

REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
NORTH ZONE – UP (WEST) CIRCLE

Report Period: July 2011 - Sep 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.
- vii) Emergency (Level 1) test calling

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

Systems audited:-

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

Facilities audited:-

1. Billing documents.
2. Customer Care records.

Field data collections carried out:-

1. RF network coverage including KPIs (Key Performance Index)
2. Inter Operator Call Assessment
3. Checking of Customer Billing/Refund Complaints (Random sample)
4. Customer Care efficiency

5. The live calling was made to assess the quality of services for Inter Operator Call Assessment, Customer Billing/Refund Complaints and Customer Care efficiency.

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

- ✓ TCIL auditors visited all the NSS (Network Sub System) and BSS (Base-station Sub System) to check data for all the operators in their respective service area.
- ✓ All the NSS and BSS data for the relevant details were collected either directly from the centralized NOC or through a remote access to the NOC.
- ✓ The Radio parameters were audited/verified from the data collected from OMC-R (Operation and Maintenance Center – Radio, as part of BSS data).
- ✓ The Drive test was conducted in high, low and medium dense areas including highways, commercial complex and residential areas and special attention was paid for the areas for which TRAI has received complaints.
- ✓ The POI and other network related parameters were audited/verified from the data collected from the OMC-S (Operation and Maintenance Center – Switch as part of NSS data).
- ✓ The data related to Billing and Customer care was checked for the previous month and verified with the customers by calling them on random basis. The process of registration and handling of the complaints was also studied for the various operators. Call centre number were called for measuring the efficiency of the call centre.
- ✓ The inter operator call assessment test was carried out during the time period as is specified in the tender document. TCBH (Time Consistent Busy Hour) is taken after observation of the traffic consistently for 3 days prior to the audit activity.
- ✓ Data has been collected for busy hour of network in case of live assessment & month of audit for all service providers & verified that service providers are providing busy hour data only for QoS service. We found that TCBH hour is matching with network busy hour as provided by service providers for UP (West) 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 UP (West) Circle in 3rd quarter (July – Sep 2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period Jan - March 2011.

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

S/N	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	Aug-2011	20 - 21 Hrs
2	Airtel Ltd	Aug-2011	20 - 21 Hrs
3	BSNL	Aug-2011	19 - 20 Hrs
4	Idea	Aug-2011	20 - 21 Hrs
5	Tata Communications (GSM)	Aug-2011	20 - 21 Hrs
6	Vodafone	Aug-2011	20 - 21 Hrs
7	Reliance Communication (GSM)	July-2011	19 - 20 Hrs
8	Uninor	Aug-2011	19 - 20 Hrs
9	Etisalat	Aug-2011	19 - 20 Hrs
10	Videocon	Aug-2011	19 - 20 Hrs
CDMA Operators			
11	MTS (CDMA)	Aug-2011	20 - 21 Hrs
12	Reliance Communication (CDMA)	July-2011	19 - 20 Hrs
13	Tata Communications (CDMA)	Aug-2011	19 - 20 Hrs

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

(A) Cellular Mobile Telephone Services

3 days Live Data Audit		B-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter														
1	Network Availability														
	a) BTS Accumulated Downtime	≤2%	0.64%	0.08%	1.72%	1.18%	0.08%	0.63%	0.17%	0.71%	0.37%	0.25%	1.59%	0.83%	0.05%
	b) Worst affected BTSs due to downtime	≤2%	0.12%	0%	1.41%	0%	0%	0.37%	0%	0%	0%	0.81%	0%	0.40%	0%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	≥95%	98.44%	97.31%	98.05%	99.07%	99.81%	99.23%	97.98%	96.37%	99.24%	96.44%	99.49%	97.94%	99.36%
	b) SDCCH/PAGING congestion	≤1%	0.14%	0.42%	0.38%	0%	0.86%	0.14%	0.09%	0.25%	0.50%	0.68%	0%	0%	0%
	c) TCH congestion	≤2%	0.43%	1%	0.61%	0.37%	1.24%	0.25%	0.53%	1.82%	0.07%	1.21%	0%	0.11%	0.02%
3	Connection maintenance (retainability)														
	a) CDR	≤2%	1.02%	0.95%	0.98%	0.42%	1.09%	0.27%	1%	1.28%	1.27%	1.48%	0.26%	0.45%	0.21%
	b) Worst affected cells>3% TCH drop	≤3%	2.82%	1.64%	2.49%	4.44%	2.70%	1.70%	5.98%	4.71%	1.06%	2.99%	1.14%	1.64%	0.61%
	c) Good voice quality	≥95%	97.10%	96.18%	96.02%	98.16%	96.52%	98.79%	96.80%	95.99%	97.31%	95.54%	99.18%	NA	NA
4	Number of POI having ≥0.5% POI congestion	≤0.5%	0	0	1	0	0	0	0	8	0	0	0	0	0
5	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	≥95%	89%	59.29%	98.90%	97.26%	92.50%	98.61%	99%	97.11%	100%	NP	NP	98.99%	99%
	b) % call answered by operators(voice to voice) within 60 sec.	≥90%	82.28%	91.90%	92.74%	100%	80.41%	94.50%	99.08%	98.89%	100%	99.23%	97.71%	72.76%	98.61%

NA: Not Applicable, NP: Not Provided

From the above 3 days live data assessment table, it is found that the operators are meeting most of the network parameters. Only exception is for “Worst affected cells >3% TCH drop”, it is seen that Etisalat, Tata (GSM) & Uninor are not satisfying the benchmark. Among the Technical Parameters it is also found that for BSNL and Uninor are having 1 & 8 nos. of POI with congestion > 0.5%. In case of “Good voice quality” RCom (CDMA) & Tata (CDMA) have declare that the data is not system generated. Rest of the operators are satisfying the benchmark successfully.

In case of performance related to Customer Care data it is seen that for the parameters “Accessibility of call centre/Customer Care” & “call answered by operators (voice to voice) within 60 sec” Aircel, Airtel, Idea & RCom (CDMA) performance are showing values below benchmark.

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
S/N	Name of Parameter		GSM Operators										CDMA Operators			
(A)	Network Service Quality Parameter															
1	Network Availability															
	a) BTS Accumulated Downtime	≤2%	0.62%	0.15%	1.54%	1.02%	0.07%	1.02%	0.27%	0.89%	0.61%	0.24%	0.15%	0.45%	0.05%	
	b) Worst affected BTSs due to downtime	≤2%	1.88%	0.27%	1.80%	0%	0.22%	0.92%	0%	1.62%	1.81%	0.79%	0%	0.67%	0%	
2	Connection Establishment (Accessibility)															
	a) CSSR (Call Setup Success Rate)	≥95%	98.17%	97.13%	96.93%	99.16%	99.89%	99.52%	97.83%	96.26%	99.64%	97.12%	99.43%	96.38%	99.40%	
	b) SDCC/PAGING congestion	≤1%	0.33%	0.44%	0.57%	0.13%	0.96%	0.24%	0.09%	0.36%	0.48%	0.66%	0%	0%	0%	
	c) TCH congestion	≤2%	0.40%	1.03%	0.87%	0.05%	1.58%	0.23%	0.49%	1.90%	0.18%	1.21%	0%	0.42%	0.01%	
3	Connection maintenance (retainability)															
	a) CDR	≤2%	1.06%	1.02%	0.92%	0.51%	1.10%	0.28%	1.16%	1.34%	1.22%	1.35%	0.32%	0.48%	0.31%	
	b) Worst affected cells>3% TCH drop	≤3%	2.86%	1.80%	2.57%	2.58%	2.95%	1.69%	10.09%	4.81%	1.06%	2.98%	1.54%	1.77%	0.57%	
	c) Good voice quality	≥95%	97.16%	96.04%	95.66%	98.21%	96.24%	98.87%	96.66%	96.12%	97.32%	95.95%	99.27%	NA	NA	
4	Number of POI having ≥0.5% POI congestion		0	0	1	0	0	0	0	8	0	0	0	0	0	
(B)	Customer Service Quality Parameters															
5	Metering/billing credibility-Post paid	≤0.1%	0.03%	0.04%	0%	NA	0.06%	0.09%	0.17%	NA	NA	0.36%	0%	0.08%	0.11%	
6	Metering /billing credibility-Pre paid	≤ 0.1%	0.04%	0.002%	0.05%	0.003%	0.001%	0.04%	0.10%	0.03%	0%	0.03%	0.11%	0.03%	0.05%	
7	Resolution of billing/ charging complaints(within 4 weeks)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	a) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	≤1week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week	≤1week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week	

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	RCom CDMA	Tata CDMA	
S/N	Name of Parameter		GSM Operators										CDMA Operators			
8	Response time to customers for assistance															
	a) Accessibility of call centre/Customer Care	≥95%	85%	92.10%	98.81%	98.56%	93.91%	98.77%	99%	96.71%	100%	94.30%	NP	98.77%	99%	
	b) % call answered by operators(voice to voice) within 60 sec.	≥90%	73.31%	88.31%	93.36%	99.86%	73.27%	90.10%	69.43%	89.74%	96.30%	92.27%	97.41%	73.92%	89.40%	
9	Termination/closure of service	≤7days	100%	100%	NP	NA	100%	100%	100%	NA	NA	100%	04%	100%	100%	
10	Time taken for refunds of deposits after closures (within 60 days).	100%	100%	100%	NP	NA	100%	100%	100%	NA	NA	100%	100%	100%	100%	

NA: Not Applicable, **NP:** Not Provided

From the above month data assessment table, it is found that the operators are mostly meeting the Network Parameters except for, the parameter “Worst affected cells>3% TCH drop” Tata (GSM) & Uninor are found not satisfying the benchmark. Among the Technical Parameters it is also found that “Number of POI having ≥0.5% POI congestion” is not met by BSNL & Uninor, having congestion in 1 & 8 nos. of POIs respectively. In case of “Good voice quality” RCom (CDMA) & Tata (CDMA) have not provide system generated data. Rest of the operators are satisfying the benchmark successfully.

In case of performance related to Customer Care data it is found that for the parameters “Metering/billing credibility-Post paid” and “Metering/billing credibility-Pre paid” Tata (GSM&CDMA),Vodafone & MTS are not satisfying the benchmark.

For parameters “Accessibility of call centre/Customer Care” & “calls answered by operators (voice-to-voice) within 60 sec” it is found that Aircel, Airtel, Idea, Uninor, Vodafone, RCom (CDMA) & Tata (GSM&CDMA) are not satisfying the benchmark.

In case of “Termination/closure of service” it is seen that MTS is not meeting the benchmark with high margin.

Operator-Assisted Drive Test

The Operator assisted Drive Test was conducted at UP (West) 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 Bareilly, Haldwani & Agra. In all the cities, zones were selected for covering different density areas (High, Medium & Low).

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
			GSM Operators							CDMA Operators				
1.1	Blocked Call Rate ($\leq 3\%$)	Bareilly	0.60%	0.67%	5.44%	0%	2.79%	0%	2.94%	0.95%	0%	0%	0%	
		Haldwani	0.94%	0.00%	0.00%	0%	2.11%	0%	NA	4.88%	NA	1.04%	0%	
		Agra	0.72%	0.76%	1.27%	0.58%	2.47%	2.91%	2.48%	1.04%	0%	0.62%	0%	
1.2	Dropped Call Rate ($\leq 2\%$)	Bareilly	0%	0%	0.68%	0%	0.56%	0%	0.59%	0%	0%	0.56%	0%	
		Haldwani	0%	0%	5.63%	0%	0%	0%	NA	0%	NA	0%	0%	
		Agra	0%	0%	2.55%	0%	1.23%	0%	0.62%	0%	0%	1.23%	0%	
1.3	% of connections with good voice quality ($\geq 95\%$)													
	(i) 0-4 (w/o frequency hopping)	Bareilly	NA									99.29%	97%	97.35%
		Haldwani	NA									NA	100%	99.06%
		Agra	NA									99%	96%	95.56%
	(ii) 0-5 (with frequency hopping)	Bareilly	98.60%	96.5%	93.17%	96%	91%	93.1%	97%	96.50%	NA			
		Haldwani	96.60%	96.2%	97%	97%	96%	94%	NA	95%				
Agra		95.70%	97.3%	95.44%	97%	91%	92%	96%	96.70%					
1.4	Call Setup Success Rate ($\geq 95\%$)	Bareilly	99.40%	99%	95.55%	100%	97.21%	100%	96%	99.05%	100%	100%	100%	
		Haldwani	99.06%	100%	88%	100%	97.89%	100%	NA	95.12%	NA	98.96%	100%	
		Agra	99.28%	99.2%	95.66%	100%	97.53%	97%	97%	98.95%	100%	98.1%	100%	

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

- “Blocked Call Rate” benchmark is not met by BSNL & Vodafone.
- “Dropped Call Rate” benchmark is not met BSNL.
- “% of connection with good voice quality” benchmark is not met by BSNL, RCom (GSM) & Uninor.
- “Call Setup Success Rate” benchmark is not met by BSNL.

Note: MTS & Videocon have no service (Spectrum) in Haldwani and similarly Tata (GSM) has no service in Bareilly, Haldwani & Agra cities. Hence in case of MTS, Videocon & Tata (GSM) drive test is not applicable in these cities.

Independent Drive Test: Submitted as a separate report

CHAPTER-3: AUDIT-PMR VERIFICATION

I. Cellular Mobile Telephone Service

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
S/N	Name of Parameter			GSM Operators									CDMA Operators				
(A)	Network Service Quality Parameter																
1	Network Availability																
	BTS Accumulated Downtime	≤2%	Reported	0.13%	0.23%	1.43%	0.45%	0.05%	0.25%	0.03%	0.38%	0.24%	0.21%	0	0.35%	0.02%	
			Verified	0.13%	0.23%	1.43%	0.45%	0.05%	0.25%	0.03%	0.38%	0.24%	0.21%	0	0.35%	0.02%	
	Worst affected BTSs due to downtime	≤2%	Reported	0.28%	0.23%	8.37%	1.67%	0.09%	0.55%	0.02%	0.05%	0.83%	0.38%	0	0.77%	0%	
Verified			0.28%	0.23%	8.37%	1.67%	0.09%	0.55%	0.02%	0.05%	0.83%	0.38%	0	0.77%	0%		
2	Connection Establishment (Accessibility)																
	CSSR (Call Setup Success Rate)	≥95%	Reported	98.47%	97.25%	95.92%	99.06%	99.87%	99.54%	98.01%	95.79%	98.86%	97.74%	0	99.69%	99.86	
			Verified	98.47%	97.25%	95.92%	99.06%	99.87%	99.54%	98.01%	95.79%	98.86%	97.74%	0	99.69%	99.86	
	SDCCH/PAGING congestion	≤1%	Reported	0.12%	0.68%	0.87%	0.13%	0.65%	0.47%	0.12%	0.41%	0.29%	0.56%	0	0.22%	0%	
			Verified	0.12%	0.68%	0.87%	0.13%	0.65%	0.47%	0.12%	0.41%	0.29%	0.56%	0	0.22%	0%	
	TCH congestion	≤2%	Reported	0.31%	1.15%	1.80%	0.14%	1.44%	0.52%	0.15%	1.63%	0.18%	1.17%	0	0.69%	0%	
Verified			0.31%	1.15%	1.80%	0.14%	1.44%	0.52%	0.15%	1.63%	0.18%	1.17%	0	0.69%	0%		
3	Connection maintenance (retainability)																
	CDR	≤2%	Reported	0.39%	1.05%	2.50%	0.60%	0.88%	0.32%	1.23%	1.75%	1.36%	1.07%	0	0.35%	0.18%	
			Verified	0.39%	1.05%	2.50%	0.60%	0.88%	0.32%	1.23%	1.75%	1.36%	1.07%	0	0.35%	0.18%	
	Worst affected cells>3% TCH drop	≤3%	Reported	2.38%	2.39%	15.33%	2.78%	3.75%	3.66%	4.71%	4.98%	3.80%	2.53%	0	0.60%	0.07%	
			Verified	2.38%	2.39%	15.33%	2.78%	3.75%	3.66%	4.71%	4.98%	3.80%	2.53%	0	0.60%	0.07%	
	Good voice quality	≥95%	Reported	97.03%	96.58%	97.25%	98.60%	99.82%	97.82%	96.26%	96.39%	97.26%	96.51%	0	98.15%	99.89%	
Verified			97.03%	96.58%	97.25%	98.60%	99.82%	97.82%	96.26%	96.39%	97.26%	96.51%	0	98.15%	99.89%		
4	Number of POI having ≥ 0.5% POI congestion	Reported	0	0	1	0	0	0	0	14	6	0	0	0	0		
		Verified	0	0	1	0	0	0	0	14	6	0	0	0	0		
(B)	Customer Service Quality Parameters																
5	Metering/billing credibility-Post paid	≤0.1%	Reported	0.09%	0.03%	0.01%	NA	NR	0%	0.04%	NA	NA	0.10%	0%	0%	0.06%	
			Verified	0.09%	0.03%	0.01%	NA	NR	0%	0.04%	NA	NA	0.10%	0%	0%	0.06%	
6	Metering /billing credibility-Pre paid	≤0.1%	Reported	0.01%	0%	0%	0.10%	NR	0.10%	0%	0%	0.08%	0.03%	0.10%	0.06%	0.07%	
			Verified	0.01%	0%	0%	0.10%	NR	0.10%	0%	0%	0.08%	0.03%	0.10%	0.06%	0.07%	

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
S/N	Name of Parameter			GSM Operators										CDMA Operators			
7	Resolution of billing/ charging complaints (within 4 weeks)	100%	Reported	100%	100%	100%	100%	NR	100%	100%	100%	100%	100%	100%	100%	100%	
			Verified	100%	100%	100%	100%	NR	100%	100%	100%	100%	100%	100%	100%	100%	
	Period of applying credit/waiver/adjustment to the customer's A/C from the date of resolutions of complaints	≤1 week	Reported	100%	100%	100%	NA	NR	100%	100%	NA	100%	100%	100%	100%	100%	
			Verified	100%	100%	100%	NA	NR	100%	100%	NA	100%	100%	100%	100%	100%	
8	Response time to customers for assistance																
	Accessibility of call centre/Customer Care	≥95%	Reported	100%	100%	100%	98.63%	NR	70%	100%	95.21%	100%	100%	99%	100%	95%	
			Verified	100%	100%	100%	98.63%	NR	70%	100%	95.21%	100%	100%	99%	100%	95%	
	% call answered by operators(voice to voice) within 60 sec.	≥90%	Reported	68.57%	80%	95%	98.98%	NR	98%	32%	90.08%	100%	77%	96.40%	97.00%	72%	
Verified			68.57%	80%	95%	98.98%	NR	98%	32%	90.08%	100%	77%	96.40%	97.00%	72%		
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%	NA	NR	100%	100%	N/A	NA	100%	0%	100%	100%	
			Verified	100%	100%	100%	NA	NR	100%	100%	N/A	NA	100%	0%	100%	100%	
10	Time taken for refunds of deposits after closures.(within 60 days	100%	Reported	100%	100%	100%	NA	NR	100%	100%	N/A	NA	100%	0%	100%	49%	
			Verified	100%	100%	100%	NA	NR	100%	100%	N/A	NA	100%	0%	100%	49%	

Critical Analysis (PMR Verification):

(The figures proved by all the operators matches with the figures obtained on verification)

- BSNL is not meeting the benchmarks for parameter “Worst affected BTSs due to downtime”.
- BSNL is not meeting the benchmarks for parameter “CDR”.
- BSNL, Idea, RCom (GSM), Tata (GSM), Uninor & Videocon are not meeting the respective benchmarks for parameter “Worst affected Cells >3% TCH drop”.
- BSNL & Uninor & are showing congestion ≥0.5% in 1 & 14 nos. of POIs respectively for the parameter “Number of POI having ≥ 0.5% POI Congestion”.
- “Accessibility of call centre/Customer Care” benchmark is not met by RCom (GSM).
- “% call answered by operator (voice to voice) within 60 sec.” benchmark is not met by Aircel, Airtel, Tata (GSM), Vodafone & Tata (CDMA).
- Tata (CDMA) is not meeting the 60 days' benchmark for parameter “Refund of deposits after closure of connection”.

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	B-mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
A	Network Service Quality Parameter														
	Network Availability														
1	a) BTS Accumulated Downtime	≤2%	0.64%	0.08%	1.72%	1.18%	0.08%	0.63%	0.17%	0.71%	0.37%	0.25%	1.59%	0.83%	0.05%
	b) Worst affected BTSs due to downtime	≤2%	0.12%	0%	1.41%	0%	0%	0.37%	0%	0%	0%	0.81%	0%	0.40%	0%
	c) Total no. of BTSs in the licensed service area		2554	6315	2056	20	5561	2168	1738	2595	441	5920	186	1488	820
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1178	383	2516	17	338	976	218	1324	116	1058	213	884	27
	e) No. of BTSs having accumulated downtime of >24 hours in a month		3	0	29	0	0	8	0	0	0	349	0	6	0
2	Connection Establishment (Accessibility)														
	a) CSSR	≥95%	98.44%	97.31%	98.05%	99.07%	99.81%	99.23%	97.98%	96.37%	99.24%	96.44%	99.49%	97.94%	99.36%
	b) SDCCH/PAGING congestion	≤1%	0.14%	0.42%	0.38%	0%	0.86%	0.14%	0.09%	0.25%	0.50%	0.68%	0%	0%	0%
	c) TCH congestion	≤2%	0.43%	1%	0.61%	0.37%	1.24%	0.25%	0.53%	1.82%	0.07%	1.21%	0%	0.11%	0.02%
3	Connection maintenance														
	a) CDR	≤2%	1.02%	0.95%	0.98%	0.42%	1.09%	0.27%	1%	1.28%	1.27%	1.48%	0.26%	0.45%	0.21%
	b) Cells having > 3% TCH drop	≤3%	2.82%	1.64%	2.49%	4.44%	2.70%	1.70%	5.98%	4.71%	1.06%	2.99%	1.14%	1.64%	0.61%
	c) Good voice quality	≥95%	97.10%	96.18%	96.02%	98.16%	96.52%	98.79%	96.80%	95.99%	97.31%	95.54%	99.18%	NA	NA
	d) No. of cells > 3% TCH drop		215	308	52	2	452	110	311	362	14	533	6	24	15
	e) Total no. of cells in the network		7623	18980	2053	60	16691	6504	5201	7796	1323	17801	558	1488	2532
4	Number of POI having ≥0.5% POI congestion		0	0	1	0	0	0	0	8	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	Nil	Uninor	Nil	Nil	Nil	Nil	Aircel, Airtel, BSNL, Vfone, Uninor, RCom, Tata, Idea	Nil	Nil	Nil	Nil	Nil
	b) Total No. of circuits on POI		22633	38601	80412	2545	132308	1818566	5278	1690264	8458	NP	8721	132308	88609

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
	c) Avg No. of call attempts on POI		1383321	6585787	65382	8358	11101110	1931924	9028	4971113	154880	13270902	4629	1931924	3201358
	d) Avg traffic served on POI (Erlang)		24126	68823	1078	161	169734	68987	318	110738	504	337311	80	68987	109245
	e) Total number of working POI Service Area wise		68	51	18	24	114	139	8	79	25	61	42	139	130
	f) Equipped Capacity of Network in respect of Traffic in erlang		98000	219114	163990	10752	217757	NP	96964	87815	14730	234314	14731	NP	255061
	g) Total traffic handled in TCBH in erlang		23535	138120	90883	NP	235762	NP	31231	78116	5	205370	1523	NP	77963
(B)	Customer Service Quality Parameters														
	Response time to customers for assistance														
5	a) Accessibility of call centre	≥95%	89%	59.29%	98.90%	97.26%	92.50%	98.61%	99%	97.11%	100%	NP	NP	98.99%	99%
	b) % of call answered by operators(voice to voice) within 60 sec	≥90%	82.28%	91.90%	92.74%	100%	80.41%	94.50%	99.08%	98.89%	100%	99.23%	97.71%	72.76%	98.61%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		104631	184854	2383	167	385774	86694	116722	201185	6	321133	699	55314	52920
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		86097	169892	2210	167	310230	81934	115649	198954	6	318668	683	40245	52186

NA: Not Applicable, **NP:** Not Provided

Parameter wise Findings (Live Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in UP (West) Service Area is as given below:-

- ***BTS accumulated downtime (benchmark $\leq 2\%$):***
All operators are satisfying the benchmark with values laying between 0.05% & 1.72%.
- ***Worst affected BTSs due to downtime (benchmark $\leq 2\%$):***
All operators are satisfying the benchmark with values laying between 0% & 1.41%.
- ***Call setup success rate (benchmark $\geq 95\%$):*** All operators are satisfying the benchmark with values laying between 96.37% and 99.81%.
- ***SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):*** All operators are satisfying the benchmark with values laying between 0% and 0.86%.
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 satisfying the benchmark with values laying between 0% and 1.82%.
- ***Call drop rate (benchmark $\leq 2\%$):*** All operators are satisfying the benchmark with values laying between 0.21% and 1.48%.
- ***Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):*** Except for Etisalat, Tata (GSM) & Uninor, rest of the operators are satisfying the benchmark with value in between 0.61% and 2.99%.
- ***Connections with good voice quality (benchmark $\geq 95\%$):*** RCom CDMA & Tata (CDMA) service providers have declared that the parameter is not system generated. Rest of operators are satisfying the benchmark with values laying between 95.54% and 99.18%.
- ***Number of POI having $\geq 0.5\%$ POI congestion:*** Most of the operators satisfying the benchmark except BSNL & Uninor showing high POI congestion ($>0.5\%$) in 1 & 8 nos. of POIs respectively.
- ***%age of call answered by operator (electronically) (benchmark $>95\%$):*** Most of the operators are satisfying the benchmark with values laying between 97.11% to 99%. except Aircel, Airtel & Idea are not satisfying the benchmark value of 95%.
- ***%age of call answered by operator (Voice to voice) (benchmark $>90\%$):*** All the operators are satisfying the benchmark except for Aircel, Idea & RCom(CDMA) are not satisfying the benchmark value of 90%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA	
			GSM Operators										CDMA Operators			
(A)	Network Service Quality Parameter															
1	Network Availability															
	a) BTS Accumulated Downtime	≤2%	0.62%	0.15%	1.54%	1.02%	0.07%	0.35%	0.27%	0.89%	0.61%	0.24%	0.15%	0.45%	0.05%	
	b) Worst affected BTSs due to downtime	≤2%	1.88%	0.27%	1.80%	0%	0.22%	0.92%	0%	1.62%	1.81%	0.79%	0%	0.67%	0%	
	c) Total no. of BTSs in the licensed service area		2554	6315	2056	20	5561	2168	1738	2595	441	5920	186	1488	820	
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		11854	7090	23530	152	2921	5721	3464	17168	1988	10677	213	4931	293	
	e) No. of BTSs having accumulated downtime of >24 hours in a month		48	17	37	0	12	20	0	42	8	3514	0	10	0	
2	Connection Establishment (Accessibility)															
	a) CSSR (Call Setup Success Rate)	≥95%	98.17%	97.13%	96.93%	99.16%	99.89%	99.52%	97.83%	96.26%	99.64%	97.12%	99.43%	96.38%	99.40%	
	b) SDCCH/PAGING congestion	≤1%	0.33%	0.44%	0.57%	0.13%	0.96%	0.24%	0.09%	0.36%	0.48%	0.66%	0%	0%	0%	
	c) TCH congestion	≤2%	0.40%	1.03%	0.87%	0.05%	1.58%	0.23%	0.49%	1.90%	0.18%	1.21%	0%	0.42%	0.01%	
3	Connection maintenance (retainability)															
	a) CDR	≤2%	1.06%	1.02%	0.92%	0.51%	1.10%	0.28%	1.16%	1.34%	1.22%	1.35%	0.32%	0.48%	0.31%	
	b) Worst affected cells>3% TCH drop	≤3%	2.86%	1.80%	2.57%	2.58%	2.95%	1.69%	10.09%	4.81%	1.06%	2.98%	1.54%	1.77%	0.57%	
	c) Good voice quality	≤95%	97.16%	96.04%	95.66%	98.21%	96.24%	98.87%	96.66%	96.12%	97.32%	95.95%	99.27%	NA	NA	
	d) Total No. of cells exceeding 3% TCH drop (call drop)		218	341	183	2	491	110	518	367	14	531	8	26	16	
	e) Total no. of cells in the network		7623	18980	2053	60	16691	6504	5201	7796	1323	17801	558	1488	2532	
4	Number of POI having ≥0.5% POI congestion		0	0	1	0	0	0	0	8	0	0	0	0	0	
	a) Name of POI not meeting the benchmark		Nil	Nil	Uninor	Nil	Nil	Nil	Nil	Aircel,Airtel,B SNL,-v- fone,uninor,Rc om,Tata,Idea	Nil	Nil	Nil	Nil	Nil	
	b) Total No. of call attempts on POI (Avg.)		13041191	64079052	2026832	85571	90749407	20046849	279878	50493448	1803834	135529667	143505	20046849	31252443	
	c) Total traffic served on POI (Erlang) (Avg.)		242152	67028	33411	1906	1377806	694340	170	1103898	1512	3477582	2482	1377806	1161433	
	d) Total No. of circuits on POI		22633	38601	80412	2545	132308	1818566	5278	1690264	8458	NP	8721	132308	88609	
	e) Total number of working POI Service Area wise		68	51	18	24	114	139	8	79	25	61	42	139	130	
	f) Capacity of POI		20511	36778	80412	2166	127409	1671622	8235	NP	4911	NP	8392	1671622	83499	

S/ N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
5	Network Data														
	a) Equipped Capacity of Network Erlang		98000	219114	163990	10752	217757	NP	96964	87815	14730	234314	14731	NP	255061
	b) Total traffic in TCBH in erlang (Avg.)		23535	138120	90883		235762	NP	31231	78116	5	205370	1523	NP	77963
	c) Total no. of customers served (as per VLR) on last day of the month		1068356	3658503	1386435	5508	8640897	NP	1240447	1640565	1874	7571429	117917	NP	950350
(B)	Customer Service Quality Parameters														
5	Metering/billing credibility-Post paid	≤0.1%	0.03%	0.04%	0%	NA	0.06%	0.09%	0.17%	NA	NA	0.36%	0%	0.08%	0.11%
	a) No. of bills issued during the period		7071	100067	43389	NA	237324	7975	15564	NA	NA	115539	492	103584	99094
	b) No. of bills disputed including billing complaints during the period		2	36	0	NA	144	7	26	NA	NA	414	0	80	108
6	Metering /billing credibility-Pre paid	≤0.1%	0.04%	0.002%	0.05%	0.003%	0.001%	0.04%	0.10%	0.03%	0%	0.03%	0.11%	0.03%	0.05%
	a) No. of charging / credit / validity complaints during the quarter		822	123	1,682	1	81	2696	2,475	1,141	0	2,399	180	1006	1,475
	b) Total no. of pre-paid customers at the end of the quarter		2135290	7467704	3102310	37952	8887501	6337159	2390855	3382188	9531	9155660	167899	3375211	3112307
7	Resolution of billing/ charging complaints(within 4 weeks)	100%	100%	100%	100%	100%	100%	100%	100%	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		3716	159	1995	1	1015	2703	2501	1141	0	2813	180	1086	1583
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		3716	159	1995	1	1015	2703	2501	1141	0	2813	180	1086	1583
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		824	159	1967	0	225	163	7	0	0	1792	178	154	426
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		2892	0	28	1	790	2540	2494	1141	0	1021	2	932	1157
	e) Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	≤1week	≤1 week	≤1 week	≤1 week	≤1week	≤1 week	≤1week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week	≤1 week

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators		
(B)	Customer Service Quality Parameters														
8	Response time to customers for assistance														
	a) Accessibility of call centre/Customer Care	≥95%	85%	92.10%	98.81%	98.56%	93.91%	98.77%	99%	96.71%	100%	94.30%	NP	98.77%	99%
	b) % call answered by operators(voice to voice) within 60 sec.	≥90%	73.31%	88.31%	93.36%	99.86%	73.27%	90.10%	69.43%	89.74%	96.30%	92.27%	97.41%	73.92%	89.40%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		19751	2074554	18547	1428	3771337	742352	101138	2212624	54	3942900	6942	547453	630212
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		14481	1832080	17317	1426	2763315	668918	70224	1985601	52	3638386	6762	404710	563424
9	Termination/closure of service	≤7days	100%	100%			100%	100%	100%			100%	4%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		59	458			2051	34	206			560	2621	311	972
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		59	458	NP	NA	2051	34	206	NA	NA	560	94	311	972
10	Time taken for refunds of deposits after closures.(within 60 days)	100%	100%	100%			100%	100%	100%			100%	100%	100%	100%

NA: Not Applicable, NP: Not Provided

Parameter-wise Findings (Month Data Assessment):

The parameter wise key takeouts for the Cellular Mobile Telephone Services providers in UP (West) Service Area is as given below:-

Network Parameters:

- **BTS accumulated downtime (benchmark $\leq 2\%$):**
All operators are satisfying the benchmark with values laying between 0.05% and 1.02%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):**
All operators are satisfying the benchmark with values laying between 0% and 1.88%.
- **Call setup success rate (benchmark $\geq 95\%$):**
All operators are satisfying the benchmark with values laying between 96.26% and 99.89%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):**
All operators are satisfying the benchmark with values laying between 0% and 0.96%.
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 satisfying the benchmark with values laying between 0% and 1.90%.
- **Call drop rate (benchmark $\leq 2\%$):**
All operators are satisfying the benchmark with values laying between 0.28% and 1.35%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 5\%$):**
Except TATA (GSM) & Uninor, all the operators are satisfying the benchmark with value in between 0.57% and 2.98%.
- **Connections with good voice quality (benchmark $\geq 95\%$):**
RCom (CDMA) & Tata (CDMA) service providers have declared that the parameter is not system generated. Rest of operators are satisfying the benchmark with values laying between 95.66% and 99.27%.
- **Number of POI having $\geq 0.5\%$ POI congestion:**
All the operators satisfying the benchmark except BSNL & Uninor show high POI congestion in 1 & 8 nos. of POIs respectively.

Customer care and billing parameters:

- **%age of call answered by operator (electronically) (benchmark $> 95\%$):**
Except Airtel, Airtel, Idea & Vodafone, all the operators are satisfying the benchmark with values laying between 96.71% and 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $> 90\%$):**
Except Airtel, Idea, Tata (GSM&CDMA), Uninor & RCom (CDMA), all the operators are satisfying the benchmark with values laying between 90.10% & 99%.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):**
Except Vodafone & Tata (GSM&CDMA), All other operators are satisfying the benchmark.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):**
Except Tata (GSM) & MTS, all the operators are satisfying the benchmark.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):**
All operators are satisfying the benchmark.
- **Termination/Closure of service (Benchmark ≤ 7 days):**
Except MTS, all operators are satisfying the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):**
All the operators are satisfying the benchmark.

(3) Sample Coverage

Switches/BSC/BTS details of operators:

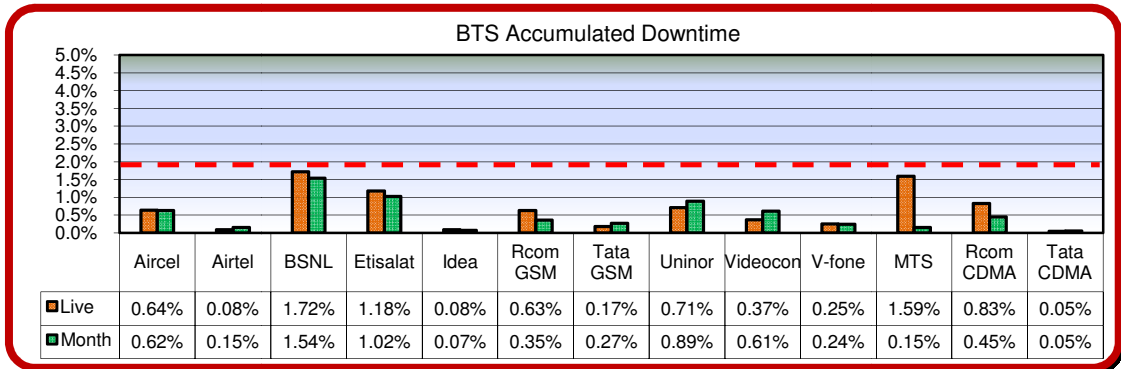
S/N	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	3	23	2554
2	Airtel Ltd	18	65	6315
3	BSNL	11	31	2056
4	Etisalat	1	5	20
5	Idea	13	44	5561
6	Reliance Communication (GSM)	8	2168	6504
7	Tata Communications (GSM)	3	18	1738
8	Vodafone	22	87	5920
9	Videocon	3	6	441
10	Uninor	6	16	2595
CDMA Operators				
11	MTS (CDMA)	1	1	186
12	Reliance Communication (CDMA)	7	4	1488
13	Tata Communications (CDMA)	6	6	820

(4) Performance (Graphical Representation)

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

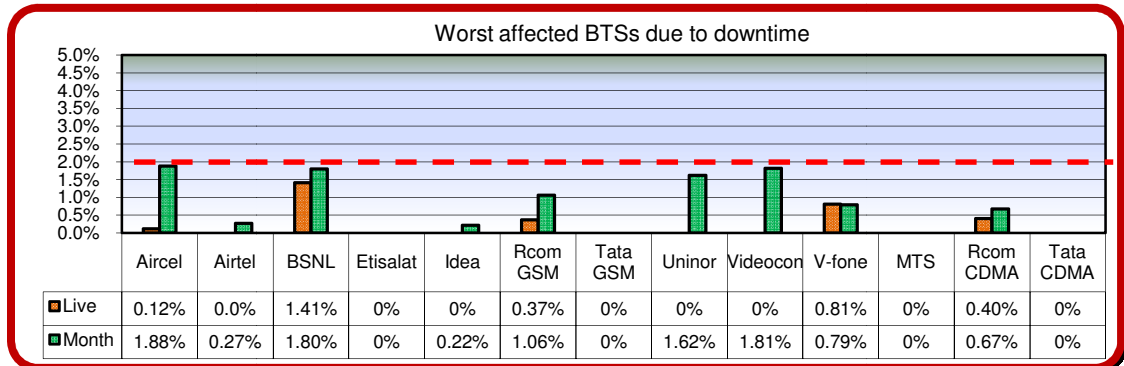
A) NETWORK PERFORMANCE

I. (a) BTS Accumulated Downtime: All operators are satisfying the TRAI benchmarks ($\leq 2\%$) in both live & month of audit.

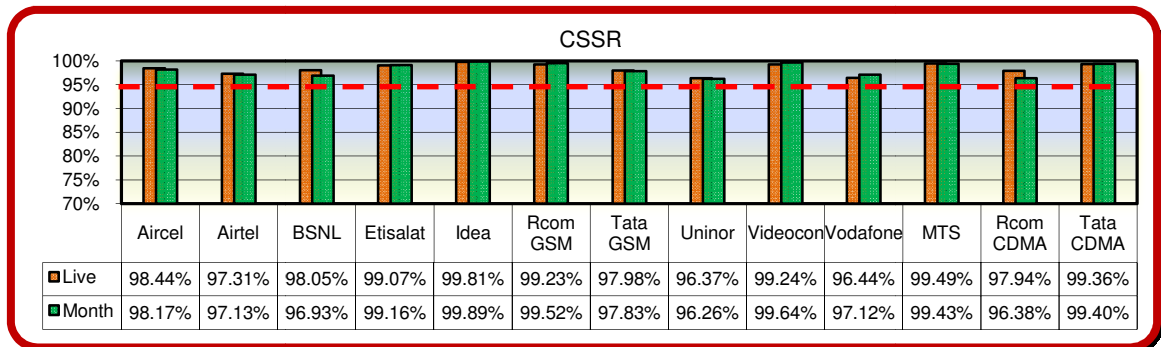


(b) Worst affected BTSs due to downtime (benchmark $\leq 2\%$):

All operators are satisfying the TRAI benchmarks ($\leq 2\%$) in both live & month of audit.

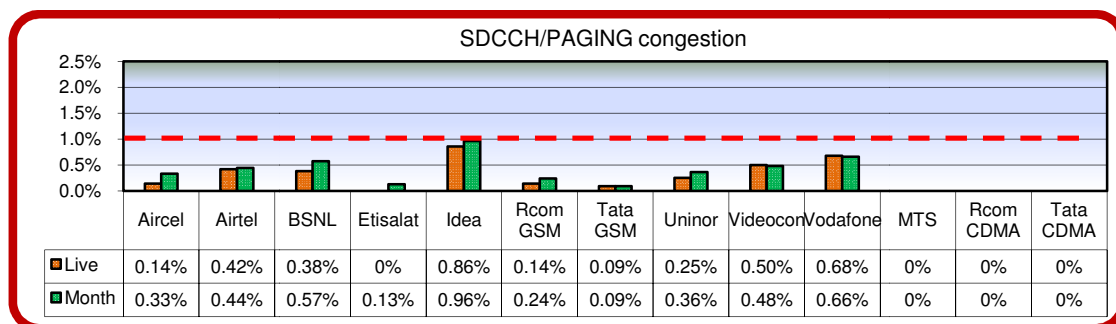


II. Call setup success rate: All operators are satisfying the TRAI benchmarks ($\geq 95\%$) in both live & month of audit.

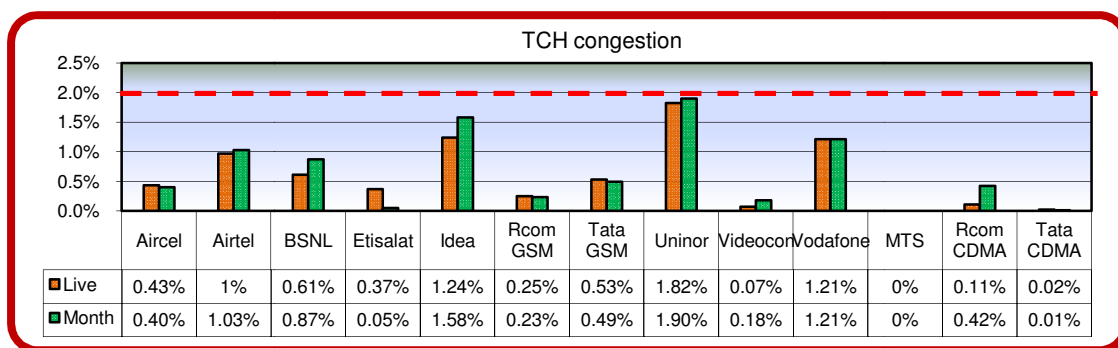


III. Blocked call rate:

SDCCH congestion: All operators are satisfying the TRAI benchmarks ($\leq 1\%$) in both live & month of audit.

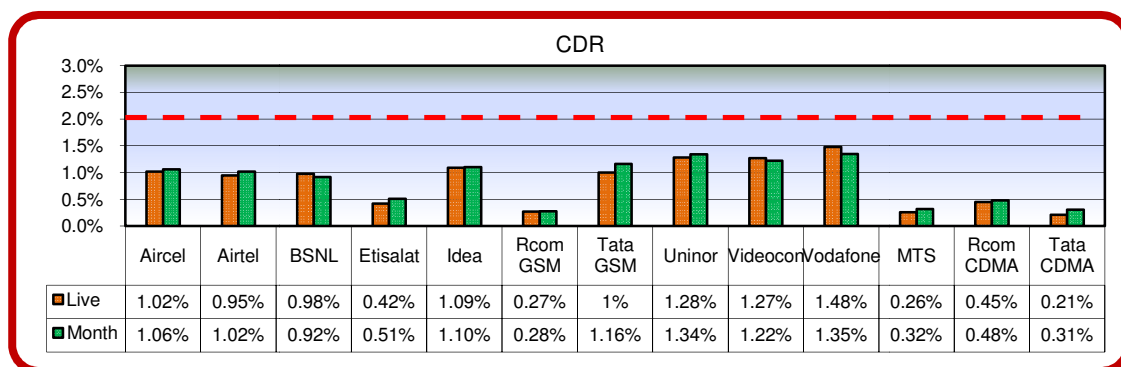


TCH congestion: All operators are satisfying the TRAI benchmarks ($\leq 2\%$) in both live & month of audit except Uninor in case one-month of measurement data.

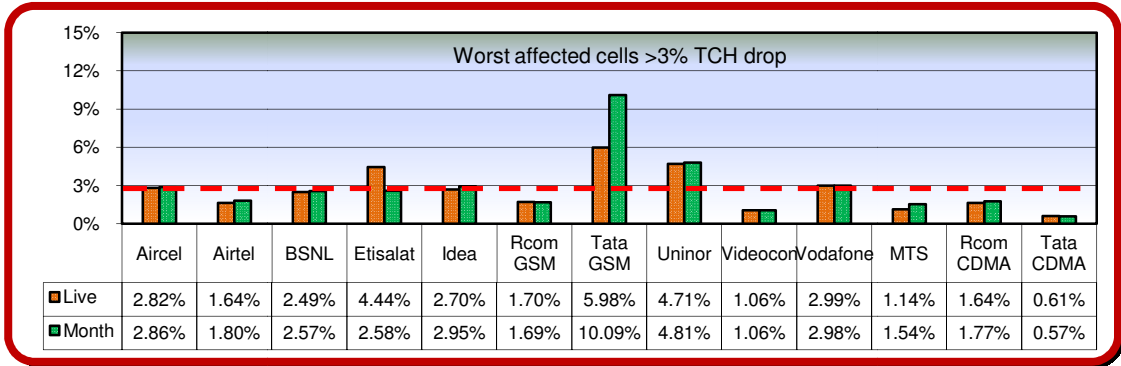


IV. Connection Maintainability (Retainability):

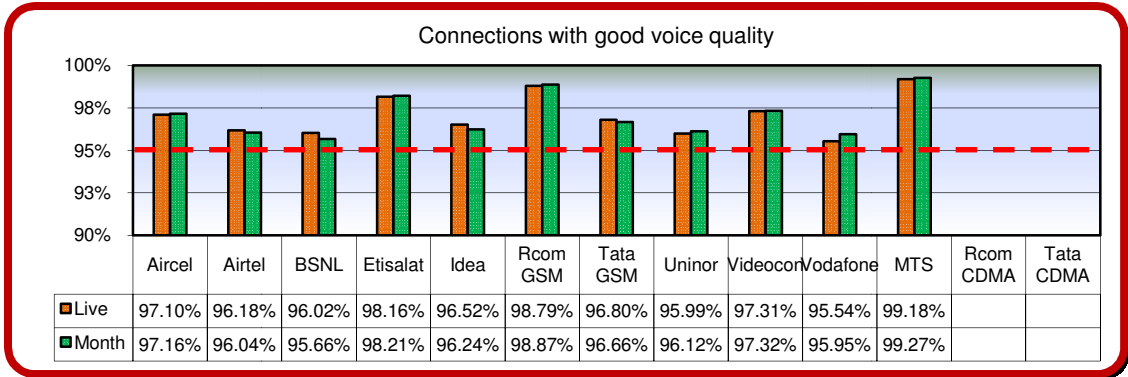
Call drop rate: All operators are satisfying the TRAI benchmarks ($\leq 2\%$) in both live & month of audit.



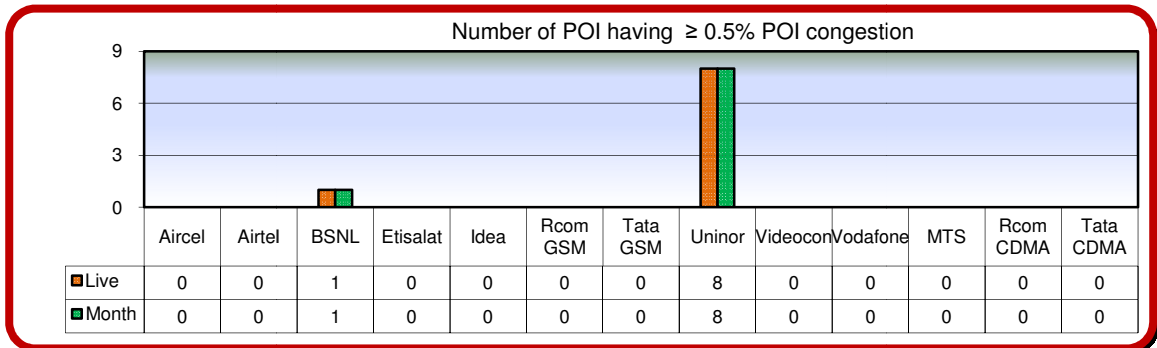
Worst affected Cell exceeding 3% TCH Drop: Etisalat, TATA (GSM) & Uninor are found not satisfying the benchmark of $\leq 3\%$. Rest of the operators are satisfying the benchmark for both cases.



Percentage of connections with good voice quality: All operators are satisfying the TRAI benchmarks ($\geq 95\%$) in both live & month of audit. RCom (CDMA) & Tata (CDMA) have not provide the system generated data.



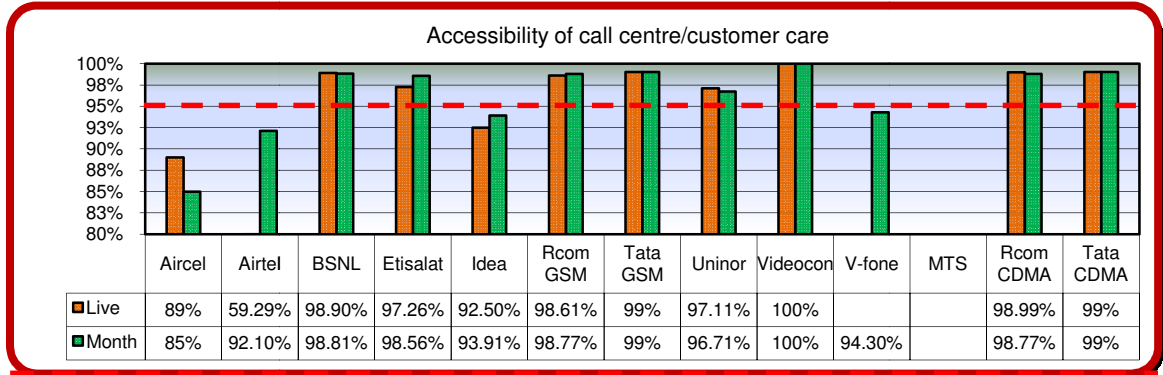
POI Congestion: For both live and month data, 1 & 8 nos. of POI for, BSNL & Uninor are found not satisfying the benchmark $\geq 0.5\%$ congestion. Rest of the operators are satisfying the benchmark for both cases.



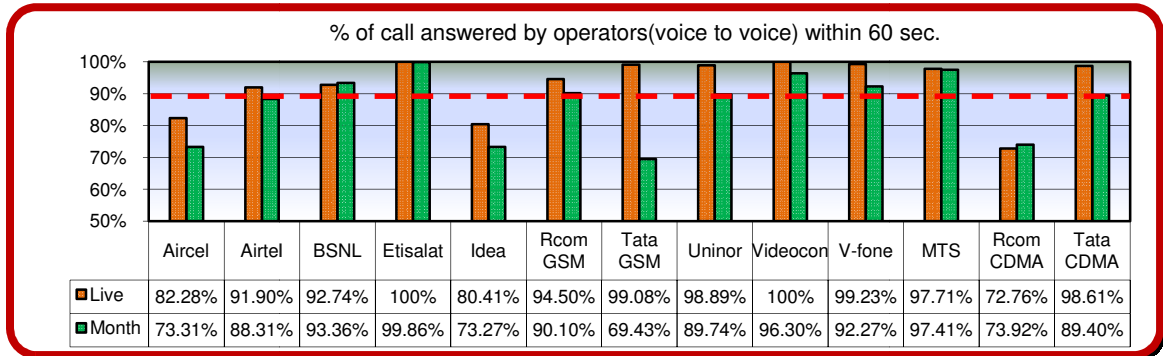
B) CUSTOMER SERVICE QUALITY PARAMETERS

(A) Response time to the customer for assistance:

Percentage of call answered (Electronically): Except Aircel, Airtel, Idea & Vodafone, all operators are satisfying the TRAI benchmarks ($\geq 95\%$) in both live & month of audit.



Percentage of call answered by operators (Voice to voice) within 60 sec: Aircel, Idea, Tata (GSM&CDMA), Uninor & RCom (CDMA) do not meet the 90% benchmark against this parameter. Data has not been provided by Airtel against this parameter.



(5) Critical Analysis

The above comparative study between live data & month data shows mostly similar trends & consistency in live and month data. However, inconsistency in live & month data was found for parameter “*percentage of calls answered by operator*” for Aircel, Airtel, Idea, Vodafone, Tata (GSM&CDMA), Uninor & RCom (CDMA)

Under the network parameters except for the parameter “*Worst affected cells > 3% TCH drop*”, where it is found that Etisalat, TATA (GSM) & Uninor are not satisfying the benchmark, operators are found having satisfactory performance.

In case of “*Number of POI having $\geq 0.5\%$ POI congestion*” it is found that 1 & 8 nos. of POIs of BSNL & Uninor showing high POI congestion.

(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	Etsalat	Idea	RCom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	RCom CDMA	Tata CDMA
Total No. of Calls Attempted	100	100	100	1	100	100	100	100	-	100	100	100	100
Total No. of calls Answered	37	41	29	1	52	33	46	28	-	58	45	39	53
Cases resolved with 4 weeks	37	41	29	1	52	33	46	28	-	58	45	39	53
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%

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

(3) Live calling to Call center

Calling Operator	Aircel	Airtel	BSNL	Etsalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA	
Call Centre No.	121	121	1503	121	12345	333	121	198	121	111	155	*333	121	
Total No. of Calls Attempted	100	100	100	No service in Meerut	100	100	100	100	No service in Meerut	100	100	100	100	
Total No. of calls connected to IVR	100	100	100		100	100	100	100		100	100	100	100	100
Calls got connected to agent within 60 Sec	79	92	91		82	95	95	94		97	98	74	95	
%age of calls got answered	79%	92%	91%		82%	95%	95%	94%		97%	98%	74%	95%	

(4) Level 1 live calling : Meerut

Meerut, UP(West) Circle	Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
	100	2	2	2	2	No service	2	2	2	2	No service	2	2	2	2
	101	2	2	2	2		2	2	2	2		2	2	2	2
	102	2	0	0	0		0	0	0	0		0	0	0	0

Level 1 live calling: Haldwani

Meerut, UP(West) Circle	Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
	100	2	2	2	2	No service	2	2	2	2	No service	2	2	2	2
	101	2	2	2	2		2	2	2	2		2	2	2	2
	102	2	0	0	0		0	0	0	0		0	0	0	0

Level 1 live calling: Agra

Meerut, UP(West) Circle	Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
	100	2	2	2	2	No service	2	2	2	2	No service	2	2	2	2
	101	2	2	2	2		2	2	2	2		2	2	2	2
	102	2	0	0	0		0	0	0	0		0	0	0	0

(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 in their records.

As per test Call result of operator's Call Center it was found that Aircel, Idea & RCom (CDMA) performance are not satisfactory

For 102 Service port is open from operator's side but call not getting connected. As per information 102 service is open from operators end but due to nonpayment issues between BSNL & 102 service for the same is not available in Meerut at present.

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

A sample of 2x50 test calls per Service Providers with in the licensed service area (UP (West) 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	Etisalat	Idea	Rcom GSM	Tata GSM	Uninor	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
Aircel	-	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	97%	-	91%	98%	99%	96%	99%	100%	100%	100%	97%	95%
Etisalat	93%	96%	83%	-	96%	92%	95%	84%	97%	100%	100%	98%	100%
Idea	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	100%
Reliance (GSM)	96%	98%	93%	100%	100%	-	94%	89%	100%	100%	100%	100%	100%
Tata (GSM)	99%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Uninor	92%	97%	98%	83%	100%	97%	96%	-	98%	98%	100%	89%	100%
Videocon	98%	100%	100%	89%	100%	94%	100%	100%	-	100%	100%	100%	97%
Vodafone	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%
MTS	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Reliance (CDMA)	97%	100%	89%	96%	100%	100%	98%	87%	88%	100%	100%	-	86%
Tata (CDMA)	100%	100%	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 UP (West) for all the operators. Route covered was about around 100 Km depending on city areas within the speed limit of 40Km/hr.

Drive Test Locations**Bareilly**

HIGH DENSE: Ghantaghar, barabazar, syamganj market, alamgiriganj market, kotwali

MEDIUM DENSE: Railway station, delhi Roadways, satellite bus stand, gangacharan, hospital, nagarnigam, cannt, circuit house

LOW DENSE: Haldwani bypass, pilibhit bypass, Industrial area, IVRI hospital

Haldwani

HIGH DENSE: Meerabazar, palikabazar, rajpuracolny, haldwani main market, nanitaal road

MEDIUM DENSE: Bombay hospital, subhasnagar, mukhani colony, dc colony, jasfarm

LOW DENSE: Katgodam, rudrapuroad, mukhani road

Agra

HIGH DENSE: Subhash Park, Tehsil, Dhakaran Chowraha, Balluganj,Chippitola

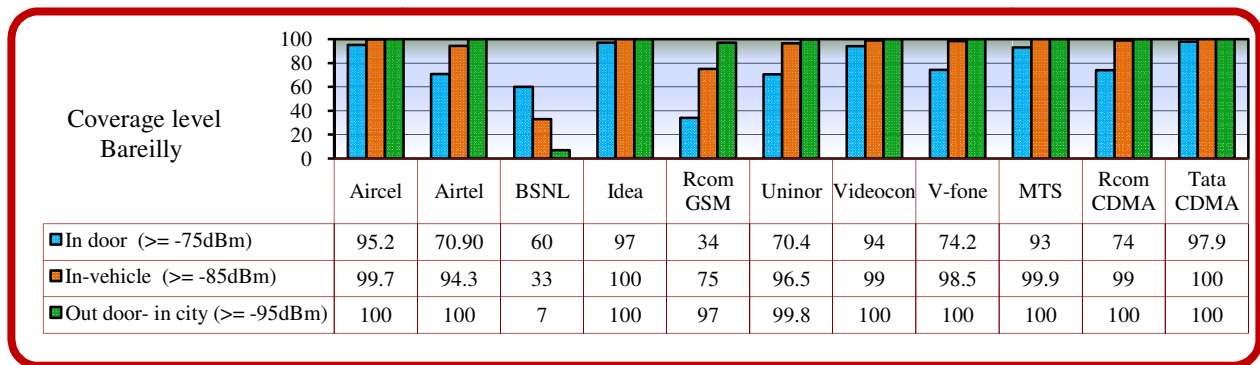
MEDIUM DENSE: Khandari, Dayal Bagh, Kamla Nagar, Sanjay Palace, Agra University & MG Road

LOW DENSE: Fatehabad Rd, Shaheed Nagar, Rajpur chungi, Maal Road, Subhash Park,Bodhla,Sinkandra, Artoni, Raunakta

2) Performance (for the respective cities)

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Uninor	Videocon	V-fone	MTS	Rcom CDMA	Tata CDMA	
			GSM Operators									CDMA Operators		
1.1	Call Attempts	Bareilly	167	297	147	153	179	147	170	210	164	180	178	
		Haldwani	106	95	71	112	95	99	NA	123	NA	96	111	
		Agra	139	131	157	173	162	103	161	96	134	162	112	
1.2	Blocked Call Rate (≤3%)	Bareilly	0.60%	0.67%	5.44%	0%	2.79%	0%	2.94%	0.95%	0%	0%	0%	
		Haldwani	0.94%	0%	0%	0%	2.11%	0%	NA	4.88%	NA	1.04%	0%	
		Agra	0.72%	0.76%	1.27%	0.58%	2.47%	2.91%	2.48%	1.04%	0%	0.62%	0%	
1.3	Dropped Call Rate (≤2%)	Bareilly	0%	0%	0.68%	0%	0.56%	0%	0.59%	0%	0%	0.56%	0%	
		Haldwani	0%	0%	5.63%	0%	0%	0%	NA	0%	NA	0%	0%	
		Agra	0%	0%	2.55%	0%	1.23%	0%	0.62%	0%	0%	1.23%	0%	
1.4	% of connections with good voice quality (≥95%)													
	(i) 0-4 (w/o frequency hopping)	Bareilly	NA									99.29%	97%	97.35%
		Haldwani	NA									NA	100%	99.06%
		Agra	NA									99%	96%	95.56%
	(ii) 0-5 (with frequency hopping)	Bareilly	98.60%	96.5%	93.17%	96%	91%	93.1%	97%	96.50%	NA			
		Haldwani	96.60%	96.2%	97%	97%	96%	94%	NA	95%	NA			
Agra		95.70%	97.3%	95.44%	97%	91%	92%	96%	96.70%	NA				
1.5	Service Coverage													
	In door (≥ -75dBm)	Bareilly	95.2	70.90	60	97	34	70.4	94	74.2	93	74	97.9	
		Haldwani	95.6	40.1	71	97	57	43.2	NA	57.3	NA	78	92.1	
		Agra	90	59	53.3	99	33	41	91	33	91.8	77	93.1	
	In-vehicle (≥ -85dBm)	Bareilly	99.7	94.3	33	100	75	96.5	99	98.5	99.9	99	100	
		Haldwani	99.9	80.3	16	100	93	86.1	NA	95.5	NA	99	99.6	
		Agra	99.4	93.5	34.5	100	77	84	100	90.2	99.9	99	99.7	
	Outdoor- in city (≥ -95dBm)	Bareilly	100	100	7	100	97	99.8	100	100	100	100	100	
		Haldwani	100	100	15	100	100	99.1	NA	99.6	NA	100	100	
Agra		100	99.8	12.2	100	95	99	100	99.8	100	99	100		
1.6	CSSR (≥95%)	Bareilly	99.40%	99%	95.55%	100%	97.21%	100%	96%	99.05%	100%	100%	100%	
		Haldwani	99.06%	100%	88%	100%	97.89%	100%	NA	95.12%	NA	98.96%	100%	
		Agra	99.28%	99.2%	95.66%	100%	97.53%	97%	97%	98.95%	100%	98.1%	100%	

Graphical Representation (Bareilly):

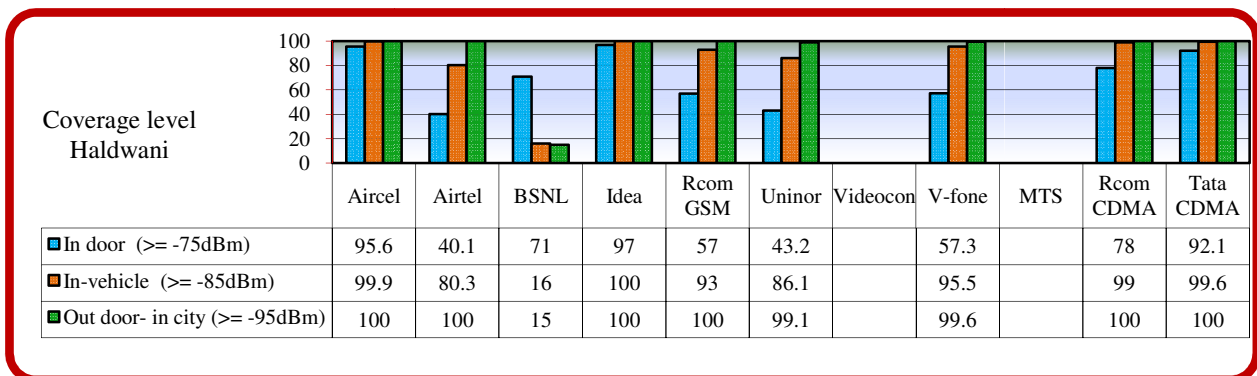


Critical Analysis

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

- For parameter “Blocked Call Rate” BSNL is not satisfying the benchmark.
- For parameter “Percentage of connections with good voice quality” BSNL, RCom (GSM) & Uninor are not satisfying the benchmark.

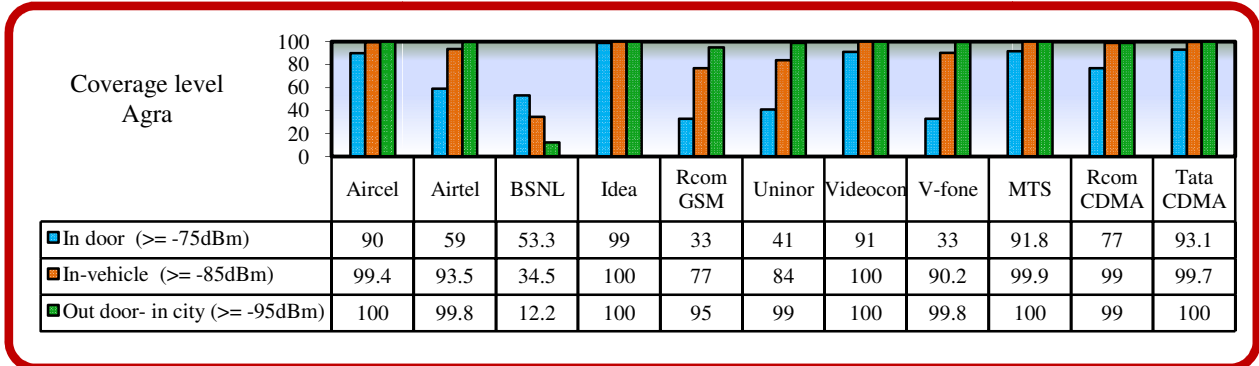
Graphical Representation (Haldwani):



Critical Analysis

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

- For parameter “Blocked Call Rate” Vodafone is not satisfying the benchmark.
- For parameter “Dropped Call Rate” BSNL is not satisfying benchmark.
- For parameter “Percentage of connections with good voice quality” Uninor is not satisfying benchmark.
- For parameter “CSSR” BSNL is not satisfying the benchmark.

Graphical Representation (Agra):**Critical Analysis**

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

- For parameter “Dropped Call Rate” BSNL is not satisfying benchmark.
- For parameter “Percentage of connections with good voice quality” RCom (GSM) & Uninor are not satisfying the benchmark.

Note: MTS & Videocon have no service (Spectrum) in Haldwani and similarly Tata (GSM) has no service in Bareilly, Haldwani & Agra cities. Hence in case of MTS, Videocon & Tata (GSM) drive test is not applicable in respective cities.

(E) Independent Drive Test
Submitted as a separate report

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

From live, month, PMR and Drive Tests findings, it can be concluded that on an average, performance of the operators in the service area, UP (West) is satisfactory for **Network Parameters**.

Only exception is found for the parameter “*Worst affected cells > 3% TCH drop*” as operators like Etisalat, TATA (GSM) & Uninor performance are found below benchmark. Similar trend is also reflected in live data measurement.

In case of “*Number of POI having $\geq 0.5\%$ POI congestion*” it is found that BSNL & Uninor show congestion of $> 0.5\%$ in 1 and 8 nos. of POIs respectively.

Under **Customer Service Quality Parameter** “*operator answered calls (voice-to-voice) within 60 sec*” parameter Aircel, Airtel, Idea, Tata (GSM&CDMA), Uninor, Vodafone, RCom (CDMA) are not fulfilling TRAI benchmark of $\geq 90\%$.

During Drive Tests

High “*Blocked Call Rates*” were found in case of BSNL & Vodafone.

High “*Dropped Call Rates*” were found in case of BSNL.

“*%age of connections with good voice quality*” parameter is not met by BSNL, RCom (GSM) & Uninor.

“*CSSR*” parameter is not satisfying by BSNL.

III. Basic Telephone Service (Wireline) Providers

.....Audit not done for this quarter

IV. Broadband Service Providers

.....Audit not done for this quarter