

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICE

FOR

NORTH ZONE – UP(E) CIRCLE

Report Period: APRIL 2012 – JUNE 2012

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Table of Contents

CHAPTER-1: Introduction

- I. Background
- II. Objectives and Methodology

CHAPTER-2: Executive Summary

- I. Preface
- II. Findings from Quality of Service Audit (Operator wise for each parameter)
 - (A) Cellular Mobile Telephone Service Providers
 - 3 days Live Data Audit
 - One Month Data Audit
 - Operator Assisted Drive Test
 - Independent Drive Test
 - (B) Basic Telephone Service (Wireline) Providers
 - NOT CONDUCTED ----
 - (C) Broadband Service Providers
 - NOT CONDUCTED ----

CHAPTER-3: Audit-PMR data verification results

- I. Cellular Mobile Telephone Service

CHAPTER-4: Detailed Findings & Analysis

- I. Cellular Mobile Telephone Service
 - (A) **MSC audit**
 - 1) 3 days live measurement data assessment & summarized findings
 - 2) One month audit data report & summarized findings
 - 3) Sample coverage
 - 4) Performance (Graphical Representation)
 - 5) Critical Analysis
 - (B) **Redressal**
 - 1) Sample coverage
 - 2) Performance based on live Calling for Billing Complaints
 - 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 Calling
 - 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 (Wireline) Providers

NOT CONDUCTED

III. Broadband Service Providers

NOT CONDUCTED

CHAPTER-1: INTRODUCTION

I. Background

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

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

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

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

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

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

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

II. Objectives and Methodology

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

- i) Verification of the data submitted by the service providers to TRAI as part of QoS monitoring reports i.e. Quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnection (POI) Congestion Reports with reference to the records maintained by the service provider.
- ii) Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using live measurement for 3 days during the month in which the audit and assessment is carried out.
- iii) Verification of the performance of service providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.
- iv) Drive tests of the mobile networks both operators assisted and independent drive test (as and where required).
- v) Billing and call center's data verification.
- vi) Live testing of the efficiency of the call center / customer care help line.
- vii) Emergency No. (Level 1) calling 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 UP(E) circle. But for parameters such as ‘Worst affected cell exceeding 3% TCH drop’ and ‘BTs 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.
- ✓ For Basic Wireline Service, the Network parameter of the QoS TRAI regulations is observed / verified for the 3 days for nearly 5% of the telephone exchanges covering 10% of the SDCA in a Service area.
- ✓ For Broadband Services audit was conducted for service provider have not baser of more than 10,000 only. Audit data was collected from the centralized NOC or through a remote access to the NOC were collected. Network parameters were also checked from the centralized NOC. MRTG, Cacti and Sandvine software were used for monitoring link utilization. Smoke Ping and Ping Test were used for monitoring Network Latency.

CHAPTER 2: EXECUTIVE SUMMARY

I. Preface

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services in UP (E) Circle in 2nd quarter (April – June 2012). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period Oct – Dec 2011.

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

Sl.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	May-2012	2000-2100 Hrs
2	Airtel Ltd	May-2012	2000-2100 Hrs
3	Idea	May-2012	2000-2100 Hrs
4	Uninor	May-2012	2000-2100 Hrs
5	BSNL	April-2012	1900-2000 Hrs
6	Reliance Communication	May-2012	1900-2000 Hrs
7	Tata Teleservices Ltd	May-2012	2000-2100 Hrs
8.	Videocon	May-2012	1100-1200 Hrs
9.	Vodafone	May-2012	2000-2100 Hrs
CDMA Operators			
10.	MTS	May-2012	2000-2100 Hrs
11.	Reliance Communication	May-2012	1900-2000 Hrs
12.	Tata Teleservices Ltd	May-2012	2000-2100 Hrs

All the NSS and BSS systems were considered for audit and assessment for the TCBH hours of individual operators.

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	Uninor	Rcom GSM	TTSL GSM	Videoco n	Vodafone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter		GSM Operators									CDMA Operators		
(A) -1	Network Service Quality Parameter													
	BTS Accumulated Downtime	<=2%	0.14%	0%	0.10%	0%	0%	0%	0.02%	0.45%	1.03%	0%	0.33%	0.04%
	Worst affected BTS due to downtime	<=2%	0%	0.10%	0.07%	0%	0%	0%	0%	0%	1.21%	0%	0%	0%
1	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	98.98%	99.71%	96.95%	97.82%	95.98%	99.85%	99.22%	99.95%	98.40%	99.00%	99.98%	99.88%
	b) SDCCH/PAGING congestion	<=1%	0.20%	0.06%	1.65%	0.71%	0.50%	0.03%	0.11%	0.05%	0.79%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.82%	0.23%	1.40%	1.47%	3.52%	0.12%	0.67%	0.00%	0.81%	0.01%	0.02%	0.12%
2	Connection maintenance (retainability)													
	a) CDR	<=2%	0.46%	0.90%	2.94%	0.88%	1.23%	0.57%	0.95%	0.00%	1.17%	0.66%	0.09%	0.71%
	b) Worst affected cells>3% TCH drop	<=3%	2.81%	2.70%	0.33%	2.62%	1.90%	0.00%	8.93%	0.00%	2.93%	2.60%	0.00%	2.78%
	c) Good voice quality	>=95%	96.47%	98.66%	97.00%	96.73%	95.69%	98.57%	96.65%	98.39%	96.40%	99.00%	99.80%	NA
3	No of POI having > 0.5% congestion	>=0.5 %	0	0	0	0	0	0	0	0	0	0	0	0
4	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	100%	96.33%	96%	81%	98%	99%	100%	100%	100%	99.92%	99%	100%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	90.41%	89.42%	78%	97.73%	92%	98.26%	98.10%	100%	96.25%	98.29%	96.83%	93.58%

NA: Not Applicable, NP: Data Not Provided

From the 3 days live data assessment, it is found that most of the operators are meeting the network parameters, except BSNL for the parameter SDCCH congestion & Call Drop Rate, Uninor for the parameter TCH congestion and TTSL(GSM) for the parameter "Worst affected cells>3% TCH drop". TTSL CDMA has no provision of providing voice Quality data, because this data is not generated in the system.

Performance related to customer care data is found to be satisfactory for most of the operators, except Airtel & BSNL for "calls answered by operators (voice-to-voice), and Idea for the parameter, Accessibility of call centre parameter.

One Month Data Audit		Bench- mark	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	TTSL GSM	Videocon	Vodafone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter		GSM Operators									CDMA Operators		
(A)	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	0.01%	0.23%	0.09%	0.13%	0.05%	0.37%	0.00%	0.47%	0.41%	0.25%	0.50%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	1.94%	0.53%	0.31%	0.41%	1.30%	1.11%	0.00%	0.00%	1.92%	0.00%	1.27%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	98.45%	99.68%	96.58%	97.70%	97%	99.83%	99.06%	99.89%	98.02%	99.99%	99.97%	99.89%
	b) SDCCH/PAGING congestion	<=1%	0.49%	0.08%	1.94%	0.72%	0.74%	0.06%	0.15%	0.11%	0.85%	0.00%	0.01%	0.01%
	c) TCH congestion	<=2%	1.06%	0.24%	1.48%	1.58%	1.84%	0.11%	0.79%	0.00%	1.13%	0.01%	0.02%	0.10%
3	Connection maintenance (retainability)													
	a) CDR	<=2%	0.45%	0.94%	1.47%	0.89%	1.30%	0.58%	1.01%	0.14%	1.18%	0.56%	0.08%	0.72%
	b) Worst affected cells>3% TCH drop	<=3%	2.65%	2.70%	1.21%	2.85%	2.05%	0.00%	10.88%	0.00%	2.97%	2.44%	0.00%	2.74%
	c) Good voice quality	>=95%	96.62%	98.60%	97%	96.74%	95.81%	98.54%	96.76%	98.08%	96.30%	99.98%	99.81%	NA
4	No of POI having > 0.5% congestion	>=0.5%	0	0	0	0	0	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters													
5	Metering/billing credibility-Post paid	<= 0.1%	0.11%	0.03%	0.09%	0.05%	NA	0.10%	0.27%	NA	0.07%	0.00%	0.09%	0.19%
6	Metering /billing credibility-Pre paid	<= 0.1%	0.01%	0.00%	0.01%	0.01%	0.02%	0.10%	0.04%	0.00%	0.04%	0.00%	0.10%	0.32%
7	Resolution of billing/ charging complaints	100% within 4 weeks	100%	100%	100%	100%	NA	100%	100%	NA	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%	NA	100%	100%	100%	100%
8	Response time to customers for assistance													
	a) Accessibility of call centre/Customer Care	>=95%	100%	92.75%	96%	99%	97%	99%	99%	100%	100%	100%	99%	99%
	b) % call answered by operators(voice to voice) within 60 sec.	>=90%	91.06%	86.83%	98%	97.88%	91%	95.79%	80.06%	100%	94.88%	96.42%	92.60%	94.93%
9	Termination/closure of service	<=7days	100%	100%	69%	100%	NA	100%	100%	NA	100%	100%	100%	100%
10	Time taken for refunds of deposits after closures.	100% within 60 days	NR	NR	100%	100%	NA	100%	100%	NA	100%	No Refunds	100%	100%

NA: Not Applicable, NR :- No Refunds

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Analysis:--

- From the month data assessment, it is found that most of the operators are meeting the network parameters, except, BSNL for SDCCH congestion parameter and TTSL (GSM) for “Worst affected cells>3% TCH drop “parameter.
- Under Metering & Billing Section for Post-Paid services, all operators are meeting the benchmark, except Airtel, TTSL (GSM) & TTSL (CDMA).
- Performance related to customer care data for Accessibility of call centre parameter is not met by Airtel, while “%age of voice to voice call” parameter is found to be un satisfactory for Airtel & TTSL (GSM). As far as Termination cases is concerned, only BSNL is not complying the benchmarks in comparison to other operators.

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Operator-Assisted Drive Test

The Operator Assisted Drive Test was conducted at UP (E) Circle for all the operators. Route covered was about around 60-80 Km depending on city areas within the speed limit of 30Km/hr. The cities covered were Barabanki, Pratapgarh and Ballia. In all the cities, zones were selected for covering different density areas (High, Medium & Low dense areas).

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	Tata GSM	Vodafone	Rcom CDMA	Tata CDMA	
			GSM Operators									CDMA Operators	
1.1	Blocked Call Rate (<=3%)	Barabanki	1.38%	0.00%	1.00%	1.07%	0.00%	1.61%	0.00%	0.00%	0.00%	0.00%	
		Pratapgarh	1.81%	0.00%	1.49%	0.00%	0.00%	0.00%	0.00%	1.51%	0.00%	0.00%	
		Ballia	0.00%	0.00%	0.00%	0.00%	0.00%	1.46%	1.35%	0.00%	1.41%	0.00%	
1.2	Dropped Call Rate (<=2%)	Barabanki	0.00%	0.00%	0.00%	0.00%	1.33%	0.00%	0.00%	0%	0.00%	0.00%	
		Pratapgarh	0.00%	0.00%	1.00%	0.00%	1.53%	0.00%	0.00%	0%	0.00%	0.00%	
		Ballia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.35%	0%	0.00%	0.00%	
1.3	% of connections with good voice quality (=>95%)												
		(i) 0-4 (w/o frequency hopping)	Barabanki									100%	99.89%
		Pratapgarh										100%	98.01%
	Ballia										99.00%	96.94%	
	(ii) 0-5 (with frequency hopping)	Barabanki	95.50%	98.20%	96%	98.10%	91.00%	95%	90.60%	95%			
	Pratapgarh	95.60%	99.30%	90.60%	93.50%	94.10%	97%	96.60%	97.37%				
Ballia	97.30%	98.10%	97.20%	95%	93.60%	95%	95.05%	95.80%					
1.4	Call Setup Success Rate (>=95%)	Barabanki	98.61%	100%	99%	98.93%	98.67%	98.39%	100%	100%	100%	100%	
		Pratapgarh	98.18%	100%	100%	100%	100%	100%	100%	98.49%	100%	100%	
		Ballia	100%	100%	100%	100%	100%	98.54%	96%	100%	98.59%	100%	
1.5	Handover Success Rate (HOSR)	Barabanki	100%	100%	98.67%	98.00%	99.15%	95.50%	100%	99%	100%	100%	
		Pratapgarh	100%	100%	98.88%	100%	98.48%	100%	100%	100%	100%	99.59%	
		Ballia	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	

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

- Good Voice quality parameter is not met by BSNL & Idea in Pratapgarh, TTSL (GSM) in Barabanki and Uninor in All 3 cities, Barabanki, Pratapgarh & Ballia respectively.

NOTE-- MTS is having an ICR agreement with TTSL and Videocon has no services in Barabanki, Pratapgarh & Ballia in UP (E) Circle.

Etisalat has Closed its operation in UP (E) Circle.

Independent Drive Test:--

SN	Parameter	TTSL (Ballia)
1.1	Call Attempts	70
1.2	Blocked Call Rate (<=3%)	1.42%
1.3	Dropped Call Rate (<=2%)	0.00%
1.4	Percentage of connections with good voice quality (=>95%)	
	(i) 0-4 (w/o frequency hopping)	
	(ii) 0-5 (with frequency hopping)	96.40%
1.5	Service Coverage	
	In door (>= -75dBm)	47.30%
	In-vehicle (>= -85dBm)	86.90%
	Outdoor- in city (>= -95dBm)	98.20%
1.6	Call Setup Success Rate (>=95%)	98.58%
1.7	Handover Success Rate	100%

Observation:-

All the parameters are met by TTSL in Ballia.

CHAPTER-3: AUDIT-PMR VERIFICATION (Oct 2011—Dec 2011)

Cellular Mobile Service:--

PMR		Bench-mark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Uninor	Rcom GSM	Tata GSM	Videocoin	Vodafone	MTS	Rcom CDM A	Tata CDM A
S/N	Name of Parameter			GSM Operators												
(A)	Network Service Quality Parameter															
1	Network Availability															
	BTS Accumulated Downtime	<=2%	Reported	0.42%	0.37%	0.78%	0.82%	0.26%	1.51%	0.45%	0.06%	1.21%	0.15%	0.17%	0.60%	0.05%
			Verified	0.42%	0.37%	0.78%	0.82%	0.26%	1.51%	0.45%	0.06%	1.21%	0.15%	0.17%	0.60%	0.05%
	Worst affected BTSs due to downtime	<=2%	Reported	1.88%	0.72%	2.20%	0.00%	0.67%	1.00%	1.12%	0.04%	0.52%	0.89%	0.00%	0.79%	0.00%
Verified			1.88%	0.72%	2.20%	0.00%	0.67%	1.00%	1.12%	0.04%	0.52%	0.89%	0.00%	0.79%	0.00%	
2	Connection Establishment (Accessibility)															
	CSSR (Call Setup Success Rate)	>=95%	Reported	98.43%	99.21%	97.33%	98.23%	99.91%	96.80%	99.16%	97.17%	99.03%	97.37%	99.50%	98.89%	98.72%
			Verified	98.43%	99.21%	97.33%	98.23%	99.91%	96.80%	99.16%	97.17%	99.03%	97.37%	99.50%	98.89%	98.72%
	SDCCH/PAGING congestion	<=1%	Reported	0.18%	0.12%	0.67%	0.59%	0.87%	0.57%	0.41%	0.22%	0.26%	0.26%	0.00%	0.00%	0.00%
			Verified	0.18%	0.12%	0.67%	0.59%	0.87%	0.57%	0.41%	0.22%	0.26%	0.26%	0.00%	0.00%	0.00%
	TCH congestion	<=2%	Reported	0.64%	0.34%	1.50%	0.12%	1.79%	2.03%	0.80%	1.22%	0.09%	1.04%	0.00%	0.57%	0.00%
Verified			0.64%	0.34%	1.50%	0.12%	1.79%	2.03%	0.80%	1.22%	0.09%	1.04%	0.00%	0.57%	0.00%	
3	Connection maintenance (retainability)															
	CDR	<=2%	Reported	0.57%	1.27%	1.60%	0.49%	1.43%	1.74%	1.20%	1.22%	1.08%	1.41%	0.45%	1.01%	0.78%
			Verified	0.57%	1.27%	1.60%	0.49%	1.43%	1.74%	1.20%	1.22%	1.08%	1.41%	0.45%	1.01%	0.78%
	Worst affected cells>3% TCH drop	<=3%	Reported	1.69%	2.91%	3.50%	1.01%	2.93%	3.60%	2.05%	3.63%	0.81%	3.34%	1.32%	0.66%	2.81%
			Verified	1.69%	2.91%	3.50%	1.01%	2.93%	3.60%	2.05%	3.63%	0.81%	3.34%	1.32%	0.66%	2.81%
	Good voice quality	>=95%	Reported	96.41%	98.39%	96.33%	98.93%	95.88%	95.62%	98.39%	96.65%	97.33%	95.93%	100.00%	98.64%	98.02%
Verified			96.41%	98.39%	96.33%	98.93%	95.88%	95.62%	98.39%	96.65%	97.33%	95.93%	100.00%	98.64%	98.02%	

PMR		Benchmark	Audit	Aircel	Airtel	BSNL	Etisalat	Idea	Uninor	Rcom GSM	Tata GSM	Videocoin	Vodafone	MTS	Rcom CDMA	Tata CDMA
S/N	Name of Parameter															
4	POI congestion	<=0.5%	Reported	0	0	0	0	0	2.67%	0	0	0	0	0	0	0
			Verified	0	0	0	0	0	2.67%	0	0	0	0	0	0	0
(B)	Customer Service Quality Parameters															
5	Metering/billing credibility-Post paid	<= 0.1%	Reported	0.04%	0.02%	0.07%	0.07%	0.05%	0.00%	0.09%	0.01%	0.00%	0.06%	0.00%	0.10%	0.00%
			Verified	0.04%	0.02%	0.07%	0.07%	0.05%	0.00%	0.09%	0.01%	0.00%	0.06%	0.00%	0.10%	0.00%
6	Metering /billing credibility-Pre paid	<= 0.1%	Reported	0.04%	0.00%	0.06%	0.06%	0.00%	0.03%	0.10%	0.00%	0.00%	0.02%	0.00%	0.10%	0.03%
			Verified	0.04%	0.00%	0.06%	0.06%	0.00%	0.03%	0.10%	0.00%	0.00%	0.02%	0.00%	0.10%	0.03%
7	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100%	100%	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100%	100%
			Verified	100%	100%	100%	100%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100%	100%
	Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<=1 week	Reported	100%	100%	100%	0%	100%	0%	100%	100%	100%	100%	100%	100%	100%
			Verified	100%	100%	100%	0%	100%	0%	100%	100%	100%	100%	100%	100%	100%
8	Response time to customers for assistance		Reported													
			Verified													
	Accessibility of call centre/Customer Care	>=95%	Reported	100.00%	99.39%	97.00%	98.41%	100%	96.96%	99.12%	98%	99.51%	100%	98.60%	98.97%	98.00%
			Verified	100.00%	99.39%	97.00%	98.41%	100%	96.96%	99.12%	98%	99.51%	100%	98.60%	98.97%	98.00%
% call answered by operators(voice to voice) within 60 sec.	>=90%	Reported	87.43%	94.50%	92.00%	99.05%	64.48%	96.11%	97.43%	96.00%	98.44%	99.25%	96.00%	97.23%	98.00%	
		Verified	87.43%	94.50%	92.00%	99.05%	64.48%	96.11%	97.43%	96.00%	98.44%	99.25%	96.00%	97.23%	98.00%	
9	Termination/closure of service															
	No.of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	100.00%	100.00%	100%	0.00%	100.00%	0.00%	100%	100%	0.00%	100.00%	0.00%	100.00%	100.00%
			Verified	100.00%	100.00%	100%	0.00%	100.00%	0.00%	100%	100%	0.00%	100.00%	0.00%	100.00%	100.00%
10	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100%	100%	100%	0%	100%	0%	100%	100%	0%	100%	0%	100%	100%
			Verified	100%	100%	100%	0%	100%	0%	100%	100%	0%	100%	0%	100%	100%

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	Bench mark	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	TTSL GSM	Videoc on	Vodafo ne	MTS	Rcom CDM A	Tata CDMA
			GSM Operators								CDMA Operators			
(A)	Network Service Quality													
-1	Parameter													
	BTS Accumulated Downtime	<=2%	0.14%	0%	0.10%	0%	0%	0.33%	0.02%	0.45%	1.03%	0%	0.33%	0.04%
	Worst affected BTS due to downtime	<=2%	0%	0.10%	0.07%	0%	0%	0%	0%	0%	1%	0%	0%	0%
	Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		278	1515	536	574	914	781	40	18	6343	65	447	22
	No. of BTSs having accumulated downtime of >24 hours in a month		0	9	5	0	0	0	0	0	103	0	0	0
2	Connection Establishment (Accessibility)													
	a) CSSR	>=95%	98.98%	99.71%	96.95%	97.82%	96%	99.85%	99.22%	99.95%	98.40%	99.00%	99.98%	99.88%
	b) SDCCH/PAGING congestion	<=1%	0.20%	0.06%	1.65%	0.71%	0.50%	0.03%	0.11%	0.05%	0.79%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	0.82%	0.23%	1.40%	1.47%	3.52%	0.12%	0.67%	0.00%	0.81%	0.01%	0.02%	0.12%
3	Connection maintenance													
	a) CDR	<=2%	0.46%	0.90%	2.94%	0.88%	1.23%	0.57%	0.95%	0.00%	1.17%	0.66%	0.09%	0.71%
	b) Cells having > 3% TCH drop	<=3%	2.81%	2.70%	0.33%	2.62%	1.90%	0.00%	8.93%	0.00%	2.93%	2.60%	0.00%	2.78%
	c) Good voice quality	>=95%	96.47%	98.66%	97.00%	96.73%	95.69%	98.57%	96.65%	98.39%	96.40%	99.00%	99.80%	NA
	d) No. of cells > 3% TCH drop		231	698	73	457	191	0	674	0	748	32	0	67
	e) Total no. of cells in the network		8,235	25,891	22121	17,429	10,066	9,996	7,547	165	25,497	1,232	5,673	2,412

S/ N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	TTSL GSM	Videoc on	Vodafo ne	MTS	Rcom CDM A	Tata CDMA
			GSM Operators						CDMA Operators					
4	No of POI having > 0.5% congestion	>=0.5 %	0	0	0	0	0	0	0	0	0	0	0	0
	a) Name of POI not meeting the benchmark		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
	b) Total No. of circuits on POI		67,308	190,161	112,813	216,969	86,271	6,802	5,914	62	224,067	12006	26,099	83,555
	c) Avg No. of call attempts on POI		1,479,197	5,516,645	4,864,334	3,453,962	4,259,062	226,823	22,740	13	5,855,774	18368	409,336	1,014,878
	d) Avg traffic served on POI (Erlang)		48,445	176,093	79,250	121,531	57,859	3,132	422	19	81,800	3795	16,054	29,491
	e) Total number of working POI Service Area wise		131	151	84	271	86	40	8	14	209	49	40	242
	f) Equipped Capacity of Network in respect of Traffic in erlang		102,000	488,001	476,308	249,780	141,048	140,000	105,000	1,621	524,006	21,000	116,000	184,869
	g) Total traffic handled in TCBH in erlang		62546	426918	275,760	157002	163265	128362	65304	1	419198	6920	44445	32760
(B)	Customer Service Quality Parameters													
5	Response time to customers for assistance													
	a) Accessibility of call centre	>=95 %	100%	96.33%	96%	81%	98%	99%	100%	100%	100%	99.92 %	99%	100%
	b) % of call answered by operators(voice to voice) within 60 sec	>=90 %	90.41%	89.42%	77.62%	97.73%	92%	98.26 %	98.10 %	100%	96.25%	98.29 %	96.83 %	93.58%
	c) No. of call attempts to call centre / customer care nos. during TCBH (Avg)		123,225	531,949	9,335	254,711	243,795	106,554	42,320	8	259,623	10,310	56,147	13,553
	d) No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Avg)		111,405	475,661	7,246	248,919	223,987	104,700	41,517	8	249,887	10,134	54,366	12,683

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Live Data Assessment):

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

- **BTS Accumulated Downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0.02% and 1.03%.
- **Worst affected BTSs due to Downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.21%.
- **Call Setup Success Rate (CSSR) (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 95.98% and 99.99%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators, are meeting the benchmark with values lying between 0% and 1.65% , except BSNL.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 3.52% , except Uninor (3.52%) which is not complying the parameter set by TRAI.
- **Call Drop Rate (CDR) (benchmark $\leq 2\%$):** Rest of the operators are meeting the benchmark with values lying between 0.00% and 2.94%, Except BSNL (2.94%) .
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** TTSL(GSM) is not satisfying the benchmark with a value 8.93% , rest of the operators are meeting the benchmark .
- **Connections with good voice quality (benchmark $\geq 95\%$):** TTSL(CDMA) has declared that the parameter is not system generated rest all CDMA & GSM operators are meeting the benchmark respectively.
- **No of POI > 0.5% Congestion (benchmark $\geq 0.5\%$):** None of the operators are having POIs more than 0.5% congestion. There was congestion found on the POIs in general, but was under the benchmark of 0.5%. Cases were found where individual POIs were showing high utilization/usage and some were 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.
- **Metering & Billing (benchmark $\leq 0.1\%$):**- Rest of the operators are meeting the benchmark, Except Aircel & TTSL (GSM & CDMA).
- **%age of call answered by operator (electronically) (benchmark $>95\%$):** All the operators are meeting the benchmark with values lying between 81% to 100%, Except Idea with a value 81%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** %): All the operators are meeting the benchmarks ,Except Airtel (89.42%) & BSNL (77.62%).

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	TTSL GSM	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators									CDMA Operators		
	a) Name of POI not meeting the benchmark		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
	b) Total No. of call attempts on POI (Avg.)		1,480,264	5,585,757	48,642,172	3,454,944	3,941,479	219,163	26,059	17	5,905,603	177610	374,476	1,022,416
	c) Total traffic served on POI (Erlang) (Avg.)		47,969	175,049	790,486	125,462	60,598	2,893	461	16	83,332	3689	14,349	29,729
	d) Total No. of circuits on POI		67,308	190,161	112,813	216,969	86,271	6,802	5,914	62	224,067	12006	26,099	83,555
	e) Total number of working POI Service Area wise		131	151	84	271	86	40	8	14	209	49	40	242
	f) Capacity of POI		65,206	189,650	102,832	205,339	78,348	6,270	5,565	47	219,052	11705	24,641	79,639
5	Network Data													
	a) Equipped Capacity of Network Erlang		102,000	488,001	476,308	249,780	141,048	140,000	105,000	1,621	524,006	21000	116,000	184,869
	b) Total traffic in TCBH in erlang (Avg.)		62,546	426,918	275,760	157,002	163,265	128,362	65,304	1	419,198	6920.00	44,445	32,760
	c) Total no. of customers served (as per VLR) on last day of the month		1,976,663	14,340,641	5,470,955	7,405,939	3,747,727	5,438,033	2,044,266	133	14,048,261	218237	3,002,796	482,497
(B)	Customer Service Quality Parameters													
5	Metering/billing credibility-Post paid	$\leq 0.1\%$	0.11%	0.03%	0.09%	0.05%	NA	0.10%	0.27%	NA	0.07%	0.00%	0.09%	0.19%
	a) No. of bills issued during the period		1,770	67,199	115,866	48,092	NA	9,271	18,075	NA	239,890	332	110,686	45,618
	b) No. of bills disputed including billing complaints during the period		2	17	105	23	NA	9	49	NA	157	0	100	88
6	Metering /billing credibility-Pre paid	$\leq 0.1\%$	0.01%	0.00%	0.01%	0.01%	0.02%	0.10%	0.04%	0.00%	0.04%	0.00%	0.10%	0.32%
	a) No. of charging / credit / validity complaints during the quarter		314	737	950	509	1,383	7,458	1,526	0	5,436	1	5,229	2,769
	b) Total no. of pre-paid customers at the end of the quarter		2,612,007	17,314,456	9,465,824	7,712,890	7,170,149	7,458,829	3,629,723	14,883	14,920,600	514,104	5,229,036	858,751

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	TTSL GSM	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators	
7	Resolution of billing/ charging complaints	<i>100% within 4 weeks</i>	100%	100%	100%	100%	NA	100%	100%	NA	100%	100%	100%	100%
	a) No. of billing/(post paid) and charging, credit/validity (pre paid) complaints resolved within 4 weeks during the quarter		100%	100%	100%	100%	NA	100%	100%	NA	100%	100%	100%	100%
	b) Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		316	754	1,055	1,557	1,383	7,467	1,575	0	5,593	1	5,329	2,857
	c) No. of billing complaints (post paid) and charging, credit/ validity complaints (pre paid) resolved in favour of the customer during the quarter		62	754	935	532	1,383	7,464	0	0	5,168	1	5,231	4
	d) No. of complaints disposed on account of not considered as valid complaints during the quarter		254	0	120	1,025	0	3	1,575	0	425	0	98	2,853
	e) Period of applying credit/waiver/adjustment to the customers account from the date of resolutions of complaints	<i><=1 week</i>	100%	100%	1	100%	1	100%	100%	NA	100%	100%	100%	100%
	8	Response time to customers for assistance												
	a) Accessibility of call centre/Customer Care	<i>>=95%</i>	100%	92.75%	96%	99%	97%	99%	99%	100.00%	100%	100%	99%	99%
	b) % call answered by operators(voice to voice) within 60 sec.	<i>>=90%</i>	91.06%	86.83%	98%	97.88%	91%	95.79%	80.06%	100.00%	94.88%	96.42%	92.60%	94.93%
	c) Total no. of call attempts to call centre &		1,169,762	531,949	9,335	254,711	243,795	106,554	42,320	8	2,595,516	13,870	56,147	13,553

S/N	Name of Parameter	Bench mark	Aircel	Airtel	BSNL	Idea	Uninor	Rcom GSM	TTSL GSM	Vi-con	V-fone	MTS	Rcom CDMA	Tata CDMA
			GSM Operators										CDMA Operators	
	customer care nos. during TCBH (Avg.).													
	d) No. of calls connected and answered successfully to call centre & customer care nos. during TCBH (Avg.).		1,065,188	4,701,029	74,043	2,355,186	2,325,551	993,156	981,325	56	2,462,651	13,374	503,440	135,362
9	Termination/closure of service	<i><=7days</i>	100%	100%	69%	100%	NA	100%	100%	NA	100%	100%	100%	100%
	a) Total No. of requests for Termination / Closure of service received during the quarter		9	388	650	114	NA	70	366	NA	2,325	109	315	953
	b) No. of requests for Termination / Closure of service complied within 7 days during the quarter		9	388	450	114	NA	70	366	NA	2,325	109	315	953
10	Time taken for refunds of deposits after closures.	<i>100% within 60 days</i>	NR	NR	100%	100%	NA	100%	100%	NA	100%	No Refunds	100%	100%

NA: Not Applicable, NP: Data Not Provided

Parameter-wise Findings (Month Data Assessment):

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

- **BTS accumulated downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 0.50%.
- **Worst affected BTSs due to downtime (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.94%.
- **Call setup success rate (benchmark $\geq 95\%$):** All operators are meeting the benchmark with values lying between 96.58% and 99.99%.
- **SDCCH/PAGING Channel congestion (benchmark $\leq 1\%$):** All operators are meeting the benchmark with values lying between 0% and 1.94%. Except BSNL with a value 1.94%.
Note: CDMA operators have provided the data for Paging Channel congestion and GSM operators provided SDCCH Channel congestion.
- **TCH congestion (benchmark $\leq 2\%$):** All operators are meeting the benchmark with values lying between 0% and 1.84%.
- **Call drop rate (benchmark $\leq 2\%$):** Rest of the operators are meeting the benchmark with values lying between 0.08% and 1.47%.
- **Cell exceeding 3% TCH drop (benchmark $\leq 3\%$):** All operators are meeting the benchmark, Except TTSL-GSM (10.88%) which is very high value in comparison to other operators and not comply TRAI benchmark. .
- **Connections with good voice quality (benchmark $\geq 95\%$):** All the GSM & CDMA operators are meeting the benchmark, Except TTSL CDMA who has declared that this parameter is not system generated.
- **No of POI > 0.5% Congestion (benchmark $\geq 0.5\%$):** None of the operators are having POIs more than 0.5% congestion. There was congestion found on the POIs in general, but was under the benchmark of 0.5%. Cases were found where individual POIs were showing high utilization/usage and some were 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. Except Airtel with a value of 92.75%.
- **%age of call answered by operator (Voice to voice) (benchmark $>90\%$):** Except Airtel, and TTSL (GSM) , rest all the operators are meeting the benchmark.
- **Metering and billing credibility-Post paid (benchmark $\leq 0.1\%$):** Rest of the operators are meeting the benchmark. Except Aircel and TTSL (GSM & CDMA) deviating with a value of 0.11% and 0.27% & 0.19% respectively.
- **Metering and billing credibility-Pre paid (benchmark $\leq 0.1\%$):** All the operators are meeting the benchmark. Except TTSL(CDMA) with a value 0.32%.
- **Resolution of billing/ charging complaints (benchmark 100% within 4 weeks):** All operators are meeting the benchmark, except Uninor, & Videocon, which has no post paid service in UP(e) circle .
- **Termination/Closure of service (Benchmark ≤ 7 days):** All operators have satisfied the benchmark .Except BSNL with a value of 69%.
- **Time taken for refunds of deposits after closures (benchmark 100% within ≤ 60 days):** All operators have satisfied the benchmark

(3) **Sample Coverage**

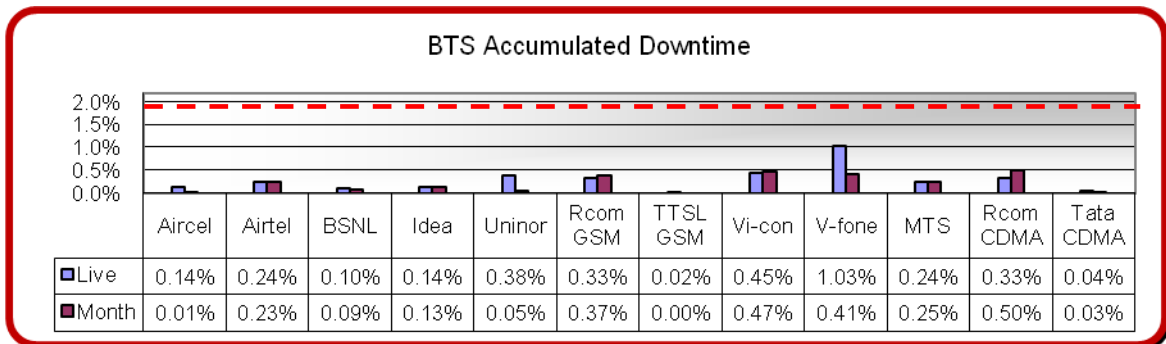
Switches/BSC/BTS details of operators:

Sl.	Name of Service Provider	No. of MSC	No. of BSC	No. of BTS
GSM Operators				
1	Aircel Ltd	3	24	2735
2	Airtel Ltd	42	97	8625
3	BSNL	31	121	7375
4	Idea	10	40	5791
5	Uninor	8	23	3316
6	Reliance Communication	4	19	3332
7	Tata Teleservices Ltd.	4	23	2518
8	Videocon	1	1	55
9	Vodafone	30	134	8521
CDMA Operators				
10.	MTS	1	1	383
11	Reliance Communication	12	12	1891
12.	Tata Teleservices Ltd.	7	9	800

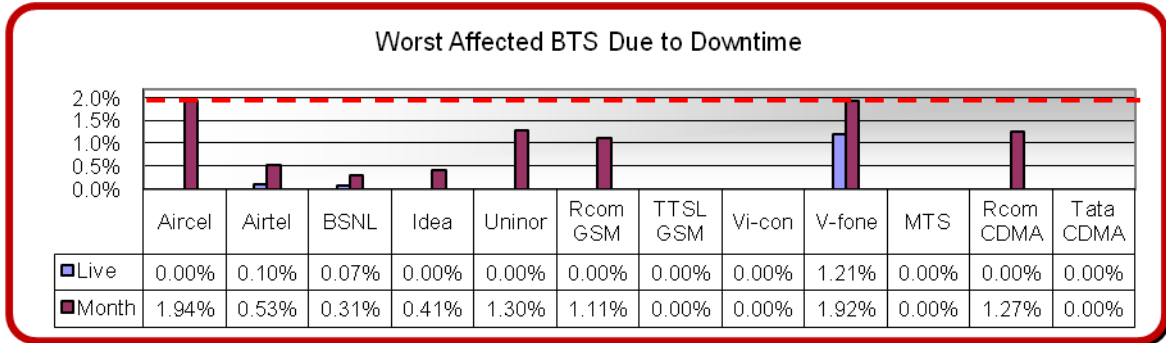
(4) **Performance (Graphical Representation)****Comparison between Live measurements and One month data Audit – Cellular Mobile Telephone Services**

A) NETWORK PERFORMANCE

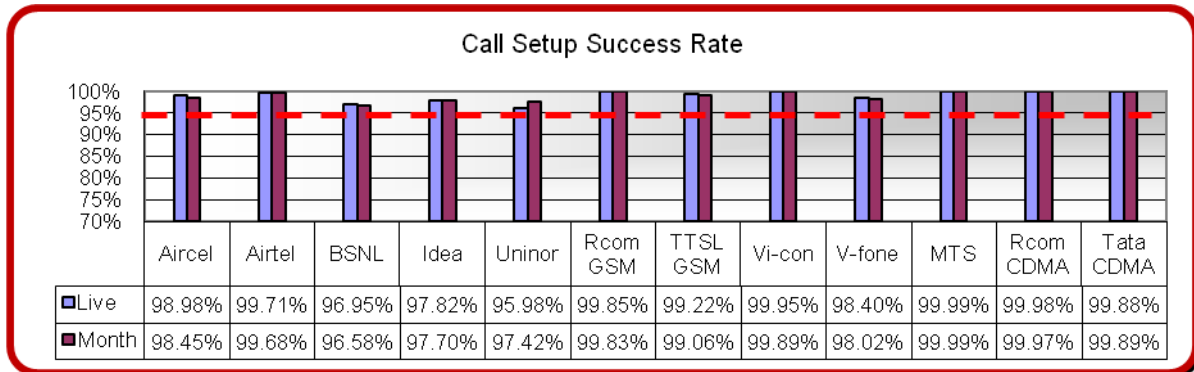
BTS Accumulated Downtime: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.



Worst Affected BTS Due to Downtime: All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit.

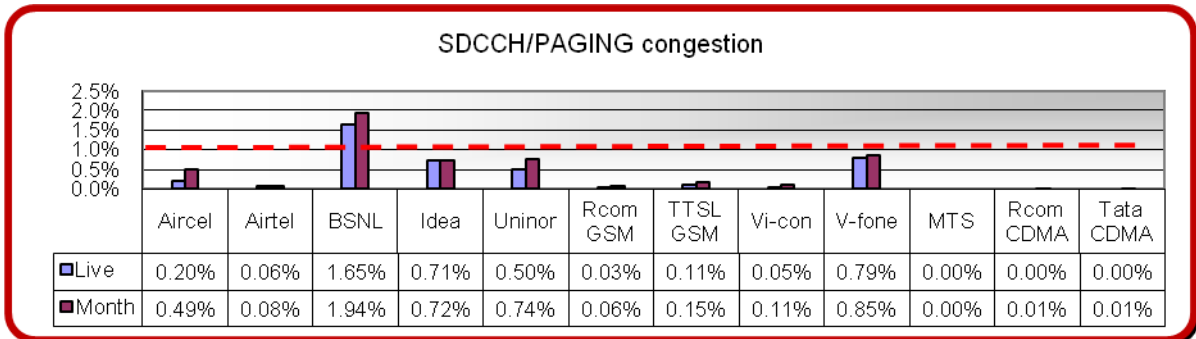


Call Setup Success Rate (CSSR): All operators are meeting the TRAI benchmarks ($\geq 95\%$) for both one month data and 3 days live data taken in the month of audit

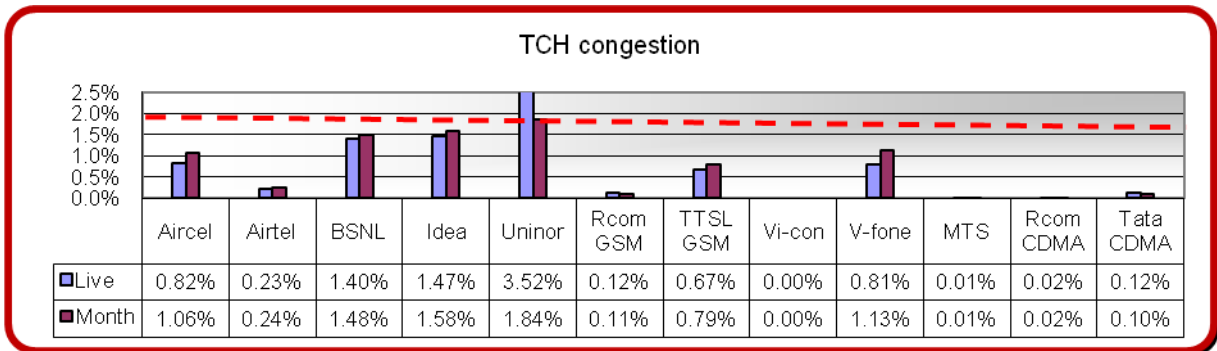


Blocked call rate:

SDCCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 1\%$) for both one month data and 3 days live data taken in the audit, Except BSNL.

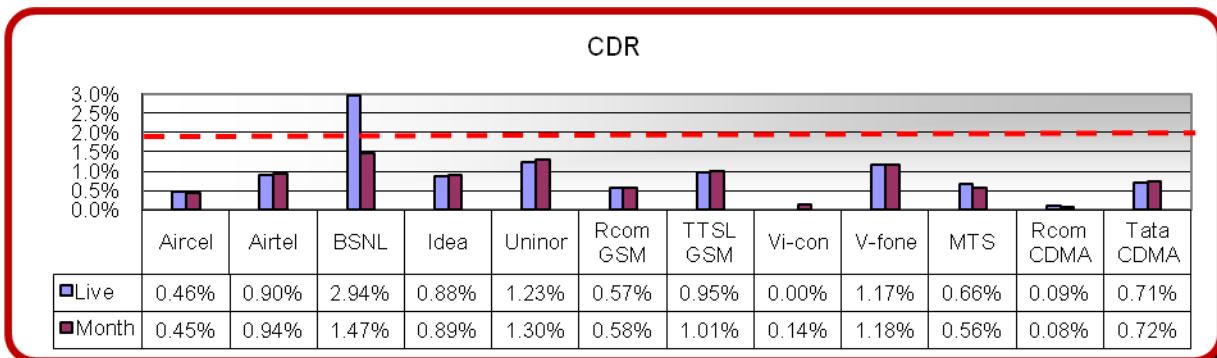


TCH congestion (%): All operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data. Except Uninor which is deviating in 3 days live data.

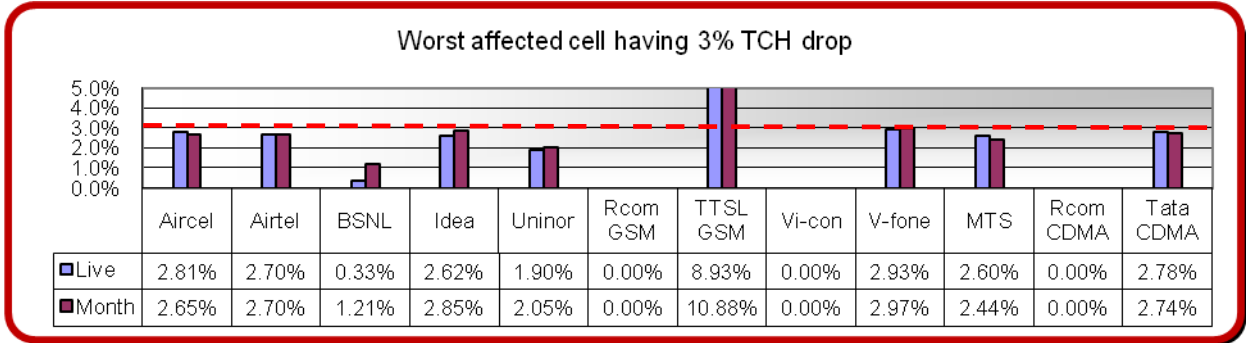


Connection Maintainability (Retain ability):

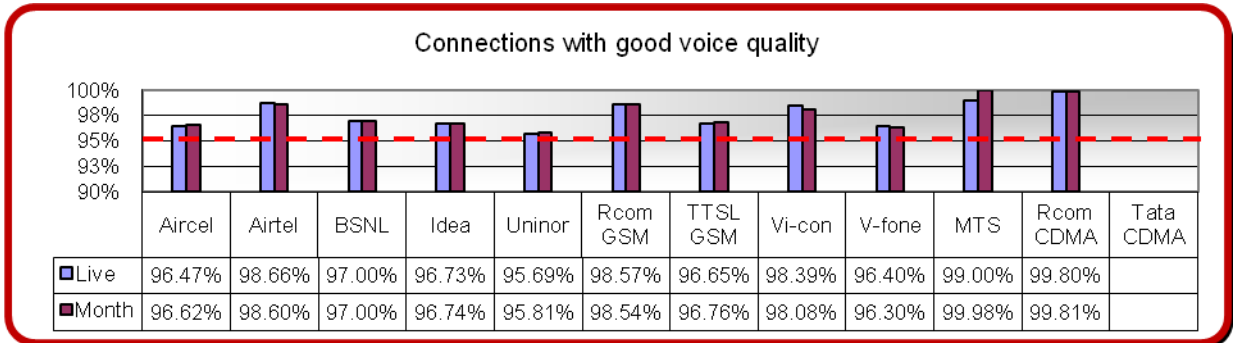
Call Drop Rate (CDR) (%): All the operators are meeting the TRAI benchmarks ($\leq 2\%$) for both one month data and 3 days live data taken in the month of audit, Except BSNL in case of Live, which are deviating from the benchmark.



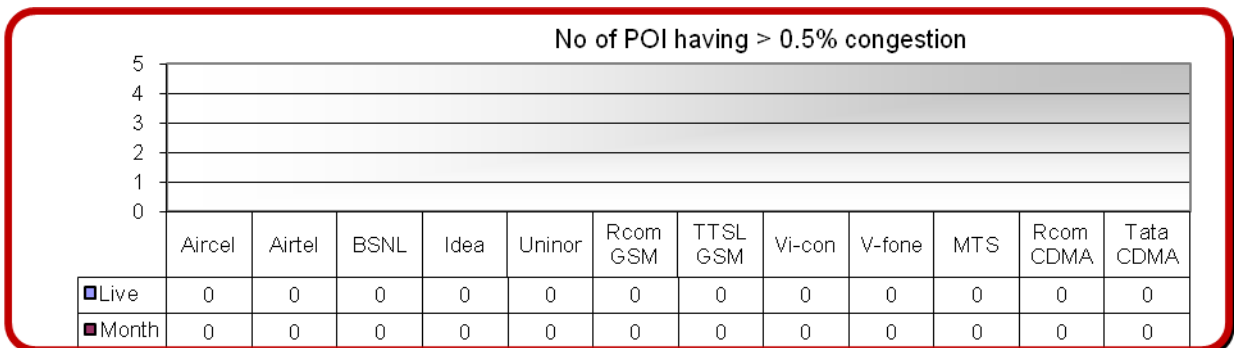
Worst affected Cell exceeding 3% TCH Drop: All the operators are meeting the TRAI benchmarks ($\leq 3\%$) for both one month data and 3 days live data. Except TTSL (GSM) which is deviating the benchmark.



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. TTSL CDMA has not provided the data as data is not generated from the system.



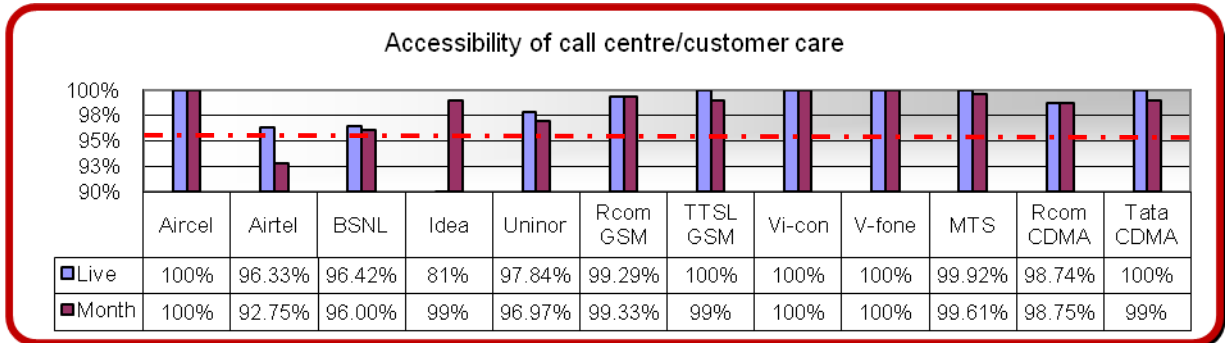
No of POI having > 0.5% Congestion: None of the operators are having POIs above 0.5% congestion ($\geq 0.5\%$) for both one month data and 3 days live data.



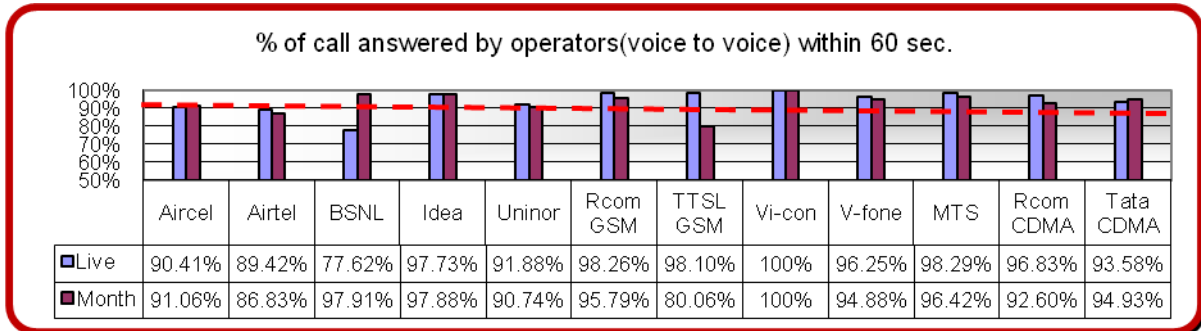
CUSTOMER SERVICE QUALITY PARAMETERS

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. Except for Airtel in case of month and Idea in case of live data.



Percentage of call answered by operators (Voice to voice) within 60 sec: All the operators are meeting the benchmark Except for Airtel in both Month & Live cases , BSNL in live and TTSL (GSM) are in Month case, not meeting the TRAI benchmarks ($\geq 90\%$).



(5) Critical Analysis

From the data table it can be seen that only BSNL, is not meeting the benchmark for the parameter SDCCH congestion & Call Drop Rate. Uninor is not meeting the benchmark for “TCH congestion”. Tata GSM is not complying the benchmark for the parameter of ‘Worst affected cells have more than 3% TCH drop rate’ with high margins. This may have happened due to mainly in the change adopted for calculating the parameter considering CBBH instead of TCBH, which reflects more practical way of calculating TCH drop keeping in view customer satisfaction.

Regarding Metering & Billing for postpaid service, Aircel and TTSL (GSM & CDMA) are having the higher value in comparison to other operators. Rest of all operators are found to be performing quite well in terms of meeting the benchmark ($\leq 95\%$).

In Prepaid service only TTSL (CDMA) is having value more than benchmark

MTS is having an ICR agreement with TTSL in UP(e) Circle.

In case of POI congestion all the operators are performing quite well in terms of meeting the benchmark ($\leq 0.5\%$). It is noticed that most of the operators are having individual POI satisfying the benchmark. But in some case overflows on individual POI are noticed causing traffic diversions to obtain the net result for POI congestion.

Performance related to customer care data for Accessibility of call centre parameter is not met by Airtel, while as % of voice to voice call parameter is found to be unsatisfactory for Airtel & TTSL(GSM). As far as Termination cases is concerned, only BSNL is not complying the benchmarks in comparison to other operators.

(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 based on Live calling for Billing Complaints

Callin as Opera tor	Aircel	Airtel	Idea	Unino r	Rcom(GSM)	TTSL GSM	Vodaf one	MTS	Rcom(CDM A)	TTSL CDM A
Total No. of calls attempted	60	80	100	70	80	20	50	1	50	30
Total No. of calls answered	40	70	80	60	75	18	45	1	45	30
Cases resolved with 4 weeks	40	70	80	60	75	18	45	1	45	30
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

(3) Live calling to call centre (Lucknow)

Calling Operator	Aircel	Airtel	Idea	BSNL	Uninor	Tata GSM	Rcom GSM	Videocoin	Vodafone	MTS	Rcom CDM A	Tata CDMA
Call Centre No.	121/198	121/198	198/12345	1500	121/198	121	*222/ *333	121	111/198	155	*222/ *333	121
Total No. of Calls Attempted	100	100	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	100	100	100	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	95	97	94	93	88	87	80	93	96	95	96	70
%age of calls got answered	95%	97%	94%	93%	88%	87%	80%	93%	96%	95%	96%	70%

(4)Level 1 live calling (Barabanki)

Emergency No.	No. of calls made				Tata (GSM)	V-fone	Tata (CDMA)	BSNL	Room (GSM)	Room (CDMA)	Uninor	MTS
		Airtel	Aircel	Idea								
100	2	2	2	2	2	2	2	2	2	2	2	2
101	2	2	2	2	2	2	2	2	2	2	2	2
102/108	2	2	2	2	2	2	2	2	2	2	2	2
139	2	2	2	2	2	2	2	2	2	2	2	2

Level 1 live calling (Pratapgarh)

Emergency No.	No. of calls made				Tata (GSM)	V-fone	Tata (CDMA)	BSNL	Room (GSM)	Room (CDMA)	Uninor	MTS
		Airtel	Aircel	Idea								
100	2	2	2	2	2	2	2	2	2	2	2	2
101	2	2	2	2	2	2	2	2	2	2	2	2
102/108	2	2	2	2	2	2	2	2	2	2	2	2
139	2	2	2	2	2	2	2	2	2	2	2	2

Level 1 live calling (Ballia)

Emergency No.	No. of calls made				Tata (GSM)	V-fone	Tata (CDMA)	BSNL	Room (GSM)	Room (CDMA)	Uninor	MTS
		Airtel	Aircel	Idea								
100	2	2	2	2	2	2	2	2	2	2	2	2
101	2	2	2	2	2	2	2	2	2	2	2	2
102/108	2	2	2	2	2	2	2	2	2	2	2	2
139	2	2	2	2	2	2	2	2	2	2	2	2

(5)Critical Analysis :

Random numbers were selected (for whom refund were given) from the operators' database of billing/metering complaints and calls were made to the customers to get their feedback for complaint redressal. It was found that the operators had made refunds in 100% cases as claimed by their records. MTS has only 1 nos of complaints , so only 1call were made during testing.

During call testing to call centre all the operators are satisfactory during calling except RCOM , TTSL & Uninor where most of calls were not connected due to congestion specially in GSM & CDMA prepaid services for both the operators in UP(e) circles. As far as Emergency no's calling is concerned, all the calls got connected of every operator from these cities (Barabanki , Pratapgarh & Ballia) in UP(e) circle. Videocon has no BTs in these cities so no Emergency no's calls were made

(C) Inter operator call assessment

(1) Sample coverage

A sample of 2x50 test calls per Service Providers with in the licensed service area UP(e) Circle were made between 1900 to 2000 hrs and between 2000 to 2100 hrs so that TCBH hours for all the operators were covered.

(2) Performance based on live Calling (Lucknow)

Calling Operator	Aircel	Airtel	Idea	Uninor	BSNL	TTSL(GSM)	RTL GSM	V-Fone	MTS	TATA CDMA	RCom CDMA
Aircel	-	96%	95%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	98%	100%	100%	99%	100%	98%	98%	100%
Idea	100%	100%	-	100%	95%	100%	100%	99%	100%	100%	98%
Uninor	100%	100%	100%	-	100%	96%	96%	100%	100%	97%	100%
BSNL	100%	100%	100%	99%	-	97%	100%	100%	98%	100%	100%
RTL GSM	100%	100%	100%	100%	100%	100%	-	95%	96%	100%	96%
TTSL GSM	100%	100%	100%	98%	100%	-	100%	100%	94%	95%	100%
V- Fone	100%	100%	96%	100%	100%	99%	100%	-	96%	100%	100%
MTS	100%	100%	99%	95%	90%	93%	95%	97%	-		
TATA CDMA	97%	100%	100%	97%	100%	100%	97%	98%	92%	-	97%
RCom CDMA	100%	100%	100%	100%	100%	100%	100%	96%	95%	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 network

(D) Drive Test of the Mobile Network of Service Providers:

SN	Parameter	City Name	Aircel	Airtel	BSNL	Idea	Uninor	Rcom (GSM)	TTSL (GSM)	Vodafone	Rcom (CDMA)	TTSL (CDMA)
			GSM Operators									CDMA Operators
1.1	Call Attempts	Barabanki	72	58	100	93	75	62	74	84	55	65
		Pratapgarh	55	48	67	46	65	79	66	66	79	59
		Ballia	36	67	36	81	170	137	74	54	71	66
1.2	Blocked Call Rate (<=3%)	Barabanki	1.38%	0.00%	1.00%	1.07%	0.00%	1.61%	0.00%	0.00%	0.00%	0.00%
		Pratapgarh	1.81%	0.00%	1.49%	0.00%	0.00%	0.00%	0.00%	1.51%	0.00%	0.00%
		Ballia	0.00%	0.00%	0.00%	0.00%	0.00%	1.46%	1.35%	0.00%	1.41%	0.00%
1.3	Dropped Call Rate (<=2%)	Barabanki	0.00%	0.00%	0.00%	0.00%	1.33%	0.00%	0.00%	0%	0.00%	0.00%
		Pratapgarh	0.00%	0.00%	1.00%	0.00%	1.53%	0.00%	0.00%	0%	0.00%	0.00%
		Ballia	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.35%	0%	0.00%	0.00%
1.4	Percentage of connections with good voice quality (>=95%) (i) 0-4 (w/o frequency hopping)	Barabanki									100%	99.89%
		Pratapgarh									100%	98.01%
		Ballia									99.00%	96.94%
	(ii) 0-5 (with frequency hopping)	Barabanki	95.50%	98.20%	96%	98.10%	91.00%	95%	90.60%	95%		
		Pratapgarh	95.60%	99.30%	90.60%	93.50%	94.10%	97%	96.60%	97.37%		
	Ballia	97.30%	98.10%	97.20%	95%	93.60%	95%	95.05%	95.80%			
1.5	Service Coverage In door (>= -75dBm)	Barabanki	62.90%	97.20%	77.50%	75.41%	60%	56%	87.98%	68.14%	79%	82.17%
		Pratapgarh	53.30%	92.30%	75.10%	47.82%	60.80%	30%	67.95%	60%	57%	75.77%
		Ballia	64.50%	92.00%	64.50%	63.89%	73.80%	40%	60.50%	81.40%	50%	77.12%
	In-vehicle (>= -85dBm)	Barabanki	93.70%	99.70%	98.60%	97.35%	91.39%	88%	99.63%	95.82%	98%	99.48%
		Pratapgarh	93.10%	99.00%	22.10%	89.86%	95.10%	76%	91.76%	94%	93%	94.49%
		Ballia	97.50%	98.10%	33.00%	98.14%	99.80%	71%	91.90%	96.34%	82%	97.39%
	Out door- in city (>= -95dBm)	Barabanki	100%	100%	100%	100%	99.20%	99%	100%	99.77%	100%	100%
Pratapgarh		100%	100%	100%	100%	99.80%	99%	98.67%	100%	100%	98%	
	Ballia	100%	100%	100%	100%	99.00%	95%	98.60%	100%	98%	100%	
1.6	Call Setup Success Rate (>=95%)	Barabanki	98.61%	100%	99%	98.93%	98.67%	98.39%	100%	100%	100%	100%
		Pratapgarh	98.18%	100%	100%	100%	100%	100%	100%	98.49%	100%	100%
		Ballia	100%	100%	100%	100%	100%	98.54%	96%	100%	98.59%	100%
1.7	Handover Success Rate (HOSR)	Barabanki	100%	100%	98.67%	98.00%	99.15%	95.50%	100%	99%	100%	100%
		Pratapgarh	100%	100%	98.88%	100%	98.48%	100%	100%	100%	100%	99.59%
		Ballia	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

- Good Voice quality parameter is not met by BSNL & Idea in Pratapgarh, TTSL (GSM) in Barabanki and Uninor in all 3 cities, Barabanki, Pratapgarh & Ballia respectively.

NOTE-- MTS is having an ICR agreement with TTSL and Videocon has no services in Barabanki, Pratapgarh & Ballia in UP(E) Circle.

(1) Sample Coverage

The Operator Assisted Drive Test was conducted at UP(E) Circle for all the operators. Route covered was about around 60- 80Km depending on city areas within the speed limit of 30Km/hr.

DRIVE TEST LOCATIONS

BARABANKI

HIGH DENSE Begambagh, chowk, medison road,abhay nagar. .
MEDIUM DENSE: Awas vikas , policeline, peerbatawan.
LOW DENSE: Dhakauli, harsani, mohamadpur, chednagar..

PRATAPGARH

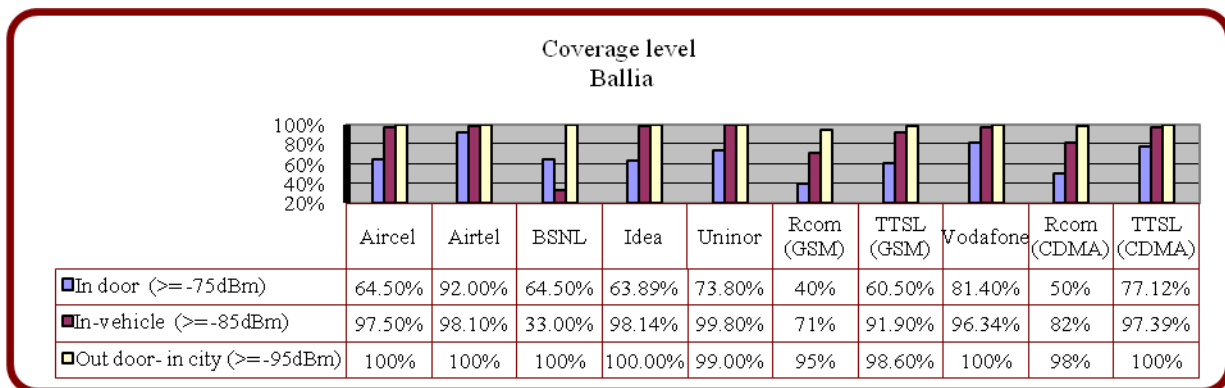
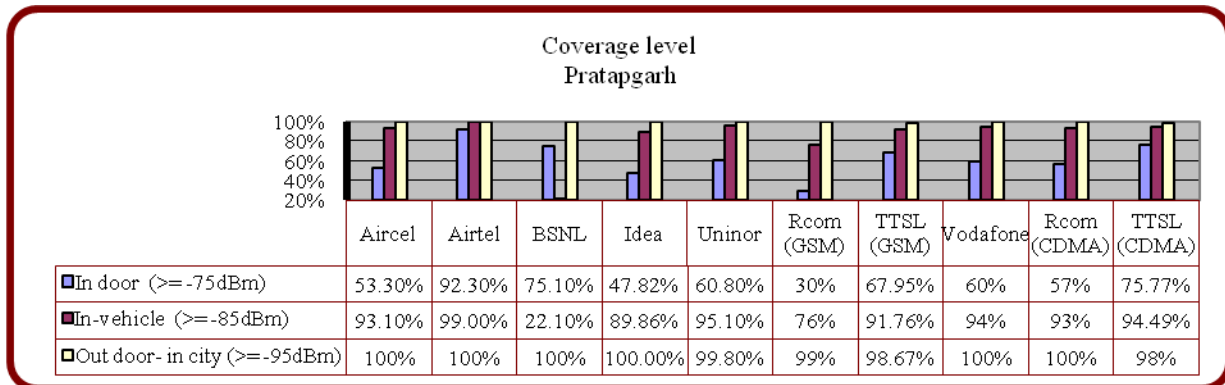
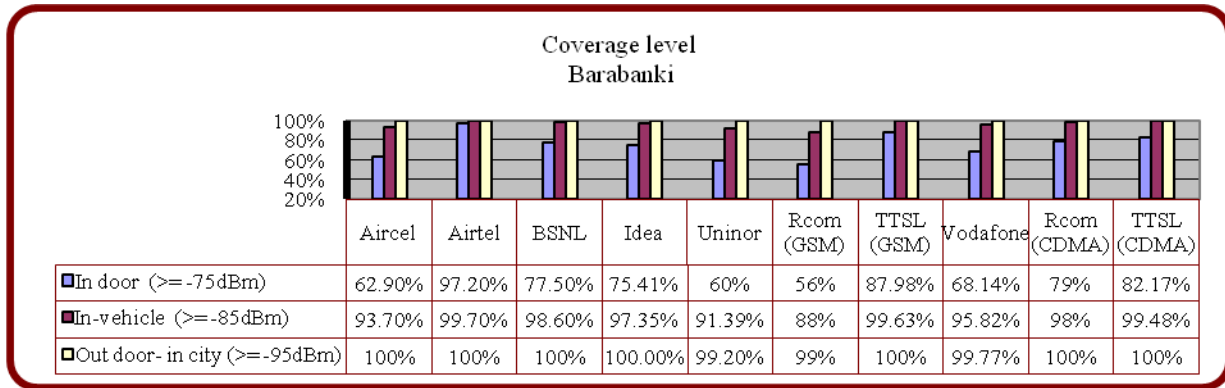
HIGH DENSE: Railway stn, paltanbazar, puranmalgodam,.
MEDIUM DENSE: Sadar, purepitai, Afeemkothi, meerabhawan.
LOW DENSE: Chilbila, ranjitpur, Bhupia mau, darwaja bazaar.

BALLIA

HIGH DENSE: Ballia Chowk, Station road, Loha Patti.
MEDIUM DENSE Ballia CS nagar, umarganj, kachehri. .
LOW DENSE: Ballia dhokali, anand nagar, professor colony..

(2) Graphical Representation

The Radio coverage level as was found in the operator assisted drive test result is shown graphical below:



(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:

- Good Voice quality parameter is not met by BSNL & Idea in Pratapgarh , while as TTSL(GSM) in Barabanki and Uninor in all 3 cities Barabanki , Pratapgarh & Ballia.
- Videocon has no service in Barabanki,, Pratapgarh & Ballia.

Operators are found satisfying the TRAI benchmark for almost all the parameters such as Blocked Call Rate, Dropped Call rate & Call setup Success Rate.

During Drive Test of BSNL in Barabanki & Ballia, some RF coverage issue was found in some areas like station road road , abhay Nagar , Awas vikas , Ballia chowk & kachehari etc. Due to this reason Voice Quality effected over there.

NOTE-- MTS is having an ICR agreement with TTSL in UP(E) Circle

(E) Independent Drive Test :-**1.) Sample Coverage**

The Operator Assisted Drive Test was conducted at UP(E) Circle for all the operators. Route covered was about around 60- 80Km depending on city areas within the speed limit of 30Km/hr.

DRIVE TEST LOCATIONS***BALLIA (TTSL)***

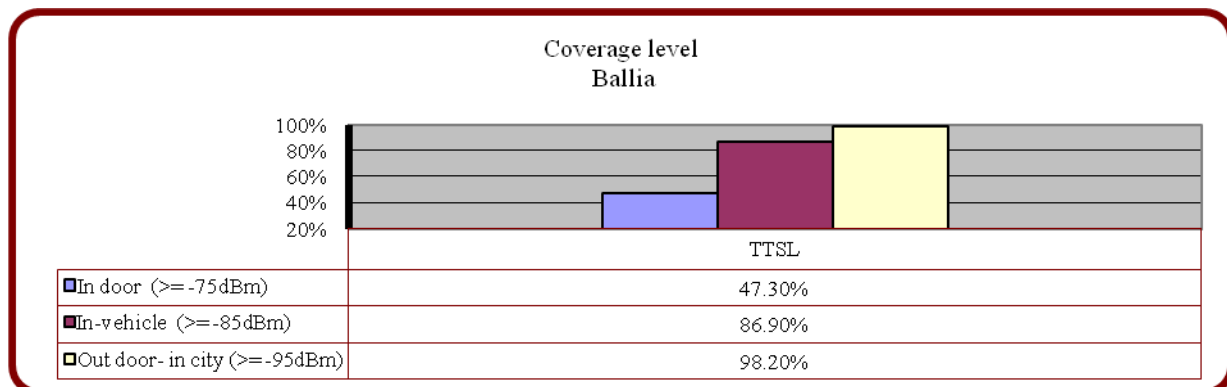
HIGH DENSE: Ballia Chowk, Station road , Loha patti..
 MEDIUM DENSE Ballia CS nagar, umarganj, kachehri.. .
 LOW DENSE: Ballia dhokali, anand nagar, professor colony.

2) Performance (for the respective cities)

SN	Parameter	TTSL (Ballia)
1.1	Call Attempts	70
1.2	Blocked Call Rate (<=3%)	1.42%
1.3	Dropped Call Rate (<=2%)	0.00%
1.4	Percentage of connections with good voice quality (=>95%)	
	(i) 0-4 (w/o frequency hopping)	
	(ii) 0-5 (with frequency hopping)	96.40%
1.5	Service Coverage	
	In door (>= -75dBm)	47.30%
	In-vehicle (>= -85dBm)	86.90%
	Outdoor- in city (>= -95dBm)	98.20%
1.6	Call Setup Success Rate (>=95%)	98.58%
1.7	Handover Success Rate	100%

Graphical Representation

The Radio coverage level as was found in the operator assisted drive test result is shown graphical below



(3)Critical Analysis

The Independent drive test data was found to be satisfactory for TTSL in Ballia in UP(E) circle. However, there is no deviation found in any parameter.

- Videocon has no service in Barabanki, Pratapgarh & Ballia.

During Drive Test of TTSL in Ballia, some RF coverage issue was found in some area like Ballia chowk and Kachehari.

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

From live & month audit findings, it can be concluded that performance of the operators in the service area UP(e) is satisfactory for **Network Parameters**. However BSNL, is not meeting the benchmark in SDCCH congestion & Call Drop Rate parameter and Uninor in TCH congestion parameter. Tata GSM is not complying the benchmark for the parameter of 'Worst affected cells have more than 3% TCH drop rate' with high margins. This may have happened due to mainly in the change adopted for calculating the parameter considering CBBH instead of TCBH, which reflects more practical way of calculating TCH drop keeping in view customer satisfaction.

Regarding **Metering/Billing Credibility Service**, Aircel and TTSL (GSM & CDMA) are having the higher value in comparison to other. Rest all operators are found to be performing quite well in terms of meeting the benchmark ($\leq 95\%$).

In Prepaid service only TTSL (CDMA) is having value more than benchmark. MTS is having an ICR agreement with TTSL in UP(e) Circle.

POI congestion is found to be satisfactory for all the operators for both month and live measurement.

Under **Customer Service Quality** section, benchmark for the parameter Accessibility of call centre parameter is not met by Airtel, while as % of voice to voice call parameter is found to be unsatisfactory for Airtel & TTSL(GSM). As far as Termination cases is concerned, only BSNL is not complying the benchmarks in comparison to other.

• During Drive Tests,

- Good Voice quality parameter is not met by BSNL & Idea in Pratapgarh, while as TTSL(GSM) in Barabanki and Uninor in all 3 cities Barabanki, Pratapgarh & Ballia.
- Videocon has no service in Barabanki, Pratapgarh & Ballia.

Operators are found satisfying the TRAI benchmark for almost all the parameters such as Blocked Call Rate, Dropped Call rate & Call setup Success Rate.

During Drive Test of BSNL in Barabanki & Ballia, some RF coverage issue was found in some areas like station road, abhay Nagar, Awas vikas, Ballia chowk & kachehari etc. Due to this reason Voice Quality effected over there.

NOTE-- MTS is having an ICR agreement with TTSL in UP(E) Circle.