EAST ZONE

TRAI AUDIT WIRELESS REPORT-WEST BENGAL CIRCLE- OND QUARTER, 2013

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2   INTRODUCTION

2.1   ABOUT TRAI

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

In pursuance of above objective, TRAI has been issuing regulations, order and directives to deal with the issues or complaints raised by the operators as well as the consumers. These regulations, order and directives have helped the nurture the growth of multi operator multi service- an open competitive market from a government owned monopoly. Also, the directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection and quality of service as well as governance of the Authority.

TRAI initiated a regulation- The Standard of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service regulations, 2009 (7 of 2009) dated the March 20, 2009 and Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated the October 6, 2006 provide for benchmarks for the parameters on customer perception of service to be achieved by service provider.

In order to assess the above regulations TRAI has commissioned a third party agency to conduct the audit of the service providers and check the performance of the operators on the various benchmarks set by Telecom Regulatory Authority of India (TRAI).

2.2   OBJECTIVES

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).

2.3   FRAMEWORK USED
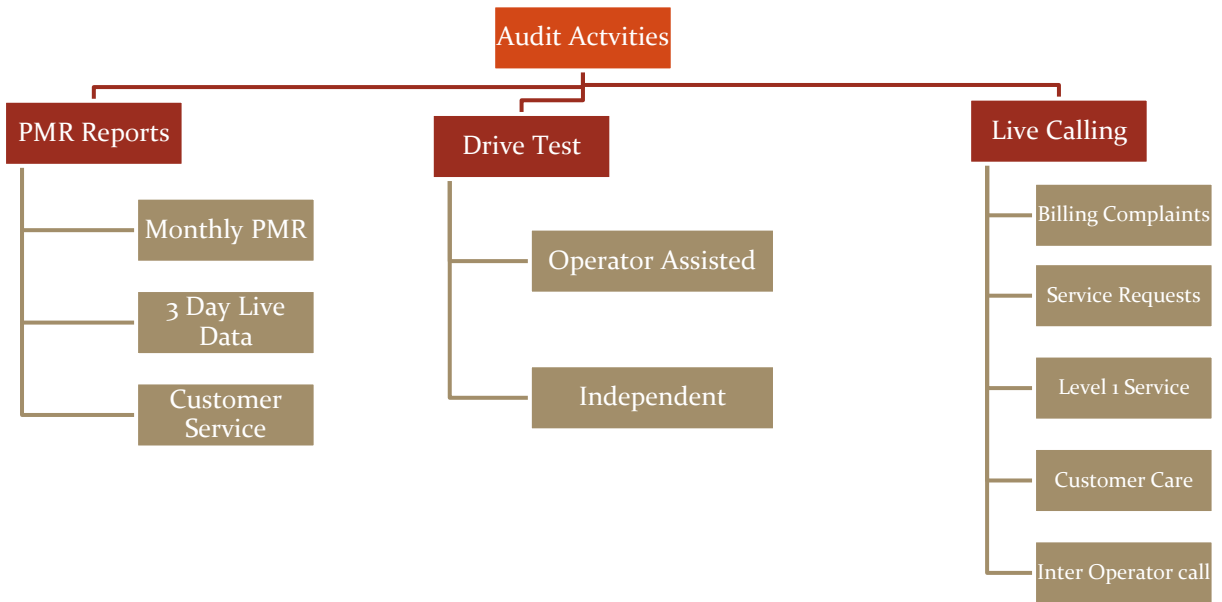
Let's discuss each of the activity in detail and the methodology adopted for each of the module-

2.3.1   PMR REPORTS

2.3.1.1   MONTHLY PMR

This involved calculation of the various Quality of Service parameters through monthly Performance Monitoring Reports (PMR's). The PMR reports were extracted and collected from operators every month. The performance of operators on various parameters was assessed against the benchmarks. Parameters include-

Network Availability

- BTS accumulated downtime
- Worst affected BTS due to downtime

Connection Establishment (Accessibility)

- Call Set Up success Rate (CSSR)

Network Congestion Parameters

- SDCCH/Paging Channel Congestion
- TCH Congestion
- Point of Interconnection

Connection Maintenance

- Call Drop rate
- Worst affected cells having more than 3% TCH drop

Voice Quality

- % Connections with good voice quality

Let's look at each of the parameter in detail and how the value is calculated-

Network Availability

- ➲ The parameter of network availability would be measured from following sub-parameters

  - ✎ BTSs Accumulated downtime (not available for service)

  - ✎ Worst affected BTSs due to downtime

  BTSs accumulated downtime (not available for service) shall basically measure the downtime of the BTSs, including its transmission links/circuits during the period of a month, but excludes all planned service downtime for any maintenance or software upgradation.

  - ✎ TRAI Benchmark –

    a. BTSs Accumulated downtime (not available for service) ≤ 2%

    b. Worst affected BTSs due to downtime ≤ 2%

Connection Establishment (Accessibility)

⊃ Definition: The ratio of calls established to total calls is known Call Set-Up Success Rate (CSSR).

⊃ Call Established means the following events have happened in call setup:-

    ↳ call attempt is made

    ↳ the TCH is allocated

    ↳ the call is routed to the outward path of the concerned MSC

⊃ Computational Methodology: Calls Established / Total Call Attempts * 100

⊃ TRAI Benchmark: > 95%

Network Congestion Parameters

⊃ Definition: It means a call is not connected because there is no free channel to serve the call attempt. This parameter represents congestion in the network. It happens at three levels:

    ↳ SDCCH Level: Stand-alone dedicated control channel

    ↳ TCH Level: Traffic Channel

    ↳ POI Level: Point of Interconnect

⊃ Computational Methodology:

    ↳ **SDCCH / TCH Congestion% = $[(A_1 \times C_1) + (A_2 \times C_2) + \ldots + (A_n \times C_n)] / (A_1 + A_2 + \ldots + A_n)$**

- Where:-A_1 = Number of attempts to establish SDCCH / TCH made on day 1

- C_1 = Average SDCCH / TCH Congestion % on day 1

- A_2 = Number of attempts to establish SDCCH / TCH made on day 2

- C_2 = Average SDCCH / TCH Congestion % on day 2

- A_n = Number of attempts to establish SDCCH / TCH made on day n

- C_n = Average SDCCH / TCH Congestion % on day n

    ↳ **POI Congestion% = $[(A_1 \times C_1) + (A_2 \times C_2) + \ldots + (A_n \times C_n)] / (A_1 + A_2 + \ldots + A_n)$**

- Where:-A_1 = POI traffic offered on all POIs (no. of calls) on day 1

- C_1 = Average POI Congestion % on day 1

- A2 = POI traffic offered on all POIs (no. of calls) on day 2

- C2 = Average POI Congestion % on day 2

- An = POI traffic offered on all POIs (no. of calls) on day n

- Cn = Average POI Congestion % on day n

➲ Benchmark:

  ↳ **SDCCH Congestion: < 1%**

  ↳ **TCH Congestion: < 2%**

  ↳ **POI Congestion: < 0.5%**

Connection Maintenance

➲ The following parameter would be further sub-divided into Call drop rate and Worst affected cells

➲ The dropped call rate is the ratio of successfully originated calls that were found to drop to the total number of successfully originated calls that were correctly released

  ↳ **Total calls dropped** = All calls ceasing unnaturally i.e. due to handover or due to radio loss

  ↳ **Total calls established** = All calls that have TCH allocation during busy hour

➲ Computational Methodology: Total Calls Dropped / Total Calls Established x 100

➲ TRAI Benchmark –

  ↳ Call drop rate ≤ 2%

  ↳ Worst affected cells having more than 3% TCH drop rate ≤ 5%

Voice Quality

➲ Definition:

  ↳ for GSM service providers the calls having a value of 0 – 4 are considered to be of good quality (on a seven point scale)

  ↳ For CDMA the measure of voice quality is Frame Error Rate (FER). FER is the probability that a transmitted frame will be received incorrectly. Good voice quality of a call is considered when it FER value lies between 0 – 4 %

➲ Computational Methodology:

    ↳ **% Connections with good voice quality** = (No. of voice samples with good voice quality / Total number of samples) x 100

➲ TRAI Benchmark: > 95%

2.3.1.2   3 DAY LIVE DATA

Network related parameters were evaluated for a period of 3 days in each month. 3 day live audit was conducted for 3 consecutive weekdays for each month. The data was extracted from eachoperator's server at the end of the 3rd day. The extracted data was analyzed to assess the various QoS parameters.

2.3.1.3   CUSTOMER SERVICE PARAMETERS

The Customer Service Quality Parameters include metering and billing credibility (postpaid and prepaid), resolution of billing/charging complaints, period of applying credit/waiver/adjustment to customer's account, response time to the customer for assistance, termination/closure of service and time taken for refund of security deposit after closures. All the customer service parameters were calculated on the quarterly basis-

Let's look at each of the parameter one by one -

Metering and Billing Credibility

➲ Billing complaints includes any of the following complaints related to billing from the point of view of customer:

    ↳ Local call charges billed as STD/ISD or vice-versa

    ↳ Toll free numbers charged

    ↳ Wrong roaming charges

    ↳ Call made/received disputed

    ↳ Wrongly charged extra for some service (SIM replacement charged twice, service not used but charged etc.)

↳ Cheque submitted on time but charged penalty for paying beyond due date (in case customer is not at fault i.e. all those that operator cannot prove that he/she is not lying)

↳ Payment made but not reflected (may be wrongly adjusted to another customer etc.)

⊃ Computational Methodology:

↳ **Billing complaints per 100 bills issued** = Total billing complaints** received during the relevant quarter / Total bills generated* during the relevant quarter

↳ *Operator to include all types of bills generated for customers. This would include printed bills, online bills and any other forms of bills generated

↳ **Billing complaints here shall include only dispute related issues (including those that may arise because of a lack of awareness at the subscribers' end). It does not include any provisional issues (such as delayed dispatch of billing statements, etc.) in which the operator has opened a ticket internally.

⊃ TRAI Benchmark: < 0.1%

⊃ Audit Procedure:

↳ Audit of billing complaint details for the complaints received during the quarter and used for arriving at the benchmark reported to TRAI would be conducted

Resolution of billing/charging complaints

⊃ Computational Methodology:

↳ **%age of billing complaints resolved within 4 weeks**=(Complaints resolved*** in 4 weeks from date of receipt / Total billing complaints** received during the period 2008) x 100

↳ **Billing complaints here shall include only dispute related issues (including those that may arise because of a lack of awareness at the subscribers' end). It does not include any provisional issues (such as delayed dispatch of billing statements, etc.) in which the operator has opened a ticket internally.

↳ *** Date of resolution in this case would refer to the date when a communication has taken place from the operator's end to inform the complainant about the final resolution of the issue / dispute.

⊃ TRAI Benchmark: 100% within 4 weeks

- ⮑ Audit Procedure:

    - ↳ Audit of ratio of billing complaints resolved to total complaints received during the quarter used for reporting the benchmark to TRAI would be conducted. At the same time we would also conduct random live back checks of complaints.

Period of refunds / payments due to customers

- ⮑ Computational Methodology:

    - ↳ **Period of all refunds = Maximum value of 'Time taken to refund'**

    - ↳ Where:-Time taken to refund = Date of refund – date of lodging complaint.

- ⮑ TRAI Benchmark:

    - ↳ Termination/Closure of Service: <=7 days

    - ↳ Time taken for refund for deposit after closures: 100% within 60 days

- ⮑ Audit Procedure:

    - ↳ Audit of refund details and complaints (only those resulting in refunds) resolution details used for arriving at the figures reported to TRAI to be conducted.

    - ↳ Operator to provide details of:-

        - ‣ <u>Dates of lodging</u> of all billing complaints resolved in favour of customer and resulting in requirement of a refund by the operator

        - ‣ <u>Dates of refund</u> pertaining to all billing complaints received during the relevant quarter

    - ↳ Also random live checks of all subscribers entitled for refund would be conducted

2.3.2 DRIVE TEST

A total of 9 cities were selected and audited in each quarter, 3 cities each month. Cities were selected on the basis of population. In each licensed service area drive test in three cities, having high population, medium population and low population. The methodology adopted for the drive test-

- ↳ The drive test covered selected cities and adjoining towns/rural areas where the service provider has commenced service, including congested areas and indoor sites.

- ✎ The drive test covered the routes including expressways, major and secondary roads/streets, Commercial, residential areas/Commercials estates to check the in-building network performance.

- ✎ The drive test of each mobile network was conducted between 10 am and 8 pm on weekdays.

- ✎ The Vehicle used in the drive tests was equipped with the test tool that automatically generates calls on the mobile telephone networks.

- ✎ The speed of the vehicle was kept at around 30-50km/hour (around 30 km/hr in case of geographically small cities)

- ✎ The holding period of each test call was 120 seconds.

- ✎ A test call was generated 10 seconds after the previous test call is completed.

- ✎ Height of the antenna was kept uniform in case of all service providers.

The parameters which were captured during the drive test include-

- ✎ Coverage-Signal strength
- ✎ Voice quality
- ✎ Call setup success rate
- ✎ Blocked calls
- ✎ Call drop rate

2.3.3 LIVE CALLING

2.3.3.1   BILLING COMPLAINTS

All the complaints booked were treated as the total population for selection of samples. From the population a sample of 100 calls was taken. Telephonic Interviews were done with 100 subscribers per service provider for each service in a licensed service area

TRAI benchmark-

% of complaints resolved in 4 weeks – 100%

Metering and billing credibility–Post Paid- Not more than 0.1% of bills issued should be disputed over a billing cycle

Metering and billing credibility –- Prepaid - Not more than 1 complaint per 1000 customers i.e. 0.1% complaints for metering, charging, credit, and validity

Resolution of billing/ charging complaints - 100% within 4 weeks

2.3.3.2   SERVICE COMPLAINTS REQUESTS

"Service request" means a request made to a service provider by its consumer pertaining to his account, and includes-

- A request for change of tariff plan;
- A request for activation or deactivation of a value added service or a supplementary service or a special pack;
- A request for activation of any service available on the service provider's network;
- A request for shift or closure or termination of service or for billing details;

All the complaints other than billing were covered. A total of 100 calls per service provider for each service in licensed service area were done by the IMRB auditors.

2.3.3.3   LEVEL 1 SERVICE

Level 1 Services include services such as police, fire, ambulance (Emergency services) Test calls were made from all the levels working in a particular SDCA visited. Total sample size (150 per license service area per service per quarter) was equally distributed among the different SDCAs visited, and the distribution among the active levels would be in proportion to the capacity of each level in that SDCA.

2.3.3.4   CUSTOMER CARE

Overall sample size is 2*50 calls per service provider per circle at different points of time, to be evenly distributed across the selected exchanges – 50 calls between 10:00 HRS to 13:00 HRS and 50 calls between 15:00 HRS to 17:00 HRS.

The time taken to answer the call through IVR and Customer Care is recorded by the audit agency.

TRAI Benchmark- Response time to the customer for assistance:
(a) Accessibility of call center/customer care/IVR>= 95%
(b) % age of calls answered by the operator (voice to voice): within 60 seconds = 90%

2.3.3.5   INTER OPERATOR CALL ASSESEMENT

A total of 100 calls per service provider to all the other service providers in a licensed service area were done for the purpose of audit.

2.4   OPERATORS COVERED

Operator	Number of Subscriber as per VLR
Aircel(DWL)	2540573
Airtel	9695888
BSNL	1470030

	Idea	2683700
13	MTS	1256781
	Reliance CDMA	928876
	Reliance GSM	6119759
	TATA CDMA	11367
	TATA GSM	5213.88
	Vodafone	12036372

Not meeting the benchmark

3   EXECUTIVE SUMMARY

3.1   PMR DATA - CONSOLIDATED

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	TCH Congestion	Call Drop Rate (%age)	Worst affected cells having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	**≤ 2%**	**≤ 2%**	**≥ 95%**	**≤ 1%**	**≤ 2%**	**≤ 2%**	**≤ 3%**	**≥ 95%**
Aircel(DWL)	0.86%	1.89%	95.75%	0.65%	1.80%	1.05%	2.49%	95.58%
Airtel	0.07%	0.20%	98.85%	0.23%	1.19%	1.38%	1.63%	97.88%
BSNL	3.31%	14.78%	98.22%	0.60%	0.99%	1.42%	19.86%	96.02%
Idea	0.36%	1.15%	98.65%	0.06%	0.18%	0.54%	2.48%	95.71%
MTS	0.29%	0.00%	99.33%	NA	0.17%	1.03%	2.56%	99.62%
Reliance CDMA	0.33%	0.00%	98.97%	0.00%	0.02%	0.15%	0.25%	99.70%
Reliance GSM	0.23%	0.78%	98.53%	0.02%	0.07%	0.65%	0.11%	98.24%
TATA CDMA	0.05%	0.00%	98.39%	0.00%	0.15%	0.80%	2.63%	98.01%
TATA GSM	0.00%	0.00%	98.30%	0.04%	0.47%	0.79%	2.10%	97.81%
Vodafone	0.01%	0.02%	99.50%	0.25%	0.50%	0.93%	1.43%	95.33%

Values highlighted in green color represent the best performance in that category for the following operator.

BTSs Accumulated Downtime:

In the West Bengal circle, BSNL does not meet the benchmark. Maximum BTS Accumulated downtime was recorded for BSNL with 3.31% and. TATA GSM had minimum BTS Accumulated downtime of 0.00%.

Worst Affected BTSs Due to Downtime:

All the operators met the benchmark except BSNL. Maximum worst affected BTSs due to downtime were recorded for BSNL 14.78% and MTS, Reliance CDMA, TATA CDMA, TATA GSM had minimum worst affected BTSs due to downtime at 0.00%.

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter. During the audits the maximum CSSR was observed for Vodafone with 99.50% of their calls getting completed. All the operators were found to be calculating the parameter as per the norm specified by TRAI. CSSR was

established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made.

Network Congestion parameters:

SDCCH / Paging Channel Congestion, TCH and POI are part of the network congestion parameters. All the operators are meeting the TRAI specified benchmarks on the congestion parameters. Aircel however was performing the worst with a SDCCH congestion of 0.65% and TCH congestion of 1.80%. All CDMA operators including Reliance CDMA and TATA CDMA leads the way in network congestion parameters with almost negligible paging as well as traffic channel congestion. The calculation methodology of these parameters was found to be in complete accordance with what has been specified by TRAI. Both RCOM CDMA and Tata Teleservices measure paging channel utilization. Almost all the operators had 0% POI.

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 highest call drop was for BSNL with 1.42%, Airtel with 1.38% and MTS with 1.05% respectively.

Worst Affected Cells having more than 3% TCH Drop

All the operators met the benchmark except BSNL. Maximum Worst Affected Cells Having More than 3% TCH Drop was recorded for BSNL 19.86% and Reliance GSM had minimum Worst Affected Cells Having More than 3% TCH Drop at 0.11%.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark however in terms of voice quality Vodafone and Aircel have relatively lower voice quality as compare to rest of the operators.

3.2   3 DAY DATA - CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	BTSs Accumulated downtime (not available for service)	Worst affected BTSs due to downtime	Call Set-up Success Rate (within licensee's own network)	SDCCH/ Paging Chl. Congestion (%age)	TCH Congestion (%age)	Call Drop Rate (%age)	Worst affected cells having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel(DWL)	1.22%	0.50%	96.44%	0.60%	1.78%	1.11%	3.54%	95.48%
Airtel	0.05%	0.00%	99.18%	0.12%	0.64%	1.26%	1.62%	98.01%
BSNL	2.72%	0.75%	98.89%	0.24%	0.42%	1.35%	20.47%	96.24%
Idea	0.33%	0.28%	99.62%	0.03%	0.03%	0.41%	0.90%	98.28%
MTS	0.20%	0.00%	99.65%	NA	0.04%	0.92%	2.59%	99.18%
Reliance CDMA	0.35%	0.00%	98.92%	0.00%	0.00%	5.94%	0.00%	99.66%
Reliance GSM	0.28%	0.00%	98.97%	0.01%	0.03%	0.52%	0.18%	98.11%
TATA CDMA	0.04%	0.00%	98.68%	0.00%	0.01%	0.76%	6.14%	98.06%
TATA GSM	0.00%	0.00%	98.69%	0.03%	0.25%	0.80%	5.82%	97.98%
Vodafone	0.01%	0.00%	97.65%	0.21%	0.35%	0.69%	0.00%	96.51%

Values highlighted in green color represent the best performance in that category for the following operator.

BTSs Accumulated Downtime:

In the West Bengal circle, BSNL does not meet the benchmark. Maximum BTS Accumulated downtime was recorded for BSNL with 2.72% and. TATA GSM had minimum BTS Accumulated downtime of 0.00%.

Worst Affected BTSs Due to Downtime:

All the operators met the benchmark except BSNL. Maximum worst affected BTSs due to downtime were recorded for BSNL 14.78% and MTS, Reliance CDMA, Reliance GSM, TATA CDMA, TATA GSM, Vodafone and Airtel had minimum worst affected BTSs due to downtime at 0.00%.

Call Set-up Success Rate (CSSR):

All the operators were comfortably meeting the benchmark on this parameter. During the audits the maximum CSSR was observed for Vodafone with 99.65% of their calls getting completed. All the operators were found to be calculating the parameter as per the norm specified by TRAI. CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made.

Network Congestion parameters:

SDCCH / Paging Channel Congestion, TCH and POI are part of the network congestion parameters. All the operators are meeting the TRAI specified benchmarks on the congestion parameters. Aircel however was performing the worst with a SDCCH congestion of 0.60% and TCH congestion of 1.78%. All CDMA operators including Reliance CDMA and TATA CDMA leads the way in network congestion parameters with almost negligible paging as well as traffic channel congestion. The calculation methodology of these parameters was found to be in complete accordance with what has been specified by TRAI. Both RCOM CDMA and Tata Teleservices measure paging channel utilization. Almost all the operators had 0% POI.

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 highest call drop was for Reliance CDMA with 5.94% and lowest was for Idea with 0.41%.

Worst Affected Cells having more than 3% TCH Drop

All the operators met the benchmark except Aircel, BSNL, TATA CDMA, and TATA GSM. Maximum Worst Affected Cells Having More than 3% TCH Drop was recorded for BSNL 20.47% and Reliance CDMA & Vodafone had minimum Worst Affected Cells Having More than 3% TCH Drop at 0.00%.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark however in terms of voice quality Vodafone and Aircel have relatively lower voice quality as compare to rest of the operators

3.3 LIVE CALLING DATA - CONSOLIDATED

Name of Service Provider	Metering and Billing	Service Requests	Level 1 Service	Response time to customer for assistance	
	%age complaints resolved within 4 weeks	Complaint /Request attended to Satisfaction	Call answered in 60 seconds	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 60 seconds
Benchmark	100%		≥ 95%	≥ 95%	≥ 90%
Aircel(DWL)	100.00%	98.00%	80.00%	99.81%	91.38%
Airtel	100.00%	97.00%	69.33%	100.00%	97.85%
BSNL	100.00%	49.00%	100.00%	97.84%	54.12%
Idea	100.00%	90.00%	100.00%	98.59%	96.92%
MTS	100.00%	88.00%	100.00%	100.00%	90.00%
Reliance CDMA	100.00%	54.00%	100.00%	99.06%	57.00%
Reliance GSM	100.00%	76.00%	100.00%	98.96%	94.58%
TATA CDMA	100.00%	73.00%	100.00%	100.00%	96.90%
TATA GSM	100.00%	73.00%	100.00%	100.00%	95.21%
Vodafone	100.00%	89.00%	100.00%	100.00%	90.49%

Level 1 Service - Call Answered in 60 seconds

As per the audited records, Aircel and Airtel do not meet the benchmark of the calls being answered in 60 seconds for reaching out to Level 1 Service.

Customer Care / Helpline Assessment

For the accessibility of customer care aspect all the service providers meet the TRAI benchmark wherein 100% of the calls were answered through IVR. However when reaching out to customer care executive for help was concerned, BSNL and Reliance CDMA fail to meet the benchmark.

3.4   INTER OPERATOR CALL ASSESSMENT - CONSOLIDATED

Inter operator call Assessment To↓ From→	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Aircel(DWL)	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	NA	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	100%	NA	100%	100%	100%	100%	100%	100%	100%
Idea	100%	100%	100%	NA	100%	100%	100%	NA	100%	100%
MTS	100%	100%	100%	100%	NA	100%	100%	100%	100%	100%
Reliance CDMA	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%
Reliance GSM	100%	100%	100%	100%	100%	100%	NA	100%	100%	100%
TATA CDMA	100%	100%	100%	100%	NA	100%	100%	NA	100%	100%
TATA GSM	100%	100%	100%	98%	99%	100%	100%	100%	NA	100%
Vodafone	100%	100%	100%	100%	100%	100%	100%	100%	100%	NA

Maximum Problem faced by the calling operator to other operator

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. Almost all operators were comfortably able to connect with each other except for Idea which faced issues in connecting to TATA GSM.

The drive test was conducted simultaneously for all the operators present in the West Bengal circle. There was in total of nine drive tests conducted in the circle in the month of October, November, and December, 2013. IMRB auditors were present in vehicles of every operator. The holding period for all test calls was 120 seconds.

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 Test were conducted in below cities-

October-

October	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	Asansol	Durgapore	Kharagpur
Date of Drive Test	28th October,2013	29th October,2013	31stOctober,2013

Route Details-

Type of location	Asansol	Durgapore	Kharagpur
Periphery of the city	Kalipahari more Via bypass kalyanpur housing	Muchipara to DSP.DSP to Muchipara	Chowrangi,kousalla more-IIT Gate-Railway workshop-

			Kharids gate-mallancha-sahachowk
Congested area	court more to hutton road to hospital more	Bidhan bnagar to banachity	LIC-Inda-kousalla more-Inda gole bazar-Kharika gate-Mallancha
Across the city	Burnpur more to ushagram via GT road	NH 2	LIC-INDA-Puratan bazar more-Railway station workshop-Kharida gate
Office complex	Asansol court buliding	Durgapore court buliding	Khargpur Municipality
Shopping complex	Galaxy mall	junction mall	Big bazar

November -

November	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	Malda	Krishnanagar	Baharampur
Date of Drive Test	22nd November,2013	26hNovember, 2013	29thNovember,2013

Route Details-

Type of location	**Malda**	**Krishnanagar**	**Baharampur**

Periphery of the city	GOUR MORE TO BULBULI MORE	GMT work shop, Hotel Haveli along with NH-34,Krishnanagar Govt.college,Post office,Joyghata,Across Krishnaganj Road.	Cossimbazar rly station-kaji najul Sarani alon Bhagirathi river to Gopal ghat to NH34 crossing –Industrial training institute-municipal primary school-Cossimbazar Rly station
Congested area	Maheshmati-Ramkrishna pally-sarbamangala pally-Gour more	Krishnangar Rail staion,Khounis park,Krishnangar Academy, Web World.RN tagor Road,AV high School.	Cover Khagra-Court Area-Behrampur new gen hospital-Gorabazar –Behrampur bus stand.
Across the city	Railway station to Gour More to Krishna Kalitola	Rising sun Youth Club Playground, Across NH-34,Hotel Astha Midway,GIMT work shop,Post office,Bhandarkhola,Java Petrol pump	NH34 to kaji nazrul sarani through catholic church-Mental hospital-kendria vidhyalaya-Bishnupur kalibari-Cossimbazar Rly station.
Office complex	AKANNOBORTI,SP ROAD MALDA	Hotel Havelli,12 MM Ghosh Street,Krishnanagar,Nadia	Hotel Samrat, Behrampur
Shopping complex	DM office malda	District Court,Krishnangar,Nadia,West Bengal	District Library, Behrampur

December -

November	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	MEDINIPORE	BANKURA-Raigunj	PURULIA
Date of Drive Test	16th December,2013	27th December,2013	17[th]December,2013

Route Details-

Type of location	MEDINIPORE	BANKURA-Raigunj	PURULIA
Periphery of the city	Amtala to Natun Bazar to jagnath Mandir to Judge court Keranitola to railway station to busstand to LIC more to Abas to high way upto Amtala	bankura station to ganga jal ghati-ranigunj	Dulmi bandh-Along state High way-Right turn-Balaji agro industry-Ranchi road crossing to overbridge-Goshala more-Sunil petrol pump-Mishtimahal
Congested area	LIC More to college to Bottola-to school bazar to jagnath Mandir	Ramsagar-Taldangra-Simlapal-Khatra-Indpur-Bankura	Purulia railway station-Busstand more-Taxi stand-Gorkha ground-Poka bandh-Kapor goli-Balbharthi school-Saheb bandh-Subhash park

Across the city	Jagnath Mandir to school bazar to keranitola to railway station	Jhantipahari-Chatna-Bankura-Ramsagar	Along State highway to poka bandh-left and right along state highway-Hora to halda road
Office complex	Sahoo Hotel Resturant	Bankura court	Zila parishad office
Shopping complex	Judge court	Debashree Restaurant	Luke Restaurant

4.1.1.1 ASANSOL-OCTOBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	97.02%	96.01%	94.10%	95.90%	88.08%	93.19%	91.82%	87.33%	99.56%	98.74%	93.03%	96.53%	83.70%	91.93%	93.03%	96.53%			97.01%	95.91%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	94.68%	92.38%	100.00%	96.94%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	5.32%	7.62%	0.00%	3.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA		0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	4.00%	4.59%	0.00%	3.27%	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%	100.00%	99.27%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%

4.1.1.2 DURGAPORE)-OCTOBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	94.71%	95.82%	99.10%	98.00%	99.10%	88.60%	98.20%	90.46%	99.97%	97.42%	96.95%	97.00%	96.30%	94.76%	96.95%	97.00%			97.58%	95.37%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	93.94%	89.64%	95.57%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	6.06%	10.37%	6.43%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA		0.00%	0.00%
Call drop rate	≤ 2%	0.00%	1.33%	0.00%	0.00%	0.00%	9.81%	0.00%	2.00%	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%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%

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4.1.1.3 KHARAGPUR-OCTOBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	97.39%	96.11%	100.00%	95.97%	92.93%	94.22%	97.31%	95.13%	99.80%	98.44%	94.77%	97.43%	97.08%	96.75%	94.77%	97.43%			96.02%	96.15%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	98.69%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	1.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA		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%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%

Key Insights- October

Asansol

Voice quality: In Asansol only Aircel, MTS and Vodafone meets the benchmark set by TRAI rest of the operators doesn't meet the benchmark in indoor and outdoor areas. The benchmark for voice quality is 95%.BSNL, Idea, Reliance CDMA, Reliance GSM and TATA CDMA does not meet in indoor and outdoor areas where as Airtel in indoor areas.

CSSR: All the networks comfortably clear the benchmark except BSNL.

Call drop rate: All the networks comfortably clear the benchmark except BSNL and Idea.

Durgapore

Voice quality: All operators meets the benchmark except Aircel, BSNL, Idea and RelianceGSM.

CSSR: All the networks comfortably clear the benchmark except BSNL.

Call drop rate: All the networks comfortably clear the benchmark except BSNL .

Kharagpur

Voice quality: In Kharagpur all the operators meet the benchmark set by TRAI except BSNL, Reliance CDMA and TATA CDMA doesn't meet the benchmark in indoor and outdoor areas. The benchmark for voice quality is 95%.BSNL, Reliance CDMA and TATA CDMA does not meet in indoor areas where as BSNL in both indoor and outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark.

4.1.1.4   MALDA-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	97.01%	84.23%	98.63%	95.88%	93.76%	91.38%	99.37%	95.94%	97.84%	99.34%	99.25%	98.43%	97.48%	95.07%					97.46%	98.17%
CSSR	≥ 95%	100.00%	94.67%	100.00%	100.00%	100.00%	95.60%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%					100.00%	100.00%
%age Blocked calls		0.00%	5.33%	0.00%	0.00%	0.00%	4.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA		NA		0.00%	0.00%
Call drop rate	≤ 2%	0.00%	1.33%	0.00%	0.00%	0.00%	0.65%	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%	97.41%	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%

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4.1.1.5   KRISHNANAGAR-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	98.80%	93.74%	97.81%	96.34%	94.33%	91.68%	95.57%	92.85%	99.27%	97.78%	100.00%	98.76%	99.30%	95.61%			99.81%	97.98%	97.45%	97.35%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	94.67%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.36%			100.00%	98.10%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA		0.00%	1.90%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	2.17%	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%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.54%			100.00%	100.00%	100.00%	100.00%

4.1.1.6   BAHARAMPUR -NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	98.19%	96.35%	98.32%	96.96%	98.97%	99.03%	95.79%	91.78%	99.39%	98.22%	100.00%	98.76%	99.88%	98.11%			99.83%	97.00%	99.50%	96.99%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			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%	NA		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%
Hands off success rate		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%	100.00%	100.00%

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Key Insights- November

Malda

Voice quality: In Malda all the operators meet the benchmark set by TRAI except Aircel and BSNL doesn't meet the benchmark in indoor and outdoor areas. The benchmark for voice quality is 95%.BSNL does not meet in indoor and outdoor areas where as Aircel in outdoor areas.

CSSR: All the networks comfortably clear the benchmark except Aircel.

Call drop rate: All the networks comfortably clear the benchmark.

Krishnanagar

Voice quality: In Krishnanagar all the operators meet the benchmark set by TRAI except Aircel, BSNL, and Idea and doesn't meet the benchmark in indoor and outdoor areas. The benchmark for voice quality is 95%.BSNL does not meet in indoor and outdoor areas and Aircel & Idea in outdoor areas.

CSSR: All the networks comfortably clear the benchmark except BSNL.

Call drop rate: All the networks comfortably clear the benchmark except BSNL.

Baharampur

Voice quality: In Baharampur all the operators meet the benchmark set by TRAI except Idea doesn't meet the benchmark in outdoor areas. The benchmark for voice quality is 95%.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark.

4.1.1.7 MEDINIPORE - DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	94.29%	93.16%	98.97%	96.32%	86.56%	91.94%	94.99%	96.61%	99.01%	97.05%	97.52%	98.90%	98.47%	97.00%	NA		99.49%	98.12%	98.43%	96.73%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	89.77%	94.81%	55.00%	92.88%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	10.24%	5.19%	0.00%	7.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.67%	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%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%	100.00%	100.00%

4.1.1.8 BANKURA-RAIGUNJ - DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	98.31%	93.45%	99.70%	97.60%	95.45%	91.67%	97.49%	93.46%	99.83%	98.38%	100.00%	99.05%	99.31%	94.88%	98.50%	97.50%	NA		96.00%	95.81%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	96.82%	97.38%	100.00%	98.74%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	3.18%	2.62%	0.00%	1.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.71%	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%	1000.00%	1000.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%

4.1.1.9 PURULIA- DECEMBER- DRIVE TEST RESULTS

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	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		MTS		Reliance CDMA		Reliance GSM		TATA CDMA		TATA GSM		Vodafone	
		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%	98.35%	95.76%	98.00%	97.77%	81.32%	85.56%	95.00%	96.83%	99.82%	99.91%	97.43%	98.08%	96.37%	95.50%	NA		98.62%	97.25%	97.63%	95.93%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	88.60%	88.37%	96.87%	96.08%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			100.00%	100.00%	100.00%	100.00%
%age Blocked calls		0.00%	0.00%	0.00%	0.00%	11.40%	11.63%	3.13%	3.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%			0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	9.07%	10.52%	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		99.63%	99.27%	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%

Key Insights- December

Mednipore

Voice quality: In Mednipore all the operators meet the benchmark set by TRAI except Aircel, BSNL and Idea doesn't meet the benchmark in indoor and outdoor areas. The benchmark for voice quality is 95%.Aircel, BSNL and does not meet in indoor and outdoor areas where as Idea in indoor areas.

CSSR: All the networks comfortably clear the benchmark except BSNL and Idea.

Call drop rate: All the networks comfortably clear the benchmark.

BANKURA-Raigunj

Voice quality: All the operators meets the benchmark set by TRAI except Aircel, BSNL, Idea and Reliance GSM doesn't meet the benchmark in indoor and outdoor areas. The benchmark for voice quality is 95%.

CSSR: All the networks comfortably clear the benchmark.

Call drop rate: All the networks comfortably clear the benchmark.

PURULIA

Voice quality: In PURULIA all the operators meet the benchmark set by TRAI except BSNL doesn't meet the benchmark in both indoor and outdoor areas. The benchmark for voice quality is 95%.

CSSR: All the networks comfortably clear the benchmark except BSNL.

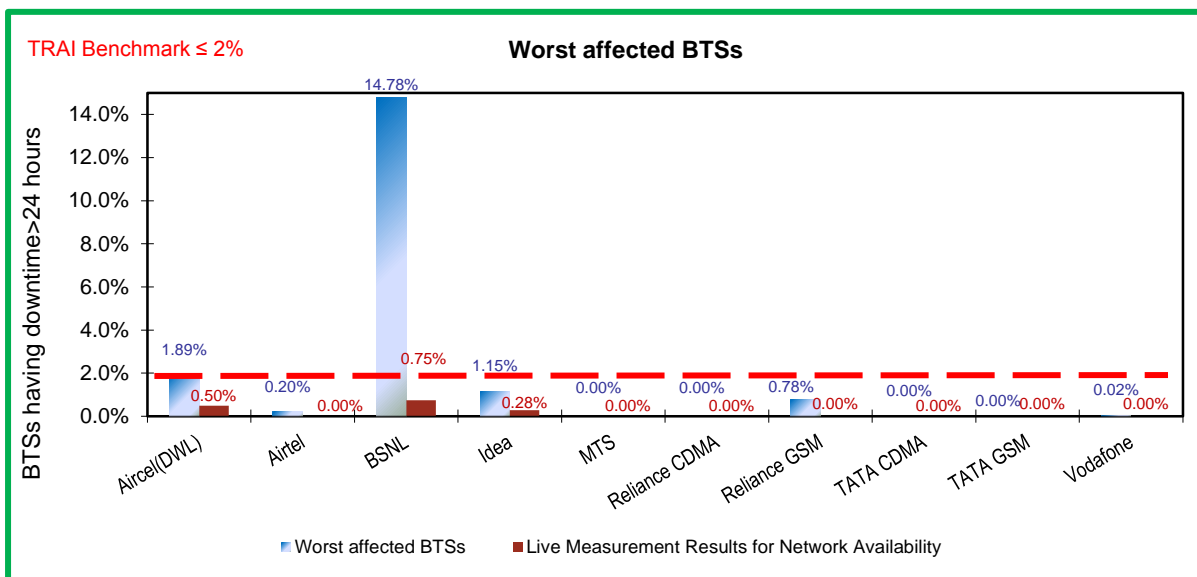**Call drop rate:** All the networks comfortably clear the benchmark.

5 DETAILED FINDINGS - COMPARISON BETWEEN PMR DATA, 3 DAY LVE DATA AND LIVE CALLING DATA

5.1 BTS ACCUMULATED DOWNTIME
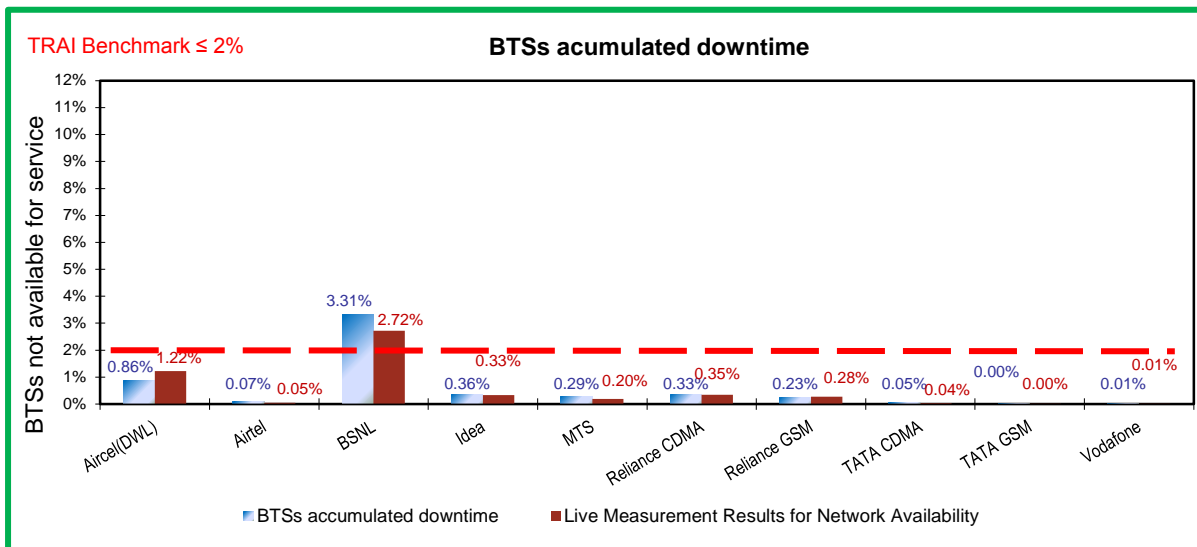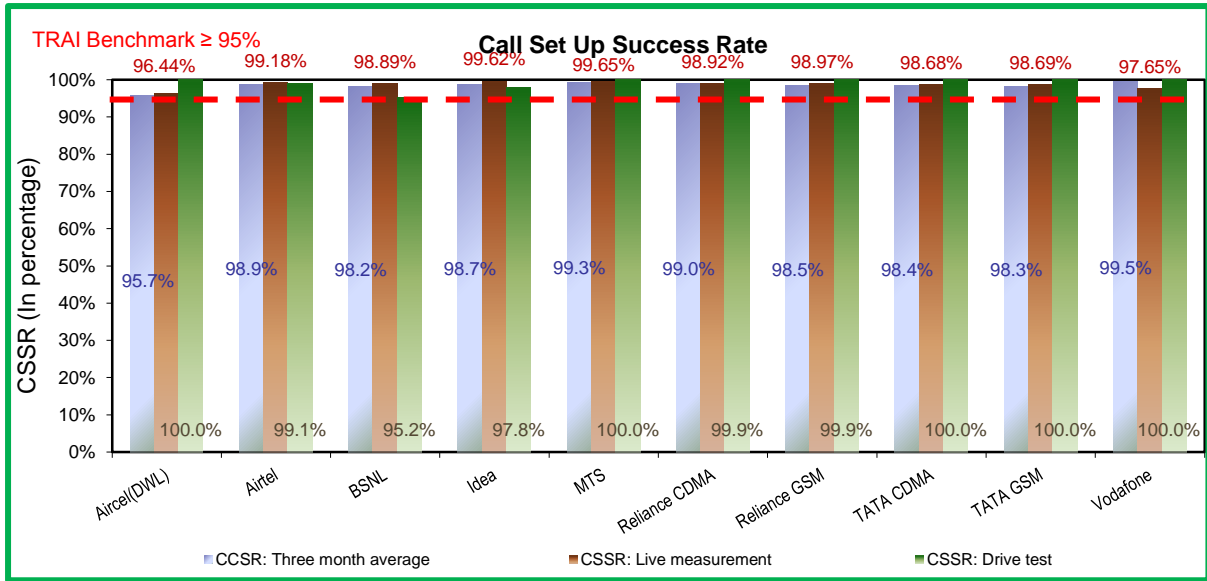

Only BSNL is not able to meet the benchmark on aspect of BTS Accumulated downtime and for live measurement.
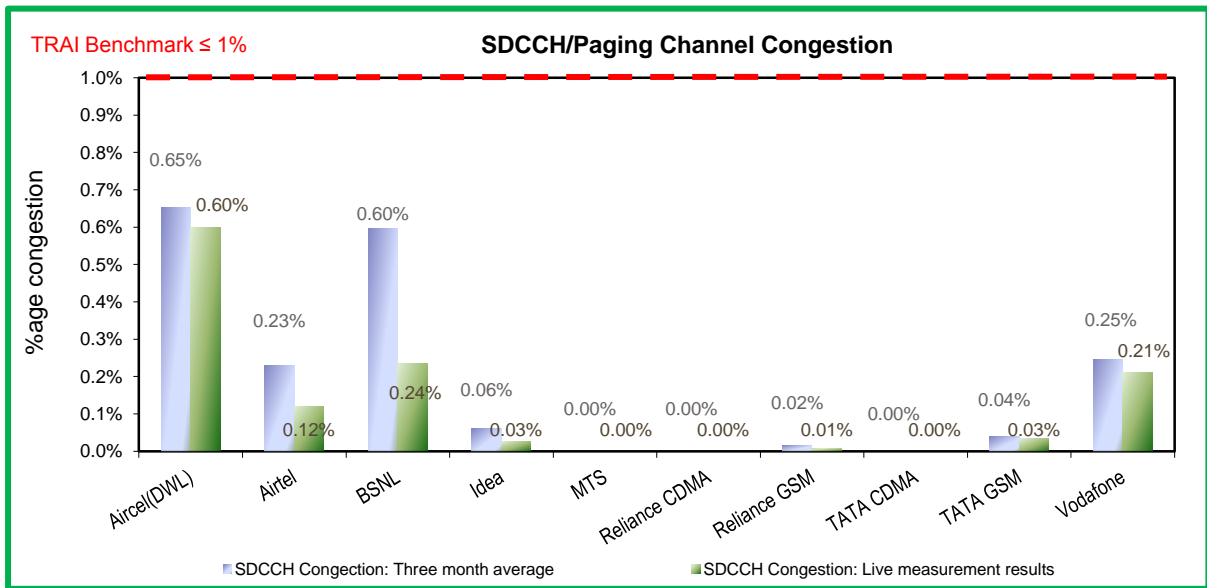
5.2 WORST AFFECTED BTS DUE TO DOWNTIME

All operators meet the benchmark except BSNL.
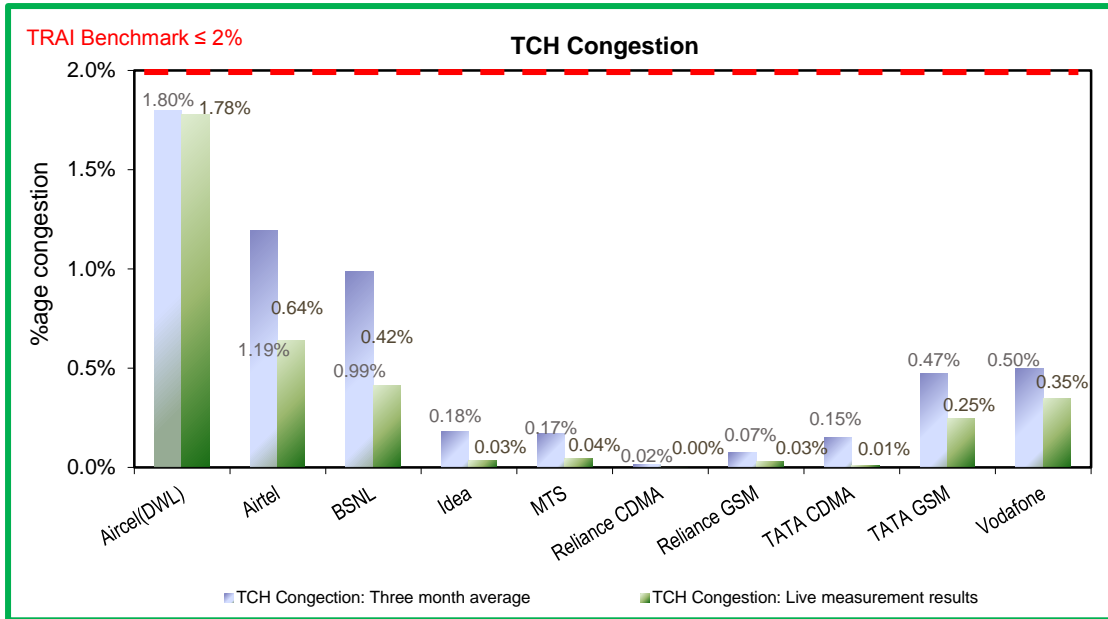
5.3 CALL SETUP SUCCESS RATE

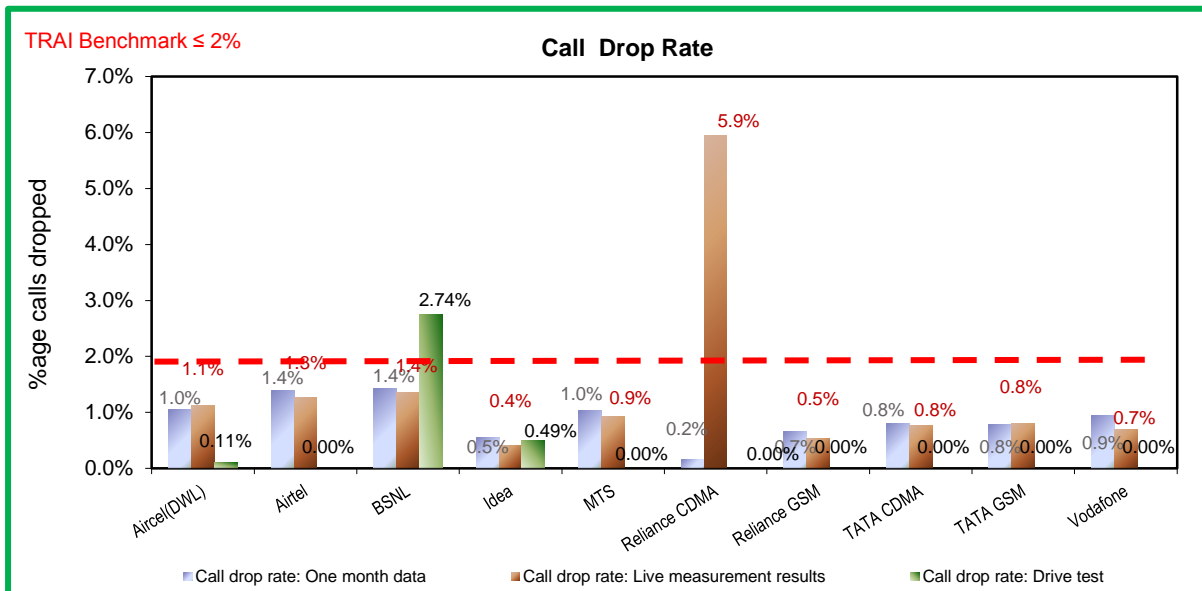All operators meet the benchmark.

5.4 SDCCH/PAGING CHANNEL CONGESTION

All operators meet the SDCCH/Paging Channel Congestion benchmark.

5.5   TCH CONGESTION

TRAI Benchmark ≤ 2%

TCH Congestion

%age congestion

- Aircel(DWL): 1.80%, 1.78%
- Airtel: 1.19%, 0.64%
- BSNL: 0.99%, 0.42%
- Idea: 0.18%, 0.03%
- MTS: 0.17%, 0.04%
- Reliance CDMA: 0.02%, 0.00%
- Reliance GSM: 0.07%, 0.03%
- TATA CDMA: 0.15%, 0.01%
- TATA GSM: 0.47%, 0.25%
- Vodafone: 0.50%, 0.35%

■ TCH Congestion: Three month average   ■ TCH Congestion: Live measurement results

All operators meet the TCH Congestion benchmark.

5.6   CALL DROP RATE

TRAI Benchmark ≤ 2%

Call Drop Rate

%age calls dropped

- Aircel(DWL): 1.0%, 1.1%, 0.11%
- Airtel: 1.4%, 1.3%, 0.00%
- BSNL: 1.4%, 1.4%, 2.74%
- Idea: 0.5%, 0.4%, 0.49%
- MTS: 1.0%, 0.9%, 0.00%
- Reliance CDMA: 0.2%, 5.9%
- Reliance GSM: 0.00%, 0.7%, 0.5%, 0.00%
- TATA CDMA: 0.8%, 0.8%, 0.00%
- TATA GSM: 0.8%, 0.8%, 0.00%
- Vodafone: 0.9%, 0.7%, 0.00%

■ Call drop rate: One month data   ■ Call drop rate: Live measurement results   ■ Call drop rate: Drive test

Reliance CDMA has the highest call drop rate vis-à-vis other operators.

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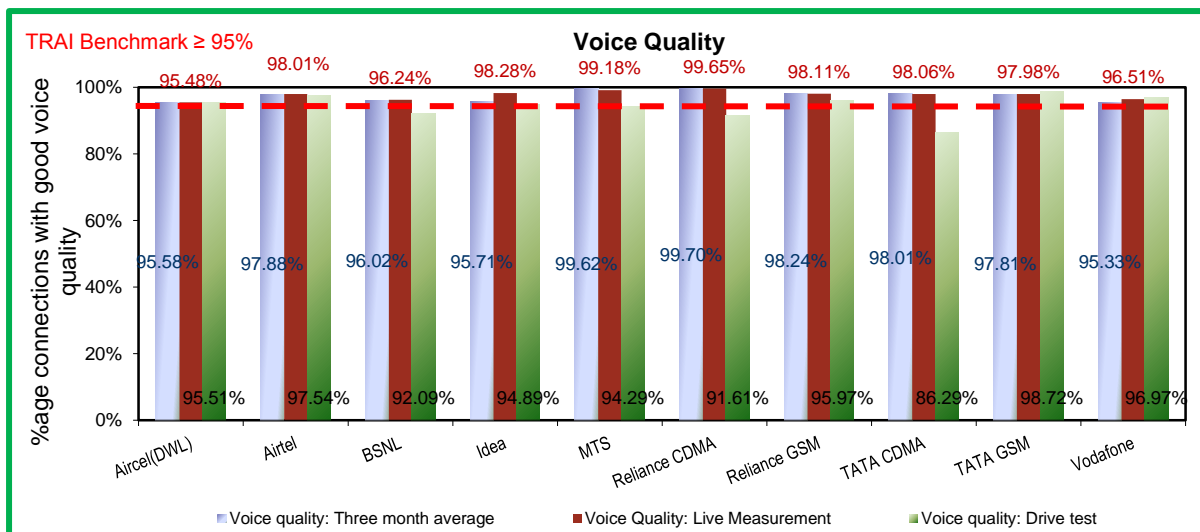
5.7   VOICE QUALITY

In Drive test a lot of operators are not able to meet the voice quality benchmark including Tata CDMA which felt quite short of the benchmark.
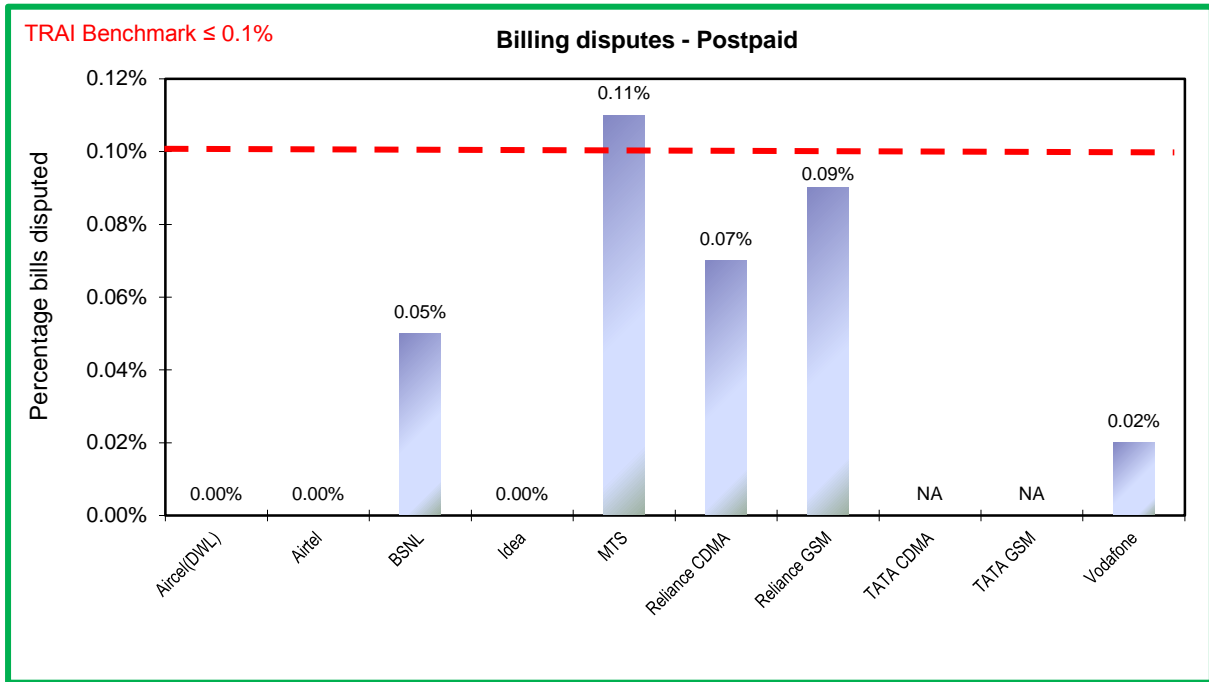
5.8   CELLS HAVING >3% TCH DROP
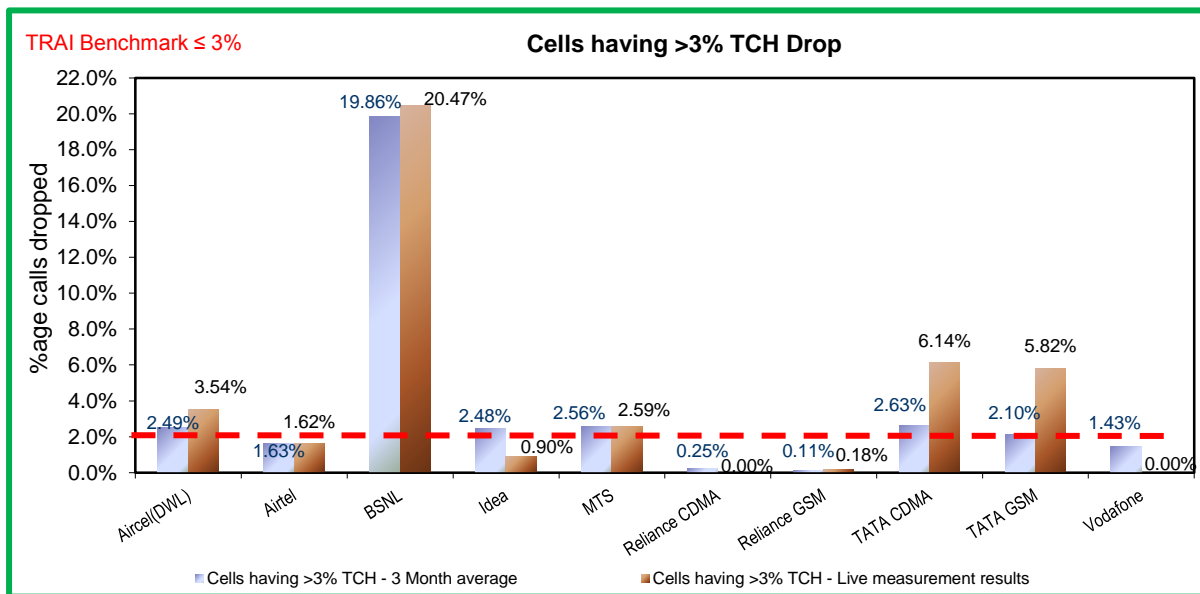
BSNL, Tata GSM, and Tata CDMA do not meet the cells having >3% TCH drop benchmark

6 DETAILED FINDINGS – NON NETWORK PARAMETERS

6.1 BILLING DISPUTES-POSTPAID

Only MTS is not able to meet the benchmark as has 0.11% of bills as being disputed.

6.2 RESOLUTION OF BILLING COMPLAINTS
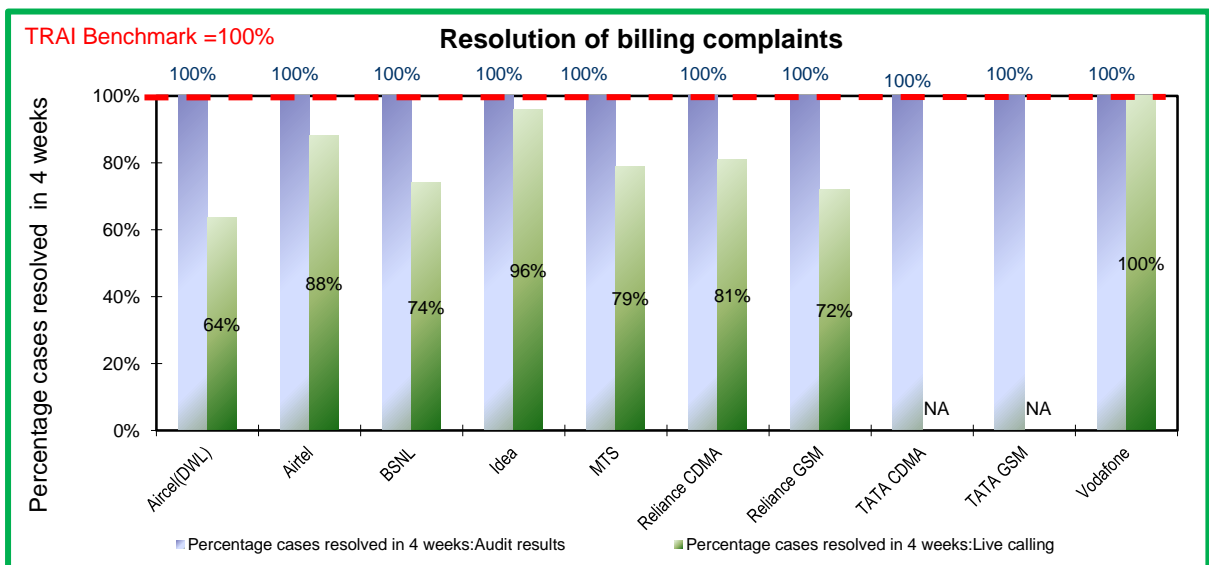
In live calling none of the operator is able to meet the benchmark for resolution of billing complaints. With Aircel performing the poorest

6.3 PERIOD OF APPLYING CREDIT/WAVIER
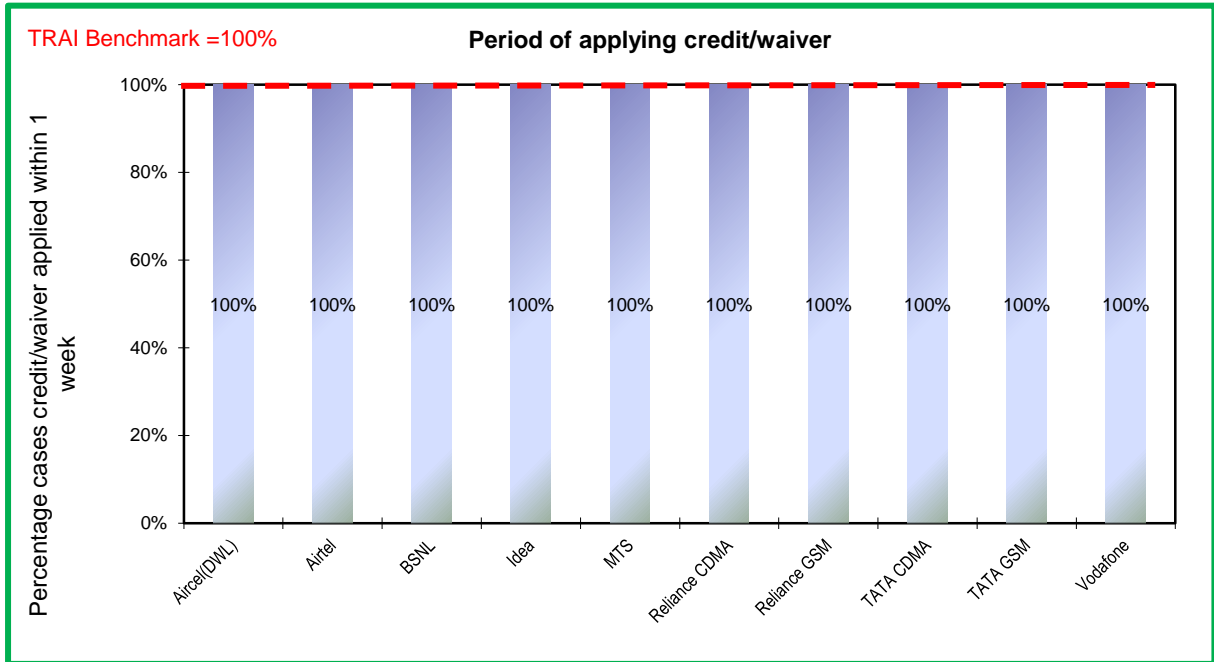
All operators meet the benchmark.

6.4 CALL CENTRE PERFORMANCE-IVR
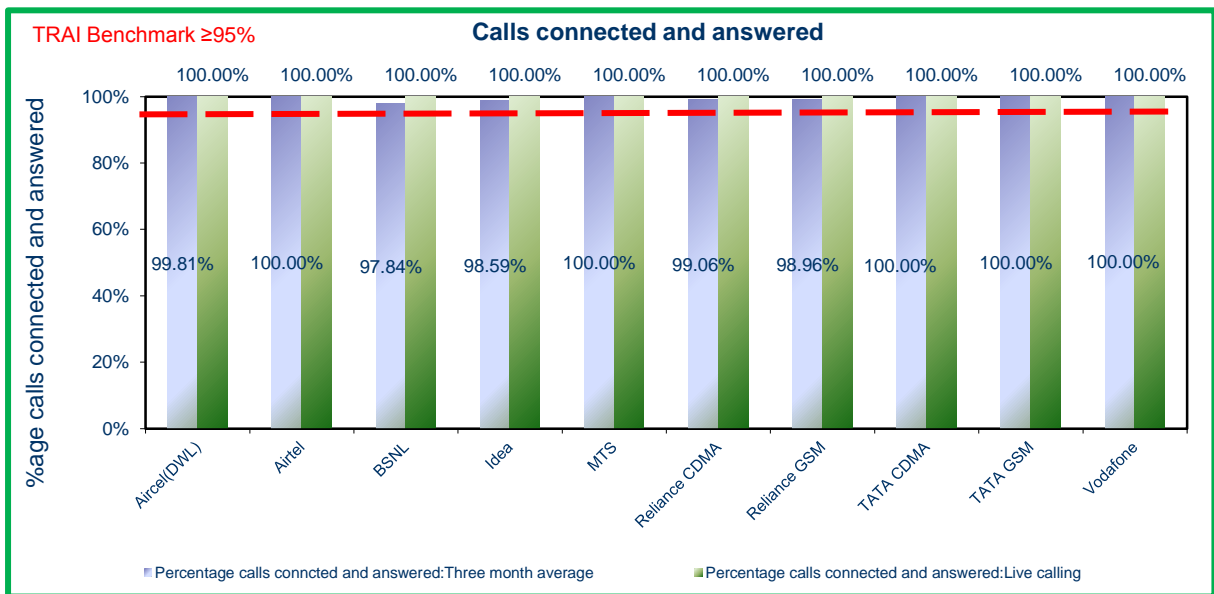
All operators meet the benchmark.

6.5 CALL CENTRE PERFORMANCE-VOICE TO VOICE
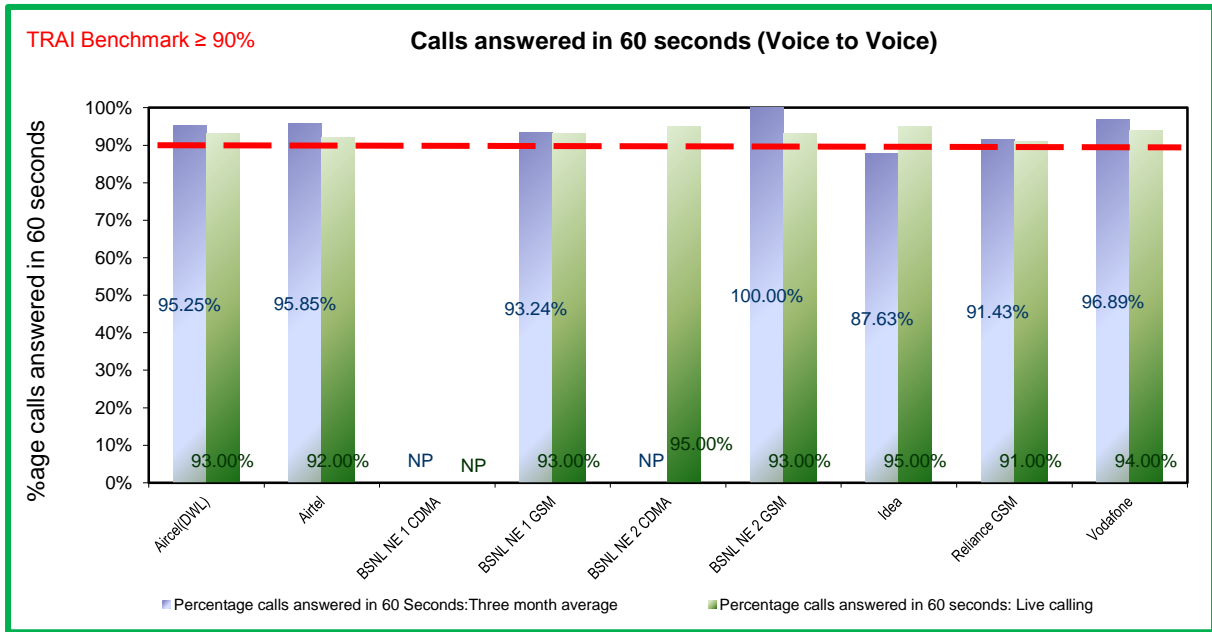
All operators meet the benchmark except Idea for three month average.

6.6 TERMINATION/CLOSURE OF SERVICE
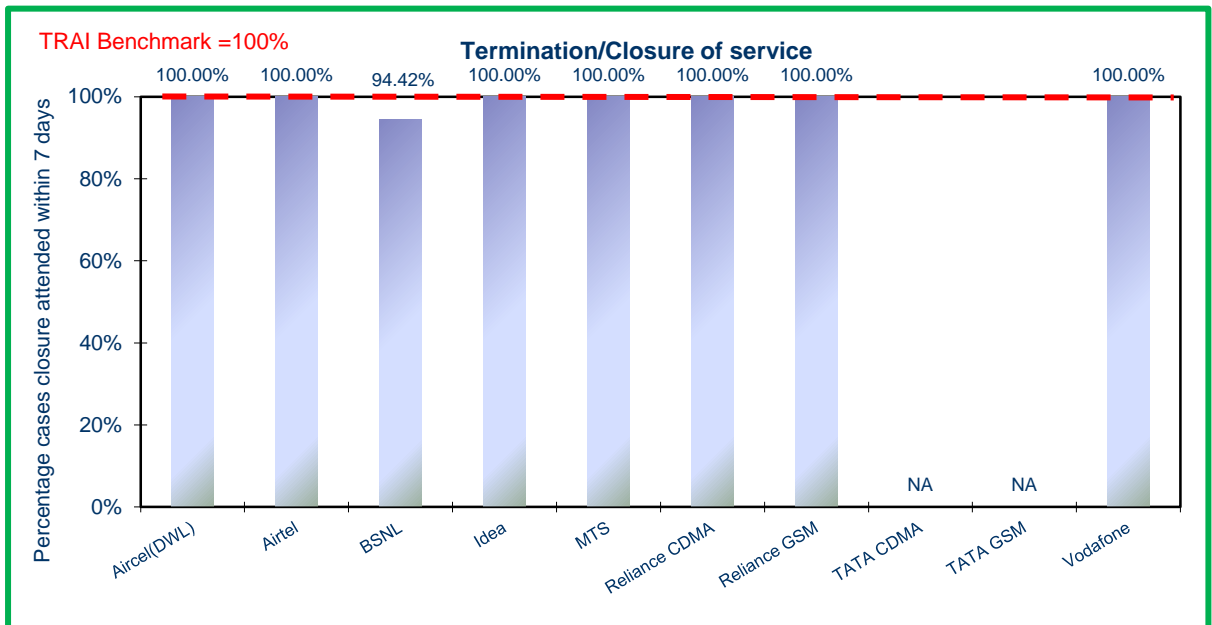
All operators meet the benchmark except BSNL.

6.7   REFUND OF DEPOSITS AFTER CLOSURE

All operators meet the benchmark except Idea which has performed the poorest on this parameter with only 31% of cases solved within the stipulated time.

6.8   BILLING COMPLAINTS - PREPAID

All operators meet the benchmark, except BSNL that has the highest percentage of billing disputes.

7 ANNEXURE

7.1 BILLING

Audit Results for Billing performance

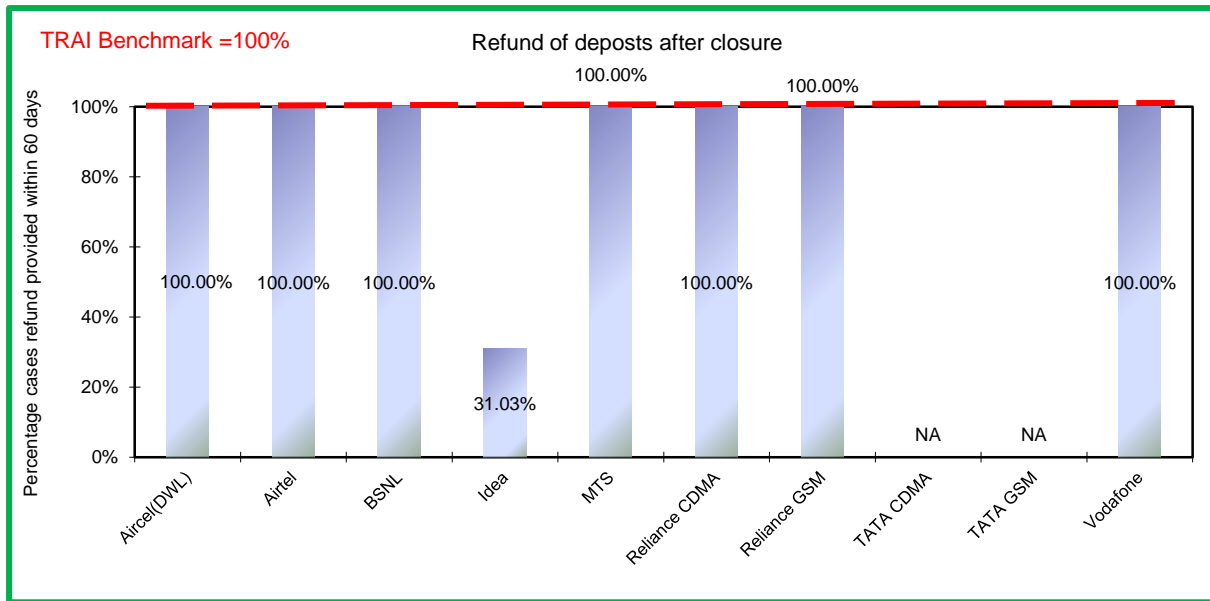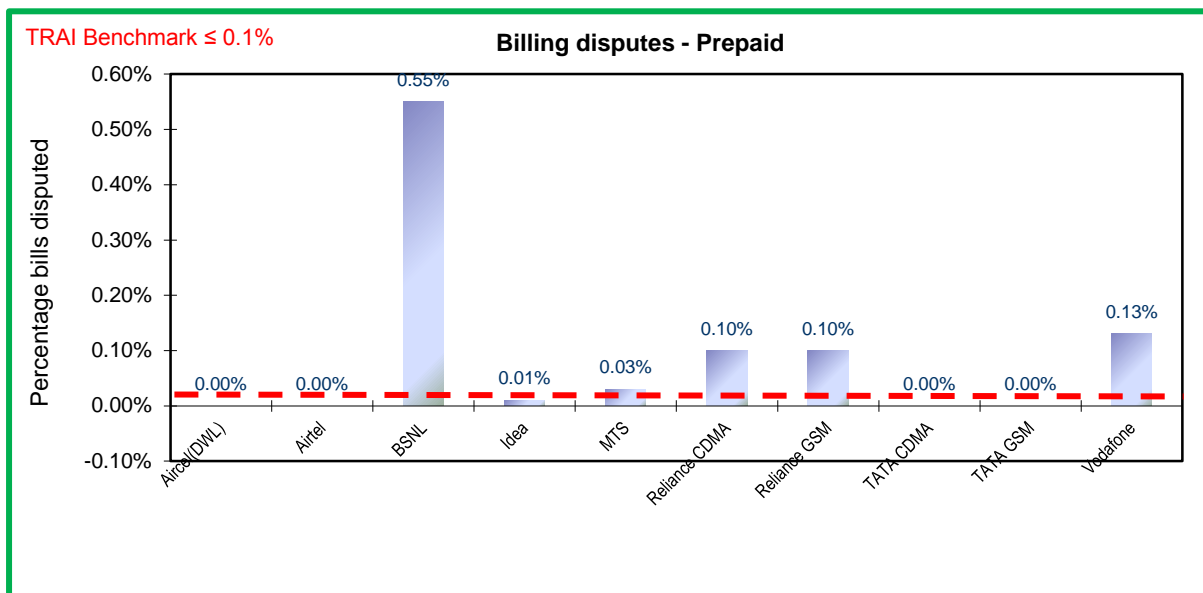| Billing Performance	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Billing disputes - Postpaid											
Total bills generated during the period		1011	59168	109568	2817	17776	22765	28128	NA	NA	608779
Total number of bills disputed		0	3	54	0	19	17	24	NA	NA	144
Percentage bills disputed	≤ 0.1%	0.00%	0.005	0.05%	0.00%	0.11%	0.07%	0.09%	NA	NA	0.02%
Billing disputes - Prepaid											
Number of complaints related to charging, credit & validity		11	275	9526	780	623	2062	12615	0	11	15462
Total number of prepaid customers in that period		3301396	96,68,158	1719248	5336739	1806995	2080557	12828435	577198	4710523	12193458
Percentage of complaints	≤ 0.1%	0.00%	0.00%	0.55%	0.01%	0.03%	0.10%	0.10%	0.00%	0.0002%	0.13%
Resolution of billing complaints											
Total number of billing/charging complaints		11	278	9580	780	642	2079	12639	0	11	15606
Total complaints considered invalid		2886	12465	9478	4168	168	12	0	0	8	0
Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1		11	278		780	642	2079	12639	0	11	15606
Percentage complaints resolved within 4 weeks of date of receipt	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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Period of applying credit / waiver										
Total number of complaints where credit/waiver is required		79	275		533	642	2079	12639	0	3	15606
Percentage cases in which credit/waiver was received within 1 week	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls made		11	75	100	100	100	95	100	NA	NA	100
Number of cases resolved in 4 weeks		7	66	74	96	79	77	72	NA	NA	100
Percentage cases resolved in four weeks	100%	64%	88%	74%	96%	79%	81%	72%	NA	NA	100%

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7.2 CUSTOMER CARE

Audit results for customer care (IVR and voice-to-Voice)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of call attempts to customer care for assistance		6497148	1470878	144315	9245261	71813	2281832	8435760	19329	356221	NA
Number of calls getting connected and answered (electronically)		6484966	1470878	141198	9114488	262950	2260279	8347879	19329	356221	NA
Percentage calls getting connected and answered	≥ 95%	99.81%	100.00%	97.84%	98.59%	100.00%	99.06%	98.96%	100.00%	100.00%	100.00%
Number of calls getting transferred to the operator (voice to voice)		2444843	2654676	NA	3841261	NA	21553	87881	19091	350929	728760
Number of calls answered by operator (voice to voice) within 60 seconds		2234180	2597705	NA	3722935	NA	12286	83116	18553	334039	659441
Percentage calls answered within 60 seconds (V2V)	≥ 90%	91.38%	97.85%	54.12%	96.92%	90.00%	57.00%	94.58%	96.90%	95.21%	90.49%

Live calling results for customer care (IVR)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls received		100	100	100	100	100	100	100	100	100	100
Total Number of calls getting connected and answered		100	100	100	100	100	100	100	100	100	100
Percentage calls getting connected and answered	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls received		100	100	100	100	100	100	100	100	100	100
Total Number of calls answered within 60 seconds		100	100	70	100	100	100	100	100	100	100
Percentage calls answered within 60 seconds	≥ 90%	100.00%	100.00%	70.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Live calling for level 1 services

Level 1 services		Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total no. of calls made		150	150	150	150	150	150	150	150	150	150
Calls answered in 60 sec		120	104	150	150	150	150	150	150	150	150
Percentage of call answered in 60 sec		80%	69%	100%	100%	100%	100%	100%	100%	100%	100%

Live calling results for resolution of service requests

Resolution of service requests	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls made		100	100	100	100	100	100	100	100	100	100
Number of cases resolved to satisfaction		98	97	49	90	88	54	76	73	73	89
Percentage cases resolved in four weeks		98%	97%	49%	90%	88%	54%	76%	73%	73%	89%

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7.3 TERMINATION/CLOSURE OF SERVICE

Audit results for termination / closure of service

Termination	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of closure request		24	286	233	171	302	79	254	NA	NA	6510
Number of requests attended within 7 days		24	286	220	171	302	79	254	NA	NA	6510
Percentage cases in which termination done within 7 days	100%	100.00%	100.00%	94.42%	100.00%	100.00%	100.00%	100.00%	NA	NA	100.00%

7.4 REFUND

Audit results for refund of deposits

Refund	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of cases requiring refund of deposits		18	41		29	NA	79	254	NA	NA	NA
Total number of cases where refund was made within 60 days		18	41		9	NA	79	254	NA	NA	NA
Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	100.00%	31.03%	100.00%	100.00%	100.00%	NA	NA	100.00%

7.5   ADDITIONAL NETWORK RELATED PARAMETRS

11. Additional Network Related parameters											
Audit Results for Total Traffic Handled in Erlang											
Traffic in Erlang		Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Equipped capacity of the network		138968	274444.56	156000	96763	84000	118000	174000	6232	30415	335949
Total traffic handled in erlang during TCBH		83277	238641.56	87406.12	63468	49668	35385.05	115524.88	472.1	13213.88	309430

Total number of customers as per VLR											
		Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total no. of customers served (as per VLR)		2540573	9695888	1470030	2683700	1256781	928876	6119759	11367	5213.88	12036372

Audit Results for POI Congestion

POI congestion	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of working POIs		58.3	37.0	84.3	107.0	36.0	19.0	44.0	75.7	32.0	43.0
No. of POIs not meeting benchmark		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Capacity of all POIs (A) - in erlangs		66213.5	126222.2	92901.5	92834.7	55046.4	8005.0	35547.0	22045.6	16298.6	295998.0
Traffic served for all POIs (B)- in erlangs		35863.4	70959.2	21604.0	45863.3	28875.0	3337.0	21579.7	6181.8	17646.1	157655.3
POI congestion	≤ 0.5%	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

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POI congestion	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	MTS	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of working POIs		58.7	37.0	81.0	107.0	36.0	19.0	44.0	85.3	32.0	43.0
No. of POIs not meeting benchmark		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Capacity of all POIs (A) - in erlangs		66767.1	376358.2	885416.0	92256.0	54874.4	8005.0	35547.0	26640.8	16282.1	294794.7
Traffic served for all POIs (B)- in erlangs		36717.6	210831.5	150847.4	44240.0	28609.9	3342.0	21423.7	7498.3	4086.5	150903.0
POI congestion	≤ 0.5%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

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