



TELECOM REGULATORY AUTHORITY OF INDIA

REPORT

ON

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

OF

BASIC WIRELINE, CELLULAR MOBILE TELEPHONE,

AND

BROADBAND SERVICES

FOR

ANDHRA PRADESH CIRCLE
(South Zone)

Report Period: April - June 2014

cs Datamation Research Services Pvt. Ltd

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

Contents

CHAPTER-1: INTRODUCTION	3
1.0 Objectives of the Audit and Assessment of Quality of Service	3
2.0 Scope of work to be undertaken	3
3.0 Quality Parameters to be audited in respect of the Basic (Wire line), Telephone Services, Broadband, and Mobile Telephone Services	3
4.0 Coverage, Sampling & Research Methodology for the Southern Zone (Andhra Pradesh)	10
5.0 Procedure adopted for Quality and Assessment of the Services	11
CHAPTER-2: EXECUTIVE SUMMARY	23
I. Preface	23
II. Findings from Quality of Service Audit (Operator wise for each parameter).....	24
CHAPTER-3: AUDIT –PMR DATA VERIFICATION RESULTS	28
3.0 Cellular Mobile Telephone Service (Network Service Quality Parameter)	28
3.1 PMR Data Verification Results for Quarter 4.....	28
3.1.4 Summarized PMR Data AP Circle (April – June’14)	31
3.2 3 Days Live Test Audit Report	36
3.3 Operator Assisted Drive Test.....	38
3.4 Independent Drive Test.....	40
3.5 Basic Telephone Service (Wireline) Providers.....	42
3.6 Broadband Summarized Quarterly Data of AP Circle (Jan-March’14):	43
3.7 CUSTOMER SERVICE QUALITY PARAMETERS	45
3.8 Redressal	47
3.8.1 Performance (live calling for billing complaints)	47
3.8.2 Live calling to call centre	47
3.8.3 Level 1 Live Calling (Emergency No.): -	48
3.9 Inter Operator Call Assessment	48
CAPTER-4: DETAILED FINDINGS, ANALYSIS AND GRAPHICAL REPRESENTATION	50
4.0 Cellular Mobile Telephone Service	50
4.1 Customer Service Quality Parameters	50
4.2 Summarized PMR Data Results in Table & Graphical	54
4.3 Drive Test Measurements Audit Report	58
4.4 3 Days LIVE Test Summary and Graphical Representation	63
CHAPTER-5: FINDINGS AND ANALYSIS	68

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 (Andhra Pradesh 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 service providers 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 centres with respect to 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 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 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 telephone connection, etc.

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 parameters 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 to be audited and monitored during drive test. All of these parameters have been covered in the Q4.

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/throughput, service availability, packet loss and network latency.

Cellular Mobile Telephone Service:

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

	(b) Worst affected cells having more than 3% TCH drop (call drop) rate	$\leq 5\%$ up to 31.03.2011 $\leq 3\%$ From 01.04.2011	One Month
	(c) connections with good voice quality	$\geq 95\%$	One Month
(iv)	Point of Interconnection(POI) Congestion (on individual POI)	$\leq 0.5\%$	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 per 1000 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	$\geq 95\%$	One Quarter
	(b) Percentage of calls answered by the operators (voice to voice) within 60 seconds	$\geq 90\%$	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 (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: By next working day: $\geq 90\%$ and within 3 days: 100%. For rural and hilly areas: By next working day: $\geq 90\%$ and Within 5 days: 100%. Rent Rebate Faults pending for >3 days and ≤ 7 days: Rent rebate for 7 days. Faults pending for >7 days and ≤ 15 days: Rent rebate for 15 days.	One Quarter
		Faults pending for >15 Days: rent rebate for one month.	
(iii)	Mean Time To Repair (MTTR)	≤ 8 Hrs	One Quarter
(iv)	(a) Call Completion Rate within a local network shall be better than	$\geq 55\%$	One Quarter
	or, (b) Answer to Seizure Ratio (ASR)	$\geq 75\%$	One Quarter
(v)	Point of Interconnection (POI) Congestion (on individual POI)	$\leq 0.5\%$	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	$\geq 95\%$	One Quarter
	(b) Percentage of calls answered by the operators (voice to voice) within 60 seconds	$\geq 90\%$	One Quarter
(xi)	Termination/closure of service	≤ 7 days	One Quarter
(xii)	Time taken for refund of deposits after Closures	100% within 60 days.	One Quarter

(iii) Broadband Service:

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.
(ii)	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 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%

(v)	<p>Bandwidth Utilization/ Throughput:</p> <p>a) Bandwidth Utilization</p> <p>i) POP to ISP Gateway Node [Intra-network] Link(s)</p> <p>ii) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity</p> <p>b) Broadband Connection Speed (download)</p>	<p><80% link(s)/route bandwidth utilization during peak hours (TCBH). If on any link(s)/route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.</p> <p>Subscribed Broadband Connection Speed to be met >80% from ISP Node to User.</p>
(vi)	Service Availability / Uptime	<p>> 90% quarter ending June 2007;</p> <p>> 98% with effect from quarter ending September 2007 and onwards</p>
(vii)	Packet Loss	<1%
(viii)	<p>Network Latency(for wired broadband access)</p> <p>User reference point at POP / ISP Gateway Node to International Gateway (IGSP/NIXI)</p> <p>User reference point at ISP Gateway Node to International nearest NAP port abroad (Terrestrial)</p>	<p><120 msec</p> <p><350 msec</p>

User reference point at ISP Gateway Node to International nearest NAP port abroad (Satellite)
<800 msec

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 under took the audit work for the Mobile services as follows: -.

- (a) 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 for Basic and Cellular Mobile Services with reference to the records maintained by the service provider and the system logs for the period. We generated the quarterly PMR at site and uploaded it on real time basis on the server at TRAI, Delhi.

The PMR report formats and parameters were finalized and any modifications or additions of parameters were undertaken in consultation with TRAI. The scope covered all future PMR parameters 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 parameters specified. The PMRs so generated were up-loaded on the server latest by 7th of the following month.

- (b) Verification of the performance of service providers 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;
- (c) Verification of the performance of service providers against the Quality of Service benchmarks, for the parameters and for the services as specified in clause 1.9, 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;
- (d) Drive tests of the mobile networks of service providers; the results were uploaded live on the server. We carried out an analysis of the drive test and loaded the results giving such information and in such format as agreed by TRAI.
- (e) Audit of the performance of call centers with respect to their accessibility and percentage of calls answered by the operators, test calling and random customer feedback by calling the customers to get feedback of the services of the service providers was also 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: Andhra Pradesh

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 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 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 benchmarks:

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

Sample size for cellular mobile services:

100% Gate way 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 areas in respective Zone in each of the quarterly period.

Number of exchanges to be covered for Basic (Wire line) services:

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 has been audited.

Number of POPs to be covered for Broadband Services:

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. Thereafter, 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 ISP

spread over in 10% (ten percent) SDCAs in 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.

4.1 Primary Data Collection and Quality Control: The primary data was collected only as per the structured questionnaire and through field visits as per mode and protocol indicated and already approved by TRAI.

The primary data was collected by Datamation's RAN Engineers. The following measures, amongst others, were adopted to ensure good quality of data:

- Contents of questionnaire along with techniques and tools used for the survey and data collection after approval of TRAI were shared with all the trained / skilled investigating personnel at the beginning of the survey through orientation;
- Standardized data collection tool and guidelines were designed by the project team;
- Monitoring and supervision of field Engineers was done by team leader and field team leaders.

4.2 Secondary data collection and use: To achieve the set objectives of the survey, information from secondary sources was also used, including information supplied from TRAI and various other relevant media/sources.

Data processing, analysis and Report writing: after collection of data and field work, data processing was done by editing, validation of data for removing duplication or incomplete information, etc. and 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 include 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 undertaken 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 a recent 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: In order to get a correct and meaningful 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 obtain a 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 audit shall be 100 subscribers or 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 /ISP Node of Broadband Service Provider. Here, the total sample size (10% of the applicants in the previous month or 100 whichever is less for every 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% or 100 per service provider per license service area, whichever is less) sample has been drawn randomly to make check back calls. A notice of minimum 3 (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 test calls:

Test calls were made to assess the availability and efficiency of Level 1 services 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:

Level 1 Services 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 (150 per license service area 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 another within the same license were made to judge the ease of connectivity amongst the operators.

A sample of 2 X 50 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 to 1300

Hrs and 50 calls between 1500 to 1700 hrs for basic service and between 1100 to 1400 hrs and between 1600 to 1900 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 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:

(a) Accessibility of call centre/customer care $\geq 95\%$

(b) % age of calls answered by the operator (voice to voice):

Within 60 seconds = 90%

The procedure for assessment of the performance in respect 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 tandem or trunk or gateway MSC out going circuits to IVR of call centre was 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 centre. 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 laid down by TRAI, both post-paid and pre-paid customers were assessed and reported. In this regard para 3.11.4 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 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 2 X 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 between 1000 to 1300 Hrs. and 50 calls between 1500 to 1700 hrs.) for basic telephone service (wireline) and similarly, 2X50 calls to the call centre of each service provider (50 calls between 1100 to 1400 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 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 details 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 complaint handling through live test at the call centre
- 100 Nos. of service complaints / requests and 100 Nos. of billing related complaints shall be taken up by the auditing agency for verifying their redressal 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, redressal and refunds of payment
- Checking of customer complaint handling through live test at the call centre
- 100 Nos. of service complaints/ requests and 100 Nos. of billing related complaints were 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 redressal there of
- Checking of customer complaint handling through live test at the call centre
- Service complaints/ requests and billing related complaints shall 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 Bandwidth Utilization/Throughput including Broadband Connection Speed, Packet Loss and Latency shall be measured on sample basis.

The detailed methodology for each Quality of Service parameter as given in the Explanatory Memorandum to the Quality of Service of Broadband Service Regulations, 2006 dated 6th October 2006 (11 of 2006) was followed. The signature of the Nodal Officer nominated by the service provider for coordination with the audit agency were 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 centre 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 at 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 TRAI.
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 reported 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 data on a scale from 0 to7 for GSM and FER value for 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 resolution	We checked the billing complaints for which credit/waiver/adjustment were made on resolution of the complaints within one week.
xi)	Termination/closure of service	The data was 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 that 100 % deposits should be 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.

There are 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 deficiency 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 month for each service provider covering a minimum distance of 100 kilometers in city area and adjoining are as including important indoor sites. These cities were proposed and finalized by TRAI. The results of analysis of data generated during such drive tests were uploaded, immediately on completion of the drive test, to the central server at TRAI.

Independent Drive Tests: We did independent drive tests in Q4 spread across the contracted zone limited to a maximum of 10 drive tests per licensed service area, in a year. The location for these drive tests was selected based on the subscriber complaints being received by TRAI or as decided by TRAI. Independent drive test covered a city and adjoining areas covering a minimum distance of 100 kilometers including congested areas 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 the routes 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 between 10 am and 8 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 was kept at around 30-50 km/hour (around 30 km/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 unit's antenna was placed at the same height and in the same vehicle. Moreover, the height of the antenna was uniform in case of all service providers.

6.0 Reporting Formats:

We developed data formats including executive summary, critical findings and detailed data analysis thereof for reporting the results of such audit and assessment. We submitted to TRAI sample design and sample reporting formats within 4 weeks of signing 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 are 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 findings on audit and assessment of QOS provided by service providers carried out in accordance with Clause 2 above. The report contained performance of each service provider for each licensed service area against the Quality of Service parameters. The report also contained a comparative analysis of 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 say (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 incorporating modifications and corrections suggested by TRAI and its acceptance	D+8 weeks
3.	Commencement 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 of 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

I. Preface

This report presents the growth trends for the telecom services in India for the quarter ending June 2014. 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** (Andhra Pradesh) in 4th quarter (April–June 2014). The primary data collection and verification of records (PMR data verification – quarterly) maintained by various operators was undertaken during the period April – June 2014.

Following are the various operators covered in Andhra Pradesh circle (South Zone) for Cellular Mobile (Wireless) services QoS audit & assessment. The Month of audit & TCBH information is also given below:

S.I.	Name of Service Provider	Month of Audit	TCBH Hour
GSM Operators			
1	Aircel Ltd	April- June' 14	1900-2000 Hrs
2	Airtel Ltd	April- June' 14	1900-2000 Hrs
3	BSNL	April- June' 14	1900-2000 Hrs
4	Idea	April- June' 14	1900-2000 Hrs
5	Reliance Communication (GSM)	April- June' 14	1900-2000 Hrs
6	Tata Communications (GSM)	April- June' 14	1900-2000 Hrs
7	Uninor	April- June' 14	1900-2000 Hrs
8	Vodafone	April- June' 14	1900-2000 Hrs
CDMA Operators			
9	Reliance Communication (CDMA)	April- June' 14	1900-2000 Hrs
10	Tata Communications (CDMA)	April- June' 14	1900-2000 Hrs

II. 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-**

- **Andhra Pradesh Circle (April'14)** - From the month Data Assessment, it is found that Aircel 2G and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **Andhra Pradesh Circle (May'14)**: From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **Andhra Pradesh Circle (June'14)**: From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **Andhra Pradesh Circle(April- June'14)**:- From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM 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 (4th Quarter), Andhra Pradesh 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 (2G& 3G) and TATA GSM is not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate in all 3days.
- Uninor is not meeting the benchmark for BTS accumulated downtime in 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).

❖ **Andhra Pradesh Circle:**

- Rcom GSM in Guntur & Krishna and Rcom CDMA in Guntur are not meeting the benchmark of **Blocked Call Rate**
- Rcom CDMA in Krishna and TATA CDMA in Warangal are not meeting the benchmark for **Dropped Call Rate**
- All service providers are meeting the benchmark Voice Quality 0-4 w/o frequency hopping.
- Rcom GSM and TATA GSM operators are not meeting the benchmark in Guntur for Voice Quality (0-5 (with frequency hopping)).
- Rcom GSM operators are not meeting the benchmark in Guntur for **Call Setup Success Rate**.

➤ **Independent Drive Test:-**

The Independent Drive Test was conducted for 4 Operators in 10 different Area as per the customer complain data. 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)

- BSNL in Kadapa, Rcom in Rajmundary, Rcom, BSNL and Airtel in Vizag and BSNL, Airtel, Uninor & TATA in Hyderabad are not meeting the benchmark of **Blocked Call Rate**.
- BSNL in Ananthpur, Rajmundary, Kakinada, Srikukalam, Vizag, Hyderabad & Kadapa, Rcom in Ananthpur, Vizag and Rajmundary, Uninor in Vizg & Hyderabad and TATA in Hyderabad are not meeting the benchmark for **Dropped Call Rate**
- Rcom in Ananthpur, Rajmundary, Kakinada & Vizag, BSNL in Ananthpur, Kadapa, Rajmundary, Kakinada, Srikukalam, Vizag, Hyderabad & Chittor, Uninor in Ananthpur, Vizag & Hyderabad, Airtel in Kadapa & Hyderabad and TATA in Tenali, Hyderabad & Kadapa are not meeting the benchmark for Voice Quality (0-5 (with frequency hopping)).
- BSNL in Kadapa, Rcom in Vizag and Uninor in Hyderabad are not meeting the benchmark for **Call Setup Success Rate**.

- Aircel & TATA in Machilipatnam, Aircel in Tenali, BSNL, Uninor & Rcom in Ananthpur, BSNL & Airtel in Kadapa, BSNL & Rcom in Rajmundary, BSNL in Srikukalam & Kakinada, BSNL, Airtel, Uninor & Rcom in Vizag and BSNL, Uninor & TATA in Hyderabad are not meeting the benchmark for Handover Success Rate.

➤ **Basic Telephone Service (Wireline) Providers:-**

- From the Month data table, it can be observed that all operators are meeting the benchmark for different parameters; however BSNL data is not available.

➤ **Broadband Service Providers:-**

- From the month of data we found that Beam Telecom is not meeting the benchmark for Faults Repair/Restoration Time and rest of operators are meeting their benchmarks.
- In Andhra Pradesh data is not available for BSNL operators it is in process.

➤ **Level 1 Live Calling (Emergency No.) Q4**

- 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 Andhra Pradesh 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:-**

A sample of live callings were taken for each operator and calls were made for assessing call center's responses within 60sec in which we found Rcom GSM was not met the benchmark($\geq 95\%$).

➤ **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 the congestion was found with all the service providers except BSNL, Idea, and Vodafone.

➤ **CUSTOMER SERVICE QUALITY PARAMETERS**

❖ **4th Quarter data Assessment (Andhra Pradesh Circle)**

- According to the parameter metering/billing credibility post-paid we found that all the service providers are meeting the benchmark except **Idea**.
- According to the parameter metering /billing credibility pre-paid we found that all the service providers are meeting the benchmark.
- According to the parameter Resolution of billing/ charging complaints we found that all the service providers are meeting the benchmark except **TATA CDMA**.
- According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints we found that all the service providers are meeting the benchmark.
- According to the parameter Accessibility of call centre/Customer Care 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 we found that all the service providers are meeting the benchmark except **Aircel, Airtel, BSNL and Rcom (GSM & CDMA)**.
- According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter we found that all the service providers are meeting the benchmark except **Aircel**.
- According to the parameter Time taken for refunds of deposits after closures after verification we found that all the service providers are meeting the benchmark except **TATA CDMA**.

CHAPTER-3: AUDIT –PMR DATA VERIFICATION RESULTS

3.0 Cellular Mobile Telephone Service (Network Service Quality Parameter)

3.1 PMR Data Verification Results for Quarter 4

3.1.1 AP Circle (April'14):

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.

AP Circle (April'14)																	
Month PMR Generation Data		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	Name of Parameter			GSM Operators												CDMA	
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	One Month	0.11%	0.12%	0.02%	0.12%	1.85%	1.10%	0.03%	0.02%	0.49%	0.20%	0.29%	0.04%	0.57%	0.04%
	Worst affected BTS due to downtime	≤ 2%	One Month	0.00%	0.00%	0.00%	0.16%	2.00%	1.90%	0.14%	0.00%	1.94%	1.49%	1.90%	0.25%	1.42%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	≥ 95%	One Month	99.50%	99.19%	99.17%	98.98%	97.98%	99.20%	99.99%	99.70%	99.69%	98.97%	98.14%	99.86%	98.27%	99.06%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Month	0.12%	0.49%	0.11%	0.26%	0.87%	0.80%	0.69%	0.00%	0.03%	0.03%	0.50%	0.06%	0.02%	0.00%
	TCH congestion	≤ 2%	One Month	0.16%	0.32%	0.07%	0.00%	1.58%	0.30%	1.07%	0.02%	0.08%	0.15%	0.75%	0.24%	0.16%	0.00%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	≤ 2%	One Month	0.91%	0.59%	0.33%	0.57%	0.91%	0.60%	0.65%	0.35%	0.41%	0.59%	0.77%	0.48%	0.25%	0.26%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Month	4.09%	0.07%	0.48%	2.84%	2.37%	2.90%	1.23%	0.35%	0.07%	4.19%	2.11%	0.48%	0.04%	0.75%
	% of Connections with good voice quality	≥ 95%	One Month	97.92%	99.77%	98.93%	99.11%	98.00%	99.80%	97.41%	99.80%	98.86%	98.23%	97.72%	98.93%	99.70%	98.31%
	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%	0.00%

Finding & Critical Analysis:

- From the month Data Assessment, it is found that Aircel 2G and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.

3.1.2 AP Circle (May'14):

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.

AP Circle (May'14)																	
Month PMR Generation Data		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	Name of Parameter			GSM Operators												CDMA	
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	One Month	0.11%	0.07%	0.01%	0.07%	1.98%	1.00%	0.03%	0.03%	0.40%	0.18%	0.31%	0.03%	0.47%	0.02%
	Worst affected BTS due to downtime	≤ 2%	One Month	0.16%	0.00%	0.00%	0.00%	1.92%	1.90%	0.12%	0.10%	1.47%	0.64%	1.95%	0.13%	1.46%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	≥ 95%	One Month	99.40%	99.34%	99.23%	98.54%	98.05%	96.86%	99.99%	99.59%	99.66%	98.73%	98.48%	99.86%	98.70%	99.19%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Month	0.11%	0.41%	0.11%	0.55%	0.98%	0.95%	0.82%	0.01%	0.04%	0.06%	0.45%	0.07%	0.00%	0.00%
	TCH congestion	≤ 2%	One Month	0.22%	0.25%	0.07%	0.00%	1.68%	1.96%	1.10%	0.06%	0.01%	0.12%	0.57%	0.24%	0.09%	0.81%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	≤ 2%	One Month	0.90%	0.55%	0.33%	0.70%	0.90%	0.70%	0.73%	0.35%	0.45%	0.59%	1.06%	0.49%	0.24%	0.28%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Month	4.08%	6.11%	47.26%	2.38%	2.39%	2.68%	1.47%	0.33%	0.03%	4.01%	2.31%	1.31%	0.08%	2.08%
	% of Connections with good voice quality	≥ 95%	One Month	97.92%	99.77%	98.92%	99.09%	98.00%	99.80%	97.57%	99.80%	98.77%	98.23%	97.92%	98.94%	99.70%	99.13%
	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%	0.00%

Finding & Critical Analysis:

- From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.

3.1.3 AP Circle (June):

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.

AP Circle (June'14)																	
Month PMR Generation Data		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	Name of Parameter			GSM Operators												CDMA	
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	One Month	0.18%	0.19%	0.02%	0.17%	1.98%	1.30%	0.06%	0.06%	0.36%	0.30%	0.28%	0.04%	0.69%	0.02%
	Worst affected BTS due to downtime	≤ 2%	One Month	0.80%	0.97%	0.00%	0.44%	1.96%	1.90%	0.39%	0.38%	1.16%	2.31%	1.99%	0.32%	1.33%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	≥ 95%	One Month	99.15%	99.40%	99.20%	98.94%	98.03%	97.03%	99.99%	99.62%	99.59%	98.78%	98.33%	99.77%	97.95%	99.11%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Month	0.24%	0.36%	0.09%	0.27%	0.79%	0.99%	0.63%	0.03%	0.10%	0.07%	0.38%	0.09%	0.00%	0.00%
	TCH congestion	≤ 2%	One Month	0.45%	0.25%	0.07%	0.00%	1.81%	1.44%	1.14%	0.04%	0.09%	0.24%	0.74%	0.23%	0.23%	0.89%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	≤ 2%	One Month	0.96%	0.52%	0.37%	0.66%	0.94%	0.72%	0.75%	0.38%	0.47%	0.68%	1.05%	0.52%	0.32%	0.29%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Month	4.51%	6.11%	0.48%	2.21%	2.58%	2.90%	1.62%	0.33%	0.08%	4.36%	2.42%	2.86%	0.04%	1.31%
	% of Connections with good voice quality	≥ 95%	One Month	97.82%	99.78%	98.92%	99.07%	98.00%	99.86%	97.64%	99.81%	98.75%	98.12%	98.08%	98.89%	99.70%	99.13%
	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%	0.00%

Finding & Critical Analysis:

- From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.

3.1.4 Summarized PMR Data AP Circle (April – June'14)

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

AP Circle (April - June'14)																	
Month PMR Generation Data		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	Name of Parameter			GSM Operators												CDMA	
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	One Qtr	0.13%	0.13%	0.02%	0.12%	1.94%	1.13%	0.04%	0.04%	0.42%	0.23%	0.29%	0.04%	0.58%	0.03%
	Worst affected BTS due to downtime	≤ 2%	One Qtr	0.32%	0.32%	0.00%	0.20%	1.96%	1.90%	0.22%	0.16%	1.52%	1.48%	1.95%	0.23%	1.40%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	≥ 95%	One Qtr	99.35%	99.31%	99.20%	98.82%	98.02%	97.70%	99.99%	99.64%	99.65%	98.83%	98.32%	99.83%	98.31%	99.12%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Qtr	0.16%	0.42%	0.10%	0.36%	0.88%	0.91%	0.71%	0.01%	0.06%	0.05%	0.44%	0.07%	0.01%	0.00%
	TCH congestion	≤ 2%	One Qtr	0.28%	0.27%	0.07%	0.00%	1.69%	1.23%	1.10%	0.04%	0.06%	0.17%	0.69%	0.24%	0.16%	0.57%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	≤ 2%	One Qtr	0.92%	0.55%	0.34%	0.64%	0.92%	0.67%	0.71%	0.36%	0.44%	0.62%	0.96%	0.50%	0.27%	0.28%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Qtr	4.23%	4.10%	0.48%	2.48%	2.45%	2.83%	1.44%	0.34%	0.06%	4.19%	2.28%	1.55%	0.05%	1.38%
	% of Connections with good voice quality	≥ 95%	One Qtr	97.89%	99.77%	98.92%	99.09%	98.00%	99.82%	97.54%	99.80%	98.79%	98.19%	97.91%	98.92%	99.70%	98.86%
	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%	0.00%

Finding & Critical Analysis:

- From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.

3.1.5 Comparative Data of TRAI and Verified by the Agency for the month of Quarter ending June'14

S.N	Parameter name	Bench mark	Audit	Avg. period	Aircel	Airtel	BSNL	Idea	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Uninor	Vodafone	Aircel 3G	Airtel 3G	BSNL 3G	Idea 3G
Network Availability																		
1	BTS accumulated downtime	≤ 2%	Report	One Qtr	0.13%	0.02%	1.97%	0.04%	0.59%	0.42%	0.02%	0.23%	0.30%	0.04%	0.13%	0.15%	1.13%	0.04%
			Verified		0.13%	0.02%	1.94%	0.04%	0.58%	0.42%	0.03%	0.23%	0.29%	0.04%	0.13%	0.12%	1.13%	0.04%
2	Worst affected BTS due to downtime	≤ 2%	Report	One Qtr	0.31%	0.00%	1.97%	0.22%	1.40%	1.53%	0.00%	1.48%	1.95%	0.23%	0.32%	0.80%	1.90%	0.16%
			Verified		0.32%	0.00%	1.96%	0.22%	1.40%	1.52%	0.00%	1.48%	1.95%	0.23%	0.32%	0.20%	1.90%	0.16%
Connection establishment (Accessibility)																		
3	Call Setup Success Rate	≥ 95%	Report	One Qtr	99.35%	99.18%	98.00%	99.99%	98.30%	99.65%	99.12%	98.88%	98.32%	99.83%	99.31%	98.95%	97.67%	99.64%
			Verified		99.35%	99.20%	98.02%	99.99%	98.31%	99.65%	99.12%	98.83%	98.32%	99.83%	99.31%	98.82%	97.70%	99.64%
4	SDCCH/ Paging Channel Congestion	≤ 1%	Report	One Qtr	0.16%	0.10%	0.90%	0.71%	0.00%	0.06%	0.01%	0.05%	0.44%	0.07%	0.42%	0.28%	0.93%	0.02%
			Verified		0.16%	0.10%	0.88%	0.71%	0.01%	0.06%	0.00%	0.05%	0.44%	0.07%	0.42%	0.36%	0.91%	0.01%
5	TCH congestion	≤ 2%	Report	One Qtr	0.27%	0.07%	1.70%	1.10%	0.16%	0.08%	0.30%	0.17%	0.69%	0.24%	0.27%	0.00%	1.23%	0.04%
			Verified		0.28%	0.07%	1.69%	1.10%	0.16%	0.06%	0.57%	0.17%	0.69%	0.24%	0.27%	0.00%	1.23%	0.04%
Connection Maintainability (Retain ability)																		
6	Call Drop Rate	≤ 2%	Report	One Qtr	0.92%	0.34%	0.90%	0.71%	0.27%	0.44%	0.28%	0.62%	0.96%	0.49%	0.55%	0.60%	0.67%	0.36%
			Verified		0.92%	0.34%	0.92%	0.71%	0.27%	0.44%	0.28%	0.62%	0.96%	0.50%	0.55%	0.64%	0.67%	0.36%
7	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	Report	One Qtr	4.23%	0.48%	2.47%	1.44%	0.05%	0.06%	0.28%	1.63%	2.28%	1.96%	6.35%	2.63%	2.83%	0.33%
			Verified		4.23%	0.48%	2.45%	1.44%	0.05%	0.06%	1.38%	4.19%	2.28%	1.55%	4.10%	2.48%	2.83%	0.34%
8	% of Connections with good voice quality	≥ 95%	Report	One Qtr	97.89%	98.92%	98.00%	97.54%	99.70%	98.79%	98.66%	98.19%	97.90%	98.92%	99.77%	99.09%	99.83%	99.80%
			Verified		97.89%	98.92%	98.00%	97.54%	99.70%	98.79%	98.86%	98.19%	97.91%	98.92%	99.77%	99.09%	99.82%	99.80%
9	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	Report	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%	0.00%
			Verified		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Findings:-

According to the data given by TRAI office and the data verified by the agency, there are differences in TATA (GSM & CDMA) and Vodafone; however we have not considered the 2nd decimal value. The data in which there is any difference marked by highlight on the above table.

3.1.6 Comparison between the PMR & 3 Day Live data (Avg. of 3month) for Quarter 4 (April – June'14)

The comparison has been done after averaging the data of 3months for both PMR (April- June) and Live test of 3days (Avg. of 3 days). We have taken the data for comparison between PMR and Live test up to 1st decimal value except the benchmark $\geq 95\%$ in this we taken before decimal value.

Comparison of PMR & Live Data April- June'14		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafo ne	Relian ce	TATA
S/ N	Name of Parameter			GSM Operators													CDMA
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	$\leq 2\%$	PMR	0.13%	0.13%	0.02%	0.12%	1.94%	1.13%	0.04%	0.04%	0.42%	0.23%	0.29%	0.04%	0.58%	0.03%
			LIVE	0.12%	0.15%	0.02%	0.18%	1.94%	1.46%	0.08%	0.05%	0.87%	0.04%	2.28%	0.26%	0.87%	0.14%
	Worst affected BTS due to downtime	$\leq 2\%$	PMR	0.32%	0.32%	0.00%	0.20%	1.96%	1.90%	0.22%	0.16%	1.52%	1.48%	1.95%	0.23%	1.40%	0.00%
			LIVE	0.00%	0.00%	0.00%	0.00%	0.05%	0.06%	0.08%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	$\geq 95\%$	PMR	99.35%	99.31%	99.20%	98.82%	98.02%	97.70%	99.99%	99.64%	99.65%	98.83%	98.32%	99.83%	98.31%	99.12%
			LIVE	99.08%	99.41%	99.21%	98.40%	97.97%	97.76%	99.99%	99.64%	97.98%	98.75%	98.08%	99.79%	97.98%	99.22%
	SDCCH/ Paging Channel Congestion	$\leq 1\%$	PMR	0.16%	0.42%	0.10%	0.36%	0.88%	0.91%	0.71%	0.01%	0.06%	0.05%	0.44%	0.07%	0.01%	0.00%
			LIVE	0.18%	0.36%	0.07%	0.19%	0.87%	0.94%	0.44%	0.01%	0.00%	0.03%	0.46%	0.08%	0.00%	0.00%
	TCH congestion	$\leq 2\%$	PMR	0.28%	0.27%	0.07%	0.00%	1.69%	1.23%	1.10%	0.04%	0.06%	0.17%	0.69%	0.24%	0.16%	0.57%
			LIVE	0.40%	0.23%	0.07%	0.01%	1.77%	1.67%	0.99%	0.02%	0.22%	0.23%	1.01%	0.21%	0.22%	0.78%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	$\leq 2\%$	PMR	0.92%	0.55%	0.34%	0.64%	0.92%	0.67%	0.71%	0.36%	0.44%	0.62%	0.96%	0.50%	0.27%	0.28%
			LIVE	1.05%	0.54%	0.38%	0.67%	0.91%	0.64%	0.78%	0.40%	0.35%	0.72%	1.03%	0.51%	0.35%	0.29%
	Worst affected cells having more than 3% TCH drop (call drop) rate	$\leq 3\%$	PMR	4.23%	4.10%	0.48%	2.48%	2.45%	2.83%	1.44%	0.34%	0.06%	4.19%	2.28%	1.55%	0.05%	1.38%
			LIVE	5.31%	6.19%	0.00%	0.06%	2.67%	2.83%	2.51%	2.25%	0.03%	4.63%	2.32%	2.67%	0.03%	1.41%
	% of Connections with good voice quality	$\geq 95\%$	PMR	97.89%	99.77%	98.92%	99.09%	98.00%	99.82%	97.54%	99.80%	98.79%	98.19%	97.91%	98.92%	99.70%	98.86%
			LIVE	97.77%	99.78%	99.04%	99.06%	98.30%	99.84%	97.61%	99.80%	99.71%	98.02%	98.01%	98.88%	99.71%	99.14%
	Point of Interconnections (POI) congestion (on individual POI)	$\leq 0.5\%$	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%	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%	0.00%

Findings:-

- There are difference in BTS accumulated downtime in Uninor, BSNL 3G, Reliance (GSM & CDMA), Vodafone & TATA (2G & 3G) and in worst affected BTS due to downtime there are difference in all operators except Airtel 2G & TATA (CDMA).
- There are difference in Call Setup Success Rate in Aircel (2G & 3G), Airtel 3G, BSNL2G, Rcom(GSM & CDMA), Uninor, Vodafone & TATA GSM & CDMA, in SDCCH/ Paging Channel Congestion Idea 2G, Airtel 3G & Aircel 3G and in TCH congestion Aircel 2G, Idea 2G, BSNL (2G&3G), Rcom (GSM&CDMA), TATA(GSM&CDMA) and Uninor has also differences.
- In Call Drop Rate some of the operators have differences like Aircel 2G, Rcom (GSM & CDMA), Uninor, TATA (GSM) & Idea 3G and in Worst affected cells having more than 3% TCH drop (call drop) rate all the operators have differences except Reliance (GSM & CDMA), & BSNL 3G however the major differences are in TATA (2G) & Vodafone, Aircel, Idea & Airtel and in % of Connections with good voice quality Aircel 2G, Airtel 2G, Idea Tata GSM, Uninor Vodafone and BSNL (2G) has differences.

3.1.7 Comparison between the PMR Data of Q3 and Q4 (Avg. of 3month) for Quarter Jan- March & April- June'14

AP Circle (Jan- March & April - June'14)																	
Comparison of PMR Q3 & Q4		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	Name of Parameter			GSM Operators												CDMA	
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	Qtr 3	0.07%	0.09%	0.02%	0.09%	1.91%	0.93%	0.01%	0.01%	0.30%	0.13%	0.27%	0.04%	0.35%	0.02%
			Qtr 4	0.13%	0.13%	0.02%	0.12%	1.94%	1.13%	0.04%	0.04%	0.42%	0.23%	0.29%	0.04%	0.58%	0.03%
	Worst affected BTS due to downtime	≤ 2%	Qtr 3	0.00%	0.00%	0.00%	0.22%	1.90%	1.81%	0.02%	0.00%	1.02%	0.84%	1.67%	0.19%	1.45%	0.00%
			Qtr 4	0.32%	0.32%	0.00%	0.20%	1.96%	1.90%	0.22%	0.16%	1.52%	1.48%	1.95%	0.23%	1.40%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	≥ 95%	Qtr 3	99.49%	99.19%	99.12%	98.64%	98.11%	98.93%	99.99%	99.70%	99.72%	98.61%	98.20%	99.71%	98.91%	99.03%
			Qtr 4	99.35%	99.31%	99.20%	98.82%	98.02%	97.70%	99.99%	99.64%	99.65%	98.83%	98.32%	99.83%	98.31%	99.12%
	SDCCH/ Paging Channel Congestion	≤ 1%	Qtr 3	0.11%	0.47%	0.12%	0.45%	0.63%	0.77%	0.63%	0.02%	0.03%	0.06%	0.29%	0.09%	0.00%	0.00%
			Qtr 4	0.16%	0.42%	0.10%	0.36%	0.88%	0.91%	0.71%	0.01%	0.06%	0.05%	0.44%	0.07%	0.01%	0.00%
	TCH congestion	≤ 2%	Qtr 3	0.13%	0.34%	0.08%	0.00%	1.74%	0.71%	0.93%	0.04%	0.06%	0.32%	0.54%	0.29%	0.04%	0.00%
			Qtr 4	0.28%	0.27%	0.07%	0.00%	1.69%	1.23%	1.10%	0.04%	0.06%	0.17%	0.69%	0.24%	0.16%	0.57%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	≤ 2%	Qtr 3	0.89%	0.59%	0.34%	0.65%	0.86%	0.89%	0.63%	0.37%	0.38%	0.62%	1.03%	0.51%	0.12%	0.29%
			Qtr 4	0.92%	0.55%	0.34%	0.64%	0.92%	0.67%	0.71%	0.36%	0.44%	0.62%	0.96%	0.50%	0.27%	0.28%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	Qtr 3	1.18%	2.22%	0.45%	2.52%	2.36%	2.81%	1.27%	0.54%	0.02%	2.05%	2.54%	1.51%	0.06%	0.70%
			Qtr 4	4.23%	4.10%	0.48%	2.48%	2.45%	2.83%	1.44%	0.34%	0.06%	4.19%	2.28%	1.55%	0.05%	1.38%
	% of Connections with good voice quality	≥ 95%	Qtr 3	97.87%	99.76%	98.93%	99.10%	97.67%	99.41%	97.38%	99.80%	98.90%	98.17%	97.71%	98.92%	99.70%	98.67%
			Qtr 4	97.89%	99.77%	98.92%	99.09%	98.00%	99.82%	97.54%	99.80%	98.79%	98.19%	97.91%	98.92%	99.70%	98.86%
	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	Qtr 3	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%
			Qtr 4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Finding & Critical Analysis:-

From the quarterly data of the month of Jan - March and April – Jun 2014 we found that there are more differences in Aircel (2G & 3G) and TATA GSM operators and also Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for Worst affected cells having more than 3% TCH drop (call drop) rate in April to June 2014.

3.2 3 Days Live Test Audit Report (4th Quarter), AP 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.

Andhra Pradesh Circle Q4_April- June'14																	
3 days Live Test Audit Data			Date	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	PARAMETER	Bench Mark		GSM Operators												CDMA	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	Day 1	0.13%	0.16%	0.02%	0.18%	1.95%	1.52%	0.08%	0.04%	0.79%	0.04%	2.37%	0.02%	0.79%	0.19%
			Day 2	0.12%	0.13%	0.02%	0.18%	1.94%	1.55%	0.08%	0.08%	0.76%	0.04%	3.27%	0.34%	0.76%	0.03%
			Day 3	0.10%	0.16%	0.02%	0.18%	1.93%	1.30%	0.08%	0.05%	1.07%	0.04%	1.20%	0.41%	1.07%	0.19%
	Worst affected BTS due to downtime	≤ 2%	Day 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.07%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
			Day 2	0.00%	0.00%	0.00%	0.00%	0.07%	0.10%	0.15%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
			Day 3	0.00%	0.00%	0.00%	0.00%	0.09%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
Connection establishment (Accessibility)																	
1	Call Setup Success Rate	≥ 95%	Day 1	99.14%	99.40%	99.08%	98.88%	97.86%	99.67%	99.99%	99.64%	97.92%	98.79%	98.08%	99.81%	97.92%	99.21%
			Day 2	99.00%	99.38%	99.30%	98.02%	97.89%	96.84%	99.99%	99.62%	98.37%	98.73%	98.06%	99.78%	98.37%	99.26%
			Day 3	99.10%	99.46%	99.26%	98.29%	98.16%	96.78%	99.99%	99.65%	97.66%	98.73%	98.11%	99.78%	97.66%	99.20%
2	SDCCH/ Paging Channel Congestion	≤ 1%	Day 1	0.17%	0.39%	0.09%	0.28%	0.96%	0.94%	0.37%	0.01%	0.00%	0.03%	0.43%	0.08%	0.00%	0.00%
			Day 2	0.23%	0.37%	0.08%	0.17%	0.89%	0.93%	0.47%	0.02%	0.00%	0.04%	0.47%	0.10%	0.00%	0.00%
			Day 3	0.16%	0.31%	0.05%	0.13%	0.76%	0.94%	0.48%	0.01%	0.00%	0.02%	0.48%	0.05%	0.00%	0.00%
3	TCH congestion	≤ 2%	Day 1	0.23%	0.21%	0.09%	0.02%	1.58%	1.82%	1.01%	0.02%	0.25%	0.22%	1.01%	0.19%	0.25%	0.79%
			Day 2	0.61%	0.25%	0.06%	0.00%	1.98%	1.68%	0.82%	0.03%	0.15%	0.23%	1.04%	0.22%	0.15%	0.74%
			Day 3	0.37%	0.23%	0.06%	0.00%	1.75%	1.51%	1.14%	0.01%	0.26%	0.23%	0.99%	0.22%	0.26%	0.80%
Connection Maintainability (Retain ability)																	
4	Call Drop Rate	≤ 2%	Day 1	1.08%	0.52%	0.38%	0.67%	0.92%	0.64%	0.76%	0.39%	0.31%	0.72%	1.05%	0.51%	0.31%	0.27%
			Day 2	1.01%	0.54%	0.35%	0.67%	0.93%	0.64%	0.73%	0.40%	0.30%	0.72%	1.02%	0.52%	0.30%	0.29%
			Day 3	1.05%	0.56%	0.41%	0.67%	0.89%	0.64%	0.84%	0.41%	0.43%	0.73%	1.03%	0.51%	0.43%	0.30%
5	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	Day 1	5.59%	6.03%	0.00%	0.06%	2.67%	2.84%	2.46%	2.21%	0.04%	4.48%	2.22%	2.71%	0.04%	1.24%
			Day 2	5.28%	6.54%	0.01%	0.06%	2.73%	2.76%	2.43%	2.37%	0.02%	4.82%	2.44%	2.75%	0.02%	1.48%
			Day 3	5.05%	5.98%	0.00%	0.06%	2.61%	2.88%	2.64%	2.17%	0.02%	4.59%	2.29%	2.55%	0.02%	1.51%
6	% of Connections with good voice quality	≥ 95%	Day 1	97.84%	99.78%	98.95%	99.06%	98.11%	99.86%	97.71%	99.81%	99.71%	98.05%	97.99%	98.89%	99.71%	99.14%
			Day 2	97.68%	99.76%	98.91%	99.01%	98.57%	99.80%	97.68%	99.80%	99.70%	98.02%	98.05%	98.89%	99.70%	99.14%
			Day 3	97.77%	99.79%	99.26%	99.10%	98.23%	99.85%	97.44%	99.81%	99.71%	98.00%	97.98%	98.87%	99.71%	99.13%
7	Point of Interconnections (POI) congestion (on	≤ 0.5%	Day 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Day 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
			Day 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

individual POI)																	
-----------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Finding & Critical Analysis:

- Aircel(2G& 3G) and TATA GSM is not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate in all 3days.
- Uninor is not meeting the benchmark for BTS accumulated downtime in day1 & day2.

3.3 Operator Assisted Drive Test (AP Circle):

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).

Drive Test Measurements													
S N	Parameter	City Name	GSM Operators								CDMA Operators		
			Airtel	Idea	Vodafone	BSNL	Uninor	Aircel	Reom GSM	TATA GSM	Rcom CDMA	TATA CDMA	
1.1	Call Attempts	GUNTUR	639	708	601	584	738	631	756	692	692	806	
		KRISHNA	587	641	495	684	691	445	566	549	576	640	
		WARANGAL	557	693	655	594	642	594	720	546	678	477	
1.2	Blocked Call Rate (<=3%)	GUNTUR	0.00%	1.00%	0.17%	0.12%	0.00%	0.00%	5.40%	0.28%	3.76%	0.00%	
		KRISHNA	0.00%	0.33%	0.19%	1.32%	0.00%	0.00%	3.35%	0.79%	0.62%	0.00%	
		WARANGAL	0.00%	0.09%	0.10%	0.43%	0.00%	0.00%	0.27%	0.56%	0.27%	0.00%	
1.3	Dropped Call Rate (<=2%)	GUNTUR	0.00%	0.05%	0.00%	0.53%	0.26%	0.00%	0.52%	0.28%	0.89%	0.82%	
		KRISHNA	0.00%	0.73%	0.00%	0.48%	0.00%	0.00%	0.88%	1.03%	2.87%	0.76%	
		WARANGAL	0.00%	0.09%	0.00%	1.25%	0.11%	0.32%	0.42%	0.34%	0.18%	2.32%	
1.4	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	GUNTUR	-	-	-	-	-	-	-	-	-	98.87%	98.70%
		KRISHNA	-	-	-	-	-	-	-	-	-	98.77%	99.52%
		WARANGAL	-	-	-	-	-	-	-	-	-	99.37%	99.16%
	(ii) 0-5 (with frequency hopping)	GUNTUR	96.56%	96.03%	96.88%	96.48%	95.45%	96.48%	93.72%	94.54%	-	-	
		KRISHNA	97.49%	96.30%	96.92%	91.31%	95.20%	98.01%	95.71%	96.28%	-	-	
WARANGAL		96.83%	96.57%	98.21%	96.80%	95.46%	97.64%	96.20%	97.00%	-	-		
1.5	Service Coverage												
	In door (>= -75dBm)	GUNTUR	71.23%	84.54%	89.09%	83.55%	94.95%	49.86%	47.25%	77.78%	49.66%	81.19%	
		KRISHNA	94.54%	91.81%	88.87%	82.01%	86.25%	58.73%	61.70%	89.27%	63.62%	82.80%	
		WARANGAL	95.76%	99.12%	94.57%	62.13%	96.60%	67.79%	61.29%	85.79%	48.53%	69.44%	
	In-vehicle (>= -85dBm)	GUNTUR	94.96%	97.98%	99.17%	98.14%	99.65%	86.57%	78.14%	97.12%	81.10%	98.35%	
		KRISHNA	99.56%	98.90%	99.32%	96.99%	98.14%	92.66%	85.89%	98.39%	86.44%	97.59%	
		WARANGAL	99.60%	99.85%	99.60%	96.31%	99.81%	96.46%	88.63%	98.28%	83.73%	94.51%	
	Outdoor- in city (>= -95dBm)	GUNTUR	99.72%	99.80%	99.90%	99.80%	99.88%	98.59%	95.09%	99.61%	98.70%	99.81%	
		KRISHNA	99.97%	99.89%	99.97%	99.49%	99.71%	99.58%	97.18%	99.89%	97.33%	99.96%	
		WARANGAL	99.96%	99.95%	99.96%	99.95%	100.00%	99.86%	100.00%	99.95%	98.63%	99.23%	
	1.6	Call Setup Success Rate (>=95%)	GUNTUR	100.00%	99.00%	99.83%	99.88%	100.00%	99.17%	94.58%	99.72%	96.18%	98.07%
			KRISHNA	100.00%	99.66%	99.81%	98.63%	99.00%	100.00%	96.66%	99.21%	99.38%	99.45%
WARANGAL			99.10%	99.91%	99.90%	99.50%	100.00%	99.80%	99.72%	99.11%	99.73%	99.16%	
1.7	Hand Over Success Rate (HOSR)	GUNTUR	100.00%	99.10%	99.83%	99.49%	98.80%	98.94%	98.56%	99.14%	100.00%	100.00%	
		KRISHNA	100.00%	99.60%	100.00%	98.55%	99.12%	99.58%	99.17%	97.33%	100.00%	100.00%	
		WARANGAL	99.83%	99.94%	99.55%	99.84%	98.96%	99.73%	99.67%	99.05%	100.00%	99.95%	
1.8	Km's Driven	GUNTUR	321										
		KRISHNA	325										
		WARANGAL	315										

Finding & Critical Analysis:

- Rcom GSM in Guntur & Krishna and Rcom CDMA in Guntur are not meeting the benchmark of **Blocked Call Rate**
- Rcom CDMA in Krishna and TATA CDMA in Warangal are not meeting the benchmark for **Dropped Call Rate**
- All service providers are meeting the benchmark Voice Quality 0-4 w/o frequency hopping.
- Rcom GSM and TATA GSM operators are not meeting the benchmark in Guntur for Voice Quality (0-5 (with frequency hopping)).
- Rcom GSM operators are not meeting the benchmark in Guntur for **Call Setup Success Rate**.

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

Independent Drive Test Measurements											
Parameter					% of connections with good voice quality (>=95%)	Service Coverage					Km's driven
	City Name	Operators	Call Attempts	Blocked Call Rate <=3%		Dropped Call Rate <=2%	0-5 with frequency hopping	Indoor >= -75 dBm	In-vehicle >= -85dBm	Outdoor- in city >= -95dBm	
Machilipatnam	BSNL	135	1.48%	0.00%	95.48%	48.00%	91.00%	100.00%	98.52%	99.45%	113
	Airtel	136	0.00%	0.74%	96.72%	58.00%	89.00%	100.00%	100.00%	96.77%	
	Aircel	135	1.48%	0.74%	96.72%	16.00%	53.00%	88.00%	98.52%	100.00%	
	TATA	138	0.00%	1.40%	95.87%	63.00%	93.00%	100.00%	100.00%	95.30%	
Tenali	BSNL	117	2.56%	1.17%	96.51%	74.00%	93.00%	100.00%	97.44%	100.00%	102
	Idea	119	0.84%	0.00%	96.72%	70.00%	96.00%	100.00%	99.16%	99.60%	
	Aircel	113	0.00%	0.00%	96.83%	44.00%	79.00%	94.00%	100.00%	97.78%	
	TATA	121	0.83%	0.83%	89.32%	74.00%	93.00%	100.00%	99.17%	98.90%	
Ananthpur	BSNL	179	2.79%	4.47%	86.12%	84.00%	99.00%	100.00%	97.21%	94.03%	121
	Vodafone	180	0.55%	1.11%	96.37%	71.00%	98.00%	100.00%	99.44%	100.00%	
	Uninor	181	0.55%	1.66%	90.76%	58.00%	91.00%	99.00%	96.69%	95.40%	
	Rcom	172	0.00%	2.33%	92.23%	67.00%	94.00%	100.00%	100.00%	89.46%	
Kadapa	BSNL	144	6.94%	5.56%	93.20%	44.00%	74.00%	94.00%	93.06%	90.07%	112
	Airtel	153	0.00%	1.96%	92.49%	61.00%	92.00%	100.00%	100.00%	97.64%	
	Idea	156	0.46%	0.00%	95.93%	73.00%	97.00%	100.00%	99.36%	100.00%	
	TATA	154	0.64%	1.30%	94.20%	67.00%	94.00%	100.00%	99.35%	100.00%	
Chittoor	BSNL	116	0.90%	1.72%	93.95%	73.00%	97.00%	100.00%	99.14%	99.31%	105
	Idea	121	0.82%	0.83%	97.83%	78.00%	98.00%	100.00%	99.17%	100.00%	
	Vodafone	122	0.00%	0.82%	96.62%	61.00%	91.00%	99.00%	100.00%	99.02%	
	Aircel	118	0.00%	0.85%	95.84%	52.00%	87.00%	99.00%	100.00%	98.51%	
Rajmundary	BSNL	182	2.74%	4.39%	83.48%	81.00%	91.00%	100.00%	97.25%	91.84%	118
	Airtel	188	0.00%	1.06%	96.17%	75.00%	96.00%	100.00%	100.00%	99.66%	
	Vodafone	186	2.15%	0.00%	95.27%	62.00%	84.00%	99.00%	97.85%	99.02%	
	Rcom	188	3.72%	4.78%	93.53%	62.00%	84.00%	97.00%	96.28%	92.80%	
Kakinada	BSNL	161	1.24%	5.59%	83.70%	84.00%	97.00%	99.00%	98.76%	92.22%	107
	Vodafone	173	2.31%	0.57%	96.54%	67.00%	94.00%	99.00%	97.69%	99.69%	
	Rcom	165	1.21%	1.21%	94.55%	36.00%	72.00%	96.00%	98.79%	94.59%	
	TATA	169	1.77%	1.77%	95.55%	59.00%	92.00%	99.00%	98.22%	98.94%	
Srikulam	BSNL	154	1.29%	3.24%	89.96%	92.00%	99.00%	100.00%	98.70%	87.02%	112
	Idea	154	0.64%	0.00%	95.17%	72.00%	99.00%	100.00%	99.35%	100.00%	
	Uninor	155	0.64%	0.00%	95.13%	62.00%	94.00%	100.00%	99.35%	98.12%	
	Rcom	149	0.00%	0.00%	95.37%	39.00%	71.00%	97.00%	100.00%	98.45%	
Vizag	BSNL	131	3.05%	6.10%	85.12%	88.00%	97.00%	99.00%	96.95%	89.36%	132
	Airtel	146	4.10%	0.68%	94.98%	53.00%	86.00%	99.00%	95.89%	97.21%	
	Uninor	152	2.63%	4.60%	91.62%	62.00%	92.00%	99.00%	97.37%	97.69%	
	Rcom	134	7.46%	3.73%	91.14%	28.00%	62.00%	86.00%	92.54%	96.73%	
Hyderabad	BSNL	174	4.02%	6.32%	92.52%	69.00%	92.00%	69.00%	95.98%	95.62%	141
	Airtel	173	3.46%	4.62%	92.57%	59.00%	90.00%	99.00%	96.53%	98.70%	
	Uninor	178	7.30%	6.74%	86.88%	72.00%	93.00%	99.00%	92.70%	88.87%	
	TATA	179	4.46%	9.50%	89.74%	75.00%	96.00%	100.00%	95.53%	93.99%	

Finding & Critical Analysis:

- BSNL in Kadapa, Rcom in Rajmundary, Rcom, BSNL and Airtel in Vizag and BSNL, Airtel, Uninor & TATA in Hyderabad are not meeting the benchmark of **Blocked Call Rate**.
- BSNL in Ananthpur, Rajmundary, Kakinada, Srikukalam, Vizag, Hyderabad & Kadapa, Rcom in Ananthpur, Vizag and Rajmundary, Uninor in Vizg & Hyderabad and TATA in Hyderabad are not meeting the benchmark for **Dropped Call Rate**
- Rcom in Ananthpur, Rajmundary, Kakinada & Vizag, BSNL in Ananthpur, Kadapa, Rajmundary, Kakinada, Srikukalam, Vizag, Hyderabad & Chittor, Uninor in Ananthpur, Vizag & Hyderabad, Airtel in Kadapa & Hyderabad and TATA in Tenali, Hyderabad & Kadapa are not meeting the benchmark for Voice Quality (0-5 (with frequency hopping)).
- BSNL in Kadapa, Rcom in Vizag and Uninor in Hyderabad are not meeting the benchmark for **Call Setup Success Rate**.
- Aircel & TATA in Machilipatnam, Aircel in Tenali, BSNL, Uninor & Rcom in Ananthpur, BSNL & Airtel in Kadapa, BSNL & Rcom in Rajmundary, BSNL in Srikukalam & Kakinada, BSNL, Airtel, Uninor & Rcom in Vizag and BSNL, Uninor & TATA in Hyderabad are not meeting the benchmark for Handover Success Rate.

3.5 Basic Telephone Service (Wireline) Providers

Summarized Quarterly Data of AP Circle (Jan-March'14):

Wire-line _ AP_Jan-March'14						
S/N	Parameters	Benchmarks	AIRTEL	BSNL	RCOM	TTSL
1	Fault incidences					
1.1	(No. of faults/100 subscribers /month) BM <5%	< 5%	2.00%	NA	0.31%	4.50%
2	Faults Repair/Restoration Time					
2.1	Fault repair by next working day(Urban Area)					
	Fault repair by next working day(Urban Area) BM >90%	>90%	91.87%	NA	100.00%	95.00%
	Within 3 days.BM 100%	100%	100.00%	NA	100.00%	100.00%
2.2	Fault repair by next working day(Rural & hilly Area)					
	By next working day	>90%	NA	NA	NA	100.00%
	Within 5 days (Hilly & Rural Area) BM 100%	100%	NA	NA	NA	100.00%
3	Rent Rebate					
3.1	Fault pending > 3 days & <7 days	Rebate for 7 days	0	NA	NA	NIL
3.2	Fault Pending > 7 days & < 15 days	Rebate for 15 days	0	NA	NA	NIL
3.3	Fault pending > 15 days	Rebate for one month	0	NA	NA	NIL
4	Mean time to Repair(MTTR)					
4.1	Mean time to Repair(MTTR)	<= 8 Hrs	3.55	NA	4.11	4.24
5	Call Completion Ratio(CCR) & Answer to seizure Ratio(ASR)					
5.1	Call Completion Ratio(CCR)	> 55%	98.64%	NA	NA	90.87%
5.2	Answer to seizure Ratio(ASR)	>75%	NA	NA	87.79%	NA
6	Metering & Billing Performance					
6.1	Metering & Billing Credibility-Post paid.BM 0.1%	< 0.1%	0.01%	NA	0.01%	0.10%
6.2	Metering & Billing Credibility-Pre paid BM 0.1%	100%	NA	NA	NA	NA
6.3	Resolution of billing charging/validity/ Complaints within 4 weeks BM 100%	100%	100.00%	NA	100.00%	100.00%
6.4	Period of all refunds/payments from the date of resolution of complaints within 1 weeks	100%	100.00%	NA	NA	NA
7						
7.1	POI Congestion (%)	≤ 0.5%	0	NA	0	0
8	Response Time to customer for assistance					
8.1	Accessibility of Call centre/customer Care within 40 seconds.BM >95%	≥95%	100.00%	NA	95.00%	95.84%
8.2	% age of calls answered by operator (voice to voice) within 60 seconds. BM >90%	≥90%	100.00%	NA	95.00%	90.01%
9	Customer care(promptness in attending to customers request					
9.1	Termination / Closures.BM <=7 days	100%	100.00%	NA	96.00%	100.00%
9.2	Time taken for refunds of deposit after closures. BM 100% within 60 days.	100%	100.00%	NA	100.00%	100.00%

Findings & Critical Analysis:-

From the Month data table, it can be observed that all operators are meeting the benchmark for different parameters; however BSNL data will be provided later.

3.6 Broadband Summarized Quarterly Data of AP Circle (Jan-March'14):

Broadband AP Circle Jan- March'14											
S/N	Parameters	Benchmarks	Averaged over a period	Airtel	Beam tele	BSNL	Hathway	Rcom	Tikona	Tata	You broadband
1	Service Provisioning/Activation Time										
1.1	%age of connections provided within 15 days of registration of demand	100%	One Quarter	100.00%	100.00%	NA	100.00%	NA	100.00%	100.00%	98.91%
1.2	In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	Credit @ Rs.10/day.	One Quarter	NA	NA	NA	NA	NA	NA	NA	NA
2	Faults Repair/Restoration Time										
2.1	% of faults repaired by next working day	>90%	One Quarter	94.00%	85.51%	NA	96.33%	100.00%	93.52%	94.42%	92.00%
2.2	% of faults repaired within 3 working day	≥99%	One Quarter	100.00%	98.20%	NA	100.00%	100.00%	99.50%	100.00%	99.00%
3	Rent Rebate										
3.1	Rent Rebate(nos.)		One Quarter	0	1911	NA	106	NA	11	0	1
4	Billing Performance										
4.1	%age of bills disputed	<2%	One Quarter	0.01%	0.33%	NA	1.85%	0.06%	0.35%	0.34%	0.00%
4.2	%age of complaints resolved within 4 weeks	100%	One Quarter	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%	100.00%
4.3	%age of cases to whom refund of deposits is made within 60 days of closures	100%	One Quarter	100.00%	NA	NA	100.00%	100.00%	100.00%	NA	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	93.00%	72.00%	NA	96.00%	96.00%	62.81%	85.95%	89.00%
5.2	%age of calls answered by operator (Voice to voice) within 90 sec	>80%	One Quarter	95.00%	82.00%	NA	98.00%	98.00%	82.71%	90.21%	92.00%
6	Bandwidth utilisation/throughput										
6.1	No. of Intra network links having Bandwidth utilization >90% during peak hours (TCBH)		One Quarter	0	0	NA	0	0	0	0	0
6.2	No. of Upstream links for International connectivity having BW utilization >90% Peak Hrs.(TCBH)		One Quarter	0	0	NA	0	0	0	0	0
6.3	% International bandwidth utilization during peak hours (TCBH) (Enclose MRTG)	<90%	One Quarter	65.50%	73.00%	NA	87.67%	73.10%	71.73%	75.12%	70.72%
6.4	Broadband Connection Speed available (download) from ISP node to user	>80%	One Quarter	99.64%	90.00%	NA	85.00%	91.00%	95.30%	99.00%	86.60%
7	Service Availability/Uptime (for all users) in %age										
7.1	Service availability /uptime (for all users) in %age	>98%	One Quarter	99.99%	99.00%	NA	99.33%	99.13%	100.00%	99.33%	99.77%
8	Packet loss										
8.1	% of Packet loss	<1%	One Quarter	0.00%	0.00%	NA	0.79%	0.56%	0.00%	0.89%	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	38	50	NA	83	50	61	72	9
9.2	User reference point at ISP Gateway node to International nearest NAP port abroad (terrestrial)	<350 msec	One Quarter	52	300	NA	305	200	220	268	287
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	NA	NA	NA

Findings & Critical Analysis:-

- From the month of data we found that Beam Telecom is not meeting the benchmark for Faults Repair/Restoration Time and rest of operators are meeting their benchmarks.
- In Andhra Pradesh data is not available for BSNL operators it is in process.

3.7 CUSTOMER SERVICE QUALITY PARAMETERS

3.7.1 4th Quarter data Assessment:

Andhra Pradesh, Q4 April - June'14													
PMR		Benchmark	Audit	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vodafone	Rcom CDMA	Tata CDMA
S.N	Name of Parameter			GSM Operators									
(B)	Customer Service Quality Parameters												
1	Metering/billing credibility Post paid	<= 0.1%	Reported	0.00%	0.01%	0.00%	0.12%	0.09%	0.00%	NA	0.07%	0.09%	0.00%
			Verified	0.00%	0.01%	0.00%	0.12%	0.09%	0.00%	NA	0.07%	0.09%	0.00%
2	Metering /billing credibility Pre paid	<= 0.1%	Reported	0.02%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.05%	0.01%	0.00%
			Verified	0.02%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.05%	0.01%	0.00%
3	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	99.70%
			Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	99.70%
4	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
			Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
5	Response time to customers for assistance												
	a) Accessibility of call centre/Customer Care	>=95%	Reported	98.13%	100.00%	98.00%	99.57%	99.40%	99.54%	95.95%	97.00%	98.88%	99.27%
			Verified	98.13%	100.00%	98.00%	99.57%	99.40%	99.54%	95.95%	97.00%	98.88%	99.27%
	b) % call answered by operators (voice to voice) within 60 sec.	>=90%	Reported	89.01%	87.00%	69.00%	94.00%	42.36%	95.00%	96.97%	96.00%	63.22%	98.00%
			Verified	89.01%	87.00%	69.00%	94.00%	42.36%	95.00%	96.97%	96.00%	63.22%	98.00%
6	Termination/closure of service												
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	99.46%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
			Verified	99.46%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
7	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
			Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	99.80%

Critical Analysis:-

- According to the parameter metering/billing credibility post-paid we found that all the service providers are meeting the benchmark except **Idea**.
- According to the parameter metering /billing credibility pre-paid we found that all the service providers are meeting the benchmark.
- According to the parameter Resolution of billing/ charging complaints we found that all the service providers are meeting the benchmark except **TATA CDMA**.
- According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints we found that all the service providers are meeting the benchmark.
- According to the parameter Accessibility of call centre/Customer Care 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 we found that all the service providers are meeting the benchmark except **Aircel, Airtel, BSNL and Rcom (GSM & CDMA)**.
- According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter we found that all the service providers are meeting the benchmark except **Aircel**.
- According to the parameter Time taken for refunds of deposits after closures after verification we found that all the service providers are meeting the benchmark except **TATA CDMA**.

3.8 Redressal

Sample coverage

A sample of billing complaints was taken for each operator and calls were made for assessing the resolution of billing/charging complaints within 4 weeks as claimed by the respective operators.

3.8.1 Performance (live calling for billing complaints)

Calling Operator	Vodafone	Airtel	Idea	Uninor	Aircel	BSNL	Rcom	Tata	RCOM CDMA	Tata CDMA
Calls Attempted	100	100	100	100	100	100	100	100	100	100
Total No. of calls Answered	96	93	94	100	90	88	85	91	89	93
Cases resolved with 4 weeks	96	93	94	100	90	88	85	91	89	93
%age of cases resolved	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Note: The difference between call attempts 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

3.8.2 Live calling to call centre

Calling Operator	Vodafone	Airtel	Idea	Uninor	Aircel	BSNL	Rcom	Tata	RCOM CDMA	Tata CDMA
Total No. of Calls Attempted	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	100	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	98	96	100	100	95	100	85	98	100	100
%age of calls got answered	98.00%	96.00%	100.00%	100.00%	95.00%	100.00%	85.00%	98.00%	100.00%	100.00%

A sample of live callings were taken for each operator and calls were made for assessing call center's responses within 60sec in which we found Rcom GSM was not met the benchmark(>=95%).

3.8.3 Level 1 Live Calling (Emergency No.):-

Level 1 calling such as calling at emergency no. Police, Fire, and Ambulance were made so as to check the service of such short codes. In different cities of Andhra Pradesh we have dialed 3times from each service providers' no. and in this way we have dialed 450 calls.

Emergency No.	No. of calls	Vodafo ne	Airtel	Idea	Uninor	Aircel	BSNL	Rcom GSM	Tata GSM	RCOM CDMA	Tata CDMA
GUNTUR											
100(Police)	50	5	5	5	5	5	5	5	5	5	5
101 (Fire)	50	5	5	5	5	5	5	5	5	5	5
108(Ambulance)	50	5	5	5	5	5	5	5	5	5	5
KRISHNA											
100(Police)	50	5	5	5	5	5	5	5	5	5	5
101 (Fire)	50	5	5	5	5	5	5	5	5	5	5
108(Ambulance)	50	5	5	5	5	5	5	5	5	5	5
WARANGAL											
100(Police)	50	5	5	5	5	5	5	5	5	5	5
101 (Fire)	50	5	5	5	5	5	5	5	5	5	5
108(Ambulance)	50	5	5	5	5	5	5	5	5	5	5

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. In different cities of Andhra Pradesh it was found to be functional.

3.9 Inter Operator Call Assessment

Sample coverage

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

Performance Based on Live Measurement

Calling Operator	Airtel	Aircel	Idea	Uninor	Vodafone	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	BSNL
Airtel	-	100.00%	100.00%	100.00%	100.00%	97.00%	100.00%	100.00%	100.00%	100.00%
Aircel	100.00%	-	100.00%	100.00%	100.00%	96.00%	95.50%	97.50%	100.00%	100.00%
Idea	100.00%	100.00%	-	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Uninor	100.00%	100.00%	100.00%	-		98.00%	100.00%	100.00%	100.00%	100.00%
Vodafone	100.00%	100.00%	100.00%	100.00%	-	100.00%	100.00%	100.00%	100.00%	100.00%
RCOM GSM	100.00%	97.00%	100.00%	100.00%	100.00%	-	97.00%	99.00%	98.00%	100.00%
RCOM CDMA	100.00%	100.00%	100.00%	100.00%	100.00%	96.00%	-	100.00%	100.00%	100.00%
TATA GSM	100.00%	100.00%	100.00%	100.00%	100.00%	97.50%	98.00%	-	100.00%	100.00%
TATA CDMA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	-	100.00%
BSNL	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 may be due to any of these parts. The result shows that the congestion was found with all the service providers except BSNL, Idea, and Vodafone.

CAPTER-4: DETAILED FINDINGS, ANALYSIS AND GRAPHICAL REPRESENTATION

4.0 Cellular Mobile Telephone Service

4.1 Customer Service Quality Parameters

4.1.1 4th Quarter data Assessment:

Andhra Pradesh, Q4 April - June'14													
PMR		Benchmark	Audit	Aircel	Airtel	BSNL	Idea	Rcom GSM	Tata GSM	Uninor	Vodafone	Rcom CDMA	Tata CDMA
S.N	Name of Parameter			GSM Operators									
(B)	Customer Service Quality Parameters												
1	Metering/billing credibility Post paid	<= 0.1%	Reported	0.00%	0.01%	0.00%	0.12%	0.09%	0.00%	NA	0.07%	0.09%	0.00%
			Verified	0.00%	0.01%	0.00%	0.12%	0.09%	0.00%	NA	0.07%	0.09%	0.00%
2	Metering /billing credibility Pre paid	<= 0.1%	Reported	0.02%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.05%	0.01%	0.00%
			Verified	0.02%	0.00%	0.00%	0.00%	0.10%	0.00%	0.00%	0.05%	0.01%	0.00%
3	Resolution of billing/ charging complaints	100% within 4 weeks	Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	99.70%
			Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	99.70%
4	Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints	<=1 week	Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
			Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
5	Response time to customers for assistance												
	a) Accessibility of call centre/Customer Care	>=95%	Reported	98.13%	100.00%	98.00%	99.57%	99.40%	99.54%	95.95%	97.00%	98.88%	99.27%
			Verified	98.13%	100.00%	98.00%	99.57%	99.40%	99.54%	95.95%	97.00%	98.88%	99.27%
	b) % call answered by operators (voice to voice) within 60 sec.	>=90%	Reported	89.01%	87.00%	69.00%	94.00%	42.36%	95.00%	96.97%	96.00%	63.22%	98.00%
			Verified	89.01%	87.00%	69.00%	94.00%	42.36%	95.00%	96.97%	96.00%	63.22%	98.00%
6	Termination/closure of service												
	No. of requests for Termination / Closure of service complied within 7 days during the quarter	<=7days	Reported	99.46%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
			Verified	99.46%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
7	Time taken for refunds of deposits after closures.	100% within 60 days	Reported	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
			Verified	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	99.80%

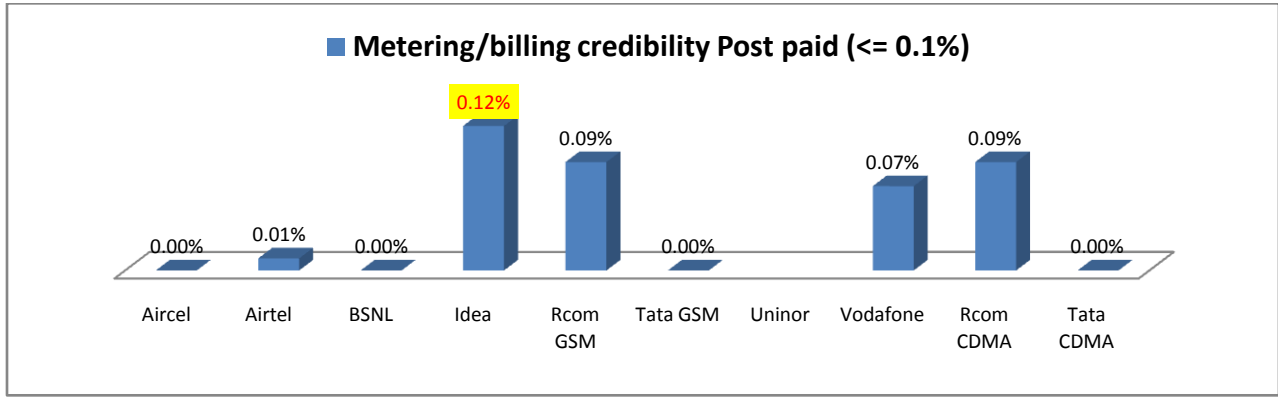


Fig. 1

According to the parameter metering/billing credibility post-paid in the table 4.1.1 and the Fig.1 we found that all the service providers are meeting the benchmark except **Idea**.

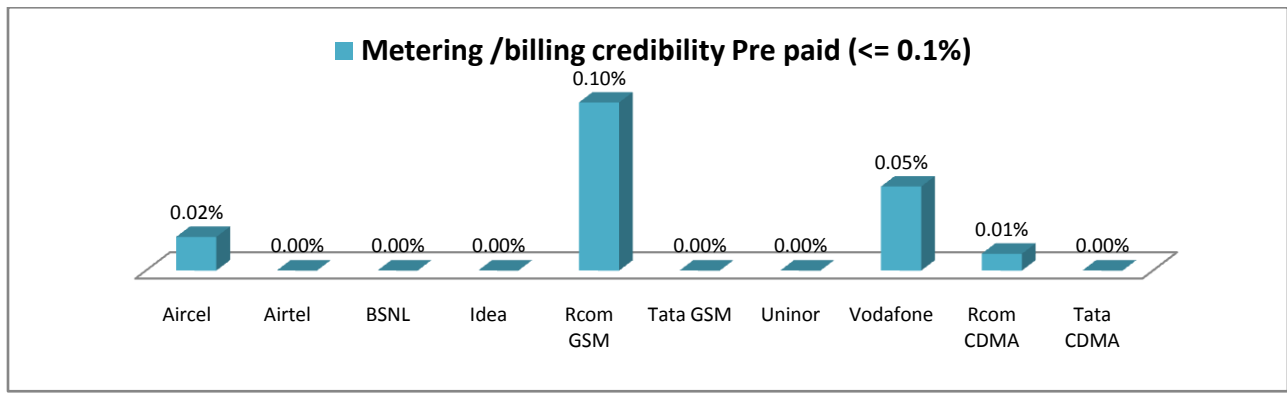


Fig. 2

According to the parameter metering /billing credibility pre-paid in the table 4.1.1 and the Fig.2 we found that all the service providers are meeting the benchmark.

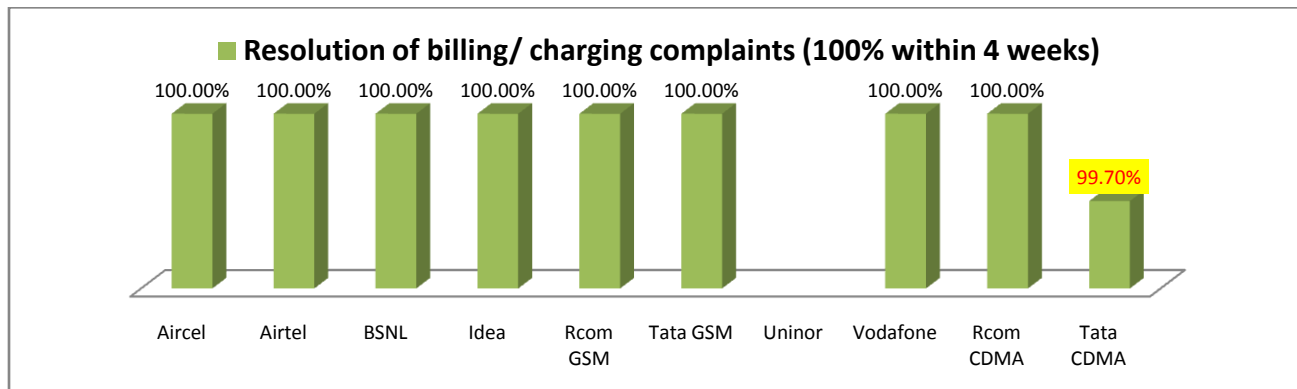


Fig. 3

According to the parameter Resolution of billing/charging complaints in the table 4.1.1 and the Fig.3 we found that all the service providers are meeting the benchmark except **TATA CDMA**.

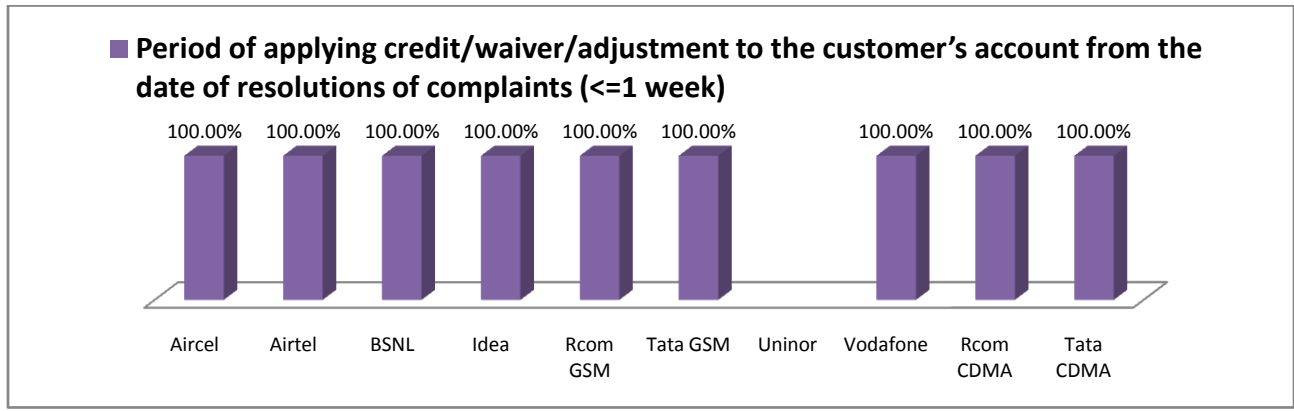


Fig. 4
According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints in the table 4.1.1 and the Fig.4 we found that all the service providers are meeting the benchmark.

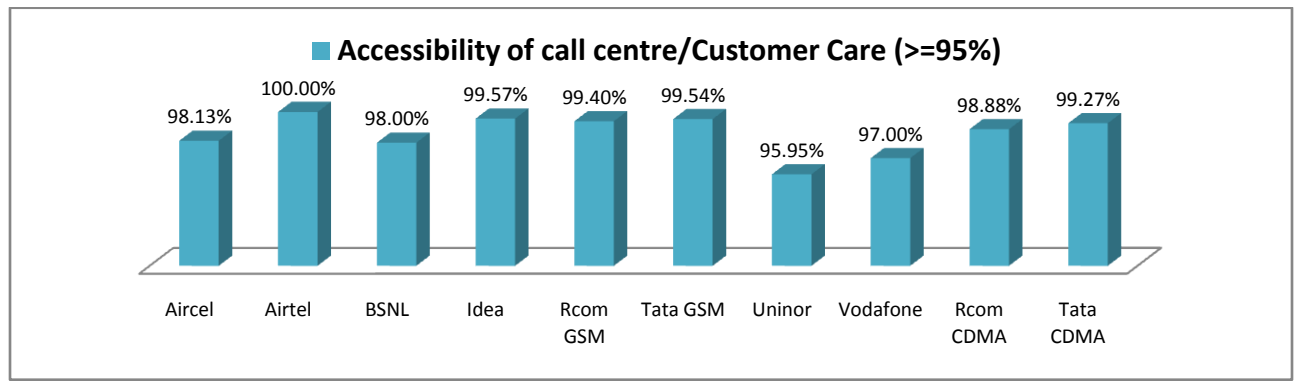


Fig. 5
According to the parameter Accessibility of call centre/Customer Care in the table 4.1.1 and the Fig.5 we found that all the service providers are meeting the benchmark.

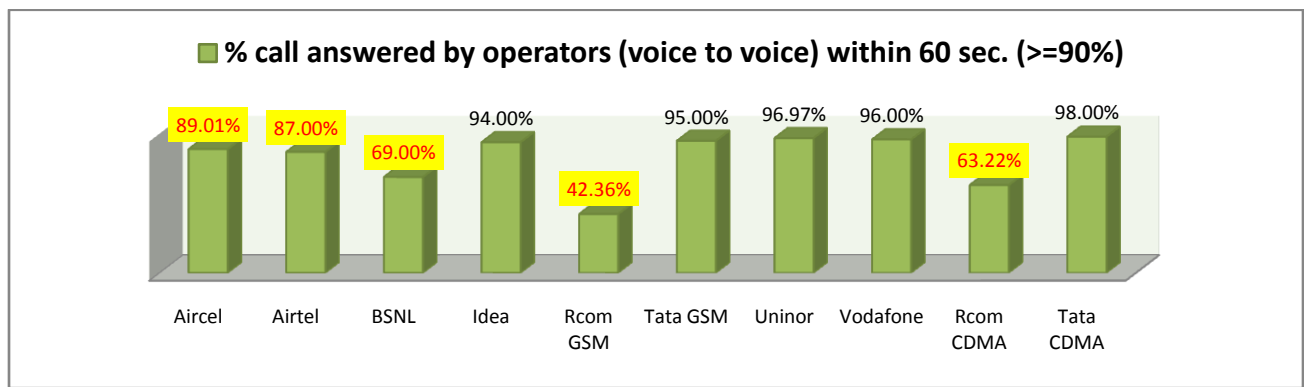


Fig. 6
According to the parameter % call answered by operators (voice to voice) within 60 sec in the table 4.1.1 and the Fig.6 we found that all the service providers are meeting the benchmark except **Aircel, Airtel, BSNL and Rcom GSM & CDMA.**

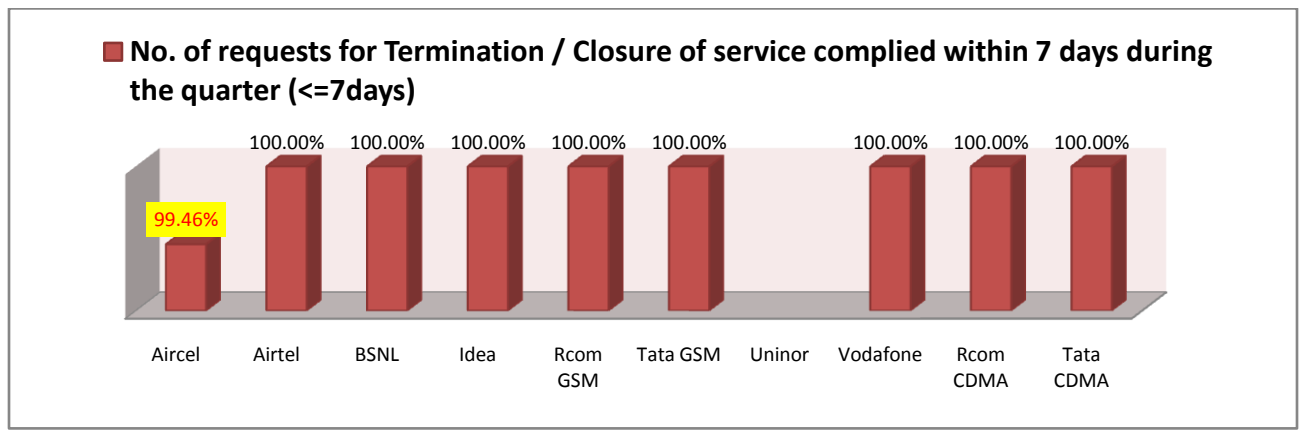


Fig. 7
 According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter in the table 4.1.1 and the Fig.7we found that all the service providers are meeting the benchmark except **Aircel**.

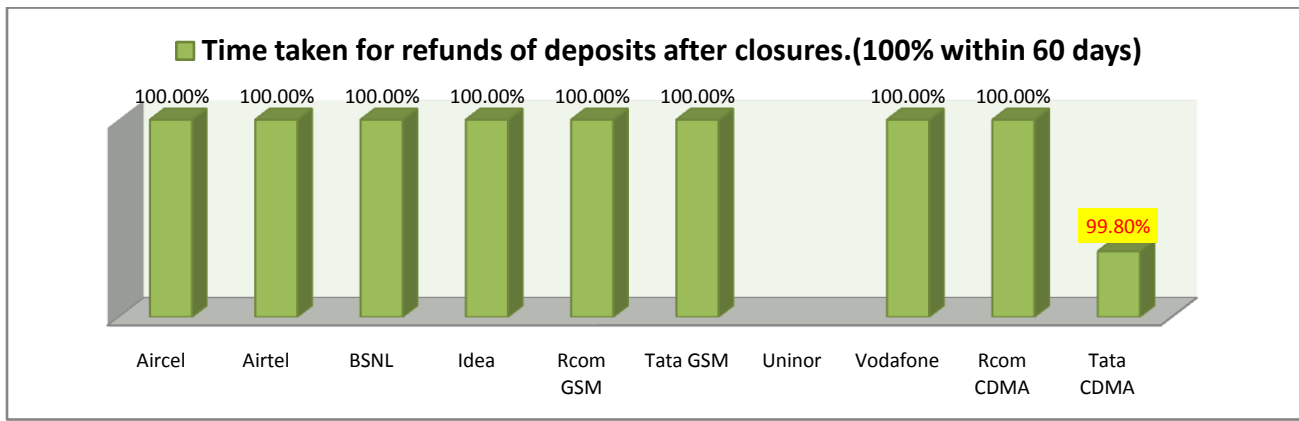


Fig. 8
 According to the parameter Time taken for refunds of deposits after closures in the table 4.1.1 and the Fig.8 we found that all the service providers are meeting the benchmark except **TATA CDMA**.

4.2 Summarized PMR Data Results in Table & Graphical

4.2.1 AP Circle (April – June'14):

AP Circle (April - June'14)																	
Month PMR Generation Data		Bench mark	Audit Period	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	Name of Parameter			GSM Operators												CDMA	
Network Service Quality Parameter																	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	One Qtr	0.13%	0.13%	0.02%	0.12%	1.94%	1.13%	0.04%	0.04%	0.42%	0.23%	0.29%	0.04%	0.58%	0.03%
	Worst affected BTS due to downtime	≤ 2%	One Qtr	0.32%	0.32%	0.00%	0.20%	1.96%	1.90%	0.22%	0.16%	1.52%	1.48%	1.95%	0.23%	1.40%	0.00%
Connection establishment (Accessibility)																	
2	Call Setup Success Rate	≥ 95%	One Qtr	99.35%	99.31%	99.20%	98.82%	98.02%	97.70%	99.99%	99.64%	99.65%	98.83%	98.32%	99.83%	98.31%	99.12%
	SDCCH/ Paging Channel Congestion	≤ 1%	One Qtr	0.16%	0.42%	0.10%	0.36%	0.88%	0.91%	0.71%	0.01%	0.06%	0.05%	0.44%	0.07%	0.01%	0.00%
	TCH congestion	≤ 2%	One Qtr	0.28%	0.27%	0.07%	0.00%	1.69%	1.23%	1.10%	0.04%	0.06%	0.17%	0.69%	0.24%	0.16%	0.57%
Connection Maintainability (Retain ability)																	
3	Call Drop Rate	≤ 2%	One Qtr	0.92%	0.55%	0.34%	0.64%	0.92%	0.67%	0.71%	0.36%	0.44%	0.62%	0.96%	0.50%	0.27%	0.28%
	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	One Qtr	4.23%	4.10%	0.48%	2.48%	2.45%	2.83%	1.44%	0.34%	0.06%	4.19%	2.28%	1.55%	0.05%	1.38%
	% of Connections with good voice quality	≥ 95%	One Qtr	97.89%	99.77%	98.92%	99.09%	98.00%	99.82%	97.54%	99.80%	98.79%	98.19%	97.91%	98.92%	99.70%	98.86%
	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%	0.00%

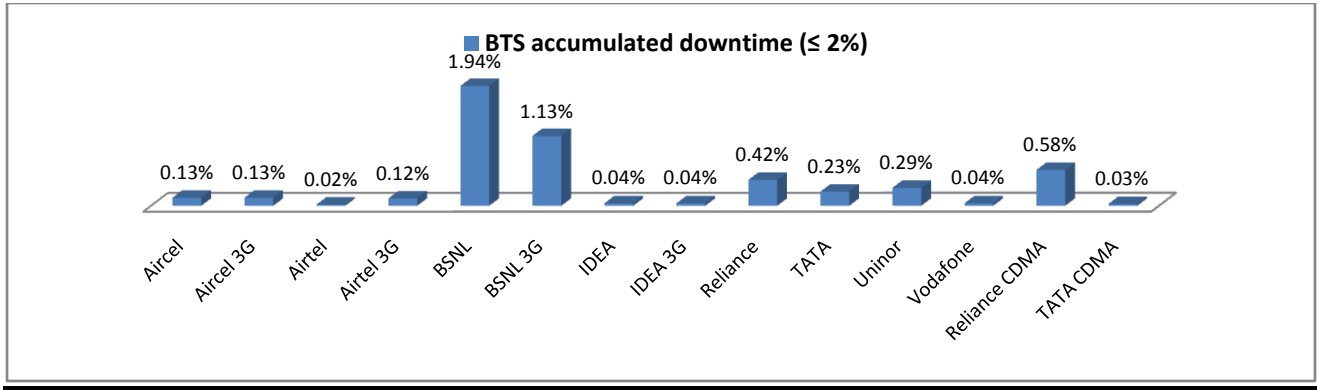


Fig. 1

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

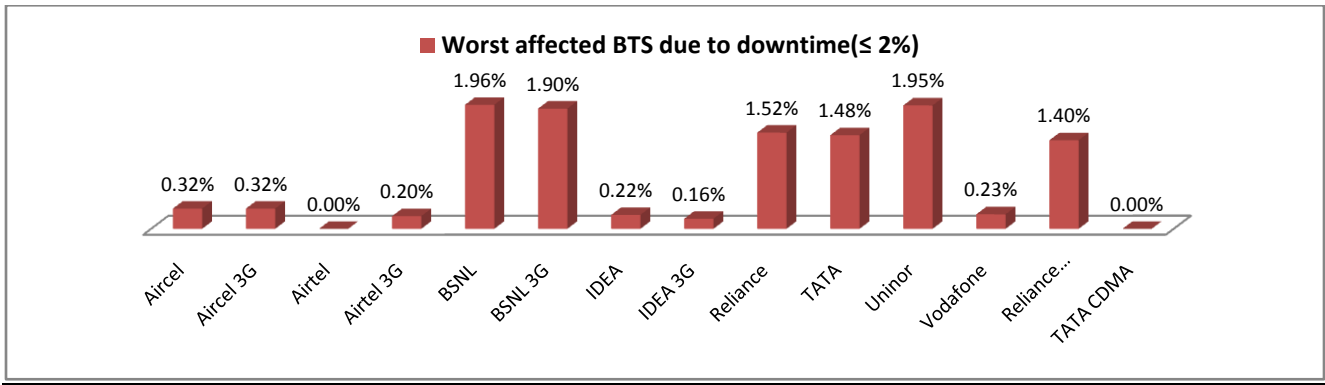


Fig. 2

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

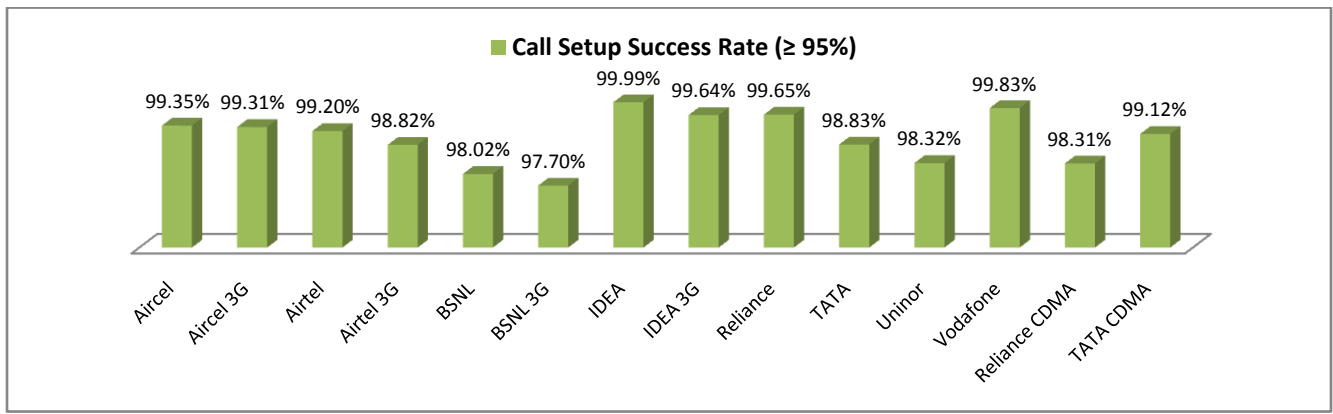


Fig. 3

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

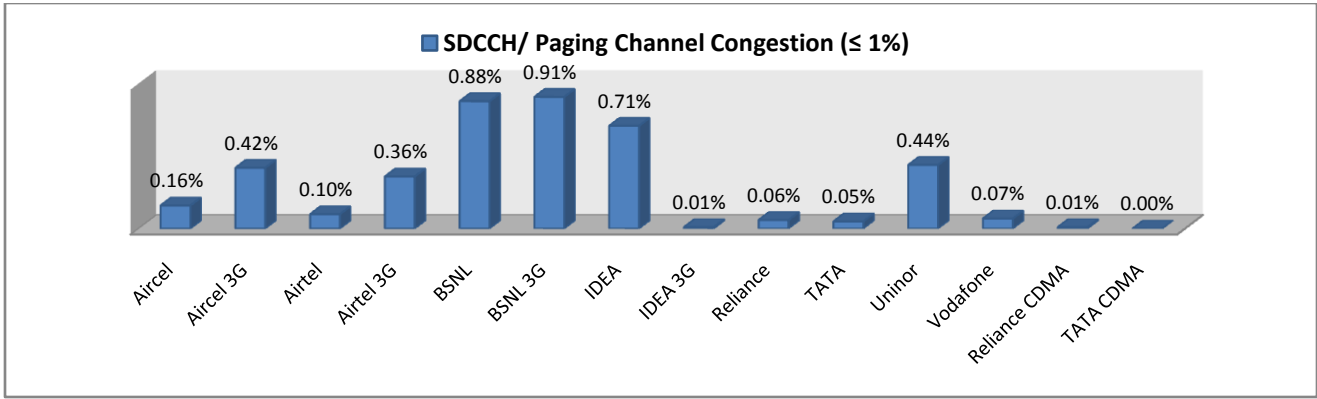


Fig. 4

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

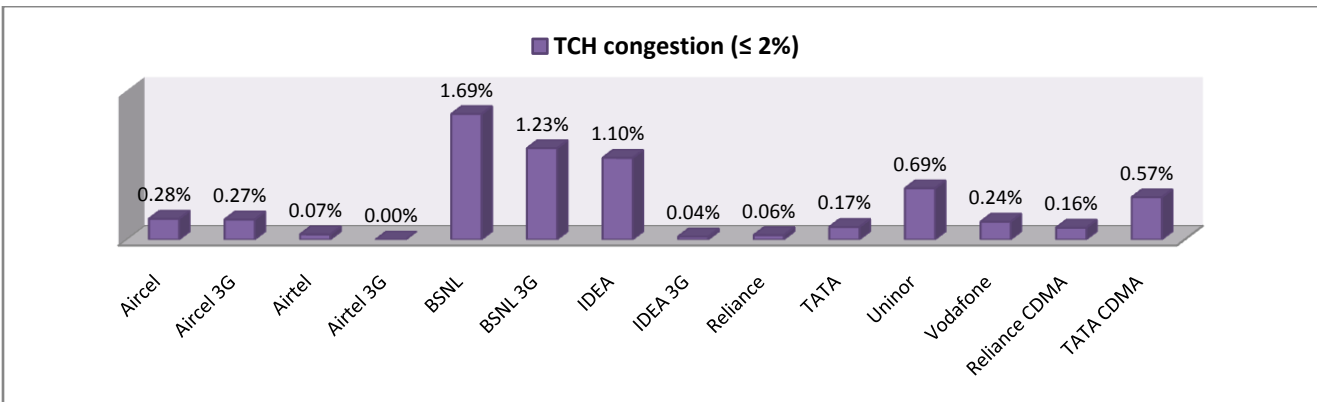


Fig. 5

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

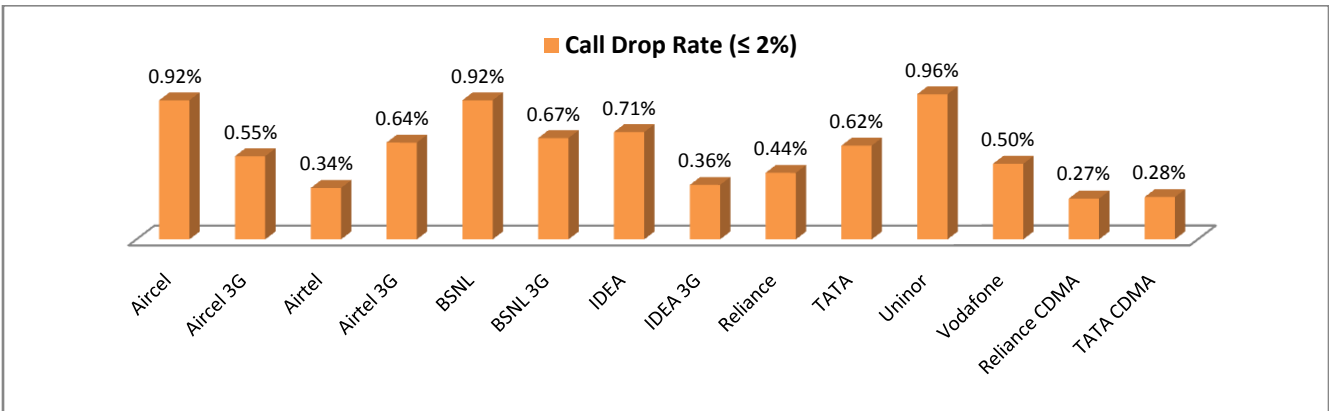


Fig. 6

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

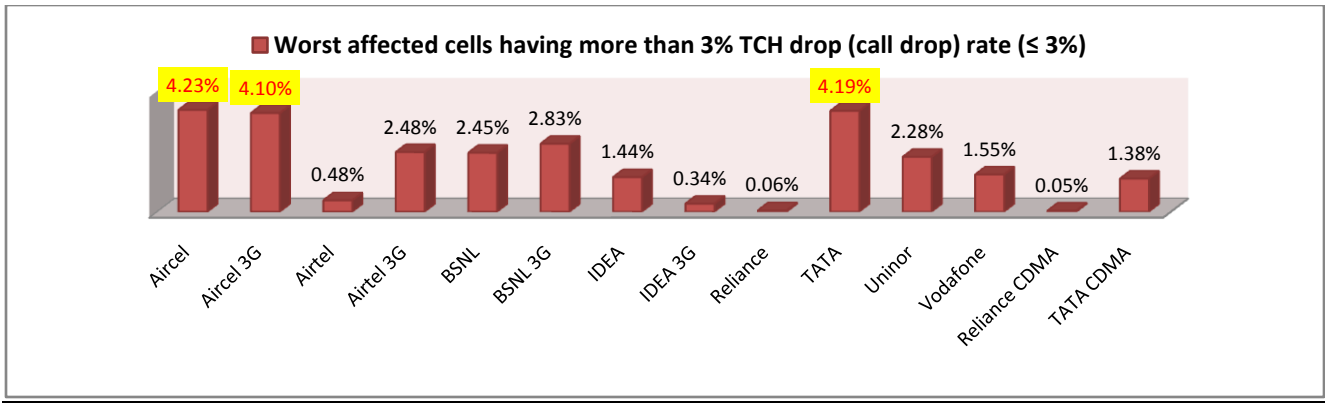


Fig. 7

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters except Aircel (2G & 3G) and TATA GSM.

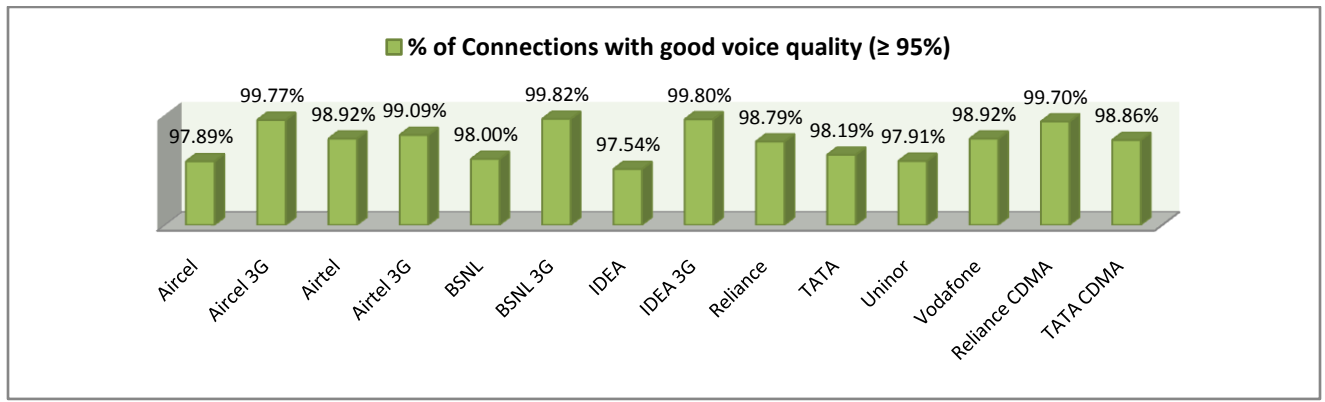


Fig. 8

According to the above graph and data on the table, it is found that all the operators are meeting the Network Parameters.

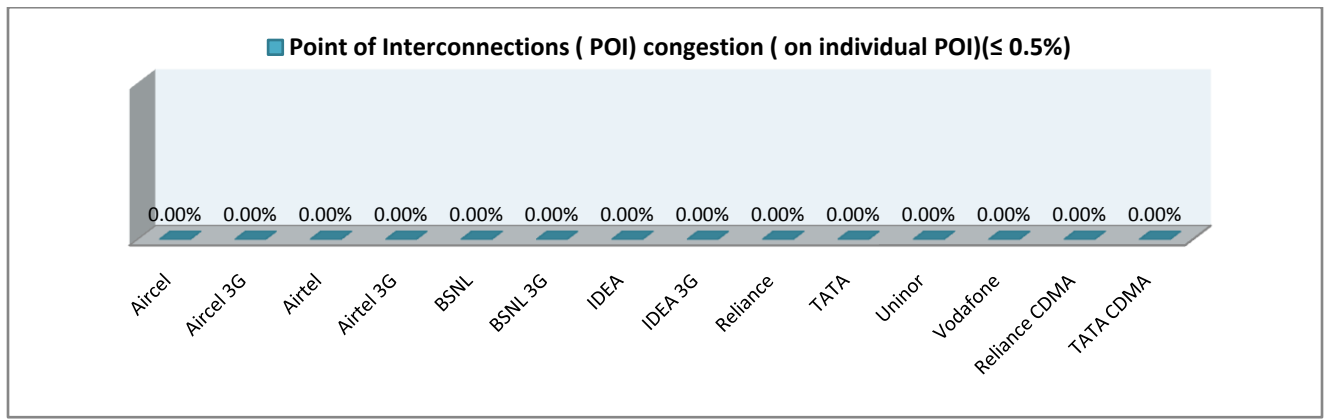


Fig. 9

According to the above graph and data on the table, it is found that all the operators are meeting the network Parameters.

4.3 Drive Test Measurements Audit Report AP Circle (Graphical Representation)

Drive Test Measurements													
S N	Parameter	City Name	GSM Operators								CDMA Operators		
			Airtel	Idea	Vodafone	BSNL	Uninor	Aircel	Rcom GSM	TATA GSM	Rcom CDMA	TATA CDMA	
1.1	Call Attempts	GUNTUR	639	708	601	584	738	631	756	692	692	806	
		KRISHNA	587	641	495	684	691	445	566	549	576	640	
		WARANGAL	557	693	655	594	642	594	720	546	678	477	
1.2	Blocked Call Rate (<=3%)	GUNTUR	0.00%	1.00%	0.17%	0.12%	0.00%	0.00%	5.40%	0.28%	3.76%	0.00%	
		KRISHNA	0.00%	0.33%	0.19%	1.32%	0.00%	0.00%	3.35%	0.79%	0.62%	0.00%	
		WARANGAL	0.00%	0.09%	0.10%	0.43%	0.00%	0.00%	0.27%	0.56%	0.27%	0.00%	
1.3	Dropped Call Rate (<=2%)	GUNTUR	0.00%	0.05%	0.00%	0.53%	0.26%	0.00%	0.52%	0.28%	0.89%	0.82%	
		KRISHNA	0.00%	0.73%	0.00%	0.48%	0.00%	0.00%	0.88%	1.03%	2.87%	0.76%	
		WARANGAL	0.00%	0.09%	0.00%	1.25%	0.11%	0.32%	0.42%	0.34%	0.18%	2.32%	
1.4	Percentage of connections with good voice quality (=>95%)												
	(i) 0-4 (w/o frequency hopping)	GUNTUR	-	-	-	-	-	-	-	-	-	98.87%	98.70%
		KRISHNA	-	-	-	-	-	-	-	-	-	98.77%	99.52%
		WARANGAL	-	-	-	-	-	-	-	-	-	99.37%	99.16%
	(ii) 0-5 (with frequency hopping)	GUNTUR	96.56%	96.03%	96.88%	96.48%	95.45%	96.48%	93.72%	94.54%	-	-	
		KRISHNA	97.49%	96.30%	96.92%	91.31%	95.20%	98.01%	95.71%	96.28%	-	-	
WARANGAL		96.83%	96.57%	98.21%	96.80%	95.46%	97.64%	96.20%	97.00%	-	-		
1.5	Service Coverage												
	In door (>= -75dBm)	GUNTUR	71.23%	84.54%	89.09%	83.55%	94.95%	49.86%	47.25%	77.78%	49.66%	81.19%	
		KRISHNA	94.54%	91.81%	88.87%	82.01%	86.25%	58.73%	61.70%	89.27%	63.62%	82.80%	
		WARANGAL	95.76%	99.12%	94.57%	62.13%	96.60%	67.79%	61.29%	85.79%	48.53%	69.44%	
	In-vehicle (>= -85dBm)	GUNTUR	94.96%	97.98%	99.17%	98.14%	99.65%	86.57%	78.14%	97.12%	81.10%	98.35%	
		KRISHNA	99.56%	98.90%	99.32%	96.99%	98.14%	92.66%	85.89%	98.39%	86.44%	97.59%	
		WARANGAL	99.60%	99.85%	99.60%	96.31%	99.81%	96.46%	88.63%	98.28%	83.73%	94.51%	
	Outdoor- in city (>= -95dBm)	GUNTUR	99.72%	99.80%	99.90%	99.80%	99.88%	98.59%	95.09%	99.61%	98.70%	99.81%	
		KRISHNA	99.97%	99.89%	99.97%	99.49%	99.71%	99.58%	97.18%	99.89%	97.33%	99.96%	
WARANGAL		99.96%	99.95%	99.96%	99.95%	100.00%	99.86%	100.00%	99.95%	98.63%	99.23%		
1.6	Call Setup Success Rate (>=95%)	GUNTUR	100.00%	99.00%	99.83%	99.88%	100.00%	99.17%	94.58%	99.72%	96.18%	98.07%	
		KRISHNA	100.00%	99.66%	99.81%	98.63%	99.00%	100.00%	96.66%	99.21%	99.38%	99.45%	
		WARANGAL	99.10%	99.91%	99.90%	99.50%	100.00%	99.80%	99.72%	99.11%	99.73%	99.16%	
1.7	Hand Over Success Rate (HOSR)	GUNTUR	100.00%	99.10%	99.83%	99.49%	98.80%	98.94%	98.56%	99.14%	100.00%	100.00%	
		KRISHNA	100.00%	99.60%	100.00%	98.55%	99.12%	99.58%	99.17%	97.33%	100.00%	100.00%	
		WARANGAL	99.83%	99.94%	99.55%	99.84%	98.96%	99.73%	99.67%	99.05%	100.00%	99.95%	

4.3.1 Call Attempts: -

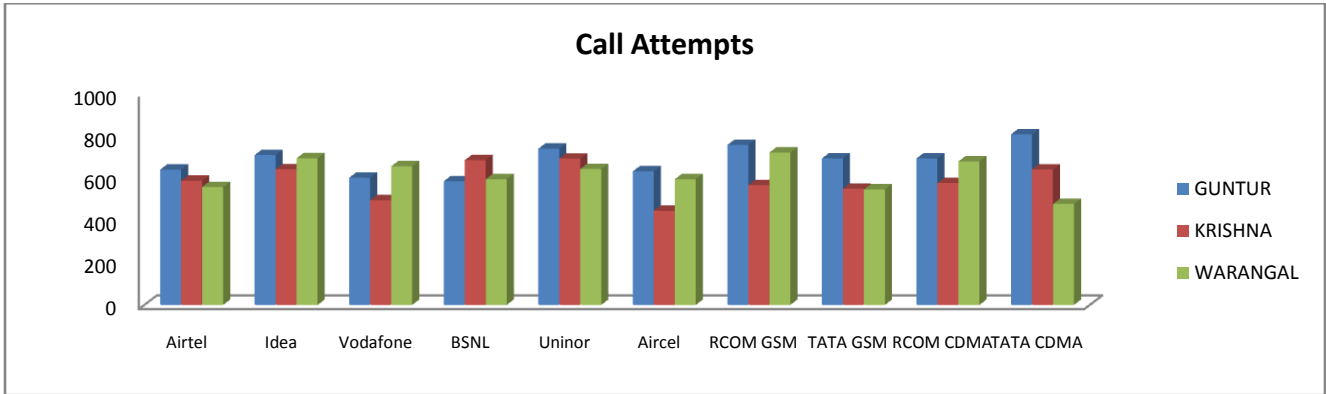


Fig.4.3.1

According to the table and the fig. 4.3.1 it shows the no. of call attempted in the different city.

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

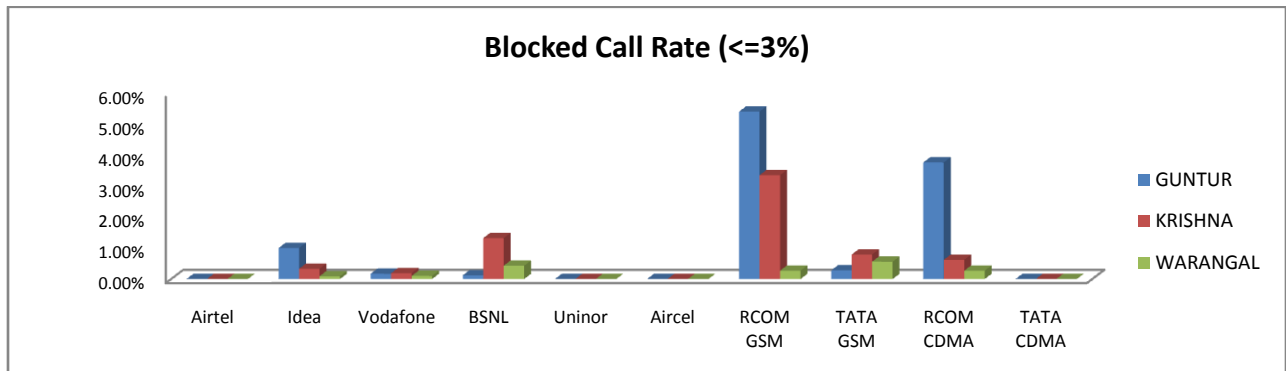


Fig.4.3.2

According to the table and the fig. 4.3.2 it shows Rcom GSM in Guntur & Krishna and Rcom CDMA in Guntur are not meeting the benchmark of **Blocked Call Rate**.

4.3.3 Dropped Call Rate (<=2%):

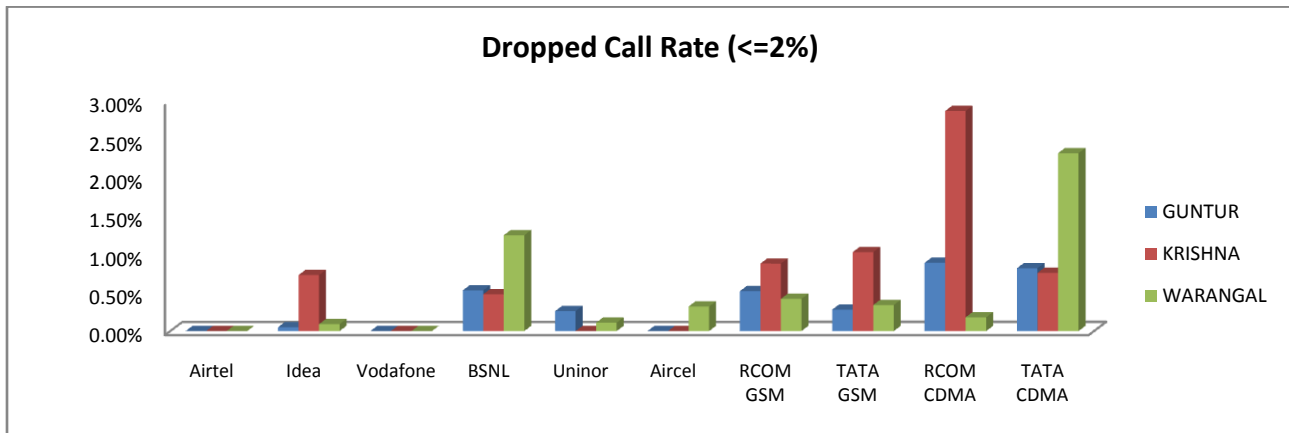


Fig. 4.3.3

According to the table and the fig. 4.3.3 it shows the Rcom CDMA in Krishna and TATA CDMA in Warangal is not meeting the benchmark for **Dropped Call Rate**.

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

4.3.4.1 0-4 (w/o frequency hopping)

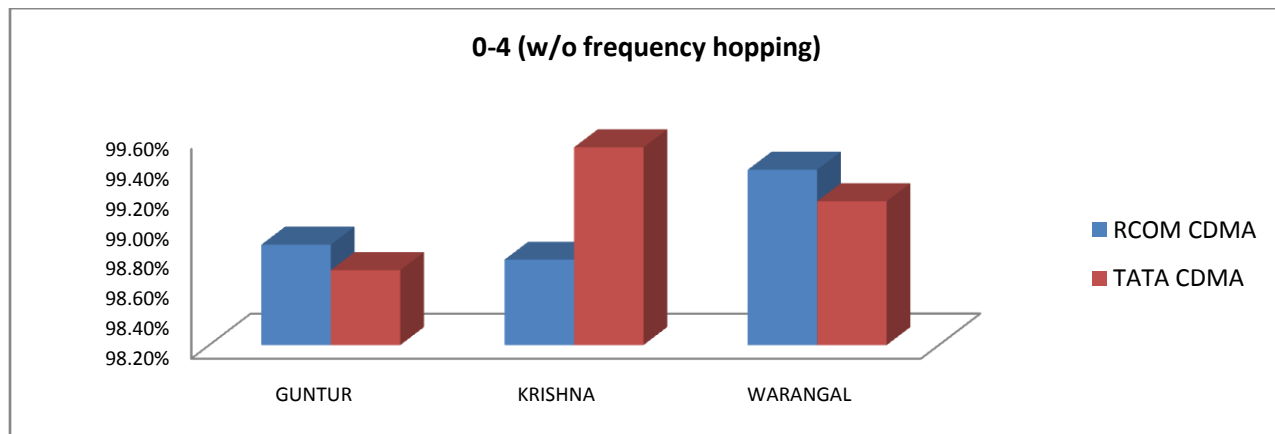


Fig. 4.3.4.1

According to the table and the fig. 4.3.4.1 it shows that all service providers are meeting the benchmark Voice Quality 0-4 (w/o frequency hopping).

4.3.4.2 0-5 (with frequency hopping)

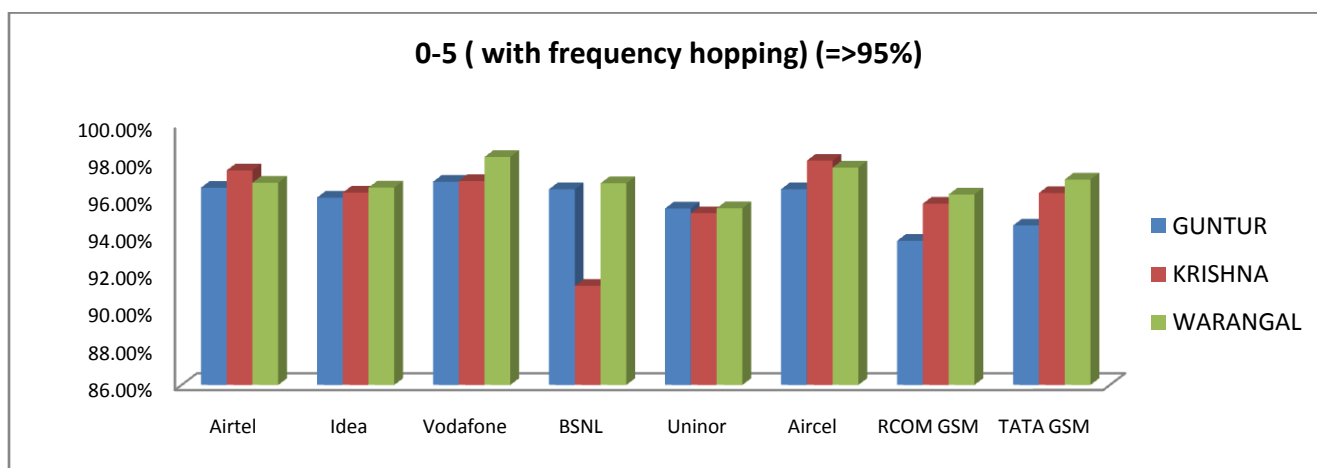


Fig. 4.3.4.2

According to the table and the fig. 4.3.4.2, it shows that the BSNL is not meeting the benchmark in Krishna and Rcom GSM & TATA GSM in Guntur is not meeting the benchmark for Voice Quality (0-5 (with frequency hopping)).

4.3.5 Service Coverage

4.3.5.1 In door ($\geq -75\text{dBm}$)

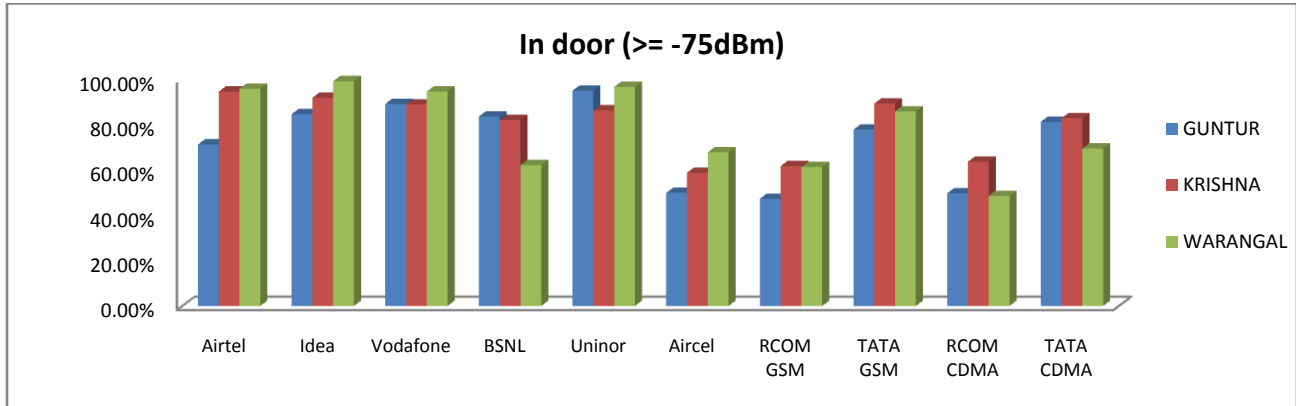


Fig.4.3.5.1

According to the table and the fig.4.3.5.1, it shows that all operators are meeting the benchmark.

4.3.5.2 In-vehicle ($\geq -85\text{dBm}$)

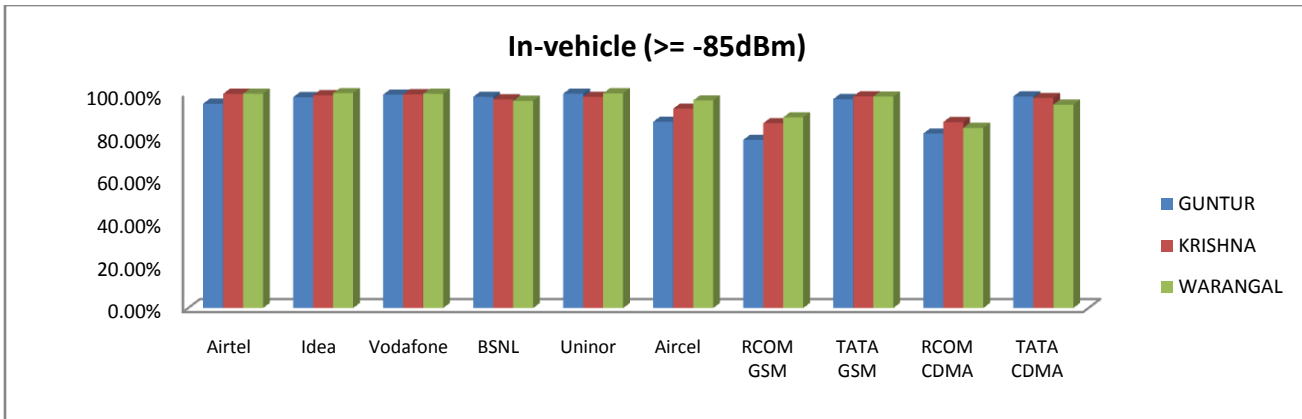


Fig. 4.3.5.2

According to the table and the fig.4.3.5.2, it shows that all operators are meeting the benchmark.

4.3.5.3 Outdoor- in city ($\geq -95\text{dBm}$)

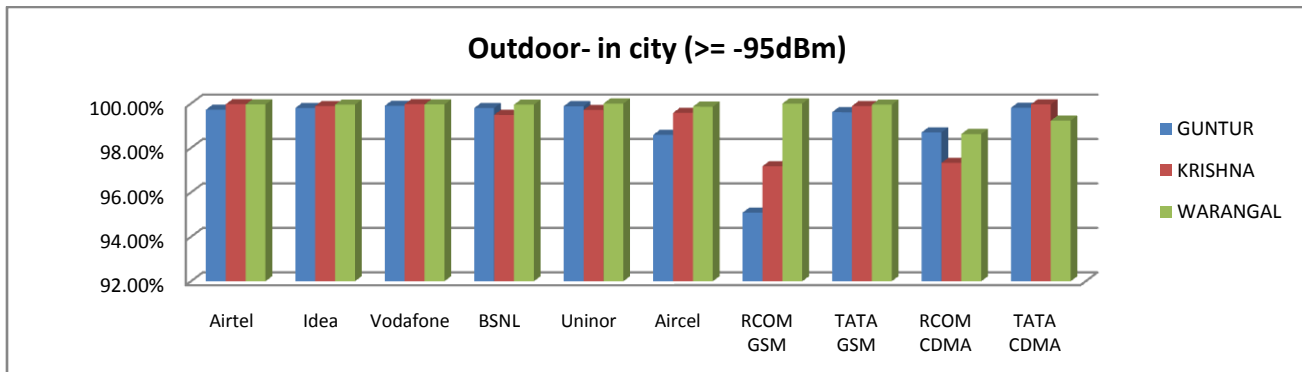


Fig. 4.3.5.3

According to the table and the fig.4.3.5.3, it shows that all operators are meeting the benchmark.

4.3.6 Call Setup Success Rate (>=95%)

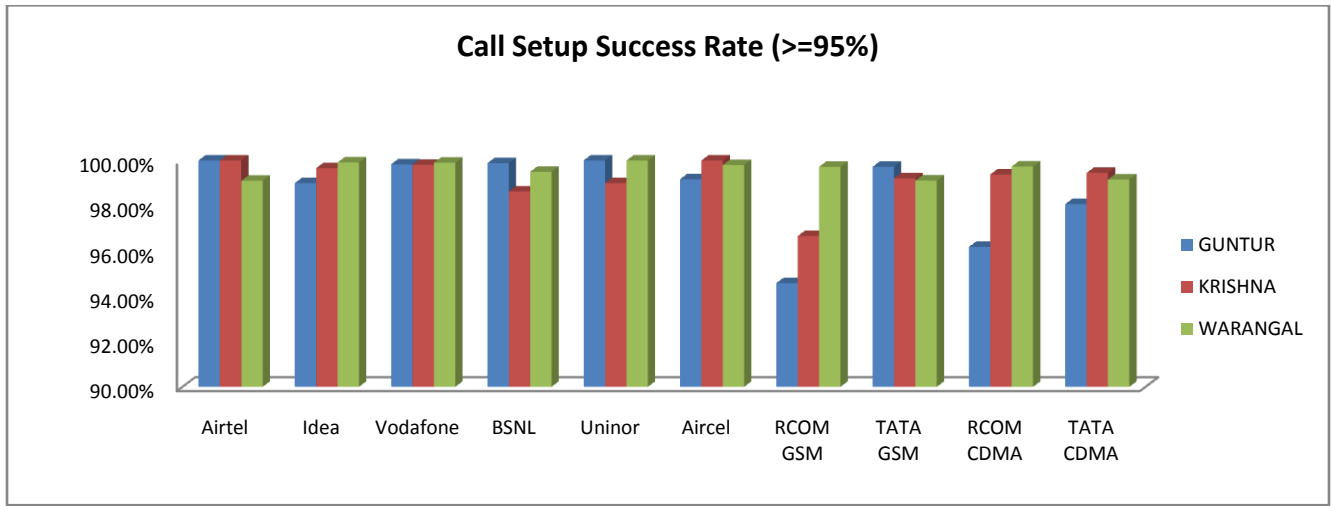


Fig. 4.3.6

According to the table and the fig. 4.3.6, it shows Rcom GSM is not meeting the benchmark for **Call Setup Success Rate** in Guntur.

4.3.7 Handover Success Rate (HOSR)

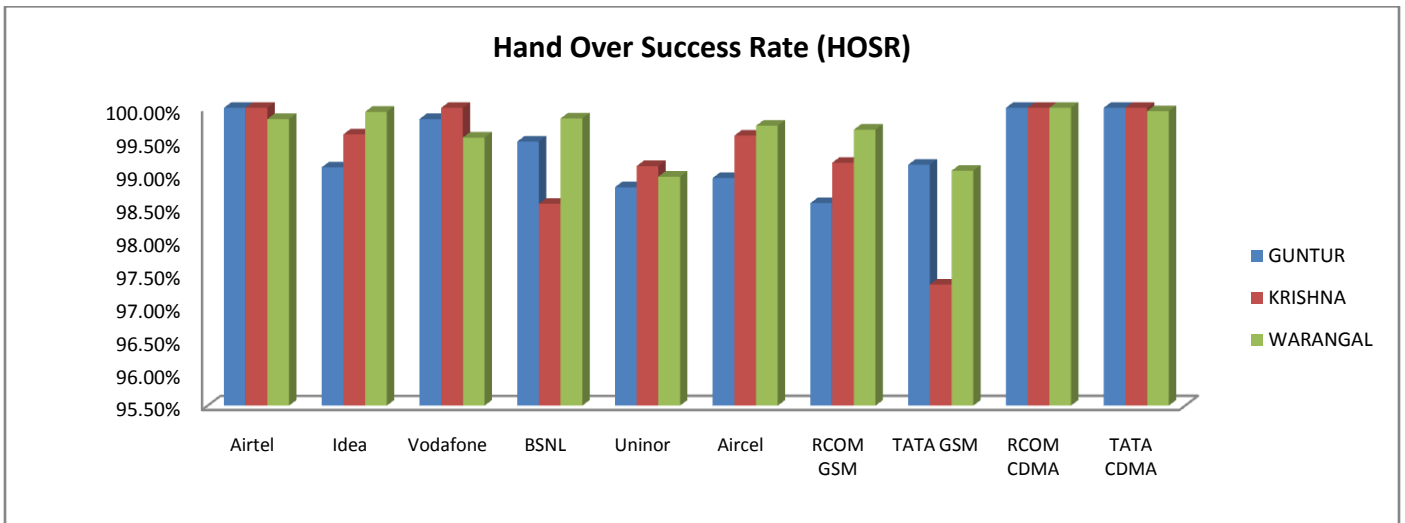


Fig.4.3.7

4.4 3 Days LIVE Test Summary and Graphical Representation For Q4_AP 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.

Andhra Pradesh Circle Q4_April - June'14																	
3 days Live Test Audit Data			Date	Aircel	Aircel 3G	Airtel	Airtel 3G	BSNL	BSNL 3G	IDEA	IDEA 3G	Reliance	TATA	Uninor	Vodafone	Reliance	TATA
S/N	PARAMETER	Bench Mark		GSM Operators												CDMA	
Network Availability																	
1	BTS accumulated downtime	≤ 2%	Day 1	0.13%	0.16%	0.02%	0.18%	1.95%	1.52%	0.08%	0.04%	0.79%	0.04%	2.37%	0.02%	0.79%	0.19%
			Day 2	0.12%	0.13%	0.02%	0.18%	1.94%	1.55%	0.08%	0.08%	0.76%	0.04%	3.27%	0.34%	0.76%	0.03%
			Day 3	0.10%	0.16%	0.02%	0.18%	1.93%	1.30%	0.08%	0.05%	1.07%	0.04%	1.20%	0.41%	1.07%	0.19%
	Worst affected BTS due to downtime	≤ 2%	Day 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.07%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
			Day 2	0.00%	0.00%	0.00%	0.00%	0.07%	0.10%	0.15%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
			Day 3	0.00%	0.00%	0.00%	0.00%	0.09%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
Connection establishment (Accessibility)																	
1	Call Setup Success Rate	≥ 95%	Day 1	99.14%	99.40%	99.08%	98.88%	97.86%	99.67%	99.99%	99.64%	97.92%	98.79%	98.08%	99.81%	97.92%	99.21%
			Day 2	99.00%	99.38%	99.30%	98.02%	97.89%	96.84%	99.99%	99.62%	98.37%	98.73%	98.06%	99.78%	98.37%	99.26%
			Day 3	99.10%	99.46%	99.26%	98.29%	98.16%	96.78%	99.99%	99.65%	97.66%	98.73%	98.11%	99.78%	97.66%	99.20%
2	SDCCH/ Paging Channel Congestion	≤ 1%	Day 1	0.17%	0.39%	0.09%	0.28%	0.96%	0.94%	0.37%	0.01%	0.00%	0.03%	0.43%	0.08%	0.00%	0.00%
			Day 2	0.23%	0.37%	0.08%	0.17%	0.89%	0.93%	0.47%	0.02%	0.00%	0.04%	0.47%	0.10%	0.00%	0.00%
			Day 3	0.16%	0.31%	0.05%	0.13%	0.76%	0.94%	0.48%	0.01%	0.00%	0.02%	0.48%	0.05%	0.00%	0.00%
3	TCH congestion	≤ 2%	Day 1	0.23%	0.21%	0.09%	0.02%	1.58%	1.82%	1.01%	0.02%	0.25%	0.22%	1.01%	0.19%	0.25%	0.79%
			Day 2	0.61%	0.25%	0.06%	0.00%	1.98%	1.68%	0.82%	0.03%	0.15%	0.23%	1.04%	0.22%	0.15%	0.74%
			Day 3	0.37%	0.23%	0.06%	0.00%	1.75%	1.51%	1.14%	0.01%	0.26%	0.23%	0.99%	0.22%	0.26%	0.80%
Connection Maintainability (Retain ability)																	
4	Call Drop Rate	≤ 2%	Day 1	1.08%	0.52%	0.38%	0.67%	0.92%	0.64%	0.76%	0.39%	0.31%	0.72%	1.05%	0.51%	0.31%	0.27%
			Day 2	1.01%	0.54%	0.35%	0.67%	0.93%	0.64%	0.73%	0.40%	0.30%	0.72%	1.02%	0.52%	0.30%	0.29%
			Day 3	1.05%	0.56%	0.41%	0.67%	0.89%	0.64%	0.84%	0.41%	0.43%	0.73%	1.03%	0.51%	0.43%	0.30%
5	Worst affected cells having more than 3% TCH drop (call drop) rate	≤ 3%	Day 1	5.59%	6.03%	0.00%	0.06%	2.67%	2.84%	2.46%	2.21%	0.04%	4.48%	2.22%	2.71%	0.04%	1.24%
			Day 2	5.28%	6.54%	0.01%	0.06%	2.73%	2.76%	2.43%	2.37%	0.02%	4.82%	2.44%	2.75%	0.02%	1.48%
			Day 3	5.05%	5.98%	0.00%	0.06%	2.61%	2.88%	2.64%	2.17%	0.02%	4.59%	2.29%	2.55%	0.02%	1.51%
6	% of Connections with good voice quality	≥ 95%	Day 1	97.84%	99.78%	98.95%	99.06%	98.11%	99.86%	97.71%	99.81%	99.71%	98.05%	97.99%	98.89%	99.71%	99.14%
			Day 2	97.68%	99.76%	98.91%	99.01%	98.57%	99.80%	97.68%	99.80%	99.70%	98.02%	98.05%	98.89%	99.70%	99.14%
			Day 3	97.77%	99.79%	99.26%	99.10%	98.23%	99.85%	97.44%	99.81%	99.71%	98.00%	97.98%	98.87%	99.71%	99.13%
7	Point of Interconnections (POI) congestion (on individual POI)	≤ 0.5%	Day 1	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%	
			Day 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
			Day 3	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	

4.4.1 Network Availability

4.4.1.1 BTS accumulated downtime ($\leq 2\%$)

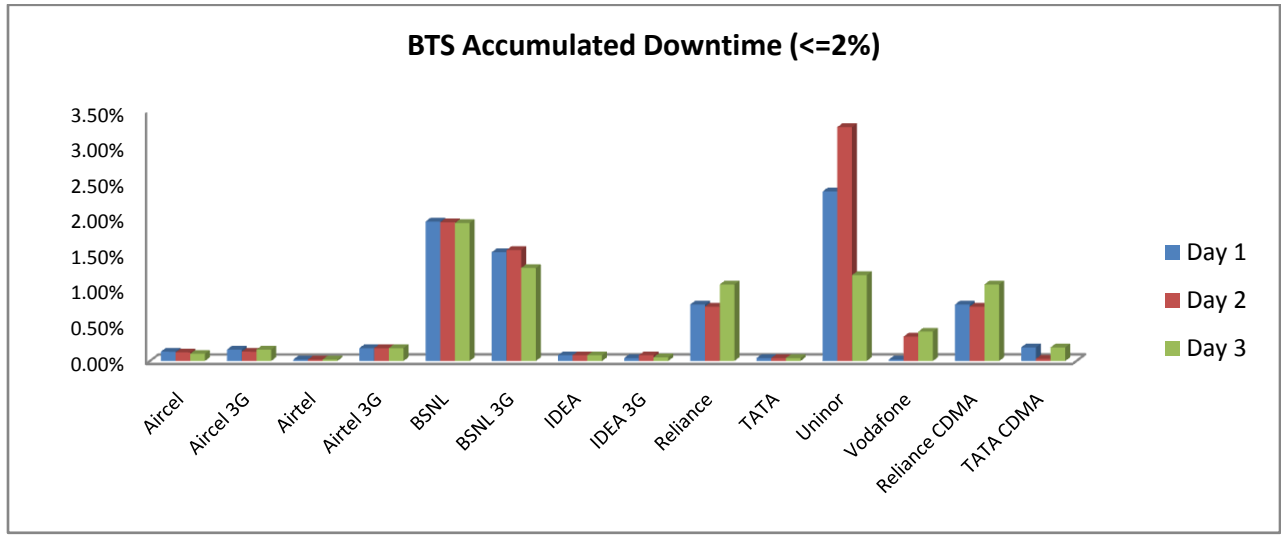


Fig.4.4.1.1

- All operators are meeting the TRAI benchmarks ($\leq 2\%$) for 3 days live data taken in the month of audit except Uninor for day1 & day2

4.4.1.2 Worst affected BTS due to downtime ($\leq 2\%$)

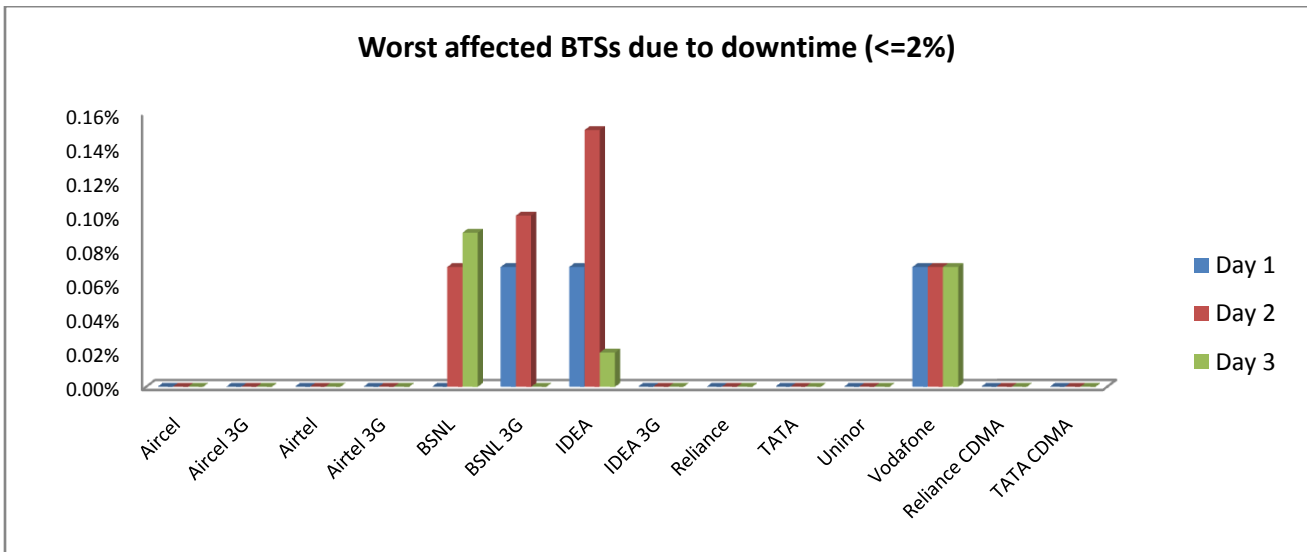


Fig.4.4.1.2

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

4.4.2 Connection establishment (Accessibility)

4.4.2.1 Call Setup Success Rate ($\geq 95\%$)

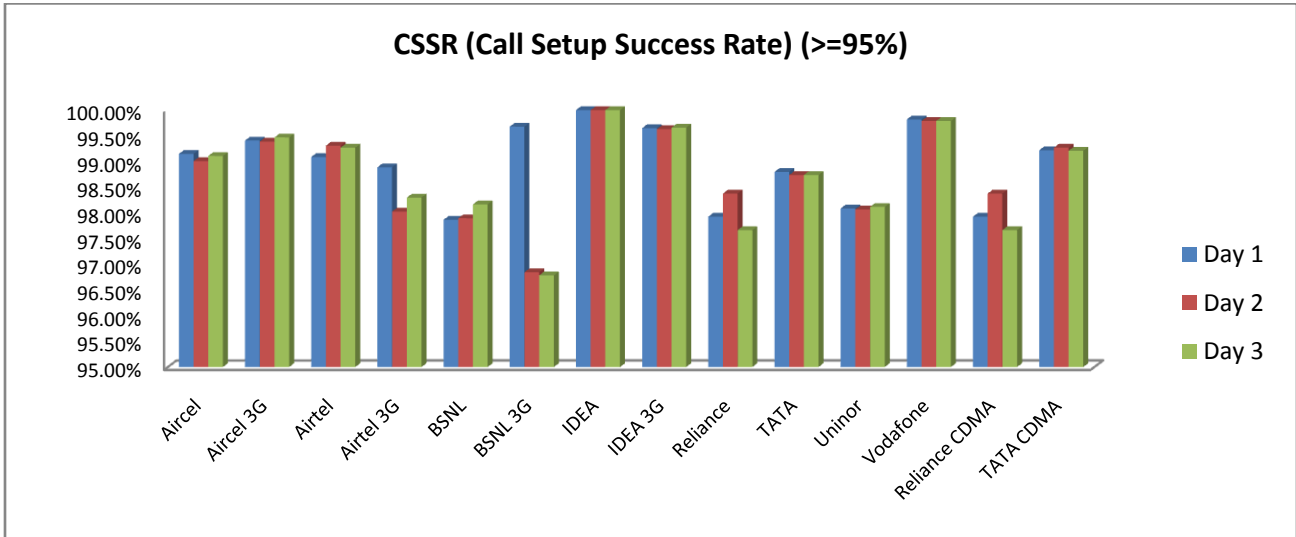


Fig. 4.4.2.1

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

4.4.2.2 SDCCH/ Paging Channel Congestion $\leq 1\%$

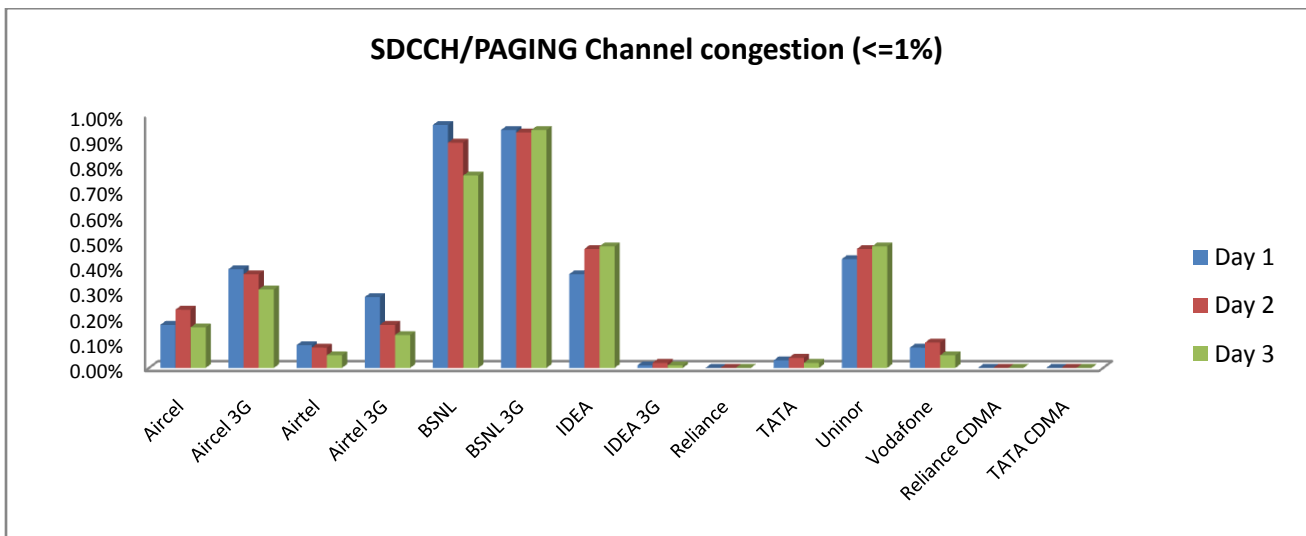


Fig. 4.4.2.2

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

4.4.2.3 TCH congestion $\leq 2\%$

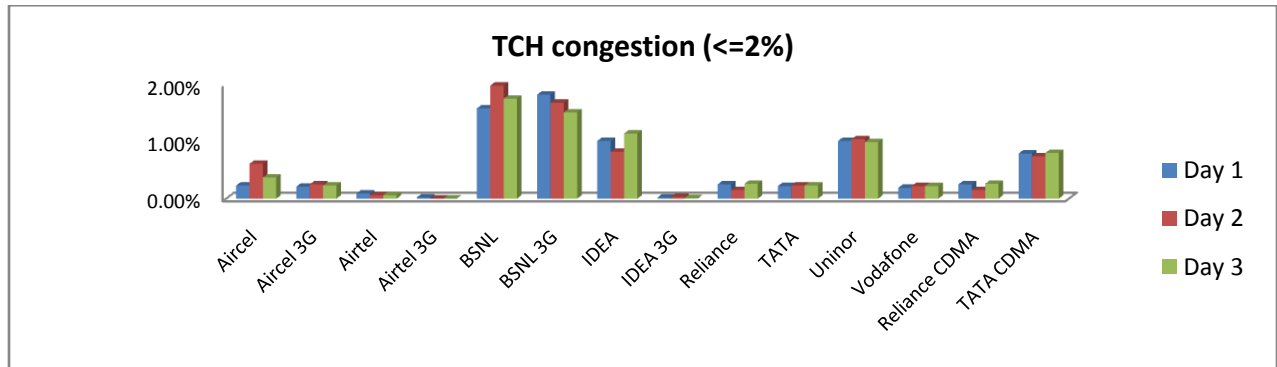


Fig. 4.4.2.3

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

4.4.3 Connection Maintainability (Retain ability)

4.4.3.1 Call Drop Rate $\leq 2\%$

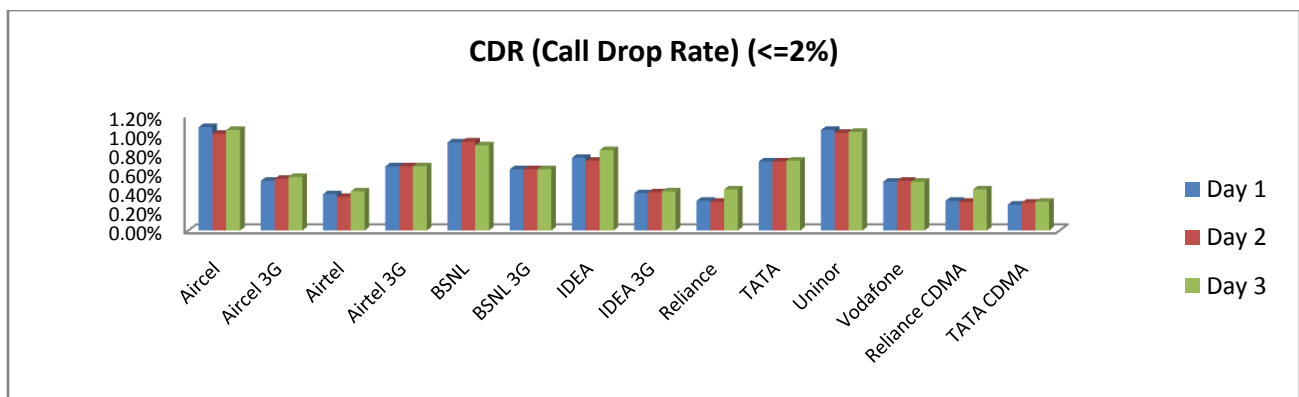


Fig. 4.4.3.1

All operators are meeting the TRAI benchmarks ($\leq 2\%$) for 3 days live data taken in the month of audit.

4.4.3.2 Worst affected cells having $> 3\%$ TCH drop (call drop) rate ($\leq 3\%$)

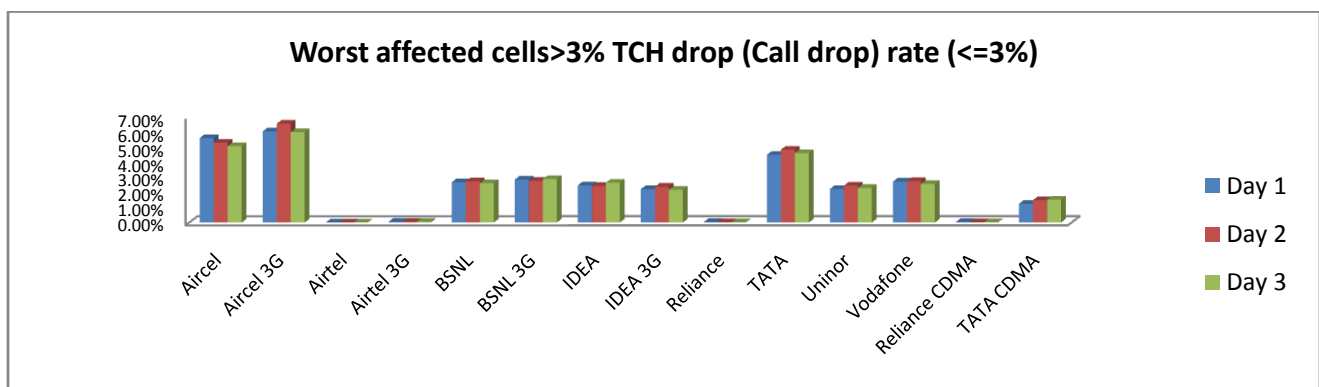


Fig. 4.4.3.2

- Aircel (2G & 3G) & TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate for all 3 days.

4.4.3.3 % of Connections with good voice quality $\geq 95\%$

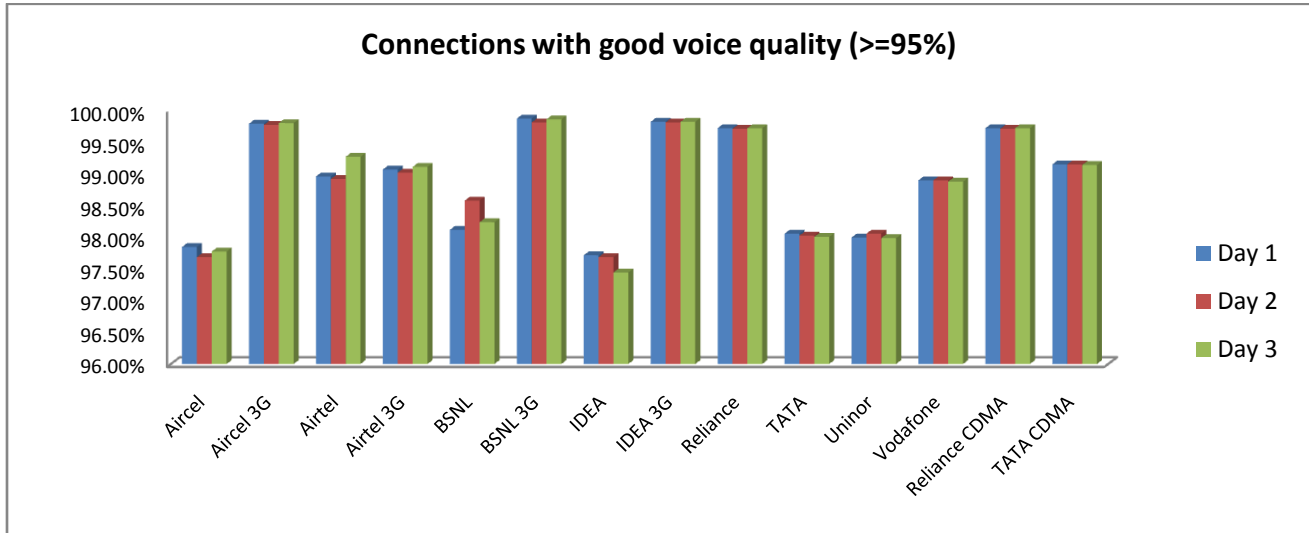


Fig. 4.4.3.3

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

4.4.3.4 Point of Interconnections (POI) congestion (on individual POI) $\leq 0.5\%$

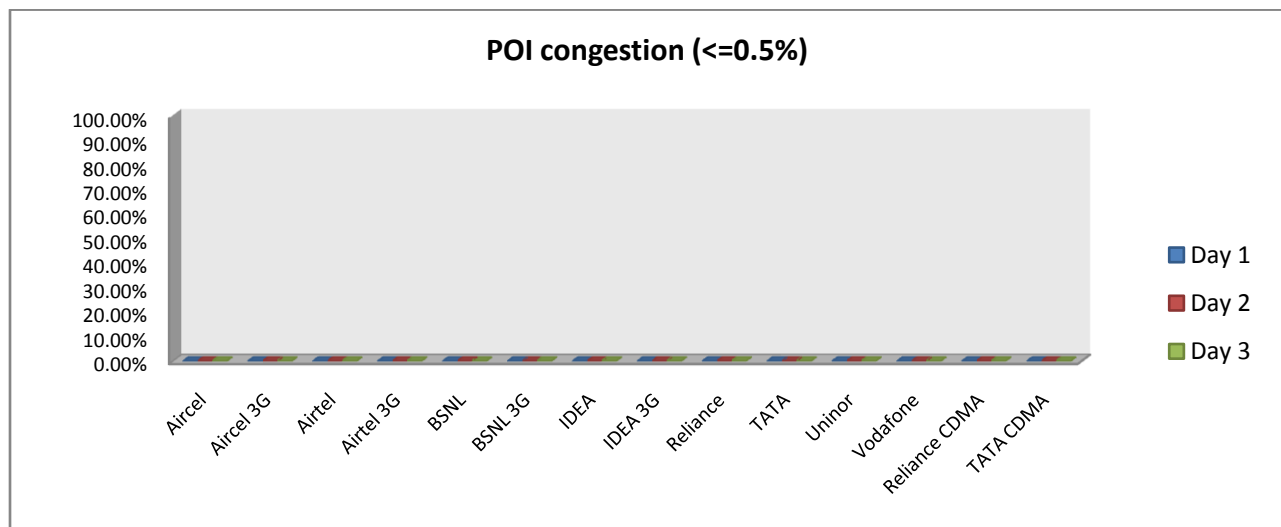


Fig. 4.4.3.4

- All operators are meeting the TRAI benchmarks ($\leq 0.5\%$) 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.

➤ As per PMR Data Verification Results for-

- **Andhra Pradesh Circle (April'14)** - From the month Data Assessment, it is found that Aircel 2G and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **Andhra Pradesh Circle (May'14):** From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **Andhra Pradesh Circle (June'14):** From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM are not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate.
- **Andhra Pradesh Circle(April- June'14):-** From the month Data Assessment, it is found that Aircel (2G & 3G) and TATA GSM 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 (4th Quarter), Andhra Pradesh 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 (2G& 3G) and TATA GSM is not meeting the benchmark for worst affected cells having more than 3% TCH drop (call drop) rate in all 3days.
- Uninor is not meeting the benchmark for BTS accumulated downtime in 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).

❖ **Andhra Pradesh Circle:**

- Rcom GSM in Guntur & Krishna and Rcom CDMA in Guntur are not meeting the benchmark of **Blocked Call Rate**
- Rcom CDMA in Krishna and TATA CDMA in Warangal are not meeting the benchmark for **Dropped Call Rate**
- All service providers are meeting the benchmark Voice Quality 0-4 w/o frequency hopping.
- Rcom GSM and TATA GSM operators are not meeting the benchmark in Guntur for Voice Quality (0-5 (with frequency hopping)).
- Rcom GSM operators are not meeting the benchmark in Guntur for **Call Setup Success Rate**.

➤ **Independent Drive Test:-**

The Independent Drive Test was conducted for 4 Operators in 10 different Area as per the customer complain data. 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)

- BSNL in Kadapa, Rcom in Rajmundary, Rcom, BSNL and Airtel in Vizag and BSNL, Airtel, Uninor & TATA in Hyderabad are not meeting the benchmark of **Blocked Call Rate**.
- BSNL in Ananthpur, Rajmundary, Kakinada, Srikukalam, Vizag, Hyderabad & Kadapa, Rcom in Ananthpur, Vizag and Rajmundary, Uninor in Vizg & Hyderabad and TATA in Hyderabad are not meeting the benchmark for **Dropped Call Rate**
- Rcom in Ananthpur, Rajmundary, Kakinada & Vizag, BSNL in Ananthpur, Kadapa, Rajmundary, Kakinada, Srikukalam, Vizag, Hyderabad & Chittor, Uninor in Ananthpur, Vizag & Hyderabad, Airtel in Kadapa & Hyderabad and TATA in Tenali, Hyderabad & Kadapa are not meeting the benchmark for Voice Quality (0-5 (with frequency hopping)).
- BSNL in Kadapa, Rcom in Vizag and Uninor in Hyderabad are not meeting the benchmark for **Call Setup Success Rate**.

- Aircel & TATA in Machilipatnam, Aircel in Tenali, BSNL, Uninor & Rcom in Ananthpur, BSNL & Airtel in Kadapa, BSNL & Rcom in Rajmundary, BSNL in Srikukalam & Kakinada, BSNL, Airtel, Uninor & Rcom in Vizag and BSNL, Uninor & TATA in Hyderabad are not meeting the benchmark for Handover Success Rate.

➤ **Basic Telephone Service (Wireline) Providers:-**

- From the Month data table, it can be observed that all operators are meeting the benchmark for different parameters; however BSNL data is not available.

➤ **Broadband Service Providers:-**

- From the month of data we found that Beam Telecom is not meeting the benchmark for Faults Repair/Restoration Time and rest of operators are meeting their benchmarks.
- In Andhra Pradesh data is not available for BSNL operators it is in process.

➤ **Level 1 Live Calling (Emergency No.) Q4**

- 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 Andhra Pradesh 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:-**

A sample of live callings were taken for each operator and calls were made for assessing call center's responses within 60sec in which we found Rcom GSM was not met the benchmark($\geq 95\%$).

➤ **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 the congestion was found with all the service providers except BSNL, Idea, and Vodafone.

➤ **CUSTOMER SERVICE QUALITY PARAMETERS**

❖ **4th Quarter data Assessment (Andhra Pradesh Circle)**

- According to the parameter metering/billing credibility post-paid we found that all the service providers are meeting the benchmark except **Idea**.
- According to the parameter metering /billing credibility pre-paid we found that all the service providers are meeting the benchmark.
- According to the parameter Resolution of billing/ charging complaints we found that all the service providers are meeting the benchmark except **TATA CDMA**.
- According to the parameter Period of applying credit/waiver/adjustment to the customer's account from the date of resolutions of complaints we found that all the service providers are meeting the benchmark.
- According to the parameter Accessibility of call centre/Customer Care 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 we found that all the service providers are meeting the benchmark except **Aircel, Airtel, BSNL and Rcom (GSM & CDMA)**.
- According to the parameter no. of requests for Termination / Closure of service complied within 7 days during the quarter we found that all the service providers are meeting the benchmark except **Aircel**.
- According to the parameter Time taken for refunds of deposits after closures after verification we found that all the service providers are meeting the benchmark except **TATA CDMA**.