

Objective Assessment of Quality of Services for (QoS) for Cellular Mobile (Wireless) Service Providers – Orissa Circle

Report: October - November - December - 2011



Prepared for: **Telecom Regulatory Authority of India**

By: **eTech Group@IMRB**

A specialist unit of IMRB International

Preface

TRAI, the regulatory watch dog for the Quality of Service for the telecom services – Basic (Wireline), Cellular Mobile (Wireless) and Broadband has commissioned this study with the objective of measuring Quality of Services under the parameters as per the published notifications.

The Audit module would assess the Quality of Service of telecom operators Basic (Wireline), Cellular Mobile (Wireless) and Broadband services) by auditing the service level records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI.

The Audit module for various circles within the Zones, due the sheer scale of data collection, has been distributed across various quarterly periods. IMRB International Auditors carried out Audits across Orissa, Bihar & Jharkhand, West Bengal, North-East, Assam and Kolkata circles. **This report details the performance of various service providers in Orissa circle against Quality of Services benchmarks for various parameters laid down by TRAI in respective regulations for Cellular (Mobile) services.**

Table of contents

	<u>Page no.</u>
1.0 Background.....	4
2.0 Objectives and Methodology	5
3.0 Sampling methodology	6
4.0 Audit methodology	7
4.1 Cellular Mobile Services	7
5.0 Executive Summary.....	8
5.1 Service provider performance report based on one month data verification: Cellular Mobile Services	9
6.0 Detailed findings – Includes comparison between Live calling/Live measurements and One month data collection.....	18
6.1 Graphical/Tabular Representations for Cellular Mobile Services	18
7.0 Compliance reports: Results of Verification of PMR.....	27
7.1 Cellular Mobile services	27
8.0 Conclusions	32
9.0 Annexure - I.....	33
9.1 Service provider performance report based on one month data	33
9.2 Monthly Point of Interconnection (POI) Congestion Report.....	33
9.3 Parameter wise performance reports for Cellular Mobile services.....	34

1.0 Background

The Telecom Regulatory Authority of India (TRAI) has a critical mandate to protect the interest of telecom consumers in addition to various other functions bestowed upon it. As part of the license conditions to telecom operators, it has the power and authority to measure the Quality of Service provided by various govt. (BSNL & MTNL) and private telecom operators. The parameters that need to be measured for Basic (Wireline) and Cellular Mobile (Wireless) services have been specified in the TRAI notification on Quality of Services of Basic (Wireline) and Cellular Mobile (Wireless) services dated 20th March, 2009. The parameters for Broadband Service have been specified in the TRAI notification for Quality of Services of Broadband Service Regulation, 2006

Audit module: To assess the quality of service of telecom operators Basic (Wireline), Cellular Mobile (Wireless) and Broadband services by auditing the service level records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI

This report highlights the findings for the Audit module for Orissa circle that was covered in period of Oct-Dec 2011. The verification of records maintained by various operators of Cellular Mobile (Wireless) service was undertaken by the auditors of IMRB International during the period Oct-Dec 2011.



***This report
highlights the Audit
Module findings for
“Orissa” circle for
Cellular Mobile
services***

2.0 Objectives and Methodology

The primary objective of the Audit module is to Audit and Assess the Quality of Services being rendered by Basic (Wireline), Cellular Mobile (Wireless), and Broadband service against the parameters notified by TRAI. (The parameters of Quality of Services (QoS) have been specified by in the respective regulations published by TRAI). Following are the key activities undertaken by Auditors during the Audit process conducted at the operator's premises



All Network related and Non network related parameters notified by TRAI in various regulations were Audited

1. **Verification of the data submitted by service providers:** This involved verification of the quarterly Performance Monitoring Reports (PMR's) and monthly Point of Interconnect (POI) Congestion reports being submitted by various service providers. The raw data in the records maintained by service providers was audited to assess the book keeping methodology.
2. **Live measurement for three days:** Network performance of service providers was assessed for three days in the month in which the Audit was carried out. Live figures from the server/ NMS software were recorded for various network related parameters.
3. **Data verification for the month in which Audits were carried out:** Subsequent to the visits for Audit during the live measurement at various Exchanges/ISP Nodes/Exchanges, data for all the network and Non network related parameters was collected from various service providers for the complete month in which the Audit was carried out. Raw data/records pertaining to these were also verified on sample basis to check the veracity of data provided by the operators.
4. **Drive tests:** Operator assisted drive test were conducted in three cities as per the norms stated in the tender.
5. **Live calling:** Live testing was done on a sample basis to check efficiency of various parameters

- Any changes or discrepancies found in the methodology were reported to the service providers and changes were suggested by IMRB Auditors.
- PMR verification was done as per the new parameters being reported to TRAI by all operators.
- Live measurement and 1 month data collection was done as per the new regulations published by TRAI on 20th March, 2009.
- Separate formats were designed each for Basic (Wireline), Cellular mobile (Wireless) and Broadband services to collect the information on various parameters

3.0 Sampling methodology

3.1 Sampling for Cellular Mobile (Wireless) service providers

Data pertaining to 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centers (MSC's) of all the Cellular Mobile Service Providers or Unified Access Service Providers (UASP) was collected and verified in specified circles/service areas. Following are the various operators covered in Orissa circle

	Name of Operator	Audit Month
Operator 1	Reliance CDMA	October, 2011
Operator 2	Idea	October, 2011
Operator 3	Aircel	October, 2011
Operator 4	Vodafone	October, 2011
Operator 5	Reliance GSM	October, 2011
Operator 6	STel	October, 2011
Operator 7	Uninor	October, 2011
Operator 8	MTS	October, 2011
Operator 9	Airtel	October, 2011
Operator 10	Tata CDMA	October, 2011
Operator 11	Tata DoCoMo	October, 2011
Operator 12	Loop	October, 2011
Operator 13	Videocon	October, 2011
Operator 14	BSNL	October, 2011

4.0 Audit methodology

4.1 Cellular Mobile Services

In a nutshell the following activities were done while auditing for various parameters for Cellular Mobile Services:

S.no	Parameter	AS REPORTED IN PMR	AS FOUND IN ACTUAL RECORDS AFTER VERIFICATION	AS FOUND IN VERIFICATION FOR THE MONTH OF AUDIT	AS FOUND IN 3 DAY LIVE MEASUREMENT DATA	LIVE CALLING	OPERATOR ASSISTED DRIVE TESTS	INDEPENDENT DRIVE TESTS
A	Network Performance							
A (i)	BTS accumulated down time	Yes	Yes	Yes				
A (ii)	Call setup success rate (within licensee own network)	Yes	Yes	Yes	Yes		Yes	Yes
A (iii)	Blocked Call Rate	Yes	Yes	Yes	Yes		Yes	Yes
A (iv)	Call Drop rate	Yes	Yes	Yes	Yes		Yes	Yes
A (v)	% Connections with good voice quality	Yes	Yes	Yes			Yes	Yes
A (vi)	Service Coverage	Yes	Yes	Yes			Yes	Yes
A (vii)	PoI Congestion	Yes	Yes	Yes				
B	Customer Helpline							
B (i)	Response time to the customer for assistance	Yes	Yes	Yes		Yes		
C	Billing Complaints							
C (i)	Billing complaints per 100 bills issued	Yes	Yes	Yes				
C (ii)	%age of billing complaints resolved within 4 weeks	Yes	Yes	Yes		Yes		
C (iii)	Period of all refunds/payments due to customers from date of resolution as in (ii) above	Yes	Yes	Yes		Yes		

5.0 Executive Summary

The objective assessment of Quality of Services (QoS) was carried out by IMRB International for all the Cellular mobile service providers during the period starting from October 2011 to December 2011 in Orissa circle. The executive summary encapsulates the key findings of the Audit by providing: -

- “Service provider performance report” for Cellular mobile service , which gives a glimpse of the performance of various operators against the benchmark specified by TRAI, during the month in which the Audit was carried out by IMRB Auditors
- “Parameter wise critical findings” for Cellular mobile services: This indicates key observations and findings from different activities carried out during the Audit process

5.1 Service provider performance report based on one month data verification: Cellular Mobile Services

Name of Service Provider	Time Consistent Busy Hour (TCBH)	Network Availability					Connection Establishment (Accessibility)			Connection Maintenance (Retainability)				POI		Network Traffic Capacity and Utilization			
		Total no. of BTSs in the licensed service area	Sum of downtime of BTSs in a month in hours	BTSs Accumulated downtime (not available for service) (%age)	No. of BTSs having accumulated downtime of >24 hours in a month	Worst affected BTSs due to downtime (%age)	Call Set-up Success Rate (within licensee's own network)	SDCCH/Paging Chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Total No. of cells exceeding 3% TCH drop (call drop)	Total no. of cells in the network	Worst affected cells having more than 3% TCH drop (%age)	%age of connection with good voice quality	POI Congestion (No. of POIs not meeting the benchmark) Note :2)	Total number of working POI Service Area wise	Equipped Capacity of Network in respect of Traffic in erlang	Total traffic handled in TCBH in erlang	Total no. of customers served (as per VLR) on last day of the month
Benchmark				≤ 2%		≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%			≤ 3%	≥ 95%	≤ 0.5%				
Reliance CDMA	19:00 - 20:00	722	1346	0.25%	0	0.00%	99.69%	0.00%	0.02%	0.96%	8	2166	0.37%	99.06%	0	22	111000	13248	420021
Idea	19:00 - 20:00	1138	2639	0.31%	0	0.00%	98.75%	0.05%	0.25%	0.57%	3077	105648	2.91%	96.74%	0	78	29042	15047	513338
Aircel	19:00 - 20:00	2546	4541	0.24%	40	1.57%	99.31%	0.44%	0.30%	1.48%	469	7518	6.24%	95.93%	0	81	135904	40248	1260273
Vodafone	19:00 - 20:00	3323	3347	0.14%	5	0.15%	98.30%	0.38%	0.88%	1.24%	260	9900	2.63%	98.15%	0	43	87296	60687	1908653
Reliance GSM	19:00 - 20:00	1797	640	0.05%	0	0.00%	99.48%	0.53%	0.72%	0.66%	46	5391	0.85%	98.91%	0	23	72000	60758	2150827
STel	19:00 - 20:00	1049	2699	0.35%	0	0.00%	98.84%	0.04%	0.08%	0.45%	93	3149	2.96%	98.06%	0	43	23627	6206	276227
Uninor	19:00 - 20:00	1004	4491	0.60%	0	0.00%	98.00%	0.43%	0.57%	1.80%	89	3000	2.97%	95.38%	0	55	32797	19825	535294
MTS	19:00 - 20:00	37	508	1.85%	0	0.00%	98.84%	0.00%	0.00%	1.68%	6	111	5.41%	95.36%	0	25	4200	5	500
Airtel	19:00 - 20:00	3641	8490	0.31%	66	1.81%	97.88%	0.37%	0.68%	1.70%	332	11441	2.90%	96.18%	0	58	245479	199693	5254716
Tata CDMA	19:00 - 20:00	469	166	0.05%	0	0.00%	99.35%	0.00%	0.00%	0.31%	7	1413	0.50%	99.81%	0	35	59875	13696	273086
Tata DoCoMo	19:00 - 20:00	1603	122	0.01%	0	0.00%	98.62%	0.06%	0.38%	0.65%	83	4814	1.72%	97.79%	0	11	80598	26173	910919
Loop	20:00 - 21:00	9	6	0.09%	0	0.00%	100.00%	0.01%	0.00%	0.26%	0	27	0.00%	96.36%	0	13	200	7	25
Videocon	20:00 - 21:00	40	141	0.47%	0	0.00%	99.14%	0.06%	0.03%	1.17%	0	120	0.00%	99.83%	0	11	5000	2	260
BSNL	19:00 - 20:00	1987	12998	0.88%	26	1.31%	98.42%	0.99%	1.58%	1.16%	36	924	3.90%	95.02%	0	15	16000	16518	416445

** Methodology not in line with QoS

Figures provided on All India basis

Not meeting the benchmark

B'mark = TRAI Benchmark, DNA = Details not available, NA: Not Applicable

Critical findings: Cellular Mobile Services

The audit for cellular mobile service providers were conducted at their respective MSCs in the Orissa circle apart from Reliance Communication whose audit was conducted at their central NOC at Mumbai.

The audit involved a three stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. Finally basis the three day live measurement the auditors needed to find out the busy hour for the service provider and collect the hourly data for this busy hour for the month in which the audit was conducted.

Busy Hour of Various Service Providers

Service Provider	Reported Time Consistent Busy Hour	Network Busy Hour found in 3 day live measurement
Reliance CDMA	19:00 - 20:00	19:00 - 20:00
Idea	19:00 - 20:00	19:00 - 20:00
Aircel	19:00 - 20:00	19:00 - 20:00
Vodafone	19:00 - 20:00	19:00 - 20:00
Reliance GSM	19:00 - 20:00	19:00 - 20:00
STel	19:00 - 20:00	19:00 - 20:00
Uninor	19:00 - 20:00	19:00 - 20:00
MTS	19:00 - 20:00	19:00 - 20:00
Airtel	19:00 - 20:00	19:00 - 20:00
Tata CDMA	19:00 - 20:00	19:00 - 20:00
Tata DoCoMo	19:00 - 20:00	19:00 - 20:00
Loop	20:00 - 21:00	20:00 - 21:00
Videocon	20:00 - 21:00	20:00 - 21:00
BSNL	19:00 - 20:00	19:00 - 20:00

The TCBH reported by all the service providers matched the network busy hour calculated by IMRB auditors for the Orissa circle.

BTSs Accumulated Downtime:

In the Orissa circle, Airtel experienced the highest worst affected BTSs (66 BTS had more than 24 hours of accumulated downtime) hours in the month of audit followed by Aircel which had 40 BTSs with more than 24 hours downtime. All service providers were meeting TRAI specified benchmark for BTS accumulated downtime and worst affected BTSs

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter. During the audits the maximum CSSR was observed for Loop with 100% of their calls getting completed. All the operators were found to be calculating the parameter as per the norm specified by TRAI. CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made.

Network Congestion parameters:

SDCCH / Paging Channel Congestion, TCH and POI are part of the network congestion parameters. All the operators are meeting the TRAI specified benchmarks for SDCCH / Paging Channel Congestion, TCH and POI. Tata CDMA leads the way in network congestion parameters with negligible paging as well as traffic channel congestion. The calculation methodology of these parameters was found to be in complete accordance with what has been specified by TRAI. Both RCOM CDMA and Tata Teleservices measure paging channel utilization. When the value of this parameter is less than 100%, it is counted as 0% congestion. There were no POIs with congestion more than the benchmark ($\leq 0.5\%$).

Call Drop Rate:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. The call drop rate was measured as the ratio of total calls dropped to the total number of call attempts for all operators. Also, all of service providers were found to be meeting the TRAI specified benchmark. The lowest call drop rate was of Loop at 0.26% while the highest was for Uninor at 1.80%.

Connections with good voice quality:

All the operators are measuring this parameter via their periodic drive tests. However, for some operators these parameters can be obtained at their switch as well. During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines.

Customer Care / Helpline Assessment

For the accessibility of customer care aspect all the service providers were found to be meeting the TRAI specified benchmark.

Billing performance

All the operators were found to be meeting the benchmark of $\leq 0.1\%$ complaints registered per 100 bills issued and the benchmark of 100% billing complaints being resolved within 4 weeks. In all cases where customers were due for refund within 1 week, all the service providers were meeting the TRAI specified benchmark of 100%.

Inter operator calls assessment

Inter operator call Assessment To↓ From→	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Reliance CDMA	NA	100%	98%	100%	100%	100%	100%	98%	100%	100%	100%	100%	100%	100%
Idea	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Aircel	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%
Vodafone	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reliance GSM	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
STel	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%
Uninor	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%
MTS	100%	100%	100%	100%	100%	100%	99%	NA	100%	100%	100%	98%	100%	100%
Airtel	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	98%	99%	100%
Tata CDMA	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%
Tata DoCoMo	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%
Loop	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%
Videocon	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	96%	NA	100%
BSNL	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA



The maximum problem faced by the calling operator to other operators

In the inter-operator call assessment, calls were made from the test SIMs of service provider whose audit was being conducted to all the other service providers. Aircel and MTS found tough connecting to a Reliance CDMA number with 98 out of 100 calls getting connected. Aircel also found it difficult connecting to a BSNL number with 98 out of 100 calls getting connected. Loop and Videocon found it difficult connecting to a Videocon and Airtel respectively with only 96 and 99 out of 100 calls getting connected.

Details of inter-operator calling are as followed:

Operator	Date	Location
Reliance CDMA	8th Dec'11	Bhubaneswar
Idea	24th Nov'11	Bhubaneswar
Aircel	29th Nov'11	Bhubaneswar
Vodafone	28th Nov'11	Bhubaneswar
Reliance GSM	9th Dec'11	Bhubaneswar
STel	5th Dec'11	Bhubaneswar
Uninor	7th Dec'11	Bhubaneswar
MTS	23rd Nov'11	Bhubaneswar
Airtel	30th Nov'11	Bhubaneswar
Tata CDMA	13th Dec'11	Bhubaneswar
Tata DoCoMo	14th Dec'11	Bhubaneswar
Loop	21st Nov'11	Bhubaneswar
Videocon	22nd Nov'11	Bhubaneswar
BSNL	12th Dec'11	Bhubaneswar

Results of Operator assisted Drive test

The drive test was conducted simultaneously for all the operators present in the Orissa circle. There was in total of three drive tests conducted in the circle. These tests were conducted in the cities of Bhubaneswar, Baripada and Sambalpur. IMRB auditors were present in vehicles of every operator. A sample of 15 – 30 test calls were made along each of the routes. The holding period for all test calls was between 120 seconds to 180 seconds. The drive test vehicle across all routes plied at a speed of less than 20 km per hour. Taking into consideration the route that was taken for the drive test; most of the major areas Orissa telecom circles were covered.

For measuring voice quality RxQual samples for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. RxQual greater than 5 meant that the sample was not of appropriate voice quality and for CDMA operators FERs of more than 4 were considered bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in Dbm with strength > -75dbm for indoor, -85 dms for in-vehile and > -95 dbm outdoor routes.

The drive tests in the Orissa circle were conducted in the cities of Bhubaneswar, Baripada and Sambalpur along the following route:

	Type of location	Bhubaneswar	Baripada	Sambalpur
Outdoor	Periphery of the city	Palasuni-Rasulgarh-Vanivihar-Acharya Vihar- Jaydev Vihar-CRP Sqr- Fire Stn-Bramunda Busstand- kandagiri Chowk-Jagmora- Gandamunda-Pokhoriput	Palbuni chowk, Takatpur chaka, Dargadihi Square, Murga badi Square, Jharpokharia Road(NH-5).	Remed Chowk-Barehipali-Panchgachia Chowk-Ainthapali-City Station
	Congested area	Rasulgarh-Bhumikhal-Laxmisagar Chowk-Cuttack Rd-Kalpana Sqr- Lewis Rd-Rabi Takis- Sishubhavan- Capital Mkt-Rajmal Sqr-Master Canteen-PMG Sqr-Ram Mandir-Janpath-Bayababa Math- Acharya Vihar-Sainik School-Press Chowk-Nalco chowk	Dargadihi Square, Tulsi square, Gosala Chowk, Station bazaar, Krushna Chandra Circle, Baripada Main market, Jubli Library, MKC High school, Bus Stand, JD Cinema square, Dargadihi square,	Ainthapali-Bhudaraja-Phatak-Police Line-Laxmi Talkies Chowk-Golebazar-Pirbaba Chowk-Court Chowk-Near to Jail
	Across the city	Kapilprasad-Punamagate-Palaspally-Airport Sqr-Ganganagar-AG Sqr-Powerhouse Chowk-Kalinga Stadium-Jaydev Vihar-Nalco Chowk-Damana Chowk-KIIT Sqr	Palbuni square, Station bazaar, Krushna Chandra Circle, Bada Bazaar, Deula sahi, Fire Station, Stadium square, Bhanjapur square, Jail road, Murgabadi, Gopi bhalab Pur Road	Court Chowk-Jail Chowk-Bhootpada Chowk- Zilla School Chowk-Laxmi Talkies Chowk-Modipada Chowk-Khetrajpur- Remed Chowk
Indoor	Office complex	IDCO Towers, Rupali sqr	BSNL , Madhuban Colony , Baripada	BSNL Office
	Shopping complex	PAL Heights, Jaydev vihar	Vishal Megamart, Murga badi	Varun Plaza

The tables given below gives a glimpse of the results of the operator assisted drive test:

Drive Test – Bhubaneswar

	B'mark	Reliance CDMA		Idea		Aircel		Vodafone		Reliance GSM		STel		Uninor		Airtel		Tata CDMA		Tata DoCoMo		BSNL	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	77.39%	85.38%	100.00%	99.30%	99.26%	97.68%	98.27%	92.76%	97.69%	95.82%	98.92%	97.69%	98.71%	93.81%	99.98%	96.16%	97.50%	93.73%	99.62%	99.19%	99.62%	95.67%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	98.77%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.92%	98.79%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.79%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	1.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.08%	1.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.21%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.66%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%	97.89%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.62%	98.02%


Drive Test – Baripada

	B'mark	Reliance CDMA		Idea		Aircel		Vodafone		Reliance GSM		STel		Uninor		MTS		Airtel		Tata CDMA		Tata DoCoMo		BSNL	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	98.22%	97.48%	98.05%	98.42%	99.43%	98.95%	98.42%	96.95%	98.30%	97.66%	99.43%	98.11%	98.69%	97.47%	95.90%	98.97%	97.24%	95.79%	94.91%	93.07%	99.60%	99.86%	97.04%	95.34%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.07%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	94.79%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.93%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.21%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.47%	1.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.64%	100.00%	100.00%	100.00%	100.00%	NA	NA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.82%	96.84%

- **MTS has rolled out its services only in Baripada of the 3 drive test locations.**
- **Hands off success rate in NA in case of MTS as they do not have provision to record it in their MSC gateway counter set up.**

Drive Test – Sambalpur

	B'mark	Reliance CDMA		Idea		Aircel		Vodafone		Reliance GSM		STel		Uninor		Airtel		Tata CDMA		Tata DoCoMo		BSNL	
		In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor	In door	Outdoor
Voice quality	≥ 95%	91.42%	95.18%	99.97%	99.15%	99.39%	97.11%	96.06%	95.03%	98.46%	96.21%	98.63%	96.57%	98.76%	95.51%	98.92%	97.01%	96.19%	94.19%	99.42%	98.91%	97.42%	96.32%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	95.59%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.46%	98.97%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.41%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.54%	1.03%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.04%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	100.00%

 Not meeting the benchmark

Following were the areas where the signal strength was found to be inadequate for the operators:

ALL SERVICE PROVIDERS

Bhubaneswar: There was interference and low signal strength recorded for all operators in the outdoor areas of Jagamara, Vanivihar, Pokhariput, Bhimtangi, Kalinga Stadium while in the indoor areas inadequate coverage was not found in any of the areas.

Baripada: There was interference and low signal strength recorded for all the operators in the outdoor areas of Station Bazaar, Goshala Chowk, Dargadhei Golei, Murgabadi, Palbani Square while in the indoor areas there was no inadequate coverage or interference recorded.

Sambalpur: There was interference and low signal strength recorded for all operators in the outdoor areas of Kacheri Road, Ainthapalli, Dhanupalli police station, Khetrajpur while in the indoor areas no interference and inadequate coverage was recorded.

***Loop and Videocon did not participate in drive test in the given cities as these service providers have not rolled out there networks in these cities.**


Conclusions:

Drive test was conducted by IMRB with the help of service providers to measure this parameter. In the drive test it was found that:

1. In Bhubaneswar, Reliance CDMA, Vodafone, Uninor and Tata CDMA were found to be not meeting the TRAI specified benchmark for voice quality.
2. In Baripada, Tata CDMA was found to be not meeting the TRAI specified benchmark for voice quality while MTS was found to be not meeting the TRAI specified benchmark for call drop rate.
3. In Sambalpur, Reliance CDMA and Tata CDMA were found to be not meeting the TRAI specified benchmark for voice quality.

Summary of Live Measurement Results – Cellular Mobile Services

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	BTSs Accumulated downtime (not available for service)	Worst affected BTSs due to downtime	Call Set-up Success Rate (within licensee's own network)	SDCCH/ Paging Chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Worst affected cells having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Reliance CDMA	0.38%	0.00%	99.61%	0.00%	0.02%	0.64%	0.64%	90.57%
Idea	0.27%	0.00%	99.27%	0.05%	0.05%	0.25%	1.87%	99.14%
Aircel	0.19%	0.00%	99.43%	0.10%	0.13%	1.06%	5.69%	97.97%
Vodafone	0.03%	0.00%	98.61%	0.34%	0.65%	1.09%	2.81%	95.88%
Reliance GSM	0.13%	0.00%	98.95%	0.02%	0.11%	0.50%	0.30%	96.48%
STel	0.13%	0.00%	99.43%	0.01%	0.05%	0.39%	2.90%	98.11%
Uninor	0.37%	0.00%	98.87%	0.03%	0.05%	1.71%	2.81%	96.84%
MTS	1.61%	0.00%	98.99%	NA	0.00%	1.07%	20.72%	98.97%
Airtel	0.21%	0.05%	98.29%	0.32%	0.67%	1.30%	2.88%	97.02%
Tata CDMA	0.01%	0.00%	99.52%	0.00%	0.00%	0.13%	0.00%	94.56%
Tata DoCoMo	0.01%	0.00%	99.11%	0.03%	0.07%	0.66%	1.72%	99.38%
Loop	0.40%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	NA
Videocon	0.00%	0.00%	99.89%	0.18%	0.11%	0.57%	0.00%	NA
BSNL	0.50%	0.00%	98.76%	0.87%	1.24%	1.49%	2.37%	96.83%

 Not meeting the benchmark

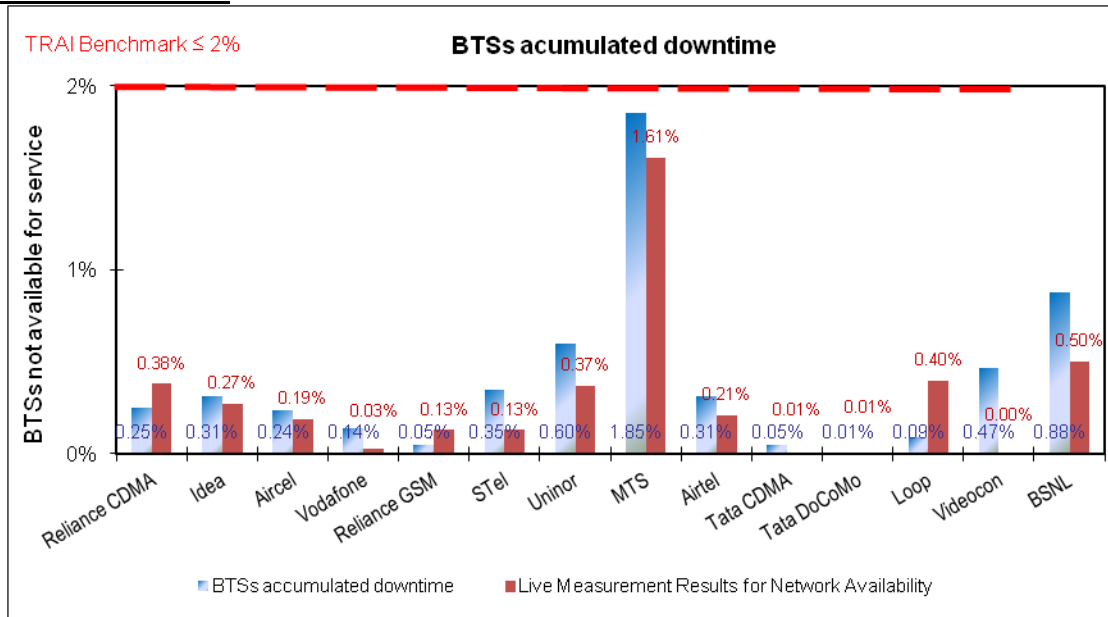
During the three day live measurement, it was found that:

- All operators except Aircel and MTS were found to be meeting the TRAI benchmark for Worst affected cells having more than 3% TCH drop parameter.
- All operators except Reliance CDMA and Tata CDMA were found to be meeting the TRAI benchmark for %age of connection with good voice quality parameter.

6.0 Detailed findings – Includes comparison between Live calling/Live measurements and One month data collection

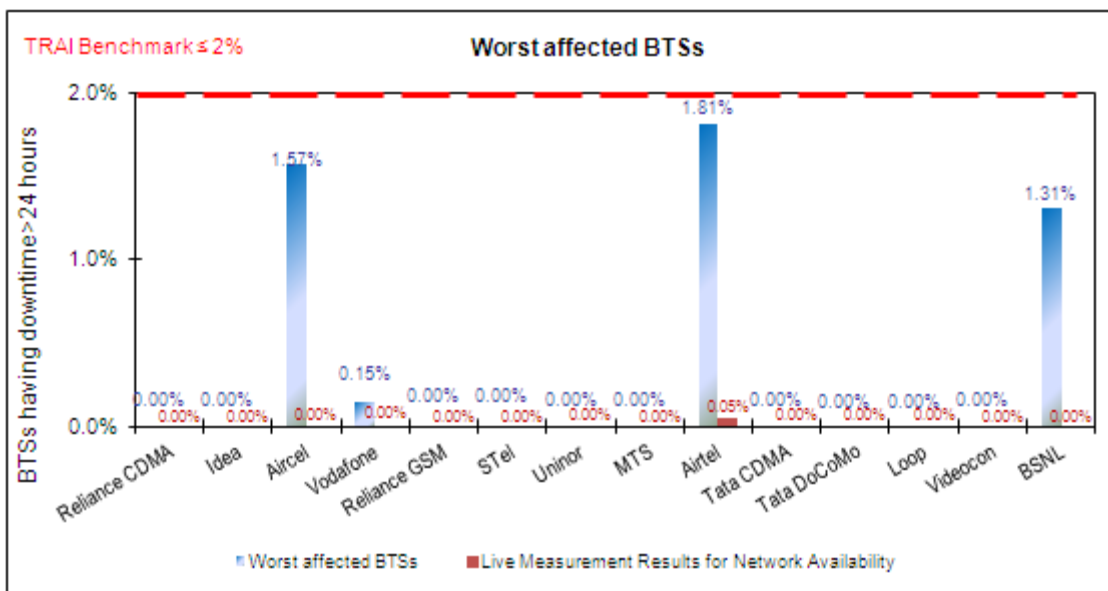
6.1 Graphical/Tabular Representations for Cellular Mobile Services

BTSS Accumulated Downtime



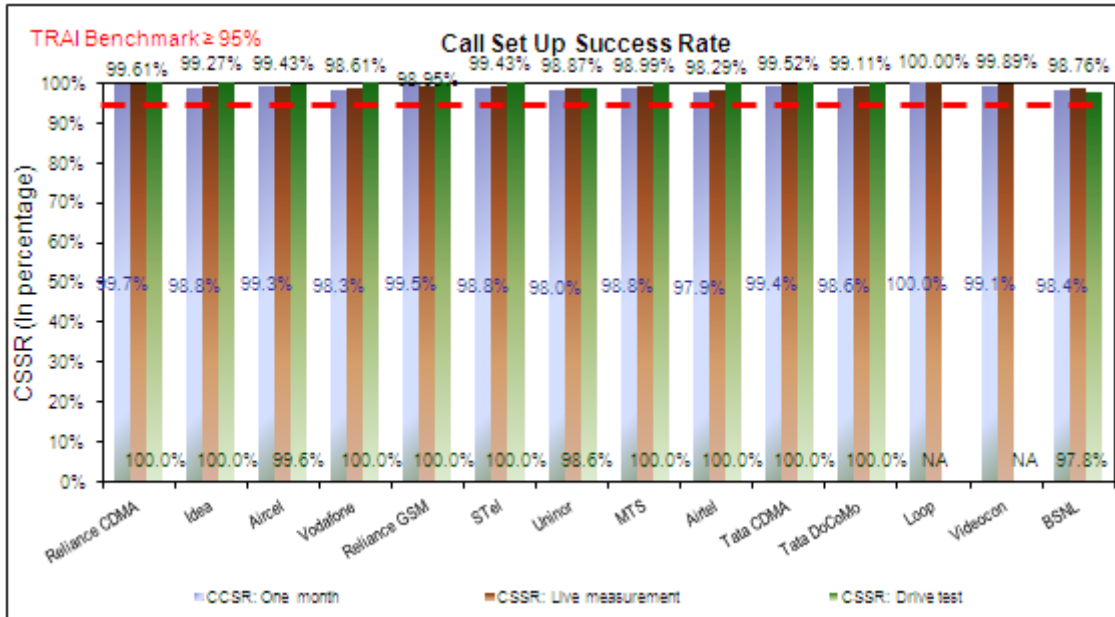
All the operators meet the benchmark

Worst Affected BTSS



All the operators meet the benchmark

Call Set-up Success Rate (CSSR)



One month

All the operators meet the benchmark

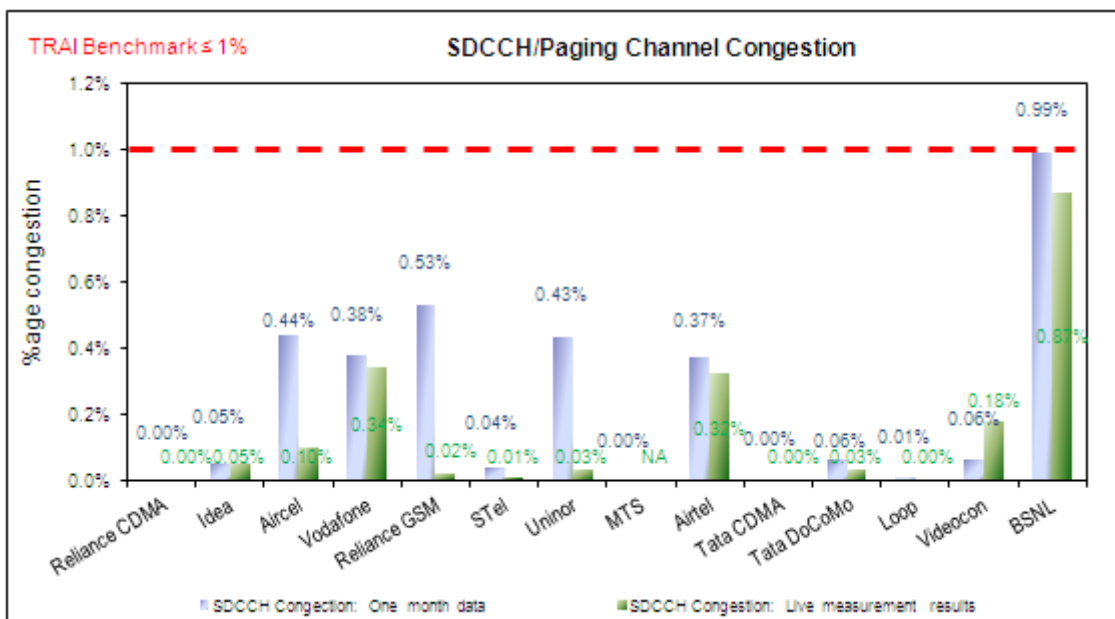
Live measurement

All the operators meet the benchmark

Drive test

All the operators meet the benchmark

SDCCH / Paging Channel Congestion



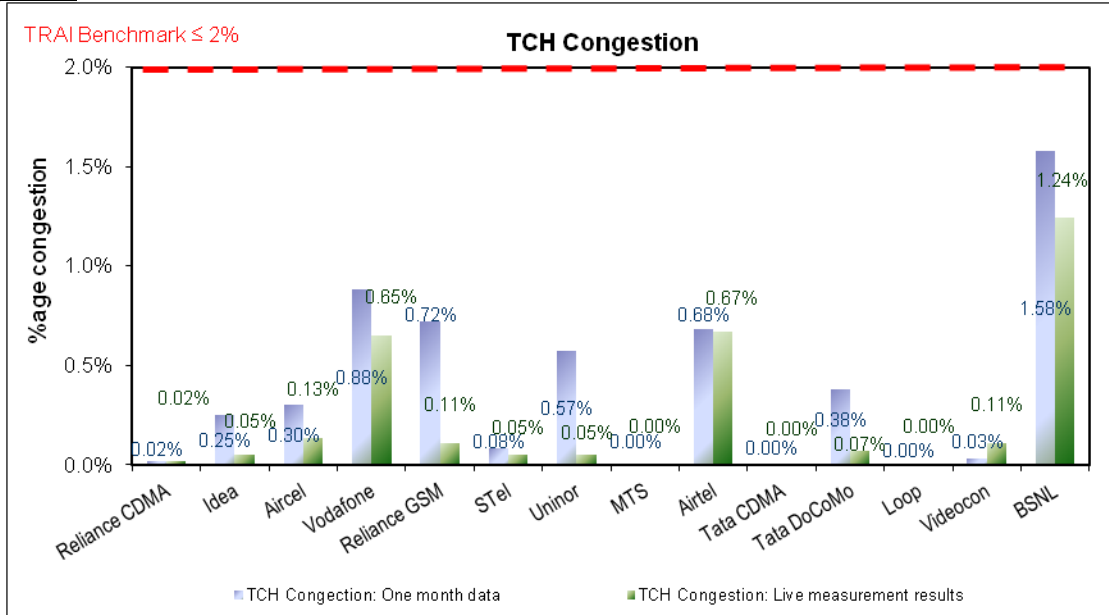
One month

All the operators meet the benchmark

Live measurement

All the operators meet the benchmark

TCH Congestion



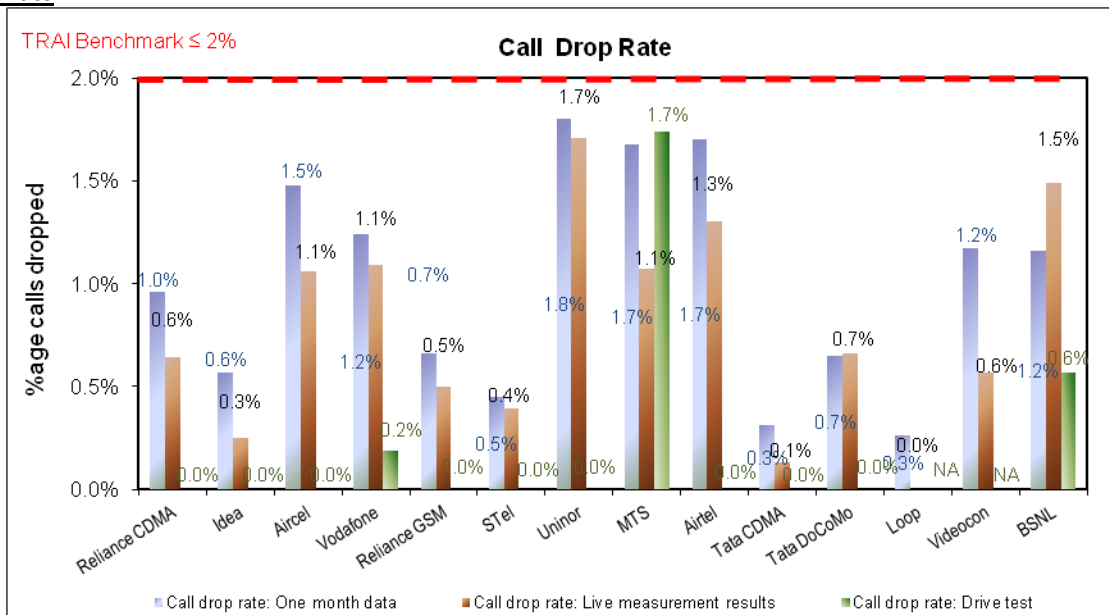
One month

All the operators meet the benchmark

Live measurement

All the operators meet the benchmark

Call Drop Rate



One month

All the operators meet the benchmark

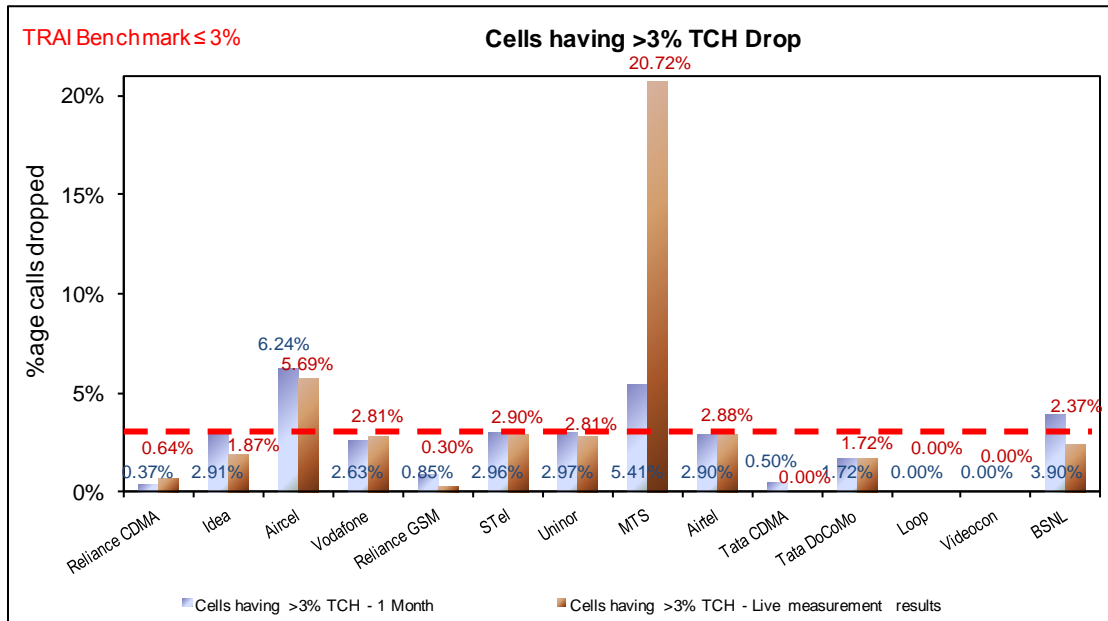
Live measurement

All the operators meet the benchmark

Drive test

All the operators meet the benchmark

Cells with more than 3% TCH Drop Rate



One month

Operator(s) meeting benchmark: Reliance CDMA, Idea, Vodafone, Reliance GSM, STel, Uninor, Airtel, Tata CDMA, Tata DoCoMo, Loop, Videocon

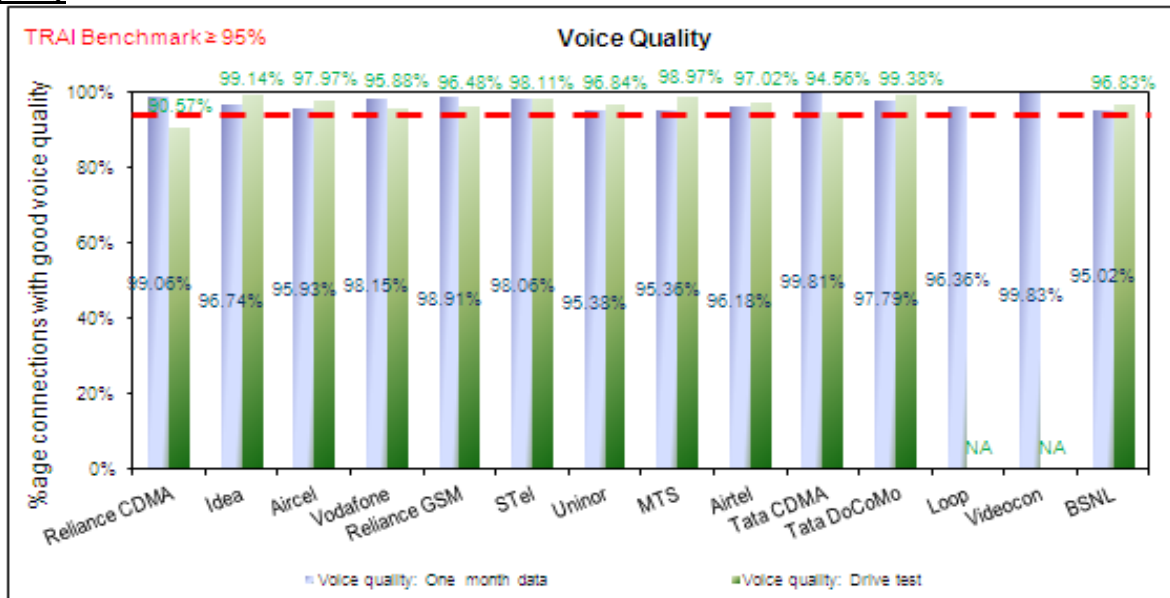
Operator(s) not meeting the benchmark: Aircel, MTS, BSNL

Live measurement

Operator(s) meeting benchmark: Reliance CDMA, Idea, Vodafone, Reliance GSM, STel, Uninor, Airtel, Tata CDMA, Tata DoCoMo, Loop, Videocon, BSNL

Operator(s) not meeting the benchmark: Aircel, MTS

Voice quality



One month

Operator(s) meeting benchmark: Reliance CDMA, Idea, Vodafone, Reliance GSM, STel, Uninor, MTS, Airtel, Tata CDMA, Tata DoCoMo, Loop, Videocon, BSNL

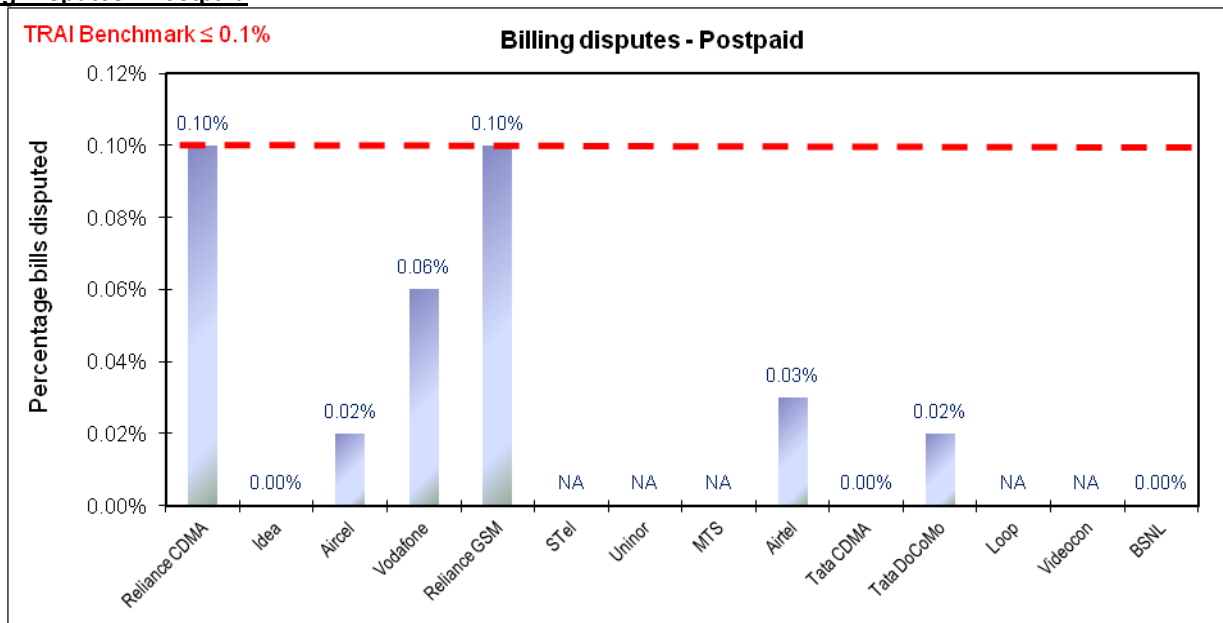
Operator(s) not meeting the benchmark: Aircel

Live measurement (Drive test)

Operator(s) meeting benchmark: Idea, Aircel, Vodafone, Reliance GSM, STel, Uninor, MTS, Airtel, Tata DoCoMo, BSNL

Operator(s) not meeting the benchmark: Reliance CDMA, Tata CDMA

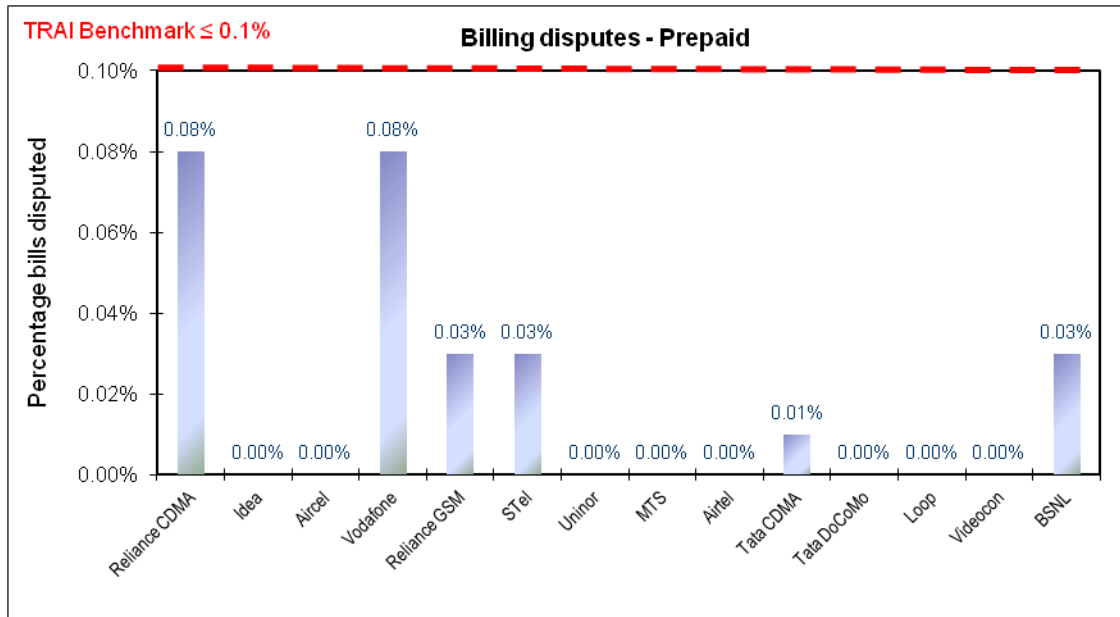
Billing Disputes - Postpaid



*Stel, Uninor, MTS, Loop and Videocon are offering only prepaid connection in Orissa circle.

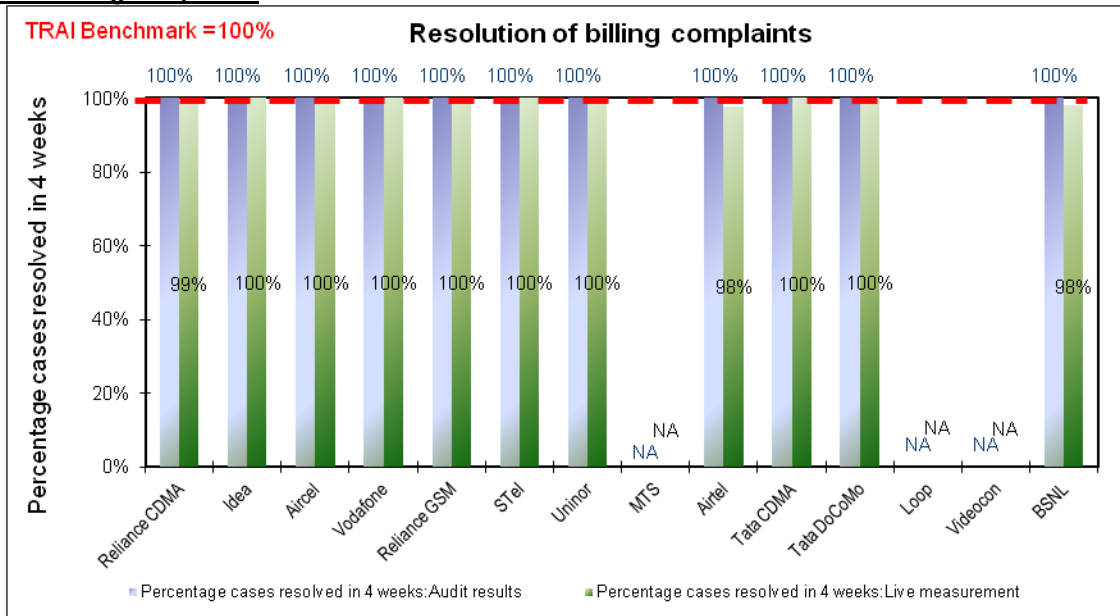
All the operators meet the benchmark

Complaints - Prepaid



All the operators meet the benchmark

Resolution of billing complaints



One month

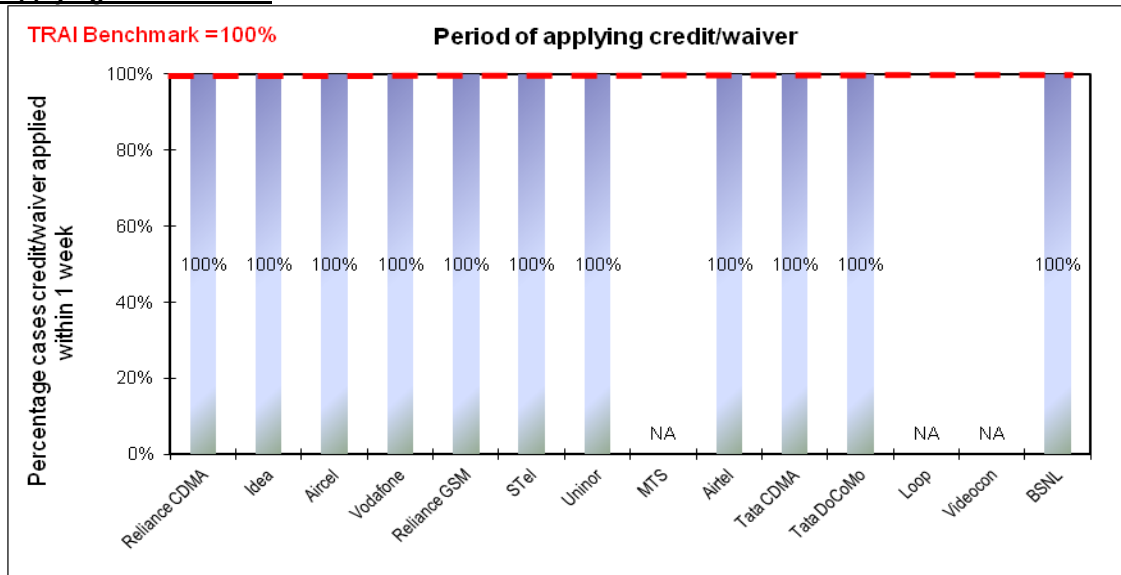
All the operators meet the benchmark

Live calling

Operator(s) meeting benchmark: Idea, Aircel, Vodafone, Reliance GSM, STel, Uninor, Tata CDMA, Tata DoCoMo

Operator(s) not meeting the benchmark: Reliance CDMA, Airtel, BSNL

Period of applying credit / waiver

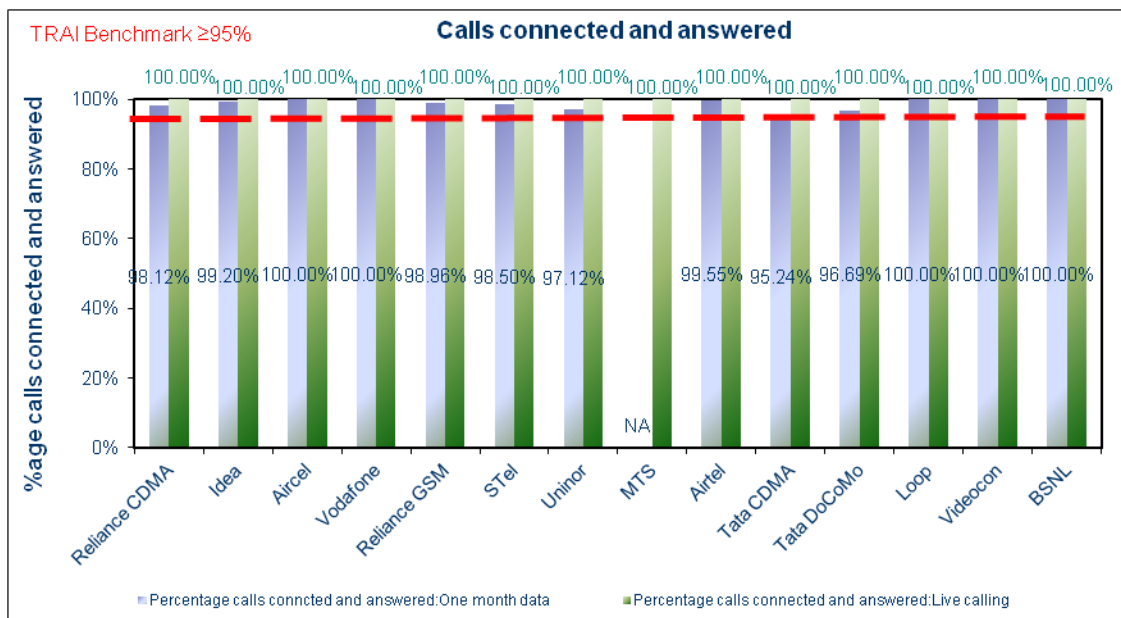


All the operators meet the benchmark

Live calling for billing Complaints

Resolution of billing complaints	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total Number of calls made		100	103	102	102	100	100	46	0	102	101	100	0	0	101
Number of cases resolved in 4 weeks		99	39	72	94	100	100	46	0	92	86	56	0	0	90
Percentage cases resolved in four weeks	100%	99%	37.86%	70.58%	92.15%	100%	100%	100%	NA	90.19%	85.14%	56%	NA	NA	89.10%

Customer Care / Helpline: Calls answered



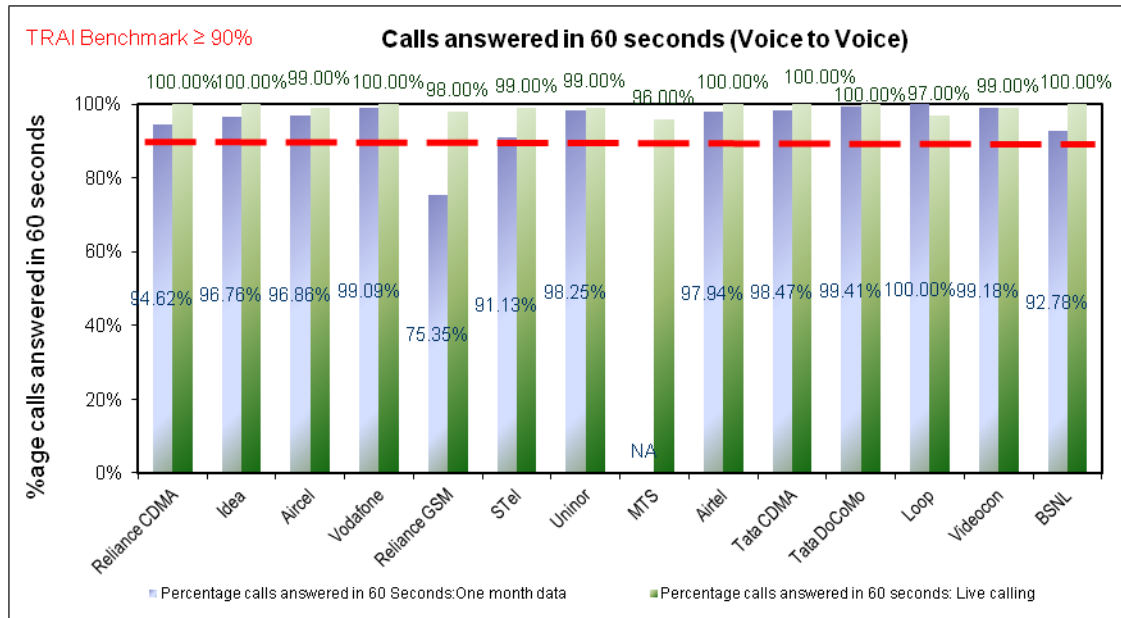
One month

All the operators meet the benchmark

Live calling

All the operators meet the benchmark

Customer Care / Helpline: Calls answered voice to voice



One month

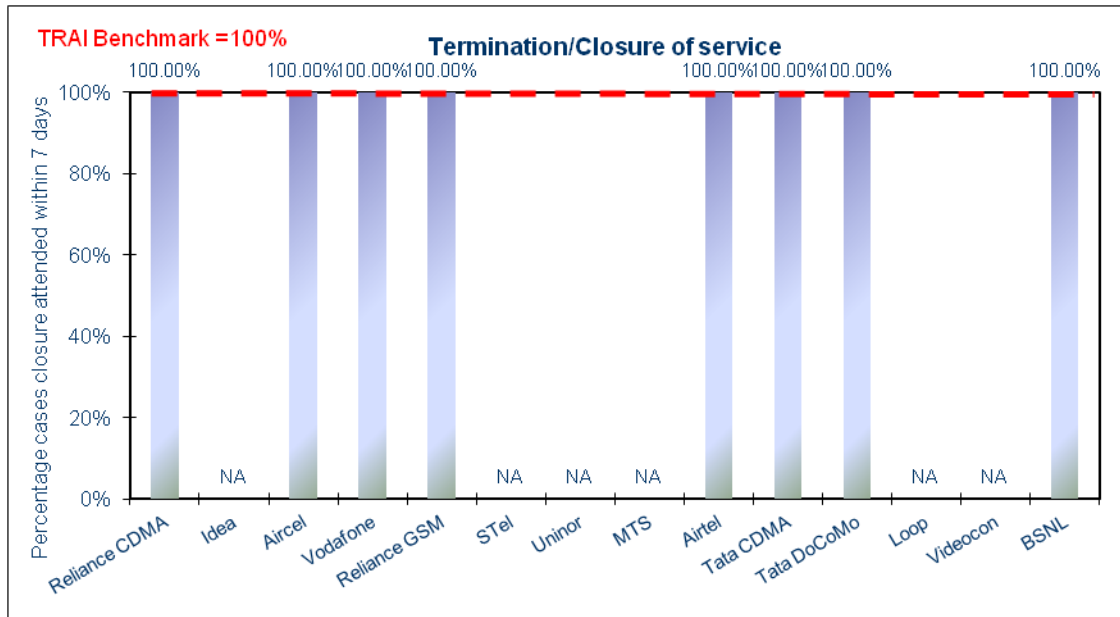
Operator(s) meeting benchmark: Reliance CDMA, Idea, Aircel, Vodafone, STel, Uninor, Airtel, Tata CDMA, Tata DoCoMo, Loop, Videocon, BSNL

Operator(s) not meeting the benchmark: Reliance GSM

Live calling

All the operators meet the benchmark

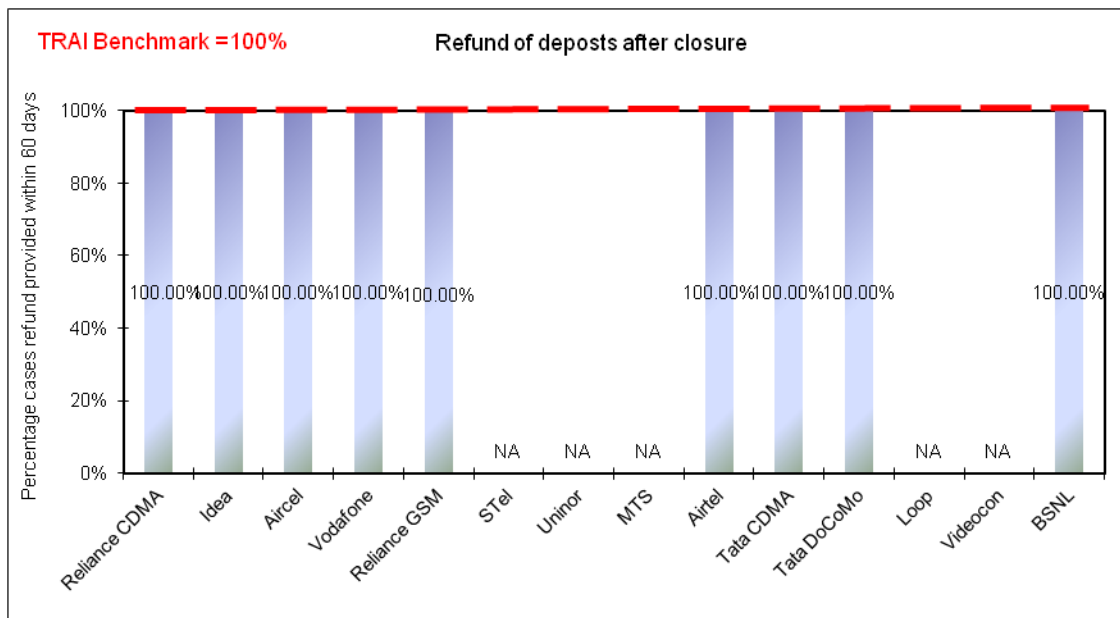
Termination / Closure of service



All the operators meet the benchmark

There were no termination/closure requests for Idea, Stel, Uninor, MTS, Loop and Videocon.

Refund of deposits



All the operators meet the benchmark

7.0 Compliance reports: Results of Verification of PMR

7.1 Cellular Mobile services

Month April, 2011

Name of Service Provider	Network Availability					Connection Establishment			Connection Maintenance (Retainability)				POI		Network Traffic Capacity				
	Total no. of BTSs in the licensed service area	Sum of downtime of BTSs in a month in hours	BTSs Accumulated downtime (not available for service) (%age)	No. of BTSs having accumulated downtime of >24 hours in a month	Worst affected BTSs due to downtime (%age)	Call Set-up Success Rate (within licensee's own network)	SDCCH/ Paging chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Total No. of cells exceeding 3% TCH drop (call drop)	Total no. of cells in the network	Worst affected cells having more than 3% TCH drop (%age)	%age connection with good voice quality	Point of interconnection (POI) Congestion	Total number of working POI Service Area wise	Equipped Capacity of Network in respect of Traffic in erlang	Total traffic handled in TCHB in erlang	Total no. of customer serves (as per VLR) on last day of the month	
Benchmark			≤ 2%		≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%			≤ 3%	≥ 95%						
Reliance CDMA	PMR	887	2037	0.32%	3	0.34%	99.85%	0.00%	0.03%	0.52%	3	887	0.34%	99.25%	0	DNA	111000	17109	0
	IMRB	887	2037	0.32%	3	0.34%	99.85%	0.00%	0.03%	0.52%	3	887	0.34%	99.25%	0	DNA	111000	17109	457522
Idea	PMR	1086	781	0.10%	0	0.00%	96.85%	0.11%	0.23%	0.54%	86	3261	2.64%	97.15%	0	DNA	28880	16002	428198
	IMRB	1086	781	0.10%	0	0.00%	96.85%	0.11%	0.23%	0.54%	2574	97650	2.64%	97.15%	0	77	28880	16002	428198
Aircel	PMR	2561	794.7	0.04%	0	0.00%	98.98%	0.36%	0.78%	0.80%	483	7563	6.39%	96.51%	1	DNA	134538	44661.3	1210450
	IMRB	2561	795	0.04%	0	0.00%	98.98%	0.36%	0.78%	1.07%	483	7563	6.39%	96.51%	0	76	134537	44661	1210450
Vodafone	PMR	3178	1842	0.04%	3	0.09%	98.45%	0.22%	1.05%	0.94%	263	9461	2.80%	98.58%	0	DNA	78152	61314	1590285
	IMRB	3178	1842	0.04%	3	0.09%	98.45%	0.22%	1.05%	0.94%	263	9461	2.80%	98.58%	0	41	78152	61314	1590285
Reliance GSM	PMR	1502	1219	0.11%	2	0.13%	99.60%	0.73%	0.97%	0.88%	45	4506	1.00%	98.24%	0	DNA	72000	63618	0
	IMRB	1502	1219	0.11%	2	0.13%	99.60%	0.73%	0.97%	0.88%	45	4506	1.00%	98.24%	0	DNA	72000	63618	1799436
STel	PMR	1032	3904.8	0.51%	0	0.00%	99.03%	0.02%	0.05%	0.41%	87	3097	2.81%	98.10%	0	DNA	DNA	DNA	DNA
	IMRB	1032	3905	0.51%	0	0.00%	99.00%	0.02%	0.05%	0.41%	87	3097	2.81%	98.06%	0	41	24083	8379	271723
Uninor	PMR	1007	7073	0.98%	2	0.2%	97.71%	0.31%	0.54%	1.88%	65	3007	2.16%	98.25%	0	DNA	33231	7502	347112
	IMRB	1007	7072	0.98%	2	0.2%	97.73%	0.31%	0.54%	1.90%	65	3007	2.16%	98.25%	0	51	33231	7501	347112
MTS	PMR	5	11	0.49%	0	0.00%	100.00%	0.00%	0.00%	0.00%	0	0	0.00%	100.00%	0	23	515	3	227
	IMRB	5	11	0.31%	0	0.00%	99.87%	0.00%	0.00%	1.30%	7	15	1.51%	96.05%	0	23	4200	2.66	227
Airtel	PMR	3545	6469.7	0.25%	51	1.40%	98.00%	0.50%	0.90%	1.30%	275	11108	2.48%	96.56%	0	DNA	238199	191598	4842064
	IMRB	3545	6469.67	0.25%	51	1.44%	97.95%	0.49%	0.86%	1.30%	275	11108	2.47%	96.56%	0	47	238199	191598	4842064
Tata CDMA	PMR	465	48.43	0.01%	0	0.00%	98.89%	0.00%	0.00%	0.11%	2	1401	0.14%	99.80%	0	DNA	61222	16845	316481
	IMRB	465	48.7	0.01%	0	0.00%	98.89%	0.00%	0.00%	0.11%	2	1401	0.14%	99.80%	0	35	61222	16845	316481

Quality of Service – Wireless Audit module report for Orissa Circle

Tata DoCoMo	PMR	1544	188	0.02%	0	0.00%	98.54%	0.25%	0.48%	0.37%	19	4618	0.41%	97.93%	0	DNA	56302	26494	858083
	IMRB	1544	188	0.02%	0	0.00%	98.54%	0.25%	0.48%	0.37%	19	4618	0.41%	97.92%	0	11	56302	26494	858083
Loop	PMR	9	21.32	0.32%	0	0.00%	98.72%	0.00%	0.00%	0.47%	0	27	0.00%	98.71%	0	DNA	200	0.97	40
	IMRB	9	21.54	0.33%	0	0.00%	98.72%	0.00%	0.00%	0.47%	0	27	0.00%	98.71%	0	13	200	0.97	40
Videocon	PMR	40	359	1.25%	0	0.00%	98.00%	0.81%	1.54%	0.85%	0	120	0.00%	98.74%	0	11	5000	0.57	669
	IMRB	40	359	1.24%	0	0.00%	98.00%	0.81%	1.54%	0.85%	0	120	0.00%	98.74%	0	11	5000	0.57	669
BSNL	PMR	1987	9983	0.68%	19	0.96%	97.00%	0.86%	1.77%	1.96%	259	5961	4.51%	98.00%	0	17	168600	122730	2315657
	IMRB	1987	9983	0.68%	19	0.96%	98.38%	0.92%	1.62%	1.92%	179	4658	4.51%	95.59%	0	15	168600	122730	2315657

Month May, 2011

Name of Service Provider	Network Availability						Connection Establishment			Connection Maintenance (Retainability)					POI		Network Traffic Capacity		
	Total no. of BTSs in the licensed service area	Sum of downtime of BTSs in a month in hours	BTSs Accumulated downtime (not available for service) (%age)	No. of BTSs having accumulated downtime of >24 hours in a month	Worst affected BTSs due to downtime (%age)	Call Set-up Success Rate (within licensee's own network)	SDCCH/Paging chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Total No. of cells exceeding 3% TCH drop (call drop)	Total no. of cells in the network	Worst affected cells having more than 3% TCH drop (%age)	%age connection with good voice quality	Point of interconnection (POI) Congestion	Total number of working POI Service Area wise	Equipped Capacity of Network in respect of Traffic in erlang	Total traffic handled in TCHB in erlang	Total no. of customer serves (as per VLR) on last day of the month	
Benchmark			≤ 2%		≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%			≤ 3%	≥ 95%						
Reliance CDMA	PMR	887	2011	0.30%	3	0.34%	99.86%	0.00%	0.05%	0.53%	4	887	0.45%	99.32%	0	DNA	111000	16891	0
	IMRB	887	2011	0.30%	3	0.34%	99.86%	0.00%	0.05%	0.53%	4	887	0.45%	99.32%	0	DNA	111000	16891	444159
Idea	PMR	1069	1716	0.21%	0	0.00%	98.85%	0.12%	0.17%	0.56%	97	3261	2.97%	97.17%	0	DNA	28070	15408	456785
	IMRB	1089	1716	0.21%	0	0.00%	98.85%	0.12%	0.17%	0.58%	2999	101091	2.97%	97.17%	0	77	28070	15408	456785
Aircel	PMR	2561	5232	0.27%	48	1.87%	98.45%	0.21%	1.26%	0.91%	538	7561	7.12%	96.00%	0	DNA	134476	44894	1184271
	IMRB	2561	5232	0.27%	48	1.87%	98.45%	0.21%	1.26%	1.21%	538	7561	7.12%	96.34%	0	81	134476	44894	1184271
Vodafone	PMR	3178	1842	0.04%	3	0.09%	98.45%	0.22%	1.05%	0.94%	263	9461	2.80%	98.58%	0	DNA	78152	61314	1590285
	IMRB	3179	3324	0.14%	2	0.06%	98.23%	0.31%	1.16%	1.15%	265	9464	2.80%	98.58%	0	41	78238	62971	1719203
Reliance GSM	PMR	1538	1146	0.10%	2	0.13%	99.59%	0.71%	0.89%	0.81%	43	4614	0.93%	98.56%	0	DNA	72000	63396	0
	IMRB	1538	1146	0.10%	2	0.13%	99.59%	0.71%	0.89%	0.81%	43	4614	0.93%	98.56%	0	DNA	72000	63396	1892397
STel	PMR	1049	4756	0.61%	0	0.00%	99.06%	0.04%	0.11%	0.43%	98	3148	3.11%	98.14%	0	DNA	23624	7636	279752
	IMRB	1049	4756	0.61%	0	0.00%	99.06%	0.04%	0.11%	0.43%	98	3148	3.11%	98.14%	0	41	23624	7636	279752
Uninor	PMR	1009	8115	0.37%	2	0.20%	97.98%	0.58%	0.17%	1.72%	142	3007	4.72%	95.69%	0	DNA	33155	8365	369516
	IMRB	1006	8115	0.37%	2	0.19%	97.97%	0.61%	0.17%	1.73%	142	3007	4.72%	95.69%	0	52	33155	8364	369516

Quality of Service – Wireless Audit module report for Orissa Circle

MTS	PMR	37	37	0.13%	0	0.00%	100.00%	0.00%	0.00%	0.00%	0	9	0.00%	100.00%	0	23	515	2	286
	IMRB	37	37	0.13%	0	0.00%	99.01%	NA	0.00%	1.35%	15	111	0.44%	96.48%	0	23	4200	2.02	286
Airtel	PMR	3561	11099	0.40%	65	1.80%	97.90%	0.5%	0.80%	1.40%	323	11159	2.90%	95.30%	0	DNA	239821.9	180396	4933253
	IMRB	3561	11099	0.40%	65	1.82%	97.88%	0.5%	0.80%	1.40%	323	11159	2.90%	95.30%	0	58	239821	180396	4933253
Tata CDMA	PMR	470	79	0.02%	0	0.00%	98.84%	0.00%	0.00%	0.19%	5	1409	0.35%	99.74%	0	DNA	62093	15860	324780
	IMRB	470	79	0.02%	0	0.00%	98.84%	0.00%	0.00%	0.19%	5	1409	0.35%	99.74%	0	35	62093	15860	324780
Tata DoCoMo	PMR	1572	400	0.03%	0	0.00%	98.79%	0.23%	0.26%	0.38%	15	4702	0.32%	97.83%	0	DNA	75724	25080	833046
	IMRB	1572	400	0.03%	0	0.00%	98.79%	0.23%	0.26%	0.38%	15	4702	0.32%	97.83%	0	11	75724	25080	833046
Loop	PMR	9	45	0.01%	0	0.00%	100.00%	0.00%	0.00%	0.00%	0	27	0.00%	97.81%	0	DNA	199.854	0.46	29
	IMRB	9	45	0.68%	0	0.00%	100.00%	0.00%	0.00%	0.00%	0	27	0.00%	97.81%	0	13	199.85	0.46	29
Videocon	PMR	40	328	1.10%	0	0.00%	99.66%	0.91%	0.34%	0.43%	0	120	0.00%	99.11%	0	11	5000	3.42	866
	IMRB	40	328	1.13%	0	0.00%	99.66%	0.91%	0.34%	0.43%	0	120	0.00%	99.11%	0	11	5000	3.42	866
BSNL	PMR	1987	10421	0.70%	24	1.21%	97.00%	0.89%	1.74%	1.94%	265	5961	4.45%	97.00%	0	DNA	168600	127346	2319399
	IMRB	1987	10421	0.70%	24	1.21%	98.11%	0.90%	1.89%	1.96%	186	4666	3.99%	97.00%	0	15	168600	127346	2319399

Month June, 2011

Name of Service Provider	Network Availability					Connection Establishment			Connection Maintenance (Retainability)					POI		Network Traffic Capacity			
	Total no. of BTSs in the licensed service area	Sum of downtime of BTSs in a month in hours	BTSs Accumulated downtime (not available for service) (%age)	No. of BTSs having accumulated downtime of >24 hours in a month	Worst affected BTSs due to downtime (%age)	Call Set-up Success Rate (within licensee's own network)	SDCCH/Paging ch. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Total No. of cells exceeding 3% TCH drop (call drop)	Total no. of cells in the network	Worst affected cells having more than 3% TCH drop (%age)	%age connection with good voice quality	Point of interconnection (POI) Congestion	Total number of working POI Service Area wise	Equipped Capacity of Network in respect of Traffic in erlang	Total traffic handled in TCHB in erlang	Total no. of customer serves (as per VLR) on last day of the month	
Benchmark			≤ 2%		≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%			≤ 3%	≥ 95%						
Reliance CDMA	PMR	887	1975	0.31%	3	0.34%	99.82%	0.00%	0.05%	0.60%	5	887	0.56%	99.31%	0	DNA	111000	16086	0
	IMRB	887	1975	0.30%	3	0.33%	99.82%	0.00%	0.05%	0.60%	5	887	0.56%	99.31%	0	DNA	111000	16086	440118
Idea	PMR	1086	875	0.11%	1	0.09%	98.87%	0.10%	0.22%	0.61%	93	3153	2.95%	96.95%	0	DNA	28070	15408	468901
	IMRB	1089	875	0.11%	1	0.09%	98.87%	0.10%	0.22%	0.61%	2890	97830	2.95%	96.95%	0	77	28070	15408	468901
Aircel	PMR	2564	6557	0.36%	71	2.77%	98.90%	0.32%	0.85%	1.10%	667.1	7570	8.80%	96.30%	0	DNA	134868	42631	1195227
	IMRB	2564	6557	0.36%	71	2.77%	98.85%	0.32%	0.85%	1.44%	667	7570	8.80%	96.30%	0	81	134867	42631	1195227
Vodafone	PMR	3232	1804	0.08%	3	0.09%	98.11%	0.33%	1.21%	1.32%	282	9623	2.90%	98.33%	0	DNA	79170	63130	1813961
	IMRB	3232	1804	0.08%	3	0.09%	98.11%	0.33%	1.21%	1.32%	282	9623	2.90%	98.33%	0	42	79170	63129	1813961

Quality of Service – Wireless Audit module report for Orissa Circle


Reliance GSM	PMR	1624	635	0.05%	4	0.25%	99.43%	0.73%	0.86%	0.76%	48	4872	0.99%	98.61%	0	DNA	72000	62526	0
	IMRB	1624	635	0.05%	4	0.24%	99.43%	0.73%	0.86%	0.76%	48	4872	0.98%	98.61%	0	DNA	72000	62525	1930292
STel	PMR	1049	6375	0.81%	0	0.00%	98.94%	0.08%	0.06%	0.47%	110	3149	3.49%	98.04%	0	DNA	23480	8150	312472
	IMRB	1049	6375	0.81%	0	0.00%	98.94%	0.08%	0.06%	0.47%	110	3149	3.49%	98.04%	0	43	23480	8150	312472
Uninor	PMR	1006	6399	0.88%	0	0.00%	98.00%	0.45%	0.12%	1.41%	149	3007	4.96%	96.00%	0	DNA	32959	9344	415471
	IMRB	1006	6399	0.88%	0	0.00%	98.00%	0.48%	0.12%	1.39%	149	3007	4.95%	95.62%	0	53	32959	9343	415471
MTS	PMR	37	393	1.48%	0	0.00%	100.00%	0.00%	0.00%	0.00%	0	0	0.00%	100.00%	0	23	515	3	259
	IMRB	37	393	1.47%	0	0.00%	98.96%	NA	0.00%	1.65%	14	111	0.42%	95.49%	0	23	4200	3	259
Airtel	PMR	3561	10584	0.40%	65	1.80%	97.90%	0.60%	0.80%	1.50%	323	11175	2.90%	95.70%	0	DNA	238514	198489	5052817
	IMRB	3561	10583	0.41%	65	1.82%	97.92%	0.57%	0.84%	1.46%	323	11175	2.89%	95.70%	0	58	238514	198488	5052817
Tata CDMA	PMR	475	93	0.03%	0	0.00%	99.11%	0.00%	0.00%	0.24%	9	1431	0.63%	99.70%	0	DNA	62726	15747	307218
	IMRB	475	93	0.03%	0	0.00%	99.11%	0.00%	0.00%	0.24%	9	1431	0.63%	99.70%	0	35	62726	15747	307218
Tata DoCoMo	PMR	1585	477	0.04%	2	0.13%	98.84%	0.18%	0.16%	0.42%	35	4741	0.74%	97.76%	0	DNA	76957	26028	849233
	IMRB	1585	477	0.04%	2	0.13%	98.84%	0.18%	0.16%	0.42%	35	4741	0.74%	97.76%	0	11	76957	26028	849233
Loop	PMR	9	65	0.91%	0	0.00%	100.00%	0.14%	0.00%	0.00%	0	27	0.00%	96.75%	0	DNA	200	0	20
	IMRB	10	66	0.91%	0	0.00%	100.00%	0.14%	0.00%	0.00%	0	30	0.00%	96.75%	0	13	200	0	20
Videocon	PMR	40	174	0.60%	0	0%	99.12%	0.23%	0.48%	0.47%	0	120	0.00%	99.07%	0	11	5000	5	1230
	IMRB	40	174	0.60%	0	0%	99.12%	0.23%	0.48%	0.47%	0	120	0.00%	99.07%	0	11	5000	5	1230
BSNL	PMR	1987	10471	0.71%	28	1.41%	96.74%	0.89%	1.70%	1.93%	263	5961	4.41%	100.00%	0	DNA	168600	128050	2343279
	IMRB	1987	10471	0.71%	28	1.41%	98.20%	0.88%	1.80%	1.95%	188	4666	4.03%	95.70%	0	15	168600	128050	2343279

Quality of Service – Wireless Audit module report for Orissa Circle


Name of Service Provider		Metering and Billing											Response time to the customer for assistance				Termination/ closure of service				
		Metering and billing credibility - post paid	No. of bills issued during the period	No. of bills disputed including billing complaints during the period	Metering and billing credibility - pre paid	No. of charging / credit / validity complaints during the quarter	Total no. of pre-paid customers at the end of the quarter	Resolution of billing/charging complaints	No. of billing/ (post-paid) and charging, credit / validity (pre-paid) complaints resolved within 4 weeks during the quarter	Total no. of billing (post-paid) and charging, credit / validity (pre-paid) complaints received during the quarter	and charging, credit / validity complaints (pre paid) resolved in favour of the customer during the	No. of complaints disposed on account of not considered as valid complaints during the quarter	Period of applying credit / waiver / adjustment to customer/s account from the date of resolution of complaints	Accessibility of call centre/ customer care	Total no. of call attempts to call centre / customer care nos. during TCBH (Note)	No. of calls connected and answered successfully to call centre / customer care nos. during TCBH (Note)	Percentage of calls answered by the operators (voice to voice) within 60 seconds	%age request for Termination / Closure of service complied within 7 days	Total No. of request for Termination / Closure of service received during the quarter	No. of requests for Termination / Closure of service complied within 7 days during the quarter	Time taken for refund of deposits after closure
Benchmark		≤ 0.1%			≤ 0.1%			100% within 4 weeks					100% Within 1 week	≥ 95%			≥ 90%	100% within 7 days			100% within 60 days
Reliance CDMA	PMR	0.06%	104900	61	0.04%	272	746086	100%	877	877	157	720	DNA	100.00%	71885	71885	94.00%	100%	196	196	100%
	IMRB	0.06%	104900	61	0.04%	272	746086	100%	877	877	157	720	DNA	100.00%	71885	71885	94.00%	100%	196	196	100%
Idea	PMR	0.02%	4691	1	0.01%	264	2131242	100%	1552	1552	265	1287	100.00%	99.00%	241288	238586	95.00%	100%	47	47	100%
	IMRB	0.02%	4691	1	0.01%	264	2131242	100%	1552	1552	265	1287	100.00%	98.88%	241288	238586	94.50%	100%	26	26	100%
Aircel	PMR	0.03%	13273	4	1.26%	31458	2502010	100%	31531	31462	2051	29411	100.00%	100.00%	280116	232513	87.37%	100%	187	187	100%
	IMRB	0.03%	13273	4	0.00%	812	2502010	100%	816	816	816	5278	100.00%	100.00%	713827	713827	87.37%	100%	187	187	100%
Vodafone	PMR	0.08%	46541	37	0.10%	6658	2323614	100%	6695	6695	4024	2671	100.00%	100.00%	191087	186930	93.00%	99%	278	276	100%
	IMRB	0.08%	46541	37	0.09%	6658	2323614	100%	6695	6695	6611	84	100.00%	99.72%	9898193	9870598	90.03%	99%	278	276	100%
Reliance GSM	PMR	0.10%	20131	20	0.06%	2141	3332639	100%	6443	6443	460	5983	DNA	46.00%	322105	143565	90.00%	100%	21	21	100%
	IMRB	0.10%	20131	20	0.06%	2141	3332639	100%	6443	6443	460	5983	DNA	46.00%	322105	143565	90.00%	100%	21	21	100%
STel	PMR	NA	0	NA	0.06%	539	864937	100%	539	539	23	516	100.00%	100.00%	265163	254842	96.00%	NA	NA	NA	NA
	IMRB	NA	0	NA	0.06%	539	864937	100%	539	539	23	516	100.00%	99.52%	1758385	1749897	96.00%	NA	NA	NA	NA
Uninor	PMR	NA	NA	NA	0.10%	1069	1079819	100%	1069	1069	0	0	0.00%	99.00%	1856055	1838812	97.00%	NA	0	NA	NA
	IMRB	NA	NA	NA	0.10%	1069	1079819	100%	1069	1069	0	0	100.00%	99.00%	1856055	1838812	97.00%	NA	0	NA	NA
MTS	PMR	0.00%	NA	NA	0.00%	0	113	100%	0	NA	NA	NA	100.00%	100.00%	0	NA	100.00%	NA	NA	NA	NA
	IMRB	NA	NA	NA	0.00%	0	145	100%	0	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	NA
Airtel	PMR	0.01%	73256	10	0.00%	127	19512213	100%	137	7351	137	7214	100.00%	97.00%	64193320	62153753	96.00%	100%	438	438	100%
	IMRB	0.01%	73256	10	0.00%	127	19512213	100%	137	137	137	7214	100.00%	96.82%	64193320	62153753	95.61%	100%	438	438	100%
Tata CDMA	PMR	0.02%	48395	11	0.01%	221	2217126	100%	854	854	232	622	DNA	99.00%	144274	144159	96.00%	100%	1901	1901	100%
	IMRB	0.02%	48395	11	0.01%	221	2217126	100%	232	854	232	622	100.00%	99.00%	144274	144159	96.00%	100%	1901	1901	100%
Tata	PMR	0.00%	12352	59	0.00%	692	2055289	100%	751	751	0	751	100.00%	97.00%	577162	556769	92.00%	100%	472	472	89%

DoCoMo	IMRB	0.00%	12352	0	0.00%	0	2055289	100%	0	751	0	751	100.00%	96.47%	577162	556769	91.72%	100%	472	472	89%
	PMR	NA	NA	NA	0.00%	0	0	NA	0	NA	NA	NA	NA	100.00%	22	22	100.00%	NA	NA	NA	NA
Loop	IMRB	NA	NA	NA	0.00%	0	787	NA	0	NA	NA	NA	NA	100.00%	3	3	100.00%	NA	NA	NA	NA
	PMR	NA	NA	NA	0.09%	9	9591	100%	9	9	9	0	NA	97.00%	454	439	95.00%	NA	NA	NA	NA
Videocon	IMRB	NA	NA	NA	0.09%	9	9591	100%	9	9	9	0	100.00%	97.00%	454	439	95.00%	NA	NA	NA	NA
	PMR	0.04%	173749	67	0.03%	3941	3769178	100%	4008	4008	94	3918	100.00%	95.00%	5051	4804	92.00%	100%	208	208	100%
BSNL	IMRB	0.04%	173749	67	0.03%	3941	3769178	100%	4008	4008	65	3943	100.00%	95.11%	5051	4804	92.41%	100%	208	208	100%

 Figures do not match with those reported in PMR

 Figures verified on all India basis

B'mark = TRAI Benchmark, DNA = Details not available

 Not meeting benchmark

8.0 Conclusions

8.1 Cellular Mobile services

1. Aircel does not meet the benchmark for Metering and billing credibility and percentage of calls answered by the operators (voice to voice) within 60 seconds
2. Aircel and BSNL were found to be not meeting benchmark for worst affected cells having more than 3% TCH drop for April month.
3. Aircel, Uninor and BSNL were found to be not meeting benchmark for worst affected cells having more than 3% TCH drop for May month
4. Aircel, Stel, Uninor and BSNL were found to be not meeting benchmark for worst affected cells having more than 3% TCH drop for May month
5. Reliance CDMA is not meeting the Accessibility of call centre/ customer care parameter.

9.0 Annexure - I

9.1 Service provider performance report based on one month data

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)			Metering and Billing				Response time to customer for assistance		Termination / closure of service	
	BTSs Accumulated downtime (not available for service)	Worst affected BTSs due to downtime	Call Set-up Success Rate (within licensee's own network)	SDCCH/Paging Chl. Congestion	TCH Congestion	Call Drop Rate (%age)	Worst affected cells having more than 3% TCH drop	%age of connection with good voice quality	Metering and billing credibility (Postpaid)	Metering and billing credibility (Prepaid)	%age complaints resolved within 4 weeks	Period of applying credit/waiver less than 1 week	Accessibility of call centre/customer care	Percentage of calls answered by operators within 60 sec	%age requests for Termination complied within 7 days	Refund of deposits after closure within 60 days
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.1%	≤ 0.1%	100%	100%	≥ 95%	≥ 90%	100%	100%
Reliance CDMA	0.25%	0.00%	99.69%	0.00%	0.02%	0.96%	0.37%	99.06%	0.10%	0.08%	100.00%	100.00%	98.12%	94.62%	100.00%	100.00%
Idea	0.31%	0.00%	98.75%	0.05%	0.25%	0.57%	2.91%	96.74%	0.00%	0.00%	100.00%	100.00%	99.20%	96.76%	NA	100.00%
Aircel	0.24%	1.57%	99.31%	0.44%	0.30%	1.48%	6.24%	0.96%	0.02%	0.00%	100.00%	100.00%	100.00%	96.86%	100.00%	100.00%
Vodafone	0.14%	0.15%	98.30%	0.38%	0.88%	1.24%	2.63%	98.15%	0.06%	0.08%	100.00%	100.00%	100.00%	99.09%	100.00%	100.00%
Reliance GSM	0.05%	0.00%	99.48%	0.53%	0.72%	0.66%	0.85%	98.91%	0.10%	0.03%	100.00%	100.00%	98.96%	75.35%	100.00%	100.00%
STel	0.35%	0.00%	98.84%	0.04%	0.08%	0.45%	2.96%	98.06%	NA	0.03%	100.00%	100.00%	98.50%	91.13%	NA	NA
Uninor	0.60%	0.00%	98.00%	0.43%	0.57%	1.80%	2.97%	95.38%	NA	0.00%	100.00%	100.00%	97.12%	98.25%	NA	NA
MTS	1.85%	0.00%	98.84%	NA	0.00%	1.68%	5.41%	95.36%	NA	0.00%	NA	NA	NA	NA	NA	NA
Airtel	0.31%	1.81%	97.88%	0.37%	0.68%	1.70%	2.90%	96.18%	0.03%	0.00%	100.00%	100.00%	99.55%	97.94%	100.00%	100.00%
Tata CDMA	0.05%	0.00%	99.35%	0.00%	0.00%	0.31%	0.50%	99.81%	0.00%	0.01%	100.00%	100.00%	95.24%	98.47%	100.00%	100.00%
Tata DoCoMo	0.01%	0.00%	98.62%	0.06%	0.38%	0.65%	1.72%	97.79%	0.02%	0.00%	100.00%	100.00%	96.69%	99.41%	100.00%	100.00%
Loop	0.09%	0.00%	100.00%	0.01%	0.00%	0.26%	0.00%	96.36%	NA	0.00%	NA	NA	100.00%	100.00%	NA	NA
Videocon	0.47%	0.00%	99.14%	0.06%	0.03%	1.17%	0.00%	99.83%	NA	0.00%	NA	NA	100.00%	99.18%	NA	NA
BSNL	0.88%	1.31%	98.42%	0.99%	1.58%	1.16%	3.90%	95.02%	0.00%	0.03%	100.00%	100.00%	100.00%	92.78%	100.00%	100.00%

9.2 Monthly Point of Interconnection (POI) Congestion Report

Name of the Service Provider	Name of POI not meeting the benchmark	Total No. of circuits on POI	Total No. of call attempts on POI	Total traffic served on POI (Erlang)	% of Congestion POI	Action already taken/ action plan for meeting the benchmark
Reliance CDMA						All POI's meeting TRAI specified benchmark
Idea						All POI's meeting TRAI specified benchmark
Aircel						All POI's meeting TRAI specified benchmark
Vodafone						All POI's meeting TRAI specified benchmark
Reliance GSM						All POI's meeting TRAI specified benchmark
STel						All POI's meeting TRAI specified benchmark
Uninor						All POI's meeting TRAI specified benchmark
MTS						All POI's meeting TRAI specified benchmark
Airtel						All POI's meeting TRAI specified benchmark
Tata CDMA						All POI's meeting TRAI specified benchmark
Tata DoCoMo						All POI's meeting TRAI specified benchmark

Loop	All POI's meeting TRAI specified benchmark
Videocon	All POI's meeting TRAI specified benchmark
BSNL	All POI's meeting TRAI specified benchmark

9.3 Parameter wise performance reports for Cellular Mobile services

1. Network Availability

Audit Results for Network Availability

	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Number of BTSs in the licensed service area		722	1138	2546	3323	1797	1049	1004	37	3641	469	1603	9	40	1987
Sum of downtime of BTSs in a month (in hours)		1346	2639	4541	3347	640	2699	4491	508	8490	166	122	6	141	12998
BTSs accumulated downtime (not available for service)	≤ 2%	0.25%	0.31%	0.24%	0.14%	0.05%	0.35%	0.60%	1.85%	0.31%	0.05%	0.01%	0.09%	0.47%	0.88%
Number of BTSs having accumulated downtime >24 hours		0	0	40	5	0	0	0	0	66	0	0	0	0	26
Worst affected BTSs due to downtime	≤ 2%	0.00%	0.00%	1.57%	0.15%	0.00%	0.00%	0.00%	0.00%	1.81%	0.00%	0.00%	0.00%	0.00%	1.31%

2. Connection Establishment (Accessibility)

Audit Results for CSSR, SDCCH and TCH congestion

CSSR	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
CSSR	≥ 95%	99.69%	98.75%	99.31%	98.30%	99.48%	98.84%	98.00%	98.84%	97.88%	99.35%	98.62%	100.00%	99.14%	98.42%

SDCCH congestion	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
SDCCH/Paging channel congestion	≤ 1%	0.00%	0.05%	0.44%	0.38%	0.53%	0.04%	0.43%	0.00%	0.37%	0.00%	0.06%	0.01%	0.06%	0.99%

TCH congestion	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
TCH congestion	≤ 2%	0.02%	0.25%	0.30%	0.88%	0.72%	0.08%	0.57%	0.00%	0.68%	0.00%	0.38%	0.00%	0.03%	1.58%

Live measurement results for CSSR, SDCCH and TCH congestion

CSSR	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
CSSR	≥ 95%	99.61%	99.27%	99.43%	98.61%	98.95%	99.43%	98.87%	98.99%	98.29%	99.52%	99.11%	100.00%	99.89%	98.76%

SDCCH congestion	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
SDCCH/Paging channel congestion	≤ 1%	0.00%	0.05%	0.10%	0.34%	0.02%	0.01%	0.03%	NA	0.32%	0.00%	0.03%	0.00%	0.18%	0.87%

TCH congestion	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
TCH congestion	≤ 2%	0.02%	0.05%	0.13%	0.65%	0.11%	0.05%	0.05%	0.00%	0.67%	0.00%	0.07%	0.00%	0.11%	1.24%

Drive test results for CSSR (Average of three drive tests) and blocked calls

CSSR	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of call attempts		541	539	550	537	548	532	572	174	539	544	538	NA	NA	536
Total number of successful calls established		541	539	548	537	548	532	564	174	539	544	538	NA	NA	524
CSSR	≥ 95%	100.00%	100.00%	99.64%	100.00%	100.00%	100.00%	98.60%	100.00%	100.00%	100.00%	100.00%	NA	NA	97.76%

Blocked calls	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
%age blocked calls		0.00%	0.00%	0.36%	0.00%	0.00%	0.00%	1.40%	0.09%	0.00%	0.00%	0.00%	NA	NA	2.24%

3. Connection Maintenance (Retainability)

Audit Results for Call drop rate and for number of cells having more than 3% TCH

Call drop rate	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of calls established		12490007	18031021	60184187	2575671	50068395	12408602	21071957	4117	260407250	28855629	32970070	382	3506	202041118
Total number of calls dropped		119780	102542	891211	32036	331592	56324	378466	69	4419393	89153	213828	1	41	2346026
Call drop rate	≤ 2%	0.96%	0.57%	1.48%	1.24%	0.66%	0.45%	1.80%	1.68%	1.70%	0.31%	0.65%	0.26%	1.17%	1.16%

Cells having more than 3% TCH	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of cells in the network		2166	105648	7518	9900	5391	3149	3000	111	11441	1413	4814	27	120	924
Total number of cells having more than 3% TCH		8	3077	469	260	46	93.32	89	6	332	7	83	0	0	36
Worst affected cells having more than 3% TCH	≤ 3%	0.37%	2.91%	6.24%	2.63%	0.85%	2.96%	2.97%	5.41%	2.90%	0.50%	1.72%	0.00%	0.00%	3.90%

Live measurement results for Call drop rate and for number of cells having more than 3% TCH

Call drop rate	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of calls established		16719562	23460010	5453363	2774237	64490423	1025360	29445820	6923	27677612	1436386	3179508	74	8984	1432960
Total number of calls dropped		107359	59737	58048	30144	324505	3977	504008	74	358789	1830	20858	0	51	21320
Call drop rate	≤ 2%	0.64%	0.25%	1.06%	1.09%	0.50%	0.39%	1.71%	1.07%	1.30%	0.13%	0.66%	0.00%	0.57%	1.49%

Cells having more than 3% TCH	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of cells in the network		2187	245664	7597	9900	5589	3149	3000	111	11466	1413	4895	27	120	929
Total number of cells having more than 3% TCH		14	4594	432	278	17	91	84	23	330	0	84	0	0	22
Worst affected cells having more than 3% TCH	≤ 3%	0.64%	1.87%	5.69%	2.81%	0.30%	2.90%	2.81%	20.72%	2.88%	0.00%	1.72%	0.00%	0.00%	2.37%

Drive test results for Call drop rate (Average of three drive tests)

Call drop rate	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of calls established		541	539	550	537	546	532	564	172	539	544	538	NA	NA	524
Total number of calls dropped		0	0	0	1	0	0	0	3	0	0	0	NA	NA	3
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	1.74%	0.00%	0.00%	0.00%	NA	NA	0.57%

4. Voice quality**Audit Results for Voice quality**

Voice quality	B'mark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of sample calls		46259648	3095704721	684141492082	428110019	3961725825	551659645	39938456838	4117	43888175615	10145	13802950648	15669	2680238	30651
Total number of calls with good voice quality		45824807	2994889224	656307651000	420196851	3918702530	540930816	38093695233	3926	42211647306	10126	13498365917	15099	2675686	29125
%age calls with good voice quality	≥ 95%	99.06%	96.74%	95.93%	98.15%	98.91%	98.06%	95.38%	95.36%	96.18%	99.81%	97.79%	96.36%	99.83%	95.02%

Drive test results for Voice quality (Average of three drive tests)

Voice quality	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of sample calls		32363	1122378	678650	1119690	72459	910603	1014894	2375276	241040	124950	949268	NA	NA	996443
Total number of calls with good voice quality		29311	1112717	664843	1073540	69911	893355	982824	2350725	233857	118149	943355	NA	NA	964867
%age calls with good voice quality	≥ 95%	90.57%	99.14%	97.97%	95.88%	96.48%	98.11%	96.84%	98.97%	97.02%	94.56%	99.38%	NA	NA	96.83%

5. POI Congestion**Audit Results for POI Congestion**

POI congestion	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of working POIs		22	78	81	43	23	43	55	25	58	35	11	13	11	15
No. of POIs not meeting benchmark		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capacity of all POIs (A) - in erlangs		622041.52	750465.1	1374170	69420	761462.2	11221	15943	494.96	5723749	900183	432065	395	341	25000
Traffic served for all POIs (B)- in erlangs		248173.3	414220.3	832550.1	38913	463006.1	4985	10812	100.88	100408.99	424689	245162	14.17	25.28	19890
POI congestion	≤ 0.3%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Live measurement results for POI congestion**6. Inter Operator Call Assessment**

Inter operator call Assessment To↓ From→	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Reliance CDMA	NA	100%	98%	100%	100%	100%	100%	98%	100%	100%	100%	100%	100%	100%
Idea	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Aircel	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	98%	100%	100%
Vodafone	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Reliance GSM	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
STel	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%

Uninor	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%
MTS	100%	100%	100%	100%	100%	100%	100%	99%	NA	100%	100%	100%	98%	100%	100%
Airtel	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	98%	99%	100%
Tata CDMA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%
Tata DoCoMo	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%
Loop	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%
Videocon	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	96%	NA	100%
BSNL	100%	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA

 The maximum problem faced by the calling operator to other operators

7. Metering and Billing credibility

Audit Results for Billing performance

Billing Performance	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Billing disputes - Postpaid															
Total bills generated during the period		30025	1961	5280	19476	10112	NA	NA	NA	25771	28749	5771	NA	NA	57993
Total number of bills disputed		30	0	1	11	10	NA	NA	NA	8	0	1	NA	NA	2
Percentage bills disputed	≤ 0.1%	0.10%	0.00%	0.02%	0.06%	0.10%	NA	NA	NA	0.03%	0.00%	0.02%	NA	NA	0.00%
Billing disputes - Prepaid															
Number of complaints related to charging, credit & validity		591	25	4	1933	1224	320	57	0	122	55	0	0	0	1290
Total number of prepaid customers in that period		759257	640065	2655104	2411863	3846441	962646	1321669	207	7088168	654635	2064005	787	10650	3828951
Percentage of complaints	≤ 0.1%	0.08%	0.00%	0.00%	0.08%	0.03%	0.03%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.03%
Resolution of billing complaints															
Total number of billing/charging complaints		621	273	115	1944	1234	320	57	0	130	55	1	0	0	1292
Total complaints considered invalid		197	248	110	246	667	53	56	NA	2883	3958	202	NA	NA	1232
Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1		621	273	115	1944	1234	320	57	NA	130	55	1	NA	NA	1292
Percentage complaints resolved within 4 weeks of date of receipt	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%
Period of applying credit / waiver															
Total number of complaints where credit/waiver is required		424	25	5	1698	567	267	1	NA	130	55	1	NA	NA	60
Percentage cases in which credit/waiver was received within 1 week	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	NA	NA	100%

***S-Tel, Uninor, Loop and Videocon offer only prepaid connections in Orissa circle.**

Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total Number of calls made		100	103	102	102	100	100	46	0	102	101	100	0	0	101
Number of cases resolved in 4 weeks		99	39	72	94	100	100	46	0	92	86	56	0	0	90
Percentage cases resolved in four weeks	100%	99%	37.86%	70.58%	92.15%	100%	100%	100%	NA	90.19%	85.14%	56%	NA	NA	89.10%

*** There were no billing complaints for MTS, Loop and Videocon**

8. Customer Care**Audit results for customer care**

Customer Care Assessment	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of call attempts to customer care for assistance		124041	79368	1984415	2767716	1186060	528300	1057675	0	1331498	473888	2245897	3	460	1964302
Number of calls getting connected and answered (electronically)		121714	78735	1984415	2767634	1173733	520397	1027248	NA	1325520	451310	2171605	3	460	1964302
Percentage calls getting connected and answered	≥ 95%	98.12%	99.20%	100.00%	100.00%	98.96%	98.50%	97.12%	NA	99.55%	95.24%	96.69%	100.00%	100.00%	100.00%
Number of calls getting transferred to the operator (voice to voice)		35472	284152	74866	923169	923789	116020	227828	NA	2036001	137175	641101	3	243	721868
Number of calls answered by operator (voice to voice) within 60 seconds		33565	274957	72518	914736	696079	105727	223833	NA	1994101	135080	637330	3	241	669716
Percentage calls answered within 60 seconds (V2V)	≥ 90%	94.62%	96.76%	96.86%	99.09%	75.35%	91.13%	98.25%	NA	97.94%	98.47%	99.41%	100.00%	99.18%	92.78%

***In case of MTS, there was no call handled by the customer care for the period Oct'11**

Live calling results for customer care

Customer Care Assessment	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total Number of calls received		100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total Number of calls getting connected and answered		100	100	100	100	100	100	100	100	100	100	100	100	100	100
Percentage calls getting connected and answered	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total Number of calls received		100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total Number of calls answered within 60 seconds		100	100	99	100	98	99	99	96	100	100	100	97	99	100
Percentage calls answered within 60 seconds	≥ 90%	100.00%	100.00%	99.00%	100.00%	98.00%	99.00%	99.00%	96.00%	100.00%	100.00%	100.00%	97.00%	99.00%	100.00%

Operator	Customer Care No.	Operator	Customer Care No.
Reliance CDMA	9861098610	MTS	155155
Idea	198, 9090012345	Airtel	121
Aircel	121, 9854012345	Tata CDMA	12524
Vodafone	198	Tata DoCoMo	121
Reliance GSM	198	Loop	121
STel	1212	Videocon	121
Uninor	121	BSNL	1503

9. Termination / closure of service

Audit results for termination / closure of service

Termination	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of closure request		67	NA	41	46	9	NA	NA	NA	116	512	63	NA	NA	22
Number of requests attended within 7 days		67	NA	41	46	9	NA	NA	NA	116	512	63	NA	NA	22
Percentage cases in which termination done within 7 days	100%	100.00%	NA	100.00%	100.00%	100.00%	NA	NA	NA	100.00%	100.00%	100.00%	NA	NA	100.00%

Audit results for refund of deposits

Refund	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total number of cases requiring refund of deposits		120	13	21	2	56	NA	NA	NA	31	158	25	NA	NA	72
Total number of cases where refund was made within 60 days		120	13	21	2	56	NA	NA	NA	31	158	25	NA	NA	72
Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	NA	NA	100.00%	100.00%	100.00%	NA	NA	100.00%

11. Additional Network Related parameters

Audit Results for Total Traffic Handled in Erlang

Traffic in Erlang	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Equipped capacity of the network		111000	29042	135904	87296	72000	23627	32797	4200	245478.84	59875	80598	199.85	5000	16000
Total traffic handled in erlang during TCBH		13247.53	15047	40247.6	60687	60758.49	6206	19825	5.01	199692.89	13696	26173	7.23	1.66	16518

Total number of customers as per VLR

	Benchmark	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total no. of customers served (as per VLR)		420021	513338	1260273	1908653	2150827	276227	535294	500	5254716	273086	910919	25	260	416445

Live calling for level 1 service's

Level 1 services	Reliance CDMA	Idea	Aircel	Vodafone	Reliance GSM	STel	Uninor	MTS	Airtel	Tata CDMA	Tata DoCoMo	Loop	Videocon	BSNL
Total no. of calls made	150	150	150	150	150	150	150	150	150	150	150	150	150	150
Calls answered in 60 sec	150	150	149	150	150	150	150	150	150	150	150	150	150	150
