

Objective Assessment of Quality of Services for (QoS) for Basic Wireline, Broadband, and Wireless Service Providers Bihar & Jharkhand Circle

Report: January – February - March 2012



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

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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 as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI.

The Survey and Audit modules for various circles within the Zones, due the sheer scale of data collection, have been distributed across various Half Yearly periods. The auditor - IMRB International carried out the audits in Orissa, Bihar & Jharkhand, West Bengal, North-East, Assam and Kolkata circles. **This report details the performance of various service providers in Bihar & Jharkhand circle against Quality of Services benchmarks for various parameters laid down by TRAI in respective regulations for Basic (Wireline), Cellular mobile (Wireless) and broadband services.**

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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

IMRB has been carrying out this exercise for TRAI since December 2007 to assess the quality of services being provided by Basic (Wireline), Cellular Mobile (Wireless) and Broadband service providers.

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 Assam circle that was covered in the period of January – March 2012. The primary data collection and verification of records maintained by various operators of Basic (Wireline), Cellular Mobile (Wireless) and broadband services was undertaken by IMRB International during the period January – March 2012.

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. **Live calling:** Live testing was done on a sample basis to check efficiency of the customer care, inter operator call assessment, Back check calls for service provisioning and fault repair

- 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

Section A:
WIRELINE

3.0 Sampling Methodology

3.1 Sampling for Basic (Wireline) services

- For BSNL the sample of exchanges was selected was spread across 10% of SDCA's in the entire service.
- For rest of the service providers (private service providers) data was collected pertaining to all the exchanges present in the circle/service area
- Following service providers are providing Basic (Wireline) service in Bihar & Jharkhand circle –

	Name of Operator
Operator 1	BSNL – Bihar
Operator 2	BSNL – Jharkhand
Operator 3	TTSL
Operator 4	RCOM

4.0 Audit methodology

4.1 Basic (Wireline) Services

Following table explains the audit methodology for Basic (Wireline) services:-

Sl. No.	Parameters	One month data verification	Live measurement	Live calling
1	Provision of telephone after registration of demand	YES	----	YES
2	Fault incidence/clearance related statistic	YES		
2.1	- Total number of faults registered per month	YES		YES
2.2	- Fault repair by next working day	YES		YES
3	Mean Time to Repair (MTTR)	YES		
4	Call Completion Rate (CCR)	YES	YES	
5	Metering and billing credibility – billing complaints	YES		YES
6	Customer care promptness	YES		
6.1	- Shifting of telephone line	YES		YES
6.2	- Processing closure request	YES		YES
6.3	- Processing of additional supplementary services	YES		YES
7	Response time to customer	YES		
7.1	- While call is getting connected and answered	YES		YES
7.2	- While call is answered by operator (voice to voice)	YES		YES
8	Time taken to refund of deposits after closure	YES		YES

Further, Reliance and Tata do not serve to retail customers and are only serving the business customers

5.0 Executive Summary

The objective assessment of Quality of Services (QoS) was carried out by IMRB International for all the Basic (Wireline) and Broadband service providers during the period starting from January to March 2012 in Bihar & Jharkhand circle. The executive summary encapsulates the key findings of the Audit by providing: -

- “Service provider performance report” for Basic (Wireline) 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 Basic (Wireline) service: 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 – Basic (Wireline) Services

Parameters	Benchmarks	*BSNL - Bihar	*BSNL - Jharkhand	TTSL	RCOM
Faults incidences (No. of faults/100 Subs./month)	≤5	4.26	4.38	0.007	0
% of faults repaired by next working day	≥ 90%	51.65%	43.31%	100.00%	NA
% of faults repaired within 3 days	100%	81.05%	55.92%	100.00%	NA
Faults pending for > 3days and ≤7 days	Rent rebate of 7 days	100.00%	100.00%	NA	NA
Faults pending for > 7 days and ≤15 days	Rent rebate of 15 days	100.00%	100.00%	NA	NA
Faults pending for > 15 days	Rent rebate of 1 month	100.00%	100.00%	NA	NA
Mean Time to Repair (MTTR)	≤ 8 Hrs	11.89	36.90	4	NA
Call Completion Rate (CCR)	≥ 55%	64.45%	56.94%	84.98%	NA
Answer to Seizure ratio (ASR)	≥ 75%	73.74%	77.44%	77.80%	96.31%
No. of POIs with congestion > 0.5%	≤ 0.5%	0.00	0.00	NA	0.00
Metering and billing credibility - Number of bills disputed during over a billing cycle	≤ 0.1%	0.08%	1.73%	0.00%	0.00%
Resolution of billing complaints within 4 weeks	100%	100.00%	100.00%	NA	NA
Period of applying credit / waiver	≤ 1 week	100.00%	100.00%	NA	NA
Closure within 7 days	100%	97.39%	89.31%	0.00%	NA
Response time to customer for assistance					
% age calls getting connected and answered	≥ 95%	95.48%	96.89%	98.14%	98.19%
% age call answered by operator in 60 seconds	≥ 90%	98.00%	87.00%	95.40%	94.03%
Time taken for refund of deposits after closures within 60 days	100%	100.00%	100.00%	NA	NA

{* Note: For BSNL data pertains to the sample 5% of exchanges audited during the audit period, whereas for rest of the operators figures pertain to all the exchanges present in the circle }

** 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

Summary of Live Measurement Results – Wireline Services

Parameters	Benchmarks	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Call Completion Rate (CCR)	≥ 55%	65.50%	58.11%	84.94%	NA
Answer to Seizure ratio (ASR)	≥ 75%	57.74%	75.46%	77.47%	94.50%

Summary of Live Calling Results – Wireline Services

Parameters	Benchmarks	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
% of faults repaired by next working day	≥ 90%	38.13%	33.33%	NA	NA
% of faults repaired within 3 days	100%	78.42%	35.56%	NA	NA
Resolution of billing complaints within 4 weeks	100%	66.67%	100.00%	NA	NA
Response time to customer for assistance					
% age calls getting connected and answered	≥ 95%	98.00%	84.00%	100.00%	100.00%
% age call answered by operator in 60 seconds	≥ 90%	85.00%	34.00%	100.00%	100.00%

Critical findings and Key take outs: Basic (Wireline) services

BSNL, Tata and RCOM are the three operators offering Basic (Wireline) Services with BSNL is the only operator providing Basic (Wireline) Services to retail customers in Bihar & Jharkhand circle. During the audit process it was observed that the service provider could not meet TRAI specified benchmark on most of the parameters specified by TRAI.

Further, Reliance and Tata are also offering their services but serving only to business customers and not to retail customers

The live calling results were found to be different from the 1 month audit data collection in certain places. To some extent the difference can be attributed to the smaller sample size undertaken for the live calling.

The parameter wise key takeouts for the Wireline service providers for the Bihar & Jharkhand circle are as under:-

Fault incidence / clearance statistics

- Fault repair remains pain point as only 52% and 43% of the total complaints registered in the sample exchanges in BSNL Bihar and Jharkhand were repaired within 24 hrs which is significantly short of TRAI specified benchmark of >90%.
- For live calling carried out by IMRB auditors only 39% and 34% of the total complaints registered by BSNL Bihar & Jharkhand subscribers were repaired within 24 hrs.
- Even for fault repair within 3 days BSNL falls short of the TRAI specified benchmark with a score of 82% and 56% respectively for Bihar & Jharkhand.
- Part reason of service provider poor performance on this parameter can be attributed to the fact that in remote areas of Bihar & Jharkhand circle prompt action on faults becomes difficult due to accessibility issues.

Traffic statistics (CCR)

- BSNL (Bihar & Jharkhand) and TTSL comfortably meet the benchmark on this parameter both during month in which audit was carried out and three days when live measurement was carried out in auditor's presence at various exchanges

Metering and billing credibility

- The service provider (BSNL Jharkhand) fails to meet TRAI specified benchmark with percentage billing complaints being greater than 0.1% of the total bills generated.

Response time to customer for assistance

- BSNL (Jharkhand) falls short of TRAI specified benchmark for calls answered by the operator in 60 seconds month audit as well as Live calling whereas BSNL Bihar fell short of this benchmark for month audit only.

Time taken for refund of deposits after closure

- BSNL met this specified benchmark whereas for Tata and RCOM there were no such cases

Level 1 service

Live calling for level 1 services

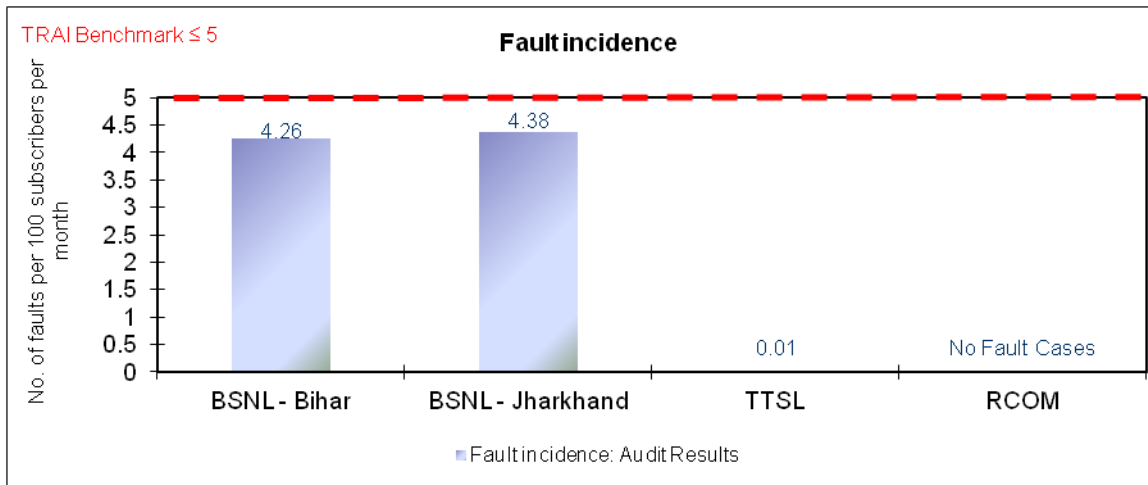
Level 1 services	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total no. of calls made		150	150	150	150
Calls answered in 60 sec		108	140	150	150
Calls answered after 60 sec		42	10	0	0

To test the efficiency of level 1 services (Trunk booking, Child helpline, Women helpline, Airline booking, Fire, Police, Railways) offered by various service providers. 150 calls were made for BSNL to different numbers and time taken to answer the call was noticed.

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

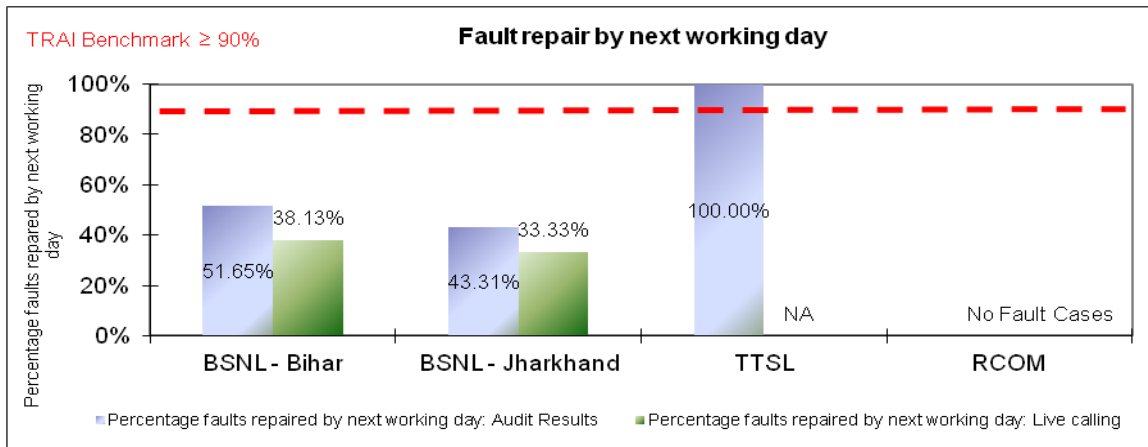
6.1 Graphical/Tabular Representations for Basic (Wireline) services

Fault incidence



All operators are meeting the benchmark

Fault repair/Restoration time (Comparison between one month audit results and live calling results)



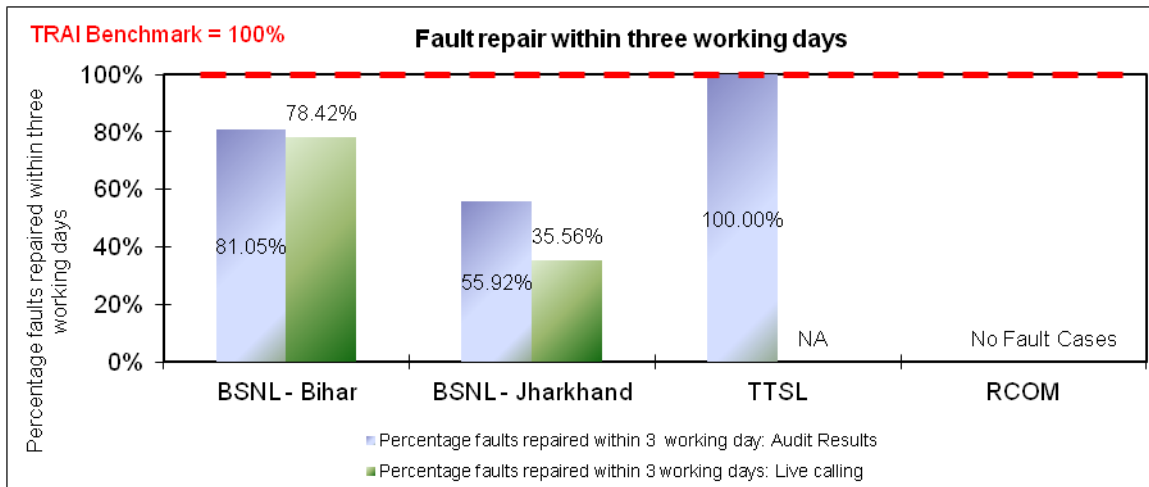
One month

Operator meeting benchmark: TTSL

Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Live calling

No operator is meeting the benchmark



One month

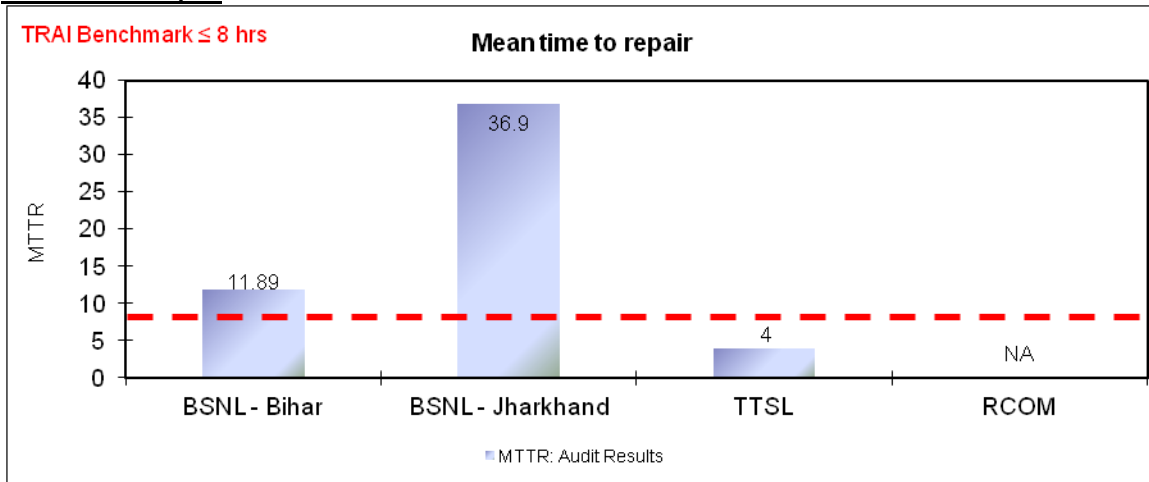
Operator meeting benchmark: TTSL

Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Live calling

No operator is meeting the benchmark

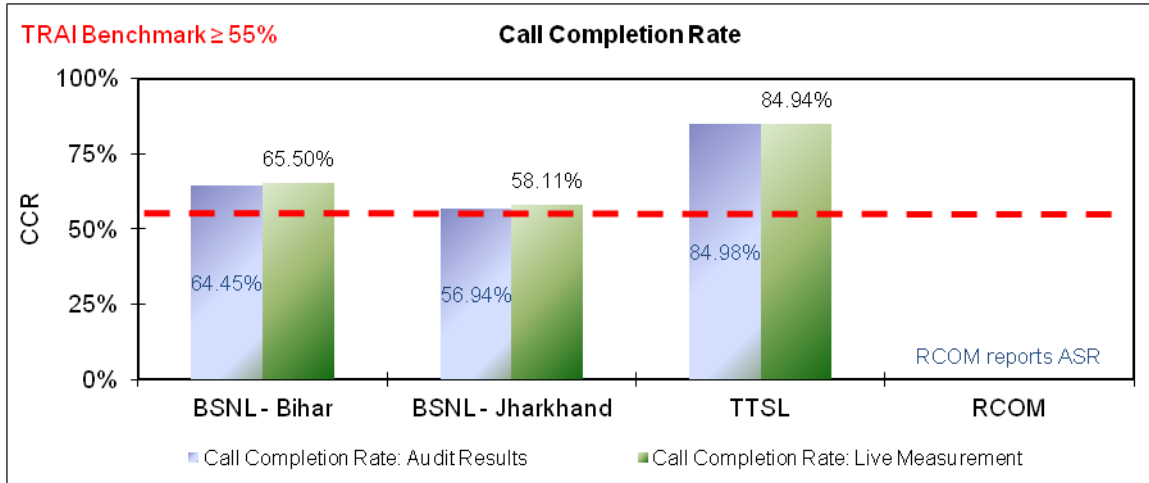
Mean time to repair



Operator meeting benchmark: TTSL

Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Call completion rate (Comparison between one month audit results and three day live measurement)



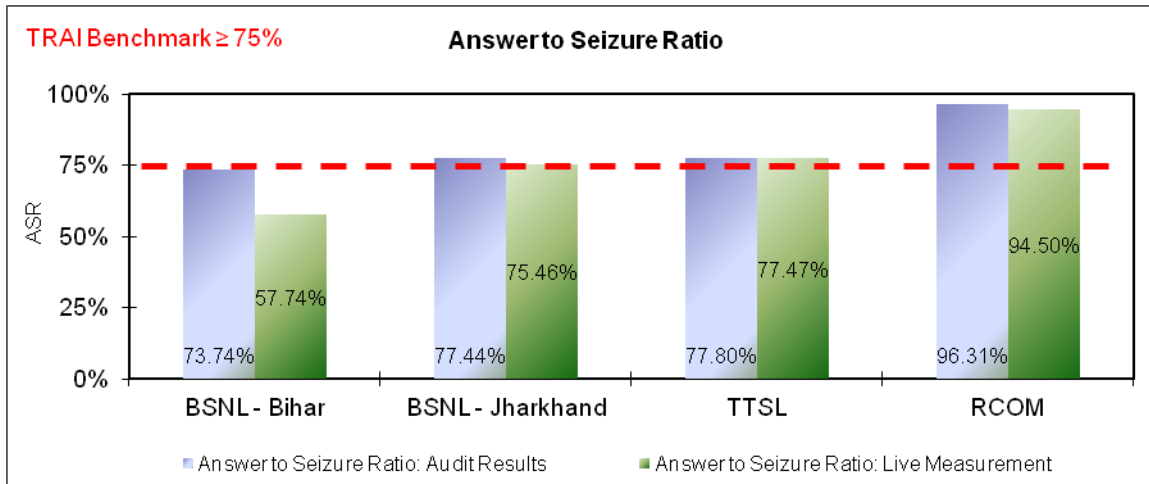
One month

All operators are meeting the benchmark

Live measurement

All operators are meeting the benchmark

Answer to Seizure Ratio (Comparison between one month audit results and three day live measurement)



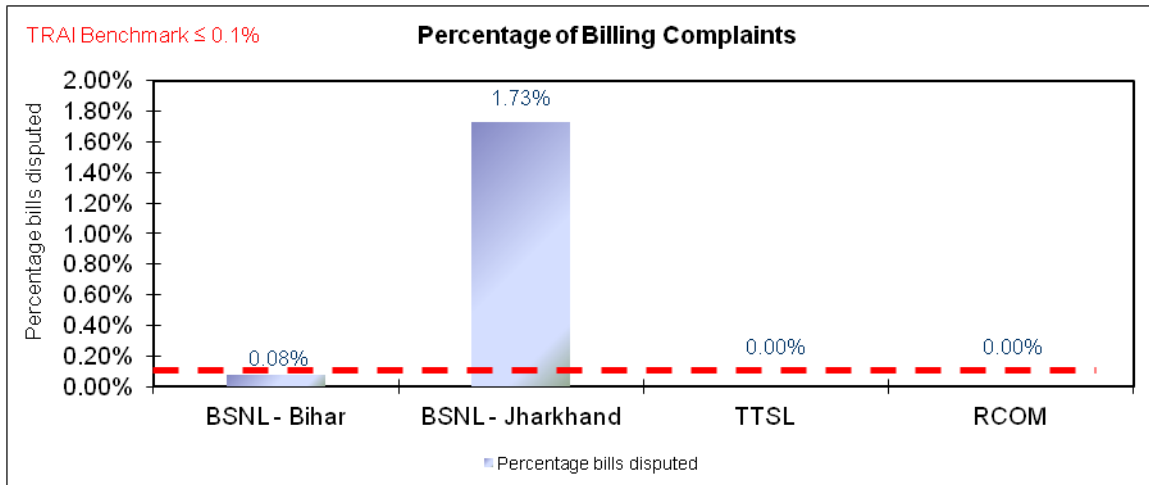
One month

Operator meeting benchmark: BSNL - Jharkhand, TTSL, RCOM
 Operator not meeting benchmark: BSNL - Bihar

Live measurement

Operator meeting benchmark: BSNL - Jharkhand, TTSL, RCOM
 Operator not meeting benchmark: BSNL - Bihar

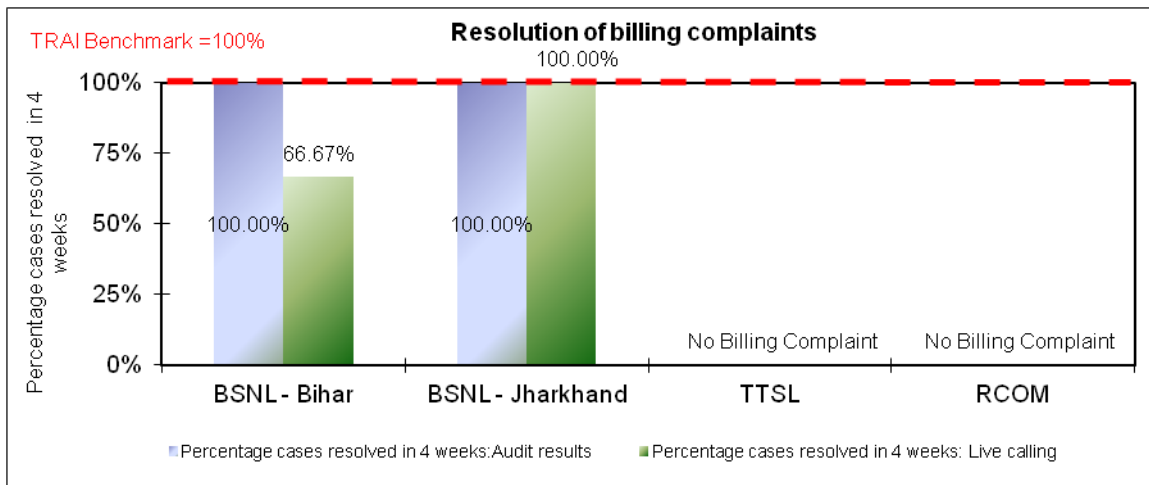
Percentage bills disputed



Operator meeting benchmark: BSNL - Bihar, TTSL, RCOM

Operator not meeting benchmark: BSNL - Jharkhand

Resolution of billing complaints - postpaid (Comparison between one month audit results and live calling results)



One month

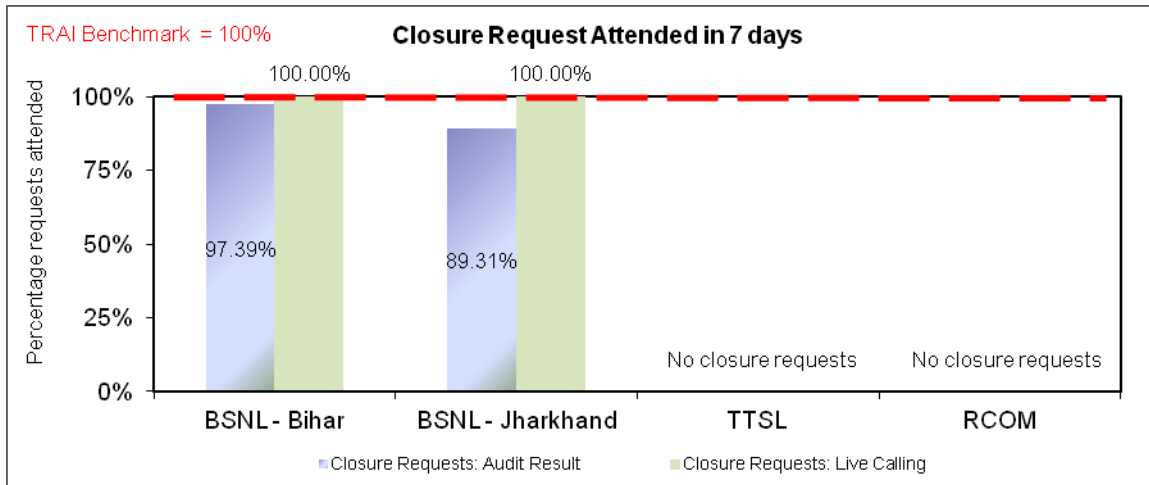
All operators are meeting the benchmark

Live calling

Operator meeting benchmark: BSNL - Jharkhand

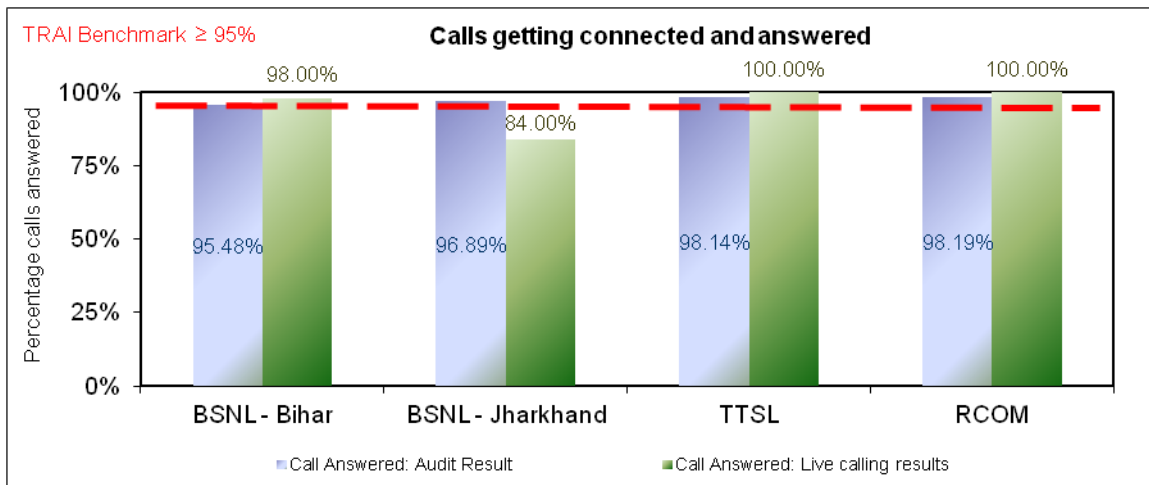
Operator not meeting benchmark: BSNL - Bihar

Closure requests attended within 7 days



No operator is meeting the benchmark

Response time to customer for assistance - Calls answered and getting connected (Comparison between one month audit and live calling results)



One month

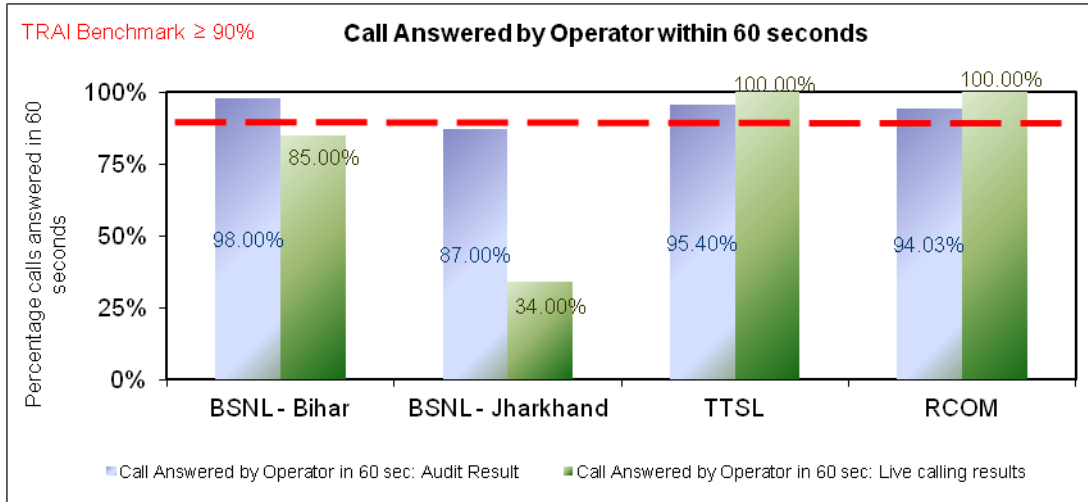
All operators are meeting the benchmark

Live calling

Operator meeting benchmark: BSNL - Bihar, TTSL, RCOM

Operator not meeting benchmark: BSNL - Jharkhand

Response time to customer for assistance - Calls answered by the operator within 60 seconds (Comparison between one month audit results and live calling results)



One month

Operator meeting benchmark: BSNL - Bihar, TTSL, RCOM

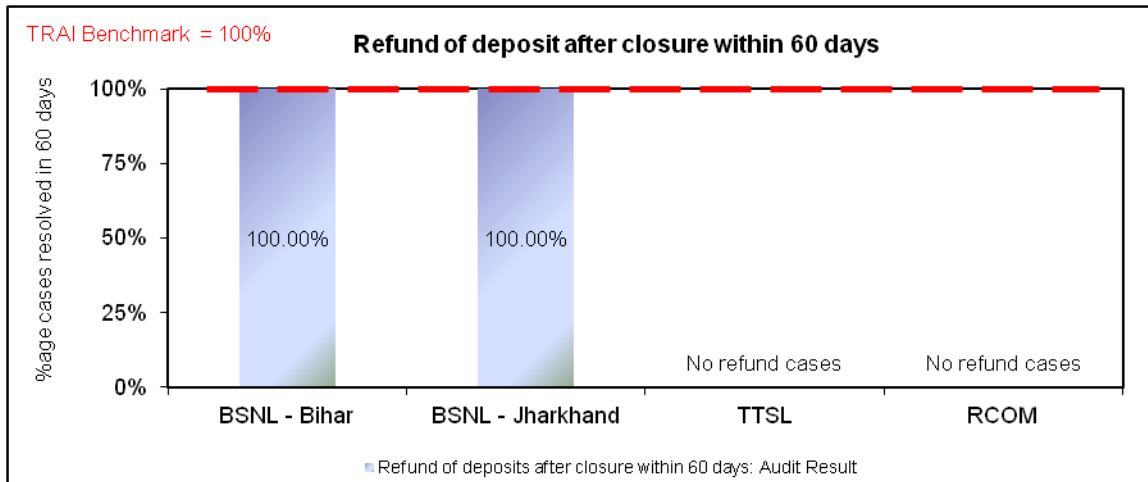
Operator not meeting benchmark: BSNL - Jharkhand

Live calling

Operator meeting benchmark: TTSL, RCOM

Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Time taken to refund of deposits after closure



All operators are meeting the benchmark

7.0 Compliance reports: Results of Verification of Records

7.1 Basic (Wireline) services

Parameters	Benchmarks	BSNL - Bihar		BSNL - Jharkhand		TTSL		RCOM	
		PMR	IMRB *	PMR	IMRB *	PMR	IMRB	PMR	IMRB
Faults incidences (No. of faults/100 Subs./month)	≤5	3.91	18.05	3.32	4.35	0.56	0.56	0.00	0.00
% of faults repaired by next working day	By next working day: ≥ 90%	94.93%	54.02%	91.07%	53.79%	100.00%	100.00%	NA	NA
Total No. of faults registered during the quarter		DNA	41573	DNA	1647	DNA	DNA	NA	NA
No. of faults repaired by next working day during the quarter		DNA	22458	DNA	886	DNA	DNA	NA	NA
No. of faults repaired within 3 days during the quarter	For urban areas	DNA	24867	DNA	1293	DNA	DNA	NA	NA
% of faults repaired within 3 days	For urban areas: ≥ 100%	98.41%	75.32%	96.50%	78.51%	100.00%	100.00%	NA	NA
No. of faults repaired within 5 days during the quarter	For rural and hilly areas	DNA	7260	DNA	1293	DNA	DNA	NA	NA
% of faults repaired within 5 days	For rural and hilly areas:	99.78%	84.83%	98.47%	100.00%	100.00%	100.00%	NA	NA
Rent Rebate :	≥ 100%								
Faults pending for > 3 days and ≤ 7 days	Rent Rebate for 7 days	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Faults pending for > 7 days and ≤ 15 days	Rent Rebate for 15 days	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Faults pending for > 15 days	Rent Rebate for 30 days	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Mean Time to Repair (MTTR)	≤ 8 Hrs	7.16	8.98	6.61	8.09	2.93	2.93	NA	NA
Call Completion Rate (CCR)	≥ 55%	71.82%	48.05%	68.42%	64.58%	98.53%	98.53%	NA	NA
Total Number of successful local calls		DNA	22387582	DNA	79247	NA	NA	NA	NA
Total local call attempts		DNA	10757180	DNA	51177	NA	NA	NA	NA
Answer to Seizure Ratio (ASR)	≥ 75 %	DNA	48.52%	DNA	69.47%	NA	NA	96.79%	96.79%
Total I/C seizures		DNA	20926061	DNA	315081	NA	NA	NA	NA
No. of answered calls		DNA	10152295	DNA	218879	NA	NA	NA	NA
Point of Interconnection (POI) Congestion (No. of Pols not meeting benchmark)	≤ 0.5%	0	0	0	0	0	0	0	0
Total number of working POI Service Area wise		DNA	67	DNA	0	NA	NA	NA	NA
Metering and billing credibility - post paid	Not more than 0.1%	DNA	0.01%	DNA	0.00%	0.00%	0.00%	0.00%	0.00%
No. of bills issued during the period		DNA	984944	DNA	23137	DNA	DNA	DNA	DNA
No. of bills disputed including billing complaints during the period		DNA	74	DNA	0	DNA	DNA	DNA	DNA

Quality of Service – Audit module report for Bihar & Jharkhand Circle

Metering and billing credibility - pre paid	Not more than 0.1%	DNA	DNA	DNA	NA	NA	NA	NA	NA
No. of charging / credit / validity complaints during the quarter		NA	NA	NA	NA	NA	NA	NA	NA
Total no. of pre-paid customers at the end of the quarter		NA	NA	NA	NA	NA	NA	NA	NA
Resolution of billing/ charging/ validity complaints	100% within 4 weeks	NA	NA	NA	NA	100.00%	100.00%	NA	NA
No. of billing/(post paid) and charging, credit / validity (pre paid) complaints resolved within 4 weeks during the quarter		DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
Total no. of billing (post paid) and charging, credit / validity (pre paid) complaints received during the quarter		DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
No. of billing complaints (post paid) and charging, credit/validity complaints (pre paid) resolved in favour of the customer during the quarter		DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
No. of complaints disposed on account of not considered as valid complaints during the quarter		DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	DNA	DNA	DNA	DNA	100%	100%	100%	100%
Response time to the customer for assistance	≥ 95%	93.63%	93.00%	91.05%	93.00%	98.14%	98.14%	97.20%	97.20%
Total no. of call attempts to call centre / customer care nos. during TCBH		DNA	64513	DNA	64513	DNA	DNA	DNA	DNA
Accessibility of call centre/ customer care		DNA	60377	DNA	60377	DNA	DNA	DNA	DNA
Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 90%	96.33%	93.00%	92.67%	93.00%	95.40%	95.40%	94.21%	94.21%
Termination / closure of service	≤ 7 days								
%age requests for Termination / Closure of service complied within 7 days	100.00%	DNA	100.00%	DNA	100.00%	NA	NA	NA	NA
Total No. of requests for Termination / Closure of service received during the quarter		DNA	38	DNA	242	0	0	0	0
No.of requests for Termination / Closure of service complied within 7 days during the quarter		DNA	38	DNA	242	0	0	0	0
Time taken for refund of deposits after closures	100% within 60 days.	DNA	100.00%	DNA	100.00%	100.00%	100.00%	100.00%	100.00%

* These have been calculated cumulatively on the basis of figures reported by various exchanges

Figures do not match with those reported in PMR
 Not meeting the benchmark
 Figures verified on all India bases

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

7.2 Conclusions

Basic Wireline Services

1. Variation observed in figures for BSNL is owing to the fact that only 5% of the total exchanges were audited for the operator whereas the data provided in the PMR is basis all the exchanges in the circle
2. Raw data on call centre details was not available at the exchanges audited and hence the same could not be verified by IMRB auditors
3. % of faults repaired by next working day was not meet as per auditors data by both BSNL (Bihar & Jharkhand)

8.0 Annexure - I

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
BSNL						All POIs meeting benchmark
Airtel						All POIs meeting benchmark
TTSL						All POIs meeting benchmark
RCOM						All POIs meeting benchmark

8.1 Parameter wise performance reports for Basic Wireline services

2.1 Audit Results for Fault repair

Fault incidences	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Faults incidences (No. of faults/100 Subs./month)	≤ 5	4.26	4.38	0.01	0

Fault repair (Urban areas)	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total No. of faults registered during the month		1789	3657	7	0
No. of faults repaired by next working day during the month		924	1584	7	0
Percentage of faults repaired by next working day during the month	≥ 90%	51.65%	43.31%	100.00%	NA
No. of faults repaired within 3 days during the month		1450	2045	7	0
Percentage of faults repaired within 3 days during the month	100%	81.05%	55.92%	100.00%	NA

Fault repair (Rural & Hilly areas)	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total No. of faults registered during the month		248	83	0	0
No. of faults repaired by next working day during the month		191	49	0	0
Percentage of faults repaired by next working day during the month	≥ 90%	77.02%	59.04%	NA	NA
No. of faults repaired within 5 days during the month		232	72	0	0
Percentage of faults repaired within 5 days during the month	100%	93.55%	86.75%	NA	NA

Rent rebate	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
No. of cases with faults pending for >3 days and ≤7 days		115	339	0	0
Out of these number of cases where rent rebate for 7 days was given		115	339	0	0
Percentage of cases where rent rebate for 7 days was given	100%	100.00%	100.00%	NA	NA
No. of cases with faults pending for >7 days and ≤15 days		58	78	0	0
Out of these number of cases where rent rebate for 15 days was given		58	78	0	0
Percentage of cases where rent rebate for 15 days was given	100%	100.00%	100.00%	NA	NA
No. of cases with faults pending for ≥15 days		21	430	0	0
Out of these number of cases where rent rebate for 30 days was given		21	430	0	0
Percentage of cases where rent rebate for 30 days was given	100%	100.00%	100.00%	NA	NA

MTTR	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Mean time taken to repair the fault in hours	≤ 8	11.89	36.9	4	NA

2.2 Live calling for fault repair

Rural & Hilly area	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total Number of calls made		234	0	0	0
Number of cases where faults were repaired by next working day		47	0	0	0
Percentage cases where faults were repaired by next working day	≥ 90%	20.09%	NA	NA	NA
Number of cases where faults were repaired within 5 days		142	0	0	0
Percentage cases where faults were repaired within 5 days	100%	60.68%	NA	NA	NA

3.1 Audit Results for Call Completion Rate (CCR)

Traffic statistics - Call Completion Rate	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total local call attempts		379357	350361	8931	NA
Total number of successful local calls		244483	199509	7590	NA
Call Completion Rate (CCR) in the local network	≥ 55%	64.45%	56.94%	84.98%	NA

Traffic statistics - Answer to Seizure Ratio	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total number of calls processed by the switch		354559	1986068	7590	317120
Total number of calls answered		261465	1537953	5905	305417
Answer to Seizure Ratio (ASR)	≥ 75%	73.74%	77.44%	77.80%	96.31%

3.2 Live measurement results for Call Completion Rate (CCR)

Traffic statistics - Call Completion Rate	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total local call attempts		75351	412314	10304	NA
Total number of successful local calls		49356	239610	8752	NA
Call Completion Rate (CCR) in the local network	≥ 55%	65.50%	58.11%	84.94%	NA

Traffic statistics - Answer to Seizure Ratio	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total number of calls processed by the switch		189719	254877.7	8752	13361
Total number of calls answered		109552	192323.7	6780	12626
Answer to Seizure Ratio (ASR)	≥ 75%	57.74%	75.46%	77.47%	94.50%

Traffic statistics - Answer to Seizure Ratio	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total number of calls processed by the switch		189719	254877.7	8752	13361
Total number of calls answered		109552	192323.7	6780	12626
Answer to Seizure Ratio (ASR)	≥ 75%	57.74%	75.46%	77.47%	94.50%

4.1 Audit Results for POI Congestion

POI congestion	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
POI traffic offered on all individual POI's		699.72	1167.2	DNA	1610.75
Served traffic for all POI's		170.37	197.45	DNA	78.2

Traffic failed on all POI's	≤ 0.5%	0.00	0.00	0.00	0.00
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4.2 Live measurement results for POI congestion

POI congestion	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
POI traffic offered on all individual POI's		699.72	682.5	DNA	1524.05
Served traffic for all POI's		164.07	172.2	DNA	142
Traffic failed on all POI's	≤ 0.5%	0.00	0.00	0.00	0.00

POI congestion	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
No. of POIs not meeting benchmark		0	0	NA	0
Total number of working POIs		25	6	NA	40

5.1 Audit Results for Billing performance

Billing Performance	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
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Billing disputes - Postpaid

Total bills generated during the period		243980	21230	280	395
Total number of bills disputed		192	367	0	0
Percentage bills disputed	≤ 0.1%	0.08%	1.73%	0.00%	0.00%

Billing disputes - Prepaid

No. of charging / credit / validity complaints during the month		0	0	0	0
Total no. of pre-paid customers at the end of the month		0	0	0	0
Number of complaints per 100 customers	≤ 0.1%	NA	NA	NA	NA

Resolution of billing complaints

Total number of billing/charging complaints		34	611	0	0
Total complaints resolved in 4 weeks from date of receipt		34	611	0	0
Percentage complaints resolved within 4 weeks of date of receipt	100%	100.00%	100.00%	NA	NA

Period of applying credit / waiver

No. of complaints resolved in favour of the customer during the month		24	600	0	0
No. of complaints disposed on account of not considered as valid complaints		10	1	0	0
Percentage cases in which credit/waiver was received within 1 week	100%	100.00%	100.00%	NA	NA

5.2 Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total Number of calls made		30	30	NA	NA
Number of cases resolved in 4 weeks		20	30	NA	NA
Percentage cases resolved in 4 weeks	100%	66.67%	100.00%	NA	NA

6.1 Audit Results for Closure Requests

Closure Requests	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total no. of requests received for Closures		153	159	5	0
Total no. of requests for closures attended within 7 days		149	142	0	0
Percentage of requests for closures attended within 7 days	100%	97.39%	89.31%	0.00%	NA

Total no. of requests for closures not attended or attended beyond 7 days		4	18	5	0
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7.1 Audit results for customer care

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total no. of call attempts to call centre / customer care nos. during TCBH		17825	225	DNA	113283
No. of calls connected and answered successfully to call centre / customer care nos. during TCBH		17019	218	DNA	111234
Percentage of calls getting connected and answered electronically	≥ 95%	95.48%	96.89%	98.14%	98.19%
Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 90%	98.00%	87.00%	95.40%	94.03%

7.2 Live calling results for customer care

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total Number of calls received		100	100	100	100
Total Number of calls getting connected and answered		98	84	100	100
Percentage calls getting connected and answered	≥ 95%	98.00%	84.00%	100.00%	100.00%

7.3 Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total Number of calls received		100	100	100	100
Total Number of calls answered within 60 seconds		85	34	100	100
Percentage calls answered within 60 seconds	≥ 90%	85.00%	34.00%	100.00%	100.00%

8.1 Audit results for refund of deposits

Refund	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total number of cases requiring refund of deposits		153	394	0	0
Total number of cases where refund was made within 60 days		153	394	0	0
Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	NA	NA

9.1 Live calling for level 1 services

Level 1 services	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Total no. of calls made		150	150	150	150
Calls answered in 60 sec		108	140	150	150
Calls answered after 60 sec		42	10	0	0

10.1 Exchange capacity and Subscribers

	Benchmark	BSNL - Bihar	BSNL - Jharkhand	TTSL	RCOM
Equipped Capacity of the exchange (in erlangs)		85288	127466	2000	64K
Total number of customers served		31960	35512	6309	4827

Section B
WIRELESS

9.0 Sampling methodology

9.1 Sampling for Cellular Mobile (Wireless) service providers

Data pertaining to 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centres (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 Bihar & Jharkhand circle

	Name of Operator	Month of Audit
Operator 1	Vodafone	January, 2012
Operator 2	Airtel	January, 2012
Operator 3	Tata Tele CDMA	January, 2012
Operator 4	Tata Tele GSM	January, 2012
Operator 5	Uninor	January, 2012
Operator 6	Etisalat	January, 2012
Operator 7	Idea	January, 2012
Operator 8	Reliance GSM	January, 2012
Operator 9	Reliance CDMA	January, 2012
Operator 10	BSNL	January, 2012
Operator 11	Videocon	January, 2012
Operator 12	MTS	January, 2012
Operator 13	Aircel	January, 2012

10.0 Audit methodology

10.1 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		

11.0 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 January 2012 to March 2012 in Bihar & Jharkhand 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

11.1 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 i.e. total outage time of all BTSs in hours during a month	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 (call drop) rate (%age)	%age of connection with good voice quality	POI Congestion (No. of POIs not meeting the benchmark)	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%			≤ 5%	≥ 95%	≤ 0.5%				
Vodafone	19:00 - 20:00	6630	24819	0.50%	63	0.95%	96.82%	0.62%	1.90%	1.80%	1818	19794	9.18%	97.01%	0	51	210212	171613	5687057
Airtel	19:00 - 20:00	7280	9649	0.18%	29	0.40%	99.07%	0.20%	0.38%	0.39%	357	21599	1.65%	98.88%	0	51	615647	517328	16209895
Tata Tele CDMA	19:00 - 20:00	1030	396	0.05%	0	0.00%	98.76%	0.00%	0.44%	1.32%	30	3144	0.95%	99.12%	0	234	196950	49473	849121
Tata Tele GSM	19:00 - 20:00	2086	201	0.01%	0	0.00%	98.52%	0.11%	0.16%	1.01%	220	6258	3.52%	97.57%	0	31	94475	32917	1421817
Uninor	19:00 - 20:00	2353	26571	1.52%	24	1.02%	98.26%	0.30%	0.97%	1.54%	188	7071	2.66%	95.61%	3	82	93930	81781	1903108
Etisalat	19:00 - 20:00	63	273	0.58%	0	0.00%	95.86%	0.15%	0.01%	1.03%	4	138	2.90%	98.18%	0	26	1398	38	1548
Idea	19:00 - 20:00	4929	29690	0.81%	89	1.81%	98.11%	0.36%	1.67%	1.34%	395	14783	2.67%	95.53%	0	83	141983	131716	4988463
Reliance GSM	19:00 - 20:00	2559	3238	0.17%	21	0.82%	96.37%	1.05%	0.48%	0.56%	138	7677	1.80%	97.94%	0	22	187000	112917	4319353
Reliance CDMA	19:00 - 20:00	1835	7486	0.55%	23	1.25%	97.05%	0.00%	1.80%	1.27%	93	3798	2.45%	98.16%	0	30	204000	92768	2392014
BSNL	19:00 - 20:00	3332	87945	3.55%	704	21.13%	75.94%	14.33%	7.85%	0.58%	2193	7528	29.13%	96.00%	1	135	250600	148009	1683258
Videocon	19:00 - 20:00	52	611	1.58%	0	0.00%	99.56%	0.40%	0.00%	1.33%	0	160	0.00%	98.17%	0	13	10000	9	1074
MTS	19:00 - 20:00	1385	12650	1.23%	13	0.94%	99.57%	0.00%	0.07%	0.88%	105	4181	2.51%	97.37%	0	52	60711	22697	576750
Aircel	19:00 - 20:00	3423	30715	1.21%	140	4.09%	98.11%	0.14%	1.34%	1.48%	502	10252	4.90%	95.30%	0	137	199477	52902	2220131

** 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 Bihar & Jharkhand 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
Vodafone	19:00-20:00 hrs	19:00-20:00 hrs
Airtel	19:00-20:00 hrs	19:00-20:00 hrs
Tata Tele CDMA	19:00-20:00 hrs	19:00-20:00 hrs
Tata Tele GSM	19:00-20:00 hrs	19:00-20:00 hrs
Uninor	19:00-20:00 hrs	19:00-20:00 hrs
Etisalat	20:00-21:00 hrs	19:00-20:00 hrs
Idea	19:00-20:00 hrs	19:00-20:00 hrs
Reliance GSM	20:00-21:00 hrs	20:00-21:00 hrs
Reliance CDMA	19:00-20:00 hrs	19:00-20:00 hrs
BSNL	19:00-20:00 hrs	19:00-20:00 hrs
Videocon	19:00-20:00 hrs	19:00-20:00 hrs
MTS	19:00-20:00 hrs	19:00-20:00 hrs
Aircel	19:00-20:00 hrs	19:00-20:00 hrs

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

BTSs Accumulated Downtime:

In the Bihar & Jharkhand circle, there were outages that led to a community being isolated at a particular point in time for all the operators. BSNL experienced the highest outage (more than 87945) hours in the month of audit.

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter except BSNL. During the audits the maximum CSSR was observed for MTS with 99.57% 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. BSNL and Reliance GSM do not meet the TRAI specified benchmark for SDCCH paging channel congestion. Reliance CDMA and BSNL are not meeting TCH congestion parameter. 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 almost no POIs with congestion for most of the service providers, except for 1 POI of BSNL and 3 POIs of Uninor

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 Airtel at 0.39% while the highest was for Vodafone 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 meet the TRAI benchmark except BSNL For Number of calls answered by operator (voice to voice) within 60 seconds Airtel, Tata GSM, Aircel, and BSNL do not meet the benchmark for the month of audit.

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, all the service providers meet the TRAI benchmark of 100% with 1 week.

Inter operator calls assessment

Inter operator call Assessment To↓ From→	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Vodafone	NA	100%	100%	100%	100%	100%	99%	97%	97%	100%	100%	95%	100%
Airtel	100%	NA	100%	100%	100%	100%	100%	95%	100%	100%	100%	98%	100%
TATA Tele CDMA	100%	100%	NA	99%	100%	100%	98%	96%	100%	100%	100%	100%	100%
Tata Tele GSM	100%	100%	100%	NA	100%	100%	99%	94%	95%	100%	100%	96%	100%
Uninor	100%	99%	100%	100%	NA	100%	100%	93%	100%	94%	100%	98%	100%
Etisalat	100%	98%	100%	100%	99%	NA	99%	98%	100%	96%	100%	100%	100%
Idea	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%	100%
Reliance GSM	100%	99%	100%	100%	97%	100%	100%	NA	100%	100%	100%	100%	100%
Reliance CDMA	100%	99%	100%	100%	96%	100%	100%	100%	NA	98%	100%	99%	100%
BSNL	100%	100%	100%	100%	96%	100%	99%	94%	100%	NA	100%	100%	100%
Videocon	100%	99%	100%	100%	99%	100%	100%	100%	100%	100%	NA	99%	100%
MTS	100%	98%	100%	100%	100%	100%	98%	99%	100%	100%	100%	NA	100%
Aircel	100%	100%	100%	100%	100%	100%	99%	99%	100%	100%	100%	100%	NA
S Tel	100%	100%	100%	100%	96%	100%	98%	94%	100%	100%	100%	99%	100%



The maximum problem faced by the calling operator to other operators

The above test calls were made in Patna. 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. Airtel found tough connecting to an Etisalat number with 98 out of 100 calls getting connected. RCOM had difficulty in connecting to a Uninor number with 93% of their calls getting completed. From MTS, only 95 out of 100 calls got connected to a Vodafone number and from BSNL only 94 calls got connected to Uninor.

Results of Operator assisted Drive test

The drive test was conducted simultaneously for all the operators present in the Bihar & Jharkhand circle. There was in total of three drive tests conducted in the circle. These tests were conducted in the cities of Madhubani, Giridih, and Samastipur. 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 Bihar & Jharkhand 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-vehicle and > -95 dbm outdoor routes.

The drive tests in the Bihar & Jharkhand circle were conducted in the cities of Madhubani, Giridih, and Samastipur was conducted along the following route:

	Type of location	Madhubani	Giridih	Samastipur
Outdoor	Periphery of the city	Lahariaganj, Rahika Road, Singhanian chowk, Railway station, Jhanjharpur Road	Suidih bridge to Snkat Mochan chowk via Tower chowk	Magardahi-Doodhpura jail
	Congested area	Thana Chowk, Bata Chowk, Shankar Churaha	Tower chowk to Muslim bazar via Padam chowk	Railway station, Marwari BZR, Gola Road, Ganesh Chowk, Station Road
	Across the city	Kotwali chowk, Thana Chowk, Railway station, Bus stand, Shankar Chauraha, Laharia chowk	Baban Toli to Madhuban Vegis via Padam Chowk and Bank of India	Magardahi, Bus stand DPS School
Indoor	Office complex	Railway Station, Madhubani	Giridih Railway Station	Railway station
	Shopping complex	Hero Honda Agency, Madhubani	Mangalam Mall	TVS Showroom

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

***Etisalat and Videocon has not participated in any of the 3 drive test locations in Bihar & Jharkhand due to non presence of its network in any of these cities.**

Drive Test – Madhubani

	B'mark	Vodafone		Airtel		Tata Tele CDMA		Tata Tele GSM		Uninor		Idea		Reliance GSM		Reliance CDMA		BSNL		MTS		Aircel	
		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%	98.02%	97.83%	98.20%	98.34%	99.24%	99.90%	99.33%	97.72%	98.60%	97.62%	96.88%	96.68%	99.77%	97.65%	98.51%	96.95%	100.00%	99.35%	100.00%	99.92%	99.39%	98.53%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.41%	99.40%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.67%	98.67%	100.00%	100.00%	100.00%	100.00%
%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%	0.00%	0.00%	0.00%	0.06%	0.04%	0.00%	0.00%	0.00%	0.00%
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%	0.00%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.56%	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%


Drive Test – Giridih

	B'mark	Vodafone		Airtel		Tata Tele CDMA		Tata Tele GSM		Uninor		Idea		Reliance GSM		Reliance CDMA		BSNL		MTS		Aircel	
		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%	98.23%	97.90%	97.89%	97.52%	94.51%	98.44%	94.51%	98.78%	94.51%	97.63%	94.51%	98.02%	94.51%	93.66%	94.51%	99.97%	94.51%	92.20%	94.51%	98.71%	94.51%	98.84%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.35%	100.00%	100.00%	100.00%	100.00%	98.51%	98.77%	100.00%	100.00%	96.72%	94.70%	100.00%	100.00%	100.00%	100.00%
%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%	0.00%	0.00%	0.00%	6.55%	16.00%	0.00%	0.00%	0.00%	0.00%
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%	1.69%	0.70%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00%	10.00%	0.00%	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%	100.00%	100.00%

Drive Test – Samastipur

	B'mark	Vodafone		Airtel		Tata Tele CDMA		Tata Tele GSM		Uninor		Idea		Reliance GSM		Reliance CDMA		BSNL		MTS		Aircel	
		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%	96.85%	97.49%	96.86%	97.84%	99.88%	99.86%	97.39%	97.92%	99.32%	98.52%	98.68%	99.30%	99.37%	95.87%	98.99%	97.38%	100.00%	100.00%	99.85%	99.28%	98.05%	97.92%

CSSR	≥ 95%	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	98.73%	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	92.31%	92.00%	100.00 %	100.00 %	100.00 %	100.00 %
%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%	0.00%	0.00%	0.00%	0.15%	0.24%	0.00%	0.00%	0.00%	0.00%
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%	4.00%	0.00%	0.00%	0.00%	0.00%
Hands off success rate		100.00 %	100.00 %	0.00%	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 %

 Not meeting the benchmark

Drive Test Conclusions:

Drive test was conducted by IMRB with the help of service providers to measure this parameter..

1. Reliance CDMA does not meet the voice quality benchmark both in Indoor and outdoor routes for Madhubani and Samastipur
2. BSNL does not meet the CSSR benchmark for BSNL in Samastipur

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%	≤ 5%	≥ 95%
Vodafone	0.53%	0.00%	95.81%	0.94%	2.64%	1.89%	4.95%	96.74%
Airtel	0.18%	0.00%	98.50%	0.37%	0.75%	0.54%	1.10%	98.60%
Tata Tele CDMA	0.06%	0.00%	99.12%	0.00%	0.00%	0.63%	0.96%	99.13%
Tata Tele GSM	0.01%	0.00%	99.10%	0.05%	0.15%	0.87%	4.02%	97.73%
Uninor	0.00%	0.00%	97.95%	0.34%	1.35%	1.51%	3.22%	95.64%
Etisalat	0.96%	0.00%	99.23%	0.02%	0.00%	0.69%	1.75%	98.21%
Idea	0.32%	0.04%	98.11%	0.55%	1.70%	1.06%	2.91%	95.53%
Reliance GSM	0.14%	0.00%	99.03%	0.16%	0.04%	0.51%	0.00%	98.13%
Reliance CDMA	0.42%	0.00%	97.70%	0.00%	0.09%	0.12%	0.04%	98.19%
BSNL	2.37%	3.48%	75.68%	13.54%	6.78%	0.42%	15.50%	96.00%
Videocon	1.36%	0.00%	99.60%	0.29%	0.01%	0.60%	0.00%	98.89%
MTS	0.96%	0.00%	99.16%	0.00%	0.01%	0.69%	2.75%	98.81%
Aircel	1.55%	0.63%	98.11%	0.08%	1.38%	1.25%	7.55%	95.17%

■ Not meeting the benchmark

During the three day live measurement, all operators except BSNL met Network availability benchmark.

Summary of Live Calling Results – Cellular Mobile Services

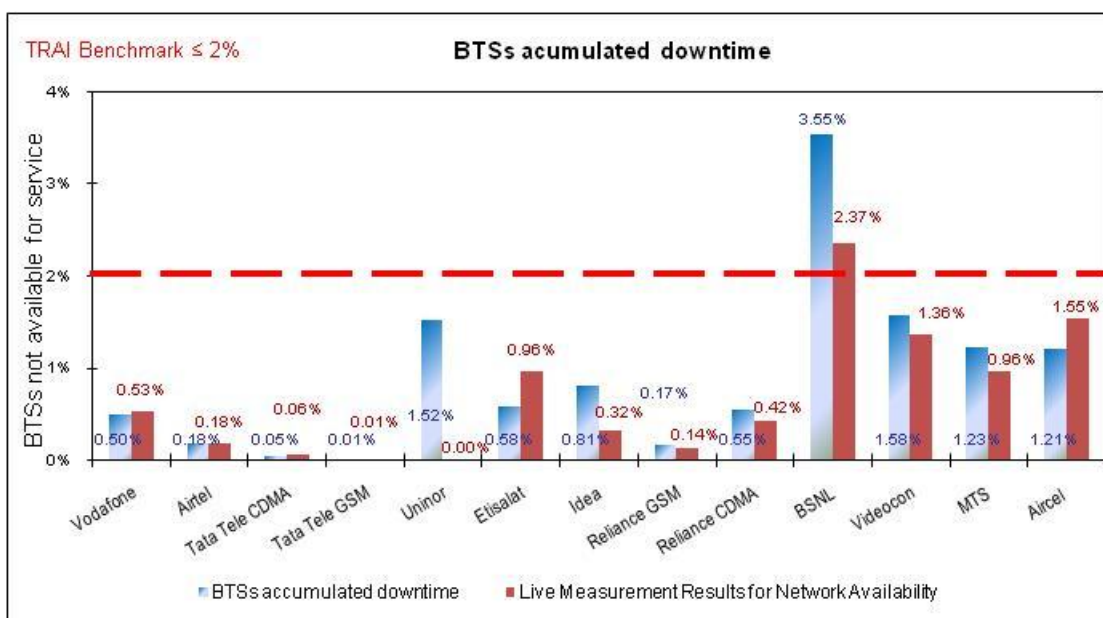
Name of Service Provider	Metering and Billing	Response time to customer for assistance	
	%age complaints resolved within 4 weeks	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 60 seconds
Benchmark	100%	≥ 95%	≥ 90%
Vodafone	100.00%	100.00%	100.00%
Airtel	100.00%	100.00%	100.00%
Tata Tele CDMA	100.00%	100.00%	100.00%

Tata Tele GSM	97.00%	100.00%	100.00%
Uninor	NA	100.00%	100.00%
Etisalat	NA	100.00%	100.00%
Idea	100.00%	100.00%	100.00%
Reliance GSM	89.00%	38.00%	36.00%
Reliance CDMA	87.00%	100.00%	96.00%
BSNL	67.00%	100.00%	96.00%
Videocon	NA	100.00%	100.00%
MTS	80.00%	100.00%	100.00%
Aircel	75.00%	100.00%	100.00%

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

12.1 Graphical/Tabular Representations for Cellular Mobile Services

BTSs Accumulated Downtime



One month

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

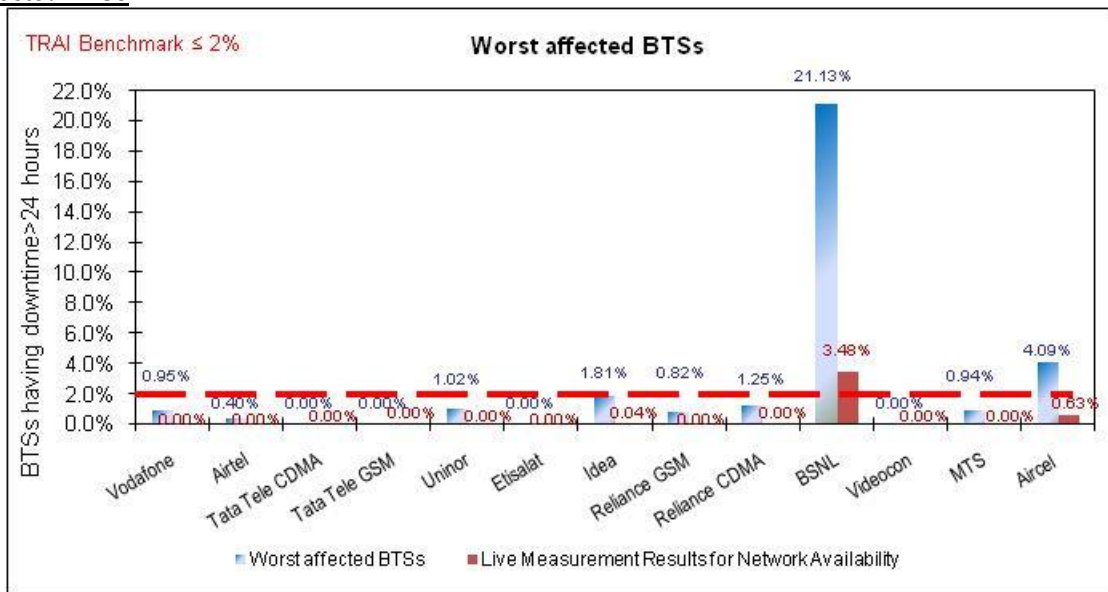
Operator(s) not meeting the benchmark: BSNL

Live measurement

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

Operator(s) not meeting the benchmark: BSNL

Worst Affected BTSs



One month

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS

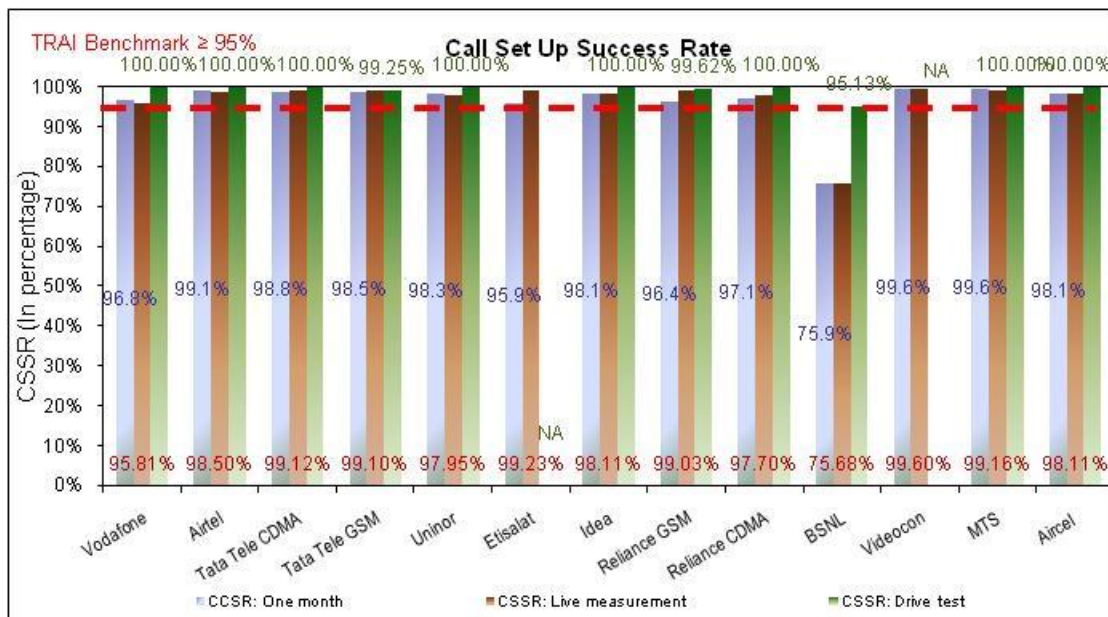
Operator(s) not meeting the benchmark: BSNL, Aircel

Live measurement

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

Operator(s) not meeting the benchmark: BSNL

Call Set-up Success Rate (CSSR)



One month

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

Operator(s) not meeting the benchmark: BSNL

Live measurement

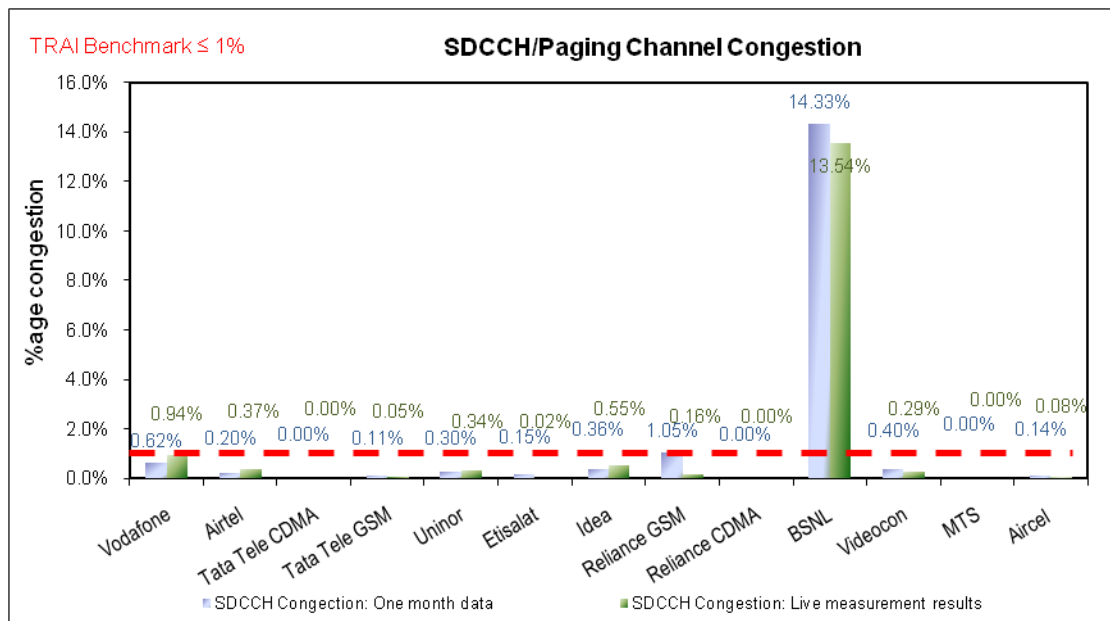
Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

Operator(s) not meeting the benchmark: BSNL

Drive test

All the operators meet the benchmark

SDCCH / Paging Channel Congestion



One month

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance CDMA, Videocon, MTS, Aircel

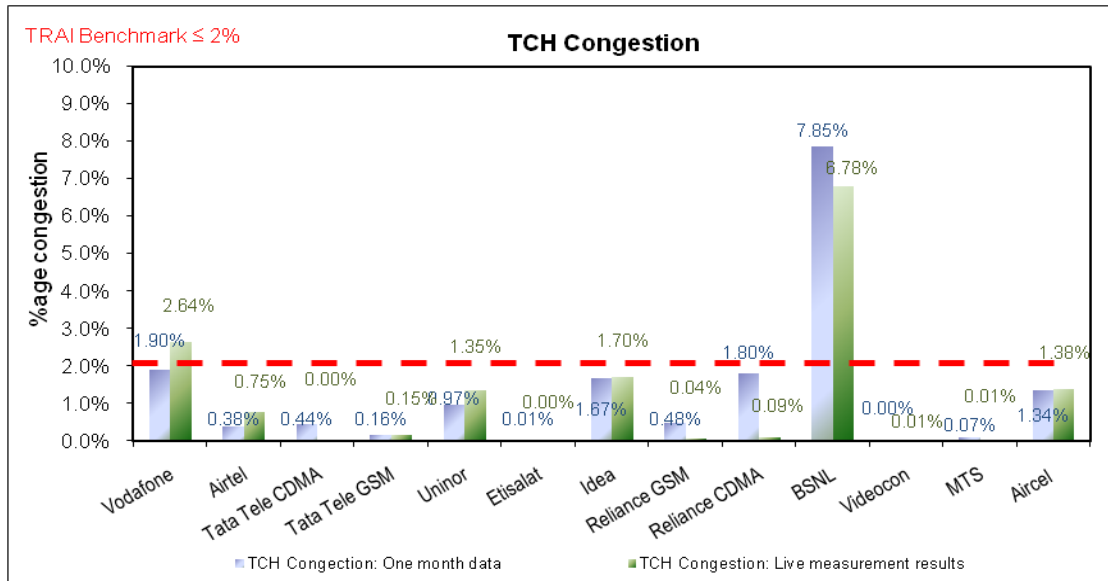
Operator(s) not meeting the benchmark: Reliance GSM, BSNL

Live measurement

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

Operator(s) not meeting the benchmark: BSNL

TCH Congestion



One month

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

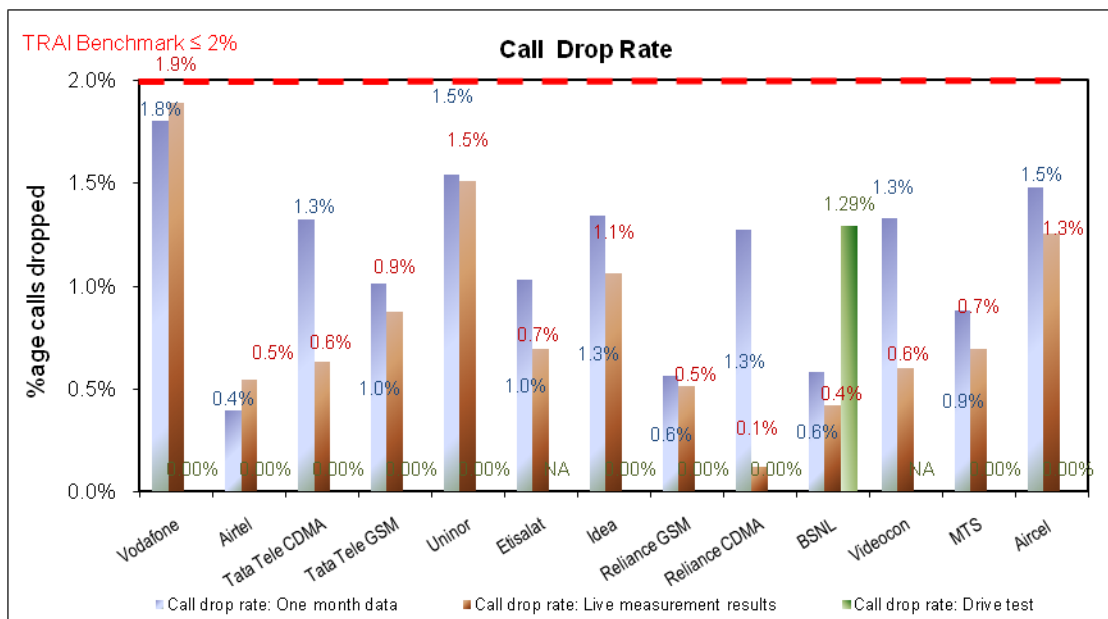
Operator(s) not meeting the benchmark: BSNL

Live measurement

Operator(s) meeting benchmark: Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

Operator(s) not meeting the benchmark: Vodafone, BSNL

Call Drop Rate



One month

All the operators meet the benchmark

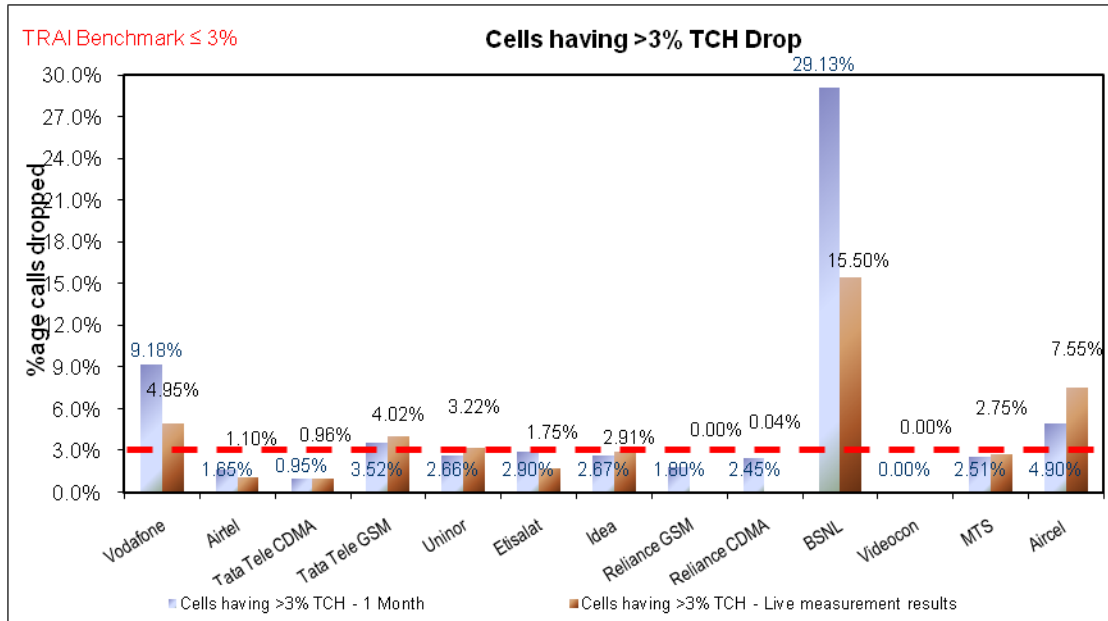
Live measurement

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: Airtel, Tata Tele CDMA, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS

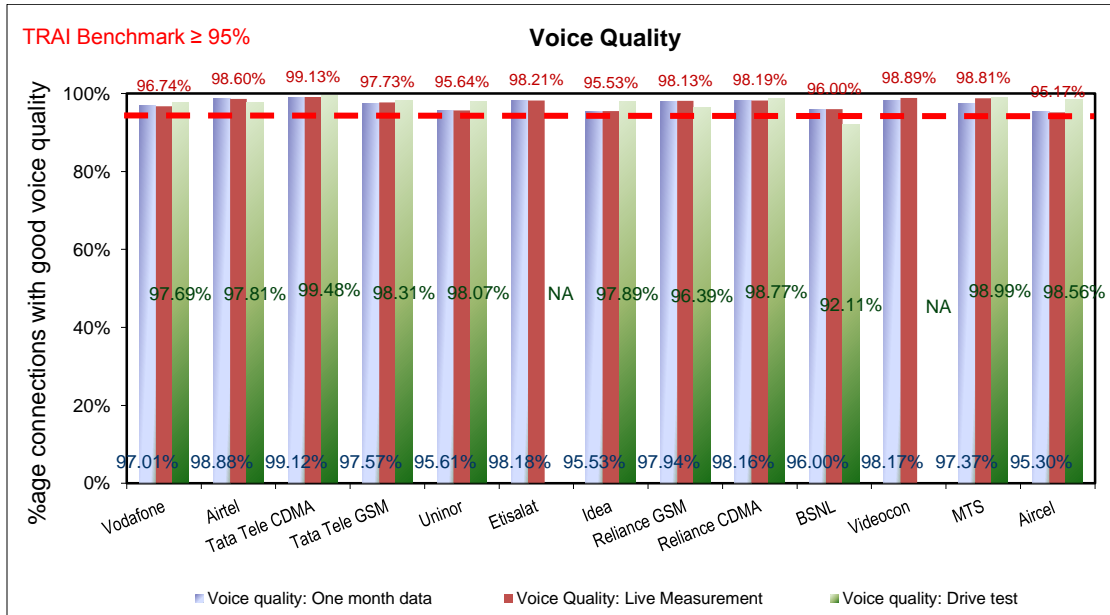
Operator(s) not meeting the benchmark: Vodafone, Tata Tele GSM, BSNL, Aircel

Live measurement

Operator(s) meeting benchmark: Airtel, Tata Tele CDMA, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS

Operator(s) not meeting the benchmark: Vodafone, Tata Tele GSM, Uninor, BSNL, Aircel

Voice quality



One month

All the operators meet the benchmark

Live measurement

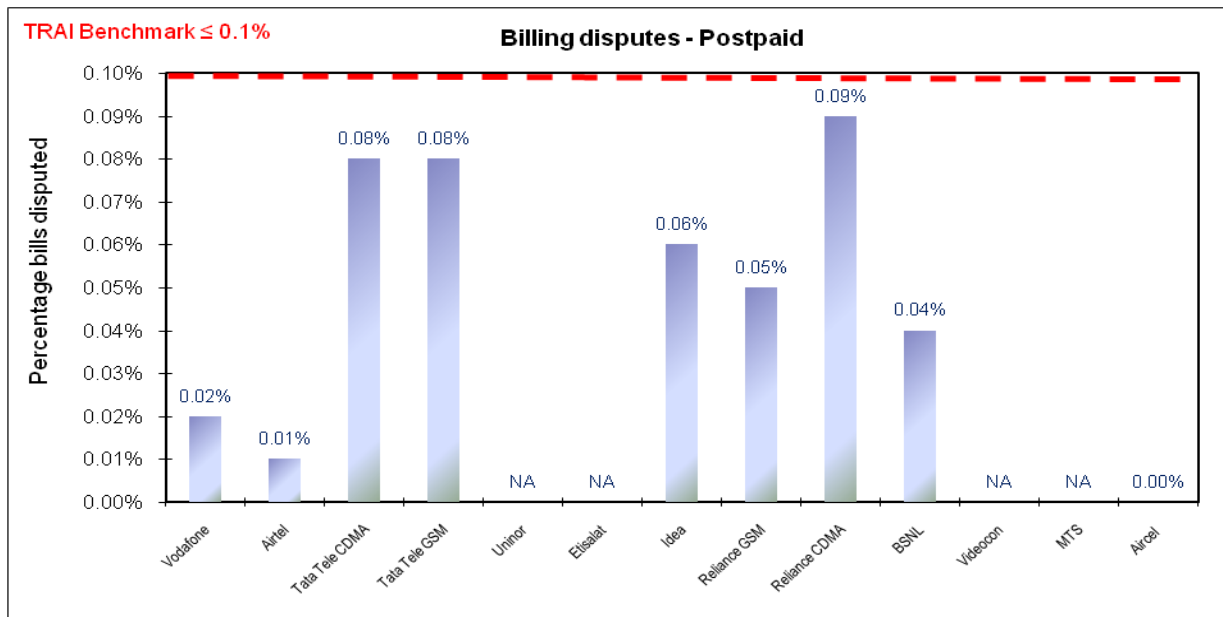
All the operators meet the benchmark

Drive test

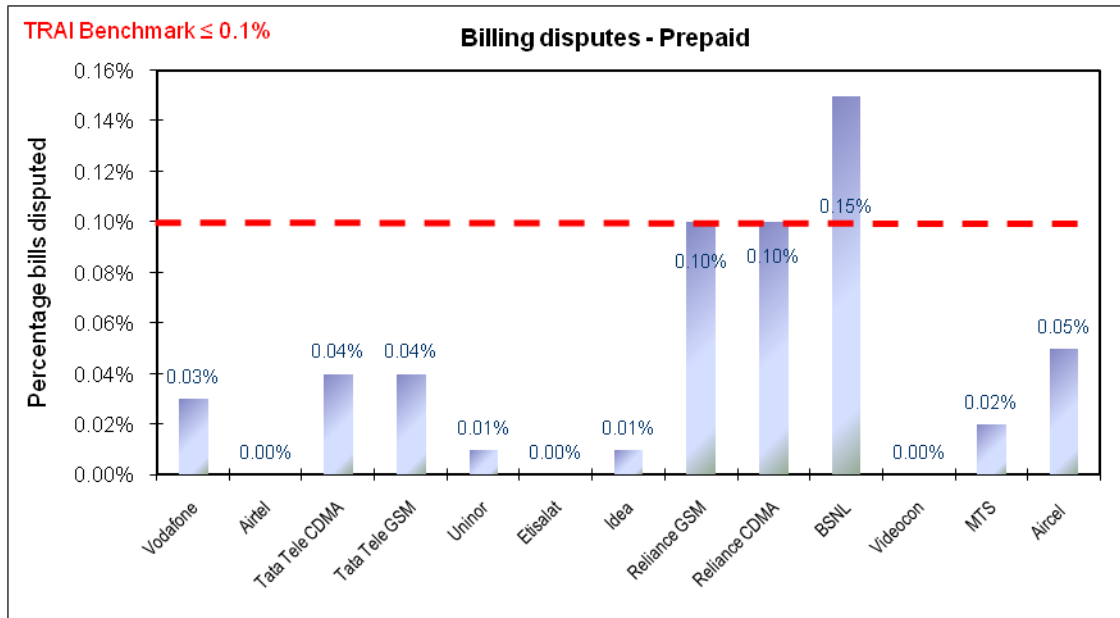
Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Idea, Reliance GSM, MTS, Aircel

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

Billing Disputes - Postpaid

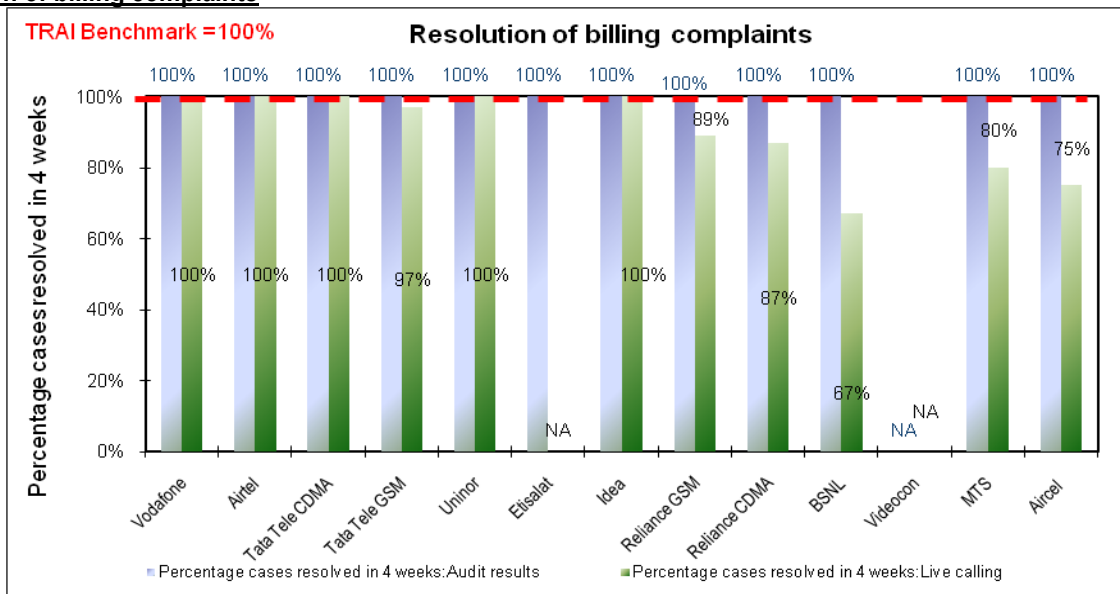


All the operators meet the benchmark
Complaints - Prepaid



Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel
 Operator(s) not meeting the benchmark: BSNL

Resolution of billing complaints



One month

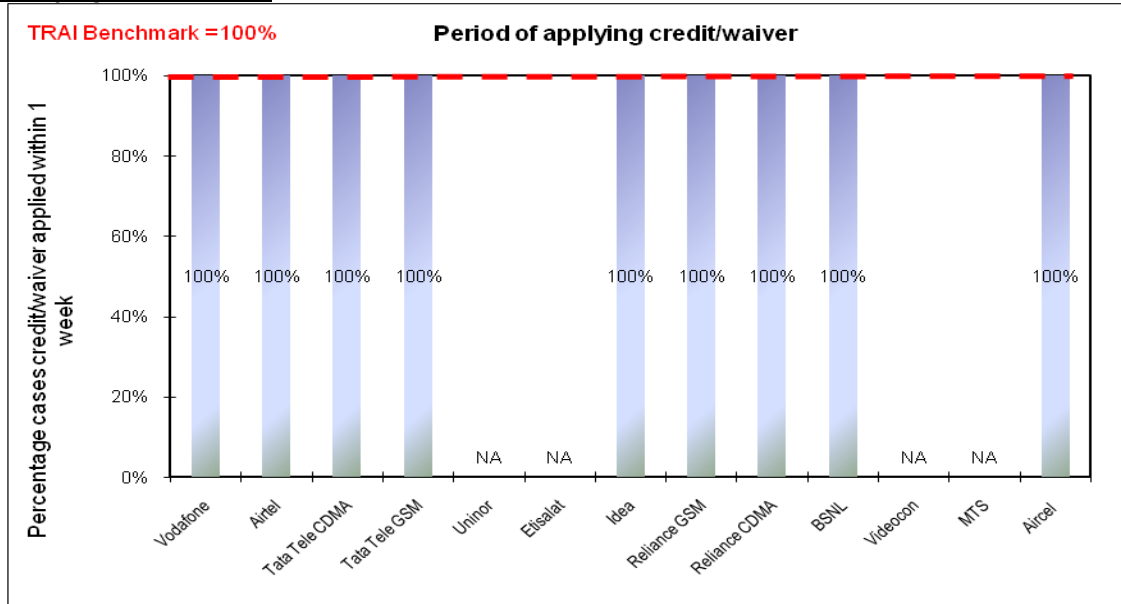
All the operators meet the benchmark

Live calling

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Uninor, Idea

Operator(s) not meeting the benchmark: Tata Tele GSM, Reliance GSM, Reliance CDMA, BSNL, MTS, Aircel

Period of applying credit / waiver

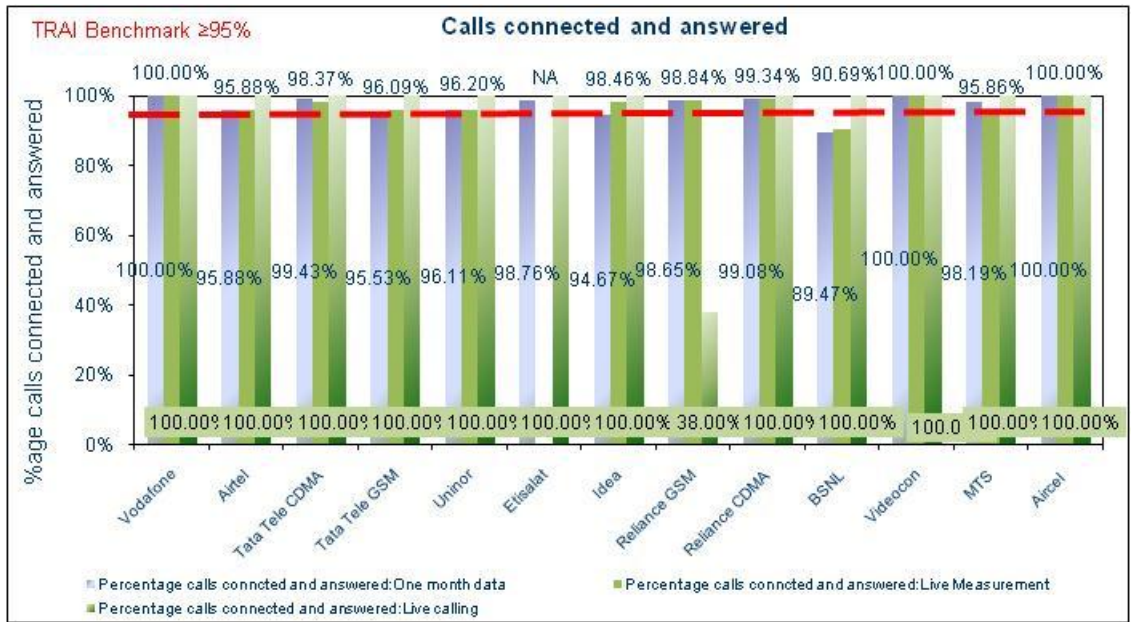


All the operators meet the benchmark

Live calling for billing Complaints

Resolution of billing complaints	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total Number of calls made		100	100	100	100	100	NA	100	100	100	100	NA	100	100
Number of cases resolved in 4 weeks		100	100	100	97	100	NA	100	89	87	67	NA	80	75
Percentage cases resolved in four weeks	100%	100%	100%	100%	97%	100%	NA	100%	89%	87%	67%	NA	80%	75%

Customer Care / Helpline: Calls answered



One month

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel
 Operator(s) not meeting the benchmark: Idea, BSNL

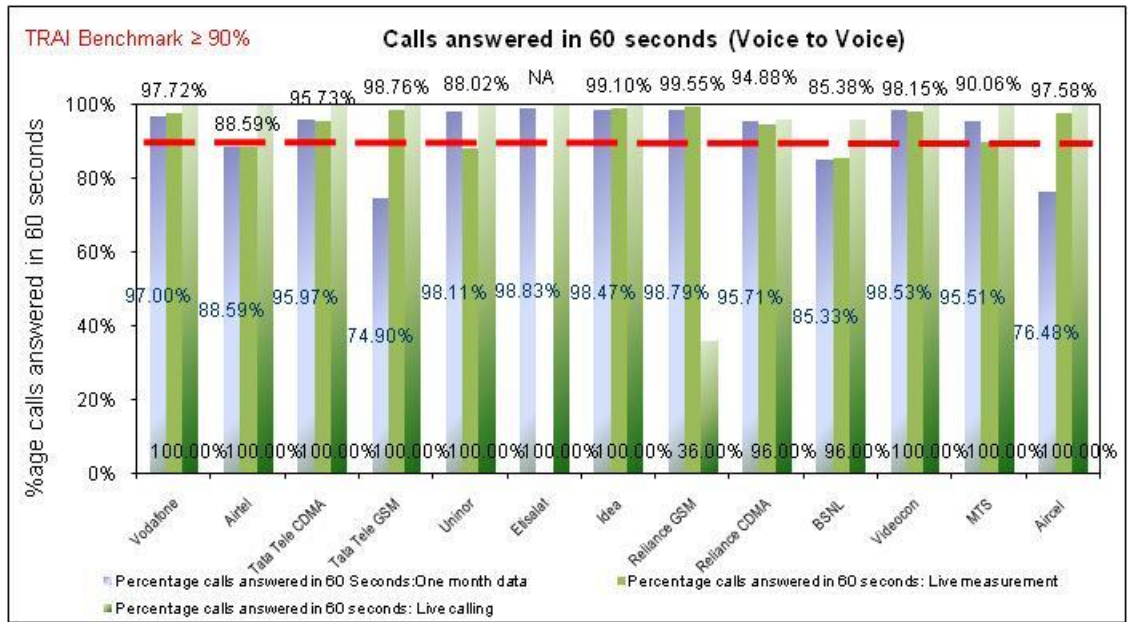
Live measurement

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel
 Operator(s) not meeting the benchmark: BSNL

Live calling

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance CDMA, BSNL, Videocon, MTS, Aircel
 Operator(s) not meeting the benchmark: Reliance GSM

Customer Care / Helpline: Calls answered voice to voice



One month

Operator(s) meeting benchmark: Vodafone, Tata Tele CDMA, Uninor, Etisalat, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS

Operator(s) not meeting the benchmark: Airtel, Tata Tele GSM, BSNL, Aircel

Live measurement

Operator(s) meeting benchmark: Vodafone, Tata Tele CDMA, Tata Tele GSM, Idea, Reliance GSM, Reliance CDMA, Videocon, MTS, Aircel

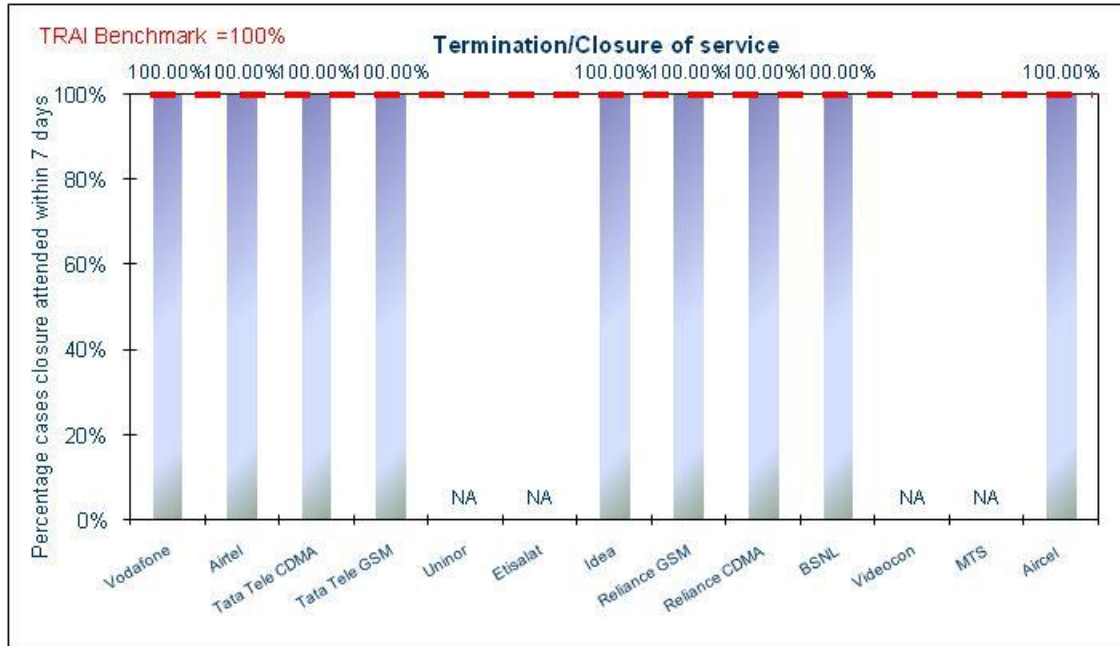
Operator(s) not meeting the benchmark: Airtel, BSNL

Live calling

Operator(s) meeting benchmark: Vodafone, Airtel, Tata Tele CDMA, Tata Tele GSM, Uninor, Etisalat, Idea, Reliance CDMA, BSNL, Videocon, MTS, Aircel

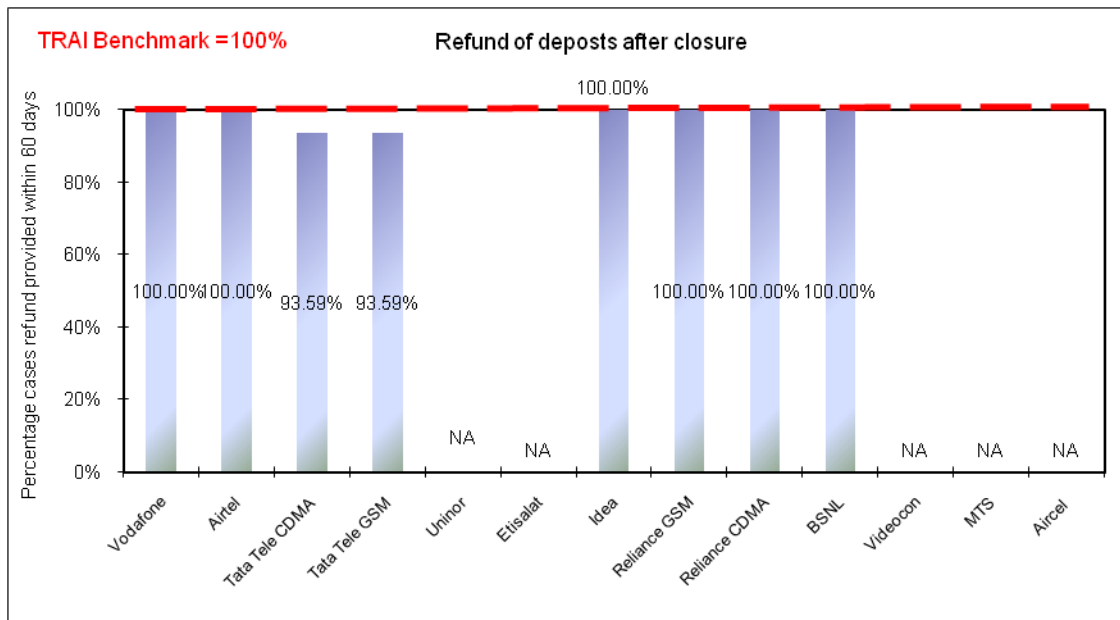
Operator(s) not meeting the benchmark: Reliance GSM

Termination / Closure of service



All the operators meet the benchmark

Refund of deposits



Operator(s) meeting benchmark: Vodafone, Airtel, Idea, Reliance GSM, Reliance CDMA, BSNL

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

Inter operator calls assessment

Inter operator call Assessment To↓ From→	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Vodafone	NA	100%	100%	100%	100%	NA	99%	97%	97%	100%	NA	95%	100%
Airtel	100%	NA	100%	100%	100%	NA	100%	95%	100%	100%	NA	98%	100%
TATA Tele CDMA	100%	100%	NA	99%	100%	NA	98%	96%	100%	100%	NA	100%	100%
Tata Tele GSM	100%	100%	100%	NA	100%	NA	99%	94%	95%	100%	NA	96%	100%
Uninor	100%	99%	100%	100%	NA	NA	100%	93%	100%	94%	NA	98%	100%
Etisalat	100%	98%	100%	100%	99%	NA	99%	98%	100%	96%	NA	100%	100%
Idea	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%	NA	100%	100%
Reliance GSM	100%	99%	100%	100%	97%	NA	100%	NA	100%	100%	NA	100%	100%
Reliance CDMA	100%	99%	100%	100%	96%	NA	100%	100%	NA	98%	NA	99%	100%
BSNL	100%	100%	100%	100%	96%	NA	99%	94%	100%	NA	NA	100%	100%
Videocon	100%	99%	100%	100%	99%	NA	100%	100%	100%	100%	NA	99%	100%
MTS	100%	98%	100%	100%	100%	NA	98%	99%	100%	100%	NA	NA	100%
Aircel	100%	100%	100%	100%	100%	NA	99%	99%	100%	100%	NA	100%	NA
S Tel	100%	100%	100%	100%	96%	NA	98%	94%		100%	NA	99%	100%



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. Airtel found tough connecting to an Etisalat number with 98 out of 100 calls getting connected. RCOM had difficulty in connecting to a Uninor number with 93% of their calls getting completed. From MTS, only 95 out of 100 calls got connected to a Vodafone number and from BSNL only 94 calls got connected to Uninor.

13.0 Compliance reports: Results of Verification of PMR

13.1 Cellular Mobile services


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 i.e. total outage time of all BTSs in hours during a month	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 (call drop) rate (%age)	%age connection with good voice quality	Point of interconnection (POI) Congestion	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%			≤ 5%	≥ 95%					
Vodafone	PMR	6143	30566	0.75%	139	2.25%	91.19%	1.99%	4.05%	2.04%	2633	18322	14.42%	96.10%	0	184720	145527.3	4884035
	IMRB	6143	30565.3	0.77%	139	2.23%	90.84%	2.55%	6.05%	2.04%	2633	18322	14.37%	96.11%	0	184720	145683.0	4899298
Airtel	PMR	7149	3447	0.10%	29	0.40%	98.40%	0.60%	0.73%	1.00%	465	20880	2.23%	98.80%	0	595224	484724.7	14963159
	IMRB	7149	3447	0.06%	29	0.40%	98.40%	0.57%	0.74%	0.99%	465	20880	2.23%	98.82%	0	595224	484724.7	14963159
Tata Tele CDMA	PMR	1034	1021	0.13%	4	0.39%	99.37%	0.00%	0.37%	0.60%	43	3153	1.37%	99.11%	0	291338	50512.3	942096
	IMRB	1034	1021	0.13%	4	0.39%	99.37%	0.00%	0.40%	0.60%	43	3153	1.37%	99.11%	0	291338	50512.3	942096
Tata Tele GSM	PMR	1998	858	0.06%	4	0.18%	97.53%	0.22%	0.33%	0.63%	127	5989	2.12%	96.82%	0	90029	30915.0	1224849
	IMRB	1998	858	0.06%	4	0.18%	97.53%	0.22%	0.33%	0.63%	127	5989	2.12%	96.82%	0	90029	30915.0	1224849
Uninor	PMR	2295	18644	1.62%	44	1.93%	95.98%	0.38%	1.92%	1.99%	303	6873	4.40%	96.50%	11	77701	66687.7	1385208
	IMRB	2295	27379	1.62%	44	1.93%	95.98%	0.38%	1.92%	1.99%	303	6873	4.40%	96.50%	11	77701	66687.7	1385208
Etisalat	PMR	63	111	0.24%	0	0.00%	95.32%	0.08%	0.00%	0.51%	7	189	3.53%	98.34%	0	1399	70.3	4610
	IMRB	63	111	0.24%	0	0.00%	95.20%	0.08%	0.00%	0.51%	7	189	3.53%	98.20%	0	1398	70.3	4610
Idea	PMR	4437	55338	1.70%	85	1.91%	97.55%	0.55%	1.52%	1.76%	378	13359	2.78%	96.62%	0	125261	108839.7	4262756
	IMRB	4437	55338	1.70%	85	1.91%	97.55%	0.55%	1.52%	1.76%	371	13359	2.78%	95.62%	0	125260	108839.0	4262756
Reliance GSM	PMR	2934	858	0.03%	14	0.46%	97.78%	0.86%	1.26%	1.30%	210	8374	2.52%	98.70%	0	148000	108818.2	DNA
	IMRB	2934	858	0.04%	14	0.47%	97.78%	0.86%	1.26%	1.30%	170	6736	2.50%	98.71%	0	148000	108818.1	3422424
Reliance CDMA	PMR	2423	9765	0.55%	36	1.50%	98.19%	0.31%	0.93%	1.11%	52	2423	2.16%	96.52%	0	262000	91805.7	DNA
	IMRB	2423	9765	0.55%	36	1.50%	99.65%	0.31%	0.97%	0.80%	52	2423	2.16%	96.70%	0	262000	91805.4	2234493
BSNL	PMR	1203	17209	1.94%	25	2.07%	96.74%	0.18%	0.76%	1.66%	126	2442	5.16%	96.67%	1	64000	23401.3	792845
	IMRB	1203	17209	1.94%	25	2.07%	96.74%	0.18%	0.76%	1.66%	126	2442	5.16%	96.67%	1	64000	23401.3	792845

Videocon	PMR	12	111	1.26%	0	0.00%	98.98%	0.38%	0.29%	1.31%	0	36	0.00%	98.79%	0	10000	14.5	2002
	IMRB	12	111	1.26%	0	0.00%	98.98%	0.38%	0.29%	1.31%	0	36	0.00%	98.79%	0	10000	15	2002
MTS	PMR	1333	15723	1.63%	11	0.80%	98.87%	0.00%	0.22%	1.00%	120	4002	2.99%	97.56%	0	60711	16690.3	448084
	IMRB	1333	15723	1.63%	11	0.80%	98.85%	0.00%	0.21%	1.00%	129	4003	3.21%	98.04%	0	60711	16690	448084
Aircel	PMR	3431	40386	1.60%	298	8.66%	98.54%	0.29%	0.89%	1.47%	557	10194	5.47%	95.47%	0	198700	52336.0	2091353
	IMRB	3465	40386	1.60%	298	8.59%	98.54%	0.29%	0.89%	1.47%	584	10192	5.72%	95.47%	0	198701	52336	2091353


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 quarter	No. of complaints disposed on account of not considered as valid complaints during the quarter	Percentage of billing/charging credit / validity (pre-paid) complaints resolved within 4 weeks during the quarter	Percentage of adjustment to customer/s account from the date of resolution of	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		
Vodafone	PMR	0.08%	27617	22	0.03%	4385	5426080	100%	4407	4407	2949	1458	100%	100.00%	479264	449781	93.24%	100%	754	754	100%
	IMRB	0.08%	27617	22	0.03%	4385	5426080	100%	4407	4407	2949	1458	100%	100.00%	479264	449780	93.00%	100%	754	754	100%
Airtel	PMR	0.01%	73822	5	0.00%	1	61904182	100%	6	7912	6	7906	100%	99%	14089316	13960067	96.00%	100%	379	379	100%
	IMRB	0.01%	73822	5	0.00%	1	61904182	100%	6	7914	6	7908	100%	99%	16033407	16159643	96.00%	100%	379	379	100%
Tata Tele CDMA	PMR	0%	111050	10	0%	325	2745342	100%	8784	8787	335	8452	100%	100%	680949	677656	97%	100%	2592	2592	DNA
	IMRB	0.00%	184026	310	0.00%	8500	2706454	100%	8810	8810	292	8208	100%	100%	7273158	7273158	100%	100%	863	863	91%
Tata Tele GSM	PMR	0%	14629	45	0%	9918	3398115	100%	9963	9963	15	9948	100%	96%	1608315	1545468	97%	100%	212	212	67%
	IMRB	0%	12563	18	0%	3011	2719084	100%	961	961	21	940	100%	96%	16758315	16039099	86%	100%	166	166	78%
Uninor	PMR	DNA	DNA	DNA	0.00%	383	3426728	100%	383	383	DNA	DNA	DNA	96%	3142112	3023588	98%	DNA	DNA	DNA	DNA
	IMRB	DNA	DNA	DNA	0.00%	383	3426728	100%	383	383	DNA	DNA	DNA	96%	3142112	3023588	98%	DNA	DNA	DNA	DNA
Etisalat	PMR	0.00%	0	0	0.01%	3	34277	100%	3	3	2	1	100%	98.62%	12080	6631	99.71%	0%	0	0	0%
	IMRB	0.00%	0	0	0.01%	3	53104	100%	3	3	2	1	100%	98.62%	12080	6631	99.71%	0%	0	0	0%

Idea	PMR	0.01%	21171	3	0.00%	460	14565399	100%	2465	2465	461	2004	100%	98.00%	3798280	3636431	100%	100%	106	106	100%
	IMRB	0.02%	21171	4	0.00%	2461	14780645	100%	2465	2465	461	2004	100%	96.00%	3798280	3636431	98%	100%	300	300	100%
Reliance GSM	PMR	0.09%	20364	18	0%	3707	5520695	100%	11139	11139	3178	7961	100%	99%	8700450	8612333	67%	100%	68	68	100%
	IMRB	0.09%	27180	24	0.10%	5690.33	5863198	100%	17095	17095	17092	3	100%	98.63%	14016146	14211225	89%	100%	91	91	100%
Reliance CDMA	PMR	0.10%	200983	184	0.06%	2013	3456572	100%	6223	6223	3381	2842	100%	99%	4974395	4903922	88%	100%	747	747	100%
	IMRB	0.10%	196677	193	0.10%	3504	3516373	100.00%	10706	10706	10256	450	100.00%	98.77%	5633232	5564214	94.65%	100.00%	196677	196677	100.00%
BSNL	PMR	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
	IMRB	0.10%	26804	3	0.09%	5280	1361532	100%	5283	5217	5217	0	100%	100%	1234	1174	92.50%	100%	273	273	100%
Videocon	PMR	DNA	DNA	DNA	0.01%	1	19823	100%	1	1	0	1	100%	100.00%	875	875	98.37%	100%	0	0	DNA
	IMRB	DNA	DNA	DNA	0.01%	1	19823	100%	1	1	0	1	100%	100.00%	875	875	98.37%	100%	0	0	DNA
MTS	PMR	DNA	DNA	DNA	0.00%	695	1291900	100%	695	695	603	92	100%	100.00%	87912	79259	90%	DNA	DNA	DNA	DNA
	IMRB	DNA	DNA	DNA	0.00%	716	1534689	100%	716	716	676	40	100%	100.00%	121317	110207	90%	DNA	DNA	DNA	DNA
Aircel	PMR	0%	5018	0%	0.17%	8300	4834539	100%	8300	8300	3311	4389	100%	100%	382790	346394	90.61%	100%	52	52	100%
	IMRB	0%	5018	0	0.16%	8300	5113473	100%	8300	8300	3311	4989	100%	100%	374517	342240	92.46%	100%	52	52	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

14.0 Conclusions

14.1 Cellular Mobile services

1. The figures reported by all the operators most of the parameters completely match the figures obtained on verification except for few operators
2. Vodafone does not meet any of the connection establishment benchmarks
3. Reliance GSM does not meet the percentage of calls answered by the operators (voice to voice) within 60 seconds parameter

15.0 Annexure - I

15.1 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%	≤ 5%	≥ 95%	≤ 0.1%	≤ 0.1%	100%	100%	≥ 95%	≥ 90%	100%	100%
Vodafone	0.50%	0.95%	96.82%	0.62%	1.90%	1.80%	9.18%	97.01%	0.02%	0.03%	100.00%	100.00%	100.00%	97.00%	100.00%	100.00%
Airtel	0.18%	0.40%	99.07%	0.20%	0.38%	0.39%	1.65%	98.88%	0.01%	0.00%	100.00%	100.00%	95.88%	88.59%	100.00%	100.00%
Tata Tele CDMA	0.05%	0.00%	98.76%	0.00%	0.44%	1.32%	0.95%	99.12%	0.08%	0.04%	100.00%	100.00%	99.43%	95.97%	100.00%	93.59%
Tata Tele GSM	0.01%	0.00%	98.52%	0.11%	0.16%	1.01%	3.52%	97.57%	0.08%	0.04%	100.00%	100.00%	95.53%	74.90%	100.00%	93.59%
Uninor	1.52%	1.02%	98.26%	0.30%	0.97%	1.54%	2.66%	95.61%	NA	0.01%	100.00%	NA	96.11%	98.11%	NA	NA
Etisalat	0.58%	0.00%	95.86%	0.15%	0.01%	1.03%	2.90%	98.18%	NA	0.00%	100.00%	NA	98.76%	98.83%	NA	NA
Idea	0.81%	1.81%	98.11%	0.36%	1.67%	1.34%	2.67%	95.53%	0.06%	0.01%	100.00%	100.00%	94.67%	98.47%	100.00%	100.00%
Reliance GSM	0.17%	0.82%	96.37%	1.05%	0.48%	0.56%	1.80%	97.94%	0.05%	0.10%	100.00%	100.00%	98.65%	98.79%	100.00%	100.00%
Reliance CDMA	0.55%	1.25%	97.05%	0.00%	1.80%	1.27%	2.45%	98.16%	0.09%	0.10%	100.00%	100.00%	99.08%	95.71%	100.00%	100.00%
BSNL	3.55%	21.13%	75.94%	14.33%	7.85%	0.58%	29.13%	96.00%	0.04%	0.15%	100.00%	100.00%	89.47%	85.33%	100.00%	100.00%
Videocon	1.58%	0.00%	99.56%	0.40%	0.00%	1.33%	0.00%	98.17%	NA	0.00%	NA	NA	100.00%	98.53%	NA	NA
MTS	1.23%	0.94%	99.57%	0.00%	0.07%	0.88%	2.51%	97.37%	NA	0.02%	100.00%	NA	98.19%	95.51%	NA	NA
Aircel	1.21%	4.09%	98.11%	0.14%	1.34%	1.48%	4.90%	95.30%	0.00%	0.05%	100.00%	100.00%	100.00%	76.48%	100.00%	NA

15.2 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
Vodafone						All POI's meeting TRAI specified benchmark
Airtel						All POI's meeting TRAI specified benchmark
Tata Tele CDMA						All POI's meeting TRAI specified benchmark
Tata Tele GSM						All POI's meeting TRAI specified benchmark
Uninor	Reliance GSM (I/O)	1115	95628	1262.81	0.581496552	Eis Augmented
	Swan Patna	30	53	0.00	100	Blocked by customer
	Airtel Marwari Awas	773	227891	771.45	17.03519559	POI utilization was more than 100%
Etisalat						All POI's meeting TRAI specified benchmark

Idea	All POI's meeting TRAI specified benchmark					
Reliance GSM	All POI's meeting TRAI specified benchmark					
Reliance CDMA	All POI's meeting TRAI specified benchmark					
BSNL	TTSL GSM	155	15447	144	0	Augmentation of 15E1s u/p
Videocon	All POI's meeting TRAI specified benchmark					
MTS	All POI's meeting TRAI specified benchmark					
Aircel	All POI's meeting TRAI specified benchmark					

15.3 Parameter wise performance reports for Cellular Mobile services

1. Network Availability

Audit Results for Network Availability

	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Number of BTSs in the licensed service area		6630	7280	1030	2086	2353	63	4929	2559	1835	3332	52	1385	3423
Sum of downtime of BTSs in a month (in hours)		24819	9649	396	201	26571	273	29690	3238	7486	87945	611	12650	30715
BTSs accumulated downtime (not available for service)	≤ 2%	0.50%	0.18%	0.05%	0.01%	1.52%	0.58%	0.81%	0.17%	0.55%	3.55%	1.58%	1.23%	1.21%
Number of BTSs having accumulated downtime >24 hours		63	29	0	0	24	0	89	21	23	704	0	13	140
Worst affected BTSs due to downtime	≤ 2%	0.95%	0.40%	0.00%	0.00%	1.02%	0.00%	1.81%	0.82%	1.25%	21.13%	0.00%	0.94%	4.09%

	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Number of BTSs in the licensed service area		6630	7217	1030	2098	1688	19	4946	3810	1839	3332	52	1385	3494
Sum of downtime of BTSs in 3 days (in hours)		2550	915	41	20	1	13.16	1151	374	552	5681	51	962	3904
BTSs accumulated downtime (not available for service)	≤ 2%	0.53%	0.18%	0.06%	0.01%	0.00%	0.96%	0.32%	0.14%	0.42%	2.37%	1.36%	0.96%	1.55%
Number of BTSs having accumulated downtime >24 hours		0	0	0	0	0	0	2	0	0	116	0	0	22
Worst affected BTSs due to downtime	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.04%	0.00%	0.00%	3.48%	0.00%	0.00%	0.63%

2. Connection Establishment (Accessibility)

Audit Results for CSSR, SDCCCH and TCH congestion

CSSR	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
CSSR	≥ 95%	96.82%	99.07%	98.76%	98.52%	98.26%	95.86%	98.11%	96.37%	97.05%	75.94%	99.56%	99.57%	98.11%

SDCCCH congestion	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
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SDCCH/Paging channel congestion	≤ 1%	0.62%	0.20%	0.00%	0.11%	0.30%	0.15%	0.36%	1.05%	0.00%	14.33%	0.40%	0.00%	0.14%
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TCH congestion	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
TCH congestion	≤ 2%	1.90%	0.38%	0.44%	0.16%	0.97%	0.01%	1.67%	0.48%	1.80%	7.85%	0.00%	0.07%	1.34%

Live measurement results for CSSR, SDCCH and TCH congestion

CSSR	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
CSSR	≥ 95%	95.81%	98.50%	99.12%	99.10%	97.95%	99.23%	98.11%	99.03%	97.70%	75.68%	99.60%	99.16%	98.11%

SDCCH congestion	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
SDCCH/Paging channel congestion	≤ 1%	0.94%	0.37%	0.00%	0.05%	0.34%	0.02%	0.55%	0.16%	0.00%	13.54%	0.29%	0.00%	0.08%

TCH congestion	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
TCH congestion	≤ 2%	2.64%	0.75%	0.00%	0.15%	1.35%	0.00%	1.70%	0.04%	0.09%	6.78%	0.01%	0.01%	1.38%

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

CSSR	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of call attempts		686	648	630	668	637	NA	630	787	659	637	NA	630	630
Total number of successful calls established		686	648	630	663	637	NA	630	784	659	606	NA	630	630
CSSR	≥ 95%	100.00%	100.00%	100.00%	99.25%	100.00%	NA	100.00%	99.62%	100.00%	95.13%	NA	100.00%	100.00%

Blocked calls	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
%age blocked calls		0.00%	0.00%	0.00%	0.75%	0.00%	NA	0.00%	0.38%	0.00%	4.87%	NA	0.00%	0.00%

3. Connection Maintenance (Retainability)

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

Call drop rate	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of calls established		DNA	7223644	416334	431124	995059	4824	1569060	475156	425144	116016	6550	274308	1070118
Total number of calls dropped		DNA	2789436	551467	433735	153239	497	2103023	265340	541209	6761	87	241392	1581105
Call drop rate	≤ 2%	1.80%	0.39%	1.32%	1.01%	1.54%	1.03%	1.34%	0.56%	1.27%	0.58%	1.33%	0.88%	1.48%

Cells having more than 3% TCH	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of cells in the network		19794	21599	3144	6258	7071	138	14783	7677	3798	7528	160	4181	10252
Total number of cells having more than 3% TCH		1818	357	30	220	188	4	395	138	93	2193	0	105	502
Worst affected cells having more than 3% TCH	≤ 3%	9.18%	1.65%	0.95%	3.52%	2.66%	2.90%	2.67%	1.80%	2.45%	29.13%	0.00%	2.51%	4.90%

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

Call drop rate	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of calls established		DNA	25650426	69067461	19722060	9931589	1160	18760620	14809400	97765740	1919229	20130	3230500	3656999
Total number of calls dropped		DNA	139477	438510	172483	149928	8	199714	754622	113860	7965	121	22291	45539
Call drop rate	≤ 2%	1.89%	0.54%	0.63%	0.87%	1.51%	0.69%	1.06%	0.51%	0.12%	0.42%	0.60%	0.69%	1.25%

Cells having more than 3% TCH	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of cells in the network		19794	21587	9432	6288	7071	57	14835	11430	5517	6659	160	4212	10267
Total number of cells having more than 3% TCH		980	237	91	253	228	1	431	0	2	1032	0	116	775
Worst affected cells having more than 3% TCH	≤ 3%	4.95%	1.10%	0.96%	4.02%	3.22%	1.75%	2.91%	0.00%	0.04%	15.50%	0.00%	2.75%	7.55%

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

Call drop rate	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of calls established		686	648	630	667	637	NA	630	784	449	622	NA	630	630
Total number of calls dropped		0	0	0	0	0	NA	0	0	0	8	NA	0	0
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%	0.00%	1.29%	NA	0.00%	0.00%

4. Voice quality

Audit & Live measurement Results for Voice quality

Voice quality	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of sample calls		DNA	10878994820	66484515	1599712866	1412422456	5426431	2454230352	3163113362	12154502	150	1041332	152	8700546330
Total number of		DNA	10757051340	65899451	1560794903	1350417109	5327896	2344428362	3097840082	119309566	144	1022264	148	8291420746

calls with good voice quality															
%age calls with good voice quality	≥ 95%	97.01%	98.88%	99.12%	97.57%	95.61%	98.18%	95.53%	97.94%	98.16%	96.00%	98.17%	97.37%	95.30%	

Voice quality	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of sample calls		DNA	3603683493	122155690	4557313116	1490904909	82780	2944609793	8421212975	299397679	150	2105195	504	300637774
Total number of calls with good voice quality		DNA	3553125485	121092935	4453703083	1425860566	81297	2813043353	8263875374	293971583	144	2081736	498	286114806
%age calls with good voice quality	≥ 95%	96.74%	98.60%	99.13%	97.73%	95.64%	98.21%	95.53%	98.13%	98.19%	96.00%	98.89%	98.81%	95.17%

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

Voice quality	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of sample calls		1043427	1232339	152602	1149859	1156534	NA	1084243	109392	51862	303955	NA	35684	1076043
Total number of calls with good voice quality		1019296	1205346	151814	1130483	1134248	NA	1061338	105442	51223	279964	NA	35324	1060498
%age calls with good voice quality	≥ 95%	97.69%	97.81%	99.48%	98.31%	98.07%	NA	97.89%	96.39%	98.77%	92.11%	NA	98.99%	98.56%

5. POI Congestion

Audit Results for POI Congestion

POI congestion	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of working POIs		51	51	238	31	82	26	83	22	30	135	13	52	136
No. of POIs not meeting benchmark		0	0	0	0	3	0	0	0	0	1	0	0	0

Total Capacity of all POIs (A) - in erlangs		144021	518789	85231	32173	47919	1376	159129	910884	1342051	64000	18.14	25027	64725
Traffic served for all POIs (B)- in erlangs		92990	303519	38882	18816	31621	24.93	85290	475365	563487	56494	1.82	14740	33855
POI congestion	≤ 0.5%	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

POI congestion	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of working POIs		51	51	234	31	82	26	83	22	30	135	13	52	137
No. of POIs not meeting benchmark		0	0	0	0	3	0	0	0	0	1	0	0	0
Total Capacity of all POIs (A) - in erlangs		144671	501969	84325	32622	50009	1376	161104	146517.4	141992.7	64000	18.14	24530	65033
Traffic served for all POIs (B)- in erlangs		100098	345179	41153	20420	34713	4.57	88738	102517.4	67949.6	53321	1.76	15039	33702
POI congestion	≤ 0.5%	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

6. Inter Operator Call Assessment

Inter operator call Assessment	To↓	From→	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Vodafone			NA	100%	100%	100%	100%	NA	99%	97%	97%	100%	NA	95%	100%
Airtel			100%	NA	100%	100%	100%	NA	100%	95%	100%	100%	NA	98%	100%
TATA Tele CDMA			100%	100%	NA	99%	100%	NA	98%	96%	100%	100%	NA	100%	100%
Tata Tele GSM			100%	100%	100%	NA	100%	NA	99%	94%	95%	100%	NA	96%	100%
Uninor			100%	99%	100%	100%	NA	NA	100%	93%	100%	94%	NA	98%	100%
Etisalat			100%	98%	100%	100%	99%	NA	99%	98%	100%	96%	NA	100%	100%
Idea			100%	100%	100%	100%	100%	NA	NA	100%	100%	100%	NA	100%	100%
Reliance GSM			100%	99%	100%	100%	97%	NA	100%	NA	100%	100%	NA	100%	100%
Reliance CDMA			100%	99%	100%	100%	96%	NA	100%	100%	NA	98%	NA	99%	100%
BSNL			100%	100%	100%	100%	96%	NA	99%	94%	100%	NA	NA	100%	100%
Videocon			100%	99%	100%	100%	99%	NA	100%	100%	100%	100%	NA	99%	100%
MTS			100%	98%	100%	100%	100%	NA	98%	99%	100%	100%	NA	NA	100%
Aircel			100%	100%	100%	100%	100%	NA	99%	99%	100%	100%	NA	100%	NA
S Tel			100%	100%	100%	100%	96%	NA	98%	94%		100%	NA	99%	100%



The maximum problem faced by the calling operator to other operators

7. Metering and Billing credibility

Audit Results for Billing performance

Billing Performance	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Billing disputes - Postpaid														
Total bills generated during the period		10408	27980	66078	66078	0	0	7807	10921	67961	52033	0	0	2915
Total number of bills disputed		2	2	53	53	0	0	5	6	64	21	0	0	0

Quality of Service – Audit module report for Bihar & Jharkhand Circle

Percentage bills disputed	≤ 0.1%	0.02%	0.01%	0.08%	0.08%	NA	NA	0.06%	0.05%	0.09%	0.04%	NA	NA	0.00%
Billing disputes - Prepaid														
Number of complaints related to charging, credit & validity		1897	0	720	720	515	2	323	5863	3516	8409	0	228	2370
Total number of prepaid customers in that period		5789707	20924412	1948008	1948008	4204457	41222	5388012	5922367	3464475	5643117	20299	1394956	5207942
Percentage of complaints	≤ 0.1%	0.03%	0.00%	0.04%	0.04%	0.01%	0.00%	0.01%	0.10%	0.10%	0.15%	0.00%	0.02%	0.05%
Resolution of billing complaints														
Total number of billing/charging complaints		3410	6524	773	773	515	2	328	5869	3580	8426	0	228	2370
Total complaints considered invalid		1661	6522	712	712	0	2	205	0	61	402	0	8	1057
Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1		3410	2	712	712	515	2	328	5869	3580	8024	NA	220	2370
Percentage complaints resolved within 4 weeks of date of receipt	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA	100%	100%
Period of applying credit / waiver														
Total number of complaints where credit/waiver is required		873	2	61	61	0	0	123	5869	3580	41	0	0	1314
Percentage cases in which credit/waiver was received within 1 week	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%	100%	NA	NA	100%

Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total Number of calls made		100	100	100	100	100	NA	100	100	100	100	NA	100	100
Number of cases resolved in 4 weeks		100	100	100	97	100	NA	100	89	87	67	NA	80	75
Percentage cases resolved in four weeks	100%	100%	100%	100%	97%	100%	NA	100%	89%	87%	67%	NA	80%	75%

8. Customer Care

Audit results for customer care

Customer Care Assessment	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of call attempts to customer care for assistance		249811	3330717	108737	599837	14847394	1691	1122501	12937710	2817303	482906	837	426442	3945885
Number of calls getting connected and answered (electronically)		249811	3193486	108121	573014	14269127	1670	1062626	12762842	2791482	432036	837	418719	3945885
Percentage calls getting connected and answered	≥ 95%	100.00%	95.88%	99.43%	95.53%	96.11%	98.76%	94.67%	98.65%	99.08%	89.47%	100.00%	98.19%	100.00%
Number of calls getting transferred to the operator (voice to voice)		232422	6020328	389659	1513299	3681218	1023	2673323	2191899	502040	308382	475	426442	1620756
Number of calls answered by operator (voice to voice) within 60 seconds		225451	5333351	373947	1133389	3611688	1011	2632499	2165477	480519	263130	468	407306	1239631
Percentage calls answered within 60 seconds (V2V)	≥ 90%	97.00%	88.59%	95.97%	74.90%	98.11%	98.83%	98.47%	98.79%	95.71%	85.33%	98.53%	95.51%	76.48%

Live measurement results for customer care

Customer Care Assessment	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of call attempts to customer care for assistance		613504	3330717	95541	603912	136644	NA	97393	1189671	259407	42100	99	66516	422949
Number of calls getting connected and answered (electronically)		613504	3193486	93980	580329	131446	NA	95894	1175908	257683	38180	99	63763	422949
Percentage calls getting connected and answered	≥ 95%	100.00%	95.88%	98.37%	96.09%	96.2%	NA	98.46%	98.84%	99.34%	90.69%	100.00%	95.86%	100.00%
Number of calls getting transferred to the operator (voice to voice)		229302	6020328	34834	129833	126332	NA	267285	220053	48077	26806	54	66516	156709
Number of calls answered by operator (voice to voice) within 60 seconds		224076	5333351	33345	128227	111197	NA	264888	219061	45616	22886	53	59905	152912
Percentage calls answered within 60 seconds (V2V)	≥ 90%	97.72%	88.59%	95.73%	98.76%	88.02	NA	99.10%	99.55%	94.88%	85.38%	98.15%	90.06%	97.58%

Live calling results for customer care

Customer Care Assessment	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
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Total Number of calls made		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	38			100		100
Percentage calls getting connected and answered	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	38.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total Number of calls made		100	100	100	100	100	100	100	100	100	100	100	100	100
Total Number of calls answered within 60 seconds		100	100	100	100	100	100	100	36		96	96	100	100
Percentage calls answered within 60 seconds	≥ 90%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	36.00%	96.00%	96.00%	100.00%	100.00%	100.00%

Following are the details of the numbers at which the calls were made

Name of operator	Customer Care number
Aircel	121
Idea	12345
Airtel	121
Uninor	121
Videocon	121
S tel	1212
BSNL BIHAR	121
BSNL Ranchi	121
MTS	155
Vodafone	121
Tata indicom	121
Tata docomo	121
Reliance GSM	*333
Reliance CDMA	*333

9. Termination / closure of service

Audit results for termination / closure of service

Termination	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of closure request		121	126	1313	1313	0	0	151	48	225	171	0	0	20
Number of requests attended within 7 days		121	126	1313	1313	0	0	151	48	225	171	0	0	20
Percentage cases in which termination done within 7 days	100%	100.00%	100.00%	100.00%	100.00%	NA	NA	100.00%	100.00%	100.00%	100.00%	NA	NA	100.00%

Audit results for refund of deposits

Refund	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total number of cases requiring refund of deposits		45	8	359	359	0	0	8	77	315	60	0	0	0
Total number of cases where refund was made within 60 days		45	8	336	336	0	0	8	77	315	60	0	0	0
Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	93.59%	93.59%	NA	NA	100.00%	100.00%	100.00%	100.00%	NA	NA	NA

11. Additional Network Related parameters

Audit Results for Total Traffic Handled in Erlang

Traffic in Erlang	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Equipped capacity of the network		210212	615647	196950	94475	93930	1398	141983	187000	204000	250600	10000	60711	199477
Total traffic handled in erlang during TCBH		171613	517328	49473	32917	81781	37.52	131716	112917	92768	148009	8.99	22697	52902

Total number of customers as per VLR

	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total no. of customers served (as per VLR)		5687057	16209895	849121	1421817	1903108	1548	4988463	4319353	2392014	1683258	1074	576750	2220131

Level 1 services	Benchmark	Vodafone	Airtel	Tata Tele CDMA	Tata Tele GSM	Uninor	Etisalat	Idea	Reliance GSM	Reliance CDMA	BSNL	Videocon	MTS	Aircel
Total no. of calls made		150	150	150	150	150	150	150	150	150	150	150	150	150
Calls answered in 60 sec		150	150	150	150	150	150	150	150	150	150	150	150	150
Calls answered after 60 sec		0	0	0	0	0	0	0	0	0	0	0	0	0

Section C
BOADBAND

16.0 Sampling Methodology

16.1 Sampling for Broadband service providers

- Audits for various Broadband service providers were conducted at the service provider's central node. Since most of the private operators have a centralized system of monitoring their network data was obtained for all the Point of Presence (POPs) present in the circle.
- For BSNL, Audit was conducted at the various exchanges/POPs providing Broadband service was verified and collected. This was done in such a way that at least 5% of POPs spread across 10% of SDCA's were covered
- For BSNL, the data pertaining to network related parameters was obtained by IMRB Auditors at the central node in Bangalore.
- For VSNL, the data pertaining to network related parameters was obtained by IMRB Auditors at the central node in Pune.
- For Sify, the data pertaining to network related parameters was obtained by IMRB Auditors at the central node in Chennai.
- Following Broadband service providers were Audited in Bihar & Jharkhand circle:

	Name of Operator
Operator 1	BSNL – Bihar
Operator 2	BSNL – Jharkhand
Operator 3	Sify
Operator 4	VSNL

17.0 Audit methodology

17.1 Broadband Services

In a nutshell, the audit methodology was as follows:

	Parameters	Verification of PMR	Three day live measurement	Data Verification for one month	Live calling
(i)	Service Provisioning/ Activation time	YES	YES	YES	YES
(ii)	Fault Repair/ Restoration Time	YES	YES	YES	YES
(iii)	Billing Performance				
-	Billing Complaints per 100 Bills issued	YES	YES	YES	
-	%age of billing complaints resolved in four weeks	YES	YES	YES	YES
-	Time taken for refund of deposits after closure	YES	YES	YES	YES
(iv)	Response time to the customer for assistance(Voice to Voice)				
-	Within 60 seconds > 60%	YES	YES	YES	YES
-	Within 90 seconds > 90%	YES	YES	YES	YES
(V)	Bandwidth Utilization/ Throughput:				
▪	A)Bandwidth Utilization				
-	POP to ISP gateway Node [Intra – network] Links	YES	YES	YES	
-	ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for international connectivity	YES	YES	YES	
▪	B) Broadband Connection Speed (Download)	YES	YES	YES	YES
(vi)	Service availability / Uptime	YES	YES	YES	
(vii)	Packet Loss	YES	YES	YES	
(viii)	Network Latency for wired broadband access)				
-	User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)	YES	YES	YES	
-	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	YES	YES	YES	
-	User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)	YES	YES	YES	

18.0 Executive Summary

The objective assessment of Quality of Services (QoS) was carried out by IMRB International for all the Broadband service providers during the period starting from January to March 2012 in Bihar & Jharkhand circle.

18.1 Service provider performance report based on one month data Verification – Broadband Services

Parameters	Benchmarks	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Service provisioning uptime					
Percentage connections provided within 15 days	100%	98.92%	49.64%	100.00%	NA
Fault repair restoration time					
Percentage faults repaired by next working days	> 90%	81.91%	14.53%	54.17%	100.00%
Percentage faults repaired within three working days	> 99%	96.88%	53.18%	83.33%	100.00%
Billing performance					
Billing complaints per 100 bills issued	< 2%	0.00%	0.52%	NA	0.00%
%age of billing complaints resolved in 4 weeks	100%	NA	100.00%	NA	NA
%age cases in which refund of deposits after closure was made in 60 days	100%	NA	100.00%	NA	NA
Customer care/helpline assessment (Voice to Voice)					
Percentage calls answered within 60 seconds	> 60%	93.69%	96.89%	95.92%	73%
Percentage calls answered within 90 seconds	> 80%	95.00%	98.22%	97.18%	76.15%
Bandwidth utilization/Throughput					
Intra network links (POP to ISP Node)			279	7	4
Total number of intra network links > 90%			0	0	0
Upstream Bandwidth (ISP Node to NIXI/NAP/IGSP)			896	0	2
Percentage bandwidth utilized on upstream links	< 80%		78.41%	NA	64.94%
Broadband download speed	> 80%		85.71%	92.77%	96.00%
Service availability/uptime	> 98%		99.92%	100.00%	99.94%
Packet loss	< 1%		0.03%	0.00%	0.40%
Network Latency					
POP/ISP Node to NIXI	< 120 msec		49.61	47	39.74
ISP node to NAP port (Terrestrial)	< 350 msec		228.69	63	281.08

{*Note: For BSNL data pertains to the sample 5% of exchanges audited during the month of audit, whereas for rest of the operators figures pertain to all the exchanges present in the circle }

** 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 and Key take outs: Broadband services

The key conclusions (Parameter wise) emerging out from the Audit exercise of four Broadband service providers are highlighted below

Service provisioning/Activation time

- BSNL Jharkhand (49.64%) does not meet the TRAI benchmark of 100% connections to be provided within 15 days.
- BSNL Bihar (98.92%) marginally falls short of TRAI benchmark of 100% connections to be provided within 15 days.
- Sify was able to meet the benchmark of 100% connections to be provided within 15 days for audit results and live calling.
- VSNL provides connection only for corporate and in the month of audits no new connection was issued. Hence, the benchmark was not applicable for VSNL.

Fault Repair/Restoration time

- BSNL Bihar (81.91%), BSNL Jharkhand (14.53%) and Sify (54.17%) are falling below the benchmarks for fault repair within next working day
- The above three operators are also not meeting the benchmark for 99% faults repaired within 3 days during the month.
- For fault repair within three working days all operators are meeting the TRAI specified benchmark of 99%

Billing performance

- All the service providers were found to be meeting the benchmark of percentage billings complaints received and time taken for resolution of billing complaints for the month in which data was collected. Sify however claim that all its retail broadband customers are prepaid and hence there are no billing complaints for Sify.
- However, during Live Calling it was found that BSNL Jharkhand was falling short of the benchmark set for resolution of cases in 4 weeks,

Customer Care/Helpline Assessment

- All operators meet the TRAI specified benchmark for calls answered by the operator in 60 seconds for the month in which audit was carried out.
- All operators except VSNL meet the benchmark for calls answered by the operator in 90 seconds for the month in which audit was carried out.

Bandwidth Utilization:

- All the service providers were found to be using Multiple Router Traffic Grapher (MRTG) to measure the bandwidth utilization at intra network links.
- All the service providers were found to be reporting combined bandwidth utilization for corporate and household customers as there is no mechanism available to provide it separately for different users.
- For Intra network link, data for Sify, BSNL and VSNL (TATA Communications) was obtained on all India bases. None of the links tested for these operators was found to be having above 90% bandwidth utilization for the month in which audit was carried out

- Also It was observed that all the links (tested during three day live measurement) in the access segment for most of the service providers were found be below 90%.
- For Bandwidth utilization on upstream links (From ISP Node to IGSP/NIXI), BSNL Bihar and BSNL Jharkhand does not meet the TRAI specified benchmark for Percentage Bandwidth utilization during peak hours (In mpbs).

Download speed

- During live measurements carried out at Pop's/ISP Node it was observed that all the operators are meeting the TRAI prescribed benchmark of greater than 80% speed available to the customer. These measurements were carried out by IMRB auditors on a sample basis during visits at PoPs and ISP Node

Service Availability/Uptime:

- All the service providers are meeting the benchmark on service availability/uptime for the month in which audit was carried out.

Packet Loss and Network Latency

- It was observed that all the service providers are measuring packet loss and latency by conducting random ping tests for their internal performance measurement. It should be noted that the network related data for BSNL for verification was obtained from their central node in Bangalore.
- However, ping tests conducted/smoked ping results during live measurements revealed that all the service providers are meeting the benchmark prescribed by TRAI.

Summary of Live Measurement Results – Broadband Services

Parameters	Benchmarks	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Bandwidth utilization/Throughput					
Intra network links (POP to ISP Node)		279	7	4	
Total number of intra network links > 90%		0	0	0	
Upstream Bandwidth (ISP Node to NIXI/NAP/IGSP)		960	0	2	
Percentage bandwidth utilized on upstream links	< 80%	81.82%	NA	58.50%	
Broadband download speed	> 80%	84.29%	94.14%	95.20%	
Service availability/uptime	> 98%	99.91%	100.00%	100.00%	
Packet loss	< 1%	0.01%	0.00%	0.12%	
Network Latency					
POP/ISP Node to NIXI	< 120 msec	36.9	40	41	
ISP node to NAP port (Terrestrial)	< 350 msec	235.53	45	299	

- All the service providers are meeting the benchmark on service availability/uptime for three day live measurements.
- For percentage Bandwidth utilization on upstream links, BSNL Bihar and BSNL Jharkhand are not meeting the benchmark during the three day live measurement and have excess capacities available on their upstream links.
- For network latency all the service providers comfortably meet the TRAI specified benchmark for ping tests carried out during live measurements.

Summary of Live Calling Results – Broadband Services

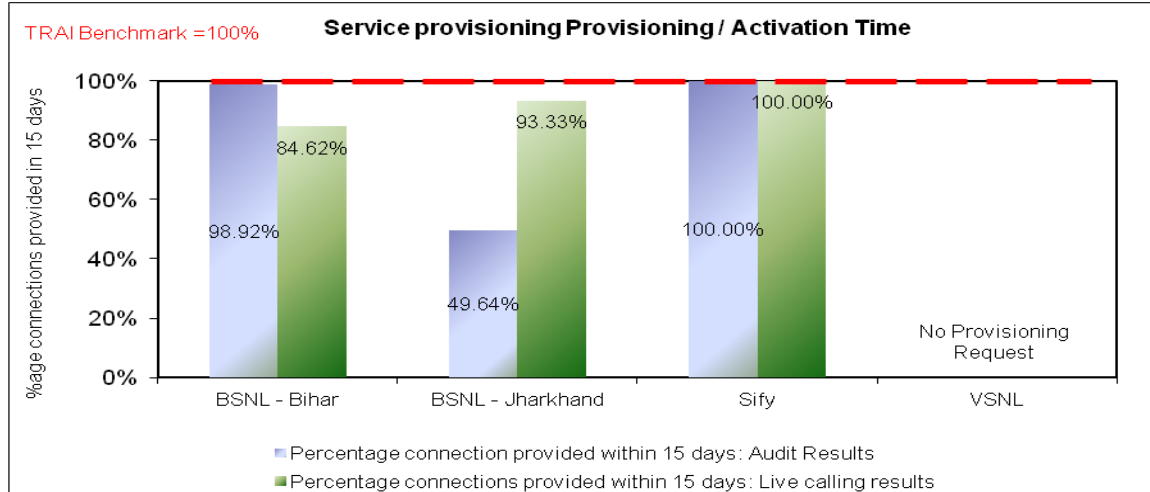
Parameters	Benchmarks	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Service provisioning uptime					
Percentage connections provided within 15 days	100%	84.62%	93.33%	100.00%	NA
Fault repair restoration time					
Percentage faults repaired by next working days	> 90%	16.05%	67.46%	90.00%	100.00%
Percentage faults repaired within three working days	> 99%	58.02%	74.60%	100.00%	100.00%
Billing performance					
%age of billing complaints resolved in 4 weeks	100%	NA	94.00%	NA	NA
Customer care/helpline assessment (Voice to Voice)					
Percentage calls answered within 60 seconds	> 60%	100.00%	100.00%	100.00%	100.00%
Percentage calls answered within 90 seconds	> 80%	100.00%	100.00%	100.00%	100.00%

- BSNL (Bihar & Jharkhand) are not meeting the benchmark for service provisioning and fault repair parameter during live calling
- BSNL Jharkhand is also not meeting benchmark for 100% billing complaints resolved during 4 weeks

19.0 Detailed findings – Includes comparison between Live calling/Live measurements and One month data collection for Broadband Services

19.1 Graphical/Tabular Representations for Broadband services

Service provisioning / Activation time (Comparison between one month audit results and live calling results)



One month

Operator meeting benchmark: Sify

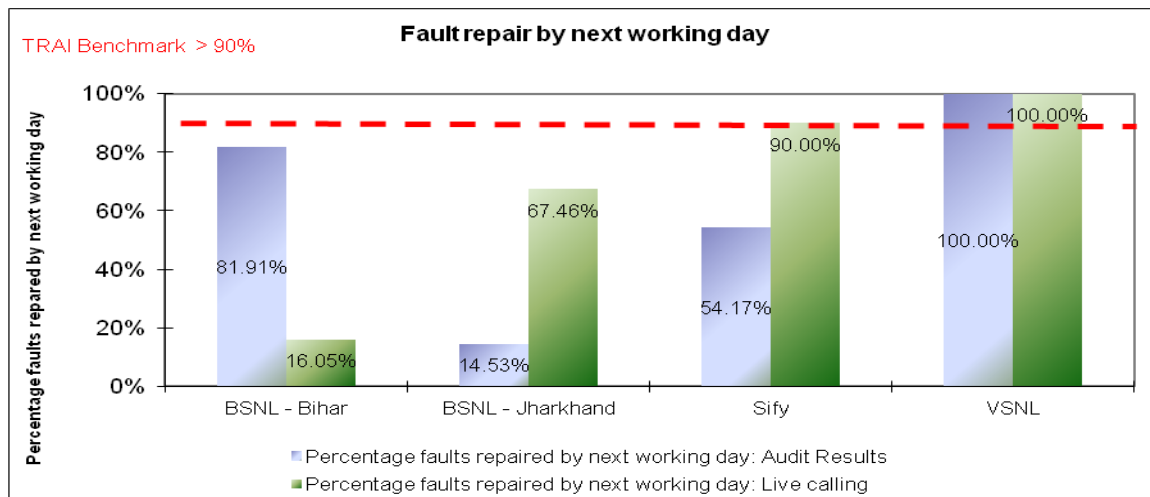
Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Live calling

Operator meeting benchmark: Sify

Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Fault repair/Restoration time (By next working day) - Comparison between one month audit results and live calling results



One month

Operator meeting benchmark: VSNL

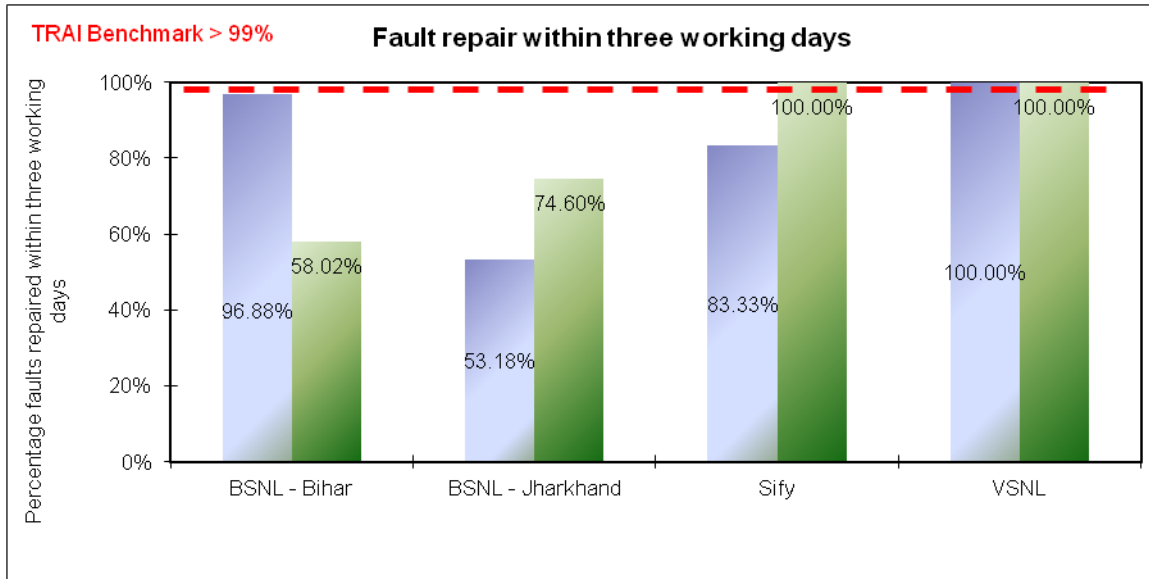
Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand, Sify

Live calling

Operator meeting benchmark: VSNL

Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand, Sify

Fault repair/Restoration time within three working days (Comparison between one month audit results and live calling results)



One month

Operator meeting benchmark: VSNL

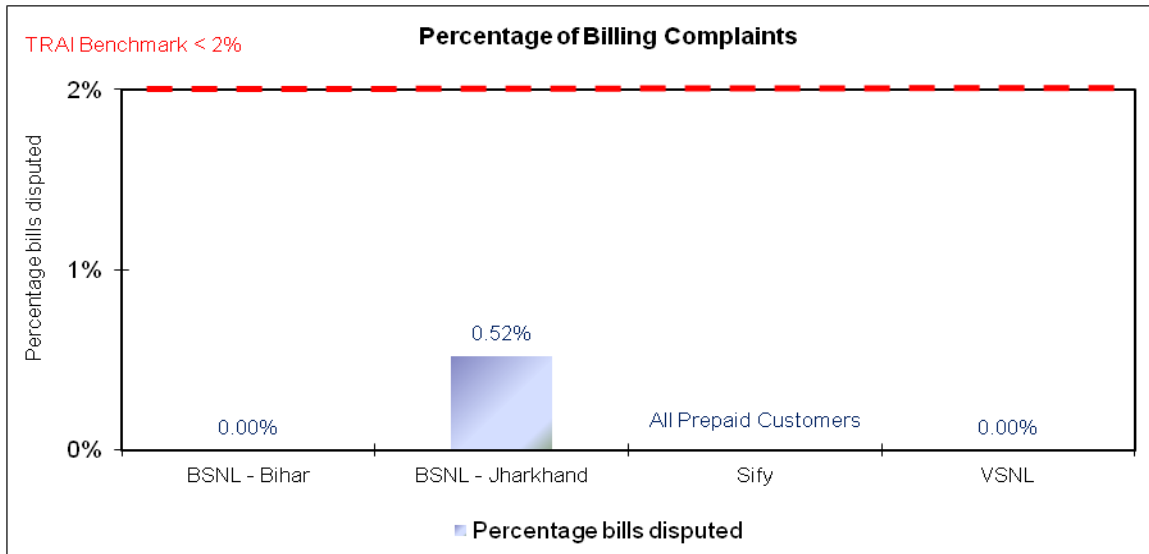
Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand, Sify

Live calling

Operator meeting benchmark: Sify, VSNL

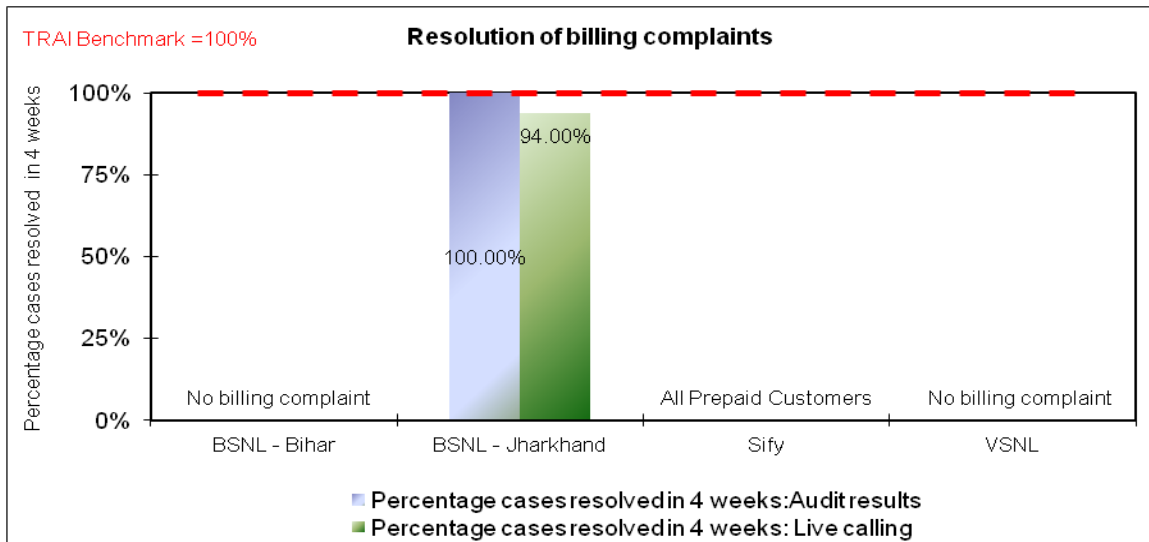
Operator not meeting benchmark: BSNL - Bihar, BSNL - Jharkhand

Percentage bills disputed



All operators are meeting the benchmark

Resolution of billing complaints (Comparison between one month audit results and live calling results)



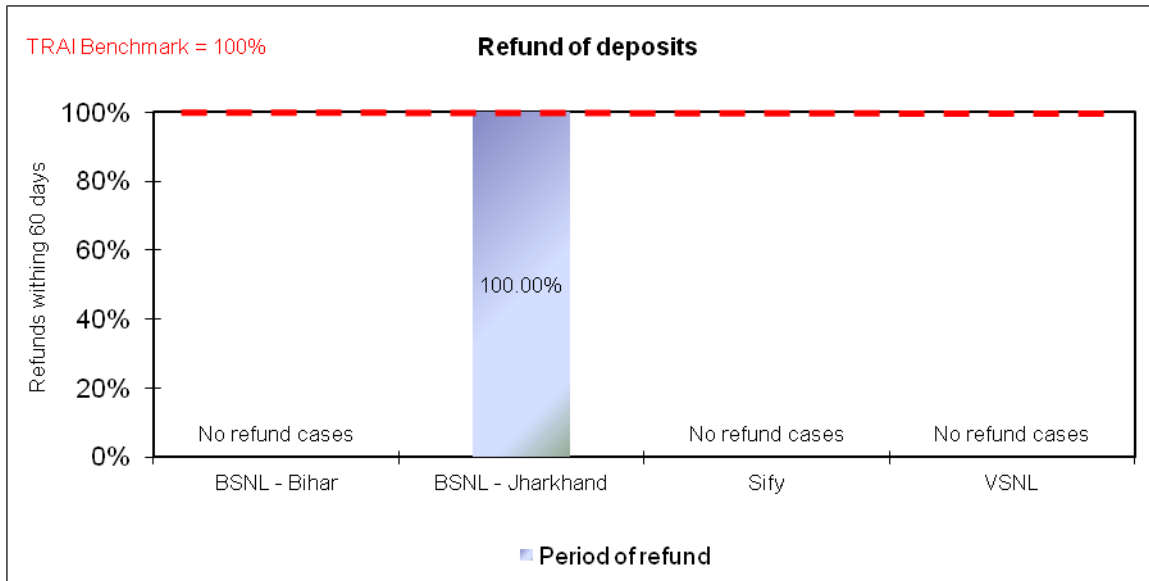
One month

All operators are meeting the benchmark

Live calling

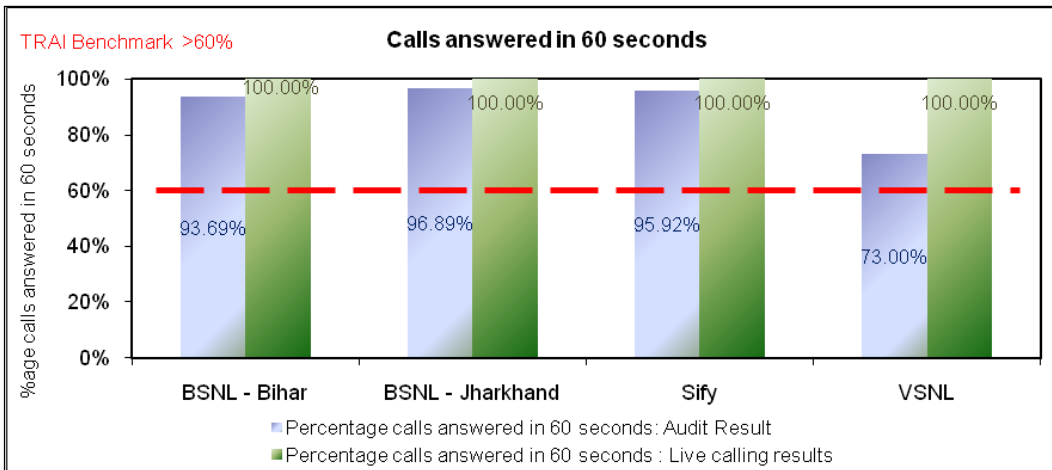
No operator is meeting the benchmark

Refund of deposits after closure



All operators are meeting the benchmark

Response time to customer for assistance - Calls answered by the operator within 60 seconds (Comparison between one month audit results and live calling results)



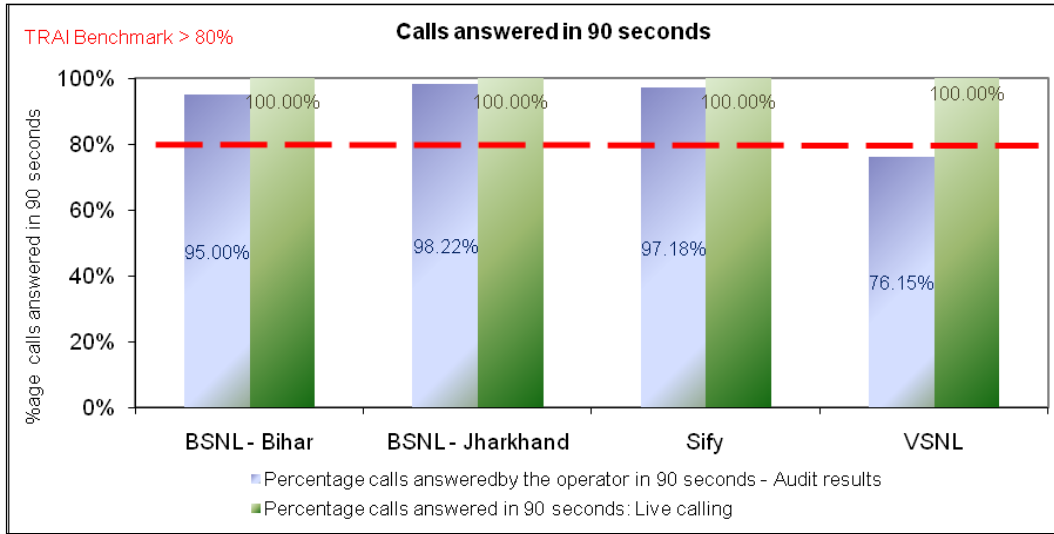
One month

All operators are meeting the benchmark

Live calling

All operators are meeting the benchmark

Response time to customer for assistance - Calls answered by the operator within 90 seconds (Comparison between one month audit results and live calling results)



One month

Operator meeting benchmark: BSNL - Bihar, BSNL - Jharkhand, Sify

Operator not meeting benchmark: VSNL

Live calling

All operators are meeting the benchmark

Bandwidth utilization at Intra network links (Comparison between one month audit results and live measurement results)

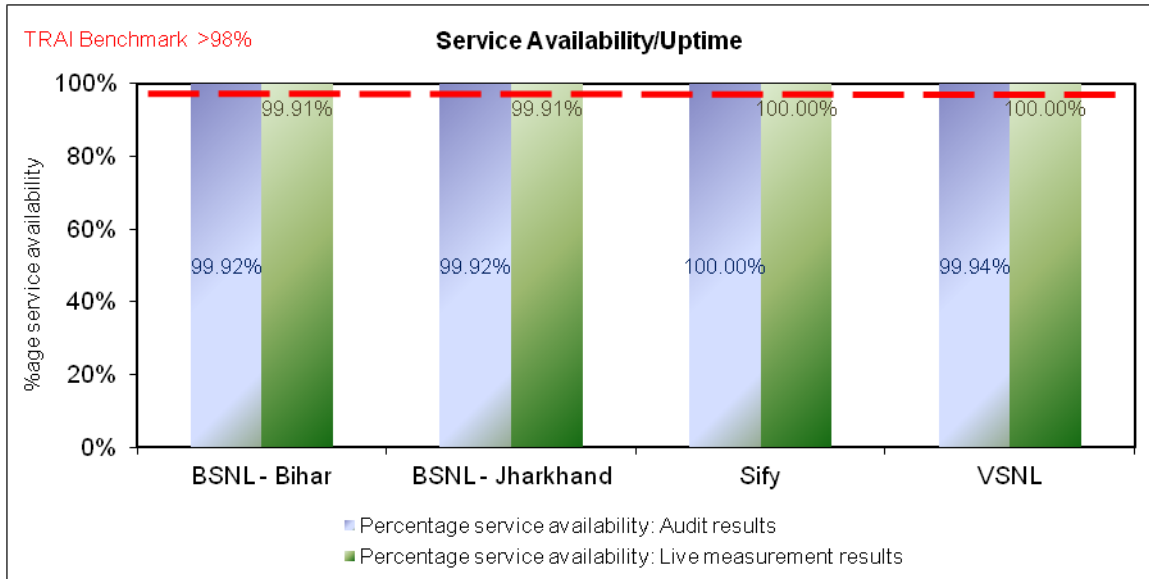
Bandwidth Utilization (One month)	B'mark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total number of intra network links		279	279	7	4
No of Intra network found to be above 90%		0	0	0	0

Bandwidth Utilization (Live measurement)	B'mark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total number of intra network links		279	279	7	4
No of Intra network found to be above 90%		0	0	0	0

Broadband download speed	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total committed download speed to the sample subscribers (In mpbs) (A)		1.4	1.4	0.0273	1
Total average download speed observed during TCBH (In Mpbs) (B)		1.18	1.18	0.0257	0.952
%age subscribed speed available to the subscriber during TCBH (B/A)*100	>80%	84.29%	84.29%	94.14%	95.20%

As far as bandwidth utilization on the intra network links is concerned all the operators seem to performing well as all the sample intra network links (Access segment) tested during live measurement were found to be below 90%.

Service availability/Uptime (Comparison between one month audit results and live measurement results)



One month

All operators are meeting the benchmark

Live calling

All operators are meeting the benchmark

20.0 Compliance reports: Results of Verification of Records

20.1 Broadband services

Parameters	Benchmarks	BSNL – Bihar		BSNL - Jharkhand		Sify		VSNL	
		PMR	IMRB*	PMR	IMRB*	PMR	IMRB	PMR	IMRB
Service provisioning uptime									
Percentage connections provided within 15 days	100%	100.00 %	98.69%	100.00 %	67.39%	99.71%	99.71%	NA	NA
Fault repair restoration time									
Percentage faults repaired by next working days	> 90%	91.40%	73.53%	94.00%	18.36%	89.30%	89.30%	94.00%	94.00%
Percentage faults repaired within three working days	> 99%	99.30%	90.34%	100.00 %	77.46%	98.02%	98.02%	96.00%	96.00%
Billing performance									
Billing complaints per 100 bills issued	< 2%	0.10%	0.00%	0.30%	0.75%	0.00%	0.00%	NA	NA
%age of billing complaints resolved in 4 weeks	100%	100.00 %	100.00 %	100.00 %	99.88%	NA	NA	NA	NA
%age cases in which refund of deposits after closure was made in 60 days	100%	100.00 %	100.00 %	100.00 %	100.00 %	NA	NA	NA	NA
Customer care/helpline assessment (Voice to Voice)									
Percentage calls answered within 60 seconds	> 60%	100.00 %	100.00 %	82.90%	82.90%	93.56%	93.56%	93.10%	93.10%
Percentage calls answered within 90 seconds	> 80%	100.00 %	100.00 %	91.90%	91.90%	95.67%	95.67%	94.46%	94.46%
Bandwidth utilization/Throughput									
Intra network links (POP to ISP Node)		0	0	0	0	0	0	0	0
Total number of intra network links > 90%		0	0	0	0	0	0	0	0
Upstream Bandwidth (ISP Node to NIXI/NAP/IGSP)		0	0	0	0	DNA	DNA	0	0
Percentage bandwidth utilized on upstream links	< 90%	75.10%	75.10%	75.10%	75.10%	84.19%	84.19%	45.43%	45.43%
Broadband download speed	> 80%	87.90%	87.90%	15.00%	99.12%	96.55%	96.55%	91.85%	91.85%
Service availability/uptime	> 98%	99.90%	99.90%	99.30%	99.30%	100.00 %	100.00 %	100.00 %	100.00 %
Packet loss	< 1%	0.04%	0.04%	0.04%	0.04%	0.00%	0.00%	0.54%	0.54%
Network Latency									
POP/ISP Node to NIXI (in msec)	< 120 msec	25	25	25	25	42	42	50	50
ISP node to NAP port (Terrestrial) (in msec)	< 350 msec	230.3	230.3	230.3	230.3	242	242	269	269

* These have been calculated cumulatively on the basis of figures reported by various exchanges



Figures do not match with those reported in PMR

Not meeting the benchmark

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

20.2 Conclusions

Broadband services

1. Complete data for Sify and network data for BSNL and VSNL was verified on an all India level
2. For BSNL Bihar and BSNL Jharkhand there is slight variation observed in for some parameters when compared to the figures reported in PMR. But the reason is largely the fact that data was obtained for sample 5% of exchanges whereas reporting is done for 100% of exchanges.
3. Percentage faults repaired within three working days was not met by all the operators. Also, only VSNL was able to meet the benchmark for percentage faults repaired by next working day.
4. Sify was not meeting the benchmark for percentage bandwidth utilized on upstream links.

21.0 Annexure - I

21.1 Parameter wise performance reports for Broadband services

1. Service Provisioning

1.1 Audit Results for Service provisioning					
	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total connections registered during the period		93	274	108	0
Number of connections provided within 15 days		92	136	108	0
Percentage of connections provided within 15 days	100%	98.92%	49.64%	100.00%	NA
Number of connections provided after 15 days of registration of demand		1	138	0	0
Number of customers to whom credit is given for delayed connections		1	138	0	0
Percentage of customers to whom credit is given for delayed connections	100%	100.00%	100.00%	NA	NA

1.2 Live calling for Service provisioning					
	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total connections registered during the period		39	30	30	0
Number of connections provided within 15 days		33	28	30	0
Percentage of connections provided within 15 days	100%	84.62%	93.33%	100.00%	NA

2. Fault Incidence / Clearance Statistics

2.1 Audit Results for Fault repair					
Fault repair	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total No. of faults registered during the month		481	1149	24	7
No. of faults repaired by next working day during the month		394	167	13	7
Percentage of faults repaired by next working day during the month	> 90%	81.91%	14.53%	54.17%	100.00%
No. of faults repaired within 3 days during the month		466	611	20	7
Percentage of faults repaired within 3 days during the month	>99%	96.88%	53.18%	83.33%	100.00%

Rent rebate	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
No. of cases with faults pending for >3 days and ≤7 days		6	538	4	0
Out of these number of cases where rent rebate for 7 days was given		6	538	4	0
Percentage of cases where rent rebate for 7 days was given	100%	100.00%	100.00%	100.00%	NA
No. of cases with faults pending for >7 days and ≤15 days		5	0	0	0
Out of these number of cases where rent rebate for 15 days was given		5	0	0	0
Percentage of cases where rent rebate for 15 days was given	100%	100.00%	NA	NA	NA
No. of cases with faults pending for ≥15 days		4	0	0	0
Out of these number of cases where rent rebate for 30 days was given		4	0	0	0
Percentage of cases where rent rebate for 30 days was given	100%	100.00%	NA	NA	NA

2.2 Live calling for fault repair

Fault repair	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Number of calls made		81	126	20	7
Number of cases where faults were repaired by next working day		13	85	18	7
Percentage cases where faults were repaired by next working day	> 90%	16.05%	67.46%	90.00%	100.00%
Number of cases where faults were repaired within 3 days		47	94	20	7
Percentage cases where faults were repaired within 3 days	>99%	58.02%	74.60%	100.00%	100.00%

3. Billing performance

3.1 Audit Results for Billing performance

Billing Performance	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Billing disputes					
Total bills generated during the period		31102	38136	0	34
Total number of bills disputed		0	199	0	0
Percentage bills disputed	< 2%	0.00%	0.52%	NA	0.00%
Resolution of billing complaints					
Total number of complaints		0	197	0	0
Total complaints resolved in 4 weeks from date of receipt		0	197	0	0
Percentage complaints resolved within 4 weeks of date of receipt	100%	NA	100.00%	NA	NA
Period of refund					
Total number of cases requiring refund		0	2	0	0
Total number of cases where credit/waiver was made within 60 days		0	2	0	0
Percentage cases in which credit/waiver was received within 60 days	100%	NA	100.00%	NA	NA

3.2 Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Number of calls made		0	100	0	0
Number of cases resolved in 4 weeks		0	94	0	0
Percentage cases resolved in 4 weeks	100%	NA	94.00%	NA	NA

4. Response time to the customer for assistance

4.1 Audit results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Number of calls received		13268	225	18319	214019
Total Number of calls answered within 60 seconds		12431	218	17572	162986
Percentage calls answered within 60 seconds	> 60%	93.69%	96.89%	95.92%	76.15%

4.2 Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Number of calls received		100	100	100	100
Total Number of calls answered within 60 seconds		100	100	100	100

Percentage calls answered within 60 seconds	> 60%	100.00%	100.00%	100.00%	100.00%
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4.3 Audit results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Number of calls received		13268	225	18319	214019
Total Number of calls answered within 90 seconds		12605	221	17802	124601
Percentage calls answered within 90 seconds	> 80%	95.00%	98.22%	97.18%	76.00%

4.4 Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Number of calls received		100	100	100	100
Total Number of calls answered within 90 seconds		100	100	100	100
Percentage calls answered within 90 seconds	> 80%	100.00%	100.00%	100.00%	100.00%

5. Bandwidth utilization

5.1 Audit results for Bandwidth Utilization

Bandwidth utilization	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Intra-network links (POP to ISP Node)					
Total number of intra network links		279	279	7	4
No of Intra network found to be above 90%		0	0	0	0
International Bandwidth					
Total number of upstream links		896	896	0	2
Total International Bandwidth available from ISP Node to IGSP/NIXI/NAP (In mpbs)		138880	138880	0	2048
Total International Bandwidth utilized during peak hours		108902	108902	0	1330
Percentage Bandwidth utilization during peak hours (In mpbs)	<80%	78.41%	78.41%	NA	64.94%
No of Intra network found to be above 90%		0	0	0	0

5.2 Live measurement results for Bandwidth Utilization

Bandwidth utilization	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Intra-network links (POP to ISP Node)					
Total number of intra network links		279	279	7	4
No of Intra network found to be above 90%		0	0	0	0
International Bandwidth					
Total number of upstream links		960	960	0	2
Total International Bandwidth available from ISP Node to IGSP/NIXI/NAP (In mpbs)		148800	148800	0	2048
Total International Bandwidth utilized during peak hours		121749	121749	0	1198.08
Percentage Bandwidth utilization during peak hours (In mpbs)	<80%	81.82%	81.82%	NA	58.50%
No of Intra network found to be above 90%		0	0	0	0

6. Broadband download speed

6.2 Live measurement results for broadband download speed					
Broadband download speed	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total committed download speed to the sample subscribers (In mpbs) (A)		1.4	1.4	0.0273	1
Total average download speed observed during TCBH (In Mpbs) (B)		1.18	1.18	0.0257	0.952
%age subscribed speed available to the subscriber during TCBH (B/A)*100	>80%	84.29%	84.29%	94.14%	95.20%

7. Service availability/uptime

7.1 Audit results for service availability					
Service Availability	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Operational Hours		122016	122016	744	30504
Total Downtime		97	97	0	18.35
Total time when the service was available		121919	121919	744	30485.65
Service Availability Uptime in Percentage	>98%	99.92%	99.92%	100.00%	99.94%

7.2 Live measurement results for service availability					
Service Availability	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Total Operational Hours		11808	11808	24	3888
Total Downtime		10.42	10.42	0	0
Total time when the service was available		11797.58	11797.58	24	3888
Service Availability Uptime in Percentage	>98%	99.91%	99.91%	100.00%	100.00%

8. Network latency / Packet loss

8.1 Audit results for Latency and packet loss					
Network Latency and Packet Loss	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Packet Loss (Percentage)	< 1%	0.03%	0.03%	0.00%	0.40%
Network Latency					
From user reference point at POP/ISP Node to IGSP/ NIXI (msec)	<120msec	49.61	49.61	47	39.74
From user reference point at ISP Gateway Node to nearest NAP Port (Terrestrial) (In msec)	<350msec	228.69	228.69	63	281.08

8.2 Live measurement results for Latency and packet loss					
Network Latency and Packet Loss	Benchmark	BSNL - Bihar	BSNL - Jharkhand	Sify	VSNL
Packet Loss (Percentage)	< 1%	0.01%	0.01%	0.00%	0.12%
Network Latency					
From user reference point at POP/ISP Node to IGSP/ NIXI (msec)	<120msec	36.9	36.9	40	41
From user reference point at ISP Gateway Node to nearest NAP Port (Terrestrial) (In msec)	<350msec	235.53	235.53	45	299
