REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE

FOR

NORTH ZONE – JAMMU & KASHMIR CIRCLE

Report Period: July 2011 – Sept 2011

Table of Contents

(B) Redressal
1) Sample coverage
2) Performance based on live measurement for three days
3) Live calling to call centre
4) Level 1 live calling
5) Critical Analysis

(C) Inter operator call assessment
1) Sample coverage
2) Performance based on live measurement
3) Critical Analysis

(D) Drive test of the mobile network of service providers
1) Sample Coverage
2) Performance (for the respective cities)
3) Critical Analysis

(E) Independent Drive Test
1) Sample Coverage
2) Performance (for the respective cities)
3) Critical Analysis

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

II.   Basic Telephone Service (Wire line) Providers
            - *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 3rd quarter (July – Sep2011). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken for the period Jan– March 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	August-2011	2000-2100 Hrs
2	Airtel Ltd	August-2011	2000-2100 Hrs
3	BSNL	August-2011	2000-2100 Hrs
4	Idea	August-2011	2000-2100 Hrs
5	Reliance Communication	July-2011	2000-2100 Hrs
6	Vodafone	August-2011	2000-2100 Hrs
CDMA Operators			
7	Tata Communications	August-2011	2000-2100 Hrs

II. Findings from Quality of Service Audit (Operator wise for each parameter)
(A) Cellular Mobile Telephone Services

S/N	3 days Live Data Audit / Name of Parameter	Bench-mark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						CDMA Operator
1	**Network Service Quality Parameter**								
	a) BTS Accumulated Downtime	<=2%	0.12%	0.02%	0.70%	0.09%	0.29%	0%	0%
	b) Worst affected BTSs due to downtime	<=2%	0.11%	0%	0.18%	0%	0.87%	0%	0%
	Connection Establishment (Accessibility)								
	a) CSSR (Call Setup Success Rate)	>=95%	96.18%	99.11%	98.00%	99.14%	99.56%	99.11%	99.20%
	b) SDCCH/PAGING congestion	<=1%	0.24%	0.12%	0.83%	0.09%	0.20%	0.24%	0%
	c) TCH congestion	<=2%	3.15%	0.15%	1.74%	0.45%	0.73%	0.89%	0%
2	**Connection maintenance (retainability)**								
	a) CDR	<=2%	1.83%	0.88%	1.77%	1.49%	0.29%	1.25%	1.15%
	b) Worst affected cells>3% TCH drop	<=3%	5.97%	1.69%	0.16%	2.65%	0.76%	4.66%	1.85%
	c) Good voice quality	>=95%	92.98%	98.72%	NA	96.27%	96.51%	97.17%	NA
3	**POI having > 0.5% 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%	100%	NP	100%	100%	98.92%	100%	NP
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	95.96%	NP	96.64%	87.04%	94.99%	99%	NP

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

__Critical Analysis:__ From the 3 days live data assessment, it is found that most of the operators are meeting the network parameters, except for Aircel and Vodafone not meeting the benchmark for "Worst affected cells>3% TCH drop" with the value of 5.97% and 4.66% respectively and Aircel is also not meeting the benchmark of TCH congestion with the value of 3.15%. Aircel is having a low %age of good voice quality connections. Performance related to customer care data is not found to be satisfactory for Idea especially for the parameter "call answered by operator (voice to voice). Good voice quality data for CDMA operator was not system generated.

Month data assessment

One Month Data Audit		B-mark	Aircel	Airtel	BSNL	Idea	Rcom	Vodafone	Tata
S/N	Name of Parameter				GSM Operators				CDMA Operator
(A)	**Network Service Quality Parameter**								
1	**Network Availability**								
	a) BTS Accumulated Downtime	<=2%	0.14%	0.11%	1.80%	0.17%	0.30%	0%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.62%	0.21%	0.07%	0%	0.87%	0%	0%
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	95.32%	99.13%	98.41%	98.98%	99.50%	98.73%	98.84%
	b) SDCCH/PAGING congestion	<=1%	0.27%	0.14%	0.83%	0.11%	0.15%	0.31%	0%
	c) TCH congestion	<=2%	3.75%	0.15%	1.57%	0.60%	0.66%	1.27%	0.16%
3	**Connection maintenance (retainability)**								
	a) CDR	<=2%	1.88%	0.87%	1.59%	1.51%	0.31%	1.31%	1.04%
	b) Worst affected cells>3% TCH drop	<=3%	6.40%	1.57%	0.17%	2.94%	0.75%	4.71%	1.91%
	c) Good voice quality	>=95%	92.35%	98.68%	NA	96.13%	96.02%	97.46%	NA
4	**No. of POI PO having > 0.5% POI congestion**	<=0.5%	1	0	0	0	0	0	0
(B)	**Customer Service Quality Parameters**								
5	**Metering/billing credibility-Post paid**	<= 0.1%	0.02%	0.01%	0.05%	0%	0.10%	0.07%	0%
6	**Metering /billing credibility-Pre paid**	<= 0.1%	0.001%	0.01%	0.07%	0%	0.04%	0.01%	0.80%
7	**Resolution of billing/ charging complaints(within 4 weeks)**	100%	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	>=95%	100%	NP	100%	100%	98.91%	100%	99%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	92.90%	88.72%	93.85%	92.00%	94.76%	98.00%	96.00%
9	**Termination/closure of service**	<=7days	100%	100%	NR	100%	100%	100%	100%
10	**Time taken for refunds of deposits after closures(within 60 days).**	100%	100%	100%	NR	100%	100%	100%	100%

NA: *Not Applicable*, **NR**: *Not Received*

Critical Analysis:

➢ From the month data assessment, it is found that most of the operators are meeting the network parameters except for some parameters like"Worst affected cells>3% TCH drop" in which Aircel and Vodafone are not meeting the benchmark with the value of 6.40% and 4.71% respectively. Besides that Aircel is also not meeting the parameters like TCH congestion and Good voice quality parameters. Metering billing pre paid parameter was not meet by TATA CDMA.

➢ Performance related to Response time to customers for assistance data is found to be satisfactory for most of the operators especially for the parameter "Accessibility of call centre/customer care". A below benchmark performance is observed in case of Airtel (88.72%) for the parameter "calls answered by operators (voice-to-voice)".

Operator-Assisted Drive Test

The Drive Test was conducted at Jammu and Kashmir for all the operators. Route covered was about around 100-150Km depending on city areas within the speed limit of 30-40Km/hr. The cities covered were Anantnag, Srinagar and Leh. In all the cities, zones were selected for covering different density areas (High, Medium & Low dense areas).

S/N	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						CDMA Operator
1.1	Blocked Call Rate (<=3%)	Anantnag	0%	0%	2.40%	0%	0.69%	1.61%	1.17%
		Srinagar	0%	0%	0%	1%	0%	0%	0%
		Leh	0%	4.34%	7.32%	Not existing operators			
1.2	Dropped Call Rate (<=2%)	Anantnag	0%	0%	2.40%	1.92%	1.38%	0%	3.52%
		Srinagar	0%	0%	1.70%	0%	0%	0%	2.92%
		Leh	0%	0%	2.44%	Not existing operators			
1.3	Percentage of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)	Anantnag	NA						92.04%
		Srinagar							91.98%
		Leh							NA
	(ii) 0-5 (with frequency hopping)	Anantnag	96.87%	97.30%	94.70%	97.33%	96.38%	98.40%	NA
		Srinagar	96.13%	97.70%	94.50%	94.36%	94.57%	95.30%	
		Leh	95.80%	94.40%	98.99%	Not existing operators			
1.4	Call Setup Success Rate (>=95%)	Anantnag	100%	100%	97.60%	100%	99.31%	98.39%	98.83%
		Srinagar	100%	100%	100%	99%	100%	100%	100%
		Leh	100%	95.66%	92.68%	Not existing operators			

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

- In Leh only 3 operators Airtel, Aircel and BSNL are having network.
- Blocked Call Rate benchmark is not met by Airtel (4.34%) and BSNL (7.32%) in Leh. Dropped Call Rate benchmark is not met by BSNL in Anantnag and Lehwith the values of 2.40% and 2.44% respectively. Tata CDMA is also not meeting the benchmark of Dropped Call Rate in Anantnag and Srinagar with the values of 3.52% and 2.92% respectively.
- Percentage of connections with Good voice quality parameter was not meet by Rcom& Idea in Srinagar, BSNL in Anantnag & Srinagar with low margins & Airtel in LEH .
- CSSR Benchmark is also not met by BSNL in Leh with a value of 92.68%.
-

Independent Drive Test----- *Submitted as a Separate Report*

Chapter- 3 Audit- PMR Data Verification
I. Cellular Mobile Telephone Service

S/N	Name of Parameter	B-mark	Audit	Aircel	Airtel	BSNL	Idea	Rcom	Vodafone	Tata
	PMR					GSM Operators				CDMA Operator
(A)	Network Service Quality Parameter									
1	Network Availability									
	BTS Accumulated Downtime	<=2%	Reported	0.10%	0.16%	1.96%	0.21%	0.60%	0.06%	0.02%
			Verified	0.10%	0.16%	1.96%	0.21%	0.60%	0.06%	0.02%
	Worst affected BTSs due to downtime	<=2%	Reported	0.23%	0.75%	1.78%	1%	1.51%	0.20%	0%
			Verified	0.23%	0.75%	1.78%	1%	1.51%	0.20%	0%
2	Connection Establishment (Accessibility)									
	CSSR (Call Setup Success Rate)	>=95%	Reported	96.77%	99.10%	98.00%	98.97%	99.52%	99.28%	99.51%
			Verified	96.77%	99.10%	98.00%	98.97%	99.52%	99.28%	99.51%
	SDCCH/PAGING congestion	<=1%	Reported	0.32%	0.12%	0.90%	0.29%	0.31%	0.20%	0%
			Verified	0.32%	0.12%	0.90%	0.29%	0.31%	0.20%	0%
	TCH congestion	<=2%	Reported	2.54%	0.15%	1.90%	0.50%	1.24%	0.17%	0.02%
			Verified	2.54%	0.15%	1.90%	0.50%	1.24%	0.17%	0.02%
3	Connection maintenance (retainability)									
	CDR	<=2%	Reported	1.13%	0.82%	2.00%	1.65%	0.33%	1.01%	0.34%
			Verified	1.13%	0.82%	2.00%	1.65%	0.33%	1.01%	0.34%
	Worst affected cells>3% TCH drop	<=3%	Reported	5.68%	1.69%	4.77%	8.01%	1.98%	3.74%	0.33%
			Verified	5.68%	1.69%	4.77%	8.01%	1.98%	3.74%	0.33%
	Good voice quality	>=95%	Reported	94.82%	98.60%	98.00%	96.85%	98.21%	98.21%	99.41%
			Verified	94.82%	98.60%	98.00%	96.85%	98.21%	98.21%	99.41%
4	No. of POI's having congestion>0.5%	<=0.5%	Reported	0	0	0	0	0	0	0
			Verified	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters									
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0%	0.01%	0%	NR	0%	0%	0.04%
			Verified	0%	0.01%	0%	NR	0%	0%	0.04%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.04%	0%	0.05%	NR	0.05%	0.02%	0.40%
			Verified	0.04%	0%	0.05%	NR	0.05%	0.02%	0.40%
7	Resolution of billing/ charging complaints (within 4 weeks)	100%	Reported	100%	100%	99%	NR	100%	100%	100%
			Verified	100%	100%	99%	NR	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%	NR	100%	100%	100%
			Verified	100%	100%	100%	NR	100%	100%	100%
8	Response time to customers for assistance									
	Accessibility of call centre/Customer Care	>=95%	Reported	100%	93.00%	100%	NR	100%	100%	95%
			Verified	100%	93.00%	100%	NR	100%	100%	95%
	% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	65.36%	76.00%	97.00%	NR	93.00%	97.00%	86.00%
			Verified	65.36%	76.00%	97.00%	NR	93.00%	97.00%	86.00%
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%	NR	100%	100%	100%
			Verified	100%	100%	100%	NR	100%	100%	100%
10	Time taken for refunds of deposits after closures. (within 60 days)	100%	Reported	100%	100%	100%	NR	100%	98%	80%
			Verified	100%	100%	100%	NR	100%	98%	80%

Critical Analysis (PMR Verification):

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

(a) Vodafone, BSNL, Idea & Aircel are not meeting the benchmark for the parameter _"Worst affected Cells>3% TCH drop"_ with high margins.

(b) In case of TCH congestion, only Aircel (2.54%) is not meeting the benchmark with low margins.

(c) BSNL is not meeting the benchmark for "Resolution of billing/ charging complaints within 4 weeks".

(d) For parameter _"Accessibility of call centre/Customer Care",_ Except Airtel, all the operators meeting the benchmark.

(e) _"% call answered by operators(voice to voice) within 60 sec."_ benchmark is only met by BSNL, Rcom GSM And Vodafone.

(f) Tata-CDMA and Vodafone is not meeting the 60 days' benchmark for _"Refund of deposits after Closure of connection"._

(g) Tata-CDMA is not meeting the benchmark _"Metering/billing credibility-Pre paid"._

IV. 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	Idea	Rcom GSM	V-fone	Tata CDMA
			GSM Operators						CDMA Operator
A	**Network Service Quality Parameter**								
	a) BTS Accumulated Downtime	<=2%	0.12%	0.02%	0.70%	0.09%	0.29%	0%	0%
	b) Worst affected BTSs due to downtime	<=2%	0.11%	0%	0.18%	0%	0.87%	0%	0%
	c) Total no. of BTSs in the licensed service area		1,774	2,415	1,082	457	918	1,149	272
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		150	152	541	30.54	189	0	0
	e) No. of BTSs having accumulated downtime of >24 hours in a month		2	0	6	0	58	0	0
1	**Connection Establishment (Accessibility)**								
	a) CSSR	>=95%	96.18%	99.11%	98.00%	99.14%	99.56%	99.11%	99.20%
	b) SDCCH/PAGING congestion	<=1%	0.24%	0.12%	0.83%	0.09%	0.20%	0.24%	0%
	c) TCH congestion	<=2%	3.15%	0.15%	1.74%	0.45%	0.73%	0.89%	0%
2	**Connection maintenance**								
	a) CDR	<=2%	1.83%	0.88%	1.77%	1.49%	0.29%	1.25%	1.15%
	b) Cells having > 3% TCH drop	<=3%	5.97%	1.69%	0.16%	2.65%	0.76%	4.66%	1.85%
	c) Good voice quality	>=95%	92.98%	98.72%	NP	96.27%	96.51%	97.17%	NP
	d) No. of cells > 3% TCH drop		314	119	5	36	19	159	16
	e) Total no. of cells in the network		5,267	7,058	3,038	1,560	2,547	3,415	880
3	**POI 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		57903	57267	16759	12904	9365	19833	8296
	c) Avg No. of call attempts on POI		49468	40850	236911	233759	153949	448999	41488
	d) Avg traffic served on POI (Erlang)		716	887	8723	6791	4159	10792	1068
	e) Total number of working POI Service Area wise		47	33	22	31	29	32	40
	f) Equipped Capacity of Network in respect of Traffic in erlang		121680	133679	61000	16089	35025	28302	36080
	g) Total traffic handled in TCBH in erlang		57538	85144	67437	9613	28450	19636	10283

S/N	Name of Parameter	B-mark	Aircel	Airtel	BSNL	Idea	Rcom GSM	V-fone	Tata CDMA
			GSM Operators						CDMA Operator
(B)	**Customer Service Quality Parameters**								
4	**Response time to customers for assistance**								
	a) Accessibility of call centre	>=95%	100%	NP	100%	100%	98.92%	100%	NP
	b) % of call answered by operators(voice to voice) within 60 sec	>=90%	95.96%	NP	96.64%	87.04%	94.99%	99%	NP
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		367,046	1,280,860	682,348	152,577	1,023,128	869,017	335,193
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		367046	1136397	682348	152577	1011992	869017	332025

Parameter-wise Findings (Live Data Assessment):

The parameter wise key takeouts 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 lying between0% and 1.80%.

➢ **"Worst affected BTSs due to downtime":** Except BSNL, All operators are meeting the benchmark with values lying *between*0% and 0.87%.

➢ **"Call setup success rate (benchmark >= 95%)":** All operators are meeting the benchmark with values lying between 96.18% and 99.56%.

➢ **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All the operators are meeting the benchmark with values lying between 0% and 0.83%.

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

➢ **TCH congestion (benchmark <= 2%):** Except for Aircel with a value of 3.15% rest of the operators are meeting the benchmark with values lying between 0% and 1.74%.

➢ **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.29% and 1.83%.

➢ **Cell exceeding 3% TCH drop (benchmark <= 3%):** Except for Aircel and Vodafone with a value of 5.97% and 4.66% respectively, rest of the operators are satisfying the benchmark with value in between 0.16% and 2.65%.

➢ **Connections with good voice quality (benchmark >= 95%):** Except Aircel with a value of 92.98%, all the GSM operators are meeting the benchmark with values lying between 96.27% and 98.72%.Cdma operator 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 with value in between 0% and 0.03%. 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%):**Except Airtel and Tata CDMA which has not provided the data, Rest all the operators are meeting the benchmark with values lying between 98.92% to 100%.

➢ **%age of call answered by operator (Voice to voice) (benchmark >90%):%):** Except for Airtel & Tata CDMA which has not provided the data and Idea which is not meeting the benchmark, Rest all the operators are meeting the benchmark.

(2) Month Data Assessment & Summarized Findings

S/N	Name of Parameter	B-mark	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						CDMA Operator
(A)	**Network Service Quality Parameter**								
1	**Network Availability**								
	a) BTS Accumulated Downtime	<=2%	0.14%	0.11%	1.80%	0.17%	0.30%	0%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	0.62%	0.21%	0.07%	0%	0.87%	0%	0%
	c) Total no. of BTSs in the licensed service area		1,774	2,415	1,082	457	918	1,149	272
	d) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		1,831	1,867	14,524	559	1,973	0	51
	e) No. of BTSs having accumulated downtime of >24 hours in a month		11	5	23	0	8	0	0
2	**Connection Establishment (Accessibility)**								
	a) CSSR (Call Setup Success Rate)	>=95%	95.32%	99.13%	98.41%	98.98%	99.50%	98.73%	98.84%
	b) SDCCH/PAGING congestion	<=1%	0.27%	0.14%	0.83%	0.11%	0.15%	0.31%	0%
	c) TCH congestion	<=2%	3.75%	0.15%	1.57%	0.60%	0.66%	1.27%	0.16%
3	**Connection maintenance (retainability)**								
	a) CDR	<=2%	1.88%	0.87%	1.59%	1.51%	0.31%	1.31%	1.04%
	b) Worst affected cells>3% TCH drop	<=3%	6.40%	1.57%	0.17%	2.94%	0.75%	4.71%	1.91%
	c) Good voice quality	>=95%	92.35%	98.68%	NP	96.13%	96.02%	97.46%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		337	121	5	40	19	156	17
	e) Total no. of cells in the network		5,267	7,058	3,038	1,560	2,547	3,415	880
4	**No. of POI's having >=0.5% congestion**	<=0.5%	1	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		63 E1's Commissioned on 08-Aug-11, overflow defined at L1 tax local TG.	NIL	NIL	NIL	NIL	NIL	NIL
	b) Total No. of call attempts on POI (Avg.)		46734	37618	142800	228154	158316	409849	32240
	c) Total traffic served on POI (Erlang) (Avg.)		705	862	6,350	6,657	4,247	9,664	828
	d) Total No. of circuits on POI		57903	57267	16759	12904	9365	19833	8296
	e) Total number of working POI Service Area wise		47	33	22	31	29	32	40
	f) Capacity of POI		57919	55825	11731	7099	8439	19151	7435
5	**Network Data**								
	a) Equipped Capacity of Network Erlang		121680	133679	61000	16089	35025	28302	36080
	b) Total traffic in TCBH in erlang (Avg.)		57538	85144	67437	9613	28450	19636	10283

	c) Total no. of customers served (as per VLR) on last day of the month		1399588	1798385	582789	344511	NP	438875	80411
(B)	**Customer Service Quality Parameters**								
5	**Metering/billing credibility-Post paid**	<= 0.1%	0.02%	0.01%	0.05%	0%	0.10%	0.07%	0%
	a) No. of bills issued during the period		93694	55556	784877	7188	19966	20369	51963
	b) No. of bills disputed including billing complaints during the period		15	5	392	0	19	15	0
6	**Metering /billing credibility-Pre paid**	<= 0.1%	0.001%	0.01%	0.07%	0%	0.04%	0.01%	0.80%
	a) No. of charging / credit / validity complaints during the quarter		72	246	417	0	168	53	5
	b) Total no. of pre-paid customers at the end of the quarter		1633200	1,988,831	609,325	118,297	463,252	562,283	63,901
7	**Resolution of billing/ charging complaints (within 4 weeks)**	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		4366	1814	809	351	187	68	138
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		4366	1814	809	351	187	68	138
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		87	251	792	78	4	29	5
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		4279	1563	17	273	183	39	133
	e) Period of applying credit/waiver/adjustment to the customer's 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	>=95%	100%	NP	100%	100%	99%	100%	99%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	92.90%	88.72%	94%	92%	95%	98%	96%
	c) Total no. of call attempts to call centre & customer care nos. during TCBH (Avg.).		NP						
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		NP						
9	**Termination/closure of service**	<=7days							
	a) Total No. of requests for Termination / Closure of service received during the quarter		41	341	NP	149	79	97	1,137
	b) No.of requests for Termination / Closure of service complied within 7 days during the quarter		41	341	NP	149	79	97	1,137
10	**Time taken for refunds of deposits after closures (within 60 days)**	100%	100%	100%	NP	100%	100%	100%	100%

NA: *Not Applicable*, **NR**: *Not Received*

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark <=2%):** All operators are meeting the benchmark with values lying between 0% and 1.80%.
- **Worst affected BTSs due to downtime (benchmark <= 2%):** Except BSNL, all operators are meeting the benchmark with values lying between 0% and 0.87%.
- **Call setup success rate (benchmark >= 95%):** All operators are meeting the benchmark with values lying between 95.32% and 99.50%.
- **SDCCH/PAGING Channel congestion (benchmark <= 1%):** All operators are meeting the benchmark with values lying between 0% and 0.83%.
  Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.

- **TCH congestion (benchmark <= 2%):** Except Aircel, rest of the operators are meeting the benchmark with values lying between 0.15% and 1.57%.
- **Call drop rate (benchmark <= 2%):** All operators are meeting the benchmark with values lying between 0.31% and 1.88%.
- **Cell exceeding 3% TCH drop (benchmark <= 3%):** Except Aircel and Vodafone with the values of 6.40% and 4.71%, all the operators are satisfying the benchmark with value in between 0.17% and 2.94%.
- **Connections with good voice quality (benchmark >= 95%):** Except for Aircel with the value of 92.35%, all the operators are meeting the benchmark with values lying between 96.02% and 98.68%.
- **No. of POI's having>0.5%congestion:** Except Aircel, having congestion in 1 POI ,rest of 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%):** Except for Airtel which has not provided the data, all operators are meeting the benchmark with values lying b/w 98.92% to 100%.
- **%age of call answered by operator (Voice to voice) (benchmark >90%):%):** Except for Airtel with a value of 88.72%,all operators are meeting the benchmark with values lying between 92.00% and 98.00%.
- **Metering and billing credibility-Post paid (benchmark <= 0.1%):** All the operators are meeting the benchmark with values lying between 0% and 0.10%.
- **Metering and billing credibility-Pre paid (benchmark <= 0.1%):**Except for Tata with a value of 0.80%,Rest all the operators are meeting the benchmark with values lying between 0% and 0.07%.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark.
- **Termination/Closure of service (Benchmark <= 7 days):** All operators are satisfying the benchmark.
- **Time taken for refunds of deposits after closures (benchmark 100% within <=60 days):**All operators are satisfying the benchmark. BSNL has not provided the data for the same.

(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	21	1774
2	Airtel Ltd	11	27	2415
3	BSNL	8	21	1082
4	Idea	1	2	525
5	Reliance Communication	2	5	918
6	Vodafone	4	15	1149
CDMA Operator				
7	Tata Communications	2	2	272

(4) Performance (Graphical Representation)

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

A)   NETWORK PERFORMANCE

BTS accumulated downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.

	Aircel	Airtel	BSNL	Idea	GSM Rcom	Vodafone	CDMA Tata
Live	0.12%	0.02%	0.70%	0.09%	0.29%	0%	0%
Month	0.14%	0.11%	1.80%	0.17%	0.30%	0%	0.03%
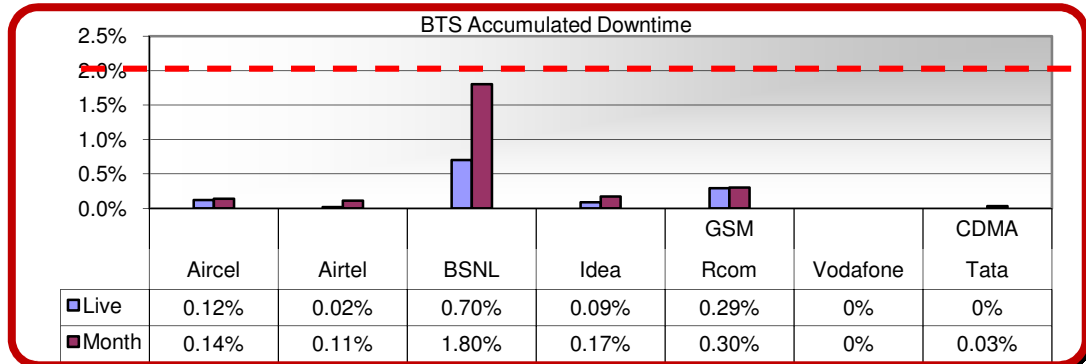
Worst affected BTSs due to downtime: All operators are meeting the TRAI benchmarks in both one month & live data Audit.

	Aircel	Airtel	BSNL	Idea	GSM Rcom	Vodafone	CDMA Tata
Live	0.00%	0.11%	0%	0.18%	0%	0.87%	0%
Month	0.62%	0.21%	0.07%	0%	0.87%	0%	0%
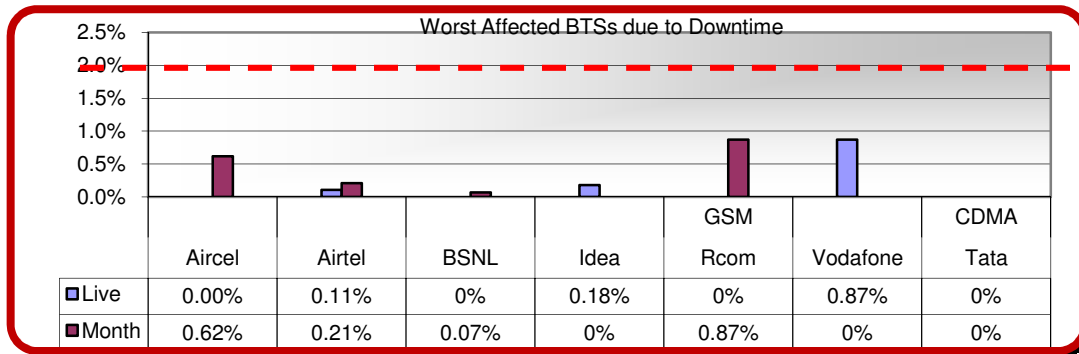
Call setup success rate: All operators are meeting the TRAI benchmarks (>= 95 %) for both one month data and 3 days live data taken in the month of audit.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	96.18%	99.11%	98.00%	99.14%	99.56%	99.11%	99.20%
Month	95.32%	99.13%	98.41%	98.98%	99.50%	98.73%	98.84%
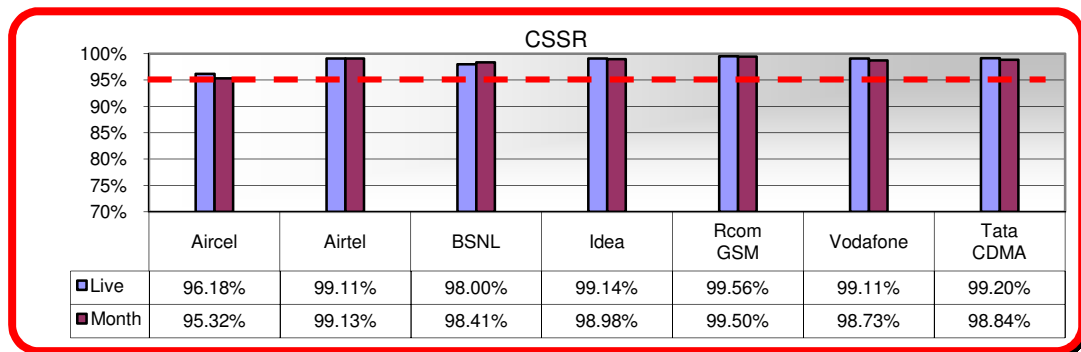
Blocked call rate:

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

SDCCH/PAGING congestion

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	0.24%	0.12%	0.83%	0.09%	0.20%	0.24%	0.00%
Month	0.27%	0.14%	0.83%	0.11%	0.15%	0.31%	0.00%

TCH congestion (%): For both live & month data, except for Aircel, All other operators are meeting the TRAI benchmarks (<= 2%) for both one month data and 3 days live data taken in the month of audit.

TCH congestion

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	3.15%	0.15%	1.74%	0.45%	0.73%	0.89%	0.00%
Month	3.75%	0.15%	1.57%	0.60%	0.66%	1.27%	0.16%

Connection Maintainability (Retainability):

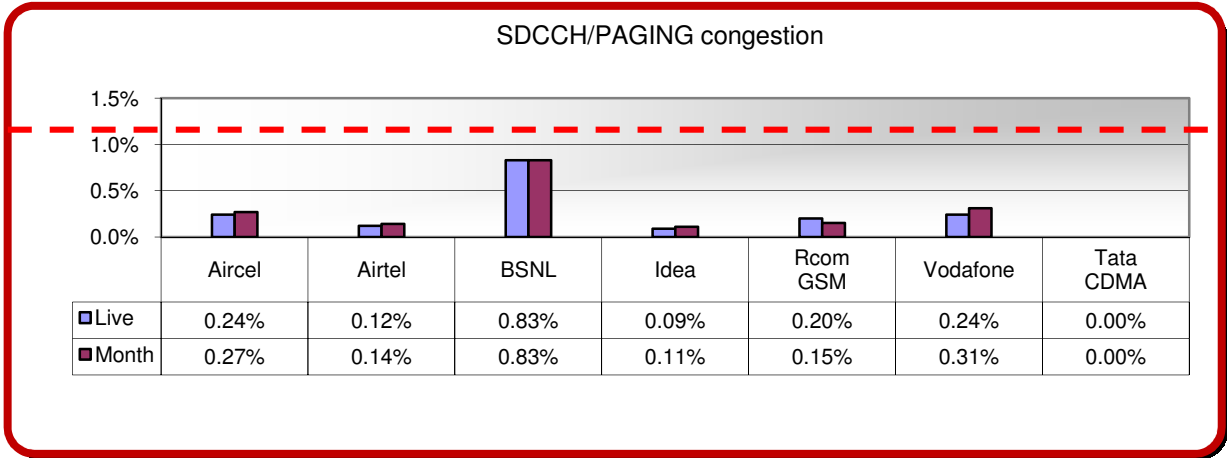**Call drop rate (<=2%):** All operators are meeting the TRAI benchmarks (<=2%) for both one month data and 3 days live data taken in the month of audit.
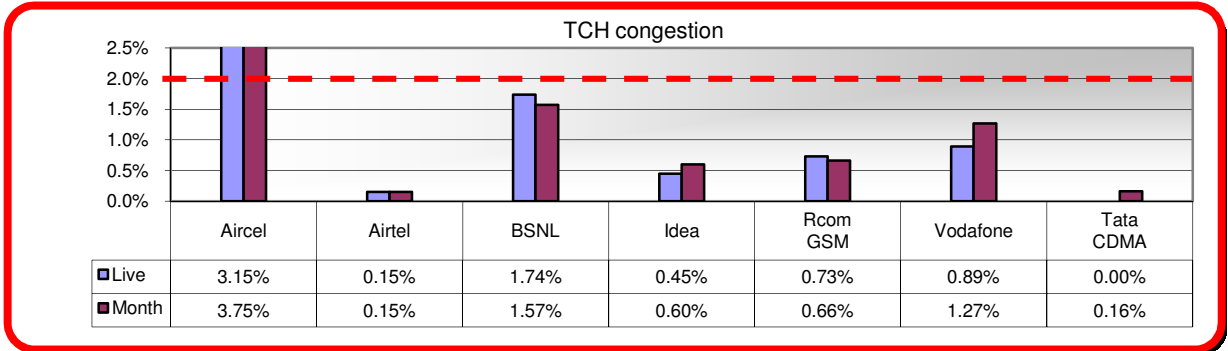

CDR

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	1.83%	0.88%	1.77%	1.49%	0.29%	1.25%	1.15%
Month	1.88%	0.87%	1.59%	1.51%	0.31%	1.31%	1.04%
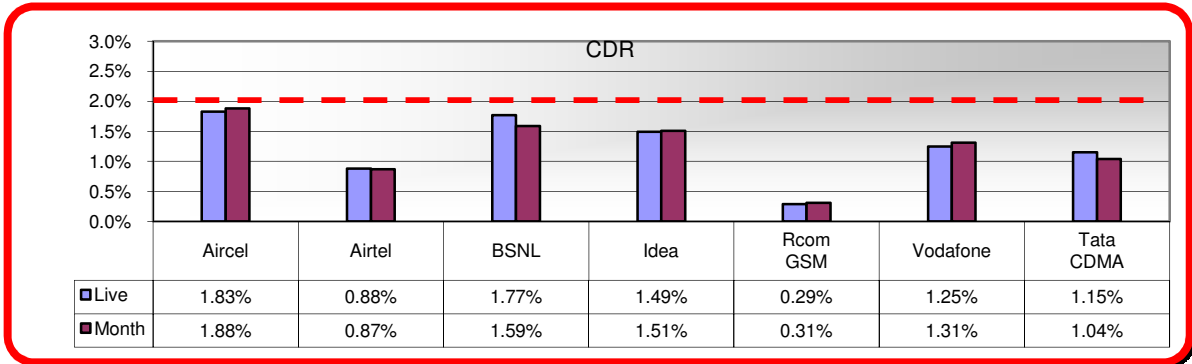
Worst affected Cell exceeding 3% TCH Drop: For both live and month data, Aircel with a value of 5.97% and 6.40% and Vodafone with a value of 4.66% and 4.71% respectively is found not meeting the benchmark of <=3%. Rests of the operators are meeting the benchmark for both cases.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	5.97%	1.69%	0.16%	2.65%	0.76%	4.66%	1.85%
Month	6.40%	1.57%	0.17%	2.94%	0.75%	4.71%	1.91%

Percentage of connections with good voice quality (benchmark >= 95%): Only Aircel with the value of 92.98% for 3 days live data and 92.35% for one month data is not meeting the benchmark, rest all the operators are meeting the TRAI benchmarks (=> 95%) for both one month data and 3 days live data taken in the month of audit. BSNL has not provided the data. For the CDMA operator the report is not system generated.
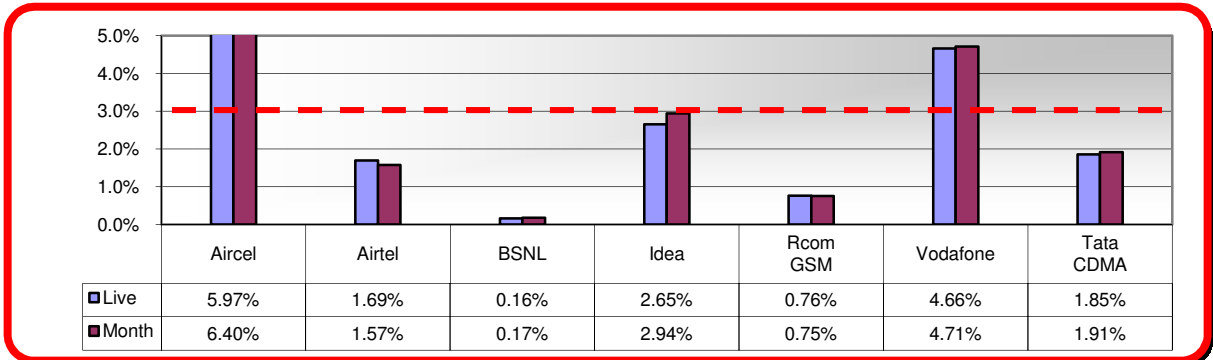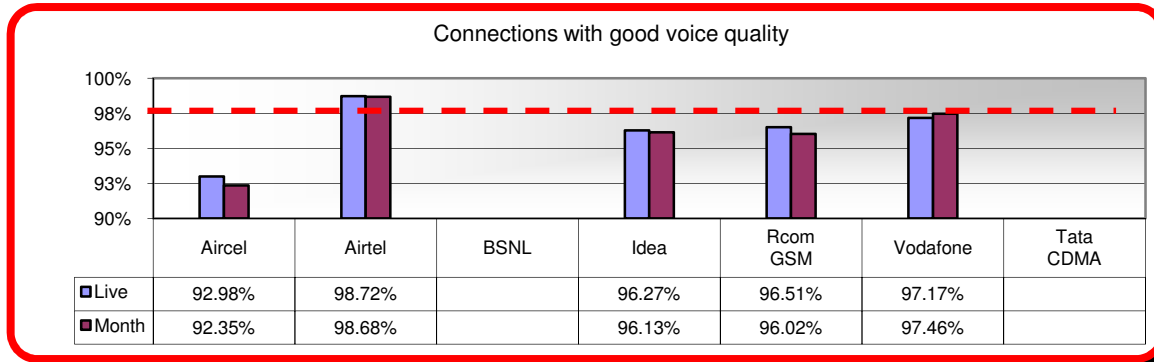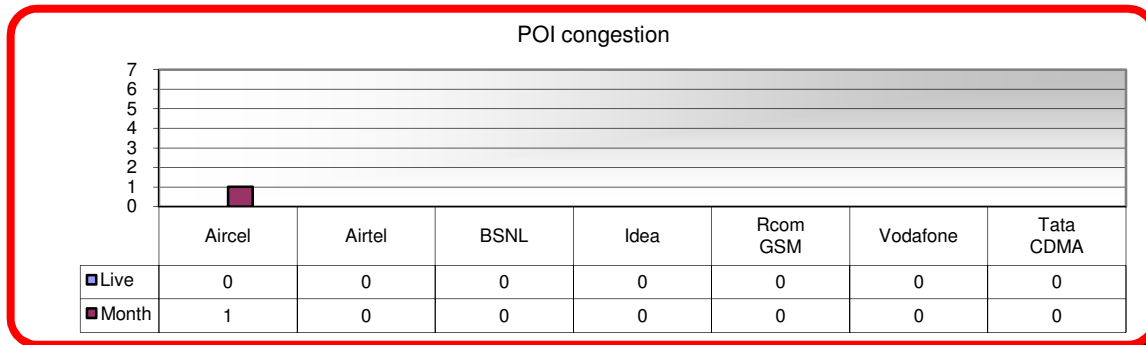
Connections with good voice quality

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	92.98%	98.72%		96.27%	96.51%	97.17%	
Month	92.35%	98.68%		96.13%	96.02%	97.46%	

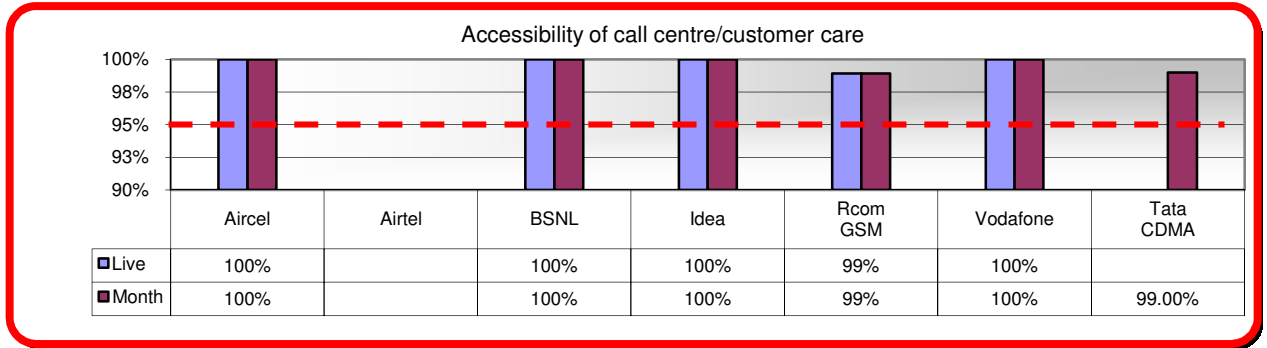**No. of POI's having >0.5% Congestion:** Except for Aircel (month data), all operators are meeting the TRAI benchmarks (<= 0.5%) for both one month data and 3 days live data taken in the month of audit.

POI congestion

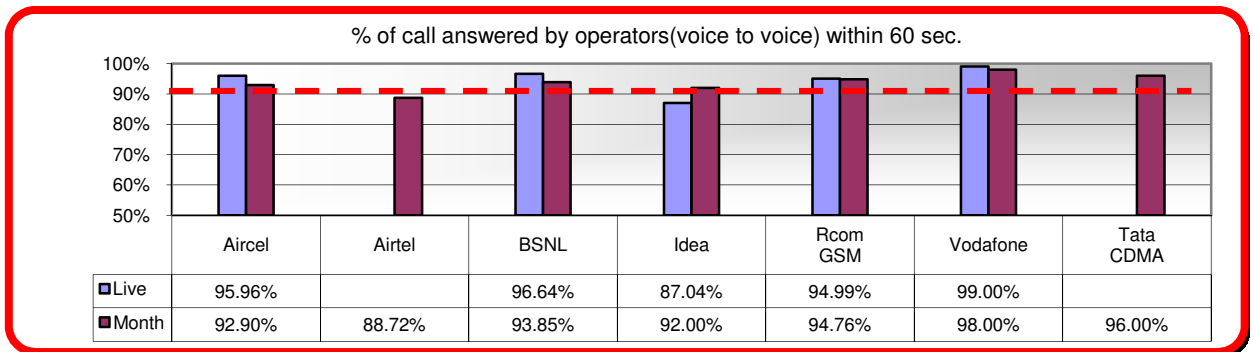|	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
Live	0	0	0	0	0	0	0
Month	1	0	0	0	0	0	0

B) CUSTOMER SERVICE QUALITY PARAMETERS

Response time to the customer for assistance:

Percentage of call answered (Electronically): All operators are meeting the TRAI benchmarks (>= 95%) for both one month data and 3 days live data taken in the month of audit except for Airtel which has not provided the data for both live and month data. TATA CDMA had also not provided the 3 days live audit data.

Accessibility of call centre/customer care

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
□ Live	100%		100%	100%	99%	100%	
■ Month	100%		100%	100%	99%	100%	99.00%

Percentage of call answered by operators (Voice to voice) within 60 sec: For Live data, only Idea and for month data, only Airtel is not meeting the benchmark. Rest all other operators are meeting benchmark for both live and month data audit. TATA CDMA had also not provided the 3 days live audit data.

% of call answered by operators(voice to voice) within 60 sec.

	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
□ Live	95.96%		96.64%	87.04%	94.99%	99.00%	
■ Month	92.90%	88.72%	93.85%	92.00%	94.76%	98.00%	96.00%

(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 "POI congestion" (Aircel) and "%age of calls answered by operator" (Airtel & Idea).

(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	Vodafone	Tata CDMA
Total No. of Calls Attempted	100	100	100	100	100	68	100
Total No. of calls Answered	94	100	98	95	94	66	95
Cases resolved with 4 weeks	93	100	97	94	92	65	95
%age of cases resolved	99%	100%	99%	99%	98%	98%	100%

(3) Live calling to call centre

Calling Operator	Aircel	Airtel	Idea	Rcom GSM	Vodafone	Tata CDMA
Total No. of Calls Attempted	100	100	129	100	100	100
Total No. of calls connected to IVR	78	100	120	65	100	100
Calls got connected to agent within 60 Sec	58	84	107	62	92	90
%age of calls got answered	58%	84%	84%	62%	92%	90%

(4)   Level 1 calling

Emergency no.	No. of calls made	Aircel	Airtel	BSNL	Idea	Rcom* GSM	Vodafone	Tata CDMA
					Anantnag			
100	5	5	5	5	5	5	5	5
101	5	5	5	5	5	5	5	5
102	5	0	0	0	0	0	0	0
139	5	5	5	5	5	5	5	5
					Srinagar			
100	5	5	5	5	5	5	5	5
101	5	5	5	5	5	5	5	5
102	5	0	0	0	0	0	0	0
139	5	5	5	5	5	5	5	5
					Leh			
100	5	5	5	5	No Service	No Service	No Service	No Service
101	5	5	5	5				
102	5	0	0	0				
139	5	5	5	5				

(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% in most of the cases as claimed by their records. Calls made on Emergency no's were all got connected except on 102 which is not in use in J&K..

(C) 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	-	99%	99%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%
BSNL	100%	99%	-	100%	98%	100%	100%
Idea	100%	100%	99%	-	100%	100%	100%
Reliance (GSM)	97%	100%	97%	100%	-	100%	100%
Vodafone	99%	100%	100%	100%	98%	-	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.

(D) Drive test of the mobile network of service providers

(1) Sample Coverage

The Operator Assisted Drive Test was conducted at Anantnag, Leh & Srinagar for all the operators. Route covered was about around 100-150 Km depending on city areas within the speed limit of 30-40Km/hr.

Drive Test Locations

ANANTNAG

LOW DENSE:	Anantnag Pahalgam highway, Srinagar Pahalgam Highway, Anantnag Qazigund Highway.
MEDIUM DENSE:	Mattan, Pahalgam.
HIGH DENSE:	Anantnag City, JanglatMandi, Mattanchowk ,lalchowk,khanabal,DC office

SRINAGAR

LOW DENSE:	Dalgate,sonawari,asjan,bypass,nowgamchowk,airport road,bemina bypass,shalteng,HMT chowk.
MEDIUM DENSE:	Karan Nagar, Nowhata, Soura, Lal Bazar, Dal Gate, Boulevard, CM House, Mughal Gardens, Chanapora chowk, Lalbazar road, Hazratbal
HIGH DENSE:	Hyderpora, Bemina, LalChowk, Jahangir Chowk, Residency Road, Poloview, Ram bagh.

LEH

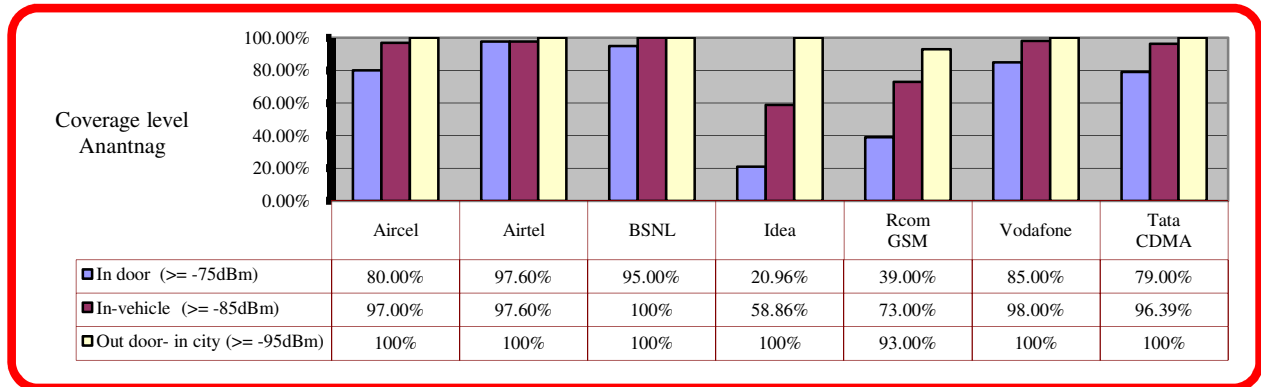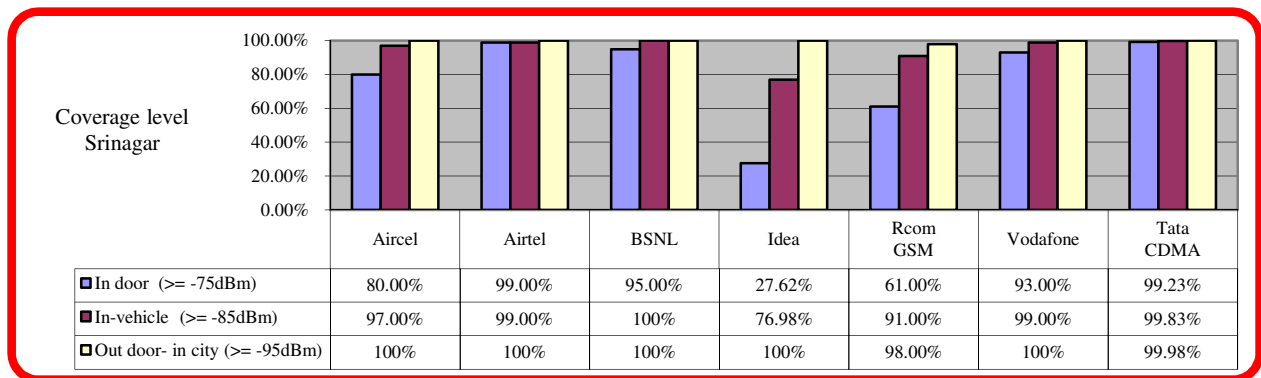|	
LOW DENSE:	Gumpa,Stoke,Manali road
MEDIUM DENSE:	DC Office ,BSNL exchange, Govt. Degree College
HIGH DENSE:	Leh city,Town hall

2) Performance (for the respective cities)

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
			GSM Operators						CDMA Operators
1.1	Call Attempts	Anantnag	134	90	166	54	144	62	85
		Srinagar	149	132	176	170	169	216	205
		Leh	44	46	41	NA			
1.2	Blocked Call Rate (<=3%)	Anantnag	0%	0%	2.40%	0%	0.69%	1.61%	1.17%
		Srinagar	0%	0%	0%	1%	0%	0%	0%
		Leh	0%	4.34%	7.32%	NA			
1.3	Dropped Call Rate (<=2%)	Anantnag	0%	0%	2.40%	1.9%	1.38%	0%	3.52%
		Srinagar	0%	0%	1.70%	0%	0%	0%	2.92%
		Leh	0%	0%	2.44%	NA			
1.4	% of connections with good voice quality (=>95%)								
	(i) 0-4 (w/o frequency hopping)	Anantnag	NA						92.04%
		Srinagar							91.98%
		Leh							
	(ii) 0-5 (with frequency hopping)	Anantnag	96.87%	97.30%	94.70%	97.33%	96.38%	98.40%	NA
		Srinagar	96.13%	97.70%	94.50%	94.36%	94.57%	95.30%	
		Leh	95.80%	94.40%	98.99%	NA			
1.5	Service Coverage								
	In door (>= -75dBm)	Anantnag	80%	97.60%	95.00%	20.96%	39.00%	85.00%	79.00%
		Srinagar	80%	99%	95.00%	27.62%	61%	93.00%	99.23%
		Leh	92.00%	100%	85.07%	NA			
	In-vehicle (>= -85dBm)	Anantnag	97.00%	97.60%	100%	58.86%	73.00%	98.00%	96.39%
		Srinagar	97.00%	99%	100%	76.98%	91%	99%	99.83%
		Leh	100%	100%	98.99%	NA			
	Out door- in city (>= -95dBm)	Anantnag	100%	100%	100%	100%	93.00%	100%	100%
		Srinagar	100%	100%	100%	100%	98.00%	100%	99.98%
		Leh	100%	100%	100%	NA			
1.6	Call Setup Success Rate (>=95%)	Anantnag	100%	100%	96.00%	100%	99.31%	98.39%	98.83%
		Srinagar	100%	100%	99.43%	99%	100%	99.47%	100%
		Leh	100%	95.66%	92.68%	NA			

Graphical Representation (Anantnag)

Coverage level Anantnag	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
■ In door (>= -75dBm)	80.00%	97.60%	95.00%	20.96%	39.00%	85.00%	79.00%
■ In-vehicle (>= -85dBm)	97.00%	97.60%	100%	58.86%	73.00%	98.00%	96.39%
□ Out door- in city (>= -95dBm)	100%	100%	100%	100%	93.00%	100%	100%

Graphical Representation (Srinagar)

Coverage level Srinagar	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
■ In door (>= -75dBm)	80.00%	99.00%	95.00%	27.62%	61.00%	93.00%	99.23%
■ In-vehicle (>= -85dBm)	97.00%	99.00%	100%	76.98%	91.00%	99.00%	99.83%
□ Out door- in city (>= -95dBm)	100%	100%	100%	100%	98.00%	100%	99.98%

Graphical Representation (Leh)

Coverage level Leh	Aircel	Airtel	BSNL	Idea	Rcom GSM	Vodafone	Tata CDMA
■ In door (>= -75dBm)	92.00%	100%	85.07%				
■ In-vehicle (>= -85dBm)	100%	100%	98.99%				
□ Out door- in city (>= -95dBm)	100%	100%	100%				
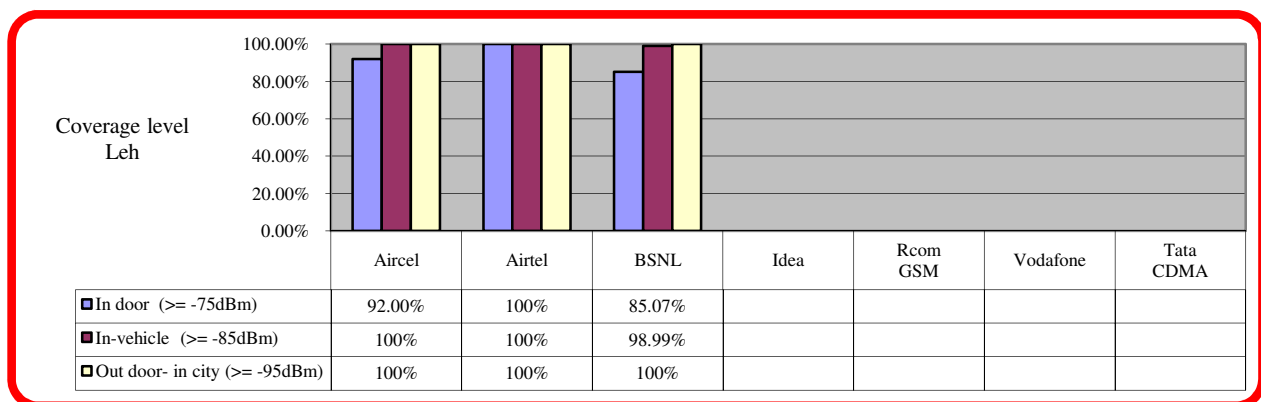
3) Critical Analysis

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

➢ Blocked Call Rate benchmark is not met by Airtel (4.34%) and BSNL (7.32%) in Leh. Dropped Call Rate benchmark is not met by BSNL in Anantnag and Leh with the values of 2.40% and 2.44% TATA CDMA is also not meeting this benchmark in Anantnag & Srinagar with values of 3.52% & 2.92 respectively.

➢ . Percentage of connections with good voice quality benchmark was not meet by BSNL in Anantnag &Srinagar ,Idea and Rcom in Srinagar,and Airtel in Leh.

➢ . CSSR Benchmark is also not met by BSNL in Leh with a value of 92.68%.

➢ .

*Note:-***Only Aircel, Airtel and BSNL have service in Leh**

The Availability of networks of Idea , Vodafone and Tata CDMA in Anantnag are specified to limited area only and are not available in each part of the area each having coverage in different parts of the area while Tata CDMA has covered almost all area in Anantnag except a part of highway is not covered between Ashmuqam and Pahalgam is not covered as they have no BTS Site between this area.

(E) Independent Drive Test

.... Submitted in 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 (Jammu & Kashmir) is satisfactory for **Network Parameters**. However, the benchmark of <=3% for "worst affected cells >3% TCH drop" is not met by Aircel and Vodafone (for both month & live data) .In the case of TCH congestion only Aircel is not meeting the benchmark(3.15%& 3.75% for both Live and Month data respectively).

➢ 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 Idea for Live Data and Airtel for month data(both system generated data only). Apart from this, when the live test calls were made to customer care centres for different operators most of the operators are not meeting the TRAI Benchmark with a huge difference in the case of Prepaid. The results of various operators under **Customer Service Quality Parameter** "operator answered calls (voice-to-voice) within 60 seconds" not meeting the benchmark in case of Prepaid are Reliance (24%), Aircel(44%) and Airtel(76%) which are having a high difference with respect to TRAI prescribed Benchmark.

➢ During **Drive Tests**, high Blocked Call Rates were found in case of Airtel and BSNL in Leh. High Dropped Call Rates were found in case of BSNL in Anantnag and Leh and in case of Tata CDMA in Anantnag and Srinagar. Most of the GSM operators have below benchmark %age of connections with good voice quality. Tata CDMA is seen to have a very low %age of connection with good voice quality (91.98%) in Srinagar and (92.04%) in Anantnag which is less than the TRAI benchmark of 95%.

II.   Basic Telephone Service (Wire line) Providers
........*Audit not done for this quarter*

III.   Broadband Service Providers
........*Audit not done for this quarter*