TELECOM REGULATORY AUTHORITY OF INDIA

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

CELLULAR MOBILE TELEPHONE SERVICES

FOR

KERALA CIRCLE

Report Period: Oct - Dec 2015

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CHAPTER-1: INTRODUCTION

1.0 Objectives of the Audit and Assessment of Quality of service:

Telecom Regulatory Authority of India has been entrusted important task of laying down the standards to be provided by the service providers and ensuring that the quality of service is provided as per norms; and also TRAI is responsible for conducting the periodical audit of such services provided by the service providers to protect the interest of the consumers of telecommunications service .TRAI engaged Datamation for the Southern Zone(TAMIL NADU circle)for the audit and assessment of Quality of Service of service provided for Basic(Wire line) Telephone Services, Broadband and Cellular Mobile Telephone Services by various Operators as per the scope of work detailed in the tender document.

2.0. Scope of work to be undertaken:

The scope of work Audit and Assessment of Quality of Service of a service provider as mandated by TRAI includes:

a) Preparation of Performance Monitoring reports(PMRs) and up-loading in the system.
b) Live measurements of the performance of Service Providers(SPs) against the benchmarks for three days during each audit.
c) Monthly audit based on one month data of the SPs.
d) Drive test of the RF networks.
e) Audit of the performance of call centers with respect to the inaccessibility and the percentage of calls answered by the operator standard on customer feedback by calling the customers to get feedback of the services provided by the service providers.
f) Transfer of data generated by the RF drive test/live measurements/PMR/monthly audit to the server located at TRAI premises on a real time basis.

3.0. Quality Parameters to be audited in respect of the Basic (Wire line), Telephone Services, Broadband, and Mobile Telephone Services:

Basic (Wire line Services): The parameters for Basic Telephone Service (Wire line) consist of various QoS indicators, which can be audited and assessed objectively, and include parameters like fault incidences, call completion rates / answerer to POI congestion and customer service parameters viz. mean time to repair faults, metering and billing credibility(post-paid and pre-paid), 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, time taken for refund of security deposit after closures ;provision of a telephone after registration of demand, shift of the telephone connection, etc. This work was not carried out in the Q1.

Mobile Telephone Services: The parameters of Quality of Service for cellular mobile telephone services have been specified under the head (A) Network Service Quality Parameters(B)Customer Service Quality Parameters. The Network Service Quality Parameters include the parameter related to (i) Network Availability (ii) Connection Establishment, (iii) Connection Maintenance (iv) POI Congestion. The Customer Service Quality Parameters include metering and billing credibility (post-paid and pre-paid), resolution of billing/charging complaints, and 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. The parameters related to the Service coverage are tobe audited and monitored during drive test. All of these parameters have been covered in the Q1.

Broadband Services: The parameters of Quality of Service for broadband services, specified in the regulation 3 of Quality of Service of Broadband Services Regulations, 2006, include service provisioning /activation time, fault repair and restoration time, billing performance, response time to customer for assistance, bandwidth utilization/through put, service availability, packet loss and network latency.

Cellular Mobile Telephone Service:

S.N	Name of Parameter	Benchmark	Avg. overa Period
A	**Network Service Quality Parameters:**		
(i)	Network Availability		
	(a) BTSs Accumulated downtime (not available for service)	≤2%	One Month
	(b) Worst affected BTSs due to downtime	≤2%	One Month
(ii)	Connection Establishment (Accessibility)		
	(a) Call Set-up Success Rate(within licensee's own network)	≥95%	One Month
	(c) SDCCH/ Paging Channel	≤1%	One Month
	(c)TCH Congestion	≤2%	One Month
(iii)	Connection maintenance (Retain ability)		
	(a) Call Drop Rate	≤2%	One Month

	(b)Worst affected cells having more than 3%TCH drop (call drop)rate	≤5% up to 31.03.2011 ≤3%From01.04.2011	One Month
	(c) connections with good voice quality	≥95%	One Month
(iv)	Point of Interconnection(POI) Congestion (on individual	≤0.5%	One Month
B	**Customer Service Quality Parameters:**		
(v)	Metering and billing credibility– post-Paid	Not more than 0.1%of bills issued should be disputed over a billing cycle	One Billing Cycle
(vi)	Metering and billing credibility– - pre-paid	Not more than 1 complaint per1000 customers i.e.0.1% complaints for metering, charging, credit, and validity	One Quarter
vii)	(a)Resolution of billing/charging complaints	100%within 4 weeks	One Quarter
	(b)Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(viii)	Response Time to the customer for assistance		
	(a) Accessibility of call Centre/ customer care	≥ 95%	One Quarter
	(b)Percentage of calls answered by the operators(voice to voice) within 60 seconds	≥ 90%	One Quarter
(ix)	Termination/closure of service	≤ 7 days	One Quarter
(x)	Time taken for refund of deposits after closures	100%within 60 days	One Quarter

(ii) Basic Service (wireline):

S.N	Name of Parameter	Benchmark	Avg. over a Period
(i)	Fault incidences(No. of faults/100 subscribers/month)	≤5	One Quarter
(ii)	Fault repair by next working day	For urban areas: By next working day:≥90%and within 3 days: 100%. For rural and hilly areas: By next working day:≥90%and Within 5 days:100%. Rent Rebate Faults pending for>3 days and ≤7 days: Rentrebate for 7 days. Faults pending for>7 days and≤15days: Rent rebatefor15 days.	One Quarter
		Faults pending for>15Days: rent rebate for one month.	
(iii)	Mean Time To Repair (MTTR)	≤8Hrs	One Quarter
(iv)	(a) Call Completion Rate within a local network shall be better than	≥55%	One Quarter
	or,		
	(b)Answer to Seizure Ratio (ASR)	≥75%	One Quarter
(v)	Point of Interconnection(POI) Congestion (on individual POI)	≤0.5%	One month
(vi)	Metering and billing credibility–post paid	Not more than 0.1%of bills issued should be disputed over a billing cycle	One Billing Cycle
(vii)	Metering and billing credibility-pre-paid	Not more than 1 complaint per 1000 customers, i.e.,0.1% complaints for metering, charging, credit, and validity	One Quarter
(viii)	Resolution of billing/ charging Complaints	100%within 4 weeks	One Quarter
(ix)	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
(x)	Response Time to the customer for assistance		
	(a) Accessibility of call Centre/ customer care	≥95%	One Quarter
	(b)Percentage of calls answered by the operators (voice to voice) within60 seconds	≥ 90%	One Quarter
(xi)	Termination/closure of service	≤7days	One Quarter
(xii)	Time taken for refund of deposits after Closures	100%within 60 days.	One Quarter

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Detailed Scope of Work implemented &Universe:

We have been undertaking audit and assessment of Quality of Service provided by every service provider (licensee) in each of the telecom circles/metro service areas under the respective Zone in the following manner:-

a) In respect of Cellular Mobile Telephone service, all the service areas/circles in each Zone are to be audited in every quarter of the year i.e.a service area will be audited four times in a year.

b) In respect of Basic service (wire line) and Broadband service , a service area /circle in the contracted Zone is to be audited only once in a year. We undertook the audit work for the Mobile services as follows: -.

c) Generation of reports at service providers site as part of QOS monitoring reports i.e. quarterly Performance Monitoring Reports (PMRs) and monthly Point of Interconnect (POI) Congestion Reports forBasicandCellularMobileServiceswithreferencetotherecordsmaintainedby the service provider andthesystemlogsfortheperiod.WegeneratedthequarterlyPMRatsiteanduploadeditonreal time basis on the server at TRAI, Delhi

d) The PMR report formats and parameters were finalized and any modifications or additions of parameterswereundertakeninconsultationwithTRAI.ThescopecoveredallfuturePMRparameters As and when defined by TRAI during the duration of the contract .The PMRs were generated on monthly

basis for the Network Service Quality Parameters of cellular mobile telephone services and on quarterly basis for Customer Service Quality Parameters of cellular mobile telephone services, basic (wire line) services and broadband services as per the parameter specified. The PMRs so generated were up-loaded on the server.

E) Verification of the performance of service provider against the Quality of Service benchmarks laid down by TRAI using live measurement for three days for the parameters for the services as specified during the month in which the audit and assessment is carried out. The results were uploaded live on the server;

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f) Verification of the performance of service provider against the Quality of Service benchmarks, for the parametersandfortheservicesasspecifiedinclause1.9, laid down by TRAI using the data for the entire month during which the live measurement as per clause (b) above is carried out; the results were uploaded live on the server;

g) Drive tests of the mobile networks of service providers; the results were uploaded live on the server.

h) We carried out an analysis of the drive test and loaded the results giving such in form action and in such format as agreed by TRAI.

i) Audit of the performance of call centers with respect to the inaccessibility and the percentage of calls answered by the operators, test calling and random customer feed back by calling the customer to get feedback of the services of the service providers weasel so carried out by Datamation. The Automatic Call Distribution (ACD) records were also verified for the calls answered by the operators within 60 seconds.

3.1 Sampling Universe:

The Telecom Licensed Service Areas / Circle for the purpose of audit and assessment are:

South Zone: KERALA

The audit and assessment of Quality of Service has been conducted for BSNL, MTNL, private basic Service providers, unified access service providers, cellular mobile service providers and ISPs (providing broadband service) in various service areas for basic telephone service (wire line), cellular mobile telephone service and broadband service. We were required to conduct the audit and

Assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in the licensed service area. The updated data in respect of licensees (service providers) who have commissioned service and their

Subscriber base/Mobile Switching Centre(MSCs)/BTS"/Exchanges/Internet Service Providers Central

Nodes (ISP Nodes) is supposed to be be intimated by TRAI from time to time and we carried out the audit and assessment of Quality of Service accordingly thereafter.

The audit and assessment of Quality of Service for all the service providers in a Telecom Circle/Metro Service Area/Licensed Service Area were completed in the same quarterly period.

Generation of performance reports against QOS benchmark

4.0 Coverage, Sampling & Research Methodology for the Southern Zone (KERALA):

Sample size for cellular mobile services:

100%Gateway MSCs (GMSC) and Mobile Switching Centre (MSC)of all the Cellular Mobile Service Provider(CMSP)or Unified Access Service Providers(UASP)were covered in specified circles/service are assign respective Zone in each of the quarterly period.

Number of exchanges to be covered for Basic (Wire line) services: (Not covered in this Quarter)

The break-up of the total number of exchanges of BSNL, MTNL and private basic service operators circle/ service area-wise, including urban and rural exchanges, and the number of exchanges, both urban and rural, that shall be covered during the year for audit and assessment of the Quality of Service shall be obtained from TRAI. As per the break-up of a number of exchanges to be covered in a year, 556 urbanexchangesand1508 rural exchanges, totaling 2064exchangesareproposed to be covered. The exchanges shall evenly be spread over in about10%of SDCAs to the extent possible with each service provider in specified circles/service areas. A service area/circle in the contracted Zone shall be audited only once in a year.

Number of POPs to be covered for Broadband Services: (Not covered in this Quarter)

We propose to first visit the ISP Central Node in licensed service area and identify the total number of Point of Presence (POPs) in each service area. Thereafter, the sample for audit and assessment of Point of Presence shall be decided in such away thatminimum5 % (five percent) of the Points of Presence of ISP Spread over in10 % (ten percent) SDCAs in specified service area/telecom circle shall be covered. The POPs a repurposed to be evenly spread overran the licensed service area. A service area/circle shall be audited only once in a year.

5.0. Procedure adopted for Quality and Assessment of the Services:

The generation and verification of performance of service providers against QOS benchmarks involved measuring of specified reporting parameters, checking of complete records, analysis of procedure and method utilized by various service providers in measuring the parameters and method averaging for the purpose of reporting. We included critical findings licensee-wise in each *quarterly* report.

Audit methods and procedures:

To measure each quality of service parameter defined by TRAI, the two main sources of data collection identified were:

- Audit of the MIS reports at exchanges (OMC or MSCs) or ISP Node of the service provider.
- Primary data collection and check back calls (live observations done during the visits)

The audit was conducted in each center of study to generate various types of data. Thus, for data collection, following activities were undertaken during the appraisal exercise.

Collection of MIS data of OMC or MSC or ISP Node:

Forth is TRAI has suggested to the service providers to maintain the QoS source data in a proper format. From the source data, we generated the quarterly/monthly performance monitoring reports (PMR). Methodology adopted was checked against instructions and standards to see if the measurement sad here to specifications.

Live Measurements and Live Data Collation:

During the audit and assessment, following activities were undertaken for live measurements and live data collection.

a) Audit and Assessment of complaint redresses and provisioning of new broadband Connections: (Not Conducted this Quarter)

Telephonic interviews are proposed to be conducted among a sample of subscribers of telephone–

- In basic service (wire-line) for those customers who reported a fault complaint, billing dispute
- In case of Mobile operators, who have had are sent billing dispute
- In case of Broadband service for those who requested for a new connection reported a fault complaint, billing dispute, complaint of Broadband connection speed (download).

Data shall be obtained on:

- Occurrence of fault complaints
- Clearance of fault within stipulated time
- Incidence of billing disputes
- Clearance of billing complaints within stipulated time
- Attendance to requests for closure/ termination of service

Sampling Procedure & quality control: order to get a correct and meaningful result from audacities important to ensure that the right sampling procedure is followed. Equally important is the process of ensuring that quality control parameters are put in place .Care shall be taken to distribute the sample to obtain random list. The distribution of sample sizes shall be evenly distributed. The sampling procedure for various activities to be carried is given below:

Sample for telephonic interview for billing complaints:

The sample size for telephonic interview of billing complaints in each audits hall be 100subscribersor the total number of complaints, whichever is less per service provider for each service in a licensed service area. All the complaints booked shall be treated as the total population for selection of samples.

Sample for telephonic interview for new connection for Broadband Service:

The sampling frame shall be for Point of Presence/ISPNo de of Broadband Service Provider. Here, the total sample size(10%oftheapplicantsinthepreviousmonthor100whicheverislessforevery service provider) has been randomly selected from the records/registers to make check back calls.

Sample for telephonic interview for service complaints/ requests:

The operator is required to provide the detail of the service complaints/requests for the month previous to the audit month for Cellular Mobile Telephone Services, Basic (wire line) Services and Broadband Services. For broadband services ,complaints related to down load speed are proposed to covered. From the list of these complaints/requests(10% or100 per service provider per license service area, whichever is less)sample has been drawn randomly to make check back calls.Anoticeofminimum3(three)weeks was provided to the service provider by us for arranging and supplying the data required for audit of exchanges ,ISP nodes and MSCs to be covered.

b) Audit and Assessment of Call Centre / customer care promptness and live measurement through the set calls:

Test calls were made to assess the availability and efficiency ofLevel1servicesandcomplaintcentre accessibility. The telephone /SIM Cards/Instruments for testing purposes were provided by the concerned service provider(s) in whose network the audit and assessment of Quality of Service is carried out. The details regarding test calls are:

(a) Testing of Level 1Services:

Level1Services include police, fire, ambulance (Emergency services)in the case of both Mobile service providers and basic telephone service providers. Test calls were made from all the levels working in a particular SDCA visited .Again, the total sample sizes (150perlicenseservice are apes service per quarter) were equally distributed among the different SDCAs visited, and the distribution among the active levels is in proportion to the capacity of each level in that SDCA.

(b) Inter-operator call assessment:

Internetwork calls me. e. calls made from one operator to another within the same license was made to judge the ease of connectivity amongst the operators.

A sample of 2X50 test calls per service provider within the licensed service area was made at different point of time to the free test numbers of another service provider (50 calls between 1000 to1300 Hrs and50 calls between1500 to1700 hrs for basic service and between1100 to1400 hrs and between 1600 to1900 hrs) for cellular mobile service. The results of these calls were compiled and reported separately for each service provider service area-wise.

The telephone/SIM Cards/Instruments for testing purposes were provided by the concerned service provider(s)in who see network the audit and assessment of Quality of Service is carried out.

(c) Testing of Complaint Centre Accessibility and response time:

(i) Basic Telephone Service (wire line) and Cellular Mobile Telephone Service:

We measured the performance of both basic telephone service (wire line)&cellular mobile services against the benchmarks of the following Quality of Service parameters:-

Response time to the customer for assistance:

(a) Accessibility of call center /customer care>=95%

(b)% age of calls answered by the operator (voice to voice): Within 60 seconds = 90%

The procedure for assessment of the performance in respect to of above parameters was made using the traffic data at the point of termination to call Centre from mobile/basic telephone network. Traffic at the candor trunk or gateway MSC outgoing circuits to IVR of call center w a s measured as per the traffic counter available in the respective switch to assess the accessibility of call Centre.

In the case of parameter % of call answered by the operator voice to voice ,assessment of IVR traffic data and CRM traffic data was analyzed during the time consistent busy hour(TCBH) of call center. In addition, we also made the test calls and correlated the results with the traffic data analysis.

The procedure (IVR menu and sub-menu)and ease of accessing the operator within the benchmark aid down by TRAI, both post-paid and pre-paid customers were assessed and reported .In this regard para3.11.4 of the Explanatory Memorandum to the Standards of Quality of Service of Basic Telephone Service(Wire line)and Cellular Mobile Telephone Service Regulations,2009andprovisionsof the Telecom Consumers Complaint Red reseal Regulations, 2012 was be followed.

Measurement:

A sample of 2X 50 calls per service provider is proposed to be made at different point of time to the call centre of each service provider from each licensed service area (50 calls between1000 to1300 Hrs.and50 calls between1500 to1700 hrs.)for basic telephone service(wire line)and similarly,2X50calls to the call centre of each service provider (50calls between 1100 to1400 hrs. and 50 calls between 1600 to 1900 hrs.)

for cellular mobile telephone service from each licensed service area to ensure statistical significance.

The time to connect to IVR shall be noted for all these calls. This is the wait time before an automatic answer machine (IVR) message begins .We then propose to measure the gap between the time when the last digit of the number is dialed and the time when the IVR message begins .Similarly the wait time before ea Call Centre agent responds to attest call shall be measured for all such test calls.

Verification and audit of records:

We propose to verify and audit the following records in respect of Basic Telephone Service (wire line): o Call Centre records for complaints

- o FRS details for fault complaints, fault repair and MTTR (Mean Time to Repair)
- o Commercial records for billing details, billing disputes and redress or thereof o Past traffic reports at local and TAX(Trunk Automatic exchanges) for Call
- o Completion Rate/*Answer to Seizure Ratio* calculations
- o Checking of customer complaint handling through live test at the call centre
- o 100 Nos. of service complaints /requests and 100Nos.of billing related complaints shall be taken up by the auditing agency for verifying their reprisal as per the record of the service provider.

We verified and audited the following records in respect of Cellular Mobile Telephone Service:

- Call Centre records for complaints
- Network maintenance and planning department (OMC and Drive Test) records for QOS parameters
- System/Network outage details, Call Set-up Success Rate, Blocked Call Rate, Call Drop Rate, worst affected cells having more than 3 % TCH drop rate ,Voice Quality ,Service Coverage and POI congestion
- Commercial and customer care records for billing disputes, reprisal and refunds of payment
- Checking of customer complaint handling through live test at the call centre
- 100 Nos.of service complaints/requests and 100Nos.of billing related complaints w a s taken up by the auditing Agency for verifying their redressal as per the record of the service provider.

We propose to verify &audit records maintained by Broadband service providers relating to:

- Call Centre records for complaints
- FRS details for fault complaints, fault repair
- Records for requests for new connection, and supplementary services
- Commercial records for billing details, billing disputes and redressed there of
- Checking of customer complaint handling through live test at the call centre
- Service complaints/request sand billing related complaints hall be taken up by the auditing agency for verifying their redresser as per the record of the service provider.

- Bandwidth Utilization/Throughput
- Broadband connection speed
- Service Availability/Uptime
- Packet Loss and Latency measurements

Network performance parameters like Bandwidth Utilization/Through put including Broadband Connection Speed, Packet Loss and Latency shall be measured on sample basis.

The detailed methodology for each Quality of Service parameters given in the Explanatory Memorandum to the Quality of Service of Broadband Service Regulations, 2006 dated 6th 2006(11of2006) was followed. The signature of the Nodal Officer nominated by the service provider for coordination with the audit agency was taken on all the formats containing the verified data for all the parameters

We shall take live measurements and collection of one month data or audit by actual visit to such NOC, OMC, call center and billing Centre.

Procedure followed for cellular mobile telephone service data generation ,verification and audit

S.N	Parameter	Procedure
i)	Network availability (a)BTS accumulated down time (b)Worst affected BTSs due to down time	The fault Alarm tracking details a the OMC(MSC) for the network outages(due to own network elements and infrastructure service provider end outages) were verified for arriving at the figures reported to T RAI.
ii)	Call Set-up Success Rate	The cell wise data generated through counters/MMC available in the switch for traffic measurements were verified.
iii)	Blocked Call Rate	Both for SDCCH and TCH congestions the data in MSCs was verified and compared with the data report end to TRAI in the Quarterly PMRs.
iv)	Call Drop Rate	This parameter was measured by the system generated (defined counters are available in the system for traffic measurement)cell wise dropped call data and total calls established figures to arrive at the authenticity and accuracy of the benchmark reported to TRAI.
v)	%Connections with good voice quality	This parameter was measured from the system generated dataonascalefrom0to7forGSMandFERvaluefor CDMA technology. We also collected the relevant city wise drive log files for all drive tests conducted to verify the parameter.

vi)	Service coverage	We also collected the relevant city wise drive log files for all drive tests conducted to verify the parameter.
vii)	POI Congestion	The traffic data generated through Gateway MSCs (GMSCs) and reported to TRAI in POI congestion reports were verified
vii)	Metering and Billing Credibility	We audited the billing complaints details on complaints received during the quarter and used for arriving at the figures reported to TRAI.
ix)	%of Billing Complaints resolved	Audit of billing complaints resolved and the total complaints received were carried out to check the figures reported to TRAI. At the same time, we also conducted random live back checks of complaints.
x)	Period of applying credit/waiver/adjustment To customers account from the date of the resolution	We checked the billing complaints for which credit/waiver/adjustment was made on the resolution of the complaints within one week.
xi)	Termination/closure of service	The data were verified for termination/closure of the services within 7 days from the date of request.
xii)	Time taken for refund of deposits after closure	We verified that100%depositsshouldbe refunded within 60 days. At the same time, we also conducted a random live back check so fall such subscribers entitled for a refund.

Drive Tests:

In the case of Cellular Mobile Service, the exercise of QoS assessment shall not be limited to generation, verification and audit of data, but we shall also verify the parameters by conducting extensive drive test in all service areas, as per the details given below, to assess the network performance.

The reared two types of drive tests that were conducted. One is operator assisted drive test and the other is independent drive tests. The details of these drive tests are given below:

Operator Assisted Drive Tests: The primary aims of these drive tests is to cross-check/validate the data on Quality of Service being provided by the telecom service providers to TRAI. These drive tests were conducted in such a manner so as to enable identification of network element deficiencies and initiation of improvements. The operator assistance was desired to ensure a greater audit transparency.

In each licensed service area drive test in three cities, having high population, medium population and low population, were conducted every monthforeachserviceprovidercoveringaminimumdistanceof100 kilometers in city area and adjoining areas including important in door sites. These cities were proposed and finalized by TRAI.Theresultsofanalysisofdatagenerateddduringsuchdrivetestswereuploaded, immediately on completion of the drive test, to the central server at TRAI.

Independent Drive Tests: We shall do independent drive tests in Q1 spread across the contracted zone limited to a Maximum of 10drivetestsperlicensedservicearea, in a year. The location for these drive test was selected based on the subscriber complaints being received by TRAI or as decided by *TRAI*. Independent drive test covered a city and adjoining areascoveringaminimumdistanceof100kilometers including congest dares and important indoor sites. The results of analysis of data generated during such drive tests will be uploaded, immediately on completion of the drive test, to the central server at TRAI.

Drive Test Methodology:

For drive test following procedure was adopted:

i. We obtained a coverage map from the service provider before starting the drive test and studied the coverage detail in terms of the signal strength .Based on the signal strength as depicted in the coverage map, the drive test was done to check the following parameters:

a. Coverage-Signal strength

b. Voice quality

c. Call setup success rate

d. Blocked calls e. Call drop rate

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

iii. The drive test covered their outes including expressways, major and secondary roads/streets, Commercial, residential areas/Commercials estates to check the in-building network performance. iv. The drive tests of each mobile network were conducted between10 am and8 pm on weekdays.

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

vi. The speed of the vehicle waskeptataround30-50km/hour (around30km/hr in case of geographically small cities)

vii. The holding period of each test call was 120 seconds.

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

ix. Measurement using engineering handsets was not done

x. The dedicated originating and terminating mobile units antenna was placed at the same height and in the same vehicle. Moreover, the height of the antenna was uniform incase of all service providers.

6.0 Reporting Formats:

We developed data formats including executive summary, critical findings and detailed data analysis the re off or reporting the results of such audit and assessment. We submitted to TRAI sample design and sample reporting formatswithin4weeksofsigning of the agreement. All these reports were enabled as online reports with sufficient flexibility of querying against various parameters.

6.1 Deliverables:

Quarterly Reports: We re-submitting quarterly reports in the formats approved by TRAI for the purpose. Five copies of such report during the quarterly period were submitted to TRAI within the time period given in the delivery schedule.

The report also contained the Audit results of service areas including executive summary, critical findings and comparison of performance of the service providers on various qualities of service parameters for which Audit work was undertaken during the *quarter.*

Reports were submitted for approval within one month of the completion of each *quarter* for audit and assessment of QoS parameters for basic service, cellular mobile service and broadband service. The report contained the finding so an audit and assessment of QOS provided by service providers carried out in accordancewithClause2above.The report contained a performance of each service provider for each licensed service area against the Quality of Service parameters. The report also contained a comparative analysis of the performance of all the service providers in a licensed service area. The report also contained an Executive Summary and critical finding along with detailed analysis.

A separate report shall also be submitted for each company/group of companies at the end of the year. The report contained an Executive Summary and critical finding along with detailed analysis to share with the service provider and take further follow-up action.

7.0.Work Plan and Delivery Schedule:

S. No.	Deliverable	Period
	Date of award of work as per the contract says (D)	
1.	Submission of all sample design and reporting formats by the Audit agency	D+4 weeks
2.	Submission of final design and reporting formats by the Audit agency In cooperating modifications and corrections suggested by TRAI and its	D+8 weeks
3.	Comment cement of audit and assessment of Quality of Service	Beginning of–the quarter following date of award of work(D) or any subsequent quarter, as decided by TRAI
4.	Submission of first quarterly report	One month from the end of the first quarter
5.	Submission of second quarterly report	One month from the end of the second quarter
6.	Submission of third quarterly report	One month from the end of the third quarter
7.	Submission of fourth quarterly report	One month from the end of the fourth quarter
8.	Commencement of audit and assessment of Quality of Service for the first quarter for the extended period	From the end of the fourth quarter or any later period as decided by TRAI
9.	Submission off first quarterly report for the extended period, if any	One month from the end of the first Quarter of extended period
10.	Submission of second quarterly report for the extended period ,if any	One month from the end of the second Quarter of extended period
11.	Submission of third quarterly report for the extended period, if any	One month from the end of the third Quarter of extended period
12.	Submission of fourth quarterly report for the extended period ,if any	One month from the end of the fourth Quarter of extended period

CHAPTER-2: EXECUTIVE SUMMARY

2.1.Preface

This report presents the growth trends for the telecom services in India for the quarter endingDec.2015.This report provides a broad perspective on the Telecom Services to serve as a reference document for various stakeholders, research agencies and analysts. Under the Unified Access Service (UAS) Regime, the details of subscriber base under wireless services, both GSM & CDMA technologies have been combined.

This report highlights the findings for the audit & assessment of Quality of Service of Cellular Mobile Services, Wire line Services & Broadband Services in **South Circle**() in 1ST Quarter (Oct – Dec.2015). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period Oct – Dec.2015.

S.I.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	AircelLtd	Oct-Dec.'15	1900-2000 Hrs
2	Airtel Ltd	Oct-Dec.'15	1900-2000 Hrs
3	BSNL	Oct-Dec.'15	1900-2000 Hrs
4	Idea	Oct-Dec.'15	1900-2000 Hrs
5	Reliance Communication (GSM)	Oct-Dec.'15	1900-2000 Hrs
6	Tata Communications (GSM)	Oct-Dec.'15	1900-2000 Hrs
7	Vodafone	Oct-Dec.'15	1900-2000 Hrs
CDMA Operators			
8	MTS	Oct-Dec.'15	1900-2000 Hrs
9	Reliance Communication (CDMA)	Oct-Dec.'15	1900-2000 Hrs
10	Tata Communications (CDMA)	Oct-Dec.'15	1900-2000 Hrs

Following are the various operators covered in circle (South Zone) for Cellular Mobile (Wireless) services QoS audit & assessment. The

Month of audit & TCBH information is also given below:

2.2 Findings from Quality of Service Audit (Operator wise for each parameter)

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the

entire month during which the live measurement is carried out.

As per PMR Data Verification Results for-

- **KERALA Circle (Oct'15) -** From the month Data Assessment, it is found that TATA (2G,3G& CDMA) are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **KERALA Circle (Nov.'15):**From the month Data Assessment, it is found that TATA (2G & CDMA)are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate
- **KERALA Circle (Dec.'15):** TATA (2G & CDMA) Operators are not meeting the benchmark for **worst affected cells having more than 3% TCH drop (call drop) rate in** Circles for the month of Dec.'15.
- **KERALA Circle(Oct- Dec.'15):-** According to the summarized data for the month of Oct, Nov and Dec. We found that only TATA (2G & CDMA) are not meeting the benchmark for **worst affected cells having more than 3% TCH drop (call drop) rate.**

➢ **As per 3 Days Live Test Audit Report (1st Quarter), Circle:-**

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using Live measurements for 3 days during the month in which the Audit and Assessment is carried out.

- Aircel, BSNL,Idea,TATAis not meeting the benchmark for **worst affected cells having more than 3% TCH drop (call drop) rate** for all the 3 Days and TATA 3G for Day1 & Day2.

➢ **As per Operator Assisted Drive Test:**

The Operator Assisted Drive Test was conducted for all the Operators. Route covered was about 100 Km depending on city areas within the speed limit of 30-40 km/hour. In all the cities Zones were selected for covering different density areas (High/Medium/Low)

Circle:

- Aircel not participated in Drive Test audit.
- All operators achieved KPI threshold for Blocked Call Rate (<=3%).
- All operators achieved KPI threshold for Dropped Call benchmark.

- All operators achieved KPI threshold benchmark for the Voice Quality parameter (0-5 (with frequency hopping)).
- All operators achieved KPI threshold benchmark for Call Setup Success Rate (>=95%).

➢ **Level 1 Live Calling (Emergency No.) Q1**

Level 1 calling such as calling at emergency no. like Police, Fire, and Ambulance were made so as to check the service of such short codes. In different cities of it was found to be functional.

➢ **Performance(live calling for billing complaints):**

We have made live calling to customers as per their complaints details and we verified their complaint and we found that most of the complaints are resolved within the time line and all the operators are meeting the TRAI benchmarks.

Live calling to call centre:-

In live calling to call centers, we found that all the operators are meeting their benchmark.

➢ **Inter Operator Call Assessment**

In the inter-operator call assessment test, calls were made from one operator to other operator so as to check congestion on both the operators' network. In such cases, the radio part, switch part and the POI in between the operators are involved and hence if any congestion is found in the network, it Nov be due to any of these parts. The result shows that there is not much congestion on the operator network; however the congestion was shown with all the operators BSNL, Vodafone, Airtel, Rcom, Tata, Idea, Aircel and MTS service provider.

➢ **CUSTOMER SERVICE QUALITY PARAMETERS**

- **1st Quarter data Assessment (Oct- Dec.'15)**
  - According to the parameter metering/billing credibility post-paid in the table**3.7.1** we found that all the service providers are meeting the benchmark.

- According to the parameter metering /billing credibility pre-paid in the table **3.7.1**we found that all the service providers are meeting the benchmark.
- According to the parameter Resolution of billing/ charging complaints in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Accessibility of call centre/Customer Care in the table **3.7.1**we found that all the service providers are meeting the benchmark.
- According to the parameter % call answered by operators (voice to voice) within 60 sec in the table **3.7.1** all the service providers are meeting the benchmark
- According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter in the table **3.7.1** we found that all the service providers are meeting the benchmark.

According to the parameter Time taken for refunds of deposits after closures in the table 3.7.1 we found that all operators meeting the benchmark.

CHAPTER-3:
AUDIT –PMR DATA VERIFICATION RESULTS

3.0 Cellular, Mobile Telephone Service

3.1 PMR Data Verification Results

3.1.1 KERALA Circle (Oct'15):

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

KERALA Circle (Oct'15)																
Oct. Month PMR Generation Data		Benchmark	Audit Period	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance 2G	TATA 2G	TATA 3G	Vodafone	Reliance CDMA	TATA CDMA	MTS CDMA
S/N	Name of Parameter															
	Network Service Quality Parameter															
	Network Availability															
1	BTS accumulated downtime	≤ 2%	One Month	0.10%	0.09%	0.49%	0.40%	0.09%	0.08%	0.00%	0.62%	0.37%	0.04%	0.00%	0.09%	0.09%
	Worst affected BTS due to downtime	≤ 2%	One Month	0.00%	0.00%	0.20%	0.20%	0.28%	0.00%	0.00%	0.00%	0.00%	0.17%	0.00%	0.00%	0.00%
	Connection establishment (Accessibility)															
2	Call Setup Success Rate	≥ 95%	One Month	99.46%	98.54%	98.69%	96.05%	99.90%	99.49%	99.19%	98.95%	98.08%	99.78%	99.27%	98.31%	99.52%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Month	0.03%	0.09%	0.18%	0.14%	0.30%	0.71%	0.03%	0.01%	0.62%	0.02%	0.00%	0.00%	0.00%
	TCH congestion	≤ 2%	One Month	0.01%	0.18%	1.31%	0.66%	1.71%	0.19%	0.20%	0.03%	0.08%	0.22%	0.85%	0.01%	0.00%
	Connection Maintainability (Retain ability)															
3	Call Drop Rate	≤ 2%	One Month	0.63%	0.41%	0.63%	1.26%	0.69%	0.41%	0.09%	0.51%	0.54%	0.51%	0.13%	0.52%	0.15%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Month	2.83%	1.58%	1.66%	0.13%	2.26%	2.29%	0.68%	2.91%	**3.96%**	1.60%	1.03%	**5.90%**	1.51%
	% of Connections with good voice quality	≥ 95%	One Month	97.12%	97.80%	99.92%	99.87%	95.10%	97.72%	99.45%	98.73%	99.74%	97.81%	99.02%	99.14%	99.20%
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	One Month	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Finding & Critical Analysis:

From the month data assessment, it is found that all the operators are meeting the network parameters except TATA 3G&TATA CDMA for worst affected cells having more than 3% TCH drop (call drop) rate. Since Airtel 3G Kerala&Vodafone3G are Sharing ICR with Idea Kerala network they are not providing 3G PMR reports Given the Justification mails to the Auditor Kerala Circle.

3.1.2 KERALA Circle (Nov.'15):

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

KERALA Circle (Nov.'15)																
Month PMR Generation Data		Benchmark	Audit Period	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA 2G	TATA 3G	Vodafone	Reliance CDMA	TATA CDMA	MTS CDMA
S/N	Name of Parameter															
	Network Service Quality Parameter															
	Network Availability															
1	BTS accumulated downtime	≤ 2%	One Month	0.09%	0.09%	0.45%	0.60%	0.13%	0.10%	0.05%	0.06%	0.02%	0.04%	0.07%	0.06%	0.03%
	Worst affected BTS due to downtime	≤ 2%	One Month	0.00%	0.00%	0.19%	0.27%	0.12%	0.00%	0.13%	0.00%	0.00%	0.13%	0.00%	0.00%	0.00%
	Connection establishment (Accessibility)															
2	Call Setup Success Rate	≥ 95%	One Month	99.53%	98.09%	98.72%	97.08%	99.91%	99.37%	98.51%	98.87%	98.47%	99.82%	99.21%	98.67%	99.51%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Month	0.02%	0.14%	0.17%	0.07%	0.16%	0.80%	0.02%	0.01%	0.49%	0.03%	0.00%	0.00%	0.00%
	TCH congestion	≤ 2%	One Month	0.01%	0.25%	1.28%	0.65%	0.99%	0.44%	0.14%	0.08%	0.54%	0.18%	0.93%	0.02%	0.00%
	Connection Maintainability (Retain ability)															
3	Call Drop Rate	≤ 2%	One Month	0.52%	0.44%	0.62%	1.10%	0.71%	0.32%	0.08%	0.55%	0.48%	0.45%	0.11%	0.46%	0.16%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Month	2.93%	1.58%	1.60%	0.12%	2.15%	2.35%	0.71%	2.85%	3.19%	1.52%	0.90%	**4.12%**	1.66%
	% of Connections with good voice quality	≥ 95%	One Month	97.65%	97.85%	99.93%	99.92%	95.06%	97.98%	99.46%	98.75%	99.75%	97.87%	99.05%	99.14%	99.20%
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	One Month	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Finding & Critical Analysis:

- From the month data assessment, it is found that all the operators are meeting the benchmark for network parameters except TATA CDMA for the parameter worst affected cells having more than 3% TCH drop (call drop) rate.

3.1.3 KERALA Circle (Dec.'15):

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

KERALA Circle (Dec.'15)																
Month PMR Generation Data		Benchmark	Audit Period	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA 2G	TATA 3G	Vodafone	Reliance CDMA	TATA CDMA	MTS CDMA
S/N	Name of Parameter															
Network Service Quality Parameter																
	Network Availability															
1	BTS accumulated downtime	≤ 2%	One Month	0.13%	0.13%	0.38%	0.34%	0.09%	0.07%	0.13%	0.05%	0.02%	0.04%	0.12%	0.03%	0.05%
	Worst affected BTS due to downtime	≤ 2%	One Month	0.00%	0.00%	0.16%	0.25%	0.15%	0.00%	0.26%	0.00%	0.00%	0.30%	0.00%	0.05%	0.00%
	Connection establishment (Accessibility)															
2	Call Setup Success Rate	≥ 95%	One Month	98.78%	98.78%	98.70%	98.89%	99.90%	99.50 %	98.77%	98.90%	98.94%	99.80%	99.12%	98.64%	99.48%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Month	0.10%	0.10%	0.18%	0.03%	0.29%	0.62%	0.03%	0.01%	0.27%	0.03%	0.00%	0.00%	0.00%
	TCH congestion	≤ 2%	One Month	0.01%	0.01%	1.21%	0.97%	1.16%	0.21%	0.17%	0.03%	0.33%	0.20%	0.00%	0.05%	0.00%
	Connection Maintainability (Retain ability)															
3	Call Drop Rate	≤ 2%	One Month	0.49%	0.49%	0.58%	1.15%	0.64%	0.33%	0.07%	0.47%	0.30%	0.42%	0.07%	0.41%	0.15%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Month	2.83%	0.49%	1.43%	0.09%	1.97%	1.49%	0.60%	2.73%	2.38%	1.20%	0.14%	3.01%	1.73%
	% of Connections with good voice quality	≥ 95%	One Month	96.75%	96.75%	99.90%	99.79%	95.71%	97.67 %	99.48%	98.79%	99.71%	97.93%	99.63%	99.14%	99.19%
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	One Month	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

finding & Critical Analysis:

TATA CDMA for worst affected cells having more than 3% TCH drop is not meeting the benchmark .Vodafone 3G is sharing network with idea network.

3.1.4 PMR Summarized Data Results in Table KERALA Circle Q1 (Oct-Dec.'15):

KERALA Circle Q1 (Oct-Dec.'15)																
Month PMR Generation Data S/N	Name of Parameter	Benchmark	Audit Period	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA 2G	TATA 3G	Vodafone	Reliance CMDA	TATA CDMA	MTS CDMA
Network Service Quality Parameter																
	Network Availability															
1	BTS accumulated downtime	≤ 2%	One Qtr.	0.11%	0.10%	0.44%	0.45%	0.10%	0.08%	0.06%	0.24%	0.14%	0.04%	0.06%	0.06%	0.06%
	Worst affected BTS due to downtime	≤ 2%	One Qtr.	0.00%	0.00%	0.18%	0.24%	0.18%	0.00%	0.13%	0.00%	0.00%	0.20%	0.00%	0.02%	0.00%
	Connection establishment (Accessibility)															
2	Call Setup Success Rate	≥ 95%	One Qtr.	99.26 %	98.47 %	98.70%	97.34%	99.90 %	99.45%	98.82%	98.91%	98.50%	99.80%	99.20%	98.54 %	99.50 %
	SDCCH/ Paging Channel Congestion	≤ 1%	One Qtr.	0.05%	0.11%	0.18%	0.08%	0.25%	0.71%	0.03%	0.01%	0.46%	0.03%	0.00%	0.00%	0.00%
	TCH congestion	≤ 2%	One Qtr.	0.01%	0.15%	1.27%	0.76%	1.29%	0.28%	0.17%	0.05%	0.32%	0.20%	0.59%	0.03%	0.00%
	Connection Maintainability (Retain ability)															
3	Call Drop Rate	≤ 2%	One Qtr.	0.55%	0.45%	0.61%	1.17%	0.68%	0.35%	0.08%	0.51%	0.44%	0.46%	0.10%	0.46%	0.15%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Qtr.	2.86%	1.22%	1.56%	0.11%	2.13%	2.04%	0.66%	2.83%	**3.18%**	1.44%	0.69%	**4.34%**	1.63%
	% of Connections with good voice quality	≥ 95%	One Qtr.	97.17 %	97.47 %	99.92%	99.86%	95.29 %	97.79%	99.46%	98.76%	99.73%	97.87%	99.23%	99.14 %	99.20 %
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	One Qtr.	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Finding & Critical Analysis:- According to the summarized data for the month of Oct, Nov and Dec. We found that only TATA 3G and CDMA is not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.

3.2.1 Comparison of LIVE DATA & PMR data for the Q1(OCTOBER-DECEMBER15).

S/N	Name of Parameter	Benchmark	Audit Period	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA 2G	TATA 3G	Vodafone	Reliance CDMA	TATA CDMA	MTS CDMA
Network Service Quality Parameter																
1	**Network Availability**															
	BTS accumulated downtime	≤ 2%	PMR	0.11%	0.10%	0.44%	0.45%	0.10%	0.08%	0.06%	0.24%	0.14%	0.04%	0.06%	0.06%	0.06%
			Live	0.01%	0.07	0.41%	0.38%	0.09%	0.29%	0.03%	0.01%	0.01%	0.00%	0.17%	0.19%	0.01%
	Worst affected BTS due to downtime	≤ 2%	PMR	0.00%	0.00%	0.18%	0.24%	0.18%	0.00%	0.13%	0.00%	0.00%	0.20%	0.00%	0.02%	0.00%
			Live	0.00%	0.00%	0.00%	0.15%	0.03%	0.00%	0.00%	0.00%%z	0	0.00%	0.13%	0.00%	0.00%
2	**Connection establishment (Accessibility)**															
	Call Setup Success Rate	≥ 95%	PMR	99.08%	99.21%	99.16%	98.30%	99.92%	98.44%	NA	99.46%	NA	98.73%	98.96%	98.41%	98.85%
			Live	99.54%	98.44%	99.15%	98.89%	98.35%	98.83%	99.00%	98.46%	98.56%	99.85%	98.13%	98.52%	99.40%
	SDCCH/ Paging Channel Congestion	≤ 1%	PMR	0.05%	0.11%	0.18%	0.08%	0.25%	0.71%	0.03%	0.01%	0.46%	0.03%	0.00%	0.00%	0.00%
			Live	0.47%	0.10%	0.11%	0.18%	0.08%	0.61%	0.01%	0.06%	0.00%	0.02%	NA	0.49%	0.02%
	TCH congestion	≤ 2%	PMR	0.01%	0.15%	1.27%	0.76%	1.29%	0.28%	0.17%	0.05%	0.32%	0.20%	0.59%	0.03%	0.00%
			Live	2.70%	0.20%	1.29%	1.29%	0.15%	1.32%	0.12%	0.15%	4.21	0.16%	NA	0.56%	0.02%
	Connection Maintainability (Retain ability)															
3	Call Drop Rate	≤ 2%	PMR	0.55%	0.45%	0.61%	1.17%	0.68%	0.35%	0.08%	0.51%	0.44%	0.46%	0.10%	0.46%	0.15%
			Live	1.43%	0.45%	1.02%	0.40%	0.65%	0.64%	NA	0.77%	0.49%	0.27%	0.11&	0.46%	0.42%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	PMR	2.86%	1.22%	1.56%	0.11%	2.13%	2.04%	0.66%	2.83%	**3.18%**	1.44%	0.69%	**4.34%**	1.63%
			Live	2.70%	1.55%	1.46%	1.24%	1.95%	1.69%	NA	4.21%	2.44%	1.27%	0.93%	3.19%	2.75%
	% of Connections with good voice quality	≥ 95%	PMR	97.17%	97.47%	99.92%	99.86%	95.29%	97.79%	99.46%	98.76%	99.73%	97.87%	99.23%	99.14%	99.20%
			Live	96.15	99.35	97.94	98.27	96.42	95.86	NA	98.75	98.62	98.75%	NA	98.75%	99.19%
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	PMR	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Live	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Findings –

- There are difference inBTS accumulated downtime in BSNL (2G &3G) and Airtel,tatacdma and tatagsm ,IDEA 3G and in Worst affected BTS due to downtime there is no major difference in Idea, BSNL (2G &3G), Reliance (GSM & CDMA) and Vodafone.
- There are difference inCall Setup Success Rate in AIRTEL,idea,VODAFONE and ,in SDCCH/ Paging Channel Congestion BSNL 2G, Idea 2G & Idea 3Gand TATA 3G and in TCH congestion Vodafone, Idea 2G, BSNL (2G & 3G), Reliance GSM, TATA 3G and MTS.
- In Call Drop Rate Aircel, BSNL 3G& 2G, Idea 3G&VodafoneTATA 2G,MTS and in Worst affected cells having more than 3% TCH drop (call drop) rate all the operators have differences except Airtel, BSNL 3G, Idea 2G and Reliance (GSM & CDMA), however the major differences are in TATA (2G & CDMA)and in % of Connections with good voice qualityAIRTEL,AIRCEL BSNL 2G&3G and Idea2G& 3G ANDMTS Also have differences.

3.2.2 3 Days Live Test Audit Report(1ST Quarter), KERALA Circle:

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using Live measurements for 3 days during the month in which the Audit and Assessment is carried out.

KERALA CIRCLE Q1 -2015 (Oct- Dec.)																
Live Test Generation Data		Bench-mark	Audit Period	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance 2G	TATA 2G	TATA 3G	Vodafone	Reliance	TATA	MTS
S/N	Name of Parameter			GSM Operators										CDMA Operators		
1	Network Service Quality Parameters															
	Network Availability															
	a) BTS Accumulated Downtime	<=2%	Day 1	0.00%	0.09%	0.38%	0.38%	0.05%	0.02%	0.04%	0.04%	0.00 %	0.02%	NA	0.00%	0.00%
			Day 2	0.00%	0.08%	0.40%	0.38%	0.09%	0.00%	0.02%	0.02%	0.00 %	0.16%	NA	0.00%	0.00%
			Day 3	0.04%	0.05%	0.43%	0.38%	0.07%	0.20%	0.04%	0.04%	0.00 %	0.19%	NA	0.00%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Day 1	0.00 %	0.00%	0.14%	0.16%	0.00%	0.19%	0.01%	0.01%	0.00 %	0.00%	NA	0.00%	0.00 %
			Day 2	0.00 %	0.00%	0.16%	0.14%	0.01%	0.14%	0.00%	0.00%	0.00 %	0.00%	NA	0.00%	0.00 %
			Day 3	0.00 %	0.00%	0.15%	0.15%	0.00%	0.32%	0.00%	0.00%	0.00 %	0.00%	NA	0.00%	0.00 %

	Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Day 1	99.49%	98.44%	99.15%	99.89%	99.89%	99.50%	99.86%	99.86%	98.56%	99.86%
			Day 2	99.54%	98.36%	99.17%	99.88%	99.88%	99.43%	99.94%	99.94%	98.61%	99.81%
			Day 3	99.58%	98.53%	99.14%	99.88%	99.88%	99.23%	99.90%	99.90%	98.52%	99.84%
	b) SDCCH/PAGING Channel congestion	<=1%	Day 1	0.01%	0.11%	0.18%	0.21%	0.21%	0.19%	0.01%	0.01%	0.00%	0.02%
			Day 2	0.01%	0.09%	0.20%	0.69%	0.69%	0.14%	0.01%	0.01%	0.00%	0.02%
			Day 3	0.03%	0.10%	0.17%	0.92%	0.92%	0.32%	0.01%	0.01%	0.00%	0.01%
	c) TCH congestion	<=2%	Day 1	0.01%	0.19%	1.21%	1.24%	1.24%	0.24%	0.16%	0.16%	0.00%	0.14%
			Day 2	0.01%	0.22%	1.41%	1.35%	0.15%	0.31%	0.11%	0.11%	0.00%	0.19%
			Day 3	0.03%	0.20%	1.26%	1.38%	0.12%	0.51%	0.09%	0.09%	0.00%	0.16%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Day 1	0.47%	0.45%	0.58%	0.65%	0.67%	0.35%	0.07%	0.07%	0.48%	0.43%
			Day 2	0.48%	0.46%	0.56%	0.66%	0.65%	0.35%	0.05%	0.05%	0.50%	0.44%
			Day 3	0.47%	0.45%	0.60%	0.62%	0.62%	0.34%	0.08%	0.08%	0.49%	0.42%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Day 1	2.67%	1.56%	1.46%	2.06%	2.52%	1.84%	0.88%	0.88%	4.33%	1.36%
			Day 2	2.85%	1.59%	1.43%	2.08%	2.56%	1.58%	0.56%	0.56%	4.21%	1.52%
			Day 3	2.59%	1.50%	1.49%	1.72%	2.19%	1.64%	0.62%	0.62%	4.09%	1.25%
	c) Connections with good voice quality	>=95%	Day 1	97.25%	97.92%	99.93%	95.88%	96.37%	97.81%	99.48%	99.48%	99.14%	97.98%
			Day 2	97.56%	97.94%	99.94%	95.84%	96.43%	97.77%	99.48%	99.48%	99.12%	97.92%
			Day 3	97.68%	97.96%	99.95%	95.86%	96.45%	97.72%	99.49%	99.49%	99.13%	97.92%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Day 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Day 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Day 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Finding & Critical Analysis:

- TATA 3G & tata cdma are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.

DRIVE TEST:-

3.2.3 Operator Assisted Drive Test (KERALA Circle):

The Operator Assisted Drive Test was conducted for all the Operators. Route covered was more than 100 Km depending on city areas within the speed limit of 30-40 km/hour. In all the cities Zones we reselected for covering different density areas (High/Medium/Low).

Drive Test Measurements												
S.N	**Parameter**	**City Name**	**Airtel**	**Idea**	**Vodafone**	**BSNL**	**Aircel**	**RCOM 2G**	**Tata GSM**	**RCOM CDMA**	**Tata CDMA**	**MTS**
1.1	Call Attempts	Alleppy	607	709	578	592	NP	582	402	619	556	589
		Thrissur	664	714	658	652	NP	465	619	540	531	700
		Thiruvalla	514	414	579	524	NP	372	440	458	431	502
1.2	Blocked Call Rate (<=3%)	Alleppy	0.16%	0.14%	0.00%	1.35%	NP	0.52%	1.24%	0.32%	0.00%	0.34%
		Thrissur	0.13%	0.14%	0.00%	0.61%	NP	4.00%	1.45%	2.00%	0.00%	0.14%
		Thiruvalla	0.86%	0.76%	0.00%	1.61%	NP	1.31%	0.00%	0.13%	0.86%	0.76%
1.3	Dropped Call Rate (<=2%)	Alleppy	0.17%	0.00%	0.00%	0.34%	NP	0.17%	0.00%	0.49%	0.00%	0.34%
		Thrissur	0.13%	0.00%	0.00%	0.77%	NP	3.00%	0.00%	2.00%	0.00%	0.29%
		Thiruvalla	0.63%	0.55%	0.63%	0.91%	NP	0.27%	1.23%	0.76%	0.76%	0.60%
1.4	Percentage of connections with good voice quality (=>95%)											
	(i) 0-4 (w/o frequency hopping)	Alleppy	-	-	-	-	NP	-	-	97.75%	97.33%	99.41%
		Thrissur	-	-	-	-	NP	-	-	99.90%	98.15%	96.96%
		Thiruvalla	-	-	-	-	NP	-	-	96.81%	97.29%	97.89%
	(ii) 0-5 (with frequency hopping)	Alleppy	98.77%	92.60%	97.22%	97.58%	NP	95.56%	98.44%	-	-	-
		Thrissur	99.06%	89.60%	97.29%	96.40%	NP	97.87%	97.14%	-	-	-
		Thiruvalla	98.54%	97.82%	96.67%	97.00%	NP	95.35%	96.81%	-	-	-
1.5	Service Coverage											
	In door (>= 75dBm)	Alleppy	70.23%	67.57%	82.19%	77.96%	NP	41.33%	26.97%	21.98%	16.22%	33.51%
		Thrissur	85.58%	56.36%	73.48	99.38%	NP	69.20%	31.76%	28.18%	44.48%	44.48%
		Thiruvalla	38.80%	24.20%	60.26%	78.35%	NP	52.29%	46.93%	46.67%	34.56%	45.51%
	In-vehicle (>= -85dBm)	Alleppy	91.79%	94.48%	95.23%	98.28%	NP	69.85%	59.76%	43.93%	36.86%	78.03%
		Thrissur	91.63%	90.15%	90.76	98.82%	NP	73.84%	64.08	53.57%	76.98%	76.98%
		Thiruvalla	88.38%	80.75%	89.67%	90.23%	NP	79.88%	73.50%	81.82%	79.19%	89.20%
	Outdoor-in city (>= -95dBm)	Alleppy	99.67%	99.84%	99.76%	99.93%	NP	90.64%	95.53%	77.31%	74.32%	89.77%
		Thrissur	99.79%	99.31%	99.46	99.67%	NP	95.30%	90.55	91.90%	96.32%	96.32%
		Thiruvalla	93.35%	99.52%	99.32%	99.53%	NP	91.87%	94.19%	94.72%	81.22%	91.11%
1.6	Call Setup Success Rate (>=95%)	Alleppy	99.67%	98.80%	98.59%	99.86%	NP	99.48%	100.00%	99.68%	100.00%	99.62%
		Thrissur	99.07%	99.43%	98.78%	99.23%	NP	99.14%	98.54%	99.63%	99.86%	99.86%
		Thiruvalla	98.91%	98.82%	100.00%	97.35%	NP	98.35%	96.31%	98.38%	98.02%	99.70%
1.7	Hand Over Success Rate (HOSR)	Alleppy	99.67%	98.49%	99.54%	100.00%	NP	99.87%	100.00%	100.00%	100.00%	99.95%
		Thrissur	99.77%	99.09%	99.74%	99.39%	NA	99.66%	100.00%	100.00%	100%	100.00%
		Thiruvalla	99.34%	99.40%	99.61%	99.35%	NP	99.75%	98.43%	100.00%	100.00%	100.00%
1.8	Km's driven	Alleppy	412 Km									
		Thrissur	600 Km									
		Thiruvalla	416 Km									

Finding & Critical Analysis:

NOTE:1.4(i)) 0-4 (w/o frequency hopping is not applicable for 2G technology similarly1.4(ii) (ii) 0-5 (with frequency hopping) is not applicable for CDMA technology. So respective boxes are kept blank.

- Aircel not participated in all the 3 SSA Drive Tests & given the justification mail to the Nodal Officer.
- All operators achieved KPI threshold for Blocked Call Rate (<=3%).
- All operators achieved KPI threshold for Dropped Call benchmark.
- All operators achieved KPI threshold benchmark for the Voice Quality parameter (0-5 (with frequency hopping)).
- All operators achieved KPI threshold benchmark for Call Setup Success Rate (>=95%).

3.2.4 CUSTOMER SERVICE QUALITY PARAMETERS

1st Quarter data Assessment (Oct- Dec.'15):

Oct- Dec.'2015													
Customer Service Quality Parameters		Benchmark	Audit	Aircel	Airtel	BSNL	Idea	R COM GSM	Tata GSM	Vodafone	RCOMCDMA	Tata CDMA	MTS CDMA
S. N	Name of Parameter												
1	Metering/billing credibility Post paid	<= 0.1%	Quar 1	0.00%	0.01%	0.00%	0.00%	0.09%	0.03%	0.09%	0.09%	0.08%	NA
2	Metering /billing credibility Pre paid	<= 0.1%	Quar 1	0.00%	0.00%	0.07%	0.04%	0.08%	0.00%	0.01%	0.05%	0.00%	0.02%
3	Resolution of billing/ charging complaints	100% within 4 weeks	Quar 1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		100% within 6 weeks	Quar 1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
4	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	Quar 1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
5	**Response time to customers for assistance**												
	a) Accessibility of call centre/Customer Care	>=95%	Quar 1	97.80%	99.00%	98.43%	99.79%	99.23%	99.24%	100.00%	99.20%	99.25%	98.66%
	b) % call answered by operators (voice to voice) within 90 sec.	>=95%	Quar 1	95.03%	96.00%	96.80%	97.20%	98.02%	99.26%	100.00%	98.29%	99.25%	95.09%
6	**Termination/closure of service**												
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Quar 1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Time taken for refunds of deposits after closures.	100% within 60 days	Quar 1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Finding &Critical Analysis:-

- According to the parameter metering/billing credibility post-paid in the table**3.7.1** we found that all the service providers except RCOM GSM, TATA GSM, VODAFONE GSM, and RCOM CDMA &TATA CDMA are meeting the benchmark.
- According to the parameter metering /billing credibility pre-paid in the table **3.7.1**we found that all the service providers EXCEPT BSNL2G,IDEA 2G,RCOM 2G,VODAFONE 2G& RCOM CDMA are meeting the benchmark.
- According to the parameter Resolution of billing/ charging complaints in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Accessibility of call centre/Customer Care in the table **3.7.1**we found that all the service providers are meeting the benchmark.
- According to the parameter % call answered by operators (voice to voice) within 60 sec in the table **3.7.1** all the service providers are meeting the benchmark
- According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Time taken for refunds of deposits after closures in the table 3.7.1 we found that all operators meeting the benchmark.

3.2.5 Redressal

Sample coverage

A sample of billing complaints was taken for each operator and calls were made for assessing the resolution of billing/chargingcomplaintswithin4weeksasclaimedby there specie operators.

3.2.6 Performance (live calling for billing complaints)

Calling Operator	Vodafone	Airtel	Idea	MTS	Aircel	BSNL	R COM GSM	Tata	RCOM CDMA	Tata CDMA
Calls Attempted	100	100	100	100	100	100	100	100	100	100
Total No. of calls	97	96	98	95	97	99	96	99	98	97
Cases resolved with 4 weeks	97%	96%	98%	95%	97%	99%	96%	99%	98%	97%
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note : The difference between call attempt and call answer is because of either Number busy ,No response or out of reach in the Network.

Findings:-

We have made live calling to customers as per their complaints details and we verified their complaint and we found that most of the complaints are resolved within the time line and all the operators are meeting the TRAI benchmarks.

3.2.7 Live calling to call centre

Calling Operator	Vodafone	Airtel	Idea	MTS	Aircel	BSNL	RCOM	Tata	RCOM CDMA	Tata CDMA
Total No. of Calls Attempted	25	25	25	25	25	25	25	25	25	25
Total No. of calls connected to IVR	25	25	25	25	25	25	25	25	25	25
Calls got connected to agent within 90 Sec	25	25	25	25	25	25	25	25	25	25
%age of calls got answered	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Findings:-

In live calling to call centers we found that all the operators are meeting their benchmark except RCOM(GSM& CDMA) for both Calls got connected to agent within 90 Sec and %age of calls got ans wered are not meeting the benchmark.

Parameter
Level1-1 Live Calling (Emergency No's)

Emergency No	No of Calls/operator	For all operato.res
100 - Police	5	Ok
101 - Fire	5	Ok
102 - Ambulance	5	Ok
104 - Health Information Helpline	5	Does not exist.
108 - Emergency and Disaster Management Helpline	5	Ok
138 - All India Helpline for Passengers	5	Ok
149 - Public Road Transport Utility Service	5	Does not exist.
181 - Chief Minister Helpline	5	Does not exist.
182 - Indian Railway Security Helpline	5	Ok
1033 - Road Accident Management Service	5	Ok
1037 - Public Grievance Cell DoT Hq as 'Telecom Consumer Grievance Redressal Helpline'	5	Does not exist.
1056 - Emergency Medical Services	5	Ok(BSNL) , Does not exist for all other operators.
106X - State of the Art Hospitals	5	Does not exist.
1063 - Public Grievance Cell DoT Hq	5	Ok
1064 - Anti Corruption Helpline	5	Does not exist.
1070 - Relief Commission for Natural Calamities	5	Ok
1071 - Air Accident Helpline	5	Does not exist.
1072 - Rail Accident Helpline	5	Ok
1073 - Road Accident Helpline	5	Does not exist.
1077 - Control Room for District Collector	5	Does not exist.
1090 - Call Alart (Crime Branch)	5	Ok
1091 - Women Helpline	5	Ok
1097 - National AIDS Helpline to NACO	5	Ok

1099 - Central Accident and Trauma Services (CATS)	5	Ok
10580 - Educational& Vocational Guidance and Counseling	5	Does not exist.
10589 - Mother and Child Tracking (MCTH)	5	Does not exist.
10740 - Central Pollution Control Board	5	Does not exist.
10741 - Pollution Control Board	5	Does not exist.
1511 - Police Related Service for all Metro Railway Project	5	Does not exist.
1512 - Prevention of Crime in Railway	5	Ok
155304 - Municipal Corporations **1514 - National Career Service(NCS)**	5	Does not exist.
15100 - Free Legal Service Helpline	5	Ok
155304 - Municipal Corporations	5	Does not exist.
1514 - National Career Service(NCS)	5	Does not exist.
155214 - Labor Helpline	5	Ok
1903 - SashastraSeemaBal (SSB)	5	Ok
1909 - National Do Not Call Registry	5	Ok
1912 - Complaint of Electricity	5	Ok
1916 - Drinking Water Supply	5	
1950 - Election Commission of India	5	Ok

3..3 Level 1 Live Calling (Emergency No.)Q1:-

Level 1 Live calling such as calling 39 emergency no's such as Police, Fire, and Ambulance etc .were made so as to check the service of such toll free numbers, it is observed that many toll free numbers are not connecting .

Critical Analysis:-

Level 1 calling such as calling at emergency no. like Police, Fire, and Ambulance were made so as to check the service of such short codes. it was found to be functional for all numbers except below numbers which are not connecting by any of the operators.

Only BSNL is connecting to the toll-free number of 1056 - Emergency Medical Services which is highlighted in yellow colour.

104 - Health Information Helpline

149 - Public Road Transport Utility Service

181 - Chief Minister Helpline

1037 - Public Grievance Cell DoT Hq as 'Telecom Consumer Grievance Redressal Helpline' 106X - State of the Art Hospitals

1064 - Anti Corruption Helpline

10580 - Educational& Vocational Guidance and Counseling

1071 - Air Accident Helpline

1073 - Road Accident Helpline

1077 - Control Room for District Collector

1071 - Air Accident Helpline

1072 - Rail Accident Helpline

10589 - Mother and Child Tracking (MCTH

10740 - Central Pollution Control Board

10741 - Pollution Control Board

1073 - Road Accident Helpline

1511 - Police Related Service for all Metro Railway Project

1077 - Control Room for District Collector1077 - Control Room for District Collector

10580 - Educational& Vocational Guidance and Counseling

10589 - Mother and Child Tracking (MCTH)

10740 - Central Pollution Control Board

10741 - Pollution Control Board

1511 - Police Related Service for all Metro Railway Project

155304 - Municipal Corporations

1514 - National Career Service(NCS)

155304 - Municipal Corporations

1514 - National Career Service(NCS)

1916 - Drinking Water Supply

3.3.0 Inter Operator Call Assessment

3.A Sample coverage

A sample of 2x50 test calls per Service Provider within the licensed service area (circle) were made between 1100 to 1400 hrs.and 1600 to 1900 hrs.so that TCBH hours for all the operators were covered.

3.3.1 Performance Based on Live Measurement

Calling Operator	Vodafone	Airtel	Idea	Aircel	BSNL	RCOM GSM	Tata GSM	RCOM CDMA	Tata CDMA	MTS
Vodafone	-	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Airtel	100.00%	-	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Idea	100.00%	100.00%	-	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Aircel	100.00%	100.00%	100.00%	-	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
BSNL	99.00%	99.00%	100.00%	100.00%	-	100.00%	100.00%	100.00%	100.00%	99.00%
RCOM GSM	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%	100.00%	100.00%	100.00%
Tata GSM	100.00%	100.00%	100.00%	100.00%	99.00%	100.00%	-	100.00%	100.00%	100.00%
RCOM GSM	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%	100.00%
Tata CDMA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%
MTS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-

Critical Analysis:-

In the inter-operator call assessment test, calls were made from one operator to other operator so as to check congestion on both the operators' network. In such cases, the radio part, switch part and the POI in between the operators are involved and hence if any congestion is found in the network, it might be due to any of these parts. The result shows that there is no congestion on the entire mobile operators network.

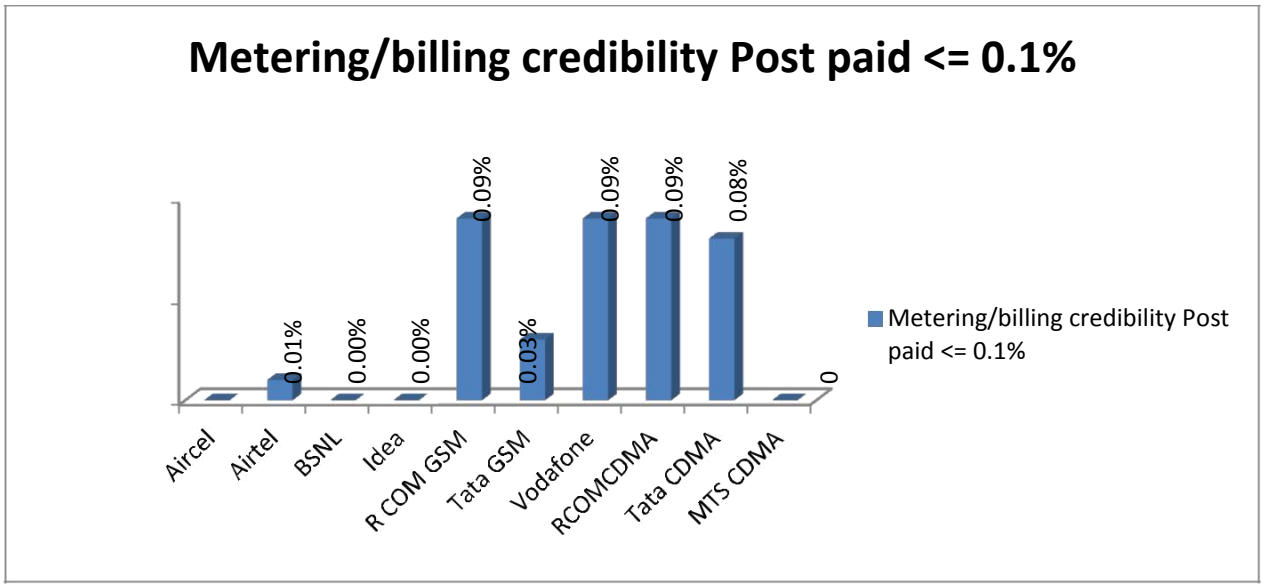
CAPTER-4:

DETAILED FINDINGS, ANALYSIS AND GRAPHICAL REPRESENTATION

4.0 CUSTOMER SERVICE QUALITY PARAMETERS(Graphical Representation)

4.1.1. Data Assessment (Oct- Dec.'15):

Oct- Dec.'2015													
Customer Service Quality Parameters		Benchmark	Audit	Aircel	Airtel	BSNL	Idea	R COM GSM	Tata GSM	Vodafone	RCOMCDMA	Tata CDMA	MTS CDMA
S. N	Name of Parameter												
1	Metering/billing credibility Post paid	<= 0.1%	Quar 1	0.00%	0.01%	0.00%	0.00%	0.09%	0.03%	0.09%	0.09%	0.08%	NA
2	Metering /billing credibility Pre paid	<= 0.1%	Quar 1	0.00%	0.00%	0.07%	0.04%	0.08%	0.00%	0.01%	0.05%	0.00%	0.02%
3	Resolution of billing/ charging complaints	100% within 4 weeks	Quar 1	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00%	100.00 %	100.00 %
		100% within 6 weeks	Quar 1	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00%	100.00 %	100.00 %
4	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	Quar 1	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00%	100.00 %	100.00 %
5	**Response time to customers for assistance**												
	a) Accessibility of call centre/Customer Care	>=95%	Quar 1	97.80 %	99.00 %	98.43 %	99.79 %	99.23 %	99.24 %	100.00 %	99.20%	99.25 %	98.66 %
	b) % call answered by operators (voice to voice) within 90 sec.	>=95%	Quar 1	95.03 %	96.00 %	96.80 %	97.20 %	98.02 %	99.26 %	100.00 %	98.29%	99.25 %	95.09 %
6	**Termination/closure of service**												
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Quar 1	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00%	100.00 %	100.00 %
7	Time taken for refunds of deposits after closures.	100% within 60 days	Quar 1	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00%	100.00 %	100.00 %



A Fig. 1

Metering/billing credibility post-paidin the table **4.2.1** and the**Fig.1**

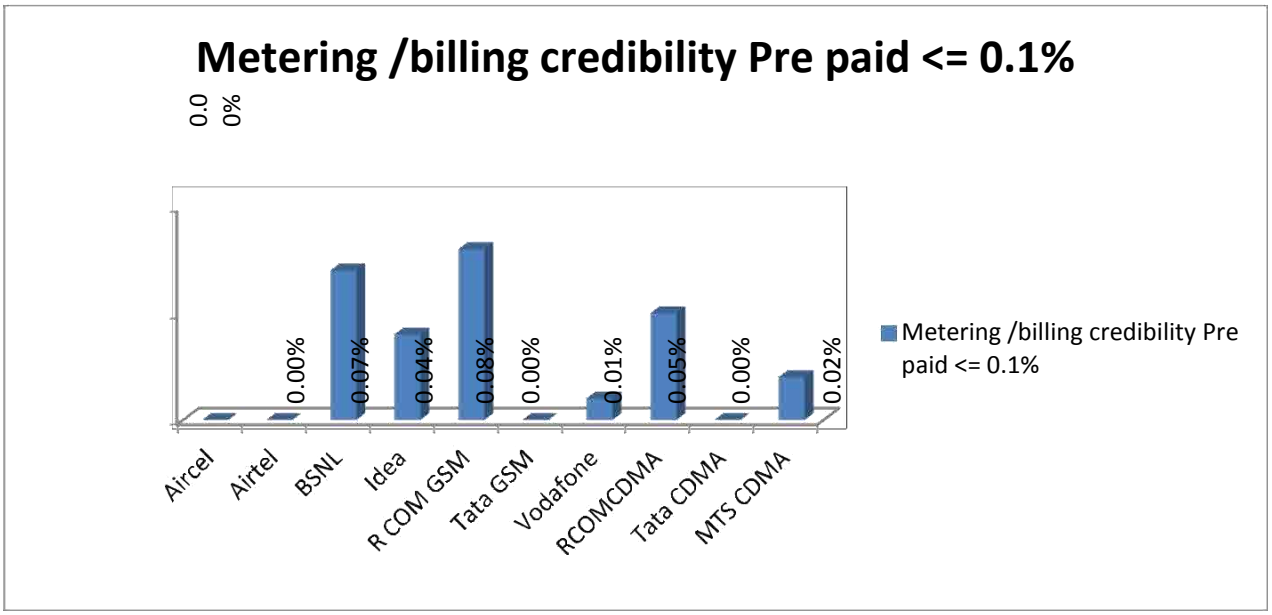


Fig. 2

Metering/billing credibility post-paid in the table **4.2.1** and the **Fig.1**

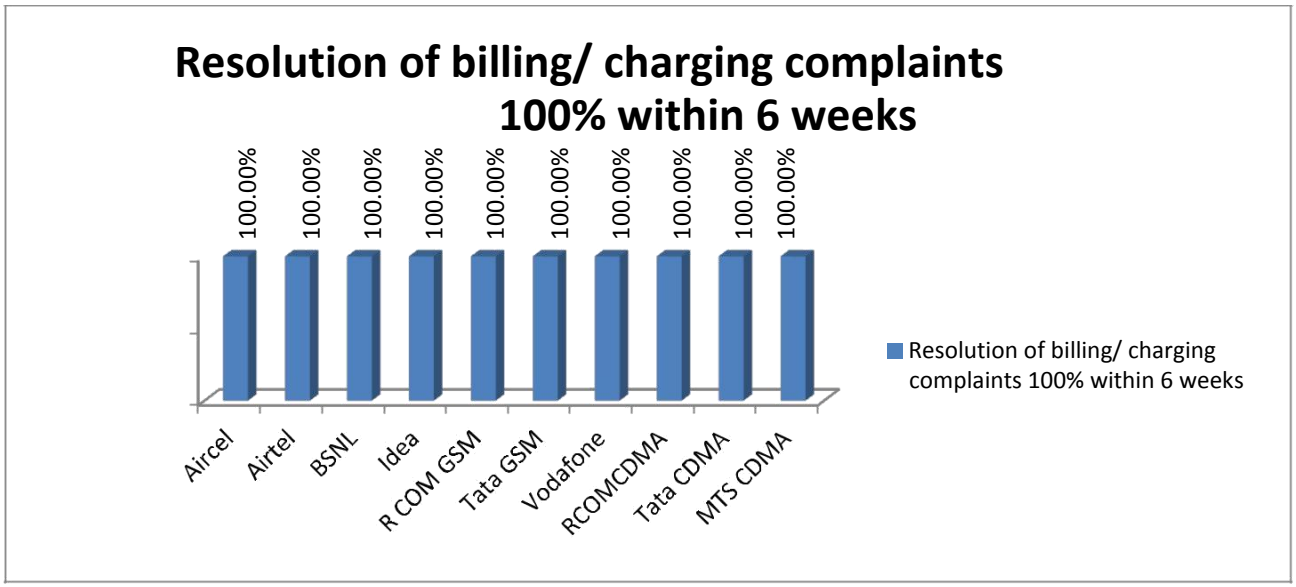


Fig. 4

Resolution of billing/ charging complaints in the table **4.2.1** and the **Fig.4**

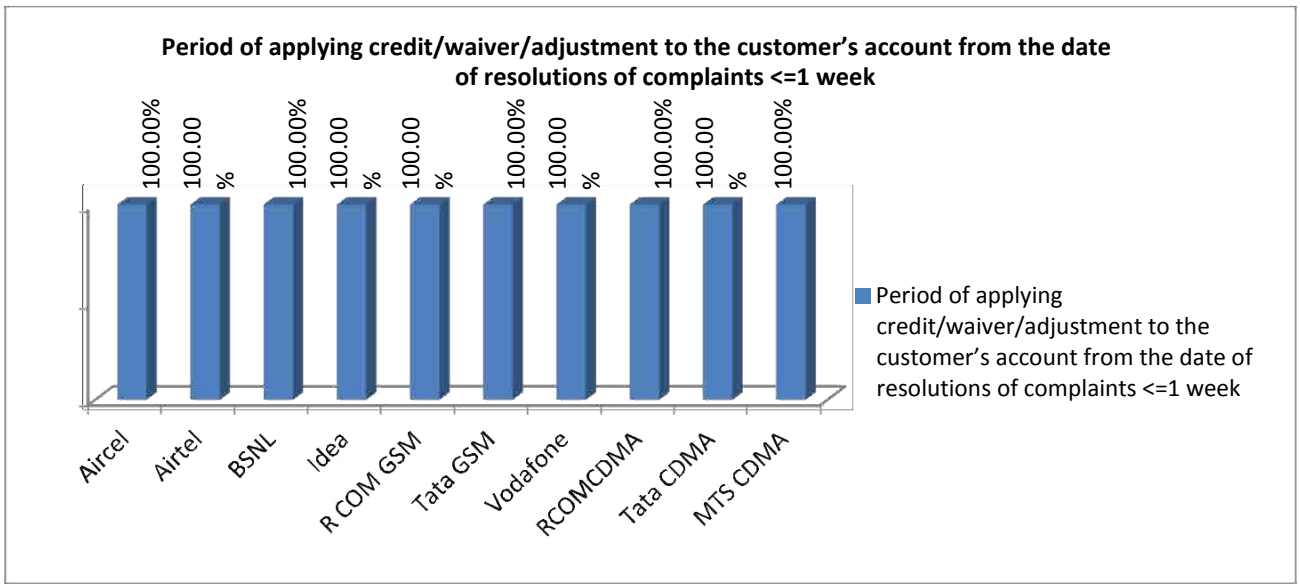


Fig. 5

Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaint in the table **4.2.1** and the**Fig.5**

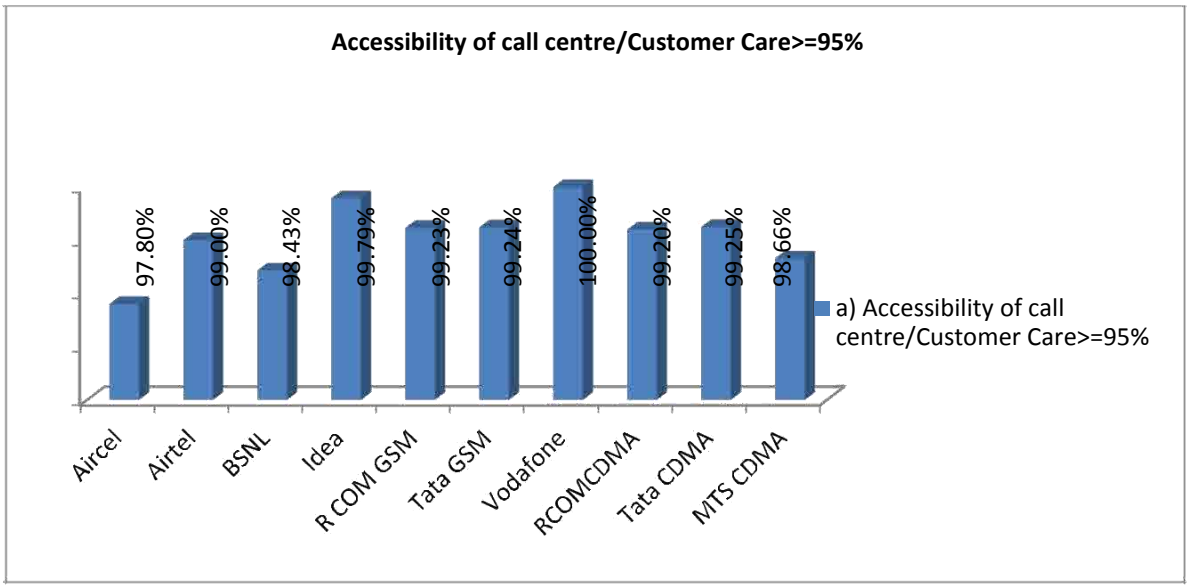


Fig. 6

Parameter Accessibility of call Centre/Customer Care in the table **4.2.1** and the**Fig.6**

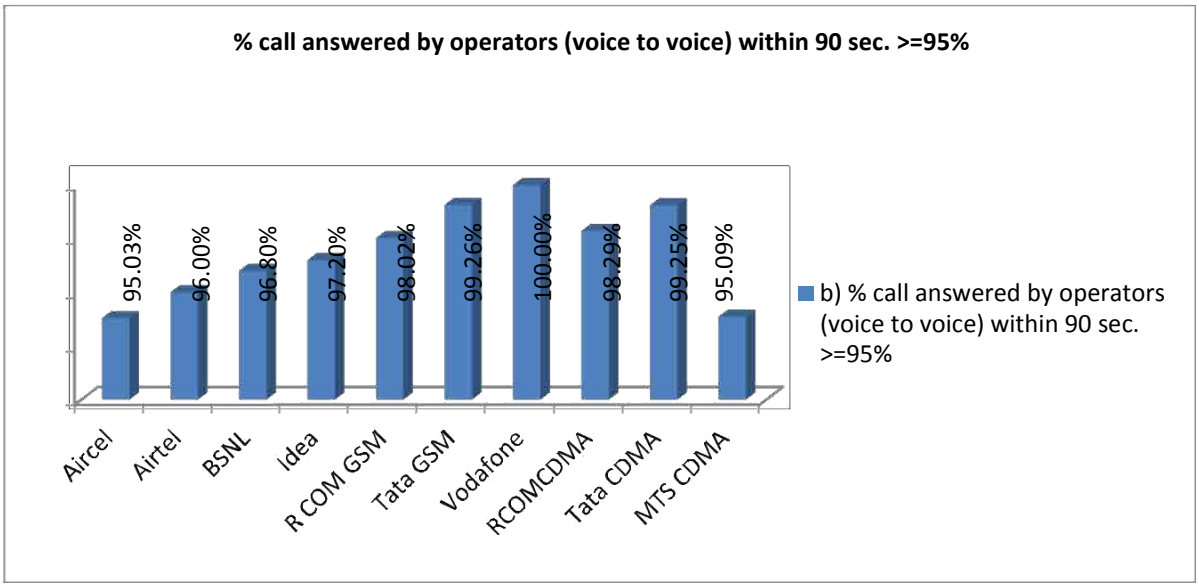


Fig. 7

Parameter % call answered by operators (voice to voice) within 90 sec in the table **4.2.1** and the**Fig.7**

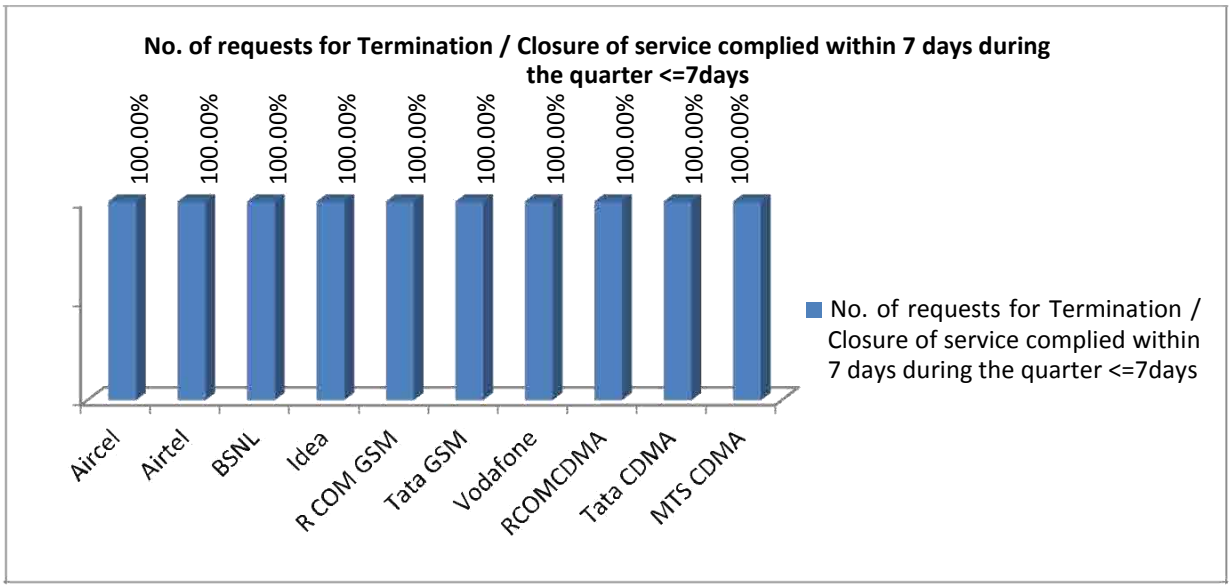


Fig. 8

Parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter in the table **4.2.1** and the**Fig.8**

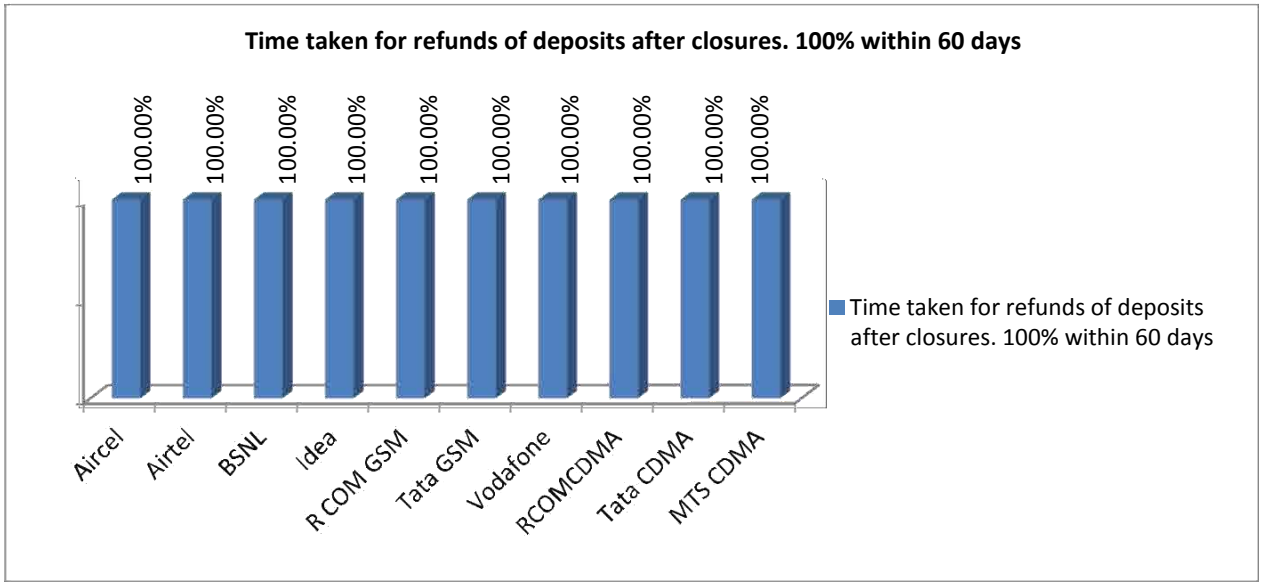


Fig. 9

Time taken for refunds of deposits after closures in the table **4.2.1** and the**Fig.9**

4.3 PMR Summarized Data Results in Table October - December& Graphical

4.3.1 KERALA Circle (Oct-Dec.'15):

KERALA Circle (Oct-Dec.'15)																
Month PMR Generation Data		**Benchmark**	**Audit Period**	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA 2G	TATA 3G	Vodafone	Reliance CMDA	TATA CDMA	MTS CDMA
S/N	**Name of Parameter**															
Network Service Quality Parameter																
1	**Network Availability**															
	BTS accumulated downtime	≤ 2%	One Qtr	0.11%	0.10%	0.44%	0.45%	0.10%	0.08%	0.06%	0.24%	0.14%	0.04%	0.06%	0.06%	0.06%
	Worst affected BTS due to downtime	≤ 2%	One Qtr	0.00%	0.00%	0.18%	0.24%	0.18%	0.00%	0.13%	0.00%	0.00%	0.20%	0.00%	0.02%	0.00%
2	**Connection establishment (Accessibility)**															
	Call Setup Success Rate	≥ 95%	One Qtr	99.26%	98.47%	98.70%	97.34%	99.90%	99.45%	98.82%	98.91%	98.50%	99.80%	99.20%	98.54%	99.50%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Qtr	0.05%	0.11%	0.18%	0.08%	0.25%	0.71%	0.03%	0.01%	0.46%	0.03%	0.00%	0.00%	0.00%
	TCH congestion	≤ 2%	One Qtr	0.01%	0.15%	1.27%	0.76%	1.29%	0.28%	0.17%	0.05%	0.32%	0.20%	0.59%	0.03%	0.00%
3	**Connection Maintainability (Retain ability)**															
	Call Drop Rate	≤ 2%	One Qtr	0.55%	0.45%	0.61%	1.17%	0.68%	0.35%	0.08%	0.51%	0.44%	0.46%	0.10%	0.46%	0.15%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Qtr	2.86%	1.22%	1.56%	0.11%	2.13%	2.04%	0.66%	2.83%	**3.18%**	1.44%	0.69%	**4.34%**	1.63%
	% of Connections with good voice quality	≥ 95%	One Qtr	97.17%	97.47%	99.92%	99.86%	95.29%	97.79%	99.46%	98.76%	99.73%	97.87%	99.23%	99.14%	99.20%
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	One Qtr	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

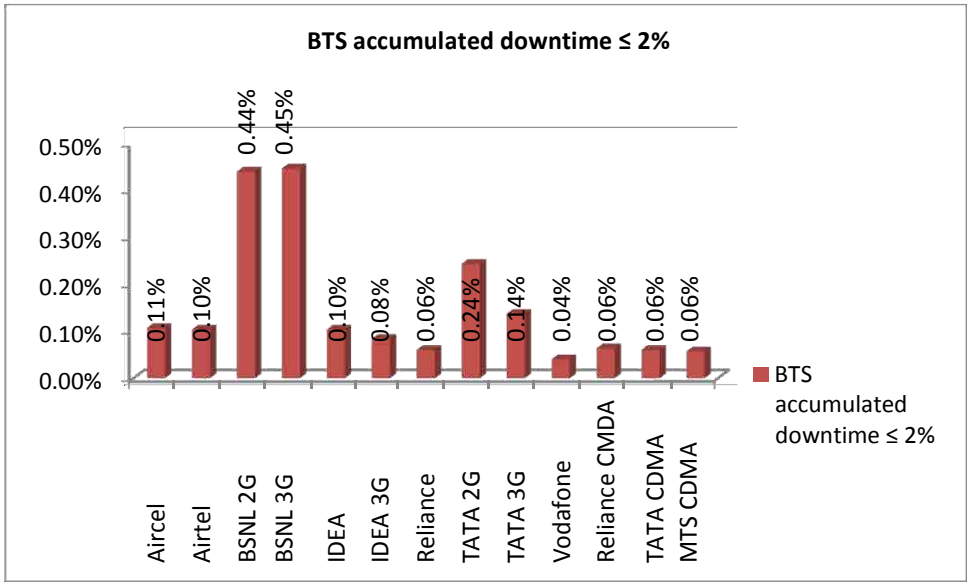


Fig.1

According to the **Fig.1**and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for BTS accumulated downtime.

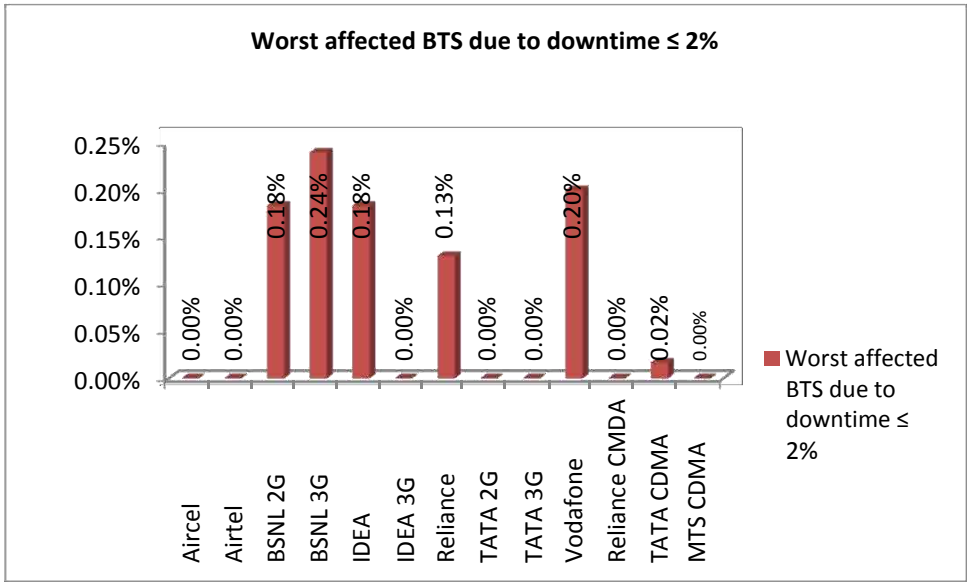


Fig.2

According to the **Fig.2** and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for worst affected BTS due to downtime.

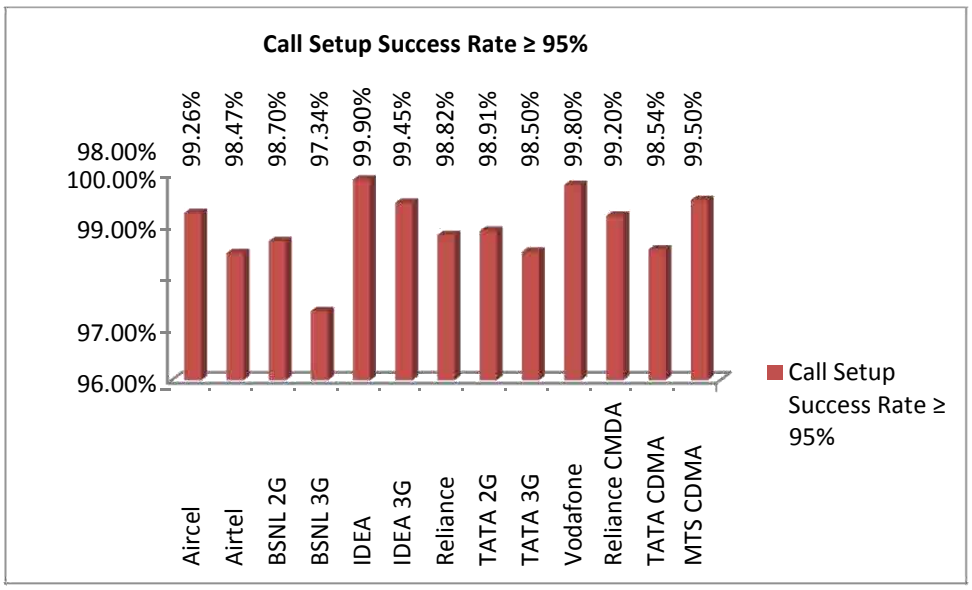


Fig. 3

According to the **Fig.3** and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for CSSR.

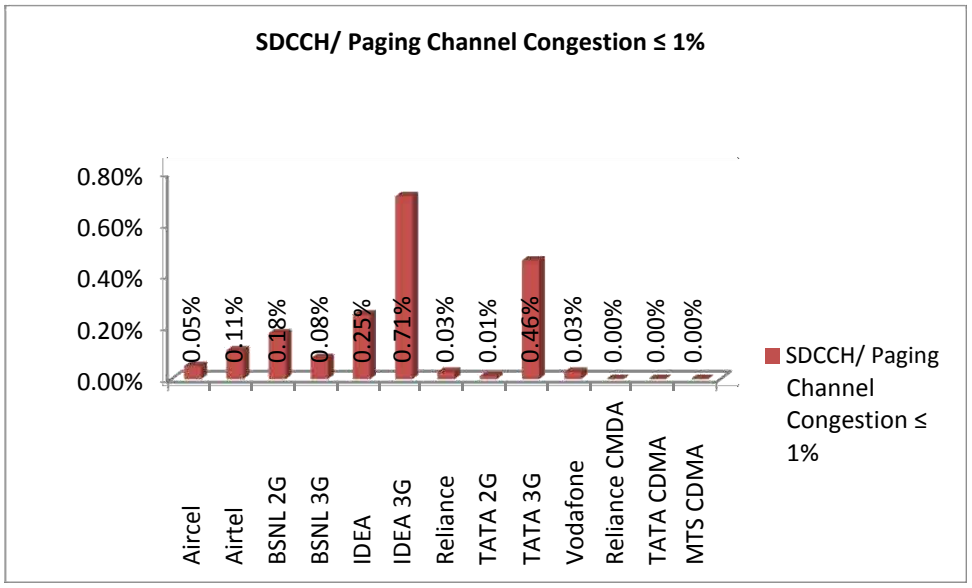


Fig.4

According to the **Fig.4**and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for SD congestion.

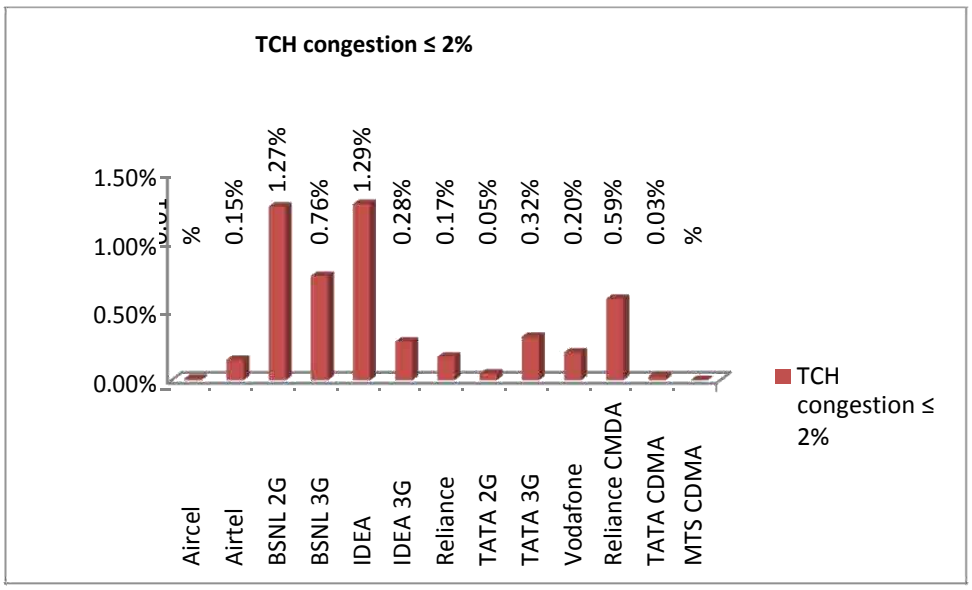


Fig. 5

According to the **Fig.5** and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for TCH congestion.

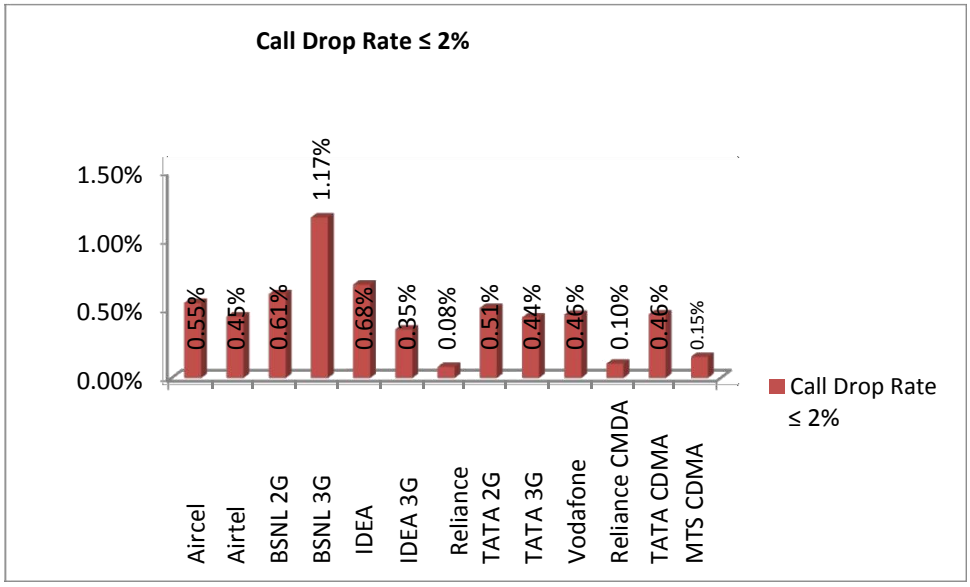


Fig. 6

According to the above graph and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for DCR. worst affected cells having more than 3% TCH drop (call drop) rate (≤ 3%) except TATA 2G & TATA CDMA.

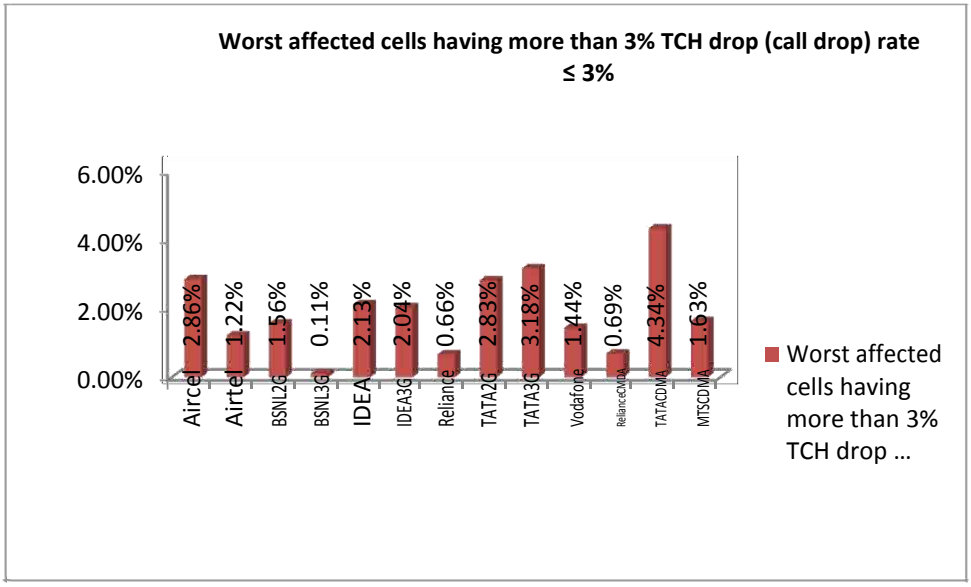


Fig.7

According to the **Fig.7** and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for Worst affected cells having DCR >=3% except Tata CDMA and 3G.

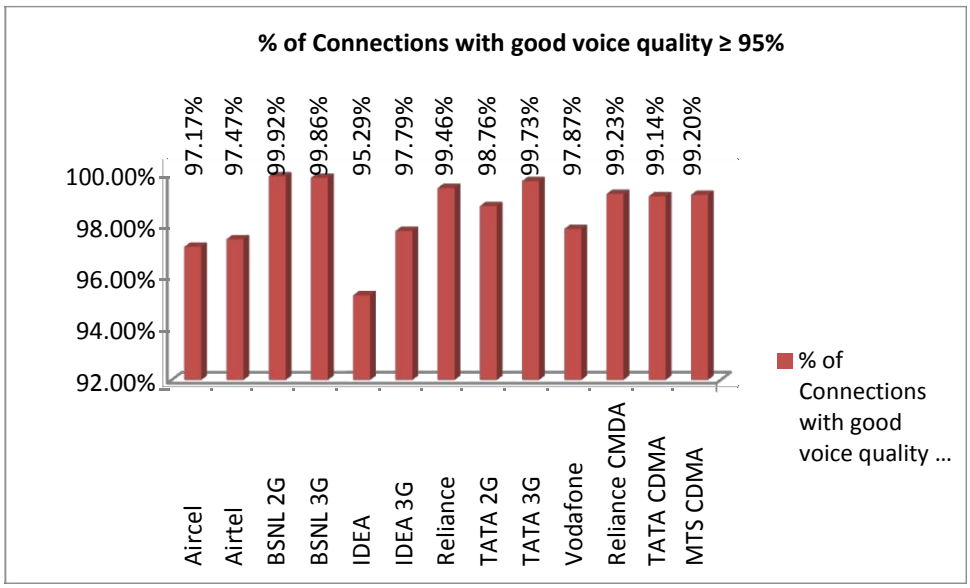


Fig. 8

According to the **Fig.8** and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for Voice quality.

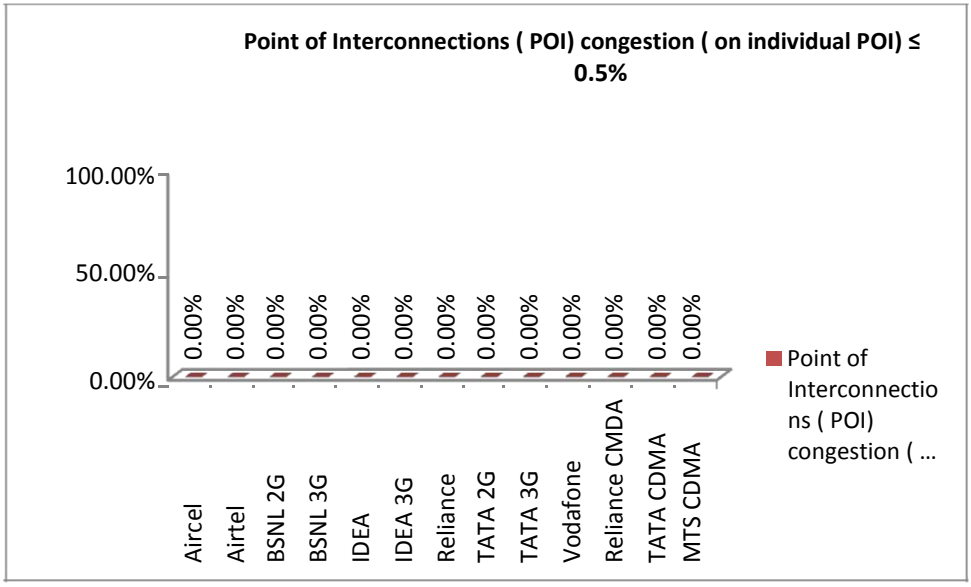


Fig.8

According to the **Fig.9** and data on the table **4.3.1**, it is found that all the operators are meeting the benchmark for POI congestion.

4.4 Drive Test Measurements Audit Report KERALA Circle (Graphical Representation)

4.4.1 Call Attempts: -

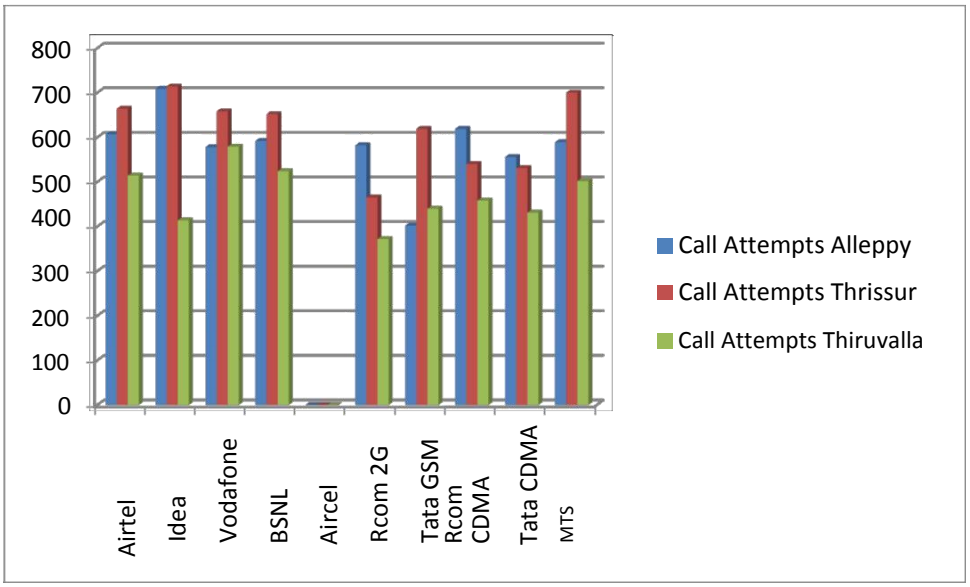


Fig.4.4.1

According to the table and the fig. 4.4.1 it shows the no. of call attempted in different city**.**

4.4.2 Blocked Call Rate (<=3%):-

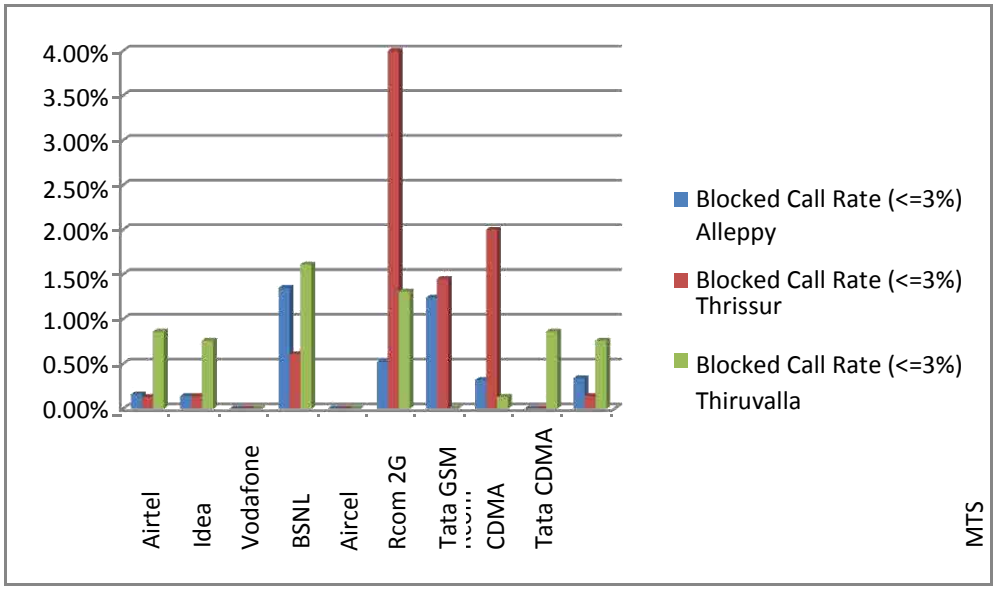


Fig.4.4.2

According to the table and the fig. 4.4.2 it shows that All operator meeting the benchmark except Rcom 2G in Thrissur SSA.

4.4.3 Dropped Call Rate (<=2%):

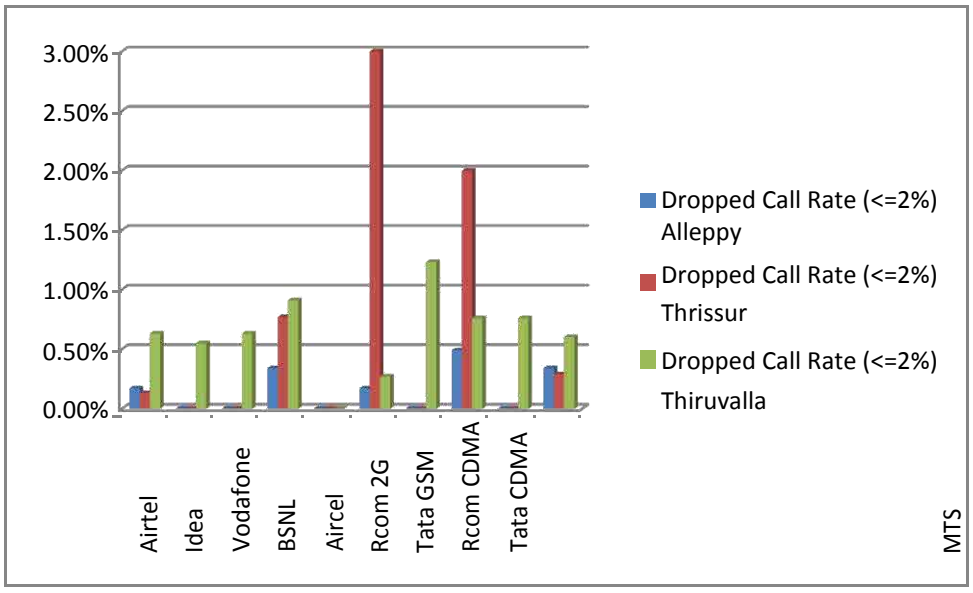


Fig.4.4.3

According to the table and the fig. 4.4.3 it shows that All operator meeting the benchmark except RCOM 2G in Thrissur SSA.

4.4.4 Percentage of connections with good voice quality (=>95%)

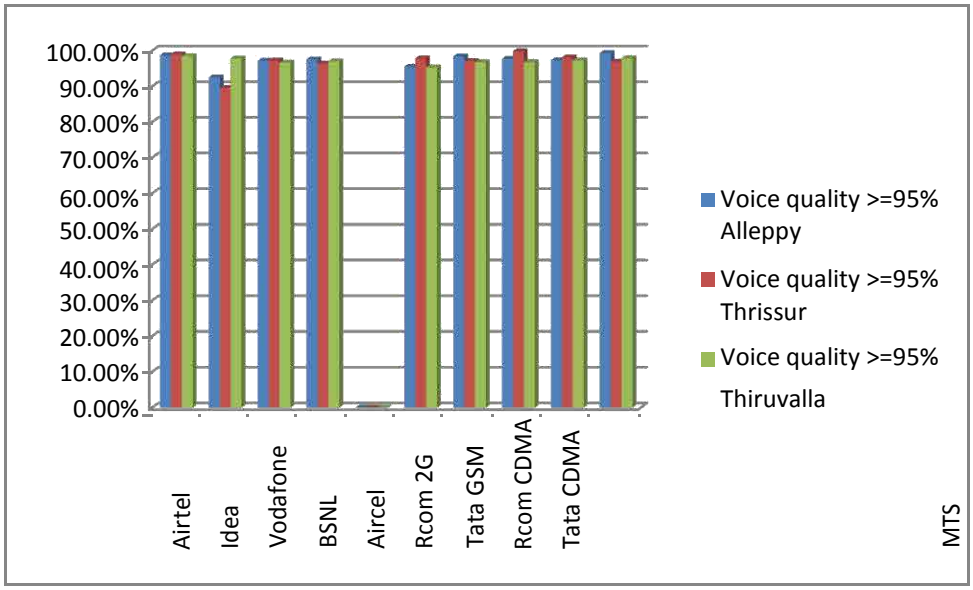
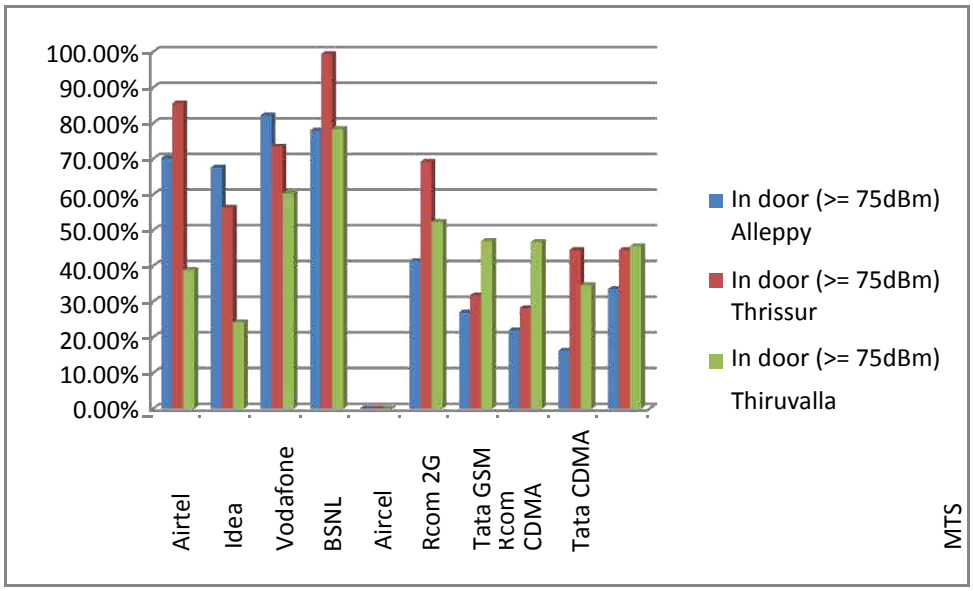


Fig.4.4.4

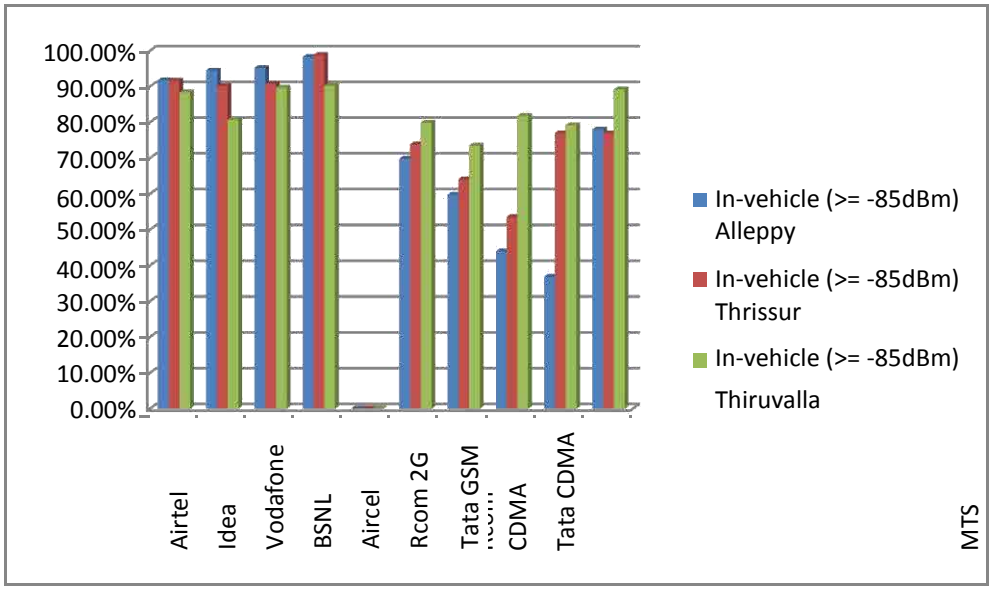
According to the table and the fig. 4.4.4 it shows that All operator meeting the benchmark

4.4.5 Service Coverage

4.4.5.1 Indoor (>= -75dBm)



4.4.5.2 In-vehicle (>= -85dBm)



4.4.5.3 Outdoor- in city (>= -95dBm)

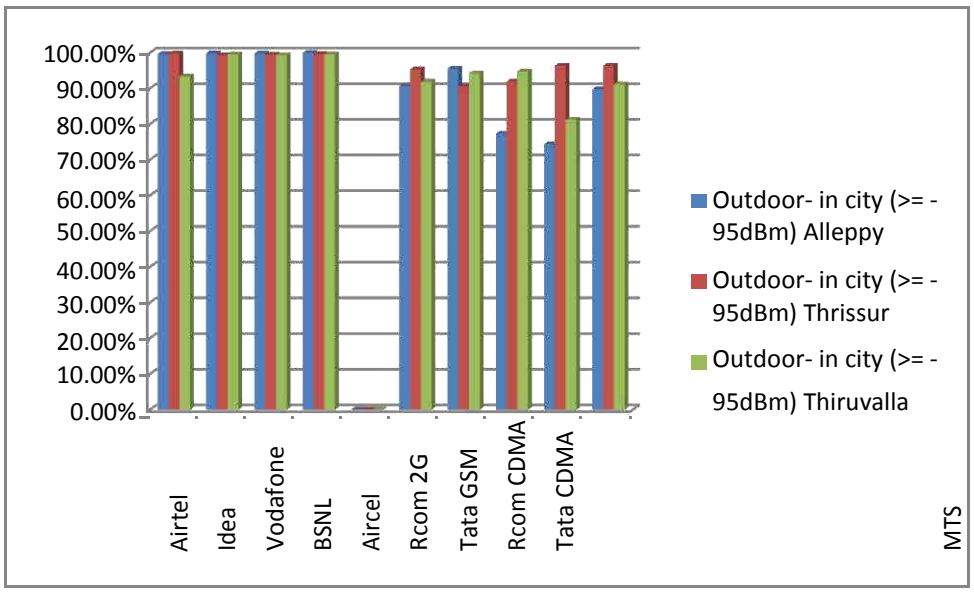


Fig. 4.4.5.3

According to the table and the fig. 4.4.5.3, it shows that all service providers are meeting their benchmark of **Outdoor- in city (>= -95dBm)**.

4.4.6 Call Setup Success Rate (>=95%)

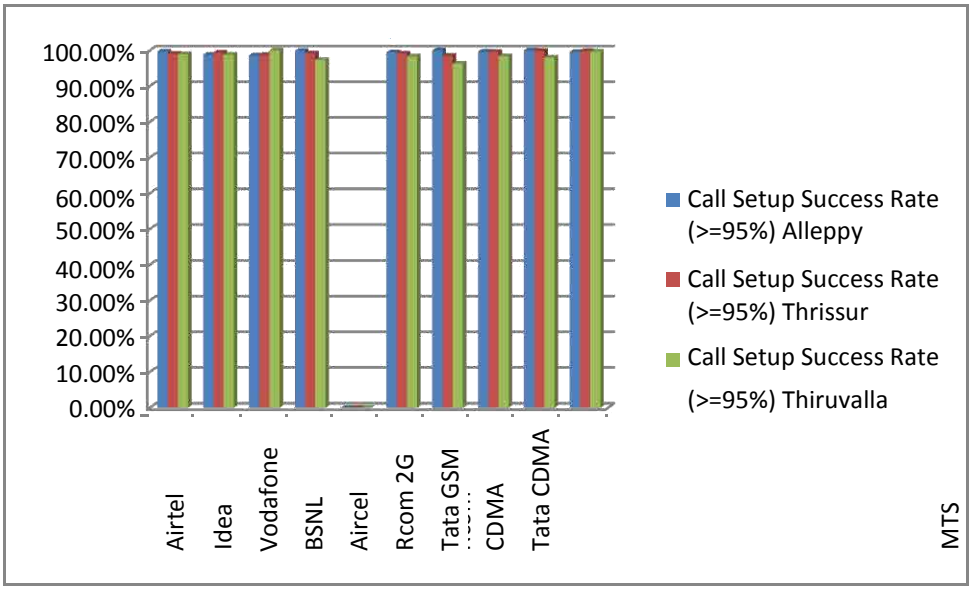


Fig. 4.4.6

According to the table and the fig. 4.4.6, it shows thatall operator meeting the benchmark of **Call Setup Success Rate**.

4.4.7 Handover Success Rate (HOSR)

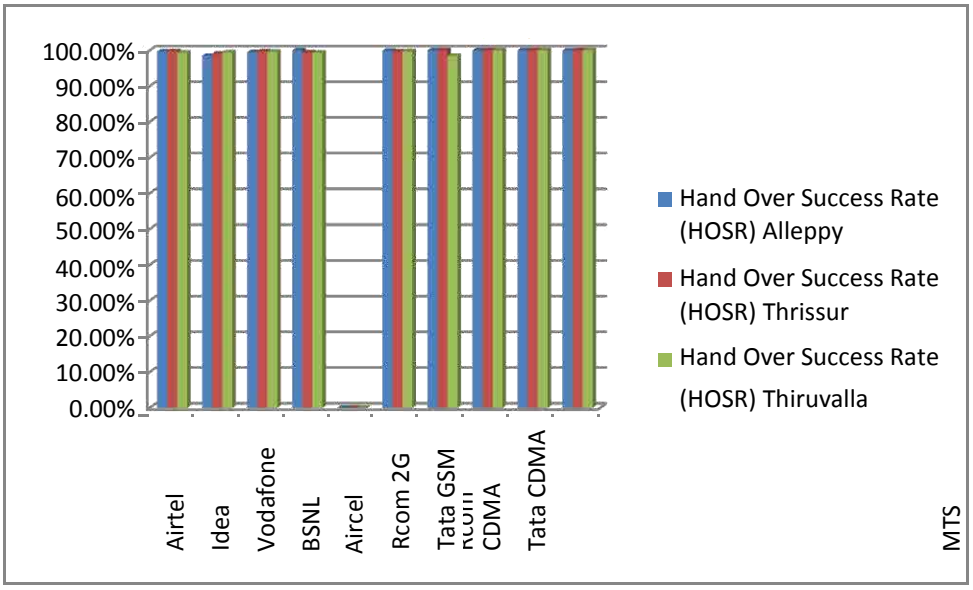


Fig.4.4.7

According to the table and the fig. 4.4.6, it shows that all operator meeting the benchmark of **HOSR**

4.5 Live Test Summary and Graphical Representation for KERALA Circle Oct-Dec 2015

KERALA CIRCLE Q1 -2015 (Oct- Dec.)															
Live Test Generation Data		**Bench-mark**	**Audit Period**	Aircel	Airtel	BSNL 2G	BSNL 3G	IDEA	IDEA 3G	Reliance 2G	TATA 2G	TATA 3G	Vodafone	Reliance	TATA	MTS
S/N	**Name of Parameter**			**GSM Operators**										**CDMA Operators**		
	Network Service Quality Parameters															
	Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Day 1	0.00%	0.09%	0.38%	0.38%	0.05%	0.02%	0.04%	0.04%	0.00%	0.02%	NA	0.00%	0.00%
			Day 2	0.00%	0.08%	0.40%	0.38%	0.09%	0.00%	0.02%	0.02%	0.00%	0.16%	NA	0.00%	0.00%
			Day 3	0.04%	0.05%	0.43%	0.38%	0.07%	0.20%	0.04%	0.04%	0.00%	0.19%	NA	0.00%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Day 1	0.00%	0.00%	0.14%	0.16%	0.00%	0.19%	0.01%	0.01%	0.00%	0.00%	NA	0.00%	0.00%
			Day 2	0.00%	0.00%	0.16%	0.14%	0.01%	0.14%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%
			Day 3	0.00%	0.00%	0.15%	0.15%	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%
2	**Connection Establishment (Accessibility)**															
	a) CSSR (Call Setup Success Rate)	>=95%	Day 1	99.49%	98.44%	99.15%	99.89%	99.89%	99.50%	99.86%	99.86%	98.56%	99.86%	NA	98.37%	99.49%
			Day 2	99.54%	98.36%	99.17%	99.88%	99.88%	99.43%	99.94%	99.94%	98.61%	99.81%	NA	98.63%	99.54%
			Day 3	99.58%	98.53%	99.14%	99.88%	99.88%	99.23%	99.90%	99.90%	98.52%	99.84%	NA	98.56%	99.58%
	b) SDCCH/PAGING Channel congestion	<=1%	Day 1	0.01%	0.11%	0.18%	0.21%	0.21%	0.19%	0.01%	0.01%	0.00%	0.02%	NA	0.50%	0.01%
			Day 2	0.01%	0.09%	0.20%	0.69%	0.69%	0.14%	0.01%	0.01%	0.00%	0.02%	NA	0.48%	0.01%
			Day 3	0.03%	0.10%	0.17%	0.92%	0.92%	0.32%	0.01%	0.01%	0.00%	0.01%	NA	0.48%	0.03%
	c) TCH congestion	<=2%	Day 1	0.01%	0.19%	1.21%	1.24%	1.24%	0.24%	0.16%	0.16%	0.00%	0.14%	NA	0.66%	0.01%
			Day 2	0.01%	0.22%	1.41%	1.35%	0.15%	0.31%	0.11%	0.11%	0.00%	0.19%	NA	0.46%	0.01%
			Day 3	0.03%	0.20%	1.26%	1.38%	0.12%	0.51%	0.09%	0.09%	0.00%	0.16%	NA	0.56%	0.03%
3	**Connection maintenance (Retainability)**															
	a) CDR (Call Drop Rate)	<=2%	Day 1	0.47%	0.45%	0.58%	0.65%	0.67%	0.35%	0.07%	0.07%	0.48%	0.43%	NA	0.47%	0.47%
			Day 2	0.48%	0.46%	0.56%	0.66%	0.65%	0.35%	0.05%	0.05%	0.50%	0.44%	NA	0.46$%	0.48%
			Day 3	0.47%	0.45%	0.60%	0.62%	0.62%	0.34%	0.08%	0.08%	0.49%	0.42%	NA	0.45%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Day 1	2.67%	1.56%	1.46%	2.06%	2.52%	1.84%	0.88%	0.88%	4.33%	1.36%	NA	3.15%	2.67%
			Day 2	2.85%	1.59%	1.43%	2.08%	2.56%	1.58%	0.56%	0.56%	4.21%	1.52%	NA	3.20%	2.85%

Datamation

			Day 3	2.59%	1.50%	1.49%	1.72%	2.19%	1.64%	0.62%	0.62%	4.09%	1.25%	NA	3.22%	2.59%
	c) Connections with good voice quality	>=95%	Day 1	97.25%	97.92%	99.93%	95.88%	96.37%	97.81%	99.48%	99.48%	99.14%	97.98%	NA	98.74%	97.25%
			Day 2	97.56%	97.94%	99.94%	95.84%	96.43%	97.77%	99.48%	99.48%	99.12%	97.92%	NA	98.75%	97.56%
			Day 3	97.68%	97.96%	99.95%	95.86%	96.45%	97.72%	99.49%	99.49%	99.13%	97.92%	NA	98.75%	97.68%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Day 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%
			Day 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%
			Day 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NA	0.00%	0.00%

4.5.1 Network Availability

4.5.1.1 BTS accumulated downtime (≤ 2%)

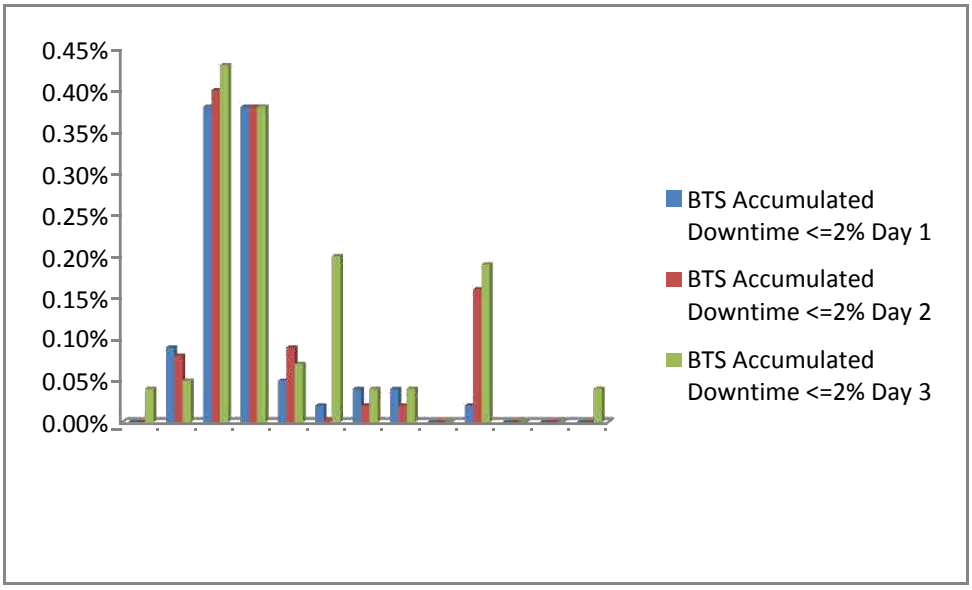


Fig. 4.5.1.1

- All operators are meeting the TRAI benchmarks **BTS accumulated downtime (≤ 2%)**for 3 days live data taken in the month of audit except MTS for day 1.

4.5.1.2 Worst affected BTS due to downtime (≤ 2%)

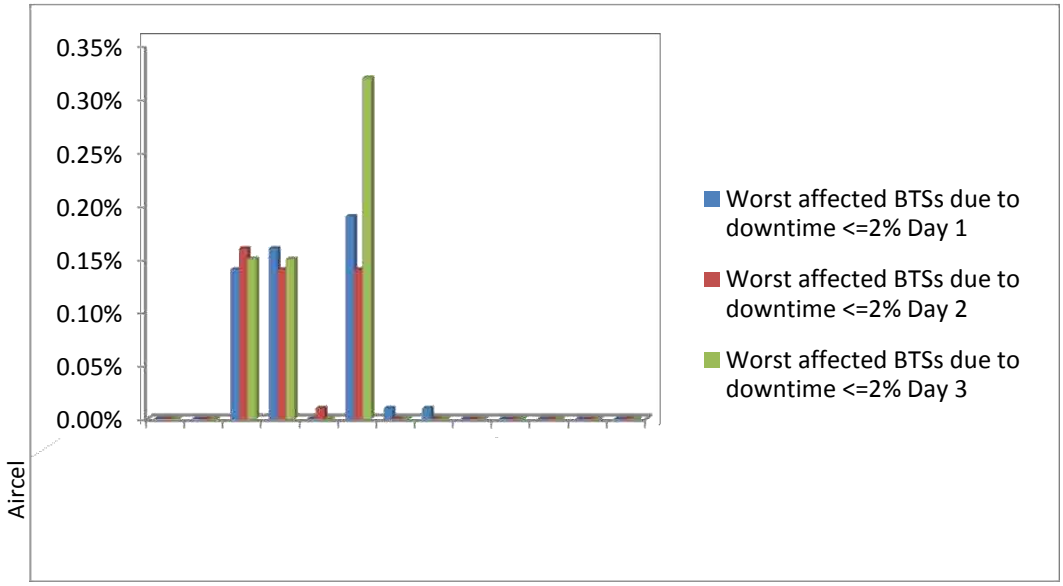


Fig. 4.5.1.2

- All operators are meeting the TRAI benchmarks **Worst affected BTS due to downtime (≤ 2%)**for 3 days live data taken in the month of audit.

4.5.2 Connection establishment (Accessibility)

4.5.2.1 Call Setup Success Rate≥ 95%

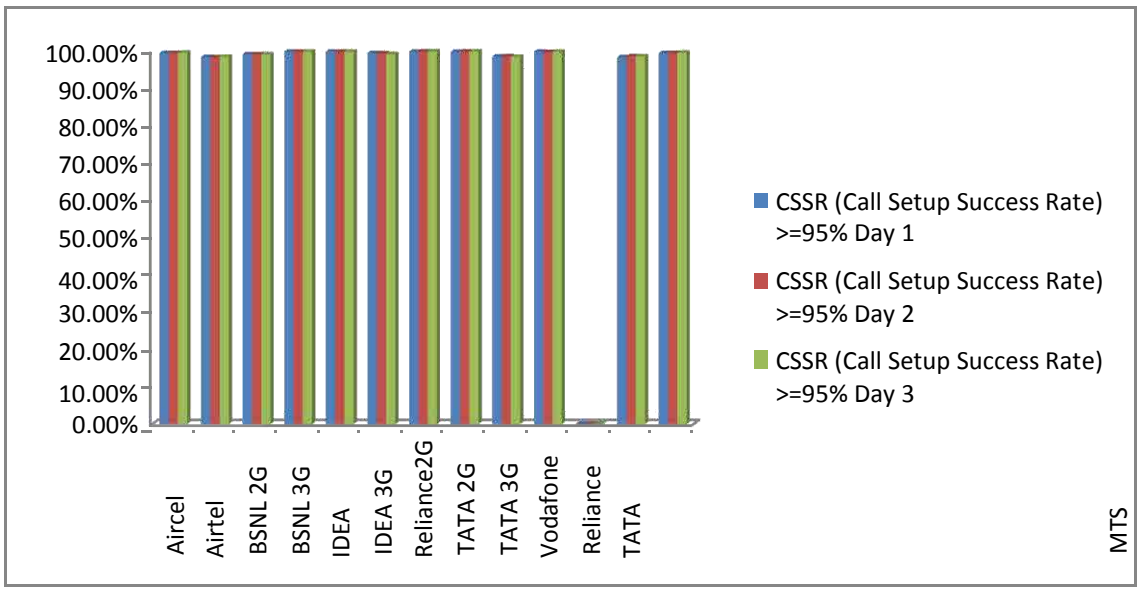


Fig. 4.5.2.1

- All operators are meeting the TRAI benchmarks (>= 95 %) for 3 days live data taken in the month of audit.

4.5.2.2 SDCCH/ Paging Channel Congestion

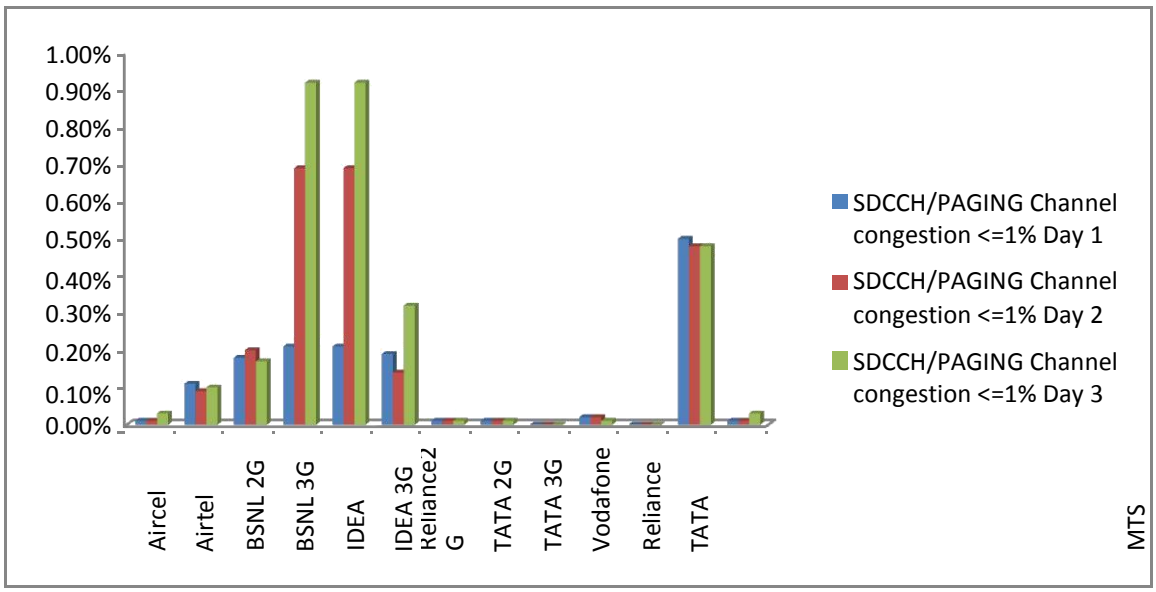


Fig. 4.5.2.2

- All operators are meeting the TRAI benchmarks (<= 1 %) for 3 days live data taken in the month of audit.

4.5.2.3 TCH congestion ≤ 2%

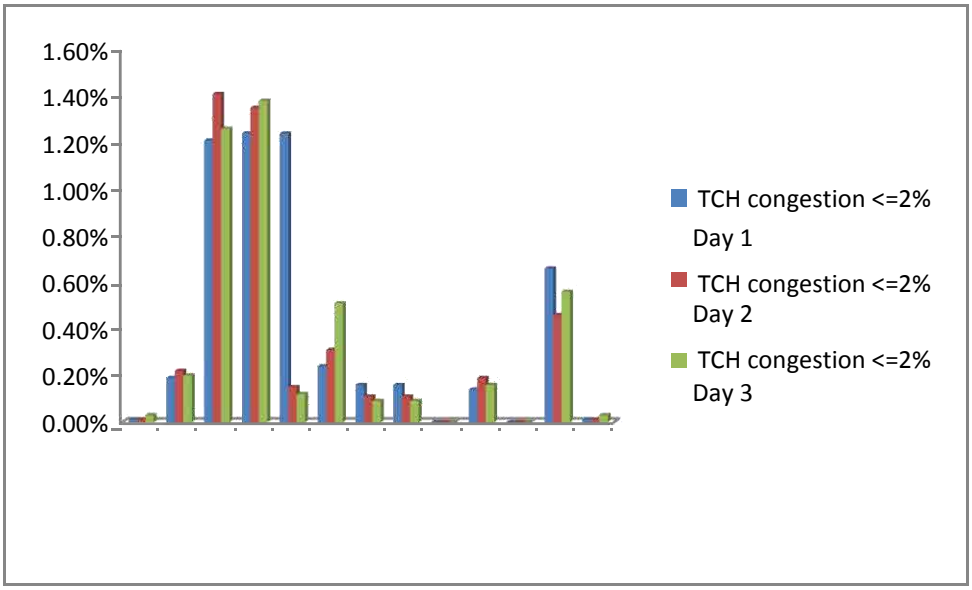


Fig. 4.5.2.3

- All operators are meeting the TRAI benchmarks (<= 2%) for 3 days live data taken in the month of audit.

4.5.3 Connection Maintainability (Retain ability)

4.5.3.1 Call Drop Rate ≤ 2%

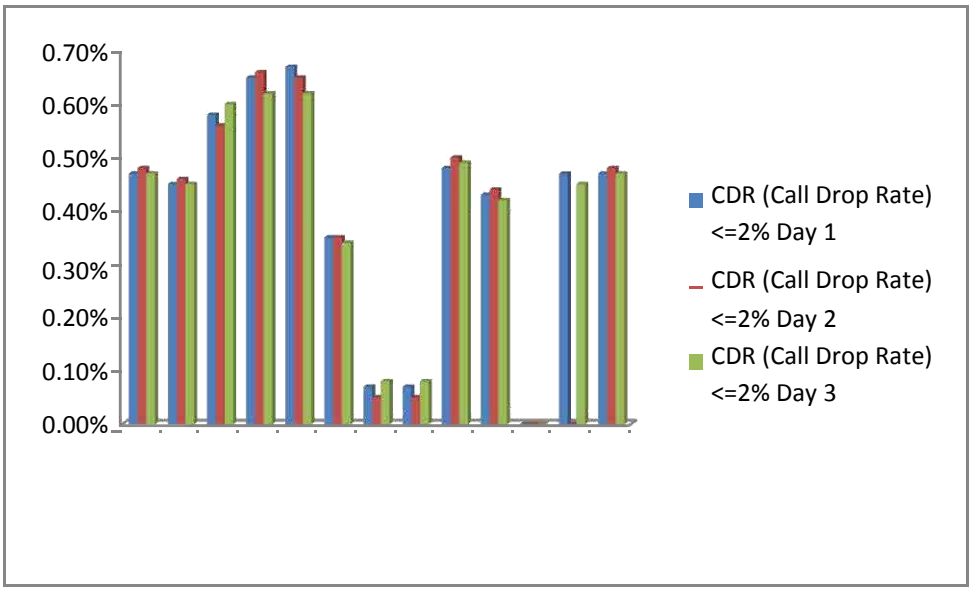


Fig. 4.5.3.1

- All operators are meeting the TRAI benchmarks (<=2%) for 3 days live data takenin the month of audit.

4.5.3.2 Worst affected cells having more than 3% TCH drop (call drop) rate

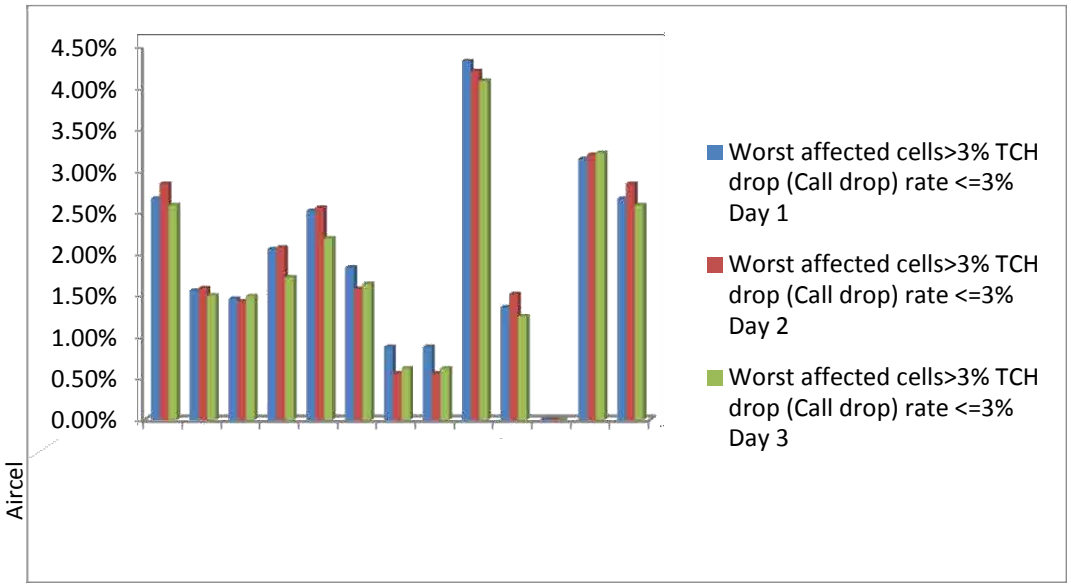


Fig. 4.5.3.2

- TATA(GSM&CDMA) are not meeting the benchmark for Worst affected cells having more than 3% TCH drop (call drop) rate in day 1, 2, 3.

4.5.3.3 % of Connections with good voice quality ≥ 95%

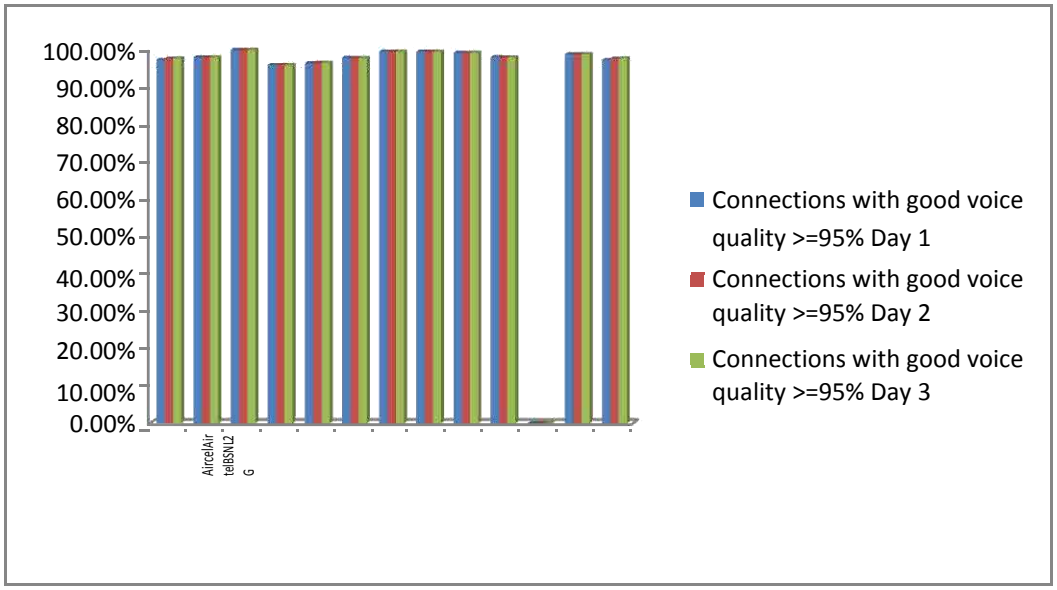


Fig. 4.5.3.3

- All operators are meeting the TRAI benchmarks (=> 95%) for 3 days live data taken in the month of audit.

4.5.3.4 Point of Interconnections (POI) congestion (on individual POI) ≤ 0.5%

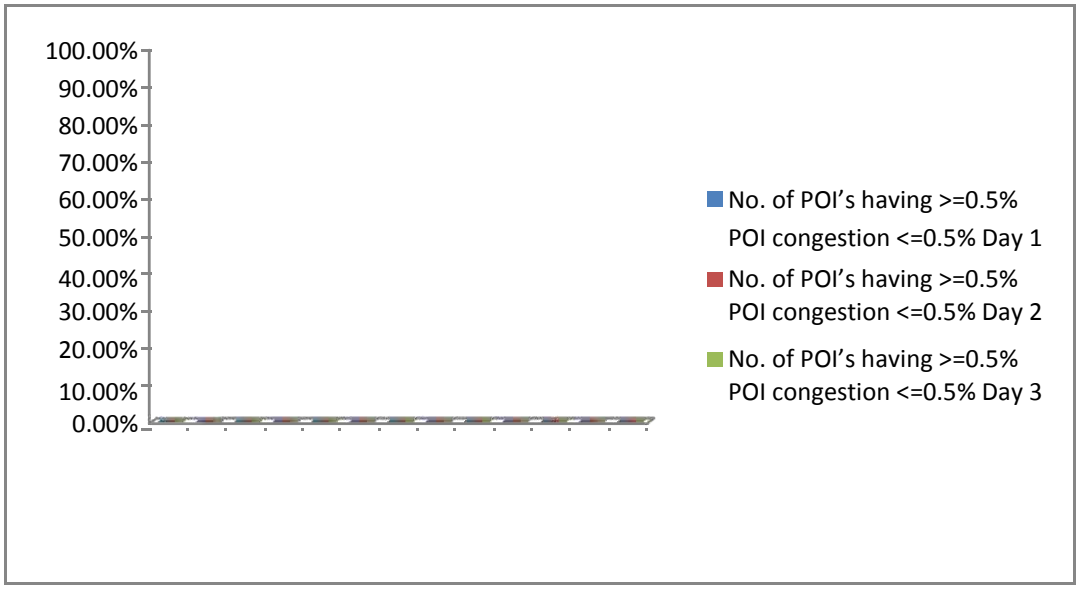


Fig. 4.5.3.4

- All operators are meeting the TRAI benchmarks (≤ 0.5%)for 3 days live data taken in the month of audit.

CHAPTER-5: FINDINGS AND ANALYSIS

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using the data for the entire month during which the live measurement is carried out.

➢ **As per PMR Data Verification Results for-**

- **KERALA Circle (Oct'15) -** From the month Data Assessment, it is found that TATA (2G,3G& CDMA) are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **KERALA Circle (Nov.'15):**From the month Data Assessment, it is found that TATA (2G & CDMA)are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate
- **KERALA Circle (Dec.'15):** TATA (2G & CDMA)Operators are not meeting the benchmark for **worst affected cells having more than 3% TCH drop (call drop) rate in** Circles for the month of Dec.'15.
- **KERALA Circle(Oct- Dec.'15):-** According to the summarized data for the month of Oct, Nov and Dec. We found that only TATA (2G & CDMA) are not meeting the benchmark for **worst affected cells having more than 3% TCH drop (call drop) rate.**

➢ **As per 3 Days Live Test Audit Report (1st Quarter), Circle:-**

Verification of the Performance of Service Providers against the Quality of Service benchmarks laid down by TRAI using Live measurements for 3 days during the month in which the Audit and Assessment is carried out.

- Aircel, BSNL,Idea,TATAis not meeting the benchmark for **worst affected cells having more than 3% TCH drop (call drop) rate**for all the 3 Days and TATA 3G for Day1 & Day2.

As per Operator Assisted Drive Test:

The Operator Assisted Drive Test was conducted for all the Operators. Route covered was about 100 Km depending on city areas within the speed limit of 30-40 km/hour. In all the cities Zones were selected for covering different density areas (High/Medium/Low)

❖ **Circle:**

- Aircel not participated in Drive Test audit.
- All operators achieved KPI threshold for Blocked Call Rate (<=3%).
- All operators achieved KPI threshold for Dropped Call benchmark.
- All operators achieved KPI threshold benchmark for the Voice Quality parameter (0-5 (with frequency hopping)).
- All operators achieved KPI threshold benchmark for Call Setup Success Rate (>=95%).

➢ **Level 1 Live Calling (Emergency No.) Q1**

- Level 1 calling such as calling at emergency no. like Police, Fire, and Ambulance were made so as to check the service of such short codes. In different cities of it was found to be functional .

➢ **Performance(live calling for billing complaints):**

- We have made live calling to customers as per their complaints details and we verified their complaint and we found that most of the complaints are resolved within the time line and all the operators are meeting the TRAI benchmarks.

➢ **Live calling to call centre:-**

- In live calling to call centers we found that all the operators are meeting their benchmark .

➢ **Inter Operator Call Assessment**

- In the inter-operator call assessment test, calls were made from one operator to other operator so as to check congestion on both the operators' network. In such cases, the radio part, switch part and the POI in between the operators are involved and hence if any congestion is found in the network, it may be due to any of these parts. The result shows that there is no congestion found on the operator network.

CUSTOMER SERVICE QUALITY PARAMETERS

1st Quarter data Assessment (Oct- Dec.'15)

- According to the parameter metering/billing credibility post-paid in the table**3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter metering /billing credibility pre-paid in the table **3.7.1**we found that all the service providers are meeting the benchmark.
- According to the parameter Resolution of billing/ charging complaints in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Accessibility of call centre/Customer Care in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter % call answered by operators (voice to voice) within 60 sec in the table **3.7.1** all the service providers are meeting the benchmark
- According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter in the table **3.7.1** we found that all the service providers are meeting the benchmark.
- According to the parameter Time taken for refunds of deposits after closures in the table 3.7.1 we found that all operators meeting the benchmark.

TELECOM REGULATORY AUTHORITY OF INDIA

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

Broadband &Wire line

SOUTHZONE KERALA & LAKSHADWEEP CIRCLE.

Report Period: OCT-DEC 2015

Cs Datamation Research Services Pvt. Ltd

Plot No 361, 1st Floor, Patparganj Indl. Area,
Delhi-110 092

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CHAPTER-1: INTRODUCTION

1.0 Objectives of the Audit and Assessment of Quality of Service:

Telecom Regulatory Authority of India has been entrusted important task of laying down the standards of quality of service to be provided by the service providers and ensuring that the quality of service is provided as per norms; and also TRAI is responsible for conducting the periodical audit of such services provided by the service providers so as to protect the interest of the consumers of telecommunications service. TRAI engaged Datamation for the Southern Zone (circle) for the audit and assessment of Quality of Service of service provided for Basic (Wire line) Telephone Services, Broadband and Cellular Mobile Telephone Services by various Operators,as perthe scopeof workdetailed in the tender document.

2.0. Scope of work to be undertaken:

A. The scope of work Audit and Assessment of Quality of Service of service providers as man dated by TRAI includes:
B. Preparation of Performance Monitoring reports (PMRs) and up-loading in the system.
C. Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days during each audit.
D. Monthly audit based on one month data of the SPs.
E. Drive test of the Rennet works.
F. Audit of the performance of call centers with respect their accessibility and percentage of calls answered by the operators and random customer feedback by calling the customers to get feedback of the services provided bythe serviceproviders.
G. Transfer of data generated by the RF drive test /live measurements/PMR/monthly audit to the server located at TRAI premises on real time basis.

3.0. Quality Parameters to be audited in respect of the Basic (Wire line), Telephone Services, Broadband, and Mobile Telephone Services:

Basic (Wire line Services): The parameters for Basic Telephone Service (Wire line) consist of various QoS indicators, which can be audited and assessed objectively, and include parameters like fault incidences, call completion rates/ answer to seizure ratio, POI congestion and customer service

parameters viz. mean time to repair faults, metering and billing credibility(post-paid and pre-paid),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, time taken for refund of security deposit.

After closures; provision of a telephone after registration of demand, shift of telephonic connection, etc.

(i) Basic Service (wire line):

S.N	Name of Parameter	Benchmark	Avg. over a Period
(i)	Fault incidences (No. of faults/100 subscribers/month)	≤5	One Quarter
(ii)	Fault repair by next working day	For urban areas:	One Quarter
		By next working day: ≥90% and within 3 days: 100%.	
		For rural and hilly areas:	
		By next working day: ≥90% and	
		Within 5 days: 100%. Rent Rebate	
		Faults pending for >3 days and ≤7 d a y s : Rent rebate for 7 days.	
		Faults pending for >7 days and≤15days: Rent rebate for 15 days.	
		Faults pending for >15Days: rent rebate for one month.	
(iii)	Mean Time To Repair (MTTR)	≤8Hrs	One Quarter
	(a) Call Completion Rate within a local network shall be better than or,	≥55%	One Quarter
(iv)	(b) Answer to Seizure Ratio (ASR)	≥75%	One Quarter
(v)	Point of Interconnection (POI) Congestion (on individual POI)	≤0.5%	One month
(vi)	Metering and billing credibility–post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle	One Billing Cycle
(vii)	Metering and billing credibility- pre-paid	Not more than 1 complaint per 1000 customers, i.e.,0.1% complaints for metering, charging, credit, and validity	One Quarter

(viii)	Resolution of billing/ charging Complaints	100% within 4 weeks	One Quarter
(ix)	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	within 1 week of resolution of complaint	One Quarter
Response Time to the customer for assistance			
(x)	(a) Accessibility of call centre/ customer care	≥ 95%	One Quarter
	(b)Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 90%	One Quarter
(xi)	Termination/closure of service	≤7days	One Quarter
(xii)	Time taken for refund of deposits after Closures	100% within 60 days.	One Quarter

(ii) **Broadband Services:** The parameters of Quality of Service for broadband services, specified in the regulation 3 of Quality of Service of Broadband Services Regulations, 2006, include service provisioning/activation time, fault repair and restoration time, billing performance, response time to customer for assistance and width utilization/throughput, service availability, packet loss and network latency.

S.N	Parameters	Benchmark
(i)	Service Provisioning/ Activation time	100% cases in =<15 working days (Subject to technical feasibility). In all cases where payment towards installation charge & security deposit is taken and the Broadband connection is not provided within 15 working days, a credit at the rate of Rs.10/ per day, subject to a maximum of installation charge or equivalent usage allowance shall be given to the customer, at the time of issue of first bill.
	Fault Repair/ Restoration Time	By next working day: > 90% and within 3 working days: 99% Rebate (a) Faults Pending for > 3 working days and < 7 working days: rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance (b) Faults Pending for > 7 working days and < 15 working days: rebate equivalent to 15 days of minimum monthly charge or equivalent usage

(ii)		allowance (c) Faults Pending for > 15 working days: rebate equivalent
(iii)	Billing Performance Billing complaints per 100 bills issued %age of Billing Complaints resolved Time taken for refund of deposits after closure	< 2% 100% within 4 weeks 100% within 60 days
(iv)	Response time to the customers for assistance	% age of calls answered by operator(Voice to Voice) Within 60 seconds > 60% Within 90 seconds > 80%
	a) Bandwidth Utilization	<80% link(s)/route bandwidth utilization during peak
	i) POP to ISP Gateway Node [Intra-	
		hours (TCBH). If on any link(s)/route bandwidth
		Bandwidth Utilization/ Throughput:
		utilization exceeds 90%, then network is considered to
(v)	ii) ISP Gateway Node to IGSP / NIXI	have congestion. For this additional provisioning of
	Node upstream Link(s)	
		Bandwidth on immediate basis, but not later than one
	for International connectivity	month, is mandated.
	b) Broadband Connection Speed	Subscribed Broadband Connection Speed to be met
	(download)	>80% from ISP Node to User.
(vi)		> 90% quarter ending June 2007;
	Service Availability / Uptime	> 98% with effect from quarter ending
		September 2007 and onwards
(vii)	Packet Loss	<1%
	Network Latency(for wired broadband	
	access)	
	User reference point at POP / ISP	
(viii)	Gateway Node to International	<120 msec
	Gateway (IGSP/NIXI)	
	User reference point at ISP Gateway	
	Node to International nearest NAP	<350 msec
	port abroad (Terrestrial)	

Detailed Scope of Work implemented & Universe:

We have been undertaking audit and assessment of Quality of Service provided by every service provider (licensee) in each of the telecom circles/metro service areas under the respective Zone in the following manner:-

- In respect of Cellular Mobile Telephone service, all the service areas/circles in each Zone are to be audited in every quarter of the year i.e. a service area will be audited four times in a year.
- In respect of Basic service (wire line) and Broadband service, a service area/circle in the contracted zone is to be audited only once in a year.

South Zone:

The audit and assessment of Quality of Service has been conducted for BSNL, MTNL, private basic service
providers, unified access service providers, cellular mobile service providers and ISPs (providing broadband service) in various service areas for basic telephone service (wire line), cellular mobile telephone service and broadband service. We were required to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband sub scriber base of more than 10,000 sub scribers in their licensed service area. The updated data in respect of licensees (service providers) who have commissioned service and their subscriber base/Mobile Switching Centre (MSCs)/BTS"/Exchanges/Internet Service Providers Central Nodes (ISP Nodes) is supposed to be intimated by TRAI from time to time and wecarried out the audit and assessment of Quality of Service accordingly thereafter.

The audit and assessment of Quality of Service for all the service providers in a Telecom Circle/Metro Service Area/Licensed Service Area were completed in the same quarterly period.

Generation of performance reports against QOS benchmarks:

4.0 Coverage, Sampling & Research Methodology for the Southern Zone ():

Sample size for cellular mobile services:

100% Gateway MSCs (GMSC) and Mobile Switching Centre (MSC) of all the Cellular Mobile Service Provider (CMSP) or Unified Access Service Providers (UASP) were covered in specified circles/service are as in respective Zone in each of the quarterly period.

Number of exchanges to be covered for Basic (Wire line) services: (Not covered in this Quarter)

The break-up of the total number of exchanges of BSNL, MTNL and private basic service operators circle/ service area-wise, including urban and rural exchanges, and the number of exchanges, both urban and rural, that shall be covered during the year (i.e. four quarters) for audit and assessment of the Quality of Service shall be obtained from TRAI. As per the break-up of number of exchanges to be covered in a year, 556 urban exchanges and 1508 rural exchanges, totaling 2064 exchanges are proposed to be covered. The exchanges shall evenly be spread over in about 10% of SDCAs to the extent possible with each service provider in specified circles/service areas. A service area/circle in the contracted Zone shall be audited only once in a year.

Number of POPs to be covered for Broadband Services: (Not covered in this Quarter)

We propose to first visit the ISP"s Central Node in licensed service area and identify the total number of Point of Presence (POPs) in each service area. There after, the sample for audit and assessment of Point of

Presence shall be decided in such a way that minimum 5% (five percent) of the Points of Presence of ISPs preadoverin10% (ten percent) SDCA sin specified service area/ telecom circle shall be covered. The POPs are proposed to be evenly spread over in the licensed service area. A service area/circle shall be audited only once in a year. tabulation. Analysis of data was done as per the scope of work and deliverables. After completion of compilation of data and analysis ,reports were compiled and submitted to TRAI which will included details on comparable parameters state wise.

5.0. Procedure adopted for Quality and Assessment of the Services:

The generation and verification of performance of service providers against QOS benchmarks involved measuring of specified reporting parameters, checking of complete records, analysis of procedure and method utilized by various service providers in measuring the parameters and method of averaging for the purpose of reporting. We included critical findings licensee-wise in each quarterly report.

Audit methods and procedures:

To measure each quality of service parameter defined by TRAI, the two main sources of data collection identified were:

- Audit of the MIS reports at exchanges (OMC or MSCs) or ISP Node of the service provider.
- Primary data collection and check back calls (live observations done during the visits)

The audit was conducted in each centre of study to generate various types of data. Thus, for data collection, following activities were undertaken during the appraisal exercise.

Collection of MIS data of OMC or MSC or ISP Node:

For this TRAI has suggested to the service providers to maintain the QoS source data in a proper format. From the source data, we generated the quarterly/monthly performance monitoring reports (PMR). Methodology adopted was checked against instructions and standards to see if the measurements adhere to specifications.

Live Measurements and Live Data Collation:

During the audit and assessment, following activities were under taken for live measurements and live data collection.

A. **Audit and Assessment of complaint redressal and provisioning of new broadband Connections: (Not conducted this Quarter)**

Telephonic interviews are proposed to be conducted among a sample of subscribers of telephone–

- In basic service(wire line) for those customers who reported a fault complaint, billing dispute
- In case of Mobile operators, who have had are cent billing dispute
- In case of Broadband service for those who requested for a new connection reported a fault complaint, billing dispute, complain to Broadband connection speed (download).

Data shall be obtained on:

- Occurrence of fault complaints
- Clearance of fault within stipulated time
- Incidence of billing disputes
- Clearance of billing complaints within stipulated time
- Attendance to requests for closure/ termination of service

Sampling Procedure & quality control: In order to data correct and meaning full result from audit it is important to ensure that the right sampling procedure is followed. Equally important is the process of ensuring that quality control parameters are put in place. Care shall be taken to distribute the sample to obtainer and on list. The distribution of sample sizes shall be evenly distributed. The sampling procedure for various activities to be carried is given below:

Sample for telephonic interview for billing complaints:

The sample size for telephonic interview of billing complaints in each audit shall be 100 subscribers or the total number of complaints, which ever is less per service provider for each service in a licensed service area. All the complaints booked shall be treated as the total population for selection of samples.

Sample for telephonic interview for new connection for Broadband Service:

The sampling frame shall be for Point of Presence/ISP Node of Broadband Service Provider. Here ,the to sample size (10% of the applicants in the previous monthor100whicheverislessforevery service provider) has been randomly selected from the records/registers to make check back calls.

Sample for telephonic interview for service complaints/ requests:

The operator is required to provide the details of the service complaints/requests for the month previous to the audit month for Cellular Mobile Telephone Services, Basic (wire line) Services and Broadband Services. For broadband services, complaints related to download speed are proposed to be covered. From the list of these complaints/requests (10%or100per service provider per license service are a, which ever is less) sample has been drawn randomly to make check back calls. Anoticeofminimum3 (three) weeks was provided to the service provider by us for arranging and supplying the data required for audit of exchanges, ISP nodes and MSCs to be covered.

b) <u>Audit and Assessment of Call Centre/customer care promptness and live measurement through test</u>

<u>calls:</u>

Test calls were made to assess the availability and efficiency of Level1services and complaint centre accessibility. The telephone /SIM Cards/Instruments for testing purposes were provided by the concerned service provider(s) in whose network the audit and assessment of Quality of Service is carried out. The details regarding test calls are:

(a)Testing of Level 1 Services:

Level1Services include police, fire, ambulance (Emergency services) in the case of both Mobile service providers and basic telephone service providers. Test calls were made from all the levels working in a particular SDCA visited. Again, the total sample sizes (150per license service are a per service per quarter) were equally distributed among the different SDCAs visited, and the distribution among the active levels is in proportion to the capacity of each level in that SDCA.

(b) Inter-operator call assessment:

Inter Network calls i.e. calls made from one operator to an other within the same license were made to judge the ease of connectivity amongst the operators.

A sample of 2X50 test calls per service provider with in the licensed service area was made at different point of time to the free test numbers of another service provider (50calls between 1000to1300 Hrsand50 calls between 1500 to 1700 Hrs for basic service and between1100 to1400 Hrs and between 1600 to1900Hrs) for cellular mobile service. The results of these calls were compiled and reported Separately for each service provider service area-wise.

The telephone/ SIM Cards /Instruments for testing purposes were provided by the concerned service provider (s) in whose network the audit and assessment of Quality of Service is carried out.

(c) Testing of Complaint Centre Accessibility and response time:

(i) Basic Telephone Service (wire line) and Cellular Mobile Telephone Service:

We measured the performance of both basic telephone service (wire line) & cellular mobile services against the benchmarks of the following Quality of Service parameters:-

Response time to the customer for assistance:

- Accessibility of call centre/customer care>=95%
- % age of calls answered by the operator (voice to voice): Within 60 seconds = 90%

The procedure for assessment of the performance in respect of above parameters was made using the traffic data at the point of termination to call centre from mobile/basic telephone network. Traffic at the and trunk or gate way MSC out going circuits to IVR of call centre was measured as per the traffic counter available in the respective witch to assess the accessibility of call centre.

In the case of parameter % of call answered by the operator voice to voice, assessment of IVR traffic data and CRM traffic data was analyzed during the time consistent busy hour (TCBH) of call centre. In addition, weal so made the test calls and correlated the results with the traffic data analysis.

The procedure (IVR menu and sub-menu) and ease of accessing the operator with in the benchmark laid down by TRAI, both post-paid and pre-paid customers were assessed and reported. In this regard para3.11.4 of the Explanatory Memorandum to the Standards of Quality of Service of Basic Telephone Service (Wire line) and Cellular Mobile Telephone Service Regulations, 2009 and provisions of the Telecom Consumers Complaint Redressal Regulations, 2012 was being followed.

(ii)Broadband service:

We propose to measure the performance of Broadband service against the benchmarks of the following Quality of Service parameters:-

Response time to the customer for assistance: % age of calls answered by operator (voice to voice): Within 60 seconds =60%,Within 90 seconds =80%

Measurement

A sample of 2X 50 calls per service provider is proposed to be made at different point of time to the call centre of each service provider from each licensed service area (50 calls between1000to1300 Hrs.and50 calls between1500to1700hrs.) for basic telephone service (wire line) and similarly, 2X50 calls to the call centre of each service provider (50 calls between1100to1400hrs.and50 calls between1600to1900hrs.) for cellular mobile telephone service from each licensed service area to ensure statistical significance. The time to connect to IVR shall be noted for all these calls. This is the wait time before an automatic answer machine (IVR) message begins. We then propose to measure the gap between the time when the last digit of the number is dialed, and the time when the IVR message begins. Similarly the wait time before a Call Centre agent responds to a test call shall be measured for all such test calls.

Verification and audit of records:

We propose to verify and audit the following records in respect of Basic Telephone Service (wire line):

- Call Centre records for complaints
- FRS de tails for fault complaints, fault repair and MTTR(Mean Time to Repair)
- Commercial records for billing details, billing disputes and redressal there of
- Past traffic reports at local and TAX(Trunk Automatic exchanges) for Call
- Completion Rate/*Answer to Seizure Ratio* calculations
- Checking of customer complain than doing through live test at the call centre
- 100Nos. of service complaints/ requests and 100Nos. of billing related complaints shall be taken up by the audit in agency for verifying the in redressal as per the record of the service provider.

We propose to verify & audit records maintained by Broadband service providers relating to:

- Call Centre records for complaints
- FRS details for fault complaints, fault repair
- Records for requests for new connection, and supplementary services
- Commercial records for billing details, billing disputes and redressal thereof
- Checking of customer complaint handling through live test at the call centre
- Service complaints/request sand billing related complaints hall be taken up by the auditing agency for verifying their redressal as per the record of the service provider.
- Bandwidth Utilization/Throughput
- Broadband connection speed
- Service Availability/Uptime
- Packet Loss and Latency measurements.

Network performance parameters like Band width Utilization/Throughput including Broadband Connection

Speed, Packet Loss and Latency shall be measured on samplebasis.

The detailed methodology for each Quality of Service parameter as given in the Explanatory

SL NO	SERVICE PROVIDERS.	CIRCLE	EXCHANGES	RURAL EXCHANGES	URBAN EXCHANGES	NO OF RURAL EXCHANGES COVERED FOR AUDIT	NO OF URBAN EXCHANGES COVERED FOR AUDIT
1	BSNL	KERALA	1286	1025	261	44	13
2	VODAFONE	KERALA	1	0	1	0	1
3	RCL(Reliance)	KERALA	1	0	1	0	1
4	AIRTEL	KERALA	1	0	1	0	1
5	TTL(TATA)	KERALA	1	0	1	0	1
TOTAL EXCHANGES			1290	102	265	44	17

For BSNL exchanges performance against each parameter has been evaluated by taking average of parameters

For all audited exchanges. The average performance value for each parameter has been given in the table below Wireline and broadband respectively.

BSNL WIRELINE

Wireline_KERALA _BSNL							
S/N	Parameters	Benchmarks	Average over a period	Oct	Nov	Dec	Quarter
1	Fault incidences						
1.1	(No. of faults/100 subscribers /month)	< 7%	One Quarter	6.1	5.67	6.55	6.11
2	Faults Repair/Restoration Time						
2.1	Fault repair by next working day(Urban Area)	>85%	One Quarter	92.13%	92.13%	92.13%	92.13%
	Within 3 days.	100%	One Quarter	NA	NA	NA	NA
2.2	Fault repair By next working day	>75%	One Quarter	82.35	85.82	76.88	81.68
	Within 5 days (Hilly & Rural Area)	100%	One Quarter	100	100	100	100
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	NIL	NIL	NIL	NIL
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	NIL	NIL	NIL	NIL
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	NIL	NIL	NIL	NIL
4	Mean time to Repair(MTTR)						
4.1	Mean time to Repair(MTTR)	<= 10 Hrs	One Quarter	9.07	9.12	9.97	9.39
6	Metering & Billing Performance						
6.1	Metering & Billing Credibility-Postpaid.	< 0.1%	One Quarter	0.00%	0.00%	0.00%	0.00%
6.2	Metering & Billing Credibility-Pre paid	< 0.1%	One Quarter	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks	98%	One Quarter	100%	100%	100%	100%
6.4	Resolution of billing charging/validity/ Complaints within 6 weeks	100%	One Quarter	100%	100%	100%	100%
6.5	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	One Quarter	100%	100%	100%	100%
7	POI Congestion						
7..1	POI Congestion (%)	≤ 0.5%	One Quarter	0%	0%	0%	0%
8	Response Time to customer for assistance						
8.1	Accessibility of Call centre/customer Care within 60 seconds.	≥95%	One Quarter	100.00%	100.00%	100.00%	100.00%
8.2	% age of calls answered by operator(voice to voice) within 90 seconds.	≥95%	One Quarter	NA	NA	NA	NA
9	Customer care(promptness in attending to customers request)						
9.1	Termination / Closures.BM <=7 days	(<=7 days) - 100%	One Quarter	100%	100%	100%	100%
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	One Quarter	100%	100%	100%	100%

BSNL is meeting bench mark for wire line in below all criteria but in the table2.1 & 8.2 are not available for BSNL Kerala & indicated as NA. .

- Fault incidences
- Faults Repair/Restoration Time Fault repair by next working day(Urban Area) Within 3 days data is not available from BSNL Kerala & shown as NA.

- Rent Rebate- No rent rebates applicable for this quarter.
- Mean time to Repair(MTTR)
- Metering & Billing Performance(For BSNL there is no prepaid Wireline service available &hence 6.2 in the table is indicated as NA)
- POI Congestion
- Response Time to customer for assistance.
- % age of calls answered by operator(voice to voice) within 90 seconds is not available by BSNL& shown as NA.
- Customer care promptness in attending to customers request .Reported complaints are terminated within 7 days & all refunds done within 60 days by BSNL.

AIRTEL WIRELINE

Wireline_ KERALA _AIRTEL							
S/N	**Parameters**	**Benchmarks**	**Averaged over a period**	**Oct**	**Nov**	**Dec**	**Quarter average**
1	Fault incidences						
1.1	(No. of faults/100 subscribers /month)	< 7%	One Quarter	2.66	2.54	2.81	2.67
2	Faults Repair/Restoration Time						
2.1	Fault repair by next working day(Urban Area)						
	Fault repair by next working day(Urban Area)	>85%	One Quarter	87.94%	86.12%	86.61%	86.89%
	Within 3 days.	100%	One Quarter	100%	100%	100%	100%
2.2	Fault repair by next working day(Rural & hilly Area)						
	By next working day	>75%	One Quarter	NA	NA	NA	NA
	Within 5 days (Hilly & Rural Area)	100%	One Quarter	NA	NA	NA	NA
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	NIL	NIL	NIL	NIL
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	NIL	NIL	NIL	NIL
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	NIL	NIL	NIL	NIL
4	Mean time to Repair(MTTR)						
4.1	Mean time to Repair(MTTR)	<= 10 Hrs	One Quarter	9	10	8	9.00
6	Metering & Billing Performance						
6.1	Metering & Billing Credibility-Postpaid.	< 0.1%	One Quarter	0.01%	0.01%	0.01%	0.01%
6.2	Metering & Billing Credibility-Pre paid	< 0.1%	One Quarter	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks	98%	One Quarter	100%	100%	100%	100%
6.4	Resolution of billing charging/validity/ Complaints within 6 weeks	100%	One Quarter	100%	100%	100%	100%
6.5	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	One Quarter	100%	100%	100%	100%
7	POI Congestion						
7..1	POI Congestion (%)	≤ 0.5%	One Quarter	0%	0%	0%	0%
8	Response Time to customer for assistance						
8.1	Accessibility of Call centre/customer Care within 60 seconds.	≥95%	One Quarter	100.00%	100.00%	100.00%	100.00%
8.2	% age of calls answered by operator(voice to voice) within 90 seconds.	≥95%	One Quarter	80.00%	73.00%	79.00%	76.33%
9	Customer care(promptness in attending to customers request						
9.1	Termination / Closures.BM <=7 days	(<=7 days) 100%	One Quarter	100%	100%	100%	100%
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	One Quarter	100%	100%	100%	100%

Airtel is meeting bench mark for wire line in below all criteria.

- Fault incidences
- Faults Repair/Restoration Time Fault repair by next working day (Rural & hilly Area) data is not available for Airtel wire line & shown as **NA**.
- Rent Rebate- No rent rebates applicable for this quarter.
- Mean time to Repair(MTTR)
- Metering & Billing Performance.
- Metering & Billing Credibility-Pre paid data is not available for Airtel wire line & shown as **NA**.
- POI Congestion
- Response Time to customer for assistance
- IVR menu used for % age of calls answered by operator (voice to voice) within 90 seconds.BSNL Kerala has closed many customer cares call centers for wire line in many BSNL exchanges
- BSNL Customer care (promptness in attending to customer's request.) meeting the benchmark.

TTL (TATA) WIRELINE

Wireline KERALA- TTL							
S/N	Parameters	Benchmarks	Average over a period	Oct-15	Nov-15	Dec-15	Quarter
1	Fault incidences						
1.1	(No. of faults/100 subscribers /month)	< 7%	One Quarter	0%	0%	0%	0%
2	Faults Repair/Restoration Time						
2.1	Fault repair by next working day(Urban Area)						
	Fault repair by next working day(Urban Area)	>85%	One Quarter	100%	86%	100%	95%
	Within 3 days.	100%	One Quarter	100%	100%	100%	100%
2.2	Fault repair by next working day(Rural & hilly Area)						
	By next working day	>75%		NA	NA	NA	NA
	Within 5 days (Hilly & Rural Area)	100%	One Quarter	NA	NA	NA	NA
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	NA	NA	NA	NA
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	NA	NA	NA	NA
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	NA	NA	NA	NA
4	Mean time to Repair(MTTR)						
4.1	Mean time to Repair(MTTR)	<= 10 Hrs	One Quarter	4	1	0	2
5	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)						
5.1	Call Completion Ratio(CCR)	> 55%	One Quarter	NA	NA	NA	NA
5.2	Answer to seizure Ratio(ASR)	>75%	One Quarter	NA	NA	NA	NA
6	Metering & Billing Performance						
6.1	Metering & Billing Credibility-Postpaid.	< 0.1%	One Quarter	0.00%	0.0%	0.0%	0.0%
6.2	Metering & Billing Credibility-Pre paid	< 0.1%	One Quarter	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks	98%	One Quarter	NA	NA	NA	NA
6.4	Resolution of billing charging/validity/ Complaints within 6 weeks	100%	One Quarter	NA	NA	NA	NA
6.5	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	One Quarter	NA	NA	NA	NA
7	POI Congestion						
7..1	POI Congestion (%)	≤ 0.5%	One Quarter	0.00%	0.00%	0.00%	0.00%
8	Response Time to customer for assistance						
8.1	Accessibility of Call centre/customer Care within 60 seconds.	≥95%	One Quarter	100%	100.00%	100.00%	100.00%
8.2	% age of calls answered by operator (voice to voice) within 90 seconds.	≥95%	One Quarter	100%	100.00%	100.00%	100.00%
9	Customer care(promptness in attending to customers request						
9.1	Termination / Closures.BM <=7 days	100%	One Quarter	0%	0%	0%	0%
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	One Quarter	0%	0%	0%	0%

TTL is meeting bench mark for wire line in below all criteria except the parameter in the table of Serial No 2.2, 3.1,3.2,3.3,5.1,5.2,6.3,6.4,6.5 are informed as not available by the TTSL network & thus indicated as NA.

- Fault incidences
- Faults Repair/Restoration Time .Fault repair by next working day(Urban Area)meeting the benchmark.
- Faults Repair/Restoration Time .Fault repair by next working day(Rural & hilly Area) data is not available for TTL & thus indicated as NA.
- Rent Rebate- No rent rebates applicable for this quarter which is shown as NA.
- Mean time to Repair (MTTR) meeting the benchmark.
- Metering &billing Credibility-Prepaid data is not available for TTL.
- Resolution of billing charging/validity/Complaints within4weeksdata is not available for TTL.
- Resolution of billing charging/validity/Complaints within6weeks data is not available for TTL.
- Period of all refunds/payments from the date of resolution of complaints within one week data is not available for TTL.
- Metering & Billing Performance TTL meeting the benchmark.
- POI Congestion is 0% for the TTL network & meeting the benchmark..
- Response Time to customer for assistance meeting the benchmark.
- IVR menu used for % age of calls answered by operator (voice to voice) within 90 seconds.
- Customer care promptness in attending to customer's request meeting the benchmark.

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RCL (Reliance) Wire line.

Wireline KERALA- RCL							
S/N	Parameters	Benchmarks	Average over a Quarter period	Oct-15	Nov-15	Dec-15	
1	Fault incidences						
1.1	(No. of faults/100 subscribers < 7% /month)		One Quarter	0.26	0.08	0.06	0.13
2	Faults Repair/Restoration Time						
2.1	Fault repair by next working day(Urban Area)						
	Fault repair by next working >85% day(Urban Area)		One Quarter	100%	86%	100%	95%
	Within 3 days.	100%	One Quarter	100%	100%	100%	100%
2.2	Fault repair by next working day(Rural & hilly Area)						
	By next working day	>75%	One Quarter	No faults in Rural and Hilly area	No faults in Rural and Hilly area	No faults in Rural and Hilly area	No faults in Rural and Hilly area
	Within 5 days (Hilly & Rural Area)	100%	One Quarter	No faults in Rural and Hilly area	No faults in Rural and Hilly area	No faults in Rural and Hilly area	No faults in Rural and Hilly area
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	NA	NA	NA	NA
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	NA	NA	NA	NA
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	NA	NA	NA	NA
4	Mean time to Repair(MTTR)						
4.1	Mean time to Repair(MTTR)	<= 10 Hrs	One Quarter	4.9	5.5	4.4	4.93
5	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)						
5.1	Call Completion Ratio(CCR)	> 55%	One Quarter	**According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline**	**According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline**	**According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline**	**According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline service**

				service providers have been exempted from reporting the ASR figures.	service providers have been exempted from reporting the ASR figures.	service providers have been exempted from reporting the ASR figures.	providers have been exempted from reporting the ASR figures.
5.2	Answer to seizure Ratio(ASR)	>75%	One Quarter	According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline service providers have been exempted from reporting the ASR figures.	According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline service providers have been exempted from reporting the ASR figures.	According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline service providers have been exempted from reporting the ASR figures.	According to the TRAI's third amendment to the Standards of Quality of service of Basic Telephone service Regulations 2014 dated 21st August 2014. The wireline service providers have been exempted from reporting the ASR figures.
6	Metering & Billing Performance						
6.1	Metering & Billing Credibility-Post paid.	< 0.1%	One Quarter	NA	NA	NA	NA
6.2	Metering & Billing Credibility-Pre paid	< 0.1%	One Quarter	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks	98%	One Quarter	**98%**	**99%**	**98%**	**98.33%**
6.4	Resolution of billing charging/validity/ Complaints within 6 weeks	100%	One Quarter	**100%**	**100%**	**100%**	**100%**
6.5	Period of all refunds/payments	100%	One Quarter	NA	NA	NA	NA

	from the date of resolution of complaints within 1 weeks						
7	POI Congestion						
7..1	POI Congestion (%)	≤ 0.5%	One Quarter	0.00%	0.00%	0.00%	0.00%
8	Response Time to customer for assistance						
8.1	Accessibility of Call centre/customer Care within 60 seconds.	≥95%	One Quarter	**98.23%**	**98.88%**	**98.10%**	**98.40%**
8.2	% age of calls answered by operator(voice to voice) within 90 seconds.	≥95%	One Quarter	**97.00%**	**98.00%**	**97.00%**	**97.33%**
9	Customer care promptness in attending to customers request						
9.1	Termination / Closures.BM <=7 days	100%	One Quarter	**No requests for Termination**	**No requests for Termination**	**100.00%**	**100.00%**
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	One Quarter	**100.00%**	**100.00%**	**100.00%**	**100.00%**

RCL Kerala is meeting bench mark for wire line in below all criteria except the parameter in the table of Serial No 3.1,3.2,3.3,5.1,5.2,6.1,6.2,6.5 are informed as not available by the RCL network & thus indicated as NA.

- Fault incidences
- Faults Repair/Restoration Time .Fault repair by next working day(Urban Area)meeting the benchmark.
- Faults Repair/Restoration Time .Fault repair by next working day(Rural & hilly Area) there are no faults reported for RCL Kerala wireline.
- Rent Rebate- No rent rebates applicable for this quarter which is shown as NA.
- Mean time to Repair (MTTR) meeting the benchmark.
- Metering &billing Credibility-Prepaid data is not available for RCL.
- Resolution of billing charging/validity/Complaints within 4weeks meeting the benchmark.
- Resolution of billing charging/validity/Complaints meeting the benchmark.
- Period of all refunds/payments from the date of resolution of complaints within one week data is not available for RCL.

- Metering & Billing Performance data is not available for RCL & indicated as NA.
- POI Congestion is 0% for the RCL network & meeting the benchmark.
- Response Time to customer for assistance meeting the benchmark.
- IVR menu used for % age of calls answered by operator (voice to voice) within 90 seconds meeting the benchmark.
- Customer care promptness in attending to customer's request is meeting the benchmark.

VODAFONE WIRELINE

Wireline Kerala VODAFONE							
S/N	**Parameters**	**Benchmarks**	**Averaged over a period**	**Oct**	**Nov**	**Dec**	**Quarter**
1	Fault incidences						
1.1	(No. of faults/100 subscribers /month)	< 7%	One Quarter	0.7	0.1	0.1	0.30
2	Faults Repair/Restoration Time						
2.1	Fault repair by next working day(Urban Area)						
	Fault repair by next working day(Urban Area)	>85%	One Quarter	100%	100%	100%	100%
	Within 3 days.	100%	One Quarter	100%	100%	100%	100%
2.2	Fault repair by next working day(Rural & hilly Area)						
	By next working day	>75%	One Quarter	NA	NA	NA	NA
	Within 5 days (Hilly & Rural Area)	100%	One Quarter	NA	NA	NA	NA
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	0	0	0	0
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	0	0	0	0
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	0	0	0	0
4	Mean time to Repair(MTTR)						
4.1	Mean time to Repair(MTTR)	<= 10 Hrs	One Quarter	2.8	3	6	3.90
6	Metering & Billing Performance						
6.1	Metering & Billing Credibility-Post paid.	< 0.1%	One Quarter	0.098%	0.099%	0.100%	0.99%
6.2	Metering & Billing Credibility-Pre paid	< 0.1%	One Quarter	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks	98%	One Quarter	100%	100%	100%	100%
6.4	Resolution of billing charging/validity/ Complaints within 6 weeks	100%	One Quarter	100%	100%	100%	100%
6.5	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	One Quarter	100%	100%	100%	100%
7	POI Congestion						
7..1	POI Congestion (%)	≤ 0.5%	One Quarter	0%	0%	0%	0%
8	Response Time to customer for assistance						
8.1	Accessibility of Call centre/customer Care within 60 seconds.	≥95%	One Quarter	100%	100%	100%	100%
8.2	% age of calls answered by operator(voice to voice) within 90 seconds.	≥95%	One Quarter	100%	100%	100%	100%
9	Customer care promptness in attending to customers request						
9.1	Termination / Closures.BM <=7 days	(<=7 days) - 100%	One Quarter	100%	100%	100%	100%
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	One Quarter	100%	100%	100%	100%

Vodafone is meeting bench mark for wireline in below all criteria Except 2.2 (Fault repair by next working day (Rural & hilly Area) By next working day.) in the table is not available shown as NA.

- Fault incidences
- Faults Repair/Restoration Time
- Rent Rebate- No rent rebates applicable for this quarter.
- Mean time to Repair (MTTR)
- Metering & Billing Performance
- POI Congestion
- Response Time to customer for assistance
- IVR menu used for % age of calls answered by operator (voice to voice) within 90 seconds.
- Customer care promptness in attending to customer's request.

Consolidated Kerala Wire line Report.

Wireline Kerala CONSOLIDATED							
S/N	**Parameters**	**Benchmarks**	**BSNL**	**Tata**	**Vodafone**	**Airtel**	**RCOM**
1	Fault incidences						
1.1	(No. of faults/100 subscribers /month)	< 7%	6.11	0%	0.30%	2.67	0.13
2	Faults Repair/Restoration Time						
2.1	Fault repair by next working day(Urban Area)						
	Fault repair by next working day(Urban Area)	>85%	92.13%	95%	100%	86.89%	100%
	Within 3 days.	100%	NA	100%	100%	100%	100%
2.2	Fault repair by next working day(Rural & hilly Area)						**No rent rebate applicable**
	By next working day	>75%	81.68	NA	NA	NA	**No rent rebate applicable**
	Within 5 days (Hilly & Rural Area)	100%	100	NA	NA	NA	**No rent rebate applicable**
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	NIL	NIL	NIL	NIL	**No rent rebate applicable**
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	NIL	NIL	NIL	NIL	**No rent rebate applicable**
3.3	Fault pending > 15 days	Rebate for one month	NIL	NIL	NIL	NIL	**No rent rebate applicable**
4	Mean time to Repair(MTTR)						
4.1	Mean time to Repair(MTTR)	<= 10 Hrs	9.39	2	3.90	9.00	4.93
6	Metering & Billing Performance						
6.1	Metering & Billing Credibility-Post paid.	< 0.1%	0.00%	0.0%	0.99%	0.01%	NA
6.2	Metering & Billing Credibility-Pre paid	< 0.1%	0.00%	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks	98%	100%	NA	100%	100%	100%
6.4	Resolution of billing charging/validity/ Complaints within 6 weeks	100%	100%	NA	100%	100%	100%
6.5	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	100%	NA	100%	100%	100%
7	POI Congestion						

7..1	POI Congestion (%)	≤ 0.5%	0.00%	0.00%	0.00%	0.00%	0.00%
8	Response Time to customer for assistance						
8.1	Accessibility of Call centre/customer Care within 60 seconds.	≥95%	100.00%	NA	100%	100.00%	98.40%
8.2	% age of calls answered by operator (voice to voice) within 90 seconds.	≥95%	NA	100.00%	100%	76.33%	97.33%
9	Customer care(promptness in attending to customers request						
9.1	Termination / Closures.BM <=7 days	(<=7 days) - 100%	100%	0%	100%	100%	100.00%
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	100%	0%	100%	100%	100.00%

KPI Summary:

In the table 6.1&6.2 Metering& billing performance data is not available for RCL 2.2, 3.1, 3.2& 3.3 data are not available for all wire line network in Kerala. Response Time to customer for assistance Airtel is not meeting the benchmark. All operators are meeting bench mark for wire line in below all criteria

- Fault incidences
- Faults Repair/Restoration Time
- Rent Rebate- No rent rebates applicable for this quarter.
- Mean time to Repair(MTTR)
- Metering & Billing Performance
- Response Time to customer for assistance.
- POI Congestion
- Response Time to customer for assistance Airtel is not meeting the benchmark.
- In % age of calls answered by operator (voice to voice) within 90 second Airtel is not
- Meeting the Benchmark & hence it is highlighted in yellow & red.
- Customer care (promptness in attending to customer's request.

BSNL Broadband Audit reports.

BSNL Broadband Audit report _Kerala:

Broadband_KERALA CIRCLE-BSNL							
S/N	Parameters	Benchmarks	Period	Oct	Nov	Dec	Quarter
1	Service Provisioning/Activation Time						
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%
2	Faults Repair/Restoration Time						
2.1	% of faults repaired by next working day	>90%	One Quarter	90.48%	93.10%	93.33%	92.30%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100.00%	100.00%	100.00%	100.00%
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	0%	0%	0%	0%
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	0%	0%	0%	0%
4	Billing Performance						
4.1	%age of bills disputed	<2%	One Quarter	0.429	0.183	0.426	0.43
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100%	100%	100%	100.00%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100%	100%	100%	100.00%
5	Response Time to the Customer for assistance						
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	NA	NA	NA	NA
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	NA	NA	NA	NA
6	Bandwidth utilization/throughput						
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		One Quarter	NIL	NIL	NIL	NIL
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	NA	NA	NA	NA
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	NA	NA	NA	NA
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	90	91	91	91
7	Service Availability/Uptime (for all users) in %age						
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	99%	99%	99%	99%
8	Packet loss						
8.1	% of Packet loss	<1%	One Quarter	NA	NA	NA	NA
9	Network latency (for wired broadband access)						
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	NA	NA	NA	NA
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	NA	NA	NA	NA
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	NA	NA	NA	NA

TTL (TATA) Broadband Audit Report _Kerala

Broadband _KERALA CIRCLE_ TTL(TATA)							
S/N	**Parameters**	**Benchmarks**	**Period**	**Oct**	**Nov**	**Dec**	**Quarter**
1	Service Provisioning/Activation Time						
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%
2	Faults Repair/Restoration Time						
2.1	% of faults repaired by next working day	>90%	One Quarter	99%	97%	98%	98.04%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100%	100%	100%	100.00%
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	For 7 days	One Quarter	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	For 15 days	One Quarter	0%	0%	0%	0%
3.3	Fault pending > 15 days	For 1 month	One Quarter	0%	0%	0%	0%
4	Billing Performance						
4.1	%age of bills disputed	<2%	One Quarter	1%	1%	0%	0.62%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	14%	50%	50%	33%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100%	100%	100%	100%
5	Response Time to the Customer for assistance						
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	88%	87%	93%	89.06%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	89%	91%	96%	91.25%
6	Bandwidth utilization/throughput						
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	0	0	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	82.00%	84.00%	70.00%	70.00%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	93.00	88.00%	85%	85%
7	Service Availability/Uptime (for all users) in %age						
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	99.93%	99.71%	99.58%	99.73%
8	Packet loss						
8.1	% of Packet loss	<1%	One Quarter	0.00	0.00	0.00	0.00
9	Network latency (for wired broadband access)						
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	51	34	39	39
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	69.7 msec	63.4 msec	60.2 msec	60 m sec
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	No Satellite Connectivity in TTSL	No Satellite Connectivity in TTSL	No Satellite Connectivity in TTSL	No Satellite Connectivity in TTSL

Broadband Kerala CIRCLE _VODAFONE							
S/N	**Parameters**	**Benchmarks**	**Period**	**October**	**November**	**December**	**Quarter**
1	Service Provisioning/Activation Time						
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%
2	Faults Repair/Restoraion Time						
2.1	% of faults repaired by next working day	>90%	One Quarter	97.00%	100.00%	100.00%	99%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100.00%	100.00%	100.00%	100%
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	For 7 days	One Quarter	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	For 15 days	One Quarter	0%	0%	0%	0%
3.3	Fault pending > 15 days	For One month	One Quarter	0%	0%	0%	0%
4	Billing Performance						
4.1	%age of bills disputed	<2%	One Quarter	1.4%	1.2 %	1.4%	1.3%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100%	100%	100%	100.00%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100%	100%	100%	100.00%
5	Response Time to the Customer for assistance						
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	100%	100%	100%	100%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	100%	100%	100%	100%
6	Bandwidth utilization/throughput						
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)	>90%	One Quarter	NA	NA	NA	NA
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)	>90%	One Quarter	NA	NA	NA	NA
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	NA	NA	NA	NA
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	NA	NA	NA	NA
7	Service Availability/Uptime (for all users) in %age						
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	NA	NA	NA	NA
8	Packet loss						
8.1	% of Packet loss	<1%	One Quarter	NA			
9	Network latency (for wired broadband access)						
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	NA	NA	NA	NA
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	NA	NA	NA	NA
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	NA	NA	NA	NA

Broadband Audit report _Kerala: RCL (Reliance)

Broadband _KERALA CIRCLE-RCL(Reliance)							
S/N	Parameters	Benchmarks	Period	Oct	Nov	Dec	Quarter
1	Service Provisioning/Activation Time						
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%
2	Faults Repair/Restoration Time						
2.1	% of faults repaired by next working day	>90%	One Quarter	100.00%	100.00%	100.00%	100.00%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100.00%	100.00%	100.00%	100.00%
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	Rebate for 7 days	One Quarter	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	Rebate for 15 days	One Quarter	0%	0%	0%	0%
3.3	Fault pending > 15 days	Rebate for one month	One Quarter	0%	0%	0%	0%
4	Billing Performance						
4.1	%age of bills disputed	<2%	One Quarter	0.10%	0.06%	0.24%	0.13%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100%	100%	100%	100%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100%	100%	100%	100%
5	Response Time to the Customer for assistance						
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	97%	98%	97%	97%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	97%	98%	97%	98%
6	Bandwidth utilization/throughput						
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		One Quarter	3	3	3	3
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	0	0	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	18.1	18.4	17.6	18
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	81.27%	96%	96.13%	91.13%
7	Service Availability/Uptime (for all users) in %age						
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	100%	100%	100%	100%
8	Packet loss						
8.1	% of Packet loss	<1%	One Quarter	0.36%	0.31%	0.33%	0.33%
9	Network latency (for wired broadband access)						
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	**8**	**5**	**6**	**19**
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	**7**	**6**	**7**	**20**
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	No satellite connectivity	No satellite connectivity	No satellite connectivity	No satellite connectivity

Broadband Audit Report Kerala _ Airtel.

Broadband_ KERALA CIRCLE _AIRTEL							
S/N	**Parameters**	**Benchmarks**	**Period**	**October**	**November**	**December**	**Quarter**
1	Service Provisioning/Activation Time						
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%
2	Faults Repair/Restoration Time						
2.1	% of faults repaired by next working day	>90%	One Quarter	93.12%	91.96%	91.60%	92.23%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100.00%	99.70%	99.74%	99.81%
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	For 7 days	One Quarter	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	For 15 days	One Quarter	0%	0%	0%	0%
3.3	Fault pending > 15 days	For one month	One Quarter	0%	0%	0%	0%
4	Billing Performance						
4.1	%age of bills disputed	<2%	One Quarter	0.01%	0.02%	0.00%	0.01%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100%	100%	100%	100.00%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100%	100%	100%	100.00%
5	Response Time to the Customer for assistance						
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	73.31%	69.48%	73.76%	72.18%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	79.50%	75.68%	79.28%	78.15%
6	Bandwidth utilization/throughput						
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		One Quarter	0%	0%	0%	0%
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	NA	NA	NA	NA
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	NA	NA	NA	NA
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	100%	100%	100%	100%
7	Service Availability/Uptime (for all users) in %age						
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	99.996%	99.981%	99.990%	100%
8	Packet loss						
8.1	% of Packet loss	<1%	One Quarter	0.00%			
9	Network latency (for wired broadband access)						
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	70	37	39	48.66
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	32	33	32	32.33
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	NA	NA	NA	NA

Broad Band Audit Report Kerala _ Asianet.

Broadband Kerala Circle ASIANET BROADBAND							
S/N	**Parameters**	**Benchmarks**	**Period**	**Oct**	**Nov**	**Dec**	**Quarter**
1	Service Provisioning/Activation Time						
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%
2	Faults Repair/Restoration Time						
2.1	% of faults repaired by next working day	>90%	One Quarter	90.19%	90.72%	90.33%	90.41%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	99.35%	99.12%	99.48%	99.32%
3	Rent Rebate						
3.1	Fault pending > 3 days &<7 days	For 7 days	One Quarter	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	For 15 days	One Quarter	0%	0%	0%	0%
3.3	Fault pending > 15 days	For 1 month	One Quarter	0%	0%	0%	0%
4	Billing Performance						
4.1	%age of bills disputed	<2%	One Quarter	1.78%	1.84%	1.87%	1.83%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100%	100%	100%	100%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100%	100%	100%	100%
5	Response Time to the Customer for assistance						
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	60%	61%	61%	61%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	80%	81%	80%	80%
6	Bandwidth utilization/throughput						
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		One Quarter	NIL	NIL	NIL	NIL
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	0	0	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	71%	72%	72%	72%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	90%	90%	90%	90%
7	Service Availability/Uptime (for all users) in %age						
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	100%	100%	99%	100%
8	Packet loss						
8.1	% of Packet loss	<1%	One Quarter	0.87%			
9	Network latency (for wired broadband access)						
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	<50msec	<50msec	<50msec	<50msec
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	<270msec	<270msec	<270msec	<270msec
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	NIL	NIL	NIL	NIL

Consolidated Report Broadband Audit Kerala.

Broadband Audit Kerala Circle									
S/N	**Parameters**	**Benchmarks**	**Period**	**BSNL**	**Airtel**	**Vodafone**	**Asianet**	**TTL**	**RCOM**
1	Service Provisioning/Activation Time								
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100%	100%	100%	100%	100%	100%
2	Faults Repair/Restoration Time								
2.1	% of faults repaired by next working day	>90%	One Quarter	92.30%	92.23%	92%	90.41%	98.04%	100%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100.00%	99.81%	100%	99.32%	100.00%	100%
3	Rent Rebate								
3.1	Fault pending > 3 days &<7 days	For 7 days	One Quarter	0%	0%	0%	0%	0%	0%
3.2	Fault Pending > 7 days &< 15 days	For 15 days	One Quarter	0%	0%	0%	0%	0%	0%
3.3	Fault pending > 15 days	For 1 month	One Quarter	0%	0%	0%	0%	0%	0%
4	Billing Performance								
4.1	%age of bills disputed	<2%	One Quarter	0.43	0.01%	1.3%	1.83%	0.62%	0.13%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100.00%	100.00%	100.00%	100%	33%	100%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100.00%	100.00%	100.00%	100%	100%	100%
5	Response Time to the Customer for assistance								
5.1	%age of calls answered by operator (Voice to voice) within 60 sec	>60%	One Quarter	NA	72.18%	100%	61%	89.06%	97%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	NA	78.15%	100%	80%	91.25%	98%
6	Bandwidth utilization/throughput								
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		One Quarter	NIL	0%	NA	NIL	0.0%	**3**
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	NA	NA	NA	0.0%	70.00%	**0**
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	NA	NA	NA	72%	85%	**18**
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	91	100%	NA	90%	85%	**91.13%**
7	Service Availability/Uptime (for all users) in %age								
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	99%	100%	NA	100%	99.73%	**100%**
8	No satellite connectivity								
8.1	% of Packet loss	<1%	One Quarter	NA	0%	NA	0.87%	0.00	0.33%
9	Network latency (for wired broadband access)								
9.1	User reference point at POP/ISP Gateway node to IGSP/NIXI	<120 msec	One Quarter	NA	48.66	NA	50	39	**19**

9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	NA	32.33	NA	270	60	**20**
9.3	User reference point at ISP Gateway node to International nearest NAP port abroad (satellite)	<800 msec	One Quarter	NA	NA	NA	NA	NA	No satellite connecti vity

KPI Summary:

All operators are meeting bench mark for Broadband in below all criteria.

- Service Provisioning/Activation Time
- Faults Repair/Restoration Time
- Rent Rebate- No rent rebates applicable for this quarter.

Billing Performance Only TTL is not meeting the benchmark**. TTL is** also not meeting the benchmark for (4.2) % age of complaints resolved within 4 weeks .

- Response Time to the Customer for assistance
- Bandwidth utilization/throughput
- **TTL** also not meeting the benchmark (6.2) No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH))
- Service Availability/Uptime (for all users) in %age.
- Network latency (for wired broadband access).

LEVEL-1 LIVE CALLING (WIRELINE) Town Name Ernakulam.

Emergency No	Total No. of Calls Attempted	Total No. of Calls Answered	% of Calls got Answered	Bharti (AIRTEL)	BSNL	RCL	Vodafone		TTL(TATA)
100 - Police	5	5	100%	OK	OK	OK	OK		OK
101 - Fire	5	5	100%	OK	OK	OK	OK		OK
102 - Ambulance	5	5	100%	OK	OK	OK	OK		OK
104 - Health Information Helpline	5	5	0%	NO	NO	NO	NO		NO
108 - Emergency and Disaster Management Helpline	5	5	100%	OK	OK	OK	OK	OK	OK
138 - All India Helpline for Passengers	5	5	100%	OK	OK	OK	OK	OK	OK
149 - Public Road Transport Utility Service	5	5	0%	NO	NO	NO	NO	NO	NO
181 - Chief Minister Helpline	5	5	0%	NO	NO	NO	NO	NO	NO
182 - Indian Railway Security Helpline	5	5	100%	OK	OK	OK	OK	OK	OK
1033 - Road Accident Management Service	5	5	100%	Ok	OK	OK	OK	OK	OK
1037 - Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal Helpline'	5	5	0%	NO	NO	NO	NO	NO	NO
1056 - Emergency Medical Services	5	5	0%	network busy	NO	yes	NO		NO
c	5	5	100%	OK	OK	OK	OK		OK

1063 - Public Grievance Cell DoT Hq	5	5	100%	OK	OK	OK	OK	OK
1064 - Anti Corruption Helpline	5	5	0%	NO	NO	NO	NO	NO
1070 - Relief Commission for Natural Calamities	5	5	100%	OK	OK	OK	OK	OK
1071 - Air Accident Helpline	5	5	0%	NO	NO	NO	NO	NO
1072 - Rail Accident Helpline	5	5	100%	OK	OK	OK	OK	OK
1073 - Road Accident Helpline	5	5	0%	network busy	Network busy	network busy	network busy	network busy
1077 - Control Room for District Collector	5	5	0%	NO	NO	NO	NO	NO
1090 - Call Alart (Crime Branch)	5	5	100%	OK	OK	OK	OK	OK
1091 - Women Helpline	5	5	100%	OK	OK	OK	OK	OK
1097 - National AIDS Helpline to NACO	5	5	0%	NO	NO	NO	NO	NO
1099 - Central Accident and Trauma Services (CATS)	5	5	0%	network busy	network busy	network busy	network busy	network busy
10580 - Educational& Vocational Guidance and Counseling	5	5	0%	NO	NO	NO	NO	NO
10589 - Mother and Child Tracking (MCTH)	5	5	0%	NO	NO	NO	NO	NO
10740 - Central Pollution Control Board	5	5	0%	NO	NO	NO	NO	NO

10741 - Pollution Control Board	5	5	0%	NO	NO	NO	NO		NO
1511 - Police Related Service for all Metro Railway Project	5	5	0%	NO	NO	NO	NO		NO
1512 - Prevention of Crime in Railway	5	5	100%	OK	OK ,	OK,	OK		OK
1514 - National Career Service(NCS)	5	5	NO	NO	NO	NO	NO		NO
15100 - Free Legal Service Helpline	5	5	0%	network busy	netwo rk busy	network busy	network busy		network busy
155304 - Municipal Corporations	5	5	NO	NO	NO	NO	NO		NO
155214 - Labor Helpline	5	5	0%	network busy	netwo rk busy	network busy	network busy		network busy
1903 - Sashastra Seema Bal (SSB)	5	5	100%	OK	OK	OK	OK		OK
1909 - National Do Not Call Registry	5	5	100%	OK	OK	OK	OK	OK	OK
1912 - Complaint of Electricity	5	5	100%	OK	OK	OK	OK	OK	OK
1916 - Drinking Water Supply	5	5	0%	NO	NO	NO	NO	NO	NO
1950 - Election Commission of India	5	5	100%	OK	OK	OK	OK	OK	OK

LEVEL-1 LIVE CALLING (WIRELINE)

Observations & findings.

.It is found that the toll free number 1056(Emergency Medical Services) is only connected from BSNL.

.The toll free numbers given below are not connected (does not Exist)from all the Kerala Wire line operators including BSNL.

.All other toll free numbers are connected from all the Wire line operators.

104 - Health Information Helpline

149 - Public Road Transport Utility Service

181 - Chief Minister Helpline

1037 - Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal Helpline' 1064 - Anti Corruption Helpline Natural Calamities

1071 - Air Accident Helpline

1072 - Rail Accident Helpline

1073 - Road Accident Helpline

1077 - Control Room for District Collector

1097 - National AIDS Helpline to NACO

10580 - Educational& Vocational Guidance and Counseling

1099 - Central Accident and Trauma Services

1097 - National AIDS Helpline to NACO

1077 - Control Room for District Collector

10589 - Mother and Child Tracking (MCTH)

10740 - Central Pollution Control Board

10741 - Pollution Control Board

1514 - National Career Service

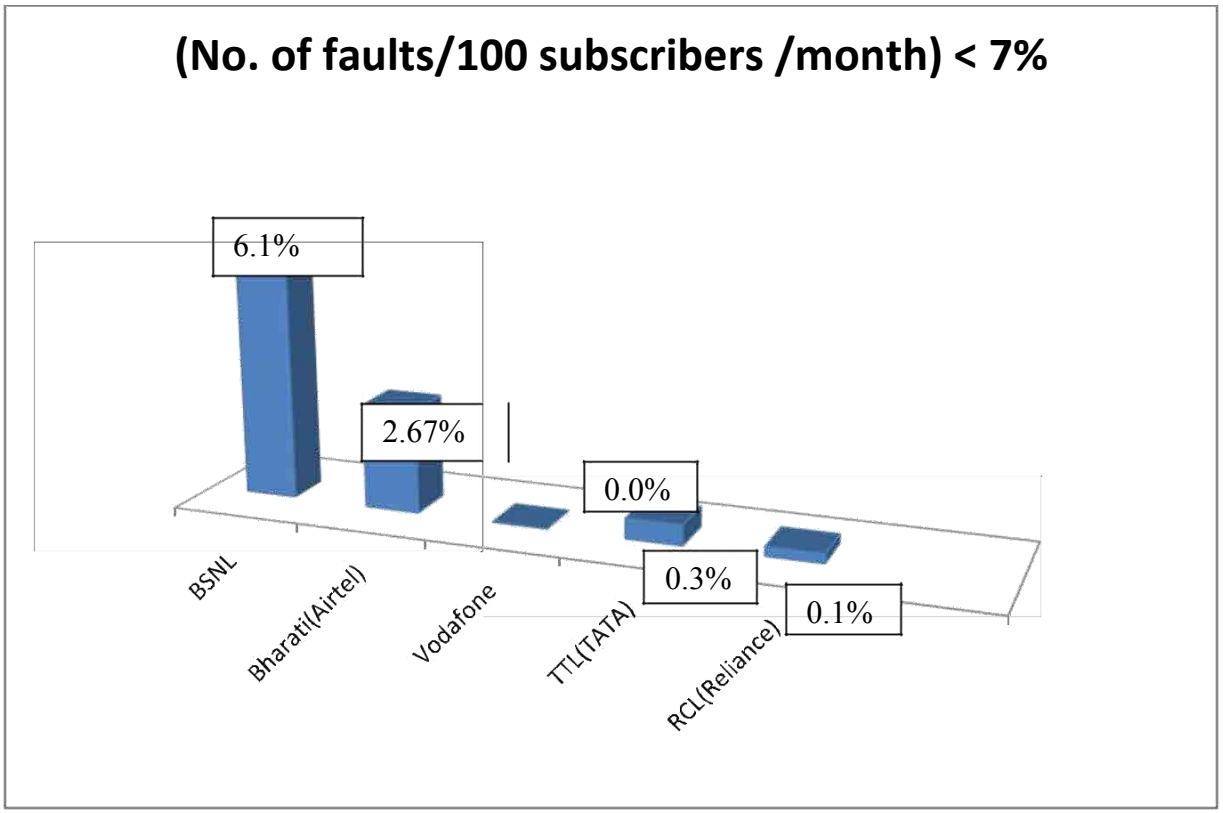
155304 - Municipal Corporations

1916 - Drinking Water Supply

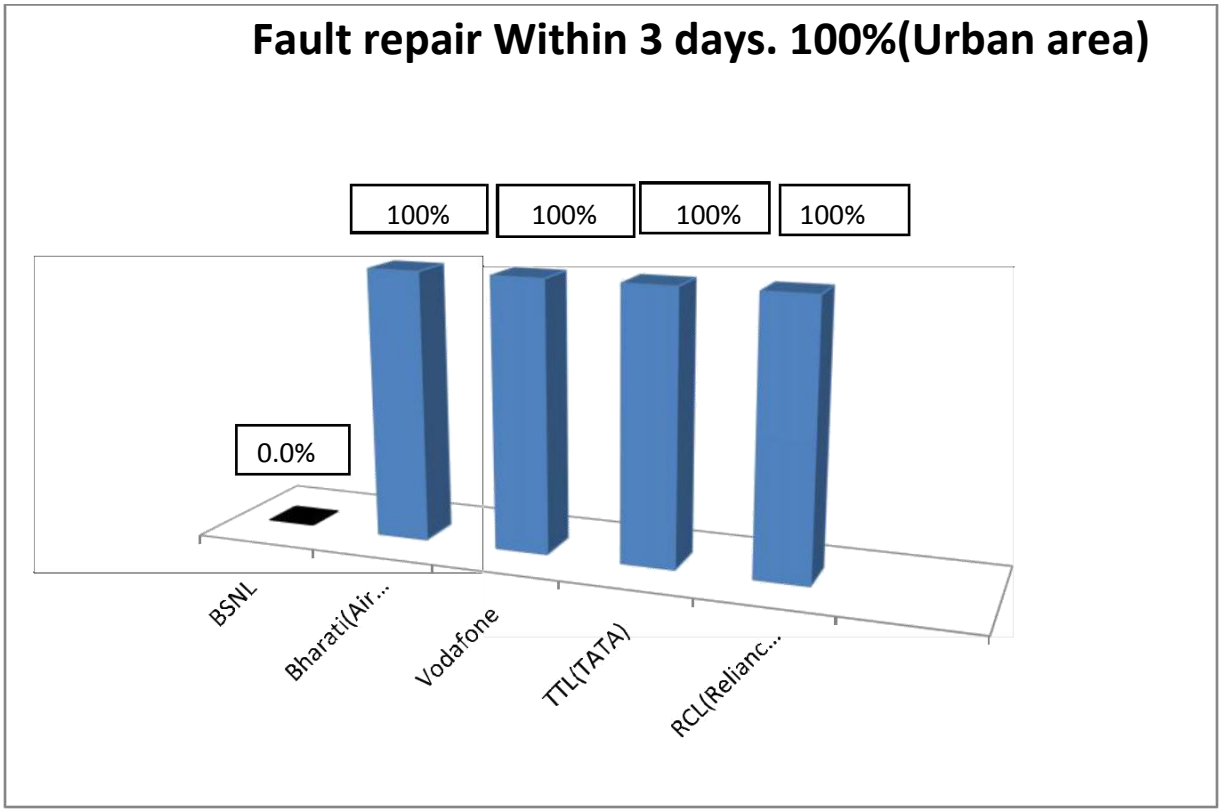
Graphical representation Broadband and wireline Audit Ke rala:

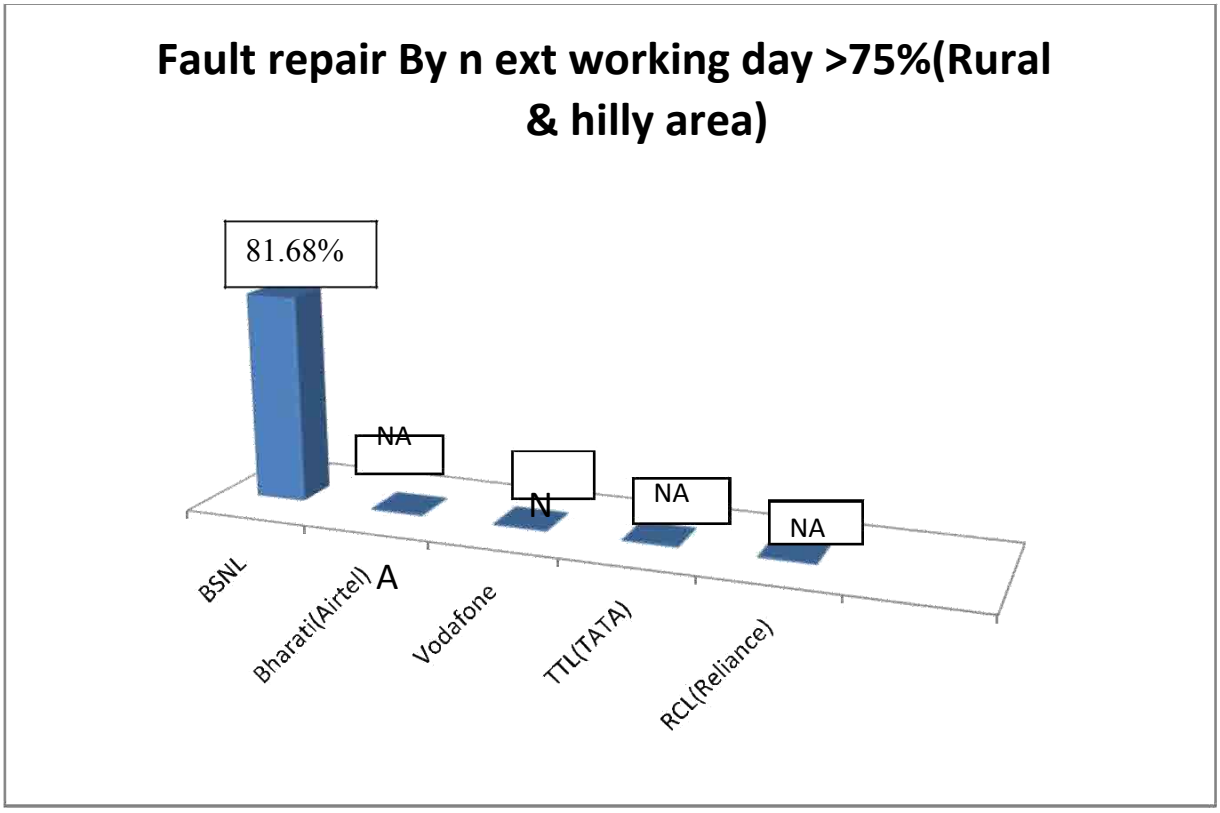
Wire line:

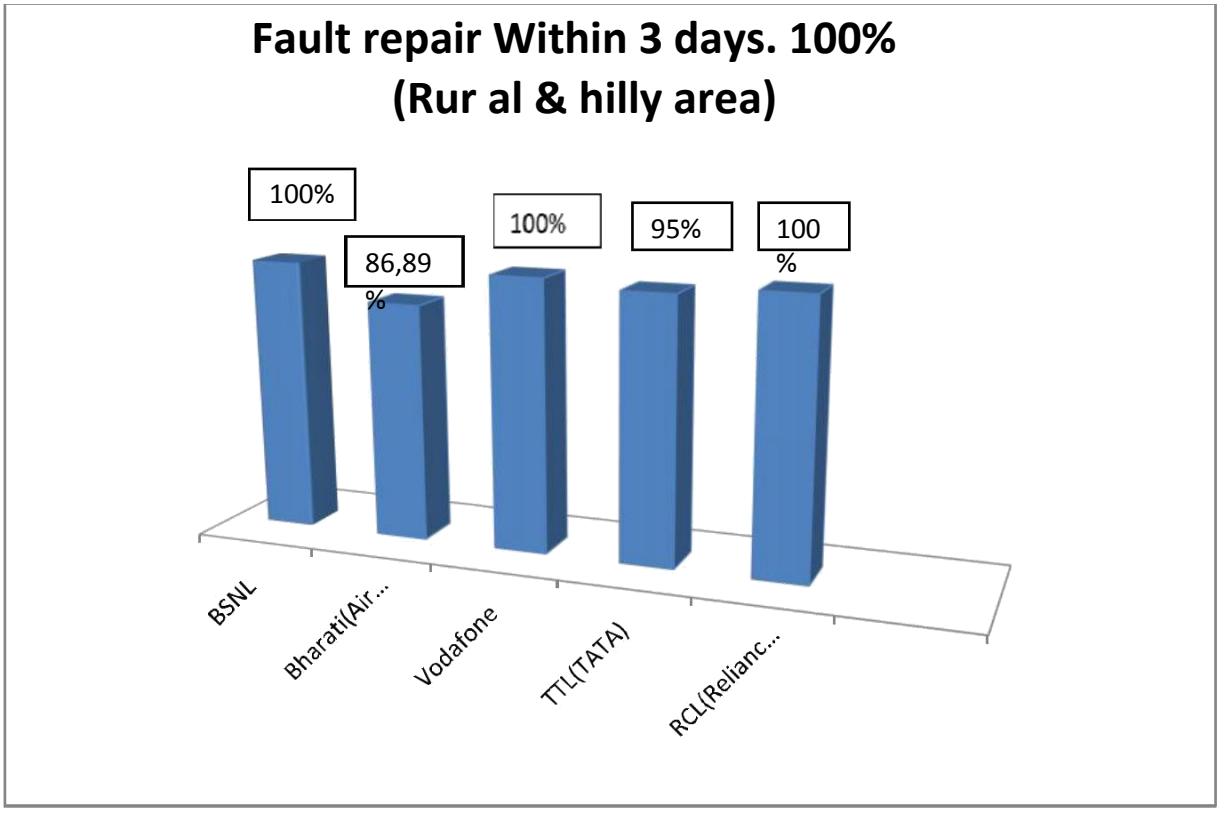
Fault incidences:



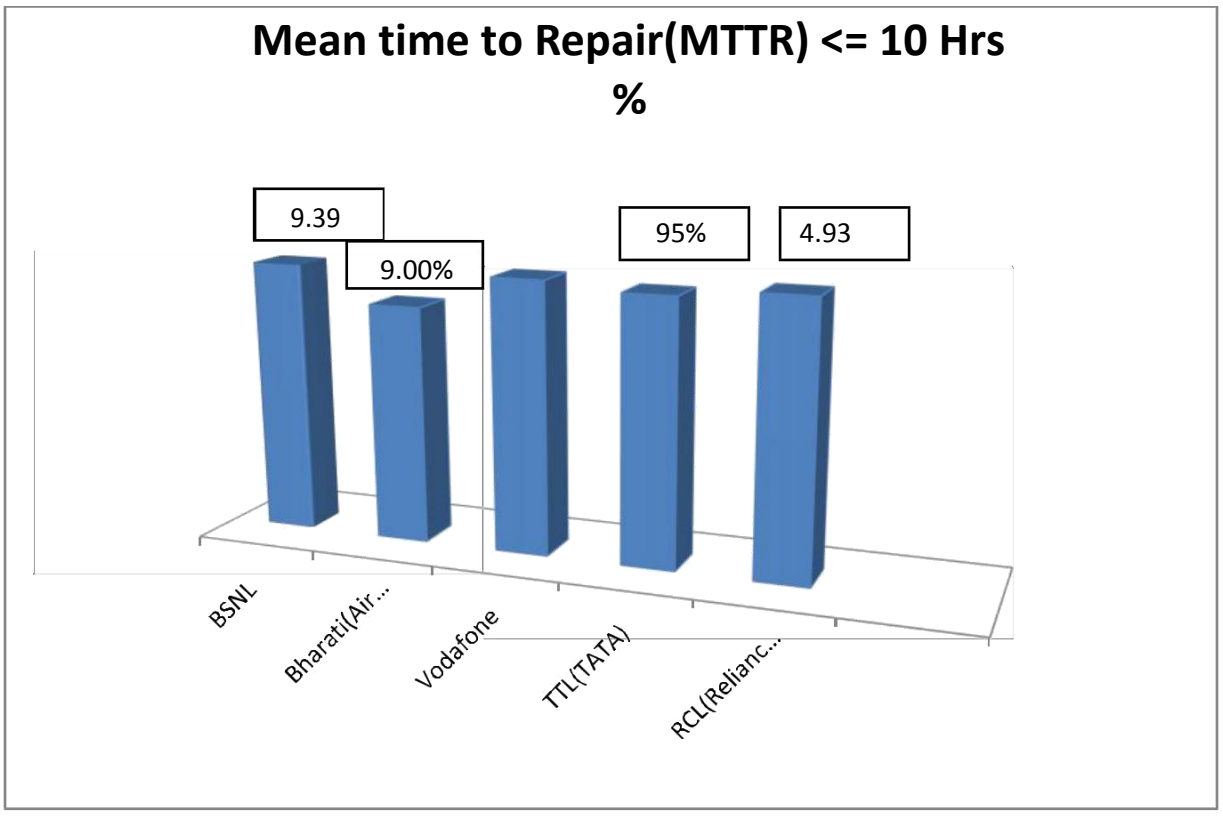
Faults Repair/Restoration Tim e



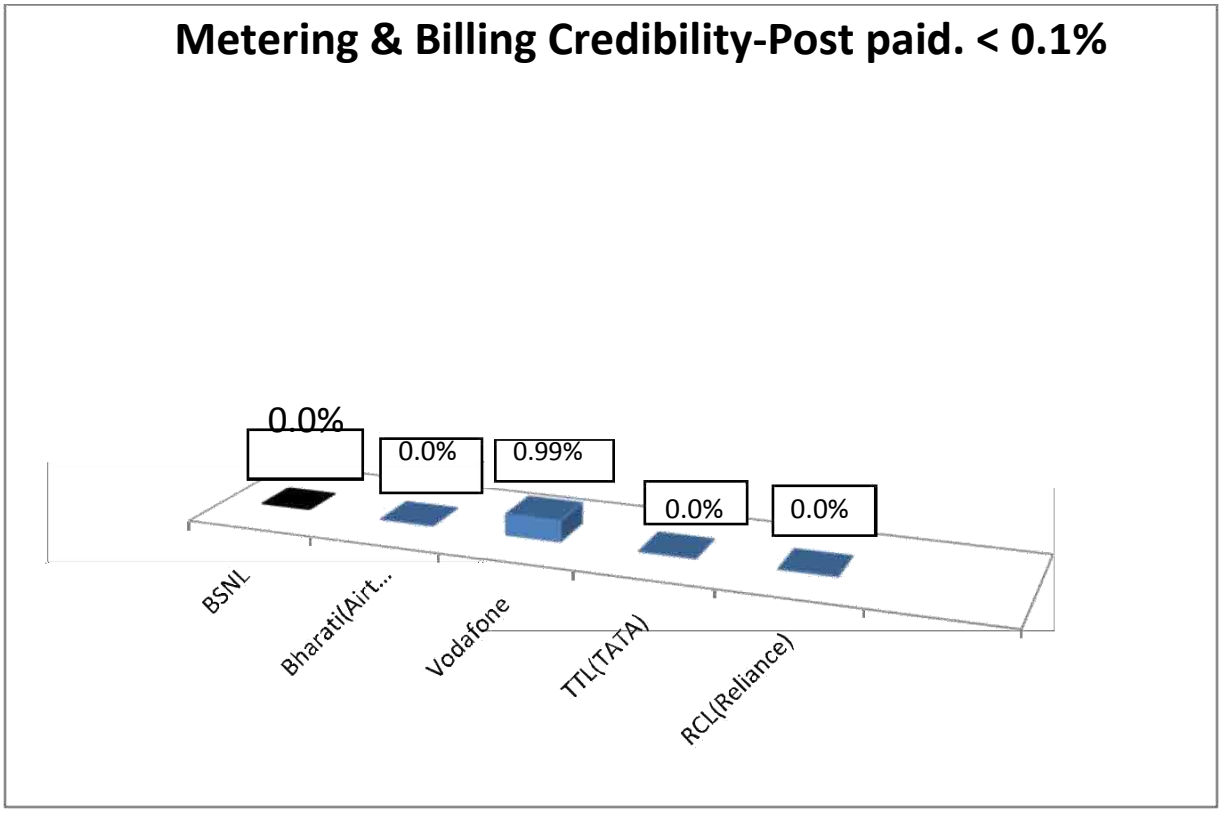

Fault repair By n ext working day >75%(Rural & hilly area)
81.68%
NA
N
A
NA
NA
BSNL
Bharati(Airtel)
Vodafone
TTL(TATA)
RCL(Reliance)

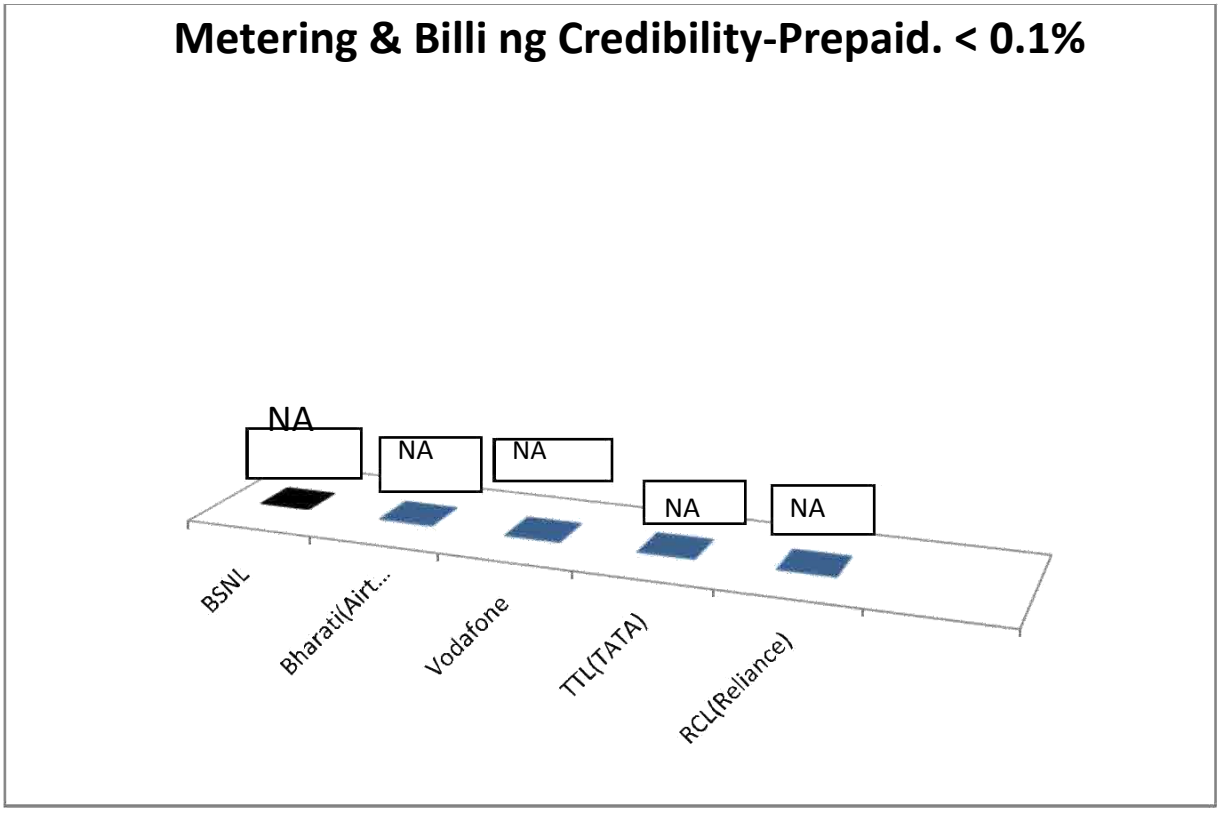

Fault repair Within 3 days. 100%
(Rur al & hilly area)
100%
86,89 %
100%
95%
100 %
BSNL
Bharati(Air...
Vodafone
TTL(TATA)
RCL(Relianc...

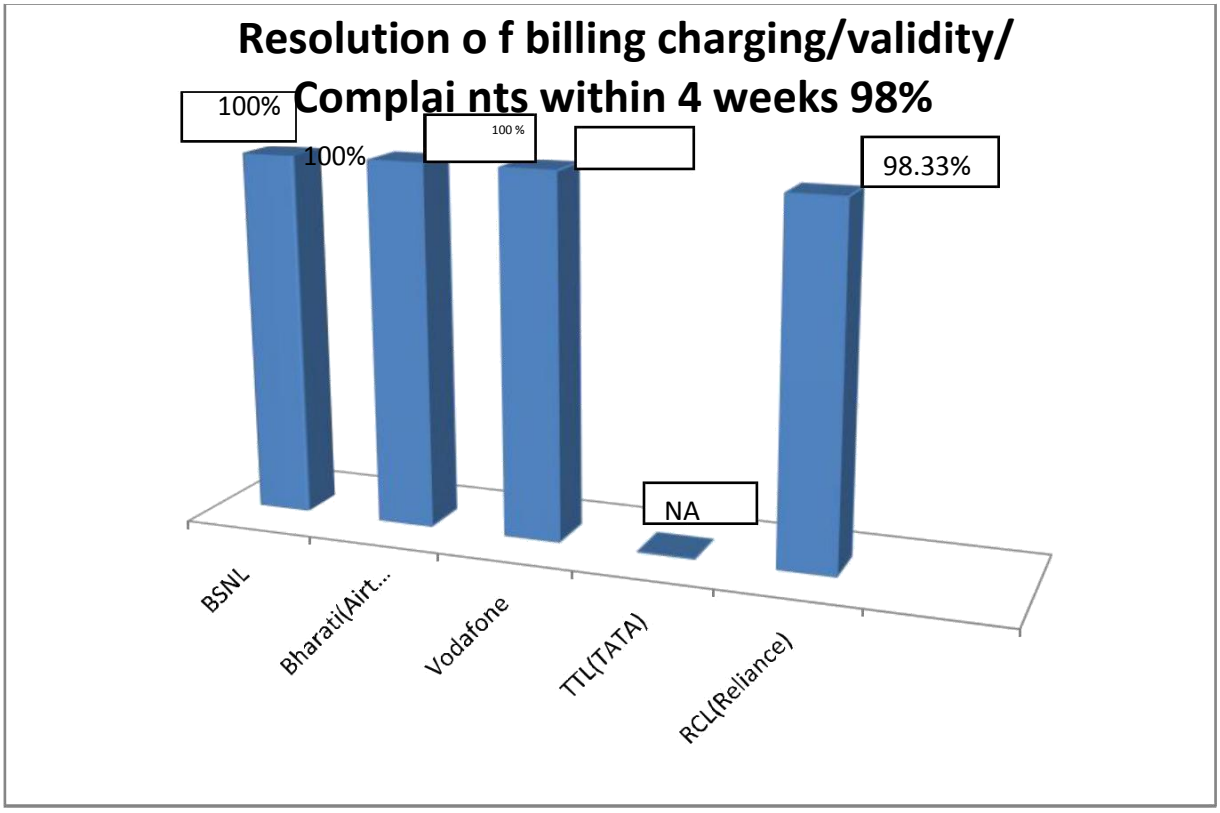
Mean time to Repair (MTTR)

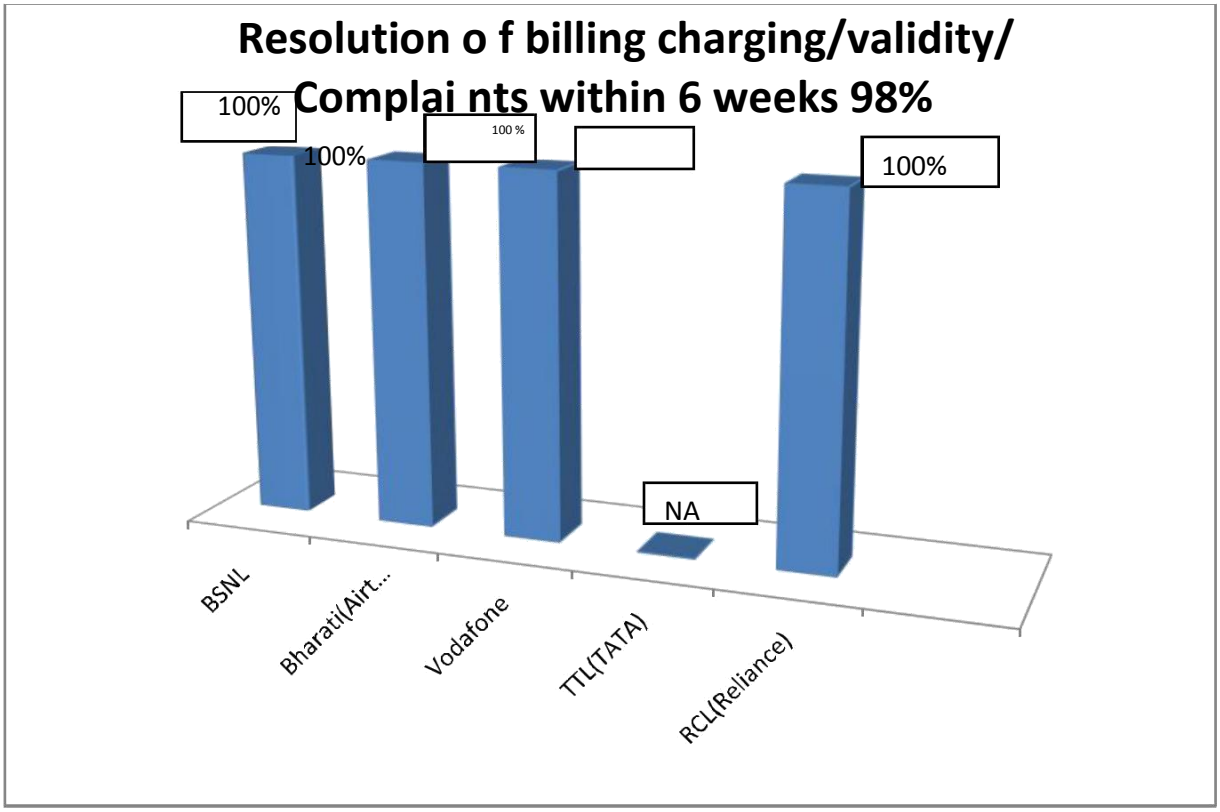


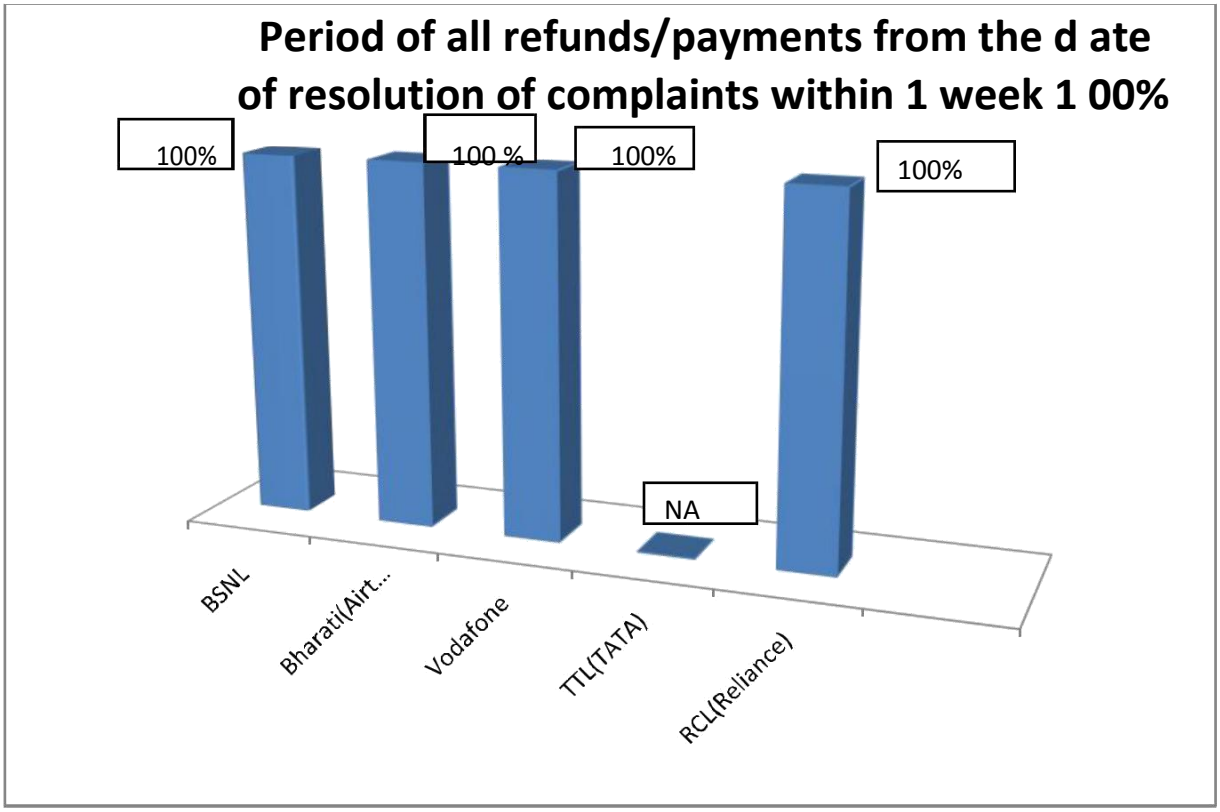
Metering & Billing Performan ce



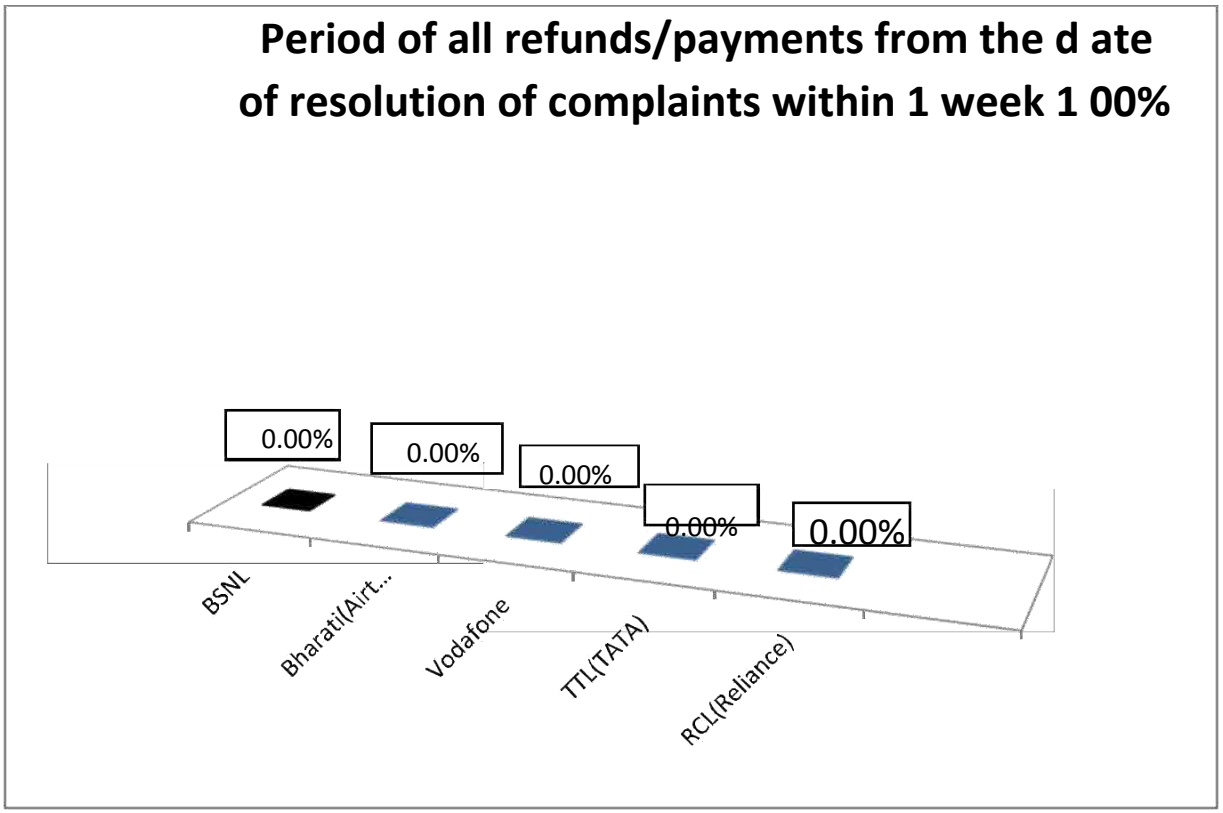

Metering & Billi ng Credibility-Prepaid. < 0.1%
NA
NA
NA
NA
NA
BSNL
Bharati(Airt...
Vodafone
TTL(TATA)
RCL(Reliance)

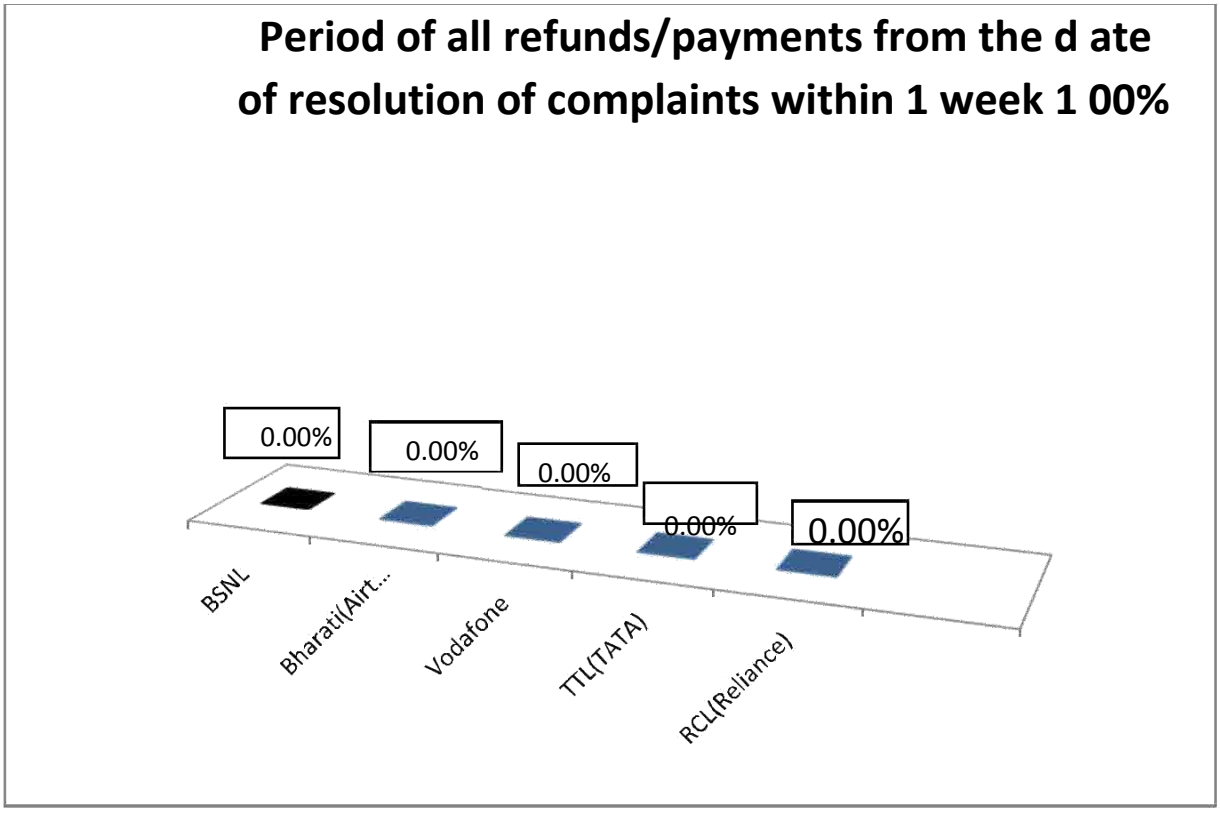

Resolution o f billing charging/validity/
Complai nts within 4 weeks 98%
100%
100%
100 %
NA
98.33%
BSNL
Bharati(Airt...
Vodafone
TTL(TATA)
RCL(Reliance)


Resolution o f billing charging/validity/
Complai nts within 6 weeks 98%
100%
100%
100 %
NA
100%
BSNL
Bharati(Airt...
Vodafone
TTL(TATA)
RCL(Reliance)

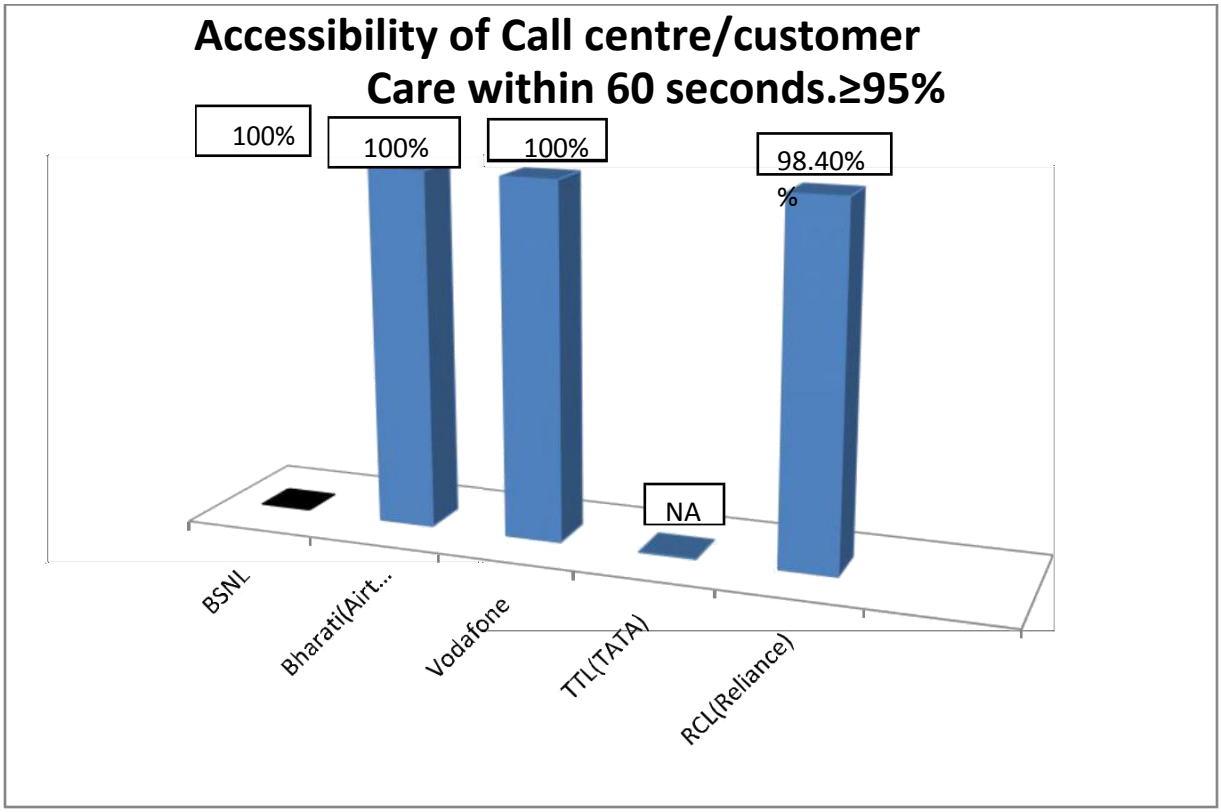

Period of all refunds/payments from the d ate of resolution of complaints within 1 week 1 00%
100%
100 %
100%
NA
100%
BSNL
Bharati(Airt...
Vodafone
TTL(TATA)
RCL(Reliance)

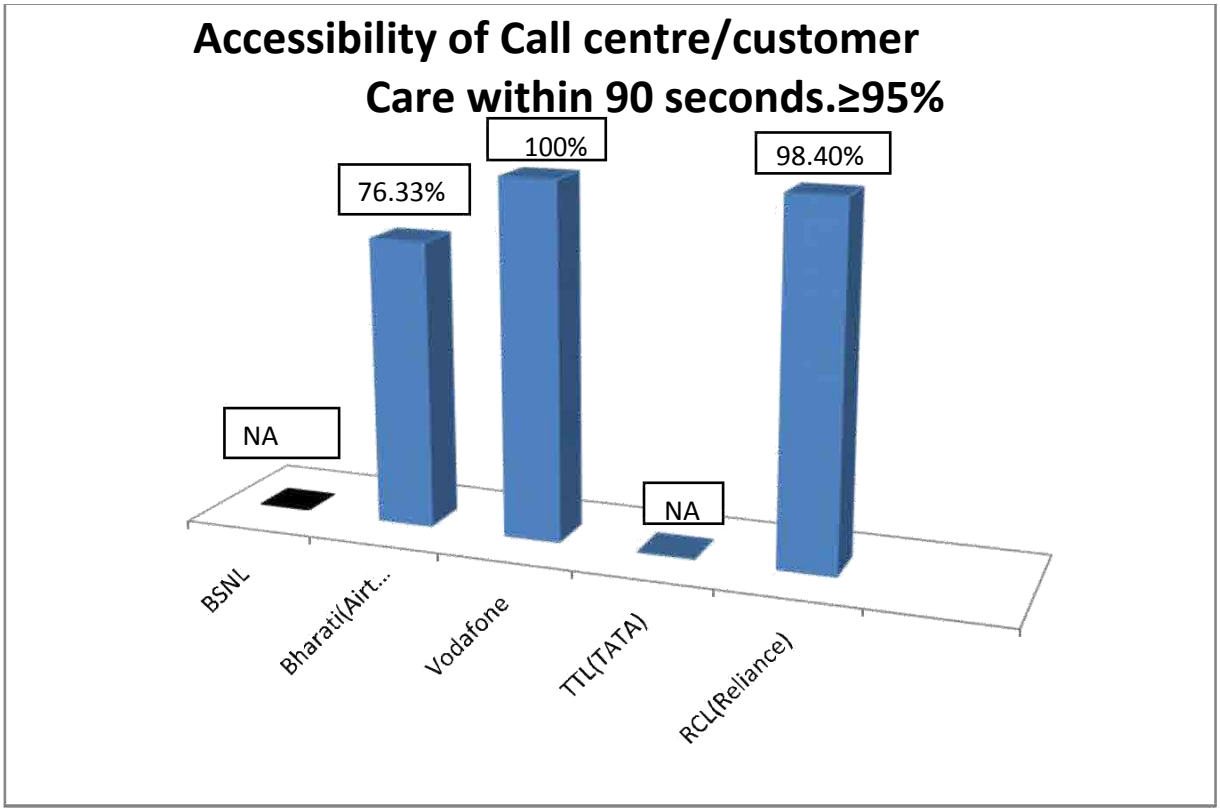
POI Congestion



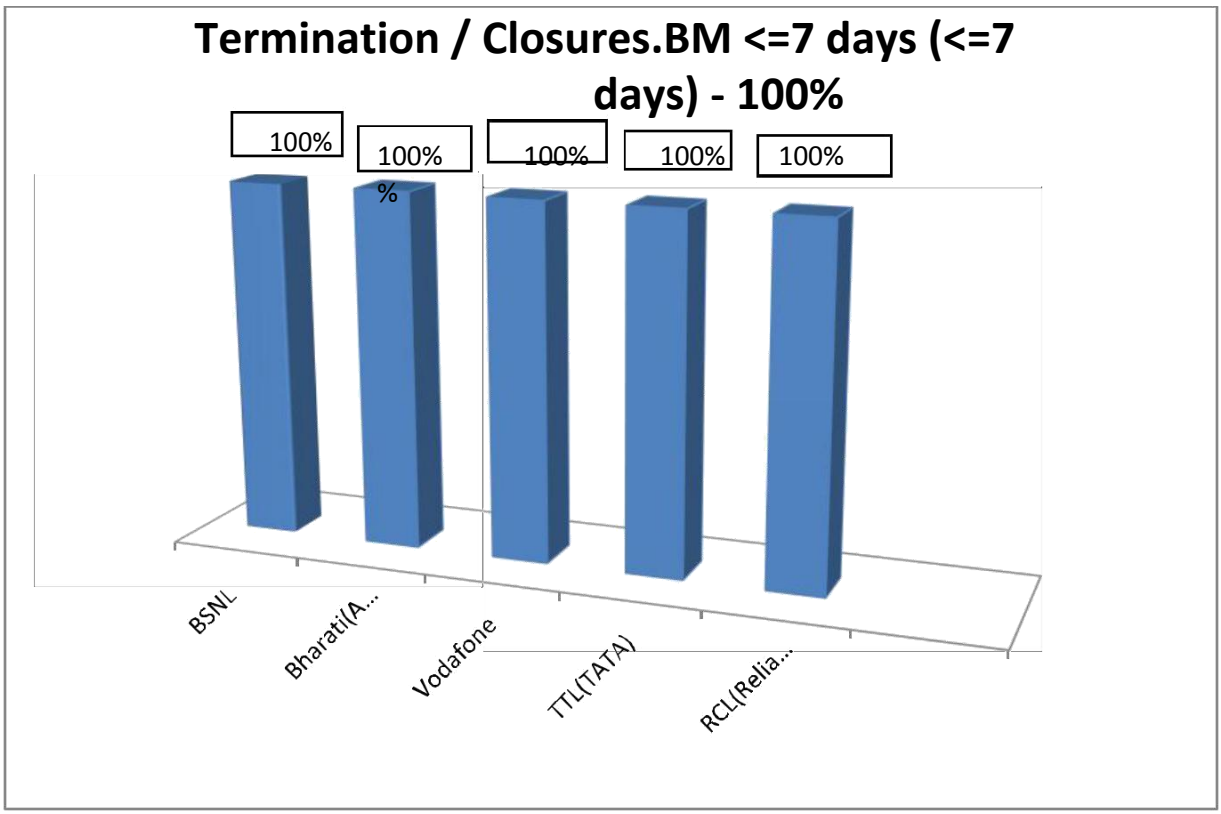

Period of all refunds/payments from the d ate of resolution of complaints within 1 week 1 00%
0.00%
0.00%
0.00%
0.00%
0.00%
BSNL
Bharati(Airt...
Vodafone
TTL(TATA)
RCL(Reliance)

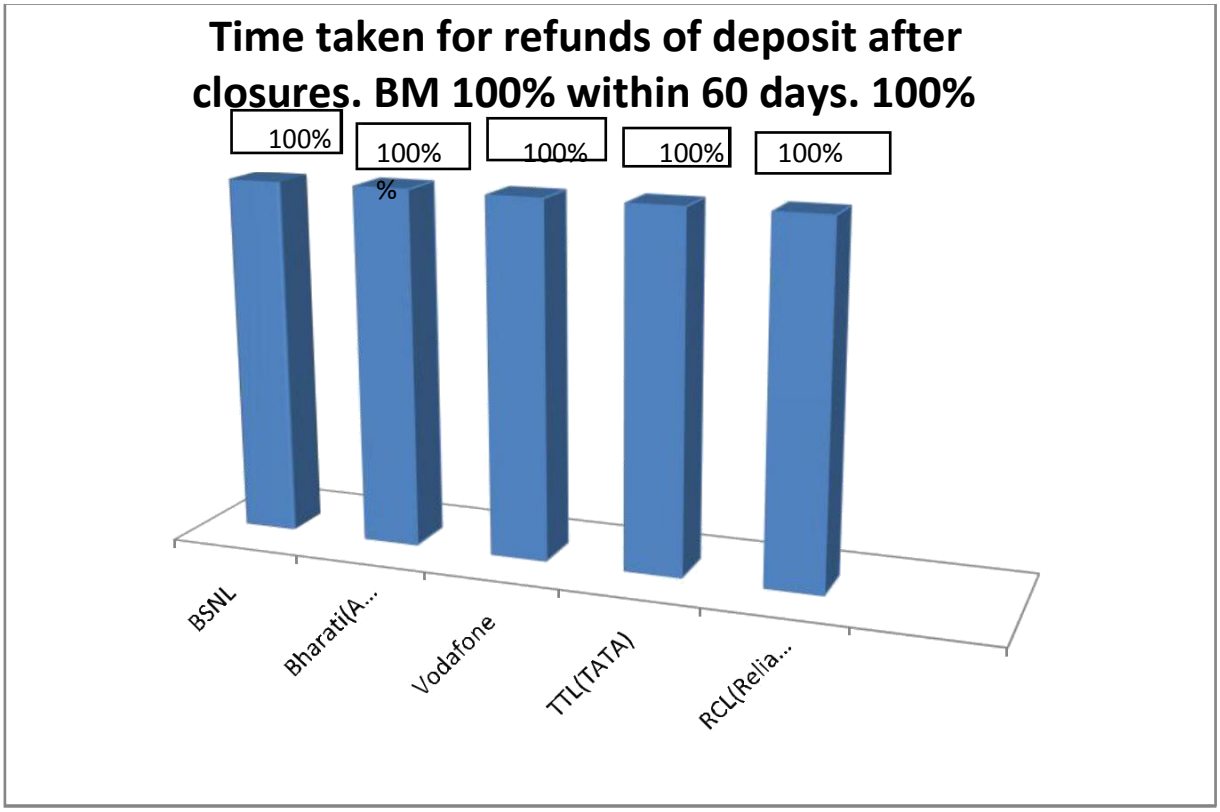
Response Time to customer for assistance




Accessibility of Call centre/customer Care within 90 seconds.≥95%
NA
76.33%
100%
NA
98.40%
BSNL
Bharati(Airt...
Vodafone
TTL(TATA)
RCL(Reliance)

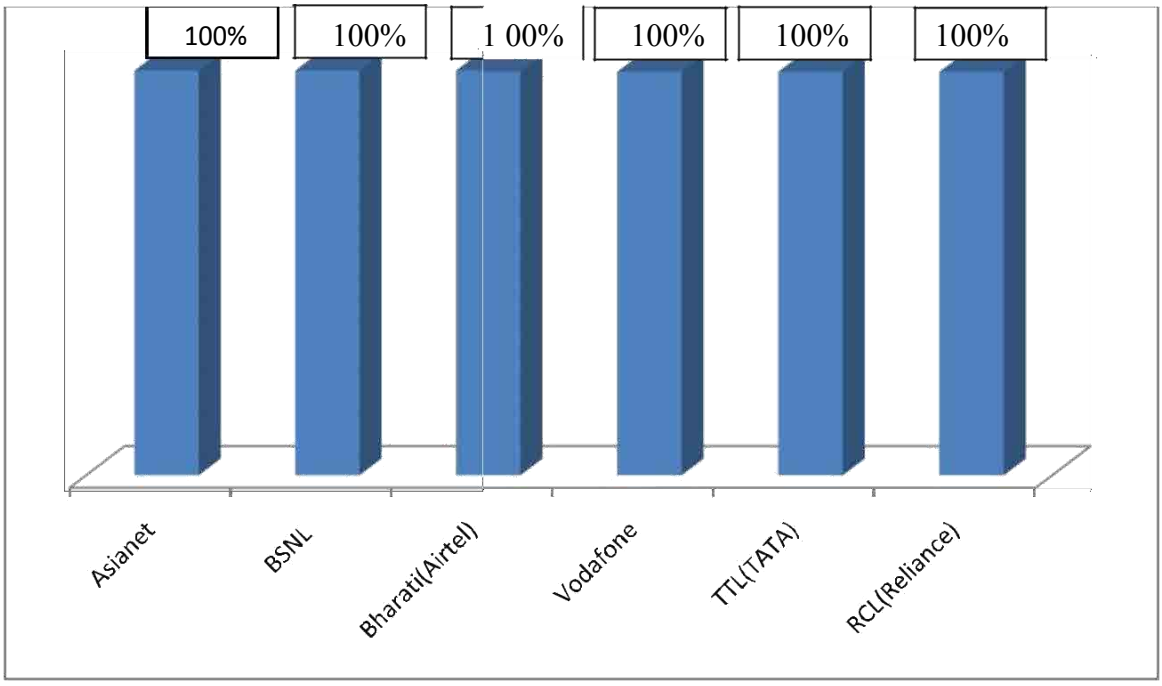
Customer care promptness in attending to customer's request



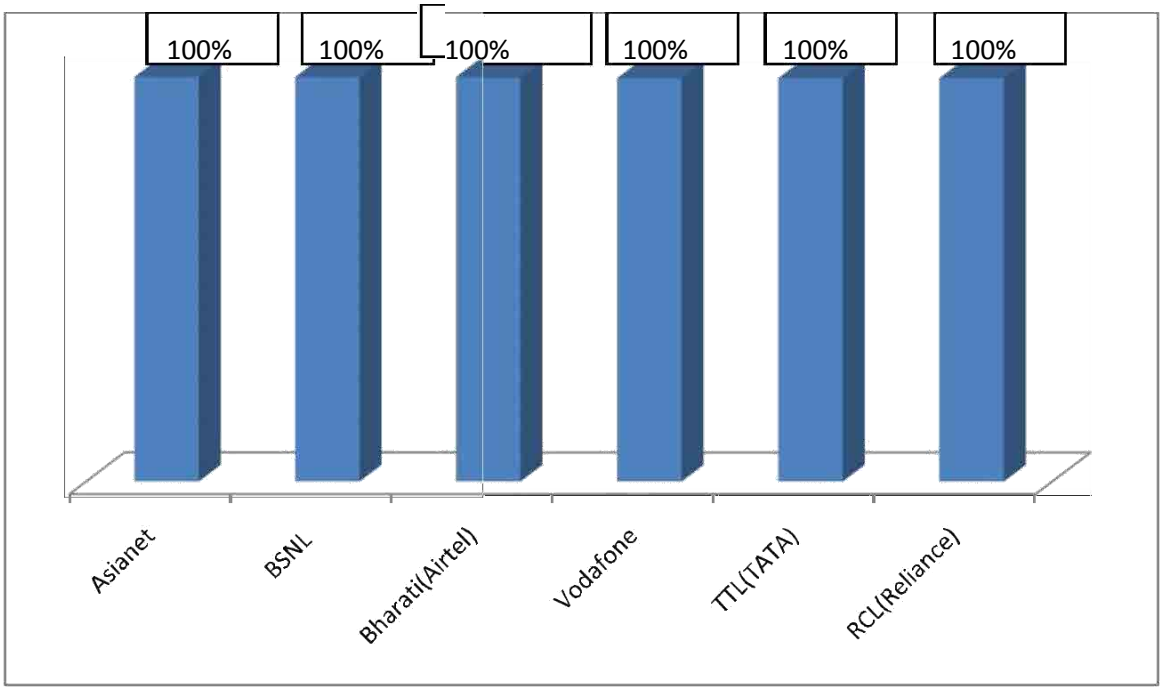

Time taken for refunds of deposit after closures. BM 100% within 60 days. 100%
100%
100%
%
100%
100%
100%
BSNL
Bharati(A...
Vodafone
TTL(TATA)
RCL(Relia...

Broadband Audit Graphical R epresentation:

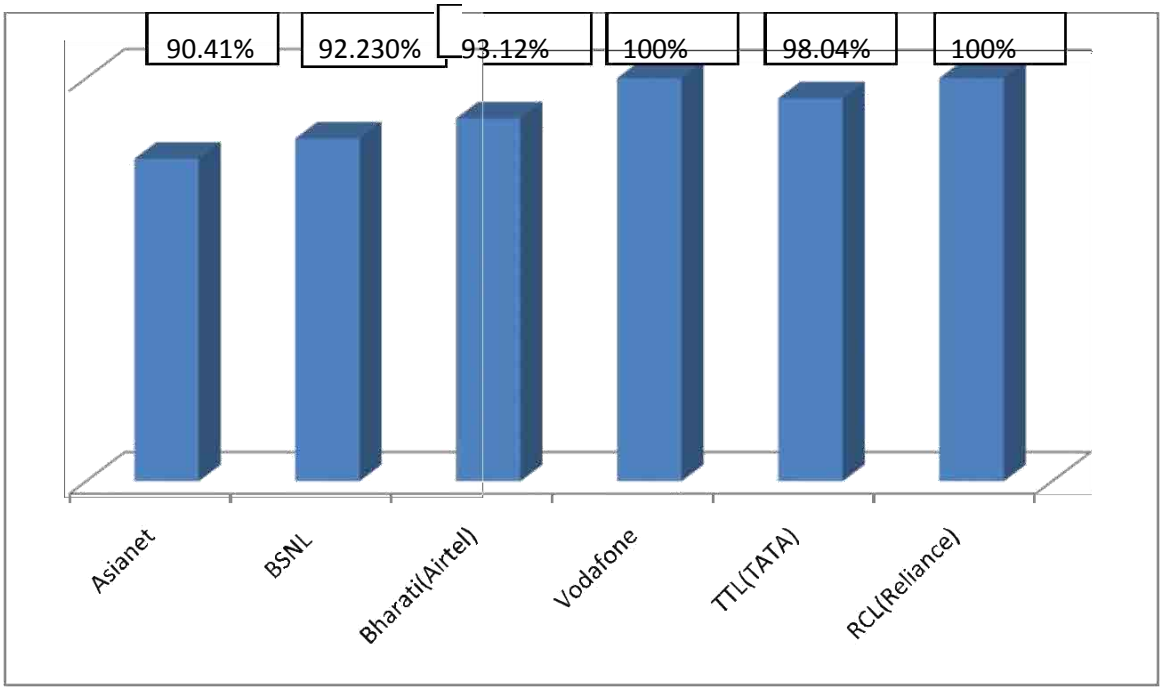
Service Provisioning/Activatio n Time



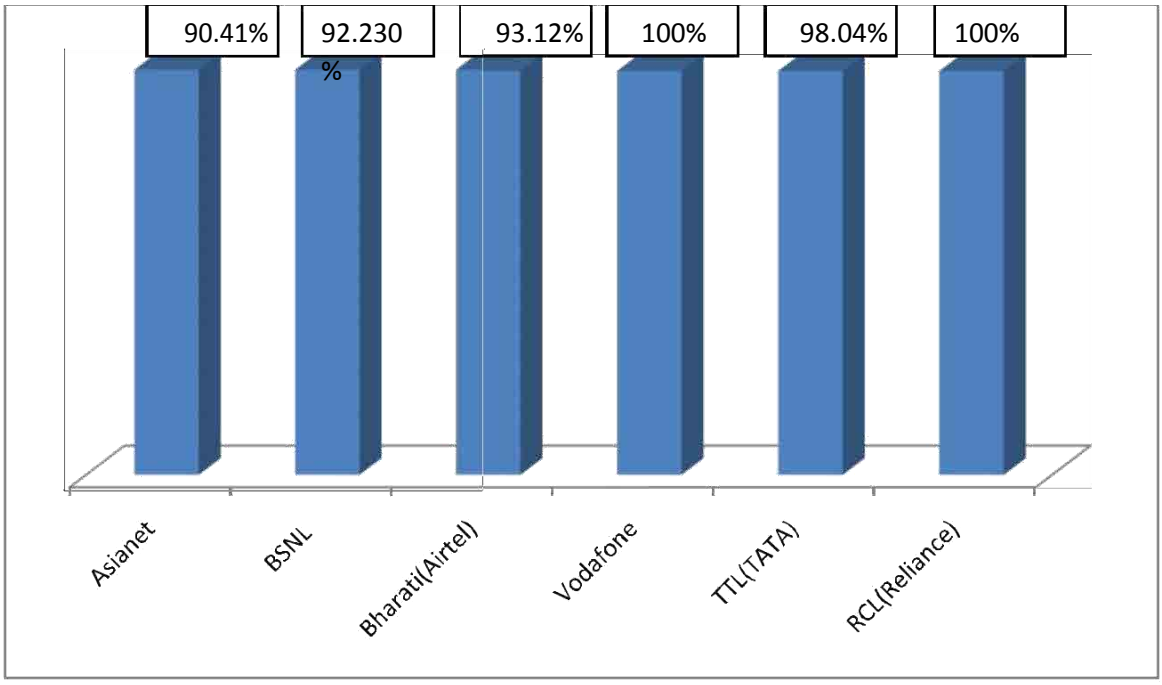
% age of connections provide d within 15 days of registration of demand 100%



Faults Repair/Restoration Time:

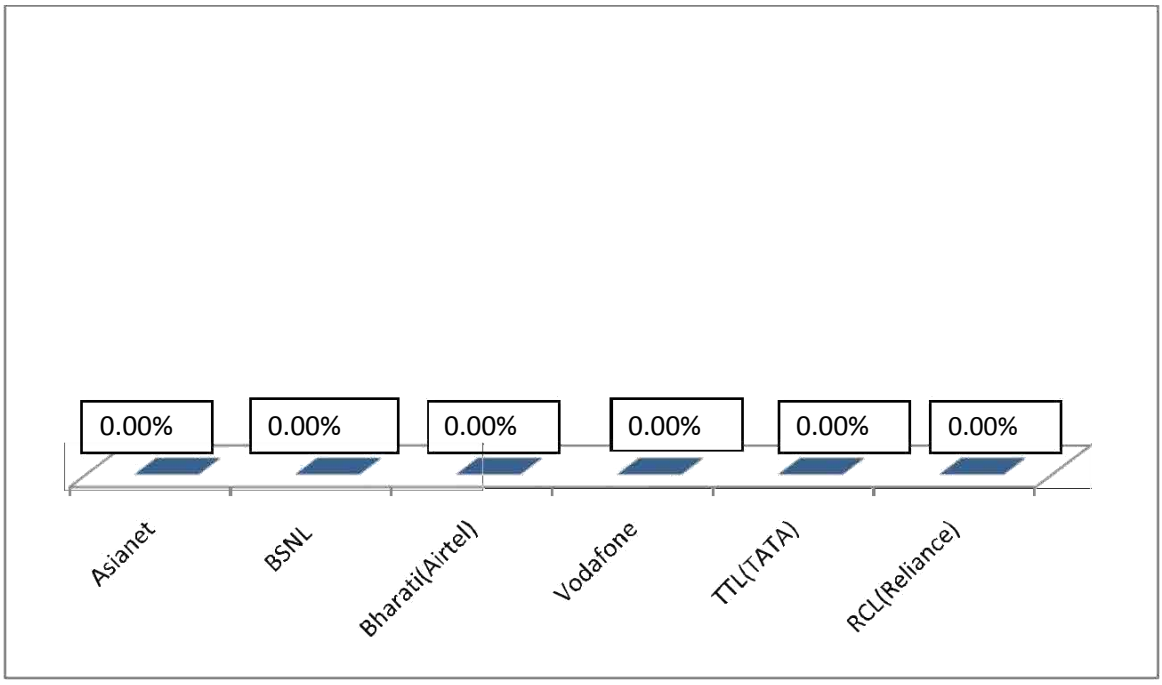


% of faults repaired within 3 working day ≥99%

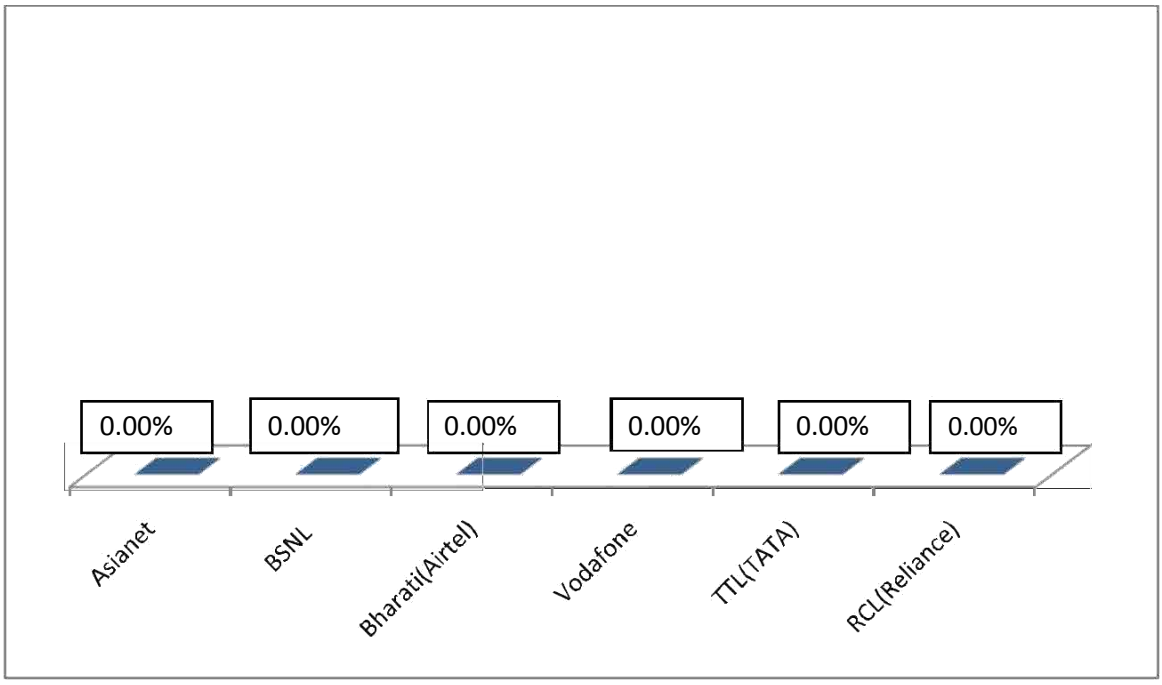


Rent Rebate:

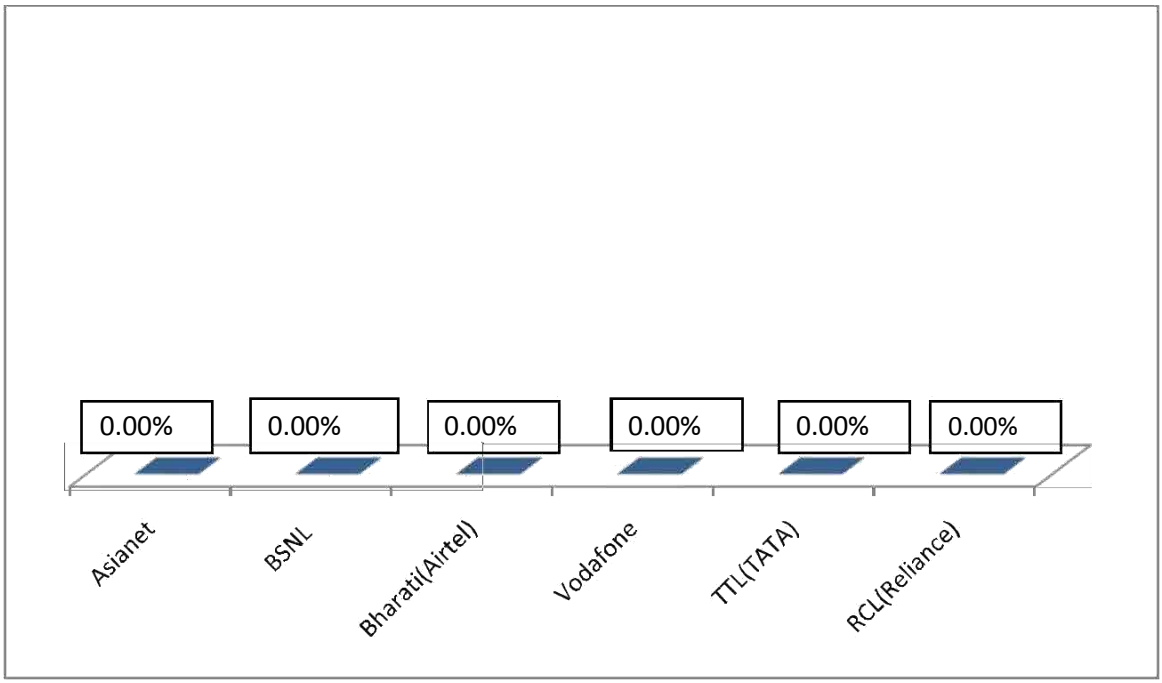
Fault pending > 3 days &<7 days



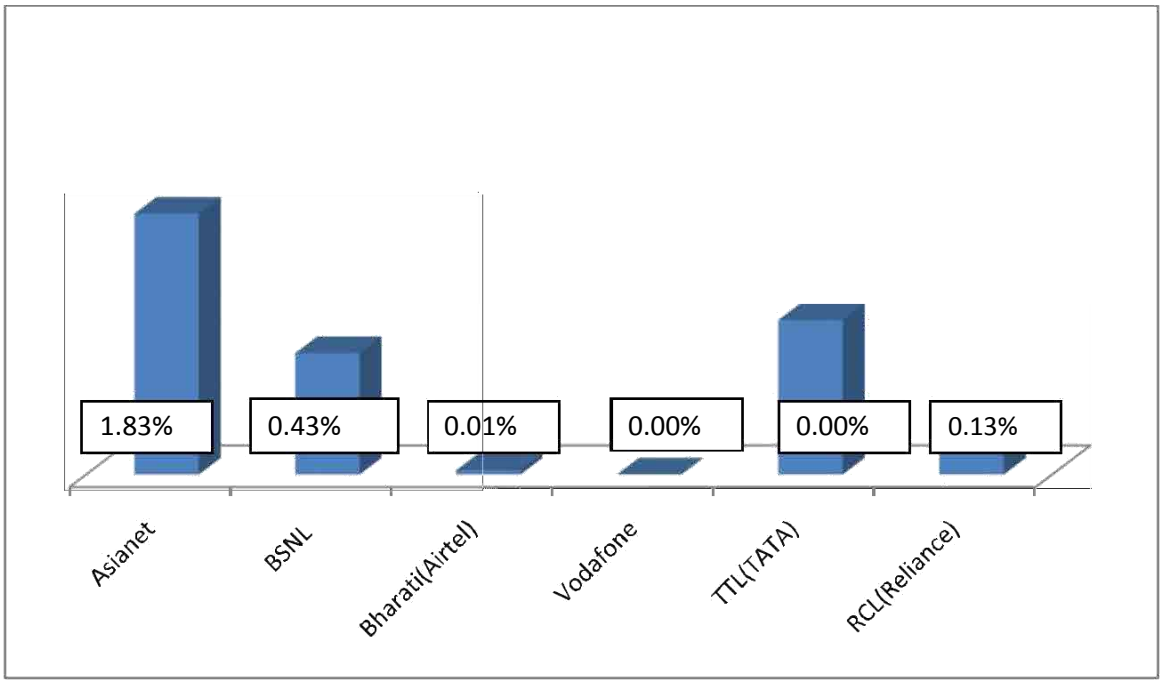
Fault Pending > 7 days &< 15 days



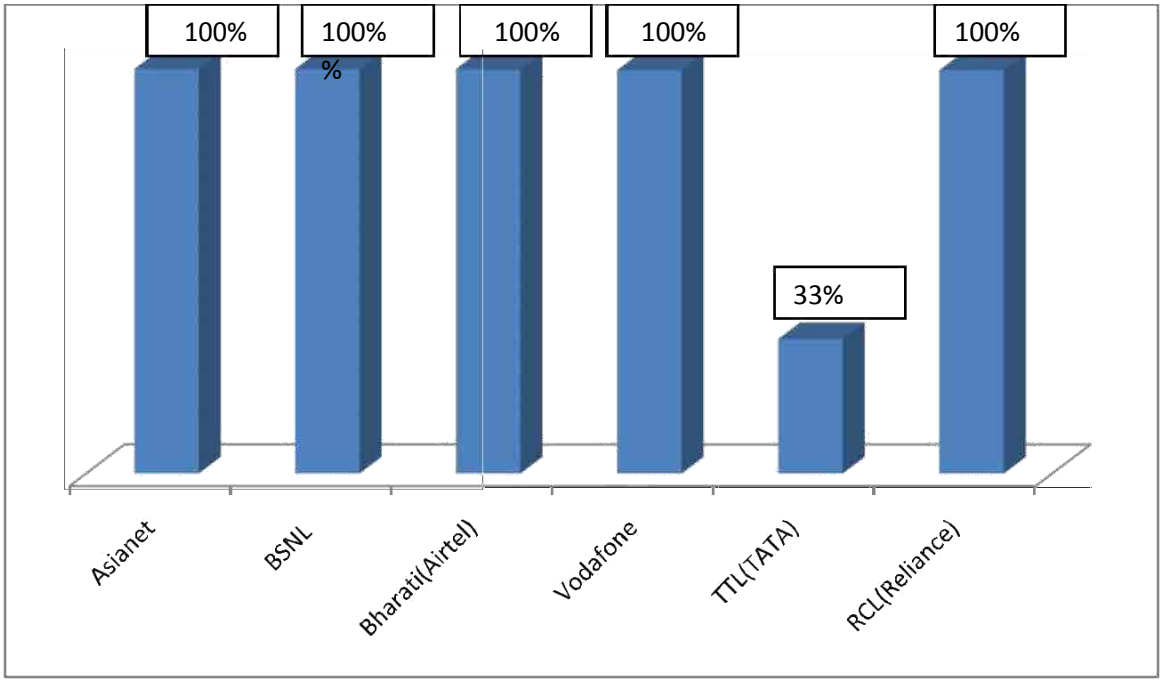
Fault pending > 15 days



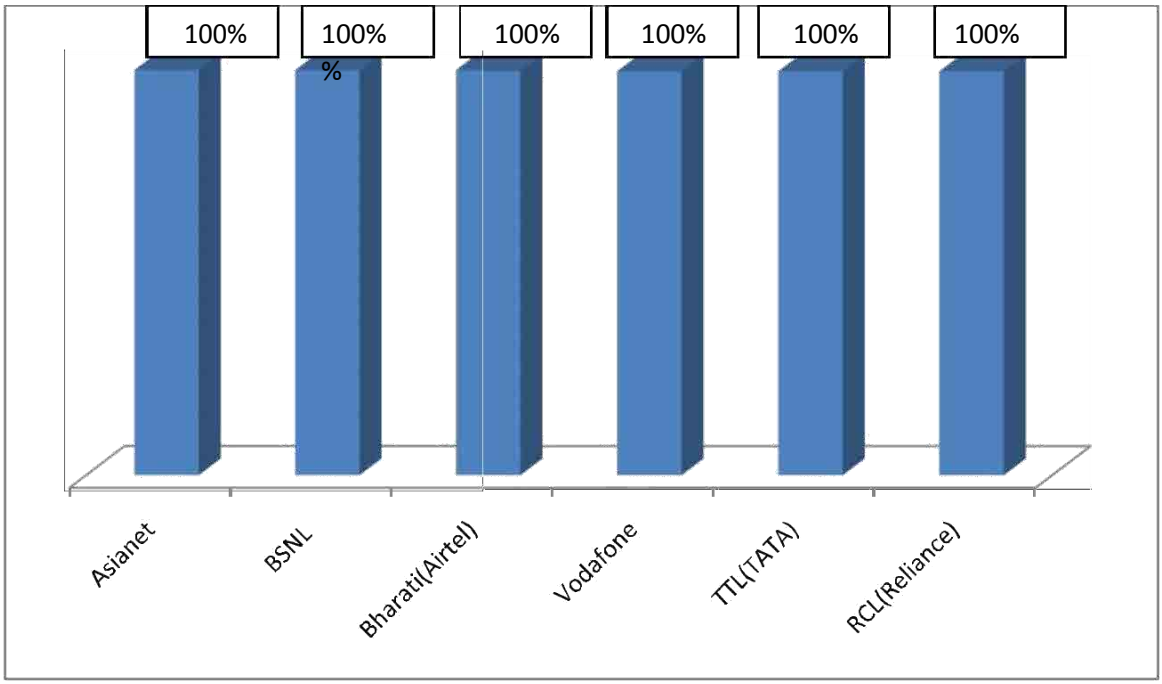
Billing Performance:



%age of complaints resolved within 4 weeks 100%

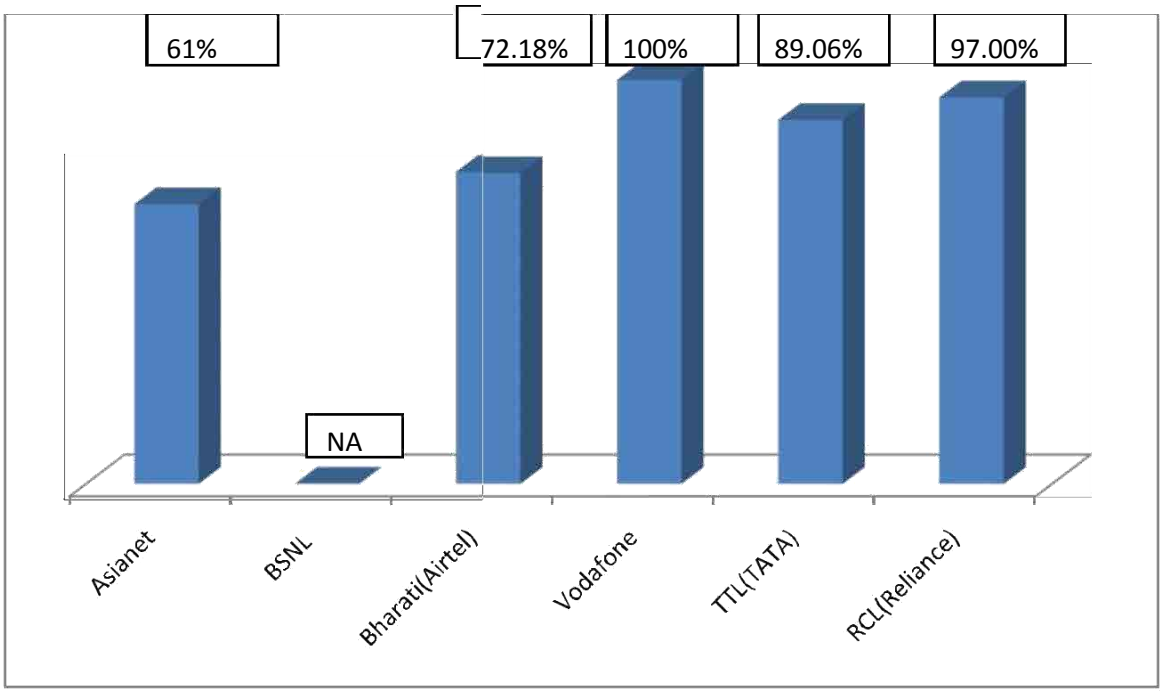


%age of cases to whom refund of deposits is made within 60 days of closures 100%

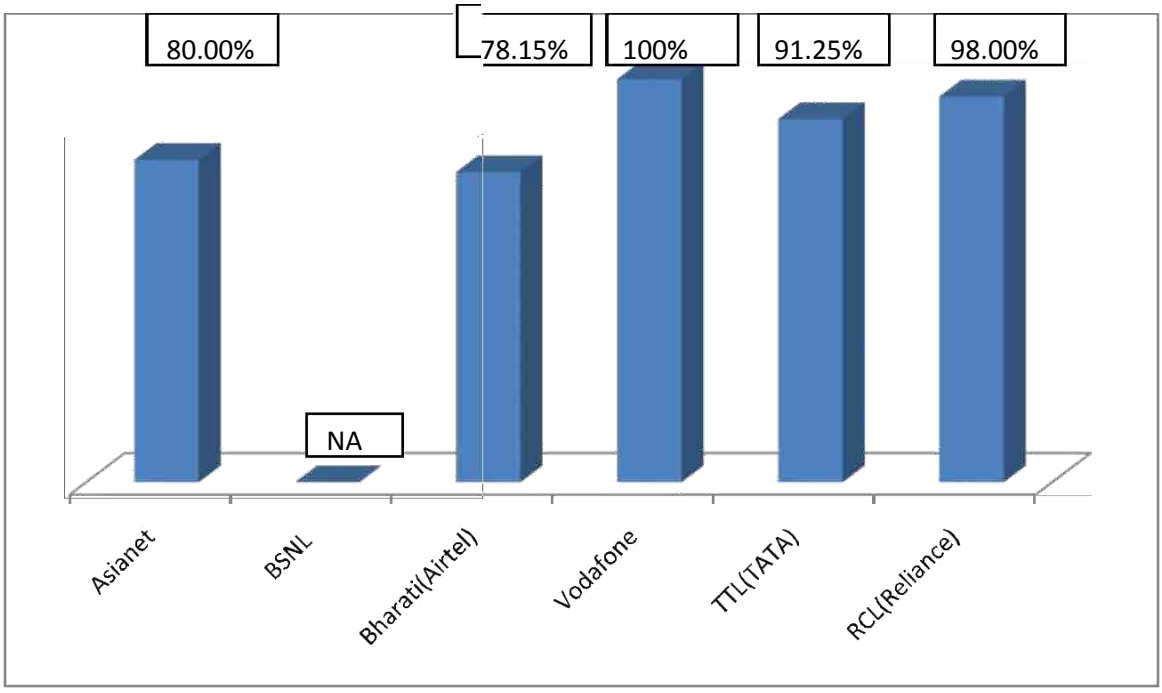


Response Time to the Customer for assistance:

%age of calls answered by op erator (Voice to voice) within 60 sec >60%

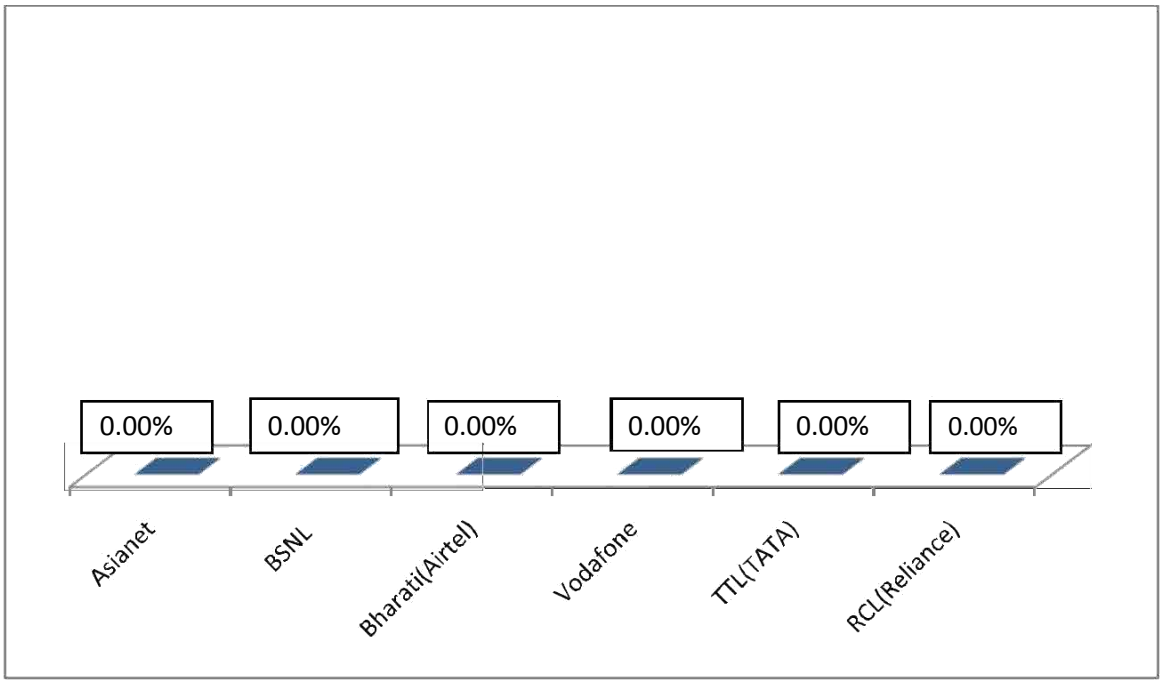


%age of calls answered by op erator (Voice to voice) within 90 sec >80%

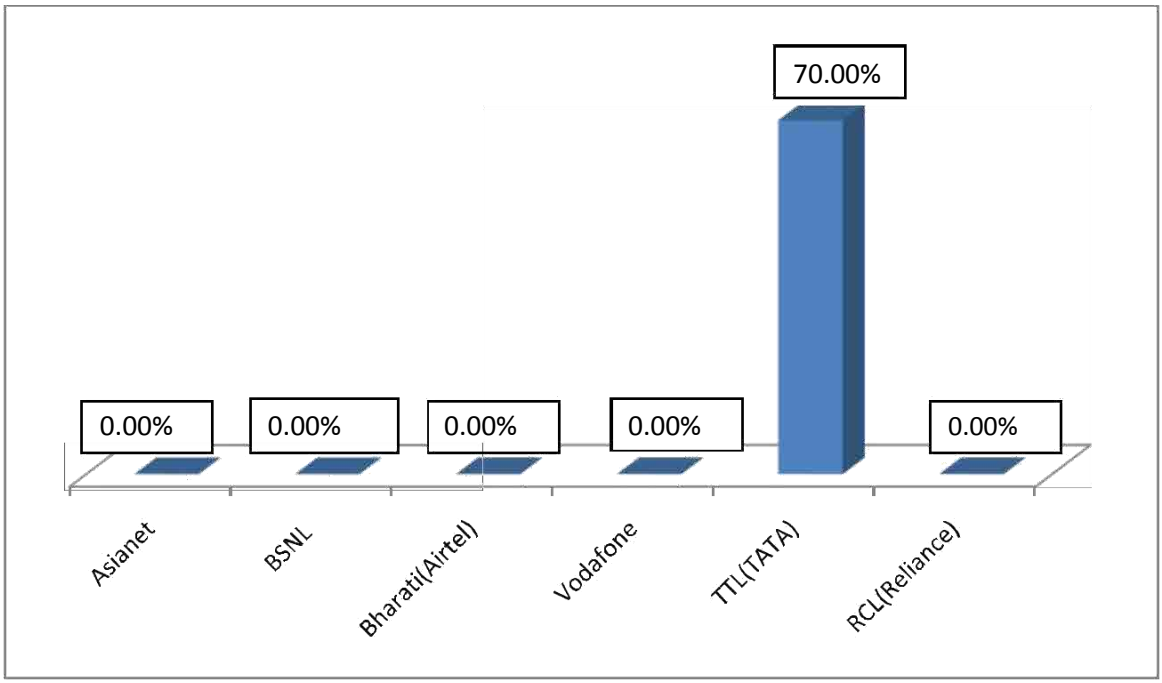


Bandwidth utilization/throughput:

No. of Intra network links having B andwidth utilization >90% during peak hours (TCBH)

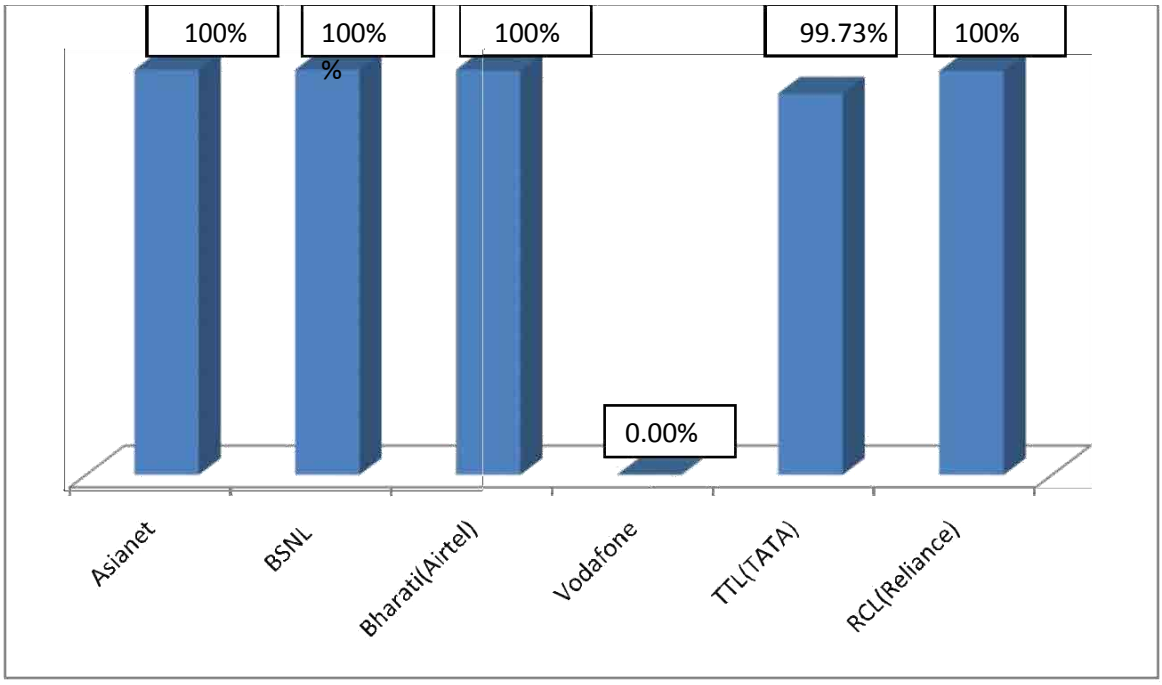


No. of Upstream links for International connectivity having BW utilization >90 % Peak Hrs.(TCBH)



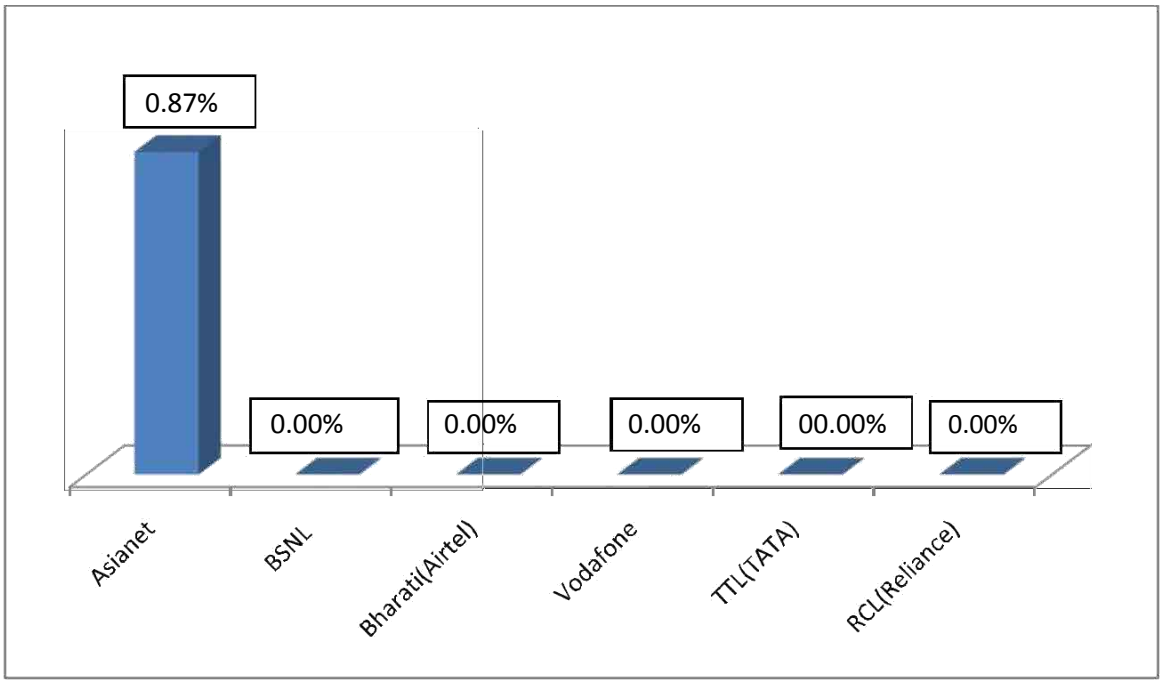
Broadband Connection Speed available (download) from ISP node t o user >80%

Service Availability/Uptime (for all users) in %age:



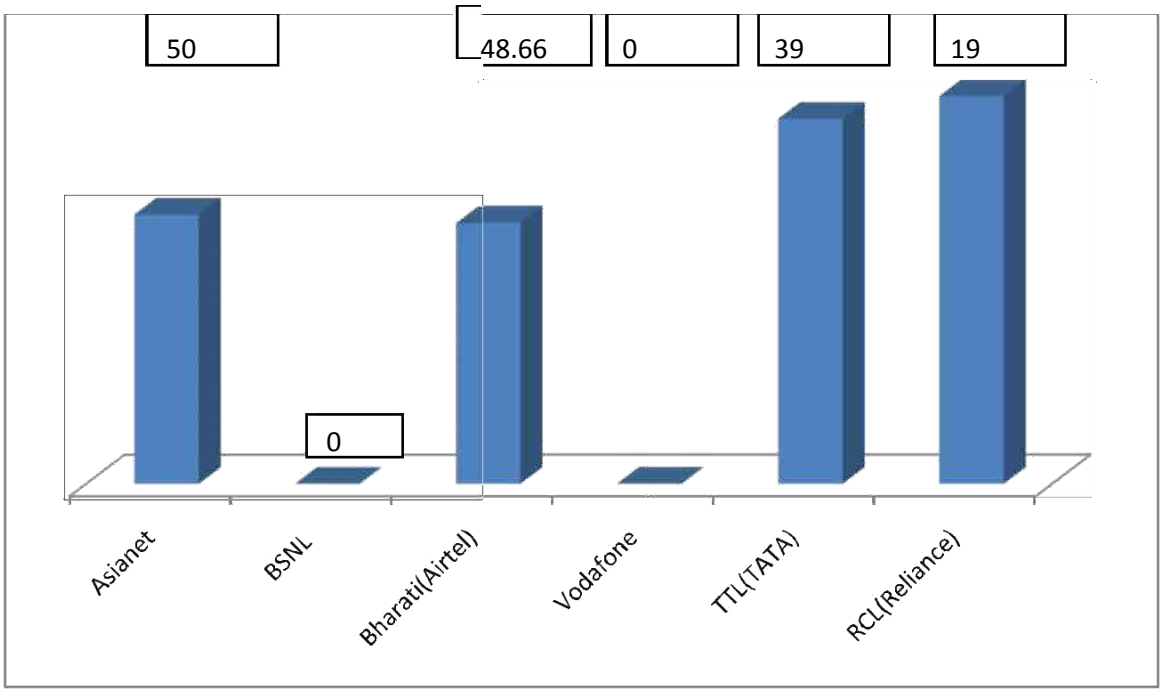
Packet loss:

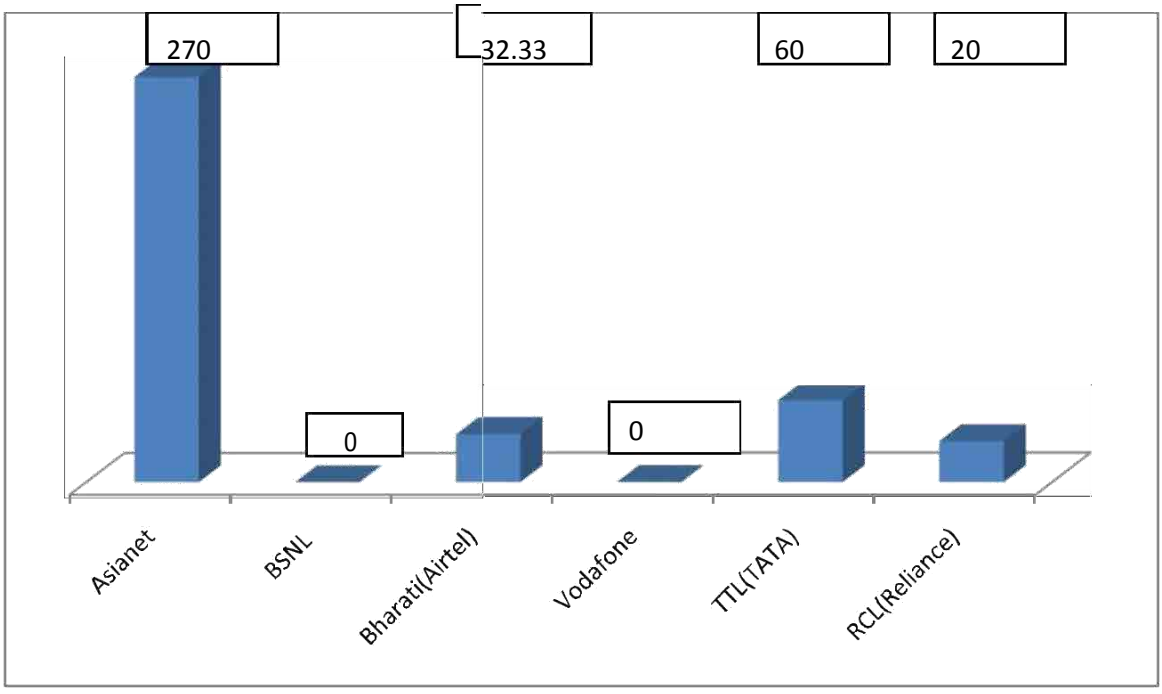
% of Packet loss <1%



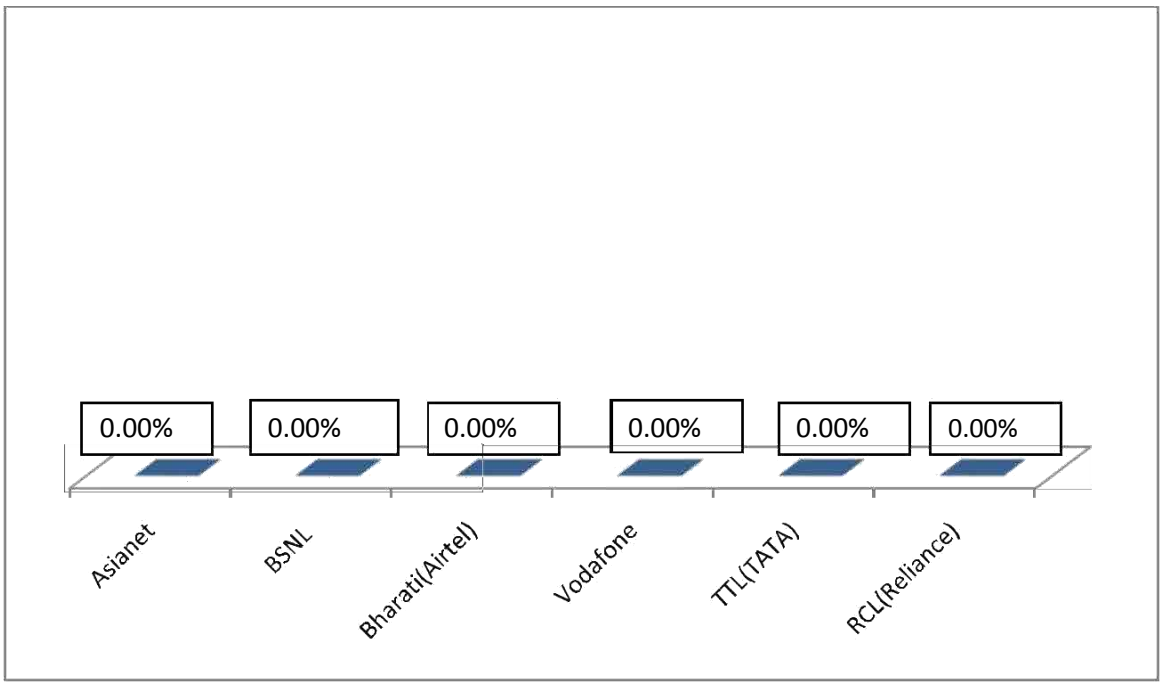
Network latency (for wired broadband access):

User reference point at POP/ISP Gateway node to IGSP/NIXI <120 m sec





User reference point at ISP G ateway node to International nearest NAP port abroad (satellite) <800 msec



Summary:

All operators are meeting bench mark for wireline audit in below all criteria.

- Fault incidences
- Faults Repair/Restoration Tim e
- Rent Rebate- No rent rebates applicable for this quarter.
- Mean time to Repair(MTTR)
- Metering & Billing Performa nce
- POI Congestion
- Response Time to customer f or assistance
- In % age of calls answered by operator (voice to voice) within 90 seconds for all operators used IVR menu. But BSNL data is not available.
- Customer care (promptness in attending to customer's request.

All emergency number getting connected through wirelines as checked and shown in the table of **Level 1 Live calling** except below toll free numbers which found as numbers does not exist.

104 **- Health Information Helpline**

149 - Public Road Transport Utility Service

181 - Chief Minister Helpline

1037 - Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal

Helpline' 1064 - Anti Corruption Helpline Natural Calamities

1071 - Air Accident Helpline

1072 - Rail Accident Helpline

1073 - Road Accident Helpline

1077 - Control Room for District Collector

1097 - National AIDS Helpline to NACO

10580 - Educational& Vocational Guidance and Counseling

1099 - Central Accident and Trauma Services

1097 - National AIDS Helpline to NACO

1077 - Control Room for District Collector

10589 - Mother and Child Tracking (MCTH)

10740 - Central Pollution Control Board

10741 - Pollution Control Board

1514 - National Career Service

155304 - Municipal Corporations

1916 - Drinking Water Supply

- **The toll free number 1056 is only connected from BSNL Wire line.**

All operators are meeting bench mark for Broadband Audit in below all criteria.

- Service Provisioning/Activation Time
- Faults Repair/Restoration Time
- Rent Rebate- No rent rebates applicable for this quarter.
- Billing Performance (Only TTSL not meeting the benchmark).
- Response Time to the Customer for assistance
- Bandwidth utilization/throughput
- Service Availability/Uptime (for all users) in %age.
- Network latency (for wired broadband access).