAI. Route covered was about 41-110 Km. The speed limit of 30-35Km/hr was maintained throughout the Drive Test. Zones were selected for covering different density areas (High, Medium & Low dense areas).

SI	Independent Drive Test	RATLAM				AMBIKAPUR			RAIGARH	SATNA	KHARGON	MORENA
		Docomo	RCOM GSM	TTSL CDMA	RCOM CDMA	Airtel	Airtel	TTSL CDMA	Video con	Voda fone	Airtel	Aircel
1.1	Blocked Call Rate (<=3%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.00%	5.00%
1.2	Dropped Call Rate (<=2%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	0.00%	1.00%
1.3	Percentage of connections with good voice quality (=>95%)											
	(i) 0-4 (w/o frequency hopping)			99.62%	98.78%			99.10%				
	(ii) 0-5 (with frequency hopping)	95.57%	98.92%			97.20%	96.08%		95.04%	93.24%	97.98%	99.31%
1.4	Call Setup Success Rate (>=95%)	100%	100%	100%	100%	100%	100%	100%	100%	98.00%	98.00%	95.00%

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

- 'Blocked Call Rate' benchmark is not met by Aircel in Morena.
- Below benchmark performance for the parameter '%age of connections with good voice quality', is found in case of Vodafone in Satna.

CHAPTER-3: AUDIT-PMR VERIFICATION

I. Cellular Mobile Telephone Service

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL MP	Idea	RTL	TTSL- GSM	Uninor	Videoco n	Vodafon e	LOOP Teleco m	Sistema	RCOM -CDM A	TTSL- CDM A
S/ N	Name of Parameter			GSM Operators										CDMA Operators		
(A)	Network Service Quality Parameter															
1	Network Availability															
	BTS Accumulated Downtime	<=2%	Reported	0.07%	0.21%	1.01%	0.69%	0.06%	0.02%	0.14%	0.24%	0.16%	0.04%	0.28%	0.13%	0.02%
			Verified	0.07%	0.21%	1.01%	0.69%	0.06%	0.02%	0.14%	0.24%	0.16%	0.04%	0.28%	0.13%	0.02%
	Worst affected BTSs due to downtime	<=2%	Reported	0%	0.92%	2.50%	0.95%	0.18%	0%	0%	0.79%	0.02%	0.01%	0%	0.44%	0%
Verified			0%	0.92%	2.50%	0.95%	0.18%	0%	0%	0.79%	0.02%	0.01%	0%	0.44%	0%	
2	Connection Establishment (Accessibility)															
	CSSR (Call Setup Success Rate)	>=95%	Reported	99.64%	98.95%	96.19%	98.81%	99.70%	97.53%	99.36%	99.20%	97.95%	99.63%	98.75%	99.57%	99.58%
			Verified	99.64%	98.95%	96.19%	98.81%	99.70%	97.53%	99.36%	99.20%	97.95%	99.63%	98.75%	99.57%	99.58%
	SDCCH/PAGING congestion	<=1%	Reported	0.02%	0.11%	0.82%	0.13%	0.15%	0.33%	0.14%	0.09%	0.17%	0%	0%	0.17%	0%
			Verified	0.02%	0.11%	0.82%	0.13%	0.15%	0.33%	0.14%	0.09%	0.17%	0%	0%	0.17%	0%
	TCH congestion	<=2%	Reported	0.27%	0.10%	1.73%	0.25%	0.06%	0.43%	0%	0.10%	1.47%	0.01%	0%	0.25%	0.01%
Verified			0.27%	0.10%	1.73%	0.25%	0.06%	0.43%	0%	0.10%	1.47%	0.01%	0%	0.25%	0.01%	
3	Connection maintenance (retainability)															
	CDR	<=2%	Reported	0.61%	1.65%	1.63%	0.81%	0.25%	1.17%	0%	0.76%	1.12%	0.58%	0.41%	0.44%	0.67%
			Verified	0.61%	1.65%	1.63%	0.81%	0.25%	1.17%	0%	0.76%	1.12%	0.58%	0.41%	0.44%	0.67%
	Worst affected cells>3% TCH drop	<=3%	Reported	2.34%	2.61%	4.72%	2.56%	0.38%	2.42%	1.37%	0.74%	2.85%	0%	2.06%	0.88%	0.51%
			Verified	2.34%	2.61%	4.72%	2.56%	0.38%	2.42%	1.37%	0.74%	2.85%	0%	2.06%	0.88%	0.51%
	Good voice quality	>=95%	Reported	98.88%	95.25%	97.67%	98.67%	99.05%	97.73%	98.72%	98.52%	97.55%	98.78%	99.18%	98.93%	99.18%
Verified			98.88%	95.25%	97.67%	98.67%	99.05%	97.73%	98.72%	98.52%	97.55%	98.78%	99.18%	98.93%	99.18%	

4	POI congestion	<=0.5%	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	0
(B)	Customer Service Quality Parameters																
5	Metering/billing credibility- Post paid	<= 0.1%	Reported	0.02%	0.02%	0%	0.06 %	0.10 %	0.05%	0%	0%	0.20%	0%	0%	0.09%	0.01%	
			Verified	0.02%	0.02%	0%	0.06 %	0.10 %	0.05%	0%	0%	0.20%	0%	0%	0.09%	0.01%	
6	Metering /billing credibility- Pre paid	<= 0.1%	Reported	0.05%	0.03%	0.05%	0.01 %	0.02 %	0%	0%	0.05%	0.04%	0%	0%	0.04%	0.02%	
			Verified	0.05%	0.03%	0.05%	0.01 %	0.02 %	0%	0%	0.05%	0.04%	0%	0%	0.04%	0.02%	
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100%	100%	0%	100%	100%	0%	0%	100%	100%	
			Verified	100%	100%	100%	100%	100%	100%	100%	0%	100%	100%	0%	0%	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%	0%	100%	100%	0%	0%	100%	100%	
			Verified	100%	100%	100%	100%	100%	100%	100%	0%	100%	100%	0%	0%	100%	100%
8	Response time to customers for assistance	>=95%	Reported	100%	99%	100%	98.70 %	98.90 %	99%	100%	96.81%	100%	100%	99.52 %	98.90 %	99%	
			Verified	100%	99%	100%	98.70 %	98.90 %	99%	100%	96.81%	100%	100%	99.52 %	98.90 %	99%	
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	85.41 %	96%	92%	93.08 %	60%	98%	99.57 %	97.09%	81.78%	100%	90%	93.23 %	96%	
			Verified	85.41 %	96%	92%	93.08 %	60%	98%	99.57 %	97.09%	81.78%	100%	90%	93.23 %	96%	
9	Termination/closure of service	<=7days	Reported	100%	100%	100%	100%	100%	100%	0%	0%	100%	0%	0%	100%	100%	
			Verified	100%	100%	100%	100%	100%	100%	100%	0%	0%	100%	0%	0%	100%	100%
			Reported	100%	99%	100%	100%	100%	76%	0%	0%	100%	0%	0%	100%	100%	
10	Time taken for refunds of deposits after closures.	100% within 60 days	Verified	100%	99%	100%	100%	100%	76%	0%	0%	100%	0%	0%	100%	100%	

Critical Analysis (PMR Verification):

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

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	Voda fone	Loop	Video con	RCOM GSM	TISL	RCOM CDMA
			GSM Operators											CDMA Operators
A	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	0.82%	0.04%	1.67%	0.03%	0.51%	0.57%	0.02%	0.51%	0.01%	0.02%	0.01%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	0.78%	0.00%	0.44%	0.04%	0.05%	0.35%	0.00%	0.00%	0.14%	0.32%	0.00%	0.56%
	c) Total no. of BTSs in the licensed service area		128	8083	4069	2704	7540	2316	4634	11	1408	4038	713	1976
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		76	228	4895	58	2784	948	74	4	12	58	4	71
	e) No. of BTSs having accumulated downtime of >24 hours in a month		1	0	18	1	4	8	0	0	2	13	0	11
2	Connection Establishment (Accessibility)													
	a) CSSR	>=95%	99.56%	98.86%	96.35%	96.36%	99.07%	94.70%	98.70%	98.18%	99.23%	98.82%	99.30%	99.34%
	b) SDCCH/PAGING congestion	<=1%	0.16%	0.24%	0.80%	0.16%	0.06%	0.25%	0.38%	0.00%	0.06%	0.02%	0.00%	0.00%
	c) TCH congestion	<=2%	0.06%	0.17%	1.81%	0.13%	0.18%	0.25%	0.88%	0.00%	0.06%	0.45%	0.01%	0.13%
3	Connection maintenance													
	a) CDR	<=2%	0.54%	1.18%	1.30%	0.94%	0.59%	1.91%	0.92%	1.85%	1.06%	0.62%	0.67%	0.65%
	b) Cells having > 3% TCH drop	<=3%	1.99%	3.76%	2.15%	3.93%	2.26%	19.08%	2.00%	9.09%	1.67%	1.36%	0.54%	0.54%
	c) Good voice quality	>=95%	99.04%	96.04%	NA	97.80%	99.11%	NA	97.80%	97.85%	98.40%	97.90%	NA	98.66%
	d) No. of cells > 3% TCH drop		8	927	261	316	519	1,200	259	3	69	164	11	32
	e) Total no. of cells in the network		384	24,694	12,136	8,041	22,980	6,290	12,939	33	4,151	12,114	2,107	5,928
4	No of POI having congestion	>=0.5%	0	0	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	b) Total No. of call attempts on POI (Avg.)		11,757	45,825	37,914	10,947	29,735	29,520	37,183	130	6,066	34,762	1,577	392,469
	c) Total traffic served on POI (Erlang) (Avg.)		186	1,579	851	212	440	887	62,740	134	133	30,678	44	15,927
	d) Total No. of circuits on POI		7,516	199,526	10,667	31,626	200,042	9,404	53,808	252	8,653	1,280,354	26,049	1,071,202
	e) Total number of working POI Service Area wise		20	78	11	32	292	8	56	14	34	60	187	53
	f) Equipped Capacity of Network in respect of Traffic in erlang		2,126	318,011	204,000	129,023	323,236	58,635	99,148	NP	58,100	221,000	143,869	176,000
	g) Total traffic handled in TCBH in erlang		500	191,555	46,380	61,165	302,607	28,320	65,770	28	19,211	152,975	39,732	119,182
(B)	Customer Service Quality Parameters													
5	Response time to customers for assistance													
	a) Accessibility of call centre	>=95%	100%	NP	98.51%	NP	98.98%	98.70%	100%	NP	100%	98.90%	NP	98.90%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	NP	NP	97.92%	96.14%	95.47%	97.92%	99.99%	NP	95.42%	97.18%	96.17%	98.12%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		NP	NP	4,185	709,853	1,905,842	4,185	4,265,874	NP	99,856	5,298,614	715,896	1,485,236
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		NP	NP	4,098	682,451	1,819,563	4,098	4,265,348	NP	95,286	5,148,931	688,452	1,457,263
NA: Not Applicable, NP: Data Not Provided														

Parameter-wise Findings (Live Data Assessment):

The parameter wise key takeout's for the Cellular Mobile Telephone Services providers in Mumbai Service Area are as given below:-

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values in between 0.01% and 1.67%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values in between 0.00% and 0.78%.
- **Call setup success rate (benchmark $\geq 95\%$):** Except for BSNL CG, all operators are meeting the benchmark with values in between 96.35% and 99.56%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values in between 0% and 0.80%.

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 in between 0.00% and 1.81%.
- **Call drop rate (benchmark $\leq 2\%$):** All the operators are meeting the benchmark with values in between 0.54% and 1.91%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** Except for Aircel, Docomo, BSNL CG & Loop, all the operators are satisfying the benchmark with value in between 0.05% and 2.26%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** CDMA service providers BSNL & TTSL have declared that the parameter is not system generated. GSM operators are meeting the benchmark with values in between 96.04% and 99.11%.
- **POI Congestion (benchmark $\leq 0.5\%$):** There is no POI congestion found in the network of any operator.
- **%age of call answered by operator (electronically) (benchmark $>95\%$):** All the operators are meeting the benchmark with values in between 98.51% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** All the operators are meeting the benchmark.

	b) Total No. of call attempts on POI (Avg.)		13,586	43,756	NP	10,791	28,643	30,034	34,148	961	6,026	34,195	1,687	214,747
	c) Total traffic served on POI (Erlang) (Avg.)		220	1,540	NP	214	437	902	62,748	980	135	29,990	45	8,883
	d) Total No. of circuits on POI		7,516	199,526	10,667	31,626	200,042	9,404	53,808	252	8,653	1,280,354	26,049	1,071,202
	e) Total number of working POI Service Area wise		20	78	11	32	292	8	56	14	34	60	187	53
5	Network Data													
	a) Equipped Capacity of Network Erlang		2,126	318,011	204,000	129,023	323,236	58,635	99,148	NP	58,100	221,000	143,869	176,000
	b) Total traffic in TCBH in erlang (Avg.)		500	191,555	46,380	61,165	302,607	28,320	65,770	28	19,211	152,975	39,732	119,182
	c) Total no. of customers served (as per VLR) on last day of the month		489,546	8,713,941	1,809,057	2,937,200	13,515,583	772,528	2,956,499	NP	536,737	6,252,173	428,891	2,588,788
(B)	Customer Service Quality Parameters													
6	Metering/billing credibility-Post paid	<= 0.1%	0.16%	0.01%	0.03%	0.39%	0.04%	NP	0.17%	NA	NA	0.10%	0.39%	0.10%
	a) No. of bills issued during the period		1,909	104,504	94,665	28,952	233,741	NP	31,897	NA	NA	63,682	28,952	134,506
	b) No. of bills disputed including billing complaints during the period		3	15	28	113	100	NP	53	NA	NA	61	113	133
7	Metering /billing credibility-Pre paid	<= 0.1%	0.00%	0.00%	0.01%	0.33%	0.00%	NP	0.05%	0.00%	0.01%	0.06%	0.33%	0.07%
	a) No. of charging / credit / validity complaints during the quarter		15	342	229	15,611	363	NP	1,857	0	161	4,581	15,611	3,060
	b) Total no. of pre-paid customers at the end of the quarter		902,903	11,437,529	2,888,916	4,762,148	15,636,028	NP	3,758,623	307	1,234,561	7,789,641	4,762,148	4,313,118
8	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	100%	NP	100%	100%	100%	100%	100%	100%
	a) No. of billing/(post paid) and charging, credit/validity (pre paid) complaints resolved within 4 weeks during the quarter		18	357	257	15,724	463	NP	53	0	161	61	15,724	3,193
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		18	357	257	15,724	7,325	NP	1,910	0	1,396	4,642	15,724	3,193

	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		16	357	257	4	463	NP	1,346	0	161	1,336	4	2,117
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		3,154	2,856	0	15,720	6,862	NP	564	0	0	3,306	15,720	1,076
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	100%	100%	100%	100%	100%	NP	100%	100%	100%	100%	100%	100%
9	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	100%	NP	99.55%	96.36%	96.69 %	99.60 %	100%	NP	96.28 %	98.90%	96.36 %	99.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	NP	NP	99.48%	96.36%	96.69 %	99.48 %	100%	NP	96.28 %	98.95%	96.36 %	98.95%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		NP	NP	4,466	712,883	1,852,300	4,466	4,294,116	NP	109,834	5,323,339	712,883	1,446,268
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		NP	NP	4,443	686,966	1,791,033	4,443	4,294,116	NP	105,752	5,267,349	686,966	1,431,116
10	Termination/closure of service	<=7days	100%	NP	91.00%	100%	100%	NP	100%	NA	NA	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		27	NP	678	662	1,528	NP	451	NA	NA	29	662	522
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		27	NP	617	662	1,528	NP	451	NA	NA	29	662	522
11	Time taken for refunds of deposits after closures.	100% within 60 days	100%	NP	100%	100%	100%	NP	100%	NA	NA	100%	100%	100%

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.01% and 1.91%.
- **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 96.37% and 99.57%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 1.67%.
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 1.69% .
- **Call drop rate (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.53% and 1.91%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):** Except for BSNL CG, Docomo & Loop, all the operators are satisfying the benchmark with value in between 0.63% and 2.25%.
- **Connections with good voice quality (benchmark $\geq 95\%$):** BSNL & TTSL service providers have declared that the parameter is not system generated. GSM operators are meeting the benchmark with values lying between 96.02% and 99.20 %.
- **POI Congestion (benchmark $\leq 0.5\%$):** No operator is POIs with congestion greater than 0.5% Here POI congestion indicates that there were call failure greater than 0.5% on that particular POI. The calls here indicate only those calls which have been already being seized by the switch and processed. But cases were found where individual POIs are showing high utilization/usage which are managed by overflow technique i.e. extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark $>95\%$):** Except for Airtel & Loop which had not provided the data , all the operators are meeting the benchmark with values lying between 96.28% and 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except for Aircel, Airtel & Loop which had not provided the data, all other operators are meeting the benchmark.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** Except for Aircel, Docomo, Vodafone, & TTSL, all other operators are meeting the benchmark.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** Except for Docomo & TTSL, all the operators are meeting the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** Except for BSNL CG which has not provided the data, all the other operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark ≤ 7 days):** Airtel & BSNL CG which had not provided the data, & BSNL MP which is not meeting the benchmark, rest of the operators had met the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** Except for BSNL CG which has not provided the data, all the other operators are meeting the benchmark.

(3) Sample Coverage

Switches/BSC/BTS details of operators:

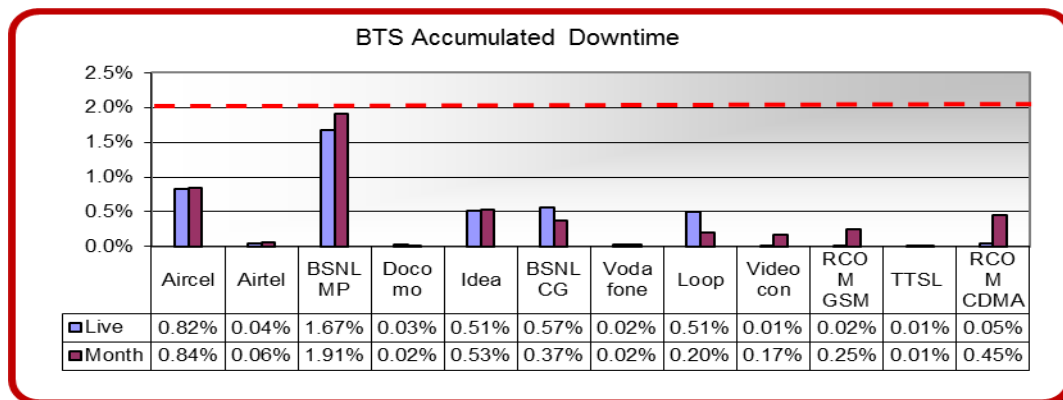
Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd (ICR with Tata)	1	2	128
2	Airtel Ltd	18	141	7875
3	BSNL CG	2	43	2238
4	BSNL MP	9	88	3957
5	Idea	27	52	7187
6	Tata Communications	3	24	2500
7	Reliance Communications	6	110	2596
8	Etisalat	Service Closed		
9	Videocon	1	9	1395
10	Vodafone	4	40	4083
11	Loop	1	1	11
CDMA Operators				
12	Tata Communications	4	8	708
13	Reliance Communications	4	79	2127

(4) Performance (Graphical Representation)

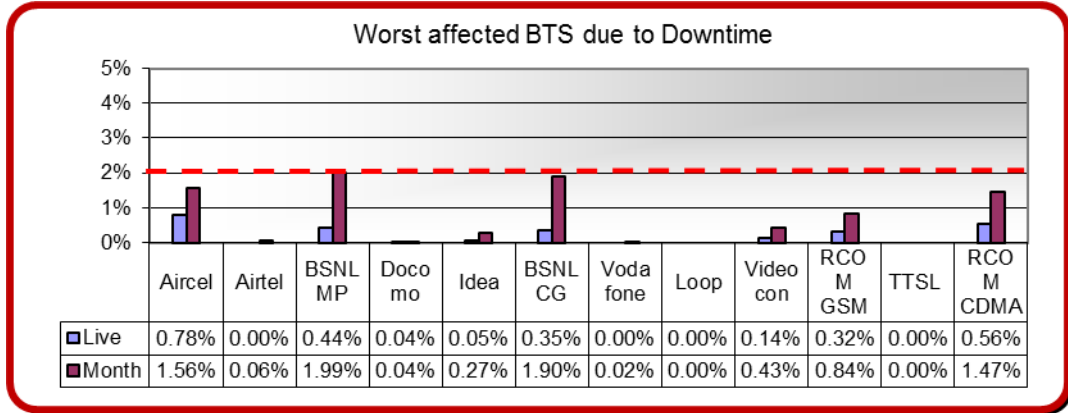
Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services

A) NETWORK PERFORMANCE

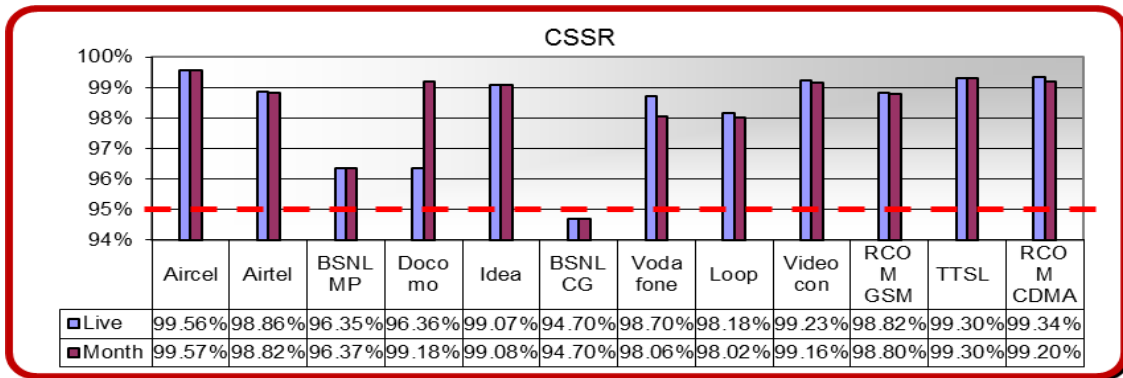
- I. BTS Accumulated Downtime:** All operators are meeting the TRAI benchmark for both one month data and 3 days live data taken in the month of audit.



Worst affected BTS due to Downtime: All operators are meeting the TRAI benchmark for both one month data and 3 days live data taken in the month of audit.

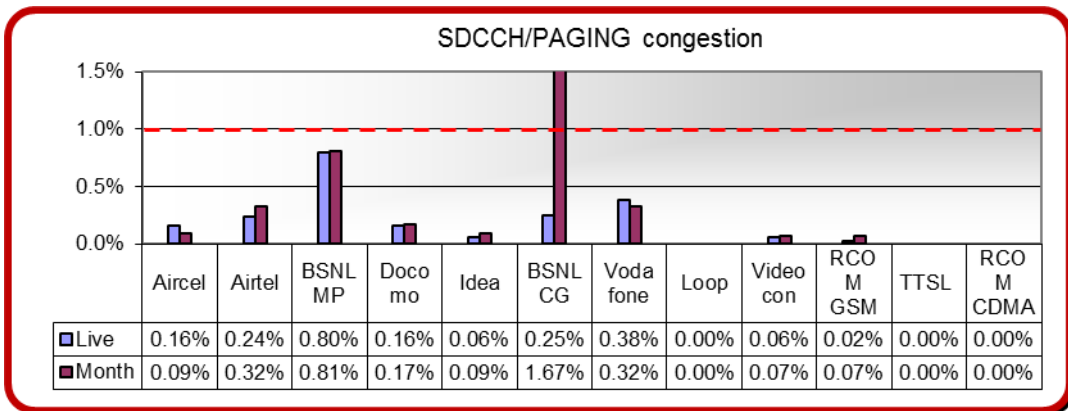


II. Call setup success rate: Except for BSNL CG, all operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit.

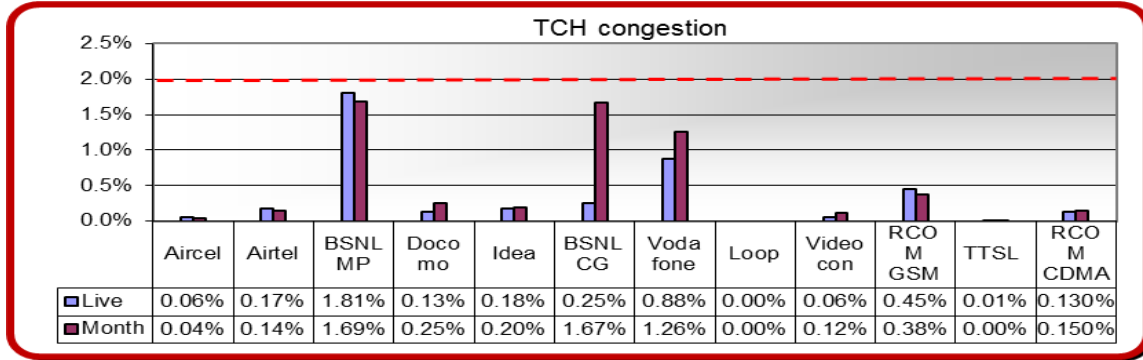


III. Blocked call rate:

SDCCH congestion: Except BSNL CG which is not meeting the benchmark in month audit data, all other operators are meeting the TRAI benchmarks ($\leq 1\%$) for both one month data and 3 days live data taken in the month of audit.

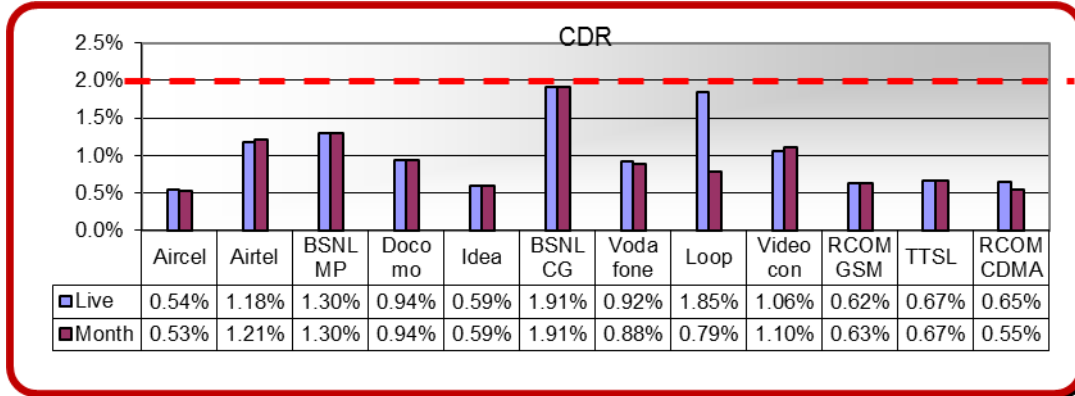


TCH congestion: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

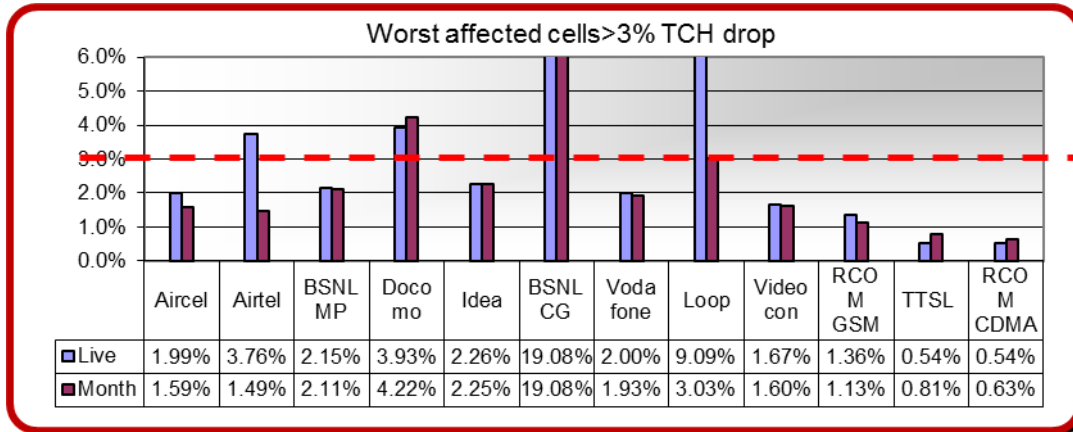


IV. Connection Maintainability (Retainability):

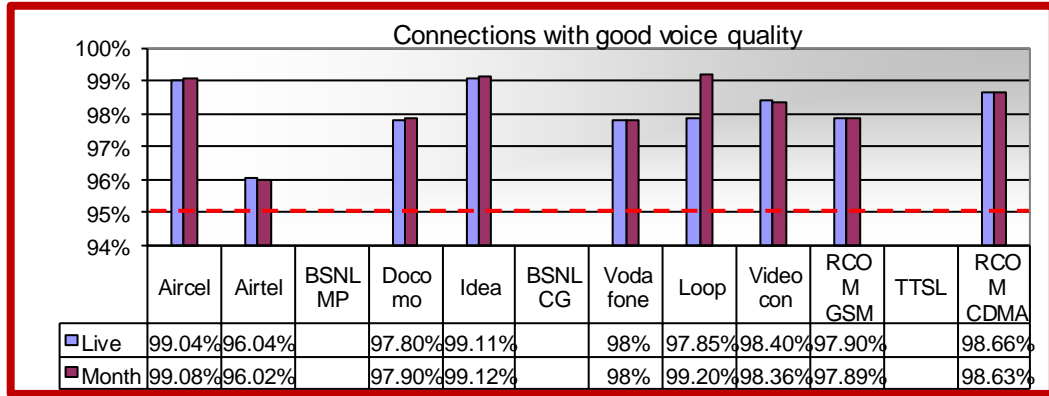
Call drop rate: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



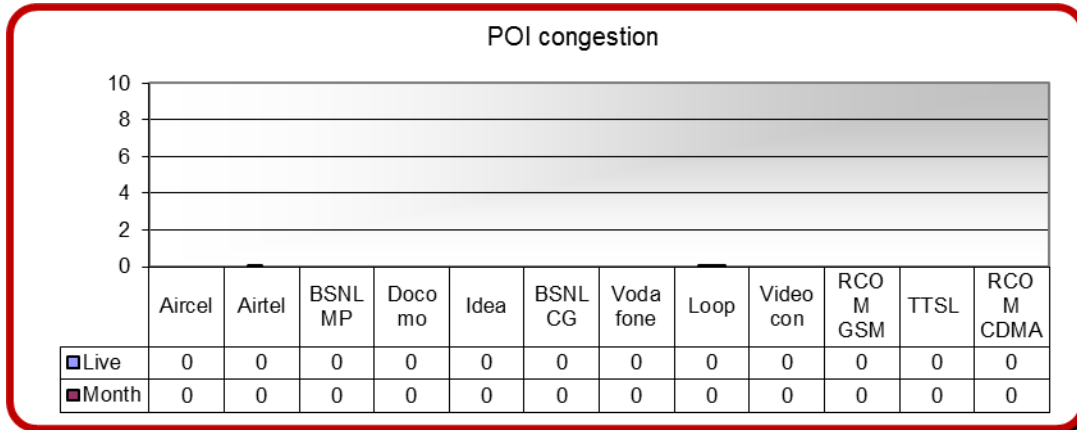
Worst affected Cell exceeding 3% TCH Drop: For both live and month data, BSNL-CG is found not meeting the benchmark of $\leq 3\%$ by very high margins. Airtel & Loop have below benchmark performance in live audit & Docomo in both live & month audit data.



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



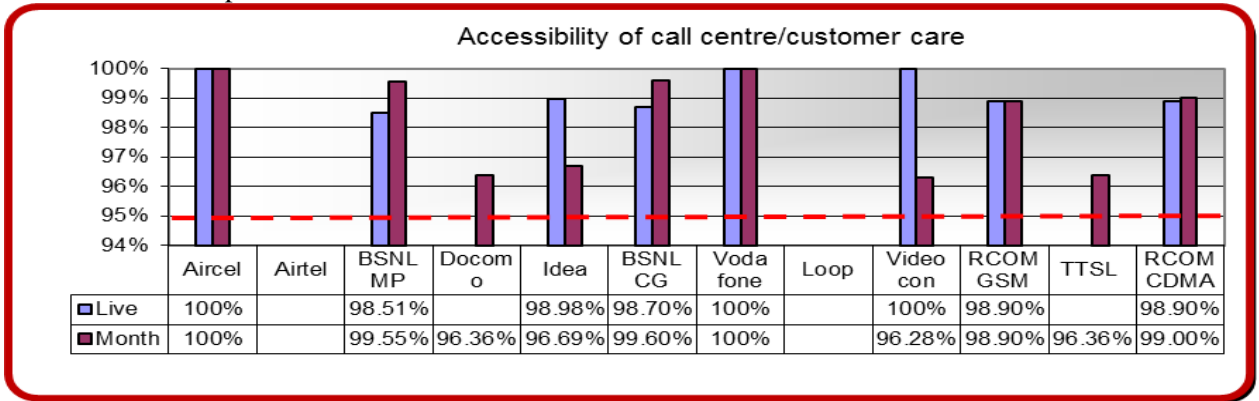
POI Congestion: No POI congestion is found in any of the operator’s network.



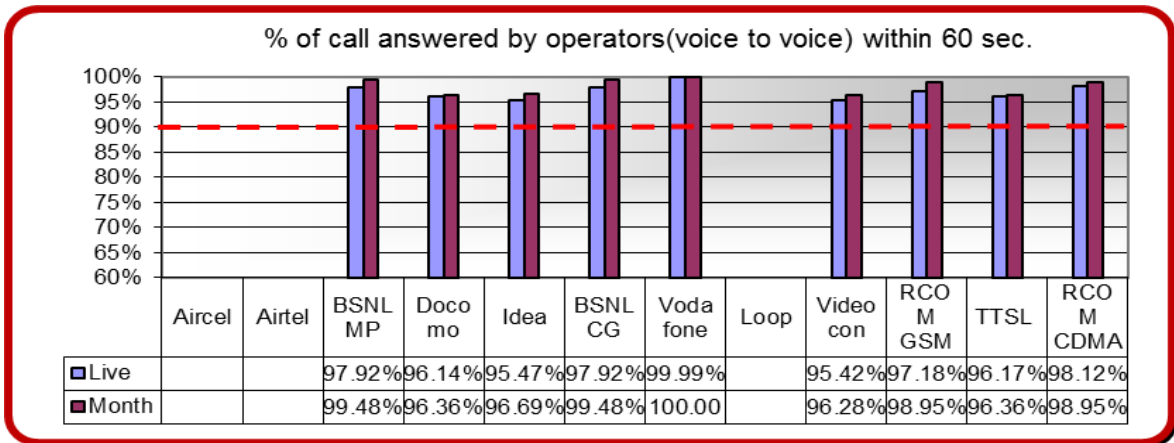
B) CUSTOMER SERVICE QUALITY PARAMETERS

(A) Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit except for Airtel, Loop for both live & moth data & Docomo & TTSL for live data audit had not provided the data.



Percentage of call answered by operators (Voice to voice) within 60 sec: Except for Aircel, Airtel, Loop which had not provided the data, all other operators are meeting the benchmark.



(5) **Critical Analysis**

The above comparative study between live data & month data shows similar trends & consistency in both the cases except for BSNL CG which is not meeting the following benchmarks Call setup success rate , SDCCH congestion , Worst affected Cell exceeding 3% TCH Drop this BM is also not met by Aircel, LOOP & Docomo.

(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 MP	Docomo	Idea	BSNL CG	Vodafone	Loop	Videocon	RCOM GSM	TTSL	RCOM CDMA
Total No. of Calls Attempted	18	100	100	100	100	Data Not Provided	53	Not Applicable	100	61	100	100
Total No. of calls Answered	15	95	93	94	95		51		93	60	95	93
Cases resolved with 4 weeks	15	95	91	93	95		50		92	60	95	93
%age of cases resolved	100%	100%	98%	99%	100%		98%		99%	100%	100%	100%

(3) Live Calling to Call Centre

Calling Operator	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	LOOP	Videocon	Vodafone	Rcom CDMA	Tata CDMA
Calls Attempted	100	100	100	100	100	100	50	100	100	100	100
Calls connected to IVR	98	97	96	100	98	100	50	96	100	96	100
%age of calls connected to IVR	98%	97%	96%	100%	98%	100%	100%	96%	100%	96%	100%
Calls got connected to agent within 60 Sec	98	97	96	100	98	100	50	96	100	96	100
%age of calls got answered by agent in 60 sec.	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(4) Level-1 Live Calling

Emergency no.		No. of calls made	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	LOOP	Videococ n	Vodafo ne	Rcom CDMA	Tata CDMA
			DURG										
100	Police	2	2	2	2	2	2	2	2	2	2	2	2
101	Fire	2	2	2	2	2	2	2	2	2	2	2	2
102	Ambulance	2	2	2	2	2	2	2	2	2	2	2	2
139	Railway	2	2	2	2	2	2	2	2	2	2	2	2
			SAGAR										
100	Police	2	2	2	2	2	2	2	2	2	2	2	2
101	Fire	2	2	2	2	2	2	2	2	2	2	2	2
102	Ambulance	2	2	2	2	2	2	2	2	2	2	2	2
139	Railway	2	2	2	2	2	2	2	2	2	2	2	2
			CHINDWARA										
100	Police	2	2	2	2	2	2	2	2	2	2	2	2
101	Fire	2	2	2	2	2	2	2	2	2	2	2	2
102	Ambulance	2	2	2	2	2	2	2	2	2	2	2	2
139	Railway	2	2	2	2	2	2	2	2	2	2	2	2

(5) Critical Analysis

Random numbers were selected from the operators' available database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. Majority of the calls were successful some of the calls were not successful for various reasons such as customer not reachable, number busy or switched off etc. Among the successful calls, it was found that the operators had made refund 100% in most of the cases as claimed by their records.

Good results were found for all the operators during live calling to their respective call centres. Similar result was found in case of Level-1 calling for emergency nos. 100, 101, 102 & 139.

(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 - Chhattisgarh Circle) were made between 1100 to 1400 hrs and between 1600 to 1900 hrs.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Loop	Videocon	Vodafone	Rcom CDMA	Tata CDMA
Aircel	-	100%	80%	100%	100%	90%	80%	85%	100%	100%	100%
Airtel	80%	-	90%	90%	100%	100%	100%	90%	95%	100%	100%
BSNL	90%	100%	-	100%	100%	100%	90%	100%	100%	85%	95%
Idea	100%	100%	100%	-	100%	100%	100%	100%	90%	100%	100%
Rcom GSM	100%	100%	85%	100%	-	100%	80%	90%	100%	100%	100%
Tata GSM	95%	100%	95%	100%	100%	-	80%	90%	100%	95%	100%
Loop	80%	100%	100%	100%	100%	100%	-	100%	100%	100%	85%
Videocon	80%	100%	100%	90%	100%	100%	90%	-	80%	100%	100%
Vodafone	90%	95%	100%	100%	100%	100%	80%	100%	-	100%	90%
Rcom CDMA	100%	80%	100%	100%	90%	100%	100%	100%	98%	-	100%
Tata CDMA	100%	100%	95%	100%	100%	90%	100%	100%	100%	90%	-

(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 Madhya Pradesh - Chhattisgarh for all the operators. Route covered was about around 100-120 Km depending on city areas within the speed limit of 30-35 Km/hr.

Drive Test Locations

SAGAR

High dense: Sadar Bazaar, Kent Road, Station road, Kabulapul, Bhagwan Ganj, Gujrathi Matket, railway stn

Medium dense: Makronia, Padmakar nagar, Civil line, Kotwali, Kachahari road, Pilikothi, Zanshi road

Low dense: Shastri nagar, Parkota, Timnadia, Tilak nagar, Mahavir nagar

Chhindwara

HIGH DENSE: Sabji Mandi, District Court, Krishi Branch Office Area, Fuwara Chowk, Budhwari Bazar, Golganj, Choti Bazar, Ram Mandir, CS Complex, Gulabra, Ganj Area, Gurunanak Nagar

MEDIUM DENSE: Police Station, BSNL Office, Bus Stand, Pola Ground Area, Civil Line, Panchsheel Nagar, ITI, Satpura Club, Madhuvan Colony, , Teachers Colony, Friends Colony, Chaar Pathak, Sukaldhana, Railway Station, Shakti Chowk, Tilak Market, Oont Khana, Lal Bag, Satyam Shivam Colony

LOW DENSE: Partala, Parasia Road, Vishu Nagar, Housing Board Colony, WCL Office Area, ITC Chawpal Sagar, NIIT Seoni Road, Pataleshwar, Narshimpur Road, Kundipura, Govt. PG College

DURG

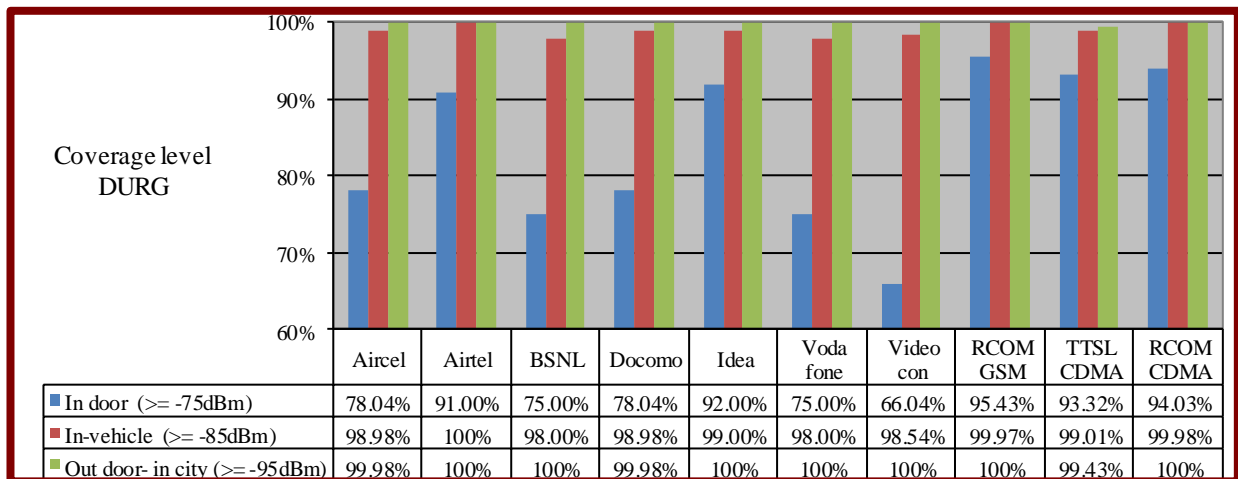
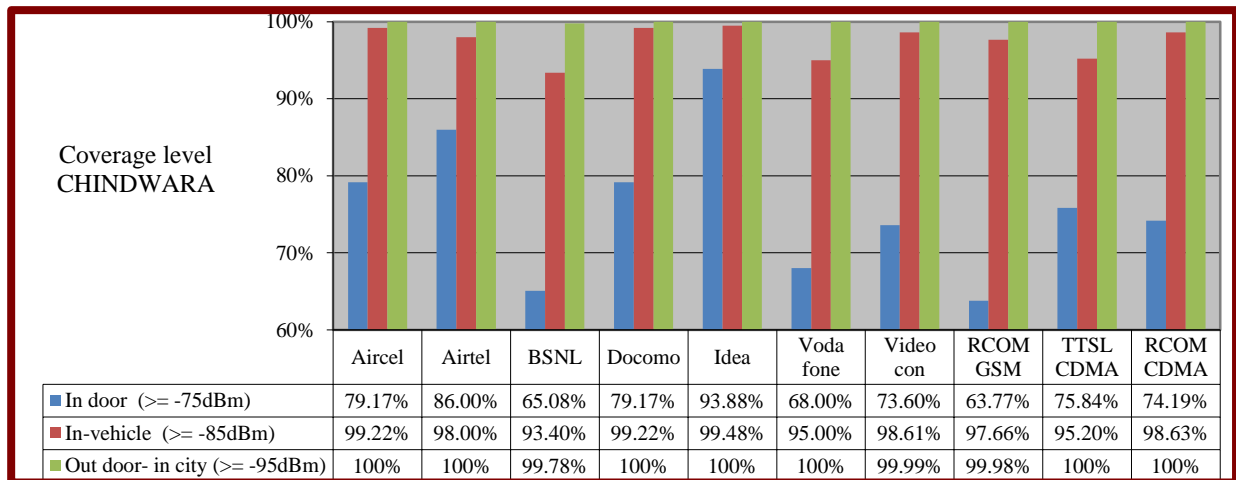
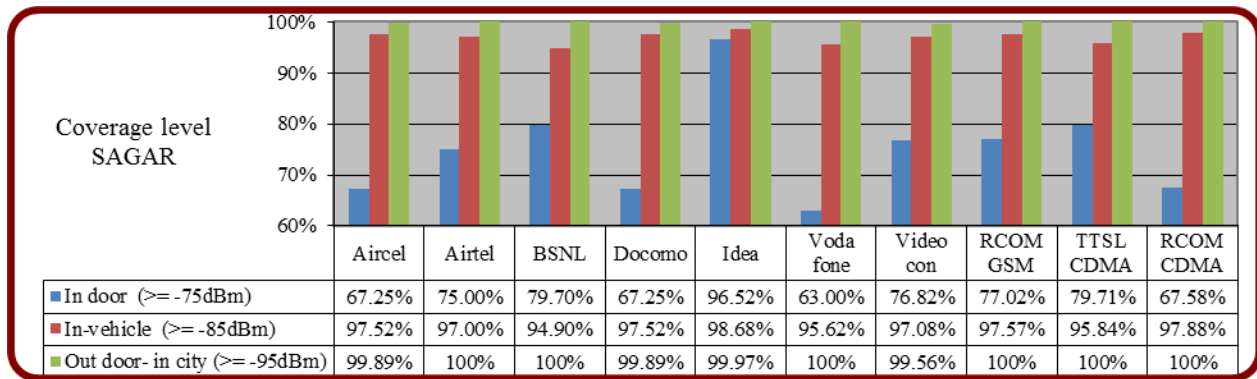
Saket colony, Ganj pura, Lakshmi nagar, Sadar bajar, Pulgoan naka, Malavia nagar, Smriti nagar, Anand nagar, Mahavir nagar, Adarsh nagar, Aryan agar, Asa nagar , Borshi colony, Kelabadi.,

2) Performance (For the respective cities)

Operator assistant Drive test

SI	Drive test Operator assisted	City	Aircel	Airtel	BSNL	Docomo	Idea	Voda fone	Video con	RCOM GSM	TTSL CDMA	RCOM CDMA
1.1	Call Attempts	Sagar	89	117	281	89	73	135	154	115	77	116
		Chindwara	96	119	63	96	129	123	127	97	86	97
		Durg	82	67	80	82	76	74	82	62	68	72
1.2	Blocked Call Rate (<=3%)	Sagar	0.00%	1.00%	4.00%	0.00%	0.00%	1.00%	1.00%	0.00%	0.00%	0.00%
		Chindwara	1.00%	1.00%	3.10%	1.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%
		Durg	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1.3	Dropped Call Rate (<=2%)	Sagar	0.00%	0.00%	3.00%	0.00%	0.00%	1.00%	0.00%	0.87%	0.00%	0.86%
		Chindwara	0.00%	1.00%	1.58%	0.00%	0.00%	0.80%	0.00%	0.00%	0.00%	0.00%
		Durg	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1.4	Percentage of connections with good voice quality (=>95%) (i) 0-4 (w/o frequency hopping)	Sagar									98.86%	98.70%
		Chindwara									99.28%	98.33%
		Durg									98.91%	95.45%
	(ii) 0-5 (with frequency hopping)	Sagar	95.34%	95.19%	88.90%	95.34%	96.64%	94.20%	98.27%	98.64%		
		Chindwara	95.18%	95.08%	90.93%	95.18%	96.34%	88.00%	99.32%	98.38%		
		Durg	95.11%	95.56%	98.60%	95.11%	95.26%	96.00%	98.84%	94.35%		
1.5	Service Coverage In door (>= -75dBm)	Sagar	67.25%	75.00%	79.70%	67.25%	96.52%	63.00%	76.82%	77.02%	79.71%	67.58%
		Chindwara	79.17%	86.00%	65.08%	79.17%	93.88%	68.00%	73.60%	63.77%	75.84%	74.19%
		Durg	78.04%	91.00%	75.00%	78.04%	92.00%	75.00%	66.04%	95.43%	93.32%	94.03%
	In-vehicle (>= -85dBm)	Sagar	97.52%	97.00%	94.90%	97.52%	98.68%	95.62%	97.08%	97.57%	95.84%	97.88%
		Chindwara	99.22%	98.00%	93.40%	99.22%	99.48%	95.00%	98.61%	97.66%	95.20%	98.63%
		Durg	98.98%	100%	98.00%	98.98%	99.00%	98.00%	98.54%	99.97%	99.01%	99.98%
	Out door- in city (>= -95dBm)	Sagar	99.89%	100%	100%	99.89%	99.97%	100%	99.56%	100%	100%	100%
		Chindwara	100%	100%	99.78%	100%	100%	100%	99.99%	99.98%	100%	100%
		Durg	99.98%	100%	100%	99.98%	100%	100%	100%	100%	99.43%	100%
1.6	Call Setup Success Rate (>=95%)	Sagar	100%	99.00%	96.10%	100%	100%	99.26%	99.35%	100%	100%	100%
		Chindwara	98.96%	99.00%	95.50%	98.96%	100%	99.19%	100%	100%	100%	100%
		Durg	100%	100%	98.60%	100%	100%	98.64%	98.78%	100%	100%	100%

Graphical Representation



(3) Critical Analysis

The drive test data was found to be satisfactory for most of the parameters. However, for the parameter 'Blocked Call Rate' BSNL is not meeting the BM in Sagar & Chindwara, "Dropped call rate" BM was not by BSNL in Sagar, Percentage of connections with good voice quality" BM was not met by BSNL & Vodafone in Sagar & Chindwara, Rcom GSM in Durg.

(E) Independent Drive test of the mobile network of service providers**1. Sample Coverage**

The Operator Assisted Drive Test was conducted for all the operators in MP-CG. Route covered in Ratlam , Khergon , Ambikapur ,Morena , Satna & Raigarh was about 45 km, 41km, 50 km ,85 km, 110 km & 52 km respectively depending on city areas within the speed limit of 25-30 Km/hr.

Drive Test Locations, Area Coverage details and Service provider's name:

1. **Aircel (Morena):** Porsa Road, Station Road, Railway Station, Over Bridge, Vivekanand Colony, Main Market, Jail Road, Police Line, 5th Batalian, Bag Bohare, M.S. Road, Barial Choraha, Galla Mandi, Jail Road, Sabjee Mandi, Sriram Colony, Nehru Park, Mill Road, Jhanda Chowk, Sadar Bazaar, Jora Highway, Morena Gaon, Gwalior Highway, Agra Road.
2. **Airtel (Ambikapur):**Darripara-Babupara-Gandhinagar-Policeline-Sadar market-Deviganj-Patelpara-Busstand-Khajurpara-Ringroad-Centraill jail-Bhatti road
3. **Airtel (Khergon):** Bhandari Petrol pump, Khandwa road, Housing board colony, Bus Stand, Nutan nagar, Bhavsar Muhalla, Patap nagar, Mangrul road, Bank colony Jawahar marg, Diversion road, Talaiye, Rahimpura, Talab chowk.
4. **Docomo (Ratlam):**Station road, Do batti, Power house road, Sajjan mill road, Chandani chowk,Tripolia road, Palace road, Bajaj Khana, Goushala road, Jawahar nagar, Indira nagar, Gandhi nagar, Hat road, Rajendra nagar, Din-dayal nagar, Rajwada, Mahu road, Chhatripur, Civil lines, Kazipura, Anand colony.
- 5.**Docomo(Ambikapur):**Darripara-Babupara-Gandhinagar-Policeline-Sadar market-Deviganj-Patelpara-Busstand-Khajurpara-Ringroad-Centraill jail-Bhatti road
6. **Vodafone (Satna):** Satna Rewa Highway, By Passroad, Tikuriya Tola, Mandi Badi, Manish Market, Gowshala Chauk, Gandhi Chauk, Nayatalab Road, Sarafa Bazaar, Chauk Bazar, Foolchand Chauk, Joollelal Mandir Road, Dalibaba, Nazirabad, Prem Nagar, Prem Vihar Colony,Dhawari, Jawahar Nagar, Rajendra Nagar, Panna Road, Pateri, Railway Colony, MG Road, MP Nagar, Barhut Nagar, Birla Road, Birla Cement Plant, Krishi Upaj Mandi, Nai Basti, Central Jail, Utaly, Airport, Sindhi Colony, Mukhtayar Ganj, Civil Line, Court, Bagha, Gadiya Tola, Umeri Tola
7. **Videocon (Raigarh):** Jindal regency-Shastrivihar-Kotra road-Lochannagar-Madhubanpara-Jharsugudaroad-Railway station-Gaurishankar mandir-Forest colony-Gulmohar Colony -Kelo Vihar Colony
8. **Rcom GSM (Ratlam):** Station road, Do batti, Power house road, Sajjan mill road, Chandani chowk,Tripolia road, Palace road, Bajaj Khana, Goushala road, Jawahar nagar, Indira nagar, Gandhi nagar, Hat road, Rajendra nagar, Din-dayal nagar, Rajwada, Mahu road, Chhatripur, Civil lines, Kazipura, Anand colony

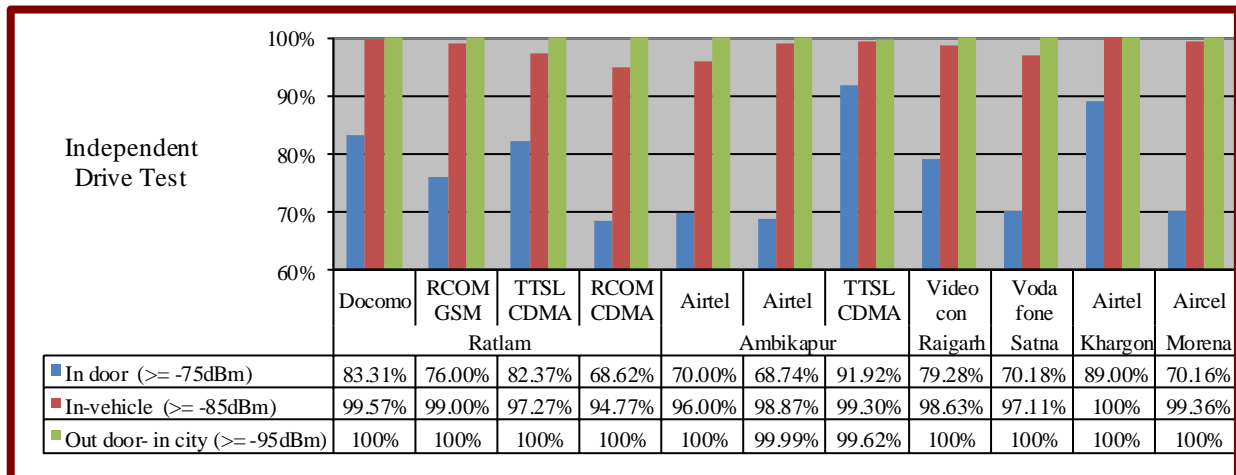
9. TTSL CDMA (Ratlam): Station road, Do batti, Power house road, Sajjan mill road, Chandani chowk, Tripolia road, Palace road, Bajaj Khana, Goushala road, Jawahar nagar, Indira nagar, Gandhi nagar, Hat road, Rajendra nagar, Din-dayal nagar, Rajwada, Mahu road, Chhatripur, Civil lines, Kazipura, Anand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

10. TTSL CDMA (Ambikapur):): Darripara-Babupara-Gandhinagar-Policeline-Sadar market-Deviganj-Patelpara-Busstand-Khajurpara-Ringroad-Central jail-Bhatti road

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

2) Performance (For the respective cities)

Independent Drive Test												
SI	Drive test Operator assistant	Ratlam				Ambikapur			Raigarh	Satna	Khargor	Morena
		Docomo	RCOM GSM	TTSL CDMA	RCOM CDMA	Airtel	Airtel	TTSL CDMA	Video con	Voda fone	Airtel	Aircel
1.1	Call Attempts	65	85	71	86	53	65	63	75	125	59	135
1.2	Blocked Call Rate (<=3%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.00%	5.00%
1.3	Dropped Call Rate (<=2%)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	0.00%	1.00%
1.4	Percentage of connections with good voice quality (>=95%)											
	(i) 0-4 (w/o frequency hopping)			99.62%	98.78%			99.10%				
	(ii) 0-5 (with frequency	95.57%	98.92%			97.20%	96.08%		95.04%	93.24%	97.98%	99.31%
1.5	Service Coverage											
	In door (>= -75dBm)	83.31%	76.00%	82.37%	68.62%	70.00%	68.74%	91.92%	79.28%	70.18%	89.00%	70.16%
	In-vehicle (>= -85dBm)	99.57%	99.00%	97.27%	94.77%	96.00%	98.87%	99.30%	98.63%	97.11%	100%	99.36%
	Out door- in city (>= -95dBm)	100%	100%	100%	100%	100%	99.99%	99.62%	100%	100%	100%	100%
1.6	Call Setup Success Rate	100%	100%	100%	100%	100%	100%	100%	100%	98.00%	98.00%	95.00%



3) Critical Analysis

- “Percentage of Connection with good voice quality” BM was not met by Vodafone in Satna.
- All the operators are satisfying the TRAI BM’s.

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

From live, month and Drive Tests findings, it can be concluded that on an average, performance of the operators in the service area (Madhya Pradesh - Chhattisgarh) is by and large satisfactory for **Network Parameters**. However, BSNL-CG is not meeting the benchmark for “Connection Establishment (Accessibility)”, “SDCCH/PAGING congestion”, Docomo, Airtel, Bsnl CG & Loop are not meeting the benchmark “Worst affected cells>3% TCH drop”.

Under **Response Time to Customer for Assistance** parameters all operators are meeting the benchmark.

Regarding **Metering/Billing Credibility** issues, Aircel, Docomo , Vodafone & TTSL Aircel, have shown a below benchmark value for Post-paid connections. Similar result has been found for Docomo & TTSL for pre-paid connections.

During **Drive Tests**, Blocked call Rate & Dropped call Rate Parameter was not met by BSNL, Vodafone , BSNL & Rcom GSM are found to have less than 95% good voice quality connections.

III. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

IV. Broadband Service Providers

.....Audit not done for this quarter