PHISTREAM
EMPOWERING LEADERSHIP, TRANSFORMING BUSINESS

TRAI
सत्यमेव जयते
Telecom Regulatory Authority of India
(IS/ISO 9001-2008 Certified Organisation)



AUDIT & ASSESSMENT OF QUALITY OF SERVICE

NORTH ZONE – UP-EAST CIRCLE

CELLULAR MOBILE TELEPHONE SERVICE (CMTS)
(APRIL TO JUNE 2016)

PREPARED BY:

PHISTREAM CONSULTING PRIVATE LIMITED
(An ISO – 9001:2008 Certified Company)
Office: C – 56A/5, First Floor, Sector – 62, Noida ● **Telephone:** +91-120-644-7778 ●
Email: info@phistream.com

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1. INTRODUCTION

1.1. ABOUT TRAI

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

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

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

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

1.2. ABOUT PHISTREAM CONSULTING PRIVATE LIMITED

Phistream Consulting Private Limited is an ISO:9001 certified company who are one of the pioneers in the field of technical audit, quality assurance and third party inspection services. Established more than a decade ago in 2004, we aspire to provide longer term savings based on year-on-year productivity. With our size, we are nimble and aspire to being a full service partner for providing consultancy services.

We have been helping our clients by determining the best solutions and enabling businesses to enjoy the benefits of top-notch support without distracting their team from the main business focus. Our business analysts have enough experience to get involved at the requirements gather stage through consulting work handing off a detailed requirements document to our operations staff who in turn can train our support and maintenance resources for ongoing engagement.

In keeping with our goal of being a one stop quality assurance and consulting partner, our specialists employ a strategy and consulting-based implementation methodology and capitalize on strong program governance to offer a wide range of services for various industry verticals.

1.3. OBJECTIVES

The primary objective of the Audit module is to:

- Audit and Assess the Quality of Services being rendered by Basic (Wireline), Cellular Mobile (Wireless), and Broadband service against the parameters notified by TRAI. (The parameters of Quality of Services (QoS) have been specified by in the respective regulations published by TRAI).
- This report covers the audit results of the audit conducted for Cellular Mobile (Wireless) services in UP East circle.

1.4. COVERAGE

The audit was conducted in UP East Circle covering all SSAs (Secondary Switching Areas).

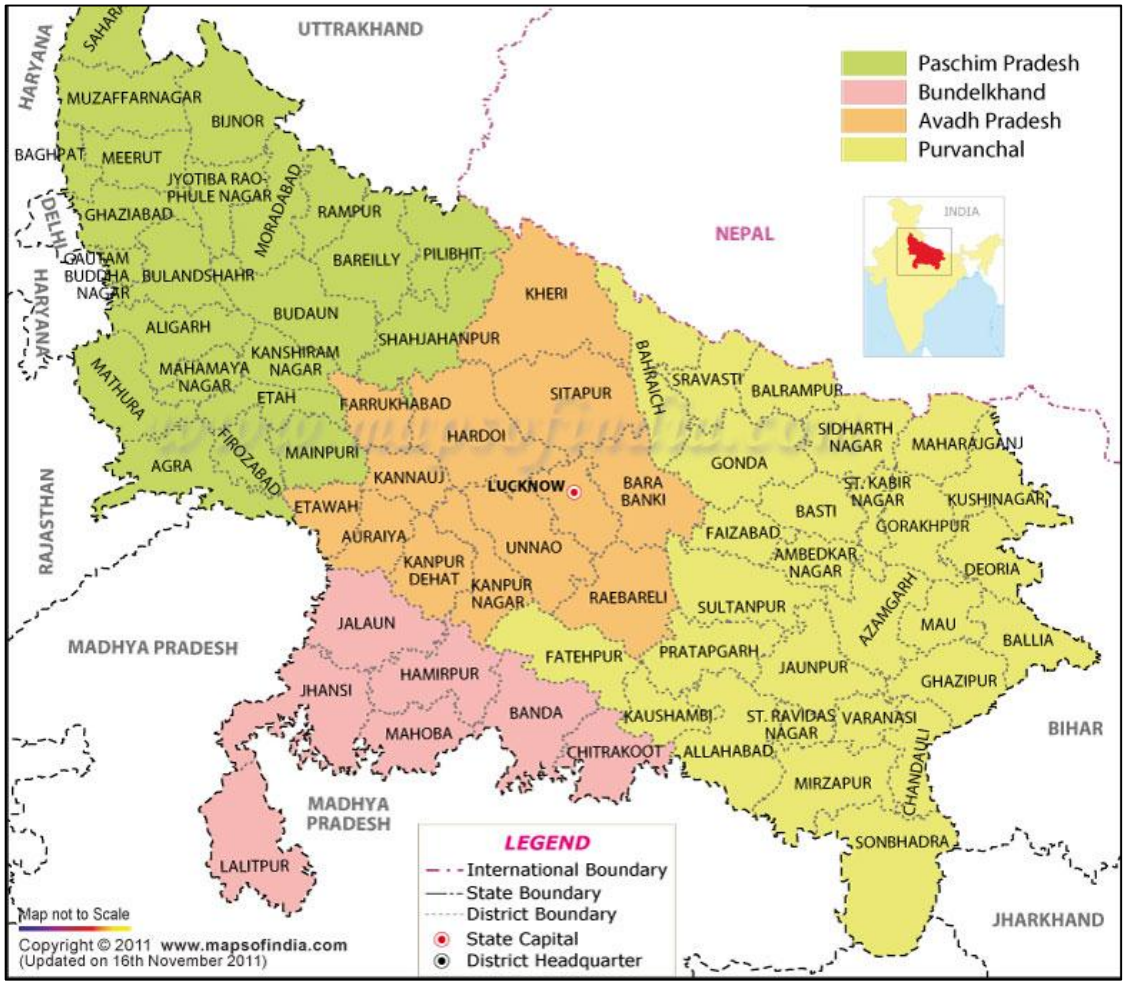


Image Source: Map of India

1.5. SSA & SDCA List

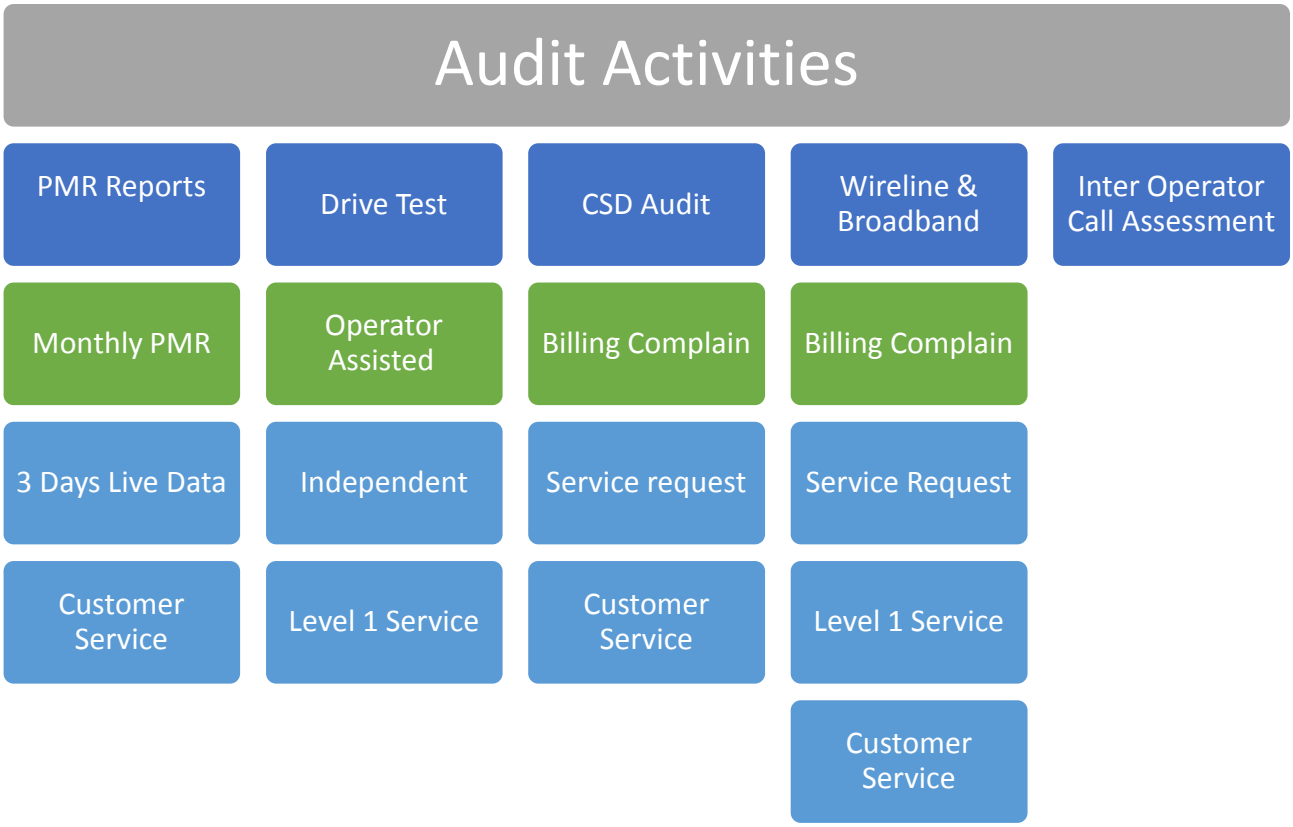
S. No.	Circle	SSA Name	SDCA Name
1	UPE	Allahabad	Allahabad
2	UPE	Allahabad	Bharwari
3	UPE	Allahabad	Karchhana (shankergarh)
4	UPE	Allahabad	Meja (sirsa)
5	UPE	Allahabad	Phoolpur
6	UPE	Allahabad	Soraon
7	UPE	Azamgarh	Azamgarh
8	UPE	Azamgarh	Ghosi
9	UPE	Azamgarh	Lalganj
10	UPE	Azamgarh	MaunathbhanApr
11	UPE	Azamgarh	Phulpur-i (phulpur)
12	UPE	Azamgarh	Phulpur-ii (atrawlia)
13	UPE	Azamgarh	Sagri
14	UPE	Bahraich	Bahraich-i (bahrailh)
15	UPE	Bahraich	Bahraich-ii (bhinga)
16	UPE	Bahraich	Kaisarganh-ii (mahasi)
17	UPE	Bahraich	Kaisarganj-i (kaiserganj)
18	UPE	Bahraich	Nanparah-ii (mihinpurwa)
19	UPE	Bahraich	Nanpara-i (nanpara)
20	UPE	Ballia	Ballia-i (ballia)
21	UPE	Ballia	Ballia-ii (raniganj)
22	UPE	Ballia	Bansdeeh
23	UPE	Ballia	Rasara
24	UPE	Banda	Baberu
25	UPE	Banda	Banda
26	UPE	Banda	Karvi -i (karvi)
27	UPE	Banda	Karvi-ii (manikpur)
28	UPE	Banda	Mau (rajapur)
29	UPE	Banda	Naraini (attarra)
30	UPE	Barabanki	Barabanki
31	UPE	Barabanki	Fatehpur
32	UPE	Barabanki	Haidergarh
33	UPE	Barabanki	Ramsanehi ghat
34	UPE	Basti	Bansi
35	UPE	Basti	Basti
36	UPE	Basti	DoJuniyaganj
37	UPE	Basti	Harraiya
38	UPE	Basti	Khalilabad -i
39	UPE	Basti	Khalilabad-ii (mehdawal)
40	UPE	Basti	Naugarh-i (tetribazar)
41	UPE	Basti	Naugarh-ii (barhani)

42	UPE	Deoria	Captanganj (khadda)
43	UPE	Deoria	Captanganj-i (captanganj)
44	UPE	Deoria	Deoria
45	UPE	Deoria	Padrauna
46	UPE	Deoria	Salempur-i (salempur)
47	UPE	Deoria	Salempur-ii (barhaj)
48	UPE	Etawah	Auraiya
49	UPE	Etawah	Bharthana
50	UPE	Etawah	Bidhuna
51	UPE	Etawah	Etawah
52	UPE	Faizabad	Akbarpur-i (akbarpur)
53	UPE	Faizabad	Akbarpur-ii (jalalpur)
54	UPE	Faizabad	Bikapur
55	UPE	Faizabad	Faizabad
56	UPE	Faizabad	Tanda-ii (baskhari)
57	UPE	Faizabad	Tandai-i (tanda)
58	UPE	Farrukhabad	Chhibramau
59	UPE	Farrukhabad	Farrukhabad (fategarh)
60	UPE	Farrukhabad	Kaimganj
61	UPE	Farrukhabad	Kannauj
62	UPE	Fatehpur	Bindki
63	UPE	Fatehpur	Fateh-pur-i (fatehpur)
64	UPE	Fatehpur	Fatehpur-ii (gazipur)
65	UPE	Fatehpur	Khaga
66	UPE	Ghazipur	Ghazipur
67	UPE	Ghazipur	Mohamdabad
68	UPE	Ghazipur	Saidpur
69	UPE	Ghazipur	Zamania
70	UPE	Gonda	Balarampur-i (balrampur)
71	UPE	Gonda	Balarampur-ii (tulsipur)
72	UPE	Gonda	Gonda
73	UPE	Gonda	Tarabganj-i (terabganj)
74	UPE	Gonda	Tarabganj-ii (colonelganj)
75	UPE	Gonda	Utraula
76	UPE	Gorakhpur	Bansgaon -i (bansgaon)
77	UPE	Gorakhpur	Bansgaon-ii (barhal ganj)
78	UPE	Gorakhpur	Gorakhpur
79	UPE	Gorakhpur	Maharajganj
80	UPE	Gorakhpur	Pharenda-i (compierganj)
81	UPE	Gorakhpur	Pharenda-ii (anand nagar)
82	UPE	Hamirpur	Charkhari
83	UPE	Hamirpur	Hamirpur
84	UPE	Hamirpur	Mahoba
85	UPE	Hamirpur	Maudaha

86	UPE	Hamirpur	Rath
87	UPE	Hardoi	Bilgam-i (madhoganj)
88	UPE	Hardoi	Bilgram-ii (sandi)
89	UPE	Hardoi	Hardoi-i (hardoi)
90	UPE	Hardoi	Hardoi-ii (baghavli)
91	UPE	Hardoi	Sandila
92	UPE	Hardoi	Shahabad
93	UPE	Jaunpur	Jaunpur
94	UPE	Jaunpur	Kerakat
95	UPE	Jaunpur	Machlishahar
96	UPE	Jaunpur	Juniyahu
97	UPE	Jaunpur	Shahganj
98	UPE	Jhansi	Chirgaon (moth)
99	UPE	Jhansi	Garauth
100	UPE	Jhansi	Jhansi
101	UPE	Jhansi	Lalitpur-i (lalitpur)
102	UPE	Jhansi	Lalitpur-ii (talbehat)
103	UPE	Jhansi	Mauranipur
104	UPE	Jhansi	Mehraun
105	UPE	Kanpur	Akbarpur
106	UPE	Kanpur	Bhognipur (pakhrayan)
107	UPE	Kanpur	Bilhaur
108	UPE	Kanpur	Derapur (jhinjak)
109	UPE	Kanpur	Ghatampur
110	UPE	Kanpur	Kanpur
111	UPE	Lakhimpur kheri	Kheri-i (kheri)
112	UPE	Lakhimpur kheri	Kheri-ii (bhira)
113	UPE	Lakhimpur kheri	Mohamdi-i (mohamdi)
114	UPE	Lakhimpur kheri	Mohamdi-ii (maigalganj)
115	UPE	Lakhimpur kheri	Nighasan-i (palliakalan)
116	UPE	Lakhimpur kheri	Nighasan-ii (tikonia)
117	UPE	Lakhimpur kheri	Nighasan-iii (dhaurahra)
118	UPE	Lucknow	Lucknow
119	UPE	Lucknow	Malihabad
120	UPE	Mainpuri	Bhogaon
121	UPE	Mainpuri	Jasrana
122	UPE	Mainpuri	Karhal
123	UPE	Mainpuri	Mainpuri
124	UPE	Mainpuri	Shikohabad
125	UPE	Mirzapur	Chunur
126	UPE	Mirzapur	Dudhi-i (dudhi)
127	UPE	Mirzapur	Dudhi-ii (pipri)
128	UPE	Mirzapur	Mirzapur-i (mirzapur)
129	UPE	Mirzapur	Mirzapur-ii (hallia)

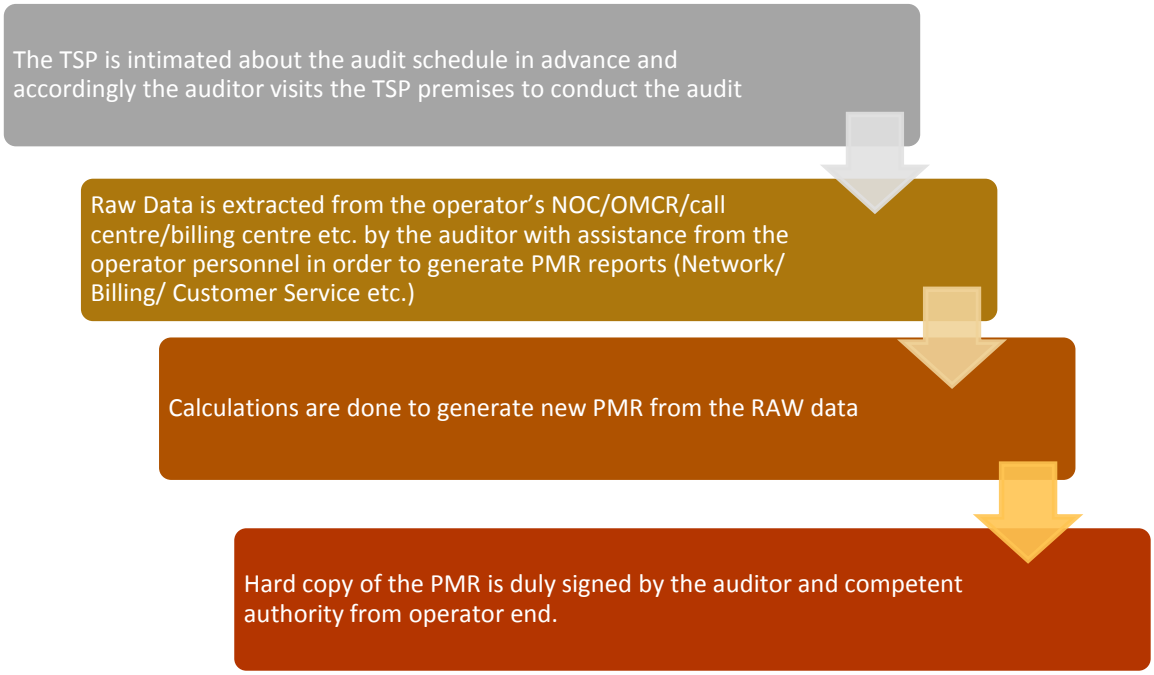
130	UPE	Mirzapur	Robertsganj -ii (obra)
131	UPE	Mirzapur	Robertsganj-i
132	UPE	Orai	Jalaun
133	UPE	Orai	Kalpi
134	UPE	Orai	Konch
135	UPE	Orai	Orai
136	UPE	Pratapgarh	Kunda
137	UPE	Pratapgarh	Patti
138	UPE	Pratapgarh	Pratapgarh
139	UPE	Raibareilly	Dalmau-i (dalmau)
140	UPE	Raibareilly	Dalmau-ii (lalganj)
141	UPE	Raibareilly	Raibareli
142	UPE	Raibareilly	Salon -i (salon)
143	UPE	Raibareilly	Salon-ii (jais)
144	UPE	Sahjahanpur	Jalalabad
145	UPE	Sahjahanpur	Powayan
146	UPE	Sahjahanpur	Shahjahanpur
147	UPE	Sahjahanpur	Tilhar
148	UPE	Sitapur	Biswan
149	UPE	Sitapur	Misrikh -i (misrikh)
150	UPE	Sitapur	Misrikh-ii (aurangabad)
151	UPE	Sitapur	Sidhauli (mahmodabad)
152	UPE	Sitapur	Sitapur
153	UPE	Sultanpur	Amethi
154	UPE	Sultanpur	Kadipur
155	UPE	Sultanpur	Musafirkhana
156	UPE	Sultanpur	Sultanpur
157	UPE	Unnao	Hasanganj
158	UPE	Unnao	Purwa (bighapur)
159	UPE	Unnao	Safipur
160	UPE	Unnao	Unnao
161	UPE	Varansi	Bhadohi
162	UPE	Varansi	Chakia
163	UPE	Varansi	Chandauli (mugalsarai)
164	UPE	Varansi	Varansi

1.6. FRAMEWORK USED



2. PMR REPORTS

Significance and methodology: PMR or Performance Monitoring Reports are generated to assess the various Quality of Service parameters involved in the mobile telephony service, which indicate the overall health of service for an operator.



The PMR report for network parameters is taken for each month of the audit quarter and is extracted and verified in the first week of the subsequent month of the audit month. For example, April 2016 audit data was collected in the month of May 2016.

The PMR report for customer service parameters is extracted from Customer Service Centre and verified once every quarter in the subsequent month of the last month of the quarter. For example, data for quarter ending June 2016 was collected in the month of June 2016.

The raw data extracted from operator's systems is used to create PMR in the following three formats:

- Monthly PMR (Network Parameters)
- 3 Day Live Measurement Data (Network Parameters)
- Customer Service Data

Let us understand these formats in details.

2.1. MONTHLY PMR

This involved calculation of the various Quality of Service network parameters through monthly Performance Monitoring Reports (PMR). The PMR reports were generated from the data extracted from operator's systems by the auditor with the assistance of the operator at the operator's premises for the month of April, May and June 2016. The performance of operators on various parameters was assessed against the benchmarks.

Parameters Includes:

Network Availability

- BTS accumulated downtime
- Worst affected BTS due to downtime

Connection Establishment (Accessibility)

- Call Set Up success Rate (CSSR)

Network Congestion Parameters

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

Connection Maintenance

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

Voice Quality

- % Connections with good voice quality

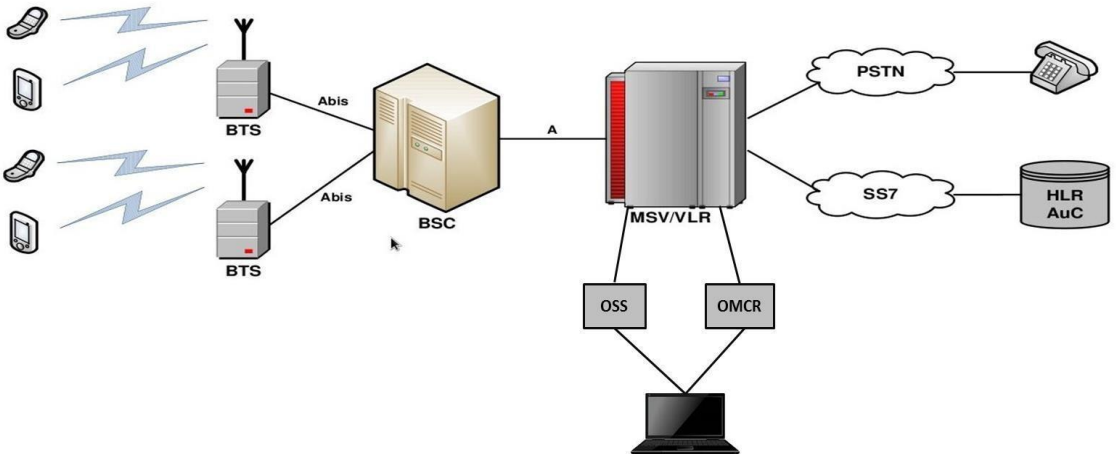
2.2. AUDIT PARAMETER: NETWORK

Let us now look at the various parameters involved in the audit reports.

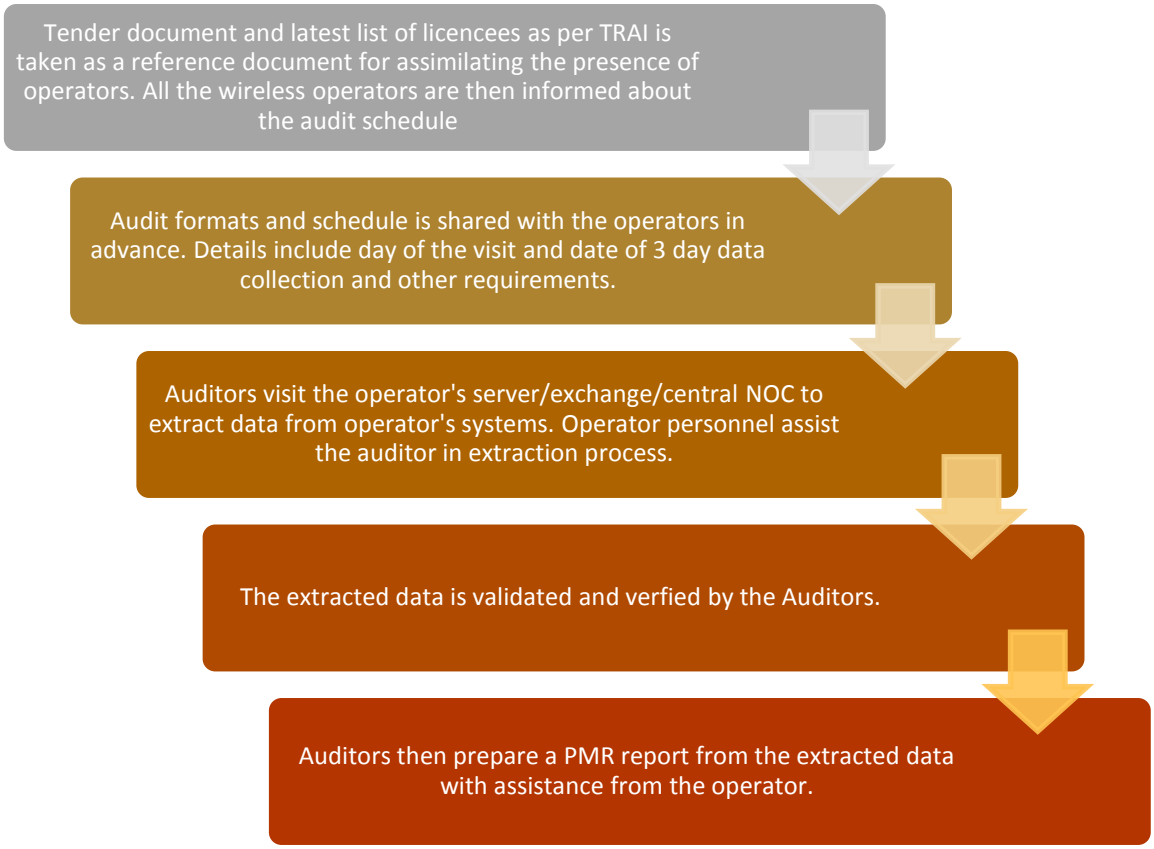
Network Availability	
BTSs Accumulated downtime (not available for service)	≤ 2%
Worst affected BTSs due to downtime	≤ 2%
Connection Establishment (Accessibility)	
Call Set-up Success Rate (within licensee's own network)	≥ 95%
SDCCH/ Paging Channel Congestion	≤ 1 %
TCH Congestion	≤ 2%
Connection Maintenance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

2.3. DATA EXTRACTION POINTS

The data is extracted from a terminal/computer connected to OMCR & OSS on the operator network.



2.4. AUDIT PROCEDURE



Extracted data is calculated as per the counter details provided by the operators. The details of counters have been provided in the report. The calculation methodology for each parameter has been stated in the table given below:

2.5. NETWORK CALCULATION METHODOLOGY

Parameter	Calculation Methodology
BTS Accumulated Downtime	Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month / (24 x Number of days in a month x Number of BTSs in the network in licensed service area) x 100
Worst Affected BTS Due to Downtime	(Number of BTSs having accumulated downtime greater than 24 hours in a month / Number of BTS in Licensed Service Area) * 100
Call Setup Success Rate	(Calls Established / Total Call Attempts) * 100
SDCCH/ Paging Channel Congestion	SDCCH / TCH Congestion% = [(A1 x C1) + (A2 x C2) +…….+ (An x Cn)] / (A1 + A2 +…+ An) Where: A1 = Number of attempts to establish SDCCH / TCH made on day 1 C1 = Average SDCCH / TCH Congestion % on day 1 A2 = Number of attempts to establish SDCCH / TCH made on day 2
TCH Congestion	C2 = Average SDCCH / TCH Congestion % on day 2 An = Number of attempts to establish SDCCH / TCH made on day n Cn = Average SDCCH / TCH Congestion % on day n
POI Congestion	POI Congestion% = [(A1 x C1) + (A2 x C2) +…….+ (An x Cn)] / (A1 + A2 +…+ An) Where: A1 = POI traffic offered on all POIs (no. of calls) on day 1 C1 = Average POI Congestion % on day 1 A2 = POI traffic offered on all POIs (no. of calls) on day 2 C2 = Average POI Congestion % on day 2 An = POI traffic offered on all POIs (no. of calls) on day n Cn = Average POI Congestion % on day n
Call Drop Rate	Total Calls Dropped / Total Calls Established x 100
Worst Affected Cells having more than 3% TCH drop	Total number of cells having more than 3% TCH drop during CBBH/ Total number of cells in the LSA x 100
Connections with good voice quality	No. of voice samples with good voice quality / Total number of samples x 100

2.6. 3G VOICE

S. No.	Name of Parameter	Definition	Formula	Benchmark
1	Network Availability			
a.	Total no. of Node B's in LSA	Total no. of Node B's Licensed in LSA		
b.	Total downtime of all Node B's	When all the sector(s) of a Node B's are down for > 60 minutes at an instant in a whole day		
c.	No. of Worst Affected Node B's	Node B'ss having more than 24 hours of Downtime in 3 Days	No. of Node B's having accumulated downtime of >24 hours in a month ((No. of Node B's having Accumulated Downtime of > 24 hrs in a month) / Total no. of BTSs in the licensed service area)*100	<=2%
d.	Node B's accumulated downtime	Node B's downtime more than 24 hr in 3 days	Total no. of Node B's in the Licensed Service Area Sum of downtime of Node B's in a month in hours i.e. total outage time of all Node B's in hours in a month [(Sum of downtime of Node B's in a month in hrs)/(24* no. of days in the month*no. of Node B's in the licensed service area)]*100	<=2%
2	Connection Establishment (Accessibility)			
a.	Call Setup Success Rate:	It is the % of total no. of call established to the total no. of call attempt	Total No. of Voice Call Attempts Total No. of Voice Call Establishment CSSR (Call Setup Success Rate = (Total No. of Voice Call Attempts/ Total No. of Voice Call Establishment)*100)	>=95%
b.	RRC Congestion:	RRC Congestion rate is the % of Total No. of RRC Failed Calls to the Total no. of RRC Assigned Calls	RRC Attempts (RRC Connection Access) (A) RRC Failed (RRC Connection Access Failed) (B) RRC Congestion (%) [B/A]*100	<=1%
c.	RAB Congestion:	RAB Congestion rate is the % of Total No. of RAB Failed Calls to the Total no. of RAB Assigned Calls	RAB Attempts (RAB Setup Access) (C) RAB Failed (RAB Setup Access Failed) (D) RAB Congestion (%) [D/C]*100	<=2%
3	Connection Maintenance (Retainability)			
a.	Circuit Switched Voice Drop Rate	It is the % of total no. of Dropped Calls to the total no. of Calls Established	Total Established Calls (A) Calls Dropped after Establishment (B) Call Drop Rate [B/A]*100	<=2%
b.			Total No. of Cells (Sector)	<=3%

	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	It is the % of total no. of Cells having > 3% Circuit Switched Voice drop to the total no. cells	Total No. of Cells exceeding 3% Circuit Switched Voice Drop Rate in CBBH (Cell Bouncing Busy Hour)	
			% of cells having more than 3% Circuit Switched Voice Drop Rate [(No. of cells having Circuit Switched Voice Drop Rate > 3% during CBBH in 31 days*100) / Total no. of cells in the licensed service area]	
c.	Percentage of connections with Good Circuit Switched Voice Quality	It can be defined as the % of Good Voice Quality Samples to the total No. of Quality Samples	Percentage of connection with Good Circuit Switched Voice Quality	>=*95%*
4	Total No. of POI's in Month having >=0.5% POI congestion	Total no. Of POI's which are exceeding the POI congession more than 0.5 %.	Total No. of call attempts on POI	<=0.5%
			Total traffic served on all POIs (Erlang)	
			Total No. of circuits on all individual POIs	
			Total number of working POI Service Area wise	
			Capacity of all POIs	
			No. of all POI's having >=0.5% POI congestion	
			Name of POI not meeting the benchmark (having >=0.5% POI congestion)	

2.7. 2G & 3G WIRELESS

S. No.	Name of Parameter	Definition	Formula	Benchmark
1	Service Activation/ Provisioning	This refers to the activation of services after activation of the SIM. This involves programming the various databases with the customer's information and any gateways to standard Internet chat or mail services or any data services.	Total No. of Subscribers for Service Activation (A) Total Service Activations provided within 4 Hours (B) Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*
2	PDP Context Activation Success Rate	PDP Context Activation Success Rate is the ratio of total number of successfully completed PDP context activations to the total attempts of context activation	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A) Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B) PDP Context Activation Success Rate =(B/A) *100	>=95%
3	Drop Rate	It measures the inability of Network to maintain a connection and is defined as the ratio of abnormal disconnects w.r.t. all disconnects.	RNC originated PS Domain Iu Connection Setup Success (A) RNC originated PS Domain Iu Connection Release (B) Drop Rate = (B/A) * 100	<=5%

3. 3 DAYS LIVE DATA

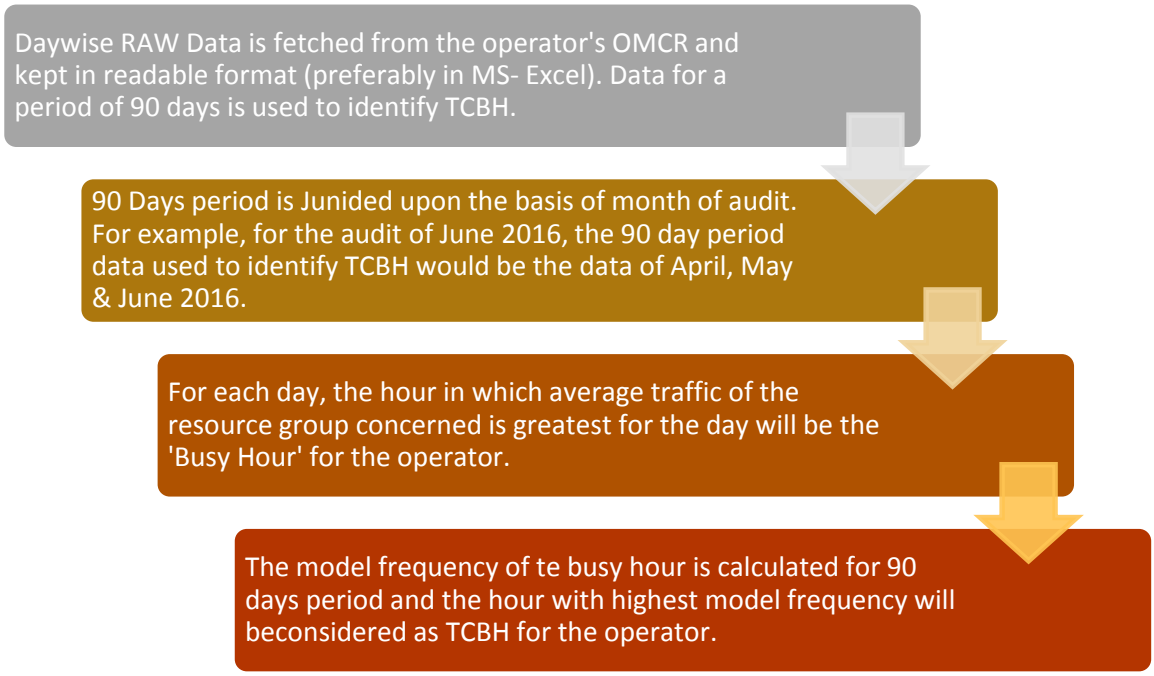
The main purpose of 3 day live measurement is to evaluate the network parameters on intraday basis. While the monthly PMR report provides an overall view of the performance of QoS parameters, the 3 day live data helps looking at intraday performance on the network parameters discussed earlier. All the calculations are done on the basis of that raw data of 3 days.

The 3 day live data provides a sample of 9 days in a quarter (3 days each month of a quarter) with hourly performance, which enables the auditor to identify and validate intraday issues for an operator on the Q0S network parameters. For example, network congestion being faced by an operator during busy/peak hours.

Network related parameters were evaluated for a period of 3 days in each month. 3 day live audit was conducted for 3 consecutive weekdays for each month. The data was extracted from each operator's server/ NOC etc. at the end of the 3rd day. The extracted data is then used to create a report (similar to PMR report) to assess the various QoS parameters.

3.1. TCBH: SIGNIFICANCE AND SELECTION METHODOLOGY

As per QoS regulations 2009 (7 of 2009), Time Consistent Busy Hour" or "TCBH" means the one hour period starting at the same time each day for which the average traffic of the resource group concerned is greatest over the days under consideration and such Time Consistent Busy Hour shall be established on the basis of analysis of traffic data for a period of ninety days.



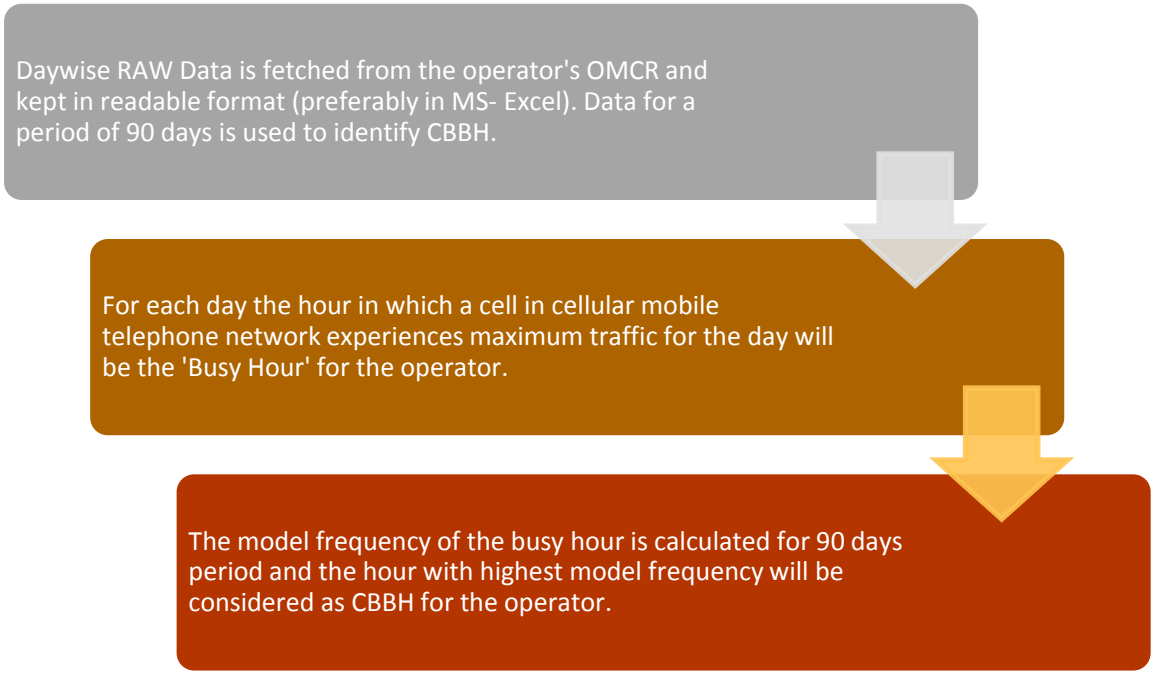
During audit, the auditors identified from the raw data that the TCBH for the operators in Apr – May – Jun 2016 was the time period as given below:

Aircel	Airtel	BSNL	Idea	RCOM CDMA	RCOM GSM	TTSL CDMA	TTSL GSM	Telenor	Videocon	Vodafone
19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00	19:00-20:00

3.2. CBBH: Significance and Selection Methodology

As per QoS regulations 2009 (7 of 2009), Cell Bouncing Busy Hour (CBBH) means the one hour period in a day during which a cell in cellular mobile telephone network experiences the maximum traffic.

Step by step procedure to identify CBBH for an operator:



4. CUSTOMER SERVICE PARAMETERS

The data to generate PMR report for customer service parameters is extracted at the operator premises and verified once every quarter in the subsequent month of the last month of the quarter. For example, data for quarter ending June 2016 was collected in the month of June 2016. To extract the data for customer service parameters for the purpose of audit, auditors primarily visit the following locations/ departments/ offices at the operator's end.

- Central Billing Center
- Central Customer Service Center

The operators are duly informed in advance about the audit schedule.

The Customer Service Quality Parameters include the following:

- Metering and billing credibility (post-paid and prepaid)
- Resolution of billing/charging complaints
- Period of applying credit/waiver/adjustment to customer's account
- Response time to the customer for assistance
- Termination/closure of service
- Time taken for refund of security deposit after closures.

Most of the customer service parameters were calculated by averaging over the quarter; however billing parameters were calculated by averaging over one billing cycle for a quarter. All the parameters have been described in detail along with key findings of the parameter in the report.

The benchmark values for each parameter have been given in the table below.

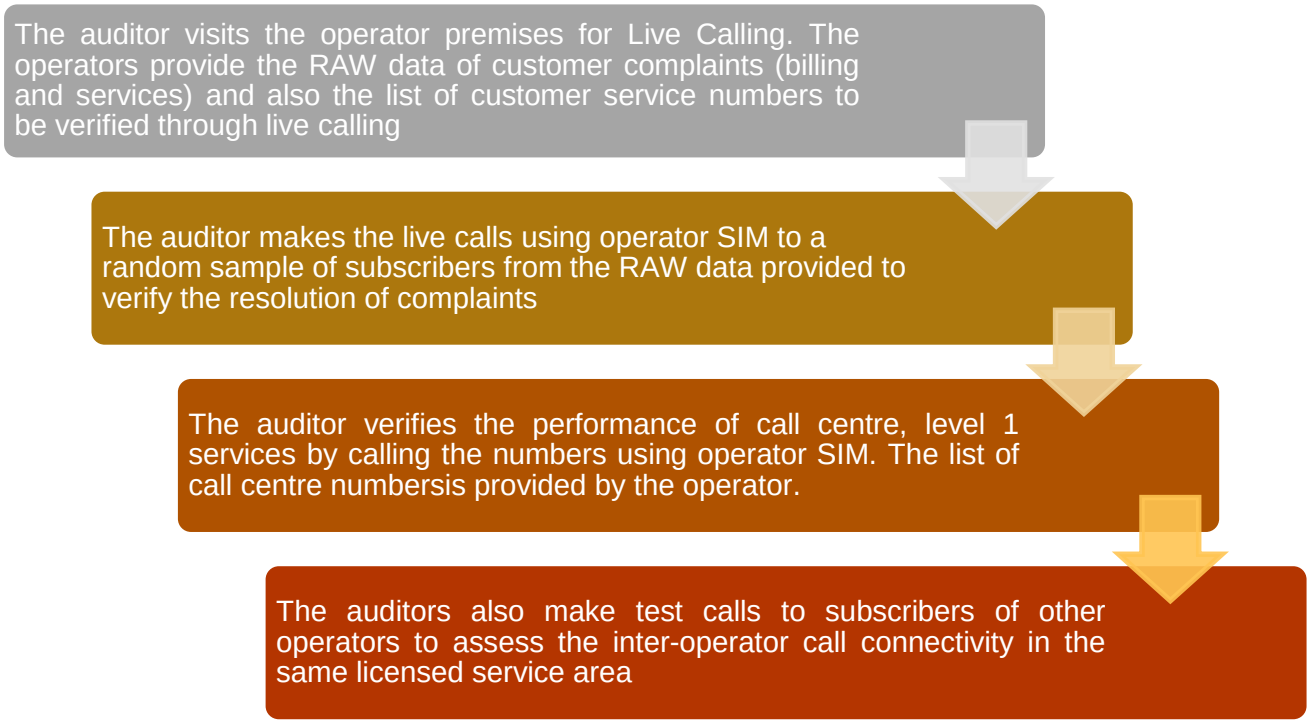
4.1. AUDIT PARAMETERS: CUSTOMER SERVICE

Metering and Billing Credibility	Benchmark
No of billing complaints received - Post paid	≤ 0.1%
No. of billing complaints received- Prepaid	≤ 0.1%
Resolution of billing/ charging complaints within 4 weeks	98%
Resolution of billing/ charging complaints within 6 weeks	100%
Period of applying credit/ waiver within 1 week of resolution of complaint	100%
Response Time to the Customer form Assistance	
Accessibility of call centre/customer care	≥ 95%
Percentage of calls answered by the operators (voice to voice) within 90 seconds	≥ 95%
Termination/ closure of service	≤ 7 days
Time taken for refund of deposits after closures within 60 days	100%

4.2. CALCULATION METHODOLOGY: CUSTOMER SERVICE PARAMETER

Parameter	Calculation Methodology
Metering and billing credibility : Post-paid	Total billing complaints received during the relevant billing cycle / Total bills generated during the relevant billing cycle *100
Metering and billing credibility : Pre-paid	Total charging complaints received during the quarter/ Total number of subscribers reported by the operator at the end of the quarter * 100
Resolution of billing/ charging complaints (Post-paid + Pre-paid)	There are two benchmarks involved here: Billing or Charging Complaints resolved in 4 weeks from date of receipt / Total billing or charging complaints received during the quarter) x 100 Billing or Charging Complaints resolved in 6 weeks from date of receipt / Total billing or charging complaints received during the quarter) x 100
Period of applying credit waiver	Number of cases where credit waiver is applied within 7 days/ total number of cases eligible for credit waiver * 100
Call centre performance IVR (Calling getting connected and answered by IVR)	Number of calls connected and answered by IVR/ All calls attempted to IVR * 100
Call centre performance (Voice to Voice)	Call centre performance Voice to Voice = (Number of calls answered by operator within 90 seconds/ All calls attempted to connect to the operator) * 100 The calculation excludes the calls dropped before 90 seconds
Time taken for termination/ closure of service	Number of closures done within 7 days/ total number of closure requests * 100
Time taken for refund for deposit after closures	Number of cases of refund after closure done within 60 days/ total number of cases of refund after closure * 100

4.3. LIVE CALLING: SIGNIFICANCE AND METHODOLOGY



Live calling activity was carried out during the period of June 2016. The data considered for live calling was for the month prior to the month in which the live calling activity was being conducted. In this case, data of April 2016 was considered for live calling activity conducted in May 2016.
A detailed explanation of each parameter is explained below:

4.4. BILLING COMPLAINTS

Live calling is done to verify Resolution of billing complaints within stipulated time. The process for this parameter is stated below:

- Auditors request the operator provided the database of all the subscribers who reported billing complaints in one month prior to the auditor visit. In case of BSNL, data for the complaints from the subscribers belonging to the sample exchanges is requested specifically.
- A sample of 10% or 100 complainants, whichever is less, is selected randomly from the list provided by operator.

Calls are made by auditors to the sample of subscribers to check and record whether the complaint was resolved within the timeframes as mentioned in the benchmark.

All the complaints related to billing as per clause 3.7.2 of QoS regulation of 20th June, 2016 were considered as population for selection of samples.

TRAI Benchmark: Resolution of billing/ charging complaints: 98% within 4 weeks, 100% within 6 weeks.

4.5. SERVICE COMPLAINTS REQUESTS

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

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

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

4.6. LEVEL 1

Level 1 is used for accessing special services like emergency services, supplementary services, inquiry and operator-assisted services.

Level 1 Services include services such as police, fire, ambulance (Emergency services). Test calls were made from operator SIMs. A total of 195 test calls were made per service provider in each SDCA where the drive test was conducted in the quarter.

While most of the Level 1 services are toll free, it has been observed that some Level 1 services may not be toll free. In April, May and June'15, auditor has tried contacting the list of Level 1 services provided by TRAI as per the NNP (National Numbering Plan).

4.7. PROCESS TO TEST LEVEL 1 SERVICE

- During the operator assisted drive test, auditors ask the operator authorized personnel to make 5 calls in each SDCA on the Level 1 Service numbers provided by TRAI. The list contains a description of the numbers along with dialling code.

- Operators might also provide a list of L1 services. To identify emergency L1 service numbers, auditors check if there is any number that starts with code '10' in that list. If auditors find any emergency number in addition to the below list, that number is also tested during live calling.

- On receiving the list, auditors verify it if the below given list of numbers are active in the service provider's network.

- If there are any other additional numbers provided by the operator, auditors also do live calling on those numbers along with below list.

- If any of these numbers is not active, then we would write the same in our report, auditors write in the report.

- Post verifying the list, auditors do live calling by equally distributing the calls among the various numbers and update the results in the live calling sheet.

L1 Number Details
100 Police
101 Fire
102 Ambulance
104 Health Information Helpline
108 Emergency and Disaster Management Helpline
138 All India Helpine for Passangers
149 Public Road Transport Utility Service
181 Chief Minister Helpline
182 Indian Railway Security Helpline
1033 Road Accident Management Service
1037 Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal Helpline'
1056 Emergency Medical Services
106X State of the Art Hospitals - AIIMS
1063 Public Grievance Cell DoT Hq
1064 Anti Corruption Helpline
1070 Relief Commission for Natural Calamities
1071 Air Accident Helpline
1072 Rail Accident Helpline
1073 Road Accident Helpline
1077 Control Room for District Collector
1090 Call Alart (Crime Branch)
1091 Women Helpline
1097 National AIDS Helpline to NACO
1099 Central Accident and Trauma Services (CATS)
10580 Educational& Vocational Guidance and Counselling
10589 Mother and Child Tracking (MCTH)
10740 Central Pollution Control Board
10741 Pollution Control Board
1511 Police Related Service for all Metro Railway Project
1512 Prevention of Crime in Railway
1514 National Career Service(NCS)
15100 Free Legal Service Helpline
155304 Municipal Corporations
155214 Labour Helpline
1903 Sashastra Seema Bal (SSB)
1909 National Do Not Call Registry
1912 Complaint of Electricity
1916 Drinking Water Supply
1950 Election Commission of India

4.8. CUSTOMER CARE

Live calling is done to verify response time for customer assistance is done to verify the performance of call centre in terms of:

- Calls getting connected and answered by operator's IVR.
- % age of calls answered by operator / voice to voice) within 90 seconds: In 95% of the cases or more

The process for this parameter is stated below:

- Overall sample size is 100 calls per service provider per circle at different points of time, evenly distributed across the selected exchanges – 50 calls between 1100 HRS to 1400 HRS and 50 calls between 1600 HRS to 1900 HRS.
- Time to answer the call by the operator was assessed from the time interviewer pressed the requisite button for being assisted by the operator.
- All the supplementary services that have any kind of human intervention are to be covered here. It also includes the IVR assisted services.

4.9. INTER OPERATOR CALL ASSESSMENT

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

Inter Operator Call Assessment	Aircel	Airtel	BSNL	Idea	Reliance CDMA	Reliance GSM	TTSL CDMA	TTSL GSM	Telenor	Videocon	Vodafone
Aircel	-	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	100%	100%	-	100%	100%	100%	100%	100%	100%	100%	100%
Idea	100%	100%	100%	-	100%	100%	100%	100%	100%	100%	100%
Reliance CDMA	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
Reliance GSM	100%	100%	100%	100%	100%	-	100%	100%	100%	100%	100%
TTSL CDMA	100%	100%	100%	100%	100%	100%	-	100%	100%	100%	100%
TTSL GSM	100%	100%	100%	100%	100%	100%	100%	-	100%	100%	100%
Telenor	100%	100%	100%	100%	100%	100%	100%	100%	-	100%	100%
Videocon	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%
Vodafone	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	-

5. DRIVE TEST: SIGNIFICANCE AND METHODOLOGY

Drive test, as the name suggests, is conducted to measure the outdoor coverage in a moving vehicle in a specified network coverage area.

The main purpose of the drive test is to check the health of the mobile network of various operators in the area in terms of coverage (signal strength), voice quality, call drop rate, call set up success rate etc.

To assess the indoor coverage, the test is also conducted at two static indoor locations in each SSA, such as Malls, office buildings, shopping complexes, government buildings etc.

There are two types of drive test as mentioned below.

- Operator Assisted Drive Test
- Independent Drive Test

The main difference between the two is that in the operator assisted, operators participate in the drive test along with their hardware, software, phones etc. while in the independent drive test PhiStream conducts the drive test on solitary basis and uses its own hardware. Operators generally do not have any knowledge of the independent drive test being conducted.

5.1. OPERATOR ASSISTED DRIVE TEST

UP East circle consist of total 32 SSA's and each SSA needs to be audit in the span of 12 months.
The methodology adopted for the drive test:

- 3 consecutive days drive test in each SSA. SSA would be defined as per DOT guidelines and month wise SSA list is finalized by regional TRAI office.
- On an average, a minimum of 80 kilometres are covered each day
- Route map was designed in such a way that all the major roads, highways and all the important towns and villages were covered as part of audit.
- Special emphasis was given to those areas where the number of complaints received were on the higher side, if provided by TRAI.
- The route is defined in a way that we cover maximum area in the SSA and try to cover maximum villages and cities within the SSA. The route is designed such that there is no overlap of roads and we can start from the point from where we had left last day (if possible).
- The route was classified as – Within City, Major Roads, Highways, Shopping complex/ Mall and Office Complex/ Government Building
- There were no fixed calls which we need to do for within city, major roads and highways, but a minimum of 30 calls in each route, i.e., within city, major roads and highways on each day. For indoors, 20 calls each for shopping and office complex each day preferably in relatively bigger city.
- The drive test covered selected cities and adjoining towns/rural areas where the service provider has commenced service, including congested areas and indoor sites.
- The drive test of each mobile network was conducted between 10 am and 8 pm on weekdays.
- The Vehicle used in the drive tests was equipped with the test tool that automatically generates calls on the mobile telephone networks.
- The speed of the vehicle was kept at around 30 km/hr.
- The holding period of each test call was 120 seconds.
- A test call was generated 10 seconds after the previous test call is completed.
- Height of the antenna was kept uniform in case of all service providers.

5.2. INDEPENDENT DRIVE TEST

The number of independent drive tests to be conducted and their locations are Decided basis TRAI recommendation.

- A minimum of 80 kilometres was traversed during the independent drive test in a SSA. The SSA would be defined as per BSNL and SSA list will be finalized by regional TRAI office.
- Route map was designed in such a way that all the major roads, highways and all the important towns and villages were covered as part of audit.
- Special emphasis was given to those areas where the number of complaints received were on the higher side, if provided by TRAI.
- The route is defined in a way that we cover maximum area in the SSA and try to cover maximum villages and cities within the SSA. The route is designed such that there is no overlap of roads (if possible).
- The route was classified as – Within city, Major Roads, Highways, Shopping complex/ Mall and Office Complex/ Government Building
- There were no fixed calls which we need to do for within city, major roads and highways, but a minimum of 30 calls in each route, i.e., within city, major roads and highways on each day. For indoors, 20 calls each for shopping and office complex each day preferably in relatively bigger city.
- The drive test covered selected cities and adjoining towns/rural areas where the service provider has commenced service, including congested areas and indoor sites.
- The drive test of each mobile network was conducted between 10 am and 8 pm on weekdays.
- The Vehicle used in the drive tests was equipped with the test tool that automatically generates calls on the mobile telephone networks.
- The speed of the vehicle was kept at around 30 km/hr.
- The holding period of each test call was 120 seconds.
- A test call was generated 10 seconds after the previous test call is completed.
- Height of the antenna was kept uniform in case of all service providers.

5.3. PARAMETERS EVALUATED DURING DRIVE TEST

The parameters which were captured during the drive test include. Below are the parameters which are captured for the GSM and CDMA operators.

- Coverage-Signal strength (GSM)
  - Total calls made (A)
  - Number of calls with signal strength between 0 to -75 dBm
  - Number of calls with signal strength between 0 to -85 dBm
  - Number of calls with signal strength between 0 to -95 dBm

- Coverage-Signal strength (CDMA)
  - Total Ec/Io BINS (A)
  - Total Ec/Io BINS with less than –15 (B)
  - Low Interference = [1 - (B/A)] x 100

- Voice quality (GSM)
  - Total RxQual Samples– A
  - RxQual samples with 0-5 value – B
  - %age samples with good voice quality = B/A x 100

- Voice quality (CDMA)
  - Total FER BINs (forward FER) – A
  - FER BINs with 0-2 value (forward FER) – B
  - FER BINs with 0-4 value (forward FER) – C
  - %age samples with FER bins having 0-2 value (forward FER) = B/A x 100
  - %age samples with FER bins having 0-4 value (forward FER) = C/A x 100
  - No. of FER samples with value > 4 = [A-C]

- Call setup success rate
  - Total number of call attempts – A
  - Total Calls successfully established – B
  - Call success rate (%age) = (B/A) x 100

- Blocked calls
  - 100% - Call Set up Rate

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

6. EXECUTIVE SUMMARY

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

6.1. OPERATORS COVERED

Name of Operator	Number of Subscriber (as on 31st Jun 2016)
Aircel	7042603
Airtel	21108697
BSNL	8268228
Idea	10784627
RCOM CDMA	2268154
RCOM GSM	7025091
TTSL CDMA	154591
TTSL GSM	4709829
Telenor	12595116
Vodafone	19489146

TSP	No. of cells	BTS	BSC	MSC+GMSC	Node B	RNC
AIRCEL	10732	3550	30	4+1	1142	6
AIRTEL	31131	10314	110	48	NA	NA
BSNL	3954	6405	78	28	1318	20
IDEA	26063	8651	48	11+3	3415	6
RCOM CDMA	3427	1139	8	5+3	NA	NA
RCOM GSM	6216	2081	19	3+1	NA	NA
TTSL CDMA	943	314	5	2+2	NA	NA
TTSL GSM	6635	2218	21	4	NA	NA
TELENOR	14672	4885	37	14	NA	NA
VODAFONE	40145	10145	140	20	3363	12

Note: Node B & RNC is Junked as Not Applicable (N.A.) for the services providers who do not have 3G services licence in the circle.

6.2. AUDIT SCHEDULE

OPERATOR	3 Days Live April 2016	Apr-16	May-16	Jun-16
AIRCEL	8th Apr 2016	6th May 2016	8th Jun 2016	8th July 2016
AIRTEL	12th Apr 2016	18th May 2016	14th Jun 2016	12th July 2016
BSNL	14th Apr 2016	24th May 2016	16th Jun 2016	14th July 2016
IDEA	11th Apr 2016	9th May 2016	11th Jun 2016	11th July 2016
RCOM	13th Apr 2016	16th May 2016	15th Jun 2016	13th July 2016
TTSL	7th Apr 2016	9th May 2016	9th Jun 2016	7th July 2016
VIDEOCON	20th Apr 2016	17th May 2016	11th Jun 2016	20th July 2016
TELENOR	12th Apr 2016	16th May 2016	14th Jun 2016	12th July 2016
VODAFONE	6th Apr 2016	13th May 2016	10th Jun 2016	6th July 2016

Note: Audit schedule mentioned above is for the PMR audit for the last month. 3 day live monitoring for the current month was carried along with the PMR audit.

6.3. CODES TO READ THE REPORT

Colour codes to read the report:

	Not meeting the benchmark
NA	Not Applicable
DNA	Data Not Available During The Audit

6.4. 2G VOICE PMR DATA: APRIL

Apr-16											
Network Parameters		Name of Service Provider									
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.11%	0.55%	1.95%	0.27%	0.02%	0.02%	0.30%	0.06%	0.20%	0.08%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.34%	1.84%	1.79%	0.83%	0.09%	0.14%	0.41%	0.00%	0.45%	0.22%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.80%	96.07%	98.43%	99.19%	98.14%	96.88%	94.48%	97.77%	95.98%	98.54%
	SDDCH/Paging chl. Congestion	≤ 1%	0.72%	0.79%	0.63%	0.71%	NA	0.43%	1.51%	0.00%	0.78%	0.33%
	TCH Congestion	≤ 2%	0.64%	0.71%	1.37%	0.74%	0.60%	0.93%	4.48%	0.12%	1.28%	1.46%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.53%	0.76%	1.38%	0.81%	0.18%	0.10%	1.33%	0.15%	0.53%	0.55%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.51%	2.87%	2.64%	2.85%	1.58%	0.33%	7.50%	1.92%	2.84%	1.71%
	%age of connection with good voice quality	≥ 95%	97.05%	95.67%	96.50%	97.37%	99.56%	99.15%	95.15%	99.97%	96.81%	96.60%

6.5. 2G VOICE PMR DATA: MAY

May-16											
Network Parameters		Name of Service Provider									
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.36%	0.66%	DNA	0.41%	0.04%	0.03%	0.29%	0.17%	0.38%	0.13%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.94%	1.89%	DNA	0.74%	0.18%	0.29%	1.13%	0.64%	1.40%	0.06%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.06%	96.18%	98.88%	99.00%	97.65%	97.07%	95.02%	98.07%	95.09%	98.41%
	SDDCH/Paging chl. Congestion	≤ 1%	0.69%	0.72%	0.65%	0.68%	NA	0.44%	1.48%	0.00%	0.92%	0.46%
	TCH Congestion	≤ 2%	0.77%	0.64%	2.02%	0.91%	0.57%	0.87%	3.89%	0.15%	1.84%	1.59%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.50%	0.87%	1.06%	0.95%	0.31%	0.11%	1.47%	0.14%	0.45%	0.57%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.49%	2.83%	2.66%	2.54%	1.99%	0.39%	8.54%	1.96%	3.17%	2.60%
	%age of connection with good voice quality	≥ 95%	97.43%	97.18%	DNA	97.12%	99.64%	99.10%	94.51%	99.97%	96.70%	95.34%

6.6. 2G VOICE PMR DATA: JUNE

Jun-16												
Network Parameters		Name of Service Provider										
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.25%	0.64%	1.74%	0.31%	0.01%	0.02%	0.51%	0.36%	0.34%	0.14%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.93%	1.91%	1.73%	0.56%	0.09%	0.10%	0.86%	0.96%	0.90%	0.05%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.03%	96.35%	98.43%	99.35%	98.10%	92.31%	96.03%	97.99%	93.57%	98.26%
	SDDCH/Paging chl. Congestion	≤ 1%	0.58%	0.47%	0.62%	0.52%	NA	81.65%	1.28%	0.00%	1.05%	0.38%
	TCH Congestion	≤ 2%	0.93%	0.62%	1.78%	0.61%	0.53%	1.97%	2.89%	0.66%	2.79%	1.74%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.63%	0.88%	1.69%	1.15%	0.29%	0.14%	1.47%	0.13%	0.62%	0.81%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.98%	2.80%	1.84%	2.34%	0.35%	0.39%	9.09%	2.10%	3.72%	3.44%
	%age of connection with good voice quality	≥ 95%	97.47%	97.09%	96.50%	97.18%	99.54%	98.74%	94.50%	99.97%	96.30%	95.96%

6.7. 2G VOICE PMR DATA: CONSOLIDATED

Consolidated												
Network Parameters		Name of Service Provider										
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.24%	0.61%	1.95%	0.33%	0.02%	0.02%	0.37%	0.20%	0.30%	0.12%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.07%	1.88%	1.79%	0.71%	0.12%	0.18%	0.80%	0.53%	0.92%	0.11%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.96%	96.20%	98.66%	99.18%	97.96%	95.42%	95.18%	97.94%	94.88%	98.40%
	SDDCH/Paging chl. Congestion	≤ 1%	0.66%	0.66%	0.64%	0.64%	NA	27.50%	1.43%	0.00%	0.92%	0.39%
	TCH Congestion	≤ 2%	0.78%	0.66%	1.69%	0.75%	0.57%	1.26%	3.75%	0.31%	1.97%	1.60%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.55%	0.84%	1.22%	0.97%	0.26%	0.12%	1.42%	0.14%	0.54%	0.65%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.66%	2.83%	2.65%	2.58%	1.31%	0.37%	8.38%	1.99%	3.25%	2.58%
	%age of connection with good voice quality	≥ 95%	97.32%	96.65%	96.50%	97.22%	99.58%	98.99%	94.72%	99.97%	96.61%	95.97%

6.8. 2G VOICE 3 DAYS LIVE DATA

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

6.9. 2G VOICE 3 DAYS LIVE DATA: APRIL

Apr-16												
Network Parameters		Name of Service Provider										
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.05%	0.23%	1.76%	0.35%	0.02%	0.02%	0.28%	0.00%	0.20%	0.10%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.08%	0.01%	0.10%	0.03%	0.00%	0.00%	0.41%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.83%	96.12%	98.29%	99.30%	98.90%	98.10%	94.18%	98.35%	96.55%	98.55%
	SDDCH/Paging chl. Congestion	≤ 1%	0.57%	0.71%	0.59%	0.49%	NA	0.31%	1.28%	0.00%	0.25%	0.26%
	TCH Congestion	≤ 2%	0.77%	0.70%	1.71%	0.65%	0.13%	0.89%	4.79%	0.14%	1.20%	1.45%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.51%	0.80%	1.70%	0.81%	0.15%	0.09%	1.39%	0.05%	0.60%	0.60%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.61%	2.90%	2.49%	2.79%	4.43%	0.92%	8.03%	2.07%	2.97%	2.10%
	%age of connection with good voice quality	≥ 95%	96.78%	97.36%	96.66%	97.42%	99.61%	99.16%	95.17%	99.44%	96.80%	96.56%

6.10. 2G VOICE 3 DAYS LIVE DATA: MAY

Network Parameters		May-16										
		Name of Service Provider										
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.23%	0.55%	1.89%	0.30%	0.03%	0.02%	0.19%	0.00%	0.20%	0.08%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.03%	0.00%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.18%	96.57%	97.03%	98.28%	95.54%	97.71%	95.02%	98.10%	96.24%	98.82%
	SDDCH/Paging chl. Congestion	≤ 1%	0.51%	0.68%	0.98%	0.77%	NA	0.50%	1.42%	0.00%	0.50%	0.31%
	TCH Congestion	≤ 2%	0.63%	0.55%	2.97%	1.61%	2.12%	1.03%	3.99%	0.15%	1.34%	1.18%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.45%	0.81%	1.81%	1.11%	0.29%	0.09%	1.35%	0.13%	0.42%	0.58%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.38%	2.86%	2.73%	2.51%	1.92%	0.24%	7.70%	1.76%	2.58%	2.05%
	%age of connection with good voice quality	≥ 95%	97.61%	97.36%	96.66%	96.73%	99.40%	99.09%	94.42%	99.97%	96.74%	96.80%

6.11. 2G VOICE 3 DAYS LIVE DATA: JUNE

Network Parameters		Jun-16										
		Name of Service Provider										
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	COM CDM	RCOM GSM	TELENOR	TSL CDM	TTSL GSM	ODAFONI	0
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.31%	0.56%	1.93%	0.42%	0.06%	0.00%	0.38%	0.23%	0.42%	0.12%	0.00%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.28%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.04%	96.59%	98.33%	99.33%	97.90%	95.06%	95.40%	98.74%	94.55%	98.16%	0.00%
	SDDCH/Paging chl. Congestion	≤ 1%	0.76%	0.53%	0.65%	0.55%	NA	0.51%	1.67%	0.00%	0.82%	0.43%	0.00%
	TCH Congestion	≤ 2%	0.84%	0.56%	1.67%	0.63%	0.61%	1.05%	3.41%	0.13%	2.41%	1.84%	0.00%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.50%	0.87%	1.93%	1.02%	0.29%	0.14%	1.60%	0.10%	0.54%	0.92%	0.00%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.62%	2.81%	0.32%	2.63%	1.40%	0.57%	9.00%	1.68%	3.32%	3.96%	0.00%
	%age of connection with good voice quality	≥ 95%	97.46%	97.09%	96.62%	97.33%	99.36%	98.99%	94.29%	99.97%	96.60%	95.50%	0.00%

6.12. 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated											
Network Parameters		Name of Service Provider									
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.20%	0.45%	1.82%	0.36%	0.04%	0.02%	0.29%	0.08%	0.27%	0.10%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.04%	0.00%	0.14%	0.02%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.02%	96.43%	97.66%	98.97%	97.44%	96.96%	94.87%	98.40%	95.78%	98.51%
	SDDCH/Paging chl. Congestion	≤ 1%	0.62%	0.64%	0.79%	0.60%	NA	0.44%	1.46%	0.00%	0.52%	0.33%
	TCH Congestion	≤ 2%	0.75%	0.60%	2.34%	0.96%	0.95%	0.99%	4.06%	0.14%	1.65%	1.49%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.49%	0.82%	1.75%	0.98%	0.25%	0.11%	1.45%	0.10%	0.52%	0.70%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.54%	2.86%	2.61%	2.64%	2.58%	0.57%	8.24%	1.84%	2.96%	2.70%
	%age of connection with good voice quality	≥ 95%	97.28%	97.27%	96.66%	97.16%	99.46%	99.08%	94.63%	99.80%	96.71%	96.29%

6.13. 3G VOICE PMR: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.32%	0.49%	1.32%	0.36%	0.37%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.25%	1.87%	1.82%	1.46%	0.82%
Connection Establishment (Accessibi	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.81%	99.83%	97.04%	99.64%	99.81%
	RRC Congestion:	≤ 1%	0.14%	0.25%	0.92%	0.58%	0.20%
	RAB Congestion:	≤ 2%	0.01%	0.17%	0.97%	0.14%	0.03%
Connection Maintenance (Retainabil	Circuit Switched Voice Drop Rate	≤ 2%	0.50%	0.43%	1.25%	0.52%	0.26%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.03%	2.07%	2.83%	2.07%	2.20%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.74%	98.42%	96.50%	98.68%	99.00%

6.14. 3G VOICE PMR: APRIL

Apr-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.12%	0.53%	1.32%	0.35%	0.30%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.26%	1.86%	1.82%	1.73%	1.44%
Connection Establishment (Accessibi	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.88%	99.77%	97.04%	99.57%	99.86%
	RRC Congestion:	≤ 1%	0.06%	0.36%	0.92%	0.67%	0.01%
	RAB Congestion:	≤ 2%	0.01%	0.23%	0.97%	0.21%	0.01%
Connection Maintenance (Retainabil	Circuit Switched Voice Drop Rate	≤ 2%	0.48%	0.46%	1.25%	0.51%	0.23%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.10%	2.12%	2.83%	2.55%	1.86%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.75%	97.99%	96.50%	98.82%	99.00%

6.15. 3G VOICE PMR: MAY

May-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.49%	0.46%	1.99%	0.42%	0.40%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	2.63%	1.84%	1.67%	1.46%	0.61%
Connection Establishment (Accessibi	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.70%	99.85%	96.33%	99.59%	99.76%
	RRC Congestion:	≤ 1%	0.26%	0.29%	0.94%	0.62%	0.27%
	RAB Congestion:	≤ 2%	0.01%	0.15%	1.01%	0.13%	0.07%
Connection Maintenance (Retainabil	Circuit Switched Voice Drop Rate	≤ 2%	0.52%	0.43%	1.15%	0.50%	0.26%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.31%	2.13%	2.74%	1.87%	2.25%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.75%	98.64%	96.50%	98.72%	99.00%

6.16. 3G VOICE PMR: JUNE

Jun-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.36%	0.49%	1.32%	0.32%	0.42%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.87%	1.92%	1.59%	1.19%	0.40%
Connection Establishment (Accessibi	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.84%	99.86%	97.10%	99.75%	99.83%
	RRC Congestion:	≤ 1%	0.10%	0.12%	0.87%	0.45%	0.32%
	RAB Congestion:	≤ 2%	0.01%	0.14%	1.02%	0.07%	0.01%
Connection Maintenance (Retainabil	Circuit Switched Voice Drop Rate	≤ 2%	0.51%	0.41%	1.17%	0.54%	0.29%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	4.68%	1.96%	2.83%	1.80%	2.49%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.74%	98.63%	96.50%	98.50%	98.99%

6.17. 3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.26%	0.42%	1.68%	0.40%	0.27%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.03%	0.00%	0.53%	0.05%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.80%	99.83%	96.94%	99.71%	99.77%
	RRC Congestion:	≤ 1%	0.27%	0.25%	0.88%	0.55%	0.34%
	RAB Congestion:	≤ 2%	0.00%	0.17%	0.89%	0.11%	0.08%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.48%	0.47%	1.12%	0.49%	0.26%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.42%	2.01%	2.79%	2.33%	2.16%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.75%	98.54%	DNA	98.76%	98.99%

6.18. 3G VOICE 3 DAYS LIVE DATA: APRIL

Apr-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.17%	0.28%	1.84%	0.55%	0.30%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.68%	0.15%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.90%	99.80%	96.94%	99.74%	99.86%
	RRC Congestion:	≤ 1%	0.08%	0.43%	0.93%	0.57%	0.01%
	RAB Congestion:	≤ 2%	0.00%	0.20%	0.90%	0.07%	0.01%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.46%	0.59%	1.14%	0.48%	0.22%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.49%	1.92%	2.84%	2.54%	1.85%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.74%	97.95%	DNA	98.81%	98.99%

6.19. 3G VOICE 3 DAYS LIVE DATA: MAY

May-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.10%	0.46%	1.51%	0.11%	0.28%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.38%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.53%	99.77%	96.94%	99.56%	99.64%
	RRC Congestion:	≤ 1%	0.70%	0.19%	0.84%	0.61%	0.99%
	RAB Congestion:	≤ 2%	0.01%	0.23%	0.88%	0.18%	0.21%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.47%	0.43%	1.11%	0.46%	0.22%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.19%	2.13%	2.74%	1.87%	1.90%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.75%	98.75%	DNA	98.84%	99.00%

6.20. 3G VOICE 3 DAYS LIVE DATA: JUNE

Jun-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.50%	0.52%	1.59%	0.55%	0.25%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.09%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.99%	99.93%	96.64%	99.82%	99.81%
	RRC Congestion:	≤ 1%	0.02%	0.13%	0.63%	0.48%	0.02%
	RAB Congestion:	≤ 2%	0.00%	0.07%	0.94%	0.08%	0.01%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.51%	0.40%	0.94%	0.53%	0.32%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.59%	1.97%	2.67%	2.58%	2.73%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.75%	98.91%	DNA	98.62%	98.99%

6.21. PMR MONTHLY 2G WIRELESS DATA - CONSOLIDATED

Consolidated												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		1330904	DNA	DNA	854226	9028	204918	528263	27	198	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1326366	DNA	DNA	854226	9021	204911	507126	26	197	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.60%	DNA	DNA	100.00%	3399.97%	100.00%	95.91%	98.61%	99.47%	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		238806480	646299869	56205284	565617601	DNA	DNA	397387757	8175594	DNA	707562697
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		237088807	645696867	56115072	564538975	DNA	DNA	390940009	7888150	DNA	705639158
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.26%	99.91%	99.84%	99.81%	98.22%	99.84%	98.33%	96.49%	DNA	99.73%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1854613618	79571129884	DNA	15028599135	11569646	769246991	3233744286	DNA	1389924964	2365122616
ii)	RNC originated PS Domain Iu Connection Release (B)		12053773	852342009	DNA	208248331	98273	29356747	31786643	DNA	28843048	114162410
iii)	Drop Rate = (B/A) * 100	<=5%	0.65%	1.07%	DNA	1.40%	0.82%	3.81%	0.98%	DNA	2.07%	4.82%

6.22. PMR MONTHLY 2G WIRELESS DATA – APRIL

Apr-16												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		1098264	DNA	DNA	707706	20463	179858	387429	32	178	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1086685	DNA	DNA	707706	20444	179847	370392	32	176	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	98.95%	DNA	DNA	100.00%	99.91%	99.99%	95.60%	100.00%	98.88%	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		232713307	673345558	DNA	571608732	DNA	DNA	374462592	7865175	DNA	731891288
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		228448304	672841620	DNA	570362352	DNA	DNA	363593793	7592060	DNA	728353931
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	98.17%	99.93%	DNA	99.78%	98.26%	99.81%	97.10%	96.53%	100.00%	99.52%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1832035021	7.651E+10	DNA	21670491372	21782793	738066954	2964297538	DNA	1446418750	2269097611
ii)	RNC originated PS Domain Iu Connection Release (B)		12452719	771314695	DNA	292983754	192350	25151100	27955992	DNA	30372550.2	99993596
iii)	Drop Rate = (B/A) * 100	<=5%	0.68%	1.01%	DNA	1.35%	0.88%	3.41%	0.94%	DNA	2.10%	4.41%

6.23. PMR MONTHLY 2G WIRELESS DATA - MAY

May-16												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		1521875	DNA	DNA	984844	6155	214948	630057	24	213	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1520222	DNA	DNA	984844	6155	214941	612257	23	212	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.89%	DNA	DNA	100.00%	100.00%	100.00%	97.17%	95.83%	99.53%	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		249788479	645377735	57164106.29	629314030	NA	NA	444413947	8408074	DNA	742930795
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		249632466	644769580	57067657	628362496	NA	NA	440377374	8107240	DNA	741807668
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.94%	99.91%	99.83%	99.85%	98.18%	99.87%	99.09%	96.42%	99.99%	99.85%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		2013268247	84504789263	DNA	12223864456	10289993	780157767	3327555402	DNA	1468657037	2417273261
ii)	RNC originated PS Domain Iu Connection Release (B)		12388378	922652881	DNA	164964442	81665.00	30812877	32696090	DNA	31339450	126755470
iii)	Drop Rate = (B/A) * 100	<=5%	0.62%	1.09%	DNA	1.35%	0.79%	3.95%	0.98%	DNA	2.13%	5.24%

6.24. PMR MONTHLY 2G WIRELESS DATA – JUNE

Jun-16												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		1372574	DNA	DNA	870128	465	219947	567304	24	202	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1372191	DNA	DNA	870128	465	219946	538730	24	202	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.97%	DNA	DNA	100.00%	100.00%	100.00%	94.96%	100.00%	100.00%	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		233917655	620176314	55246461	495930040	NA	NA	373286732	8253534	DNA	647866008
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		233185652	619479401	55162486	494892078	NA	NA	368848860	7965149	DNA	646755876
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.69%	99.89%	99.85%	99.79%	DNA	99.84%	98.81%	96.51%	DNA	99.83%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1718537585	77698499571	DNA	11191441577	2636151	789516251	3409379917	DNA	1254699104	2408996977
ii)	RNC originated PS Domain Iu Connection Release (B)		11320222	863058452	DNA	166796796	20805	32106264	34707847	DNA	24817144	115738163
iii)	Drop Rate = (B/A) * 100	<=5%	0.66%	1.11%	DNA	1.49%	0.79%	4.07%	1.02%	DNA	1.98%	4.80%

6.25. WIRELESS DATA 3G MONTHLY PMR CONSOLIDATED

Consolidated							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		1447225	DNA	DNA	854226	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1446207	DNA	DNA	854226	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.93%	DNA	DNA	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		238806480	DNA	54040999	431466654	290439830
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		237088807	DNA	53773779	427859697	288586016
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.26%	99.98%	99.51%	99.17%	99.36%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		173854064	19148362	1131253724	528104274	666608445
ii)	RNC originated PS Domain Iu Connection Release (B)		1280303	262060	31675862	9146333	3176429
iii)	Drop Rate = (B/A) * 100	<=5%	0.74%	1.36%	2.80%	1.73%	0.48%

6.26. WIRELESS DATA 3G MONTHLY PMR – APR

Apr-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	707706	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	707706	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		232713307	DNA	54037594	438062972	295839508
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		228448304	DNA	53985012	434277350	293055489
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	98.17%	99.97%	99.90%	99.14%	99.06%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		166889708	17296106	1131253724	523443300	623930220
ii)	RNC originated PS Domain Iu Connection Release (B)		1152405	272560	31675862.3	8861433	2788125
iii)	Drop Rate = (B/A) * 100	<=5%	0.69%	1.58%	2.80%	1.69%	0.45%

6.27. WIRELESS DATA 3G MONTHLY PMR – MAY

May-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		1521875	DNA	DNA	984844	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1520222	DNA	DNA	984844	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.89%	DNA	DNA	100.00%	DNA
2	D						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		249788479	DNA	57179083	474398532	304301465
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		249632466	DNA	56772635	469951976	302987546
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.94%	99.98%	99.29%	99.06%	99.57%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		177997559	21697629	DNA	554178296	703722483
ii)	RNC originated PS Domain Iu Connection Release (B)		1258427	334034	DNA	9729417	3367958
iii)	Drop Rate = (B/A) * 100	<=5%	0.71%	1.54%	DNA	1.76%	0.48%

6.28. WIRELESS DATA 3G MONTHLY PMR – JUNE

Jun-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		1372574	DNA	DNA	870128	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1372191	DNA	DNA	870128	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.97%	DNA	DNA	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		233917655	DNA	50906320.82	381938458	271178516
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		233185652	DNA	50563690	379349765	269715012
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.69%	99.99%	99.33%	99.32%	99.46%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		176674925	18451350	DNA	506691226	672172633
ii)	RNC originated PS Domain Iu Connection Release (B)		1430077	179587	DNA	8848150	3373203
iii)	Drop Rate = (B/A) * 100	<=5%	0.81%	0.97%	DNA	1.75%	0.50%

6.29. 3 DAYS LIVE WIRELESS DATA 2G PMR – APRIL

Apr-16												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	47154	531	19296	35807	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	47154	531	19293	34164	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	100.00%	99.98%	95.41%	DNA	DNA	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		22258693	67279626	DNA	54030048	DNA	DNA	34975439	794514	468395	69526286
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		22255326	67218169	DNA	53972226	DNA	DNA	34947963	766532	468086	69389547
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.98%	99.91%	DNA	99.89%	98.56%	99.84%	99.92%	96.48%	99.93%	99.80%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		183928535	7409566325	DNA	1143322048	12516399	77611727	323833683	DNA	96869544	222222561
ii)	RNC originated PS Domain Iu Connection Release (B)		1153687	73102303	DNA	15480604	135919	2581106	4193868	DNA	1969723	10384993
iii)	Drop Rate = (B/A) * 100	<=5%	0.63%	0.99%	DNA	1.35%	1.09%	3.33%	1.30%	DNA	2.03%	4.67%

6.30. 3 DAYS LIVE WIRELESS DATA 2G PMR – MAY

May-16												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	49812	531	44300	74855	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	49812	531	44300	73250	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	100.00%	100.00%	97.86%	DNA	DNA	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		24224794	61344076	DNA	58581304	NA	NA	42662949	830216	DNA	70994397
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		24223840	61281204	DNA	58507142	NA	NA	42526419	799798	DNA	70921133
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.90%	DNA	99.87%	98.87%	99.77%	99.68%	96.34%	100.00%	99.90%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		195004852	7912937918	DNA	1.156E+09	1113839	76496539	300542911	DNA	151790304	253260309
ii)	RNC originated PS Domain Iu Connection Release (B)		1091965	87157659	DNA	13298542	7273	2983279	2559801	DNA	3154747	11302090
iii)	Drop Rate = (B/A) * 100	<=5%	0.56%	1.10%	DNA	1.15%	0.65%	3.90%	0.85%	DNA	2.08%	4.46%

6.31. 3 DAYS LIVE WIRELESS DATA 2G PMR – JUNE

Jun-16												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	41512	183	8664	65233	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	41512	183	8664	63532	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	100.00%	100.00%	97.39%	DNA	DNA	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	65318053	DNA	58690572	DNA	DNA	45700348	875025	DNA	63748862
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	65268003	DNA	58619618	DNA	DNA	42285662	843752	DNA	63688411
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	99.92%	DNA	99.88%	98.79%	99.92%	92.53%	96.43%	99.95%	99.91%
3	B											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	7834658202	DNA	1328281804	1118084	75354532	322976083	DNA	134144459	236471968
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	85955582	DNA	21609609	9458	2929749	3387598	DNA	2983429	11873704
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	1.10%	DNA	1.63%	0.85%	3.89%	1.05%		2.22%	5.02%

6.32. 3 DAYS LIVE WIRELESS DATA 2G PMR – CONSOLIDATED

CONSOLIDATED												
Cellular Mobile Telephone Services												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter												
1	Service Activation/ Provisioning											
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	46159.33333	415	24086.66667	58631.66667	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	46159.33333	415	24085.66667	56982	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	100.00%	99.99%	96.89%	DNA	DNA	DNA
2	PDP Context Activation Success Rate											
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		23241743.5	64647251.67	DNA	57100641.33	DNA	DNA	41112912	833251.7	468395	68089848.33
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		23239583	64589125.33	DNA	57032995.33	DNA	DNA	39920014.67	803360.7	468086	67999697
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.99%	99.91%	DNA	99.88%	98.74%	99.84%	97.38%	96.41%	99.96%	99.87%
3	Drop Rate											
i)	RNC originated PS Domain Iu Connection Setup Success (A)		189466694	7719054148	DNA	1209158149	4916107	76487599	315784226	DNA	127601436	237318279
ii)	RNC originated PS Domain Iu Connection Release (B)		1122826	82071848	DNA	16796252	50883	2831378	3380422	DNA	2702633	11186929
iii)	Drop Rate = (B/A) * 100	<=5%	0.59%	1.06%	DNA	1.38%	0.86%	3.70%	1.07%	DNA	2.11%	4.72%

6.33. 3 DAYS LIVE WIRELESS DATA 3G PMR – APRIL

Apr-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	47154	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	47154	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		22258693	DNA	10723615	42869934	28669250
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		22255326	DNA	10690670	42529602	28530575
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.98%	99.99%	99.69%	99.21%	99.52%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		16803020	645399.3	112720200	50420518	69521245
ii)	RNC originated PS Domain Iu Connection Release (B)		112462	10156.72	3385399	852338	339950
iii)	Drop Rate = (B/A) * 100	<=5%	0.67%	1.57%	3.00%	1.69%	0.49%

6.34. 3 DAYS LIVE WIRELESS DATA 3G PMR – MAY

May-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	49812	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	49812	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		24224794	DNA	5503959	44674138	27867448
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		24223840	DNA	5493702	44327240	27757234
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	DNA	99.81%	99.22%	99.60%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		17772660	DNA	113571424	61325351	68646911
ii)	RNC originated PS Domain Iu Connection Release (B)		108602	DNA	3340008	997432	297713
iii)	Drop Rate = (B/A) * 100	<=5%	0.61%	DNA	2.94%	1.63%	0.43%

6.35. 3 DAYS LIVE WIRELESS DATA 3G PMR – JUNE

Jun-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	41512	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	41512	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		23717925	DNA	DNA	45167672	27372948
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		23715551	DNA	DNA	44812760	27225985
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.99%	DNA	DNA	99.21%	99.46%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		16731209	DNA	DNA	58966103	67571465
ii)	RNC originated PS Domain Iu Connection Release (B)		147415	DNA	DNA	1037833	340936
iii)	Drop Rate = (B/A) * 100	<=5%	0.88%	DNA	DNA	1.76%	0.50%

6.36. 3 DAYS LIVE WIRELESS DATA 3G PMR – CONSOLIDATED

CONSOLIDATED							
Cellular Mobile Telephone Services							
S. No.	**Name of Parameter**	**Benchmark**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**VODAFONE**
Network Service Quality Parameter							
1	**Service Activation/ Provisioning**						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	46159	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	46159	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA
2	**PDP Context Activation Success Rate**						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		23400471	DNA	8113787	44237248	27969882
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		23398239	DNA	8092186	43889867	27837931
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.99%	99.99%	99.75%	99.21%	99.53%
3	**Drop Rate**						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		17102296	645399	113145812	56903991	68579874
ii)	RNC originated PS Domain Iu Connection Release (B)		122826	10157	3362703	962534	326200
iii)	Drop Rate = (B/A) * 100	<=5%	0.72%	1.57%	2.97%	1.69%	0.48%

6.37. POI CONGESTION: CONSOLIDATED

Consolidated												
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service												
S. No.	**Name of Parameter**	**Benchmark**	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM CDMA**	**RCOM GSM**	**TELENOR**	**TTSL CDMA**	**TTSL GSM**	**VODAFONE**
7	**Total No. of POI's in Month having < = 0.5% POI congestion**											
	Total No. of call attempts on POI		3930662	7605824	2926171	8772155	823282	1264017	5581885	1845226	323864	14303484
	Total traffic served on all POIs (Erlang)		82987	116003	728222	191472	15902	29328	104752	33225	5608	348746
	Total No. of circuits on all individual POIs		121182	189249	104140	316543	56826	49642	191370	74322	10347	607961
	Total number of working POI Service Area wise		117	154	1132	342	144	51	31	160	19	44
	Capacity of all POIs		115147	183335	70280	303955	43148	46462	182241	67333	9484	614004
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

6.38. POI CONGESTION: APRIL

Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
1	**Total No. of POI's in Month having < = 0.5% POI congestion**											
	Total No. of call attempts on POI		3660643	7976756	3762696	8654762	870845	1246398	5244992	2060628	348345	14048974
	Total traffic served on all POIs (Erlang)		78216	123026	757852	188091	16977	28856	101401	37609	5445	343775
	Total No. of circuits on all individual POIs		114697	187818	140969	313942	57437	49165	190470	76056	10345	609853
	Total number of working POI Service Area wise		112	155	93	333	139	53	31	160	20	44
	Capacity of all POIs		108972	181857	93442	301486	43131	46014	181763	71353	9480	615915
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

6.39. POI CONGESTION: MAY

May-16												
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
7	**Total No. of POI's in Month**											
	Total No. of call attempts on POI		4155767	7904550	2089647	9018145	859757	1148520	5977492	1991754	317242	14452610
	Total traffic served on all POIs (Erlang)		86593	119790	698592	196444	16922	27091	108352	36285	5635	350106
	Total No. of circuits on all individual POIs		123972	187377	67311	317856	57917	48460	190778	73625	10345	604589
	Total number of working POI Service Area wise		119	155	2171	345	148	50	31	160	20	44
	Capacity of all POIs		117792	181413	47118	305200	44271	45443	182211	65322	9480	610597
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

6.40. POI CONGESTION: JUNE

Jun-16												
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service												
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
7	**Total No. of POI's in Month having < = 0.5% POI congestion**											
	Total No. of call attempts on POI		3975578	6936167	DNA	8643558	739245	1397132	5523170	1483296	306005	14408867
	Total traffic served on all POIs (Erlang)		84152	105195	DNA	189880	13807	32037	104504	25781	5744	352359
	Total No. of circuits on all individual POIs		124876	192553	DNA	317832	55125	51300	192862	73284	10352	609441
	Total number of working POI Service Area wise		119	153	DNA	349	144	51	31	160	17	43
	Capacity of all POIs		118679	186734	DNA	305179	42043	47928	182748	65324	9494	615499
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	0	0	1
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

7. CUSTOMER SERVICE DELIVERY

7.1. BILLING AND CUSTOMER CARE

Name of Service Provider	Metering and Billing credibility		Billing Complaints			Termination & Closures	Time taken for refund of deposits after closures: Benchmark	Response time to customer for assistance	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints resolved within 6 weeks	%age of where credit/waiver is received within one week	% of Termination/ Closure of service within 7 days (100 %)	Cleared over a period of <60 days (100%)	%age of calls answered by the IVR	%age of call answered by the operators (voice to voice) within 90 seconds
Benchmark	≤ 0.1%	≤ 0.1%	≥ 98%	= 100%	= 100%	= 100%	= 100%	≥ 95%	≥ 95%
AIRCEL	0.00%	0.00%	NA	NA	100.00%	100.00%	100.00%	98.28%	95.57%
AIRTEL	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	77.03%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
IDEA	0.04%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	95.70%	99.74%
RCOM CDMA	0.09%	0.04%	100.00%	100.00%	100.00%	100.00%	85.93%	99.13%	88.15%
RCOM GSM	0.08%	0.09%	100.00%	100.00%	100.00%	100.00%	76.26%	99.57%	93.74%
TELENOR	NA	0.02%	NA	NA	100.00%	NA	NA	99.04%	98.63%
TTSL CDMA	0.00%	0.00%	NA	NA	100.00%	100.00%	100.00%	NA	99.77%
TTSL GSM	0.00%	0.00%	100.00%	100.00%	100.00%	69.59%	100.00%	99.73%	97.56%
VODAFONE	0.08%	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.85%

Name of Service Provider	Customer Care & Grievances Redressal	
	% of Complaints addressed at call centre level	% of Complaints addressed by Appellate Authority
Benchmark		
AIRCEL	100.00%	100.00%
AIRTEL	98.05%	100.00%
BSNL	DNA	DNA
IDEA	100.00%	100.00%
RCOM CDMA	100.00%	100.00%
RCOM GSM	100.00%	100.00%
TELENOR	DNA	NIL
TTSL CDMA	99.85%	100.00%
TTSL GSM	98.94%	79.07%
VODAFONE	100.00%	NIL

7.2. LIVE CALLING DATA: CONSOLIDATED

Name of Service Provider	Metering and Billing (Service Request)				Response time to customer for Assistanse	
	Total Calls Attempted	No. of Subscribers reached	Compalints/ Request attended to satisfaction	% of Complaints/ Request attended to satisfaction	Accessibility of call centre / Customer care	%age of call answered by the operators (voice to voice) within 90 seconds
Benchmark					**≥ 95%**	**≥ 95%**
AIRCEL	80	49	45	91.84%	100.00%	96.00%
AIRTEL	211	119	115	96.64%	100.00%	100.00%
BSNL	357	250	227	90.80%	100.00%	100.00%
IDEA	345	200	198	99.00%	100.00%	100.00%
RCOM CDMA	NA	NA	NA	NA	NA	NA
RCOM GSM	230	179	168	93.85%	100.00%	94.00%
TELENOR	329	200	193	96.50%	97.00%	97.00%
TTSL CDMA	3	3	3	100.00%	100.00%	100.00%
TTSL GSM	300	122	119	97.54%	100.00%	100.00%
VODAFONE	224	190	168	88.42%	100.00%	98.00%

7.3. 3 DAYS LIVE CALL CENTRE DATA

Response time to customer assistance						
OPERATOR	**Total no of calls attempted to customer care/Call center**	**Total no. of calls successfully established to customer care/Call center**	**% age of Accessibility of Call centre**	**Total Calls reached to operator for (Voice to Voice)**	**Total number of calls answered by the operator (Voice to voice) within 90 seconds**	**% age calls answered by the operator within 90 seconds**
DAYS	AVERAGE					
OPERATOR			>=95%			>=95%
AIRCEL	727727	716357	98.44%	159694	156885	98.24%
AIRTEL	152494	152494	100.00%	279190	274769	98.42%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA
IDEA	851987	851987	100.00%	255685	255638	99.98%
RCOM CDMA	21616	21349	98.76%	4900	4706	96.04%
RCOM GSM	182015	180942	99.41%	38126	37621	98.68%
TELENOR	DNA	DNA	DNA	DNA	DNA	DNA
TTSL CDMA	DNA	DNA	DNA	198	197	99.49%
TTSL GSM	22198	21798	98.20%	32471	32111	98.89%
Vodafone	DNA	DNA	DNA	DNA	DNA	DNA

8. L1 CALLING DATA

L1 Calling data covers all the SDCA covered across the four operator assisted drive tests:

- Shahjahanpur: 4th May to 6th May 2016
- Mirzapur: 25th May 2016 to 27th May 2016
- Basti : 15th June to 17th June

8.1. SHAHJAHANPUR

AIRCEL						
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Tilhar	Jalalabad	Powayan	Hardoi Turn
1	100	5	√	√	√	√
2	101	5	√	√	√	√
3	102	5	√	√	√	√
4	104	5	×	×	×	×
5	108	5	√	√	√	√
6	138	5	×	×	×	×
7	149	5	×	×	×	×
8	181	5	×	×	×	×
9	182	5	√	√	√	√
10	1033	5	×	×	×	×
11	1037	5	×	×	×	×
12	1056	5	×	×	×	×
13	1060	5	×	×	×	×
14	1063	5	×	×	×	×
15	1064	5	×	×	×	×
16	1070	5	×	×	×	×
17	1071	5	×	×	×	×
18	1072	5	×	×	×	×
19	1073	5	√	×	×	√
20	1077	5	×	×	×	×
21	1090	5	√	√	√	√
22	1091	5	√	√	√	√
23	1097	5	√	√	√	√
24	1099	5	×	×	×	×
25	10580	5	×	×	×	×
26	10589	5	×	×	×	×
27	10740	5	×	×	×	×
28	10741	5	×	×	×	×
29	1511	5	×	×	×	×
30	1512	5	×	×	×	×
31	1514	5	×	×	×	×
32	15100	5	×	×	×	×
33	155304	5	×	×	×	×
34	155214	5	√	√	√	√
35	1903	5	√	√	√	√
36	1909	5	√	√	√	×
37	1912	5	×	×	√	√
38	1916	5	×	×	×	×
39	1950	5	√	√	×	×

AIRTEL					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Shajahnpur	Hardoi Mod	Ram Leela Maidan
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	108	5	√	√	√
5	138	5	√	√	√
6	149	5	√	√	√
7	181	5	√	√	√
8	182	5	√	√	√
9	1071	5	√	√	√
10	1072	5	√	√	√
11	1073	5	√	3	√
12	15100	5	√	√	√
13	155214	5	√	√	√
14	1903	5	√	√	√
15	1909	5	√	√	√
16	1912	5	√	√	√
17	1916	5	√	√	√
18	1950	5	√	√	√
19	1090	5	√	√	√
20	1091	5	√	√	√
21	1097	5	√	√	√
22	1552	5	√	√	√
23	102	5	×	×	×
24	149	5	×	×	×
25	1037	5	×	×	×
26	1056	5	×	×	×
27	1060	5	×	×	×
28	1064	5	×	×	×
29	1071	5	×	×	×
30	1073	5	×	×	×
31	1090	5	×	×	×
32	1099	5	×	×	×
33	10580	5	×	×	×
34	10589	5	×	×	×
35	10740	5	×	×	×
36	10741	5	×	×	×
37	1511	5	×	×	×
38	1514	5	×	×	×
39	1916	5	×	×	×

BSNL						
SR. NO.	EMERGENCY NUMBER	CALLS MADE	TILHAR	JALLALABAD	POWAYA	SHAHJAHANPUR
1	100	5	√	√	√	√
2	101	5	√	√	√	√
3	102	5	√	√	√	√
4	104	5	×	×	×	×
5	108	5	×	×	×	×
6	138	5	√	√	√	√
7	149	5	√	√	√	√
8	181	5	×	×	×	×
9	182	5	×	×	×	×
10	1033	5	√	√	√	√
11	1037	5	×	×	×	×
12	1056	5	×	×	×	×
13	1060	5	×	×	×	×
14	1063	5	×	×	×	×
15	1064	5	×	×	×	×
16	1070	5	×	×	×	×
17	1071	5	×	×	×	×
18	1072	5	×	×	×	×
19	1073	5	×	×	×	×
20	1077	5	×	×	×	×
21	1090	5	√	√	√	√
22	1091	5	×	×	×	×
23	1097	5	×	×	×	×
24	1099	5	×	×	×	×
25	10580	5	×	×	×	×
26	10589	5	×	×	×	×
27	10740	5	×	×	×	×
28	10741	5	×	×	×	×
29	1511	5	×	×	×	×
30	1512	5	×	×	×	×
31	1514	5	×	×	×	×
32	15100	5	√	√	√	√
33	155304	5	×	×	×	×
34	155214	5	×	×	×	×
35	1903	5	√	√	√	√
36	1909	5	√	√	√	√
37	1912	5	√	√	√	√
38	1916	5	×	×	×	×
39	1950	5	×	×	×	×

IDEA

SR. NO.	EMERGENCY NUMBER	CALLS MADE	Kannoj	Chibramau	Kaimganj	Farukhabad
1	100	5	√	√	√	√
2	101	5	√	√	√	√
3	102	5	√	√	√	√
4	104	5	×	×	×	×
5	108	5	√	√	√	√
6	138	5	√	√	√	√
7	149	5	×	×	×	×
8	181	5	×	×	×	×
9	182	5	×	×	×	×
10	1033	5	×	×	×	×
11	1037	5	×	×	×	×
12	1056	5	×	×	×	×
13	1060	5	×	×	×	×
14	1063	5	×	×	×	×
15	1064	5	×	×	×	×
16	1070	5	×	×	×	×
17	1071	5	×	×	×	×
18	1072	5	×	×	×	×
19	1073	5	×	×	×	×
20	1077	5	×	×	×	×
21	1090	5	√	√	√	√
22	1091	5	×	×	×	×
23	1097	5	√	√	√	√
24	1099	5	×	×	×	×
25	10580	5	×	×	×	×
26	10589	5	×	×	×	×
27	10740	5	×	×	×	×
28	10741	5	×	×	×	×
29	1511	5	×	×	×	×
30	1512	5	√	√	√	√
31	1514	5	×	×	×	×
32	15100	5	×	×	×	×
33	155304	5	×	×	×	×
34	155214	5	×	×	×	×
35	1903	5	√	√	√	√
36	1909	5	√	√	√	√
37	1912	5	×	×	×	×
38	1916	5	×	×	×	×
39	1950	5	√	√	√	√

RCOM CDMA						
SR. NO.	EMERGENCY NUMBER	CALLS MADE	TILHAR	JALALABAD	POWAYAN	SAHJAHANPUR
1	100	5	√	√	√	√
2	101	5	√	√	√	√
3	102	5	√	√	√	√
4	104	5	x	x	x	x
5	108	5	√	√	√	√
6	138	5	√	√	√	√
7	149	5	√	√	√	√
8	181	5	√	√	√	√
9	182	5	x	x	x	x
10	1033	5	√	√	√	√
11	1037	5	x	x	x	x
12	1056	5	x	x	x	x
13	1060	5	x	x	x	x
14	1063	5	x	x	x	x
15	1064	5	x	x	x	x
16	1070	5	x	x	x	x
17	1071	5	x	x	x	x
18	1072	5	x	x	x	x
19	1073	5	√	√	√	√
20	1077	5	x	x	x	x
21	1090	5	√	√	√	√
22	1091	5	x	x	x	x
23	1097	5	√	√	√	√
24	1099	5	x	x	x	x
25	10580	5	x	x	x	x
26	10589	5	x	x	x	x
27	10740	5	x	x	x	x
28	10741	5	x	x	x	x
29	1511	5	√	√	√	√
30	1512	5	√	√	√	√
31	1514	5	x	x	x	x
32	15100	5	√	√	√	√
33	155304	5	x	x	x	x
34	155214	5	x	x	x	x
35	1903	5	√	√	√	√
36	1909	5	√	√	√	√
37	1912	5	x	x	x	x
38	1916	5	x	x	x	x
39	1950	5	√	√	√	√

RCOM GSM						
SR. NO.	EMERGENCY NUMBER	CALLS MADE	TILHAR	JALALABAD	POWAYAN	SAHJAHANPUR
1	100	5	√	√	√	√
2	101	5	√	√	√	√
3	102	5	√	√	√	√
4	104	5	x	x	x	x
5	108	5	√	√	√	√
6	138	5	√	√	√	√
7	149	5	√	√	√	√
8	181	5	√	√	√	√
9	182	5	x	x	x	x
10	1033	5	√	√	√	√
11	1037	5	x	x	x	x
12	1056	5	x	x	x	x
13	1060	5	x	x	x	x
14	1063	5	x	x	x	x
15	1064	5	x	x	x	x
16	1070	5	x	x	x	x
17	1071	5	x	x	x	x
18	1072	5	x	x	x	x
19	1073	5	√	√	√	√
20	1077	5	x	x	x	x
21	1090	5	√	√	√	√
22	1091	5	x	x	x	x
23	1097	5	√	√	√	√
24	1099	5	x	x	x	x
25	10580	5	x	x	x	x
26	10589	5	x	x	x	x
27	10740	5	x	x	x	x
28	10741	5	x	x	x	x
29	1511	5	√	√	√	√
30	1512	5	√	√	√	√
31	1514	5	x	x	x	x
32	15100	5	√	√	√	√
33	155304	5	x	x	x	x
34	155214	5	x	x	x	x
35	1903	5	√	√	√	√
36	1909	5	√	√	√	√
37	1912	5	x	x	x	x
38	1916	5	x	x	x	x
39	1950	5	√	√	√	√

			TATA CDMA			
SR. NO.	**EMERGENCY NUMBER**	CALLS MADE	TILHAR	JALALABAD	PUWAYAN	SHAHJAHAPUR
1	100	5	√	√	√	√
2	101	5	√	√	√	×
3	102	5	√	√	√	√
4	104	5	√	√	√	√
5	108	5	√	√	×	√
6	138	5	×	×	×	×
7	149	5	√	×	×	×
8	181	5	√	√	√	√
9	182	5	√	√	×	√
10	1033	5	×	√	×	×
11	1037	5	√	√	√	√
12	1056	5	√	√	√	√
13	1060	5	×	×	×	×
14	1063	5	×	×	×	×
15	1064	5	√	×	√	√
16	1070	5	√	×	√	√
17	1071	5	√	×	√	√
18	1072	5	√	×	√	√
19	1073	5	√	×	√	√
20	1077	5	√	×	√	√
21	1090	5	√	√	√	√
22	1091	5	√	√	√	√
23	1097	5	√	√	√	×
24	1099	5	√	√	√	×
25	10580	5	×	×	×	×
26	10589	5	×	×	×	×
27	10740	5	×	×	×	×
28	10741	5	×	×	×	×
29	1511	5	×	×	×	×
30	1512	5	×	×	×	×
31	1514	5	×	×	×	×
32	15100	5	√	√	√	√
33	155304	5	×	×	×	×
34	155214	5	×	×	×	×
35	1903	5	×	√	√	×
36	1909	5	√	√	√	×
37	1912	5	×	×	×	×
38	1916	5	×	×	×	×
39	1950	5	×	×	×	×

TATA GSM						
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Lilhar	Jalalabad	Puwayan	Shahjahapur
1	100	5	√	√	√	√
2	101	5	√	√	√	√
3	102	5	√	√	√	√
4	104	5	×	×	×	×
5	108	5	√	√	√	√
6	138	5	√	√	√	√
7	149	5	×	√	√	√
8	181	5	√	√	√	√
9	182	5	×	×	×	×
10	1033	5	√	√	√	√
11	1037	5	×	√	×	×
12	1056	5	×	√	×	×
13	1060	5	×	×	×	×
14	1063	5	×	×	×	×
15	1064	5	×	×	×	×
16	1070	5	×	×	×	×
17	1071	5	×	×	×	×
18	1072	5	×	×	×	×
19	1073	5	×	√	√	√
20	1077	5	√	√	√	√
21	1090	5	√	×	√	√
22	1091	5	×	×	√	×
23	1097	5	√	√	√	×
24	1099	5	×	×	×	×
25	10580	5	×	×	×	×
26	10589	5	×	×	×	×
27	10740	5	×	×	×	×
28	10741	5	×	×	×	×
29	1511	5	√	×	×	×
30	1512	5	×	×	×	×
31	1514	5	×	×	×	×
32	15100	5	×	√	×	×
33	155304	5	×	×	×	×
34	155214	5	×	×	×	×
35	1903	5	×	√	√	√
36	1909	5	×	×	×	×
37	1912	5	×	×	√	×
38	1916	5	×	×	×	×
39	1950	5	×	×	×	×

VODAFONE						
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Tilhar	Jalalabad	Puwayan	Shahjhanpur
1	100	5	√	√	√	√
2	101	5	×	×	√	√
3	102	5	√	√	√	√
4	104	5	×	×	×	×
5	108	5	√	√	√	√
6	138	5	×	×	√	√
7	149	5	×	×	×	×
8	181	5	√	√	√	√
9	182	5	×	×	×	×
10	1033	5	×	×	×	×
11	1037	5	×	×	×	×
12	1056	5	×	×	×	×
13	1060	5	×	×	×	×
14	1063	5	√	√	√	√
15	1064	5	×	×	×	×
16	1070	5	×	×	×	×
17	1071	5	×	×	×	×
18	1072	5	×	×	×	×
19	1073	5	×	×	×	×
20	1077	5	×	×	×	×
21	1090	5	√	√	√	√
22	1091	5	√	√	√	√
23	1097	5	√	√	√	√
24	1099	5	×	×	×	×
25	10580	5	×	×	×	×
26	10589	5	×	×	×	×
27	10740	5	×	×	×	×
28	10741	5	×	×	×	×
29	1511	5	×	×	×	×
30	1512	5	×	×	×	×
31	1514	5	×	×	×	×
32	15100	5	√	√	√	√
33	155304	5	×	×	×	×
34	155214	5	√	√	√	√
35	1903	5	√	√	√	×
36	1909	5	√	√	√	√
37	1912	5	×	×	×	×
38	1916	5	×	×	×	×
39	1950	5	√	√	×	×

8.2. MIRZAPUR

AIRCEL					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Mirzapur	Renukoot	Birla Temple
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	104	5	×	×	×
5	108	5	√	√	√
6	138	5	×	×	×
7	149	5	×	×	×
8	181	5	×	×	×
9	182	5	√	√	√
10	1033	5	×	×	×
11	1037	5	×	×	×
12	1056	5	×	×	×
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	×	×
17	1071	5	×	×	×
18	1072	5	×	×	×
19	1073	5	√	×	×
20	1077	5	√	×	×
21	1090	5	√	√	√
22	1091	5	√	×	×
23	1097	5	√	√	×
24	1099	5	×	×	×
25	10580	5	×	×	×
26	10589	5	×	×	×
27	10740	5	×	×	×
28	10741	5	×	×	×
29	1511	5	×	×	×
30	1512	5	×	×	×
31	1514	5	×	×	×
32	15100	5	×	×	×
33	155304	5	×	×	×
34	155214	5	√	×	×
35	1903	5	√	×	×
36	1909	5	√	√	√
37	1912	5	√	×	×
38	1916	5	×	×	×
39	1950	5	√	×	×

AIRTEL					
SR. NO.	**EMERGENCY NUMBER**	**CALLS MADE**	**Mirzapur**	**Robersganj**	**Obera**
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	105	5	√	√	√
5	138	5	√	√	√
6	149	5	√	√	√
7	181	5	√	√	√
8	182	5	√	√	√
9	1071	5	√	√	√
10	1072	5	√	√	√
11	1073	5	√	√	√
12	15100	5	√	√	√
13	155214	5	√	√	√
14	1903	5	√	√	√
15	1909	5	√	√	√
16	1912	5	√	√	√
17	1916	5	√	√	√
18	1950	5	√	√	√
19	1090	5	√	√	√
20	1091	5	√	√	√
21	1097	5	√	√	√
22	1552	5	√	√	√
23	102	5	×	×	×
24	149	5	×	×	×
25	1037	5	×	×	×
26	1056	5	×	×	×
27	1060	5	×	×	×
28	1064	5	×	×	×
29	1071	5	×	×	×
30	1073	5	×	×	×
31	1090	5	×	×	×
32	1099	5	×	×	×
33	10580	5	×	×	×
34	10589	5	×	×	×
35	10740	5	×	×	×
36	10741	5	×	×	×
37	1511	5	×	×	×
38	1514	5	×	×	×
39	1916	5	×	×	×

IDEA

SR. NO.	EMERGENCY NUMBER	CALLS MADE	Mirzapur	Robertsganj	Renukoot
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	104	5	×	×	×
5	108	5	√	√	√
6	138	5	√	√	√
7	149	5	×	×	×
8	181	5	×	×	×
9	182	5	√	√	√
10	1033	5	√	√	√
11	1037	5	×	×	×
12	1056	5	×	×	×
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	×	×
17	1071	5	×	×	×
18	1072	5	√	√	√
19	1073	5	√	√	√
20	1077	5	×	×	×
21	1090	5	√	√	√
22	1091	5	×	×	×
23	1097	5	√	√	√
24	1099	5	×	×	×
25	10580	5	×	×	×
26	10589	5	×	×	×
27	10740	5	×	×	×
28	10741	5	×	×	×
29	1511	5	×	×	×
30	1512	5	√	√	√
31	1514	5	×	×	×
32	15100	5	×	×	×
33	155304	5	×	×	×
34	155214	5	×	×	×
35	1903	5	√	√	√
36	1909	5	√	√	√
37	1912	5	×	×	×
38	1916	5	×	×	×
39	1950	5	√	√	√

RCOM
CDMA

SR. NO.	EMERGENCY NUMBER	CALLS MADE	Mirzapur	Robertsganj	Renukoot
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	x
4	104	5	x	x	x
5	108	5	√	√	√
6	138	5	√	x	x
7	149	5	√	√	√
8	181	5	√	√	√
9	182	5	√	x	x
10	1033	5	x	x	x
11	1037	5	x	x	x
12	1056	5	x	x	x
13	1060	5	√	√	√
14	1063	5	x	x	x
15	1064	5	x	x	x
16	1070	5	x	x	x
17	1071	5	x	x	x
18	1072	5	√	√	√
19	1073	5	x	x	x
20	1077	5	x	x	x
21	1090	5	√	√	√
22	1091	5	x	x	x
23	1097	5	√	√	√
24	1099	5	x	x	x
25	10580	5	x	x	x
26	10589	5	x	x	x
27	10740	5	x	x	x
28	10741	5	x	x	x
29	1511	5	√	√	√
30	1512	5	x	√	√
31	1514	5	√	√	√
32	15100	5	x	x	x
33	155304	5	x	x	x
34	155214	5	x	x	x
35	1903	5	√	√	√
36	1909	5	√	√	√
37	1912	5	x	√	√
38	1916	5	x	x	x
39	1950	5	√	√	√

RCOM GSM

SR. NO.	EMERGENCY NUMBER	CALLS MADE	Mirzapur	Robertsganj	Renukoot
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	x
4	104	5	x	x	x
5	108	5	√	√	√
6	138	5	√	x	x
7	149	5	√	√	√
8	181	5	√	√	√
9	182	5	√	x	x
10	1033	5	x	x	x
11	1037	5	x	x	x
12	1056	5	x	x	x
13	1060	5	√	√	√
14	1063	5	x	x	x
15	1064	5	x	x	x
16	1070	5	x	x	x
17	1071	5	x	x	x
18	1072	5	√	√	√
19	1073	5	x	x	x
20	1077	5	x	x	x
21	1090	5	√	√	√
22	1091	5	x	x	x
23	1097	5	√	√	√
24	1099	5	x	x	x
25	10580	5	x	x	x
26	10589	5	x	x	x
27	10740	5	x	x	x
28	10741	5	x	x	x
29	1511	5	√	√	√
30	1512	5	x	√	√
31	1514	5	√	√	√
32	15100	5	x	x	x
33	155304	5	x	x	x
34	155214	5	x	x	x
35	1903	5	√	√	√
36	1909	5	√	√	√
37	1912	5	x	√	√
38	1916	5	x	x	x
39	1950	5	√	√	√

8.3. BASTI

Aircel					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	KHALILABAD	DUMARIYAGANJ	CHHABNI BAZAR
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	104	5	×	×	×
5	108	5	√	√	√
6	138	5	×	×	×
7	149	5	×	×	×
8	181	5	×	×	×
9	182	5	√	√	√
10	1033	5	×	×	×
11	1037	5	×	×	×
12	1056	5	×	×	×
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	×	×
17	1071	5	×	×	×
18	1072	5	√	√	×
19	1073	5	√	√	√
20	1077	5	√	×	×
21	1090	5	√	√	√
22	1091	5	√	×	×
23	1097	5	√	√	×
24	1099	5	×	×	×
25	10580	5	×	×	×
26	10589	5	×	×	×
27	10740	5	×	×	×
28	10741	5	×	×	×
29	1511	5	×	×	×
30	1512	5	×	×	×
31	1514	5	×	×	×
32	15100	5	×	×	×
33	155304	5	×	×	×
34	155214	5	√	×	×
35	1903	5	√	√	√
36	1909	5	√	√	√
37	1912	5	√	×	×
38	1916	5	×	×	×
39	1950	5	√	×	×

Airtel				
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Methwal	Dumariya Gaung
1	100	5	√	√
2	101	5	√	√
3	102	5	√	√
5	108	5	√	√
6	138	5	√	√
7	149	5	√	√
8	181	5	√	√
8	182	5	√	√
9	1077	5	√	√
10	1090	5	√	√
11	1091	5	√	√
12	1512	5	√	√
13	15100	5	√	√
14	155214	5	√	√
15	1903	5	√	√
16	1909	5	√	√
17	1950	5	√	√
18	1912	5	√	√
19	104	0	×	×
20	1033	0	×	×
21	1037	0	×	×
22	1056	0	×	×
23	1060	0	×	×
24	1063	0	×	×
25	1064	0	×	×
26	1070	0	×	×
27	1071	0	×	×
28	1072	0	×	×
29	1073	0	×	×
30	1097	0	×	×
31	1099	0	×	×
32	10580	0	×	×
33	10589	0	×	×
34	10740	0	×	×
35	10741	0	×	×
36	1511	0	×	×
37	1514	0	×	×
38	155304	0	×	×
39	1916	0	×	×

IDEA					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Khalilabad	Domariyaganj	Chhawani
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	104	5	×	×	×
5	108	5	√	√	√
6	138	5	×	×	×
7	149	5	×	×	×
8	181	5	×	×	×
9	182	5	×	×	×
10	1033	5	√	√	√
11	1037	5	×	×	×
12	1056	5	×	×	×
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	×	×
17	1071	5	×	×	×
18	1072	5	×	×	×
19	1073	5	×	×	×
20	1077	5	×	×	×
21	1090	5	√	√	√
22	1091	5	×	×	×
23	1097	5	√	√	√
24	1099	5	×	×	×
25	1511	5	×	×	×
26	1512	5	×	×	×
27	1514	5	×	×	×
28	1903	5	√	√	√
29	1909	5	√	√	√
30	1912	5	×	×	×
31	1916	5	×	×	×
32	1950	5	√	√	√
33	10580	5	×	×	×
34	10589	5	×	×	×
35	10740	5	×	×	×
36	10741	5	×	×	×
37	15100	5	×	×	×
38	155214	5	×	×	×
39	155304	5	×	×	×

Telenor					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Sant Kabir Nagar	Doomariyaganj	Basti
1	100	5	√	√	√
2	101	5	×	×	√
3	102	5	√	√	√
4	104	5	×	×	×
5	108	5	√	√	√
6	138	5	×	×	×
7	191	5	×	×	×
8	181	5	√	√	√
9	182	5	×	×	×
10	1033	5	×	×	×
11	1037	5	×	×	×
12	1056	5	×	×	×
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	×	×
17	1071	5	×	×	×
18	1072	5	×	×	×
19	1073	5	×	×	×
20	1077	5	√	√	√
21	1090	5	√	√	√
22	1091	5	×	×	×
23	1097	5	×	×	×
24	1099	5	×	×	×
25	10580	5	×	×	×
26	10589	5	×	×	×
27	10740	5	×	×	×
28	10741	5	×	×	×
29	1511	5	×	×	×
30	1512	5	×	×	×
31	1514	5	×	×	×
32	15100	5	×	×	×
33	155304	5	×	×	×
34	155214	5	×	×	×
35	1903	5	×	×	×
36	1909	5	√	√	√
37	1912	5	×	×	×
38	1916	5	×	×	×
39	1950	5	√	√	√

TTSL CDMA					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Khalilabad	Domariya Ganj	Basti
1	100	5	√	No Coverage	√
2	101	5	√	No Coverage	√
3	102	5	√	No Coverage	√
4	104	5	√	No Coverage	√
5	108	5	√	No Coverage	√
6	138	5	√	No Coverage	√
7	149	5	√	No Coverage	√
8	181	5	×	No Coverage	×
9	182	5	×	No Coverage	×
10	1033	5	×	No Coverage	×
11	1037	5	√	No Coverage	√
12	1056	5	√	No Coverage	√
13	1060	5	√	No Coverage	√
14	1063	5	×	No Coverage	×
15	1064	5	×	No Coverage	×
16	1070	5	√	No Coverage	√
17	1071	5	√	No Coverage	√
18	1072	5	√	No Coverage	×
19	1073	5	√	No Coverage	×
20	1077	5	×	No Coverage	×
21	1090	5	√	No Coverage	√
22	1091	5	×	No Coverage	√
23	1097	5	√	No Coverage	√
24	1099	5	×	No Coverage	√
25	10580	5	√	No Coverage	×
26	10589	5	√	No Coverage	×
27	10740	5	×	No Coverage	×
28	10741	5	×	No Coverage	×
29	1511	5	√	No Coverage	√
30	1512	5	√	No Coverage	√
31	1514	5	×	No Coverage	×
32	15100	5	√	No Coverage	√
33	155304	5	×	No Coverage	×
34	155214	5	×	No Coverage	×
35	1903	5	√	No Coverage	×
36	1909	5	√	No Coverage	√
37	1912	5	×	No Coverage	×
38	1916	5	×	No Coverage	×
39	1950	5	×	No Coverage	×

TTSL GSM					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Khalilabad	Domariya Ganj	Chhawani
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	104	5	√	√	√
5	108	5	√	√	√
6	138	5	√	√	√
7	149	5	√	√	√
8	181	5	√	√	√
9	182	5	×	√	√
10	1033	5	√	√	√
11	1037	5	×	√	√
12	1056	5	×	√	√
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	√	√
17	1071	5	√	√	×
18	1072	5	×	√	×
19	1073	5	√	√	×
20	1077	5	√	√	√
21	1090	5	√	√	√
22	1091	5	×	√	√
23	1097	5	√	√	×
24	1099	5	×	√	√
25	10580	5	×	×	×
26	10589	5	×	×	×
27	10740	5	×	×	×
28	10741	5	×	×	×
29	1511	5	×	×	×
30	1512	5	×	×	×
31	1514	5	×	×	×
32	15100	5	×	√	√
33	155304	5	×	×	√
34	155214	5	×	×	×
35	1903	5	×	√	×
36	1909	5	×	√	×
37	1912	5	×	√	×
38	1916	5	×	×	×
39	1950	5	×	×	×

Vodafone					
SR. NO.	EMERGENCY NUMBER	CALLS MADE	Near Mehdawal	Dumariaganj	Haraiya
1	100	5	√	√	√
2	101	5	√	√	√
3	102	5	√	√	√
4	104	5	×	√	√
5	108	5	√	√	√
6	138	5	×	×	×
7	149	5	×	×	×
8	181	5	×	×	×
9	182	5	×	×	×
10	1033	5	×	×	×
11	1037	5	×	×	×
12	1056	5	×	×	×
13	1060	5	×	×	×
14	1063	5	×	×	×
15	1064	5	×	×	×
16	1070	5	×	×	×
17	1071	5	×	×	×
18	1072	5	×	×	×
19	1073	5	×	×	×
20	1077	5	√	×	√
21	1090	5	√	√	√
22	1091	5	√	√	√
23	1097	5	√	√	√
24	1099	5	×	×	×
25	10580	5	×	×	×
26	10589	5	×	×	×
27	10740	5	×	×	×
28	10741	5	×	×	×
29	1511	5	×	×	×
30	1512	5	×	×	×
31	1514	5	×	×	×
32	15100	5	×	×	√
33	155304	5	×	×	×
34	155214	5	×	×	√
35	1903	5	×	×	√
36	1909	5	√	√	√
37	1912	5	×	×	×
38	1916	5	×	×	×
39	1950	5	×	×	×

9. OPERATOR ASSISTED DRIVE TEST

The drive test was conducted simultaneously for all the operators present in the UP East circle. As per the new directive given by TRAI headquarters, drive test for the month of April, May and June, 2016 were conducted at a SSA level. Drive test was conducted for three days in each SSA and the selection of routes ensured that the maximum towns, villages, highways are covered as part of drive test. The routes were selected on basis of the complaints received from the customers. The auditors were present in vehicles of every operator. The holding period for all test calls was 120 seconds and the gap between calls was 10 seconds.

For measuring voice quality RxQual samples for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. RxQual greater than 5 meant that the sample was not of appropriate voice quality and for CDMA operators FERs of more than 4 were considered bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in Dbm with strength > -75dbm for indoor, -85 dbm for in-vehicle and > -95 dbm outdoor routes. Below is the schedule and operators involved in the drive test for the UP East circle.

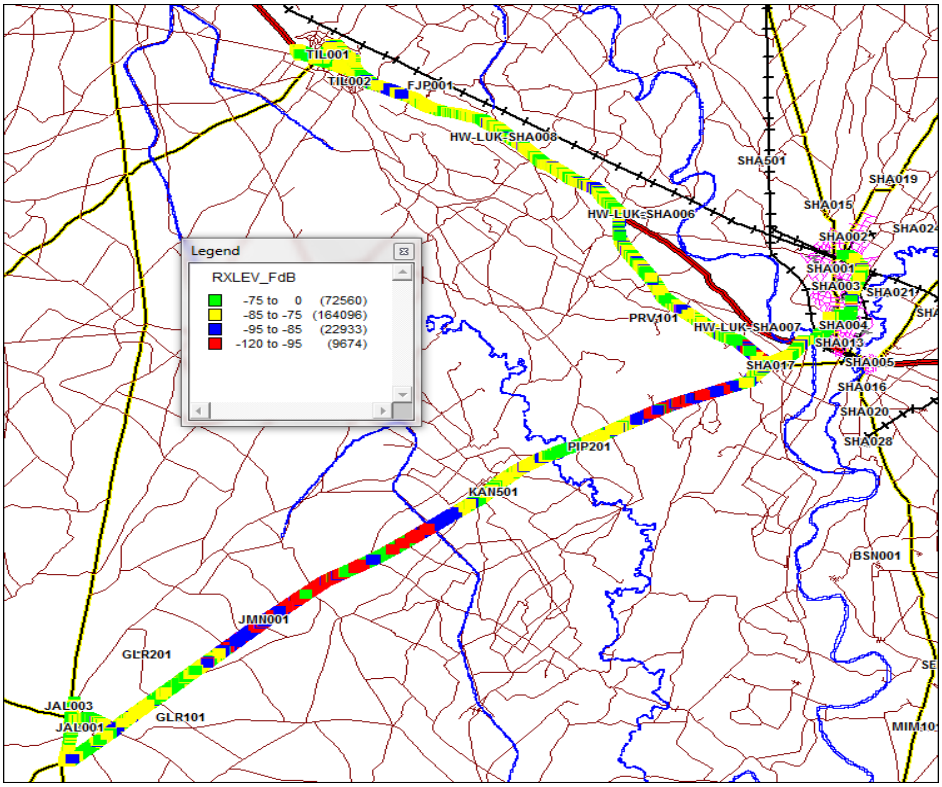
9.1. MAY: SHAHJAHANPUR SSA

Month	Name of SSA covered	Drive Test Schedule
May 2016	SHAHJAHANPUR	May 4, 2016 to May 6, 2016

9.2. DISTANCE COVERED: SHAHJAHANPUR SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
SHAHJAHANPUR SSA	135 km	178 km	110 km

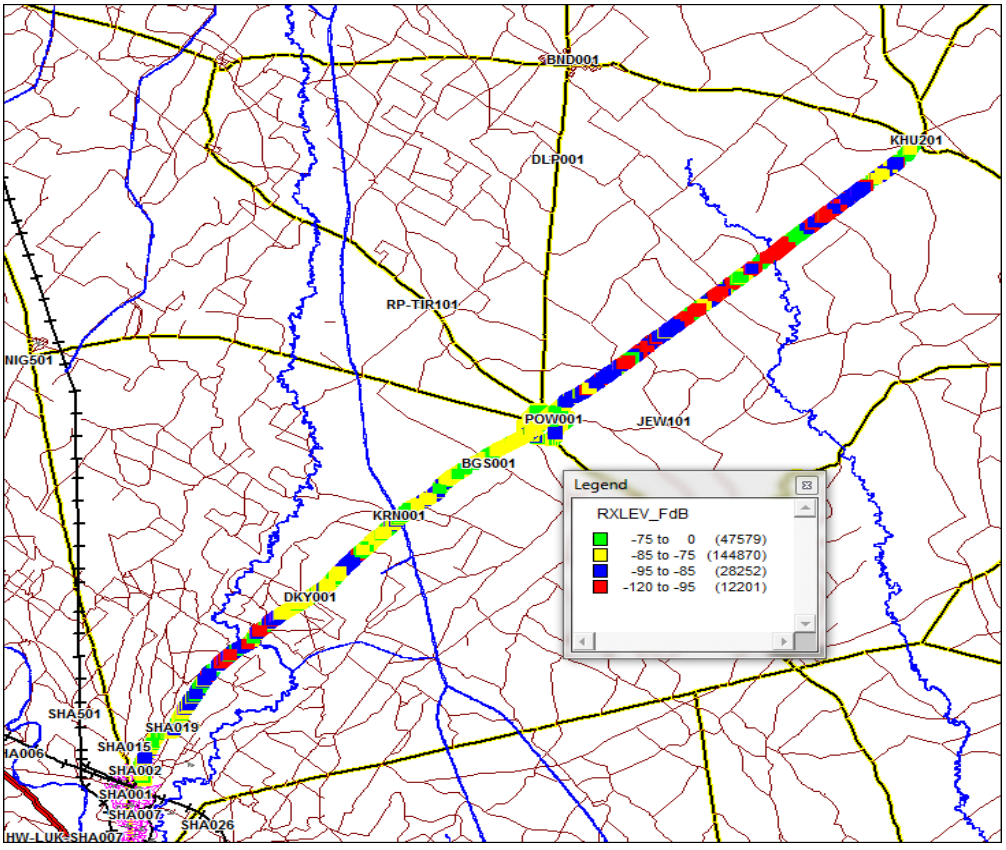
9.3. ROUTE MAP: SHAHJAHANPUR SSA: DAY 1



ROUTE COVERED- DAY1

1. Tilhar
2. Azizganj
3. Bharsandi
4. Banthara
5. Kapasheda
6. Bhedpur
7. Shahjahapur
8. Lalpur
9. Jamaur
10. Bahadurpur
11. Jahageerpur
12. Shikanderpur
13. Jamuniya
14. Purena
15. Gularia
16. Jalalabad

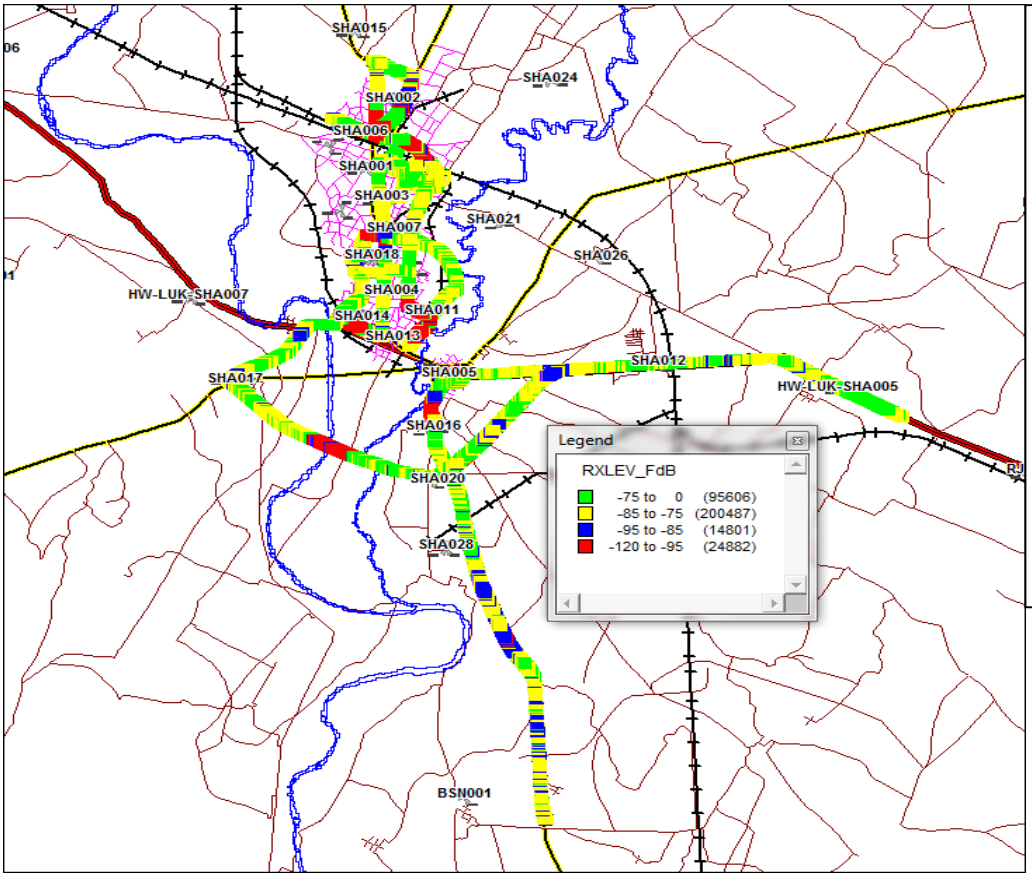
9.4. ROUTE MAP: SHAHJAHANPUR SSA: DAY 2



ROUTE COVERED- DAY2

1. Shahjahanpur
2. Niyampur
3. Barapur
4. Gandhapur
5. Mahua Pathak
6. Mainari
7. Kuwarpur
8. Powayan
9. Mubarikpur
10. Gangasara
11. Bahadurpur
12. Silhua
13. Khusmana

9.5. ROUTE MAP: SHAHJAHANPUR SSA: DAY 3



ROUTE COVERED- DAY3

1. Jalal Nagar
2. Ram Nagar Colony
3. Parzai
4. Taran Tickey
5. Shahjahanpur
6. Bijlipura
7. Sabji Mandi
8. South City
9. Misripur
10. Jamuthi
11. Ballia
12. Chauthera
13. Badshahnagar

9.6. DRIVE TEST OUTCOME

	Aircel	Airtel	Idea	TELENOR	Bsnl	Rcom GSM	Rcom CDMA	Tata CDMA	Tata GSM	VODAFONE
Total Calls Attempt (A)	479	501	510	443	688	393	411	297	409	457
Total Calls Blocked (B)	2	5	5	2	88	1	0	0	1	1
Blocked Call Rate in % (B*100/A)	0.42%	1.00%	0.98%	0.45%	12.79%	0.25%	0.00%	0.00%	0.2%	0.22%
Total Calls Established ('C)	477	496	503	441	564	392	411	293	408	456
Total Calls Drop (D)	0	0	0	1	14	2	3	0	0	0
Dropped Calls Rate in % (D*100/C)	0.00%	0.00%	0.00%	0.22%	2.48%	0.51%	0.73%	0.00%	0.00%	0.00%
Call Setup Success Rate in % (C*100/A)	99.58%	99.00%	98.63%	99.55%	81.98%	99.75%	100.00%	98.65%	99.76%	99.78%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100%	99.8%	99.80%	99.18%	84.44%	100%	100.00%	100%	100%	100%

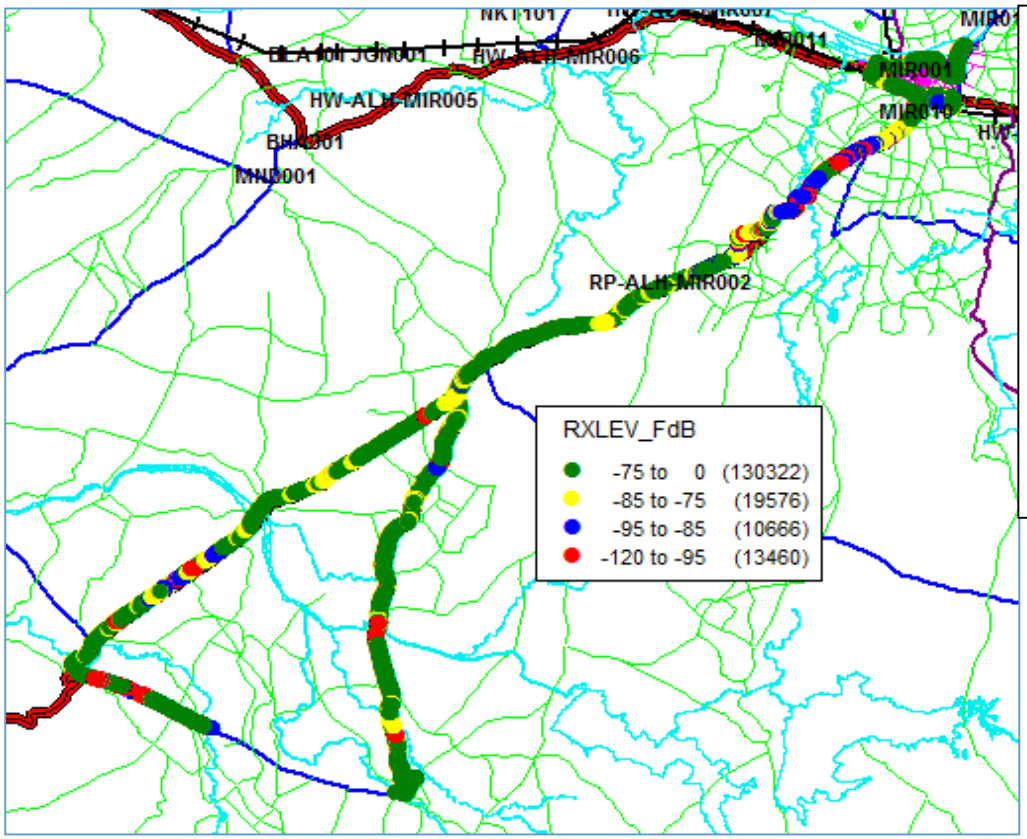
9.7. MAY: MIRZAPUR SSA

Month	Name of SSA covered	Drive Test Schedule
May 2016	MIRZAPUR	May 25, 2016 to May 27, 2016

9.8. DISTANCE COVERED: MIRZAPUR SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
MIRZAPUR SSA	135 km	190 km	170 km

9.9. ROUTE MAP: MIRZAPUR SSA: DAY 1



Route Covered- Day 1

1 Mirzapur Station

2 Mirzapur

3 Laalganj

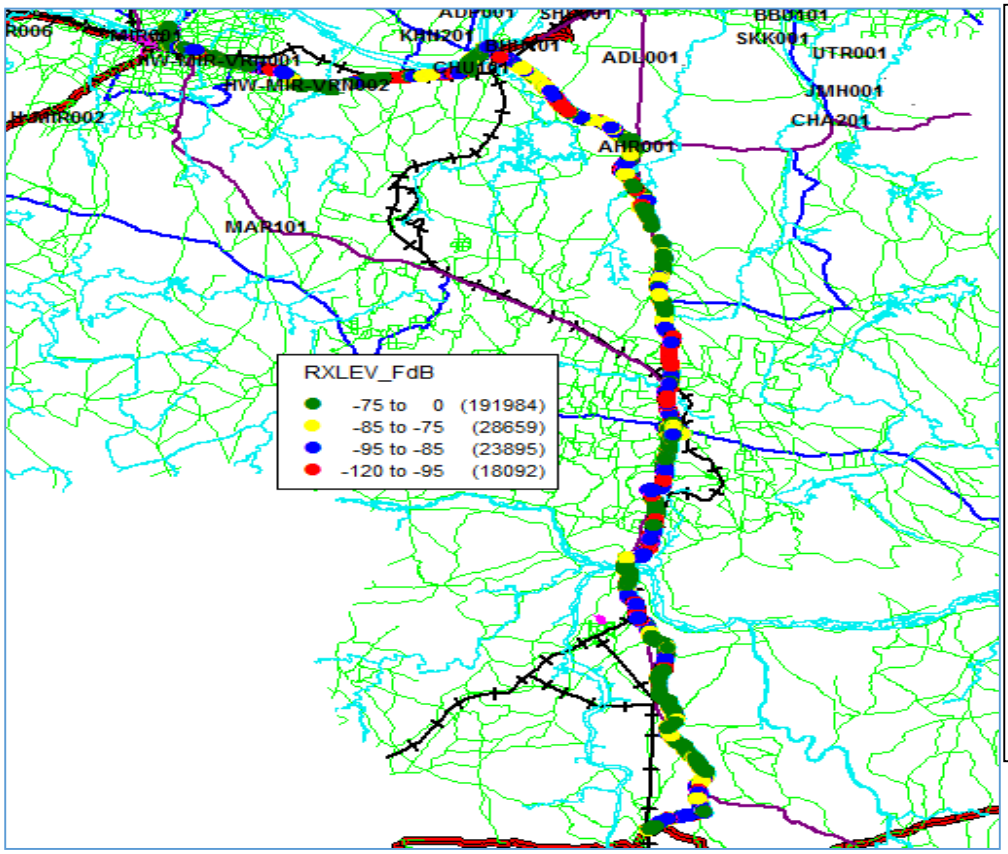
4 Halia

5 Halia Market

6 SBI

7 PNB

9.10. ROUTE MAP: MIRZAPUR SSA: DAY 2



Route Covered- Day 2

1 BSNL Office

2 Chunar Market

3 Ghantaghar

4 Police Station

5 Tahsil

6 Nagarnigam

7 Rudhauli

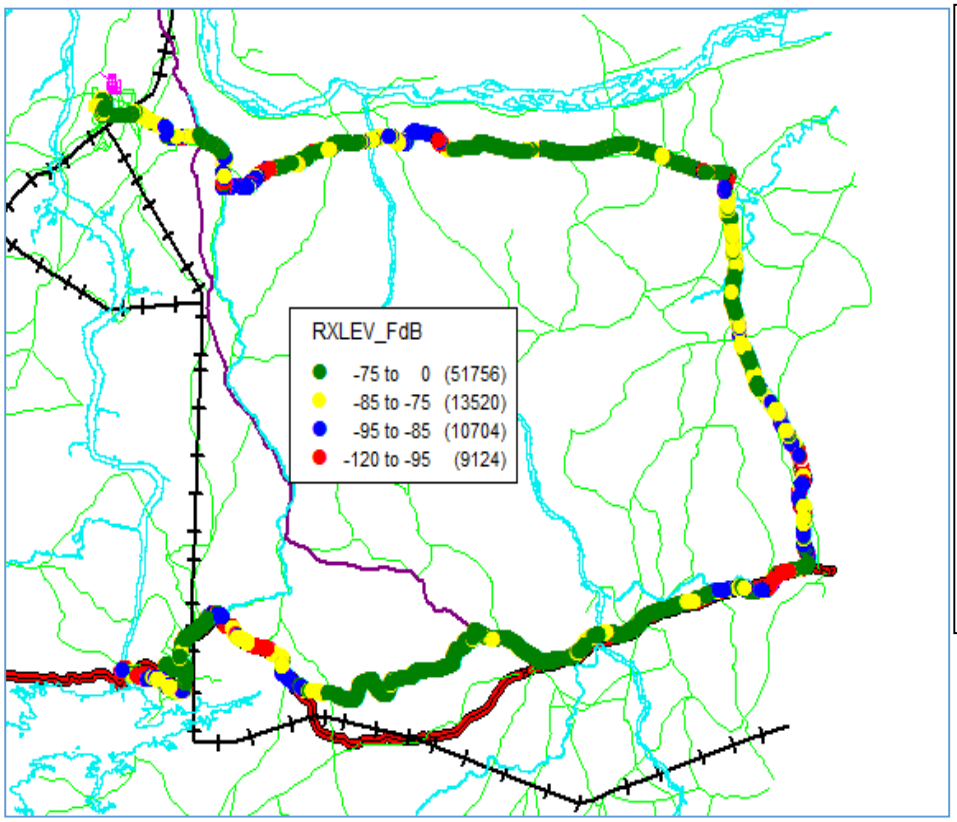
8 Dharamshala

9 Ahrura

10 Robertganj

11 Renukoot

9.11. Route Map: MIRZAPUR SSA: Day 3



Route Covered- Day 3

1 Birla Temple

2 Renukoot

3 Rihand Dam

4 Pipri

5 Murdhawa Mod

6 Obra

7 Dudhi

8 Yindhamganj

9 Kon

9.12. Drive Test Outcome

	Aircel	Airtel	Idea	TELENOR	RCOM GSM	RCOM CDMA	VODAFONE
Total Calls Attempt (A)	218	467	443	357	212	213	528
Total Calls Blocked (B)	1	3	7	10	5	0	4
Blocked Call Rate in % (B*100/A)	0.46%	0.64%	1.58%	2.80%	2.36%	0.00%	0.76%
Total Calls Established ('C)	217	464	436	347	207	213	524
Total Calls Drop (D)	0	1	2	1	0	1	0
Dropped Calls Rate in % (D*100/C)	0.00%	0.22%	0.46%	0.29%	0.00%	0.47%	0.00%
Call Setup Success Rate in % (C*100/A)	99.54%	99.36%	98.42%	97.20%	97.64%	100.00%	99.24%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	98.83%	99.5%	97.30%	98.52%	99.65%	100.00%	98.26%

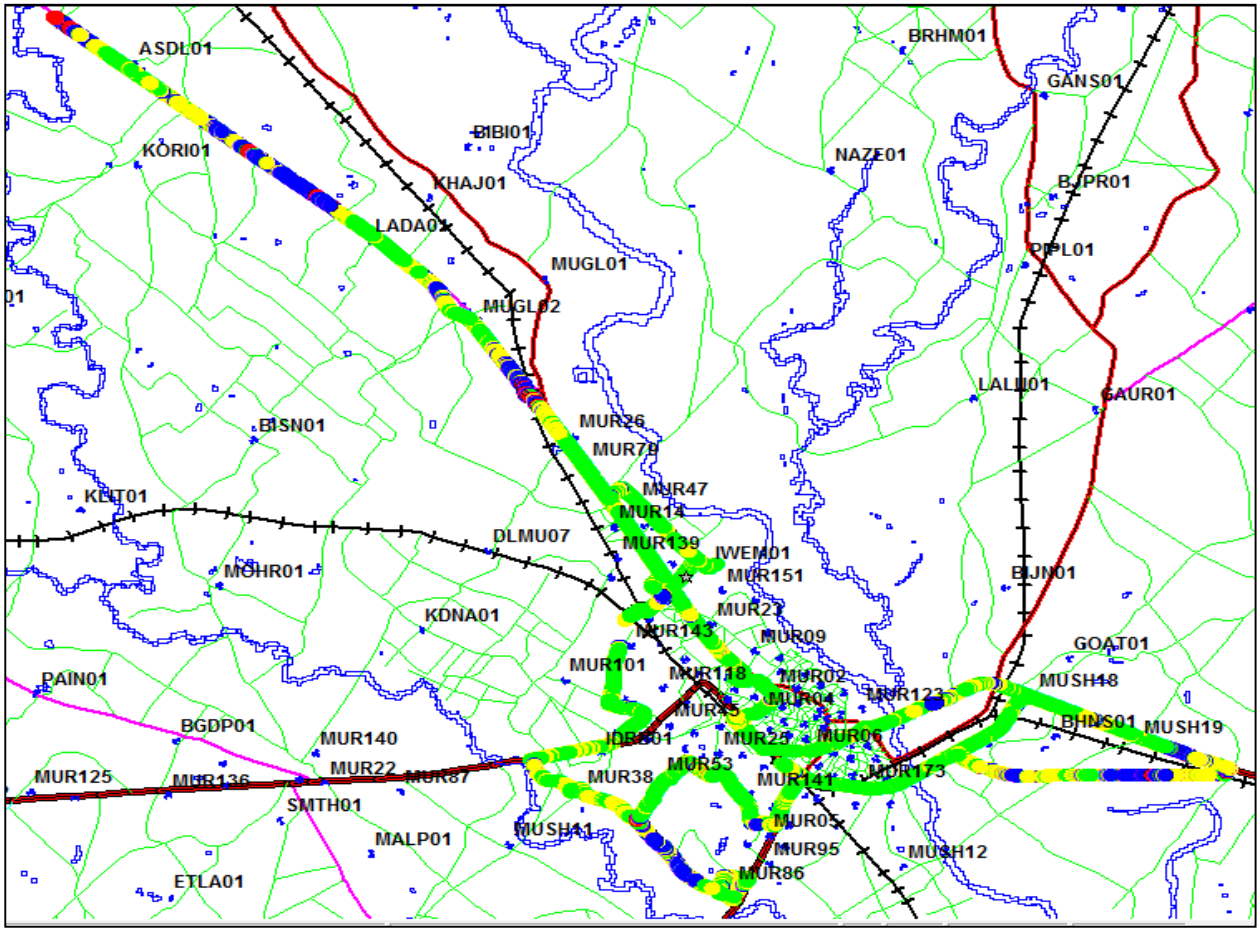
9.13. BASTI SSA

Month	Name of SSA covered	Drive Test Schedule
JUNE	BASTI	15th June – 17th June

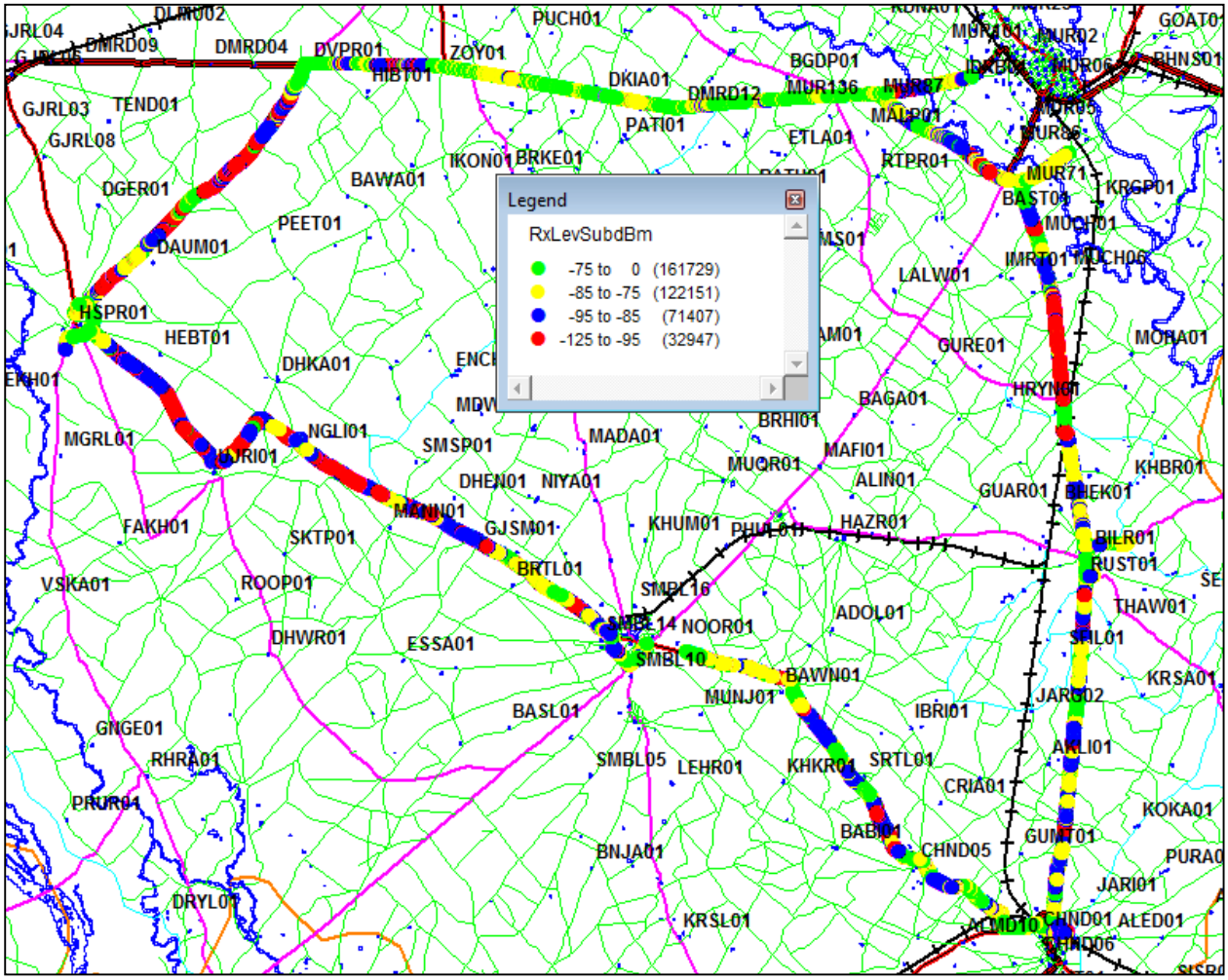
9.14. DISTANCE COVERED: BASTI SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
Basti SSA	170 km	200 km	130 km

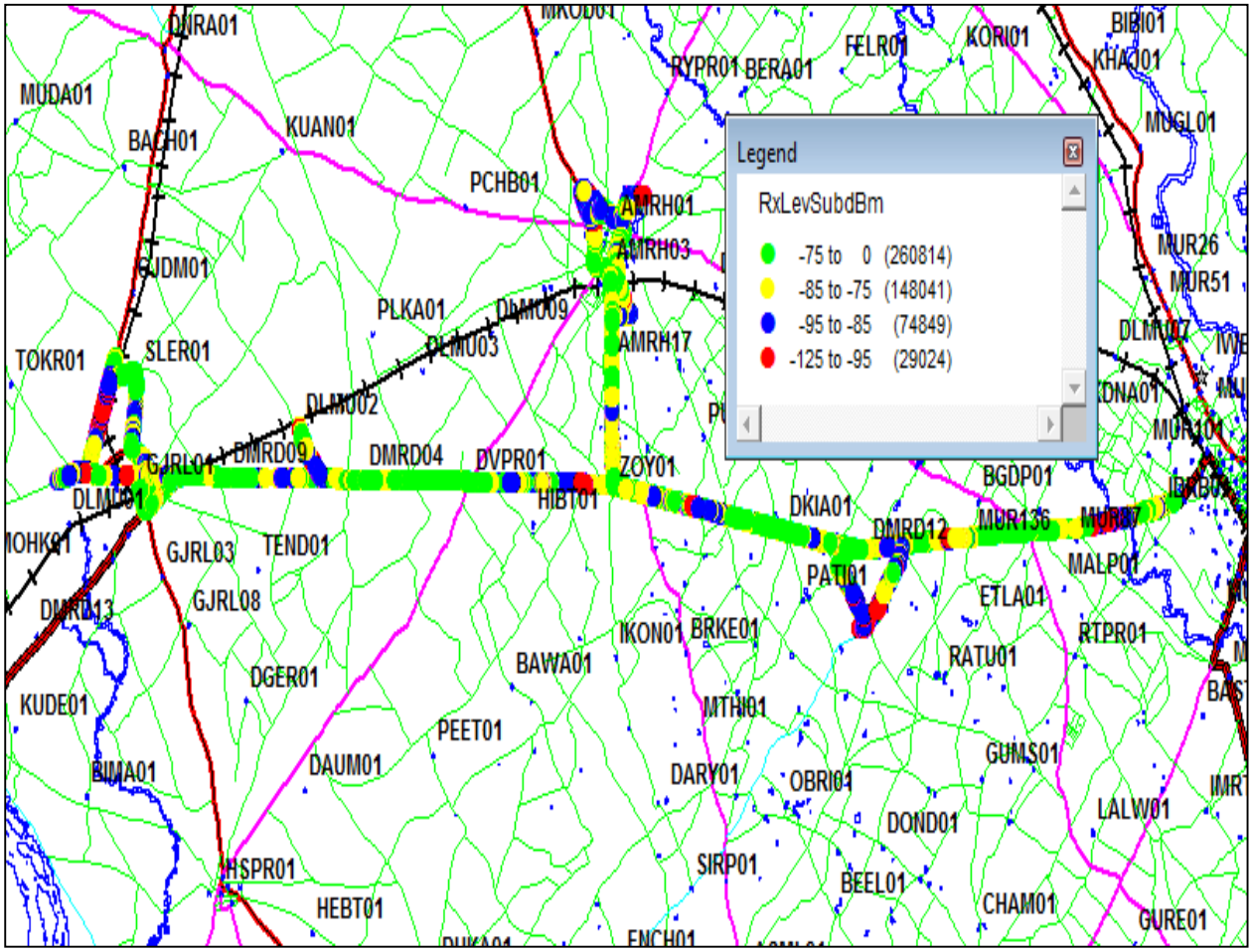
9.15. ROUTE MAP: BASTI SSA: DAY 1



9.16. ROUTE MAP: BASTI SSA: DAY 2



9.17. Route Map: Basti SSA: Day 3



9.18. Drive Test Outcome

	TELENOR	**Aircel**	Airtel	MTS	IDEA	RCOM GSM	TTSL GSM	TTSL CDMA	Vodafone
Total Calls Attempt (A)	411	420	540	DNA	540	DNA	388	179	680
Total Calls Blocked (B)	4	1	6	DNA	6	DNA	1	0	2
Blocked Call Rate in % (B*100/A)	0.97%	0.24	1.11%	DNA	1.11%	DNA	0.26%	0.00%	0.29%
Total Calls Established ('C)	407	419	534	DNA	534	DNA	386	178	678
Total Calls Drop (D)	0	0	0	DNA	0	DNA	0	1	1
Dropped Calls Rate in % (D*100/C)	0.00	0.00	0.00%	DNA	0.00%	DNA	0.00%	0.56%	0.15%
Call Setup Success Rate in % (C*100/A)	99.03	99.76	98.89%	DNA	98.89%	DNA	99.48%	99.44%	99.71%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.40	97.14	98.5%	DNA	98.5%	DNA	100.0%	100.0%	100.00%

10. COUNTER DETAILS

Sl No.	KPI	Formula with Counter Description
1	CSSR= (No of established Calls / No of Attempted Calls)%	*No of established Calls* = ([Assignment Requests]-([Failed Assignments (Signaling Channel)]+[Failed Assignments during MOC on the A Interface (Including Directed Retry)]+[Failed Assignments during MTC on the A Interface (Including Directed Retry)]+[Failed Assignments during Emergency Call on the A Interface (Including Directed Retry)] +[Failed Assignments during Call Re-establishment on the A Interface (Including Directed Retry)]+[Failed Mode Modify Attempts (MOC) (TCHF)]+[Failed Mode Modify Attempts (MTC) (TCHF)]+[Failed Mode Modify Attempts (Emergency Call) (TCHF)]+[Failed Mode Modify Attempts (Call Re-establishment) (TCHF)]+[Failed Mode Modify Attempts (MOC) (TCHH)]+[Failed Mode Modify Attempts (MTC) (TCHH)]+[Failed Mode Modify Attempts (Call Re-establishment) (TCHH)]))/*No of Attempted Calls* = ([Assignment Requests (Signaling Channel) (TCH)] + [Assignment Requests (Signaling Channel) (SDCCH)] + [Assignment Requests (TCHF Only)] + [Assignment Requests (TCHH Only)] + [Assignment Requests (TCHF Preferred, Channel Type Unchangeable)] + [Assignment Requests (TCHH Preferred, Channel Type Unchangeable)] + [Assignment Requests (TCHF or TCHH, Channel Type Unchangeable)] + [Assignment Requests (TCHF Preferred, Channel Type Changeable)] + [Assignment Requests (TCHH Preferred, Channel Type Changeable)] + [Assignment Requests (TCHF or TCHH, Channel Type Changeable)])
2	SDCCH congestion= (SDCCH Failure/SDCCH attempts)%	*SDCCH Failure*= ([Channel Assignment Failures (All Channels Busy or Channels Unconfigured) in Immediate Assignment Procedure (SDCCH)] + [Failed Internal Intra-Cell Handovers (No Channel Available) (SDCCH)] + [Number of Unsuccessful Incoming Internal Inter-Cell Handovers (No Channel Available) (SDCCH)] + [Failed Incoming External Inter-Cell Handovers (No Channel Available) (SDCCH)])/*SDCCH attempts* = ([Channel Assignment Requests in Immediate Assignment Procedure (SDCCH)] + [Internal Intra-Cell Handover Requests (SDCCH)] + [Number of Incoming Internal Inter-Cell Handover Requests (SDCCH) (900/850/810-900/850/810)] + [Number of Incoming Internal Inter-Cell Handover Requests (SDCCH) (1800/1900-1800/1900)] + [Number of Incoming Internal Inter-Cell Handover Requests (SDCCH) (900/850/810-1800/1900)] + [Number of Incoming Internal Inter-Cell Handover Requests (SDCCH) (1800/1900-900/850/810)] + [Incoming External Inter-Cell Handover Requests (SDCCH) (900/850/810-900/850/810)] + [Incoming External Inter-Cell Handover Requests (SDCCH) (1800/1900-1800/1900)] + [Incoming External Inter-Cell Handover Requests (SDCCH) (900/850/810-1800/1900)] + [Incoming External Inter-Cell Handover Requests (SDCCH) (1800/1900-900/850/810)])
3	TCH congestion= (TCH Failures /TCH Attempts)%	*TCH Failures*= ((Failed TCH Seizures due to Busy TCH (Signaling Channel)+([Failed Assignments (First Assignment, No Channel Available in Assignment Procedure)]+[Failed Assignments (First Assignment, No Channel Available in Directed Retry Procedure)]+[Failed Assignments (Reconnection to Old Channels, No Channel Available in Assignment)]+[Failed Assignments (Reconnection to Old Channels, No Channel Available in Directed Retry)])/*TCH Attempts* = ([Assignment Requests (Signaling Channel) (TCH)] + [Assignment Requests (Signaling Channel) (SDCCH)] + [Assignment Requests (TCHF Only)] + [Assignment Requests (TCHH Only)] + [Assignment Requests (TCHF Preferred, Channel Type Unchangeable)] + [Assignment Requests (TCHH Preferred, Channel Type Unchangeable)] + [Assignment Requests (TCHF or TCHH, Channel Type Unchangeable)] + [Assignment Requests (TCHF Preferred, Channel Type Changeable)] + [Assignment Requests (TCHH Preferred, Channel Type Changeable)] + [Assignment Requests (TCHF or TCHH, Channel Type Changeable)])
4	Call Drop Rate= (The total no of dropped calls*100)/Total no of calls successfully established (where traffic channel is allotted)	*The total no of dropped calls*= ([Call Drops on Radio Interface in Stable State (Traffic Channel)] + [Call Drops on Radio Interface in Handover State (Traffic Channel)] + [Call Drops Due to No MR from MS for a Long Time (Traffic Channel)] + [Call Drops due to Abis Terrestrial Link Failure (Traffic Channel)] + [Call Drops due to Equipment Failure (Traffic Channel)] + [Call Drops due to Forced Handover (Traffic Channel)] + [Call Drops due to local switching Start Failure] + [Call Drops

		due to Failures to Return to Normal Call from local switching])/*Total no of calls successfully established (where traffic channel is allotted)* = ([Assignment Requests]-([Failed Assignments (Signaling Channel)]+[Failed Assignments during MOC on the A Interface (Including Directed Retry)]+[Failed Assignments during MTC on the A Interface (Including Directed Retry)]+[Failed Assignments during Emergency Call on the A Interface (Including Directed Retry)] +[Failed Assignments during Call Re-establishment on the A Interface (Including Directed Retry)]+[Failed Mode Modify Attempts (MOC) (TCHF)]+[Failed Mode Modify Attempts (MTC) (TCHF)]+[Failed Mode Modify Attempts (Emergency Call) (TCHF)]+[Failed Mode Modify Attempts (Call Re-establishment) (TCHF)]+[Failed Mode Modify Attempts (MOC) (TCHH)]+[Failed Mode Modify Attempts (MTC) (TCHH)]+[Failed Mode Modify Attempts (Call Re-establishment) (TCHH)])
5	**Call Drop Rate= (No of cells having call drop rate >3% during CBBH in a month*100)/Total no of cells in the licensed service area**	**Above formula with counters being used in CBBH.**
6	**Connection with good quality voice= (Connection with good quality voice/Total voice samples)%**	***Connection with good quality voice* = ((Number of MRs on Downlink TCHF (Receive Quality Rank 0)+Number of MRs on Downlink TCHF (Receive Quality Rank 1)+Number of MRs on Downlink TCHF (Receive Quality Rank 2)+Number of MRs on Downlink TCHF (Receive Quality Rank 3)+Number of MRs on Downlink TCHF (Receive Quality Rank 4)+Number of MRs on Downlink TCHF (Receive Quality Rank 5)+Number of MRs on Downlink TCHH (Receive Quality Rank 0)+Number of MRs on Downlink TCHH (Receive Quality Rank 1)+Number of MRs on Downlink TCHH (Receive Quality Rank 2)+Number of MRs on Downlink TCHH (Receive Quality Rank 3)+Number of MRs on Downlink TCHH (Receive Quality Rank 4)+Number of MRs on Downlink TCHH (Receive Quality Rank 5)) /*Total voice samples*= ((Number of MRs on Downlink TCHF (Receive Quality Rank 0)+Number of MRs on Downlink TCHF (Receive Quality Rank 1)+Number of MRs on Downlink TCHF (Receive Quality Rank 2)+Number of MRs on Downlink TCHF (Receive Quality Rank 3)+Number of MRs on Downlink TCHF (Receive Quality Rank 4)+Number of MRs on Downlink TCHF (Receive Quality Rank 5)+Number of MRs on Downlink TCHF (Receive Quality Rank 6)+Number of MRs on Downlink TCHF (Receive Quality Rank 7)+Number of MRs on Downlink TCHH (Receive Quality Rank 0)+:Number of MRs on Downlink TCHH (Receive Quality Rank 1)+Number of MRs on Downlink TCHH (Receive Quality Rank 2)+Number of MRs on Downlink TCHH (Receive Quality Rank 3)+Number of MRs on Downlink TCHH (Receive Quality Rank 4)+Number of MRs on Downlink TCHH (Receive Quality Rank 5)+Number of MRs on Downlink TCHH (Receive Quality Rank 6)+Number of MRs on Downlink TCHH (Receive Quality Rank 7))**

10.1. ERICSSON

Sl No.	KPI	Ericsson
1	**CSSR= (No of established Calls / No of Attempted Calls)%**	CSSR (No of established Calls / No of Attempted Calls)=(TCASSALL/TASSALL)*100
2	**SDCCH congestion= (SDCCH Failure/SDCCH attempts)%**	SDCCH congestion (SDCCH Failure/SDCCH attempts)% = (CCONGS/CCALLS)*100
3	**TCH congestion= (TCH Failures /TCH Attempts)%**	TCH congestion (TCH Failures /TCH Attempts)%= (CNRELCONG+TNRELCONG)/TASSALL)*100
4	**Call Drop Rate= (The total no of dropped calls*100)/Total no of calls successfully established (where traffic channel is allotted)**	Call Drop Rate (Total no dropped calls/No of established calls)%= (TNDROP)/TCASSALL*100
5	**Call Drop Rate= (No of cells having call drop rate >3% during CBBH in a month*100)/Total no of cells in the licensed service area**	Above formula with counters being used in CBBH.

6	**Connection with good quality voice= (Connection with good quality voice/Total voice samples)%**	Connection with good quality voice (Connection with good quality voice samples 0-5 /Total voice samples)= 100 * (QUAL50DL + QUAL40DL + QUAL30DL + QUAL20DL + QUAL10DL + QUAL00DL) / (QUAL70DL + QUAL60DL + QUAL50DL + QUAL40DL + QUAL30DL + QUAL20DL + QUAL10DL + QUAL00DL)

Ericsson Counters

Counter	Counter Description
TCASSALL	Number of assignment complete messages on TCH for all MS classes
TASSALL	Number of first assignment attempts on TCH for all MS classes.
CNRELCONG	Number of released connections on SDCCH due to TCH or Transcoder (TRA) congestion.
TNRELCONG	Number of released TCH signalling connections due to transcoder resource congestion during immediate assignment on TCH
CCONGS	Congestion counter for SDCCH. Stepped per congested allocation attempt.
CCALLS	Channel allocation attempt counter on SDCCH.
TNDROP	The total number of dropped TCH Connections.
QUAL00DL	Number of quality 0 reported on downlink.
QUAL10DL	Number of quality 1 reported on downlink.
QUAL20DL	Number of quality 2 reported on downlink.
QUAL30DL	Number of quality 3 reported on downlink.
QUAL40DL	Number of quality 4 reported on downlink.
QUAL50DL	Number of quality 5 reported on downlink.
QUAL60DL	Number of quality 6 reported on downlink.
QUAL70DL	Number of quality 7 reported on downlink

10.2. NSN (NOKIA SIEMENS NETWORK)

Sl No.	KPI	NSN
1	CSSR= (No of established Calls / No of Attempted Calls)%	CSSR= 100-100*((SDCCH_BUSY_ATT)-(TCH_SEIZ_DUE_SDCCH_CON) + (SDCCH_RADIO_FAIL)+(SDCCH_RF_OLD_HO)+(SDCCH_USER_ACT)+(SDCCH_BCSU_RESET)+(SDCCH_NETW_ACT)+(SDCCH_BTS_FAIL)+(SDCCH_LAPD_FAIL)+ (BLCK_8I_NOM)/ {(CH_REQ_MSG_REC)+(PACKET_CH_REQ)}-{(GHOST_CCCH_RES)-(REJ_SEIZ_ATT_DUE_DIST)}
2	SDCCH congestion= (SDCCH Failure/SDCCH attempts)%	SDCCH congestion = (sdcch_busy_att - .tch_seiz_due_sdcch_con)/{(CH_REQ_MSG_REC)+(PACKET_CH_REQ)}-{(GHOST_CCCH_RES)-(REJ_SEIZ_ATT_DUE_DIST)}
3	TCH congestion= (TCH Failures /TCH Attempts)%	TCH congestion = BLCK_8I_NOM / {(TCH_NORM_SEIZ)+(MSC_I_SDCCH_TCH_AT)+(BSC_I_SDCCH_TCH_AT)}
4	Call Drop Rate= (The total no of dropped calls*100)/Total no of calls successfully established (where traffic channel is allotted)	TCH Drop = (drop_after_tch_assign)-(tch_re_est_release) / {(TCH_NORM_SEIZ)+(MSC_I_SDCCH_TCH_AT)+(BSC_I_SDCCH_TCH_AT)}
5	Call Drop Rate= (No of cells having call drop rate >3% during CBBH in a month*100)/Total no of cells in the licensed service area	Above formula with counters being used in CBBH.
6	Connection with good quality voice= (Connection with good quality voice/Total voice samples)%	Connection with good quality voice= (FREQ_DL_QUAL0+FREQ_DL_QUAL1+FREQ_DL_QUAL2+FREQ_DL_QUAL3+FREQ_DL_QUAL4+FREQ_DL_QUAL5) / (FREQ_DL_QUAL0+FREQ_DL_QUAL1+FREQ_DL_QUAL2+FREQ_DL_QUAL3+FREQ_DL_QUAL4+FREQ_DL_QUAL5+FREQ_DL_QUAL6+FREQ_DL_QUAL7)

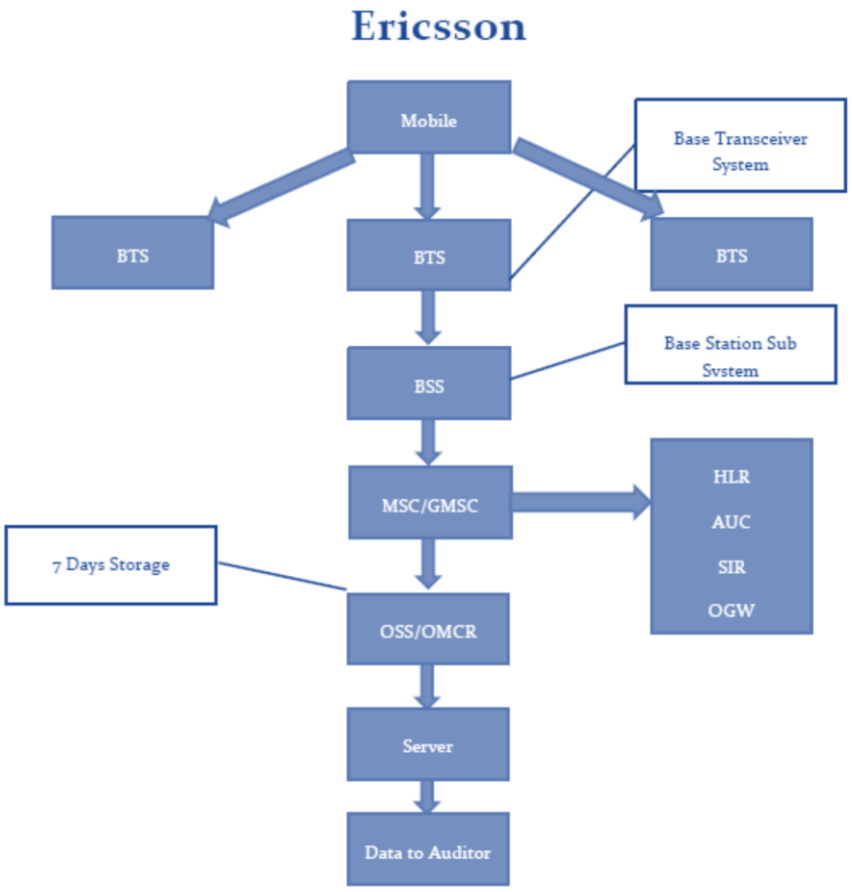
10.3. HUAWEI

SR .NO	KPI	HUAWEI FORMULA
1	CALL SETUP SUCCES (NUM)	[Successful CS IS-95 Orig Call Setups + Successful CS IS-2000 Orig Call Setups + Successful CS IS-95 Term Call Setups + Successful CS IS-2000 Term Call Setups] ([1157628567] + [1157628587] + [1157628568] + [1157628588])
2	CALL SETUP SUCCES (DEN)	[CS IS-95 Orig Attempts + CS IS-2000 Orig Attempts + CS IS-95 Term Attempts + CS IS-2000 Term Attempts] ([1157628553] + [1157628573] + [1157628554] + [1157628574])

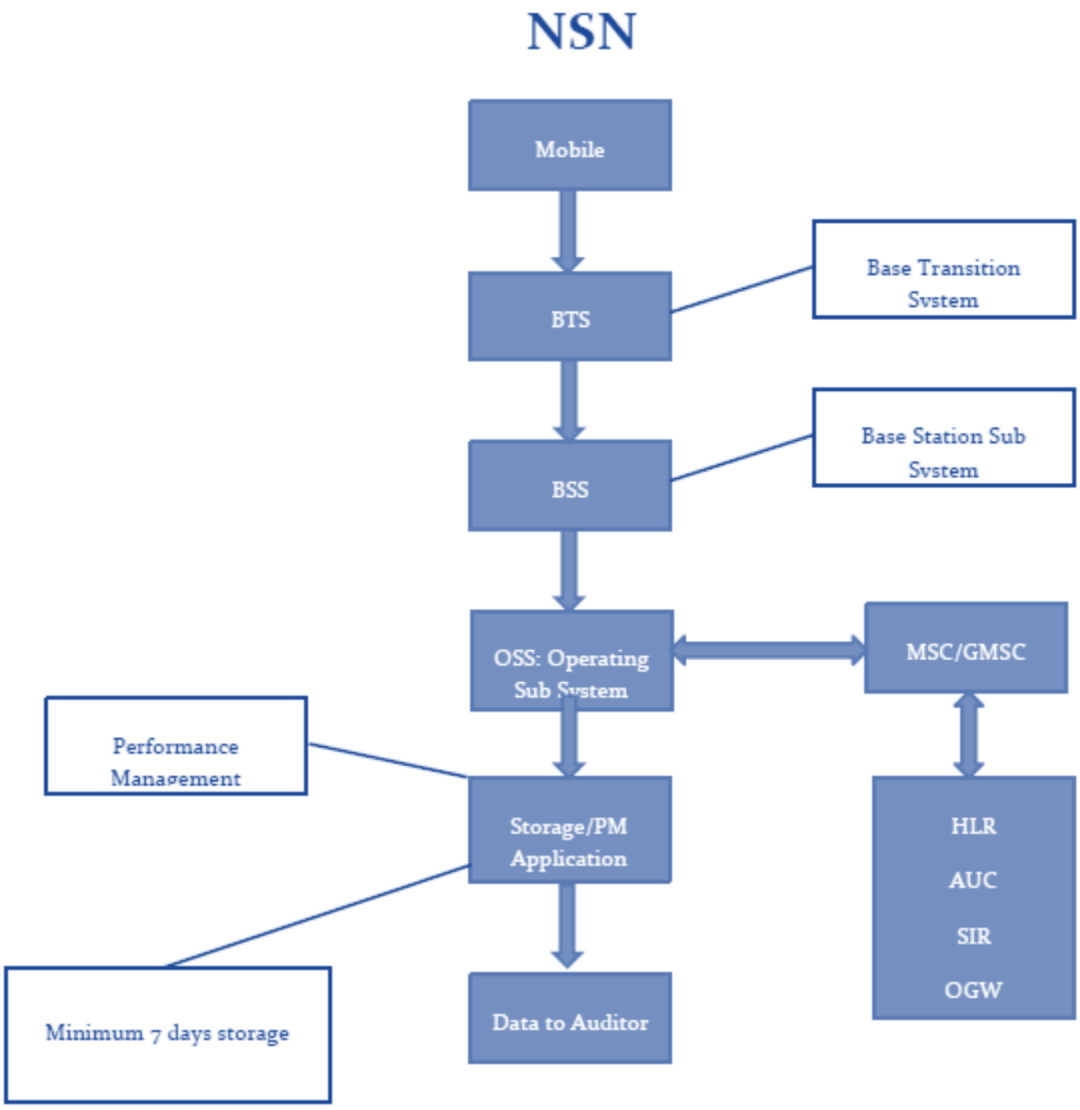
3	CALL SETUP SUCCESS RATE (%)	CALL SETUP SUCCES (NUM) / CALL SETUP SUCCES (DEN) * 100\
4	CALL DROP RATE (NUM)	[CS IS-95 Call Drops (Too many Erasure frames) + CS IS-2000 Call Drops (Too many Erasure frames) + CS IS-95 Call Drops (No reverse frame received) + CS IS-2000 Call Drops (No reverse frame received) + CS IS-95 Call Drops (Abis interface abnormal) + CS IS-2000 Call Drops (Abis interface abnormal) + CS IS-95 Call Drops (A2 interface abnormal) + CS IS-2000 Call Drops (A2 interface abnormal) + CS IS-95 Call Drops (HHO fail) + CS IS-2000 Call Drops (HHO fail) + CS IS-95 Call Drops (Other causes) + CS IS-2000 Call Drops (Other causes)] ([1157628608] + [1157628614] + [1157628609] + [1157628615] + [1157628610] + [1157628616] + [1157628611] + [1157628617] + [1157628612] + [1157628618] + [1157628613] + [1157628619])
5	CALL DROP RATE(DEN)	[Successful CS IS-95 Orig Call Setups + Successful CS IS-2000 Orig Call Setups + Successful CS IS-95 Term Call Setups + Successful CS IS-2000 Term Call Setups + CS IS-95 Successful Incoming Hard HOs + CS IS-2000 Successful Incoming Hard HOs] [1157628619]) x 100/([1157628567] + [1157628587] + [1157628568] + [1157628588] + [1157628569] + [1157628589])]
6	Call DROP Rate	CALL DROP RATE (NUM) / CALL DROP RATE(DEN) * 100\
7	RF BLOCK RATE (NUM)	{[(TCH Assignment Requests-CS Orig-IS95[Times] + TCH Assignment Requests-CS Orig-IS2000[Times] + TCH Assignment Requests-CS Term-IS95[Times] + TCH Assignment Requests-CS Term-IS2000[Times]) - (Successful TCH Assignments-CS Orig-IS95[Times] + Successful TCH Assignments-CS Orig-IS2000[Times] + Successful TCH Assignments-CS Term-IS95[Times] + Successful TCH Assignments-CS Term-IS2000[Times])] {[(1157628621 + 1157628628 + 1157628635+ 1157628642)
8	RF BLOCK RATE (DEN)	[((TCH Assignment Requests-CS Orig-IS95[Times] + TCH Assignment Requests-CS Orig-IS2000[Times] + TCH Assignment Requests-CS Term-IS95[Times] + TCH Assignment Requests-CS Term-IS2000[Times]))]} [(1157628621 + 1157628628 + 1157628635+ 1157628642)]}
9	RF BLOCK RATE	RF BLOCK RATE (NUM) / RF BLOCK RATE (DEN) *100
10	Call Quality (RFER)	CS Reverse Link Average FER of Carrier[%

11. BLOCK SCHEMATIC DIAGRAM

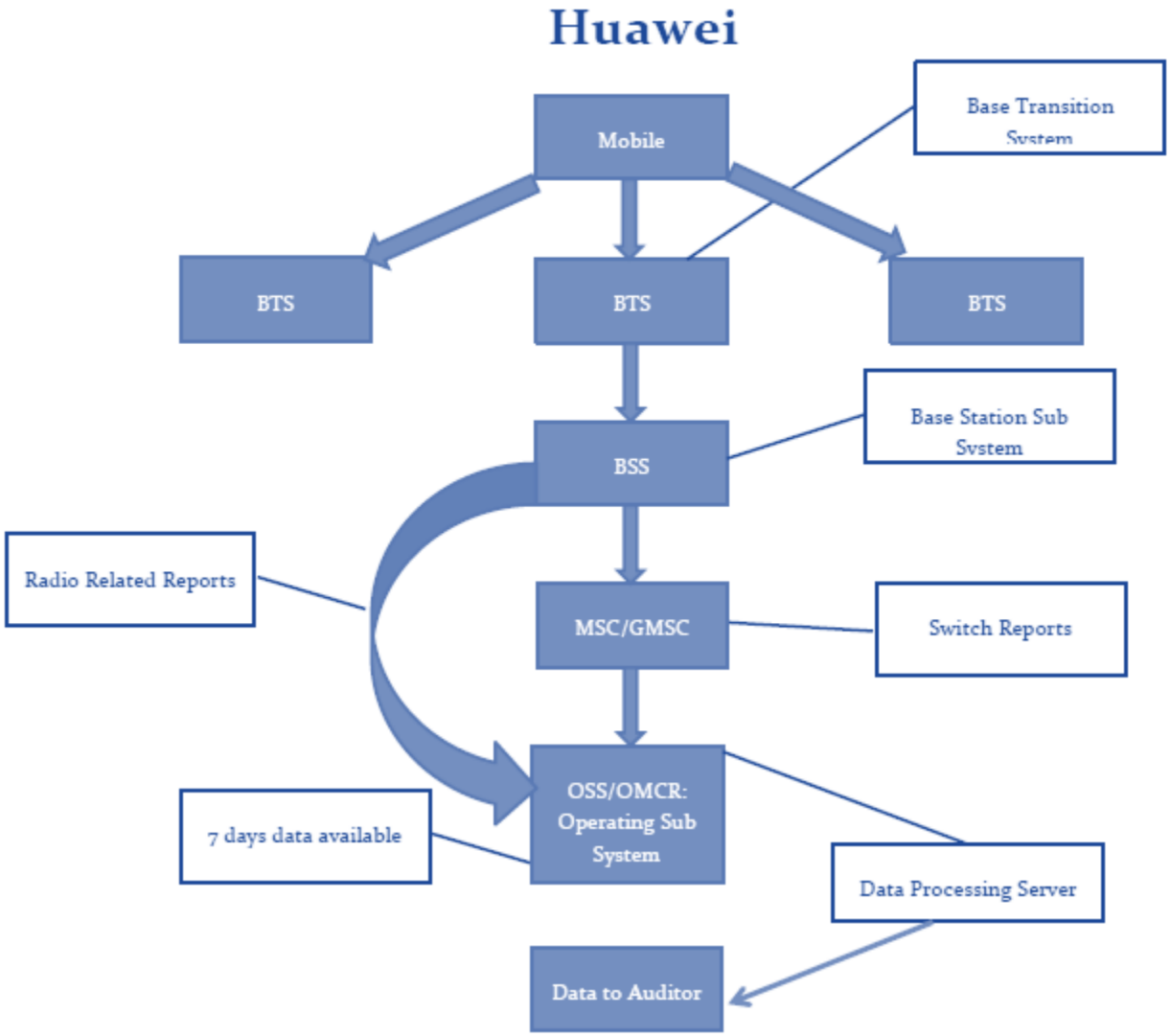
11.1. ERICSSON



11.2. NSN


NSN
Mobile
BTS
Base Transition Svstem
BSS
Base Station Sub Svstem
OSS: Operating Sub System
MSC/GMSC
Performance Management
Storage/PM Application
HLR
AUC
SIR
OGW
Minimum 7 days storage
Data to Auditor

11.3. HUAWEI


Huawei
Mobile
Base Transition System
BTS
BTS
BTS
Base Station Sub System
BSS
Radio Related Reports
MSC/GMSC
Switch Reports
OSS/OMCR: Operating Sub System
7 days data available
Data Processing Server
Data to Auditor

12. ABBREVIATIONS

Following terms/abbreviations have been used in this report. This section provides meaning of the abbreviations used in the report.

- TRAI – Telecom Regulatory Authority of India
- QoS – Quality of Service
- JFM'16 – Refers to the quarter of April, May and June 2016
- SSA – Secondary Switching Area
- NOC – Network Operation Center
- OMC – Operations and Maintenance Center
- MSC – Mobile Switching Center
- PMR – Performance Monitoring Reports
- TCBH – Time Consistent Busy Hour
- CBBH - Cell Bouncing Busy Hour
- BTS – Base Transceiver Station
- CSSR – Call Setup Success Rate
- TCH – Traffic Channel
- SDCCH – Standalone Dedicated Control Channel
- CDR – Call Drop Rate
- FER – Frame Error Rate
- SIM – Subscriber Identity Module
- GSM – Global System for Mobile
- CDMA – Code Division Multiple Access
- NA – Not Applicable
- NC – Non Compliance
- POI – Point of Interconnection
- IVR – Interactive Voice Response
- STD – Standard Trunk Dialling
- ISD – International Subscriber Dialling

13 ANNEXURE

13.1. 2G VOICE PMR DATA: CONSOLIDATED

Consolidated												
Network Parameters		Name of Service Provider										
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.24%	0.61%	1.95%	0.33%	0.02%	0.02%	0.37%	0.20%	0.30%	0.12%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.07%	1.88%	1.79%	0.71%	0.12%	0.18%	0.80%	0.53%	0.92%	0.11%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.96%	96.20%	98.66%	99.18%	97.96%	95.42%	95.18%	97.94%	94.88%	98.40%
	SDDCH/Paging chl. Congestion	≤ 1%	0.66%	0.66%	0.64%	0.64%	NA	27.50%	1.43%	0.00%	0.92%	0.39%
	TCH Congestion	≤ 2%	0.78%	0.66%	1.69%	0.75%	0.57%	1.26%	3.75%	0.31%	1.97%	1.60%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.55%	0.84%	1.22%	0.97%	0.26%	0.12%	1.42%	0.14%	0.54%	0.65%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	2.66%	2.83%	2.65%	2.58%	1.31%	0.37%	8.38%	1.99%	3.25%	2.58%
	%age of connection with good voice quality	≥ 95%	97.32%	96.65%	96.50%	97.22%	99.58%	98.99%	94.72%	99.97%	96.61%	95.97%

13.2. 3G VOICE PMR: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.32%	0.49%	1.32%	0.36%	0.37%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.25%	1.87%	1.82%	1.46%	0.82%
Connection Establishment (Accessibi	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.81%	99.83%	97.04%	99.64%	99.81%
	RRC Congestion:	≤ 1%	0.14%	0.25%	0.92%	0.58%	0.20%
	RAB Congestion:	≤ 2%	0.01%	0.17%	0.97%	0.14%	0.03%
Connection Maintenance (Retainabil ity)	Circuit Switched Voice Drop Rate	≤ 2%	0.50%	0.43%	1.25%	0.52%	0.26%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	5.03%	2.07%	2.83%	2.07%	2.20%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.74%	98.42%	96.50%	98.68%	99.00%

13.3. BILLING AND CUSTOMER CARE

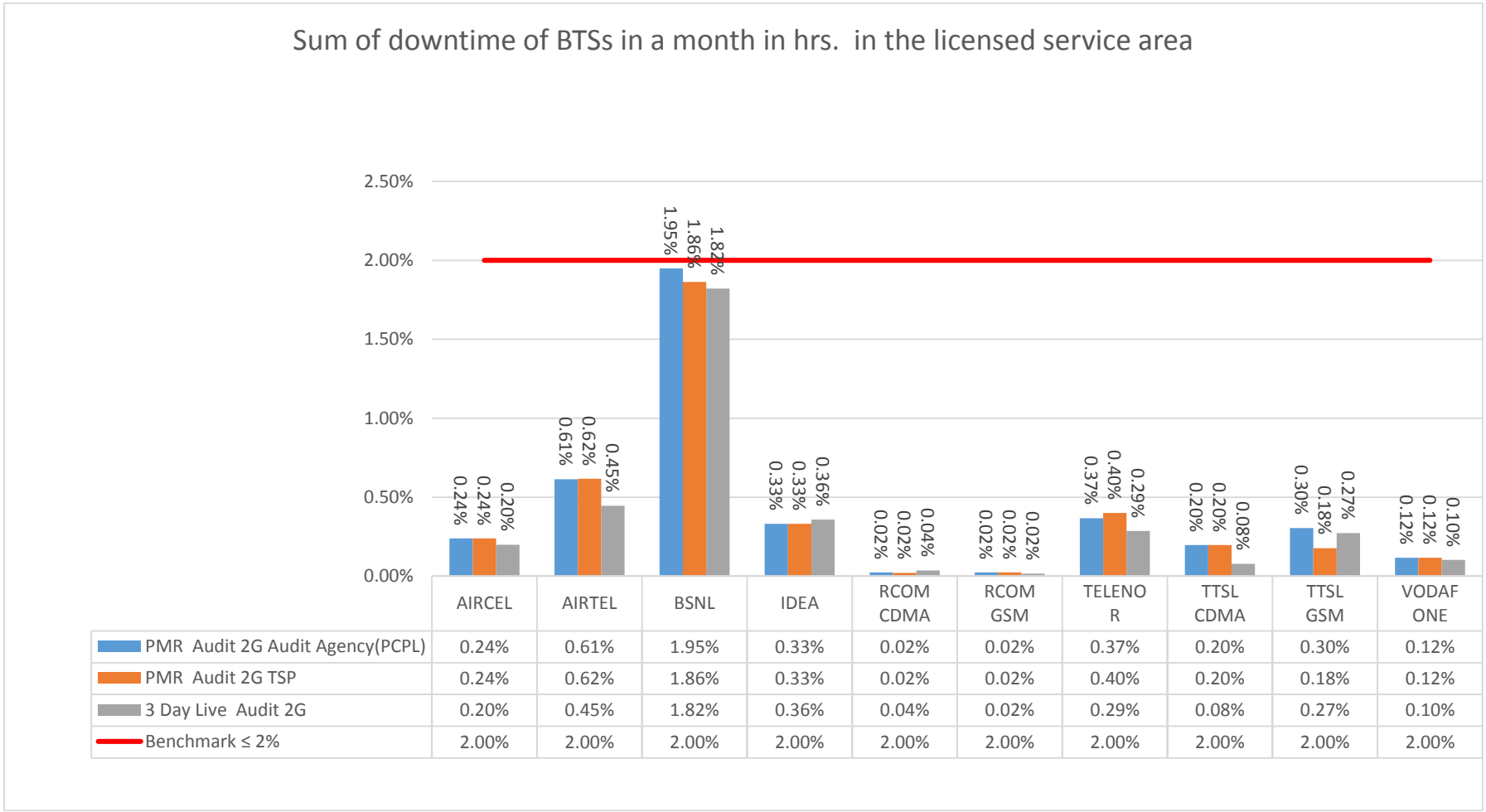
Name of Service Provider	Metering and Billing credibility		Billing Complaints			Termination & Closures	Time taken for refund of deposits after closures: Benchmark	Response time to customer for assistance	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints resolved within 6 weeks	%age of where credit/waiver is received within one week	% of Termination/ Closure of service within 7 days (100 %)	Cleared over a period of <60 days (100%)	%age of calls answered by the IVR	%age of call answered by the operators (voice to voice) within 90 seconds
Benchmark	≤ 0.1%	≤ 0.1%	≥ 98%	= 100%	= 100%	= 100%	= 100%	≥ 95%	≥ 95%
AIRCEL	0.00%	0.00%	NA	NA	100.00%	100.00%	100.00%	98.28%	95.57%
AIRTEL	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	77.03%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
IDEA	0.04%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	95.70%	99.74%
RCOM CDMA	0.09%	0.04%	100.00%	100.00%	100.00%	100.00%	85.93%	99.13%	88.15%
RCOM GSM	0.08%	0.09%	100.00%	100.00%	100.00%	100.00%	76.26%	99.57%	93.74%
TELENOR	NA	0.02%	NA	NA	100.00%	NA	NA	99.04%	98.63%
TTSL CDMA	0.00%	0.00%	NA	NA	100.00%	100.00%	100.00%	NA	99.77%
TTSL GSM	0.00%	0.00%	100.00%	100.00%	100.00%	69.59%	100.00%	99.73%	97.56%
VODAFONE	0.08%	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.85%

13.4. PMR Comparison (TSP vs. Audit Agency): Network Parameters

PMR Report Comparison between Audit Agency and TSP

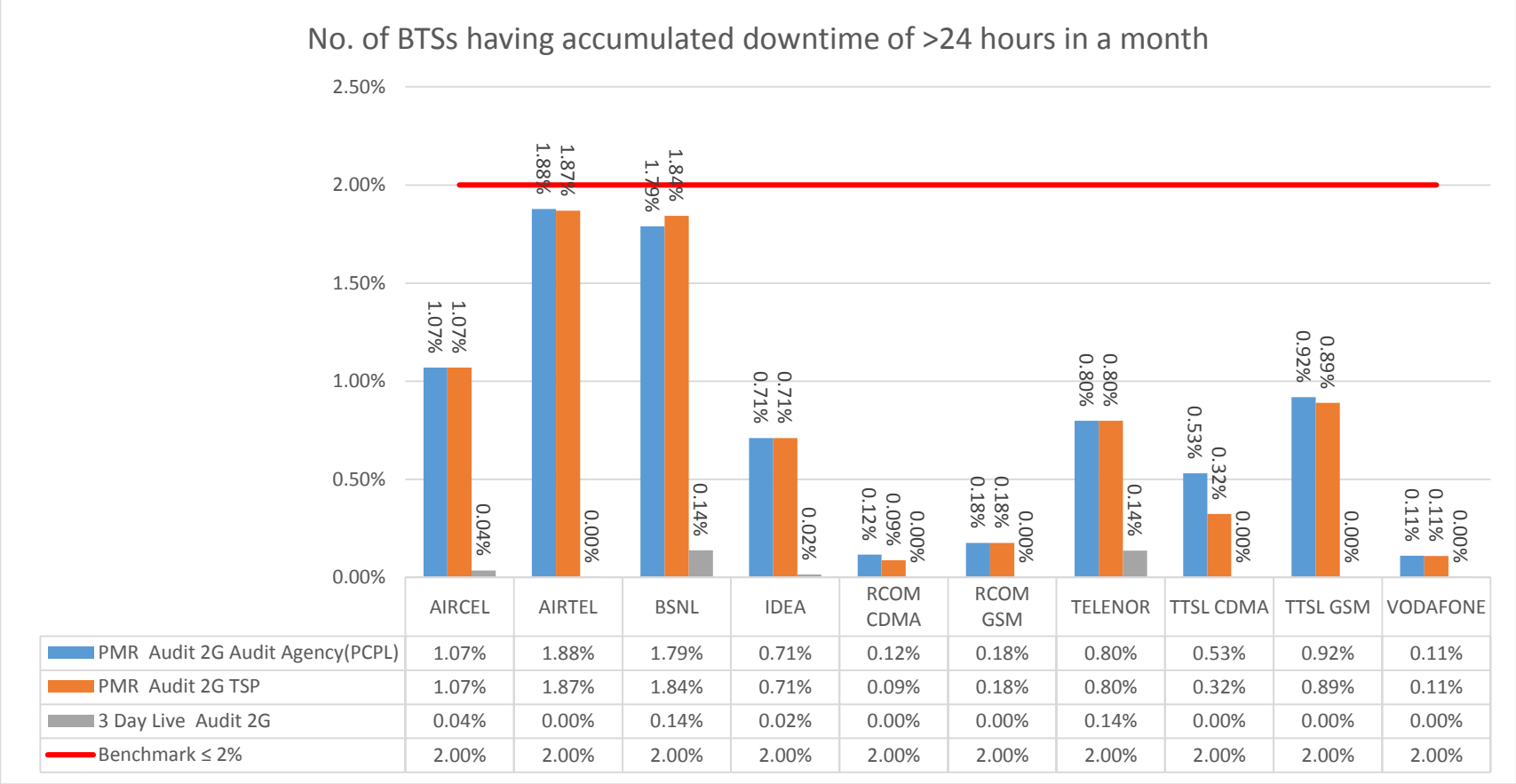
Network Parameters		Benchmark		Name of Service Provider									
				AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.24%	0.61%	1.95%	0.33%	0.02%	0.02%	0.37%	0.20%	0.30%	0.12%
			TSP	0.24%	0.62%	1.86%	0.33%	0.02%	0.02%	0.40%	0.20%	0.18%	0.12%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	1.07%	1.88%	1.79%	0.71%	0.12%	0.18%	0.80%	0.53%	0.92%	0.11%
			TSP	1.07%	1.87%	1.84%	0.71%	0.09%	0.18%	0.80%	0.32%	0.89%	0.11%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	98.96%	96.20%	98.66%	99.18%	97.96%	95.42%	95.18%	97.94%	94.88%	98.40%
			TSP	98.96%	96.15%	98.58%	99.18%	97.97%	95.42%	95.18%	97.94%	95.57%	98.40%
	SDDCH/Paging chl. Congestion	≤ 1%	Agency	0.66%	0.66%	0.64%	0.64%	NA	0.56%	1.43%	0.00%	0.92%	0.39%
			TSP	0.66%	0.73%	0.63%	0.64%	0.00%	0.56%	1.43%	0.00%	0.92%	0.39%
	TCH Congestion	≤ 2%	Agency	0.78%	0.66%	1.69%	0.75%	0.57%	1.26%	3.75%	0.31%	1.97%	1.60%
			TSP	0.78%	0.67%	1.71%	0.75%	0.56%	1.26%	3.75%	0.31%	1.97%	1.60%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	Agency	0.55%	0.84%	1.22%	0.97%	0.26%	0.12%	1.42%	0.14%	0.54%	0.65%
			TSP	0.55%	0.83%	1.38%	0.97%	0.26%	0.12%	1.42%	0.19%	0.42%	0.64%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	Agency	2.66%	2.83%	2.65%	2.58%	1.31%	0.37%	8.38%	1.99%	3.25%	2.58%
			TSP	2.66%	2.84%	2.40%	2.57%	1.28%	0.37%	8.24%	1.99%	3.25%	2.58%
	%age of connection with good voice quality	≥ 95%	Agency	97.32%	96.65%	96.50%	97.22%	99.58%	98.99%	94.72%	99.97%	96.61%	95.97%
			TSP	97.32%	96.50%	96.50%	97.22%	99.64%	98.99%	94.72%	99.83%	97.24%	95.97%

13.4.1. SUM OF DOWNTIME OF BTSS IN A MONTH IN HRS. IN THE LICENSED SERVICE AREA



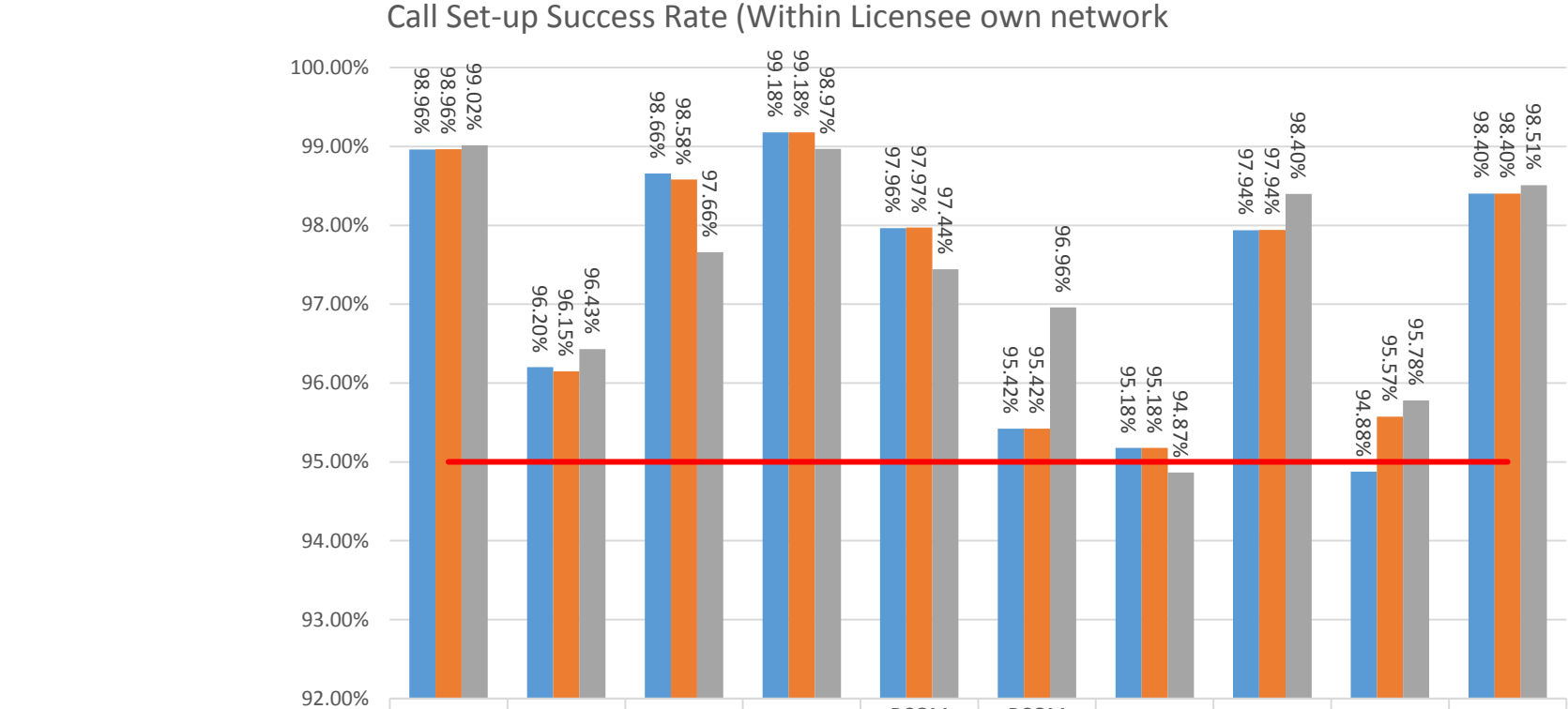
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.24%	0.61%	1.95%	0.33%	0.02%	0.02%	0.37%	0.20%	0.30%	0.12%
PMR Audit 2G TSP	0.24%	0.62%	1.86%	0.33%	0.02%	0.02%	0.40%	0.20%	0.18%	0.12%
3 Day Live Audit 2G	0.20%	0.45%	1.82%	0.36%	0.04%	0.02%	0.29%	0.08%	0.27%	0.10%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

13.4.2. NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF >24 HOURS IN A MONTH



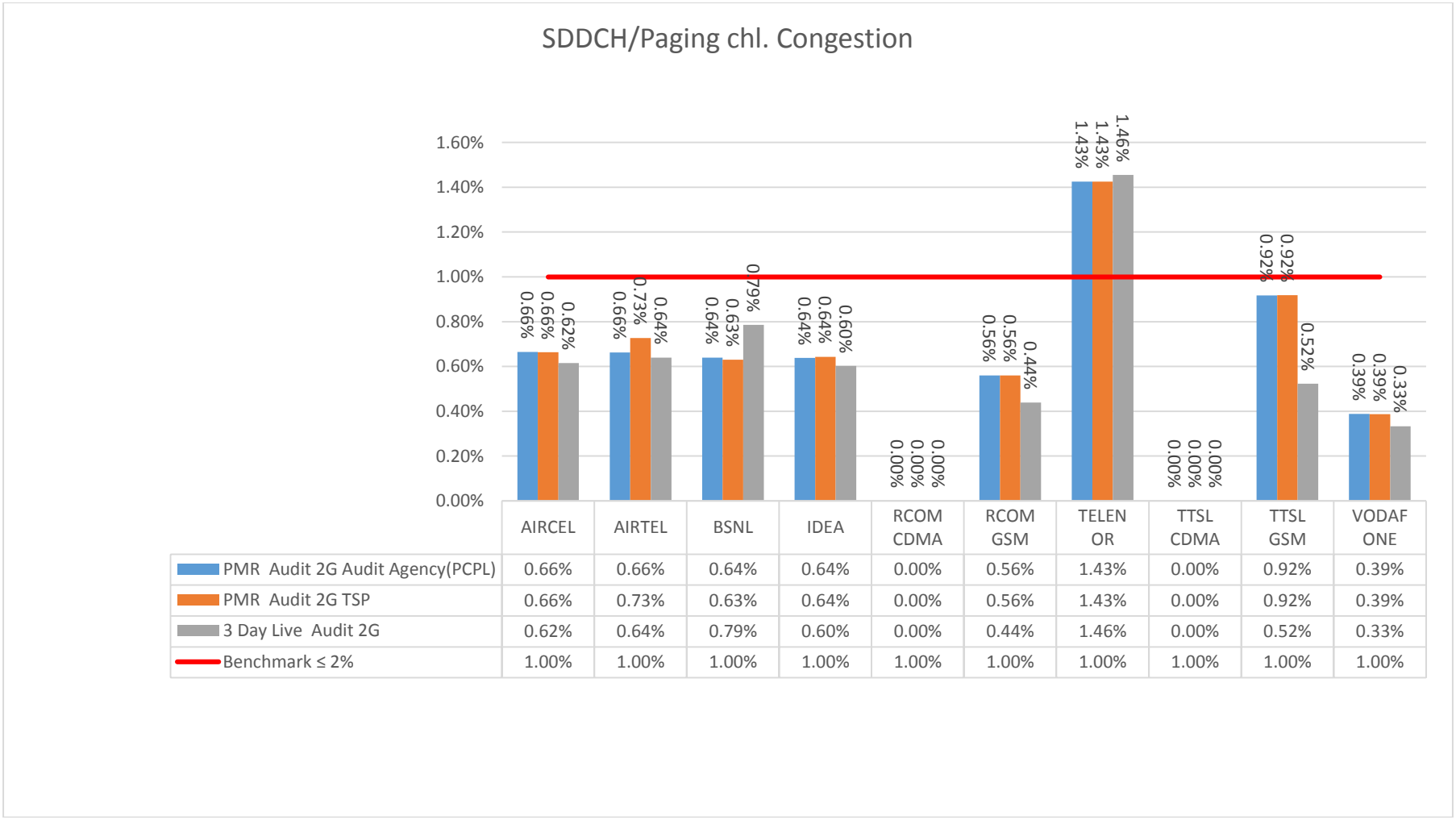
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	1.07%	1.88%	1.79%	0.71%	0.12%	0.18%	0.80%	0.53%	0.92%	0.11%
PMR Audit 2G TSP	1.07%	1.87%	1.84%	0.71%	0.09%	0.18%	0.80%	0.32%	0.89%	0.11%
3 Day Live Audit 2G	0.04%	0.00%	0.14%	0.02%	0.00%	0.00%	0.14%	0.00%	0.00%	0.00%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

13.4.3. CALL SET-UP SUCCESS RATE (WITHIN LICENSEE OWN NETWORK)



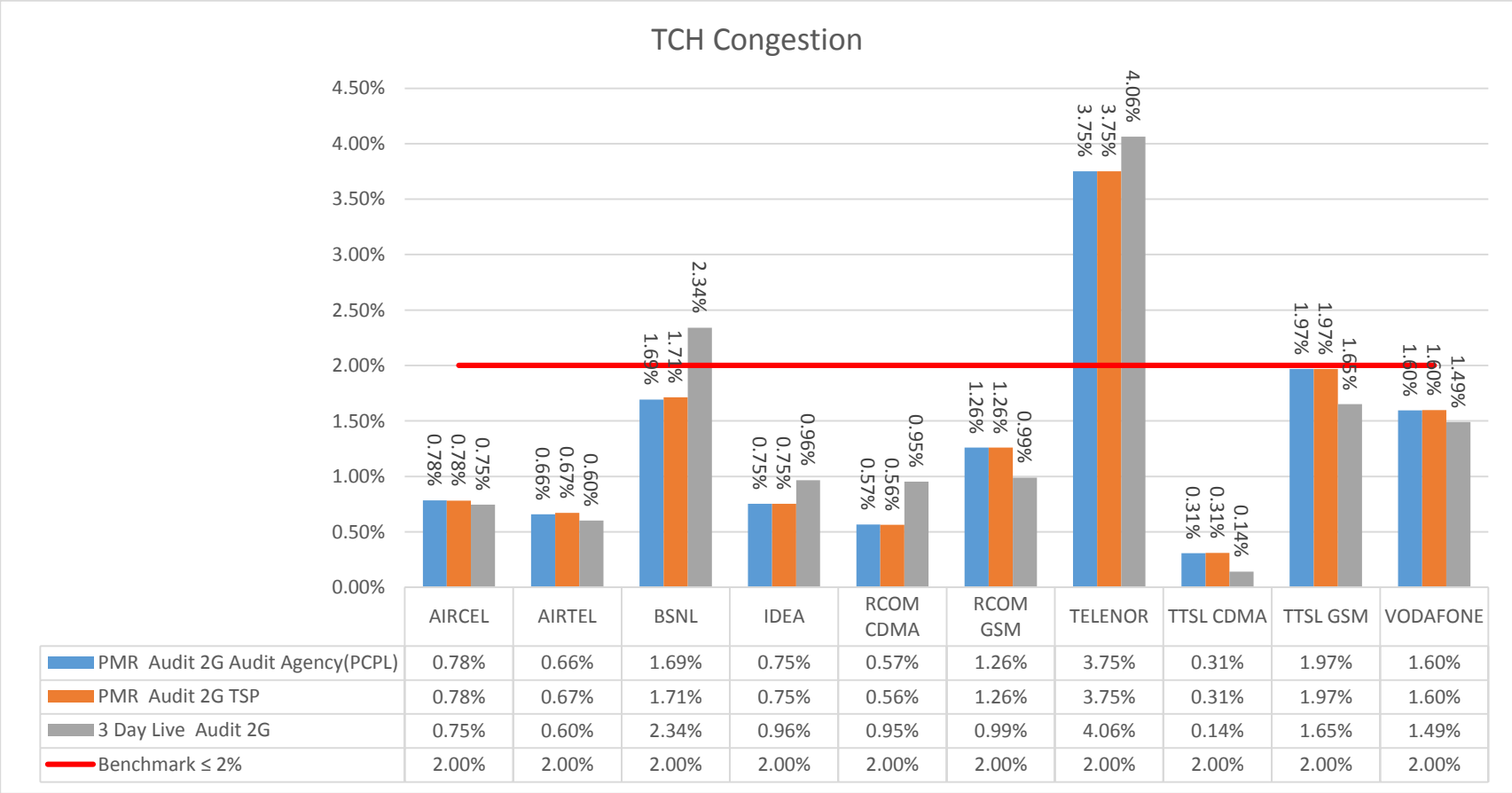
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	98.96%	96.20%	98.66%	99.18%	97.96%	95.42%	95.18%	97.94%	94.88%	98.40%
PMR Audit 2G TSP	98.96%	96.15%	98.58%	99.18%	97.97%	95.42%	95.18%	97.94%	95.57%	98.40%
3 Day Live Audit 2G	99.02%	96.43%	97.66%	98.97%	97.44%	96.96%	94.87%	98.40%	95.78%	98.51%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%

13.4.4. SDDCH/PAGING CHL. CONGESTION



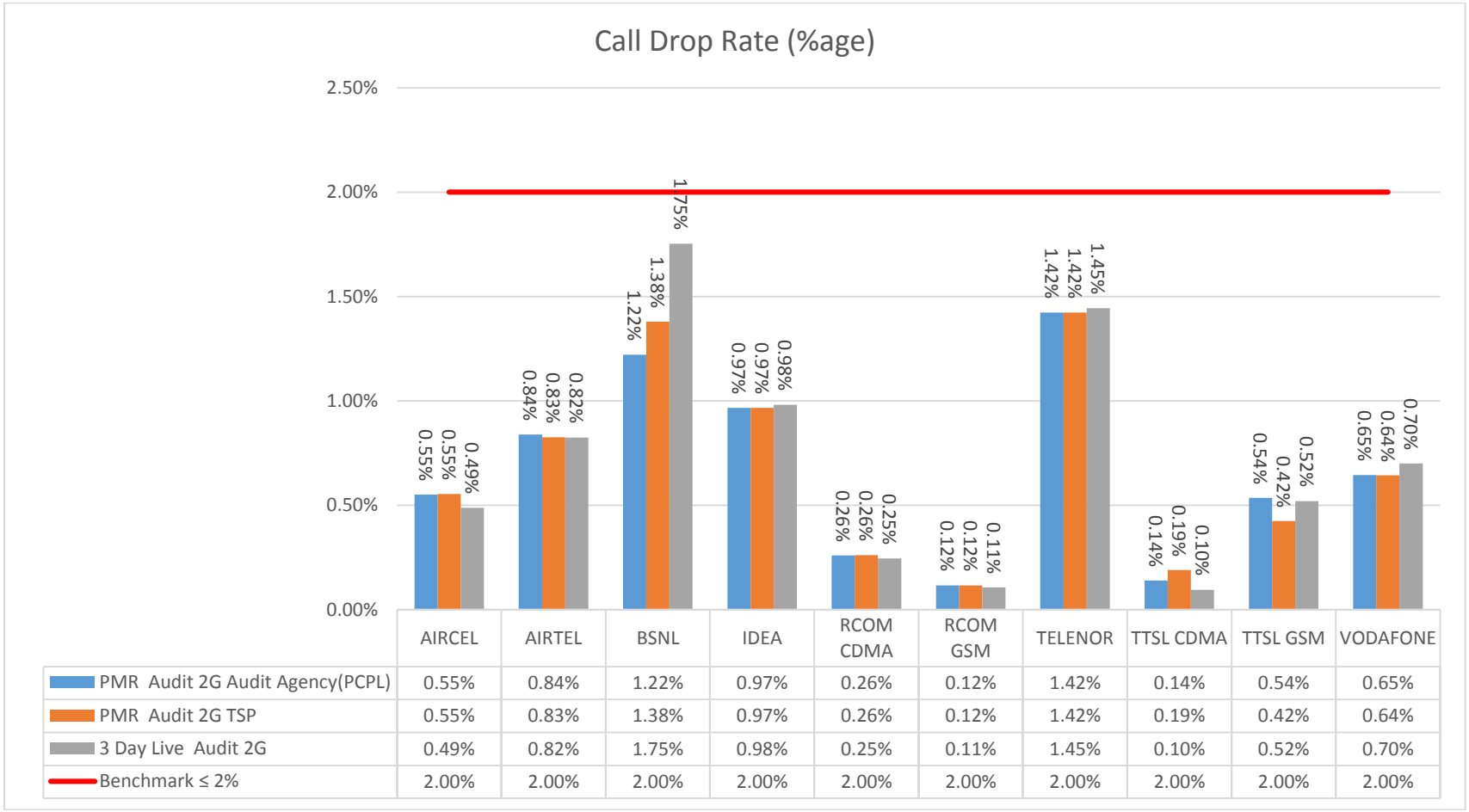
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.66%	0.66%	0.64%	0.64%	0.00%	0.56%	1.43%	0.00%	0.92%	0.39%
PMR Audit 2G TSP	0.66%	0.73%	0.63%	0.64%	0.00%	0.56%	1.43%	0.00%	0.92%	0.39%
3 Day Live Audit 2G	0.62%	0.64%	0.79%	0.60%	0.00%	0.44%	1.46%	0.00%	0.52%	0.33%
Benchmark ≤ 2%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

13.4.5. TCH CONGESTION



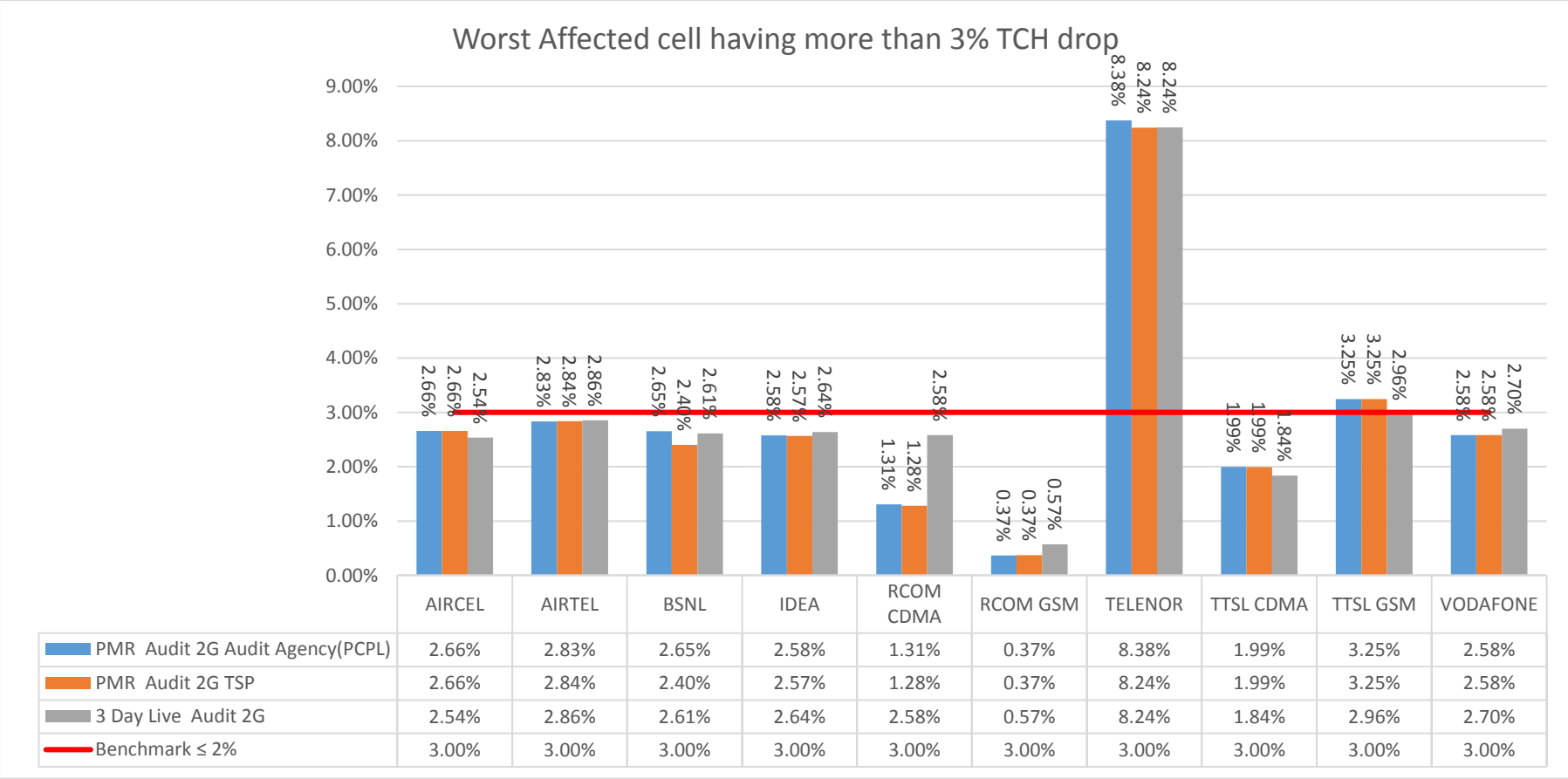
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.78%	0.66%	1.69%	0.75%	0.57%	1.26%	3.75%	0.31%	1.97%	1.60%
PMR Audit 2G TSP	0.78%	0.67%	1.71%	0.75%	0.56%	1.26%	3.75%	0.31%	1.97%	1.60%
3 Day Live Audit 2G	0.75%	0.60%	2.34%	0.96%	0.95%	0.99%	4.06%	0.14%	1.65%	1.49%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

13.4.6. CALL DROP RATE (%AGE)



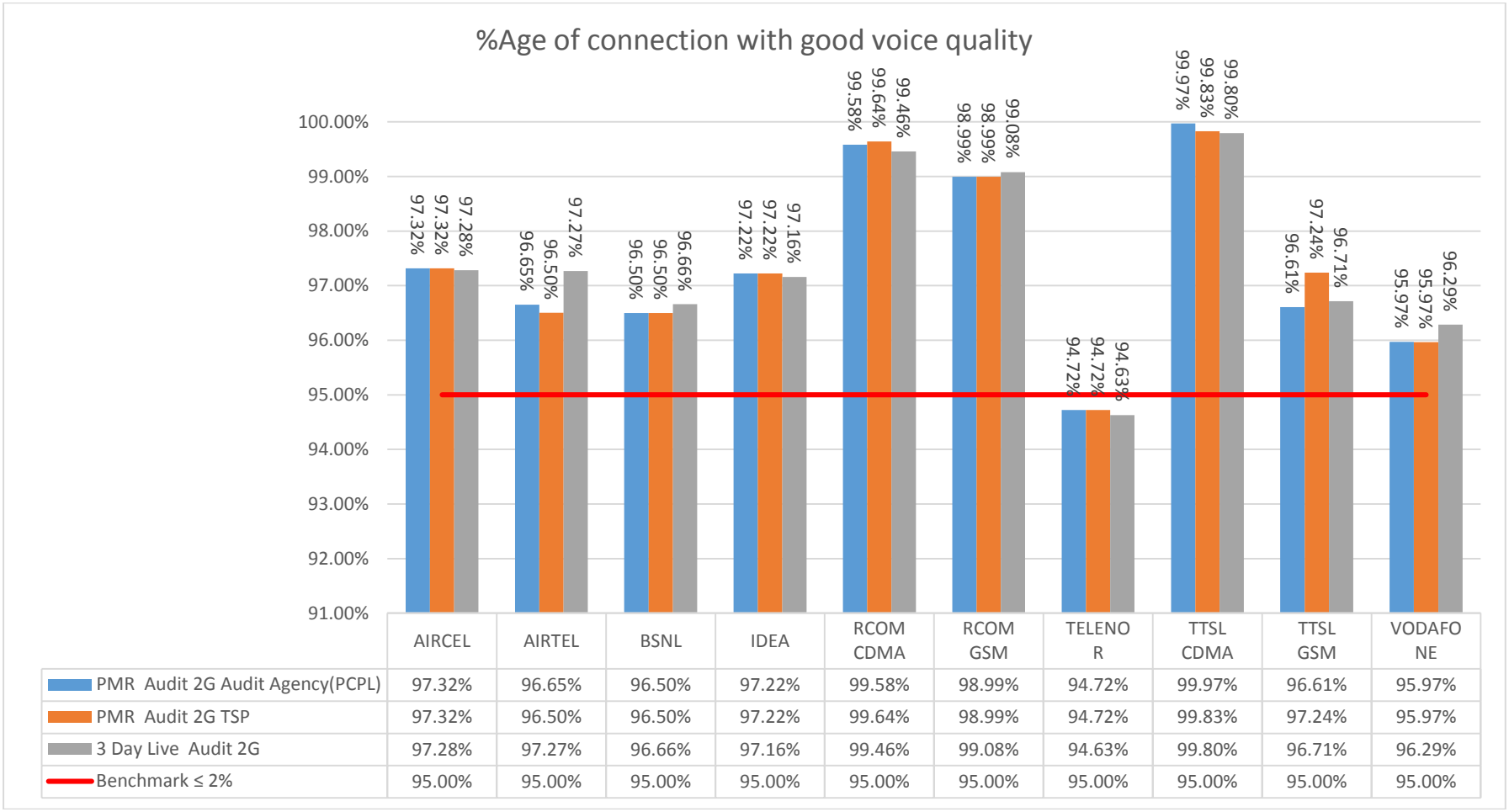
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.55%	0.84%	1.22%	0.97%	0.26%	0.12%	1.42%	0.14%	0.54%	0.65%
PMR Audit 2G TSP	0.55%	0.83%	1.38%	0.97%	0.26%	0.12%	1.42%	0.19%	0.42%	0.64%
3 Day Live Audit 2G	0.49%	0.82%	1.75%	0.98%	0.25%	0.11%	1.45%	0.10%	0.52%	0.70%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

13.4.7. WORST AFFECTED CELL HAVING MORE THAN 3% TCH DROP



	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	2.66%	2.83%	2.65%	2.58%	1.31%	0.37%	8.38%	1.99%	3.25%	2.58%
PMR Audit 2G TSP	2.66%	2.84%	2.40%	2.57%	1.28%	0.37%	8.24%	1.99%	3.25%	2.58%
3 Day Live Audit 2G	2.54%	2.86%	2.61%	2.64%	2.58%	0.57%	8.24%	1.84%	2.96%	2.70%
Benchmark ≤ 2%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%

13.4.8. %AGE OF CONNECTION WITH GOOD VOICE QUALITY

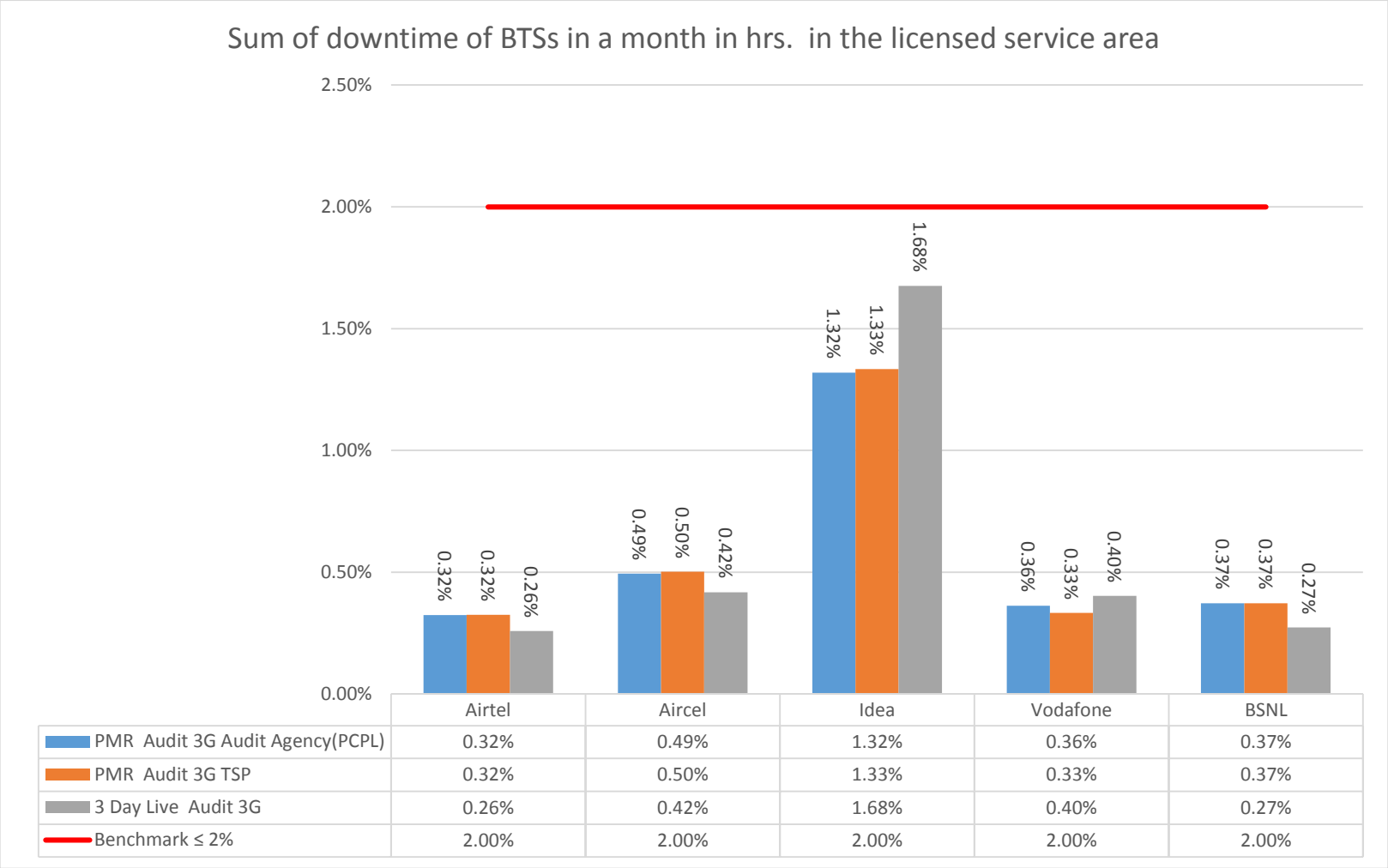


	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	97.32%	96.65%	96.50%	97.22%	99.58%	98.99%	94.72%	99.97%	96.61%	95.97%
PMR Audit 2G TSP	97.32%	96.50%	96.50%	97.22%	99.64%	98.99%	94.72%	99.83%	97.24%	95.97%
3 Day Live Audit 2G	97.28%	97.27%	96.66%	97.16%	99.46%	99.08%	94.63%	99.80%	96.71%	96.29%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%

13.5. PMR Comparison (TSP vs. Audit Agency): 3G Network Parameters

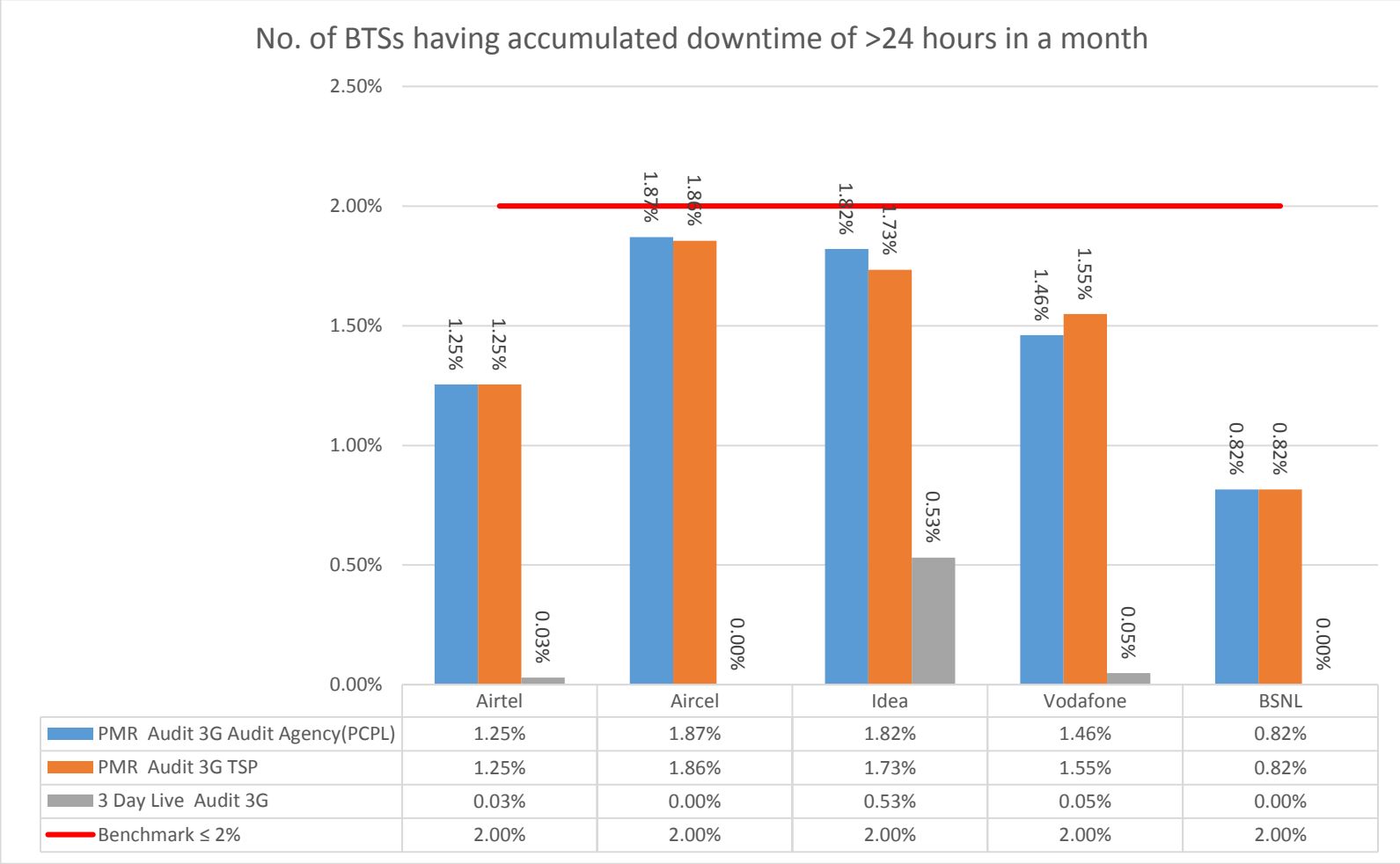
PMR Report Comparison between Audit Agency and TSP								
Network Parameters		Name of Service Provider						
		Benchmark		AIRCEL	AIRTEL	BSNL	IDEA	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.32%	0.49%	1.32%	0.36%	0.37%
			TSP	0.32%	0.50%	1.33%	0.33%	0.37%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	1.25%	1.87%	1.82%	1.46%	0.82%
			TSP	1.25%	1.86%	1.73%	1.55%	0.82%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	97.81%	99.83%	97.04%	99.64%	99.81%
			TSP	97.81%	99.82%	96.33%	99.63%	99.81%
	RRC Congestion:	≤ 1%	Agency	0.14%	0.25%	0.92%	0.58%	0.20%
			TSP	0.14%	0.30%	0.90%	0.60%	0.20%
	RAB Congestion:	≤ 2%	Agency	0.01%	0.17%	0.97%	0.14%	0.03%
			TSP	0.01%	0.18%	1.10%	0.17%	0.03%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	Agency	0.50%	0.43%	1.25%	0.52%	0.26%
			TSP	0.50%	0.44%	1.47%	0.52%	0.26%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	Agency	5.03%	2.07%	2.83%	2.07%	2.20%
			TSP	5.03%	2.11%	0.93%	2.25%	2.20%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	Agency	99.74%	98.42%	96.50%	98.68%	99.00%
			TSP	99.75%	98.35%	96.50%	98.72%	99.00%

13.5.1. SUM OF DOWNTIME OF BTSS IN A MONTH IN HRS. IN THE LICENSED SERVICE AREA



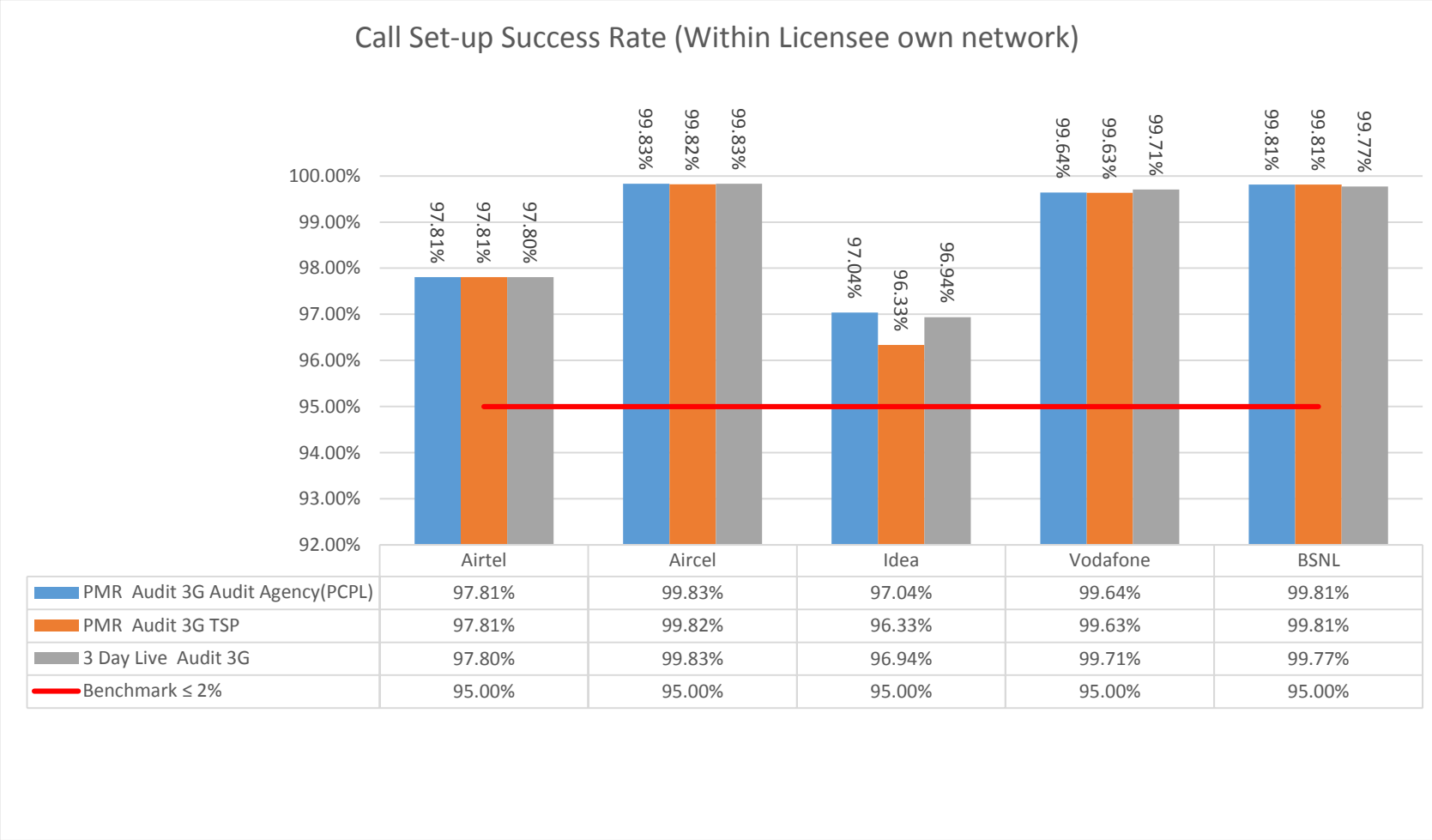
	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	0.32%	0.49%	1.32%	0.36%	0.37%
PMR Audit 3G TSP	0.32%	0.50%	1.33%	0.33%	0.37%
3 Day Live Audit 3G	0.26%	0.42%	1.68%	0.40%	0.27%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

13.5.2. NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF >24 HOURS IN A MONTH



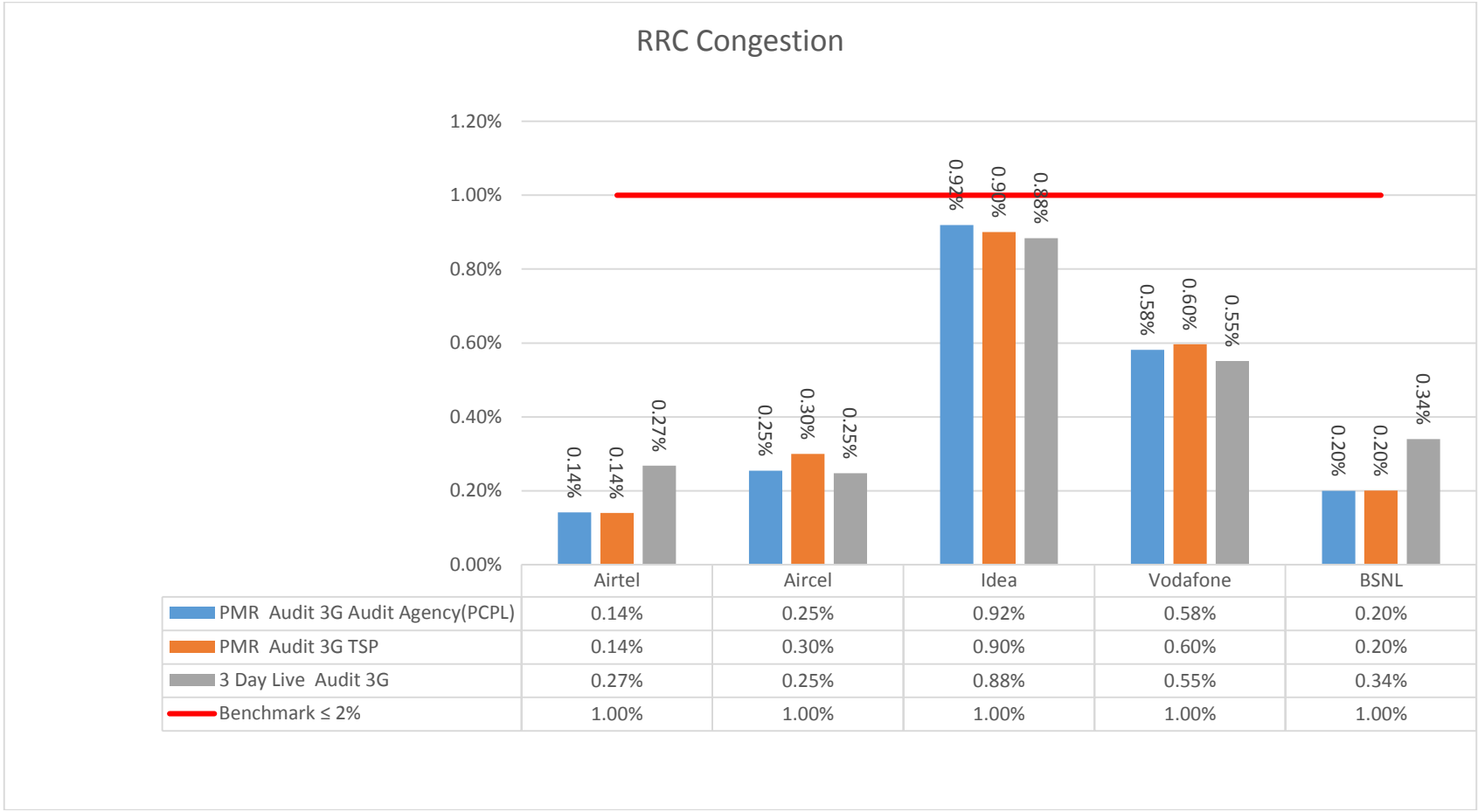
	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	1.25%	1.87%	1.82%	1.46%	0.82%
PMR Audit 3G TSP	1.25%	1.86%	1.73%	1.55%	0.82%
3 Day Live Audit 3G	0.03%	0.00%	0.53%	0.05%	0.00%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

13.5.3. CALL SET-UP SUCCESS RATE (WITHIN LICENSEE OWN NETWORK)



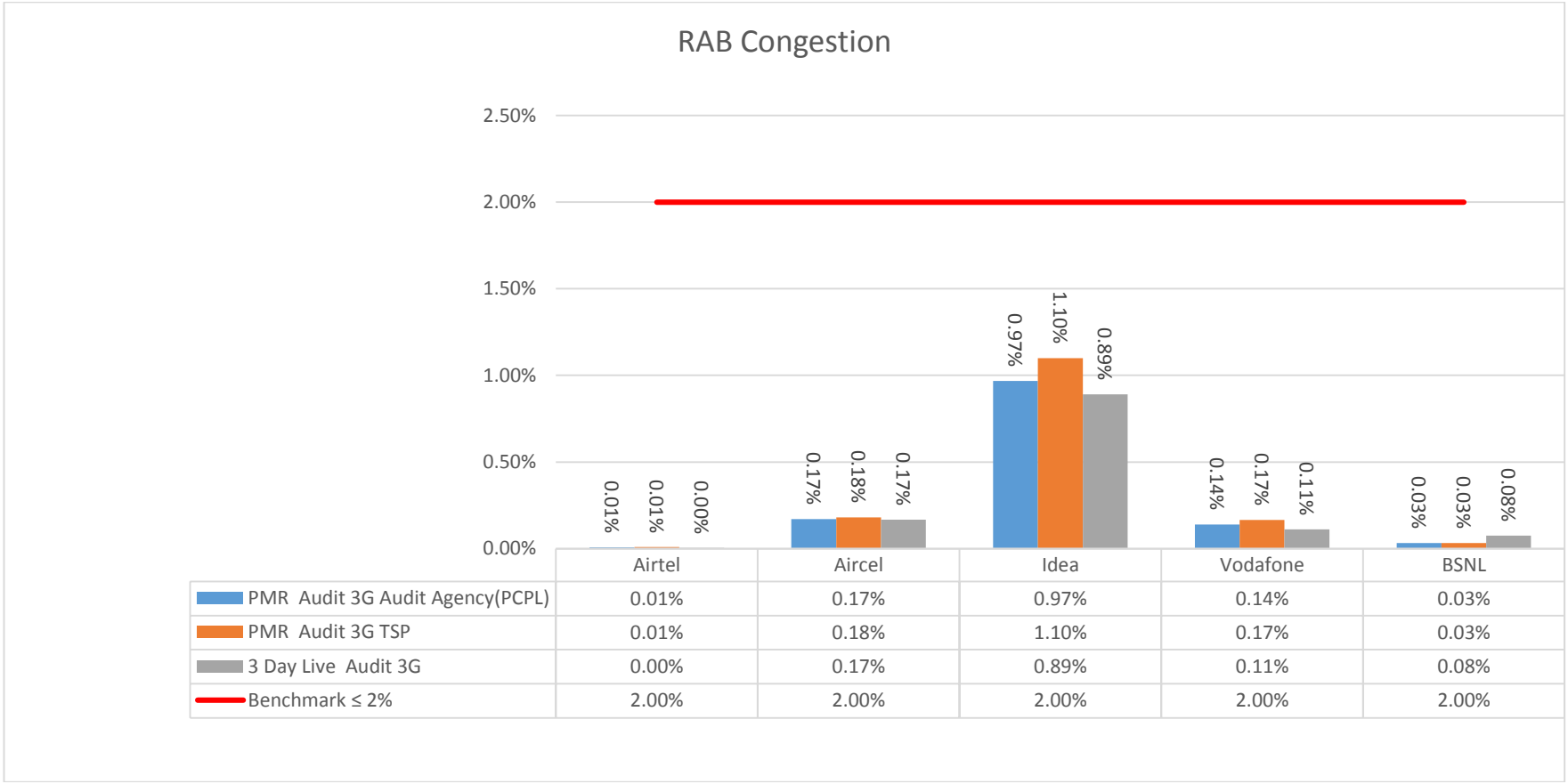
	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	97.81%	99.83%	97.04%	99.64%	99.81%
PMR Audit 3G TSP	97.81%	99.82%	96.33%	99.63%	99.81%
3 Day Live Audit 3G	97.80%	99.83%	96.94%	99.71%	99.77%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%

13.5.4. RRC CONGESTION



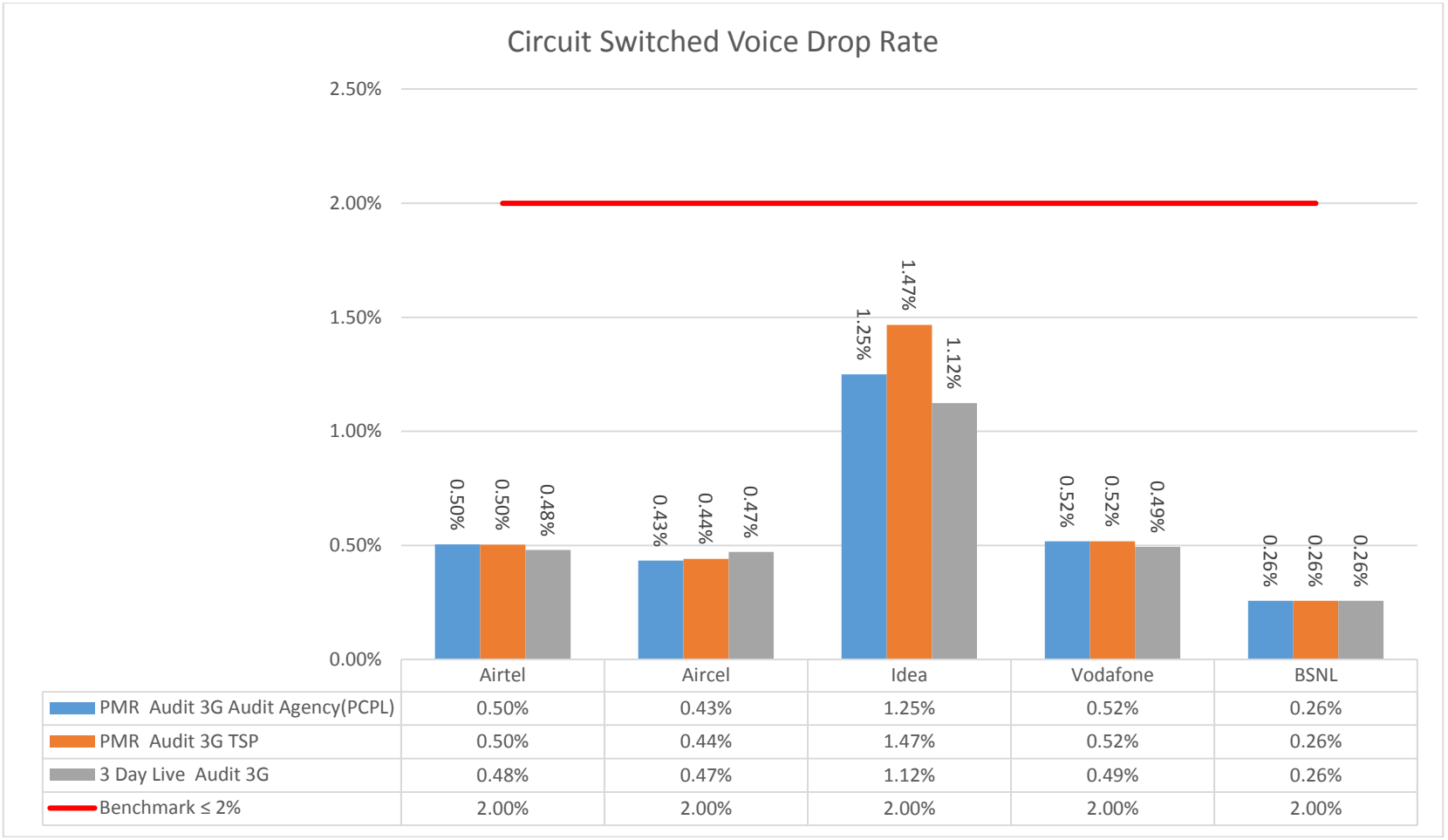
	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	0.14%	0.25%	0.92%	0.58%	0.20%
PMR Audit 3G TSP	0.14%	0.30%	0.90%	0.60%	0.20%
3 Day Live Audit 3G	0.27%	0.25%	0.88%	0.55%	0.34%
Benchmark ≤ 2%	1.00%	1.00%	1.00%	1.00%	1.00%

13.5.5. RAB CONGESTION



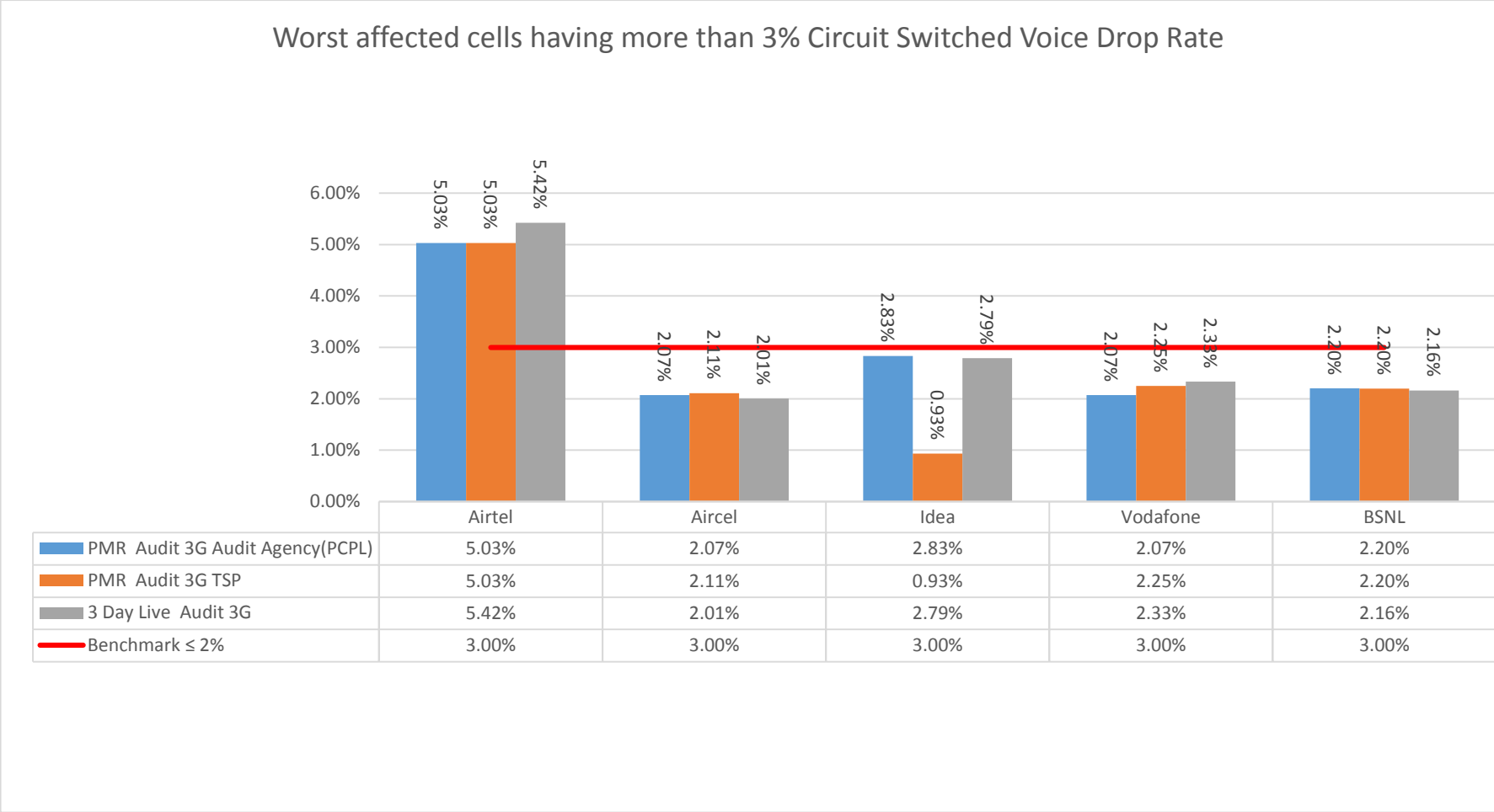
	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	0.01%	0.17%	0.97%	0.14%	0.03%
PMR Audit 3G TSP	0.01%	0.18%	1.10%	0.17%	0.03%
3 Day Live Audit 3G	0.00%	0.17%	0.89%	0.11%	0.08%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

13.5.6. CIRCUIT SWITCHED VOICE DROP RATE



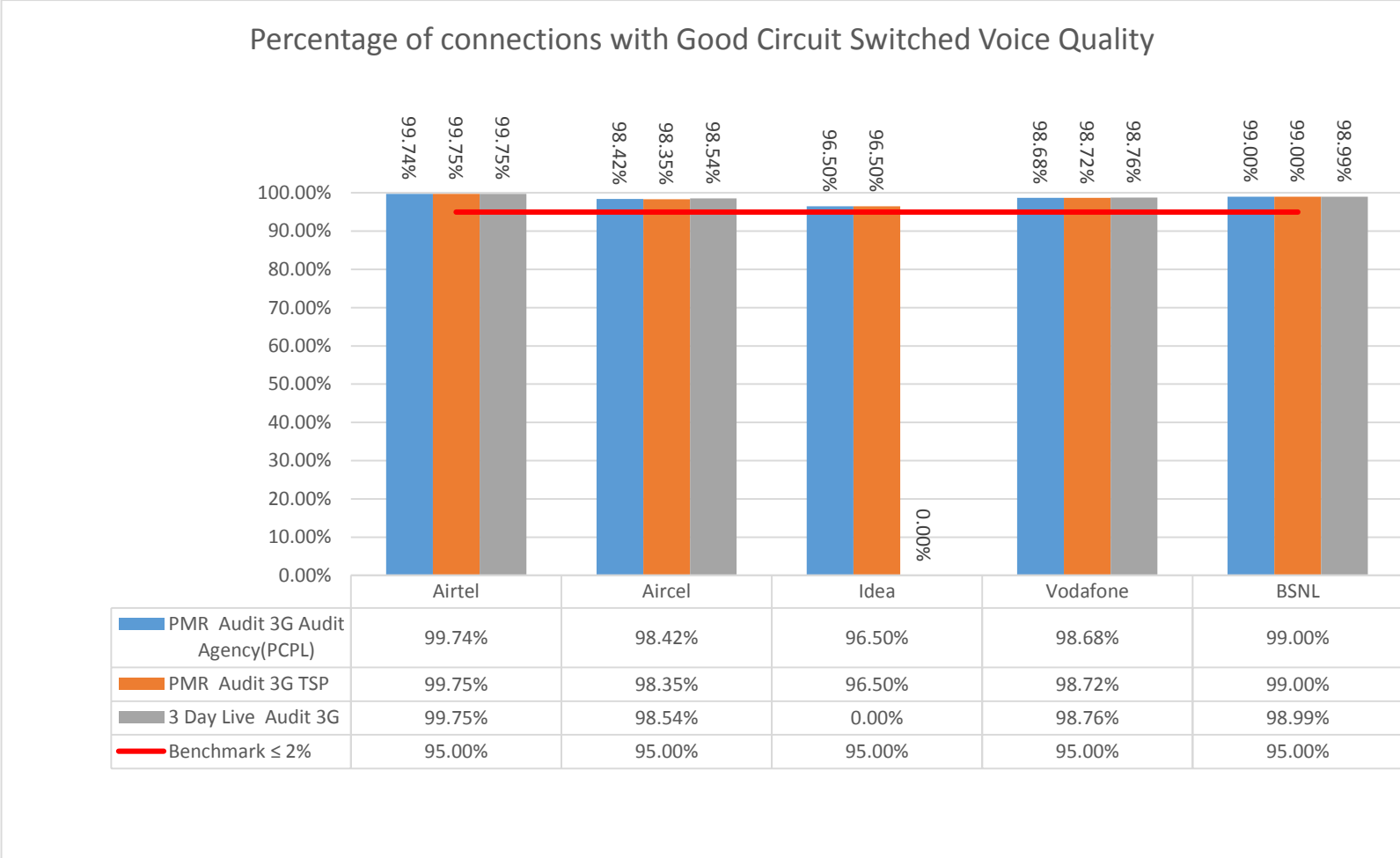
	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	0.50%	0.43%	1.25%	0.52%	0.26%
PMR Audit 3G TSP	0.50%	0.44%	1.47%	0.52%	0.26%
3 Day Live Audit 3G	0.48%	0.47%	1.12%	0.49%	0.26%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

13.5.7. WORST AFFECTED CELLS HAVING MORE THAN 3% CIRCUIT SWITCHED VOICE DROP RATE



	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	5.03%	2.07%	2.83%	2.07%	2.20%
PMR Audit 3G TSP	5.03%	2.11%	0.93%	2.25%	2.20%
3 Day Live Audit 3G	5.42%	2.01%	2.79%	2.33%	2.16%
Benchmark ≤ 2%	3.00%	3.00%	3.00%	3.00%	3.00%

13.5.8. PERCENTAGE OF CONNECTIONS WITH GOOD CIRCUIT SWITCHED VOICE QUALITY

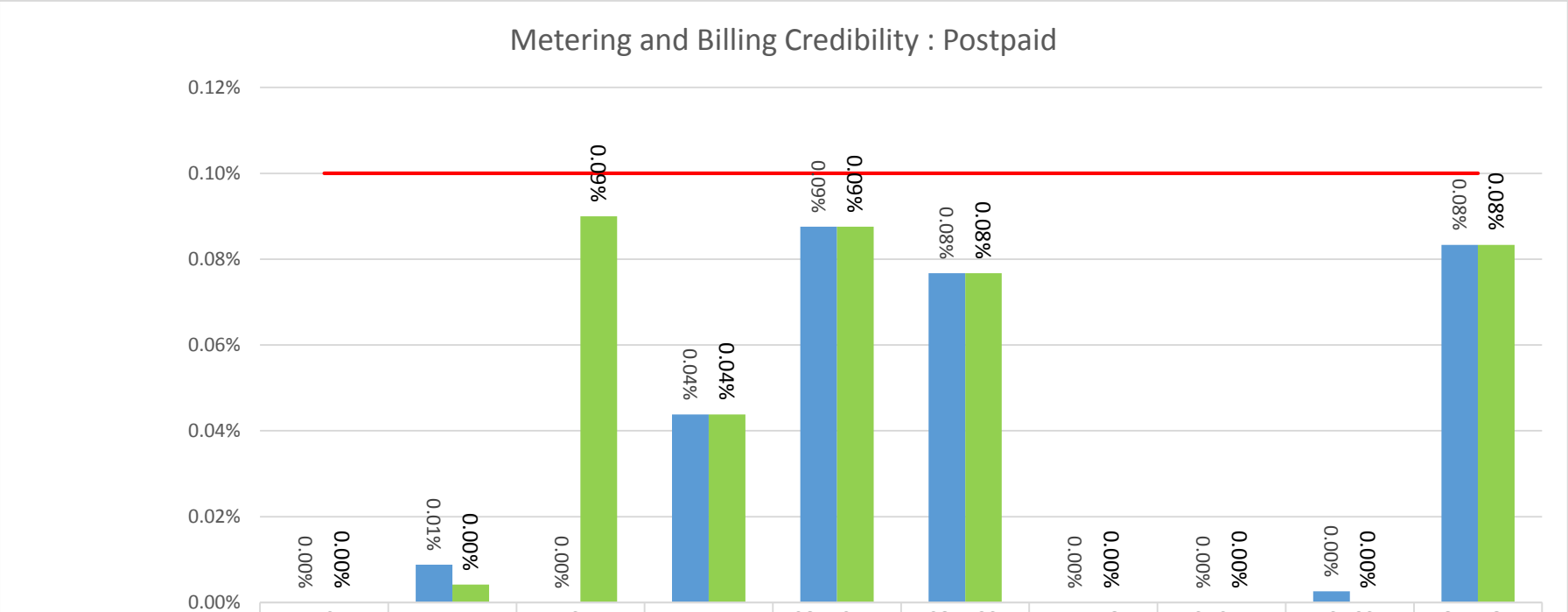


	Airtel	Aircel	Idea	Vodafone	BSNL
PMR Audit 3G Audit Agency(PCPL)	99.74%	98.42%	96.50%	98.68%	99.00%
PMR Audit 3G TSP	99.75%	98.35%	96.50%	98.72%	99.00%
3 Day Live Audit 3G	99.75%	98.54%	0.00%	98.76%	98.99%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%

13.6. PMR Comparison (TSP vs. Audit Agency): CSD Parameters

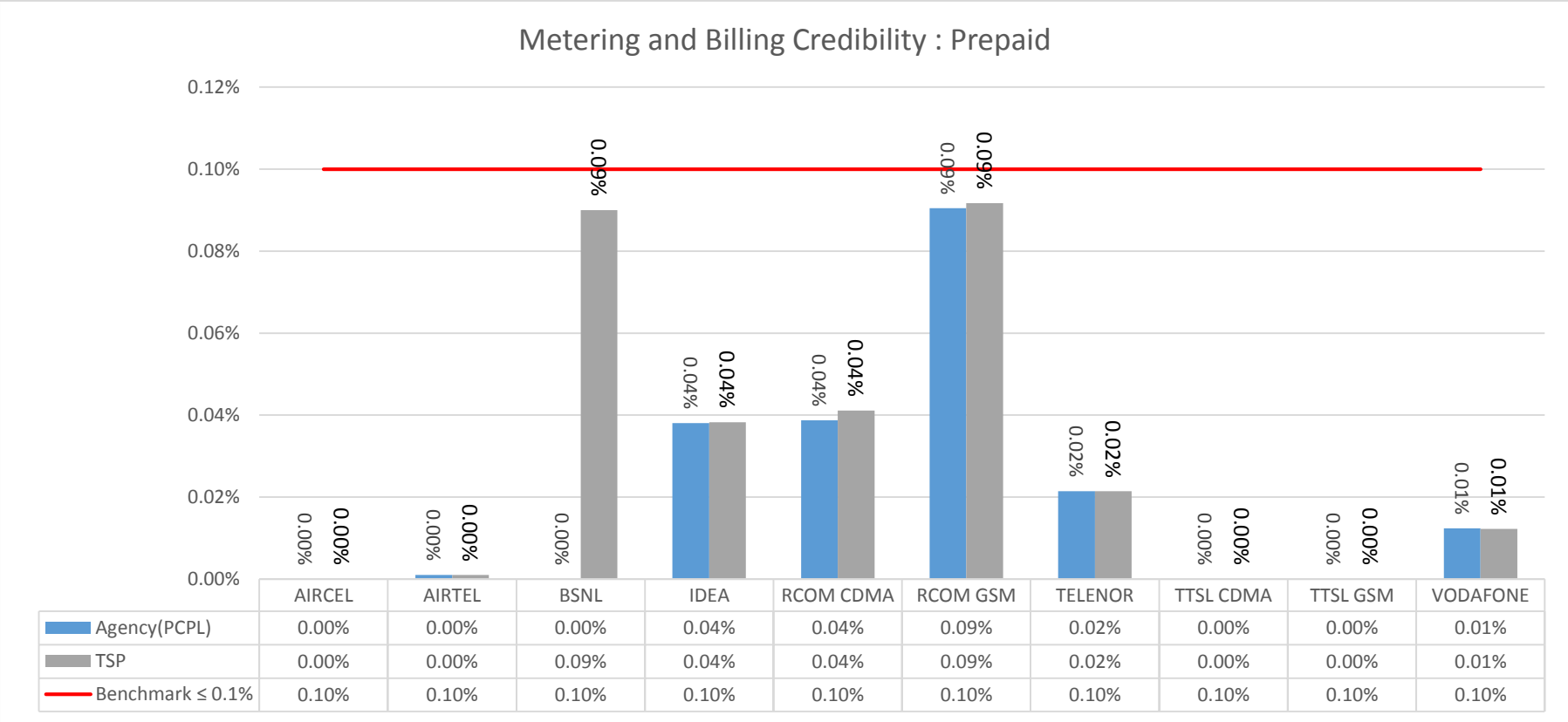
Name of Service Provider	Metering and Billing credibility				Billing Complaints						Termination & Closures		Time taken for refund of deposits after closures: Benchmark		Response time to customer for assistance			
	Postpaid Subscribers		Prepaid Subscribers		%age complaints resolved within 4 weeks		%age complaints resolved within 6 weeks		%age of where credit/waiver is received within one week		% of Termination/ Closure of service within 7 days (100 %)		Cleared over a period of <60 days (100%)		%age of calls answered by the IVR		%age of call answered by the operators (voice to voice) within 90 seconds	
Benchmark	≤ 0.1%		≤ 0.1%		≥ 98%		= 100%		= 100%		= 100%		= 100%		≥ 95%		≥ 95%	
	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP
AIRCEL	0.00%	0.00%	0.00%	0.00%	NA	100.00%	NA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.28%	98.28%	95.57%	95.57%
AIRTEL	0.01%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	77.03%	76.93%
BSNL	DNA	0.09%	DNA	0.09%	DNA	100.00%	DNA	100.00%	DNA	100.00%	DNA	100.00%	DNA	100.00%	DNA	99.00%	DNA	97.14%
IDEA	0.04%	0.04%	0.04%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	95.70%	95.70%	99.74%	99.74%
RCOM CDMA	0.09%	0.09%	0.04%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	85.93%	85.93%	99.13%	99.13%	88.15%	88.15%
RCOM GSM	0.08%	0.08%	0.09%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	76.26%	76.26%	99.57%	99.57%	93.74%	93.74%
TELENOR	NA	NA	0.02%	0.02%	NA	100.00%	NA	100.00%	100.00%	NA	NA	NA	NA	NA	99.04%	99.04%	98.63%	98.63%
TTSL CDMA	0.00%	0.00%	0.00%	0.00%	NA	100.00%	NA	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	99.77%	99.77%
TTSL GSM	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	69.59%	100.00%	100.00%	100.00%	99.73%	99.73%	97.56%	97.56%
VODAFONE	0.08%	0.08%	0.01%	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.85%	98.86%

13.6.1. POSTPAID SUBSCRIBERS



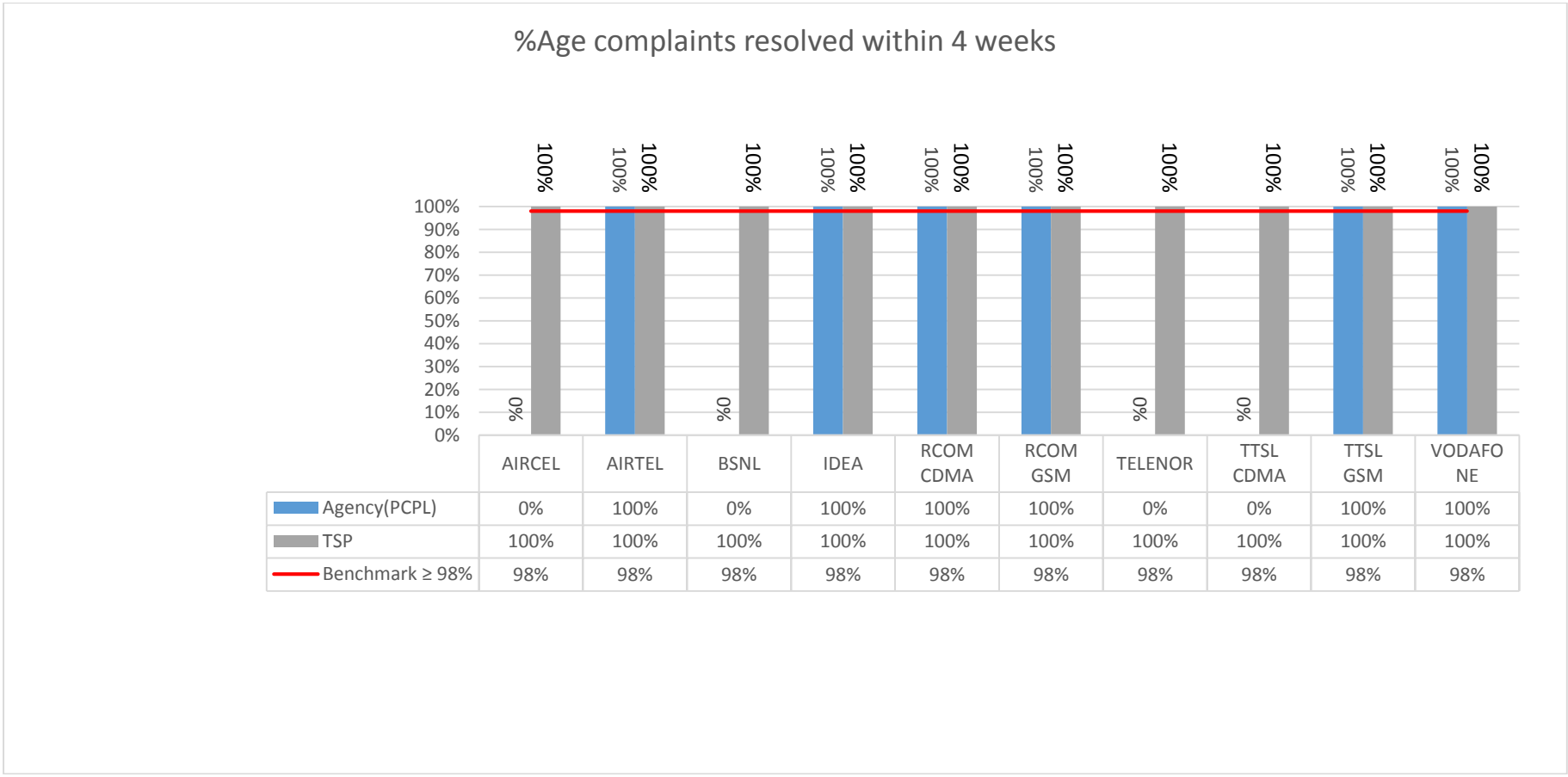
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	0.00%	0.01%	0.00%	0.04%	0.09%	0.08%	0.00%	0.00%	0.00%	0.08%
TSP	0.00%	0.00%	0.09%	0.04%	0.09%	0.08%	0.00%	0.00%	0.00%	0.08%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

13.6.2. PREPAID SUBSCRIBERS



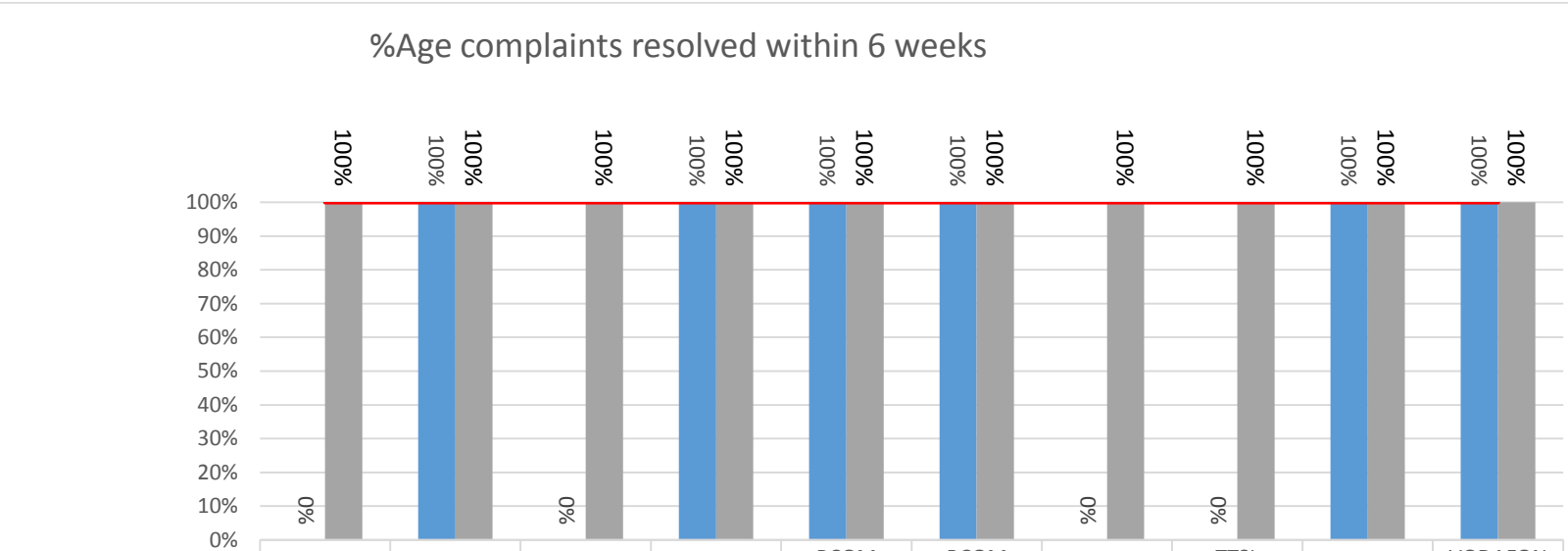
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	0.00%	0.00%	0.00%	0.04%	0.04%	0.09%	0.02%	0.00%	0.00%	0.01%
TSP	0.00%	0.00%	0.09%	0.04%	0.04%	0.09%	0.02%	0.00%	0.00%	0.01%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

13.6.3. %AGE COMPLAINTS RESOLVED WITHIN 4 WEEKS



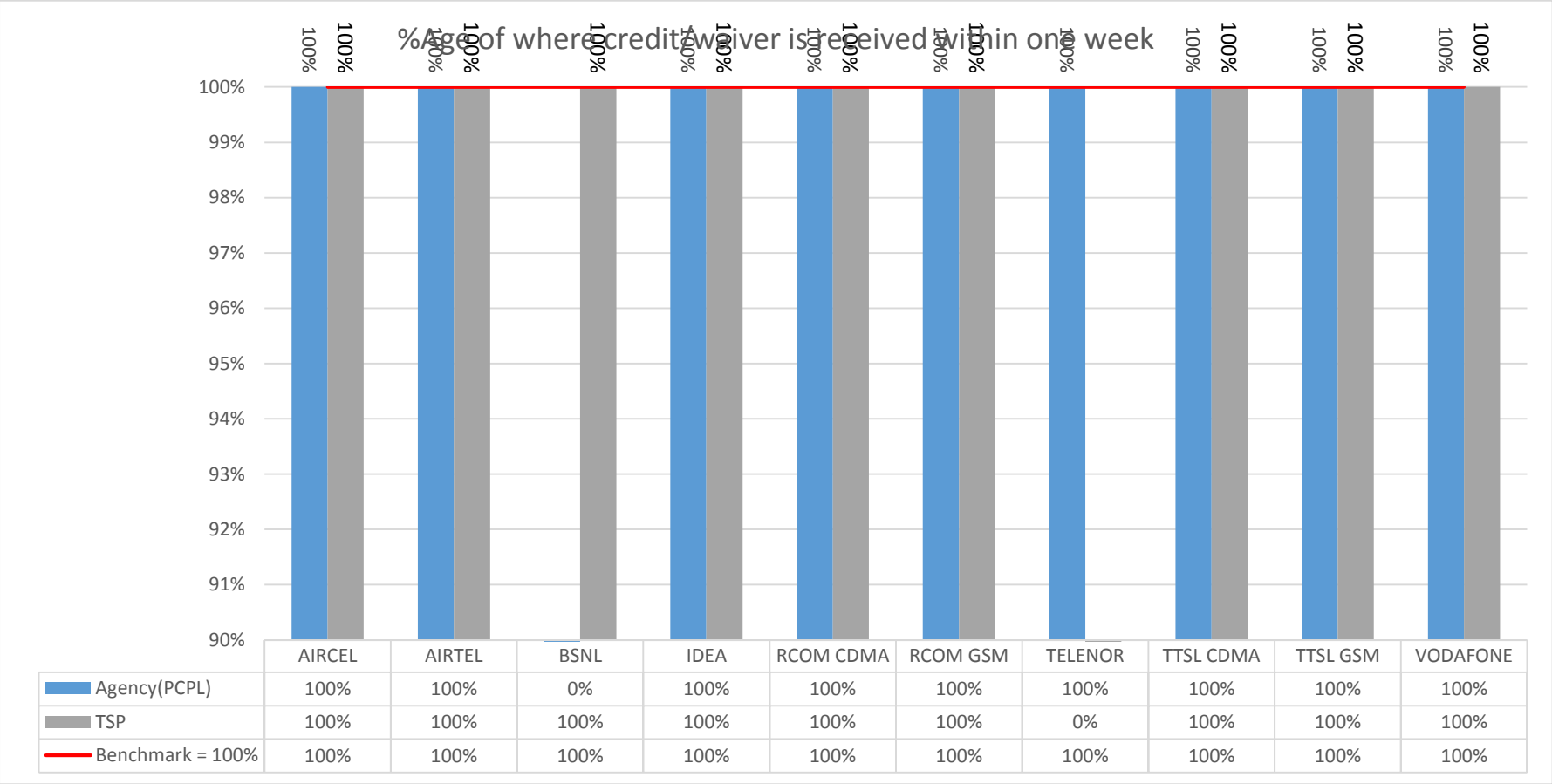
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	0%	100%	0%	100%	100%	100%	0%	0%	100%	100%
TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Benchmark ≥ 98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%

13.6.4. %AGE COMPLAINTS RESOLVED WITHIN 6 WEEKS



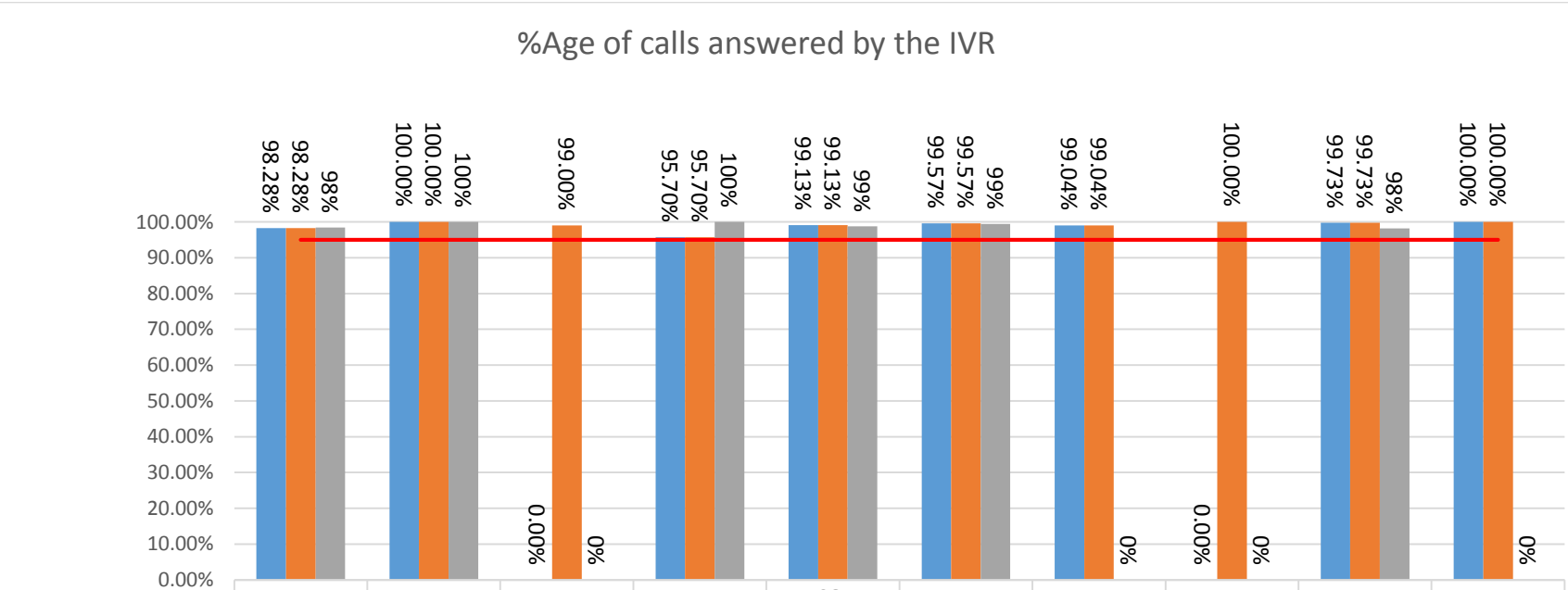
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	0%	100%	0%	100%	100%	100%	0%	0%	100%	100%
TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

13.6.5. %AGE OF WHERE CREDIT/WAIVER IS RECEIVED WITHIN ONE WEEK



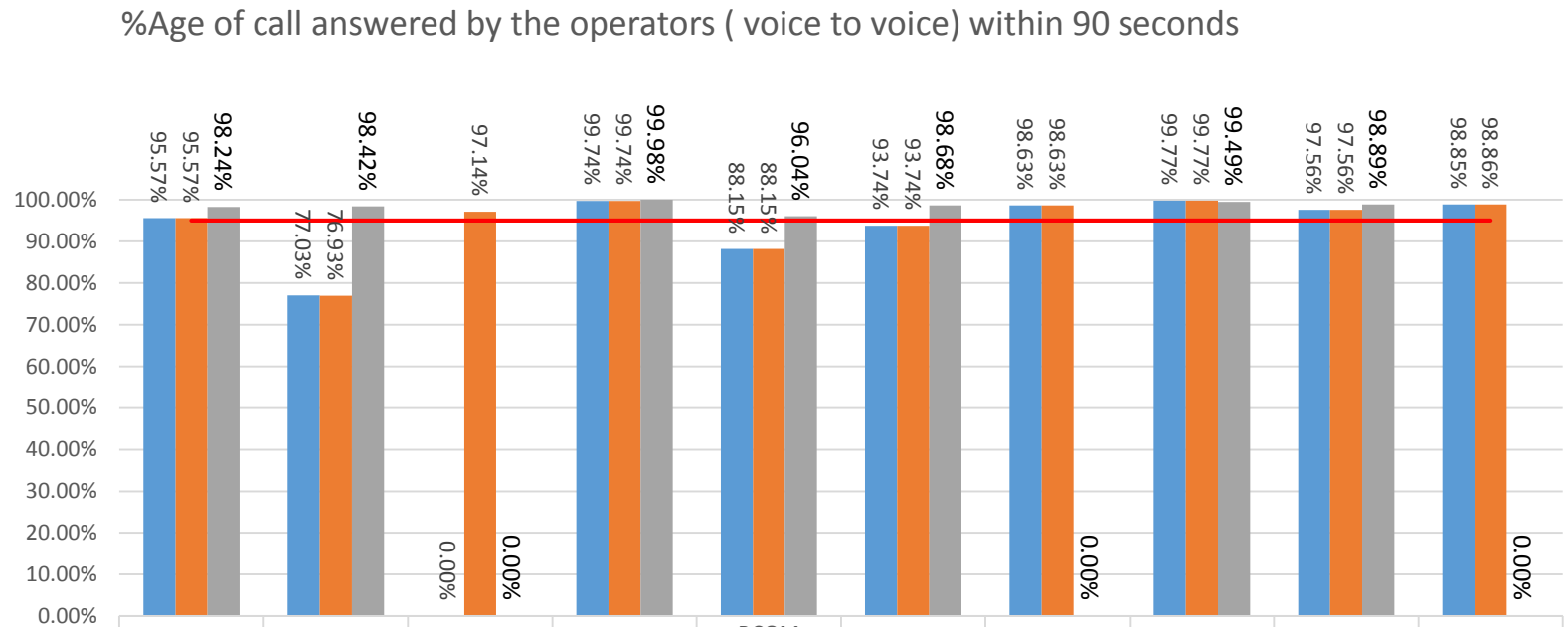
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%
TSP	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

13.6.6. %AGE OF CALLS ANSWERED BY THE IVR



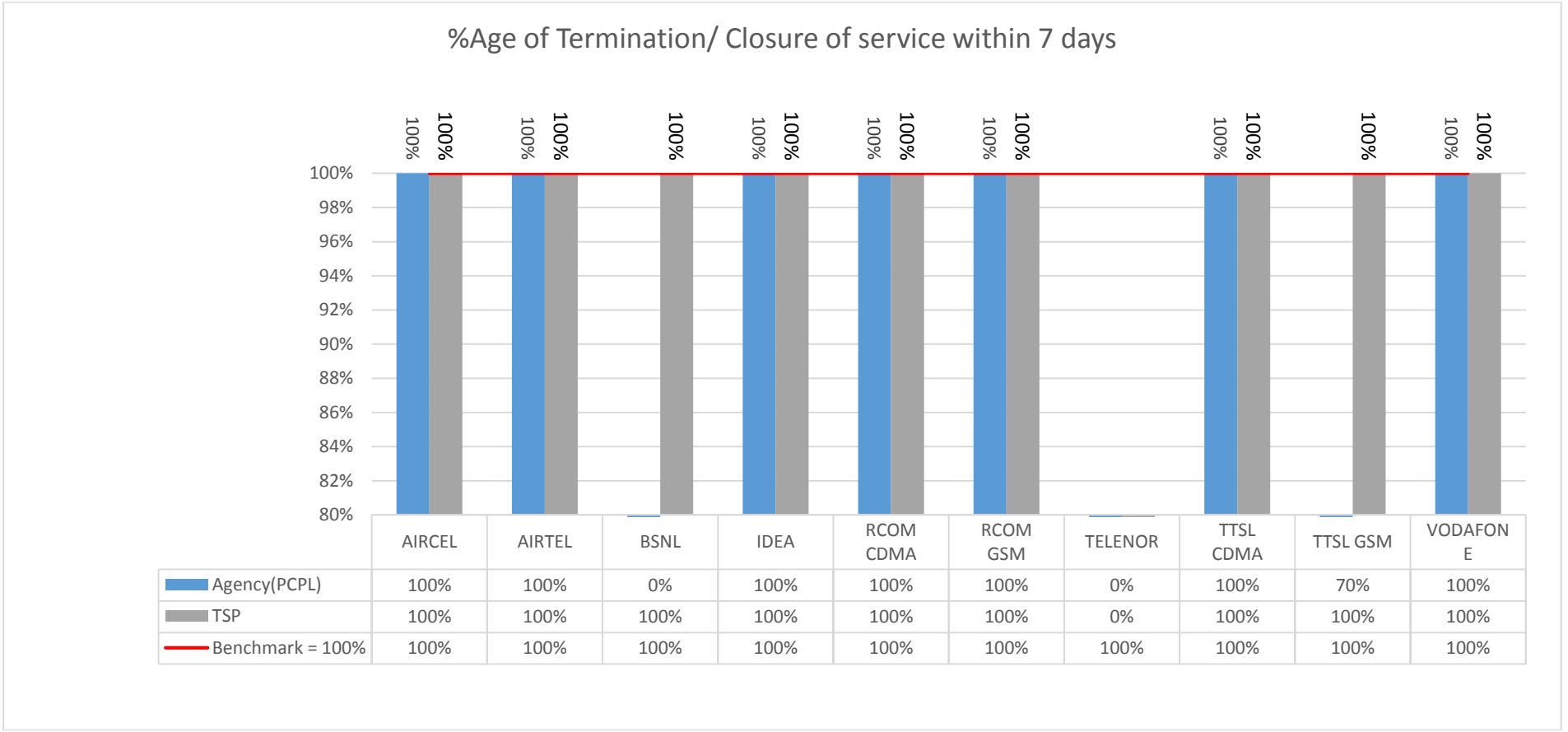
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	98.28%	100.00%	0.00%	95.70%	99.13%	99.57%	99.04%	0.00%	99.73%	100.00%
TSP	98.28%	100.00%	99.00%	95.70%	99.13%	99.57%	99.04%	100.00%	99.73%	100.00%
Live Calling	98%	100%	0%	100%	99%	99%	0%	0%	98%	0%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

13.6.7. %AGE OF CALL ANSWERED BY THE OPERATORS (VOICE TO VOICE) WITHIN 90 SECONDS



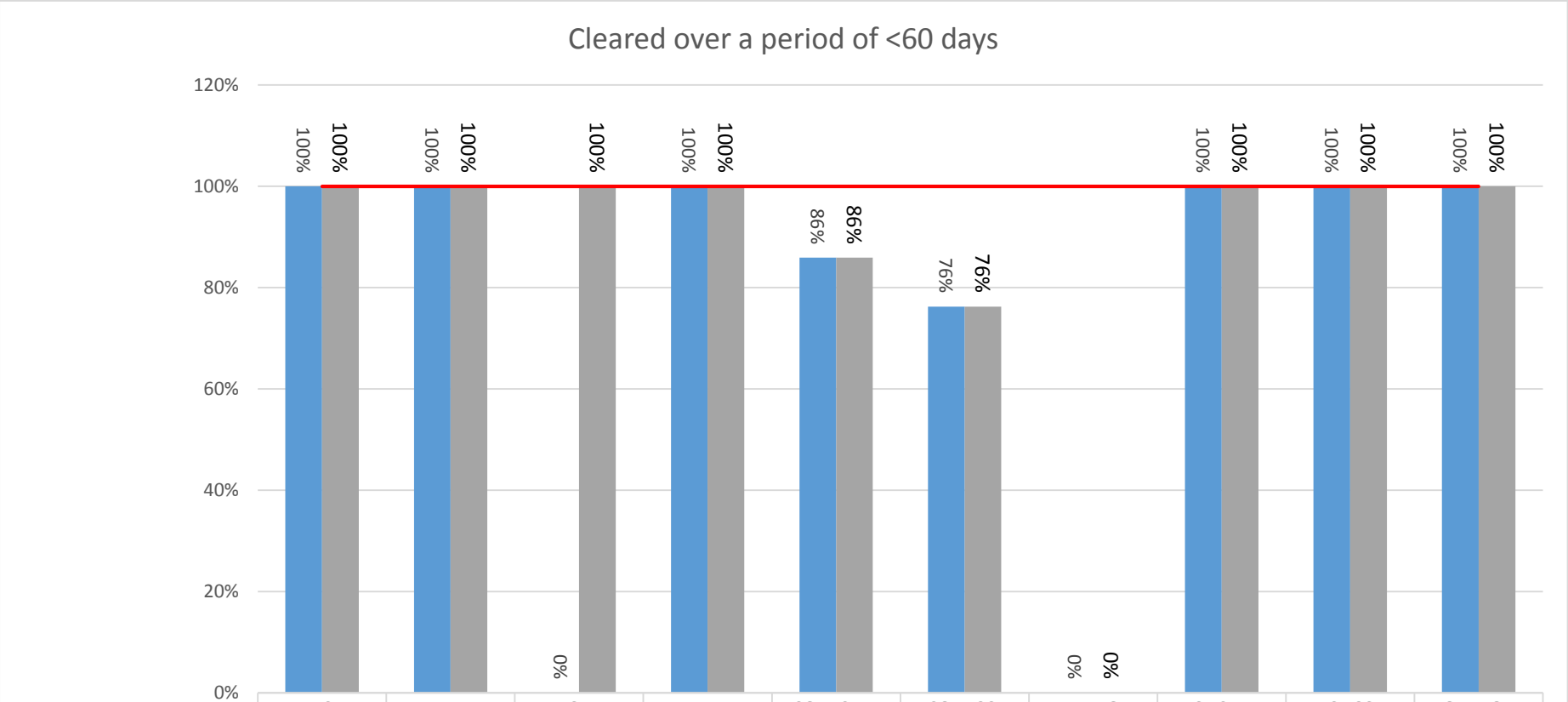
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	95.57%	77.03%	0.00%	99.74%	88.15%	93.74%	98.63%	99.77%	97.56%	98.85%
TSP	95.57%	76.93%	97.14%	99.74%	88.15%	93.74%	98.63%	99.77%	97.56%	98.86%
Live Calling	98.24%	98.42%	0.00%	99.98%	96.04%	98.68%	0.00%	99.49%	98.89%	0.00%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

13.6.8. % OF TERMINATION/ CLOSURE OF SERVICE WITHIN 7 DAYS (100 %)



	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	100%	100%	0%	100%	100%	100%	0%	100%	70%	100%
TSP	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

13.6.9. CLEARED OVER A PERIOD OF <60 DAYS (100%)



	AIRCEL	AIRTEL	BSNL	IDEA	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Agency(PCPL)	100%	100%	0%	100%	86%	76%	0%	100%	100%	100%
TSP	100%	100%	100%	100%	86%	76%	0%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

14 KEY FINDINGS

NETWORK FINDINGS (2G):

- TTSL GSM has parameter value of 94.88% and has failed to meet the benchmark of ≥ 95% Call set-up Success rate (within Licensee own network)
- Telenor has parameter value of 3.75% and has failed to meet the benchmark of ≤ 2% for TCH Congestion
- Telenor has parameter value of 8.38% and has failed to meet the benchmark of ≤ 3% for Worst affected cell having more than 3% TCH drop
- TTSL GSM has parameter value of 3.25% and has failed to meet the benchmark of ≤ 3% for Worst affected cell having more than 3% TCH drop
- Telenor has parameter value of 94.72% and has failed to meet the benchmark of ≥ 95% for percentage of connection with good voice quality.

NETWORK FINDINGS (3G):

- AIRCEL has parameter value of 5.03% and has failed to meet the benchmark of ≤ 3% for Worst affected cell having more than 3% TCH drop

CUSTOMER SERVICE DELIVERY:

- TTSL GSM has parameter value of 69.59% and has failed to meet the benchmark of = 100% for Percentage of termination/closure of service within 7 days
- RCOM CDMA has parameter value of 85.93% and has failed to meet the benchmark of = 100% for refund of deposits after closure cleared over a period of < 60 days
- RCOM GSM has parameter value of 76.26% and has failed to meet the benchmark of = 100% for refund of deposits after closure cleared over a period of < 60 days
- AIRTEL has parameter value of 77.03% and has failed to meet the benchmark of ≥ 95% for Percentage of call answered by the operators (voice to voice) within 90 seconds
- RCOM CDMA has parameter value of 88.15% and has failed to meet the benchmark of ≥ 95% for Percentage of call answered by the operators (voice to voice) within 90 seconds
- RCOM GSM has parameter value of 93.74% and has failed to meet the benchmark of ≥ 95% for Percentage of call answered by the operators (voice to voice) within 90 seconds

PHISTREAM
EMPOWERING LEADERSHIP, TRANSFORMING BUSINESS

TRAI
सत्यमेव जयते
Telecom Regulatory Authority of India
(IS/ISO 9001-2008 Certified Organisation)



AUDIT & ASSESSMENT OF QUALITY OF SERVICE

NORTH ZONE – UP-EAST CIRCLE

WIRELINE & BROADBAND SERVICES (APRIL TO JUNE 2016)

PREPARED BY:

PHISTREAM CONSULTING PRIVATE LIMITED
(An ISO – 9001:2008 Certified Company)
Office: C – 56A/5, First Floor, Sector – 62, Noida ● **Telephone:** +91-120-644-7778 ●
Email: info@phistream.com

TABLE OF CONTENTS

1. INTRODUCTION

1.1. ABOUT TRAI

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

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

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

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

1.2. ABOUT PHISTREAM CONSULTING PRIVATE LIMITED

Phistream Consulting Private Limited is an ISO: 9001 certified company who are one of the pioneers in the field of technical audit, quality assurance and third party inspection services. Established more than a decade ago in 2004, we aspire to provide longer term savings based on year-on-year productivity. With our size, we are nimble and aspire to being a full service partner for providing consultancy services.

We have been helping our clients by determining the best solutions and enabling businesses to enjoy the benefits of top-notch support without distracting their team from the main business focus. Our business analysts have enough experience to get involved at the requirements gather stage through consulting work handing off a detailed requirements document to our operations staff who in turn can train our support and maintenance resources for ongoing engagement.

In keeping with our goal of being a one stop quality assurance and consulting partner, our specialists employ a strategy and consulting-based implementation methodology and capitalize on strong program governance to offer a wide range of services for various industry verticals.

1.3. OBJECTIVES

The primary objective of the Audit module is to:

- Audit and Assess the Quality of Services being rendered by Basic (Wireline), Cellular Mobile (Wireless), and Broadband service against the parameters notified by TRAI. (The parameters of Quality of Services (QoS) have been specified by in the respective regulations published by TRAI).
- This report covers the audit results of the audit conducted for Cellular Mobile (Wireless) services in UP East circle.

1.4. COVERAGE

The audit was conducted in UP East Circle covering all SSAs (Secondary Switching Areas).

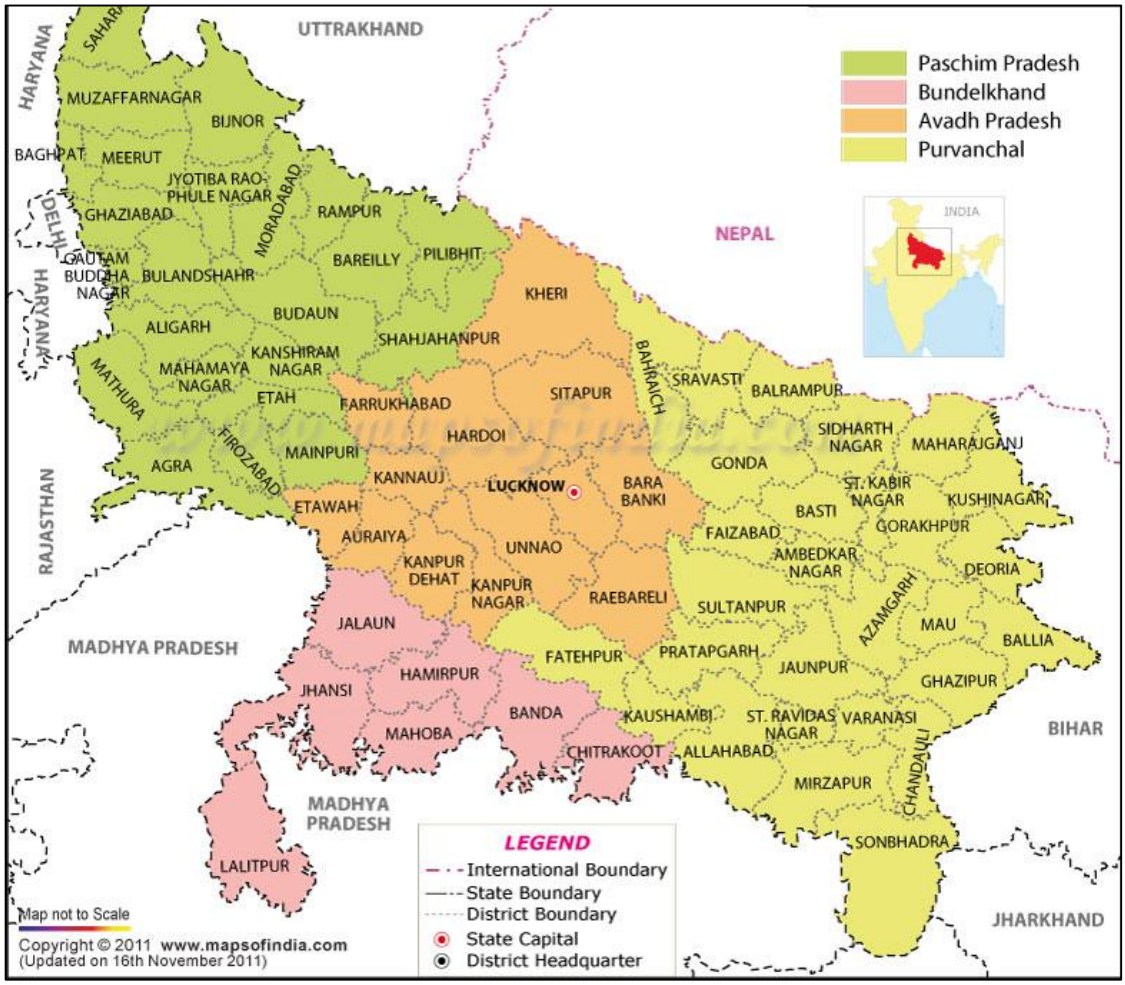
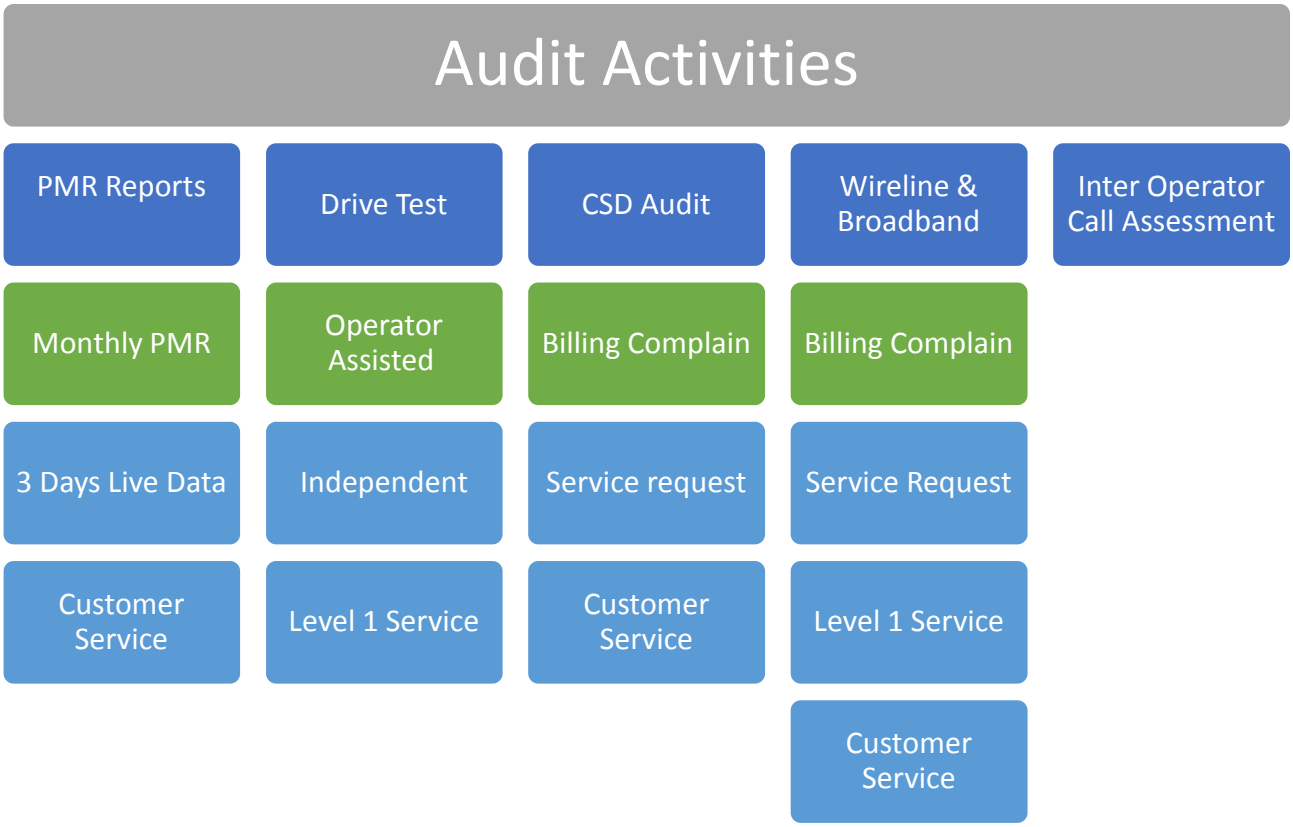


Image Source: Map of India

1.5. FRAMEWORK USED



2. Basic Telephone Service (Wireline) and Broadband Services

2.1. Wireline Service Parameter

S. No.	Name of Parameter	Benchmark
1	Fault incidences (Fault incidences subscribers / month)	≤ 7
2	Fault repair by next working day	For urban areas: By next working day: ≥85% and within 5 days: 100%. For rural and hilly areas: By next working day: ≥75% and within 7days: 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. Faults pending for> 15 days: rent rebate for one month.
3	Mean Time To Repair (MTTR)	≤ 10 Hrs
4	Point of Interconnection (POI) Congestion (on individual POI)	≤ 0.5%
5	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle
6	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
7	Resolution of billing / charging complaints	≥ 98% within 4 weeks 100% within 6 weeks
8	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	Within one week of resolution of complaint
9	Response Time to the customer for assistance	
	(a) Accessibility of call centre/ customer care	≥ 95%
	(b)Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 95%
10	Termination/ closure of service	≤ 7
11	Time taken for refund of deposits after closures	100% within 60 days.

2.2. BROADBAND SERVICE PARAMETER

S. No.	Name of Parameter	Benchmark
1	Service provisioning\ Activation	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 ofRs.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.
2	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 to one month of minimum monthly usage allowance.
3	Billing Performance	
	• Billing complaints per 100 bills issued	<2%
	• %age of Billing Complaints Resolved	100% within 4 weeks
	• Time taken for refund of deposits after closure	100% within 60 days
4	Response time to the customer assitance	% age of calls answered by operator (Voice to Voice) Within 60 seconds > 60% Within 90 seconds > 80%
5	Bandwidth Utilization/ throughput	
	a) Bandwidth Utilization	
	i) POP to ISP Gateway Node (Intra – Network) Links.	<80% link(s)/route bandwidth utilization during peak hours (TCBH).
	ii) ISP Gateway Node to IGSP / NIXI upstream links for international connectivity.	
	b) Broadband connection speed (download).	Subscribed Broadband Connection Speed to be met >80% from ISP Node to User.
6	Service Availability / Uptime for all users	> 98%
7	Packet Loss (for wired broadband access)	<1%
8	Network Latency (for wired broadband access)	
	• User reference point at POP\ ISP gateway node to international gateway.	<120 msec
	• User reference point at ISP Gateway Node to international nearest NAP port abroad.	<350 msec
	• User reference point at ISP Gateway Node to international nearest NAP port abroad	<800 msec

9	Customer perception of services	
a	% satisfied with the provision of services.	>90%
b	% satisfied with the billing performance.	>90%
c	% satisfied with help services	>90%
d	% satisfied with network performance, reliability and availability	>85%
e	% satisfied with maintainability	>85%
f	% satisfied with Overall customer satisfaction	>85%
g	% satisfied Customer satisfaction with offered supplementary services such as allocation of static/fixed IP addresses, email-id's.	>85%

3. EXECUTIVE SUMMARY : BASIC (WIRELINE)

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

3.1. BASIC (WIRELINE)

The QoS audit for basic (wire line) service was undertaken for assessment of quarterly performance of the service providers for quarter ended June-2016.

Sampling has been done for each service provider separately as per TRAI Guideline. In an LSA, sample has been included all POPs located in 10% of SDCAs in the LSA or 10 SDCAs, whichever is more, subject to maximum of the number of SDCAs covered by the service provider in the LSA. SDCAs selected should be evenly spread over the LSA and shall include major population centers. List and details of POPs shall be obtained from NOC/ISP Node of the operators. The performance of the Service providers against each parameter has been evaluated by taking average of performance value of each parameter for all the exchanges of the respective service providers. The averaged value of each parameter has been tabulated as follows.

For BSNL exchanges, performance against each parameter has been evaluated by taking average of performance value of each parameter for all the audited exchanges. The average value of each parameter has been tabulated as follows:

Sr. No	Service Provider	Circle	Audit Location	Total Exchange (Urban+Rural)	No. of Urban/Rural Exchanges Covered for audit	Total SDCA Coverd for audit
3	AIRTEL	Rajasthan	BHARTI AIRTEL LIMITED, LUCKNOW, UP	1	1	1
1	BSNL	Rajasthan	LUCKNOW,ALLAHABAD	2131	170	16
2	RCL	Rajasthan	DAKC, MUMBAI	1	1	1
4	TTSL	Rajasthan	ALLAHABAD	1	1	1
Total Exchanges at present				**2133**	**172**	**18**

3.2. SERVICE PROVIDER PERFORMANCE REPORT BASED ON QUARTERLY MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS

AVERAGED QUARTERLY (APR TO JUNE 16) AUDIT DATA FOR WIRELINE (BASIC) SERVICES – UPE CIRCLE							
Wireline Audit Data		Benchmark	Audit Period	BHARTI AIRTEL	BSNL	RCL	TTL
S/ N	Name of Parameter			WIRELINE SERVICE PROVIDERS			
1	**Fault incidences**						
	% of (No. of faults/100 subscribers /month)	*< 7%*	Quarterly	DNA	3.70%	0.04%	1.62%
2	**Faults Repair/Restoration Time**						
	% of fault repair by next working day (Urban Area)	*>85%*	Quarterly	87.89%	90%	100%	100%
	% of fault repair Within 5 days (Urban Area)	*100%*	Quarterly	100%	100%	100%	100%
	% of fault repair by next working day (Rural & hilly Area)	*>75%*	Quarterly	DNA	90%	DNA	DNA
	% of fault repair Within 7 days (Rural & hilly Area)	*100%*	Quarterly	DNA	100%	DNA	DNA
	Mean time to Repair(MTTR)	*≤10 Hrs*	Quarterly	6.11	NP	5.4	1.74
3	**Rent Rebate**						
	Fault pending > 3 days & <7 days	*Rebate for 7 days*	Quarterly	263	0	0	0
	Fault Pending > 7 days & < 15 days	*Rebate for 15 days*	Quarterly	0	0	0	0
	Fault pending > 15 days	*Rebate for 1 month*	Quarterly	0	0	0	0
4	**Metering & Billing Credibility**						
	% of disputed Bills over bills issued (Post Paid)	*< 0.1%*	Quarterly	0.00%	0.00%	0.00%	0.10%
	% of Pre-paid Charging Complaints	*< 0.1%*	Quarterly	DNA	DNA	DNA	DNA
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	*98% within 4 weeks*	Quarterly	100%	100%	100%	100%
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	*100% within 6 weeks*	Quarterly	100%	100%	100%	100%
	Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	*<=1 week*	Quarterly	100%	100%	100%	100%
5	**POI Congestion**						
	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0
6	**Response Time to customer for assistance**						
	% Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	*>=95%*	Quarterly	100%	97.95%	96.80%	DNA
	% age of calls answered by the operators (voice to voice) within 90 seconds.	*>=95%*	Quarterly	91.00%	97.80%	98.7	DNA
7	**Customer care(promptness in attending to customers request)**						
	Termination / Closures	*100% within <=7days*	Quarterly	100%	100%	100%	DNA
	Time taken for refunds of deposit after closures	*100% within 60 days*	Quarterly	100%	100%	100%	DNA

3.3. SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS LIVE MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS

3 DAYS LIVE DATA FOR WIRELINE (BASIC) SERVICES – UPE CIRCLE							
3 days live Wireline Audit Data		Benchmark	Audit Period	BHARTI AIRTEL	BSNL	RCL	TTL
S/ N	Name of Parameter			WIRELINE SERVICE PROVIDERS			
1	**POI Congestion**						
	No. of POI's having congestion >0.5%		Live	0	0	0	0
2	**Response Time to customer for assistance**						
	A) Total no of calls attempted to customer care /Call center		Live	8696	10192	1614	DNA
	B) Total no. of calls successfully established to customer care/Call center		Live	8696	9982	1574	DNA
	C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Live	100%	97.94%	98.52%	DNA
	D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		Live	854	1701	1574	DNA
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Live	779	1698	1556	DNA
	F) % age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	>=95%	Live	91.22%	99.82%	99%	DNA

3.4. KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINE)

Fault Incidences: The audit of the service providers revealed that the performance of all service providers was well within the benchmark against the benchmark of < 7 %.

Fault Repair/Restoration Time: All Operators met the benchmark on this parameter.

Mean Time to Repair: All operators met the benchmark for MTTR.

Metering and Billing performance: For this parameter also, the performance of the service providers was found well within the compliance benchmarks.

POI Congestion: All operators were found meeting the benchmark for this parameter.

Response Time to Customer for assistance: For percentage of calls getting connected to call centre, the performance of all service providers was within the benchmark of >95%.
With respect to the parameter of **calls answered by operator (voice to voice),** the performance of all service providers was within the benchmark of >95%.

Termination/Closures: For this parameter, the performance of all the service providers was within the prescribed benchmark.

Time taken for refund of deposit: For this parameter, the performance of all the service providers was within the prescribed benchmark.

3.5. INTER OPERATOR CALL ASSESSMENT (WIRELINE)

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in UPE Circle during the time 1000 to 1300 Hrs and 1500 to 1700 was carried out by auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT						
Calling Operators	**Circle Name**	**Total No. of calls Made**	**BHARTI AIRTEL**	**BSNL**	**RCL**	**TTL**
BHARTI AIRTEL	UPE	100	--	100%	100%	100%
BSNL	UPE	100	100%	--	100%	100%
RCL	UPE	100	100%	100%	--	100%
TTL	UPE	100	100%	100%	100%	--
VODAFONE	UPE	100	100%	100%	100%	100%

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. Thus there was no remarkable problem in interconnection from one operator to other operators.

3.6. 9.5 LEVEL-1 LIVE CALLING (WIRELINE)

SR. NO.	EMERGENCY NUMBER	CIRCLE	BSNL	RCL	TSL
1	100	UP East	√	√	√
2	101	UP East	√	√	√
3	102	UP East	√	√	√
4	104	UP East	√	√	√
5	108	UP East	√	√	√
6	138	UP East	√	√	√
7	149	UP East	×	×	×
8	181	UP East	√	√	√
9	182	UP East	√	√	√
10	1033	UP East	√	√	√
11	1037	UP East	×	×	×
12	1056	UP East	×	×	×
13	1060	UP East	×	×	×
14	1063	UP East	×	×	×
15	1064	UP East	×	×	×
16	1070	UP East	×	×	×
17	1071	UP East	×	×	×
18	1072	UP East	√	√	√
19	1073	UP East	×	×	×
20	1077	UP East	×	×	×

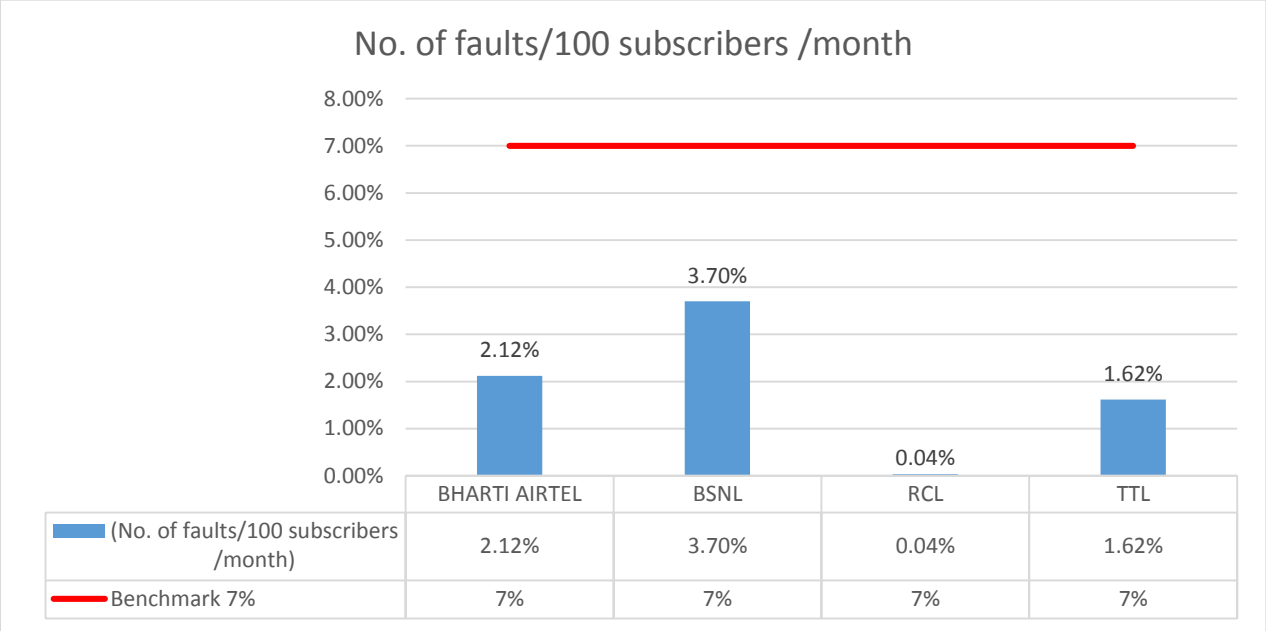
21	1090	UP East	×	×	×
22	1091	UP East	×	×	×
23	1097	UP East	√	√	√
24	1099	UP East	×	×	×
25	10580	UP East	×	×	×
26	10589	UP East	×	×	×
27	10740	UP East	×	×	×
28	10741	UP East	×	×	×
29	1511	UP East	×	×	×
30	1512	UP East	×	×	×
31	1514	UP East	×	×	×
32	15100	UP East	√	√	√
33	155304	UP East	×	×	×
34	155214	UP East	×	×	×
35	1903	UP East	√	√	√
36	1909	UP East	√	√	√
37	1912	UP East	√	√	√
38	1916	UP East	×	×	×
39	1950	UP East	√	√	√

3.7. CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)

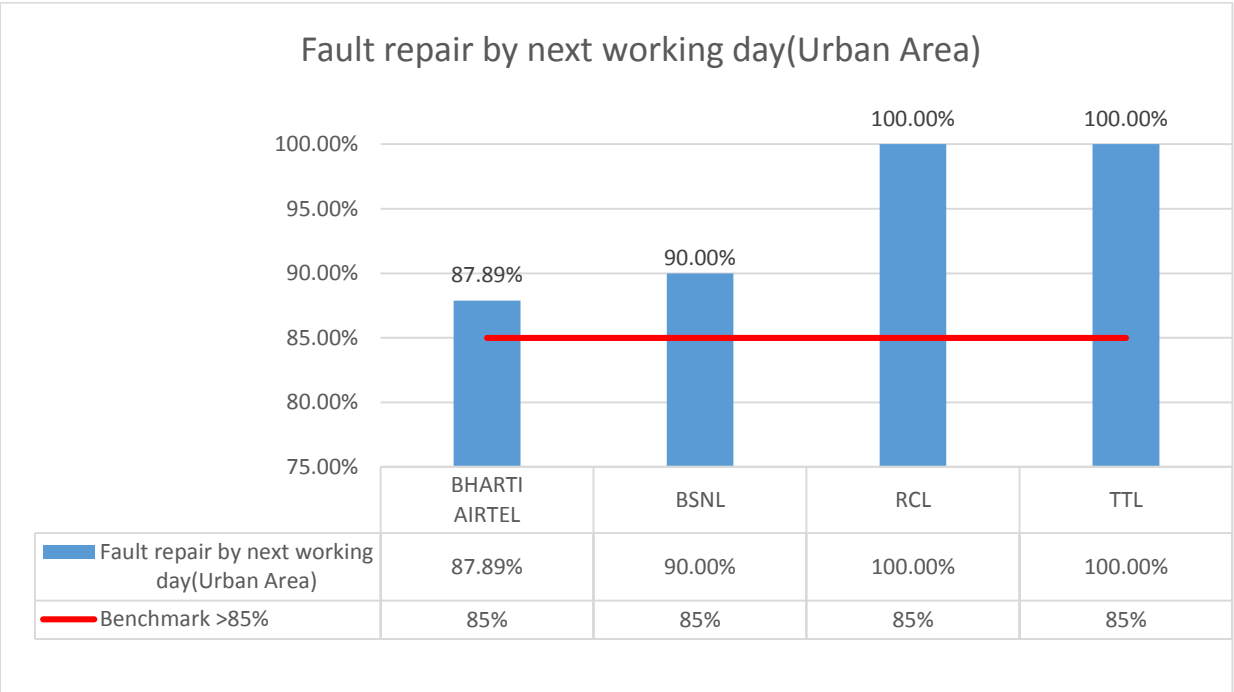
LIVE CALLING TO CALL CENTRE						
Parameters	**Benchmark**	**Circle Name**	**BHARTI AIRTEL**	**BSNL**	**RCL**	**TTL**
Total No. of calls Attempted		UPE	100	100	100	100
A) Total no of calls attempted to customer care/Call center		UPE	100	100	100	100
B) Total no. of calls successfully established to customer care/Call center		UPE	100	100	100	100
C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	UPE	100.00%	100.00%	100.00%	100.00%
D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		UPE	100	100	100	100
E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UPE	100	100	100	100
F) % age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	>=95%	UPE	100.00%	100.00%	100.00%	100.00%

In case of calls answered by operators (voice to voice), when test calls were made to the call centers of different service providers, 100% of calls were answered by the call center operators within stipulated time in the network of Airtel, RCL, Vodafone, BSNL and TTL.

3.8. GRAPHICAL REPRESENTATION

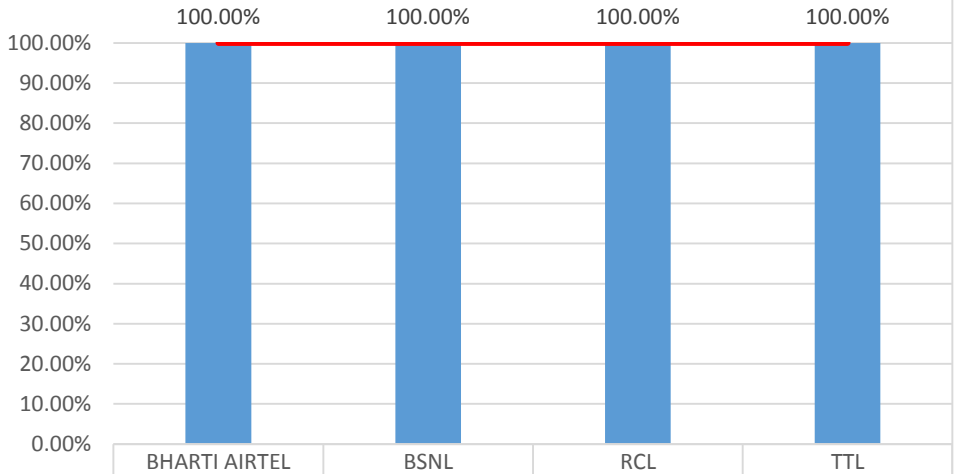


	BHARTI AIRTEL	BSNL	RCL	TTL
(No. of faults/100 subscribers /month)	2.12%	3.70%	0.04%	1.62%
Benchmark 7%	7%	7%	7%	7%



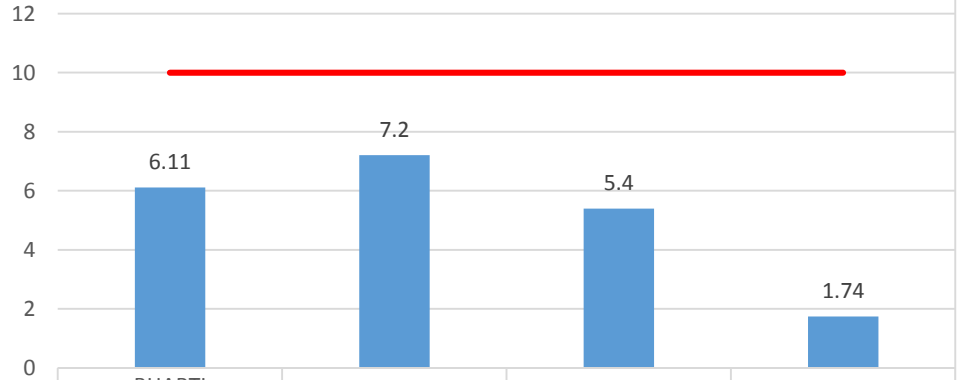
	BHARTI AIRTEL	BSNL	RCL	TTL
Fault repair by next working day(Urban Area)	87.89%	90.00%	100.00%	100.00%
Benchmark >85%	85%	85%	85%	85%

Percentage of fault repair within 5 days (Urban Area)



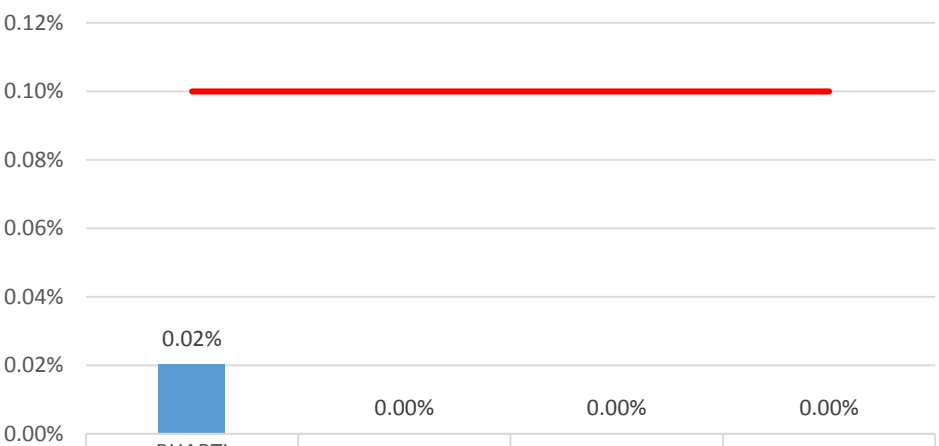
	BHARTI AIRTEL	BSNL	RCL	TTL
% of fault repair within 5 days (Urban Area)	100.00%	100.00%	100.00%	100.00%
Benchmark 100%	100%	100%	100%	100%

Mean time to Repair(MTTR)



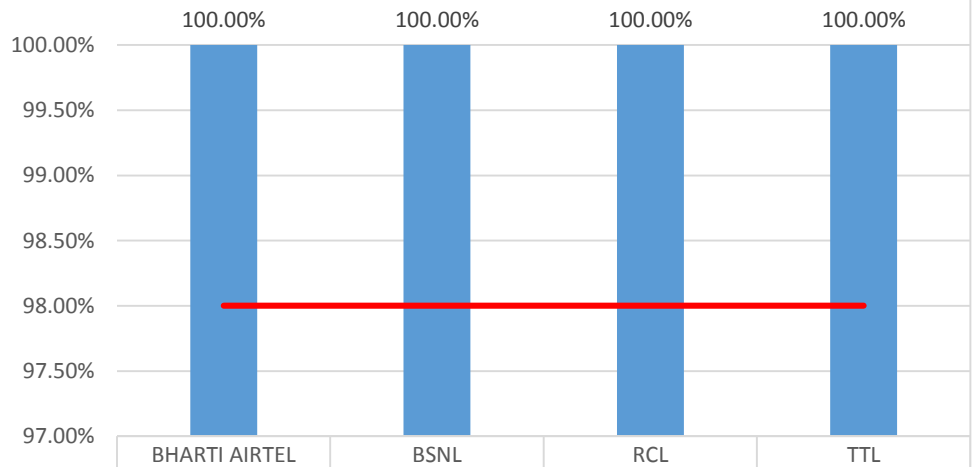
	BHARTI AIRTEL	BSNL	RCL	TTL
Mean time to Repair(MTTR)	6.11	7.2	5.4	1.74
Benchmark ≤10 Hrs	10	10	10	10

Metering & Billing Performance



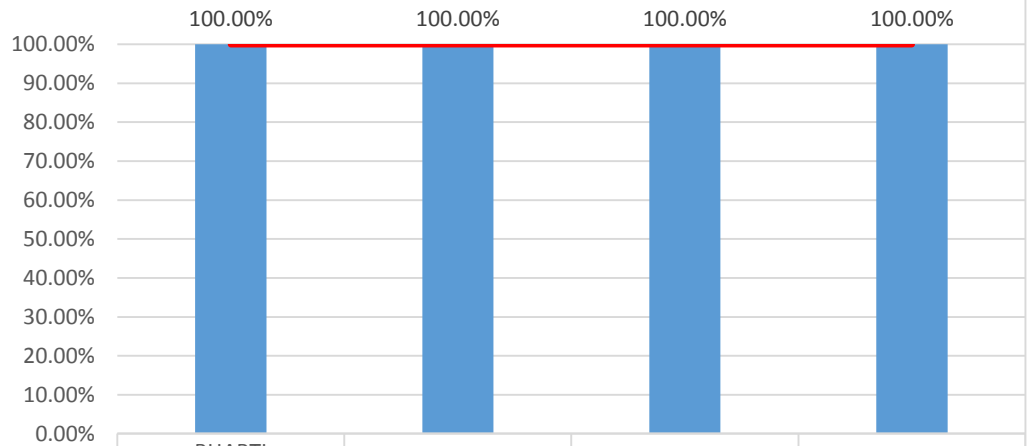
	BHARTI AIRTEL	BSNL	RCL	TTL
% of disputed Bills over bills issued (Post Paid)	0.02%	0.00%	0.00%	0.00%
Benchmark < 0.1%	0.10%	0.10%	0.10%	0.10%

Percentage of billing complaints resolved within 4 weeks



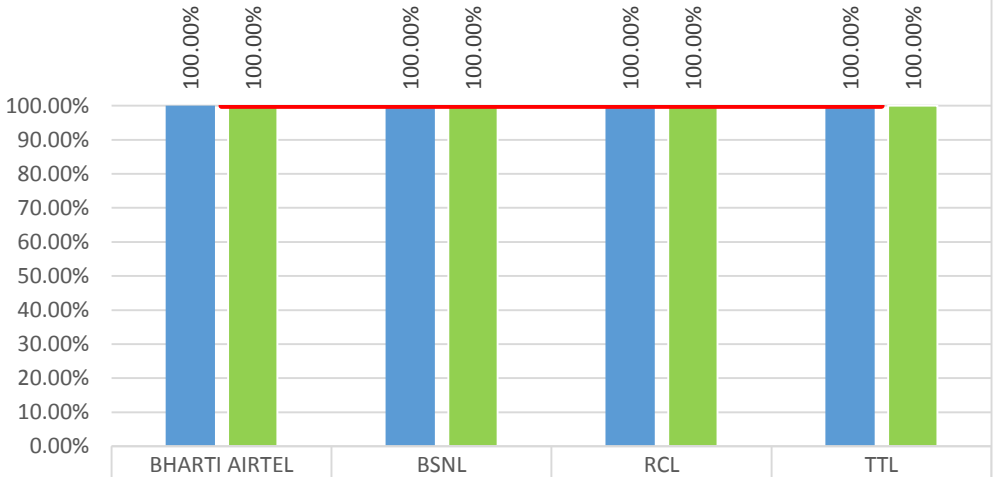
	BHARTI AIRTEL	BSNL	RCL	TTL
% of billing complaints resolved within 4 weeks	100.00%	100.00%	100.00%	100.00%
Benchmark < 98%	98.00%	98.00%	98.00%	98.00%

Percentage of billing complaints resolved within 6 weeks



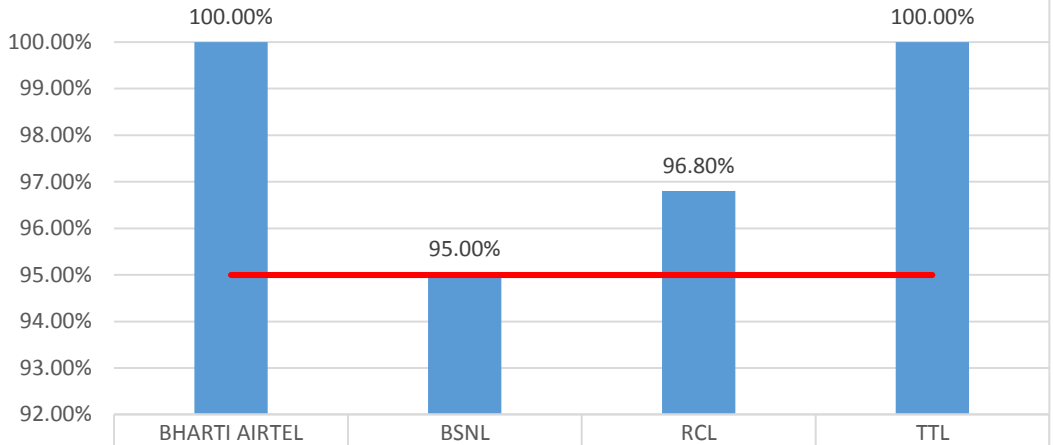
	BHARTI AIRTEL	BSNL	RCL	TTL
% of billing complaints resolved within 6 weeks	100.00%	100.00%	100.00%	100.00%
Benchmark < 100%	100.00%	100.00%	100.00%	100.00%

Customer care(promptness in attending to customers request)



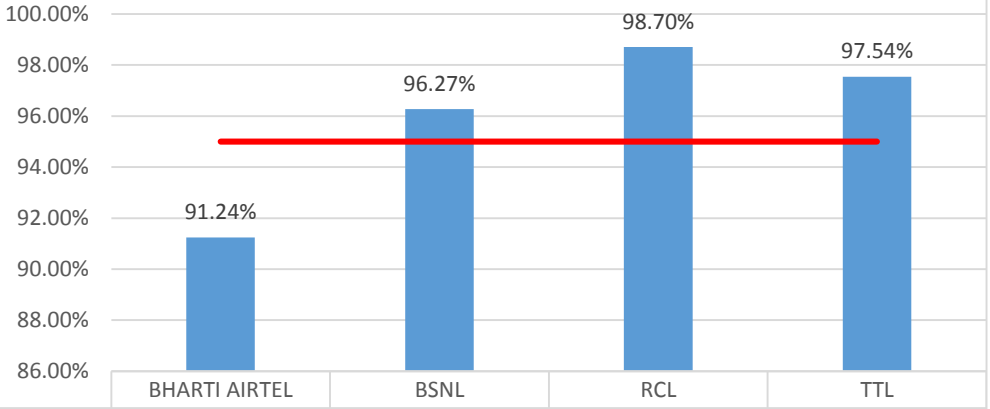
	BHARTI AIRTEL	BSNL	RCL	TTL
Termination / Closures	100.00%	100.00%	100.00%	100.00%
Time taken for refunds of deposit after closures	100.00%	100.00%	100.00%	100.00%
Benchmark < 100%	100.00%	100.00%	100.00%	100.00%

Accessibility of Call centre/customer Care



	BHARTI AIRTEL	BSNL	RCL	TTL
Accessibility of Call centre/customer Care	100.00%	95.00%	96.80%	100.00%
Benchmark >=95%	95.00%	95.00%	95.00%	95.00%

Percentage of calls answered by operator(voice to voice) within 90 seconds



	BHARTI AIRTEL	BSNL	RCL	TTL
% age of calls answered by operator(voice to voice) within 90 seconds	91.24%	96.27%	98.70%	97.54%
Benchmark >=95%	95.00%	95.00%	95.00%	95.00%

4. EXECUTIVE SUMMARY : BROADBAND

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

4.1. QUALITY OF SERVICE AUDIT OF BROADBAND SERVICE PROVIDERS

Phistream has 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 as per TRAI guideline; Sampling shall be done for each service provider separately. In an LSA, sample shall include all POPs located in 10% of SDCAs in the LSA or 10 SDCAs, whichever is more, subject to maximum of the number of SDCAs covered by the service provider in the LSA. SDCAs selected should be evenly spread over the LSA and shall include major population centers. List and details of POPs shall be obtained from NOC/ISP Node of the operators. A service areal circle in the contracted Zone shall be audited only once in a year.

Discussion with the private broadband service providers reveals that there is no concept of their PoPs on SDCA basis; they are maintaining their entire data on centralized basis so audit has been done for the centralized data.

Audit was done for the following Broadband service Providers in Rajasthan circle.

SL. NO.	NAME OF BROADBAND SERVICE PROVIDERS	LOCATION OF AUDIT / POP
1	**BHARTI AIRTEL**	BHARTI AIRTEL LIMITED, LUCKNOW, UP
2	**BSNL**	BARABANKI, LAKHIMPUR KHIRI, FAIZABAD SSA
3	**RCL**	DAKC, MUMBAI
4	**TIKONA**	TIKONA, LUCKNOW, UP
5	**PACENET**	BROADBAND PACENET INDIA PVT LTD, S-23,AJAY ENCLAVE, NEAR SUBHASH NAGAR METRO STATION, NEW DELHI

4.2. QUARTERLY MEASURMENT DATA FOR BROADBAND SERVICE PROVIDERS

AVERAGED QUARTERLY (APR TO JUNE-16) AUDIT DATA FOR BROADBAND SERVICES									
Broadband Audit Data		Bench-mark	Circle Name	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS					
1	Service Provisioning/Activation Time								
	A) No of connections registered during the period		UPE	3415	1127	913	5899	796	211
	B) Total number of connections provided within 15 days of registration on demand during the period		UPE	3415	1127	913	5899	796	207
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	*<15 days*	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	98.10%
	D)Total number of connections provided after 15 days of registration on demand		UPE	0	0	0	0	0	0
	E) %age of connections provided after 15 days of registration on demand		UPE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	F) 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/ per day.*	UPE	0	0	0	0	0	0
2	Fault Repair/Restoration Time								
	A) Total number of faults registered during the period		UPE	6063	954	964	12979	1890	79
	B) Total number of faults repaired by next working day		UPE	5550	899	964	11718	1689	79
	C) % age of faults repaired by next working day	*>90%*	UPE	91.54%	94.23%	100.00%	90.28%	89.37%	100.00%
	D) Total number of faults repaired within three working days		UPE	6005	954	964	12914	1884	79
	E)% age of faults repaired within three working days	*≥99%*	UPE	99.04%	100.00%	100.00%	99.50%	99.68%	100.00%
3	Rent 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)		UPE	0	0	0	291	0	0

	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		UPE	0	0	0	231	0	0
	C) Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		UPE	0	0	0	77	0	0
4	**Billing Performance**								
	A) Total bills generated during period		UPE	131018	8242	37004	62888	DNA	853
	B) Total complaints received from customers/ Bills disputed		UPE	12	0	42	584	DNA	0
	C) Billing complaints per 100 bills issued	*<2%*	UPE	0.01%	0.00%	0.11%	0.93%	DNA	0.00%
	D) Total number of complaints resolved in 4 weeks from date of receipt		UPE	12	0	42	584	DNA	0
	E) %age billing complaints resolved in 4 weeks	*100%*	UPE	100.00%	100.00%	100.00%	100	DNA	100.00%
	F) Total number of cases requiring refund of deposits after closure		UPE	320	47	6	20	DNA	0
	G) Total number of cases where refund was made in <60 days		UPE	320	43	6	20	DNA	0
	H) Percentage cases in which refund received within 60 days	*100%*	UPE	100.00%	**91.49%**	100.00%	100.00%	DNA	100.00%
5	**Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)**								
	A) Total number of calls received by the operator		UPE	72776	81360	98281	122322	311819	24
	B) Total number of calls answered by the operator within 60 seconds		UPE	59702	77487	93118	79525	21720	24
	C) % age calls answered by the operator in 60 seconds	*>60%*	UPE	82.04%	95.24%	94.75%	65.01%	72.79%	100.00%
	D) Total number of calls answered by the operator within 90 seconds		UPE	62976	79936	93864	102162	231983	24
	E) % age calls answered by the operator within 90 seconds	*>80%*	UPE	86.53%	98.25%	95.51%	83.52%	80.42%	100.00%
6	**Bandwidth Utilization/ Throughput: (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.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).**								
6.1	**POP to ISP Gateway Node [Intra-network] Link(s)**								
	A) Total Bandwidth Available at the link for the period days		UPE	25500	18000	6000	7630	5425	693

	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)		UPE	21145.4	7803	1253.61	4981.71	5124	545
	C) % age Bandwidth utilized during the period	*<80%*	UPE	82.92%	43.35%	20.89%	65.29%	94.45%	**78.64%**
6.2	**A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity**								
	A) Total number of upstream links for International connectivity		UPE	6	DNA	12	7	6	DNA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		UPE	0	DNA	0	0	0	DNA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		UPE	25500	DNA	348000	6770	5425	DNA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mpbs		UPE	21145.4	DNA	142774	5136.1	5154	DNA
	E) %age International Bandwidth utilization during peak hours (TCBH)	*<80%*	UPE	82.92%	DNA	41.03%	75.87%	95.00%	DNA
6.3	Broadband Connection Speed (download) - from ISP Node to User								
	A) Total committed download speed to the sample subscribers (In mpbs)		UPE	6	6	3	12288	15	9
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		UPE	6.33	5.57	2.55	10461	15	8.21
	C) % age subscribed speed available to the subscriber during TCBH	*>80%*	UPE	105.50%	92.83%	85.00%	85.13%	100.00%	91.22%
7	**Service Availability/Uptime**								
	A) Total operational Hours		UPE	95380464	2184	2184	2184	2184	2184
	B) Total downtime (In hours)		UPE	67157.28	1	15.64	7.384	0.15	2
	C) Total time when the service was available (In Hrs)		UPE	95313306.72	2183	2168.36	2176.616	2183.85	2182.00
	D) % age of Service availability uptime	*>98%*	UPE	99.93%	99.95%	99.28%	99.66%	99.99%	99.91%
8	**Packet Loss**								
	A) Total number of ping packets transmitted		UPE	3000	3000	91000	3000	3000	3000
	B) Total number of ping packets lost		UPE	0	7	351	0	0	2
	C) % age packet loss	*<1%*	UPE	0.00%	0.23%	0.39%	0.00%	0.00%	0.07%

9	**Network latency (for wired broadband access)**								
9.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway								
	A) Total number of ping packets transmitted		UPE	3000	3000	3000	4000	3000	3000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	133.4	71.46	9	120	213	258
	C) Average round trip tip time for all the ping transmitted	*<120 ms*	UPE	44.46	23.82	3	40	71	86
9.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)								
	A) Total number of ping packets transmitted		UPE	3000	3000	3000	4000	3000	3000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	331	269.82	72	147	333	213
	C) Average round trip tip time for all the ping transmitted	*<350 ms*	UPE	112.05	89.94	24	49	111	71
9.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)								
	A) Total number of ping packets transmitted		UPE	DNA	DNA	DNA	DNA	DNA	DNA
	B) Total round trip time for all the ping packets transmitted during the period		UPE	DNA	DNA	DNA	DNA	DNA	DNA
	C) Average round trip tip time for all the ping transmitted	*<800 ms*	UPE	DNA	DNA	DNA	DNA	DNA	DNA

4.3. SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS MEASUREMENT DATA VERIFICATION FOR BROADBAND SERVICE PROVIDERS

3 DAYS LIVE DATA FOR BROADBAND SERVICES									
3 days live Broadband Audit Data		**Bench-mark**	**Circle Name**	**BHARTI-AIRTEL**	**BSNL (ALBD)**	**RCL**	**TIKONA**	**DEN NETWORKS**	**PACENET**
S/ N	**Name of Parameter**			**BROADBAND SERVICE PROVIDERS**					
1	**Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)**								
	A) Total number of calls received by the operator		UPE	5011	3869	3674	4305	9521	5

	B) Total number of calls answered by the operator within 60 seconds		UPE	4320	3850	3593	2861	8967	5
	C) % age calls answered by the operator in 60 seconds	*>60%*	UPE	86.21%	99.51%	97.80%	66.46%	95.00%	100.00%
	D) Total number of calls answered by the operator within 90 seconds		UPE	4508	3867	3629	3687	9118	5
	E) % age calls answered by the operator within 90 seconds	*>80%*	UPE	89.96%	99.95%	98.78%	85.64%	98.00%	100.00%
2	**Bandwidth Utilization/ Throughput: (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.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).**								
2.1	**POP to ISP Gateway Node [Intra-network] Link(s)**								
	A) Total Bandwidth Available at the link for the period days		UPE	25500	18000	6000	7695	5580	693
	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)		UPE	21145.4	7721	1518.5	5135.81	5068	551
	C) % age Bandwidth utilized during the period	*<80%*	UPE	82.92%	42.89%	25.31%	66.74%	90.82%	79.51%
2.2	**A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity**								
	A) Total number of upstream links for International connectivity		UPE	6	DNA	12	3	6	DNA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		UPE	0	DNA	0	0	0	DNA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		UPE	25500	DNA	348000	7125	5580	DNA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mpbs		UPE	21145.4	DNA	176971.2	5511.78	5068	DNA
	E) %age International Bandwidth utilization during peak hours (TCBH)	*<80%*	UPE	82.92%	DNA	50.85%	77.36%	90.82%	DNA

2.3	Broadband Connection Speed (download) - from ISP Node to User								
	A) Total committed download speed to the sample subscribers (In mpbs)		UPE	6	6	4.50	12288	15	10
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		UPE	6.33	5.3	4.29	11084	15	9.13
	C) % age subscribed speed available to the subscriber during TCBH	*>80%*	UPE	105.50%	88.33%	95.33%	90.20%	100.00%	91.30%
3	**Packet Loss**								
	A) Total number of ping packets transmitted		UPE	3000	3000	3000	3000	3000	3000
	B) Total number of ping packets lost		UPE	0	7	0	0	0	11
	C) % age packet loss	*<1%*	UPE	0.00%	0.23%	0.00%	0.00%	0.00%	0.37%
4	**Network latency (for wired broadband access)**								
4.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway								
	A) Total number of ping packets transmitted		UPE	3000	3000	3000	4000	3000	3000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	133.4	166.18	5.46	120	213	117
	C) Average round trip tip time for all the ping transmitted	*<120 ms*	UPE	44.46	55.39	1.82	40	71	39
4.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)								
	A) Total number of ping packets transmitted		UPE	3000	3000	3000	4000	3000	3000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	331	374.58	5.43	147	333	267
	C) Average round trip tip time for all the ping transmitted	*<350 ms*	UPE	112.05	124.86	1.81	49	111	89
4.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)								

	A) Total number of ping packets transmitted		UPE	DNA	DNA	DNA	DNA	DNA	DNA
	B) Total round trip time for all the ping packets transmitted during the period		UPE	DNA	DNA	DNA	DNA	DNA	DNA
	C) Average round trip tip time for all the ping transmitted	*<800 ms*	UPE	DNA	DNA	DNA	DNA	DNA	DNA
5	**Service Availability/Uptime**								
	A) Total operational Hours		UPE	72	72	72	72	72	72
	B) Total downtime (In hours)		UPE	0	0	0	0.20	0.05	0
	C) Total time when the service was available (In Hrs)		UPE	72	72	72	71.79	71.95	72
	D) % age of Service availability uptime	*>98%*	UPE	100.00%	100.00%	100.00%	99.71%	99.93%	100.00%

NA: Not applicable

NP: Data not provided

4.4. KEY FINDINGS: BROADBAND SERVICES

Service Provisioning / Activation Time: The audit of the service providers revealed that all **operators** met the benchmark of the parameter **Connection within 15 days.**

Fault Repair/Restoration Time: With regards to the fault related parameters, the performance of the service providers Den-Network not meeting with the benchmark as 89.37%.

Billing Performance: For this parameter the performance of the service providers was found well within the compliance benchmarks.
As far as the concern of refund BSNL not meeting the benchmark as 91.49%

Response Time to Customer for assistance by operator (Voice to Voice): For percentage of calls getting connected to call center and answered, all service providers were found meeting the benchmark for this parameter.

Bandwidth Utilization/ Throughput: All the service providers were found using Multiple Router Traffic Grapher (MRTG) and also it was observed that all service providers were reporting combined bandwidth utilization for corporate customers and household customers.
The performance of service providers with respect of these parameters Airtel not meeting with the benchmark as 82.92% and Den-Network also not meeting with the benchmark as 85.00%.

Service Availability/Uptime: All service providers were found meeting the benchmark for this parameter.

Packet Loss and Network Latency: It was observed that almost all operators were measuring packet loss and latency by conducting ping test on random basis for their internal assessment. All operators found meeting the benchmark.

4.5. CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE FOR BROADBAND SERVICES						
	CIRCLE NAME	**BHARTI-AIRTEL**	**BSNL**	**RCL**	**TIKONA**	**PACENET**
Total No. of calls Attempted	UPE	100	NP	100	100	100
Total number of calls answered by the operator within 60 seconds	UPE	83	NP	100	100	96
% age calls answered by the operator in 60 seconds	UPE	83.00%	NP	100.00%	100.00%	96.00%
Total number of calls answered by the operator within 90 seconds	UPE	92	NP	100	100	100
% age calls answered by the operator within 90 seconds	UPE	92.00%	NP	100.00%	100.00%	100.00%

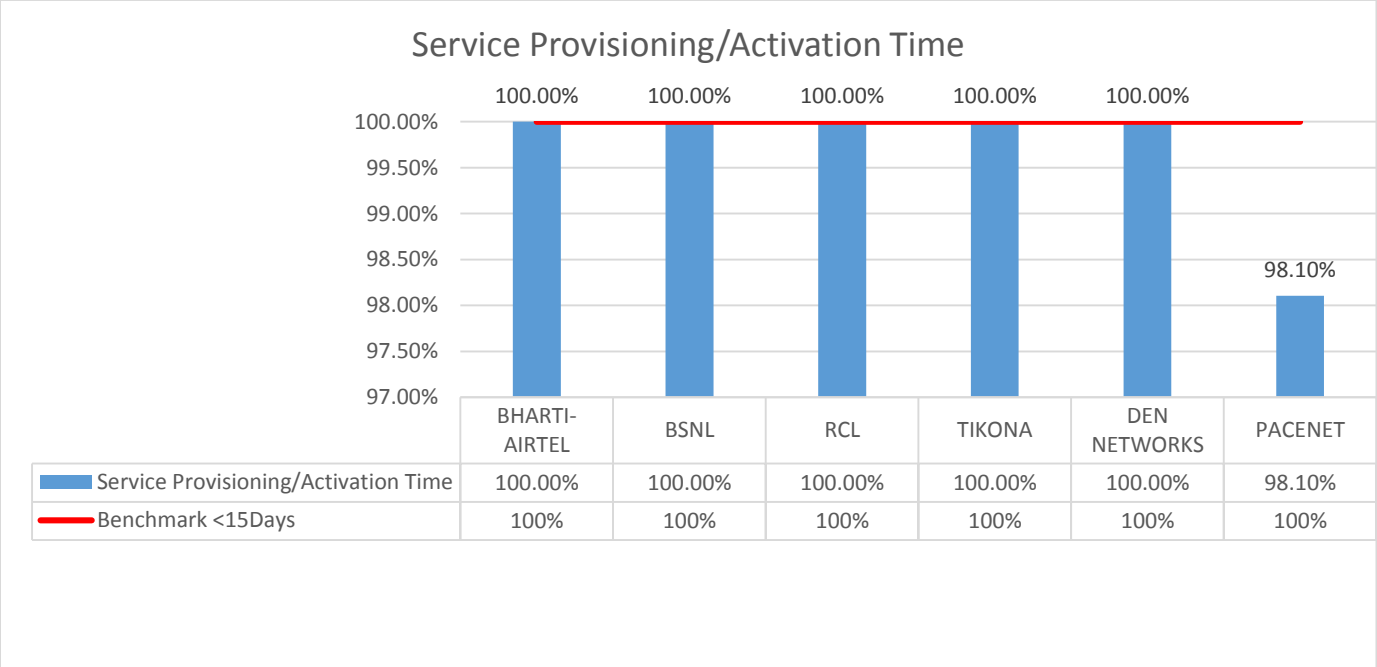
In case of calls answered by operators (voice to voice) within 60 seconds and 90 seconds, when test calls were made to the call centres, all broadband service providers were found meeting the TRAI prescribed benchmark.

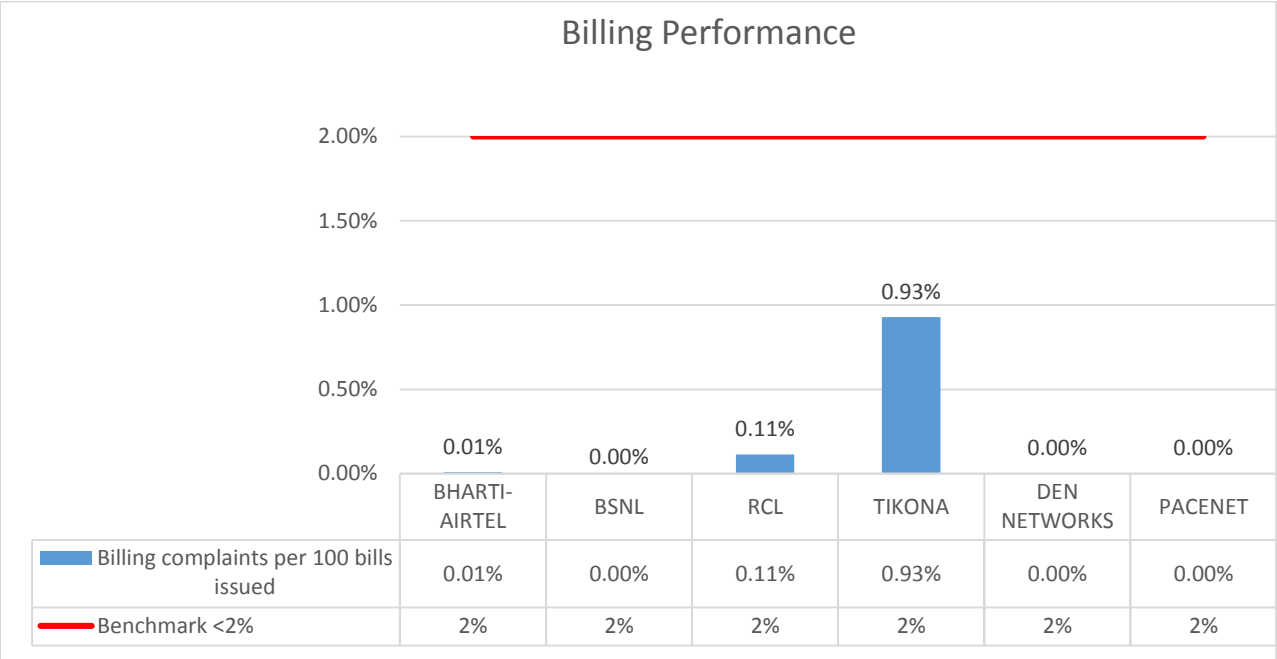
4.6. LIVE CALLING FOR BILLING COMPLIANTS

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS						
	Circle Name	**BHARTI-AIRTEL**	**BSNL**	**RCL**	**TIKONA**	**PACENET**
Total No. of calls Attempted	UPE	14	DNA	42	100	2
Total No. of calls Answered	UPE	14	DNA	35	100	2
Cases resolved within 4 weeks	UPE	14	DNA	35	100	2
%age of cases resolved	UPE	100.00%	DNA	100.00%	100.00%	100.00%

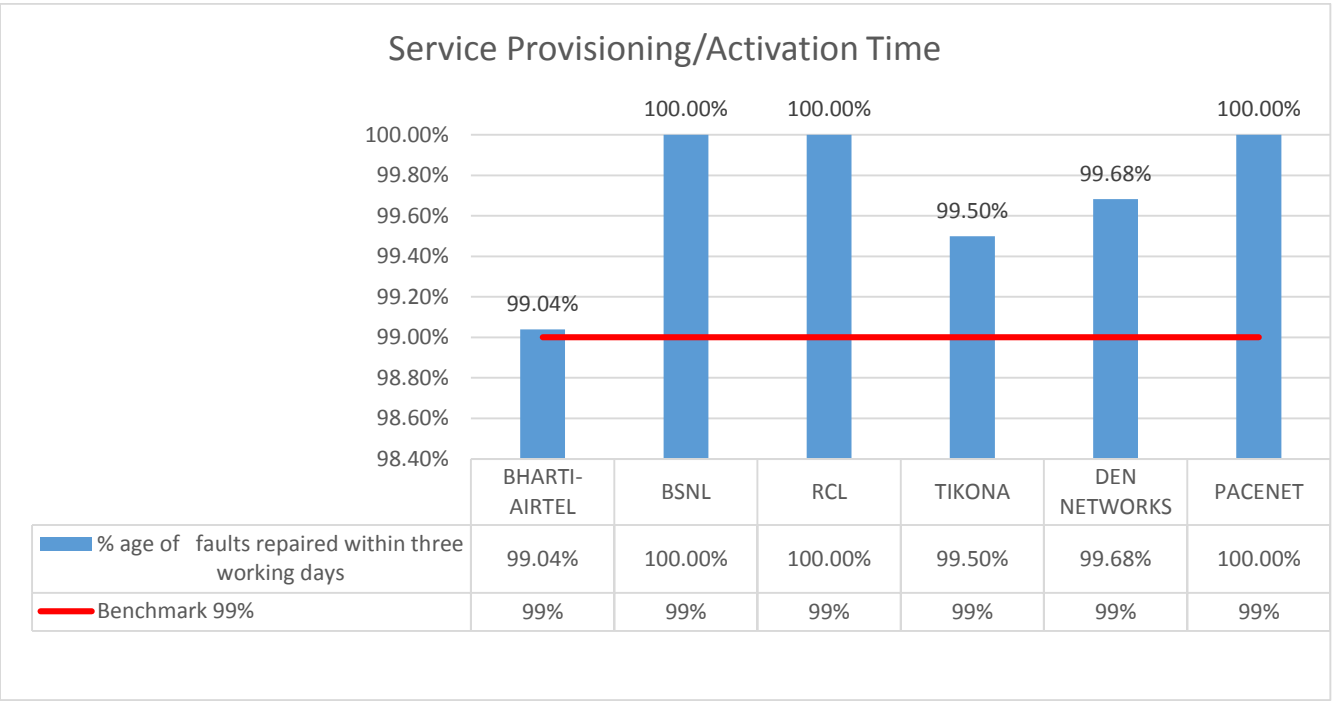
To test the Service Providers performance on billing related complaints and their resolutions, auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, some of the customers did not attend the calls while few others reported that there complaints have been resolved but did not remember about the duration of their resolution. However, most of the customers reported their satisfaction on resolution of the billing complaints.

4.7. GRAPHICAL REPRESENTATION

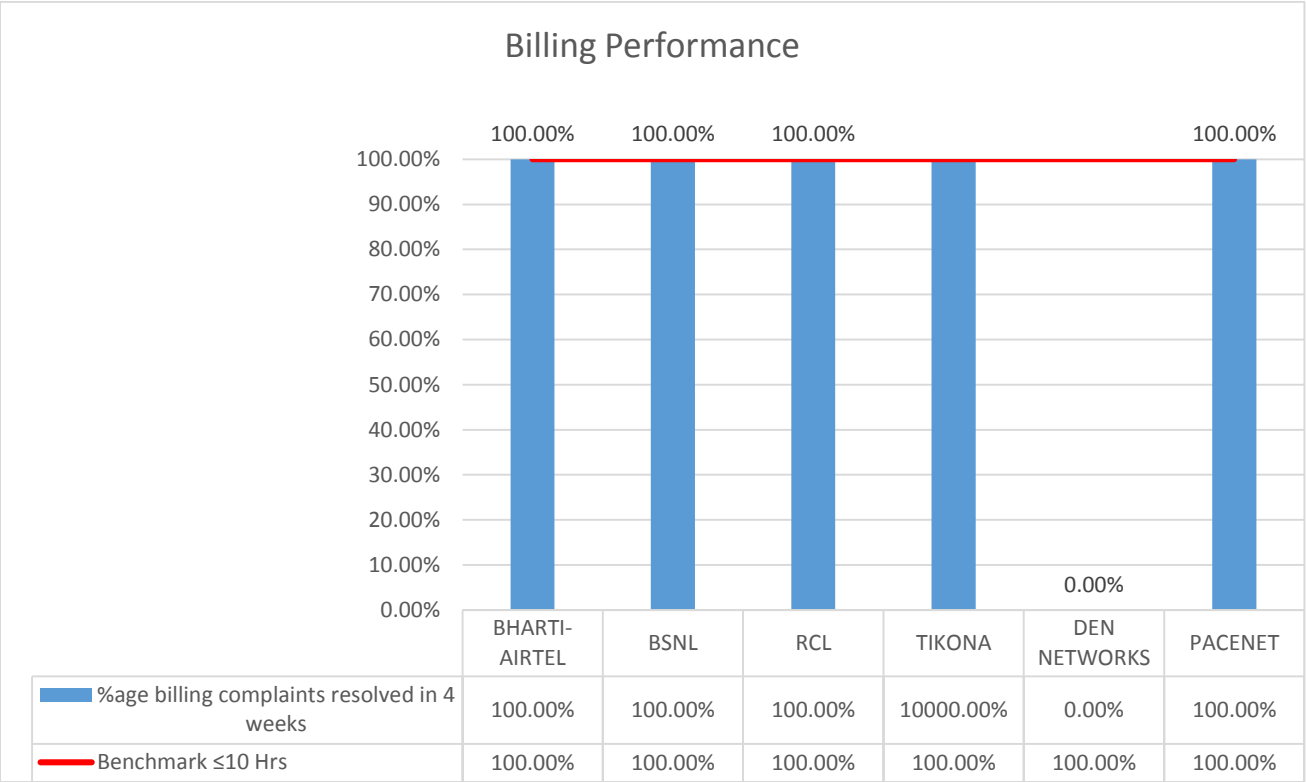




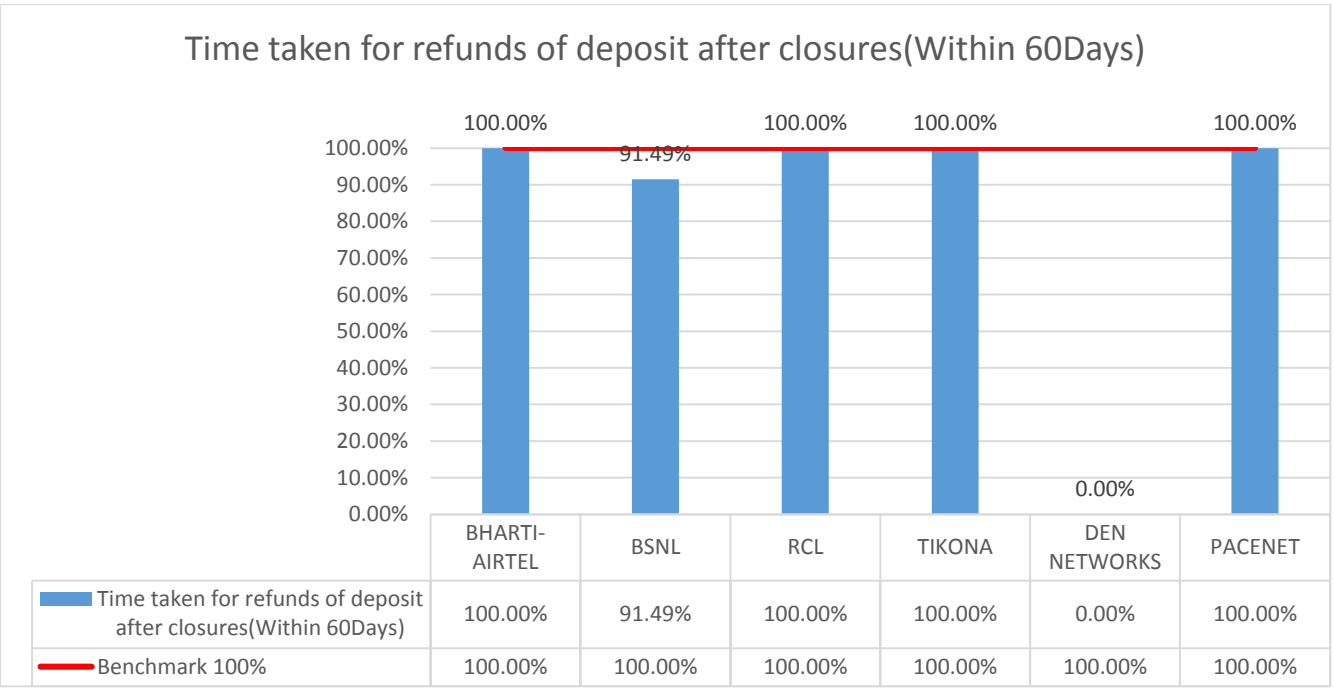
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Billing complaints per 100 bills issued	0.01%	0.00%	0.11%	0.93%	0.00%	0.00%
Benchmark <2%	2%	2%	2%	2%	2%	2%



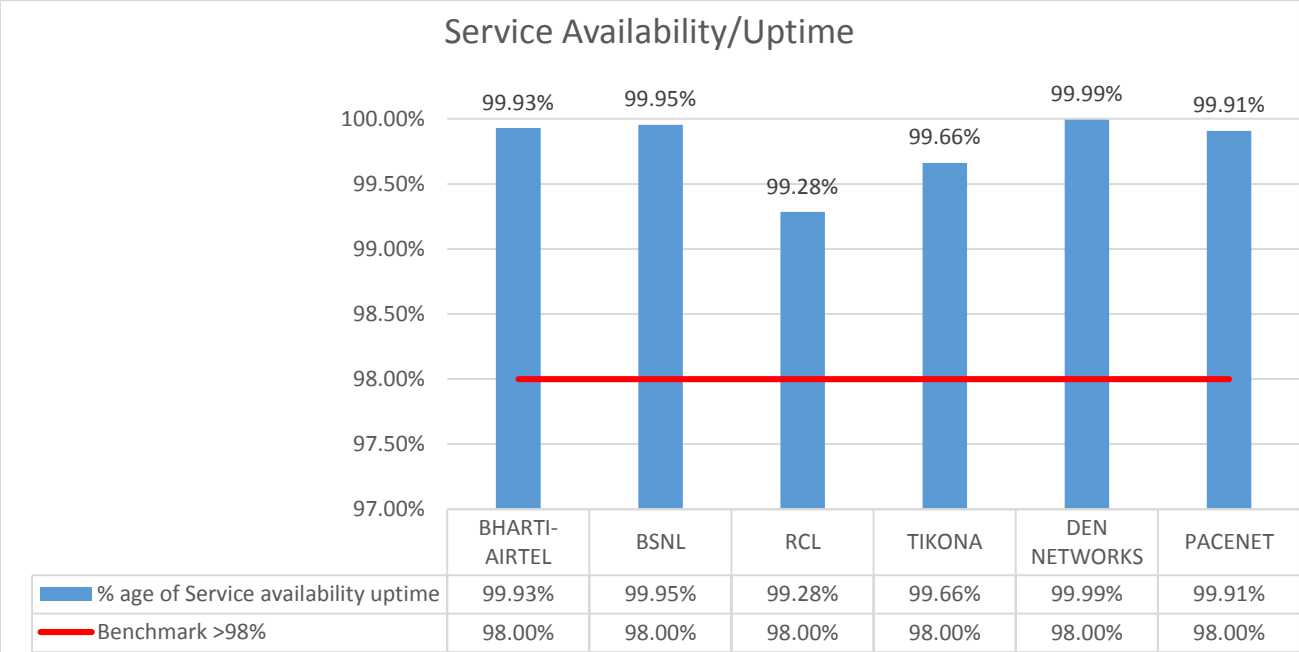
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
% age of faults repaired within three working days	99.04%	100.00%	100.00%	99.50%	99.68%	100.00%
Benchmark 99%	99%	99%	99%	99%	99%	99%



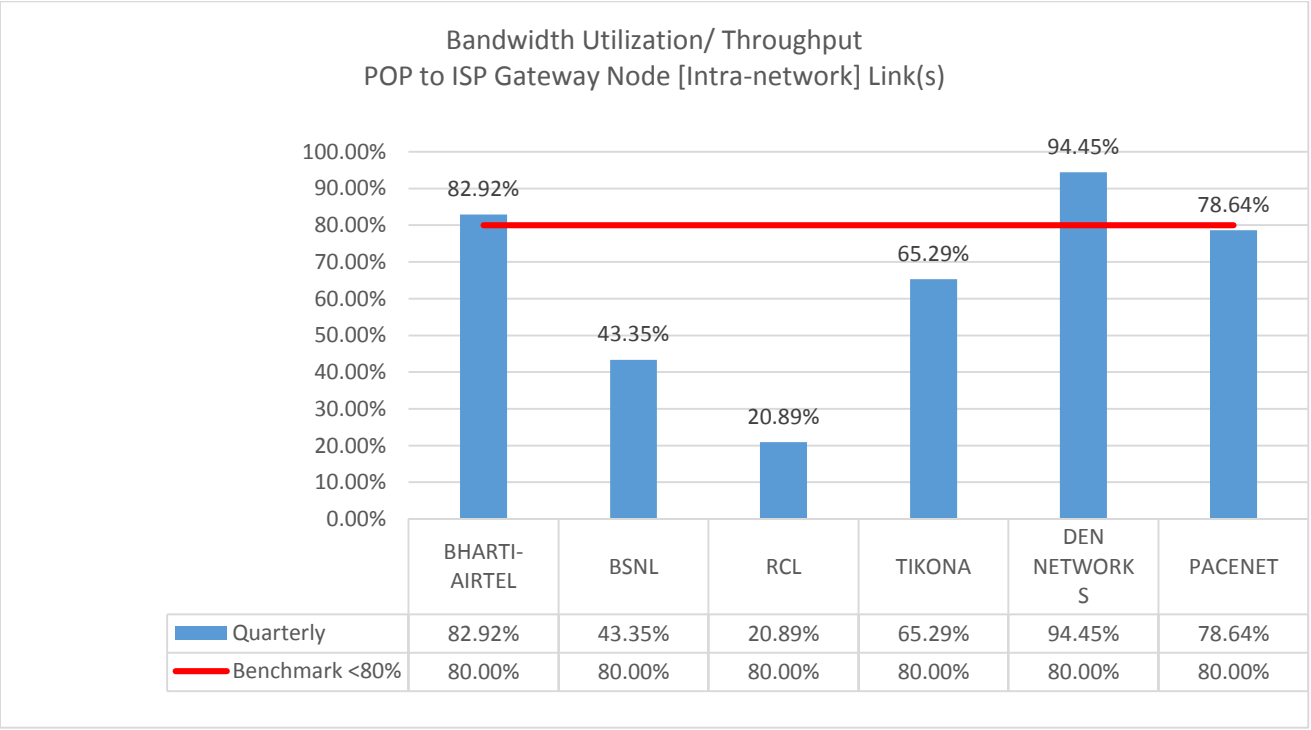
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
%age billing complaints resolved in 4 weeks	100.00%	100.00%	100.00%	10000.00%	0.00%	100.00%
Benchmark ≤10 Hrs	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



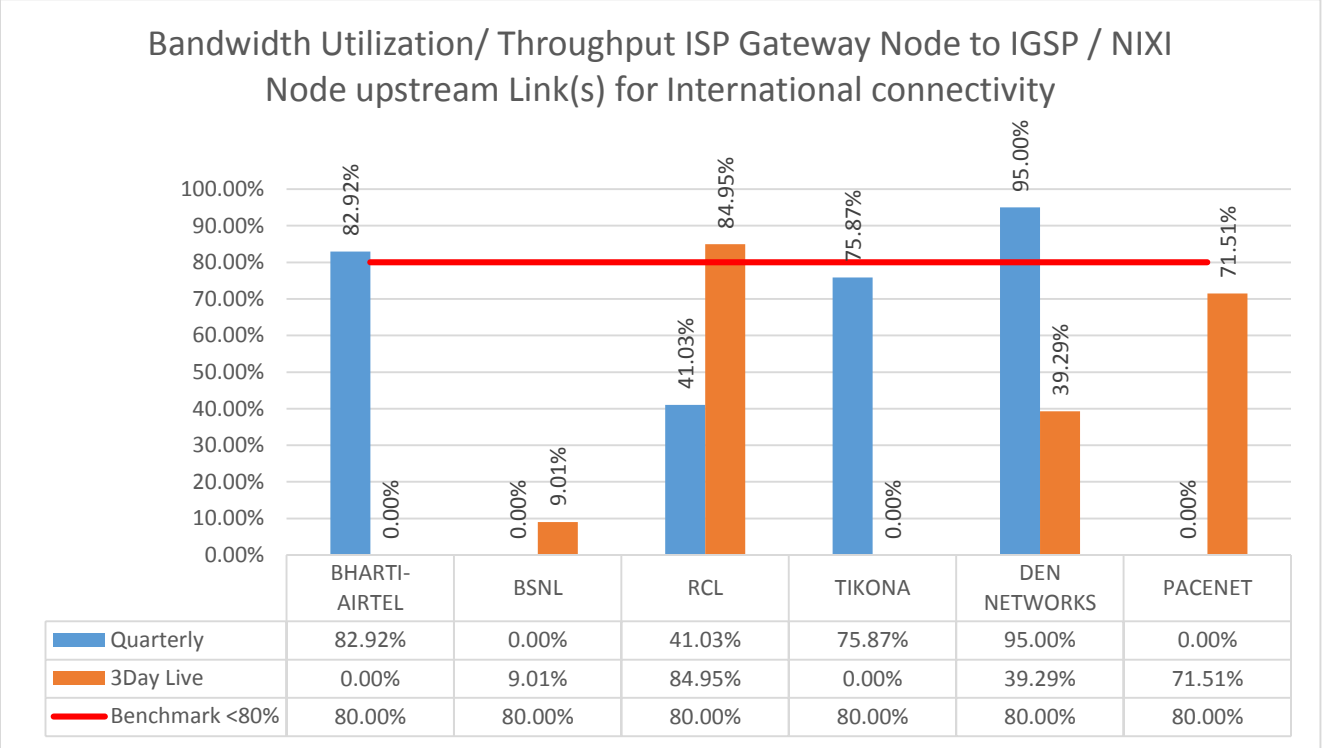
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Time taken for refunds of deposit after closures(Within 60Days)	100.00%	91.49%	100.00%	100.00%	0.00%	100.00%
Benchmark 100%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



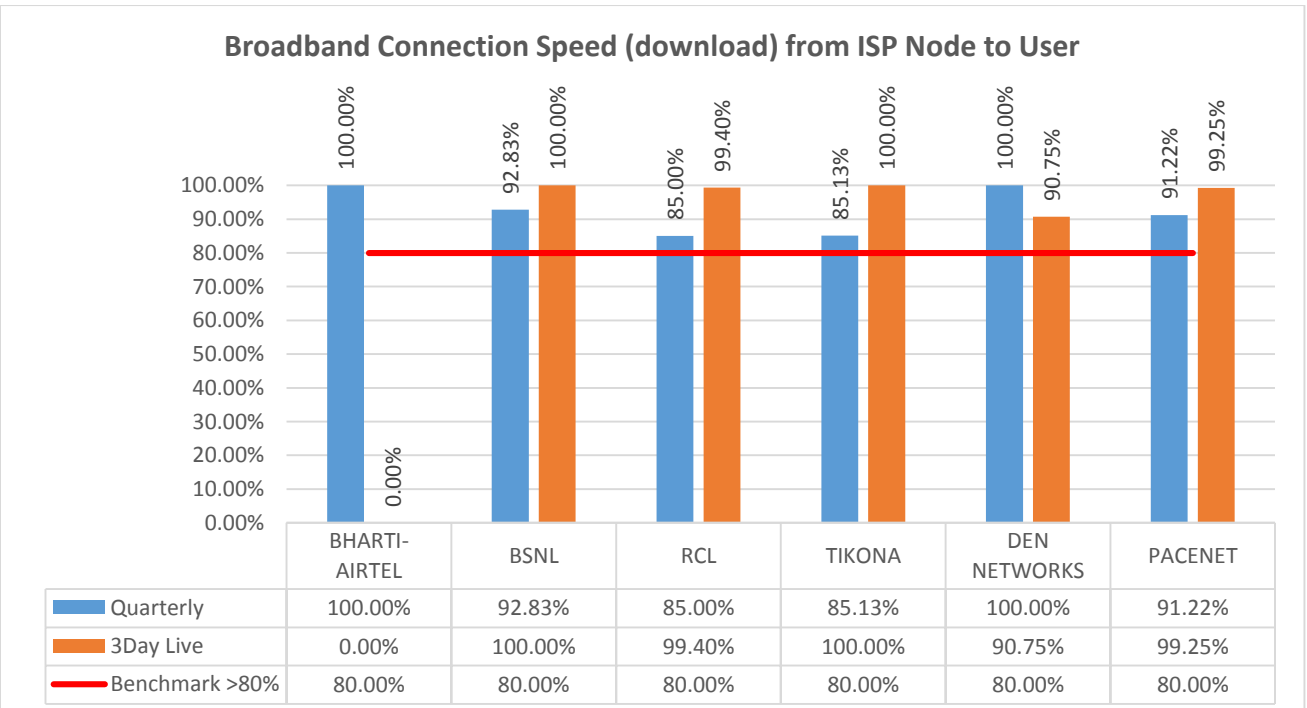
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
% age of Service availability uptime	99.93%	99.95%	99.28%	99.66%	99.99%	99.91%
Benchmark >98%	98.00%	98.00%	98.00%	98.00%	98.00%	98.00%



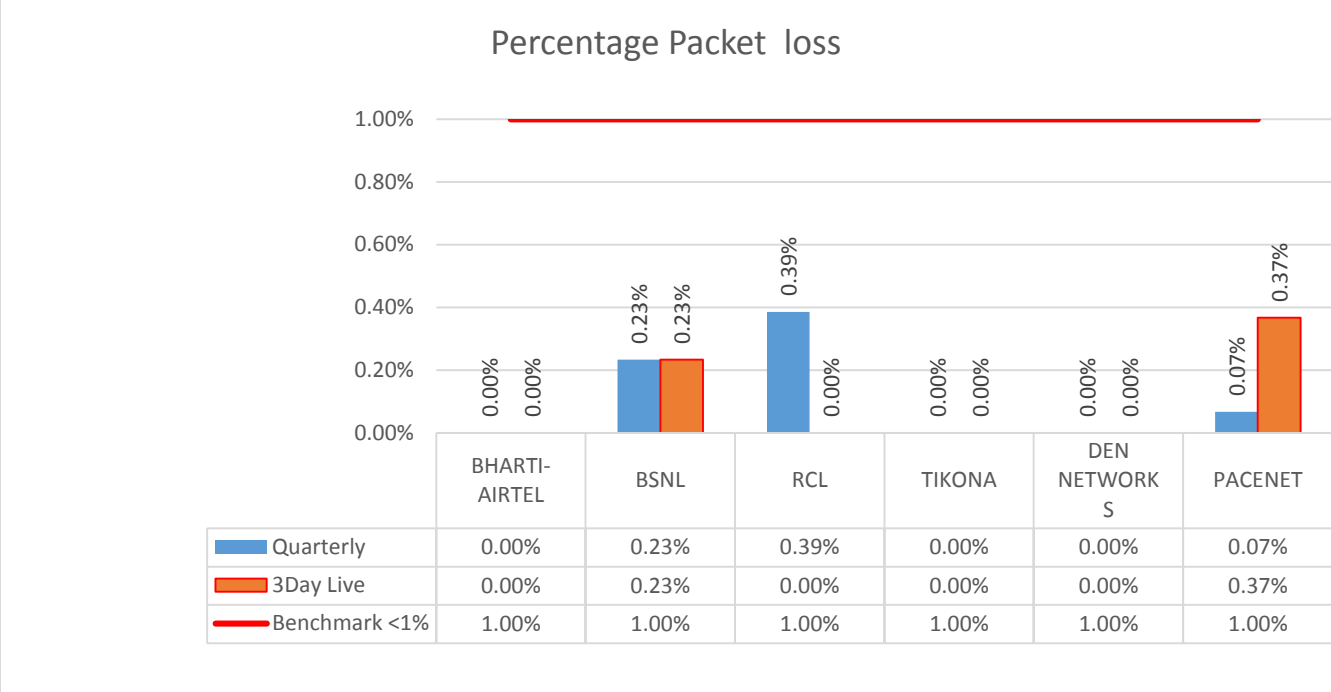
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	82.92%	43.35%	20.89%	65.29%	94.45%	78.64%
Benchmark <80%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%



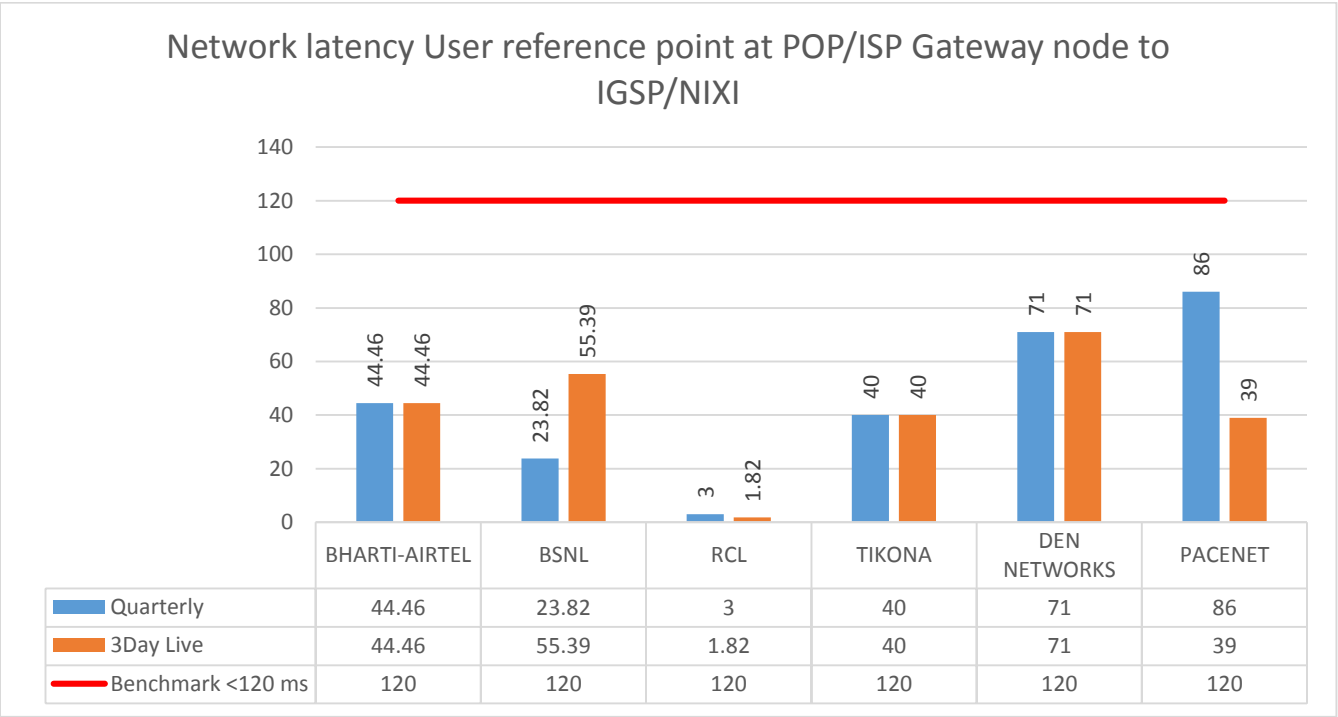
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	82.92%	0.00%	41.03%	75.87%	95.00%	0.00%
3Day Live	0.00%	9.01%	84.95%	0.00%	39.29%	71.51%
Benchmark <80%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%



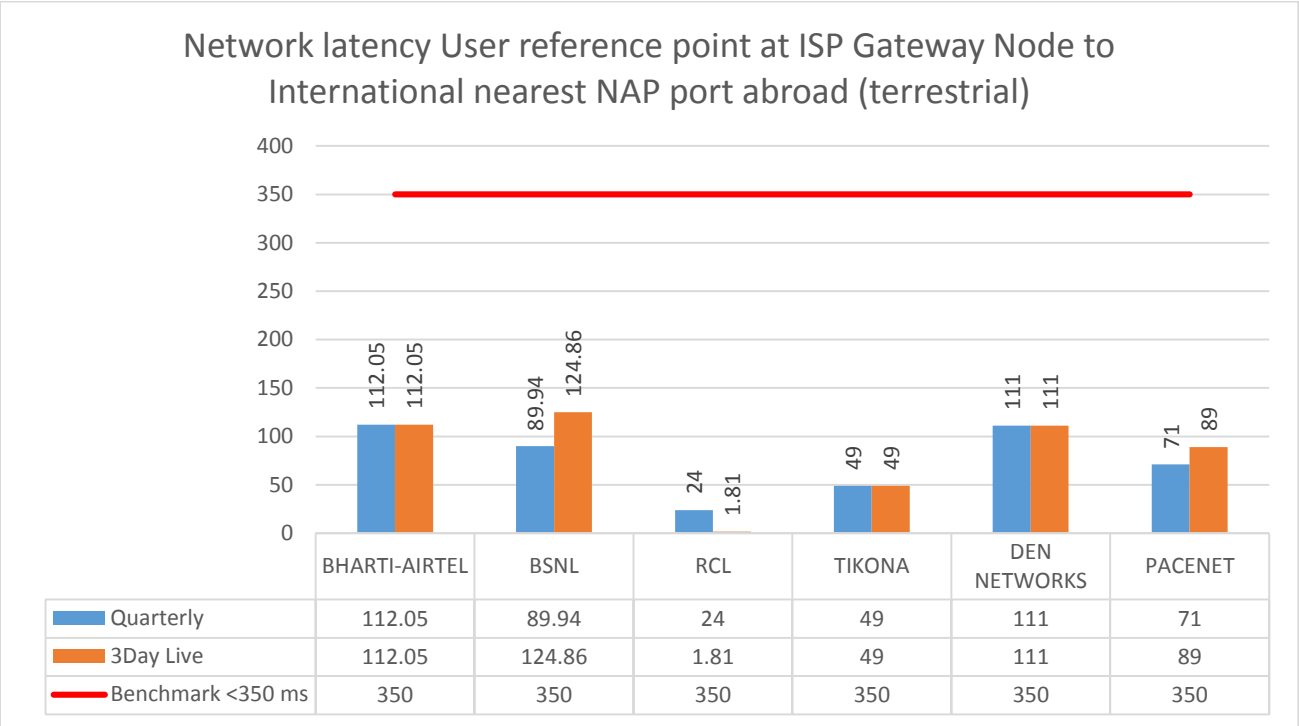
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	100.00%	92.83%	85.00%	85.13%	100.00%	91.22%
3Day Live	0.00%	100.00%	99.40%	100.00%	90.75%	99.25%
Benchmark >80%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%



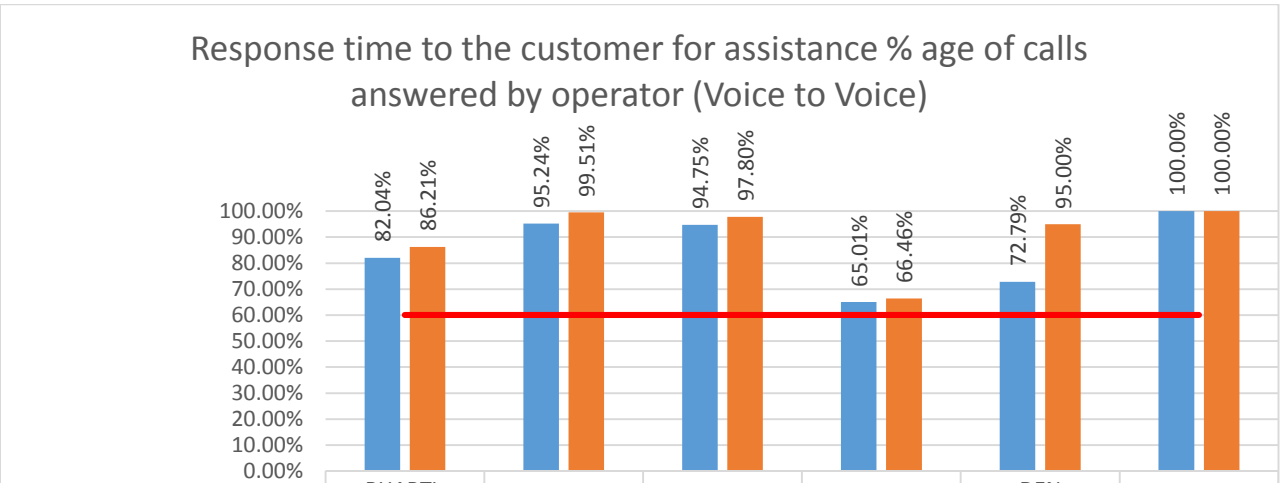
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	0.00%	0.23%	0.39%	0.00%	0.00%	0.07%
3Day Live	0.00%	0.23%	0.00%	0.00%	0.00%	0.37%
Benchmark <1%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%



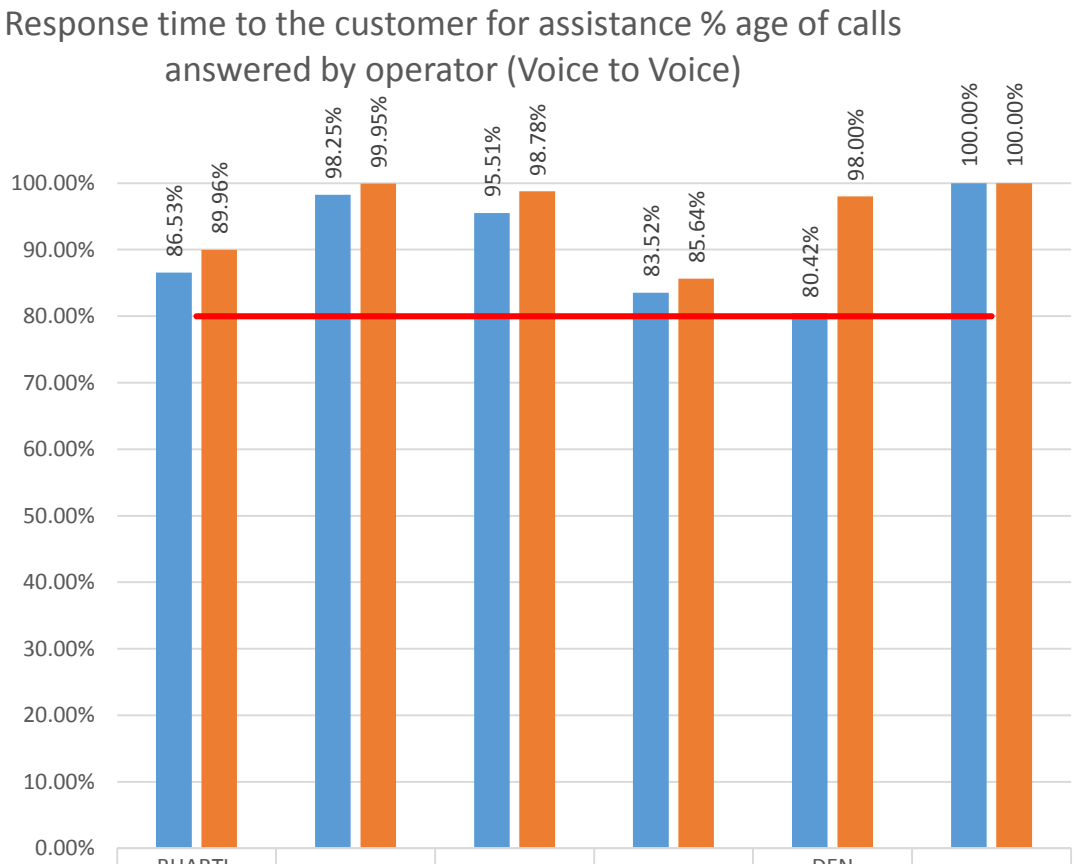
	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	44.46	23.82	3	40	71	86
3Day Live	44.46	55.39	1.82	40	71	39
Benchmark <120 ms	120	120	120	120	120	120



	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	112.05	89.94	24	49	111	71
3Day Live	112.05	124.86	1.81	49	111	89
Benchmark <350 ms	350	350	350	350	350	350



	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	82.04%	95.24%	94.75%	65.01%	72.79%	100.00%
3Day Live	86.21%	99.51%	97.80%	66.46%	95.00%	100.00%
Benchmark >60%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%



	BHARTI-AIRTEL	BSNL	RCL	TIKONA	DEN NETWORKS	PACENET
Quarterly	86.53%	98.25%	95.51%	83.52%	80.42%	100.00%
3Day Live	89.96%	99.95%	98.78%	85.64%	98.00%	100.00%
Benchmark >80%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%

5. ABBREVIATIONS

Following terms/abbreviations have been used in this report. This section provides meaning of the abbreviations used in the report.

- TRAI – Telecom Regulatory Authority of India
- QoS – Quality of Service
- AMJ'16 – Refers to the quarter of April, May and June 2016
- SSA – Secondary Switching Area
- NOC – Network Operation Center
- OMC – Operations and Maintenance Center
- MSC – Mobile Switching Center
- PMR – Performance Monitoring Reports
- TCBH – Time Consistent Busy Hour
- CBBH - Cell Bouncing Busy Hour
- BTS – Base Transceiver Station
- CSSR – Call Setup Success Rate
- TCH – Traffic Channel
- SDCCH – Standalone Dedicated Control Channel
- CDR – Call Drop Rate
- FER – Frame Error Rate
- SIM – Subscriber Identity Module
- GSM – Global System for Mobile
- CDMA – Code Division Multiple Access
- NA – Not Applicable
- NC – Non Compliance
- POI – Point of Interconnection
- IVR – Interactive Voice Response
- STD – Standard Trunk Dialling
- ISD – International Subscriber Dialling