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 WEST CIRCLE
CELLULAR MOBILE TELEPHONE SERVICE (CMTS)
(JANUARY TO MARCH 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 market from a government owned monopoly. Also, the directions, orders and regulations issued cover a wide range of subjects including tariff, interconnection and quality of service as well as governance of the Authority.

TRAI initiated a regulation - The Standard of Quality of Service of Basic Telephone Service (Wireline) and Cellular Mobile Telephone Service regulations, 2009 (7 of 2009) dated 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 Marade 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 Cellular Mobile (Wireless) 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 West Circle.

1.4. COVERAGE

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

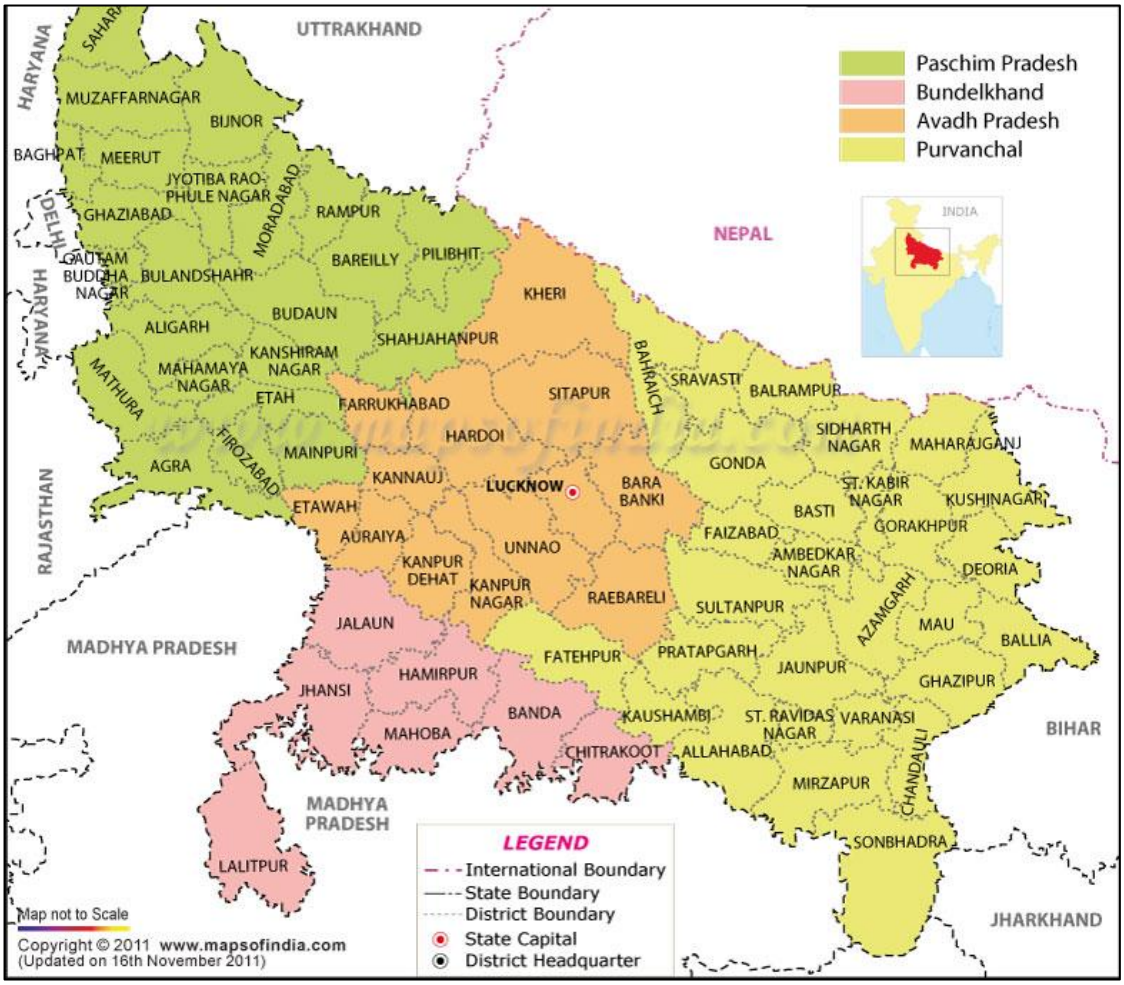


Image Source: Maps of India

1.5. SSA LIST:

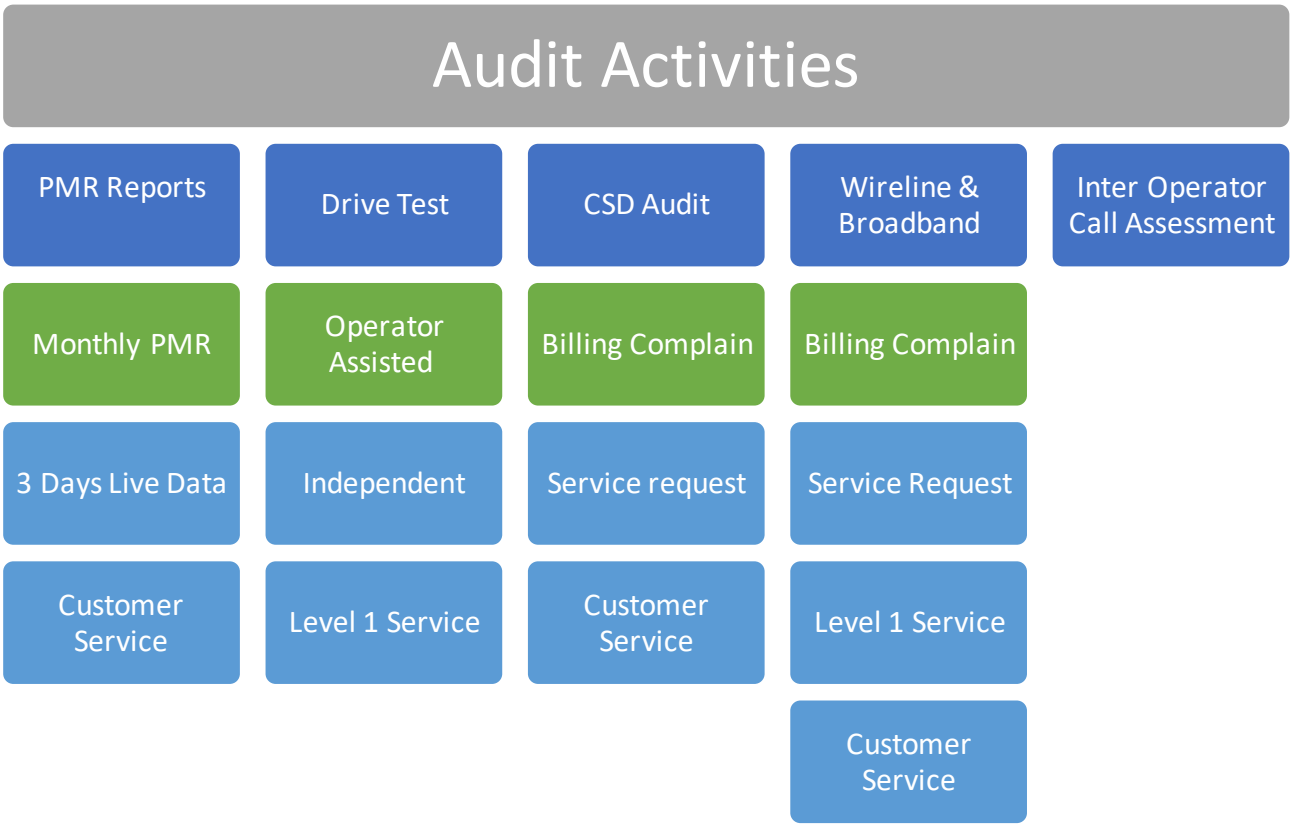
S. No.	Circle	SSA Name	SDCA Name
1	UPW	Agra	Achhnera
2	UPW	Agra	Agra
3	UPW	Agra	Ferozabad
4	UPW	Agra	Jarar
5	UPW	Aligarh	Aligarh
6	UPW	Aligarh	Atrauli

7	UPW	Aligarh	Hathras
8	UPW	Aligarh	Khair
9	UPW	Aligarh	Sikandra rao
10	UPW	Badaun	Badaun
11	UPW	Badaun	Bisauli
12	UPW	Badaun	Dataganj
13	UPW	Badaun	Gunnaur
14	UPW	Badaun	Sahaswan
15	UPW	Bareilly	Aonla -i
16	UPW	Bareilly	Aonla-ii (ramnagar)
17	UPW	Bareilly	Baheri
18	UPW	Bareilly	Bareilly
19	UPW	Bareilly	Nawabganj
20	UPW	Bareilly	Pitamberpur
21	UPW	Bijnore	Bijnore-i
22	UPW	Bijnore	Bijnore-ii (chandpur)
23	UPW	Bijnore	Dhampur
24	UPW	Bijnore	Nagina
25	UPW	Bijnore	Najibabad
26	UPW	Etah	Aliganj (ganjdundwara)
27	UPW	Etah	Etah
28	UPW	Etah	Jalesar
29	UPW	Etah	Kasganj
30	UPW	Ghaziabad	Bulandshahr
31	UPW	Ghaziabad	Debai
32	UPW	Ghaziabad	Garhmukteshwar
33	UPW	Ghaziabad	Ghaziabad+dadri
34	UPW	Ghaziabad	Hapur
35	UPW	Ghaziabad	Khurja
36	UPW	Ghaziabad	Modinagar
37	UPW	Ghaziabad	Pahasu
38	UPW	Ghaziabad	Sikandrabad
39	UPW	Ghaziabad	Siyana
40	UPW	Mathura	Chhata (kosikalan)
41	UPW	Mathura	Mant (vrindavan)
42	UPW	Mathura	Mathura
43	UPW	Mathura	Sadabad
44	UPW	Meerut	Baghpat-ii (baraut)
45	UPW	Meerut	Mawana
46	UPW	Meerut	Meerut
47	UPW	Meerut	Sardhana
48	UPW	Moradabad	Amroha
49	UPW	Moradabad	Bilari

50	UPW	Moradabad	Hasanpur
51	UPW	Moradabad	Moradabad
52	UPW	Moradabad	Sambhal
53	UPW	Muzaffarnagar	Budhana
54	UPW	Muzaffarnagar	Jansath (khatauli)
55	UPW	Muzaffarnagar	Kairana (shamli)
56	UPW	Muzaffarnagar	Muzaffar nagar
57	UPW	Pilibhit	Bisalpur
58	UPW	Pilibhit	Pilibhit
59	UPW	Pilibhit	Puranpur
60	UPW	Rampur	Rampur
61	UPW	Rampur	Shahabad
62	UPW	Saharanpur	Deoband
63	UPW	Saharanpur	Nakur (gangoh)
64	UPW	Saharanpur	Saharanpur
65	UPW	Almora	Almora
66	UPW	Almora	Bageshw ar
67	UPW	Almora	Champaw at
68	UPW	Almora	Dharchula
69	UPW	Almora	Munsiari
70	UPW	Almora	Pithoragarh
71	UPW	Almora	Ranikhet
72	UPW	Dehradun	Chakrata (dakpather)
73	UPW	Dehradun	Dehradun
74	UPW	Kotdw ara	Chamoli
75	UPW	Kotdw ara	Joshimath-i
76	UPW	Kotdw ara	Joshimath-ii (badrinath)
77	UPW	Kotdw ara	Karan prayag
78	UPW	Kotdw ara	Lansdow n-i
79	UPW	Kotdw ara	Lansdow n-ii (kotdw ara)
80	UPW	Kotdw ara	Lansdow n-iii (syunsi)
81	UPW	Kotdw ara	Pauri-i
82	UPW	Kotdw ara	Pauri-ii (bubakhal)
83	UPW	Kotdw ara	Ukhimath (guptkashi)
84	UPW	Nainital	Haldw ani-i
85	UPW	Nainital	Haldw ani-ii (chorgalian)
86	UPW	Nainital	Kashipur
87	UPW	Nainital	Khatima
88	UPW	Nainital	Khatima-ii (sitarganj)
89	UPW	Nainital	Kichha-i (rudrapur)
90	UPW	Nainital	Kichha-ii (bazpur)
91	UPW	Nainital	Nainital
92	UPW	Saharanpur	Roorkee-i

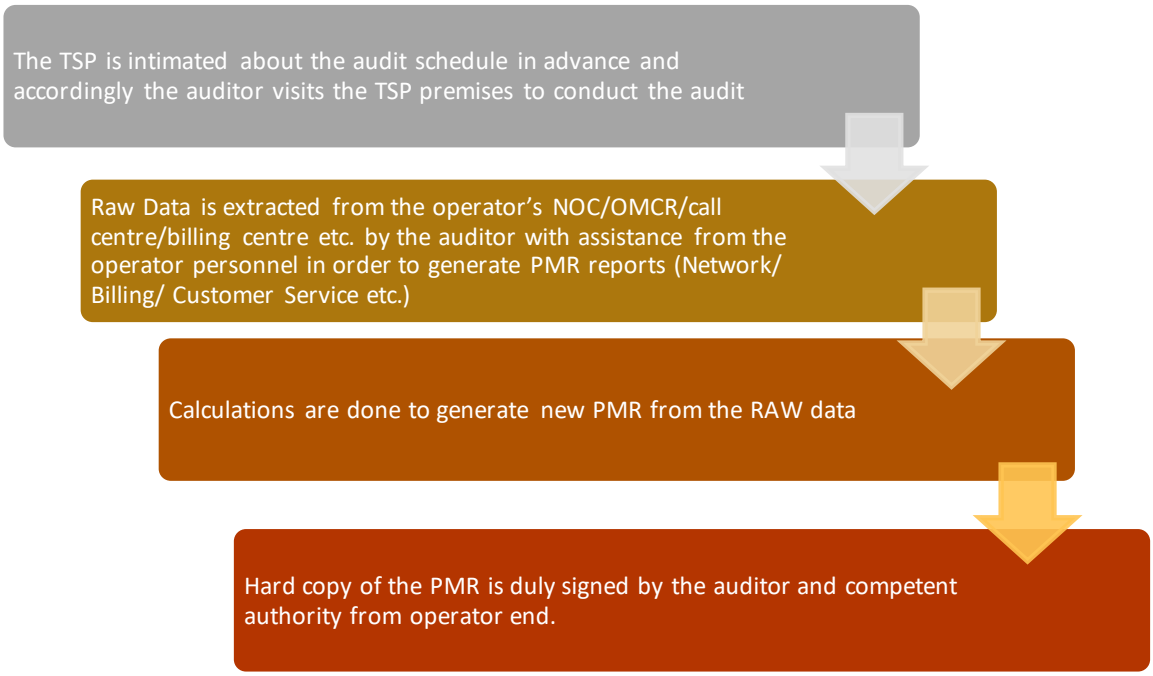
93	UPW	Saharanpur	Roorkee-ii (hardw ar)
94	UPW	Uttarkashi	Bhatw ari-i (uttarkashi)
95	UPW	Uttarkashi	Bhatw ari-i (gangotri)
96	UPW	Uttarkashi	Deoprayag-i
97	UPW	Uttarkashi	Deoprayag-ii (jakholi)
98	UPW	Uttarkashi	Dunda
99	UPW	Uttarkashi	Partapnagar
100	UPW	Uttarkashi	Purola
101	UPW	Uttarkashi	Rajgarhi
102	UPW	Uttarkashi	Tehri

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, January 2016 audit data was collected in the month of February 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 March 2016 was collected in the month of March 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 January, February and March 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

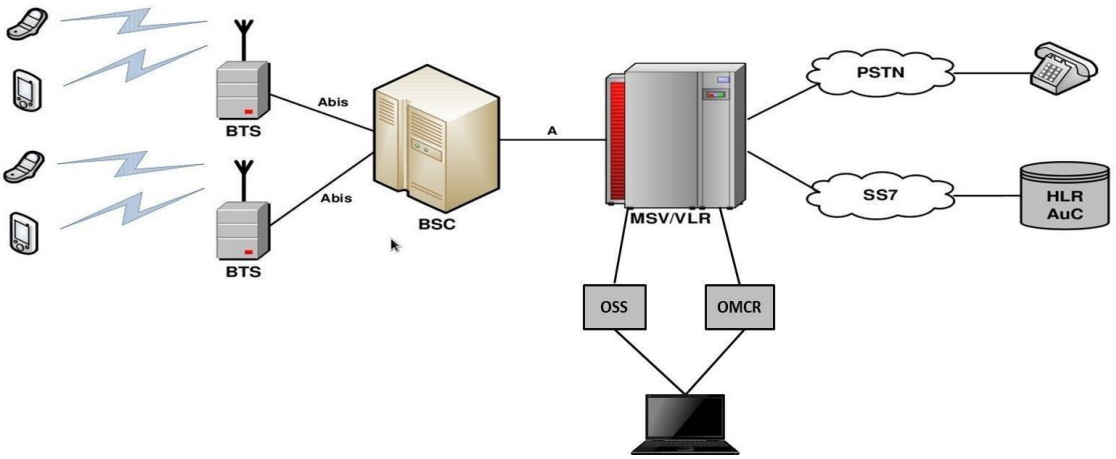
2.2. AUDIT PARAMETER: NETWORK

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

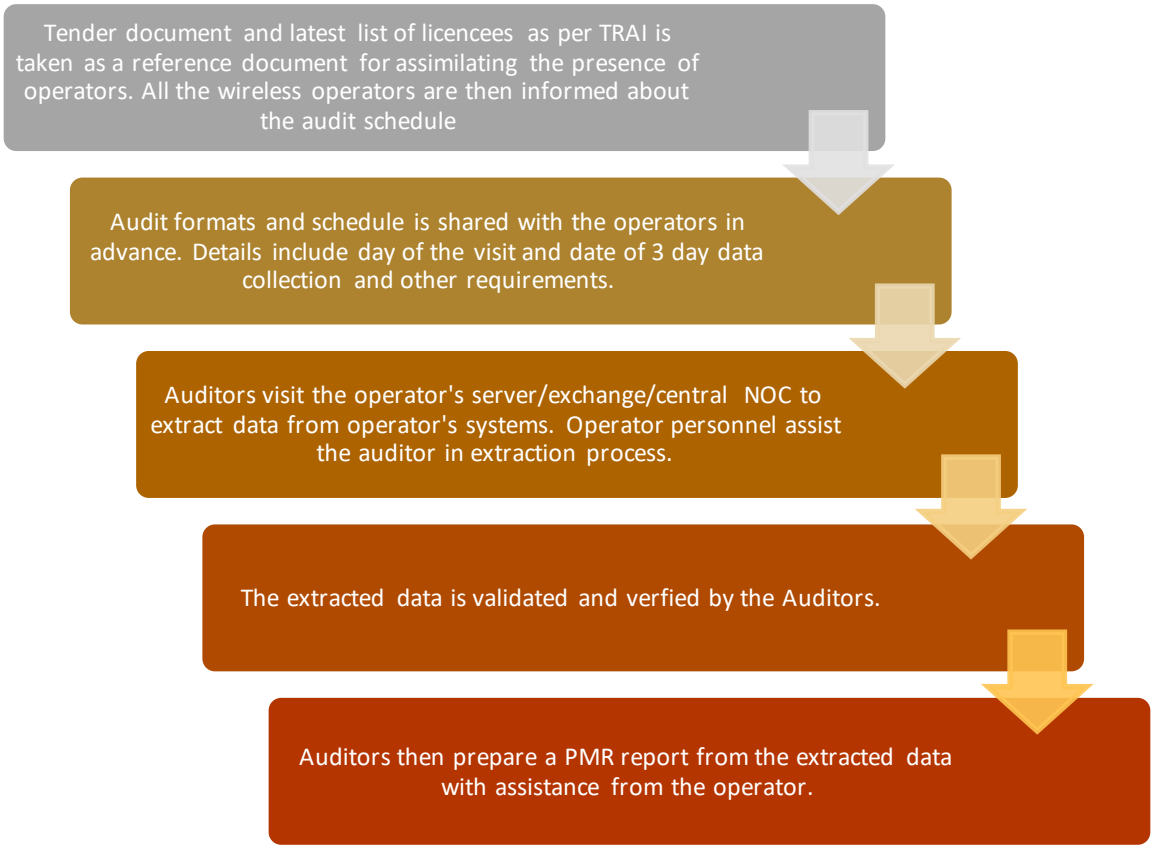
Network Availability	
BTSs Accumulated downtime (not available for service)	≤ 2%
Worst affected BTSs due to downtime	≤ 2%
Connection Establishment (Accessibility)	
Call Set-up Success Rate (within licensee's own network)	≥ 95%
SDCCH/ Paging Channel Congestion	≤ 1 %
TCH Congestion	≤ 2%
Connection Maintenance (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	*<=2%*

			[(Sum of dow ntime 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	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 Sw itched 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.	Worst affected cells having more than 3% Circuit Sw itched Voice Drop Rate:	It is the % of total no. of Cells having > 3% Circuit Sw itched Voice drop to the total no. cells	Total No. of Cells (Sector) Total No. of Cells exceeding 3% Circuit Sw itched Voice Drop Rate in CBBH (Cell Bouncing Busy Hour) % of cells having more than 3% Circuit Sw itched Voice Drop Rate [(No. of cells having Circuit Sw itched Voice Drop Rate > 3% during CBBH in 31 days*100) / Total no. of cells in the licensed service area]	*<=3%*
c.	Percentage of connections w ith Good Circuit Sw itched Voice Quality	It can be defined as the % of Good Voice Quality Samples to the total No. of Quality Samples	Percentage of connection w ith Good Circuit Sw itched Voice Quality	*>=95%*
4	Total No. of POI's in Month having >=0.5% POI congestion	Total no. Of POI's w hich are exceeding the POI congestion more than 0.5 %.	Total No. of call attempts on POI Total traffic served on all POIs (Erlang) Total No. of circuits on all individual POIs Total number of w orking POI Service Area w ise Capacity of all POIs	<=0.5%

			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

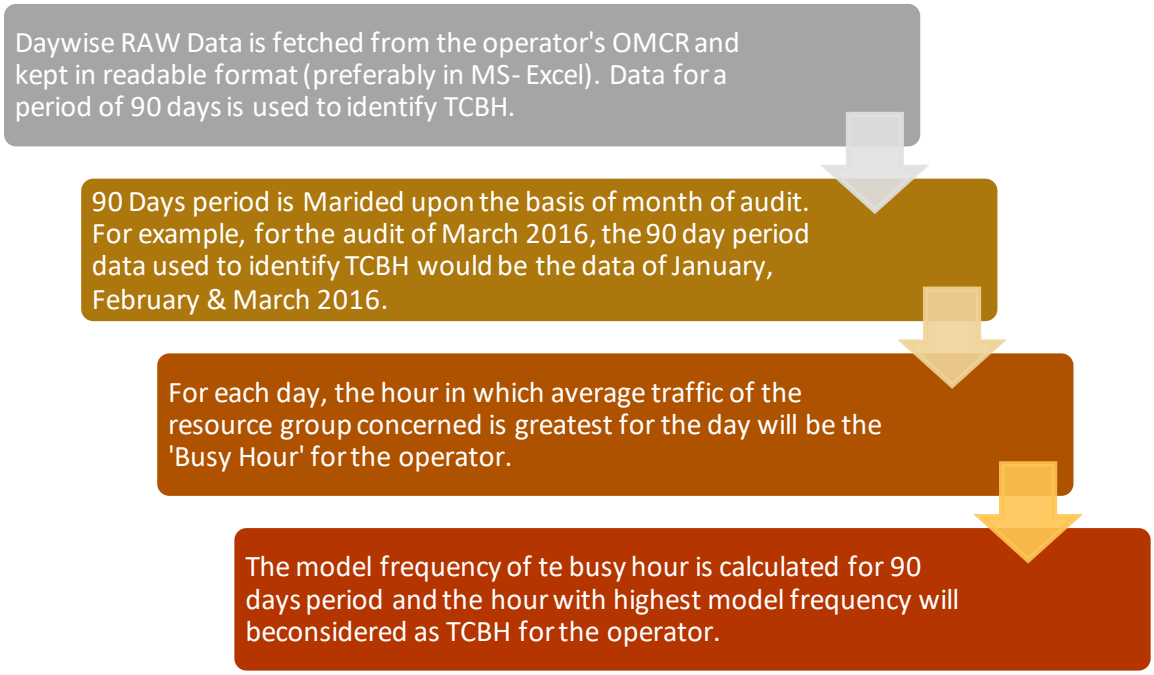
The main purpose of 3 day live measurement is to evaluate the network parameters on intraday basis. While the monthly PMR report provides an overall view of the performance of QoS parameters, the 3 day live data helps looking at intraday performance on the network parameters discussed earlier. All the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



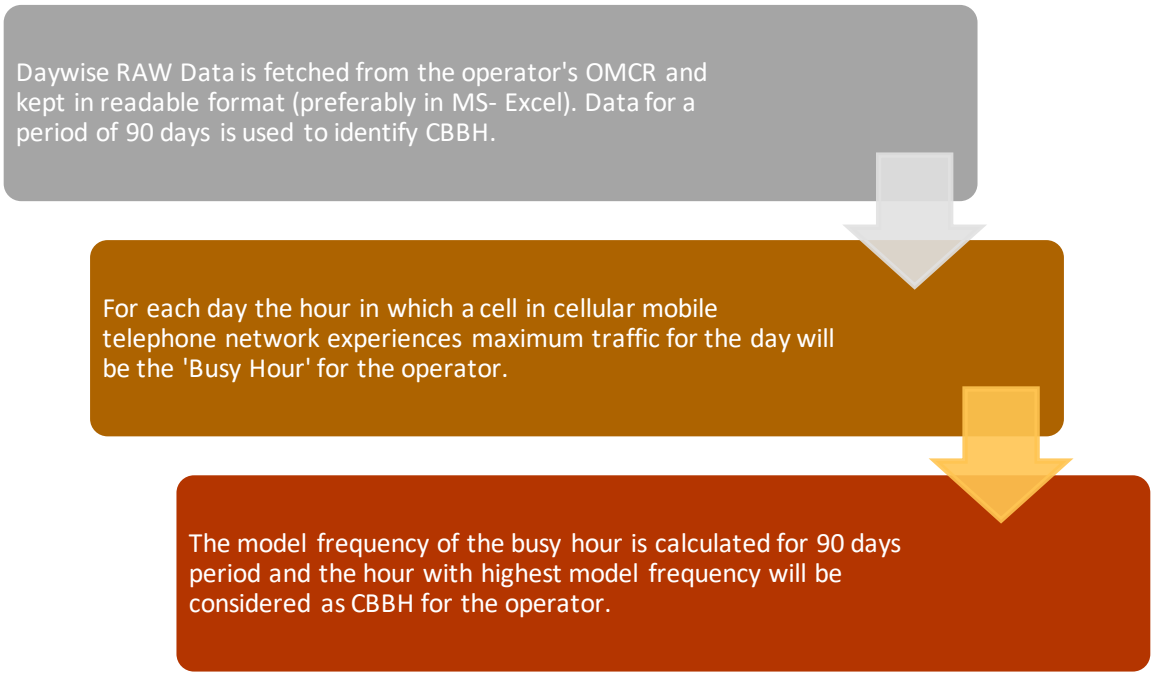
During audit, the auditors identified from the raw data that the TCBH for the operators in Jan – Feb – Mar 2016 was the time period as given below:

Aircel	Airtel	BSNL	Idea	RCOM GSM	RCOM CDMA	MTS	TTSL CDMA	TTSL GSM	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

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 March 2016 was collected in the month of March 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.

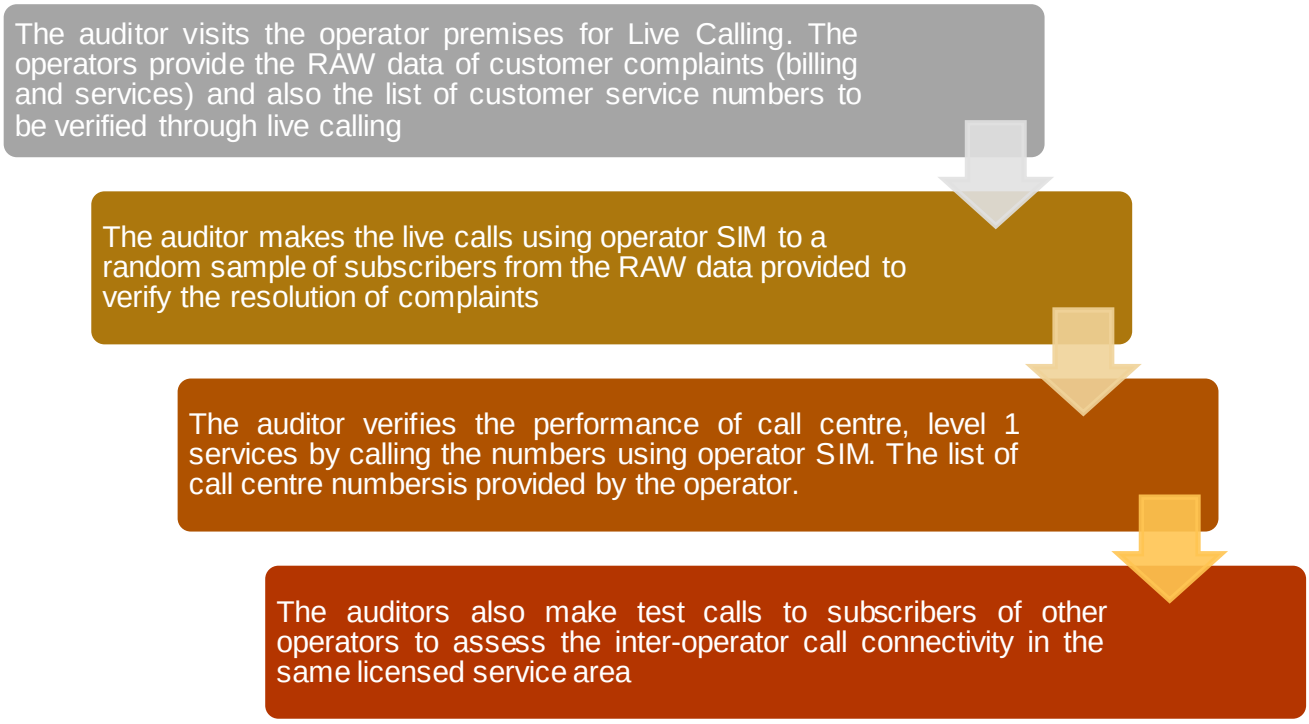
4.1. AUDIT PARAMETERS: CUSTOMER SERVICE

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 March 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 January 2016 was considered for live calling activity conducted in February 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 150 test calls were made per service provider 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 January, February and March'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	RCOM GSM	RCOM CDMA	TTSL CDMA	TTSL GSM	TELENOR	Vodafone	MTS
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%
RCOM GSM	100%	100%	100%	100%	-	100%	100%	100%	100%	100%	100%
RCOM CDMA	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%
Vodafone	100%	100%	100%	100%	100%	100%	100%	100%	100%	-	100%
MTS	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 West Circle consist of total 19 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 Marided 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 West Circle, with a parameter wise performance evaluation as compared to TRAI benchmark.

6.1. OPERATORS COVERED

Name of Operator	Number of Subscriber (Upto March 31, 2016)
Aircel	427258
Airtel	24320272
BSNL	3284818
Idea	14489273
MTS	116531
RCOM CDMA	1263190
RCOM GSM	4854120
TTSL 2G	427137
TTSL 3G	4047220
Telenor	8588311
Vodafone	11572864

TSP	No. of Cells	BTS	BSC	MSC+GMSC	Node B	RNC
Aircel	2026	671	8	1+1	NA	NA
Airtel	20522	6916	70	4+6	4162	13
Idea	25092	8928	59	19	4114	8
TTSL GSM	5376	1765	18	3	904	4
TTSL CDMA	1483	466	4	3+2	NA	NA
RCOM GSM	4939	1646	14	3+1	NA	NA
RCOM CDMA	2946	983	4	3	NA	NA
Vodafone	21448	7116	78	7+4		
BSNL	7715	2642	33	13	1250	9
BSNL Uttarakhand	3022	1009	14	5	480	6
Telenor	12151	4023	31	13	NA	NA
MTS	1228	339	1	1	NA	NA
Aircel	2026	671	8	1+1	NA	NA

Note: Node B & RNC is marked 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) January 2016	January 2016	February 2016	March 2016
Airtel	12th Jan 2016	18th Feb 2016	14th Mar 2016	12th Apr 2016
Vodafone	6th Jan 2016	13th Feb 2016	10th Mar 2016	6th Apr 2016
Idea	11th Jan 2016	9th Feb 2016	11th Mar 2016	11th Apr 2016
Reliance	13th Jan 2016	16th Feb 2016	15th Mar 2016	13th Apr 2016
BSNL	14th Jan 2016	24th Feb 2016	16th Mar 2016	14th Apr 2016
Aircel	8th Jan 2016	6th Feb 2016	8th Mar 2016	8th Apr 2016
Tata Teleservices	7th Jan 2016	9th Feb 2016	9th Mar 2016	7th Apr 2016
Videocon	20th Jan 2016	17th Feb 2016	11th Mar 2016	20th Apr 2016
Telenor	12th Jan 2016	16th Feb 2016	14th Mar 2016	12th Apr 2016
MTS	11th Jan 2016	5th Feb 2016	7th Mar 2016	11th Apr 2016

Colour codes to read the report:

	Not meeting the benchmark
NA	Not Applicable
DNA	Data not available (at TSP Premises)

6.3. 2G VOICE PMR DATA: JANUARY

Jan-16													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.14%	0.73%	1.55%	1.43%	0.13%	0.03%	0.03%	0.05%	0.20%	0.19%	0.26%	2.79%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.20%	0.91%	1.91%	1.82%	0.25%	0.00%	0.20%	0.30%	0.43%	0.64%	0.92%	1.82%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.58%	98.64%	98.27%	97.92%	97.77%	99.62%	97.78%	98.20%	98.30%	99.19%	97.99%	98.65%
	SDDCH/Paging chl. Congestion	≤ 1%	0.17%	0.68%	0.61%	0.49%	0.94%	0.00%	0.00%	0.33%	0.40%	0.00%	0.39%	0.81%
	TCH Congestion	≤ 2%	0.82%	1.02%	1.47%	1.30%	1.55%	0.00%	0.84%	0.32%	1.10%	0.05%	0.46%	1.35%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.23%	1.19%	1.58%	1.09%	0.17%	0.15%	0.09%	0.59%	0.37%	0.72%	0.88%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.90%	2.13%	2.16%	2.51%	2.41%	1.79%	0.92%	0.28%	1.22%	1.99%	3.91%	3.47%
	%age of connection with good voice quality	≥ 95%	95.80%	96.12%	95.50%	97.20%	96.39%	96.52%	98.68%	98.63%	96.53%	98.97%	97.09%	96.62%

6.4. 2G VOICE PMR DATA: FEBRUARY

Feb-16													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.09%	0.67%	1.57%	1.38%	0.07%	0.03%	0.02%	0.01%	0.21%	0.16%	0.21%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.45%	0.60%	1.90%	1.73%	0.11%	0.00%	0.10%	0.00%	0.35%	0.21%	0.68%	0.68%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.05%	98.65%	98.55%	97.13%	98.24%	99.66%	97.62%	98.19%	98.43%	99.09%	98.14%	98.84%
	SDDCH/Paging chl. Congestion	≤ 1%	0.31%	0.78%	0.67%	0.73%	0.56%	0.00%	0.00%	0.24%	0.45%	0.00%	0.32%	0.41%
	TCH Congestion	≤ 2%	0.95%	1.03%	1.45%	1.36%	1.26%	0.00%	0.93%	0.39%	1.00%	0.05%	0.41%	1.16%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.37%	1.06%	1.17%	1.47%	1.10%	0.18%	0.14%	0.08%	0.55%	0.22%	0.84%	0.87%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.88%	2.30%	2.25%	2.67%	2.74%	2.07%	0.81%	0.22%	1.18%	1.85%	3.53%	2.82%
	%age of connection with good voice quality	≥ 95%	96.98%	96.00%	95.56%	96.94%	96.25%	98.55%	98.66%	98.62%	96.54%	98.94%	97.10%	96.40%

6.5. 2G VOICE PMR DATA: MARCH

Mar-16													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.10%	0.96%	1.37%	1.35%	0.07%	0.03%	0.03%	0.01%	0.26%	0.17%	0.27%	0.20%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.45%	1.01%	1.98%	1.65%	0.10%	0.00%	0.20%	0.00%	0.47%	0.21%	0.68%	0.49%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.99%	98.69%	98.66%	97.24%	97.97%	99.50%	98.60%	97.83%	98.31%	99.17%	98.08%	98.79%
	SDDCH/Paging chl. Congestion	≤ 1%	0.28%	0.89%	0.60%	0.85%	0.75%	0.00%	0.00%	0.37%	0.37%	0.00%	0.34%	0.56%
	TCH Congestion	≤ 2%	0.88%	0.98%	1.34%	1.30%	1.40%	0.00%	0.17%	0.33%	0.77%	0.02%	0.45%	1.21%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.02%	1.18%	1.47%	1.20%	0.25%	0.16%	0.09%	0.58%	0.24%	0.60%	0.86%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.83%	1.81%	2.17%	2.48%	2.65%	2.52%	0.78%	0.28%	1.12%	2.01%	2.99%	2.67%
	%age of connection with good voice quality	≥ 95%	96.26%	95.97%	95.60%	97.12%	96.13%	98.51%	99.18%	99.06%	96.55%	98.92%	97.07%	96.43%

6.6. 2G VOICE PMR DATA: CONSOLIDATED

Consolidated													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.79%	1.50%	1.39%	0.09%	0.03%	0.03%	0.02%	0.22%	0.17%	0.24%	1.06%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.70%	0.84%	1.93%	1.73%	0.15%	0.00%	0.17%	0.10%	0.42%	0.36%	0.76%	1.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.87%	98.66%	98.49%	97.43%	97.99%	99.60%	98.00%	98.07%	98.34%	99.15%	98.07%	98.76%
	SDDCH/Paging chl. Congestion	≤ 1%	0.25%	0.78%	0.63%	0.69%	0.75%	0.00%	0.00%	0.32%	0.41%	0.00%	0.35%	0.59%
	TCH Congestion	≤ 2%	0.88%	1.01%	1.42%	1.32%	1.40%	0.00%	0.65%	0.35%	0.96%	0.04%	0.44%	1.24%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.10%	1.18%	1.51%	1.13%	0.20%	0.15%	0.09%	0.57%	0.28%	0.72%	0.87%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.87%	2.08%	2.19%	2.55%	2.60%	2.12%	0.84%	0.26%	1.17%	1.95%	3.48%	2.99%
	%age of connection with good voice quality	≥ 95%	96.34%	96.03%	95.55%	97.08%	96.26%	97.86%	98.84%	98.77%	96.54%	98.94%	97.08%	96.48%

6.7. 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.

6.8. 2G VOICE 3 DAYS LIVE DATA: JANUARY

Jan-16														
Network Parameters		Name of Service Provider												
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.19%	0.72%	1.70%	1.37%	0.07%	0.03%	0.03%	0.06%	0.18%	0.14%	0.21%	0.14%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.65%	0.00%	1.06%	0.00%	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%	97.49%	98.74%	95.93%	97.70%	97.77%	99.55%	97.61%	98.75%	98.38%	99.15%	97.92%	98.05%
	SDDCH/Paging chl. Congestion	≤ 1%	0.14%	0.63%	0.65%	0.44%	0.59%	0.00%	0.00%	0.25%	0.40%	0.00%	0.48%	1.51%
	TCH Congestion	≤ 2%	0.53%	0.91%	1.56%	1.44%	1.71%	0.00%	0.85%	0.33%	0.99%	0.05%	0.46%	1.95%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.23%	1.28%	1.51%	1.09%	0.20%	0.18%	0.09%	0.64%	0.46%	0.74%	0.79%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.95%	2.12%	2.47%	2.48%	2.05%	1.68%	0.99%	0.28%	1.14%	5.72%	3.97%	4.26%
	%age of connection with good voice quality	≥ 95%	95.72%	96.11%	95.11%	97.03%	96.38%	98.20%	99.00%	99.08%	96.65%	98.97%	97.10%	96.40%

6.9. 2G VOICE 3 DAYS LIVE DATA: FEBRUARY

Feb-16														
Network Parameters		Name of Service Provider												
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.10%	0.72%	1.80%	1.45%	0.09%	0.00%	0.02%	0.02%	0.20%	0.25%	0.27%	0.00%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.63%	0.00%	3.48%	0.00%	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%	97.88%	98.61%	98.60%	97.22%	98.38%	99.62%	97.69%	98.44%	98.57%	99.19%	98.42%	98.96%
	SDDCH/Paging chl. Congestion	≤ 1%	0.10%	0.55%	0.75%	0.74%	0.54%	0.00%	0.00%	0.20%	0.29%	0.00%	0.15%	0.39%
	TCH Congestion	≤ 2%	0.90%	1.05%	1.40%	1.42%	1.16%	0.00%	0.90%	0.33%	0.94%	0.05%	0.31%	1.04%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.05%	1.18%	1.49%	1.04%	0.24%	0.11%	0.07%	0.53%	0.26%	0.70%	0.98%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.68%	1.76%	2.13%	2.73%	2.47%	2.67%	0.75%	0.22%	0.94%	2.48%	3.85%	4.11%
	%age of connection with good voice quality	≥ 95%	95.77%	96.12%	95.67%	97.22%	96.32%	98.34%	98.53%	99.09%	96.46%	98.92%	97.17%	96.54%

6.10. 2G VOICE 3 DAYS LIVE DATA: MARCH

Mar-16													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.09%	0.77%	1.77%	1.38%	0.14%	0.01%	0.04%	0.01%	0.29%	0.41%	0.64%	0.25%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.76%	0.00%	1.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.21%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.12%	98.13%	98.58%	97.12%	97.54%	99.61%	97.93%	97.10%	98.49%	99.20%	97.84%	98.57%
	SDDCH/Paging chl. Congestion	≤ 1%	0.15%	0.77%	0.54%	0.96%	1.22%	0.00%	0.00%	0.35%	0.37%	0.00%	0.38%	0.60%
	TCH Congestion	≤ 2%	0.61%	1.48%	1.42%	1.33%	1.50%	0.00%	0.43%	0.36%	0.95%	0.00%	0.59%	1.43%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.37%	1.19%	1.17%	1.49%	1.20%	0.18%	0.20%	0.10%	0.61%	0.25%	0.61%	0.83%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.88%	1.78%	2.39%	2.39%	2.74%	2.33%	1.12%	0.38%	1.40%	1.95%	3.08%	2.60%
	%age of connection with good voice quality	≥ 95%	96.26%	95.91%	95.66%	96.97%	96.33%	98.63%	99.28%	99.03%	96.50%	98.91%	97.11%	96.65%

6.11. 2G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.13%	0.74%	1.76%	1.40%	0.10%	0.01%	0.03%	0.03%	0.22%	0.27%	0.37%	0.13%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.68%	0.00%	1.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.83%	98.49%	97.70%	97.35%	97.90%	99.59%	97.74%	98.10%	98.48%	99.18%	98.06%	98.52%
	SDDCH/Paging chl. Congestion	≤ 1%	0.13%	0.65%	0.65%	0.71%	0.78%	0.00%	0.00%	0.26%	0.35%	0.00%	0.34%	0.83%
	TCH Congestion	≤ 2%	0.68%	1.15%	1.46%	1.40%	1.46%	0.00%	0.73%	0.34%	0.96%	0.03%	0.45%	1.48%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.16%	1.21%	1.50%	1.11%	0.21%	0.16%	0.09%	0.59%	0.32%	0.68%	0.87%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.83%	1.88%	2.33%	2.53%	2.42%	2.23%	0.95%	0.30%	1.16%	3.38%	3.63%	3.65%
	%age of connection with good voice quality	≥ 95%	95.92%	96.04%	95.48%	97.07%	96.34%	98.39%	98.94%	99.07%	96.54%	98.93%	97.13%	96.53%

6.12. 3G VOICE PMR: CONSOLIDATED

Consolidated								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.96%	0.92%	0.50%	0.41%	0.28%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.07%	0.91%	0.50%	1.65%	0.98%	0.63%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.77%	96.07%	98.41%	99.19%	97.75%	100.00%
	RRC Congestion:	≤ 1%	0.08%	0.89%	0.74%	0.96%	0.46%	0.02%
	RAB Congestion:	≤ 2%	0.00%	1.59%	0.58%	0.46%	1.49%	0.05%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.48%	1.27%	1.49%	0.27%	0.29%	0.54%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.19%	2.24%	2.60%	2.52%	2.26%	5.09%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.91%	DNA	DNA	99.17%	99.12%	98.45%

6.13. 3G VOICE PMR: JANUARY

Jan-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.92%	0.00%	0.00%	0.38%	0.32%	0.00%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.49%	0.00%	0.00%	1.96%	1.37%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.71%	DNA	DNA	99.25%	98.05%	100.00%
	RRC Congestion:	≤ 1%	0.11%	DNA	DNA	0.95%	0.40%	0.02%
	RAB Congestion:	≤ 2%	0.00%	DNA	DNA	0.44%	1.45%	0.02%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.47%	DNA	DNA	0.25%	0.32%	0.63%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.09%	DNA	DNA	2.47%	2.35%	6.48%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.93%	DNA	DNA	99.24%	99.11%	98.59%

6.14. 3G VOICE PMR: FEBRUARY

Feb-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.94%	1.33%	0.00%	0.37%	0.27%	0.00%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.92%	1.47%	0.00%	1.24%	1.11%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.81%	96.05%	DNA	99.19%	97.02%	100.00%
	RRC Congestion:	≤ 1%	0.08%	0.88%	DNA	0.94%	0.53%	0.01%
	RAB Congestion:	≤ 2%	0.00%	1.61%	DNA	0.47%	1.71%	0.04%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.47%	1.69%	DNA	0.27%	0.31%	0.52%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.18%	2.16%	DNA	2.51%	2.40%	4.38%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.92%	DNA	DNA	99.23%	99.12%	98.59%

6.15. 3G VOICE PMR: MARCH

Mar-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.03%	1.43%	1.49%	0.47%	0.26%	0.53%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.79%	1.25%	1.51%	1.74%	0.44%	1.88%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.78%	96.09%	98.41%	99.14%	98.19%	100.00%
	RRC Congestion:	≤ 1%	0.07%	0.89%	0.74%	0.98%	0.46%	0.02%
	RAB Congestion:	≤ 2%	0.00%	1.57%	0.58%	0.46%	1.32%	0.10%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.51%	0.85%	1.49%	0.30%	0.26%	0.45%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.29%	2.32%	2.60%	2.59%	2.03%	4.40%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.88%	DNA	DNA	99.05%	99.13%	98.16%

6.16. 3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.76%	1.24%	DNA	0.41%	0.37%	1.14%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.88%	0.21%	DNA	0.09%	0.04%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.80%	95.97%	DNA	99.07%	97.60%	100.00%
	RRC Congestion:	≤ 1%	0.08%	0.98%	DNA	0.99%	0.47%	0.01%
	RAB Congestion:	≤ 2%	0.00%	1.58%	DNA	0.59%	1.67%	0.02%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.47%	0.87%	DNA	0.27%	0.33%	0.38%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.16%	2.28%	DNA	2.56%	2.69%	4.59%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.92%	DNA	DNA	99.17%	99.11%	98.28%

6.17. 3G VOICE 3 DAYS LIVE DATA: JANUARY

Jan-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.03%	1.26%	DNA	0.30%	0.30%	DNA
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.70%	0.21%	DNA	0.07%	0.12%	DNA
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.73%	95.66%	DNA	99.06%	98.27%	100.00%
	RRC Congestion:	≤ 1%	0.16%	0.89%	DNA	1.16%	0.37%	0.02%
	RAB Congestion:	≤ 2%	0.00%	1.61%	DNA	0.61%	1.38%	0.01%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.47%	0.87%	DNA	0.23%	0.29%	0.56%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.09%	2.25%	DNA	2.24%	2.25%	DNA
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.92%	DNA	DNA	99.24%	99.12%	98.56%

6.18. 3G VOICE 3 DAYS LIVE DATA: FEBRUARY

Feb-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.12%	1.14%	DNA	0.46%	0.36%	0.90%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.91%	0.21%	DNA	0.12%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.84%	96.12%	DNA	99.25%	96.92%	100.00%
	RRC Congestion:	≤ 1%	0.03%	0.97%	DNA	0.86%	0.57%	0.02%
	RAB Congestion:	≤ 2%	0.00%	1.57%	DNA	0.51%	1.69%	0.05%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.45%	0.85%	DNA	0.25%	0.35%	0.17%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.19%	2.44%	DNA	2.57%	3.06%	4.59%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.93%	DNA	DNA	99.21%	99.10%	98.27%

6.19. 3G VOICE 3 DAYS LIVE DATA: MARCH

Mar-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.13%	1.32%	DNA	0.46%	0.46%	1.39%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.03%	0.21%	DNA	0.07%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.81%	96.14%	DNA	98.89%	97.61%	100.00%
	RRC Congestion:	≤ 1%	0.05%	1.09%	DNA	0.95%	0.47%	0.00%
	RAB Congestion:	≤ 2%	0.00%	1.55%	DNA	0.65%	1.93%	0.01%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.48%	0.89%	DNA	0.31%	0.35%	0.41%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.21%	2.16%	DNA	2.85%	2.77%	4.59%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.90%	DNA	DNA	99.06%	99.12%	98.00%

6.20. POI CONGESTION: CONSOLIDATED

Consolidated														
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service														
S. No.	Name of Parameter	Benchmark	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM
Network Service Quality Parameter														
7	Total No. of POI's in Month having < = 0.5% POI congestion													
	Total No. of call attempts on POI		266375	2512176	17833	18182	26494	4214	424206	786230	33816559	622043	619330	3043003
	Total traffic served on all POIs (Erlang)		6356	108633	17826	18175	673	68	8033	16139	777253	19959	11204	69699
	Total No. of circuits on all individual POIs		10215	183972	62000	61471	1465	155	30183	39948	1608640	52324	20573	145522
	Total number of working POI Service Area wise		44	45	37	37	157	50	103	53	36	151	32	116
	Capacity of all POIs		8953	177301	46455	46380	1252	136	27193	37506	1537658	48178	18912	142898
	No. of all POI's having >=0.5% POI congestion		0	0	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	NIL	NIL

6.21. POI CONGESTION: JANUARY

Jan-16														
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter														
1	Total No. of POI's in Month having < = 0.5% POI congestion													
	Total No. of call attempts on POI		222646	2393867	16837	16837	24891	4317	414488	734074	2500645	378621	540344	3136706
	Total traffic served on all POIs (Erlang)		4356	103915	16834	16834	474	70	7759	14925	59375	19604	10103	95031
	Total No. of circuits on all individual POIs		10076	181195	62357	62357	1809	155	30540	39945	143364	52342	20400	145445
	Total number of working POI Service Area wise		44	45	37	37	156	50	103	53	36	151	32	117
	Capacity of all POIs		8826	174862	46677	46677	1263	136	27519	37506	136108	48189	18744	142820
	No. of all POI's having >=0.5% POI congestion		0	0	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	NIL	NIL

6.22. POI CONGESTION: FEBRUARY

Feb-16														
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter														
1	Total No. of POI's in Month having < = 0.5% POI congestion													
	Total No. of call attempts on POI		277037	2567676	DNA	18880	26972	4214	423293	803595	2957525	416318	637027	2966148
	Total traffic served on all POIs (Erlang)		9177	110861	DNA	18873	1047	67	8051	16675	67080	20410	11501	57504
	Total No. of circuits on all individual POIs		10075	185242	DNA	60412	1288	155	30158	39997	143133	52310	20659	145914
	Total number of working POI Service Area wise		44	45	DNA	37	159	50	103	53	35	151	32	115
	Capacity of all POIs		8825	178394	DNA	46232	1242	136	27181	37557	136506	48162	18996	143284
	No. of all POI's having >=0.5% POI congestion		0	0	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	NIL	NIL

6.23. POI CONGESTION: MARCH

Mar-16														
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
Network Service Quality Parameter														
1	Total No. of POI's in Month having < = 0.5% POI congestion													
	Total No. of call attempts on POI		299441	2574984	18829	18829	27619	4111	434836	821022	95991506	1071188	680620	3026154
	Total traffic served on all POIs (Erlang)		5536	111124	18818	18818	498	66	8290	16816	2205303	19863	12009	56561
	Total No. of circuits on all individual POIs		10495	185479	61643	61643	1297	155	29852	39901	4539423	52321	20659	145206
	Total number of working POI Service Area wise		44	45	37	37	157	50	103	53	36	151	32	115
	Capacity of all POIs		9209	178646	46232	46232	1251	136	26879	37455	4340361	48183	18996	142591
	No. of all POI's having >=0.5% POI congestion		0	0	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	NIL	NIL

6.24. 2G WIRELESS DATA: JANUARY

Jan-16														
Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	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)		62922	DNA	DNA	DNA	5553	DNA	DNA	DNA	5878	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		62910	DNA	DNA	DNA	5553	DNA	DNA	DNA	5514	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.98%	DNA	DNA	DNA	100%	DNA	DNA	DNA	93.81%	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		2148272	630372	DNA	DNA	790624	838810	DNA	DNA	58449578	285055	101360	65314
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		2078002	630303	DNA	DNA	785207	823215	DNA	DNA	57947104	275127	101290	64811
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	96.73%	99.99%	DNA	DNA	99.31%	98.14%	DNA	DNA	99.14%	96.52%	99.93%	99.23%
3														
i)	RNC originated PS Domain Iu Connection Setup Success (A)		87808	DNA	DNA	DNA	DNA	823215	DNA	DNA	130617920	DNA	156580622	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		15416520	DNA	DNA	DNA	DNA	6926	DNA	DNA	751664	DNA	1308641	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.57%	DNA	DNA	DNA	DNA	0.84%	DNA	DNA	0.58%	DNA	0.84%	4.26%

6.25. 2G WIRELESS DATA: FEBRUARY

Feb-16														
Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	RCOM CDMA	RCOM	TELENOR	TTSL CDMA	TTSL-GSM	VODAFONE
Network Service Quality Parameter														
1	Service Activation/ Provisioning													
i)	Total No. of Subscribers for Service Activation (A)		75234	DNA	DNA	DNA	6410	DNA	DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		75185	DNA	DNA	DNA	6410	DNA	DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.93%	DNA	DNA	DNA	100.00%	DNA	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		2225584	629785	DNA	DNA	887379	889386	DNA	NA	DNA	273605	105142	255358
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		2174914	628298	DNA	DNA	881851	876194	DNA	NA	DNA	264409	104953	254398
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	97.72%	99.76%	DNA	DNA	99.30%	98.52%	97.00%	99.44%	DNA	96.64%	99.82%	99.64%
3	Drop Rate													
i)	RNC originated PS Domain Iu Connection Setup Success (A)		15955562	DNA	DNA	DNA	DNA	876194	257392	64310911	DNA	DNA	150436974	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		92008	DNA	DNA	DNA	DNA	8236	255675	1203033	DNA	DNA	1229789	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.58%	DNA	DNA	DNA	DNA	0.94%	0.67%	1.87%	DNA	DNA	0.82%	4.00%

6.26. 2G WIRELESS DATA: MARCH

Mar-16														
Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	RCOM CDMA	RCOM	TELENOR	TTSL CDMA	TTSL-GSM	VODAFONE
Network Service Quality Parameter														
1	Service Activation/ Provisioning													
i)	Total No. of Subscribers for Service Activation (A)		176769	DNA	DNA	DNA	4186	DNA	DNA	DNA	180447	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		176752	DNA	DNA	DNA	4186	DNA	DNA	DNA	170457	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.99%	DNA	DNA	DNA	100%	DNA	DNA	DNA	94.46%	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		2310909	618218	DNA	DNA	1696751	851418	DNA	DNA	1495453027	277197	122938	253050
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		2266749	617952	DNA	DNA	1693746	837593	DNA	DNA	1484926569	267549	122880	252827
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	98.09%	99.96%	DNA	DNA	99.87%	98.38%	97.21%	99.50%	99.296%	96.52%	99.95%	99.91%
3	Drop Rate													
i)	RNC originated PS Domain Iu Connection Setup Success (A)		16301816	DNA	DNA	DNA	512489628	837593	266498	60441700	3698112546	DNA	133635330	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		102404	DNA	DNA	DNA	5793025	7706	264340	1178396	23680816	DNA	1159518	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.63%	0.70%	DNA	DNA	1.13%	0.92%	0.81%	1.95%	0.64%	DNA	0.87%	4.09%

6.27. 2G WIRELESS DATA: CONSOLIDATED

Consolidated Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	RCOM CDMA	RCOM	TELENOR	TTSL CDMA	TTSL-GSM	VODAFONE
Network Service Quality Parameter														
1	Service Activation/ Provisioning													
i)	Total No. of Subscribers for Service Activation (A)		104975	DNA	DNA	DNA	5383	DNA	DNA	DNA	93163	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		104949	DNA	DNA	DNA	5383	DNA	DNA	DNA	87986	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.97%	DNA	DNA	DNA	100.00%	DNA	DNA	DNA	94.14%	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		2228255	626125	DNA	DNA	1124918	859871	DNA	DNA	776951303	278619	109813	191241
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		2173222	625518	DNA	DNA	1120268	845667	DNA	DNA	771436837	269028	109707	190679
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	97.51%	99.90%	DNA	DNA	99.50%	98.35%	97.11%	99.47%	99.22%	96.56%	99.90%	99.59%
3	Drop Rate													
i)	RNC originated PS Domain Iu Connection Setup Success (A)		10781729	DNA	DNA	DNA	512489628	845667	261945	62376305	1914365233	DNA	146884309	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		5203644	DNA	DNA	DNA	5793025	7623	260008	1190715	12216240	DNA	1232649	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.59%	0.70%	DNA	DNA	1.13%	0.90%	0.74%	1.91%	0.61%	DNA	0.84%	4.12%

6.28. 2G WIRELESS 3 DAYS LIVE DATA: JANUARY

Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	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	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		6538278	DNA	DNA	DNA	2360490	2850534	DNA	DNA	DNA	293189	305539	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		6307160	DNA	DNA	DNA	2343808	2802249	DNA	DNA	DNA	282963	305415	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	96.47%	DNA	DNA	DNA	99.29%	98.31%	DNA	DNA	DNA	96.51%	99.96%	DNA
3														
	RNC originated PS Domain Iu Connection Setup Success (A)		261718	DNA	DNA	DNA	DNA	2802249	DNA	DNA	DNA	DNA	461559885	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		46036051	DNA	DNA	DNA	DNA	32183	DNA	DNA	DNA	DNA	3790693	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.57%	DNA	DNA	DNA	DNA	1.15%	DNA	DNA	DNA	DNA	0.82%	DNA

6.29. 2G WIRELESS 3 DAYS LIVE DATA: FEBRUARY

Feb-16														
Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	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	DNA	12650	DNA	DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	12650	DNA	DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	100.00%	DNA	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		6614847	DNA	DNA	DNA	2533920	2836139	DNA	DNA	150173943	816148	290428	191403
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		6492024	DNA	DNA	DNA	2516892	2788945	DNA	DNA	149876944	788756	289811	190911
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	98.14%	DNA	DNA	DNA	99.33%	98.34%	DNA	DNA	99.80%	96.64%	99.79%	99.74%
3														
	RNC originated PS Domain Iu Connection Setup Success (A)		280610	DNA	DNA	DNA	DNA	2788945	DNA	DNA	398693080	DNA	455338429	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		49380471	DNA	DNA	DNA	DNA	30685	DNA	DNA	2383201	DNA	3732235	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.57%	DNA	DNA	DNA	DNA	1.10%	DNA	DNA	0.60%	DNA	0.82%	4.27%

6.30. 2G WIRELESS 3 DAYS LIVE DATA: MARCH

Mar-16														
Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	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	DNA	DNA	DNA	DNA	DNA	14949	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	14231	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	95.20%	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		7517917	DNA	DNA	DNA	4580578	2623416	DNA	DNA	147233388	882943	362951	772913
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		7412734	DNA	DNA	DNA	4578306	2583482	DNA	DNA	144437165	852093	362706	770938
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	98.60%	DNA	DNA	DNA	99.95%	98.48%	DNA	DNA	98.10%	96.51%	99.93%	99.74%
3														
i)	RNC originated PS Domain Iu Connection Setup Success (A)		291510	DNA	DNA	DNA	1534862389	2583482	DNA	DNA	377516131	DNA	403634277	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		47822595	DNA	DNA	DNA	16743014	21420	DNA	DNA	2214859	DNA	3460242	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.61%	DNA	DNA	DNA	1.09%	0.83%	DNA	DNA	0.59%	DNA	0.86%	3.80%

6.31. 2G Wireless 3 Days Live Data: Consolidated

Consolidated														
Cellular Mobile Telephone Services														
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL	IDEA	MTS	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	DNA	12650	DNA	DNA	DNA	14949	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	12650	DNA	DNA	DNA	14231	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	100.00%	DNA	DNA	DNA	95.20%	DNA	DNA	DNA
2	PDP Context Activation Success Rate													
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		6890347	DNA	DNA	DNA	3158329	2770030	DNA	DNA	148703666	664093	319639	482158
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		6737306	DNA	DNA	DNA	3146335	2724892	DNA	DNA	147157055	641271	319311	480925
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	97.74%	DNA	DNA	DNA	99.52%	98.37%	DNA	DNA	98.95%	96.55%	99.89%	99.74%
3	Drop Rate													
i)	RNC originated PS Domain Iu Connection Setup Success (A)		277946	DNA	DNA	DNA	1534862389	2724892	DNA	DNA	388104606	DNA	440177530	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		47746372	DNA	DNA	DNA	16743014	28096	DNA	DNA	2299030	DNA	3661057	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.58%	DNA	DNA	DNA	1.09%	1.03%	DNA	DNA	0.59%	DNA	0.83%	4.04%

6.32. 3G Wireless Data: January

Jan-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	DNA	DNA	DNA	122921	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	DNA	DNA	DNA	122921	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	DNA	DNA	DNA	100.00%	DNA
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	DNA	288097.129	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	DNA	9877	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	DNA	DNA	DNA	3.43%	DNA

6.33. 3G WIRELESS DATA: FEBRUARY

Feb-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	1858897	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	1858897	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	DNA	DNA	25733980	126006.8621	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	DNA	DNA	25673672	126007	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	DNA	DNA	99.77%	100.00%	DNA
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	DNA	347748.3448	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	DNA	14735	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	DNA	DNA	DNA	4.24%	DNA

6.34. 3G WIRELESS DATA: MARCH

Mar-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	4186.451613	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	4186.451613	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100.00%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		343674.29	DNA	DNA	1108418.71	134128.3548	48882.58065
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		34594.87	DNA	DNA	1101930.387	134128.1935	48366.29032
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.98%	DNA	DNA	99.41%	99.99%	98.93%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	23314039.55	340473.7097	62228051
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	226436.9355	12816.77419	62038970
iii)	Drop Rate = (B/A) * 100	<=5%	0.50%	DNA	DNA	0.97%	3.76%	0.30%

6.35. 3G WIRELESS DATA: CONSOLIDATED

Consolidated								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	931542	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	931542	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	100%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		343674	DNA	DNA	13421199	127685	48883
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		34595	DNA	DNA	13387801	127685	48366
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.98%	DNA	DNA	99.59%	100.00%	98.93%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	23314040	325440	62228051
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	226437	12476	62038970
iii)	Drop Rate = (B/A) * 100	<=5%	0.50%	DNA	DNA	0.97%	3.81%	0.30%

6.36. 3G WIRELESS 3 DAYS LIVE DATA: JANUARY

Jan-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	DNA	DNA	DNA	358979	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	DNA	DNA	DNA	358979	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	DNA	DNA	DNA	100.00%	DNA
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	DNA	807858	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	DNA	26623	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	DNA	DNA	DNA	3.30%	DNA

6.37. 3G WIRELESS 3 DAYS LIVE DATA: FEBRUARY

Feb-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	DNA	DNA	DNA	369709	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	DNA	DNA	DNA	369709	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	DNA	DNA	DNA	100.00%	DNA
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	DNA	1087824	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	DNA	49866	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	DNA	DNA	DNA	4.58%	DNA

6.38. 3G WIRELESS 3 DAYS LIVE DATA: MARCH

Mar-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	DNA	DNA	2927780	370430	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	DNA	DNA	2911182	370430	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	DNA	DNA	99.43%	100.00%	DNA
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	71063833	1060489	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	676528	42369	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	DNA	DNA	0.95%	4.00%	0.37%

6.39. 3G WIRELESS 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRTEL	BSNL UK	BSNL UP-WEST	IDEA	TTSL	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		DNA	DNA	DNA	2927780	366373	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		DNA	DNA	DNA	2911182	366373	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	DNA	DNA	DNA	99.43%	100.00%	DNA
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	DNA	DNA	71063833	985390	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	DNA	DNA	676528	39619	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	DNA	DNA	DNA	0.95%	3.96%	0.37%

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%	100.00%	100.00%	100.00%	100.00%	100.00%	98.30%	99.08%
AIRTEL	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	87.73%
BSNL/MTNL	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.06%
IDEA	0.08%	0.01%	99.99%	100.00%	100.00%	100.00%	100.00%	99.28%	99.30%
MTS	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.68%	97.18%
RCOM-GSM	0.08%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	99.63%	95.85%
RCOM-CDMA	0.08%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	99.27%	95.89%
TTSL-GSM	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.75%	88.44%
TTSL-CDMA	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.84%	99.74%
VODAFONE	0.11%	0.23%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.00%
TELENOR	NA	0.02%	100.00%	100.00%	100.00%	NIL	NIL	99.08%	99.01%
VIDEOCON	NA	0.00%	100.00%	100.00%	NA	NA	100.00%	100.00%	96.06%

Name of Service Provider	Customer Care & Grievances Redressal	
	% of Complaints addressed at call center level	% of Complaints addressed by Appellate Authority
AIRCEL	100.00%	100.00%
AIRTEL	99.33%	80.00%
BSNL/MTNL	65.41%	NIL
IDEA	44.72%	100.00%
MTS	18.18%	100.00%
RCOM-GSM	100.00%	100.00%
RCOM-CDMA	100.00%	100.00%
TTSL-GSM	98.35%	91.72%
TTSL-CDMA	99.65%	75.00%
VODAFONE	100.00%	100.00%
TELENOR	0.00%	NIL
VIDEOCON	100.00%	100.00%

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	DNA	DNA	DNA	DNA	DNA	DNA
AIRTEL	245	200	200	100.00%	100%	99%
BSNL	215	200	190	95%	100%	100%
IDEA	307	200	200	100%	100%	100%
MTS	9	2	2	100%	100%	100%
RCOM-GSM	77	57	49	86%	100%	100%
RCOM-CDMA	75	47	47	100%	100%	100%
TTSL-GSM	2	2	2	100%	100%	98%
TTSL-CDMA	NA	NA	NA	NA	100%	99%
VODAFONE	200	100	100	100%	100%	100%
TELENOR	132	100	100	100%	100%	100%

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	DNA	DNA	DNA	DNA	DNA	DNA
AIRTEL	85195	85195	100.00%	132054	129523	98.08%
BSNL	110749	110749	100.00%	51212	50199	98.02%
IDEA	1136570	1128403	99.28%	317789	316428	99.57%
MTS	21526	21362	99.24%	621	597	96.14%
RCOM-GSM	142752	141315	98.99%	18040	17411	96.51%
RCOM-CDMA	65404	65052	99.46%	8687	8472	97.53%
TTSL-GSM	304953	304491	99.85%	34208	33553	98.09%
TTSL-CDMA	NIL	NIL	NIL	585	585	100.00%
VODAFONE	695192	695192	100.00%	261063	256974	98.43%
TELENOR	653551	647012	99.00%	195618	194107	99.23%

8. L1 CALLING DATA

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

- Bijnore: 4th Feb to 6th Feb 2016
- Rampur: 22nd Feb to 24th Feb 2016
- Muzaffarnagar: 29th Feb to 2nd Mar 2016
- Nanital: 29th Mar to 31st Mar 2016

8.1. BIJNORE

	MTS				
SR. N.	EMERGENCY NUMBER	BIJNORE	CHANDPUR	DHAMPUR	NAZIBA BAD
1	100	√	√	√	√
2	101	√	√	√	×
3	102	√	√	√	√
4	104	×	×	×	×
5	108	√	√	√	√
6	138	×	×	×	×
7	149	×	×	×	×
8	181	×	×	×	×
9	182	×	×	×	×
10	1033	×	×	×	×
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	×
16	1070	√	√	√	√
17	1071	×	×	×	×
18	1072	×	×	×	×
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	×	√	√
22	1091	×	×	×	×
23	1097	×	×	×	×
24	1099	×	×	×	×
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	×	×	×	×
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	×	×	×	×
36	1909	×	×	×	×
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	√	√	√	×

	RCOM GSM			
SR. N.	EMERGENCY NUMBER	BIJNORE/CHANDPUR	DHAMPUR/NAGINA	NAGIBABAD
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	√	√	√
7	149	×	×	×
8	181	√	√	√
9	182	√	×	×
10	1033	√	√	√
11	1037	√	√	×
12	1056	×	×	×
13	1060	×	×	×
14	1063	√	√	×
15	1064	×	×	×
16	1070	×	√	×
17	1071	×	×	×
18	1072	×	×	×
19	1073	×	×	×
20	1077	×	×	×
21	1090	√	√	√
22	1091	×	×	×
23	1097	×	×	×
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	√	√	√
30	1512	√	√	√
31	1514	√	√	√
32	15100	√	√	√
33	155304	×	×	×
34	155214	×	×	×
35	1903	√	√	√
36	1909	√	√	√
37	1912	×	×	×
38	1916	×	×	×
39	1950	×	×	×

	TATA CDMA					
SR. N.	EMERGENCY NUMBER	BIJNORE	CHANDPUR	NAGINA	DHAMPUR	NAJIBABAD
1	100	√	√	√	√	√
2	101	√	√	√	√	√
3	102	√	√	√	√	√
4	104	×	×	×	×	×
5	108	×	×	×	×	×
6	138	√	√	√	√	√
7	149	√	√	√	√	√
8	181	×	×	×	×	×
9	182	×	×	×	×	×
10	1033	√	√	√	√	√
11	1037	×	×	×	×	×
12	1056	×	×	×	×	×
13	1060	×	×	×	×	×
14	1063	×	×	×	×	×
15	1064	×	×	×	×	×
16	1070	√	√	√	√	√
17	1071	√	√	√	√	√
18	1072	×	×	×	×	×
19	1073	×	×	×	×	×
20	1077	×	×	×	×	×
21	1090	×	×	×	×	×
22	1091	×	×	×	×	×
23	1097	√	√	√	√	√
24	1099	×	×	×	×	×
25	10580	×	×	×	×	×
26	10589	×	×	×	×	×
27	10740	×	×	×	×	×
28	10741	×	×	×	×	×
29	1511	×	×	×	×	×
30	1512	×	×	×	×	×
31	1514	×	×	×	×	×
32	15100	√	√	√	√	√
33	155304	×	×	×	×	×
34	155214	×	×	×	×	×
35	1903	×	×	×	×	×
36	1909	×	×	×	×	×
37	1912	×	×	×	×	×
38	1916	×	×	×	×	×
39	1950	×	×	×	×	×

	TATA GSM					
SR. N.	EMERGENCY NUMBER	BIJNORE	CHANDPUR	NAGINA	DHAMPUR	NAJIBABAD
1	100	√	√	√	√	√
2	101	√	√	√	√	√
3	102	√	√	√	√	√
4	104	×	×	×	×	×
5	108	×	×	×	×	×
6	138	√	√	√	√	√
7	149	√	√	√	√	√
8	181	×	×	×	×	×
9	182	×	×	×	×	×
10	1033	√	√	√	√	√
11	1037	×	×	×	×	×
12	1056	×	×	×	×	×
13	1060	×	×	×	×	×
14	1063	×	×	×	×	×
15	1064	×	×	×	×	×
16	1070	√	√	√	√	√
17	1071	√	√	√	√	√
18	1072	×	×	×	×	×
19	1073	×	×	×	×	×
20	1077	×	×	×	×	×
21	1090	×	×	×	×	×
22	1091	×	×	×	×	×
23	1097	√	√	√	√	√
24	1099	×	×	×	×	×
25	10580	×	×	×	×	×
26	10589	×	×	×	×	×
27	10740	×	×	×	×	×
28	10741	×	×	×	×	×
29	1511	×	×	×	×	×
30	1512	×	×	×	×	×
31	1514	×	×	×	×	×
32	15100	√	√	√	√	√
33	155304	×	×	×	×	×
34	155214	×	×	×	×	×
35	1903	×	×	×	×	×
36	1909	×	×	×	×	×
37	1912	×	×	×	×	×
38	1916	×	×	×	×	×
39	1950	×	×	×	×	×

	TELENOR			
SR. N.	EMERGENCY NUMBER	BIJNORE	CHANDPUR	NAGINA
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	√	√	√
7	149	×	×	×
8	181	×	×	×
9	182	√	×	×
10	1033	√	√	√
11	1037	×	×	×
12	1056	×	√	×
13	1060	√	√	×
14	1063	√	√	×
15	1064	×	√	×
16	1070	×	√	×
17	1071	×	×	×
18	1072	×	×	×
19	1073	×	×	×
20	1077	×	×	×
21	1090	√	√	√
22	1091	×	×	×
23	1097	×	×	×
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	√	√	√
30	1512	√	√	√
31	1514	√	√	√
32	15100	√	√	√
33	155304	×	×	×
34	155214	×	×	×
35	1903	√	√	√
36	1909	√	√	√
37	1912	×	×	×
38	1916	×	×	×
39	1950	×	×	×

8.2. RAMPUR

		AIRTEL			
SR. N.	EMERGENCY NUMBER	CALLS MADE	Rampur	Shahabad	TaNda
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. N.	**EMERGENCY NUMBER**	**Rampur**	**Shahbad**	**TaNda**
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	√	√	√
7	149	×	×	×
8	181	×	×	×
9	182	√	√	√
10	1033	√	×	×
11	1037	×	×	×
12	1056	×	×	×
13	1060	×	×	×
14	1063	√	×	×
15	1064	×	×	×
16	1070	√	×	×
17	1071	×	×	×
18	1072	×	×	×
19	1073	×	×	×
20	1077	×	×	×
21	1090	√	×	×
22	1091	√	×	×
23	1097	√	×	×
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	×	×	×
30	1512	×	×	×
31	1514	×	×	×
32	15100	×	×	×
33	155304	×	×	×
34	155214	×	×	×
35	1903	√	×	×
36	1909	√	×	×
37	1912	√	×	×
38	1916	×	×	×
39	1950	×	×	×

	MTS		
SR. N.	**EMERGENCY NUMBER**	**Rampur**	**Sahabad**
1	100	√	√
2	101	√	√
3	102	√	√
4	104	×	×
5	108	√	√
6	138	×	×

7	149	×	×
8	181	×	×
9	182	×	×
10	1033	×	×
11	1037	×	×
12	1056	×	×
13	1060	×	×
14	1063	×	×
15	1064	×	×
16	1070	×	×
17	1071	×	×
18	1072	×	×
19	1073	×	×
20	1077	×	×
21	1090	√	√
22	1091	√	√
23	1097	×	×
24	1099	×	×
25	10580	×	×
26	10589	×	×
27	10740	×	×
28	10741	×	×
29	1511	×	×
30	1512	×	×
31	1514	×	×
32	15100	×	×
33	155304	×	×
34	155214	×	×
35	1903	×	×
36	1909	×	×
37	1912	×	×
38	1916	×	×
39	1950	×	×

	RCOM CDMA			
SR. N.	**EMERGENCY NUMBER**	**Rampur**	**TaNda,Swar**	**Shahabad**
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	√	√	√
7	149	×	×	×
8	181	√	√	√
9	182	×	×	×
10	1033	√	√	√
11	1037	×	×	×
12	1056	×	×	×
13	1060	×	×	×
14	1063	×	×	×

15	1064	×	×	×
16	1070	×	×	×
17	1071	×	×	×
18	1072	×	×	×
19	1073	×	×	×
20	1077	×	×	×
21	1090	√	√	√
22	1091	×	×	×
23	1097	×	×	×
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	×	×	√
30	1512	×	×	√
31	1514	×	×	√
32	15100	×	×	√
33	155304	×	×	×
34	155214	×	×	×
35	1903	×	×	√
36	1909	×	×	√
37	1912	×	×	×
38	1916	×	×	×
39	1950	×	×	×

	RCOM GSM			
SR. N.	**EMERGENCY NUMBER**	**Rampur**	**TaNda,Swar**	**Shahabad**
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	√	√	√
7	149	×	×	×
8	181	√	√	√
9	182	×	×	×
10	1033	√	√	√
11	1037	×	×	×
12	1056	×	×	×
13	1060	×	×	×
14	1063	×	×	×
15	1064	×	×	×
16	1070	×	×	×
17	1071	×	×	×
18	1072	×	×	×
19	1073	×	×	×
20	1077	×	×	×
21	1090	√	√	√
22	1091	×	×	×
23	1097	×	×	×
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	×	×	√
30	1512	×	×	√
31	1514	×	×	√
32	15100	×	×	√
33	155304	×	×	×
34	155214	×	×	×
35	1903	×	×	√
36	1909	×	×	√
37	1912	×	×	×
38	1916	×	×	×
39	1950	×	×	×

	TATA CDMA		
SR. N.	**EMERGENCY NUMBER**	**RAMPUR**	**SHAHABAD**
1	100	√	√
2	101	√	√
3	102	√	√
4	104	×	×
5	108	×	×
6	138	√	√
7	149	√	√
8	181	×	×
9	182	×	×
10	1033	√	√
11	1037	×	×
12	1056	×	×
13	1060	×	×
14	1063	×	×
15	1064	×	×
16	1070	√	√
17	1071	√	√
18	1072	×	×
19	1073	×	×
20	1077	×	×
21	1090	√	√
22	1091	×	×
23	1097	√	√
24	1099	×	×
25	10580	×	×
26	10589	×	×
27	10740	×	×
28	10741	×	×
29	1511	×	×
30	1512	×	×
31	1514	×	×
32	15100	√	√
33	155304	×	×
34	155214	×	×
35	1903	×	×
36	1909	√	√
37	1912	×	×
38	1916	×	×
39	1950	×	×

	TATA GSM			
SR. N.	**EMERGENCY NUMBER**	**Rampur**	**Shahabad**	**TaNda**
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	×	×	×
7	149	×	×	×
8	181	×	×	×
9	182	√	√	√
10	1033	√	√	√
11	1037	×	×	×
12	1056	×	×	×
13	1060	×	×	×
14	1063	×	×	×
15	1064	×	×	×
16	1070	√	√	√
17	1071	×	×	×
18	1072	×	×	×
19	1073	√	√	√
20	1077	×	×	×
21	1090	√	√	√
22	1091	×	×	×
23	1097	√	√	√
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	×	×	×
30	1512	√	√	√
31	1514	×	×	×
32	15100	×	×	×
33	155304	×	×	×
34	155214	×	×	×
35	1903	×	×	×
36	1909	×	×	×
37	1912	×	×	×
38	1916	×	×	×
39	1950	√	√	√

	TELENOR		
SR. N.	**EMERGENCY NUMBER**	**Rampur**	**Sahabad**
1	100	√	√
2	101	√	√
3	102	√	√
4	104	×	×
5	108	√	√
6	138	×	×
7	149	×	×
8	181	×	×
9	182	√	×
10	1033	√	√
11	1037	×	×
12	1056	×	×
13	1060	×	×
14	1063	×	×
15	1064	×	×
16	1070	√	√
17	1071	×	×
18	1072	×	×
19	1073	×	×
20	1077	×	×
21	1090	√	√
22	1091	×	×
23	1097	√	√
24	1099	×	×
25	10580	×	×
26	10589	×	×
27	10740	×	×
28	10741	×	×
29	1511	×	×
30	1512	√	√
31	1514	×	×
32	15100	×	×
33	155304	×	×
34	155214	×	×
35	1903	√	√
36	1909	√	√
37	1912	√	√
38	1916	×	×
39	1950	×	×

8.3. MUZZAFFARNAGAR

		AIRTEL				
SR. N.	EMERGENCY NUMBER	CALLS MADE	MUZAFFERNAGER	JANSATH	BHUDHANA/KAIRANA	KAIRANA
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. N.	**EMERGENCY NUMBER**	**MUZAFFERNAGER**	**JANSATH**	**BHUDHANA/KAIRANA**
1	100	√	√	√
2	101	√	√	√
3	102	√	√	√
4	104	×	×	×
5	108	√	√	√
6	138	√	√	√
7	149	×	×	×
8	181	√	√	√
9	182	√	√	√
10	1033	√	√	√
11	1037	×	×	×
12	1056	×	×	×
13	1060	×	×	×
14	1063	√	√	√
15	1064	×	×	×
16	1070	√	√	√
17	1071	×	×	×
18	1072	×	×	×
19	1073	×	×	×
20	1077	×	×	×
21	1090	√	√	√
22	1091	√	√	√
23	1097	√	√	√
24	1099	×	×	×
25	10580	×	×	×
26	10589	×	×	×
27	10740	×	×	×
28	10741	×	×	×
29	1511	×	×	×
30	1512	×	×	×
31	1514	×	×	×
32	15100	√	√	√
33	155304	×	×	×
34	155214	×	×	×
35	1903	√	√	√
36	1909	√	√	√
37	1912	√	√	√
38	1916	×	×	×
39	1950	×	×	×

	MTS				
SR. N.	EMERGENCY NUMBER	MUZAFFAR NAGAR	JANSATH	BUDHNA	KAIRANA
1	100	×	√	√	√
2	101	×	√	√	√
3	102	×	√	√	√
4	104	×	√	×	×
5	108	×	√	√	√
6	138	×	×	√	√
7	149	×	×	×	×
8	181	×	×	×	√
9	182	×	×	×	√
10	1033	×	×	√	√
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	√
16	1070	×	√	√	√
17	1071	×	×	×	×
18	1072	×	×	×	√
19	1073	×	×	×	√
20	1077	×	×	×	√
21	1090	×	×	√	√
22	1091	×	×	√	√
23	1097	×	×	×	×
24	1099	×	×	×	×
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	×	×	×	×
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	×	×	×	×
36	1909	×	×	×	×
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	√	√	√

	RCOM CDMA				
SR. N.	**EMERGENCY NUMBER**	**MUZAFFARNAGAR**	**JANSATH**	**BUDHANA**	**KAIRANA**
1	100	√	√	√	√
2	101	√	√	√	√
3	102	√	×	√	√
4	104	×	×	×	×
5	108	√	√	√	√
6	138	×	×	×	×
7	149	√	√	√	√
8	181	√	√	√	√
9	182	×	×	×	×
10	1033	×	×	×	×
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	×
16	1070	×	×	×	×
17	1071	×	×	×	×
18	1072	×	×	×	×
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	√	√	√	√
24	1099	×	×	×	×
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	×	×	×	×
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	×	×	×	×
36	1909	√	√	√	√
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	×	×	×

	RCOM GSM				
SR. N.	EMERGENCY NUMBER	MUZAFFARNAGAR	JANSATH	BUDHANA	KAIRANA
1	100	√	√	√	√
2	101	√	√	√	√
3	102	√	×	√	√
4	104	×	×	×	×
5	108	√	√	√	√
6	138	×	×	×	×
7	149	√	√	√	√
8	181	√	√	√	√
9	182	×	×	×	×
10	1033	×	×	×	×
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	×
16	1070	×	×	×	×
17	1071	×	×	×	×
18	1072	×	×	×	×
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	√	√	√	√
24	1099	×	×	×	×
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	×	×	×	×
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	×	×	×	×
36	1909	√	√	√	√
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	×	×	×

	TELENOR				
SR. N.	EMERGENCY NUMBER	MUZFFARNAGAR	JANSATH	BUDHANA	KIRANA
1	100	√	√	√	√
2	101	√	√	√	√
3	102	√	√	√	√
4	104	×	×	×	×
5	108	√	√	√	√
6	138	√	√	√	√
7	149	√	√	√	√
8	181	√	√	√	√
9	182	√	√	√	√
10	1033	√	√	√	√
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	×
16	1070	√	√	√	√
17	1071	×	×	×	×
18	1072	√	√	√	√
19	1073	√	√	√	√
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	√	√	√	√
24	1099	×	×	×	×
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	√	√	√	√
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	√	√	√	√
36	1909	√	√	√	√
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	×	×	×

	TATA CDMA				
SR. N.	EMERGENCY NUMBER	MUZAFFAR NAGAR	JANSATH	BUDHANA	KAIRANA
1	100	√	√	√	√
2	101	√	√	√	√
3	102	√	√	√	√
4	104	×	×	×	×
5	108	√	√	√	√
6	138	√	√	√	√
7	149	×	×	×	×
8	181	×	×	×	×
9	182	√	√	√	√
10	1033	√	√	√	√
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	×
16	1070	√	√	√	√
17	1071	√	√	√	√
18	1072	√	√	√	√
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	√	√	√	√
24	1099	×	×	×	×
25	1511	×	×	×	×
26	1512	×	×	×	×
27	1514	×	×	×	×
28	1903	×	×	×	×
29	1909	√	√	√	√
30	1912	×	×	×	×
31	1916	×	×	×	×
32	1950	×	×	×	×
33	10580	×	×	×	×
34	10589	×	×	×	×
35	10740	×	×	×	×
36	10741	×	×	×	×
37	15100	√	√	√	√
38	155214	×	×	×	×
39	155304	×	×	×	×

	TATA GSM				
SR. N.	EMERGENCY NUMBER	MUZAFFARNAGAR	KIARANA	JANSATH	BUDHANA
1	100	√	√	√	√
2	101	√	√	√	√
3	102	√	√	√	√
4	104	×	×	×	×
5	108	√	√	√	√
6	138	×	×	×	×
7	149	×	×	×	×
8	181	√	√	√	√
9	182	×	×	×	×
10	1033	√	√	√	√
11	1037	×	×	×	×
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	×	×	×	×
15	1064	×	×	×	×
16	1070	√	√	√	√
17	1071	×	×	×	×
18	1072	×	×	×	×
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	√	√	√	√
24	1099	×	×	×	×
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	√	√	√	√
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	√	√	√	√
36	1909	×	×	×	×
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	×	×	×

8.4. NANITAL

		AIRTEL						
SR. N.	EMERGENCY NUMBER	CALLS MADE	HALDWANI/CHORGALIYA	NAINITAL	BAAZPUR,KASHIPUR	KASHIPUR	KHATIMA	RUDRAPUR/
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. N.	EMERGENCY NUMBER	HALDWANI/CHORGALIYA	SITARGANJ/KHATIMA	BAAZPUR,KASHIPUR	RUDRAPUR/
1	100	√	√	√	√
2	101	×	×	×	×
3	102	×	×	×	×
4	104	√	√	√	√
5	108	√	√	√	√
6	138	√	√	√	√
7	149	√	√	√	√
8	181	√	√	√	√
9	182	×	×	×	×
10	1033	√	√	√	√
11	1037	√	√	√	√
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	√	√	√	√
15	1064	×	×	×	×
16	1070	×	×	×	×
17	1071	×	×	×	×
18	1072	√	√	√	√
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	×	×	×	×
24	1099	√	√	√	√
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	×	×	×	×
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	√	√	√	√
36	1909	√	√	√	√
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	×	×	×

	RCOM GSM				
SR. N.	EMERGENCY NUMBER	HALDWANI/CHORGALIYA	SITARGANJ/KHATIMA	BAAZPUR,KASHIPUR	RUDRAPUR/
1	100	√	√	√	√
2	101	×	×	×	×
3	102	×	×	×	×
4	104	√	√	√	√
5	108	√	√	√	√
6	138	√	√	√	√
7	149	√	√	√	√
8	181	√	√	√	√
9	182	×	×	×	×
10	1033	√	√	√	√
11	1037	√	√	√	√
12	1056	×	×	×	×
13	1060	×	×	×	×
14	1063	√	√	√	√
15	1064	×	×	×	×
16	1070	×	×	×	×
17	1071	×	×	×	×
18	1072	√	√	√	√
19	1073	×	×	×	×
20	1077	×	×	×	×
21	1090	√	√	√	√
22	1091	×	×	×	×
23	1097	×	×	×	×
24	1099	√	√	√	√
25	10580	×	×	×	×
26	10589	×	×	×	×
27	10740	×	×	×	×
28	10741	×	×	×	×
29	1511	×	×	×	×
30	1512	×	×	×	×
31	1514	×	×	×	×
32	15100	×	×	×	×
33	155304	×	×	×	×
34	155214	×	×	×	×
35	1903	√	√	√	√
36	1909	√	√	√	√
37	1912	×	×	×	×
38	1916	×	×	×	×
39	1950	×	×	×	×

	TATA CDMA					
SR. N.	EMERGENCY NUMBER	HALDWANI	KASHIPUR	RUDRAPUR	SITARGANJ	KHATIMA
1	100	√	√	√	√	√
2	101	√	√	√	√	√
3	102	√	√	√	√	√
4	104	×	×	×	×	×
5	108	√	√	√	√	√
6	138	√	√	√	√	√
7	149	×	×	×	×	×
8	181	×	×	×	×	×
9	182	√	√	√	√	√
10	1033	√	√	√	√	√
11	1037	×	×	×	×	×
12	1056	×	×	×	×	×
13	1060	×	×	×	×	×
14	1063	×	×	×	×	×
15	1064	×	×	×	×	×
16	1070	√	√	√	√	√
17	1071	×	×	×	×	×
18	1072	×	×	×	×	×
19	1073	×	×	×	×	×
20	1077	×	×	×	×	×
21	1090	√	√	√	√	√
22	1091	×	×	×	×	×
23	1097	√	√	√	√	√
24	1099	×	×	×	×	×
25	1511	×	×	×	×	×
26	1512	×	×	×	×	×
27	1514	×	×	×	×	×
28	1903	×	×	×	×	×
29	1909	√	√	√	√	√
30	1912	×	×	×	×	×
31	1916	×	×	×	×	×
32	1950	×	×	×	×	×
33	10580	×	×	×	×	×
34	10589	×	×	×	×	×
35	10740	×	×	×	×	×
36	10741	×	×	×	×	×
37	15100	√	√	√	√	√
38	155214	×	×	×	×	×
39	155304	×	×	×	×	×

	TATA GSM								
SR. N.	EMERGENCY NUMBER	HALDWANI	CHORGALIYA	NAINITAL	BAZPUR	KASHIPUR	RUDRAPUR	SITARGANJ	KHATIMA
1	100	√	×	√	√	√	√	√	√
2	101	√	×	√	√	√	√	√	√
3	102	√	×	√	√	×	×	×	×
4	104	×	×	×	√	×	×	√	×
5	108	×	×	×	√	√	√	√	√
6	138	×	×	×	×	×	×	×	×
7	149	×	×	×	×	×	×	×	×
8	181	√	×	√	√	√	√	×	×
9	182	×	×	×	√	×	√	×	×
10	1033	√	×	√	√	√	√	√	√
11	1037	×	×	×	×	×	×	×	×
12	1056	×	×	×	×	×	×	×	×
13	1060	×	×	×	×	×	×	×	×
14	1063	×	×	×	×	×	×	×	×
15	1064	×	×	×	×	×	×	√	×
16	1070	×	×	×	×	√	√	×	√
17	1071	×	×	×	×	×	×	×	×
18	1072	×	×	×	×	×	×	×	×
19	1073	×	×	×	×	×	×	×	×
20	1077	×	×	×	×	×	×	×	×
21	1090	×	×	×	√	×	√	×	×
22	1091	×	×	√	×	×	×	×	×
23	1097	×	×	×	√	√	√	√	√
24	1099	×	×	×	×	×	×	×	×
25	10580	×	×	×	×	×	×	×	×
26	10589	×	×	×	×	×	×	×	×
27	10740	×	×	×	×	×	×	×	×
28	10741	×	×	×	×	×	×	×	×
29	1511	×	×	×	×	×	×	×	×
30	1512	√	×	√	√	√	×	√	√
31	1514	×	×	×	×	×	×	×	×
32	15100	√	×	×	×	×	√	×	×
33	155304	×	×	×	×	×	×	×	×
34	155214	×	×	×	×	×	×	×	×
35	1903	×	×	×	×	×	×	×	×
36	1909	×	×	×	×	×	×	×	×
37	1912	×	×	×	×	×	×	×	×
38	1916	×	×	×	×	×	×	×	×
39	1950	×	×	×	×	×	×	×	×

	TELENOR						
SR. N.	EMERGENCY NUMBER	HALDWANI	CHORGALIYAN	BAZPUR	KASHIPUR	SITARGUNJ	KHATIMA
1	100	√	√	√	√	√	√
2	101	√	√	√	√	√	√
3	102	√	√	√	√	√	√
4	104	×	×	×	×	×	×
5	108	√	√	√	√	√	√
6	138	√	√	√	√	√	√
7	149	×	×	×	×	×	×
8	181	√	√	√	√	√	√
9	182	√	√	√	√	√	√
10	1033	√	√	√	√	√	√
11	1037	×	×	×	×	×	×
12	1056	×	×	×	×	×	×
13	1060	×	×	×	×	×	×
14	1063	√	√	√	√	√	√
15	1064	×	×	×	×	×	×
16	1070	×	×	×	×	×	×
17	1071	×	×	×	×	×	×
18	1072	√	√	√	√	√	√
19	1073	×	×	×	×	×	×
20	1077	×	×	×	×	×	×
21	1090	√	√	√	√	√	√
22	1091	×	×	×	×	×	×
23	1097	×	×	×	×	×	×
24	1099	×	×	×	×	×	×
25	10580	×	×	×	×	×	×
26	10589	×	×	×	×	×	×
27	10740	×	×	×	×	×	×
28	10741	×	×	×	×	×	×
29	1511	×	×	×	×	×	×
30	1512	×	×	×	×	×	×
31	1514	×	×	×	×	×	×
32	15100	×	×	×	×	×	×
33	155304	×	×	×	×	×	×
34	155214	×	×	×	×	×	×
35	1903	√	√	√	√	√	√
36	1909	√	√	√	√	√	√
37	1912	√	√	√	√	√	√
38	1916	×	×	×	×	×	×
39	1950	×	×	×	×	×	×

9. Operator Assisted Drive Test

The drive test was conducted simultaneously for all the operators present in the UP West circle. As per the new directive given by TRAI headquarters, drive test for the month of January, February and March, 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 West circle.

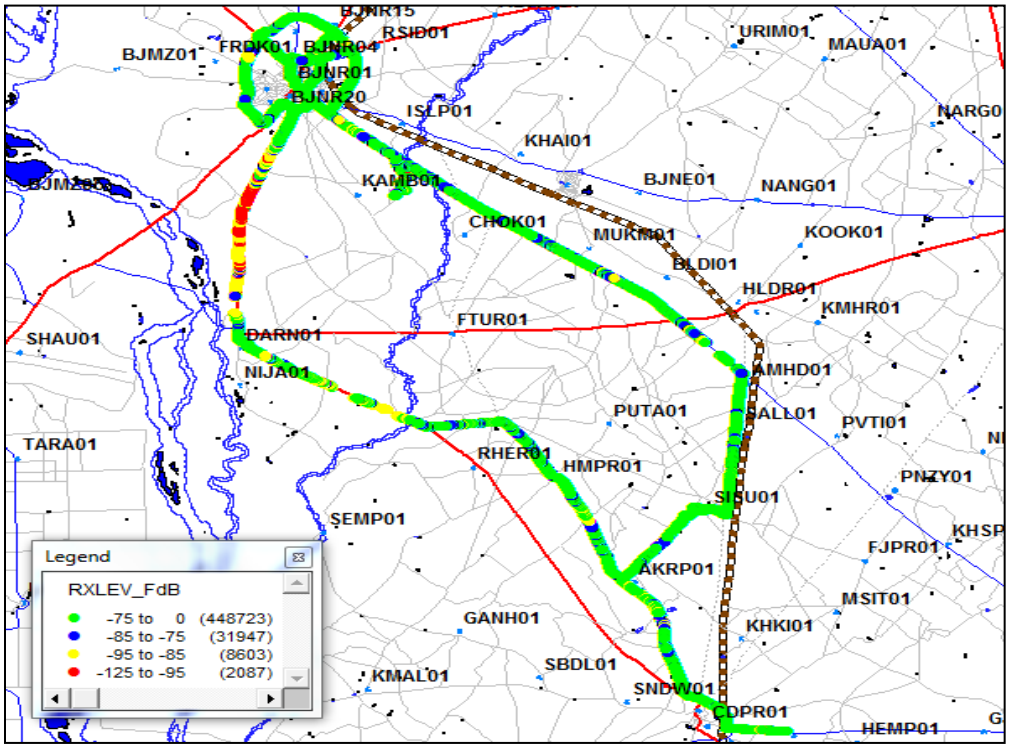
9.1. February: BIJNORE SSA

Month	Name of SSA covered	Drive Test Schedule
February 2016	BIJNORE	February 4, 2016 to February 6, 2016

9.2. Distance Covered: BIJNORE SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
BIJNORE SSA	120 km	122 km	136 km

9.3. ROUTE MAP: BIJNORE SSA: DAY 1

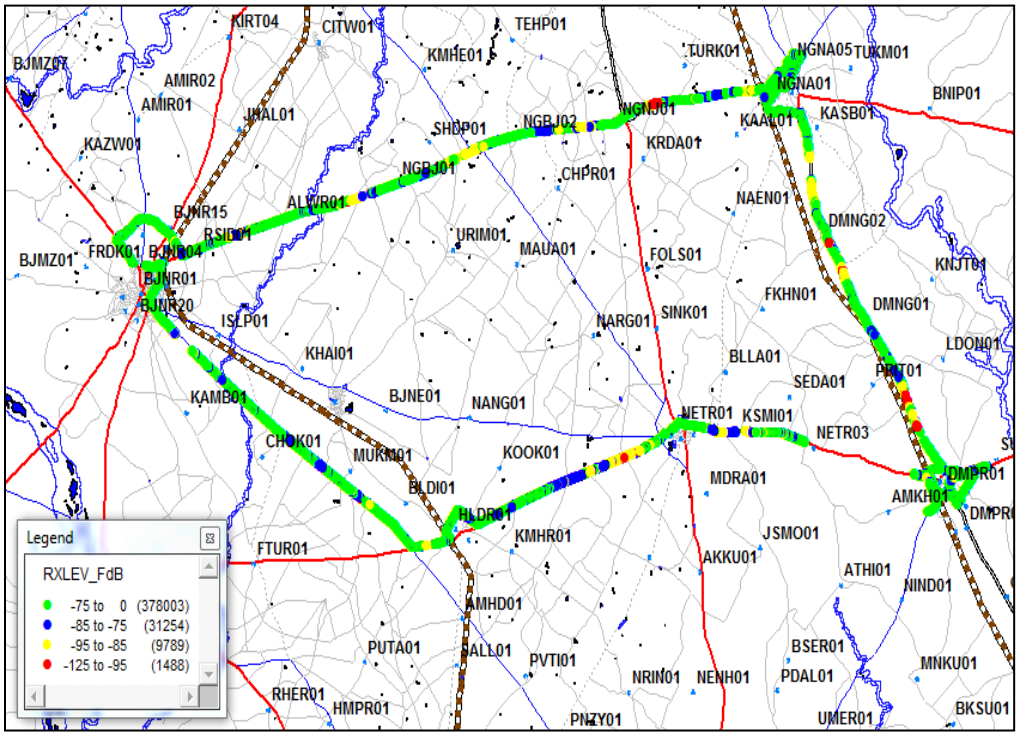


Route Covered-

Day 1

1. BSNL EXCHANGE BIJNOR
2. SRS CINEMA
3. SHAKTI CHOK
4. RING ROAD
5. BUS STAND
6. CIVIL LINES
7. HALDAUR ROAD
8. VILL. HALDAUR
9. VILL. AMHERA
10. VILL. SISAUNA
11. VILL. AKBARPUR
12. BUS STAND CHANDPUR

9.4. ROUTE MAP: BIJNORE SSA: DAY 2

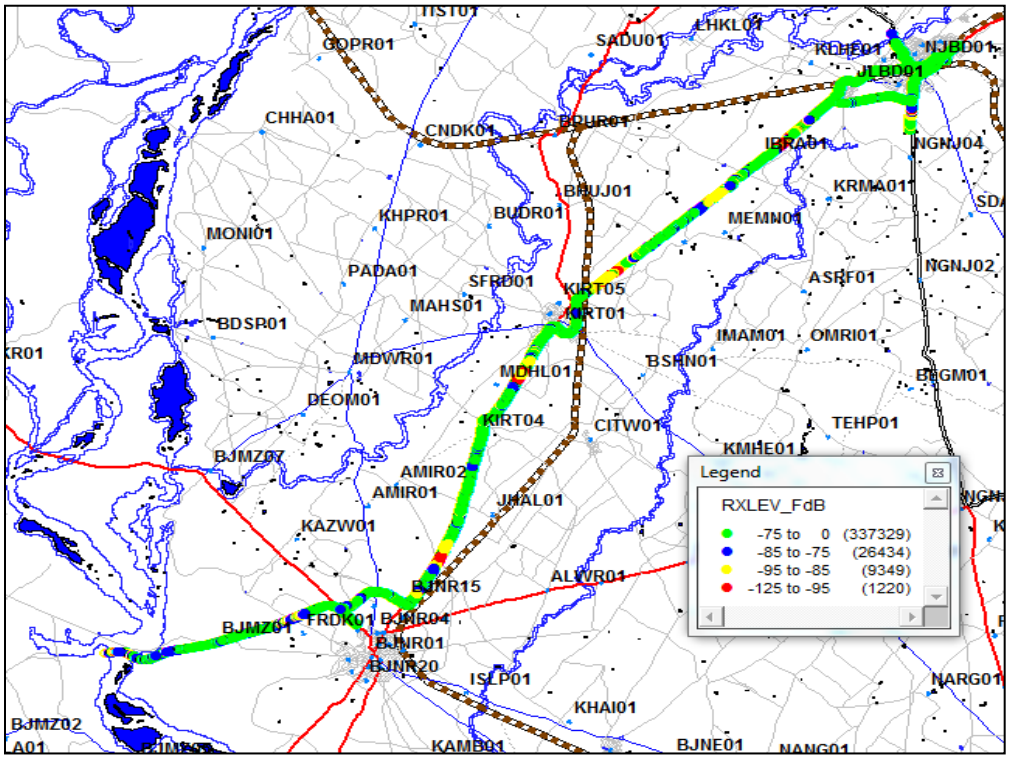


Route Covered-

Day 2

1. BSNL EXCHANGE BIJNOR
2. SRS CINEMA
3. SHAKTI CHOK
4. RING ROAD
5. NAGINA
6. BUS STAND DHAMPUR
7. STATE BANK COLONY DHAMPUR
8. PUNJABI COLONY DHAMPUR
9. RAILWAY STATION DHAMPUR
10. NEHTAUR
11. HALDAUR

9.5. ROUTE MAP: BIJNORE SSA: DAY 3



Route Covered-

Day 3

1. BSNL EXCHANGE BIJNOR
2. SRS CINEMA
3. SHAKTI CHOK
4. RING ROAD

5. NAGAR PALIKA KIRATPUR

6. VILL. IBRAHIMPUR-SHANPUR

7.RAILWAY STATION NAJIBABAD

8.BUS STAND NAJIBABAD

9. PATHANPURA

10.MAQBARA

9.6. DRIVE TEST OUTCOME

	Airtel	BSNL	IDEA	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Telenor	Vodafone
Total Calls Attempt (A)	608	431	476	418	319	303	490	498	591	553
Total Calls Blocked (B)	0.00%	0	4	0	2	2	0	0	3	0.00%
Blocked Call Rate in % (B*100/A)	0.00%	0.00%	0.84%	0.00%	0.63%	0.66%	0.00%	0.00%	0.51%	0.00%
Total Calls Established ('C)	606	431	465	418	317	301	490	498	578	552
Total Calls Drop (D)	0.00%	0	0	0	1	0	0	0	2	1
Dropped Calls Rate in % (D*100/C)	0.00%	0.00%	0.00%	0.00%	0.32%	0.00%	0.00%	0.41%	0.41%	0.41%
Call Setup Success Rate in % (C*100/A)	99.67%	100.00%	97.69%	100.00%	99.37%	99.34%	100.00%	97.58%	97.58%	97.58%
Handover Success Rate % (total HO Success	99.64%	100.00%	98.91%	100.00%	100.00%	100.00%	100.00%	100.00%	99.03%	99.39%

* 100/Total HO attempt)										

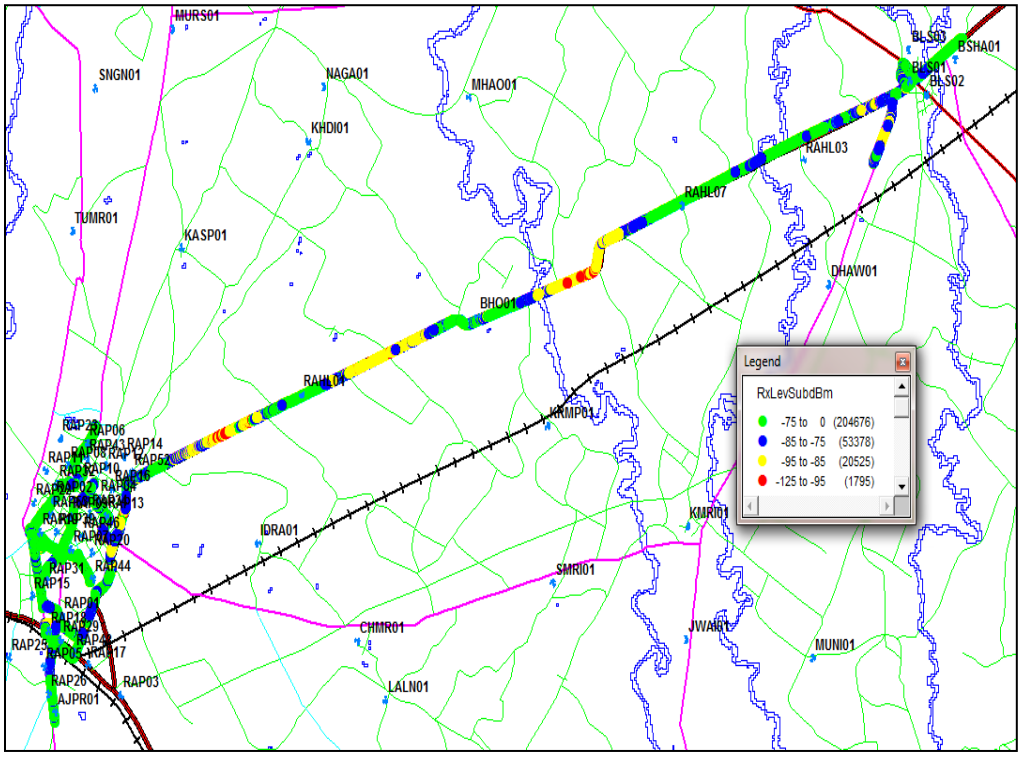
9.7. FEBRUARY: RAMPUR SSA

Month	Name of SSA covered	Drive Test Schedule
February 2016	RAMPUR	February 22, 2016 to February 24, 2016

9.8. DISTANCE COVERED: RAMPUR SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
RAMPUR SSA	104 km	134 km	80 km

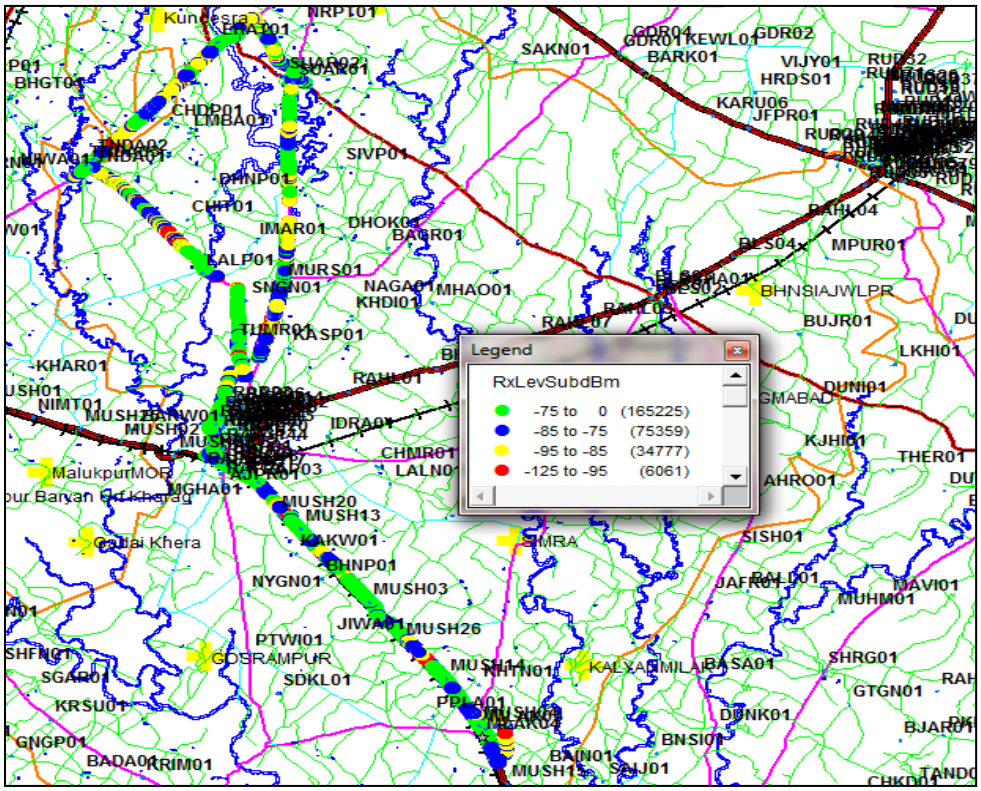
9.9. ROUTE MAP: RAMPUR SSA: DAY 1



Route Covered- Day 1

1. **Bsnl exchange**
2. **Shahabad Gate**
3. **Zinayat Khan Rd**
4. **Kotwali Rd**
5. **Bazar Nasrulla Rd**
6. **Wazid Nagar**
7. **Talaab Mohalla**
8. **Khatkan**
9. **Mala Rd**
10. **Jail Rd**
11. **Katra**
12. **Sarrafa Rd**
13. **Taxi Stand**
14. **Civil lines**
15. **Tanda Rd**
16. **Station Rd**
17. **Kemri Rd**
18. **Khan Market**
19. **Bhot Thana**
20. **Bilaspur**

9.10. ROUTE MAP: RAMPUR SSA: DAY 2

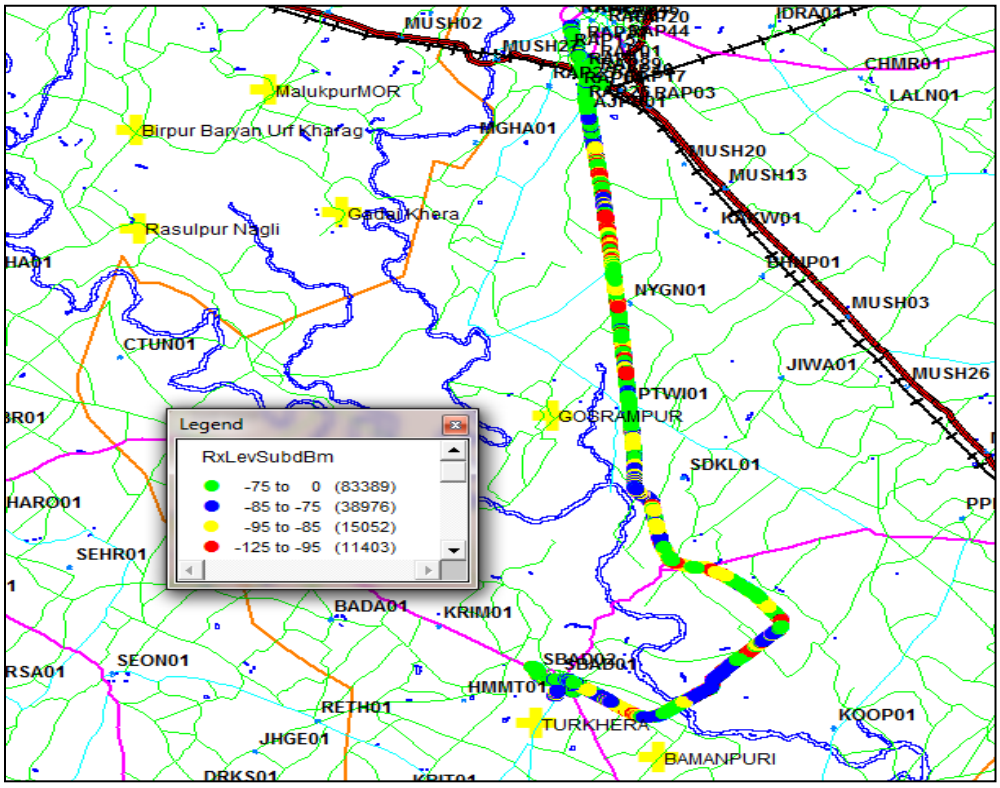


Route Covered-

Day 2

1. **Begamabad Rd**
2. **Bilaspur Rd**
3. **Maswasi Rd**
4. **Nanhi Puliya**
5. **Bazpur Rd**
6. **Sadar Bazar**
7. **Rampur Rd**
8. **Shikham Rd**
9. **Mohanpura**
10. **Nagaliya**
11. **Lalpur**
12. **Milak**
13. **Guru Amardas Market**
14. **Jalif Nagla**
15. **BSNL Exchange Tanda**
16. **Shikwa Rd**
17. **Mohd. Ali Jauhar Rd**
18. **Bareilly Highway**
19. **Dhamora**

9.11. ROUTE MAP: RAMPUR SSA: DAY 3



Route Covered- Day 3

1. **BSNL Exchange**
2. **Jauhar Rd**
3. **Civil Lines**
4. **New Awas Vikas**
5. **Jwala Nagar**
6. **Naveen Mandi**
7. **Awla Rd**
8. **Dhakiya Rd**
9. **Nakkasha Market**
10. **Ajeetpur Rd**
11. **Shahabad Rd**
12. **Patwai Rd**

9.12. DRIVE TEST OUTCOME

	Airtel	IDEA	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA CDMA	Telenor	Vodafone
Total Calls Attempt (A)	413	513	373	406	389	394	365	398	549
Total Calls Blocked (B)	7	1	0	3	5	0	0	1	0
Blocked Call Rate in % (B*100/A)	1.69%	0.19%	0.00%	0.74%	1.29%	0.00%	0.00%	0.25%	0.00%
Total Calls Established ('C)	402	508	373	403	384	394	365	397	549
Total Calls Drop (D)	1	0	0	2	1	0	0	0	1
Dropped Calls Rate in % (D*100/C)	0.25%	0.00%	0.00%	0.50%	0.26%	0.00%	0.00%	0.00%	0.18%
Call Setup Success Rate in % (C*100/A)	97.34%	99.03%	100.00%	99.26%	98.71%	100.00%	100.00%	99.75%	100.00%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.03%	99.34%	100.00%	100.00%	98.56%	100.00%	100.00%	98.72%	99.16%

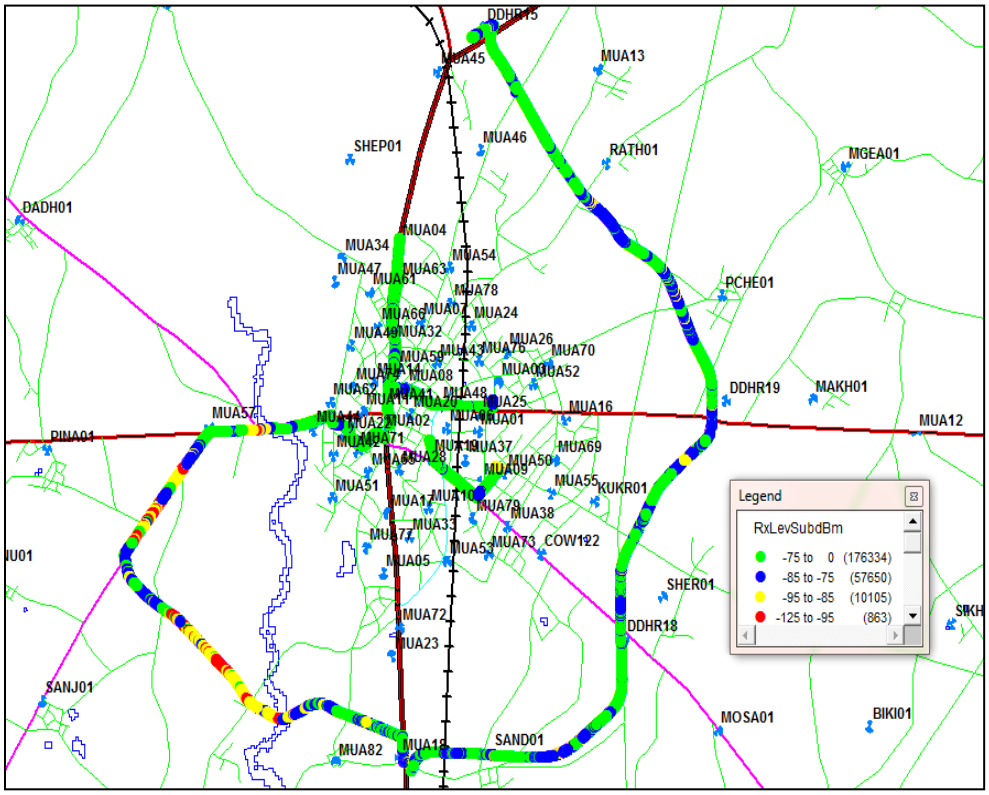
9.13. MARCH: MUZAFFARNAGAR SSA

Month	Name of SSA covered	Drive Test Schedule
March 2016	MUZAFFARNAGAR	February 29, 2016 to March 2, 2016

9.14. DISTANCE COVERED: MUZAFFARNAGAR SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
MUZAFFARNAGAR SSA	95 km	130 km	105 km

9.15. ROUTE MAP: MUZAFFARNAGAR SSA: DAY 1



Route Covered-

Day 1

BSNL EXCHANGE, NEW MANDI MUZAFFARNAGAR

MAHAVEER CHOK

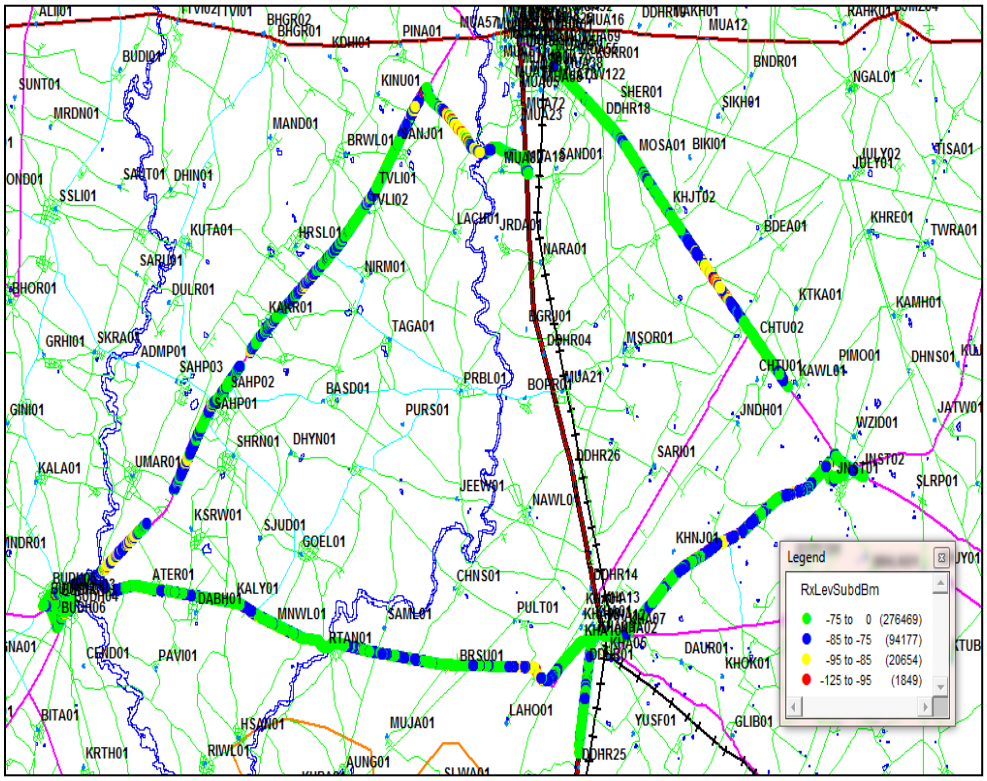
PRAKASH CHOK

SHIV CHOK

BUS STAND

RAILWAYS STATION

9.16. ROUTE MAP: MUZAFFARNAGAR SSA: DAY 2

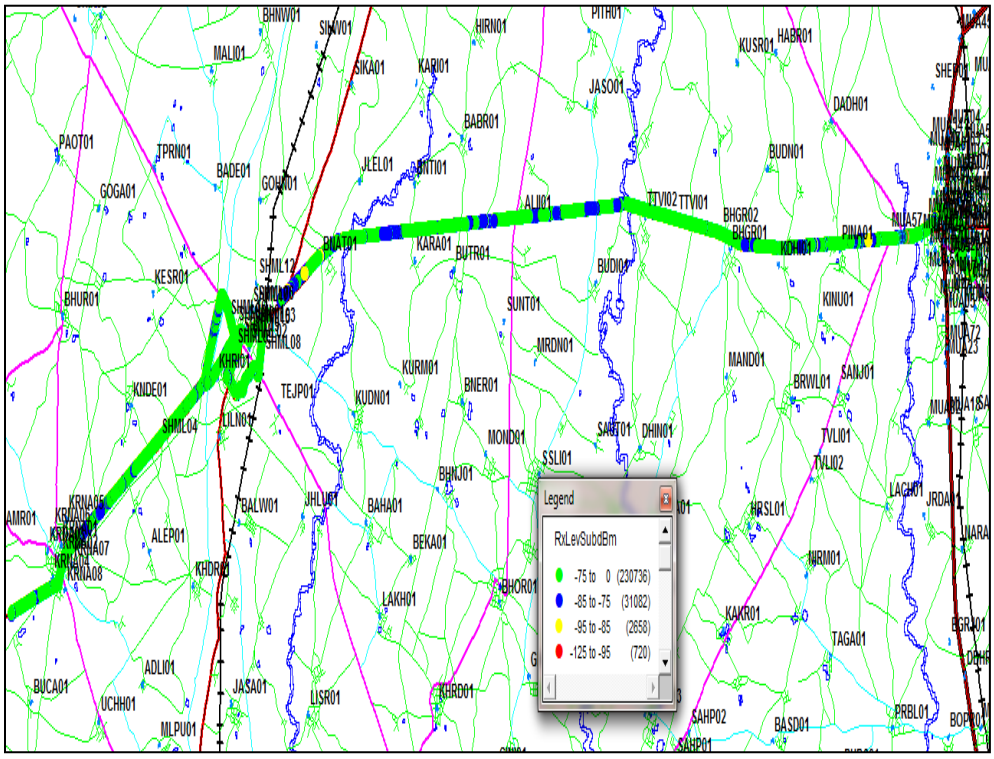


Route Covered-

Day 1

1. BSNL EXCHANGE, NEW MANDI MUZAFFARNAGAR
2. VILL. SIKHERA
3. JANSATH MARKET
4. BUS STAND JANSATH
5. JANSATH-KHATAULI ROAD
6. BUS STAND KHATAULI
7. TRIVENI SUGAR MILLS KHATAULI
8. CHEETAL KHATAULI
9. KHATAULI-

9.17. ROUTE MAP: MUZAFFARNAGAR SSA: DAY 3



Route Covered-

Day 1

1. BSNL EXCHANGE, NEW MANDI MUZAFFARNAGAR
2. SHAMLI BUS STAND MUZAFFARNAGAR
3. SHAMLI ROAD
4. VILL. TITAVI
5. BUS STAND SHAMLI
6. MILL ROAD SHAMLI
7. SHAMLI-KAIRANA ROAD
8. MARKET

9.18. DRIVE TEST OUTCOME

	Airtel	BSNL	IDEA	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA CDMA	Telenor	Vodafone
Total Calls Attempt (A)	453	572	570	**441**	531	429	490	547	539	551
Total Calls Blocked (B)	8	3	6	0	1	4	0	0	5	2
Blocked Call Rate in % (B*100/A)	1.77%	0.52%	1.05%	0.00%	0.19%	0.93%	0.00%	0.00%	0.93%	0.36%
Total Calls Established ('C)	445	569	564	441	530	425	490	547	533	549
Total Calls Drop (D)	0	5	0	0	1	1	0	0	1	2
Dropped Calls Rate in % (D*100/C)	0.00%	0.88%	0.00%	0.00%	0.19%	0.24%	0.41%	0.41%	0.41%	0.41%
Call Setup Success Rate in % (C*100/A)	98.23%	99.48%	98.95%	100.00%	99.81%	99.07%	97.58%	97.58%	97.58%	97.58%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.23%	98.12%	99.37%	100.00%	100.00%	99.66%	100.00%	100.00%	98.72%	98.96%

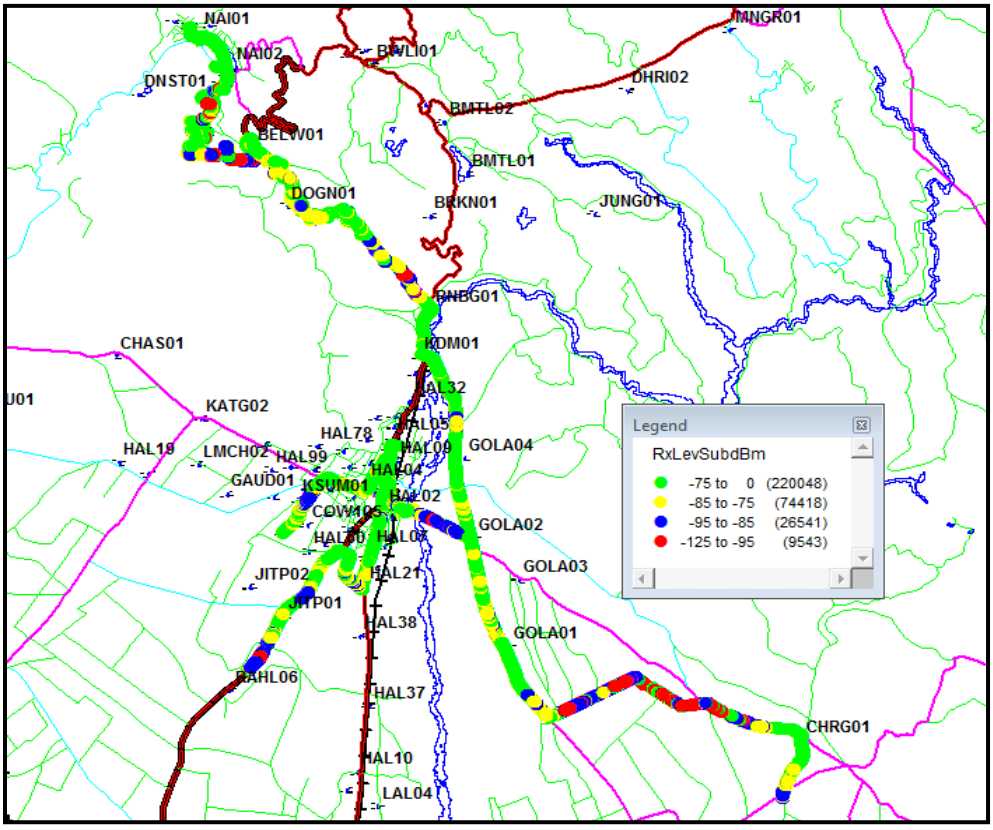
9.19. MARCH: NAINITAL SSA

Month	Name of SSA covered	Drive Test Schedule
March 2016	NAINITAL	March 29, 2016 to March 31, 2016

9.20. DISTANCE COVERED: NAINITAL SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
NAINITAL SSA	135 km	142 km	135 km

9.21. ROUTE MAP: NAINITAL SSA: DAY 1



Route Covered- Day 1

BSNL T/E

MPEG COLLEGE

TIKONIA

KOTWALI

MANDI

TEENPANI

TRANSPORT NAGAR

BHELBABA

HIGH COURT

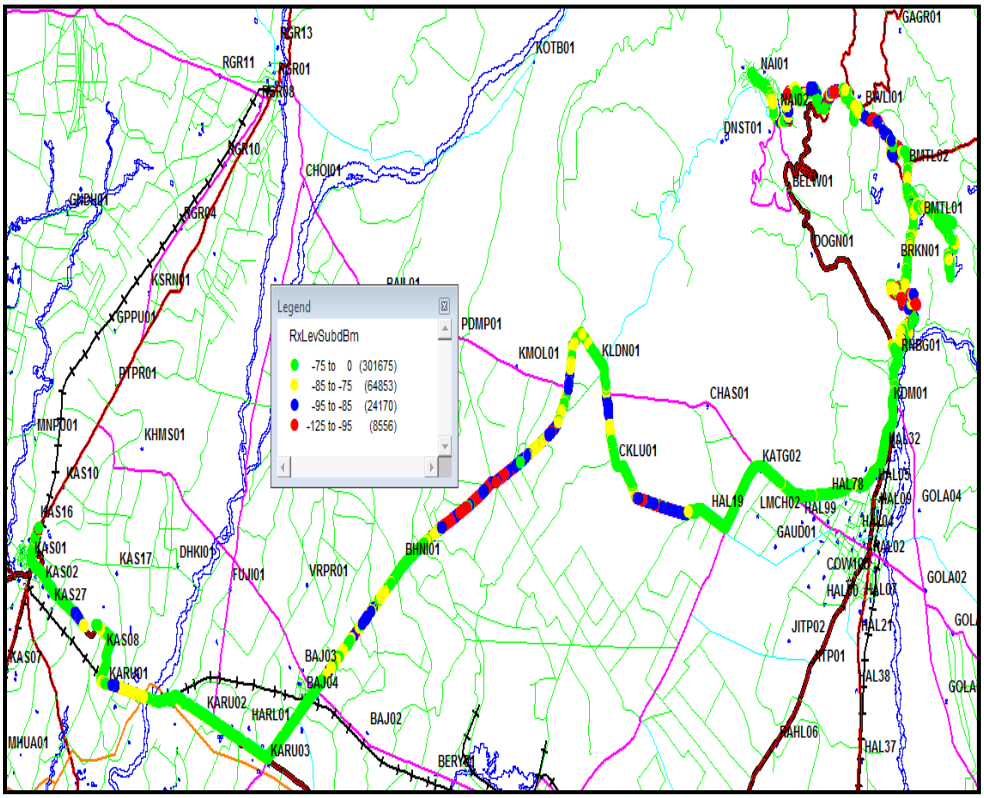
MALL ROAD NAINITAL.

RAMPUR RD

DEVAL CHOUR

CHRAYAL

9.22. ROUTE MAP: NAINITAL SSA: DAY 2

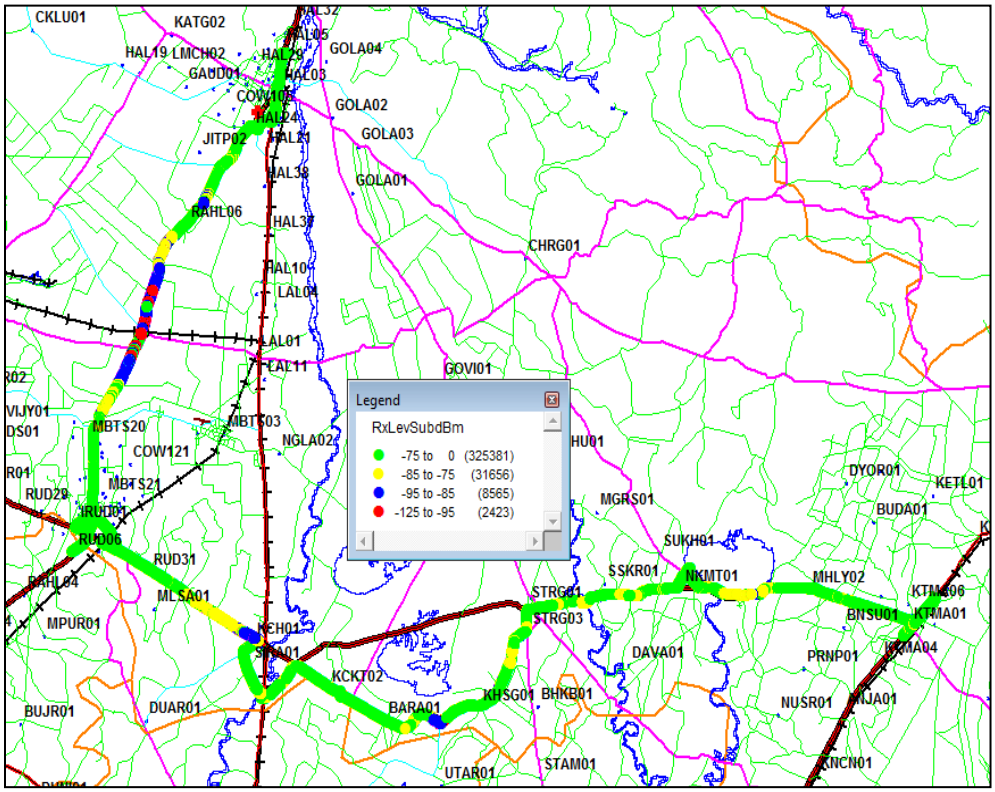


Route Covered-

Day 2

1. **BSNL T/E**
2. **MALL RD**
3. **BAAZPUR MAIN MARKET**
4. **STATION RD KASHIPUR.**
5. **KATHGODAM**
6. **BHAWALI**
7. **COLTEX**
8. **BHEEMTAL**
9. **NAUGACHIYATAL**
10. **AMARPALI INSTITUTE**
11. **BAAZPUR**
12. **KASHIPUR.**
13. **PANCHAKKI**
14. **CHAMBAPUL**
15. **KATGHARIA**
16. **LAMACHOUR**
17. **KALADUNGI**

9.23. ROUTE MAP: NAINITAL SSA: DAY 3



Route Covered-

Day 3

1. SUPERTECH MALL
2. BSNL T/E
3. RUDRAPUR
4. SABZI MANDI
5. NAVODAYA SCHOOL
6. KASHIPUR RD
7. CIVIL LINE
8. NEAR GANDHI PARK
9. RAMLEELA MAIDAN
10. TEHSIL RD
11. INDUSTRIAL ESTATE
12. KHATIMA RD.
13. BUS STAND
14. KOTWALI
15. RUDRAPUR

9.24. DRIVE TEST OUTCOME

	Airtel	RCOM CDMA	RCOM GSM	TATA GSM	TATA CDMA	Telenor
Total Calls Attempt (A)	638	528	447	440	451	417
Total Calls Blocked (B)	2	2	4	0	0	3
Blocked Call Rate in % (B*100/A)	0.31%	0.38%	0.89%	0.00%	0.00%	0.72%
Total Calls Established ('C)	635	526	443	440	451	414
Total Calls Drop (D)	2	0	0	0	0	1
Dropped Calls Rate in % (D*100/C)	0.31%	0.00%	0.00%	0.00%	0.00%	0.24%
Call Setup Success Rate in % (C*100/A)	99.53%	99.62%	99.11%	100.00%	100.00%	99.28%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.08%	100.00%	99.63%	100.00%	100.00%	99.45%

Note: Team of three TSP's (Idea, MTS and Vodafone) unfortunately met an accident post the drive test due to which they were not able submit the final report to the audit agency.

10. COUNTER DETAILS

S. 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

S. 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 dow nlink.
QUAL20DL	Number of quality 2 reported on dow nlink.
QUAL30DL	Number of quality 3 reported on dow nlink.
QUAL40DL	Number of quality 4 reported on dow nlink.
QUAL50DL	Number of quality 5 reported on dow nlink.
QUAL60DL	Number of quality 6 reported on dow nlink.
QUAL70DL	Number of quality 7 reported on dow nlink

10.2. NSN (NOKIA SIEMENS NETWORK)

S. 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 (w here 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 w ith counters being used in CBBH.
6	Connection w ith good quality voice= (Connection w ith good quality voice/Total voice samples)%	Connection w ith 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)

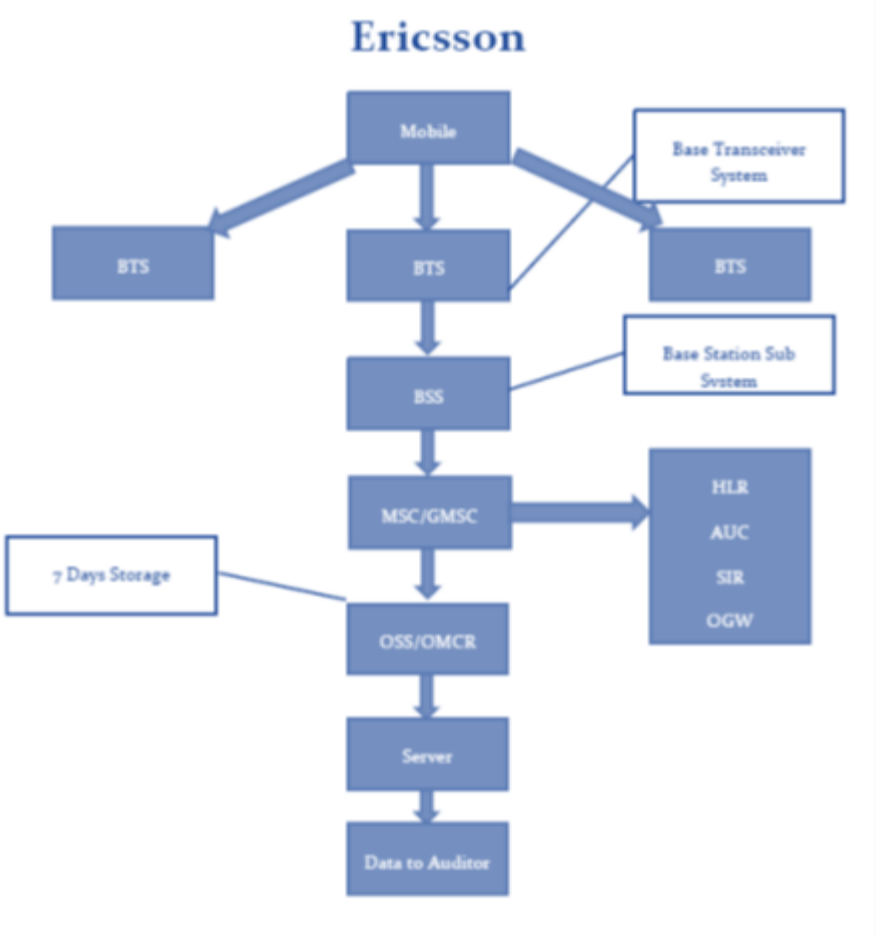
10.3. HUAWEI

S..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])]

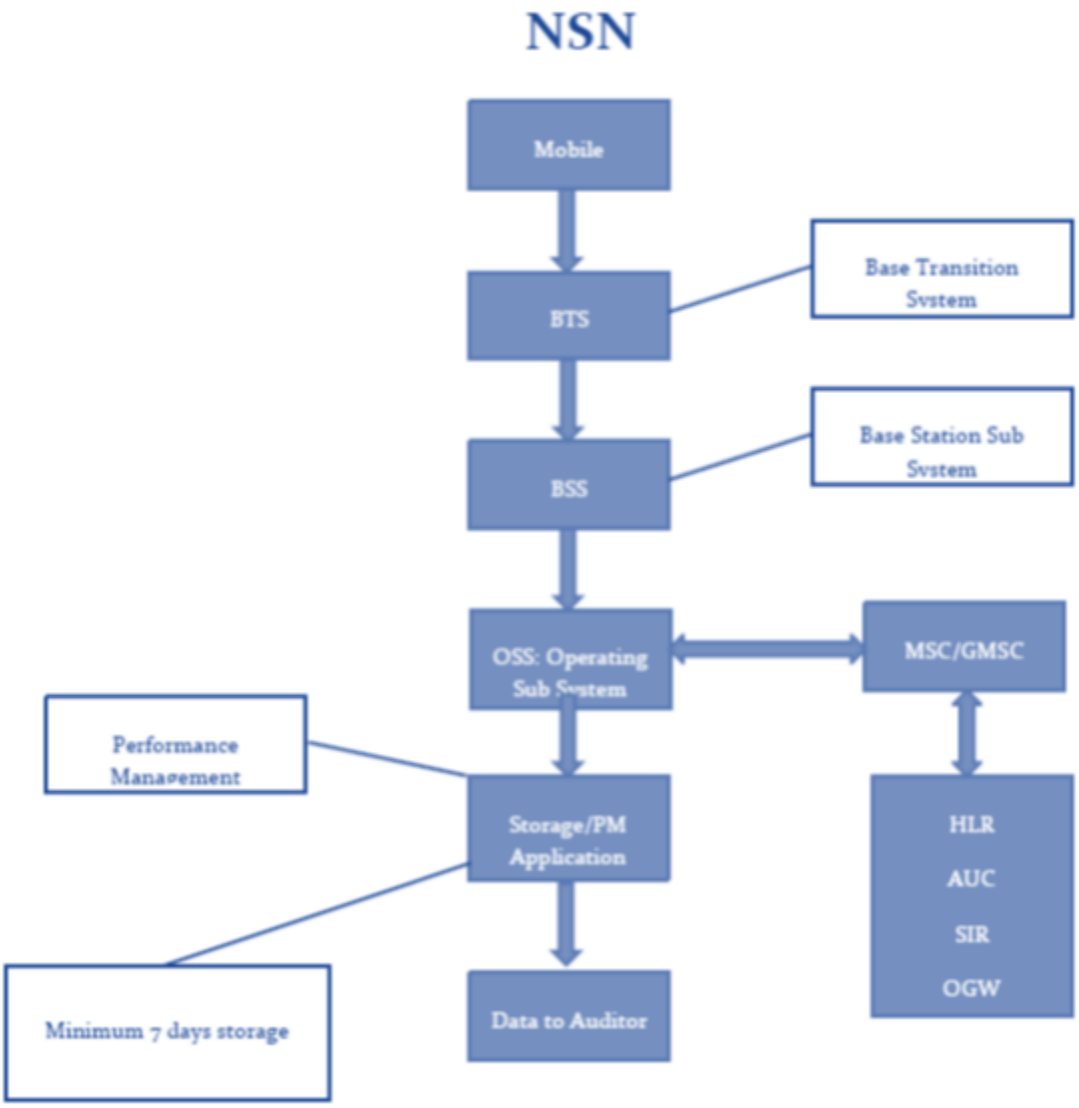
6	Call DROP Rate	CALL DROP RATE (NUM) / CALL DROP RATE(DEN) * 100\
7	RF BLOCK RATE (NUM)	{[(TCH Assignment Requests-CS Orig-IS95[Times] + TCH Assignment Requests-CS Orig-IS2000[Times] + TCH Assignment Requests-CS Term-IS95[Times] + TCH Assignment Requests-CS Term-IS2000[Times]) - (Successful TCH Assignments-CS 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

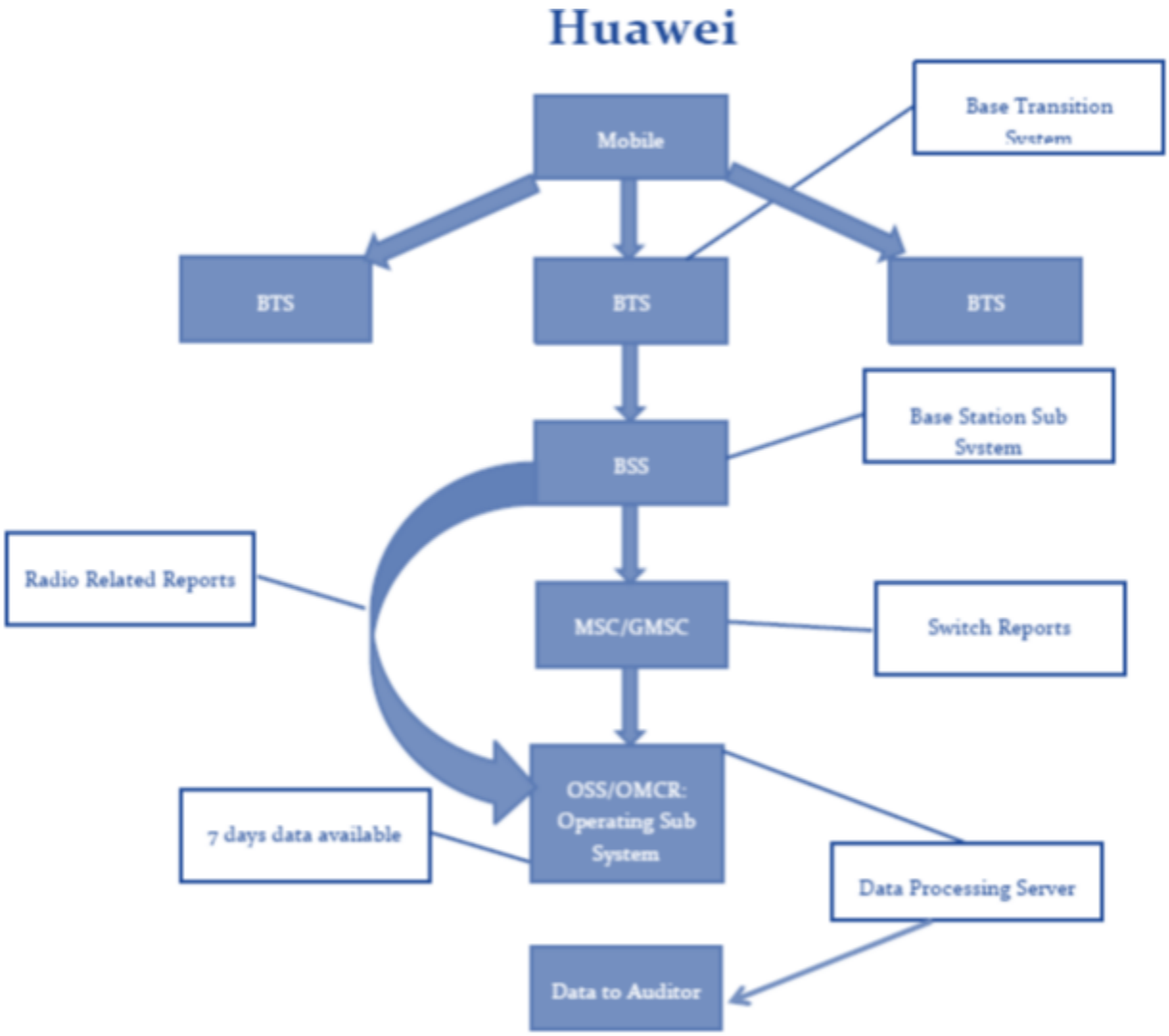
11.1. ERICSSON



11.2. NSN


NSN
Mobile
BTS
Base Transition System
BSS
Base Station Sub System
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
- PCPL – Phistream Consulting Private Limited
- JFM'16 – Refers to the quarter of January, February and March 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 Dialing
- ISD – International Subscriber Dialing

13 ANNEXURE

13.1. 2G VOICE PMR DATA: CONSOLIDATED

Consolidated													
Network Parameters		Name of Service Provider											
		Benchmark	AIRCEL	AIRTEL	BSNL UK	BSNL UPW	IDEA	MTS	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%	0.79%	1.50%	1.39%	0.09%	0.03%	0.03%	0.02%	0.22%	0.17%	0.24%	1.06%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.70%	0.84%	1.93%	1.73%	0.15%	0.00%	0.17%	0.10%	0.42%	0.36%	0.76%	1.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.87%	98.66%	98.49%	97.43%	97.99%	99.60%	98.00%	98.07%	98.34%	99.15%	98.07%	98.76%
	SDDCH/Paging chl. Congestion	≤ 1%	0.25%	0.78%	0.63%	0.69%	0.75%	0.00%	0.00%	0.32%	0.41%	0.00%	0.35%	0.59%
	TCH Congestion	≤ 2%	0.88%	1.01%	1.42%	1.32%	1.40%	0.00%	0.65%	0.35%	0.96%	0.04%	0.44%	1.24%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.36%	1.10%	1.18%	1.51%	1.13%	0.20%	0.15%	0.09%	0.57%	0.28%	0.72%	0.87%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	1.87%	2.08%	2.19%	2.55%	2.60%	2.12%	0.84%	0.26%	1.17%	1.95%	3.48%	2.99%
	%age of connection with good voice quality	≥ 95%	96.34%	96.03%	95.55%	97.08%	96.26%	97.86%	98.84%	98.77%	96.54%	98.94%	97.08%	96.48%

- TTSL GSM has parameter value of 3.48% and failed to meet the benchmark of ≤ 3% Worst affected cell having TCH drop.

13.2. 3G VOICE PMR: CONSOLIDATED

Consolidated								
Network Parameters		Name of Service Provider						
		Benchmark	AIRTEL	BSNL UK	BSNL UPW	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.96%	0.92%	0.50%	0.41%	0.28%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.07%	0.91%	0.50%	1.65%	0.98%	0.63%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.77%	96.07%	98.41%	99.19%	97.75%	100.00%
	RRC Congestion:	≤ 1%	0.08%	0.89%	0.74%	0.96%	0.46%	0.02%
	RAB Congestion:	≤ 2%	0.00%	1.59%	0.58%	0.46%	1.49%	0.05%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.48%	1.27%	1.49%	0.27%	0.29%	0.54%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	1.19%	2.24%	2.60%	2.52%	2.26%	5.09%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.91%	DNA	DNA	99.17%	99.12%	98.45%

- VODAFONE has parameter value of 5.09% and failed to meet the benchmark of ≤ 3% Worst affected cell having TCH drop.

13.3. BILLING AND CUSTOMER CARE

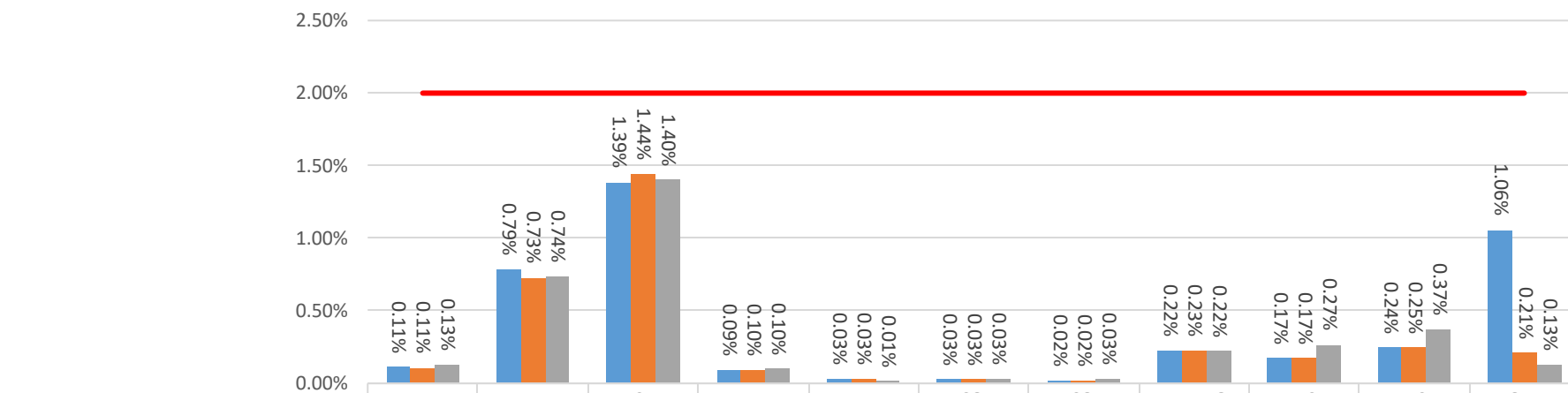
Name of Service Provider	Metering and Billing credibility		Billing Complaints			Termination & Closures	Time taken for refund of deposits after closures: Benchmark	Response time to customer for assistance	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints 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%	100.00%	100.00%	100.00%	100.00%	100.00%	98.30%	99.08%
AIRTEL	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	87.73%
BSNL/MTNL	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.06%
IDEA	0.08%	0.01%	99.99%	100.00%	100.00%	100.00%	100.00%	99.28%	99.30%
MTS	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.68%	97.18%
RCOM-GSM	0.08%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	99.63%	95.85%
RCOM-CDMA	0.08%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	99.27%	95.89%
TTSL-GSM	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.75%	88.44%
TTSL-CDMA	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.84%	99.74%
VODAFONE	0.11%	0.23%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.00%
TELENOR	NA	0.02%	100.00%	100.00%	100.00%	NIL	NIL	99.08%	99.01%
VIDEOCON	NA	0.00%	100.00%	100.00%	NA	NA	100.00%	100.00%	96.06%

Name of Service Provider	Customer Care & Grievances Redressal	
	% of Complaints addressed at call center level	% of Complaints addressed by Appellate Authority
AIRCEL	100.00%	100.00%
AIRTEL	99.33%	80.00%
BSNL/MTNL	65.41%	NIL
IDEA	44.72%	100.00%
MTS	18.18%	100.00%
RCOM-GSM	100.00%	100.00%
RCOM-CDMA	100.00%	100.00%
TTSL-GSM	98.35%	91.72%
TTSL-CDMA	99.65%	75.00%
VODAFONE	100.00%	100.00%
TELENOR	0.00%	NIL
VIDEOCON	100.00%	100.00%

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

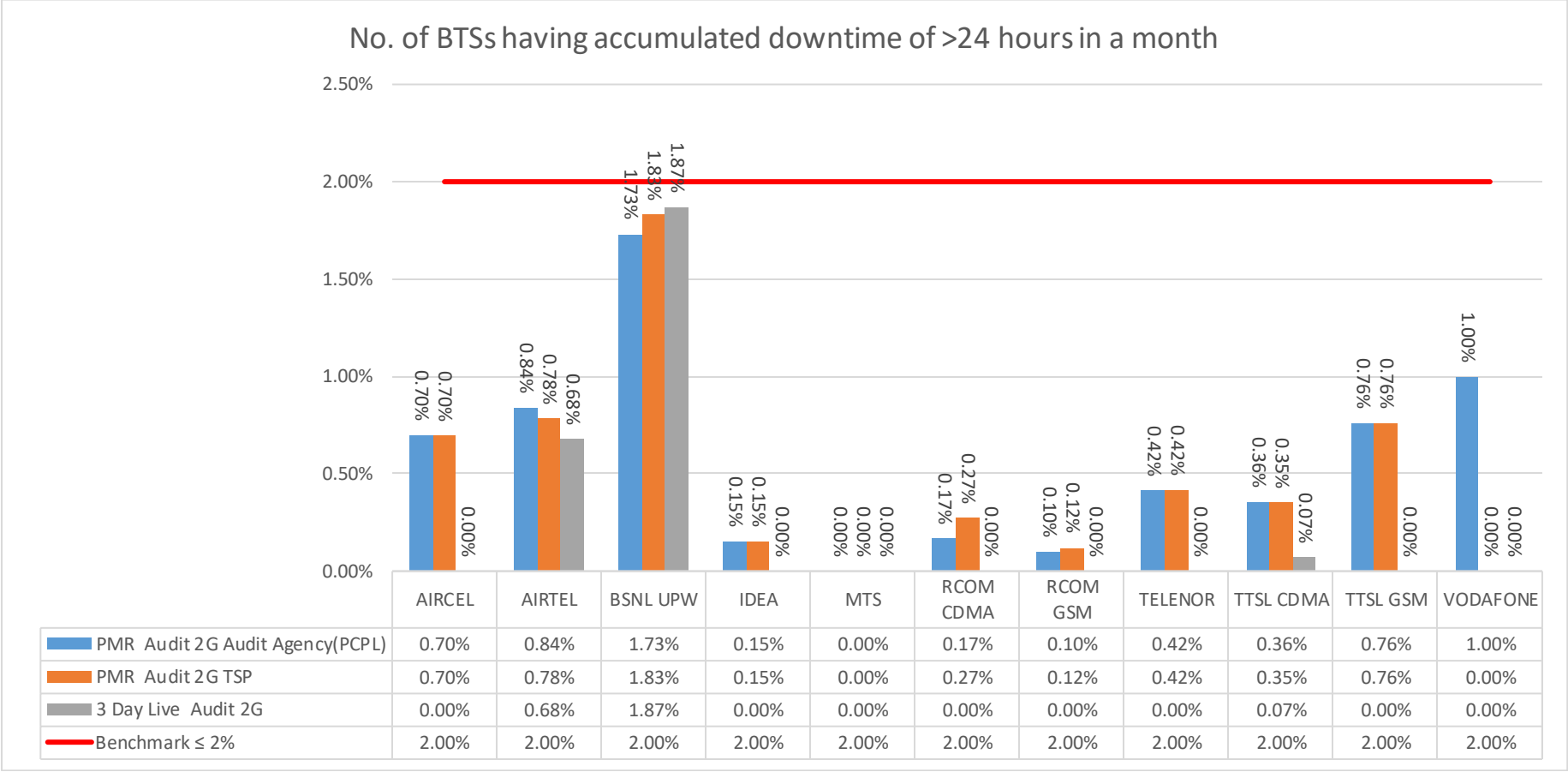
PMR Report Comparison between Audit Agency and TSP														
Network Parameters		Name of Service Provider												
		Benchmark		AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	Videocon	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.11%	0.79%	1.44%	0.09%	0.03%	0.03%	0.02%	0.22%	0.17%	0.24%	DNA	1.06%
			TSP	0.11%	0.73%	1.44%	0.10%	0.03%	0.03%	0.02%	0.23%	0.17%	0.25%	0.21%	0.22%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	0.70%	0.84%	1.83%	0.15%	0.00%	0.17%	0.10%	0.42%	0.36%	0.76%	DNA	1.00%
			TSP	0.70%	0.78%	1.83%	0.15%	0.00%	0.27%	0.12%	0.42%	0.35%	0.76%	0.00%	0.99%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	97.87%	98.66%	97.96%	97.99%	99.60%	98.00%	98.07%	98.34%	99.15%	98.07%	DNA	98.76%
			TSP	97.87%	98.65%	97.96%	97.99%	99.60%	98.00%	98.07%	97.74%	99.15%	98.07%	99.33%	98.76%
	SDDCH/Paging chl. Congestion	≤ 1%	Agency	0.25%	0.78%	0.66%	0.75%	0.00%	0.00%	0.32%	0.41%	0.00%	0.35%	DNA	0.59%
			TSP	0.25%	0.75%	0.66%	0.75%	0.00%	0.00%	0.32%	0.58%	0.00%	0.35%	0.04%	0.58%
	TCH Congestion	≤ 2%	Agency	0.88%	1.01%	1.37%	1.40%	0.00%	0.65%	0.35%	0.96%	0.04%	0.44%	DNA	1.24%
			TSP	0.88%	1.02%	1.37%	1.40%	0.00%	0.65%	0.35%	1.53%	0.04%	0.44%	0.04%	1.24%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	Agency	0.36%	1.10%	1.34%	1.13%	0.20%	0.15%	0.09%	0.57%	0.28%	0.72%	DNA	0.87%
			TSP	0.36%	1.13%	1.34%	1.13%	0.20%	0.15%	0.09%	0.67%	0.28%	0.72%	0.45%	0.87%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	Agency	1.87%	2.08%	2.37%	2.60%	2.12%	0.84%	0.26%	1.17%	1.95%	3.48%	DNA	2.99%
			TSP	1.86%	2.17%	2.37%	2.60%	2.12%	0.84%	0.26%	2.51%	1.95%	3.48%	0.00%	2.99%
	%age of connection with good voice quality	≥ 95%	Agency	96.34%	96.03%	96.32%	96.26%	97.86%	98.84%	98.77%	96.54%	98.94%	97.08%	DNA	96.48%
			TSP	96.07%	96.05%	96.34%	96.26%	98.53%	98.84%	98.77%	96.61%	98.94%	97.09%	99.02%	96.48%

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



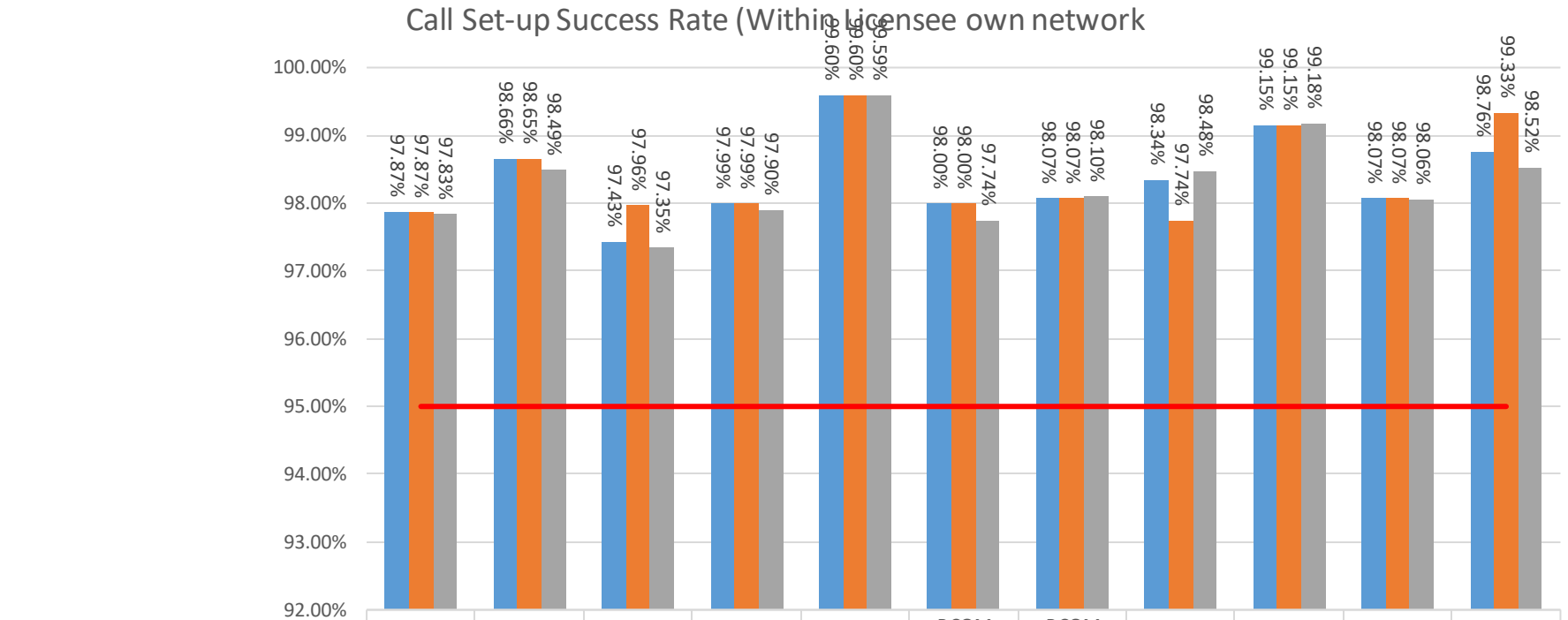
	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.11%	0.79%	1.39%	0.09%	0.03%	0.03%	0.02%	0.22%	0.17%	0.24%	1.06%
PMR Audit 2G TSP	0.11%	0.73%	1.44%	0.10%	0.03%	0.03%	0.02%	0.23%	0.17%	0.25%	0.21%
3 Day Live Audit 2G	0.13%	0.74%	1.40%	0.10%	0.01%	0.03%	0.03%	0.22%	0.27%	0.37%	0.13%
Benchmark ≤ 2%	2.00%	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



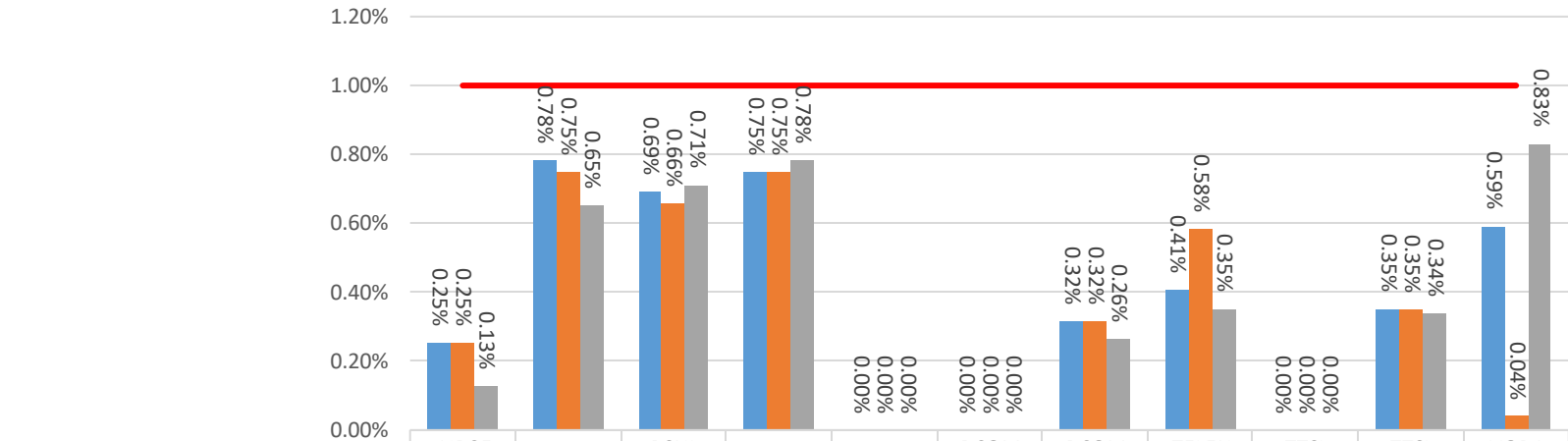
	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.70%	0.84%	1.73%	0.15%	0.00%	0.17%	0.10%	0.42%	0.36%	0.76%	1.00%
PMR Audit 2G TSP	0.70%	0.78%	1.83%	0.15%	0.00%	0.27%	0.12%	0.42%	0.35%	0.76%	0.00%
3 Day Live Audit 2G	0.00%	0.68%	1.87%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	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%	2.00%

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



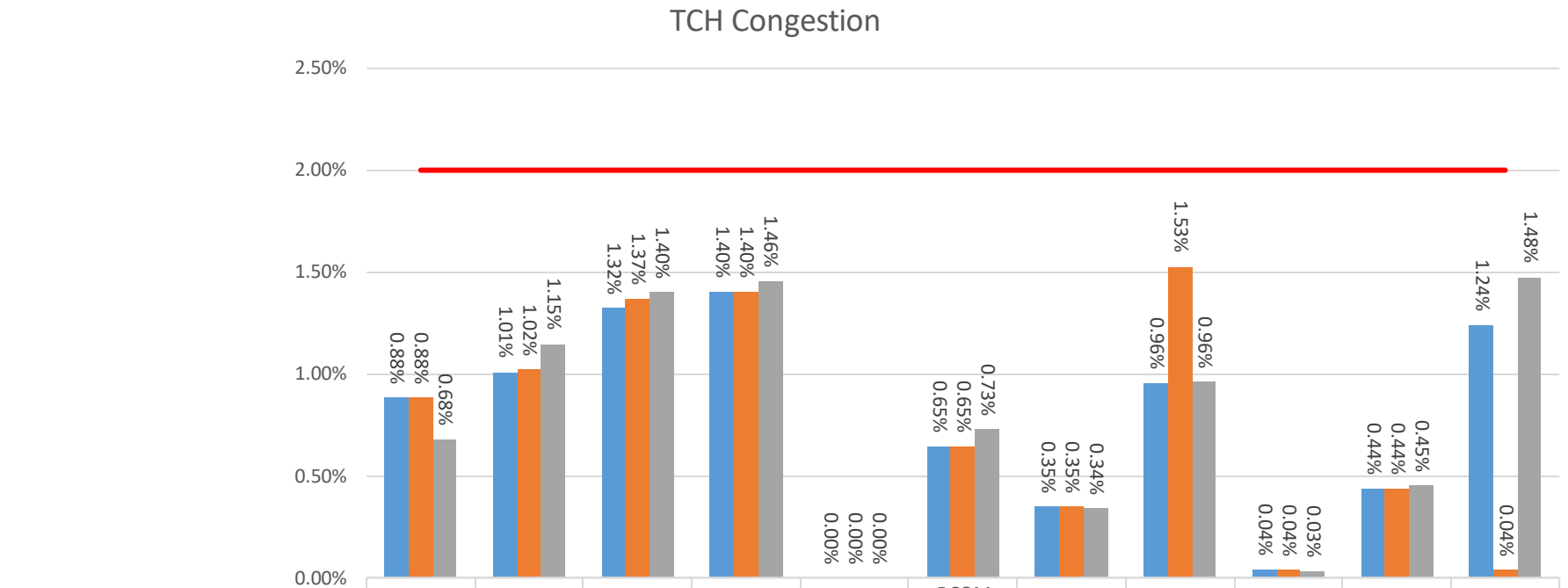
	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	97.87%	98.66%	97.43%	97.99%	99.60%	98.00%	98.07%	98.34%	99.15%	98.07%	98.76%
PMR Audit 2G TSP	97.87%	98.65%	97.96%	97.99%	99.60%	98.00%	98.07%	97.74%	99.15%	98.07%	99.33%
3 Day Live Audit 2G	97.83%	98.49%	97.35%	97.90%	99.59%	97.74%	98.10%	98.48%	99.18%	98.06%	98.52%
Benchmark ≤ 2%	95.00%	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



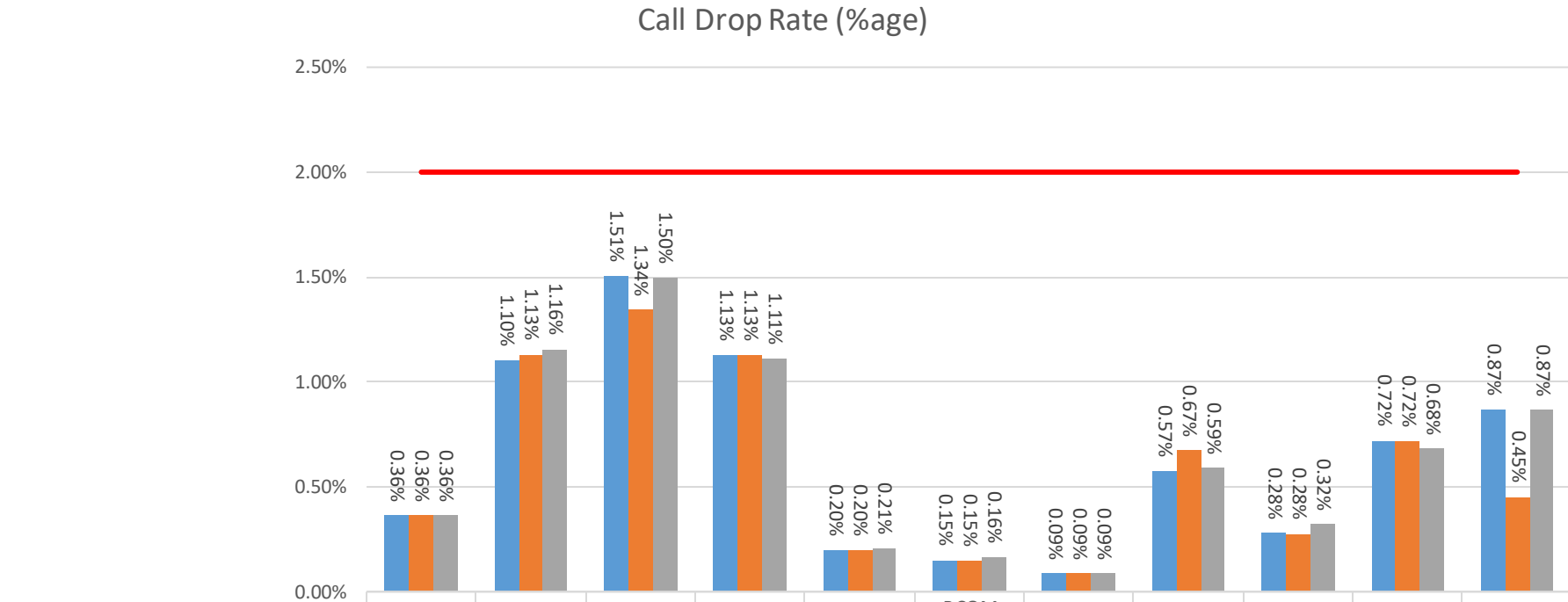
	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.25%	0.78%	0.69%	0.75%	0.00%	0.00%	0.32%	0.41%	0.00%	0.35%	0.59%
PMR Audit 2G TSP	0.25%	0.75%	0.66%	0.75%	0.00%	0.00%	0.32%	0.58%	0.00%	0.35%	0.04%
3 Day Live Audit 2G	0.13%	0.65%	0.71%	0.78%	0.00%	0.00%	0.26%	0.35%	0.00%	0.34%	0.83%
Benchmark ≤ 2%	1.00%	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



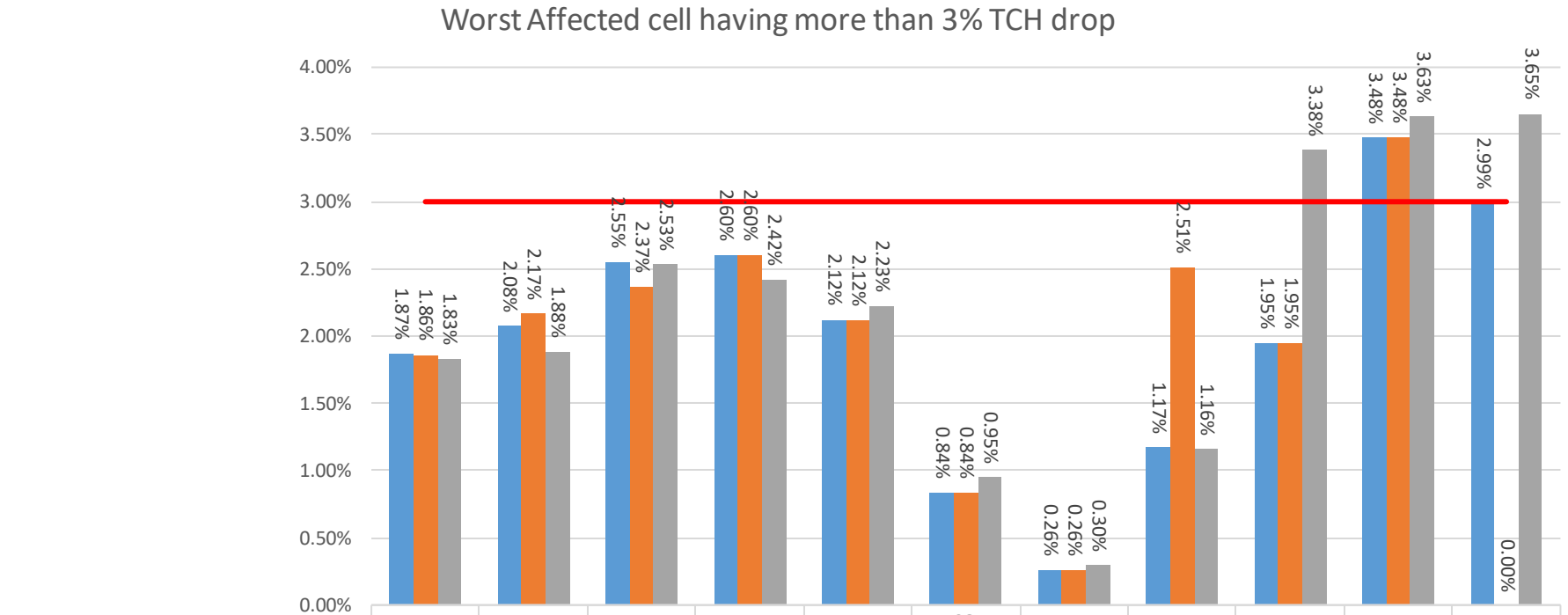
	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.88%	1.01%	1.32%	1.40%	0.00%	0.65%	0.35%	0.96%	0.04%	0.44%	1.24%
PMR Audit 2G TSP	0.88%	1.02%	1.37%	1.40%	0.00%	0.65%	0.35%	1.53%	0.04%	0.44%	0.04%
3 Day Live Audit 2G	0.68%	1.15%	1.40%	1.46%	0.00%	0.73%	0.34%	0.96%	0.03%	0.45%	1.48%
Benchmark ≤ 2%	2.00%	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)



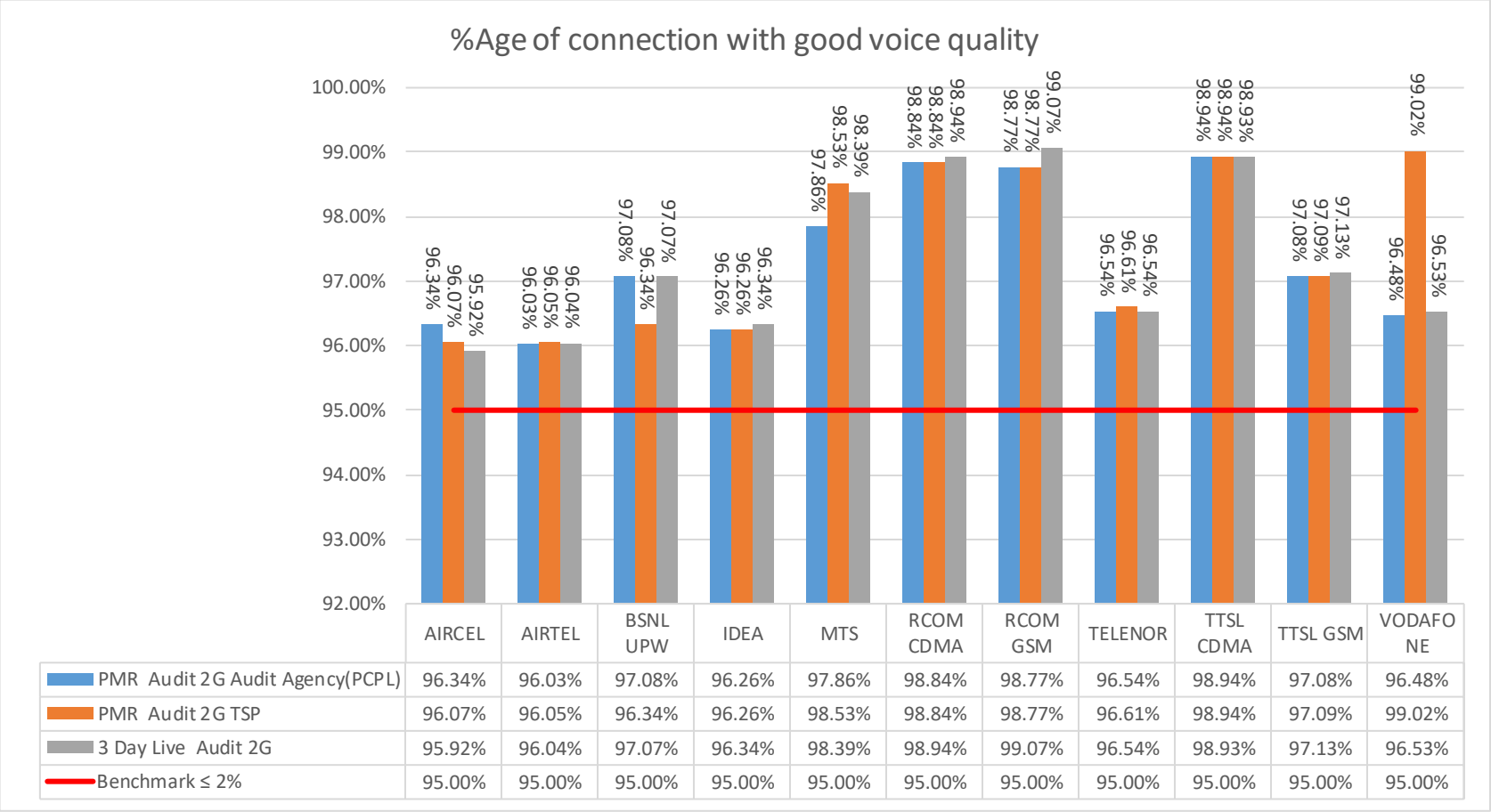
	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	0.36%	1.10%	1.51%	1.13%	0.20%	0.15%	0.09%	0.57%	0.28%	0.72%	0.87%
PMR Audit 2G TSP	0.36%	1.13%	1.34%	1.13%	0.20%	0.15%	0.09%	0.67%	0.28%	0.72%	0.45%
3 Day Live Audit 2G	0.36%	1.16%	1.50%	1.11%	0.21%	0.16%	0.09%	0.59%	0.32%	0.68%	0.87%
Benchmark ≤ 2%	2.00%	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 UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	1.87%	2.08%	2.55%	2.60%	2.12%	0.84%	0.26%	1.17%	1.95%	3.48%	2.99%
PMR Audit 2G TSP	1.86%	2.17%	2.37%	2.60%	2.12%	0.84%	0.26%	2.51%	1.95%	3.48%	0.00%
3 Day Live Audit 2G	1.83%	1.88%	2.53%	2.42%	2.23%	0.95%	0.30%	1.16%	3.38%	3.63%	3.65%
Benchmark ≤ 2%	3.00%	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

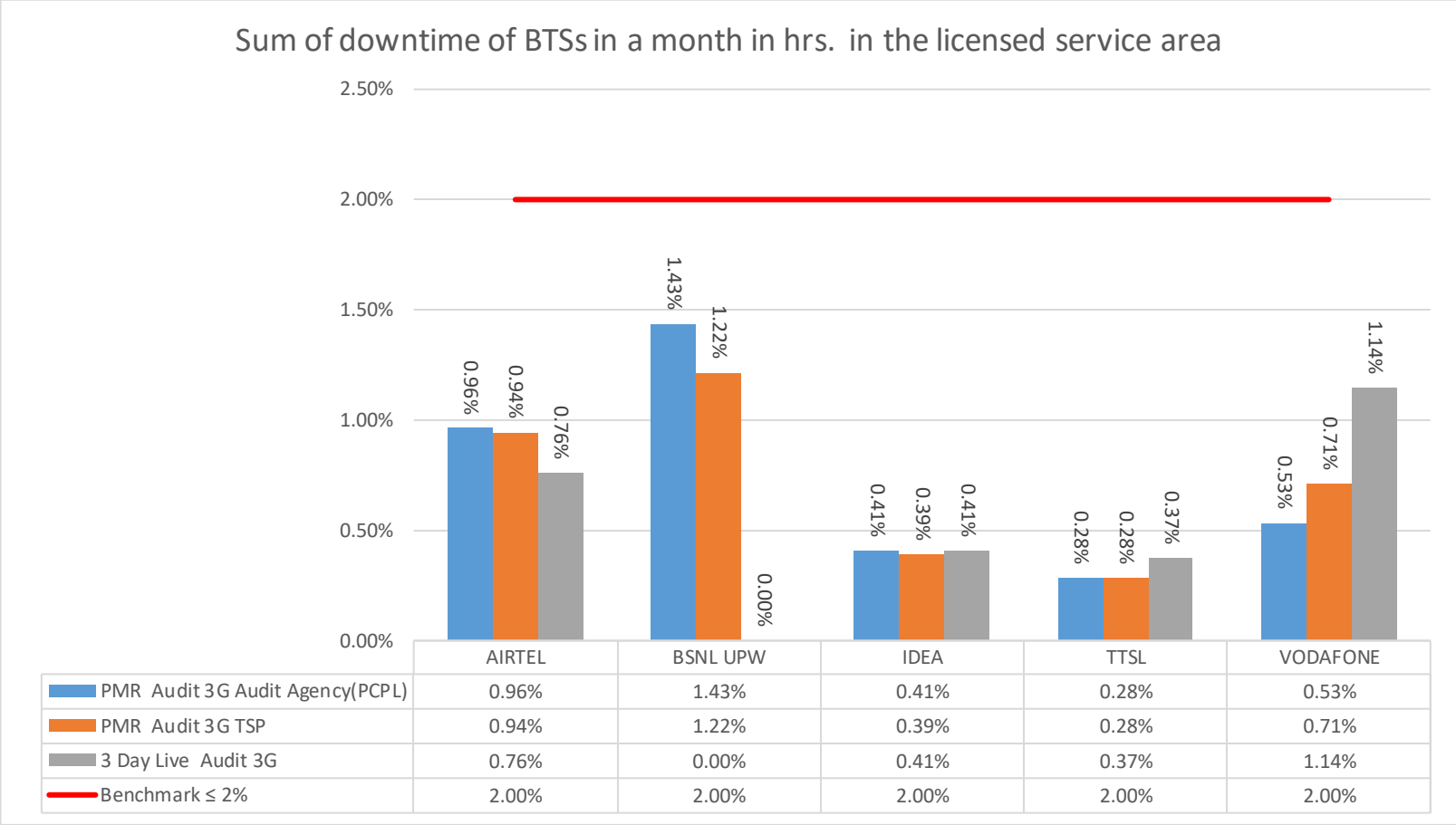


	AIRCEL	AIRTEL	BSNL UPW	IDEA	MTS	RCOM CDMA	RCOM GSM	TELENOR	TTSL CDMA	TTSL GSM	VODAFONE
PMR Audit 2G Audit Agency(PCPL)	96.34%	96.03%	97.08%	96.26%	97.86%	98.84%	98.77%	96.54%	98.94%	97.08%	96.48%
PMR Audit 2G TSP	96.07%	96.05%	96.34%	96.26%	98.53%	98.84%	98.77%	96.61%	98.94%	97.09%	99.02%
3 Day Live Audit 2G	95.92%	96.04%	97.07%	96.34%	98.39%	98.94%	99.07%	96.54%	98.93%	97.13%	96.53%
Benchmark ≤ 2%	95.00%	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): Network Parameters

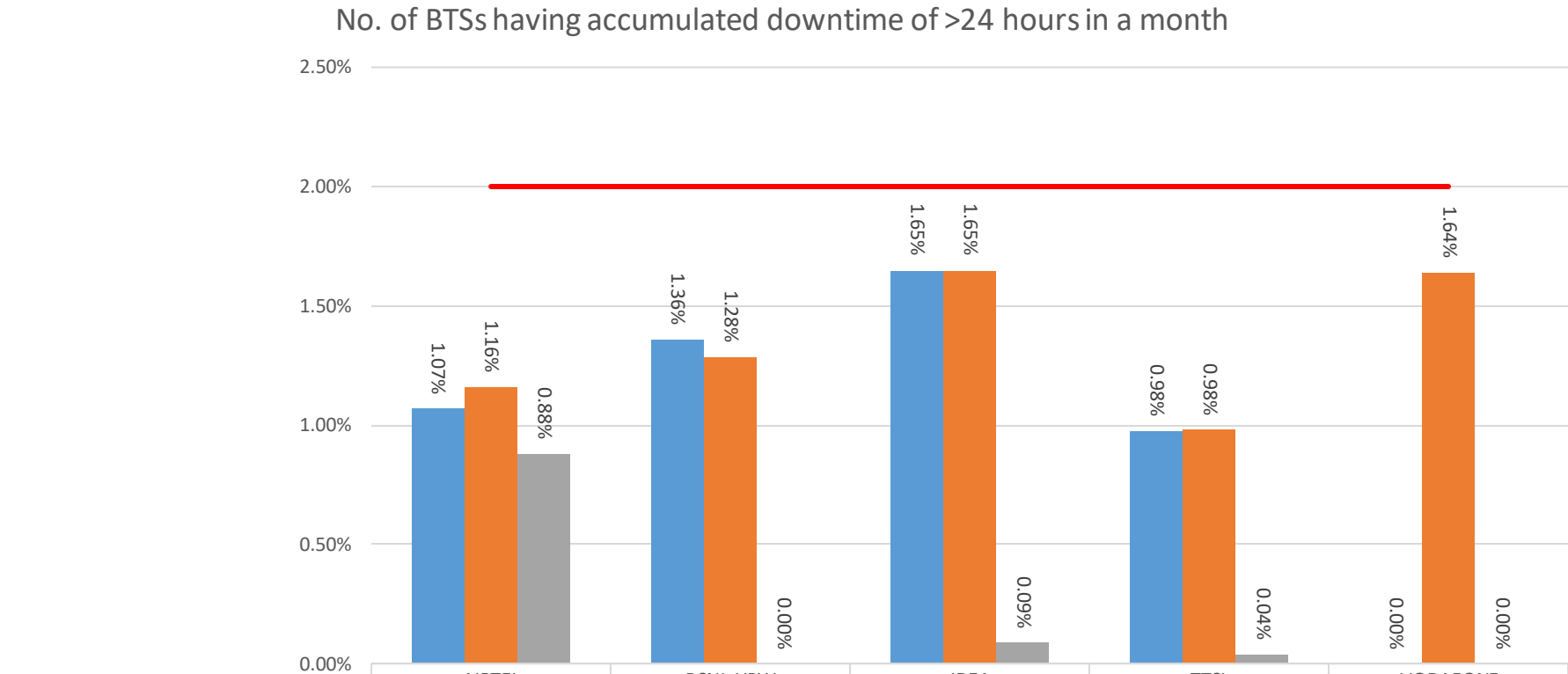
PMR Report Comparison between Audit Agency and TSP								
Network Parameters		Name of Service Provider						
		Benchmark		AIRTEL	BSNL	IDEA	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.96%	1.43%	0.41%	0.28%	0.18%
			TSP	0.94%	1.22%	0.39%	0.28%	0.71%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	1.07%	1.36%	1.65%	0.98%	0.63%
			TSP	1.16%	1.28%	1.65%	0.98%	1.64%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	99.77%	97.24%	99.19%	97.75%	100.00%
			TSP	99.76%	96.67%	99.19%	97.75%	66.43%
	RRC Congestion:	≤ 1%	Agency	0.08%	0.81%	0.96%	0.46%	0.02%
			TSP	0.09%	0.72%	0.96%	0.46%	0.01%
	RAB Congestion:	≤ 2%	Agency	0.00%	1.09%	0.46%	1.49%	0.05%
			TSP	0.00%	1.30%	0.46%	1.49%	0.02%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	Agency	0.48%	1.38%	0.27%	0.29%	0.54%
			TSP	0.47%	1.15%	0.27%	0.30%	0.39%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	Agency	1.19%	2.42%	2.52%	2.26%	5.09%
			TSP	1.14%	2.13%	2.50%	2.26%	4.48%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	Agency	98.91%	DNA	99.17%	99.12%	98.45%
			TSP	98.92%	96.70%	99.17%	99.12%	98.46%

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



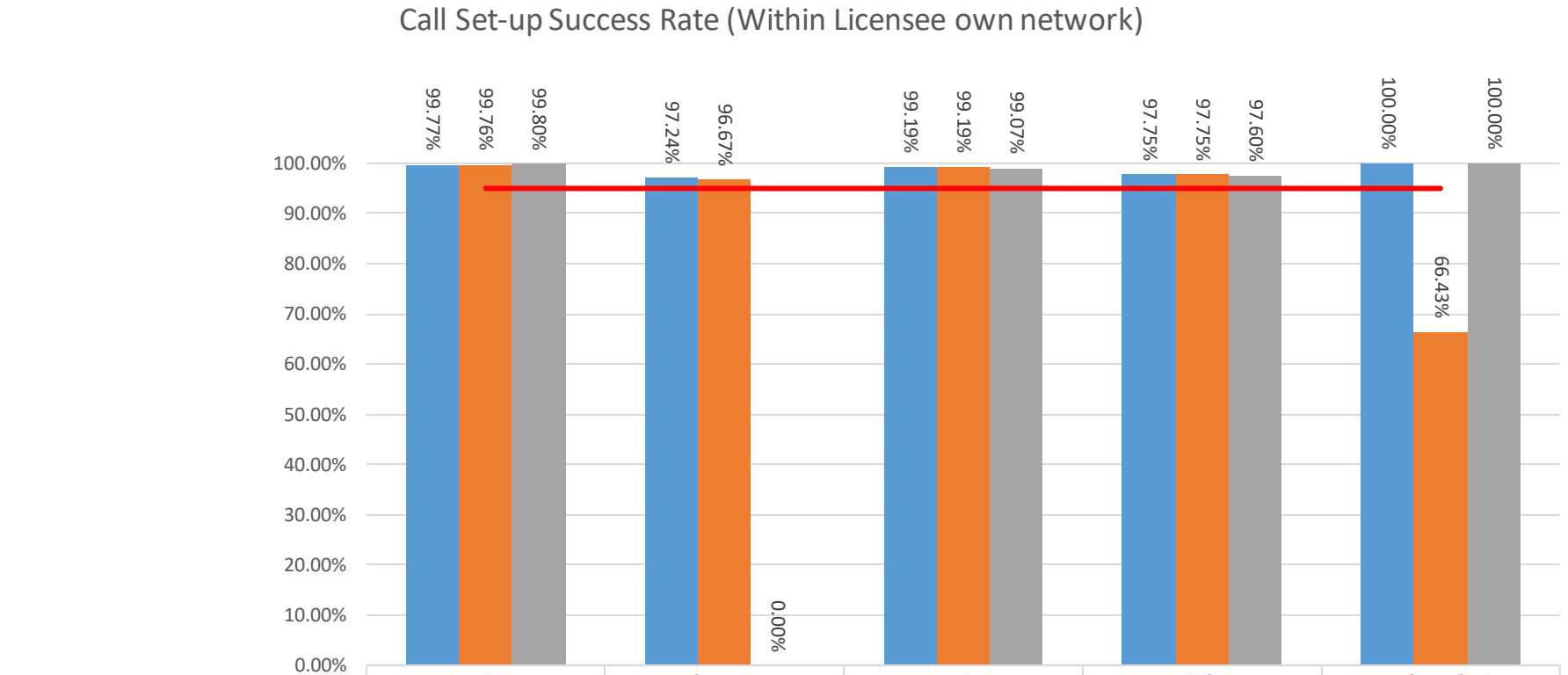
	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	0.96%	1.43%	0.41%	0.28%	0.53%
PMR Audit 3G TSP	0.94%	1.22%	0.39%	0.28%	0.71%
3 Day Live Audit 3G	0.76%	0.00%	0.41%	0.37%	1.14%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

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



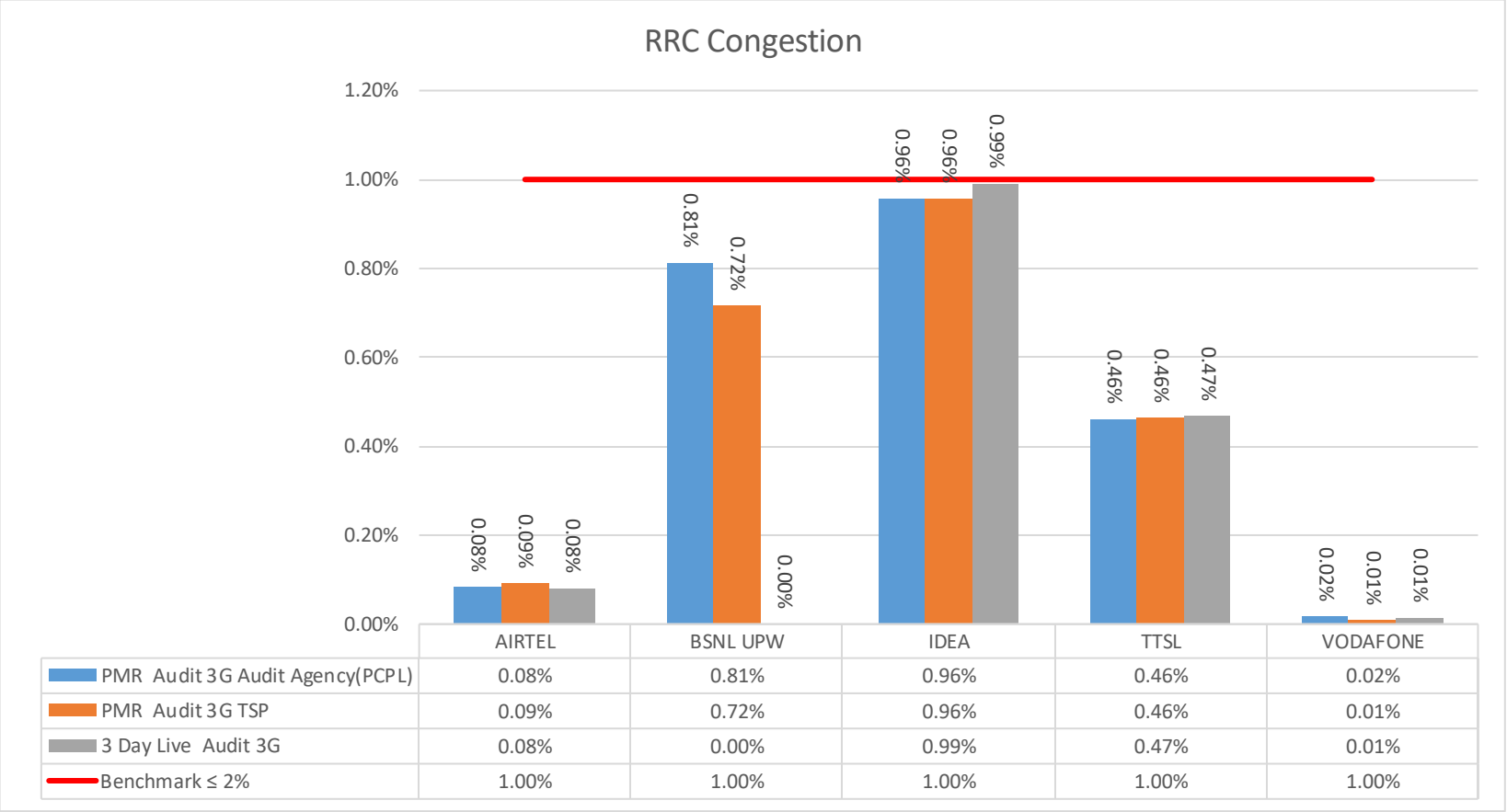
	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	1.07%	1.36%	1.65%	0.98%	0.00%
PMR Audit 3G TSP	1.16%	1.28%	1.65%	0.98%	1.64%
3 Day Live Audit 3G	0.88%	0.00%	0.09%	0.04%	0.00%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

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



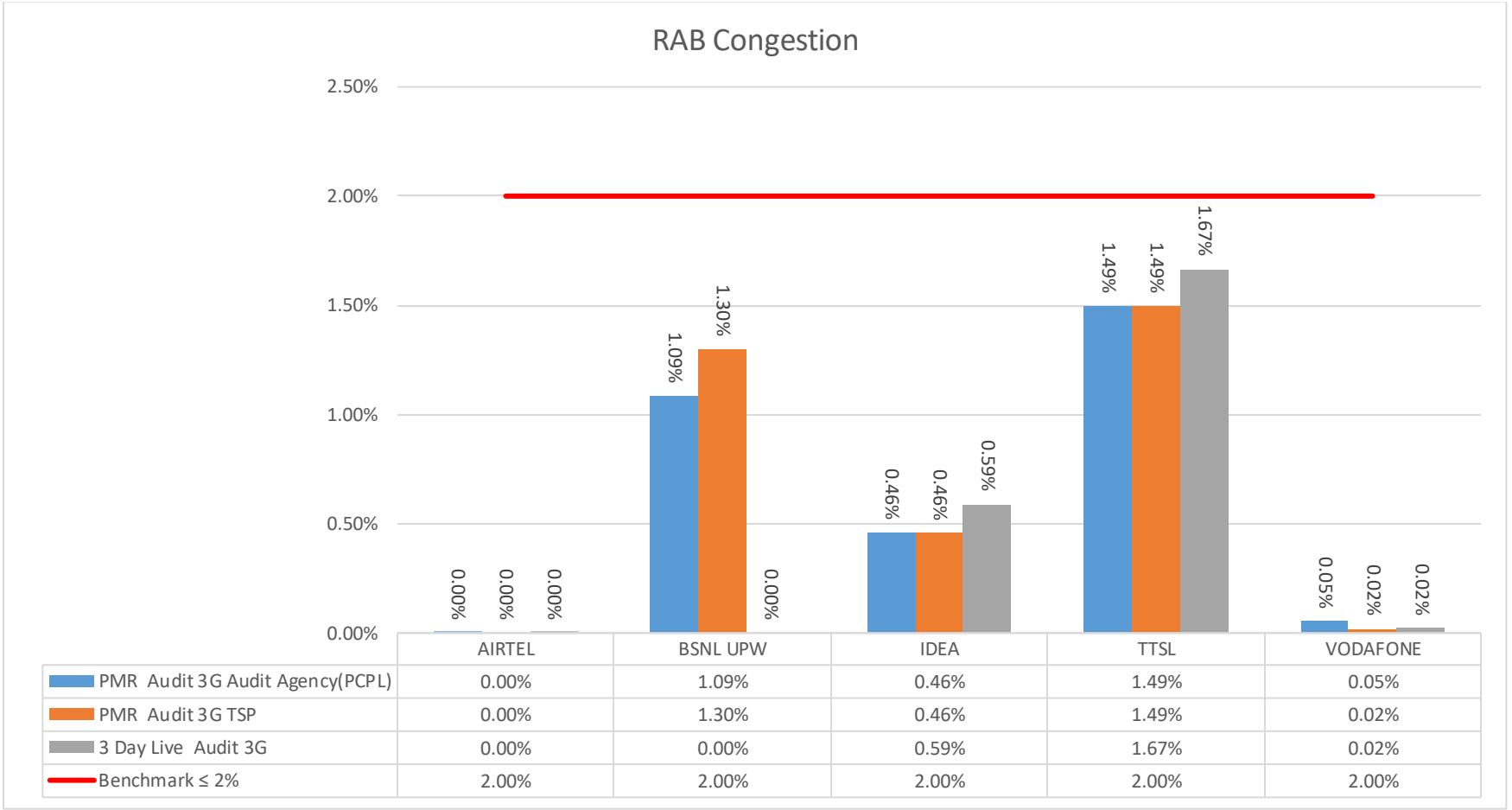
	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	99.77%	97.24%	99.19%	97.75%	100.00%
PMR Audit 3G TSP	99.76%	96.67%	99.19%	97.75%	66.43%
3 Day Live Audit 3G	99.80%	0.00%	99.07%	97.60%	100.00%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%

13.5.4. RRC CONGESTION



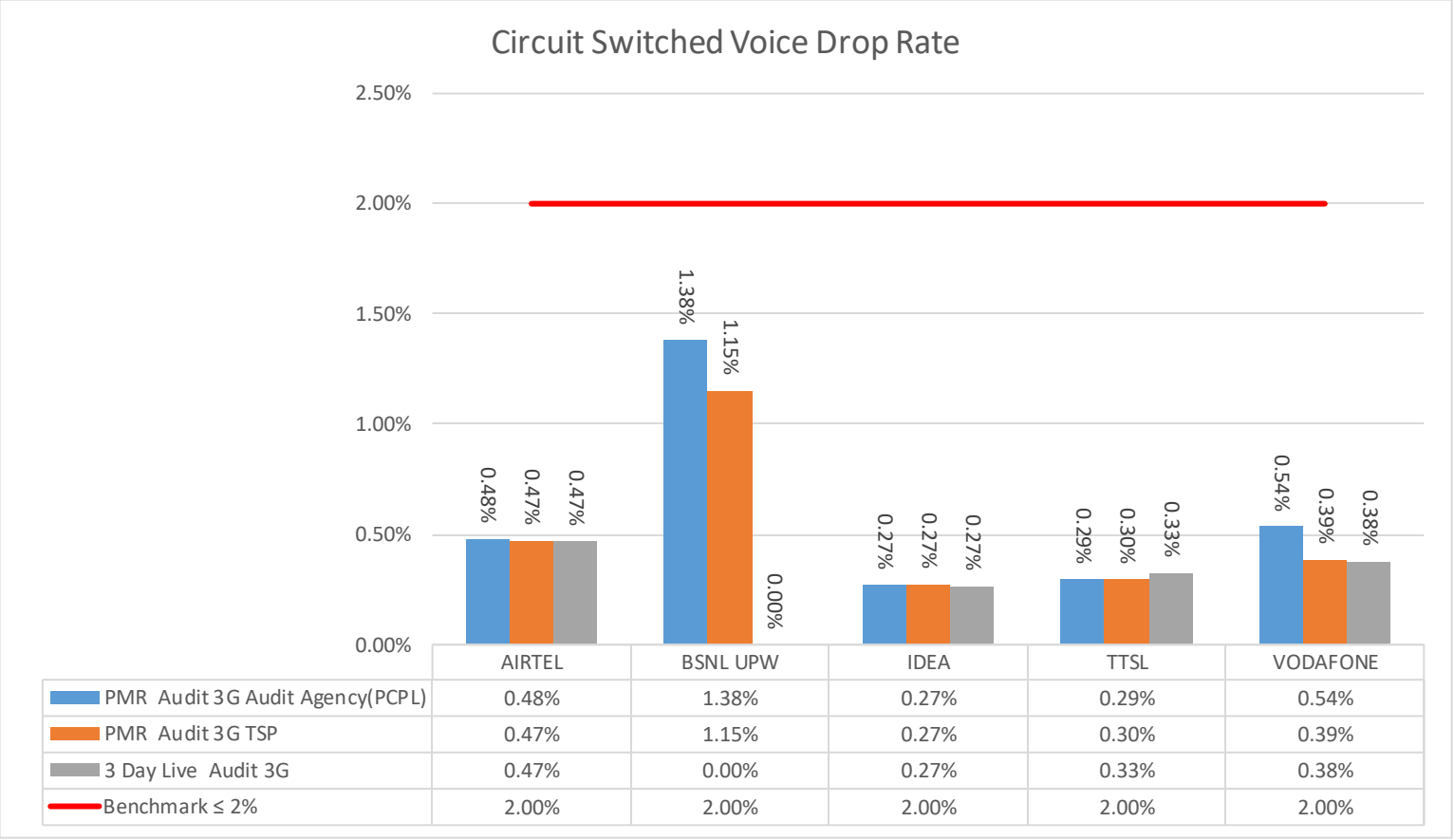
	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	0.08%	0.81%	0.96%	0.46%	0.02%
PMR Audit 3G TSP	0.09%	0.72%	0.96%	0.46%	0.01%
3 Day Live Audit 3G	0.08%	0.00%	0.99%	0.47%	0.01%
Benchmark ≤ 2%	1.00%	1.00%	1.00%	1.00%	1.00%

13.5.5. RAB CONGESTION



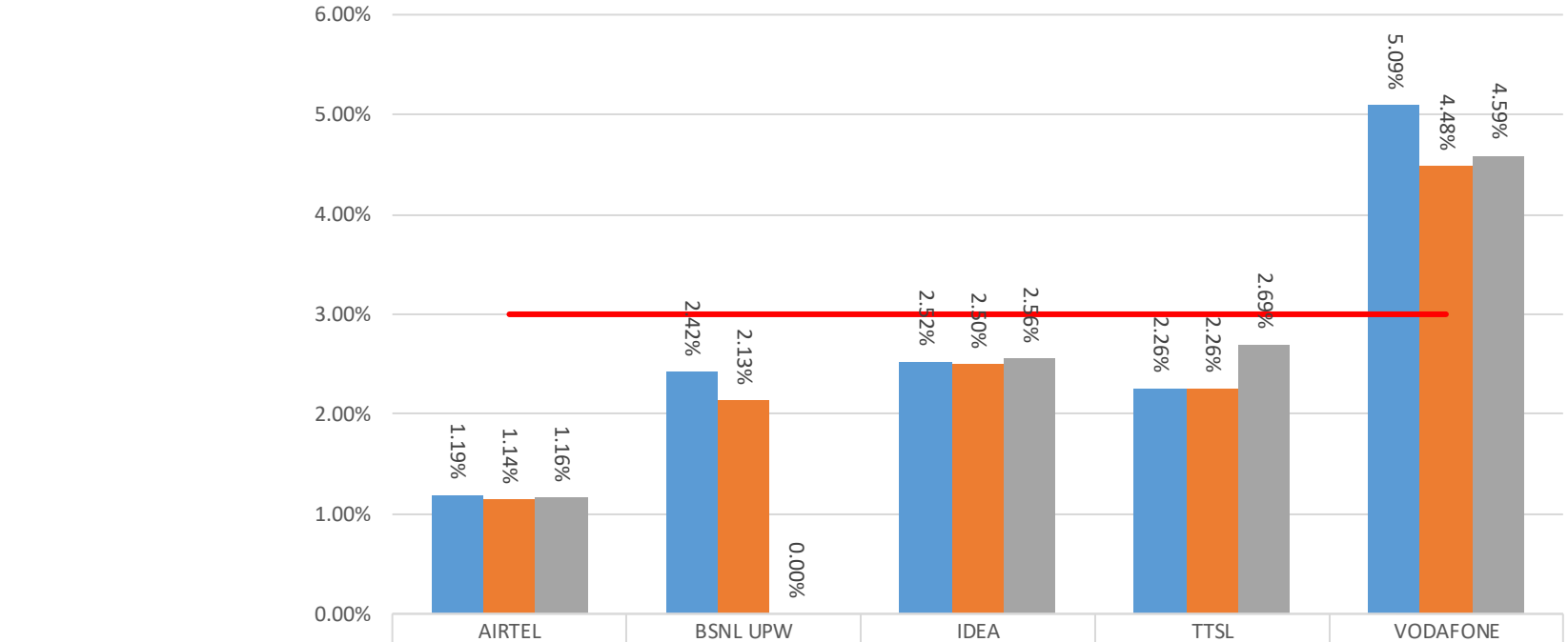
	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	0.00%	1.09%	0.46%	1.49%	0.05%
PMR Audit 3G TSP	0.00%	1.30%	0.46%	1.49%	0.02%
3 Day Live Audit 3G	0.00%	0.00%	0.59%	1.67%	0.02%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

13.5.6. CIRCUIT SWITCHED VOICE DROP RATE



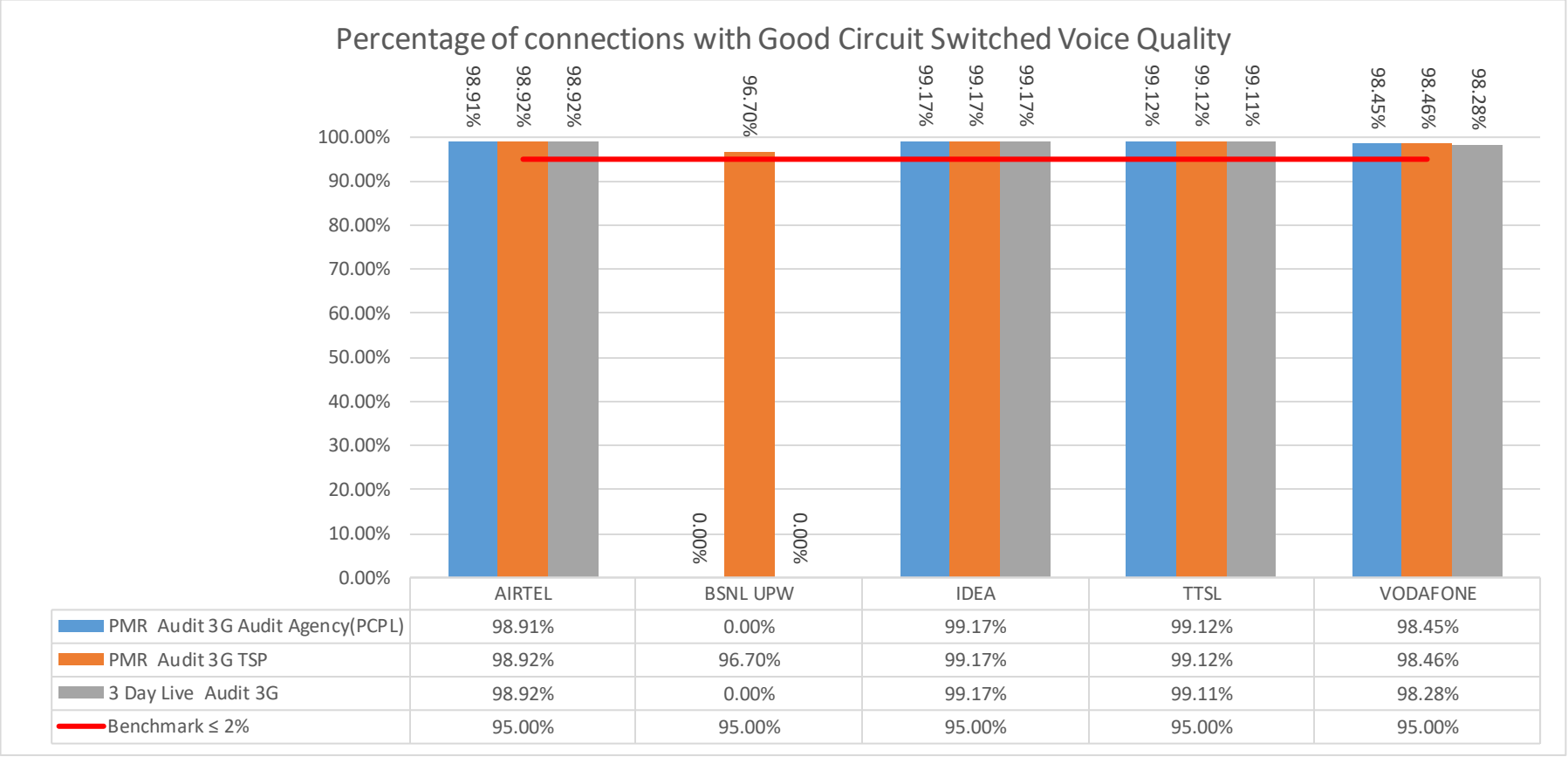
	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	0.48%	1.38%	0.27%	0.29%	0.54%
PMR Audit 3G TSP	0.47%	1.15%	0.27%	0.30%	0.39%
3 Day Live Audit 3G	0.47%	0.00%	0.27%	0.33%	0.38%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

Worst affected cells having more than 3% Circuit Switched Voice Drop Rate



	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	1.19%	2.42%	2.52%	2.26%	5.09%
PMR Audit 3G TSP	1.14%	2.13%	2.50%	2.26%	4.48%
3 Day Live Audit 3G	1.16%	0.00%	2.56%	2.69%	4.59%
Benchmark ≤ 2%	3.00%	3.00%	3.00%	3.00%	3.00%

13.5.7. PERCENTAGE OF CONNECTIONS WITH GOOD CIRCUIT SWITCHED VOICE QUALITY

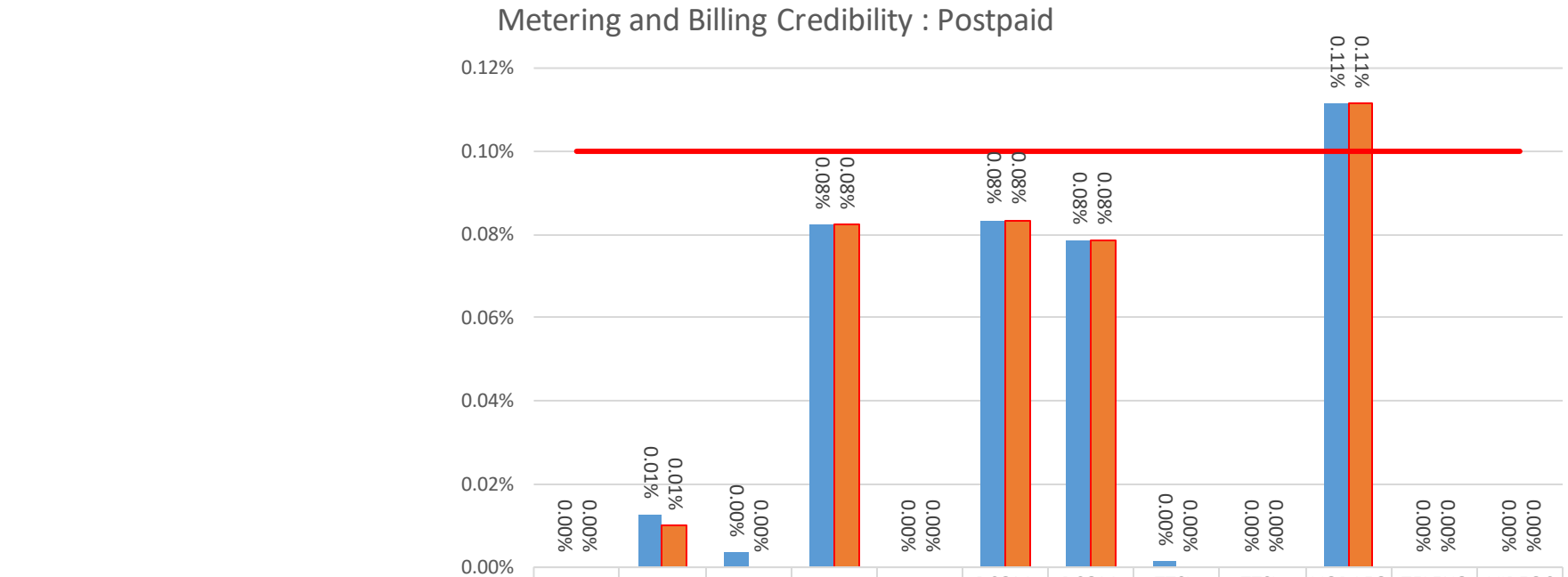


	AIRTEL	BSNL UPW	IDEA	TTSL	VODAFONE
PMR Audit 3G Audit Agency(PCPL)	98.91%	0.00%	99.17%	99.12%	98.45%
PMR Audit 3G TSP	98.92%	96.70%	99.17%	99.12%	98.46%
3 Day Live Audit 3G	98.92%	0.00%	99.17%	99.11%	98.28%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%

13.6. `PMR COMPARISON (TSP VS. AUDIT AGENCY): CSD PARAMETERS

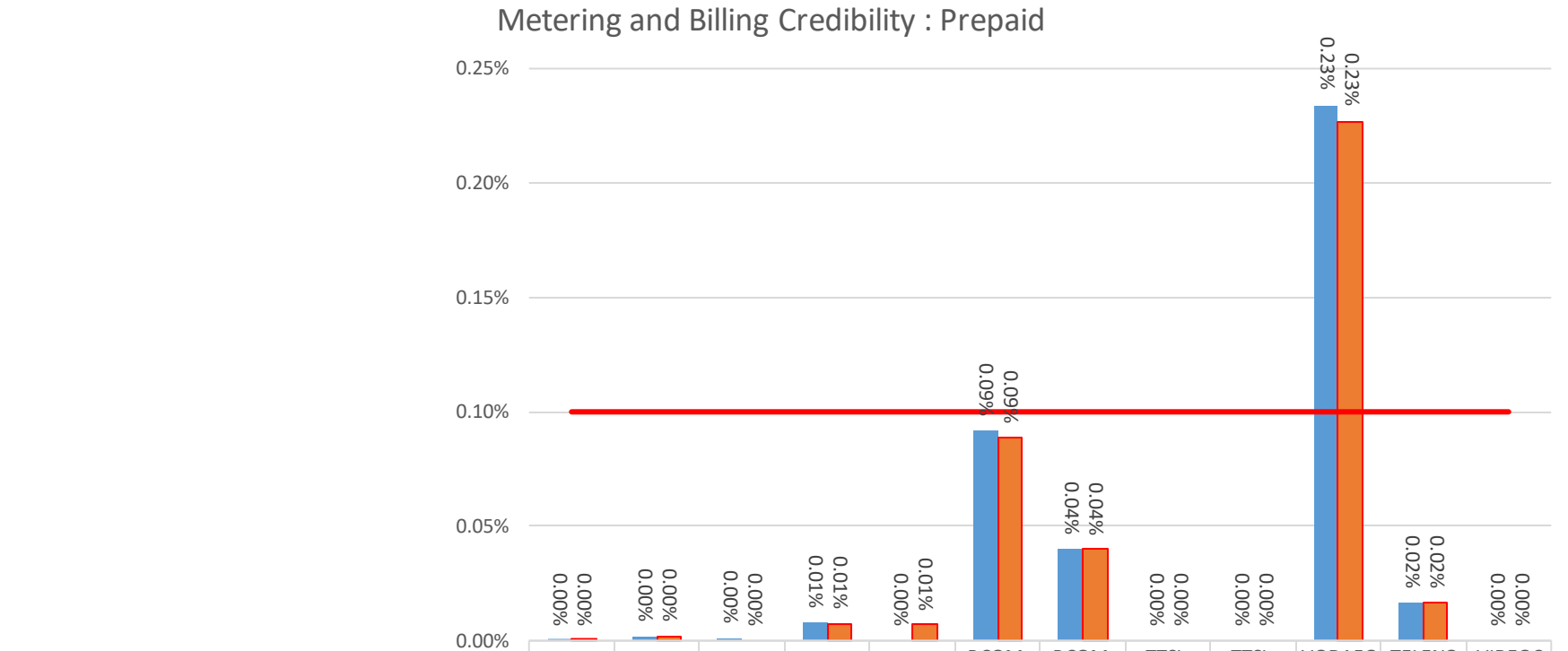
Name of Service Provider	Metering and Billing credibility				Billing Complaints						Termination & Closures		Time taken for refund of deposits after closures: Benchmark		Response time to customer for assistance			
	Postpaid Subscribers		Prepaid Subscribers		%age complaints resolved within 4 weeks		%age 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	
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%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.30%	98.30%	99.08%	99.08%
AIRTEL	0.01%	0.01%	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%	87.73%	87.73%
BSNL	0.00%	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%	98.06%	98.81%
IDEA	0.08%	0.08%	0.01%	0.01%	99.99%	99.99%	100.00%	100.00%	100.00%	99.81%	100.00%	100.00%	100.00%	100.00%	99.28%	99.28%	99.30%	99.30%
MTS	0.00%	0.00%	0.00%	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.68%	98.68%	97.18%	95.60%
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%	100.00%	100.00%	99.63%	99.63%	95.85%	95.85%
RCOM-CDMA	0.08%	0.08%	0.04%	0.04%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.27%	99.27%	95.89%	95.89%
TTSL-GSM	0.00%	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%	99.75%	99.75%	88.44%	88.44%
TTSL-CDMA	0.00%	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%	99.75%	100.00%	97.77%	99.77%
VODAFONE	0.11%	0.11%	0.23%	0.23%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.00%	96.06%
TELENOR	NA	NA	0.02%	0.02%	100.00%	100.00%	100.00%	100.00%	NIL	NIL	NIL	NIL	NIL	NIL	99.08%	99.08%	99.01%	99.01%
VIDEOCON	NA	NA	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	NA	NA	NA	NA	100.00%	100.00%	100.00%	100.00%	96.06%	96.06%

13.6.1. METERING AND BILLING CREDIBILITY : POSTPAID



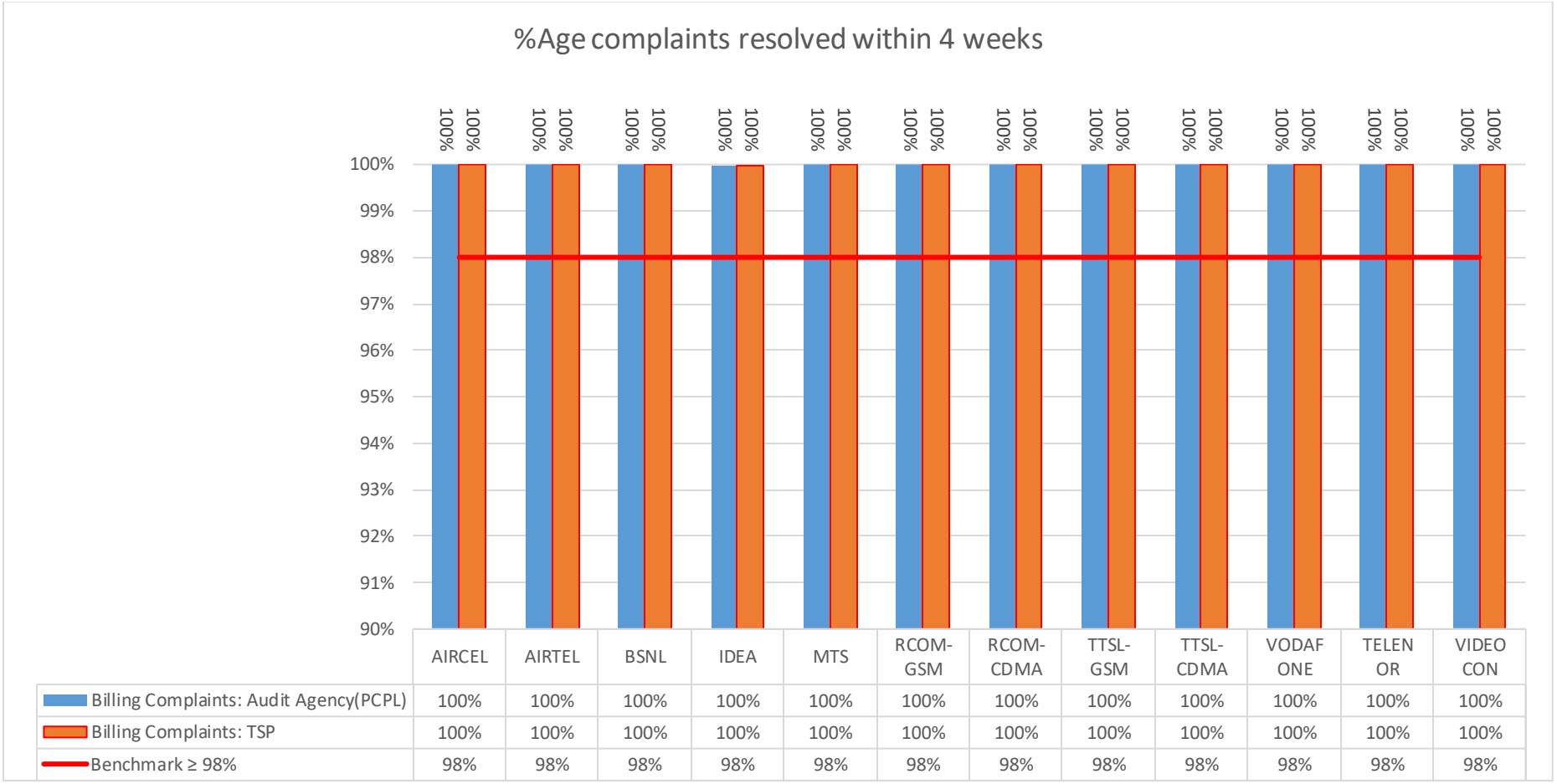
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Billing Performance for Postpaid: Audit Agency(PCPL)	0.00%	0.01%	0.00%	0.08%	0.00%	0.08%	0.08%	0.00%	0.00%	0.11%	0.00%	0.00%
Billing Performance for Postpaid: TSP	0.00%	0.01%	0.00%	0.08%	0.00%	0.08%	0.08%	0.00%	0.00%	0.11%	0.00%	0.00%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

13.6.2. METERING AND BILLING CREDIBILITY : PREPAID



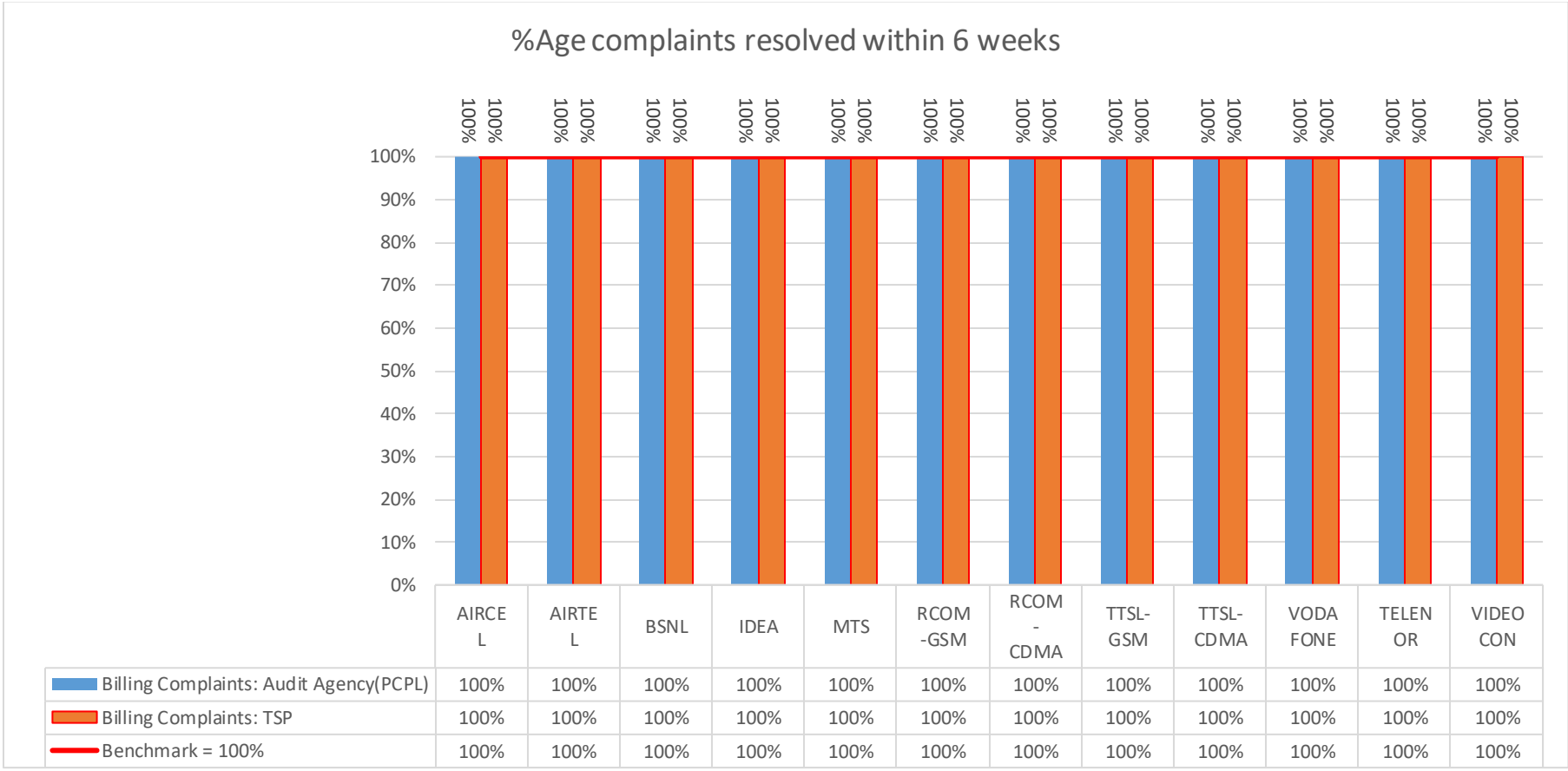
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Billing Performance for Prepaid: Audit Agency(PCPL)	0.00%	0.00%	0.00%	0.01%	0.00%	0.09%	0.04%	0.00%	0.00%	0.23%	0.02%	0.00%
Billing Performance for Prepaid: TSP	0.00%	0.00%	0.00%	0.01%	0.01%	0.09%	0.04%	0.00%	0.00%	0.23%	0.02%	0.00%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

13.6.3. %AGE COMPLAINT RESOLVED WITHIN 4 WEEKS



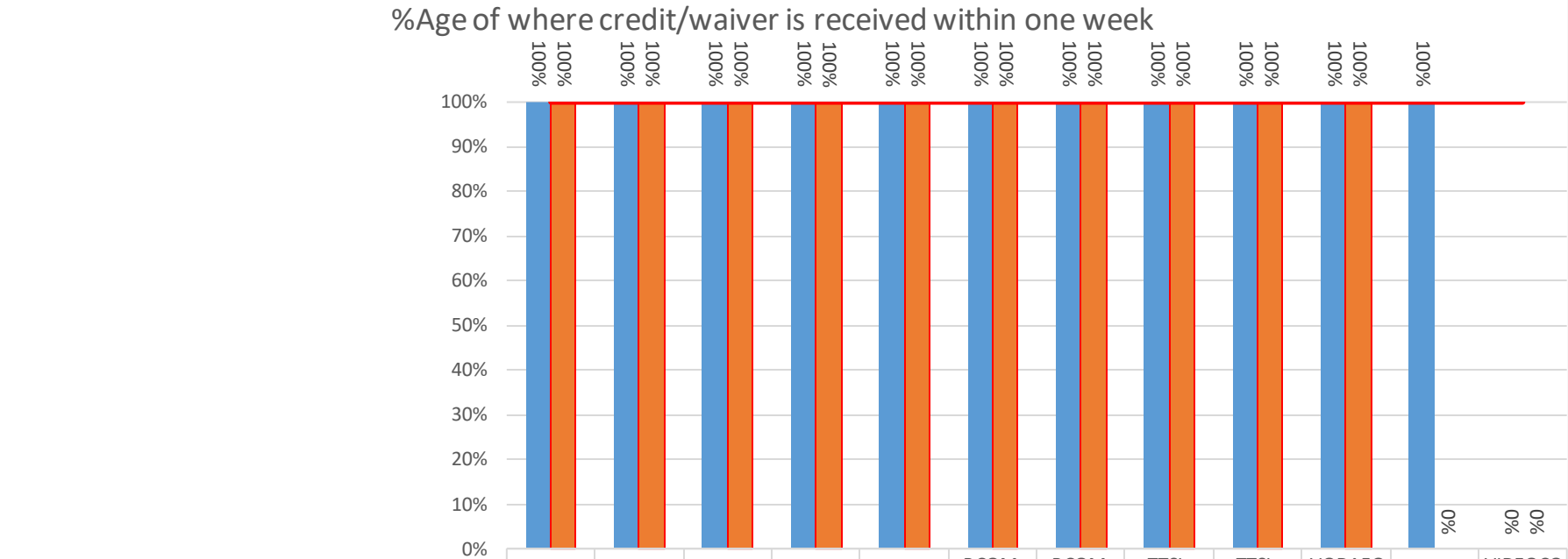
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Billing Complaints: Audit Agency(PCPL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billing Complaints: TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Benchmark ≥ 98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%

13.6.4. %AGE COMPLAINTS RESOLVED WITHIN 6 WEEKS



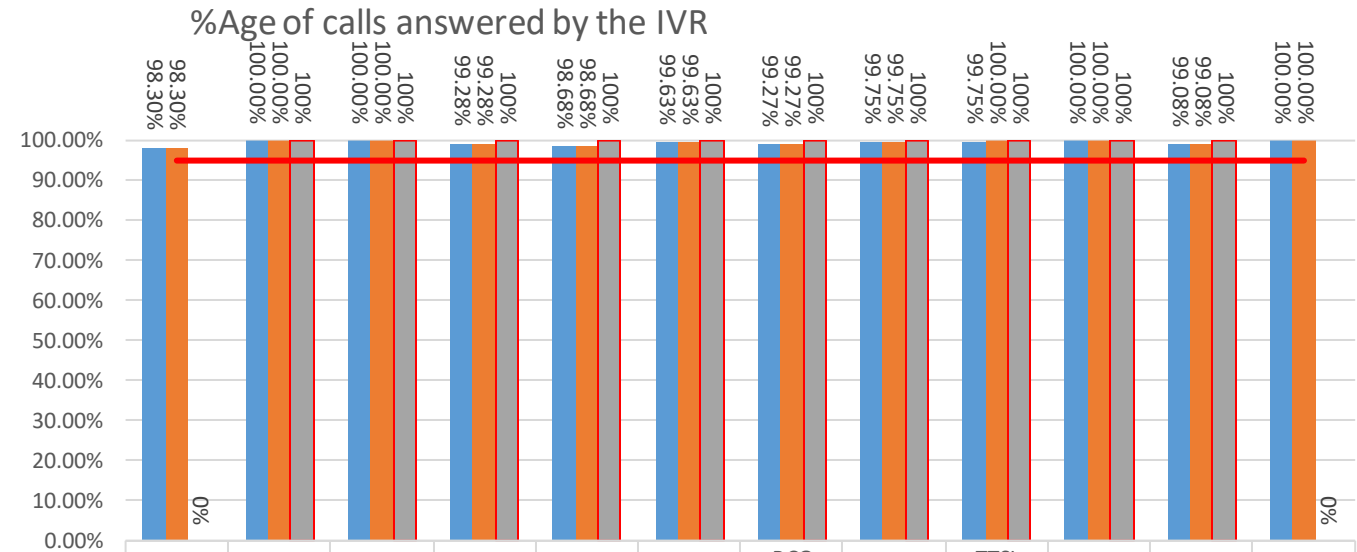
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Billing Complaints: Audit Agency(PCPL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Billing Complaints: TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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



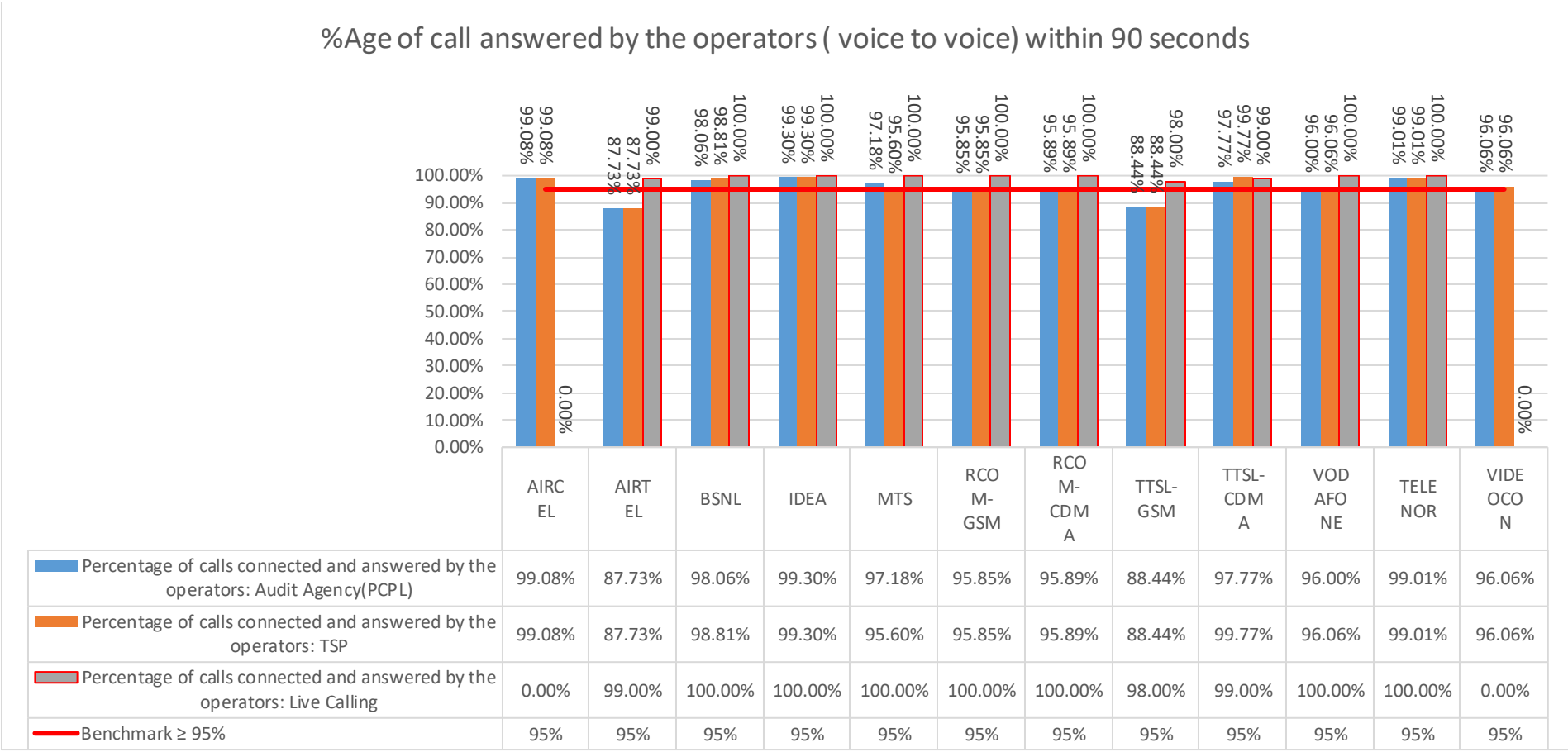
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
%Age of Credit/weiver is received within one week: Audit Agency(PCPL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%
%Age of Credit/weiver is received within one week: TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

13.6.6. %AGE OF CALLS ANSWERED BY THE IVR



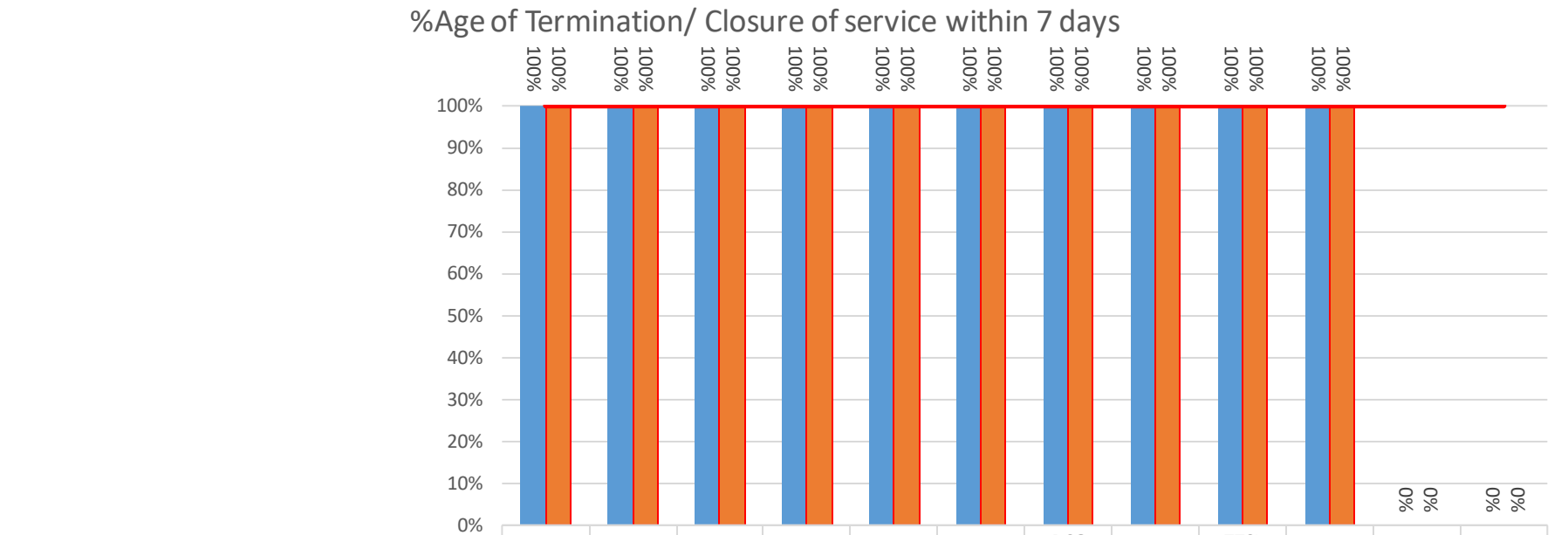
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Percentage of calls connected and answered : Audit Agency(PCPL)	98.30%	100.00%	100.00%	99.28%	98.68%	99.63%	99.27%	99.75%	99.75%	100.00%	99.08%	100.00%
Percentage of calls connected and answered : TSP	98.30%	100.00%	100.00%	99.28%	98.68%	99.63%	99.27%	99.75%	100.00%	100.00%	99.08%	100.00%
Percentage of calls connected and answered : Live Calling	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

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



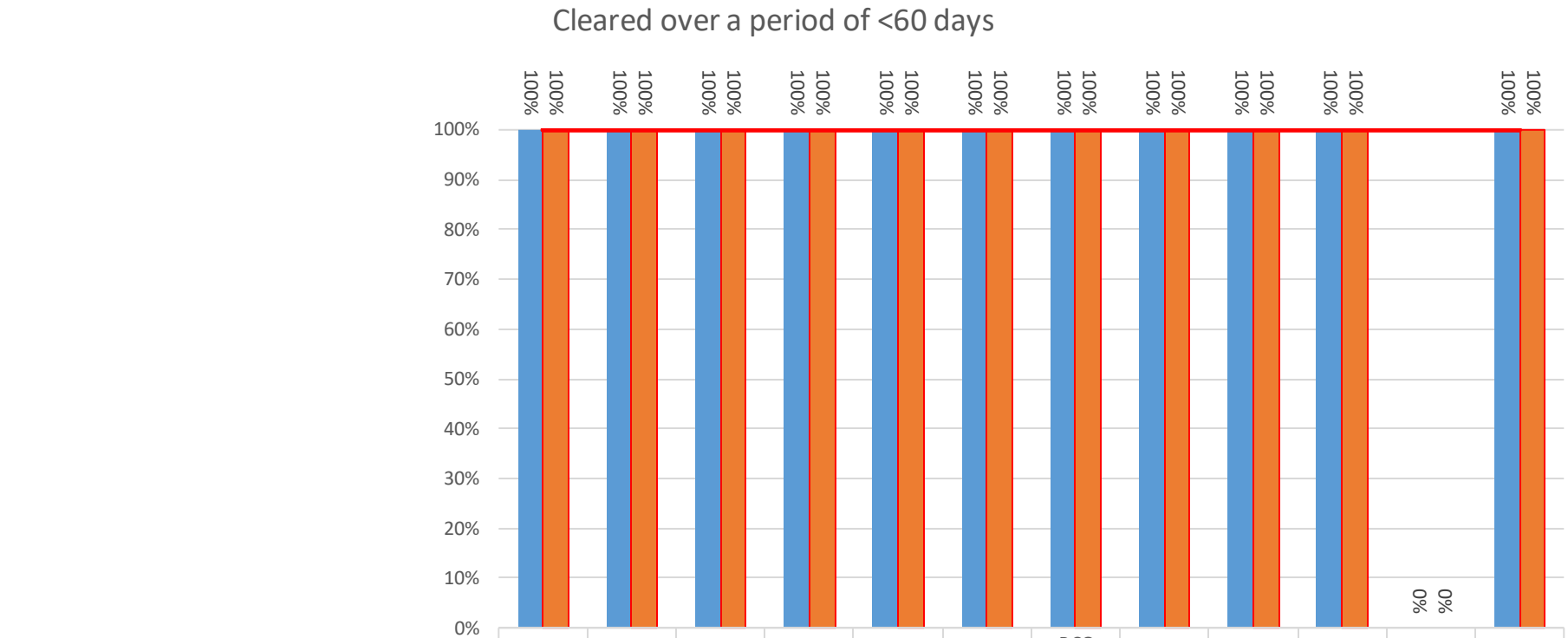
	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Percentage of calls connected and answered by the operators: Audit Agency(PCPL)	99.08%	87.73%	98.06%	99.30%	97.18%	95.85%	95.89%	88.44%	97.77%	96.00%	99.01%	96.06%
Percentage of calls connected and answered by the operators: TSP	99.08%	87.73%	98.81%	99.30%	95.60%	95.85%	95.89%	88.44%	99.77%	96.06%	99.01%	96.06%
Percentage of calls connected and answered by the operators: Live Calling	0.00%	99.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.00%	99.00%	100.00%	100.00%	0.00%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

13.6.8. %AGE OF TERMINATION/CLOSURE OF SERVICE WITHIN 7 DAYS



	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Percentage cases closure done within 7 days: Audit Agency(PCPL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%
Percentage cases closure done within 7 days: TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

13.6.9. CLEARED OVER A PERIOD OF <60 DAYS



	AIRCEL	AIRTEL	BSNL	IDEA	MTS	RCOM-GSM	RCOM-CDMA	TTSL-GSM	TTSL-CDMA	VODAFONE	TELENOR	VIDEOCON
Percentage refund of deposits after closures: Audit Agency(PCPL)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	100%
Percentage refund of deposits after closures: TSP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

14 KEY FINDINGS

14.2. 2G VOICE PMR - CONSOLIDATED

- TTSL GSM has parameter value of 3.48% and failed to meet the benchmark of ≤ 3% Worst affected cell having TCH drop.

14.3. 3G VOICE PMR - CONSOLIDATED

- VODAFONE has parameter value of 5.09% and failed to meet the benchmark of ≤ 3% Worst affected cell having TCH drop.

14.4. BILLING AND CUSTOMER CARE

- AIRTEL has parameter value of 87.93% and failed to meet the benchmark of ≥95% response time to customer assistance with %age of call answered by the operators (voice to voice) within 90 seconds.
- TTSL GSM has parameter value of 88.44% and failed to meet the benchmark of ≥95% response time to customer assistance with %age of call answered by the operators (voice to voice) within 90 seconds
- VODAFONE has a parameter value of 0.11% and failed to meet the benchmark of ≤0.1% metering and credibility for postpaid subscriber.
- VODAFONE has a parameter value of 0.23% and failed to meet the benchmark of ≤0.1% metering and credibility for prepaid subscriber.