



**EAST
ZONE**

TRAI AUDIT WIRELESS REPORT-BIHAR & JHARKHAND CIRCLE- JFM QUARTER, 2014

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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.

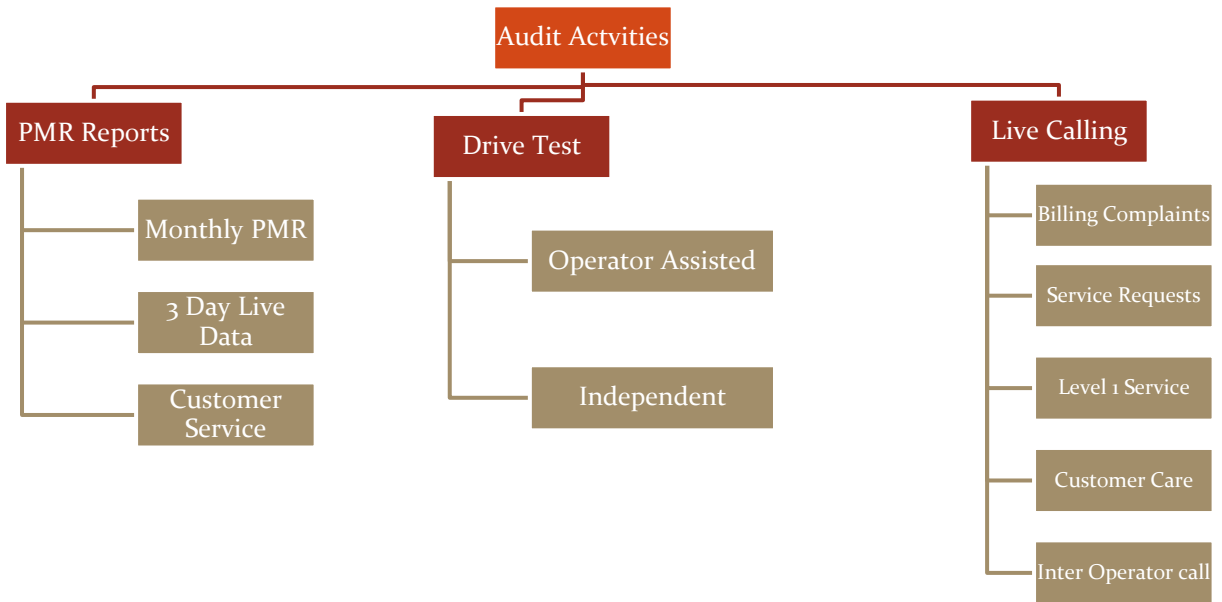
In order to assess the above regulations TRAI has commissioned a third party agency to conduct the audit of the service providers and check the performance of the operators on the various benchmarks set by Telecom Regulatory Authority of India (TRAI).

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 in presence of IMRB representative from the operator's premises for the month of January, February and March. 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

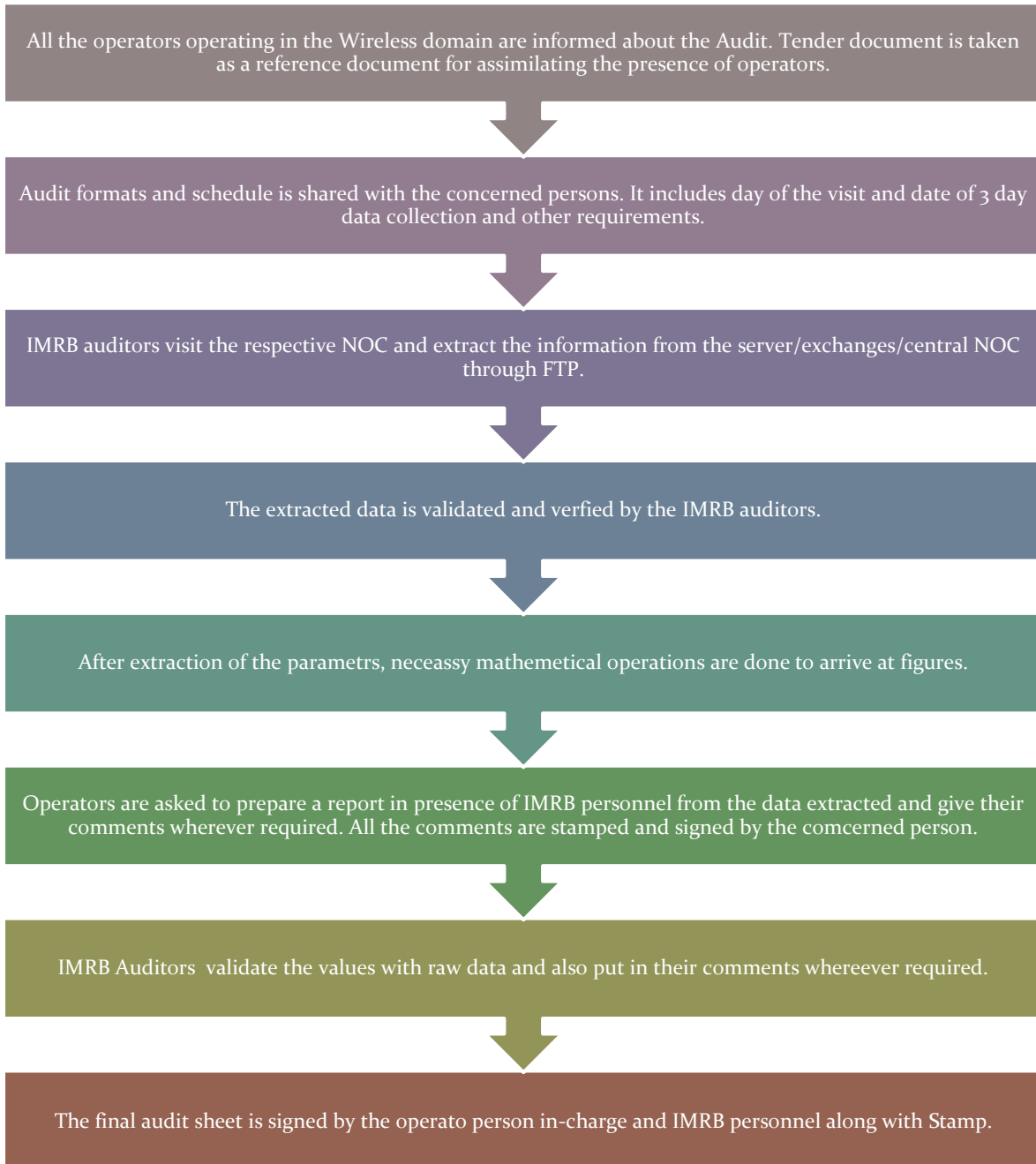
- Call Drop rate
- Worst affected cells having more than 3% TCH drop

Voice Quality

- % Connections with good voice quality

2.3.1.2 AUDIT PROCEDURE

Below is the key steps followed for extraction of reports at operator premise-



2.3.1.3 AUDIT PARAMETERS

Network Related

| Network Availability | |
|--|--------|
| BTSs Accumulated downtime (not available for service) | ≤ 2% |
| Worst affected BTSs due to downtime | ≤ 2% |
| Connection Establishment (Accessibility) | |
| Call Set-up Success Rate (within licensee's own network) | ≥ 95% |
| SDCCH/ Paging Channel Congestion | ≤ 1 % |
| TCH Congestion | ≤ 2% |
| Connection Maintenance (Retainability) | |
| Call Drop Rate | ≤ 2% |
| Worst affected cells having more than 3% TCH drop (call drop) rate | ≤ 3% |
| Connections with good voice quality | ≥ 95% |
| Point of Interconnection | |
| (POI) Congestion (on individual POI) | ≤ 0.5% |

Customer Service Quality-

| Metering and Billing Credibility | |
|--|----------|
| No of billing complaints received - Post paid | ≤ 0.1% |
| No. of billing complaints received- Prepaid | ≤ 0.1% |
| Resolution of billing/ charging complaints within 4 weeks | 100% |
| Period of applying credit/ waiver within 1 week of resolution of complaint | 100% |
| Response Time to the Customer form Assistance | |
| Accessibility of call centre/customer care | ≥ 95% |
| Percentage of calls answered by the operators (voice to voice) within 60 seconds | ≥ 90% |
| Termination/ closure of service | ≤ 7 days |
| Time taken for refund of deposits after closures within 60 days | 100% |

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

2.3.1.3.1 BTS ACCUMULATED DOWNTIME

- The parameter of network availability would be measured from following sub-parameters
 1. BTSs Accumulated downtime (not available for service)
 2. Worst affected BTSs due to downtime
- 1. **Definition - 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 up gradation. For measuring the performance against the benchmark for this parameter the downtime of each BTS lasting more than 1 hour at a time in a day during the period of a month were considered.
- 2. **Computation Methodology -**
BTS accumulated downtime (not available for service) = Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month / (24 x Number of days in a month x Number of BTSs in the network in licensed service area) x 100
- 3. **TRAI Benchmark -**
 - a. BTSs Accumulated downtime (not available for service) $\leq 2\%$
- 4. **Audit Procedure -**
 - The fault alarm details at the OMC (MSC) for the network outages (due to own network elements and infrastructure service provider end outages) was audited
 - All the BTS in service area were considered. Planned outages due to network up gradation, routine maintenance were not considered.
 - Any outage as a result of force majeure were not considered at the time of calculation
 - Data is extracted from the server of the operator. This data is in raw format which is further processed to arrive at the cumulative values.
 - List of operating sites with cell details and ids are taken from the operator.

- When there is any outage a performance report gets generated in line with that cell resulting and master base of the Accumulated downtime and worst affected BTS due to downtime.

2.3.1.3.2 WORST AFFECTED BTS DUE TO DOWNTIME

1. **Definition – Worst Affected BTS due to downtime** shall basically measure percentage of BTS having downtime greater than 24 hours in a month. Planned outages was not considered as part while computing.

For measuring the parameter “Percentage of worst affected BTSs due to downtime” the downtime of each BTS lasting for more than 1 hour at a time in a day during the period of a month was considered.

2. **Computation Methodology –**

Worst affected BTSs due to downtime =
$$\frac{\text{(Number of BTSs having accumulated downtime greater than 24 hours in a month)}}{\text{Number of BTS in Licensed Service Area}} * 100$$

3. **TRAI Benchmark –**

- a. Worst affected BTSs due to downtime $\leq 2\%$

4. **Audit Procedure –**

- i. The fault alarm details at the OMC (MSC) for the network outages (due to own network elements and infrastructure service provider end outages) was audited
- ii. All the BTS in service area were considered. Planned outages due to network up gradation, routine maintenance were not considered.
- iii. Any outage as a result of force majeure were not considered at the time of calculation
- iv. All the BTS having down time greater than 24 hours is assessed and values of BTS accumulated downtime is computed in accordance.

2.3.1.3.3 CALL SET-UP SUCCESS RATE (CSSR)

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

2. **Computation Methodology-**

$$(\text{Calls Established} / \text{Total Call Attempts}) * 100$$

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

3. **TRAI Benchmark** \geq 95%

4. **Audit Procedure -**

- ↳ The cell-wise data generated through counters/ MMC available in the switch for traffic measurements
- ↳ CSSR calculation should be measured using OMC generated data only
- ↳ Measurement should be only in Time Consistent Busy Hour (CBBH) period for all days of the week
- ↳ Counter data is extracted from the NOC of the operators.
- ↳ Total calls established include all calls established excluding Signaling blocking, TCH Drop and TCH blocking.
- ↳ The numerator and denominator values are derived from adding the counter values from the MSC.

2.3.1.3.4 NETWORK CHANNEL CONGESTION- PAGING CHANNEL /TCH CONGESTION/POI

1. **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:

- ↳ SDCCCH Level: Stand-alone dedicated control channel
- ↳ TCH Level: Traffic Channel
- ↳ POI Level: Point of Interconnect

2. Computational Methodology:

$$\Rightarrow \text{SDCCH / TCH Congestion\%} = [(A_1 \times C_1) + (A_2 \times C_2) + \dots + (A_n \times C_n)] / (A_1 + A_2 + \dots + A_n)$$

- Where:-A₁ = Number of attempts to establish SDCCH / TCH made on day 1
- C₁ = Average SDCCH / TCH Congestion % on day 1
- A₂ = Number of attempts to establish SDCCH / TCH made on day 2
- C₂ = 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

$$\Rightarrow \text{POI Congestion\%} = [(A_1 \times C_1) + (A_2 \times C_2) + \dots + (A_n \times C_n)] / (A_1 + A_2 + \dots + A_n)$$

- Where:-A₁ = POI traffic offered on all POIs (no. of calls) on day 1
- C₁ = 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
- A_n = POI traffic offered on all POIs (no. of calls) on day n
- C_n = Average POI Congestion % on day n

3. Benchmark:

⇒ SDCCH Congestion: ≤ 1%

⇒ TCH Congestion: ≤ 2%

⇒ POI Congestion: ≤ 0.5%

4. Audit Procedure –

- ⇒ Audit of the details of SDCCH and TCH congestion percentages computed by the operator (using OMC–Switch data only) would be conducted
- ⇒ The operator should be measuring this parameter during Time consistent busy hour (TCBH) only SDCCH

2.3.1.3.5 CALL DROP RATE

1. **Definition** - 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
2. **Computational Methodology:** $(\text{Total Calls Dropped} / \text{Total Calls Established}) \times 100$
3. **TRAI Benchmark** -
 - ↳ Call drop rate $\leq 2\%$
4. **Audit Procedure** -
 - ↳ Audit of traffic data of the relevant quarter kept in OMC-R at MSCs and used for arriving at CDR was used
 - ↳ The operator should only be considering those calls which are dropped during Time consistent busy hour (TCBH) for all days of the relevant quarter.

2.3.1.3.6 WORST AFFECTED CELLS HAVING MORE THAN 3% TCH DROP

1. **Definition- Worst Affected Cells having more than 3% TCH drop** shall measure the ratio of total number of cells in the network to the ratio of cells having more than 3% TCH drop.
2. **Computational Methodology:** $(\text{Total number of cells having more than 3\% TCH drop} / \text{Total number of cells in the network}) \times 100$
3. **TRAI Benchmark** -
 - ↳ Worst affected cells having more than 3% TCH drop rate $\leq 3\%$
4. **Audit Procedure** -
 - ↳ Audit of traffic data of the relevant quarter kept in OMC-R at MSCs and used for arriving at CDR would be conducted.

- ↪ The operator should only be considering those calls which are dropped during Cell Bouncing Busy hour (CBBH) for all days of the relevant quarter.

2.3.1.3.7 VOICE QUALITY

1. Definition:

- ↪ for GSM service providers the calls having a value of 0 – 5 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 %

2. Computational Methodology:

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

3. TRAI Benchmark: ≥ 95%

4. Audit Procedure –

- a. A sample of calls would be taken randomly from the total calls established.
- b. The operator should only be considering those calls which are meeting the desired benchmark of good voice quality

2.3.1.4 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.

2.3.1.5 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 -

2.3.1.5.1 METERING AND BILLING CREDIBILITY

- Billing complaints includes any of the following complaints related to billing from the point of view of customer which include:
 - ↳ 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.)

All the complaints related to billing as per clause 3.7.2 of QoS regulation of 20th March, 2009 were covered.

- Computational Methodology:
 - ↳ **Billing complaints per 100 bills issued** = (Total billing complaints** received during the relevant quarter / Total bills generated* during the relevant quarter)*100
 - ↳ *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: $\leq 0.1\%$

➤ 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

➤ Invalid Complaints: Operator has an automated complain log in system, few of the complaints get clarified from the IVRS and rest of calls which are through the V2V, dealt by customer representatives. There are solutions to all possible complaints attended by Customer care representative.

As per the operators, Complaints pertaining to below categories are classified as invalid-

↳ Activated VAS service by mistake leading to deduction of Balance

↳ Not aware of tariff plan

↳ Internet activated leading to deduction in balance

↳ Not aware of data charges

↳ MMS sent instead of SMS

↳ Someone else in the family made some calls due to which balance is deducted

↳ Roaming resulting in deduction of balance.

↳ Calls made to special numbers

↳ Money not credited for recharge, in some cases vendor has not done it correctly leading to complaints

This list is indicative and not exhaustive.

2.3.1.5.2 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) 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. Complaints raised by the consumers to operator are only considered as part of the calculation.

↳ *** 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.

- **%age of billing complaints resolved within 4 weeks:** 100% within 4 weeks
- **Period of applying credit/ waiver/adjustment to customer's account from the date of resolution of complaints:** Within One week of resolution of complaints
- **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.
 - ↳ Percentage of cases where credit/wavier or adjustment is given within one week of resolution of complaints.

2.3.1.5.3 PERIOD OF REFUNDS / PAYMENTS DUE TO CUSTOMERS

- **Computational Methodology:**
 - ↳ **Time taken for refund for deposit after closures = (number of cases of refund after closure done within 60 days/ total number of cases of refund after closure) * 100**
 - ↳ Any case where the operators need to return the amount back to consumers post closure of service in form of cheque/cash is considered to be refund.
- **TRAI Benchmark:**
 - ↳ Termination/Closure of Service: <=7 days
 - ↳ Time taken for refund for deposit after closures: 100% within 60 days
- **Audit Procedure:**
 - ↳ Operator to provide details of:-
 - Dates of lodging of all closure request resolved resulting in requirement of a refund by the operator.

- Dates of refund pertaining to all closure request 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 3 SSA were selected and audited in each quarter, 1 SSA in each month.. The methodology adopted for the drive test-

- ↳ 3 consecutive days drive test in one SSA every month. SSA would be defined as per BSNL and month wise SSA list will be finalized by regional TRAI office.
- ↳ Route map was designed in such a way that all the major roads, highways and all the important towns and villages were covered as part of audit.
- ↳ Special emphasis will be given to those areas where the number of complaints received is on the higher side.
- ↳ We need to define route details so that we cover maximum area in the SSA and try to cover maximum villages and cities within the SSA. We should also try to design the route such that there is no overlap and we can start from the point from where we had left last day(if possible).
- ↳ The route were classified as-
 - With In city
 - Major Roads
 - Highways
 - Shopping complex
 - Office Complex
- ↳ There were no fixed calls which we need to do for within city, major roads and highways, but a minimum of 30 calls in each route, i.e., within city, major roads and highways on each day. For indoors, 20 calls each for shopping and office complex each day preferably in relatively bigger city.
- ↳ 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 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. Below are the parameters which are captured for the GSM and CDMA operators-

- ↪ Coverage-Signal strength (GSM)
 - ✓ Total calls made (A)
 - ✓ Number of calls with signal strength between 0 to -75 dBm
 - ✓ Number of calls with signal strength between -75 to -85 dBm
 - ✓ Number of calls with signal strength between -85 to -120 dBm
- ↪ Coverage-Signal strength (CDMA)
 - ✓ Total Ec/Io BINS (A)
 - ✓ Total Ec/Io BINS with less than -15 (B)
 - ✓ Low Interference = $[1 - (B/A)] \times 100$
- ↪ Voice quality (GSM)
 - ✓ Total Rx Qual Samples- A
 - ✓ Rx Qual samples with 0-5 value - B
 - ✓ %age samples with good voice quality = $B/A \times 100$
- ↪ Voice quality (CDMA)
 - ✓ Total FER BINS (forward FER) - A
 - ✓ FER BINS with 0-2 value (forward FER) - B
 - ✓ FER BINS with 0-4 value (forward FER) - C
 - ✓ %age samples with FER bins having 0-2 value (forward FER) = $B/A \times 100$
 - ✓ %age samples with FER bins having 0-4 value (forward FER) = $C/A \times 100$
 - ✓ No. of FER samples with value $> 4 = [A-C]$
- ↪ Call setup success rate
 - ✓ Total number of call attempts - A
 - ✓ Total Calls successfully established - B
 - ✓ Call success rate (%age) = $(B/A) \times 100$
- ↪ Blocked calls
 - ✓ 100% - Call Set up Rate
- ↪ Call drop rate
 - ✓ Total Calls successfully established - A

- ✓ Total calls dropped after being established – B
- ✓ Call Drop Rate (%age) = (B/A) x 100

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

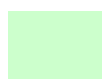
A total of 100 calls per service provider to all the other service providers in a licensed service area were done for the purpose of audit.

2.4 OPERATORS COVERED

| Operator | Number of Subscriber as per VLR |
|---------------|---------------------------------|
| Aircel(DWL) | 358531 |
| Airtel | 21424138 |
| BSNL | 620271 |
| Idea | 7126885 |
| Reliance CDMA | 2515773 |
| Reliance GSM | 6464331 |
| TATA CDMA | 473988 |
| TATA GSM | 887332 |
| Uninor | 3995092 |
| Vodafone | 3585311 |



Not Meeting the benchmark



Best Performing Operator

3 EXECUTIVE SUMMARY

3.1 PMR DATA – 3 MONTHS- CONSOLIDATED

The objective assessment of Quality of Service (QoS) carried out by IMRB gives an insight into the overall performance of various operators in the Bihar circle, with a parameter wise performance evaluation as compared to TRAI benchmark.

| Name of Service Provider | Network Availability | | Connection Establishment (Accessibility) | | | Connection Maintenance (Retainability) | | |
|--------------------------|--|------------------------------------|--|------------------------------|----------------|--|---|--|
| | BTs Accumulated downtime (not available for service) | Worst affected BTs 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) | 1.67% | 10.24% | 97.63% | 0.58% | 1.81% | 1.06% | 4.63% | 94.80% |
| Airtel | 0.09% | 0.25% | 96.49% | 0.16% | 0.22% | 0.26% | 2.01% | 99.00% |
| BSNL | 2.88% | 13.80% | 85.15% | 0.85% | 2.49% | 13.74% | 6.63% | 95.24% |
| Idea | 0.53% | 1.73% | 98.35% | 0.57% | 1.49% | 1.27% | 2.78% | 97.33% |
| Reliance CDMA | 0.22% | 0.34% | 98.21% | NA | 0.01% | 0.26% | 0.48% | 99.47% |
| Reliance GSM | 0.08% | 0.50% | 96.24% | 0.24% | 0.08% | 0.48% | 0.08% | 97.87% |
| TATA CDMA | 0.09% | 0.00% | 97.53% | NA | 0.79% | 0.84% | 2.29% | 98.23% |
| TATA GSM | 0.00% | 0.00% | 99.21% | 0.11% | 0.08% | 0.41% | 0.24% | 97.89% |
| Uninor | 0.17% | 0.56% | 97.41% | 0.54% | 1.93% | 0.53% | 1.45% | 93.87% |
| Vodafone | 0.31% | 1.40% | 99.72% | 0.06% | 0.26% | 0.69% | 1.74% | 97.86% |

Following are the parameter wise observations for Wireless Operators for Bihar circle:

BTs Accumulated Downtime:

The audit results showed that on the whole, all the operators met the TRAI specified criteria for the outage due to downtime of the base transceiver stations (BTS) except for BSNL. TATA GSM performed the best of the lot with no downtime reported followed by Reliance GSM, Airtel, and TATA CDMA.

Worst Affected BTs Due to Downtime:

During the audit it is found that all the operators meet the benchmark specified by TRAI except Aircel and BSNL. TATA CDMA and TATA GSM performed the best vis-à-vis other competitors.

Call Set-up Success Rate (CSSR):

All the operators comfortably met the TRAI benchmark except BSNL.

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 except for BSNL in TCH congestion.

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. All service providers were found to be meeting the TRAI specified benchmark except BSNL.

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 except Aircel and BSNL. Reliance GSM was performing the best on this parameter when compared to other service providers.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark specified by TRAI except Aircel and Uninor.

3.2 3 DAY DATA – CONSOLIDATED

A three day live measurement was conducted to measure the QoS provided by the operators. It was seen from the live data collected, that the performance of the operators across all parameter more or less corroborated the audit data collected.

| 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 | %age of connection with good voice quality |
| Benchmark | ≤ 2% | ≤ 2% | ≥ 95% | ≤ 1% | ≤ 2% | ≤ 2% | ≤ 3% | ≥ 95% |
| Aircel(DWL) | 1.62% | 0.00% | 97.22% | 0.58% | 2.36% | 1.13% | 0.00% | 94.72% |
| Airtel | 0.16% | 0.00% | 98.36% | 0.13% | 0.18% | 0.26% | 0.70% | 98.70% |
| BSNL | 1.99% | 2.64% | 86.29% | 3.24% | 2.33% | 8.59% | 4.97% | 92.44% |
| Idea | 0.50% | 0.07% | 98.57% | 0.54% | 1.40% | 0.93% | 2.81% | 97.15% |
| Reliance CDMA | 0.21% | 0.00% | 98.33% | NA | 0.01% | 0.23% | 0.00% | 98.80% |
| Reliance GSM | 0.12% | 0.00% | 97.06% | 0.20% | 0.07% | 0.50% | 0.00% | 97.94% |
| TATA CDMA | 0.04% | 0.00% | 98.24% | NA | 0.43% | 0.33% | 2.26% | 98.21% |
| TATA GSM | 0.00% | 0.00% | 99.36% | 0.03% | 0.06% | 0.38% | 1.29% | 98.04% |
| Uninor | 0.18% | 0.00% | 97.82% | 0.65% | 2.59% | 0.53% | 1.71% | 93.81% |
| Vodafone | 0.29% | 0.00% | 99.76% | 0.05% | 0.24% | 0.69% | 2.23% | 97.79% |

BTSS Accumulated Downtime:

The audit results showed that on the whole, all the operators met the TRAI specified criteria for the outage due to downtime of the base transceiver stations (BTS). TATA GSM performed the best of the lot with no downtime reported followed by the TATA CDMA.

Worst Affected BTSs Due to Downtime:

During the audit it is found that all the operators' meet the benchmark specified by TRAI except BSNL.

Call Set-up Success Rate (CSSR):

All operators comfortably met the TRAI benchmark except BSNL at 86.29%. The best performance was recorded for the operator Vodafone at 99.76% CSSR.

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 TCH congestion parameters except Aircel, BSNL, and Uninor and for SDCCH/ Paging Channel Congestion only BSNL is not able to meet the benchmark. The calculation methodology of these parameters was found to be in complete accordance with what has been specified by TRAI.

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. All service providers were found to be meeting the TRAI specified benchmark except BSNL.

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 except BSNL. Aircel, Reliance CDMA and Reliance GSM did not have even a single cell having more than 3% TCH Drop.

Voice Quality:

During the audit it was found that all the service providers were meeting the benchmark specified by TRAI except BSNL, Airtel and Uninor.

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) | 91.00% | 97.00% | 93.33% | 100.00% | 99.00% |
| Airtel | 98.00% | 98.00% | 92.67% | 100.00% | 95.00% |
| BSNL | 66.67% | 78.00% | 47.33% | 100.00% | 38.00% |
| Idea | 88.00% | 94.00% | 85.00% | 100.00% | 95.00% |
| Reliance CDMA | 82.00% | 89.00% | 90.67% | 100.00% | 12.00% |
| Reliance GSM | 86.00% | 81.00% | 93.33% | 100.00% | 94.00% |
| TATA CDMA | 90.00% | 88.00% | 93.33% | 100.00% | 100.00% |
| TATA GSM | 84.00% | 95.00% | 90.00% | 100.00% | 100.00% |
| Uninor | 67.39% | 58.33% | 61.33% | 100.00% | 100.00% |
| Vodafone | 90.00% | 97.00% | 96.00% | 100.00% | 98.00% |

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 (live calling exercise) none of the operators were able to meet the benchmark.

Complaint/Request Attended to Satisfaction

All the operators performed satisfactorily in terms of satisfaction of the customers for service requests. Uninor and BSNL have the lowest percentage of complaints attended to satisfaction. Airtel is performing better as compared to other operators on this parameter.

Level 1 Service

None of the operator were able to meet the TRAI benchmark for level 1 service except Vodafone.

We have contacted the following numbers from each operator sim which counts 150 calls.

- Police-100.
- Fire station- 101,
- Ambulance-102

Accessibility of Call Centre/Customer Care-IVR

All the operators were meeting the TRAI specified benchmark of 95%. For IVR, 100% connectivity was observed for all the operators.

Customer Care / Helpline Assessment

It was seen that the majority of operators comfortably met the TRAI benchmark of 90% of calls answered by the centres within 60 seconds except BSNL and Reliance CDMA.

3.4 BILLING AND CUSTOMER CARE - CONSOLIDATED

| Name of Service Provider | Billing Disputes | | Billing Complaints | Response time to customer for assistance | Customer care | |
|--------------------------|----------------------|---------------------|-------------------------------------|--|---|--|
| | Postpaid Subscribers | Prepaid Subscribers | % of complaints resolved in 4 weeks | % of cases where credit/wavier is received within one week | Percentage of calls answered by the operators IVR within 60 seconds | Percentage of calls answered by the operators (voice to voice) within 60 seconds |
| Benchmark | ≤ 0.1% | ≤ 0.1% | ≥ 100% | ≥ 100% | ≥ 95% | ≥ 90% |
| Aircel(DWL) | 0.00% | 0.00% | 100.00% | 100.00% | 72.78% | 90.61% |
| Airtel | 0.01% | 0.01% | 100.00% | 100.00% | 100.00% | 86.51% |
| BSNL | 0.00% | 0.00% | 100.00% | 100.00% | 90.23% | 97.00% |
| Idea | 0.01% | 0.01% | 100.00% | 100.00% | 99.57% | 94.67% |
| Reliance CDMA | 0.09% | 0.10% | 100.00% | 100.00% | 99.04% | 90.00% |
| Reliance GSM | 0.08% | 0.10% | 100.00% | 100.00% | 98.98% | 94.00% |
| TATA CDMA | 0.05% | 0.00% | 100.00% | 100.00% | 99.46% | 97.00% |
| TATA GSM | 0.20% | 0.00% | 100.00% | 100.00% | 96.73% | 96.00% |
| Uninor | NA | 0.02% | 100.00% | 100.00% | 96.13% | 96.57% |
| Vodafone | 0.02% | 0.02% | 100.00% | 100.00% | 100.00% | 81.30% |

Billing Disputes – Postpaid Subscribers

For the billing disputes for the postpaid subscribers, it was seen that all operators met the benchmark except TATA GSM with an average of only 0.04% complaints, which was much within the TRAI benchmark of less than 0.5%. Aircel and BSNL showed the best performance with no billing complaints registered against them.

NA: Not Applicable; Uninor does not have any postpaid subscribers

Billing Disputes – Prepaid Subscribers

For the prepaid customers all the operators meets the benchmark comfortably. Aircel, BSNL, TATA CDMA, and TATA GSM showed the best performance with no billing complaints registered against them.

Billing Complaints -% of complaints resolved in 4 weeks

It was observed that all the operators meet the TRAI criteria of resolution of complaint within 4 weeks with a perfect score of 100% for all the operators.

Response Time to customer for assistance - % of cases in which advance wavier is received within one week

It was observed that all the operators met the TRAI benchmark of providing credit or waiver within one week in case of complaints received.

Customer Care Percentage of calls answered by the operators IVR within 60 seconds

From the audit it can be seen that on an average 95.85% of the calls were answered by the operators within IVR. Operators Airtel and Vodafone performed better than other operators with 100% their calls being answered within the stipulated time. Airtel and BSNL failed to meet the benchmark of 95% with only 72.78% and 90.23% of IVR calls was being attended within 60 seconds.

Customer Care Percentage of calls answered by the operators (Voice to Voice) within 60 seconds

For the voice to voice calls, an average of 81.85% of the calls was answered within 60 seconds from the total calls. TATA CDMA had the highest percentage of calls being answered whereas Airtel and Vodafone did not meet the TRAI benchmark

3.5 INTER OPERATOR CALL ASSESSMENT - CONSOLIDATED

| Inter operator call Assessment To↓ From→ | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
|--|-------------|---------|---------|---------|---------------|--------------|-----------|----------|---------|----------|
| Aircel(DWL) | NA | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Airtel | 100.00% | NA | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 99.00% | 100.00% | 99.00% |
| BSNL | 100.00% | 100.00% | NA | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Idea | 100.00% | 100.00% | 100.00% | NA | 100.00% | 99.00% | 99.00% | 100.00% | 100.00% | 100.00% |
| Reliance CDMA | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Reliance GSM | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% | 100.00% | 100.00% | 100.00% |
| TATA CDMA | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% | 100.00% | 100.00% |
| TATA GSM | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uninor | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% |
| Vodafone | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA |



Maximum Problem faced by the calling operator to other operator

In the inter-operator call assessment, calls were being made from the test SIMs of service provider (whose audit was being conducted) to all the other service providers. All operators were comfortably able to connect with each other with Aircel, BSNL, Reliance CDMA, Reliance GSM, TATA CDMA, TATA GSM, Uninor and Vodafone having 100% connectivity.

4 DETAILED FINDINGS - DRIVE TEST DATA

The drive test was conducted simultaneously for all the operators present in the Bihar circle. As per the new directive given by TRAI headquarters, drive test for the month of January, February and March, 2014 were conducted at a SSA level. Drive test was conducted for three days in each SSA and the selection of routes ensured that the maximum towns, villages, highways are covered as part of drive test. The routes were selected on basis of the complaints received from the customers. 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.

Below is the schedule of the drive test for the Bihar circle-

| Month | Name of SSA Covered | Date of Drive Test |
|----------|---------------------|--------------------------|
| January | Chapra | 29th Jan to 31st Jan |
| February | Darbhanga | 25th Feb to 27th Feb |
| March | Gaya | 24th March to 26th March |
| Year | 2014 | |

Route Details – January – Chapra SSA –

| | | January | | |
|---------|------------------|---|--|---|
| | | Chapra | | |
| | Type of location | Day 1 | Day 2 | Day 3 |
| Outdoor | Major Roads | SARA DHALA-JAGDAM COLLEGE-BUS STAND-DAROGA RAI CHOWK-THANA CHOWK-MUNICIPALITY CHOWK | CHHAPRA TOWN(JALAPUR)-BARHAMPUR-SHYAMCHAK-FAKULI | NAWAJI TOLA-BHIKHARI CHOWK-BISHUNPURA |
| | Highways | NAWAJI TOLA-GARKHA-SONHO-AMNAUR-MARHAURA-KHAIRA-CHANCHAURA | BARHAMPUR-REVELGANJ-MANJHI-TAJPUR-EKMA-KOPA-TEKNIWAS-NAINI-SAKARDIH-JALALPUR | BISHUNPURA-DORIGANJ-AAMI-DIGHWARA-SHETALPUR-DARIYAPUR-PARSA-NAYAGAON-PARMANANDPUR-SONEPUR |
| | With in the City | MUNICIPALITY CHOWK-MAUNA CHOWK-SAHEBGANJ-RAILWAY STATION-GUDRI BAZAAR-SHYAMCHAK-BARHAMPUR | NA | NA |
| Indoor | Office complex | VMART | | |
| | Shopping complex | | RAILWAY STATION | |

Drive Test Result – January – Chapra SSA

| Name of SSA | Chapra | Month | January | Consolidated | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|--------|-------------|---------|--------------|---------|------------------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|---------|---------|---------|---------|---------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 | | | | | | |
| Signal Strength - 0 to -75 dBm | | 73.75% | 34.08% | 96.79% | 79.59% | No Data Received | | | | 77.61% | 70.43% | NA | | 62.19% | 47.64% | NA | | NA | | 100.00% | 51.33% | 86.11% | 75.29% | | | | |
| Signal Strength -75 to -85 dBm | | 26.18% | 40.03% | 3.19% | 17.04% | | | | | 22.19% | 26.10% | | | 34.19% | 30.99% | | | | | 0.00% | 27.56% | 13.66% | 18.75% | | | | |
| Signal Strength -85 to -120 dBm | | 0.07% | 25.90% | 0.02% | 3.37% | | | | | 0.20% | 3.47% | | | 3.62% | 21.37% | | | | | 0.00% | 21.10% | 0.23% | 5.95% | | | | |
| Voice quality | ≥ 95% | 98.71% | 87.79% | 99.25% | 96.76% | | | | | 97.59% | 94.86% | | | 99.94% | 90.54% | | | | | 99.43% | 88.60% | 100.00% | 92.83% | 98.37% | 90.82% | 98.35% | 95.95% |
| CSSR | ≥ 95% | 100.00% | 98.13% | 100.00% | 100.00% | | | | | 100.00% | 99.59% | | | 100.00% | 98.30% | | | | | 97.29% | 92.25% | 100.00% | 97.81% | 100.00% | 97.83% | 100.00% | 100.00% |
| %age Blocked calls | | 0.00% | 1.87% | 0.00% | 0.00% | | | | | 0.00% | 0.41% | | | 0.00% | 1.70% | | | | | 2.70% | 7.74% | 0.00% | 2.19% | 0.00% | 2.17% | 0.00% | 0.00% |
| Call drop rate | ≤ 2% | 0.00% | 1.05% | 0.00% | 0.00% | | | | | 0.00% | 0.00% | | | 17.00% | 1.30% | | | | | 100.00% | 1.92% | 0.00% | 1.36% | 0.00% | 2.11% | 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% |

Signal Strength

| January | | | | |
|---------------------------------|---------------|---------|-----------|---------|
| % Ec/lo BINS with less than -15 | Reliance CDMA | | TATA CDMA | |
| | In door | Outdoor | In door | Outdoor |
| | 0.00% | 4.12% | 49.07% | 4.67% |

Voice Quality

None of operator was able to meet the benchmark on voice quality in outdoor areas except Airtel and Vodafone.

Call Set Success Rate (CSSR)

All the operators comfortably meet the benchmark except Reliance GSM in Outdoor areas.

Call Drop Rate

All the operators comfortably meet the benchmark except Reliance CDMA and Reliance GSM in indoor areas.

Route Details – February – Darbhanga SSA –

| | | February | | |
|---------|------------------|---|---|--|
| | | Darbhanga | | |
| | Type of location | Day 1 | Day 2 | Day 3 |
| Outdoor | Major Roads | Mabbi to Bithouli Via Karjapatti | Shishona more via Baheri to Surha Chatti | Bela More via dilli more, airforce camp, tarsarai to Baghmore. |
| | Highways | Bithouli to Mabbi Via Simri | Dhonar Chowk Via Benipur to Barnual. | Hazma Chauraha to Jatmalpur Shiv Mandir. |
| | With in the City | Railway Stn via tower chowk , bus stand to Mabbi. | PandaSarai Rly Gumti Via Hajma Chouraha, naka no.5 to Donar Chowk | Bagh More via railway station , lahariya sarai tower , kachari to Hazama Chauraha. |
| Indoor | Office complex | V-Mart Darbhanga | | |
| | Shopping complex | Railway Station. | | |

Drive Test Result – February – Darbhanga SSA

| Name of SSA | Darbhangha | Month | February | Consolidated | | | | | | | | | | | | | | | | | |
|----------------------------------|------------|-------------|----------|--------------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength -0 to -75 dBm | | 69.28% | 23.89% | 99.41% | 62.76% | 83.33% | 64.05% | 90.01% | 84.23% | NA | | 89.26% | 65.07% | NA | | NA | | 100.00% | 63.44% | 86.24% | 70.69% |
| Signal Strength --75 to -85 dBm | | 29.23% | 32.83% | 0.59% | 35.10% | 16.67% | 25.87% | 9.99% | 13.34% | NA | | 10.74% | 21.67% | NA | | NA | | 0.00% | 23.09% | 13.44% | 23.68% |
| Signal Strength --85 to -120 dBm | | 1.49% | 43.28% | 0.00% | 2.14% | 0.00% | 10.08% | 0.01% | 2.43% | NA | | 0.00% | 13.26% | NA | | NA | | 0.00% | 13.48% | 0.31% | 5.63% |
| Voice quality | ≥ 95% | 98.71% | 90.34% | 99.46% | 96.26% | 94.45% | 93.52% | 96.25% | 96.25% | 99.75% | 93.15% | 94.33% | 89.12% | NA | 70.27% | NA | | 99.14% | 86.49% | 99.10% | 97.74% |
| CSSR | ≥ 95% | 100.00% | 97.01% | 100.00% | 100.00% | 100.00% | 97.52% | 100.00% | 100.00% | 100.00% | 99.21% | 100.00% | 99.56% | NA | 94.01% | NA | | 100.00% | 94.85% | 100.00% | 100.00% |
| %age Blocked calls | | 0.00% | 2.99% | 0.00% | 0.00% | 0.00% | 2.48% | 0.00% | 0.00% | 0.00% | 0.79% | 0.00% | 0.44% | NA | 5.99% | NA | | 0.00% | 5.15% | 0.00% | 0.00% |
| Call drop rate | ≤ 2% | 0.00% | 0.30% | 0.00% | 0.00% | 0.00% | 0.56% | 0.00% | 0.00% | 0.00% | 1.98% | 0.00% | 0.17% | NA | 16.18% | NA | | 0.00% | 1.22% | 0.00% | 0.00% |
| Hands off success rate | | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 98.56% | 100.00% | 66.67% | 100.00% | 100.00% | 100.00% | 99.82% | NA | 99.66% | NA | | 100.00% | 100.00% | 100.00% | 100.00% |

Signal Strength

| February | | | | |
|---------------------------------|---------------|---------|-----------|---------|
| % Ec/Io BINS with less than -15 | Reliance CDMA | | TATA CDMA | |
| | In door | Outdoor | In door | Outdoor |
| | 99.95% | 97.73% | 49.80% | 34.46% |

Voice Quality

None of operator was able to meet the benchmark on voice quality in outdoor areas except Airtel and Vodafone.

Call Set Success Rate (CSSR)

All the operators comfortably meet the benchmark except Tata CDMA and Uninor in Outdoor areas.

Call Drop Rate

All operators comfortably meet the benchmark except Tata CDMA

Route Details – March – Gaya SSA –

| | | March | | |
|---------|------------------|--|--|---|
| | | Gaya | | |
| Outdoor | Type of location | Day 1 | Day 2 | Day 3 |
| | Major Roads | Jehanabad to Ullasganj | Sherghati Via Cherki to Gaya Airport | Gaya to Goh Via Guraro |
| | Highways | Gaya to Jehanabad and Ullasganj to Gaya | Cant. Via dobhi to sherghati | Goh to Gaya Via Panchanangpur |
| | With in the City | Manpur bazar via Tekari road to Gaya station | Gaya Rly.Stn Via KP road, Kotwalipolice stn, GB road to Nadraganj to DAV School, Jail road , Gaya Railway Stn. | Rly Stn. ,FCI godam, Jagdeonagar, Telariroad , rly. Hospital, Gaya rly Stn. |

| | | | | |
|--------|------------------|--------------|--|--|
| Indoor | Office complex | Gaya Station | | |
| | Shopping complex | V-Mart | | |

Drive Test Result – March – Gaya SSA

| Name of SSA | Gaya | Month | March | Consolidated | | | | | | | | | | | | | | | | | |
|---------------------------------|--------|-------------|---------|--------------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength - 0 to -75 dBm | | 99.16% | 40.87% | 75.61% | 83.15% | 77.61% | 48.87% | 81.62% | 68.96% | NA | | 92.27% | 63.48% | NA | NA | | | 100.00% | 60.54% | 75.68% | 76.19% |
| Signal Strength -75 to -85 dBm | | 0.83% | 25.27% | 24.11% | 14.76% | 22.19% | 34.21% | 18.06% | 25.67% | | | 7.58% | 25.79% | | | | | 0.00% | 17.11% | 23.05% | 19.91% |
| Signal Strength -85 to -120 dBm | | 0.01% | 33.86% | 0.29% | 2.09% | 0.20% | 16.92% | 0.31% | 5.36% | | | 0.15% | 10.73% | | | | | 0.00% | 22.35% | 1.27% | 3.89% |
| Voice quality | ≥ 95% | 97.99% | 86.25% | 97.98% | 96.02% | 99.00% | 97.01% | 98.56% | 96.23% | 99.95% | 96.80% | 99.08% | 92.21% | 100.00% | 95.11% | 95.81% | 84.96% | 99.05% | 97.94% | | |
| CSSR | ≥ 95% | 100.00% | 99.07% | 100.00% | 100.00% | 100.00% | 97.68% | 100.00% | 100.00% | 100.00% | 98.84% | 100.00% | 98.92% | 100.00% | 97.99% | 100.00% | 98.75% | 100.00% | 100.00% | | |
| %age Blocked calls | | 0.00% | 0.93% | 0.00% | 0.00% | 0.00% | 2.32% | 0.00% | 0.00% | 0.00% | 1.16% | 0.00% | 1.08% | 0.00% | 2.01% | 0.00% | 1.25% | 0.00% | 0.00% | | |
| Call drop rate | ≤ 2% | 0.00% | 1.38% | 0.00% | 0.00% | 0.00% | 3.96% | 0.00% | 0.00% | 0.00% | 0.50% | 0.00% | 0.46% | 0.00% | 3.45% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| Hands off success rate | | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 99.22% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 58.50% | 99.91% | 100.00% | 100.00% | 100.00% | 100.00% | | |

Signal Strength

| % Ec/lo BINS with less than -15 | March | | | |
|--|---------------|---------|-----------|---------|
| | Reliance CDMA | | TATA CDMA | |
| | In door | Outdoor | In door | Outdoor |
| | 0.16% | 1.16% | 49.07% | 15.35% |

Voice Quality

All operators were meeting the benchmark on voice quality except Aircel, Reliance GSM and Uninor in outdoor areas.

Call Set Success Rate (CSSR)

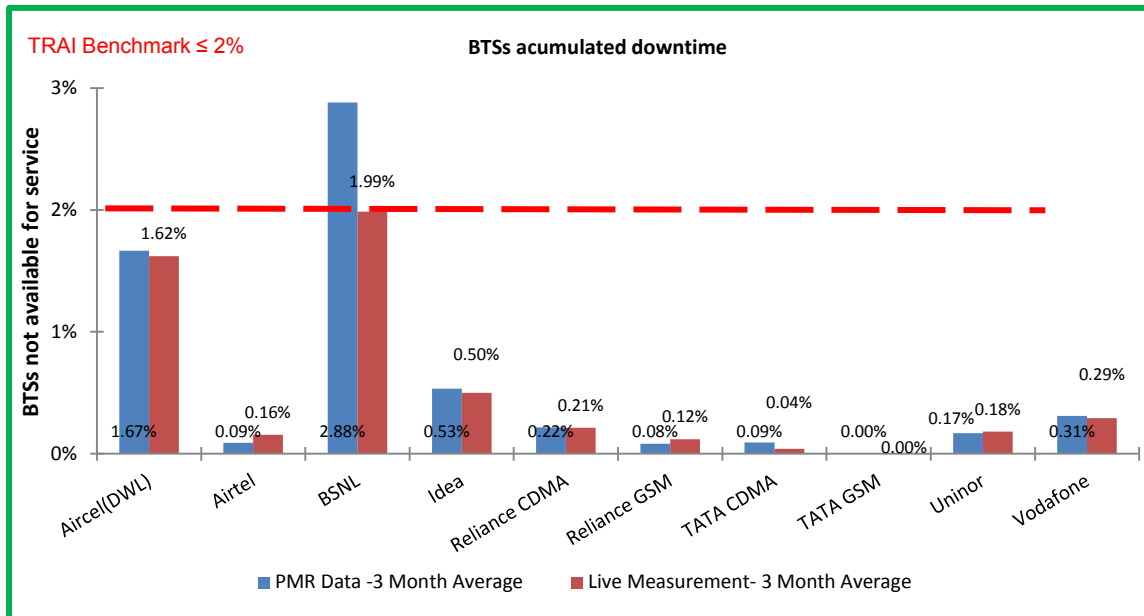
All operators comfortably meet the benchmark.

Call Drop Rate

All operators comfortably meet the benchmark except BSNL, TATA and CDMA

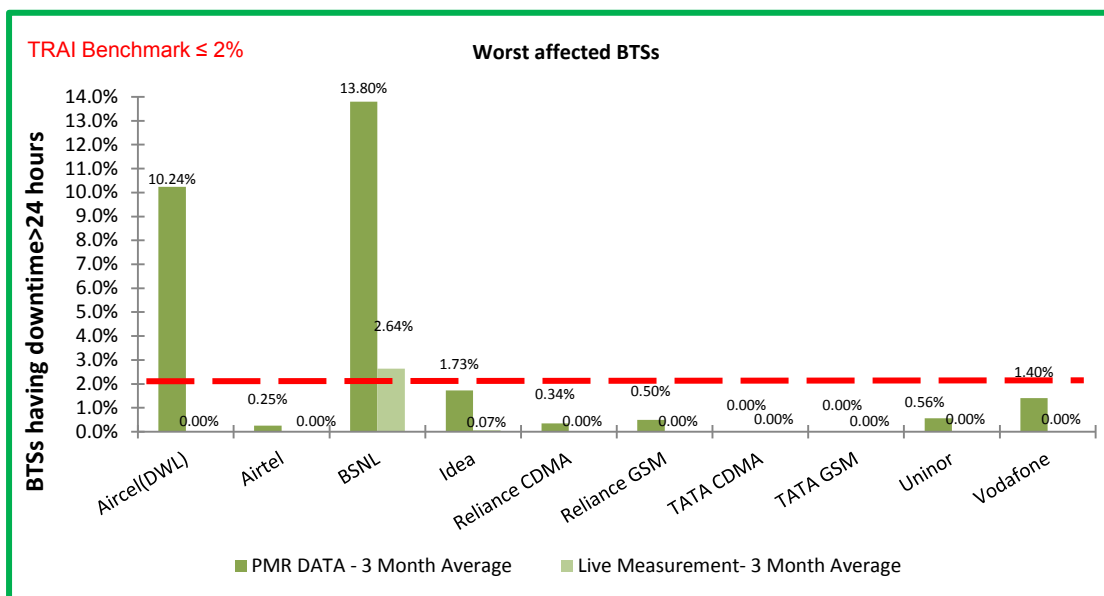
5 DETAILED FINDINGS - COMPARISON BETWEEN PMR DATA, 3 DAY LVE DATA AND LIVE CALLING DATA

5.1 BTS ACCUMULATED DOWNTIME



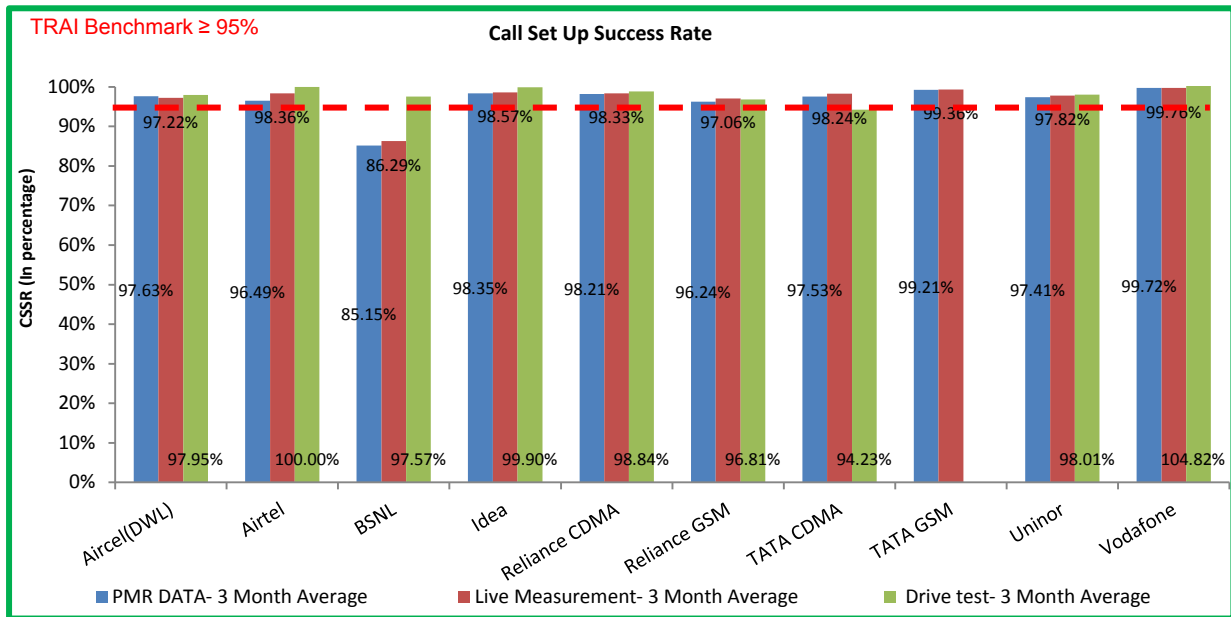
All operators meet the TRAI benchmark of having BTS downtime less than 2% except for BSNL in PMR data.

5.2 WORST AFFECTED BTS DUE TO DOWNTIME



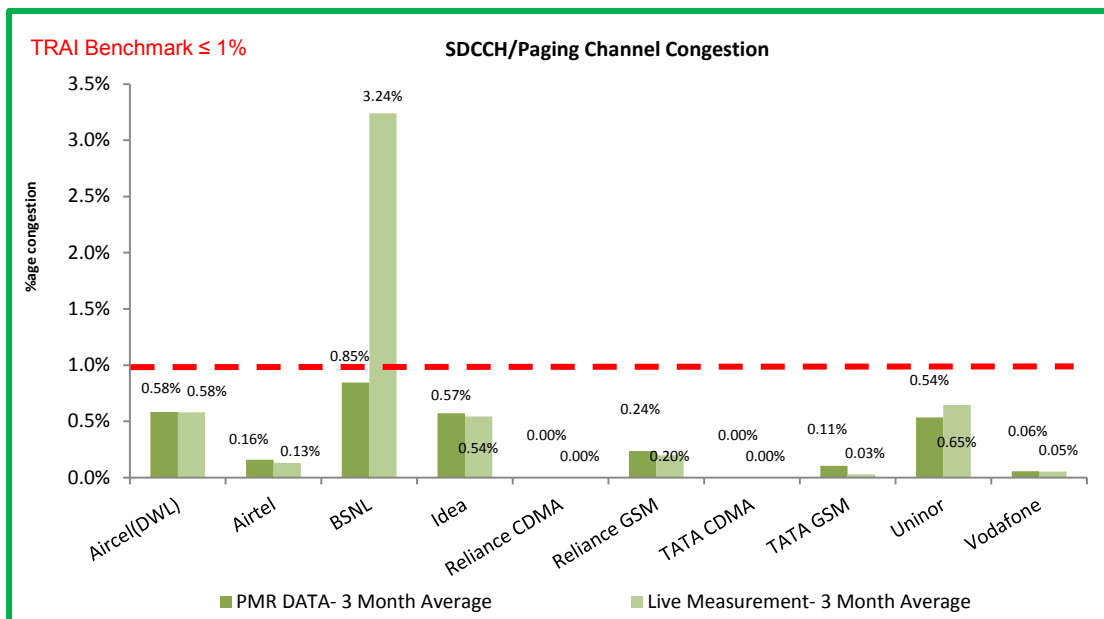
All operators met the benchmark for the worst affected BTS due to downtime except Aircel for PMR data and BSNL for PMR as well as live data. The PMR data shows a higher value for the worst affected BTS as compared to the live measurement data and it also observed that there is a significant difference between MR and Live Measurement data for Aircel, BSNL and Vodafone.

5.3 CALL SET UP SUCCESS RATE



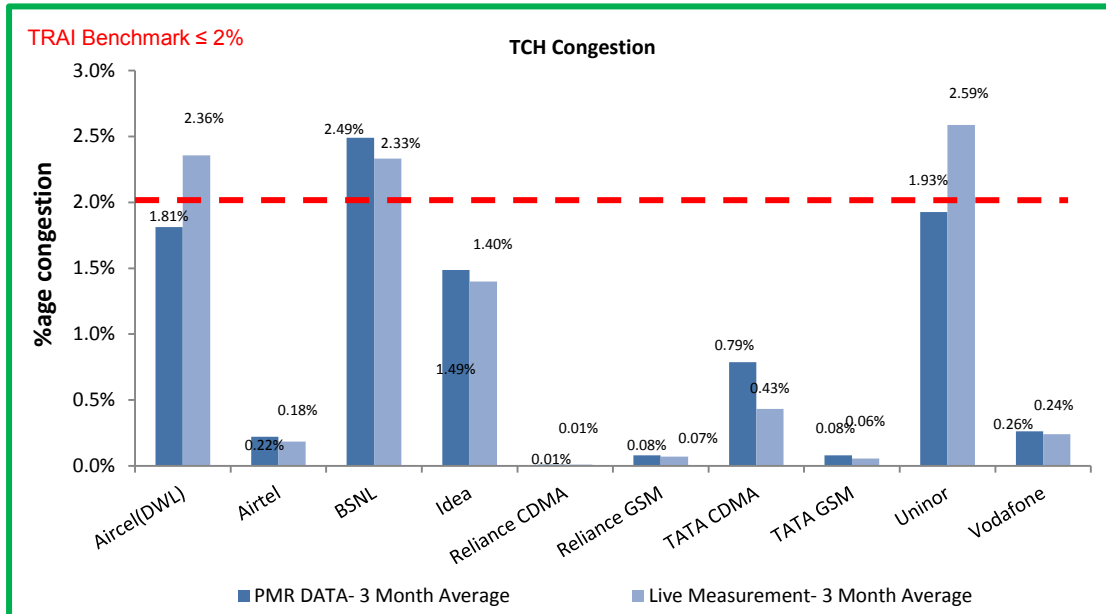
All operators meet the benchmark across Monthly PMR, Live measurement and Drive Test except BSNL for PMR and live data; and Tata CDMA for Drive test data.

5.4 SDCCH/PAGING CHANNEL CONGESTION



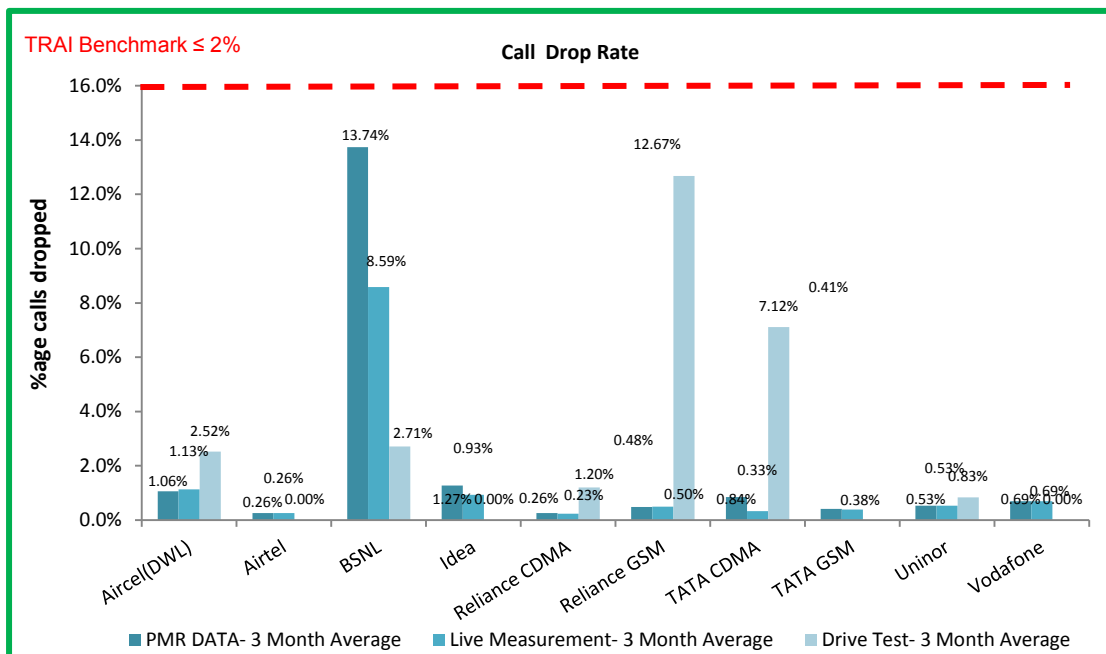
All operators meet the benchmark except BSNL for live data and BSNL had significant difference between PMR and Live Measurement data.

5.5 TCH CONGESTION



All operators meet the benchmark except Airtel, BSNL, and Uninor for Live measurement and Airtel and BSNL for PMR data and there was a slight difference between PMR and Live Measurement data for Airtel and Uninor.

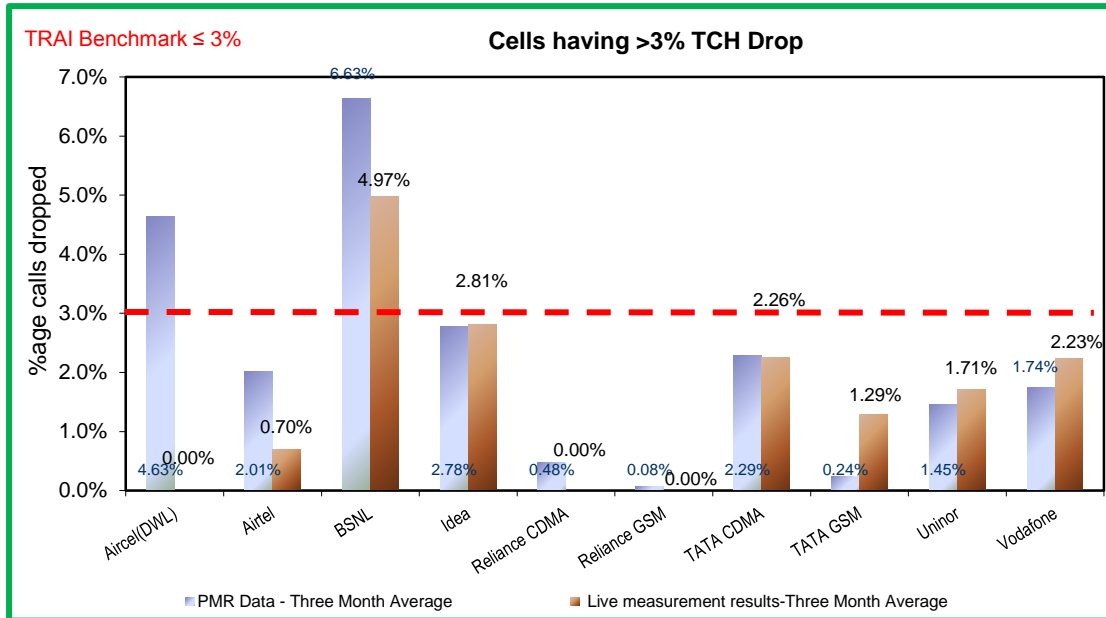
5.6 CALL DROP RATE



BSNL was not able to meet the call drop rate benchmark for any of the of the three data collection methodologies. Additionally Airtel, Reliance GSM and Tata CDMA were not able to meet the

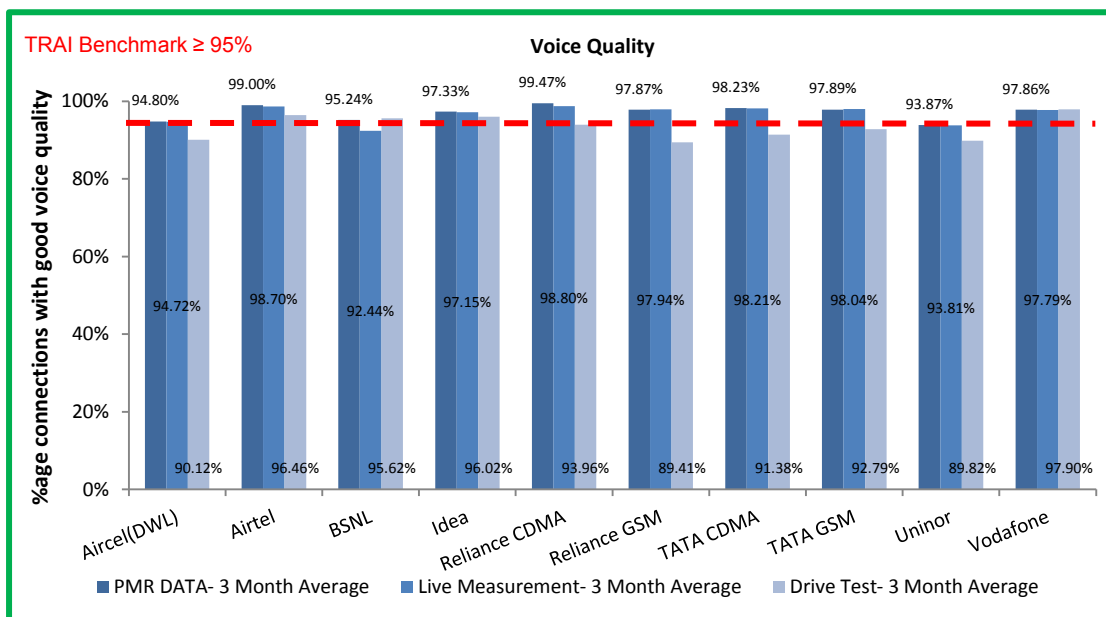
benchmark for call drop rate for drive test methodology and there was a significant difference between PMR, Live Measurement and Drive Test data for BSNL and for Reliance GSM, TATA CDMA and TATA GSM had a huge difference in Drive Test.

5.7 CELLS HAVING GREATER THAN 3% TCH DROP



All operators were meeting the benchmark except Aircel and BSNL in both PMR data and live measurement methodology and there was a significant difference between PMR and Live Measurement data for Aircel, BSNL and Vodafone.

5.8 VOICE QUALITY

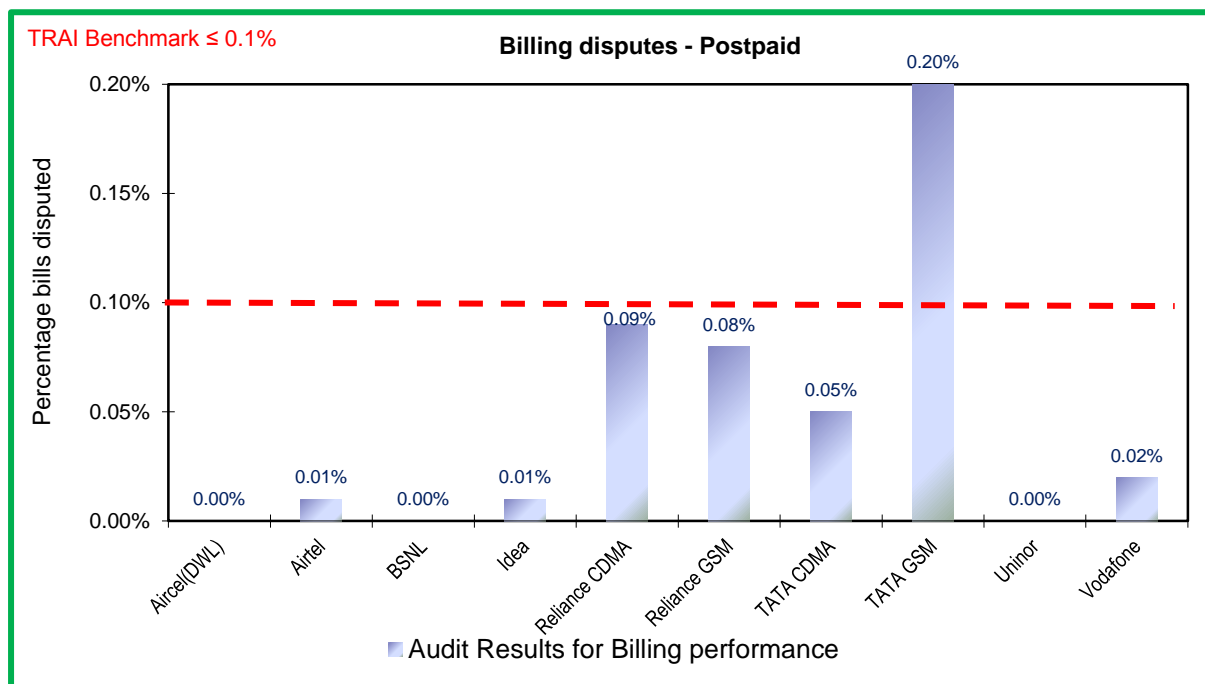


All the three methods showed comparable results for voice quality. Following were the operator that did not meet the benchmark across all three methods

- PMR Data: Aircel
- Live Measurement: Aircel, BSNL, and Uninor
- Drive Test: Aircel, Reliance CDMA, Reliance GSM, Tata CDMA and Uninor

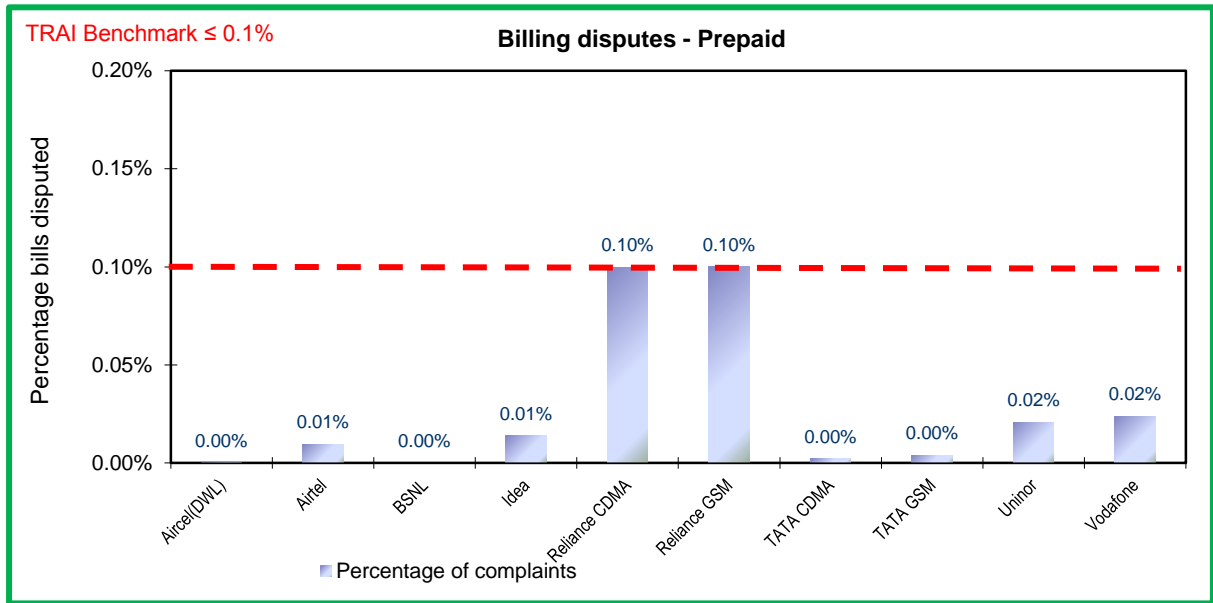
6 DETAILED FINDINGS – NON NETWORK PARAMETERS

6.1 BILLING DISPUTES-POSTPAID



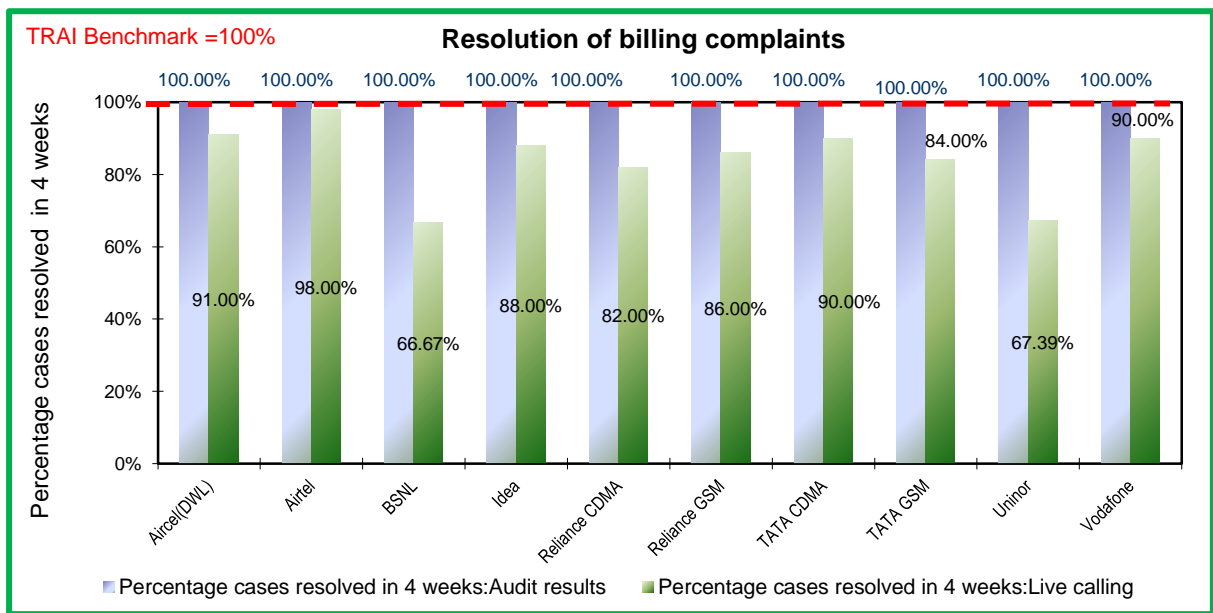
All operators meet the TRAI benchmark for percentage billing disputes for postpaid except TATA GSM.

6.2 BILLING DISPUTES-PREPAID



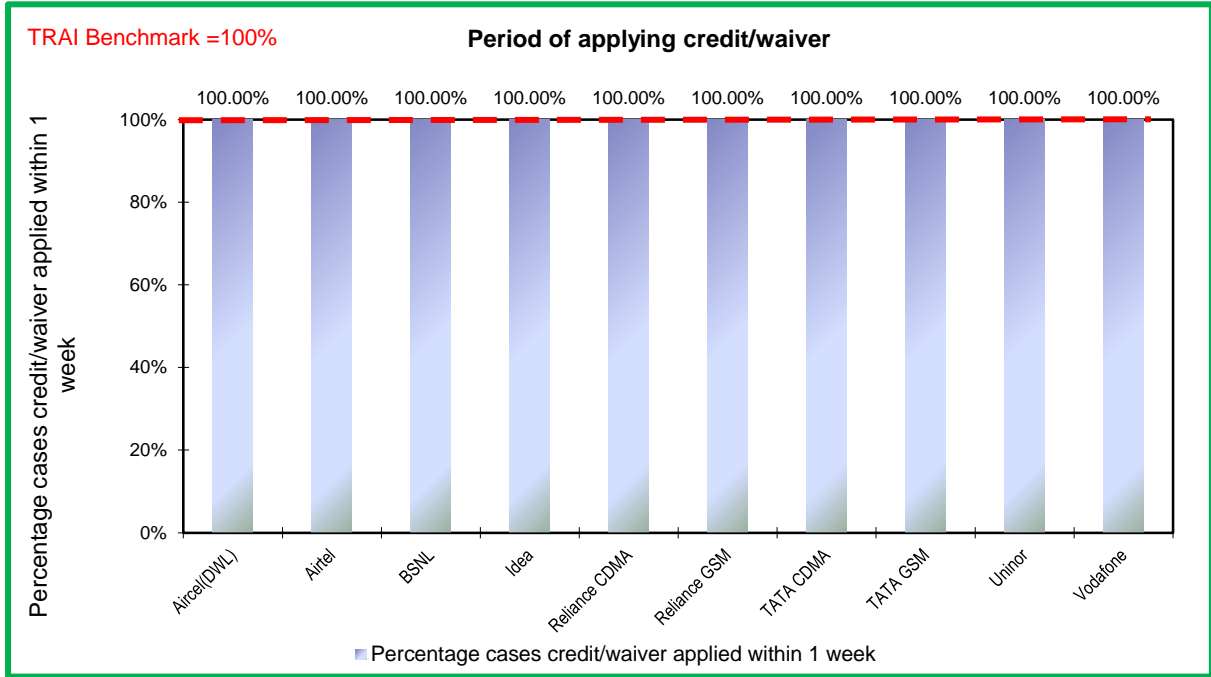
All operators met the TRAI benchmark for percentage billing disputes for prepaid.

6.3 RESOLUTION OF BILLING COMPLAINTS



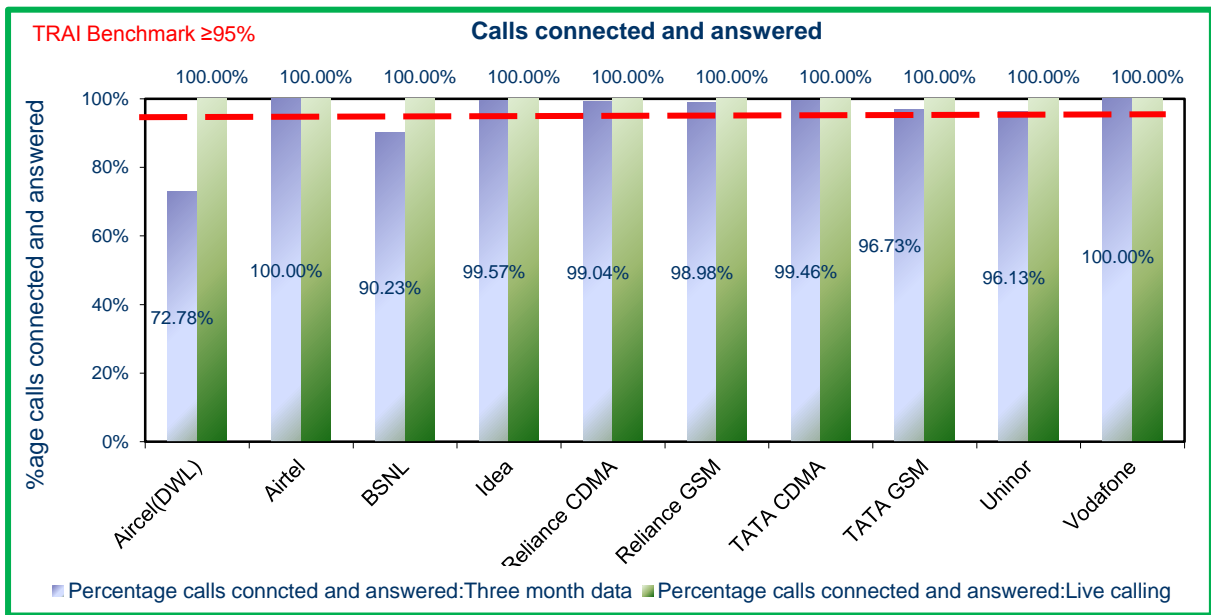
The audit results showed that all the operators meet the TRAI benchmark for 100% resolution of complaints within four weeks for PMR. However, for live calling none of the operators were able to meet the benchmark set by TRAI for all the operators.

6.4 PERIOD OF APPLYING CREDIT/WAVIER



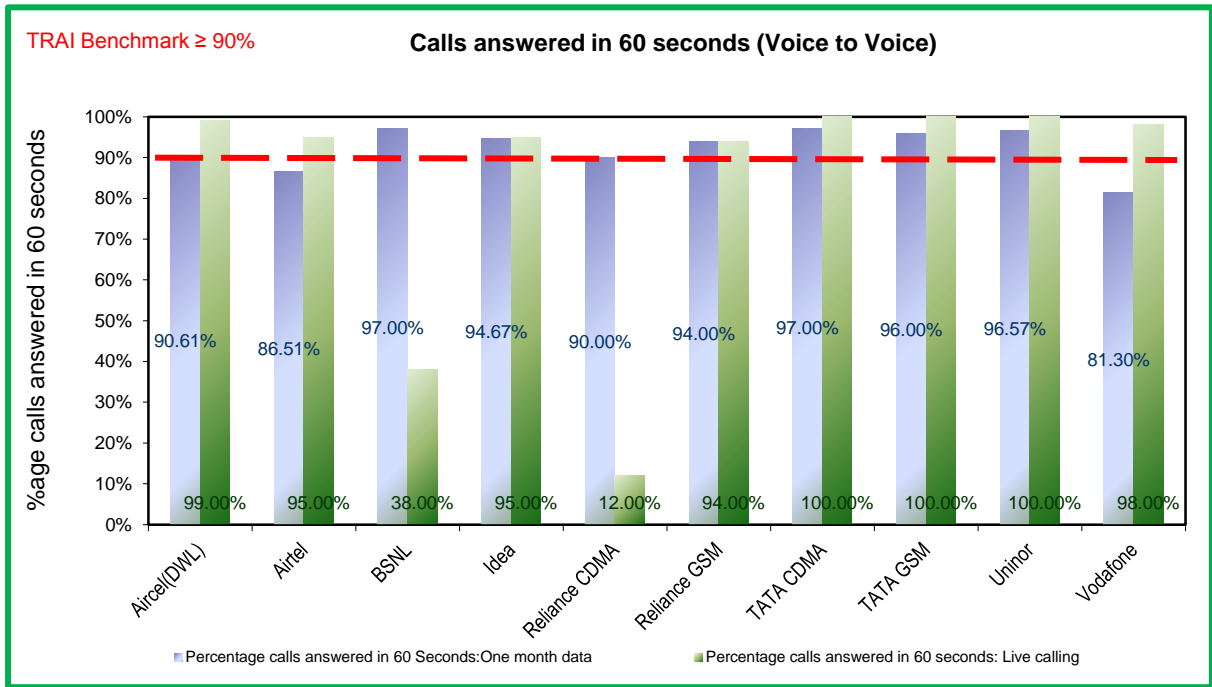
All operators meet the benchmark.

6.5 CALL CENTRE PERFORMANCE-IVR



All operators meet the benchmark except Aircel and BSNL for PMR data

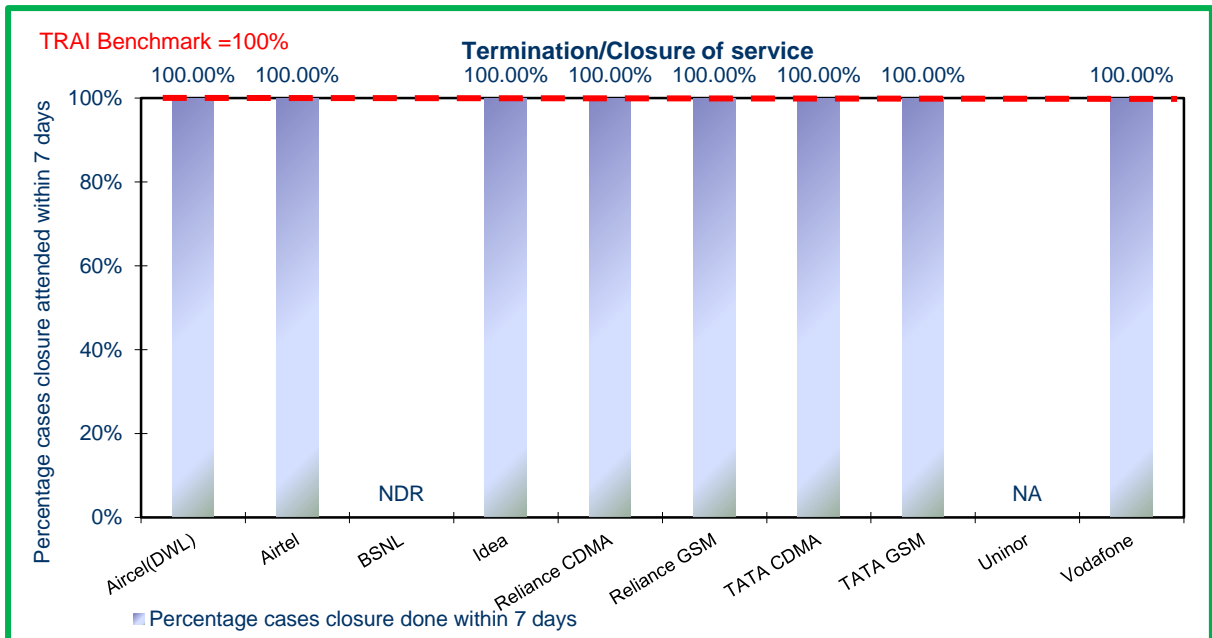
6.6 CALL CENTRE PERFORMANCE-VOICE TO VOICE



Following operators across both the methods do not meet the benchmark

One month data: Airtel and Vodafone
 Live calling: BSNL and Reliance CDMA.

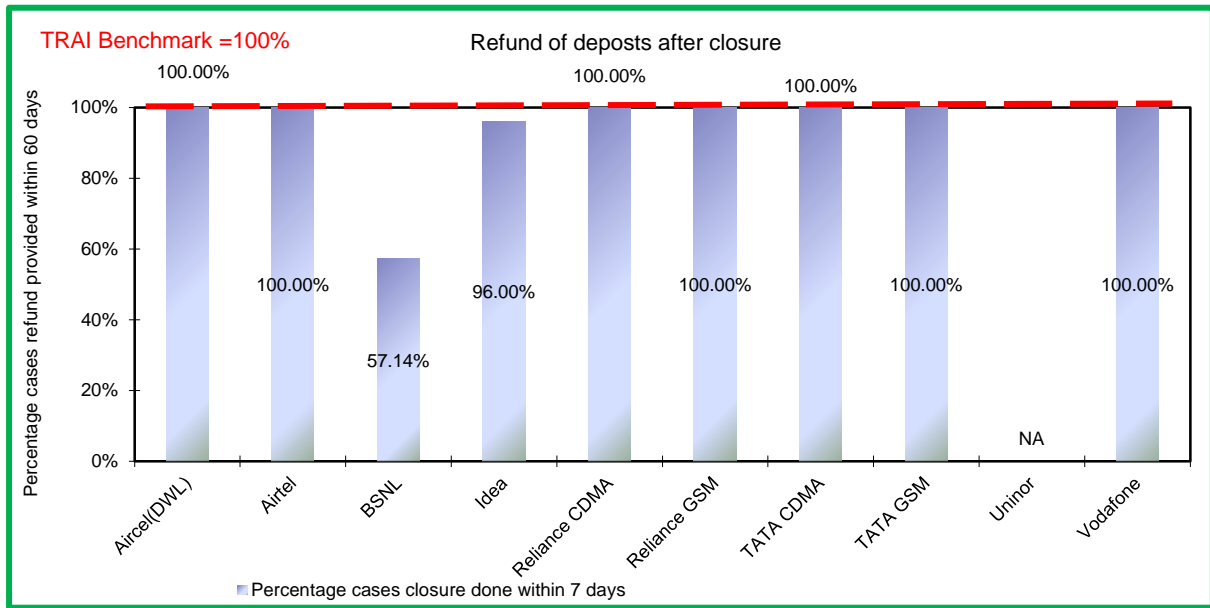
6.7 TERMINATION/CLOSURE OF SERVICE



All the operators met the benchmark

NA: Not Applicable; Uninor does not have any postpaid subscriber

6.8 REFUND OF DEPOSITS AFTER CLOSURE



All the operators met the benchmark except BSNL.

NA: Not Applicable; Uninor does not have any postpaid subscriber

7.2 CONNECTION ESTABLISHMENT (ACCESSIBILITY)

| Audit Results for CSSR, SDCCH and TCH congestion | | | | | | | | | | | |
|---|-----------|-------------|--------|--------|--------|---------------|--------------|-----------|----------|--------|----------|
| CSSR | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| CSSR | ≥ 95% | 97.63% | 96.49% | 85.15% | 98.35% | 98.21% | 96.24% | 97.53% | 99.21% | 97.41% | 99.72% |
| SDCCH congestion | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| SDCCH/Paging channel congestion | ≤ 1% | 0.58% | 0.16% | 0.85% | 0.57% | NA | 0.24% | NA | 0.11% | 0.54% | 0.06% |
| TCH congestion | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| TCH congestion | ≤ 2% | 1.81% | 0.22% | 2.49% | 1.49% | 0.01% | 0.08% | 0.79% | 0.08% | 1.93% | 0.26% |
| Live measurement results for CSSR, SDCCH and TCH congestion | | | | | | | | | | | |
| CSSR | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| CSSR | ≥ 95% | 97.22% | 98.36% | 86.29% | 98.57% | 98.33% | 97.06% | 98.24% | 99.36% | 97.82% | 99.76% |
| SDCCH congestion | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| SDCCH/Paging channel congestion | ≤ 1% | 0.58% | 0.13% | 3.24% | 0.54% | NA | 0.20% | NA | 0.03% | 0.65% | 0.05% |
| TCH congestion | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| TCH congestion | ≤ 2% | 2.36% | 0.18% | 2.33% | 1.40% | 0.01% | 0.07% | 0.43% | 0.06% | 2.59% | 0.24% |

| Drive test results for CSSR (Average of three drive tests) and blocked calls | | | | | | | | | | | |
|--|-----------|-------------|---------|--------|--------|---------------|--------------|-----------|----------|--------|----------|
| CSSR | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of call attempts | | 407 | 628 | 533 | 396 | 683 | 702 | 538 | NA | 415 | 616 |
| Total number of successful calls established | | 399 | 628 | 520 | 396 | 675 | 679 | 509 | | 407 | 649 |
| CSSR | ≥ 95% | 97.95% | 100.00% | 97.57% | 99.90% | 98.84% | 96.81% | 94.23% | | 98.01% | 104.82% |
| Blocked calls | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| %age blocked calls | | 2.05% | 0.00% | 2.44% | 0.10% | 1.16% | 3.19% | 5.77% | NA | 1.99% | -4.82% |

7.3 CONNECTION MAINTENANCE (RETAINABILITY)

| Audit Results for Call drop rate and for number of cells having more than 3% TCH | | | | | | | | | | | |
|--|-----------|-------------|-----------|-----------|-----------|---------------|--------------|-----------|----------|-----------|-----------|
| Call drop rate | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of calls established | | 189297738 | 822543630 | 495811422 | 219783839 | 68803671 | 156403876 | 30591501 | 27892535 | 193905481 | 237600623 |
| Total number of calls dropped | | 1771793 | 2134893 | 11240599 | 2768432 | 176644 | 753515 | 257838 | 113514 | 1027618 | 1653969 |
| Call drop rate | ≤ 2% | 1.06% | 0.26% | 13.74% | 1.27% | 0.26% | 0.48% | 0.84% | 0.41% | 0.53% | 0.69% |
| Cells having more than 3% TCH | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of cells in the network | | 6297 | 17733 | 2509 | 13422 | 3540 | 8069 | 1431 | 1897 | 5029 | 15104 |
| Total number of cells having more than 3% TCH | | 3263 | 9152 | 1591 | 6939 | 1791 | 4039 | 771 | 949 | 2572 | 7764 |
| Worst affected cells having more than 3% TCH | ≤ 3% | 4.63% | 2.01% | 6.63% | 2.78% | 0.48% | 0.08% | 2.29% | 0.24% | 1.45% | 1.74% |

| Live measurement results for Call drop rate and for number of cells having more than 3% TCH | | | | | | | | | | | |
|---|-----------|-------------|------------|---------|----------|---------------|--------------|-----------|----------|----------|----------|
| Call drop rate | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of calls established | | 6456893 | 1960469782 | 6696132 | 22538413 | 6475470 | 66775874 | 46261953 | 34781467 | 20473940 | 23787438 |
| Total number of calls dropped | | 64151 | 5196966 | 326588 | 210498 | 15168 | 333049 | 147272 | 133185 | 108000 | 163998 |
| Call drop rate | ≤ 2% | 1.13% | 0.26% | 8.59% | 0.93% | 0.23% | 0.50% | 0.33% | 0.38% | 0.53% | 0.69% |
| | | | | | | | | | | | |
| Cells having more than 3% TCH | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of cells in the network | | 0 | 39749 | 2509 | 13344 | 3537 | 8066 | 1464 | 1919 | 5002 | 15142 |
| Total number of cells having more than 3% TCH | | 0 | 14035 | 1594 | 6935 | 1769 | 4034 | 771 | 971 | 2593 | 7838 |
| Worst affected cells having more than 3% TCH | ≤ 3% | 0.00% | 0.70% | 4.97% | 2.81% | 0.00% | 0.00% | 2.26% | 1.29% | 1.71% | 2.23% |

| Drive test results for Call drop rate (Average of three drive tests) | | | | | | | | | | | |
|--|-----------|-------------|--------|-------|-------|---------------|--------------|-----------|----------|--------|----------|
| Call drop rate | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of calls established | | 399 | 628 | 519 | 396 | 676 | 680 | 508 | NA | 407 | 614 |
| Total number of calls dropped | | 11 | 0 | 14 | 0 | 8 | 88 | 31 | | 3 | 0 |
| Call drop rate | ≤ 2% | 2.52% | 0.00% | 2.71% | 0.00% | 1.20% | 12.67% | 7.12% | | 0.83% | 0.00% |

7.4 VOICE QUALITY

| Audit Results for Voice quality | | | | | | | | | | | |
|---|-----------|-------------|--------------|--------|-------------|---------------|--------------|--------------|------------|-------------|-------------|
| Voice quality | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of sample calls | | 18699211898 | 119596532351 | 867230 | 36003953541 | NA | 7962918845 | 69562338180 | 4667112812 | 26807836016 | 40517206343 |
| Total number of calls with good voice quality | | 17726074649 | 118380469428 | 412404 | 35040358914 | NA | 7793416153 | 68327669137 | 4568666318 | 25164086804 | 39648939911 |
| %age calls with good voice quality | ≥ 95% | 94.80% | 99.00% | 95.24% | 97.33% | 99.47% | 97.87% | 98.23% | 97.89% | 93.87% | 97.86% |
| Live measurement results for Voice quality | | | | | | | | | | | |
| Voice quality | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of sample calls | | 633554869 | 12942113711 | 697 | 3695423536 | NA | 4062518734 | 159382377971 | 5718413966 | 2832350116 | 4148627403 |
| Total number of calls with good voice quality | | 600067438 | 12837355740 | 531 | 3589971619 | NA | 3982849926 | 156538599765 | 5606130930 | 2656834129 | 4056907167 |
| %age calls with good voice quality | ≥ 95% | 94.72% | 98.70% | 92.44% | 97.15% | 98.80% | 97.94% | 98.21% | 98.04% | 93.81% | 97.79% |
| Drive test results for Voice quality (Average of three drive tests) | | | | | | | | | | | |
| Voice quality | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of sample calls | | 683992 | 1356131 | 75727 | 928360 | 154052 | 158392 | 110299 | 502474 | 713037 | 773038 |
| Total number of calls with good voice quality | | 615437 | 1307717 | 71375 | 892890 | 145673 | 142386 | 101416 | 466237 | 640666 | 756302 |
| %age calls with good voice quality | ≥ 95% | 90.12% | 96.46% | 95.62% | 96.02% | 93.96% | 89.41% | 91.38% | 92.79% | 89.82% | 97.90% |

Note: - On the aspect of Voice quality, Reliance CDMA only shared the overall value. Current equipment used by Reliance does not have capability to fetch these parameters.

7.5 POI CONGESTION

| Audit Results for POI Congestion | | | | | | | | | | | |
|---|-----------|-------------|-----------|------------|-----------|---------------|--------------|-----------|----------|----------|-----------|
| POI congestion | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of working POIs | | 51.00 | 756.33 | 113.67 | 76.00 | 95.33 | 97.67 | 208.67 | 19.00 | 56.33 | 57.00 |
| No. of POIs not meeting benchmark | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Capacity of all POIs (A) - in erlangs | | 90774.00 | 586606.76 | 10358.67 | 206680.92 | 160606.23 | 61877.95 | 77872.50 | 67280.42 | 55001.59 | 229691.63 |
| Traffic served for all POIs (B)- in erlangs | | 59178.29 | 356770.15 | 1291123.33 | 122725.29 | 10303.81 | 13392.96 | 26934.00 | 25357.48 | 41062.48 | 121315.44 |
| POI congestion | ≤ 0.5% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.32% | 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 | Uninor | Vodafone |
| Total number of working POIs | | 51.00 | 255.00 | 83.00 | 76.00 | 95.33 | 97.67 | 208.67 | 19.00 | 56.33 | 57.00 |
| No. of POIs not meeting benchmark | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total Capacity of all POIs (A) - in erlangs | | 90774.50 | 192528.73 | 10358.67 | 206582.89 | 30671.98 | 62178.09 | 78087.67 | 67280.42 | 55550.75 | 160065.02 |
| Traffic served for all POIs (B)- in erlangs | | 60750.86 | 129327.27 | 134331.83 | 123506.40 | 20442.81 | 14062.47 | 27094.33 | 25591.59 | 42681.65 | 84783.15 |
| POI congestion | ≤ 0.5% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.32% | 0.00% | 0.00% |

7.6 METERING AND BILLING CREDIBILITY

| Audit Results for Billing performance | | | | | | | | | | | |
|--|-----------|-------------|-------------|------------|------------|---------------|--------------|------------|------------|------------|------------|
| Billing Performance | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Billing disputes - Postpaid | | | | | | | | | | | |
| Total bills generated during the period | | 5143.00 | 288030.00 | 69614 | 19228.00 | 76681.00 | 38456.00 | 62260.00 | 14637.00 | NA | 97886.00 |
| Total number of bills disputed | | 0.00 | 15.00 | 0.00 | 1.00 | 72.00 | 32.00 | 31.00 | 30.00 | NA | 18.00 |
| Percentage bills disputed | ≤ 0.1% | 0.00% | 0.01% | 0.00% | 0.01% | 0.09% | 0.08% | 0.05% | 0.20% | NA | 0.02% |
| Billing disputes - Prepaid | | | | | | | | | | | |
| Number of complaints related to charging, credit & validity | | 4.00 | 2072.00 | 0.00 | 910.00 | 2693.00 | 6532.00 | 45.00 | 205.00 | 1062.00 | 1719.00 |
| Total number of prepaid customers in that period | | 5197555.00 | 21763729.00 | 2101800.00 | 6629488.00 | 2699995.00 | 6537045.00 | 2268096.00 | 5232256.00 | 5102712.00 | 7234859.00 |
| Percentage of complaints | ≤ 0.1% | 0.00% | 0.01% | 0.00% | 0.01% | 0.10% | 0.10% | 0.00% | 0.00% | 0.02% | 0.02% |
| Resolution of billing complaints | | | | | | | | | | | |
| Total number of billing/charging complaints | | 4.00 | 2087.00 | 0.00 | 2903.00 | 2765.00 | 6564.00 | 76.00 | 235.00 | 1062.00 | 1737.00 |
| Total complaints considered invalid | | 0.00 | 0.00 | 0.00 | 1992.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Number of complaints resolved in 4 weeks from date of receipt for complaints listed in 5.3.1 | | 4.00 | 2087.00 | 0.00 | 2903.00 | 2765.00 | 6564.00 | 76.00 | 235.00 | 1062.00 | 1737.00 |
| Percentage complaints resolved within 4 weeks of date of receipt | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Period of applying credit / waiver | | | | | | | | | | | |
| Total number of complaints where credit/waiver is required | | 0.00 | 2087.00 | 0.00 | 2903.00 | 2765.00 | 6564.00 | 76.00 | 235.00 | 1062.00 | 1737.00 |
| Percentage cases in which credit/waiver was received within 1 week | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

Note: - Uninor does not offer postpaid service.

| 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 | Uninor | Vodafone |
| Total Number of calls made | | 100.00 | 100.00 | 78.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 46.00 | 100.00 |
| Number of cases resolved in 4 weeks | | 91.00 | 98.00 | 52.00 | 88.00 | 82.00 | 86.00 | 90.00 | 84.00 | 31.00 | 90.00 |
| Percentage cases resolved in four weeks | 100.00% | 91.00% | 98.00% | 66.67% | 88.00% | 82.00% | 86.00% | 90.00% | 84.00% | 67.39% | 90.00% |

7.7 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 | Uninor | Vodafone |
| Total number of call attempts to customer care for assistance | | 31489209.00 | 8558433.00 | 42698 | 635496.00 | 2257853.00 | 4710454.00 | 1237110.00 | 4336564.00 | 2168922.00 | 20104004.00 |
| Number of calls getting connected and answered (electronically) | | 22917149.00 | 8558160.00 | 38528 | 632750.00 | 2236146.00 | 4662432.00 | 1230371.00 | 4194734.00 | 2084943.00 | 20104004.00 |
| Percentage calls getting connected and answered | ≥ 95% | 72.78% | 100.00% | 90.23% | 99.57% | 99.04% | 98.98% | 99.46% | 96.73% | 96.13% | 100.00% |
| Number of calls getting transferred to the operator (voice to voice) | | 5501661.00 | 11157653.00 | 915388 | 2907493.00 | No Data | No Data | No Data | No Data | 4572327.00 | 7455596.00 |
| Number of calls answered by operator (voice to voice) within 60 seconds | | 4985055.00 | 9652329.00 | 885163 | 2752439.00 | No Data | No Data | 116773.00 | 452793.00 | 4415363.00 | 6061395.00 |
| Percentage calls answered within 60 seconds (V2V) | ≥ 90% | 90.61% | 86.51% | 97.00% | 94.67% | 90.00% | 94.00% | 97.00% | 96.00% | 96.57% | 81.30% |

Note: - Reliance CDMA, Reliance GSM are not sharing the numerator and denominator value, since they are only sharing the direct values hence it is taken no data received (NDR)

| Live calling results for customer care (IVR) | | | | | | | | | | | |
|---|-----------|-------------|---------|---------|---------|---------------|--------------|-----------|----------|---------|----------|
| Customer Care Assessment | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of call attempts to customer care for assistance | | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Number of calls getting connected and answered (electronically) | | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| 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 | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total Number of calls received | | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Total Number of calls getting connected and answered | | 99.00 | 95.00 | 38.00 | 95.00 | 12.00 | 94.00 | 100.00 | 100.00 | 100.00 | 98.00 |
| Percentage calls getting connected and answered | ≥ 95% | 99.00% | 95.00% | 38.00% | 95.00% | 12.00% | 94.00% | 100.00% | 100.00% | 100.00% | 98.00% |

7.8 DRIVE TEST

Note: -

- We did receive the BSNL drive test report for the month of January even after sending repeated mails and reminders.
- Since TATA GSM is in ICR we do not have the reports for this quarter

7.8.1 JANUARY- CHAPRA

| Name of SSA | Chapra | Month | January | Day | One | | | | | | | | | | | | | | | | |
|---------------------------------|--------|-------------|---------|---------|---------|------------------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength - 0 to -75 dBm | | 73.75% | 26.75% | 96.79% | 83.88% | No Data Received | | 77.61% | 68.82% | NA | | 62.19% | 46.54% | NA | | NA | | 100.00% | 46.21% | NA | 73.27% |
| Signal Strength -75 to -85 dBm | | 26.18% | 37.36% | 3.19% | 13.02% | | | 22.19% | 27.72% | | | 34.19% | 30.56% | | | | | 0.00% | 23.57% | NA | 20.72% |
| Signal Strength -85 to -120 dBm | | 0.07% | 35.89% | 0.02% | 3.10% | | | 0.20% | 3.47% | | | 3.62% | 22.90% | | | | | 0.00% | 30.22% | NA | 6.01% |
| Voice quality | ≥ 95% | 98.71% | 86.53% | 99.25% | 96.61% | | | 97.59% | 95.17% | 99.94% | 88.20% | 99.43% | 84.55% | 100.00% | 88.20% | 98.37% | 88.94% | NA | 96.70% | | |
| CSSR | ≥ 95% | 100.00% | 96.42% | 100.00% | 100.00% | | | 100.00% | 100.00% | 100.00% | 98.20% | 97.29% | 92.95% | 100.00% | 98.20% | 100.00% | 94.95% | NA | 100.00% | | |
| %age Blocked calls | | 0.00% | 3.58% | 0.00% | 0.00% | | | 0.00% | 0.00% | 0.00% | 1.79% | 2.70% | 7.04% | 0.00% | 1.79% | 0.00% | 5.05% | NA | 0.00% | | |
| Call drop rate | ≤ 2% | 0.00% | 2.69% | 0.00% | 0.00% | | | 0.00% | 0.00% | 17.00% | 2.17% | 100.00% | 1.58% | 0.00% | 2.17% | 0.00% | 4.37% | NA | 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% | NA | 100.00% | | |

Note: - Vodafone do not have the coverage in indoor areas hence it is taken Not Applicable.

| Name of SSA | Chapra | Month | January | Day | Two | | | | | | | | | | | | | | | | | | |
|----------------------------------|--------|-------------|---------|---------|---------|------------------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|--------|--------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 | | |
| Signal Strength - 0 to -75 dBm | | NA | 37.78% | NA | 75.26% | No Data Received | | NA | 72.38% | NA | | NA | 53.17% | NA | | NA | | NA | 44.93% | 86.11% | 71.46% | | |
| Signal Strength --75 to -85 dBm | | NA | 37.17% | NA | 21.34% | | | NA | 22.81% | | | NA | 30.62% | | | | | NA | 16.21% | NA | 33.97% | 13.66% | 20.97% |
| Signal Strength --85 to -120 dBm | | NA | 25.05% | NA | 3.40% | | | NA | 4.81% | | | NA | 93.74% | | | | | NA | 94.57% | NA | 89.85% | 98.35% | 92.50% |
| Voice quality | ≥ 95% | NA | 90.72% | NA | 96.42% | | | NA | 93.63% | NA | 94.57% | NA | 93.74% | NA | 94.57% | NA | 95.63% | NA | 98.53% | 100.00% | 100.00% | | |
| CSSR | ≥ 95% | NA | 99.10% | NA | 100.00% | | | NA | 100.00% | NA | 97.29% | NA | 91.97% | NA | 95.63% | NA | 1.47% | 0.00% | 0.00% | | | | |
| %age Blocked calls | | NA | 0.90% | NA | 0.00% | | | NA | 0.00% | NA | 2.70% | NA | 8.03% | NA | 4.37% | NA | 1.96% | 0.00% | 0.00% | | | | |
| Call drop rate | ≤ 2% | NA | 0.46% | NA | 0.00% | | | NA | 0.00% | NA | 0.49% | NA | 2.08% | NA | 1.08% | NA | 100.00% | 100.00% | 100.00% | | | | |
| Hands off success rate | | NA | 100.00% | NA | 100.00% | | | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | 100.00% | 100.00% | | | | |

All the operators do not have the coverage in indoor areas except Vodafone hence it is taken as Not Applicable.

| Name of SSA | Chapra | Month | January | Day | Three | | | | | | | | | | | | | | | | | | |
|----------------------------------|--------|-------------|---------|---------|---------|------------------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|----|--------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 | | |
| Signal Strength - 0 to -75 dBm | | NA | 37.70% | NA | 79.64% | No Data Received | | NA | 70.09% | NA | | NA | 43.21% | NA | | NA | | NA | 62.86% | NA | 81.16% | | |
| Signal Strength --75 to -85 dBm | | NA | 45.55% | NA | 16.76% | | | NA | 27.78% | | | NA | 31.78% | | | | | NA | 25.01% | NA | 25.15% | NA | 14.57% |
| Signal Strength --85 to -120 dBm | | NA | 16.75% | NA | 3.60% | | | NA | 2.13% | | | NA | 87.53% | | | | | NA | 95.73% | NA | 11.99% | NA | 4.27% |
| Voice quality | ≥ 95% | NA | 86.14% | NA | 97.24% | | | NA | 95.77% | NA | 88.85% | NA | 87.53% | NA | 95.73% | NA | 93.67% | NA | 98.65% | | | | |
| CSSR | ≥ 95% | NA | 98.88% | NA | 100.00% | | | NA | 98.77% | NA | 99.39% | NA | 91.84% | NA | 99.59% | NA | 100.00% | NA | 100.00% | | | | |
| %age Blocked calls | | NA | 1.12% | NA | 0.00% | | | NA | 1.23% | NA | 0.61% | NA | 8.15% | NA | 0.40% | NA | 0.00% | NA | 0.00% | | | | |
| Call drop rate | ≤ 2% | NA | 0.00% | NA | 0.00% | | | NA | 0.00% | NA | 1.23% | NA | 2.11% | NA | 0.82% | NA | 0.00% | NA | 0.00% | | | | |
| Hands off success rate | | NA | 100.00% | NA | 100.00% | | | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | 100.00% | 100.00% | | | | |

All the operators do not have the coverage in indoor areas hence it is taken as Not Applicable.

7.8.2 FEBRUARY- DARBHANGA

| Name of SSA | Darbhanga | Month | February | Day | One | | | | | | | | | | | | | | | | |
|---------------------------------|-----------|-------------|----------|---------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength - 0 to -75 dBm | | 69.28% | 19.33% | 99.41% | 53.69% | 83.33% | 53.81% | 90.01% | 80.82% | NA | NA | 89.26% | 69.40% | NA | NA | 100.00% | 74.14% | 86.24% | 67.97% | | |
| Signal Strength -75 to -85 dBm | | 29.23% | 38.71% | 0.59% | 43.27% | 16.67% | 37.55% | 9.99% | 14.45% | | | 10.74% | 22.32% | | | 0.00% | 18.40% | 13.44% | 25.29% | | |
| Signal Strength -85 to -120 dBm | | 1.49% | 41.96% | 0.00% | 3.04% | 0.00% | 8.64% | 0.01% | 4.73% | | | 0.00% | 8.28% | | | 0.00% | 7.46% | 0.31% | 6.74% | | |
| Voice quality | ≥ 95% | 98.71% | 92.99% | 99.46% | 96.41% | 94.45% | 94.60% | 96.25% | 97.45% | 99.75% | 89.62% | 94.33% | 91.17% | NA | 69.87% | 99.14% | 86.91% | 99.10% | 97.70% | | |
| CSR | ≥ 95% | 100.00% | 99.54% | 100.00% | 100.00% | 100.00% | 98.45% | 100.00% | 100.00% | 100.00% | 99.76% | 100.00% | 99.17% | NA | 90.29% | 100.00% | 90.96% | 100.00% | 100.00% | | |
| %age Blocked calls | | 0.00% | 0.46% | 0.00% | 0.00% | 0.00% | 1.55% | 0.00% | 0.00% | 0.00% | 0.24% | 0.00% | 0.83% | NA | 9.71% | 0.00% | 9.04% | 0.00% | 0.00% | | |
| Call drop rate | ≤ 2% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.90% | 0.00% | 0.00% | 0.00% | 3.73% | 0.00% | 0.25% | NA | 20.59% | 0.00% | 2.78% | 0.00% | 0.00% | | |
| Hands off success rate | | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 96.44% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 99.45% | NA | 99.56% | 100.00% | 100.00% | 100.00% | 100.00% | | |

Note: - TATA CDMA does not have coverage in indoor areas hence taken as Not Applicable

| Name of SSA | Darbhanga | Month | February | Day | Two | | | | | | | | | | | | | | | | |
|---------------------------------|-----------|-------------|----------|---------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength - 0 to -75 dBm | | NA | 23.14% | NA | 39.07% | NA | 71.43% | NA | 82.74% | NA | NA | NA | 56.81% | NA | NA | NA | 51.65% | NA | 65.71% | | |
| Signal Strength -75 to -85 dBm | | NA | 27.42% | NA | 57.92% | NA | 16.17% | NA | 15.23% | | | NA | 22.83% | | | NA | 26.47% | NA | 27.74% | | |
| Signal Strength -85 to -120 dBm | | NA | 49.43% | NA | 3.01% | NA | 12.41% | NA | 2.04% | | | NA | 20.36% | | | NA | 21.88% | NA | 6.55% | | |
| Voice quality | ≥ 95% | NA | 90.47% | NA | 96.57% | NA | 94.26% | NA | 95.30% | NA | 91.64% | NA | 89.91% | NA | 66.14% | NA | 88.91% | NA | 97.73% | | |
| CSR | ≥ 95% | NA | 96.00% | NA | 100.00% | NA | 98.10% | NA | 100.00% | NA | 97.87% | NA | 99.52% | NA | 93.04% | NA | 98.79% | NA | 100.00% | | |
| %age Blocked calls | | NA | 4.00% | NA | 0.00% | NA | 1.90% | NA | 0.00% | NA | 2.13% | NA | 0.48% | NA | 6.96% | NA | 1.21% | NA | 0.00% | | |
| Call drop rate | ≤ 2% | NA | 0.90% | NA | 0.00% | NA | 0.79% | NA | 0.00% | NA | 1.88% | NA | 0.25% | NA | 22.10% | NA | 0.00% | NA | 0.00% | | |
| Hands off success rate | | NA | 100.00% | NA | 100.00% | NA | 99.23% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 99.62% | NA | 100.00% | NA | 100.00% | | |

All the operators do not the have coverage in indoor areas hence it is taken as Not Applicable.

| Name of SSA | Darbhanga | Month | February | Day | Three | | | | | | | | | | | | | | | | |
|----------------------------------|-----------|-------------|----------|---------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength - 0 to -75 dBm | | NA | 29.21% | NA | 95.51% | NA | 66.92% | NA | 89.14% | NA | | NA | 69.01% | NA | | NA | | NA | 64.52% | NA | 78.38% |
| Signal Strength --75 to -85 dBm | | NA | 32.36% | NA | 4.12% | NA | 23.89% | NA | 10.34% | NA | | NA | 19.86% | NA | | NA | | NA | 24.39% | NA | 18.01% |
| Signal Strength --85 to -120 dBm | | NA | 38.43% | NA | 0.37% | NA | 9.19% | NA | 0.52% | NA | | NA | 11.13% | NA | | NA | | NA | 11.09% | NA | 3.61% |
| Voice quality | ≥ 95% | NA | 87.55% | NA | 95.79% | NA | 91.70% | NA | 96.00% | NA | 98.18% | NA | 86.28% | NA | 74.81% | NA | | NA | 83.66% | NA | 97.80% |
| CSSR | ≥ 95% | NA | 95.49% | NA | 100.00% | NA | 96.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 98.70% | NA | | NA | 94.81% | NA | 100.00% |
| %age Blocked calls | | NA | 4.51% | NA | 0.00% | NA | 3.99% | NA | 0.00% | NA | 0.00% | NA | 0.00% | NA | 1.30% | NA | | NA | 5.19% | NA | 0.00% |
| Call drop rate | ≤ 2% | NA | 0.00% | NA | 0.00% | NA | 0.00% | NA | 0.00% | NA | 0.32% | NA | 0.00% | NA | 5.86% | NA | | NA | 0.88% | NA | 0.00% |
| Hands off success rate | | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 0.00% | NA | 100.00% | NA | 100.00% | NA | 99.81% | NA | | NA | 100.00% | NA | 100.00% |

All the operators do not have the coverage in indoor areas hence it is taken as Not Applicable.

7.8.3 MARCH-GAYA

| Name of SSA | Gaya | Month | March | Day | One | | | | | | | | | | | | | | | | |
|----------------------------------|--------|-------------|---------|---------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength - 0 to -75 dBm | | 99.16% | 38.92% | 75.61% | 82.31% | 77.61% | 68.82% | 81.62% | 75.25% | 0.00% | | 92.27% | 64.01% | 0.00% | | NA | | 100.00% | 64.02% | 75.68% | 73.09% |
| Signal Strength --75 to -85 dBm | | 0.83% | 27.87% | 24.11% | 16.26% | 22.19% | 27.72% | 18.06% | 20.02% | 0.00% | | 7.58% | 28.93% | 0.00% | | NA | | 0.00% | 16.51% | 23.05% | 21.85% |
| Signal Strength --85 to -120 dBm | | 0.01% | 33.21% | 0.29% | 1.43% | 0.20% | 3.47% | 0.31% | 4.73% | 0.00% | | 0.15% | 7.05% | 0.00% | | NA | | 0.00% | 19.47% | 1.27% | 5.06% |
| Voice quality | ≥ 95% | 97.99% | 85.30% | 97.98% | 96.21% | 99.00% | 97.42% | 98.56% | 96.22% | 99.95% | 97.72% | 99.08% | 94.22% | 100.00% | 96.34% | NA | | 95.81% | 84.05% | 99.05% | 97.90% |
| CSSR | ≥ 95% | 100.00% | 98.48% | 100.00% | 100.00% | 100.00% | 96.67% | 100.00% | 100.00% | 100.00% | 98.77% | 100.00% | 99.00% | 100.00% | 97.78% | NA | | 100.00% | 98.52% | 100.00% | 100.00% |
| %age Blocked calls | | 0.00% | 1.52% | 0.00% | 0.00% | 0.00% | 3.33% | 0.00% | 0.00% | 0.00% | 1.23% | 0.00% | 1.00% | 0.00% | 2.22% | NA | | 0.00% | 1.48% | 0.00% | 0.00% |
| Call drop rate | ≤ 2% | 0.00% | 1.55% | 0.00% | 0.00% | 0.00% | 3.87% | 0.00% | 0.00% | 0.00% | 0.43% | 0.00% | 0.51% | 0.00% | 4.01% | NA | | 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% | 58.50% | 99.74% | NA | | 100.00% | 100.00% | 100.00% | 100.00% |

| Name of SSA | Gaya | Month | March | Day | Two | | | | | | | | | | | | | | | | |
|----------------------------------|--------|-------------|---------|---------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength -0 to -75 dBm | | NA | 38.84% | NA | 88.09% | NA | 44.36% | NA | 66.09% | NA | NA | 61.77% | NA | NA | NA | 61.76% | NA | 75.53% | | | |
| Signal Strength --75 to -85 dBm | | NA | 23.48% | NA | 9.60% | NA | 36.47% | NA | 29.65% | | NA | 26.58% | | | NA | 20.46% | | | | | |
| Signal Strength --85 to -120 dBm | | NA | 37.68% | NA | 2.31% | NA | 19.17% | NA | 4.26% | | NA | 11.65% | | | NA | 4.01% | | | | | |
| Voice quality | ≥ 95% | NA | 87.56% | NA | 95.67% | NA | 96.11% | NA | 96.21% | NA | 95.74% | NA | 90.34% | NA | 91.75% | NA | 84.57% | NA | 97.67% | | |
| CSSR | ≥ 95% | NA | 100.00% | NA | 100.00% | NA | 98.33% | NA | 100.00% | NA | 98.14% | NA | 98.25% | NA | 96.20% | NA | 99.02% | NA | 100.00% | | |
| %age Blocked calls | | NA | 0.00% | NA | 0.00% | NA | 1.67% | NA | 0.00% | NA | 1.86% | NA | 1.75% | NA | 3.80% | NA | 0.98% | NA | 0.00% | | |
| Call drop rate | ≤ 2% | NA | 1.28% | NA | 0.00% | NA | 5.33% | NA | 0.00% | NA | 1.07% | NA | 0.88% | NA | 5.46% | NA | 0.00% | NA | 0.00% | | |
| Hands off success rate | | NA | 100.00% | NA | 100.00% | NA | 98.33% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | | |

All the operators do not have the coverage in indoor areas hence it is taken as Not Applicable.

| Name of SSA | Gaya | Month | March | Day | Three | | | | | | | | | | | | | | | | |
|----------------------------------|--------|-------------|---------|---------|---------|---------|---------|---------|---------|---------------|---------|--------------|---------|-----------|---------|----------|---------|---------|---------|----------|---------|
| | B'mark | Aircel(DWL) | | Airtel | | BSNL | | Idea | | Reliance CDMA | | Reliance GSM | | TATA CDMA | | TATA GSM | | Uninor | | 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 |
| Signal Strength -0 to -75 dBm | | NA | 44.86% | NA | 79.04% | NA | 33.44% | NA | 65.56% | NA | NA | 64.66% | NA | NA | NA | 55.84% | NA | 79.96% | | | |
| Signal Strength --75 to -85 dBm | | NA | 24.46% | NA | 18.43% | NA | 38.43% | NA | 27.34% | | NA | 21.85% | | | NA | 17.43% | | | | | |
| Signal Strength --85 to -120 dBm | | NA | 30.68% | NA | 2.53% | NA | 28.13% | NA | 7.10% | | NA | 13.49% | | | NA | 2.61% | | | | | |
| Voice quality | ≥ 95% | NA | 85.89% | NA | 96.19% | NA | 97.50% | NA | 96.26% | NA | 96.94% | NA | 92.07% | NA | 97.23% | NA | 86.24% | NA | 98.27% | | |
| CSSR | ≥ 95% | NA | 98.73% | NA | 100.00% | NA | 98.05% | NA | 100.00% | NA | 99.63% | NA | 99.52% | NA | 100.00% | NA | 98.72% | NA | 100.00% | | |
| %age Blocked calls | | NA | 1.27% | NA | 0.00% | NA | 1.95% | NA | 0.00% | NA | 0.37% | NA | 0.48% | NA | 0.00% | NA | 1.28% | NA | 0.00% | | |
| Call drop rate | ≤ 2% | NA | 1.30% | NA | 0.00% | NA | 2.67% | NA | 0.00% | NA | 0.00% | NA | 0.00% | NA | 0.90% | NA | 0.00% | NA | 0.00% | | |
| Hands off success rate | | NA | 100.00% | NA | 100.00% | NA | 99.33% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | NA | 100.00% | | |

All the operators do not have the coverage in indoor areas hence it is taken as Not Applicable.

7.8.4 SIGNAL STRENGTH DATA FOR CDMA OPERATORS

| | Day 1 | | | | Day 2 | | | | Day 3 | | | | |
|----------|--|---------------|---------|-------------|---------|---------------|---------|-------------|---------|---------------|------------|-------------|---------|
| January | % Ec/lo BINS with less than -15 | Reliance CDMA | | TATA CDMA | | Reliance CDMA | | TATA CDMA | | Reliance CDMA | | TATA CDMA | |
| | | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor |
| | | 0.00% | 5.41% | 49.07% | 5.41% | No Coverage | 2.83% | No Coverage | 2.83% | No Coverage | 0 Coverage | No Coverage | 5.79% |
| February | % Ec/lo BINS with less than -15 | Reliance CDMA | | TATA CDMA | | Reliance CDMA | | TATA CDMA | | Reliance CDMA | | TATA CDMA | |
| | | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor |
| | | 99.95% | 96.74% | No Coverage | 60.93% | No Coverage | 96.60% | 49.80% | 37.40% | No Coverage | 99.86% | No Coverage | 5.07% |
| March | % Ec/lo BINS with less than -15 | Reliance CDMA | | TATA CDMA | | Reliance CDMA | | TATA CDMA | | Reliance CDMA | | TATA CDMA | |
| | | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor | In door | Outdoor |
| | | 0.16% | 1.17% | 49.07% | 35.58% | No Coverage | 1.38% | No Coverage | 6.84% | No Coverage | 0.94% | No Coverage | 3.63% |

7.9 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 | Uninor | Vodafone |
| Total number of closure request | | 7.00 | 1035.00 | NA | 49.00 | 69.00 | 129.00 | 594.00 | 137.00 | NA | 1033.00 |
| Number of requests attended within 7 days | | 7.00 | 1035.00 | NA | 49.00 | 69.00 | 129.00 | 594.00 | 137.00 | NA | 1033.00 |
| Percentage cases in which termination done within 7 days | 100.00% | 100.00% | 100.00% | NDR | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% |

Note: - BSNL did not provide any hence it is taken as Not Applicable whereas Uninor does not offer postpaid services.

7.10 TIME TAKEN FOR REFUND OF DEPOSITS AFTER CLOSURE

| Audit results for refund of deposits | | | | | | | | | | | |
|---|-----------|-------------|---------|--------|--------|---------------|--------------|-----------|----------|--------|----------|
| Refund | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total number of cases requiring refund of deposits | | 5.00 | 54.00 | 7.00 | 25.00 | No Data | No Data | 8.00 | 7.00 | NA | 246.00 |
| Total number of cases where refund was made within 60 days | | 5.00 | 54.00 | 4.00 | 24.00 | No Data | No Data | 8.00 | 7.00 | NA | 246.00 |
| Percentage cases in which refund was receive within 60 days | 100.00% | 100.00% | 100.00% | 57.14% | 96.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% |

Note: - Uninor does not offer postpaid services.

7.11 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 | Uninor | Vodafone |
| Eqipped capacity of the network | | 161733.00 | 728002.15 | 74100.00 | 195081.67 | 146000.00 | 235000.00 | 79358.40 | 49295.00 | 125008.11 | 161733.00 |
| Total taffic handled in erlang during TCBH | | 118503.00 | 6665692.52 | 23032.00 | 183031.78 | 90709.00 | 158313.00 | 26100.94 | 22872.88 | 171393.38 | 118503.00 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| Total number of customers as per VLR | | | | | | | | | | | |
| | | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total no. of customers served (as per VLR) | | 358531.00 | 21424138.00 | 620271.00 | 7126885.00 | 2515773.00 | 6464331.00 | 473988.00 | 887332.00 | 3995092.00 | 3585311.00 |

| Live calling for level 1 services | | | | | | | | | | | |
|---|-----------|-------------|--------|--------|--------|---------------|--------------|-----------|----------|--------|----------|
| Level 1 services | | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total no. of calls made | | 150.00 | 150.00 | 150.00 | 100.00 | 150.00 | 150.00 | 150.00 | 150.00 | 150.00 | 150.00 |
| Calls answered in 60 sec | | 140.00 | 139.00 | 71.00 | 85.00 | 136.00 | 140.00 | 140.00 | 135.00 | 92.00 | 144.00 |
| Calls answered after 60 sec | | 93.33% | 92.67% | 47.33% | 85.00% | 90.67% | 93.33% | 93.33% | 90.00% | 61.33% | 96.00% |
| % of calls connected in 60 seconds | | 0.9333 | 0.9267 | 0.4733 | 0.85 | 0.9067 | 0.9333 | 0.9333 | 0.9 | 0.6133 | 0.96 |
| | | | | | | | | | | | |
| Live calling results for resolution of service requests | | | | | | | | | | | |
| Resolution of service requests | Benchmark | Aircel(DWL) | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total Number of calls made | | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 36.00 | 100.00 |
| Number of cases resolved to satisfaction | | 97.00 | 98.00 | 78.00 | 94.00 | 89.00 | 81.00 | 88.00 | 95.00 | 21.00 | 97.00 |
| Percentage cases resolved in four weeks | | 97.00% | 98.00% | 78.00% | 94.00% | 89.00% | 81.00% | 88.00% | 95.00% | 58.33% | 97.00% |

7.12 TOTAL CALL MADE DURING THE DRIVE TEST

| January | | | | | | | | | | |
|------------------------|--------|--------|------|------|---------------|--------------|-----------|----------|--------|----------|
| | Aircel | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total No of calls made | 434 | 40 | NDR | 40 | 743 | 712 | 823 | ICR | 398 | 532 |
| February | | | | | | | | | | |
| | Aircel | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total No of calls made | 467 | 180 | 531 | 120 | 619 | 705 | 896 | ICR | 433 | 624 |
| March | | | | | | | | | | |
| | Aircel | Airtel | BSNL | Idea | Reliance CDMA | Reliance GSM | TATA CDMA | TATA GSM | Uninor | Vodafone |
| Total No of calls made | 441 | 681 | 656 | 448 | 721 | 641 | 516 | 402 | 414 | 692 |

Note: - IMRB International, ensures minimum of 100 km is travelled on each day.



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