



**EAST
ZONE**

TRAI AUDIT WIRELESS REPORT- ORISSA CIRCLE- OND QUARTER, 2013

Prepared By -



Prepared For-



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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.

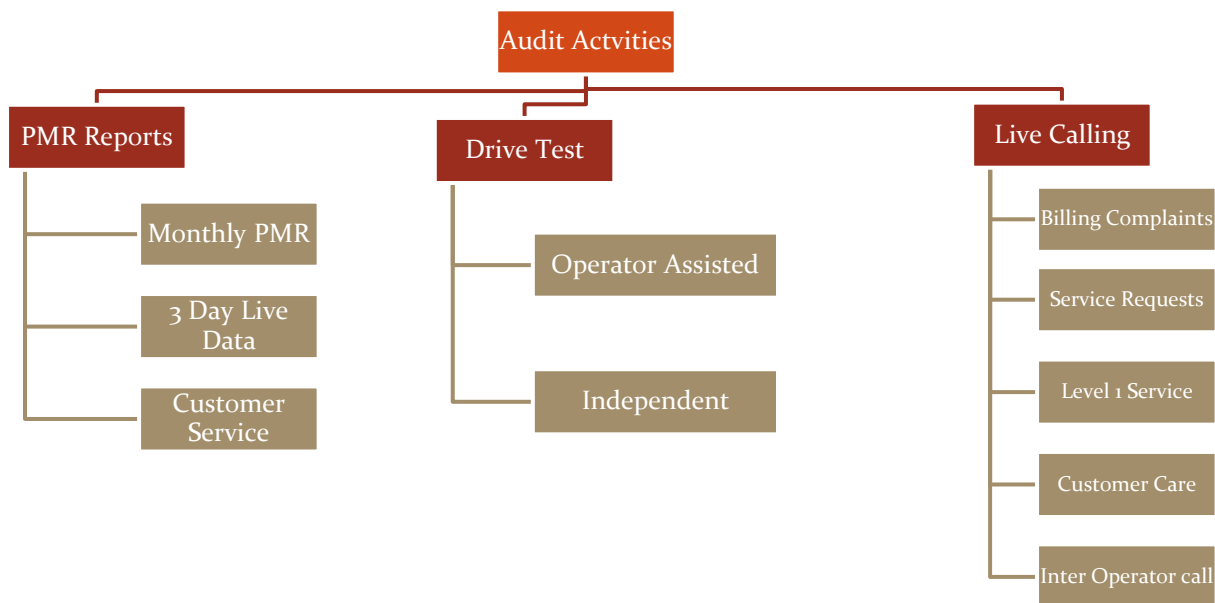
In order to assess the above regulations TRAI has commissioned a third party agency to conduct the audit of the service providers and check the performance of the operators on the various benchmarks set by Telecom Regulatory Authority of India (TRAI).

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 –

- BTSs Accumulated downtime (not available for service) $\leq 2\%$
- Worst affected BTSs due to downtime $\leq 2\%$

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: $\text{Calls Established} / \text{Total Call Attempts} * 100$
- 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%** = $[(A_1 \times C_1) + (A_2 \times C_2) + \dots + (A_n \times C_n)] / (A_1 + A_2 + \dots + A_n)$
 - 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%** = $[(A_1 \times C_1) + (A_2 \times C_2) + \dots + (A_n \times C_n)] / (A_1 + A_2 + \dots + A_n)$
 - Where:- A_1 = POI traffic offered on all POIs (no. of calls) on day 1
 - C_1 = Average POI Congestion % on day 1

- A_2 = POI traffic offered on all POIs (no. of calls) on day 2
- C_2 = Average POI Congestion % on day 2
- A_n = POI traffic offered on all POIs (no. of calls) on day n
- C_n = 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 \leq 2%
 - ↳ Worst affected cells having more than 3% TCH drop rate \leq 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 its 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 each operator'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:-
 - Dates of lodging of all billing complaints resolved in favour of customer and resulting in requirement of a refund by the operator
 - Dates of refund 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)	1985908
Airtel	7309044
BSNL	386860

Idea	928698
Reliance CDMA	320284
Reliance GSM	3121438
TATA CDMA	156075
TATA GSM	1321332
Vodafone	2889202



Not Meeting the benchmark

3 EXECUTIVE SUMMARY

3.1 PMR DATA – 3 MONTHS- 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)	0.50%	1.59%	98.69%	0.53%	0.50%	1.09%	2.63%	95.46%
Airtel	0.76%	1.89%	98.39%	0.60%	1.12%	1.11%	0.94%	95.84%
BSNL	1.01%	0.80%	99.16%	0.72%	0.84%	1.21%	0.87%	97.20%
Idea	0.27%	1.23%	99.48%	0.29%	0.28%	0.42%	1.32%	98.96%
Reliance CDMA	0.36%	0.27%	99.39%	0.00%	0.00%	0.10%	0.95%	99.65%
Reliance GSM	0.06%	0.06%	98.15%	0.00%	0.01%	0.53%	0.20%	99.23%
TATA CDMA	0.05%	0.00%	98.44%	0.00%	0.12%	0.78%	1.07%	98.25%
TATA GSM	0.08%	0.59%	99.12%	0.10%	0.22%	0.47%	0.53%	97.87%
Vodafone	0.10%	0.34%	99.18%	0.47%	0.82%	0.78%	2.36%	98.35%



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

BTSS Accumulated Downtime:

In the Orissa circle, all operators met the benchmark. Maximum BTS Accumulated downtime was recorded for BSNL with 1.01% and Airtel with 0.76% respectively. TATA CDMA had minimum BTS Accumulated downtime.

Worst Affected BTSS Due to Downtime:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

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 Idea with 99.48% 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. BSNL however was performing the worst with a SDCCH congestion of 0.72% and TCH congestion of 0.84%. 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 1.21%, Airtel with 1.11% and Aircel with 1.09% respectively.

Worst Affected Cells Having More than 3% TCH Drop:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark however in terms of voice quality Airtel 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)	0.80%	0.32%	98.73%	0.33%	0.56%	1.13%	2.80%	95.46%
Airtel	0.03%	0.00%	98.59%	0.28%	0.79%	1.07%	2.14%	96.21%
BSNL	0.99%	0.12%	99.32%	0.67%	0.68%	1.15%	0.83%	96.02%
Idea	0.33%	0.15%	99.69%	0.21%	0.08%	0.38%	1.63%	97.89%
Reliance CDMA	0.58%	0.00%	99.47%	0.00%	0.00%	0.06%	0.66%	99.85%
Reliance GSM	0.03%	0.00%	98.87%	0.07%	0.14%	0.46%	0.29%	99.06%
TATA CDMA	0.04%	0.00%	98.58%	0.00%	0.72%	0.78%	0.63%	98.26%
TATA GSM	2.27%	0.43%	99.37%	0.01%	0.06%	0.45%	2.60%	97.90%
Vodafone	0.09%	0.01%	99.66%	0.11%	0.34%	0.74%	2.34%	98.42%

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

BTSS Accumulated Downtime:

In the Orissa circle, all operators met the benchmark except TATA GSM. Maximum BTS Accumulated downtime was recorded for TATA GSM with 2.27%. Airtel & Reliance GSM had minimum BTS Accumulated downtime.

Worst Affected BTSS Due to Downtime:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

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 Idea with 99.69% 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. 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.

Worst Affected Cells Having More than 3% TCH Drop:

During the audit it was found that all the service providers were measuring this parameter as per the TRAI guidelines. All the operators were comfortably meeting the benchmark on this parameter.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark however in terms of voice quality Airtel and BSNL 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)	98.00%	99.00%	100.00%	100.00%	98.00%
Airtel	98.00%	99.00%	100.00%	100.00%	100.00%
BSNL	97.00%	99.00%	100.00%	100.00%	100.00%
Idea	96.00%	97.00%	100.00%	100.00%	99.00%
Reliance CDMA	98.00%	99.00%	100.00%	100.00%	100.00%
Reliance GSM	100.00%	100.00%	100.00%	100.00%	99.00%
TATA CDMA	100.00%	100.00%	99.33%	100.00%	99.00%
TATA GSM	100.00%	100.00%	100.00%	100.00%	99.00%
Vodafone	100.00%	99.00%	100.00%	100.00%	100.00%

Complaints Resolved within 4 weeks

As per the audited records, all the operators resolve the complaints within 4 weeks of registration of complaints. However as per the consumers Aircel, Airtel, BSNL, Idea, Reliance CDMA are not meeting the benchmarks.

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. Aircel is worst performing on the aspect of reaching to customer care executive.

3.4 INTER OPERATOR CALL ASSESSMENT - CONSOLIDATED

Inter operator call Assessment To↓ From→	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Aircel(DWL)	NA	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	NA	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	100%	NA	100%	100%	100%	100%	100%	100%
Idea	100%	99%	100%	NA	100%	100%	100%	98%	100%
Reliance CDMA	100%	100%	100%	100%	NA	100%	100%	100%	100%
Reliance GSM	100%	100%	100%	100%	100%	NA	100%	100%	100%
TATA CDMA	100%	100%	100%	100%	100%	100%	NA	100%	100%
TATA GSM	100%	100%	100%	100%	100%	100%	100%	NA	100%
Vodafone	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 AIRTEL AND TATA GSM which faced a slight difficulty in connecting with IDEA.

4 DETAILED FINDINGS - DRIVE TEST DATA

The drive test was conducted simultaneously for all the operators present in the Orissa circle. There was in total of six drive tests conducted in the circle in the month of November and December, 2013. There was no drive test conducted for the month of October due to cyclone. The decision was taken in consultation with TRAI local office and the supporting documents were submitted to TRAI head office. 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 dbm for in-vehicle and > -95 dbm outdoor routes.

The Drive Test were conducted in below cities-

November -

November	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	Behrampur	Baleswar	Dhenkanal
Date of Drive Test	26th November,2013	28th November,2013	29th November,2013

Route Details-

Type of location	Behrampur	Baleswar	Dhenkanal
Periphery of the city	Palasuni-Rasulgarh-Vanivihar-AcharyaVihar-JaydevVihar-CRP Sqr- Fire Stn-BramundaBusstand-kandagiriChowk-Jagmora-Gandamunda-Pokhoriput	KurudaChowk, Birla Tyres, Old FM Univ., Januganjolei,	Shyamcharanpur, Saptasajyachowk, Synergy Engg. College, ShrikrisnaBhawan, Nachipur, Saktisugar, Bypass, FCI, Dhenkanal
Congested area	Rasulgarh-Bhumikhal-LaxmisagarChowk-Cuttack Rd-KalpanaSqr- Lewis Rd-Rabi Takis-Sishubhavan-Capital Mkt-RajmalSqr-Master Canteen-PMG Sqr-Ram Mandir-Janpath-Bayababa Math-AcharyaVihar-Sainik School-Press Chowk-Nalco chowk	Phandichowk, Chidiapolo, Hospital Road, Cinema chowk, FM college square, Adimabas, Policeline Square, ITI Square, Central school chowk, Poduapada, Mathasahi, Prob Road	Bypass Angul, Laxmi Bazar, Padma Bazar,Nuasasan, Meena Bazar, Ganesh Bazar, Synergy Engg College
Across the city	Kapilprasad-Palaspalli-Ganganagar-Suryanagar-Powerhouse chowk-JaydevVihar-Ekamravilla-VIP Colony-Mayfair-Fortun Tower-Nalco chowk-Chandrasekharpur-Damanachowk-Patia square-Nandankanan Road-Sikharchandi	Remuna market, Medical chowk, Januganjolei, Bhimpadachhaka, BaliaChhaka, Bus stand, Fakirmohangolei, Station square, Policelinechowk, ITI chowk, Khuruda	Dhenkanal Bypass, Gopabandhu school, RTO Office, St Xavier High School, Bus Stand, Nice Institute, Amarnath Theater, Ganesh Bazar, Kalinga Eye Hospital
Office complex	IDCO Towers, RupalisqrTowers, Rupalisqr	Telephone Bhawan, Station square	G.M.T.D Office (BSNL), Dakhinakali Road
Shopping complex	PAL Heights, Jaydevvihar	Municipal Market Complex, Phandi Bazar	Jagannathshyamsundar Market Complex, Ganesh Bazar

December -

December	City 1-High Population	City 2-Medium Population	City 3-Low Population
City Name	Puri	Jajpur	Anugul
Date of Drive Test	16 th December,2013	20 th December,2013	26 th December,2013

Route Details-

Type of location	Puri	Jajpur	Anugul
Periphery of the city	Balighat, PKDA Square, CT Road, Mayfair, Clerk Road, Swargadwar, Cocopalms, Baliapanda	SathipurRoad,HedaPadia,QuereshiMohillah , River Bank Road, SundarMuhaniChowk	Hatisalpada,ITICollege,Imigrationcolony,Hakimpada,Ta mritColony,PTC High School, From Tarmit colony bridge to Durgahotel Rd through Canal road .
Congested area	Market Chhak, Balagandi, Hospital square, Badasankha, Gundichamandir, Matiapadachhak, Madhuban, Mahavir, Gopalpurchhak, Balighat, Sriramnagar	QuereshiMohallah Sub Road,Rajpur,BepariBerhampur,Belampurchowk,Budhha bridge,Birajatemple,Jodikua,Itachhati	Hatisalpada,Karadagadia,SaraswatiSisuMandir,Kendriya Vidyalaya,Hemsagarpada,Sikshyakapada, Busstand,Police training centre
Across the city	Mayfair, Sadarthana, Jhadeswarichhak, Policeline, Darjipokhari, Hospital square, Kumbharpada, Batamangala	NC College , Ram Mandir,City Main Road, Girl's High School, BelampurChowk,BirajaChowk,DurgaTalkies,Till River Bank Ltd	Post office Nalco nagar,Khandasar,Durga Hotel Rd,Kadampadia,Womenscollege,Hatisalpada,Karadagadia
Office complex	Customer care office (BSNL), Puri	B.S.N.L Office	BSNL Telephone Bhawan
Shopping complex	Grand Centre, Near Jagannath temple, Puri	Biraja Shopping Complex	SEETAL PLAZA

4.1.1.1 BEHRAMPUR-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		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
Voice quality	≥ 95%	99.09%	97.38%	99.53%	96.67%	99.05%	95.16%	79.50%	81.00%	98.72%	98.15%	96.11%	96.24%	100.00%	99.66%	98.50%	93.93%	99.50%	97.33%
CSSR	≥ 95%	100.00%	99.38%	100.00%	100.00%	100.00%	98.70%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.88%	96.64%	100.00%	100.00%
%age Blocked calls		0.00%	0.62%	0.00%	0.00%	0.00%	1.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.13%	5.02%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	1.56%	0.67%	0.00%	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.67%	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%	99.97%	100.00%	100.00%

4.1.1.2 BALESWAR-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		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
Voice quality	≥ 95%	97.70%	96.90%	99.71%	98.18%	95.76%	96.16%	88.00%	88.67%	99.85%	99.25%	99.05%	96.47%	98.82%	99.16%	99.18%	95.36%	96.50%	97.67%
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%	0.00%	0.00%	0.00%	0.00%
Call drop rate	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	0.98%	0.00%	0.98%	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%

4.1.1.3 DHENKANAL-NOVEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		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
Voice quality	≥ 95%	99.35%	97.10%	99.48%	98.49%	97.05%	96.00%	94.35%	93.00%	98.64%	99.66%	97.95%	98.50%	100.00%	97.76%	99.82%	98.04%	98.50%	98.33%
CSSR	≥ 95%	100.00%	100.00%	100.00%	100.00%	100.00%	99.02%	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%	0.98%	0.00%	0.00%	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%	0.00%	0.00%	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	3.50%	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%

4.1.1.4 KEY INSIGHTS-NOVEMBER

Behrampur

Voice quality: All the operators meet the benchmark set by TRAI except Idea and TATA GSM were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas where as TATA GSM in indoor areas.

CSSR: All the networks comfortably clear the benchmark except TATA GSM.

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

Baleswar

Voice quality: All the operators meet the benchmark set by TRAI except Idea were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

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

Dhenkenal

Voice quality: All the operators meet the benchmark set by TRAI except, Idea were not able to meet the benchmark on voice quality in indoor and outdoor areas. The benchmark for voice quality is 95%.Idea is not meeting the benchmark in both indoor and outdoor areas.

CSSR: All the networks comfortably clear the benchmark.

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

4.1.1.5 PURI-DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		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
Voice quality	≥ 95%	99.25%	96.44%	99.12%	98.04%	97.02%	95.45%	96.90%	96.03%	99.29%	97.55%	95.79%	96.04%	100.00%	99.80%	99.18%	98.76%	98.92%	98.39%
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%	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%

4.1.1.6 JAJPUR-DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		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
Voice quality	≥ 95%	99.60%	94.90%	99.36%	98.71%	97.95%	96.23%	95.64%	96.08%	99.71%	99.23%	99.36%	96.86%	100.00%	99.96%	99.61%	99.38%	98.21%	97.92%
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%	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%

4.1.1.7 ANUGUL-DECEMBER- DRIVE TEST RESULTS

	B'mark	Aircel(DWL)		Airtel		BSNL		Idea		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
Voice quality	≥ 95%	96.31%	97.54%	99.76%	98.37%	98.10%	96.34%	96.55%	97.55%	98.72%	97.10%	97.06%	97.75%	99.97%	99.73%	98.83%	97.92%	99.35%	99.33%
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%	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%

4.1.1.8 KEY INSIGHTS-DECEMBER

Puri

Voice quality: All the operators meet the benchmark set by TRAI except Reliance. 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.

Jajpur

Voice quality: All the operators meet the benchmark set by TRAI except Aircel was not able to meet the benchmark on voice quality 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.

Anugul

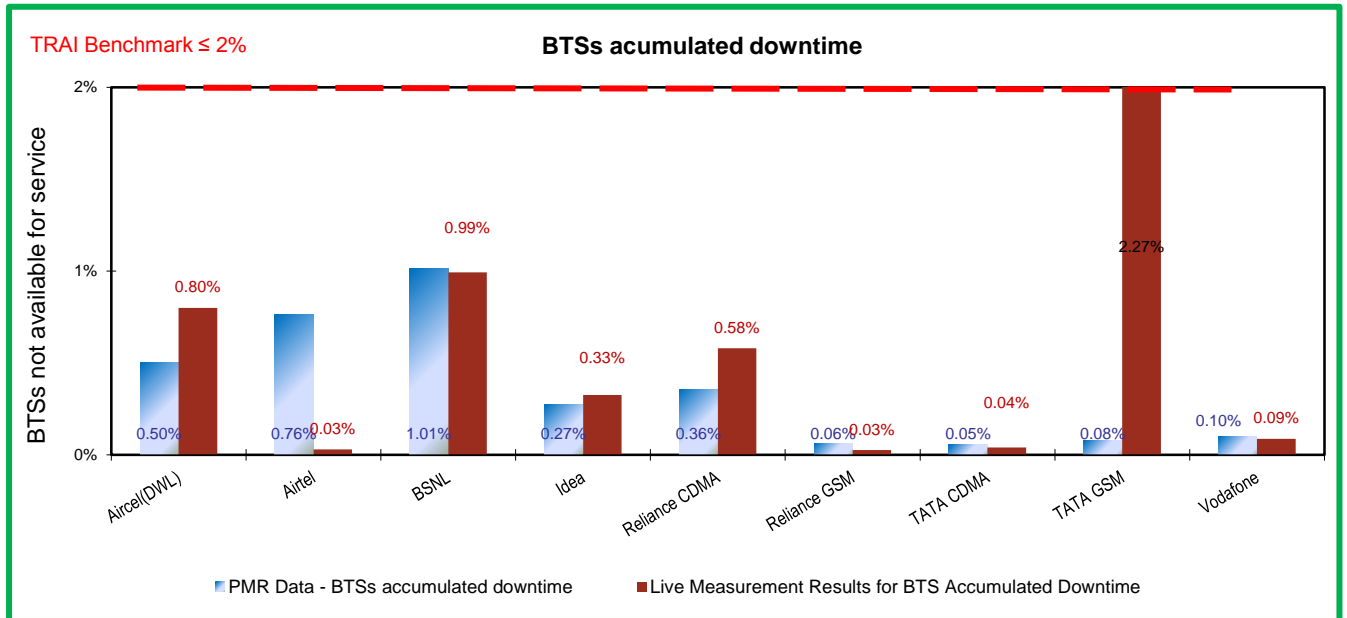
Voice quality: All the operators meet the benchmark set by TRAI. The benchmark for voice quality is 95%.

CSSR: All the networks comfortably clear the benchmark.

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

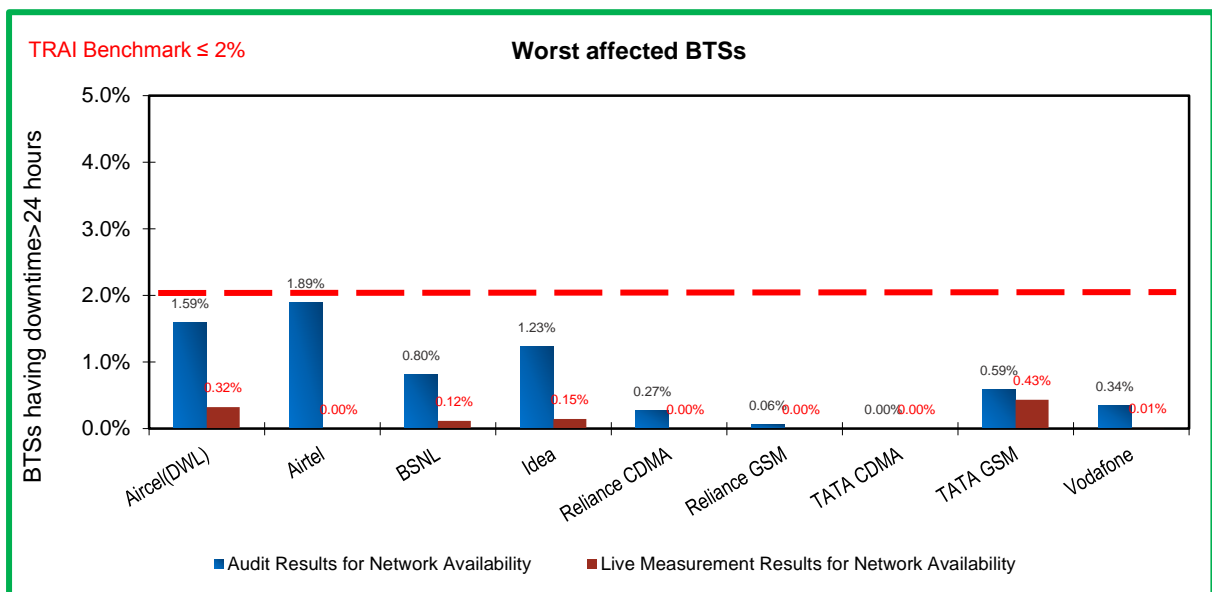
5 DETAILED FINDINGS - COMPARISON BETWEEN PMR DATA, 3 DAY LVE DATA AND LIVE CALLING DATA

5.1 BTS ACCUMULATED DOWNTIME



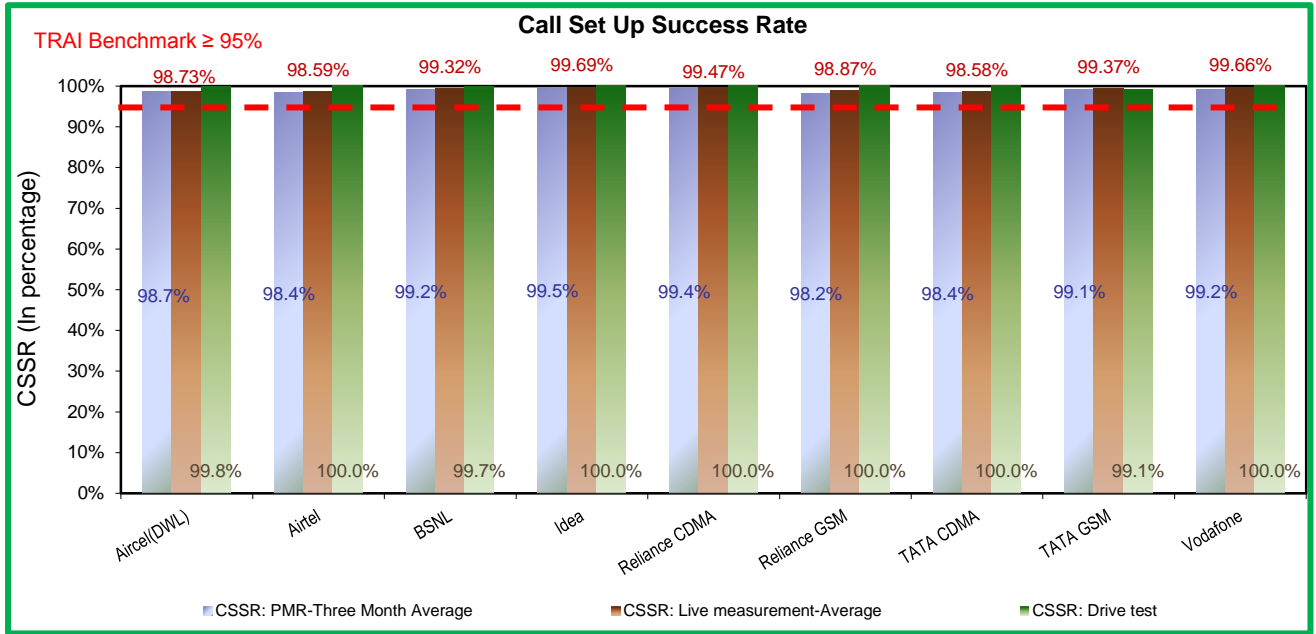
The result of the PMR data and live measurement is almost similar except for TATA GSM where there is a considerable difference on the aspect of BTS Accumulated Downtime. TATA GSM does not meet the benchmark on the aspect of BTS Accumulated Downtime.

5.2 WORST AFFECTED BTS DUE TO DOWNTIME



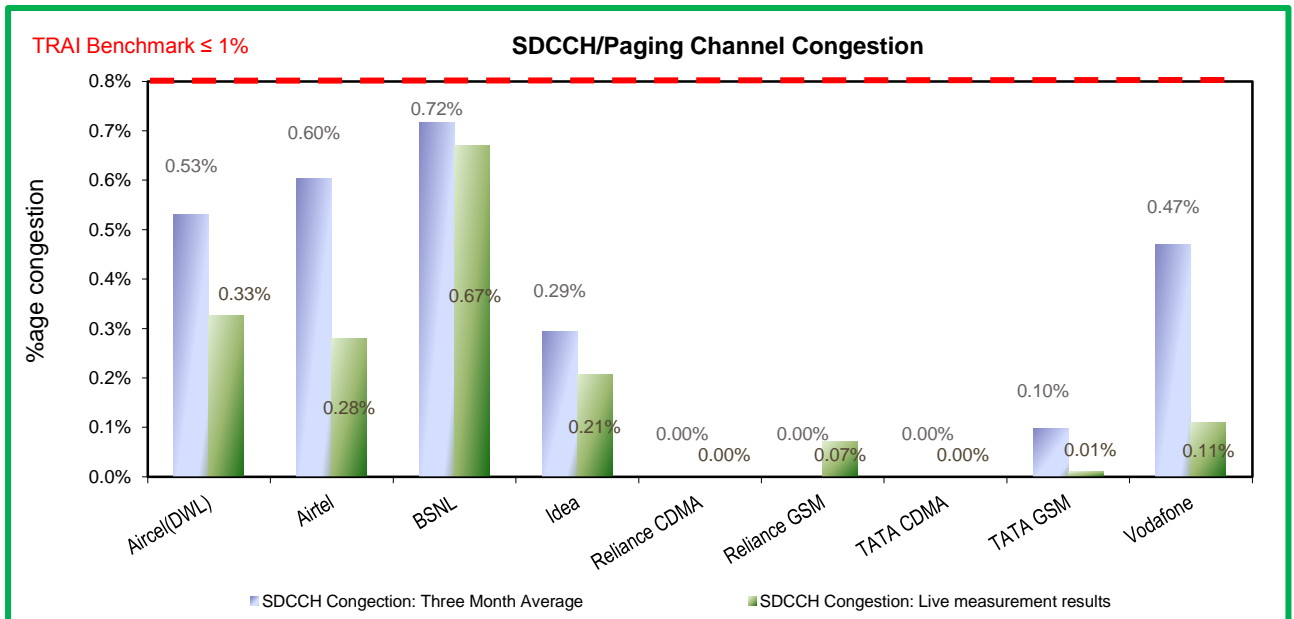
All the operators meet the benchmark, Aircel and Airtel have the maximum worst affected BTS due to downtime.

5.3 CALL SET UP SUCCESS RATE



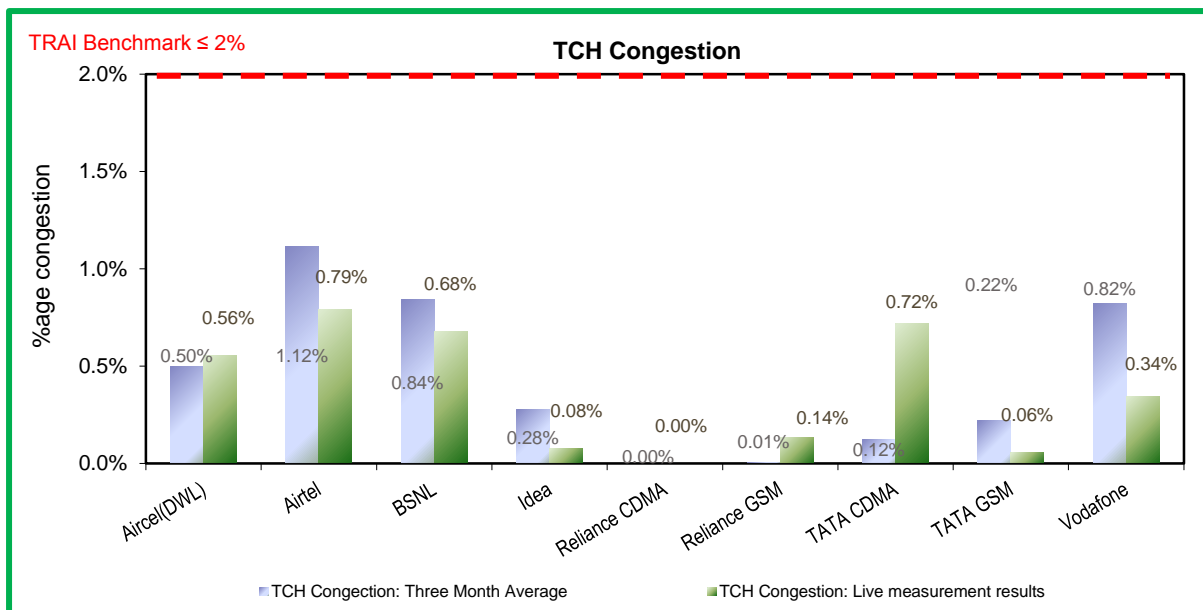
All the operators are meeting the benchmark across Monthly PMR, Live measurement and Drive Test.

5.4 SDCCH/PAGING CHANNEL CONGESTION



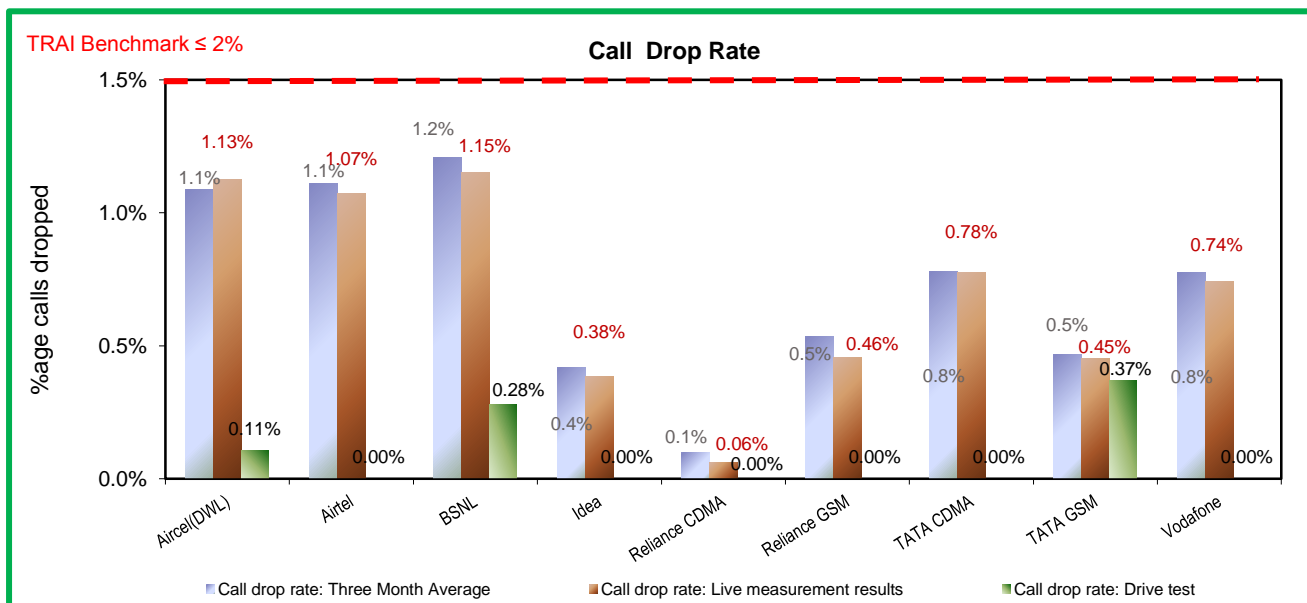
All the operators meet the benchmark.

5.5 TCH CONGESTION



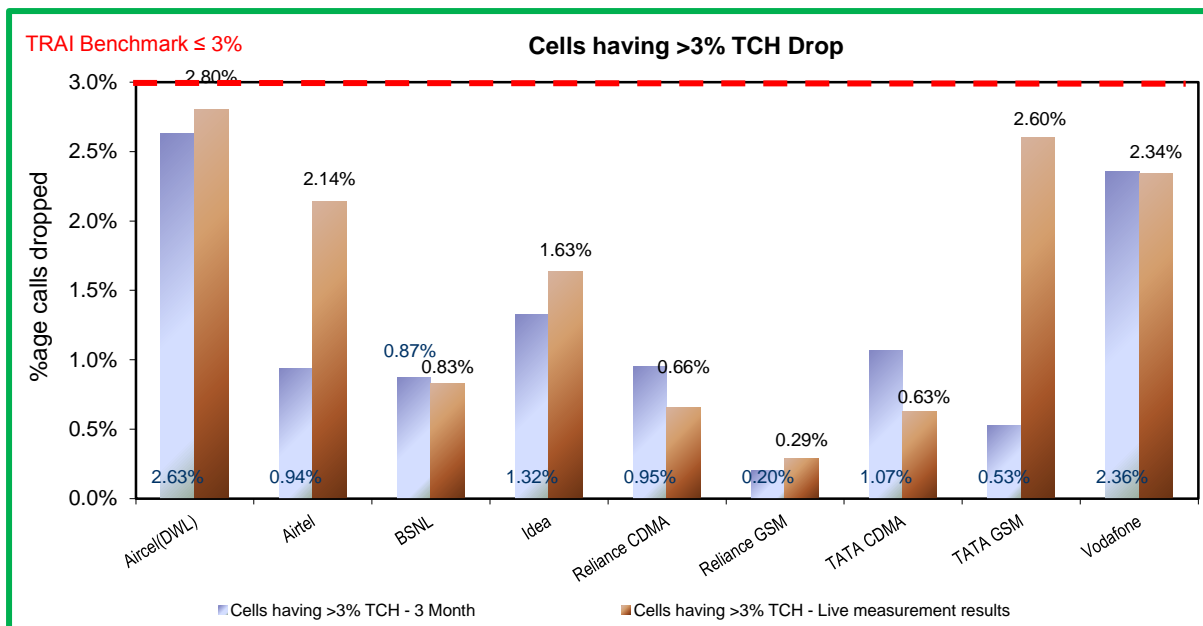
All the operator meets the benchmark. Significant difference observed in TATA CDMA and Vodafone findings.

5.6 CALL DROP RATE



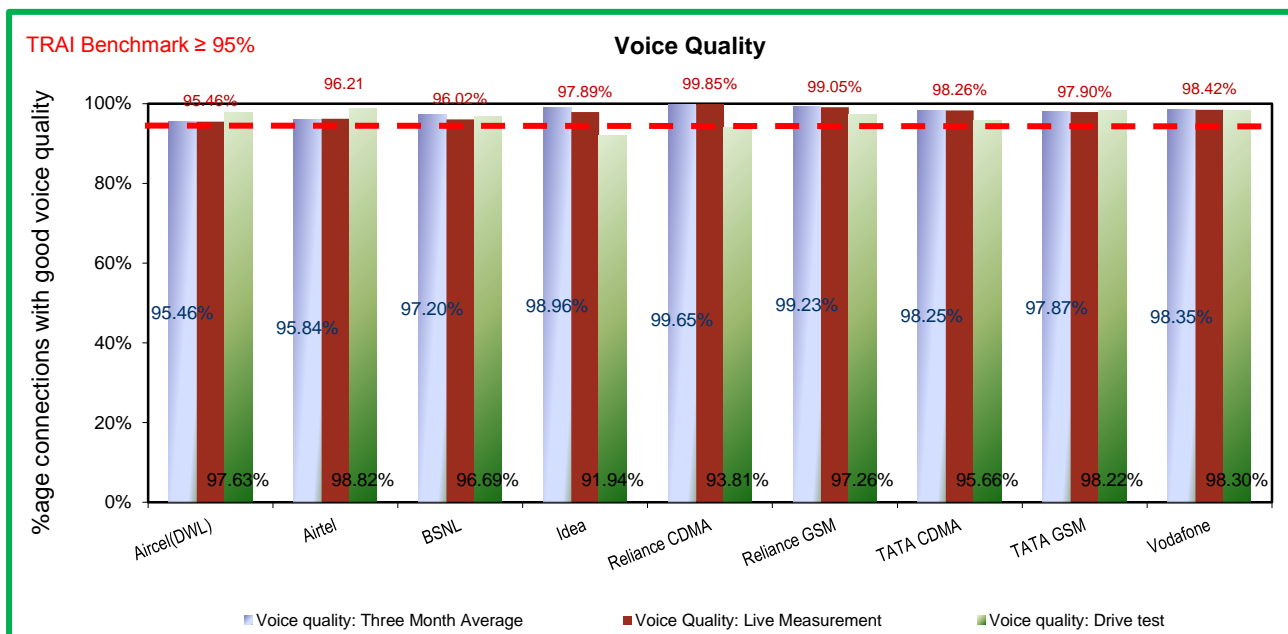
All the operators meet the benchmark. There is no significant difference across the benchmark monthly PMR, Live measurement results and Drive test.

5.7 CELLS HAVING GREATER THAN 3% TCH DROP



Aircel and Vodafone are performing relatively poorly but all the operators meet the benchmark of 3%.

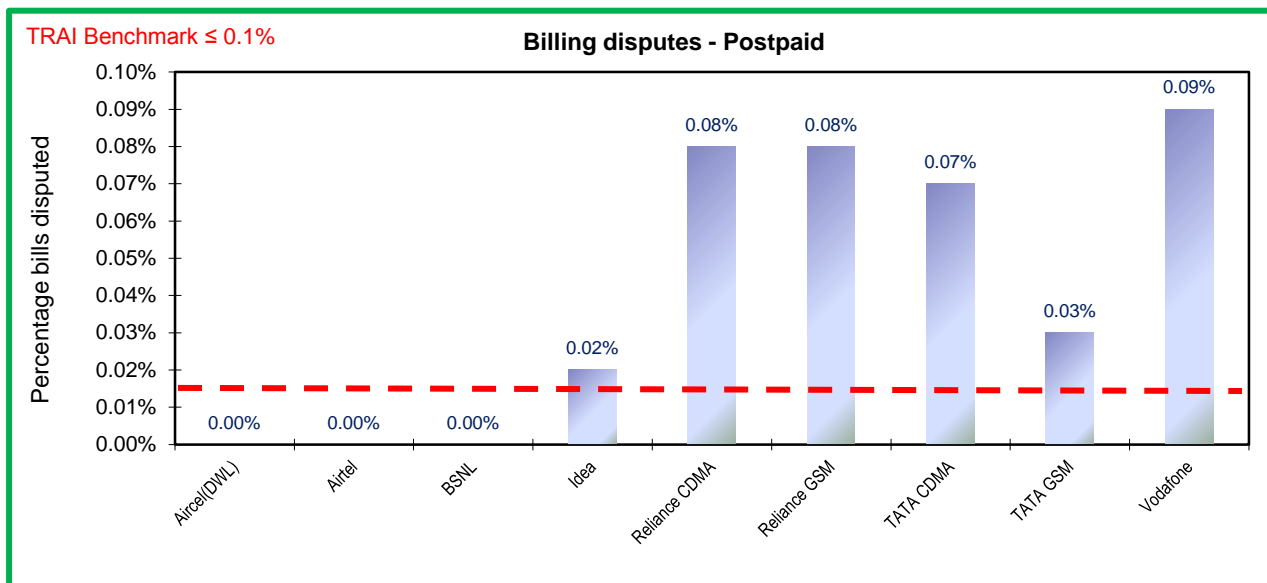
5.8 VOICE QUALITY



All the operators are meeting the benchmark though Airtel and Aircel is faring poorly as compare to other operators.

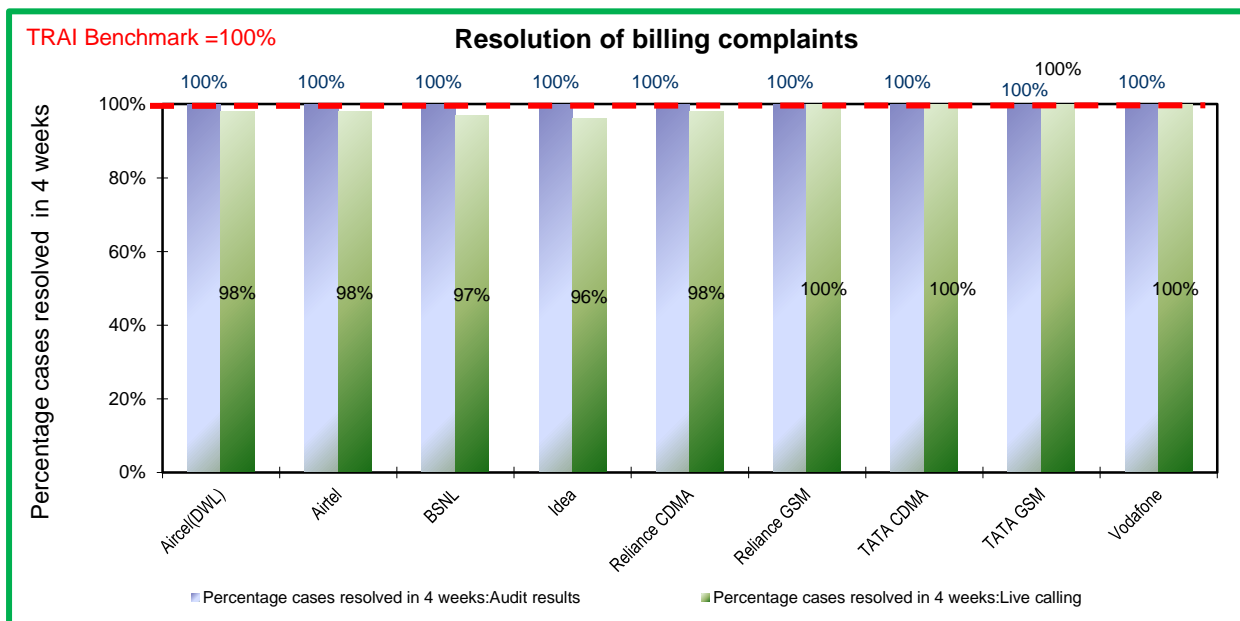
6 DETAILED FINDINGS – NON NETWORK PARAMETERS

6.1 BILLING DISPUTES-POSTPAID



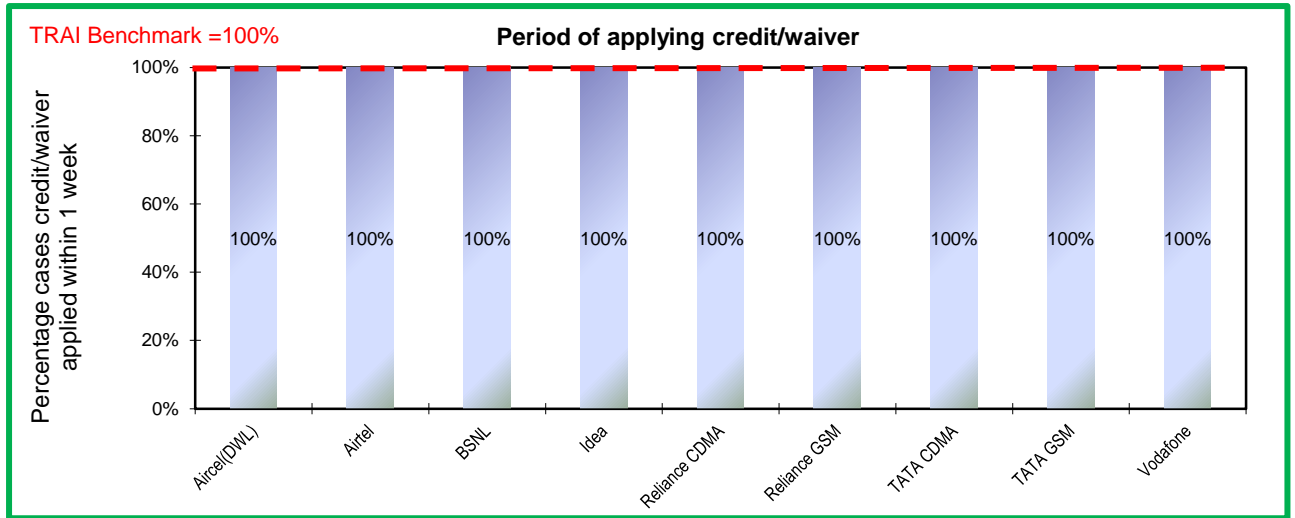
All the operators meet the benchmark, billing disputes for Vodafone was highest.

6.2 RESOLUTION OF BILLING COMPLAINTS



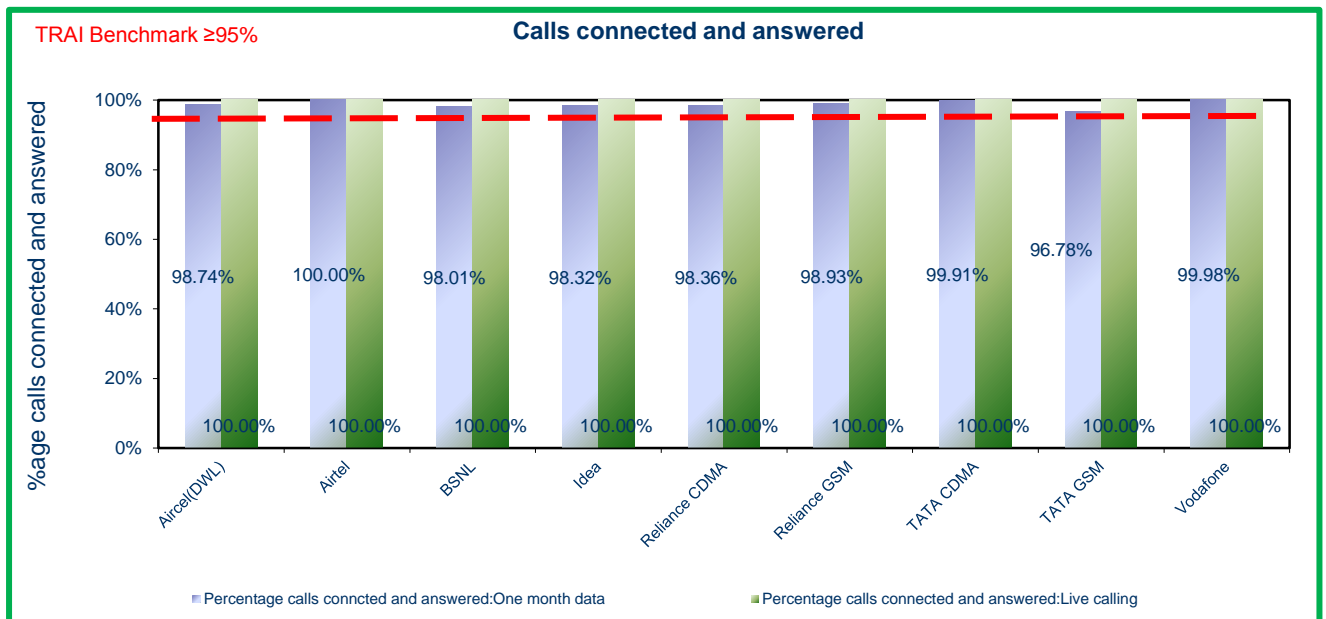
As per the operators all the complaints were resolved in 4 weeks' time however as per customers Aircel, Airtel, BSNL, Idea, Reliance CDMA do not meet the benchmark on this aspect.

6.3 PERIOD OF APPLYING CREDIT/WAVIER



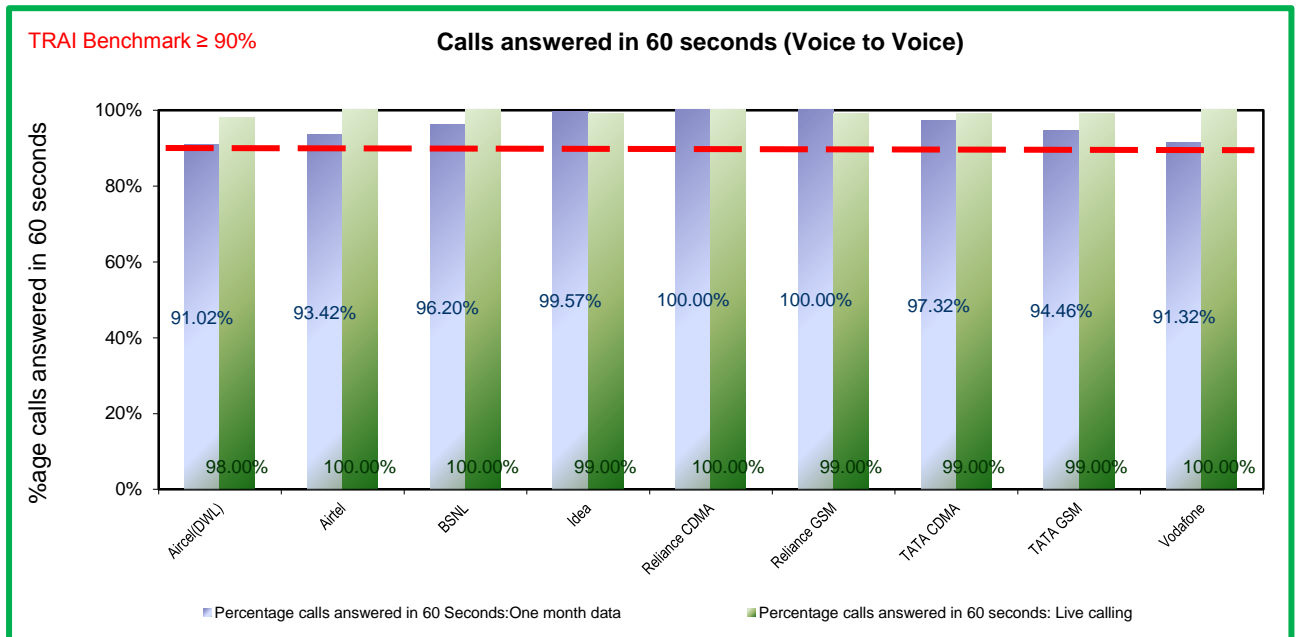
As per the operators meet the benchmark.

6.4 CALL CENTRE PERFORMANCE-IVR



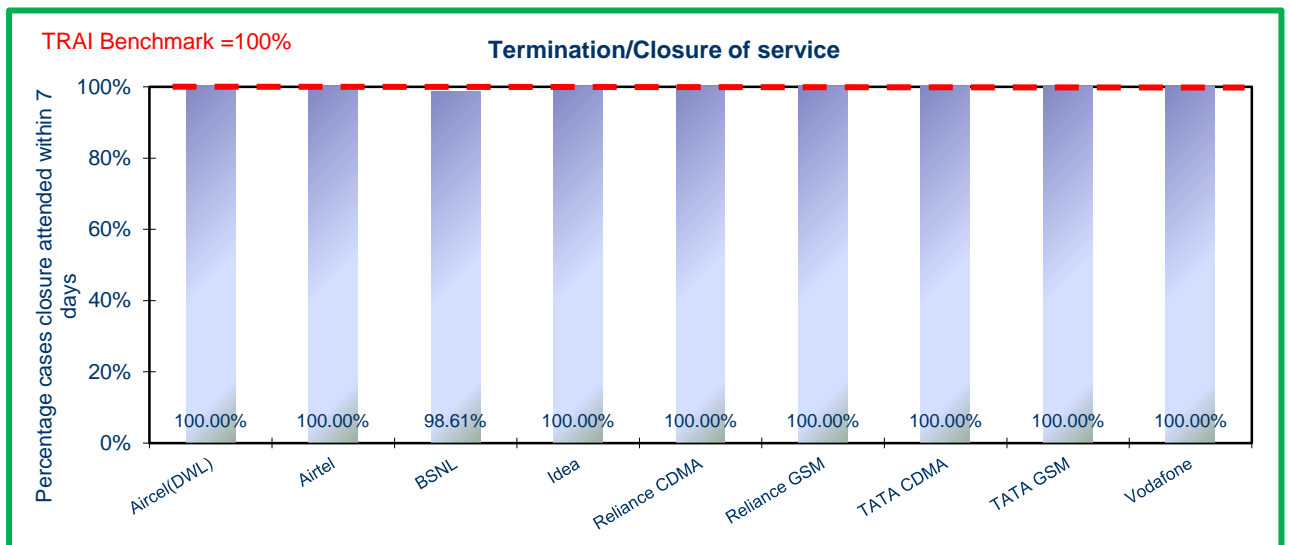
All the operators meet the benchmark. IVR has 100% connectivity across operators.

6.5 CALL CENTRE PERFORMANCE-VOICE TO VOICE



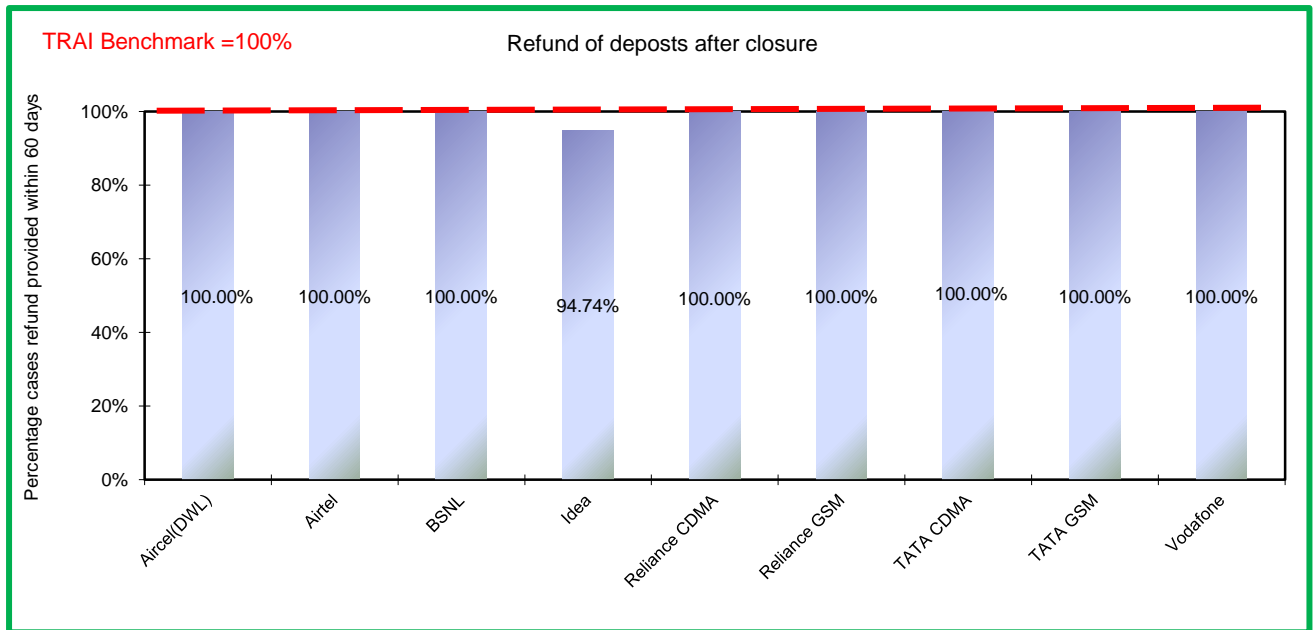
All the operators meet the benchmark. Vodafone and Aircel performing relatively poorly as compare to the others.

6.6 TERMINATION/CLOSURE OF SERVICE



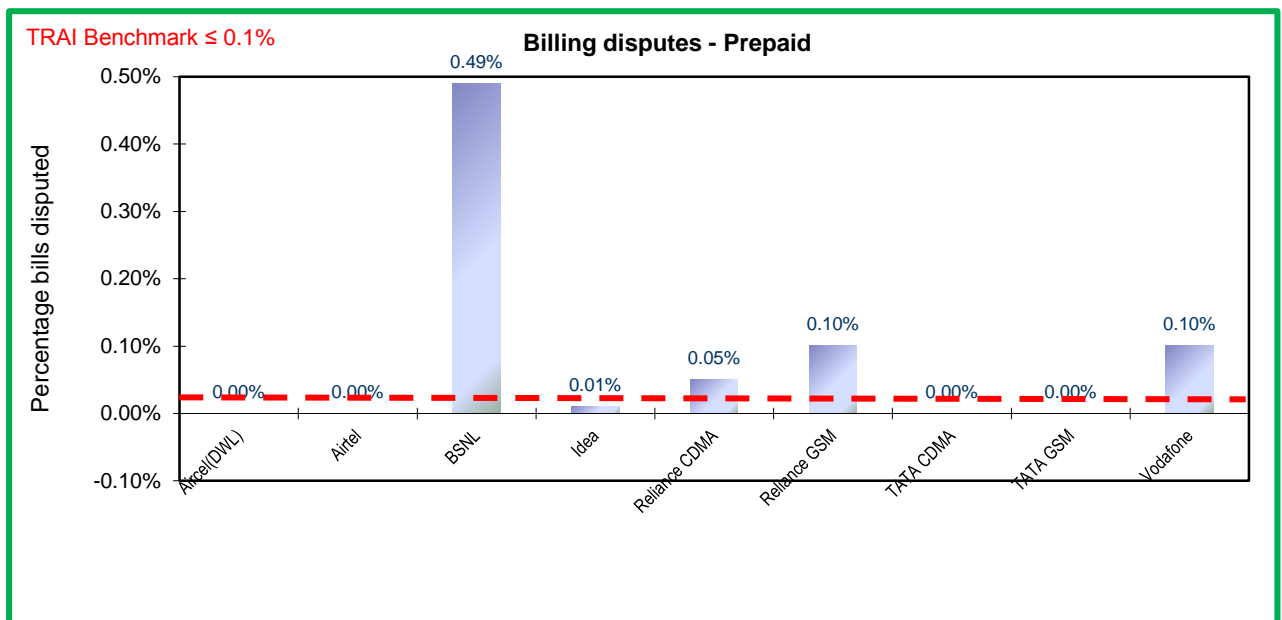
All the operators meet the benchmark on the aspect of closure of services in 7 days

6.7 REFUND OF DEPOSITS AFTER CLOSURE



Idea being the only operator which does not meet the benchmark for refund of deposits within 60 days post closure of service.

6.8 BILLING COMPLAINTS - PREPAID



BSNL, Reliance and Vodafone are not meeting the benchmark on the aspect of billing disputes complaints for metering, charging, credit and validity.

7 ANNEXURE

7.1 BILLING

Audit Results for Billing performance

Billing Performance	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Billing disputes - Postpaid										
Total bills generated during the period		5850	95726	59571	5753	20703	22703	4582	9847	29090
Total number of bills disputed		0	2	1	1	17	19	3	3	27
Percentage bills disputed	≤ 0.1%	0.00%	0.00%	0.00%	0.02%	0.08%	0.08%	0.07%	0.03%	0.09%
Billing disputes - Prepaid										
Number of complaints related to charging, credit & validity		0	132	15423	145	355009	3723	7	19	3061
Total number of prepaid customers in that period		2962136	7241283	3162834	1052841	188	3751138	242968	2240391	3155877
Percentage of complaints	≤ 0.1%	0.00%	0.00%	0.49%	0.01%	188834.57%	0.10%	0.00%	0.00%	0.10%
Resolution of billing complaints										
Total number of billing/charging complaints		0	134	15424	146	205	3742	10	22	3088
Total complaints considered invalid		338	4988	14734	414	44	0	10	22	0

Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1		0	134	15424	146	205	3742	10	22	3088
Percentage complaints resolved within 4 weeks of date of receipt	100%	100%	100%	100%	100%	NA	100%	100%	100%	100%
Period of applying credit / waiver										
Total number of complaints where credit/waiver is required		0	134	690	146	161	3742	0	0	820
Percentage cases in which credit/waiver was received within 1 week	100%	100%	100%	100%	100%	100%	100%	NA	NA	100%

Live calling results for resolution of billing complaints

Resolution of billing complaints	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls made		100	100	100	100	100	100	6	22	100
Number of cases resolved in 4 weeks		98	98	97	96	98	100	6	22	100
Percentage cases resolved in four weeks	100%	98%	98%	97%	96%	98%	100%	100%	100%	100%

7.2 CUSTOMER CARE

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

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of call attempts to customer care for assistance		3358406	457813	90733	71346	146753	2337981	139112	1803884	2284750
Number of calls getting connected and answered (electronically)		3316055	457813	88929	70147	144346	2313015	138986	1745763	2284225
Percentage calls getting connected and answered	≥ 95%	98.74%	100.00%	98.01%	98.32%	98.36%	98.93%	99.91%	96.78%	99.98%
Number of calls getting transferred to the operator (voice to voice)		1062146	1563380	31445	321474	30483	52254	10914	275811	894391
Number of calls answered by operator (voice to voice) within 60 seconds		966776	1460432	30249	320077	27917	347181	10622	260535	816748
Percentage calls answered within 60 seconds (V2V)	≥ 90%	91.02%	93.42%	96.20%	99.57%	100.00%	664.41%	97.32%	94.46%	91.32%

Live calling results for customer care (IVR)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls received		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
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%

Live calling results for customer care (Voice to Voice)

Customer Care Assessment	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls received		100	100	100	100	100	100	100	100	100
Total Number of calls answered within 60 seconds		98	100	100	99	100	99	99	99	100
Percentage calls answered within 60 seconds	≥ 90%	98.00%	100.00%	100.00%	99.00%	100.00%	99.00%	99.00%	99.00%	100.00%

Live calling for level 1 services

Level 1 services		Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total no. of calls made		150	150	150	150	150	150	150	150	150
Calls answered in 60 sec		150	150	150	150	150	150	149	150	150
Calls answered after 60 sec		0	0	0	0	0	0	1	0	0

Live calling results for resolution of service requests

Resolution of service requests		Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total Number of calls made		100	100	100	100	100	100	100	100	100

Number of cases resolved to satisfaction		99	99	99	97	99	100	100	100	99
Percentage cases resolved in four weeks		99.00%	99.00%	99.00%	97.00%	99.00%	100.00%	100.00%	100.00%	99.00%

7.3 TERMINATION/CLOSURE OF SERVICE

Audit results for termination / closure of service

Termination	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of closure request		22	295	72	6	19	65	139	310	96
Number of requests attended within 7 days		22	295	71	6	19	65	139	310	96
Percentage cases in which termination done within 7 days	100%	100.00%	100.00%	98.61%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

7.4 REFUND

Audit results for refund of deposits

Refund	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of cases requiring refund of deposits		27	11	72	19	112	72	5	31	31
Total number of cases where refund was made within 60 days		27	11	72	18	112	72	5	31	31
Percentage cases in which refund was receive within 60 days	100%	100.00%	100.00%	100.00%	94.74%	100.00%	100.00%	100.00%	100.00%	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	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Eqipped capacity of the network		128047.91	297133.49	16000	39416	53000	92000	65436	84752	107101.2
Total taffic handled in erlang during TCBH		63666.61	244041.68	16631.14	20749	10294	62266	10574	34240	86490.95

Total number of customers as per VLR

		Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total no. of customers served (as per VLR)		1985908	7309044	386860	928698	320284	3121438	156075	1321332	2889202

Audit Results for POI Congestion

POI congestion	Benchmark	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of working POIs		93.3	22.0	13.0	58.0	8.0	8.0	45.0	11.0	46.0
No. of POIs not meeting benchmark		0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Capacity of all POIs (A) - in erlangs		1435945.8	93912.7	25000.0	314969.0	10750.0	27385.0	415122.7	347719.3	2766433.6
Traffic served for all POIs (B)- in erlangs		891196.9	50690.0	24572.0	166183.9	3479.0	16144.3	186741.6	148281.3	1167081.3
POI congestion	≤ 0.5%	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	Aircel(DWL)	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TATA CDMA	TATA GSM	Vodafone
Total number of working POIs		93.3	22.0	13.0	58.0	8.0	8.0	45.0	44.0	46.0
No. of POIs not meeting benchmark		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Capacity of all POIs (A) - in erlangs		4302555.5	92172.4	25000.0	31462.9	10966.0	27502.0	13733.1	33932.3	270629.4
Traffic served for all POIs (B)- in erlangs		1225823.0	40649.4	22941.0	16487.4	3709.0	17171.0	6379.8	14995.7	118026.8
POI congestion	≤ 0.5%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%



8, Balaji Estate, Guru RavidassMarg,
New Delhi, DL 110 019, India
☎+91 (11) 4269 7800

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