

REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
NORTH ZONE – JAMMU & KASHMIR 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 (Wire line) 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 wire line, 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) call testing done.

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 Jammu & Kashmir circle. But for parameters such as ‘Worst affected cell exceeding 3% TCH drop’ and ‘BTSs accumulated down time’ CBBH (Cell Bouncing Busy Hour) was taken instead of TCBH (Time Consistent Busy Hours) as per the TRAI new regulation 2009. This has resulted in high value for ‘Cell exceeding 3% TCH drop’ parameter for some of the service providers.

CHAPTER-2: EXECUTIVE SUMMARY

I. Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in Jammu & Kashmir Circle in 1st quarter (January – March2012). 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 Jammu & Kashmir 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	Feb 2012	1900-2000 Hrs
2	Airtel Ltd	Feb 2012	1900-2000 Hrs
3	BSNL	Feb 2012	1900-2000 Hrs
4	Idea	Feb 2012	1900-2000 Hrs
5	Reliance Communication	Feb 2012	1900-2000 Hrs
6	Vodafone	Feb 2012	1900-2000 Hrs
CDMA Operators			
7	Tata Communications	Feb 2012	1900-2000 Hrs

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	Idea	Rcom GSM	Vodafone	Tata CDMA
S/N	Name of Parameter		GSM Operators						
1	Network Availability								
	a) BTS Accumulated Downtime	<=2%	1.51%	0.04%	5.17%	0.20%	0.63%	0.01%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	0.02%	0.00%	0.04%	0.03%	0.00%	0.00%	0.00%
	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	97.74%	99.20%	96.74%	99.35%	99.48%	99.22%	99.12%
	b) SDCCH/PAGING congestion	<=1%	0.29%	0.09%	0.90%	0.04%	0.01%	0.09%	0.05%
	c) TCH congestion	<=2%	1.56%	0.12%	1.82%	0.13%	0.12%	0.78%	0.53%
2	Connection maintenance (retainability)								
	a) CDR	<=2%	1.51%	0.79%	1.89%	1.32%	0.55%	1.04%	0.05%
	b) Worst affected cells>3% TCH drop	<=3%	4.91%	1.58%	0.19%	2.47%	0.17%	2.81%	0.53%
	c) Good voice quality	>=95%	95.17%	98.77%	NA	95.68%	98.61%	97.57%	NA
3	No. of POI's having congestion >0.5%		0	0	0	0	0	0	0
4	Response time to customers for assistance								
	a) Accessibility of call centre/Customer Care	>=95%	99%	100.00%	100.00%	100.00%	99.01%	100%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	94.63%	93.50%	95.46%	97.15%	93.89%	98.34%	100.00%

NA: Not Applicable, NR: Not Received

From the 3 days live data assessment, it is found that all the operators are meeting the network parameters, except for BSNL which is found not meeting the benchmark for "BTS Accumulated Downtime", Aircel is not meeting the benchmark for "Worst affected cells>3% TCH drop". CDMA operators & BSNL has declared that "Good voice quality" BM was not system generated.

Performance related to customer care data is found to be satisfactory for most of the operators.

Month data assessment

One Month Data Audit		Bench-mark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
S/N	Name of Parameter		GSM Operators						CDMA
(A)	Network Service Quality Parameter								
1	Network Availability								
	a) BTS Accumulated Downtime	<=2%	1.71%	0.04%	4.27%	0.21%	0.58%	0.03%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	0.01%	0.00%	0.04%	0.03%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	97.43%	99.13%	97.62%	99.29%	99.47%	99.37%	99.18%
	b) SDCCH/PAGING congestion	<=1%	0.34%	0.08%	0.87%	0.09%	0.01%	0.28%	0.02%
	c) TCH congestion	<=2%	1.89%	0.13%	1.68%	0.14%	0.11%	0.64%	0.46%
3	Connection maintenance (retainability)								
	a) CDR	<=2%	1.57%	0.78%	1.73%	1.29%	0.56%	1.14%	0.95%
	b) Worst affected cells>3% TCH drop	<=3%	4.68%	1.56%	0.18%	2.76%	0.16%	2.75%	2.12%
	c) Good voice quality	>=95%	95.14%	98.85%	NA	95.64%	98.60%	97.55%	NA
4	No. of POI's having congestion >0.5%		0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters								
5	Metering/billing credibility-Post paid	<= 0.1%	0.00%	0.01%	0.05%	0.02%	0.01%	0.01%	0.16%

6	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.01%	0.00%	0.07%	0.07%	0.10%	0.02%	0.02%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	100%	100%	100%
	a) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	≤ 1 week	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance								
	a) Accessibility of call centre/Customer Care	$\geq 95\%$	98%	99.03%	100.00%	100.00%	98.99%	100%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	$\geq 90\%$	83.77%	95.15%	95.21%	92.73%	94.88%	96.75%	93.36%
9	Termination/closure of service	≤ 7 days	100%	100%	100%	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	100%	100.00%	100%	100%	100%	100%	100%

NA: Not Applicable, NR: Not Received

From the month data assessment, it is found that all the operators are meeting the network parameters , except for BSNL which is not meeting the benchmark for "BTS Accumulated Downtime" & Aircel not meeting the BM "Worst affected cells>3% TCH drop" .

Performance related to customer care data is found to be satisfactory for most of the operators for the parameter "calls answered by operators (voice-to-voice)" BM was not meet by Aircel. "Metering/Billing Credibility (Post/Pre-Paid)" BM was not meet by TATA CDMA. BSNL & TATA CDMA has declared that "Good voice quality" parameter was not system generated.

NA: Not Applicable, NR: Not Received

Operator-Assisted Drive Test

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						
1.1	Call Attempts	Udhampur	94	119	98	75	72	90	97
		Budgam	88	69	79	44	115	107	35
		Kupwara	85	77	98	No Service	92	94	39
1.2	Blocked Call Rate (<=3%)	Udhampur	0.00	0.00	2.04	0.00	1.38	2.22	0.00
		Budgam	0.00	1.44	8.86	0.00	0	3.74	0.00
		Kupwara	0.00	0.00	4.08	No Service	0.00	0.00	0.00
1.3	Dropped Call Rate (<=2%)	Udhampur	0.00	0.00	2.04	0.00	0.00	0.00	2.06
		Budgam	0.00	0.00	0.00	0.00	0.00	0.00	2.85
		Kupwara	0.00	0.00	4.08	No Service	0.00	0.00	0.00
1.4	Percentage of connections with good voice quality (=>95%) (i) 0-4 (w/o frequency hopping)	Udhampur							97.97
		Budgam							97.27
		Kupwara							97.38
	(ii) 0-5 (with frequency hopping)	Udhampur	95.1	95.6	96.1	95.9	97.1	98.9	
		Budgam	95.4	97.3	96.3	98.1	97.36	98.8	
		Kupwara	96.7	97.6	93.7	No Service	98.44	99.3	
1.5	Service Coverage (%) In door (>= -75dBm)	Udhampur	79	81.78	81.3	48.7	47.9	90.13	91.88
		Budgam	55	89.2	54.5	74.1	65.7	92	87.34
		Kupwara	32	85.4	55.7	No Service	57.81	72	80.15
	In-vehicle (>= -85dBm)	Udhampur	96	99.9	96.1	78.52	86.72	98.73	99.96
		Budgam	87	98.3	93.3	86.6	93.26	99	99.92
		Kupwara	46	97	86	No Service	94.84	95	98.56
	Out door- in city (>= -95dBm)	Udhampur	100	100	100	100	99.32	99.99	100
		Budgam	99	100	100	100	99.28	100	100
		Kupwara	100	100	100	No Service	99.94	100	99.61
1.6	Call Setup Success Rate (>=95%)	Udhampur	100	100	97.96	100	98.62	97.78	100
		Budgam	100	98.56	91.14	100	100	96.26	100
		Kupwara	100	100	95.92	No Service	100	100	100

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

1. Blocked call rate parameter is not met by BSNL in Budgam & Kupwara and Vodafone in Budgam.
2. Dropped call rate parameter is not met by BSNL in Udhampur & Kupwara, TATA CDMA in Udhampur & Budgam.
3. Percentage of connection with good voice quality BM was not met by BSNL in Kupwara.
4. CSSR BM was not met by BSNL in Budgam.

Overall performance of BSNL was not found to be satisfactory during the drive test. Idea has having no coverage in Kupwara as there is no BTS site.

Independent Drive Test

SN	Parameter	Aircel	BSNL	Reliance GSM	Tata CDMA
		Kulgam	Kulgam	Kishtwar	Reasi
1.1	Call Attempts	65	112	64	34
1.2	Blocked Call Rate (<=3%)	1.53	15.20	0	0
1.3	Dropped Call Rate (<=2%)	0.00	2.67	0	0
1.4	Percentage of connections with good voice quality (=>95%)				
	(i) 0-4 (w/o frequency hopping)				97.84
	(i) 0-5 (with frequency hopping)	95.9	84	98.51	
1.5	Service Coverage (%)				
	In door (>= -75dBm)	58	33.2	76.13	80.09
	In-vehicle (>= -85dBm)	89	61	99.25	97.01
	Out door- in city (>= -95dBm)	100	100	100	100
1.6	Call Setup Success Rate (>=95%)	98.47	84.80	100	100

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

1. Blocked call rate BM was not met by BSNL in Kulgam.
 2. Dropped call rate BM was not met by BSNL in Kulgam.
 3. Good voice Quality benchmark was not met by BSNL in Kulgam.
 4. CSSR BM was not met by BSNL in Kulgam.
- BSNL was found not meeting any of the benchmark in Kulgam except for “Service coverage” BM.

CHAPTER-3: AUDIT-PMR VERIFICATION

I. Cellular Mobile Telephone Service

PMR		Bench- mark	Audit	Aircel	Airtel	BSNL	Idea	Rcom GSM	V-fone	Tata CDMA
S/N	Name of Parameter									
(A)	Network Service Quality Parameter									
1	Network Availability									
	BTS Accumulated Downtime	<=2%	Reported	0.35%	0.12%	1.90%	0.12%	0.27%	0.00%	0.05%
			Verified	0.35%	0.12%	1.90%	0.12%	0.27%	0.00%	0.05%
	Worst affected BTSs due to downtime	<=2%	Reported	3%	0.30%	1.83%	0.07%	0.85%	0.00%	0.00%
			Verified	3%	0.30%	1.83%	0.07%	0.85%	0.00%	0.00%
2	Connection Establishment (Accessibility)									
	CSSR (Call Setup Success Rate)	>=95%	Reported	96.06%	99.11%	98.00%	98.91%	99.52%	98.65%	99.13%
			Verified	96.06%	99.11%	98.00%	98.91%	99.52%	98.65%	99.13%
	SDCCH/PAGING congestion	<=1%	Reported	0.38%	0.13%	0.90%	0.10%	0.15%	0.36%	0%
			Verified	0.38%	0.13%	0.90%	0.10%	0.15%	0.36%	0%
	TCH congestion	<=2%	Reported	3.83%	0.15%	1.90%	0.65%	0.66%	0.70%	0.11%
Verified			3.83%	0.15%	1.90%	0.65%	0.66%	0.70%	0.11%	
3	Connection maintenance (retainability)									
	CDR	<=2%	Reported	1.21%	0.86%	2.00%	1.57%	0.29%	1.09%	0.85%
			Verified	1.21%	0.86%	2.00%	1.57%	0.29%	1.09%	0.85%
	Worst affected cells>3% TCH drop	<=3%	Reported	4.04%	1.69%	4.83%	2.91%	0.71%	2.87%	1.78%
			Verified	4.04%	1.69%	4.83%	2.91%	0.71%	2.87%	1.78%
	Good voice quality	>=95%	Reported	92.38%	98.60%	98.00%	96.19%	97.72%	97.58%	98.99%
Verified			92.38%	98.60%	98.00%	96.19%	97.72%	97.58%	98.99%	

4	No. of POI's having congestion >0.5%		Reported	1	0	0	0	0	0	0
			Verified	1	0	0	0	0	0	0
(B)	Customer Service Quality Parameters									
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.02%	0.01%	0.10%	0.06%	0.09%	0.06%	0.00%
			Verified	0.02%	0.01%	0.10%	0.06%	0.09%	0.06%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.02%	0.01%	0.10%	0.00%	0.06%	0.01%	0.00%
			Verified	0.02%	0.01%	0.10%	0.00%	0.06%	0.01%	0.00%
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	99%	100%	100%	100%	100%
			Verified	100%	100%	99%	100%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	Reported	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance									
			Accessibility of call centre/Customer Care	>=95%	Reported	100%	100%	100%	96%	99%
	Verified	100%			100%	100%	96%	99%	100%	99%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	90%	93%	96%	89%	97%	87%	96%
Verified			90%	93%	96%	89%	97%	87%	96%	
9	Termination/closure of service									
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	100%	100%	100%	100%

Critical Analysis (PMR Verification):

The figures proved by all the operators match the figures obtained on verification.

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	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						
A	Network Service Quality Parameter								
1	Network Availability								
	a) BTS Accumulated Downtime	<=2%	1.51%	0.04%	5.17%	0.20%	0.63%	0.01%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	0%	0%	0.04%	0.03%	0.00%	0%	0%
	c) Total no. of BTSs in the licensed service area		1805	2446	1122	480	954	1181	274
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1963	62	4178	70	436	10	8
	e) No. of BTSs having accumulated downtime of >24 hours in a month		20	0	30	12	1	0	0
	c) CSSR	>=95%	97.74%	99.20%	96.74%	99.35%	99.48%	99.22%	99.12%
	d) SDCCH/PAGING congestion	<=1%	0.29%	0.09%	0.90%	0.04%	0.01%	0.09%	0.05%
	e) TCH congestion	<=2%	1.56%	0.12%	1.82%	0.13%	0.12%	0.78%	0.53%
2	Connection maintenance								0.00%
	a) CDR	<=2%	1.51%	0.79%	1.89%	1.32%	0.55%	1.04%	0.93%
	b) Cells having > 3% TCH drop	<=3%	4.91%	1.58%	0.19%	2.47%	0.17%	2.81%	2.08%
	c) Good voice quality	>=95%	95.17%	98.77%	NP	95.68%	98.61%	97.57%	0.00%
	d) No. of cells > 3% TCH drop		794	338	18	106	15	297	56
	e) Total no. of cells in the network		5385	7150	3102	1430	2862	3529	898
3	No. of POI's having congestion >0.5%		0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL	NIL
	b) Total No. of circuits on POI		60,116	24,902	25,403	6,001	14,345	23,015	8,378
	c) Avg No. of call attempts on POI		39,745	243,050	308,708	95,309	212,863	427,899	34,440
	d) Avg traffic served on POI (Erlang)		563	10,926	30,763	7,944	6,830	10,940	793

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e) Total number of working POI Service Area wise		51	18	22	18	30	42	42
f) Capacity of POI		60120	24202	14816	5356	12145	22011	8378
g) Equipped Capacity of Network in respect of Traffic in erlang		124847	135028	12275	#REF!	40000	26883	62525
h) Total traffic handled in TCBH in erlang		48539	80476	77786	5518	24778	20765	19873
(B) Customer Service Quality Parameters								
4 Response time to customers for assistance								
a) Accessibility of call centre	>=95%	99%	100.00%	100.00%	100.00%	99.01%	100%	100.00%
b) % of call answered by operators(voice to voice) within 60 sec	>=90%	94.63%	93.50%	95.46%	97.15%	93.89%	98.34%	100.00%
c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		17,478	181,886	200	257,342	619,118	1,206,430	30,168
d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		17,478	180,716	200	241,684	612,104	1,206,430	19,972

NA: Not Applicable, NP: Not Provided

Parameter-wise Findings (Live Data Assessment):

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

- **“BTS Accumulated Downtime”:** All operators are meeting the benchmark with values laying between 0.01% and 1.51%.
- **“Worst affected BTSs due to downtime”:** All operators are meeting the benchmark with values laying *between* 0% and 0.04%.
- **“Call setup success rate (benchmark \geq 95%)”:** All operators are meeting the benchmark with values laying between 96.74% and 99.48%.
- **SDCCH/PAGING Channel congestion (benchmark \leq 1%):** All the operators are meeting the benchmark with values laying between 0.01% and 0.90%.

Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.

- **TCH congestion (benchmark \leq 2%):** All the operators are meeting the benchmark with values laying between 0.12% and 1.82%.
- **Call drop rate (benchmark \leq 2%):** All operators are meeting the benchmark with values laying between 0.55% and 1.89%.
- **Cell exceeding 3% TCH drop (benchmark \leq 3%):** Except for Aircel with a value of 4.91%, rests of the operators are satisfying the benchmark with value in between 0.17% and 2.81%.
- **Connections with good voice quality (benchmark \geq 95%):** All the GSM operators are meeting the benchmark with values lying between 95.17% and 98.77%. CDMA operator & BSNL has not provided the data as same is not system generated.
- **No. of POI's having >0.5% Congestion:** All the operators are meeting the benchmark. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark $>95%$):** All the operators are meeting the benchmark with values laying between 99.01% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90%$):** All the operators are meeting the benchmark with values laying between 93.50% to 100%.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	Benchmark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						
(A)	Network Service Quality Parameter								
1	Network Availability								
	a) BTS Accumulated Downtime	<=2%	1.71%	0.04%	4.27%	0.21%	0.58%	0.03%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	0.01%	0.00%	0.04%	0.03%	0.00%	0.00%	0.00%
	c) Total no. of BTSs in the licensed service area		1805	2,446	1,122	480	954	1,181	274
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		21544	724	33326	710	3855	213	152
	e) No. of BTSs having accumulated downtime of >24 hours in a month		171	1	279	116	14	0	0
2	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	97.43%	99.13%	97.62%	99.29%	99.47%	99.37%	99.18%
	b) SDCCH/PAGING congestion	<=1%	0.34%	0.08%	0.87%	0.09%	0.01%	0.28%	0.02%
	c) TCH congestion	<=2%	1.89%	0.13%	1.68%	0.14%	0.11%	0.64%	0.46%
3	Connection maintenance (retainability)								
	a) CDR	<=2%	1.57%	0.78%	1.73%	1.29%	0.56%	1.14%	0.95%
	b) Worst affected cells>3% TCH drop	<=3%	4.68%	1.56%	0.18%	2.76%	0.16%	2.75%	2.12%
	c) Good voice quality	>=95%	95.14%	98.85%	NP	95.64%	98.60%	97.55%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		7311	3238	159	1146	135	2819	551

	e) Total no. of cells in the network		5385	7150	3102	1430	2862	3529	898
4	No. of POI's having congestion >0.5%	$\leq 0.5\%$	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL	NIL
	b) Total No. of call attempts on POI (Avg.)		37,000	320,116	241,796	89,218	192,025	394,442	22,821
	c) Total traffic served on POI (Erlang) (Avg.)		548	10,107	46,969	7,907	6,120	10,615	791
	d) Total No. of circuits on POI		60,116	24,902	25,403	6,001	14,345	23,015	8,378
	e) Total number of working POI Service Area wise		51	18	22	18	30	42	42
	f) Capacity of POI		60,120	24,202	NR	5,356	13,276	22,011	8,378
5	Network Data								
	a) Equipped Capacity of Network Erlang		124847	135028	12275	12275	40000	26883	62525
	b) Total traffic in TCBH in erlang (Avg.)		48539	80476	5518	5518	24778	20765	19873
	c) Total no. of customers served (as per VLR) on last day of the month		1350726	1973084	156117	156,117	370533	541224	80963
(B)	Customer Service Quality Parameters								
5	Metering/billing credibility-Post paid	$\leq 0.1\%$	0.00%	0.01%	0.01%	0.02%	0.01%	0.01%	0.16%
	a) No. of bills issued during the period		99954	58524	791887	11843	19142	21633	45141
	b) No. of bills disputed including billing complaints during the period		0	4	130	2	1	3	71
6	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.01%	0.00%	0.02%	0.07%	0.10%	0.02%	0.02%
	a) No. of charging / credit / validity complaints during the quarter		120	77	185	109	501	142	10

	b) Total no. of pre-paid customers at the end of the quarter		1,460,612	2,309,143	6,53,325	151,226	501,356	664,338	62,421
7	Resolution of billing/ charging complaints	<i>100% within 4 weeks</i>	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		120	81	315	111	502	145	81
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		120	81	315	111	502	145	81
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		120	81	302	111	502	145	81
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		0	0	13	0	0	0	0
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<i><=1 week</i>	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance								
	a) Accessibility of call centre/Customer Care	<i>>=95%</i>	98.20%	99.03%	100.00%	100.00%	98.99%	100%	100.00%
	b) % call answered by operators(voice to voice) within 60 sec.	<i>>=90%</i>	83.77%	95.15%	95.21%	92.73%	94.88%	96.75%	93.36%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		112,641	1,358,022	81,568	115,093	46,582	22,629	8,175

	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		94,354	1,292,187	77,660	106,722	44,196	21,894	7,632
9	Termination/closure of service	<i><=7days</i>	100%	100%	100%	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		1,709	319	760	67	38	84	630
	b) No. of requests for Termination / Closure of service complied within 7 days during the quarter		1,709	319	760	67	38	84	630
10	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	100%	100.00%	100%	100%	100%	100%	100%

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark <=2%):** Except for BSNL, all operators are meeting the benchmark with values laying between 0.03% and 1.71%.
- **Worst affected BTSs due to downtime (benchmark <= 2%):** All operators are meeting the benchmark with values laying between 0% and 0.04%.
- **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values in between 97.43% and 99.47%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0.01% and 0.87%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark <= 2%):** All the operators are meeting the benchmark with values in between 0.11% and 1.89%.
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values in between 0.56% and 1.73%.
- **Cell exceeding 3% TCH drop (benchmark <= 3%):** Except for Aircel, all the other operators are satisfying the benchmark with value in between 0.16% and 2.76%.
- **Connections with good voice quality (benchmark >= 95%):** All the operators are satisfying the benchmark with values in between 95.14% and 98.85%. TATA CDMA operator & BSNL have declared that data is not system generated.
- **No. of POI's having >0.5% congestion:** All the operators are found meeting the benchmark. There was no congestion found overall on the POI, but cases were found where individual POIs are showing high utilization/usage. Some are in the range of over 100% though causing no traffic failure due to overflow technique i.e. the extra traffic is carried over by some other operating POI as has been designed to do so.
- **%age of call answered by operator (electronically) (benchmark >95%):** All operators are meeting the benchmark with values in b/w 98.20% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark >90%):** Except for Aircel ,all operators are meeting the benchmark with values in between 92.73% to 96.75%.
- **Metering and billing credibility-Postpaid (benchmark <= 0.1%):** Except for Tata CDMA ,all the operators are meeting the benchmark with values in between 0% and 0.02%.
- **Metering and billing credibility-Pre paid (benchmark <= 0.1%):** All the operators are meeting the benchmark with values in between 0% and 0.10%.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark <= 7 days):** All operators are satisfying the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):** All operators are satisfying the benchmark.

(3) Sample Coverage

Switches/BSC/BTS details of operators:

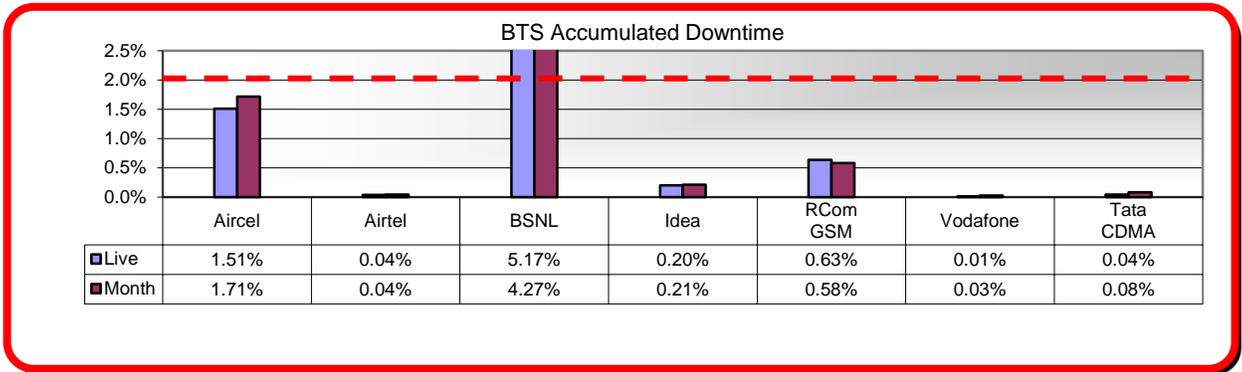
S/N	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	5	22	1805
2	Airtel Ltd	11	27	2446
3	BSNL	8	21	1122
4	Idea	2	3	480
5	Reliance Communication	2	6	954
6	Vodafone	4	15	1181
CDMA Operator				
7	Tata Communications	2	2	2742

(4) Performance (Graphical Representation)

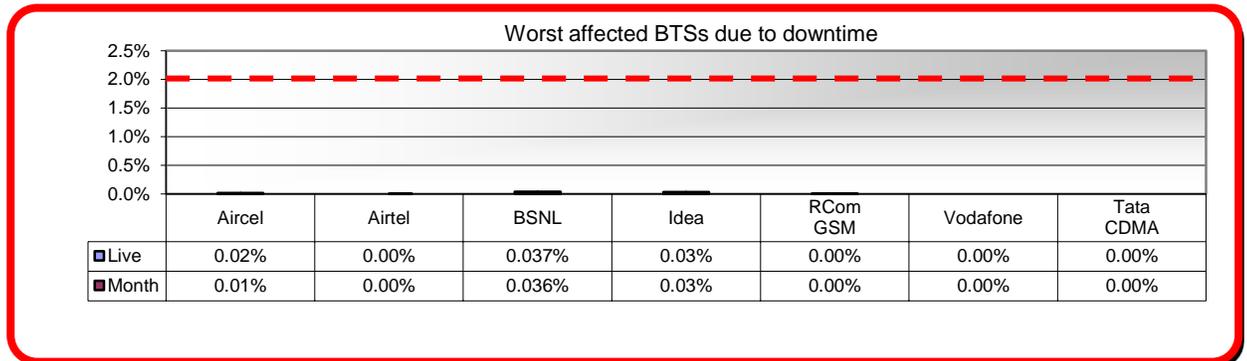
Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services

A) NETWORK PERFORMANCE

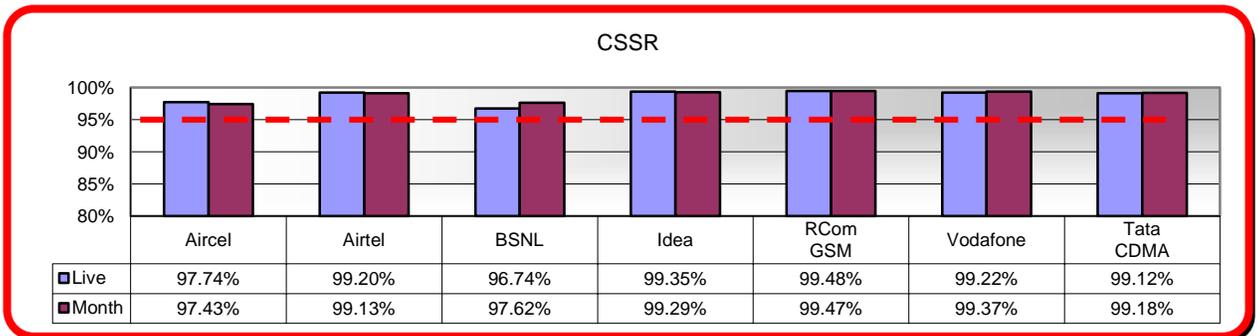
BTS accumulated downtime: Except for BSNL which is found not meeting the BM in both One month & 3 days live audit, all operators are meeting the TRAI benchmarks in both one month & live data Audit.



Worst affected BTSs due to downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.

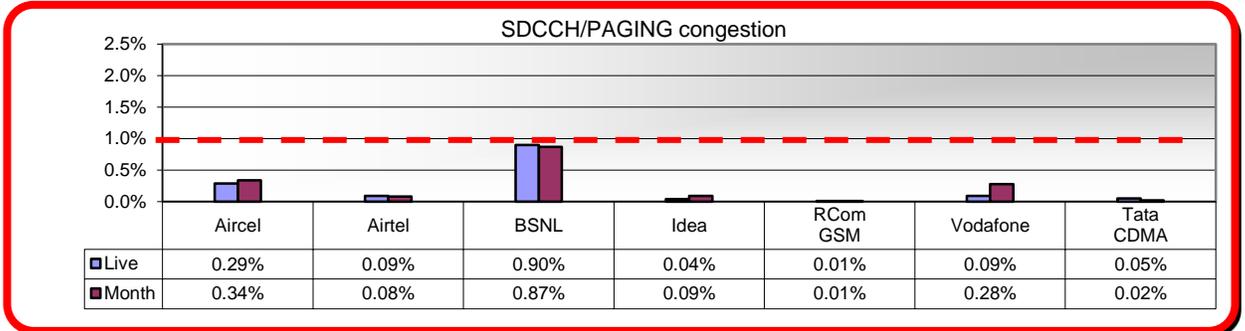


Call setup success rate: All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit.

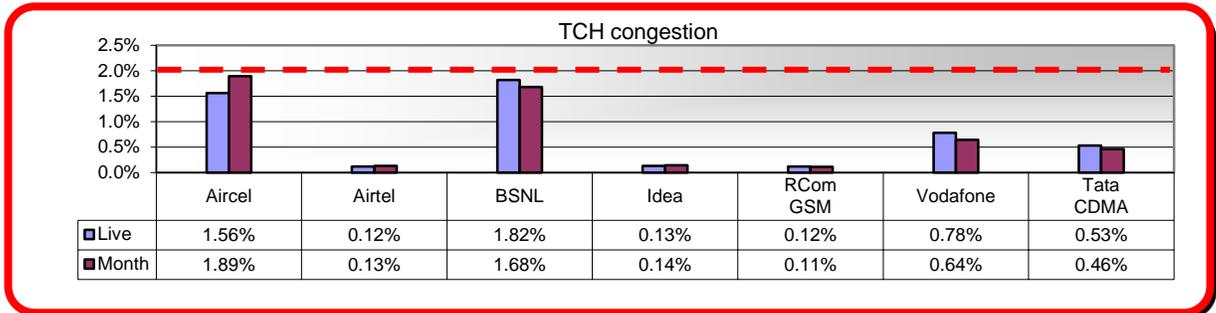


Blocked call rate:

SDCCH congestion (%): All operators have satisfied the benchmark successfully in both live and month audit

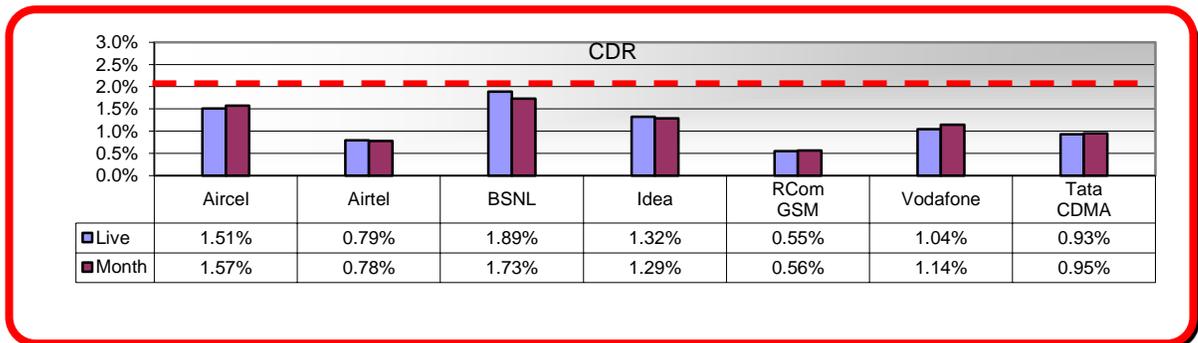


TCH congestion (%): All the operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

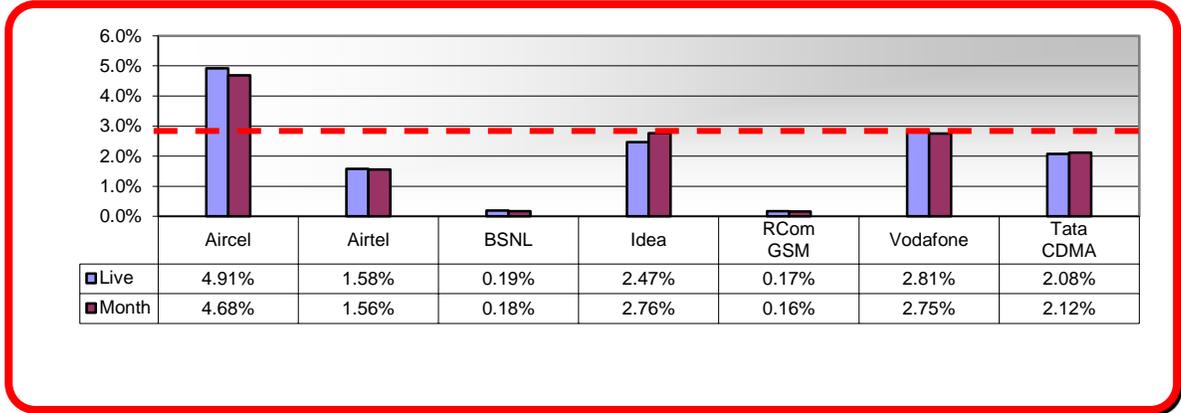


Connection Maintainability (Retainability):

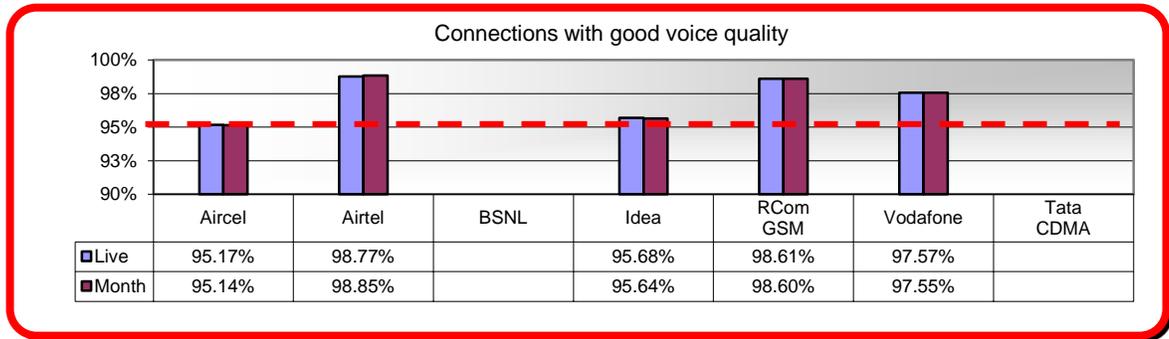
Call drop rate ($\leq 2\%$): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



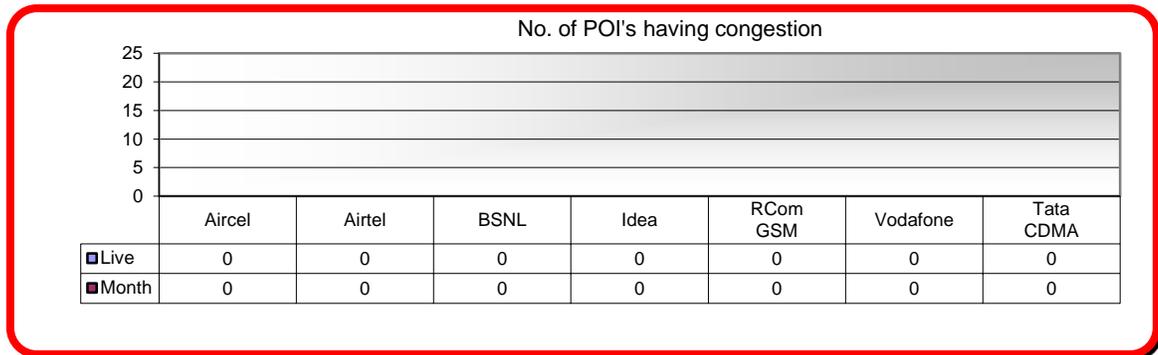
Worst affected Cell exceeding 3% TCH Drop: For both live and month data, Aircel is found not meeting the benchmark of $\leq 3\%$. Rests of the operators are meeting the benchmark for both cases.



Percentage of connections with good voice quality (benchmark $\geq 95\%$): All the operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit. BSNL and CDMA operator has declared that data is not system generated.



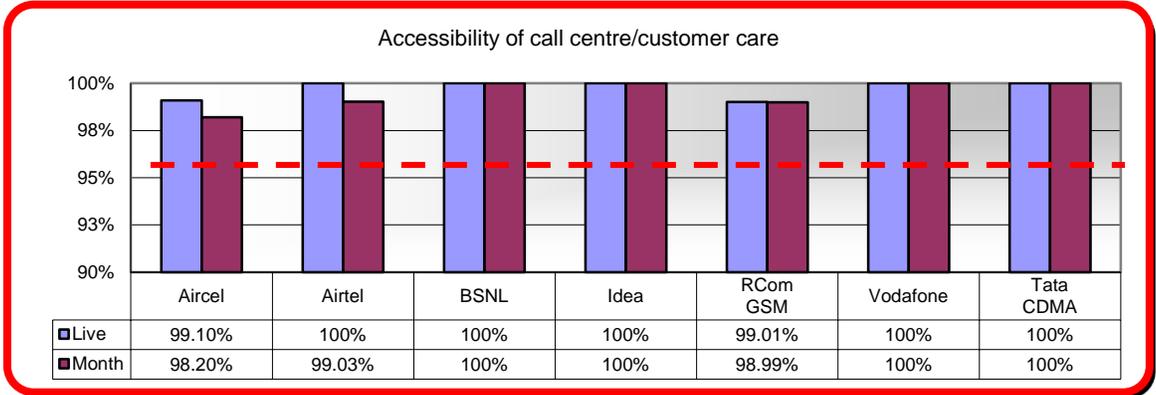
No. of POI's having $>0.5\%$ Congestion: All the operators are meeting the TRAI benchmarks ($\leq 0.5\%$) for both one month data and 3 days live data taken in the month of audit.



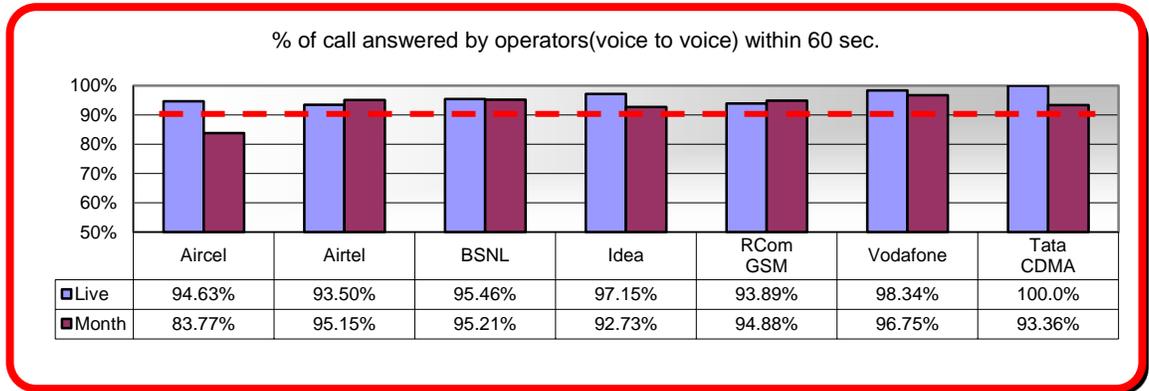
B) CUSTOMER SERVICE QUALITY PARAMETERS

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.



Percentage of call answered by operators (Voice to voice) within 60 sec: Aircel is found not meeting the BM in Month data audit ,all other operators are meeting benchmark for both live and month data audit.



(5) Critical Analysis

The above comparative study between live data & month data shows similar trends in both the cases. However, inconsistency in live & month data was found for parameters like “BTS accumulated downtime” ,“Worst affected cells>3% TCH drop” ,”% call answered by operators(voice to voice) within 60 sec.”.

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

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

(2) Performance (live calling for billing complaints)

Calling Operator	Aircel	Airtel	BSNL	Idea	Rcom GSM	V-fone	Tata CDMA
Total No. of Calls Attempted	10	12	12	6	8	9	8
Total No. of calls Answered	10	12	12	6	8	9	8
Cases resolved within 4 weeks	10	6	12	6	8	9	8
%age of cases resolved	100%	50%	100%	100%	100%	100%	100%

(3) Live calling to call centre

Calling Operator	Aircel	Airtel	Idea	Rcom GSM	Vodafone	Tata CDMA	BSNL
Total No. of Calls Attempted	100	100	100	100	100	100	100
Total No. of calls connected to IVR	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	90	92	96	96	94	92	93
%age of calls got answered	90%	92%	96%	96%	94%	92%	93%

(4) Level 1 calling

Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone	Tata CDMA
		Udhampur						
100	Police	2	2	2	2	2	2	2
101	Fire	2	2	2	2	2	2	2
102	Ambulance(Directly Routed to Hospital)	2	2	2	2	2	2	2
139	Railway	3	3	3	3	3	3	3
Budgam								
100	Police	2	0	2	2	0	2	2
101	Fire	2	0	2	2	0	2	2
102	Ambulance(Directly Routed to Hospital)	2	0	0	2	2	2	2
139	Railway	3	3	3	3	3	3	3
Kupwara								
100	Police	2	0	2	No Service	2	2	2
101	Fire	2	0	2	No Service	2	2	2
102	Ambulance (Directly Routed to Hospital)	2	0	2	No Service	0	0	2
139	Railway	3	3	3	No Service	3	3	3

(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 Except Airtel the operators had made refunds in 100% cases as claimed by their records.

The Status of Calls made on Emergency no's in Budgam and Kupwara is much below satisfactory level. Only exception was for Railway no. 139. Idea was having no BTS site in Kupwara. It is to be noted that 102 no is not in use in J&K for ambulance service instead 102 no. is directly routed to hospital by some of the operators. It is also to be noted that in all the districts or towns where emergency numbers got connected the routing of the nos. were not properly directed. Like call made on 100 no from Kupwara from BSNL no. was routed to Srinagar PCR instead of local Kupwara PCR. Similarly call made on 101 no. from reliance from Kupwara was routed to Sopore fire service. The same Problem was observed in Budgam and many other cities /towns/districts. Overall it can be concluded that out of the 3 towns in Udhampur emergency no. calling were better.

Call centre calls were successfully connected within the 60 seconds time for all the operators to the IVR and calls connected to call centre agents were also 100% for all the operators.

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

A sample of 2x50 test calls per Service Providers with in the licensed service area (Jammu & Kashmir Circle) were made between 1100 to 1400 hrs and between 1900 to 2100 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live measurement

Calling Operator	Aircel	Airtel	BSNL	Idea	Reliance (GSM)	V-fone	Tata (CDMA)
Aircel	-	98%	99%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%
BSNL	100%	97%	-	100%	99%	100%	100%
Idea	100%	100%	98%	-	100%	100%	100%
Reliance (GSM)	98%	100%	99%	100%	-	100%	100%
Vodafone	97%	100%	100%	100%	99%	-	100%
Tata (CDMA)	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.

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

The Operator Assisted Drive Test was conducted at Udhampur, Budgam & Kupwara for all the operators. Route covered was about around 40-120 Km depending on city areas within the speed limit of 30-40Km/hr.

Drive Test Locations**UDHAMPUR**

LOW DENSE: Main Market, Salathia Chowk, Golemarket, Hospital Road, Bus Stand

MEDIUM DENSE: Subashnagar, Shakti Nagar, Omera, Dhar Road, Birma Bridge,
Chopra, Police Line, Army Cant, Rehambal

HIGH DENSE: Natha Top, Patnitop, Kud, Chenani, Garhi, Mand, Tikri, Suketer, Jaghar
Kotli, Nandni, Bantalab, Nagrota

BUDGAM

LOW DENSE: Dc Office Budgam, Budgam Sports Stadium. Naslapore

MEDIUM DENSE: Railway Area Army Camp, Ompora, Krimsher, Rathpura

HIGH DENSE: Bye Pass Link Road, Medical Health Center. Gvt. Midle School

KUPWARA

LOW DENSE: Kupwara Market. Zangli Army Camp, Sogan Road, Bus Stand

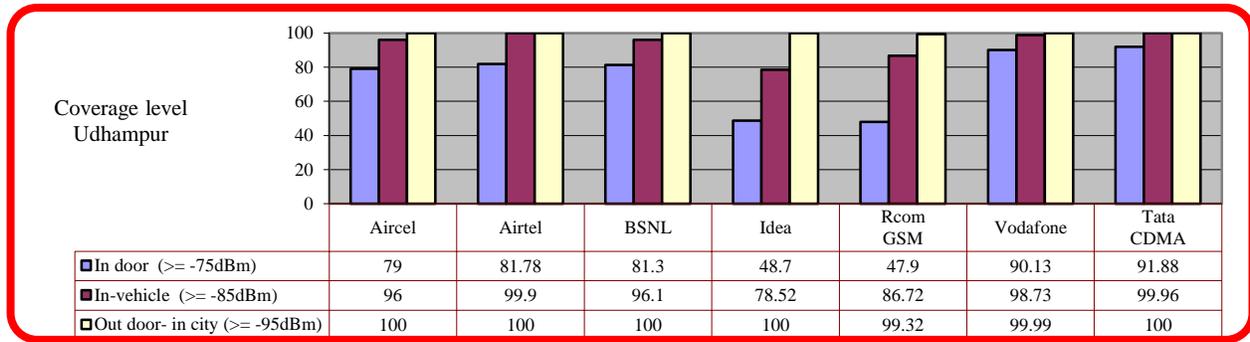
MEDIUM DENSE: Sugam, Cheerkut, Kralpora, Chowkibal

HIGH DENSE: Kupwara Link Road, Darul Aloom Kupwara Saibug Area

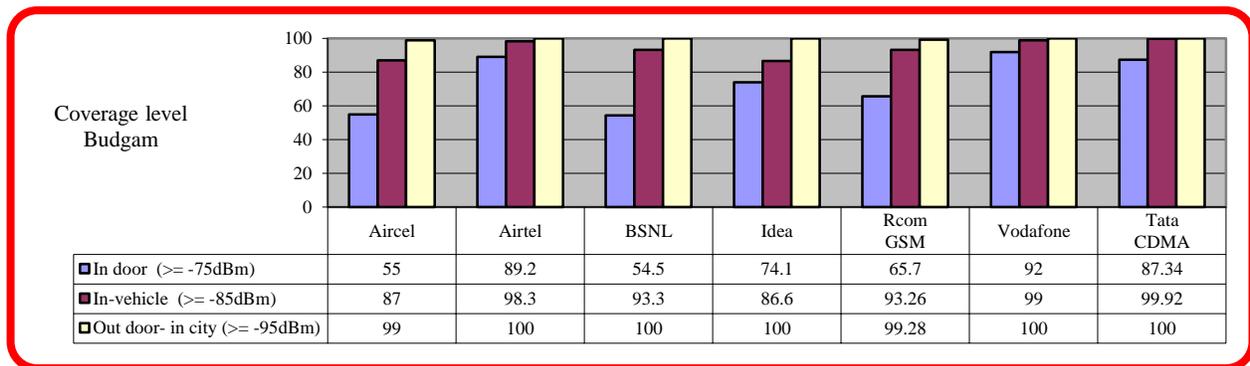
2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						
1.1	Call Attempts	Udhampur	94	119	98	75	72	90	97
		Budgam	88	69	79	44	115	107	35
		Kupwara	85	77	98	No Coverage	92	94	39
1.2	Blocked Call Rate (<=3%)	Udhampur	0.00	0.00	2.04	0.00	1.38	2.22	0.00
		Budgam	0.00	1.44	8.86	0.00	0	3.74	0.00
		Kupwara	0.00	0.00	4.08	No Coverage	0.00	0.00	0.00
1.3	Dropped Call Rate (<=2%)	Udhampur	0.00	0.00	2.04	0.00	0.00	0.00	2.06
		Budgam	0.00	0.00	0.00	0.00	0.00	0.00	2.85
		Kupwara	0.00	0.00	4.08	No Coverage	0.00	0.00	0.00
1.4	Percentage of connections with good voice quality (=>95%) (i) 0-4 (w/o frequency hopping)	Udhampur							97.97
		Budgam							97.27
		Kupwara							97.38
	(ii) 0-5 (with frequency hopping)	Udhampur	95.1	95.6	96.1	95.9	97.1	98.9	
		Budgam	95.4	97.3	96.3	98.1	97.36	98.8	
		Kupwara	96.7	97.6	93.7	No Coverage	98.44	99.3	
1.5	Service Coverage (%) In door (>= -75dBm)	Udhampur	79	81.78	81.3	48.7	47.9	90.13	91.88
		Budgam	55	89.2	54.5	74.1	65.7	92	87.34
		Kupwara	32	85.4	55.7	No Coverage	57.81	72	80.15
	In-vehicle (>= -85dBm)	Udhampur	96	99.9	96.1	78.52	86.72	98.73	99.96
		Budgam	87	98.3	93.3	86.6	93.26	99	99.92
		Kupwara	46	97	86	No Coverage	94.84	95	98.56
	Out door- in city (>= -95dBm)	Udhampur	100	100	100	100	99.32	99.99	100
		Budgam	99	100	100	100	99.28	100	100
		Kupwara	100	100	100	No Coverage	99.94	100	99.61
1.6	Call Setup Success Rate (>=95%)	Udhampur	100	100	97.96	100	98.62	97.78	100
		Budgam	100	98.56	91.14	100	100	96.26	100
		Kupwara	100	100	95.92	No Coverage	100	100	100

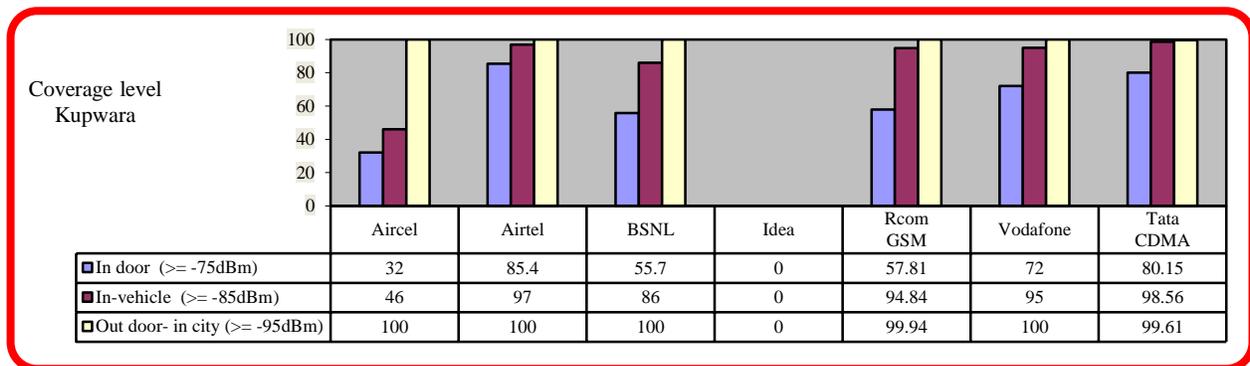
Graphical Representation (Udhampur)



Graphical Representation (Budgam)



Graphical Representation (Kupwara)



3) Critical Analysis

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

1. Blocked call rate parameter is not met by BSNL in Budgam & Kupwara, Vodafone in Budgam.
2. Dropped call rate parameter is not met by BSNL in Udhampur & Kupwara, TATA CDMA in Udhampur & Budgam.
3. Percentage of connection with good voice quality BM was not met by BSNL in Kupwara.
4. CSSR BM was not met by BSNL in Budgam.

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

The Independent Drive Test was conducted at Kulgam, Kishtwar & Reasi in Jammu & Kashmir Circle. Route covered was about around 28-130 Km depending on city areas within the speed limit of 30-40Km/hr.

Name and Drive Test Places of the service provider :

- i) Kulgam - Aircel, BSNL
- ii) Kishtwar - RCOM GSM
- iii) Reasi - Tata CDMA

Area Coverage Details:

KULGAM

Shaheen Hotel, Aaru Area. Singh Medicate, Bismillah complx fruit grovers shop, DC Office,stand,Govt College, sports stadium

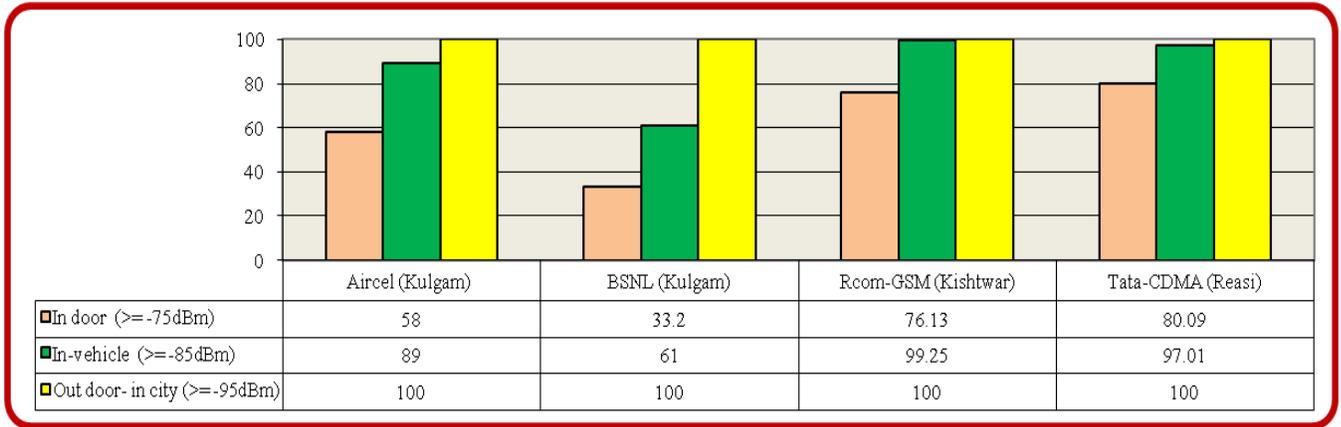
KISHTWAR

Busstand road, Semna colony, Playground road, Dool Paddar road, Hasti, Hidyah Mohalla, Hospital road,BSNL exchange road

REASI

Reasi, Bus stand, Main Market, Ward No 8, District Court, NHPC Colony, Ward No 6,and Reasi Residential area, Jyotipuram Highway, and outer circle of the reasi.

SN	Parameter	Aircel (Kulgam)	BSNL (Kulgam)	RCom-GSM (Kishtwar)	Tata-CDMA (Reasi)
1.1	Call Attempts	65	112	64	34
1.2	Blocked Call Rate (<=3%)	1.53	15.20	0	0
1.3	Dropped Call Rate (<=2%)	0.00	2.67	0	0
1.4	Percentage of connections with good voice quality (=>95%)				
	(i) 0-4 (w/o frequency hopping)				97.84
	(i) 0-5 (with frequency hopping)	95.9	84	98.51	
1.5	Service Coverage (%)				
	In door (>= -75dBm)	58	33.2	76.13	80.09
	In-vehicle (>= -85dBm)	89	61	99.25	97.01
	Outdoor- in city (>= -95dBm)	100	100	100	100
1.6	Call Setup Success Rate (>=95%)	98.47	84.80	100	100

Graphical Representation**3) Critical Analysis**

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

- **BSNL was found not meeting any of the benchmark in Kulgam except for “Service coverage” BM as there were very less no. of BTS in Kulgam which resulted in parameters like poor voice quality ,high block rate and high drop rate.**

(E) 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 (Jammu & Kashmir) is satisfactory for **Network Parameters**. However, the benchmark of “BTS Accumulated Downtime” is not met by BSNL, <=3% for “worst affected cells >3% TCH drop” is not met by Aircel (for both month & live data) .
- Under **Customer Service Quality Parameter** “operator answered calls (voice-to-voice) within 60 seconds” parameter it is found that most of the operators are fulfilling TRAI benchmark of >=90% except Aircel for Month Data(both system generated data only).
- During **Drive Tests**, high Blocked Call Rates were found in case of BSNL in Kupwara & Budgam. High Dropped Call Rates were found in case of BSNL in Udhampur & Kupwara and TATA CDMA in Udhampur & Budgam. Most of the GSM operators have satisfied the benchmark %age of connections with good voice quality of TRAI, except for BSNL which is unable to meet the BM in Kupwara. Call setup success rate BM was not met by BSNL in Budgam. It is to be noted that Aircel, Airtel and BSNL having maximum coverage in these areas drive test for these operators was done extensively. For rest of the operators having limited no. of sites mainly in town areas, drive test was done selectively. Tata CDMA has 1

site each in Budgam and Kupwara so there Drive Test was conducted in very specified areas only. Idea is having no BTS in Kupwara so no Drive Test was conducted for this operator.

II. Basic Telephone Service (Wire line) Providers

.....Audit not done for this quarter

III. Broadband Service Providers

.....Audit not done for this quarter