



AUDIT & ASSESSMENT OF QUALITY OF SERVICE

NORTH ZONE – UP WEST CIRCLE CELLULAR MOBILE TELEPHONE SERVICE (CMTS) (OCTOBER TO DECEMBER 2015)

PREPARED BY:

PHISTREAM CONSULTING PRIVATE LIMITED
(An ISO – 9001:2008 Certified Company)

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TABLE OF CONTENTS

1.	INTRODUCTION	6
1.1.	ABOUT TRAI	6
1.2.	ABOUT PHISTREAM CONSULTING PRIVATE LIMITED	6
1.3.	OBJECTIVES	6
1.4.	COVERAGE	7
1.5.	SSA LIST:	7
1.6.	FRAMEWORK USED	10
2.	PMR REPORTS	11
2.1.	MONTHLY PMR	11
2.2.	AUDIT PARAMETER: NETWORK	13
2.3.	DATA EXTRACTION POINTS	13
2.4.	AUDIT PROCEDURE	14
2.5.	NETWORK CALCULATION METHODOLOGY	14
2.6.	3G VOICE	15
2.7.	2G & 3G WIRELESS	17
3.	3 DAYS LIVE DATA	18
3.1.	TCBH: SIGNIFICANCE AND SELECTION METHODOLOGY	18
3.2.	CBBH: SIGNIFICANCE AND SELECTION METHODOLOGY	19
4.	CUSTOMER SERVICE PARAMETERS	20
4.1.	AUDIT PARAMETERS: CUSTOMER SERVICE	20
4.2.	CALCULATION METHODOLOGY: CUSTOMER SERVICE PARAMETER	21
4.3.	LIVE CALLING: SIGNIFICANCE AND METHODOLOGY	22
4.4.	BILLING COMPLAINTS	22
4.5.	SERVICE COMPLAINTS REQUESTS	22
4.6.	LEVEL 1	23
4.6.1.	PROCESS TO TEST LEVEL 1 SERVICE	23
4.7.	CUSTOMER CARE	24
4.8.	INTER OPERATOR CALL ASSESSMENT	25
5.	DRIVE TEST: SIGNIFICANCE AND METHODOLOGY	26
5.1.	OPERATOR ASSISTED DRIVE TEST	26
5.2.	INDEPENDENT DRIVE TEST	27
5.3.	PARAMETERS EVALUATED DURING DRIVE TEST	27
6.	EXECUTIVE SUMMARY	29
6.1.	OPERATORS COVERED	29
6.2.	AUDIT SCHEDULE	30
6.3.	2G VOICE PMR DATA: OCTOBER	31
6.4.	2G VOICE PMR DATA: NOVEMBER	32
6.5.	2G VOICE PMR DATA: DECEMBER	33
6.6.	2G VOICE PMR DATA: CONSOLIDATED	34
6.7.	2G VOICE 3 DAYS LIVE DATA	35
6.8.	2G VOICE 3 DAYS LIVE DATA: OCTOBER	35
6.9.	2G VOICE 3 DAYS LIVE DATA: NOVEMBER	36
6.10.	2G VOICE 3 DAYS LIVE DATA: DECEMBER	37
6.11.	2G VOICE 3 DAYS LIVE DATA: CONSOLIDATED	38
6.12.	3G VOICE PMR: CONSOLIDATED	39
6.13.	3G VOICE PMR: OCTOBER	40
6.14.	3G VOICE PMR: NOVEMBER	41
6.15.	3G VOICE PMR: DECEMBER	42
6.16.	3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED	43
6.17.	3G VOICE 3 DAYS LIVE DATA: OCTOBER	44
6.18.	3G VOICE 3 DAYS LIVE DATA: NOVEMBER	45
6.19.	3G VOICE 3 DAYS LIVE DATA: DECEMBER	46
7.	Customer Service delivery	48
7.1.	Billing and Customer Care	48
7.2.	Live Calling Data: Consolidated	49
7.3.	3 Days Live Call Centre Data	50
8.	NETWORK PARAMETER: DESCRIPTION AND DETAILED FINDINGS	51
8.1.	BTS ACCUMULATED DOWNTIME	51
8.1.1.	KEY FINDINGS: SUM OF DOWNTIME OF BTSS: CONSOLIDATED	52
8.1.2.	KEY FINDINGS: SUM OF DOWNTIME OF BTSS: OCTOBER	52
8.1.3.	KEY FINDINGS: SUM OF DOWNTIME OF BTSS: NOVEMBER	53
8.1.4.	KEY FINDINGS: SUM OF DOWNTIME OF BTSS: DECEMBER	53
8.2.	WORST AFFECTED BTS DUE TO DOWNTIME	54
8.2.1.	KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF >24 HRS: CONSOLIDATED	55
8.2.2.	KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF > 24 HRS: OCTOBER	55

8.2.3.	KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF > 24 HRS: NOVEMBER	56
8.2.4.	KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF > 24 HRS: DECEMBER	56
8.3.	CALL SETUP SUCCESS RATE	57
8.3.1.	KEY FINDINGS: CALL SETUP SUCCESS RATE: CONSOLIDATED	58
8.3.2.	KEY FINDINGS: CALL SETUP SUCCESS RATE: OCTOBER	59
8.3.3.	KEY FINDINGS: CALL SETUP SUCCESS RATE: NOVEMBER	60
8.3.4.	KEY FINDINGS: CALL SETUP SUCCESS RATE: DECEMBER	60
8.4.	NETWORK CHANNEL CONGESTION: PAGING CHANNEL/ TCH CONGESTION/ POI.....	61
8.4.1.	KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: CONSOLIDATED	62
8.4.2.	KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: OCTOBER	62
8.4.3.	KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: NOVEMBER	63
8.4.4.	KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: DECEMBER	63
8.4.5.	KEY FINDINGS: TCH CONGESTION: CONSOLIDATED	64
8.4.6.	KEY FINDINGS: TCH CONGESTION: OCTOBER	64
8.4.7.	KEY FINDINGS: TCH CONGESTION: NOVEMBER	65
8.4.8.	KEY FINDINGS: TCH CONGESTION: DECEMBER	65
8.5.	CALL DROP RATE	66
8.5.1.	KEY FINDINGS: CALL DROP RATE: CONSOLIDATED	66
8.5.2.	KEY FINDINGS: CALL DROP RATE: OCTOBER	67
8.5.3.	KEY FINDINGS: CALL DROP RATE: NOVEMBER	67
8.5.4.	KEY FINDINGS: CALL DROP RATE: DECEMBER	68
8.6.	CELLS HAVING GREATER THAN 3% TCH DROP	68
8.6.1.	KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: CONSOLIDATED	69
8.6.2.	KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: OCTOBER	70
8.6.3.	KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: NOVEMBER	71
8.6.4.	KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: DECEMBER	72
8.7.	VOICE QUALITY	72
8.7.1.	KEY FINDINGS: VOICE QUALITY: CONSOLIDATED	73
8.7.2.	KEY FINDINGS: VOICE QUALITY: OCTOBER	74
8.7.3.	KEY FINDINGS: VOICE QUALITY: NOVEMBER	74
8.7.4.	KEY FINDINGS: VOICE QUALITY: DECEMBER	75
8.8.	POI CONGESTION: CONSOLIDATED	75
8.9.	POI CONGESTION: OCTOBER	76
8.10.	POI CONGESTION: NOVEMBER	76
8.11.	POI CONGESTION: DECEMBER	77
9.	L1 CALLING DATA	78
9.1.	Airtel	78
9.2.	BSNL	79
9.3.	Idea	80
9.4.	MTS	81
9.5.	RCOM CDMA	82
9.6.	RCOM GSM	83
9.7.	TATA CDMA	84
9.8.	TATA GSM	85
9.9.	Telenor	86
9.10.	Vodafone	87
10.	NON NETWORK PARAMETERS: DESCRIPTION AND DETAILED FINDINGS	89
10.1.	METERING AND BILLING CREDIBILITY	89
10.1.1.	KEY FINDINGS: METERING AND BILLING CREDIBILITY: POST – PAID	90
10.1.2.	KEY FINDINGS: METERING AND BILLING CREDIBILITY: PREPAID	91
10.2.	RESOLUTION OF BILLING COMPLAINTS	91
10.2.1.	KEY FINDINGS: BILLING COMPLAINTS RESOLUTION WITHIN 4 WEEKS	92
10.2.2.	KEY FINDINGS: BILLING COMPLAINTS RESOLUTION WITHIN 6 WEEKS	93
10.3.	PERIOD OF APPLYING CREDIT / WAVER	93
10.3.1.	KEY FINDINGS	94
10.4.	CALL CENTRE PERFORMANCE: IVR	94
10.4.1.	KEY FINDINGS	95
10.5.	CALL CENTER PERFORMANCE: VOICE TO VOICE	95
10.5.1.	KEY FINDINGS	96
10.6.	TERMINATION OR CLOSURE OF SERVICE	96
10.6.1.	KEY FINDINGS	97
10.7.	REFUND OF DEPOSIT AFTER CLOSURE	97
10.7.1.	KEY FINDINGS	98
11.	CRITICAL FINDINGS	99
12.	PMR Comparison (tsp vs audit agency)	102
12.1.	NETWORK PARAMETERS	102
12.2.	CSD PARAMETERS	103
12.3.	Key findings: BTS Accumulated Downtime	104
12.4.	Key findings: Worst Effected BTSs due to Downtime	104
12.5.	Key findings: Call Setup Success Rate	105
12.6.	Key findings: SDCC/ PAGING Chl. Congestion	105
12.7.	Key findings: TCH Congestion	106
12.8.	Key findings: Call Drop Rate	106

12.9.	Key findings: Worst effected cell more than 3% TCH drop	107
12.10.	Key findings: Connection with good voice quality	107
12.11.	Key findings: Metering and Billing Credibility: Post Paid	108
12.12.	Key findings: Metering and Billing Credibility: Prepaid	108
12.13.	Key findings: Resolution of billing/charging complaints within 4 weeks	109
12.14.	Key findings: Resolution of billing/charging complaints within 6 weeks	109
12.15.	Key findings: Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	110
12.16.	Key findings: Accessibility of call centre/ customer care	110
12.17.	Key findings: Percentage of calls answered by the operators (voice to voice) within 90 seconds	111
12.18.	Key findings: Percentage requests for Termination / Closure of service complied within 7 days	112
12.19.	Key findings: Time taken for refund of deposits after closures within 60 days	113
13.	OPERATOR ASSISTED DRIVE TEST	114
13.1.	NOVEMBER: ALMORA SSA	114
13.2.	DISTANCE COVERED: ALMORA SSA	114
13.3.	ROUTE MAP: ALMORA SSA: DAY 1	114
13.4.	ROUTE MAP: BAGHESHWAR SSA: DAY 2	116
13.5.	ROUTE MAP: ALMORA SSA: DAY 3	117
13.6.	DRIVE REPORT ANALYSIS	118
13.6.1.	AIRTEL DAY 1:	118
13.6.2.	AIRTEL DAY 2:	119
13.6.3.	AIRTEL DAY 3:	121
13.6.4.	AIRTEL OVERALL	122
13.6.5.	MTS CDMA: DAY 1	123
13.6.6.	MTS OVERALL	124
13.6.7.	IDEA: DAY 1	125
13.6.8.	IDEA: DAY 2	126
13.6.9.	IDEA: DAY 3	128
13.6.10.	IDEA: OVERALL	129
13.6.11.	RCOM GSM: DAY 1	130
13.6.12.	RCOM GSM :OVERALL	131
13.6.13.	RCOM CDMA: DAY 1	132
13.6.14.	RCOM OVERALL	133
13.6.15.	VODAFONE:DAY:1	134
13.6.16.	VODAFONE:DAY 2	135
13.6.17.	VODAFONE:DAY 3	136
13.6.18.	VODAFONE: OVERALL	138
13.7.	DRIVE TEST OUTCOME SUMMERY	138
13.8.	DECEMBER: ALIGARH SSA	139
13.9.	DISTANCE COVERED: ALIGARH SSA	139
13.10.	ROUTE MAP: ALIGARH SSA: DAY 1	139
13.11.	ROUTE MAP: ALIGARH SSA: DAY 2	140
13.12.	ROUTE MAP: ALIGARH SSA: DAY 3	141
13.13.	DRIVE TEST ANALYSIS	142
13.13.1	AIRTEL: DAY 1	142
13.13.2	AIRTEL: DAY 2	143
13.13.3	AIRTEL: DAY 3	145
13.13.4	AIRTEL: OVERALL	146
13.13.5	RCOM GSM: DAY 1	147
13.13.6	RCOM GSM: DAY 2	148
13.13.7	RCOM GSM: DAY 3	150
13.13.8	RCOM GSM: OVERALL	151
13.13.9	RCOM CDMA: DAY 1	152
13.13.10	RCOM CDMA: DAY 2	153
13.13.11	RCOM CDMA: DAY 3	154
13.13.12	RCOM CDMA: OVERALL	156
13.13.13	TTSL CDMA:DAY 1	156
13.13.14	TTSL CDMA:DAY 2	158
13.13.15	TTSL CDMA :DAY 3	159
13.13.16	TTSL CDMA: OVERALL	160
13.13.17	TTSL GSM:DAY 1	161
13.13.18	TTSL GSM: 2 DAY	162
13.13.19	TTSL GSM:DAY 3	163
13.13.20	TTSL GSM:OVERALL	164
13.13.21	MTS CDMA:DAY 2	165
13.13.22	MTS CDMA:DAY 3	166
13.13.23	MTS CDMA: OVERALL	168
13.13.24	BSNL CDMA:DAY 2	168
13.13.25	BSNL CDMA:DAY 3	170
13.13.26	BSNL CDMA:OVERALL	171
13.13.27	BSNL GSM:DAY 2	172
13.13.28	BSNL GSM:DAY 3	173
13.13.29	BSNL GSM:OVERALL	174

13.13.30	VODAFONE:DAY 1	175
13.13.31	VODAFONE :DAY 2.....	176
13.13.32	VODAFONE:DAY 3.....	177
13.13.33	VODAFONE:OVERALL	178
13.13.34	TELENOR:DAY 1	179
13.13.35	TELENOR:DAY 2	180
13.13.36	TELENOR:DAY 3.....	182
13.13.37	TELENOR:OVERALL	183
13.14.	DRIVE TEST OUTCOME SUMMERY	184
14.	COUNTER DETAILS.....	185
14.1.	Ericsson	186
14.2.	NSN (Nokia Siemens Network)	187
14.3.	Huawei	187
15.	BLOCK SCHEMATIC DIAGRAM.....	189
13.7.	Ericsson	189
13.8.	NSN	190
13.9.	Huawei	191
16.	ABBREVIATIONS	192
17.	ANNEXURE	193

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 decade ago in 2004, we aspire to provide longer term savings based on year-on-year productivity. With our size, we are nimble and aspire to being a full service partner for providing consultancy services.

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

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

1.3. OBJECTIVES

The primary objective of the Audit module is to:

- Audit and Assess the Quality of Services being rendered by Basic (Wireline), Cellular Mobile (Wireless), and Broadband service against the parameters notified by TRAI. (The parameters of Quality of Services (QoS) have been specified by in the respective regulations published by TRAI).

- This report covers the audit results of the audit conducted for Cellular Mobile (Wireless) services in UP West Circle.

1.4. COVERAGE

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

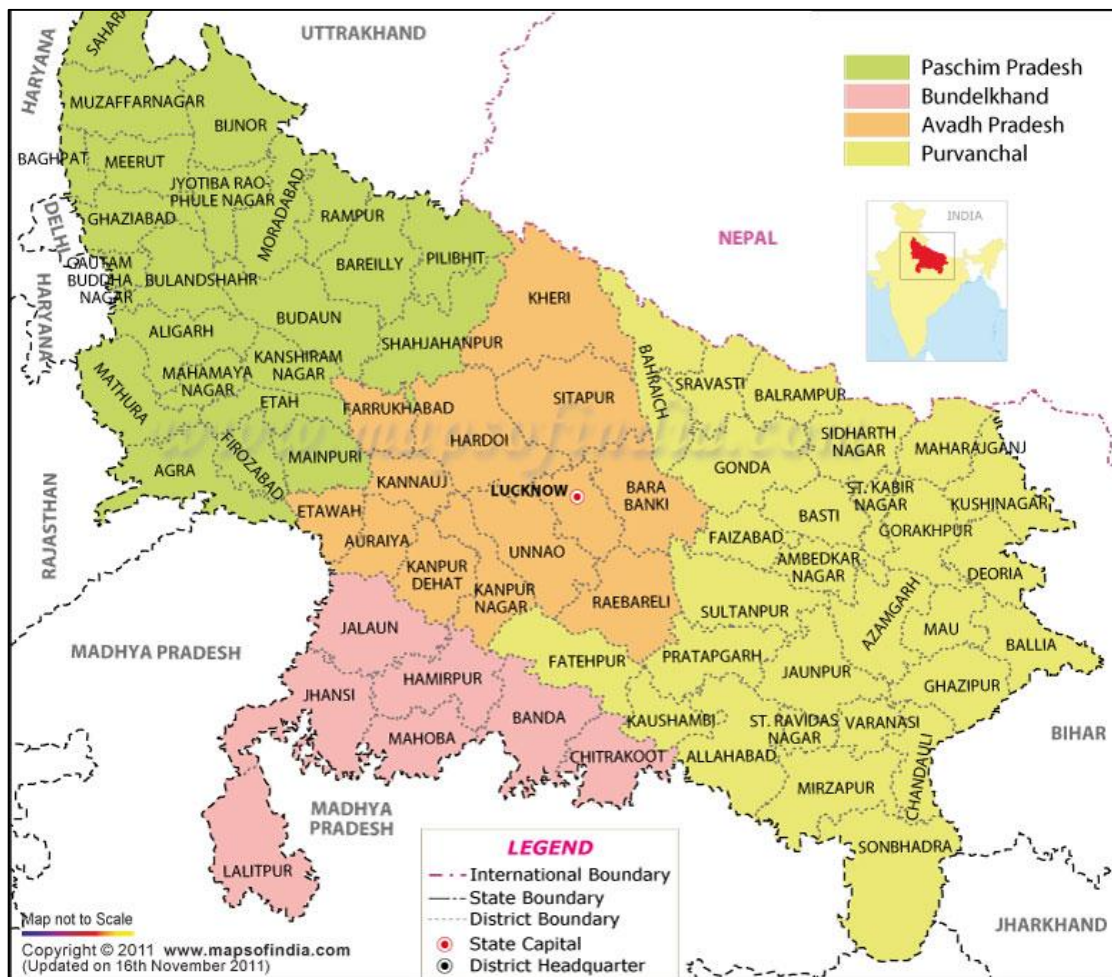


Image Source: Maps of India

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	Bageshwar
67	UPW	Almora	Champawat
68	UPW	Almora	Dharchula
69	UPW	Almora	Munsiari
70	UPW	Almora	Pithoragarh
71	UPW	Almora	Ranikhet
72	UPW	Dehradun	Chakrata (dakpathar)
73	UPW	Dehradun	Dehradun
74	UPW	Kotdwara	Chamoli
75	UPW	Kotdwara	Joshimath-i
76	UPW	Kotdwara	Joshimath-ii (badrinath)
77	UPW	Kotdwara	Karan prayag
78	UPW	Kotdwara	Lansdown-i
79	UPW	Kotdwara	Lansdown-ii (kotdwara)
80	UPW	Kotdwara	Lansdown-iii (syunsi)
81	UPW	Kotdwara	Pauri-i
82	UPW	Kotdwara	Pauri-ii (bubakhal)
83	UPW	Kotdwara	Ukhimath (guptkashi)
84	UPW	Nainital	Haldwani-i
85	UPW	Nainital	Haldwani-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 (hardwar)
94	UPW	Uttarkashi	Bhatwari-i (uttarkashi)
95	UPW	Uttarkashi	Bhatwari-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

Audit Activities

PMR Reports

Drive Test

CSD Audit

Wireline &
Broadband

Inter Operator
Call Assessment

Monthly PMR

Operator
Assisted

Billing Complain

Billing Complain

3 Days Live Data

Independent

Service request

Service Request

Customer
Service

Level 1 Service

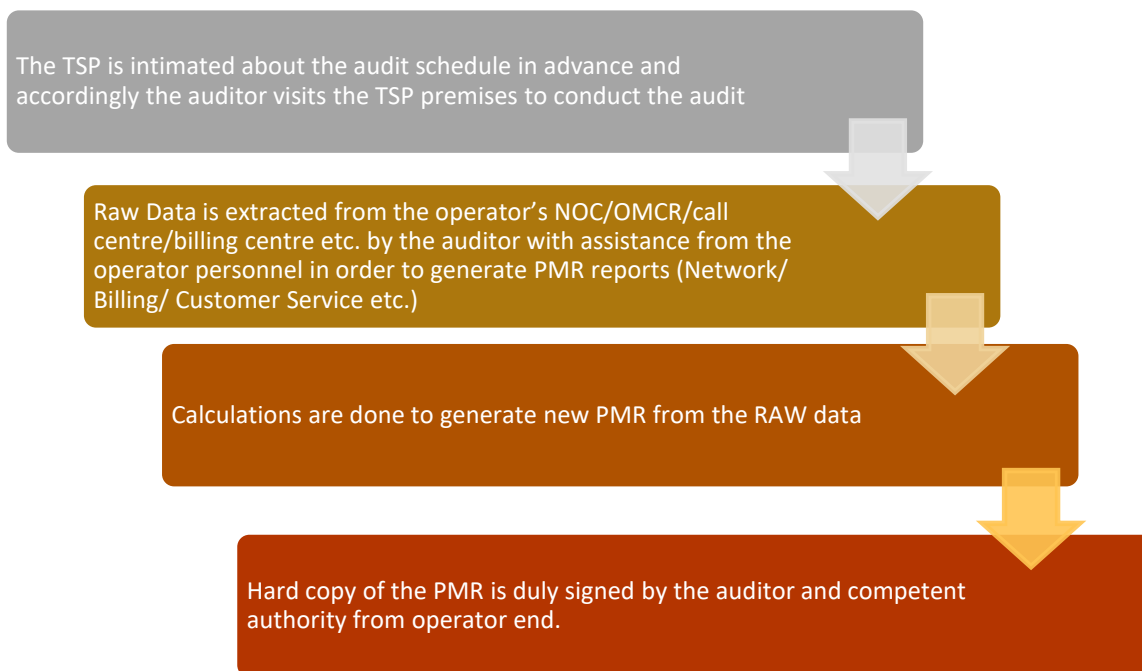
Customer
Service

Level 1 Service

Customer
Service

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, October 2015 audit data was collected in the month of November 2015.

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 December 2015 was collected in the month of December 2015.

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 October, November and December 2015. 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

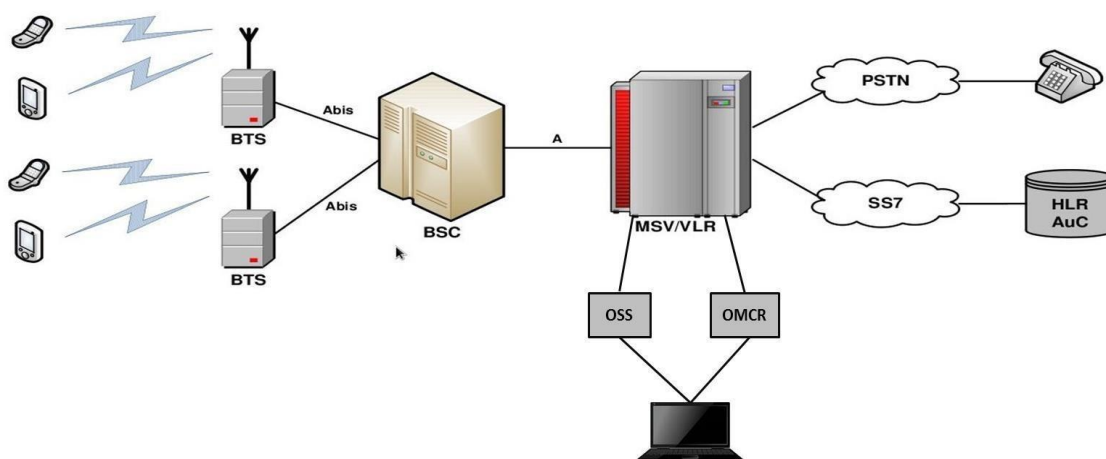
2.2. AUDIT PARAMETER: NETWORK

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

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

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

Tender document and latest list of licencees as per TRAI is taken as a reference document for assimilating the presence of operators. All the wireless operators are then informed about the audit schedule

Audit formats and schedule is shared with the operators in advance. Details include day of the visit and date of 3 day data collection and other requirements.

Auditors visit the operator's server/exchange/central NOC to extract data from operator's systems. Operator personnel assist the auditor in extraction process.

The extracted data is validated and verified by the Auditors.

Auditors then prepare a PMR report from the extracted data with assistance from the operator.

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	$\text{SDCCH / TCH Congestion\%} = [(A1 \times C1) + (A2 \times C2) + \dots + (An \times Cn)] / (A1 + A2 + \dots + An)$ <p>Where: A1 = Number of attempts to establish SDCCH / TCH made on day 1 C1 = Average SDCCH / TCH Congestion % on day 1 A2 = Number of attempts to establish SDCCH / TCH made on day 2 C2 = Average SDCCH / TCH Congestion % on day 2</p>
TCH Congestion	$\text{C2} = \text{Average SDCCH / TCH Congestion \% on day 2}$ $\text{An} = \text{Number of attempts to establish SDCCH / TCH made on day n}$ $\text{Cn} = \text{Average SDCCH / TCH Congestion \% on day n}$
POI Congestion	$\text{POI Congestion\%} = [(A1 \times C1) + (A2 \times C2) + \dots + (An \times Cn)] / (A1 + A2 + \dots + An)$ <p>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</p>
Call Drop Rate	$\text{Total Calls Dropped} / \text{Total Calls Established} \times 100$
Worst Affected Cells having more than 3% TCH drop	$\text{Total number of cells having more than 3\% TCH drop during CBBH} / \text{Total number of cells in the LSA} \times 100$
Connections with good voice quality	$\text{No. of voice samples with good voice quality} / \text{Total number of samples} \times 100$

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's having more than 24 hours of Downtime in 3 Days	$\text{No. of Node B's having accumulated downtime of >24 hours in a month}$ $((\text{No. of Node B's having Accumulated Downtime of > 24 hrs in a month}) / \text{Total no. of BTSs in the licensed service area}) \times 100$	<=2%
d.		Node B's downtime more than 24 hr in 3 days	Total no. of Node B's in the Licensed Service Area	<=2%

	Node B's accumulated downtime		Sum of downtime of Node B's in a month in hours i.e. total outage time of all Node B's in hours in a month	
			[(Sum of downtime of Node B's in a month in hrs)/(24* no. of days in the month*no. of Node B's in the licensed service area)]*100	
2	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	>=95%
			Total No. of Voice Call Establishment	
			CSSR (Call Setup Success Rate = (Total No. of Voice Call Attempts/ Total No. of Voice Call Establishment)*100)	
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)	<=1%
			RRC Failed (RRC Connection Access Failed) (B)	
			RRC Congestion (%) [B/A]*100	
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)	<=2%
			RAB Failed (RAB Setup Access Failed) (D)	
			RAB Congestion (%) [D/C]*100	
3	Connection Maintenance (Retainability)			
a.	Circuit Switched Voice Drop Rate	It is the % of total no. of Dropped Calls to the total no. of Calls Established	Total Established Calls (A)	<=2%
			Calls Dropped after Establishment (B)	
			Call Drop Rate [B/A]*100	
b.	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	It is the % of total no. of Cells having > 3% Circuit Switched Voice drop to the total no. cells	Total No. of Cells (Sector)	<=3%
			Total No. of Cells exceeding 3% Circuit Switched Voice Drop Rate in CBBH (Cell Bouncing Busy Hour)	
			% of cells having more than 3% Circuit Switched Voice Drop Rate [(No. of cells having Circuit Switched Voice Drop Rate > 3% during CBBH in 31 days*100) / Total no. of cells in the licensed service area]	
c.	Percentage of connections with Good Circuit Switched Voice Quality	It can be defined as the % of Good Voice Quality Samples to the total No. of Quality Samples	Percentage of connection with Good Circuit Switched Voice Quality	>=95%
4	Total No. of POI's in Month having >=0.5% POI congestion	Total no. Of POI's which are exceeding the POI congestion more than 0.5 %.	Total No. of call attempts on POI	<=0.5%
			Total traffic served on all POIs (Erlang)	
			Total No. of circuits on all individual POIs	

			Total number of working POI Service Area wise	
			Capacity of all POIs	
			No. of all POI's having $\geq 0.5\%$ POI congestion	
			Name of POI not meeting the benchmark (having $\geq 0.5\%$ 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)	Within 4 Hours with 95% Success Rate
			Total Service Activations provided within 4 Hours (B)	
			Service Activation / Provisioning = $(B/A) * 100$	
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)	$\geq 95\%$
			Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)	
			PDP Context Activation Success Rate = $(B/A) * 100$	
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)	$\leq 5\%$
			RNC originated PS Domain Iu Connection Release (B)	
			Drop Rate = $(B/A) * 100$	

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 QoS 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.

Daywise RAW Data is fetched from the operator's OMCR and kept in readable format (preferably in MS- Excel). Data for a period of 90 days is used to identify TCBH.

90 Days period is decided upon the basis of month of audit. For example, for the audit of December 2015, the 90 day period data used to identify TCBH would be the data of October, November & December 2015.

For each day, the hour in which average traffic of the resource group concerned is greatest for the day will be the 'Busy Hour' for the operator.

The model frequency of the busy hour is calculated for 90 days period and the hour with highest model frequency will be considered as TCBH for the operator.

During audit, the auditors identified from the raw data that the TCBH for the operators in Oct – Nov – Dec 2015 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:

Daywise RAW Data is fetched from the operator's OMCR and kept in readable format (preferably in MS- Excel). Data for a period of 90 days is used to identify CBBH.

For each day the hour in which a cell in cellular mobile telephone network experiences maximum traffic for the day will be the 'Busy Hour' for the operator.

The model frequency of the busy hour is calculated for 90 days period and the hour with highest model frequency will be considered as CBBH for the 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 December 2015 was collected in the month of December 2015. 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)	<p>There are two benchmarks involved here:</p> <p>Billing or Charging Complaints resolved in 4 weeks from date of receipt / Total billing or charging complaints received during the quarter) x 100</p> <p>Billing or Charging Complaints resolved in 6 weeks from date of receipt / Total billing or charging complaints received during the quarter) x 100</p>
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)	<p>Call centre performance Voice to Voice = (Number of calls answered by operator within 90 seconds/ All calls attempted to connect to the operator) * 100</p> <p>The calculation excludes the calls dropped before 90 seconds</p>
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

The auditor visits the operator premises for Live Calling. The operators provide the RAW data of customer complaints (billing and services) and also the list of customer service numbers to be verified through live calling

The auditor makes the live calls using operator SIM to a random sample of subscribers from the RAW data provided to verify the resolution of complaints

The auditor verifies the performance of call centre, level 1 services by calling the numbers using operator SIM. The list of call centre numbers is provided by the operator.

The auditors also make test calls to subscribers of other operators to assess the inter-operator call connectivity in the same licensed service area

Live calling activity was carried out during the period of December 2015. 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 October 2015 was considered for live calling activity conducted in November 2015. 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, 2015 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 October, November and December'15, auditor has tried contacting the list of Level 1 services provided by TRAI as per the NNP (National Numbering Plan).

4.6.1. 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 Helpline 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

4.7. 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.

4.8. 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	-	99%	99%	99%	99%	100%	99%	98%	98%	99%	100%
Airtel	99%	-	98%	99%	98%	97%	98%	99%	97%	100%	97%
BSNL	98%	100%	-	98%	100%	98%	97%	99%	99%	98%	98%
Idea	100%	100%	100%	-	100%	97%	100%	99%	97%	100%	99%
RCOM GSM	98%	97%	97%	98%	-	100%	99%	100%	98%	98%	100%
RCOM CDMA	97%	100%	99%	98%	100%	-	98%	98%	99%	97%	100%
TTSL CDMA	98%	96%	98%	97%	99%	97%	-	99	99	96%	97%
TTSL GSM	97%	98%	99%	99%	100%	98%	99	-	99	99%	100%
TELENOR	98%	99%	97%	99%	100%	99%	97	98	-	97%	100%
Vodafone	98%	96%	98%	98%	100%	99%	97%	98%	99%	-	100%
MTS	99%	97%	99%	98%	100%	100%	100%	99%	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 decided basis TRAI recommendation.

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

5.3. PARAMETERS EVALUATED DURING DRIVE TEST

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

- Coverage-Signal strength (GSM)
 - Total calls made (A)
 - Number of calls with signal strength between 0 to -75 dBm
 - Number of calls with signal strength between 0 to -85 dBm
 - Number of calls with signal strength between 0 to -95 dBm
- Coverage-Signal strength (CDMA)
 - Total Ec/Io BINS (A)
 - Total Ec/Io BINS with less than -15 (B)
 - Low Interference = $[1 - (B/A)] \times 100$

- Voice quality (GSM)
 - Total RxQual Samples– A
 - RxQual samples with 0-5 value – B
 - %age samples with good voice quality = $B/A \times 100$
- Voice quality (CDMA)
 - Total FER BINs (forward FER) – A
 - FER BINs with 0-2 value (forward FER) – B
 - FER BINs with 0-4 value (forward FER) – C
 - %age samples with FER bins having 0-2 value (forward FER) = $B/A \times 100$
 - %age samples with FER bins having 0-4 value (forward FER) = $C/A \times 100$
 - No. of FER samples with value > 4 = [A-C]
- Call setup success rate
 - Total number of call attempts – A
 - Total Calls successfully established – B
 - Call success rate (%age) = $(B/A) \times 100$
- Blocked calls
 - 100% - Call Set up Rate
- Call drop rate
 - Total Calls successfully established – A
 - Total calls dropped after being established – B
 - Call Drop Rate (%age) = $(B/A) \times 100$

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 December 31, 2015)
BSNL	2365478
Airtel	2145698
Aircel	427258
Idea	1036987
Reliance (CDMA + GSM)	1569875
Vodafone	10472148
TATA (CDMA + GAM)	658742
Systema Shyam Teleservices Ltd	80000
Telenor	8467092

TSP	No. of Cells	BTS	BSC	MSC+GMSC	Node B	RNC
Aircel	1979	656	8	1+1	NA	NA
Airtel	20256	6781	70	4+6	3695	12
Idea	25092	8928	59	19	4114	8
TTSL GSM	5303	1740	18	3	NA	NA
TTSL CDMA	1493	469	4	3+2	NA	NA
RCOM GSM	4945	1647	14	3+1	NA	NA
RCOM CDMA	2943	983	4	3	NA	NA
Vodafone	20835	6911	82	7+4	NA	NA
BSNL	7715	2642	33	13	1250	9
BSNL Uttarakhand	2946	992	14	5	472	5
Videocon	21	7	1	1	NA	NA
Telenor	11928	3959	32	12	NA	NA
MTS	1212	340	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) October 2015	October 2015	November 2015	December 2015
Airtel	27 th Oct 2015	18 th Nov 2015	14 th Dec 2015	12 th Jan 2016
Vodafone	26 th Oct 2015	13 th Nov 2015	10 th Dec 2015	6 th Jan 2016
Idea	20 th Oct 2015	9 th Nov 2015	11 th Dec 2015	11 th Jan 2016
Reliance	29 th Oct 2015	16 th Nov 2015	15 th Dec 2015	13 th Jan 2016
BSNL	28 th Oct 2015	24 th Nov 2015	16 th Dec 2015	14 th Jan 2016
Aircel	30 th Oct 2015	6 th Nov 2015	8 th Dec 2015	8 th Jan 2016
Tata Teleservices	2 nd Nov 2015	9 th Nov 2015	9 th Dec 2015	7 th Jan 2016
Videocon	31 st Oct 2015	17 th Nov 2015	11 th Dec 2015	20 th Jan 2016
Telenor	28 th Oct 2015	16 th Nov 2015	14 th Dec 2015	12 th Jan 2016
MTS	23 rd Oct 2015	5 th Nov 2015	7 th Dec 2015	11 th Jan 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: OCTOBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%age)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.20%	0.76%	98.13%	0.16%	0.78%	0.35%	2.19%	96.03%
Airtel	1.14%	1.27%	98.90%	0.51%	0.77%	1.26%	2.14%	95.86%
BSNL	1.28%	1.85%	96.58%	0.20%	1.24%	1.37%	2.15%	97.13%
Idea	0.11%	0.34%	97.65%	0.96%	1.70%	1.24%	2.70%	96.75%
MTS	0.02%	0.00%	96.66%	NA	0.00%	0.17%	2.25%	98.45%
RCOM CDMA	0.05%	0.41%	98.80%	NA	0.65%	0.13%	0.75%	98.53%
RCOM GSM	0.57%	0.36%	98.06%	0.20%	0.29%	0.08%	0.34%	99.07%
TELENOR	0.23%	0.74%	97.80%	0.55%	1.32%	0.52%	1.46%	95.83%
TTSL CDMA	0.14%	0.43%	99.08%	NA	0.04%	0.53%	5.26%	98.92%
TTSL GSM	0.20%	0.41%	98.04%	0.19%	0.60%	0.90%	5.30%	97.18%
Videocon	0.24%	0.00%	99.17%	0.02%	0.00%	0.43%	0.00%	99.60%
Vodafone	0.63%	0.46%	99.49%	0.18%	0.51%	0.76%	2.88%	96.96%
BSNL UK	0.50%	1.94%	97.42%	0.51%	1.12%	1.41%	1.80%	95.75%

- TTSL CDMA has parameter value of **5.26%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at ≤ 3%.
- TTSL GSM has parameter value of **5.30%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at ≤ 3%.

6.4. 2G VOICE PMR DATA: NOVEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.10%	0.46%	98.12%	0.37%	0.37%	0.32%	2.05%	95.91%
Airtel	1.02%	1.04%	98.78%	0.94%	0.88%	1.34%	2.13%	96.09%
BSNL	1.50%	1.72%	97.66%	0.58%	1.47%	0.77%	2.22%	96.87%
Idea	0.16%	0.15%	96.85%	0.99%	1.98%	1.15%	2.44%	96.66%
MTS	0.03%	0.00%	99.72%	NA	0.00%	0.18%	2.02%	98.36%
RCOM CDMA	0.04%	0.20%	95.60%	NA	0.74%	0.11%	0.71%	99.07%
RCOM GSM	0.04%	0.24%	95.77%	0.24%	0.24%	0.08%	0.49%	99.06%
TELENOR	0.23%	0.42%	98.11%	0.55%	1.19%	0.50%	1.34%	95.85%
TTSL CDMA	0.12%	0.43%	99.20%	NA	0.07%	0.53%	5.33%	98.95%
TTSL GSM	0.21%	0.64%	98.11%	0.22%	0.54%	0.92%	5.40%	97.09%
Videocon	0.21%	0.00%	99.00%	0.00%	0.00%	0.60%	0.00%	99.60%
Vodafone	0.18%	0.80%	99.03%	0.55%	0.97%	0.75%	2.78%	96.49%
BSNL UK	1.31%	1.82%	96.90%	0.41%	1.19%	1.33%	1.96%	95.81%

- TTSL CDMA has parameter value of **5.33%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at ≤ 3%.
- TTSL GSM has parameter value of **5.40%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at ≤ 3%.

6.5. 2G VOICE PMR DATA: DECEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.13%	0.61%	97.97%	0.15%	0.56%	0.35%	2.00%	96.02%
Airtel	1.04%	0.95%	98.94%	0.56%	0.73%	1.49%	2.33%	96.01%
BSNL	1.44%	1.85%	97.60%	0.63%	1.39%	1.67%	2.59%	96.96%
Idea	0.12%	0.23%	97.33%	0.95%	1.91%	1.27%	2.71%	96.40%
MTS	0.03%	0.00%	99.68%	NA	0.00%	0.14%	1.92%	98.14%
RCOM CDMA	0.02%	0.20%	97.81%	NA	0.10%	0.11%	0.54%	98.66%
RCOM GSM	0.03%	0.30%	98.92%	0.18%	0.25%	0.08%	0.28%	98.69%
TELENOR	0.19%	0.18%	98.27%	0.56%	1.19%	0.55%	1.50%	96.12%
TTSL CDMA	0.18%	0.21%	99.23%	NA	0.37%	0.50%	4.94%	98.97%
TTSL GSM	0.25%	0.58%	97.96%	0.27%	0.57%	0.86%	4.95%	97.13%
Videocon	0.09%	0.00%	99.18%	0.29%	0.00%	1.14%	0.00%	98.73%
Vodafone	0.48%	1.05%	99.02%	0.65%	0.98%	0.78%	3.21%	96.25%
BSNL UK	1.55%	1.81%	96.83%	0.61%	1.34%	1.28%	2.18%	96.12%

- TTSL CDMA has parameter value of **4.94%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **4.95%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- Vodafone has parameter value of **3.21%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.

6.6. 2G VOICE PMR DATA: CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.14%	0.61%	98.07%	0.23%	0.57%	0.34%	2.08%	95.99%
Airtel	1.07%	1.09%	98.87%	0.67%	0.79%	1.36%	2.20%	95.99%
BSNL	1.41%	1.81%	97.28%	0.47%	1.37%	1.27%	2.32%	96.99%
Idea	0.13%	0.24%	97.28%	0.97%	1.86%	1.22%	2.62%	96.60%
MTS	0.03%	0.00%	98.69%	NA	0.00%	0.16%	2.06%	98.32%
RCOM CDMA	0.04%	0.27%	97.40%	NA	0.50%	0.12%	0.67%	98.75%
RCOM GSM	0.21%	0.30%	97.58%	0.21%	0.26%	0.08%	0.37%	98.94%
TELENOR	0.22%	0.45%	98.06%	0.55%	1.23%	0.52%	1.43%	95.93%
TTSL CDMA	0.15%	0.36%	99.17%	NA	0.16%	0.52%	5.18%	98.95%
TTSL GSM	0.22%	0.54%	98.04%	0.23%	0.57%	0.89%	5.22%	97.13%
Videocon	0.18%	0.00%	99.12%	0.10%	0.00%	0.72%	0.00%	99.31%
Vodafone	0.43%	0.77%	99.18%	0.46%	0.82%	0.76%	2.96%	96.57%
BSNL UK	1.12%	1.86%	97.05%	0.51%	1.22%	1.34%	1.98%	95.89%

- TTSL CDMA has parameter value of **5.18%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.22%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.

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: OCTOBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%age)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.20%	0.15%	98.19%	0.33%	1.10%	0.37%	2.32%	96.10%
Airtel	0.06%	1.67%	98.87%	0.38%	0.80%	1.27%	2.12%	95.78%
BSNL	1.26%	1.10%	96.52%	0.21%	1.41%	1.40%	2.17%	96.78%
Idea	0.35%	0.00%	97.45%	1.21%	1.76%	1.23%	3.04%	96.79%
MTS	0.05%	0.00%	99.18%	NA	0.00%	0.19%	0.67%	98.38%
RCOM CDMA	0.05%	0.00%	98.74%	NA	0.39%	0.18%	0.58%	99.51%
RCOM GSM	0.06%	0.00%	99.00%	0.16%	0.28%	0.09%	0.35%	99.06%
TELENOR	0.20%	0.00%	98.32%	0.50%	1.11%	0.48%	1.89%	95.91%
TTSL CDMA	0.02%	0.00%	99.31%	NA	0.02%	0.50%	4.17%	98.95%
TTSL GSM	0.14%	0.00%	98.32%	0.11%	0.43%	0.86%	5.10%	97.13%
Videocon	0.53%	0.00%	99.32%	0.00%	0.00%	0.39%	0.00%	99.82%
Vodafone	0.23%	0.16%	99.48%	0.17%	0.52%	0.78%	2.97%	96.88%
BSNL UK	0.35%	0.02%	97.65%	0.46%	1.00%	1.42%	1.86%	95.90%

- Idea has parameter value of **1.21%** and failed to meet the benchmark of $\leq 1\%$ for SDDCH/Paging chl. Congestion.
- TTSL CDMA has parameter value of **4.17%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.10%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- Idea has parameter value of **3.04%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

6.9. 2G VOICE 3 DAYS LIVE DATA: NOVEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%age)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.15%	0.15%	98.02%	0.16%	0.39%	0.35%	2.36%	95.97%
Airtel	0.04%	1.09%	98.59%	0.71%	1.09%	1.30%	1.89%	95.90%
BSNL	1.46%	1.05%	97.69%	0.72%	1.62%	0.70%	2.49%	96.29%
Idea	0.22%	0.00%	97.64%	0.90%	1.73%	1.17%	2.58%	96.76%
MTS	0.03%	0.00%	99.40%	NA	0.00%	0.16%	1.35%	98.64%
RCOM CDMA	0.03%	0.00%	80.96%	NA	1.16%	0.09%	0.63%	99.53%
RCOM GSM	0.04%	0.00%	99.29%	0.02%	0.21%	0.07%	0.31%	99.06%
TELENOR	0.00%	0.00%	98.53%	0.39%	1.12%	0.42%	0.95%	95.86%
TTSL CDMA	0.21%	0.00%	99.13%	NA	0.13%	0.65%	5.66%	98.95%
TTSL GSM	0.31%	0.00%	97.77%	0.28%	0.81%	1.02%	6.51%	97.06%
Videocon	0.00%	0.00%	99.63%	0.00%	0.00%	0.44%	0.00%	99.76%
Vodafone	0.16%	0.00%	99.01%	0.45%	0.99%	0.72%	2.28%	96.92%
BSNL UK	1.31%	0.00%	96.26%	0.57%	1.81%	1.45%	2.11%	95.82%

- RCOM CDMA has parameter value of **80.96%** and failed to meet the benchmark of ≥95% for Call Set-up Success Rate (Within Licensee own network).
- TTSL CDMA has parameter value of **5.66%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **6.51%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.

6.10. 2G VOICE 3 DAYS LIVE DATA: DECEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.04%	0.00%	97.98%	0.10%	0.64%	0.32%	2.16%	95.94%
Airtel	1.07%	0.98%	98.86%	0.49%	0.79%	1.53%	2.52%	95.94%
BSNL	1.41%	0.92%	97.75%	0.50%	1.35%	1.73%	2.60%	96.87%
Idea	0.11%	0.00%	97.51%	0.85%	1.91%	1.36%	2.83%	96.28%
MTS	0.00%	0.00%	99.73%	NA	0.00%	0.11%	2.02%	98.26%
RCOM CDMA	0.02%	0.00%	98.44%	NA	0.37%	0.11%	0.68%	99.67%
RCOM GSM	0.03%	0.00%	99.43%	0.18%	0.22%	0.08%	0.23%	99.22%
TELENOR	0.15%	0.00%	98.19%	0.62%	1.24%	0.56%	1.48%	95.87%
TTSL CDMA	0.18%	0.00%	99.25%	NA	0.05%	0.48%	4.95%	98.96%
TTSL GSM	0.30%	0.12%	98.14%	0.18%	0.54%	0.90%	4.92%	97.04%
Videocon	0.65%	0.00%	99.18%	0.00%	0.00%	0.37%	0.00%	99.99%
Vodafone	0.40%	0.00%	99.08%	0.49%	0.92%	0.89%	3.54%	96.27%
BSNL UK	1.58%	0.00%	95.72%	0.51%	1.45%	1.31%	2.16%	96.22%

- TTSL CDMA has parameter value of **4.95%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **4.92%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- Vodafone has parameter value of **3.54** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.

6.11. 2G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.13%	0.10%	98.06%	0.20%	0.71%	0.35%	2.28%	96.00%
Airtel	0.39%	1.25%	98.77%	0.53%	0.89%	1.37%	2.18%	95.87%
BSNL	1.38%	1.02%	97.32%	0.48%	1.46%	1.28%	2.42%	96.65%
Idea	0.23%	0.00%	97.53%	0.99%	1.80%	1.25%	2.82%	96.61%
MTS	0.03%	0.00%	99.44%	0.00%	0.00%	0.15%	1.35%	98.43%
RCOM CDMA	0.03%	0.00%	92.71%	0.00%	0.63%	0.13%	0.42%	99.39%
RCOM GSM	0.04%	0.00%	99.24%	0.12%	0.24%	0.08%	0.30%	99.11%
TELENOR	0.12%	0.00%	98.35%	0.51%	1.15%	0.49%	1.44%	95.88%
TTSL CDMA	0.14%	0.00%	99.23%	0.00%	0.07%	0.55%	4.93%	98.95%
TTSL GSM	0.26%	0.04%	98.08%	0.19%	0.59%	0.93%	5.51%	97.08%
Videocon	0.39%	0.00%	99.38%	0.00%	0.00%	0.40%	0.00%	99.86%
Vodafone	0.26%	0.05%	99.19%	0.37%	0.81%	0.80%	2.93%	96.69%
BSNL UK	1.08%	0.01%	96.54%	0.51%	1.42%	1.39%	2.04%	95.98%

- TTSL CDMA has parameter value of **4.93%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.51%** and failed to meet the benchmark of ≤ 3% for Worst Affected cell having more than 3% TCH drop.
- RCOM CDMA has parameter value of **92.71%** and failed to meet the benchmark of ≥ 95% for Call Set-up Success Rate (Within Licensee own network).

6.12. 3G VOICE PMR: CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	1.32%	1.34%	99.48%	0.11%	0.00%	0.60%	1.19%	98.76%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
Idea	0.37%	1.36%	99.25%	0.96%	0.42%	0.27%	2.37%	99.23%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.24%	0.53%	98.26%	0.50%	1.47%	0.40%	3.15%	99.13%
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	1.27%	0.53%	96.45%	1.34%	1.29%	1.33%	2.66%	DNA

- BSNL UK has parameter value of **1.34%** and failed to meet the benchmark of ≤1% for RRC Congestion.
- TATA GSM has parameter value of **3.15%** and failed to meet the benchmark of ≤ 3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

6.13. 3G VOICE PMR: OCTOBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	1.60%	1.99%	99.15%	0.06%	0.00%	0.77%	1.25%	98.44%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
Idea	0.43%	1.61%	99.26%	1.03%	0.43%	0.27%	2.34%	99.21%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.27%	0.86%	98.43%	0.53%	1.27%	0.43%	3.32%	99.11%
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA

- TATA GSM has parameter value of **3.32%** and failed to meet the benchmark of ≤3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

6.14. 3G VOICE PMR: NOVEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	1.18%	1.04%	99.61%	0.15%	0.00%	0.51%	1.16%	98.91%
BSNL	NA	NA	NA	NA	NA	NA	NA	NA
Idea	0.30%	1.10%	99.21%	0.93%	0.41%	0.28%	2.39%	99.26%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.21%	0.24%	98.36%	0.46%	1.44%	0.37%	2.97%	99.14%
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	1.11%	0.00%	96.75%	1.78%	1.19%	1.46%	2.85%	DNA

- BSNL UK has parameter value of **1.78%** and failed to meet the benchmark of ≤1% for RRC Congestion.
- **For each instance of "DNA (Data Not Available)", please refer the respective hard copy of audit report(s).

6.15. 3G VOICE PMR: DECEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	1.19%	1.00%	99.67%	0.12%	0.00%	0.52%	1.16%	98.94%
BSNL	NA	NA	NA	NA	NA	NA	NA	NA
Idea	0.38%	1.36%	99.27%	0.92%	0.41%	0.25%	2.39%	99.22%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.25%	0.48%	98.00%	0.51%	1.71%	0.39%	3.16%	99.13%
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	1.42%	1.06%	96.14%	0.90%	1.39%	1.19%	2.46%	DNA

- TATA GSM has parameter value of **3.16%** and failed to meet the benchmark of ≤ 3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

6.16. 3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	0.05%	1.36%	99.35%	0.16%	0.00%	0.57%	1.12%	98.81%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
Idea	0.58%	0.24%	99.30%	0.90%	0.40%	0.27%	2.51%	99.20%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.23%	0.00%	97.60%	0.34%	1.54%	0.39%	3.25%	99.07%
Videocon	NA	NA	NA	NA	NA	NA	NA	NA
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	1.15%	0.11%	96.86%	0.97%	1.15%	1.10%	2.59%	DNA

- TATA GSM has parameter value of **3.25%** and failed to meet the benchmark of ≤3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.
- **For each instance of "DNA (Data Not Available)", please refer the respective hard copy of audit report(s).

6.17. 3G VOICE 3 DAYS LIVE DATA: OCTOBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	0.05%	1.59%	99.51%	0.00%	0.00%	0.55%	1.16%	98.60%
BSNL	NA	NA	NA	NA	NA	NA	NA	NA
Idea	0.93%	0.34%	99.29%	0.83%	0.42%	0.25%	2.21%	99.19%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.20%	0.00%	96.47%	0.00%	1.31%	0.38%	3.35%	98.94%
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA

- TATA GSM has parameter value of **3.35%** and failed to meet the benchmark of ≤3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

6.18. 3G VOICE 3 DAYS LIVE DATA: NOVEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	0.05%	1.35%	98.81%	0.37%	0.00%	0.54%	0.99%	98.89%
BSNL	NA	NA	NA	NA	NA	NA	NA	NA
Idea	0.50%	0.32%	99.35%	0.90%	0.36%	0.31%	2.78%	99.20%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.33%	0.00%	98.16%	0.45%	1.59%	0.42%	3.40%	99.14%
Videocon	NA	NA	NA	NA	NA	NA	NA	NA
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	0.99%	0.00%	97.70%	1.02%	1.26%	1.34%	2.82%	DNA

- TATA GSM has parameter value of **3.40%** and failed to meet the benchmark of ≤3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.
- BSNL UK has parameter value of **1.02%** and failed to meet the benchmark of ≤1% for RRC Congestion.
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

6.19. 3G VOICE 3 DAYS LIVE DATA: DECEMBER

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	0.04%	1.15%	99.72%	0.11%	0.00%	0.63%	1.20%	98.93%
BSNL	NA	NA	NA	NA	NA	NA	NA	NA
Idea	0.32%	0.05%	99.25%	0.96%	0.43%	0.25%	2.54%	99.20%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.16%	0.00%	98.16%	0.56%	1.73%	0.38%	3.01%	99.13%
Videocon	NA	NA	NA	NA	NA	NA	NA	NA
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	1.31%	0.21%	96.02%	0.92%	1.04%	0.85%	2.35%	DNA

- TATA GSM has parameter value of **3.01%** and failed to meet the benchmark of ≤3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

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	Customer Care	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints resolved within 6 weeks	%age of credit/wei ver 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%	97.69%	98.55%
Airtel	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.58%
BSNL	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.78%
Idea	0.06%	0.00%	99.99%	100.00%	100.00%	100.00%	100.00%	99.38%	98.64%
RCOM CDMA	0.08%	0.02%	100.00%	100.00%	100.00%	100.00%	100.00%	98.10%	95.58%
RCOM GSM	0.08%	0.09%	100.00%	100.00%	100.00%	100.00%	93.13%	98.26%	88.71%
TTSL CDMA	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	96.36%	98.07%	99.69%
TTSL GSM	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.21%	95.19%
Vodafone	0.19%	0.17%	100.00%	100.00%	100.00%	100.00%	100.00%	100%	94.31%
TELENOR	NA	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.07%	99.51%
MTS	0.00%	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	94.39%

- Vodafone has parameter value of **0.19%** and failed to meet the benchmark of ≤0.1% for Metering and Billing Credibility (Post-paid Subscribers).
- Vodafone has parameter value of **0.17%** and failed to meet the benchmark of ≤0.1% for Metering and Billing Credibility (Prepaid Subscribers).
- TTSL CDMA has parameter value of **88.71%** and failed to meet the benchmark of ≥ 95% for %age of call answered by the operators (voice to voice) within 90 seconds.
- VODAFONE has parameter value of **94.31%** and failed to meet the benchmark of ≥ 95% for %age of call answered by the operators (voice to voice) within 90 seconds.
- MTS has parameter value of **94.39%** and failed to meet the benchmark of ≥ 95% for %age of call answered by the operators (voice to voice) within 90 seconds.

- Postpaid subscribers are not available with Telenor.

Name of Service Provider	Customer Care & Grievances Redressal	
	% of complaints addressed at call center level.	% of complaints addressed by Appellate authority.
Benchmark		
Aircel	100.00%	100.00%
Airtel	98.70%	1.33%
BSNL	65.53%	NIL
Idea	37.12%	0.00%
RCOM CDMA	100.00%	100.00%
RCOM GSM	100.00%	100.00%
TTSL CDMA	99.51%	100.00%
TTSL GSM	98.17%	100.00%
Vodafone	100.00%	100.00%
TELENOR	DNA	100.00%
MTS	22.02%	0.00%

7.2. Live Calling Data: Consolidated

Name of Service Provider	Metering and Billing (Service Request)				Response time to customer for Assistance	
	Total Calls Attempted	No. of Subscribers reached	Compalints/ Request attended to satisfaction	% of Compalints/ 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	0.00%	0.00%	0.00%	0.00%	100.00%	98.55%
Airtel	0.00%	0.00%	0.00%	0.00	100.00%	98.00%
BSNL	18	18	18	100.00%	100.00%	97.78%
Idea	254	201	201	100.00%	99.38%	98.64%
RCOM CDMA	212	131	131	100%	98.00%	96.00%
RCOM GSM	151	100	100	100.00%	98.00%	89.00%
TTSL CDMA	0	0	0	0.00%	98.07%	99.69%
TTSL GSM	0	0	0	0.00%	99.27%	95.19%
Vodafone	200	200	200	100.00%	100.00%	94.39%
TELENOR	150	100	100	100.00%	99.07%	99.51%
MTS	21	13	13	100.00%	98.60%	96.35%

Live calling data has been conducted by the auditor from the operator call centre(s).

- RCOM GSM has parameter value of **89.00%** and failed to meet the benchmark of $\geq 95\%$ for %age of call answered by the operators (voice to voice) within 90 seconds.
- Vodafone has parameter value of **94.39%** and failed to meet the benchmark of $\geq 95\%$ for %age of call answered by the operators (voice to voice) within 90 seconds.

7.3. 3 Days Live Call Centre Data

Response time to customer assistance								
	% age of Accessibility of Call centre	% age calls answered by the operator within 90 seconds	% age of Accessibility of Call centre	% age calls answered by the operator within 90 seconds	% age of Accessibility of Call centre	% age calls answered by the operator within 90 seconds	% age of Accessibility of Call centre	% age calls answered by the operator within 90 seconds
	Day 1		Day 2		Day 3		Averaged	
TSP Name	$\geq 95\%$	$\geq 95\%$	$\geq 95\%$	$\geq 95\%$	$\geq 95\%$	$\geq 95\%$	$\geq 95\%$	$\geq 95\%$
AIRCEL	98.57%	98.12%	98.52%	96.07%	98.48%	97.00%	98.52%	97.08%
AIRTEL	100.00%	95.60%	100.00%	96.00%	100.00%	93.10%	100.00%	94.90%
IDEA	99.47%	97.89%	99.59%	99.59%	99.44%	99.44%	99.47%	98.97%
RCOM CDMA	100.00%	97.00%	100.00%	99.00%	100.00%	97.00%	100.00%	97.66%
RCOM GSM	100.00%	99.00%	100.00%	96.00%	100.00%	98.00%	100.00%	98.00%
TTSL CDMA	97.90%	100.00%	98.30%	100.00%	98.10%	100.00%	98.10%	100.00%
TTSL GSM	98.80%	99.20%	98.40%	98.00%	99.40%	96.90%	98.87%	98.00%
TELENOR	99.12%	99.40%	99.19%	99.79%	99.09%	99.28%	99.13%	99.49%
VODAFONE	100.00%	99.68%	100.00%	98.00%	100.00%	96.70%	100.00%	98.13%
BSNL	100.00%	99.82%	100.00%	99.92%	100.00%	99.85%	100.00%	99.86%
MTS	100.00%	100.00%	97.16%	100.00%	99.21%	94.44%	98.79%	98.15%

- Airtel has parameter value of **94.90%** and failed to meet the benchmark of $\geq 95\%$ for % age calls answered by the operator within 90 seconds.

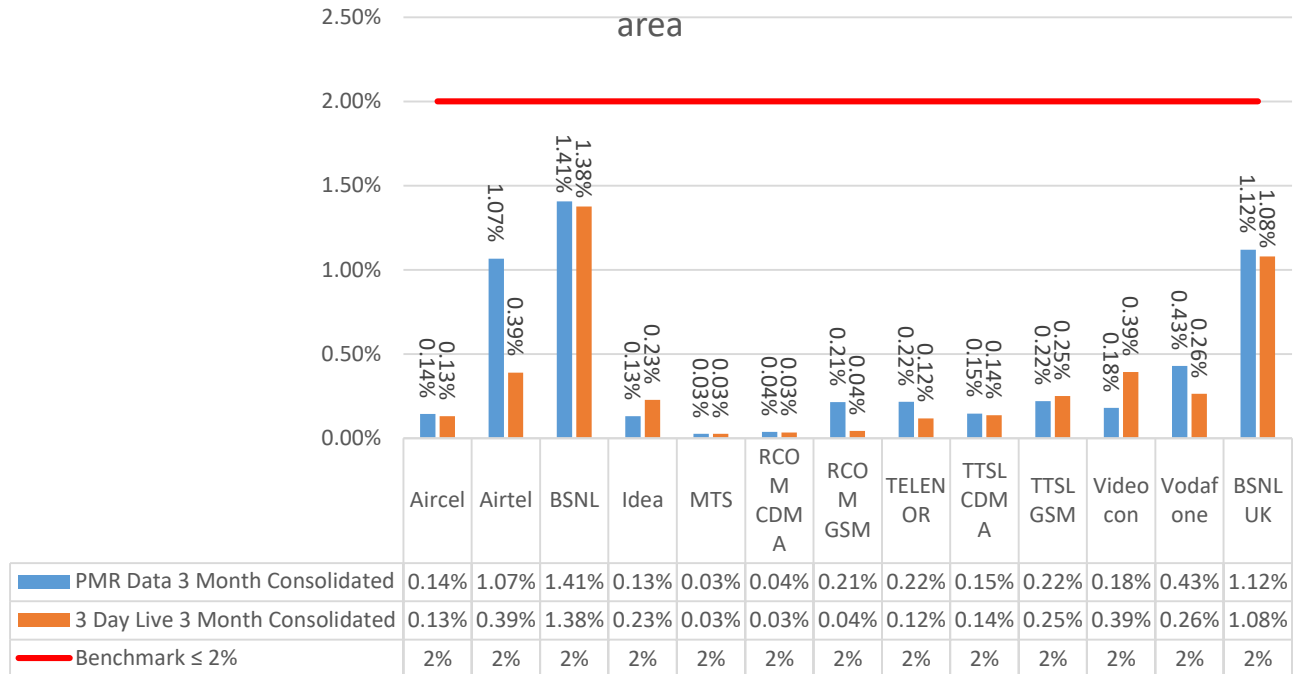
8. NETWORK PARAMETER: DESCRIPTION AND DETAILED FINDINGS

8.1. BTS ACCUMULATED DOWNTIME

- Parameter Description:
 - The parameter of network availability would be measured from following sub-parameters:
 - BTSs Accumulated Downtime (not available for service)
 - Worst effected BTSs due to downtime
- Definition: BTSs (Base Transceiver Station) accumulated downtime (not available for service) shall basically measure the downtime of the BTSs, including its transmission links/circuits during the period of a month, but excludes all planned service downtime for any maintenance or software up gradation. For measuring the performance against the benchmark for this parameter the downtime of each BTS lasting more than 1 hour at a time in a day during the period of a month were considered.
- Computation Methodology:
 - $$\text{BTS accumulated downtime (not available for service)} = \frac{\text{Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month}}{24 \times \text{Number of days in a month} \times \text{Number of BTSs in the network in licensed service area}} \times 100$$
- TRAI Benchmark: BTSs Accumulated downtime (not available for service) $\leq 2\%$
- Audit Procedure:
 - The fault alarm details at the OMC (MSC) for the network outages (due to own network elements and infrastructure service provider end outages) was audited.
 - All the BTS in service area were considered. Planned outages due to network up gradation, routine maintenance were not considered.
 - Any outage as a result of force majeure were not considered at the time of calculation.
 - Data is extracted from system log of the server of the operator. This data is in raw format which is further processed to arrive at the cumulative values.
 - List of operating sites with cell details and ids are taken from the operator.
 - When there is any outage a performance report gets generated in line with that cell resulting and master base of the Accumulated downtime and worst affected BTS due to downtime.

8.1.1. KEY FINDINGS: SUM OF DOWNTIME OF BTSS: CONSOLIDATED

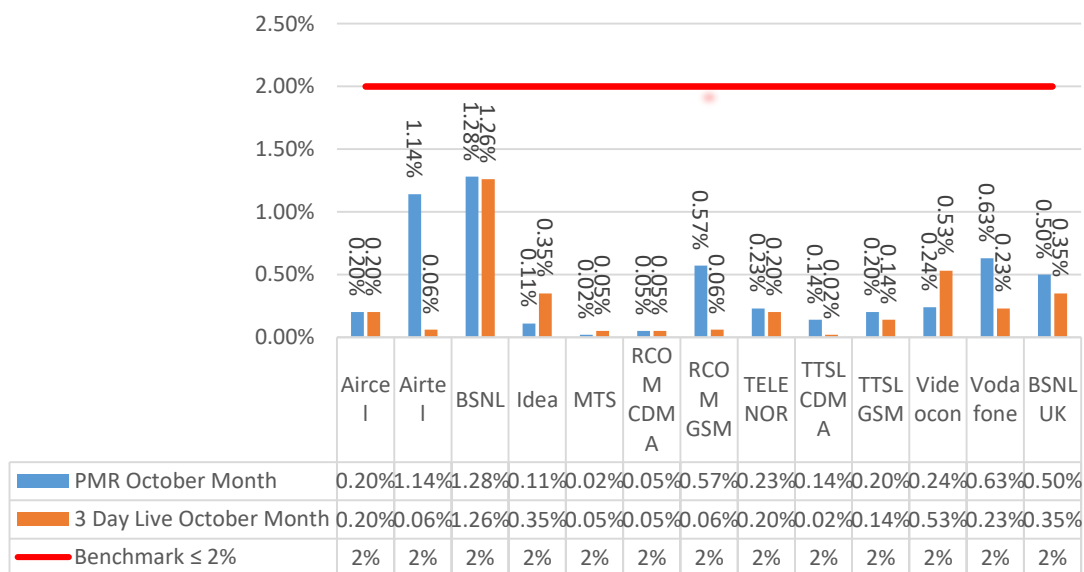
Sum of downtime of BTSS in a month in hrs. in the licensed service



- It is clear from the analysis that all the operators are within benchmark.

8.1.2. KEY FINDINGS: SUM OF DOWNTIME OF BTSS: OCTOBER

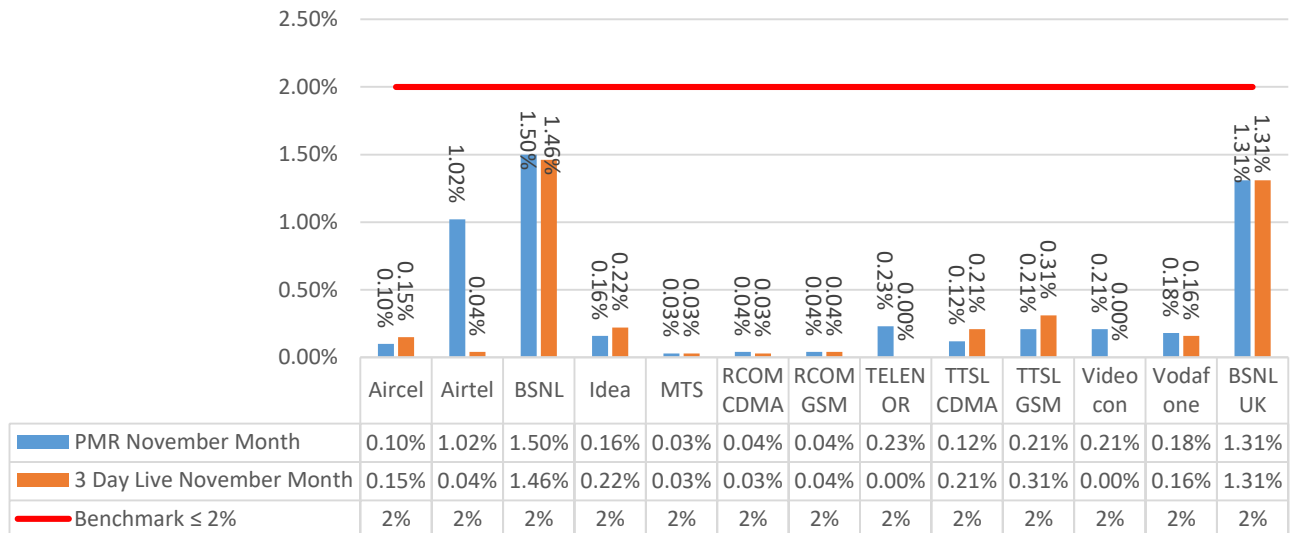
Sum of downtime of BTSS in a month in hrs. in the licensed service area



- It is clear from the analysis that all the operators are within benchmark.

8.1.3. KEY FINDINGS: SUM OF DOWNTIME OF BTSS: NOVEMBER

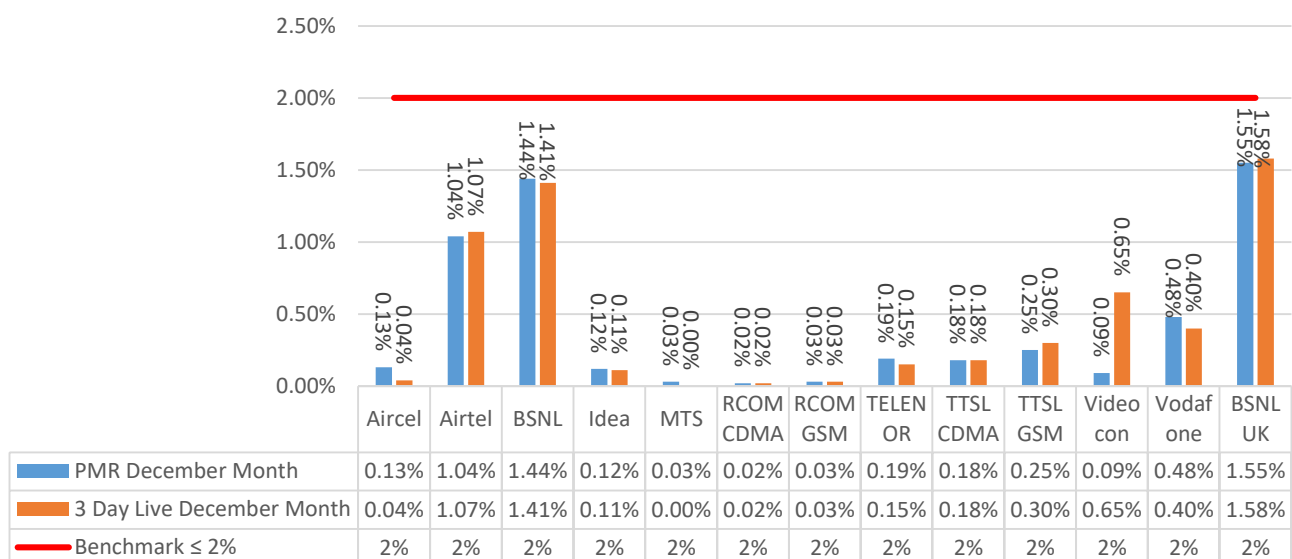
Sum of downtime of BTSs in a month in hrs. in the licensed service area



- It is clear from the analysis that all the operators are within benchmark.

8.1.4. KEY FINDINGS: SUM OF DOWNTIME OF BTSS: DECEMBER

Sum of downtime of BTSs in a month in hrs. in the licensed service area



- It is clear from the analysis that all the operators are within benchmark.

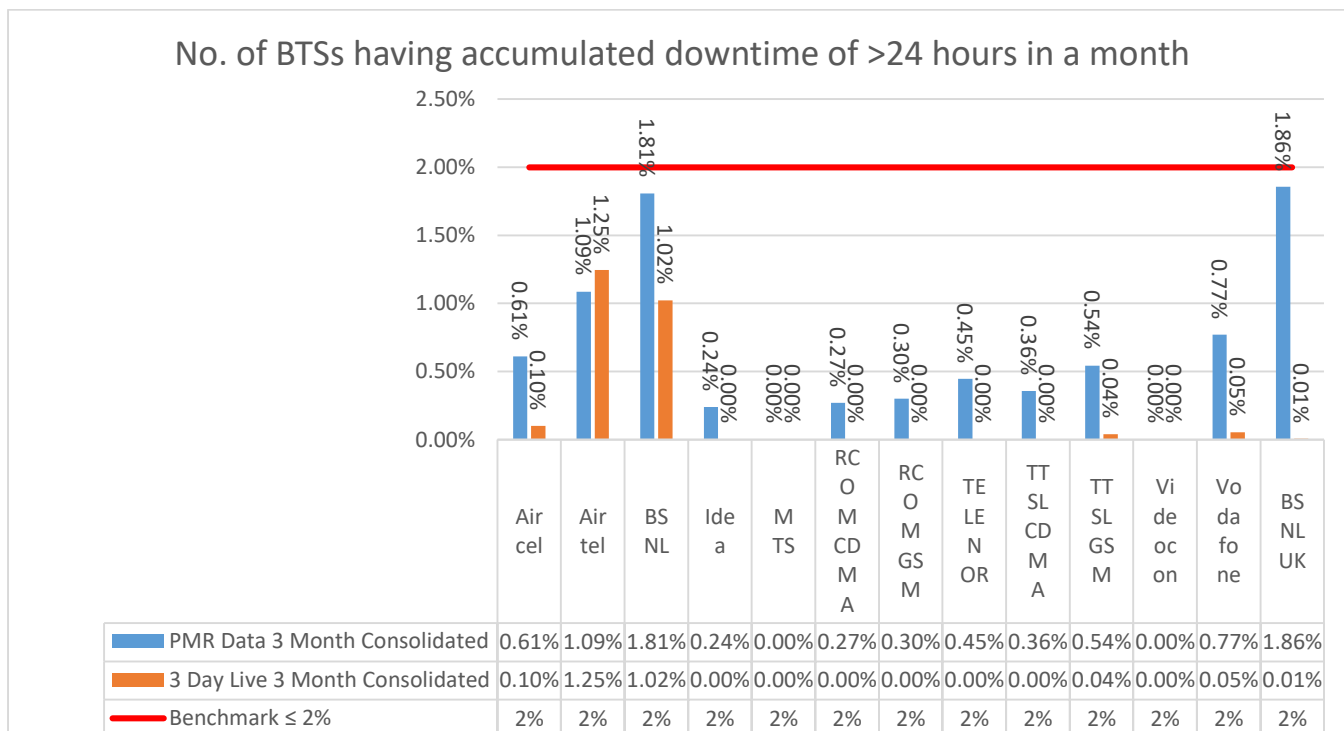
8.2. WORST AFFECTED BTS DUE TO DOWNTIME

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

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

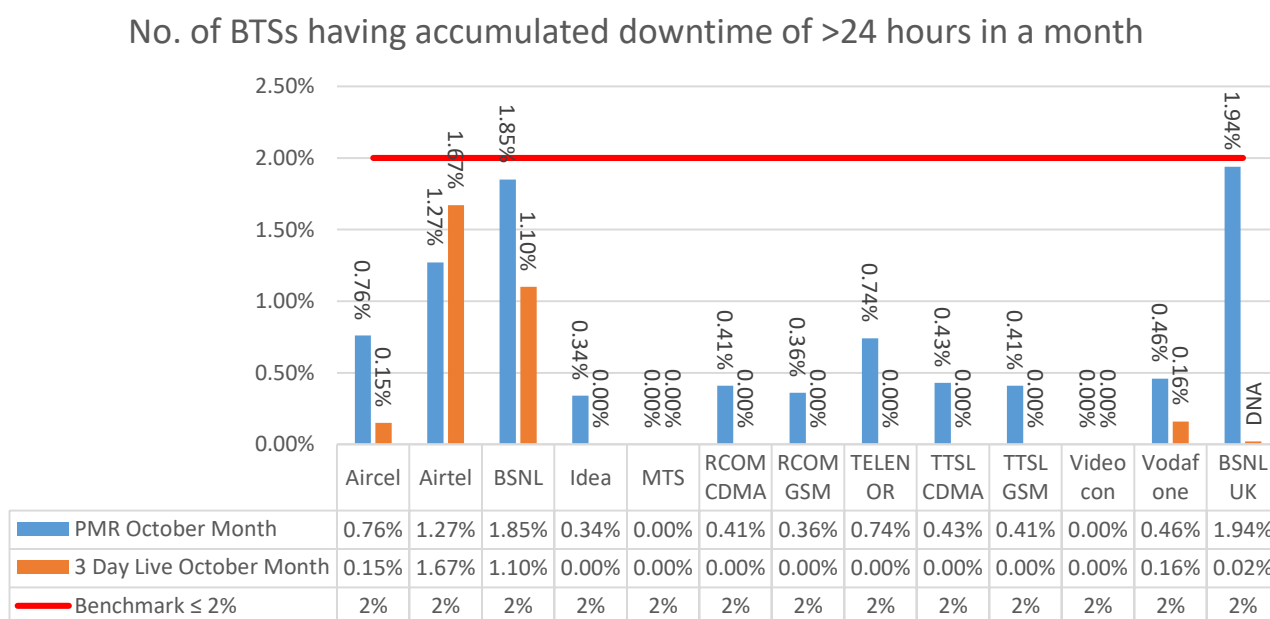
- Computation Methodology: Worst affected BTSs due to downtime =
$$\frac{\text{Number of BTSs having accumulated downtime greater than 24 hours in a month}}{\text{Number of BTS in Licensed Service Area}} * 100$$
- TRAI Benchmark: Worst affected BTSs due to downtime $\leq 2\%$
- Audit Procedure:
 - The fault alarm details at the OMC (MSC) for the network outages (due to own network elements and infrastructure service provider end outages) was audited.
 - All the BTS in service area were considered. Planned outages due to network up gradation, routine maintenance were not considered.
 - Data is extracted from system log of the server of the operator. This data is in raw format which is further processed to arrive at the cumulative values.
 - Any outage as a result of force majeure was not considered at the time of calculation.
 - List of operating sites with cell details and ids are taken from the operator.
 - All the BTS having down time greater than 24 hours is assessed and values of BTS accumulated downtime is computed in accordance.

8.2.1. KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF >24 HRS: CONSOLIDATED



- It is clear from the analysis that all the operators are within benchmark.

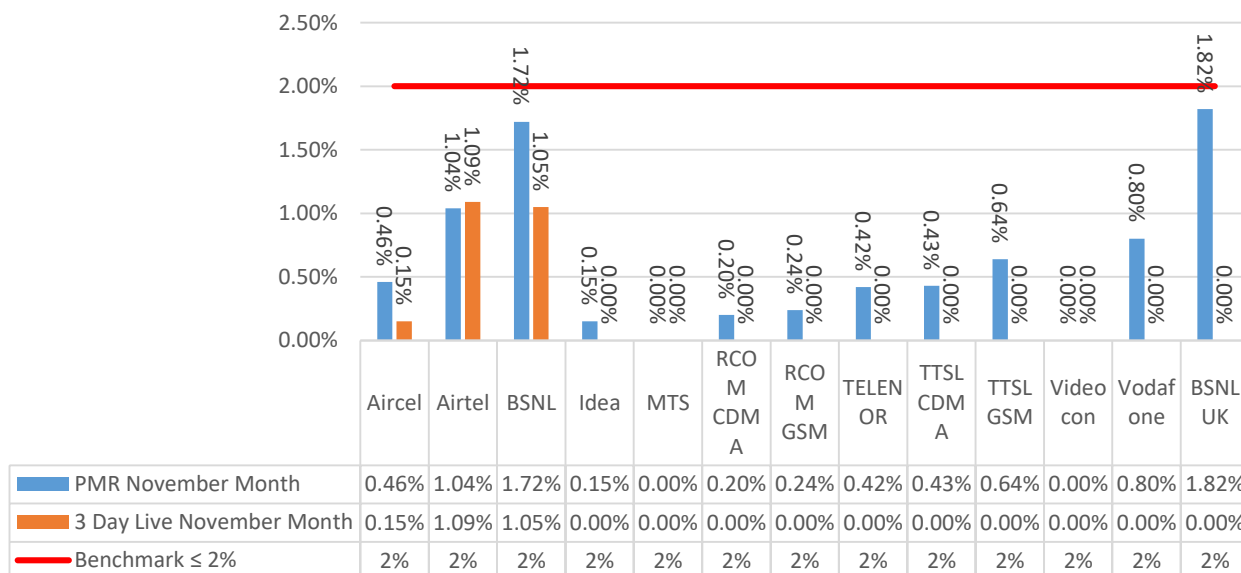
8.2.2. KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF > 24 HRS: OCTOBER



- It is clear from the analysis that all the operators are within benchmark.

8.2.3. KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF > 24 HRS: NOVEMBER

No. of BTSS having accumulated downtime of >24 hours in a month



- It is clear from the analysis that all the operators are within benchmark.

8.2.4. KEY FINDINGS: NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF > 24 HRS: DECEMBER

No. of BTSS having accumulated downtime of >24 hours in a month



- It is clear from the analysis that all the operators are within benchmark.

8.3. CALL SETUP SUCCESS RATE

- Definition: The ratio of successful calls established to total calls is known as Call Set-Up Success Rate (CSSR).
- Computational Methodology: $\frac{\text{Calls Established}}{\text{Total call attempts}} * 100$

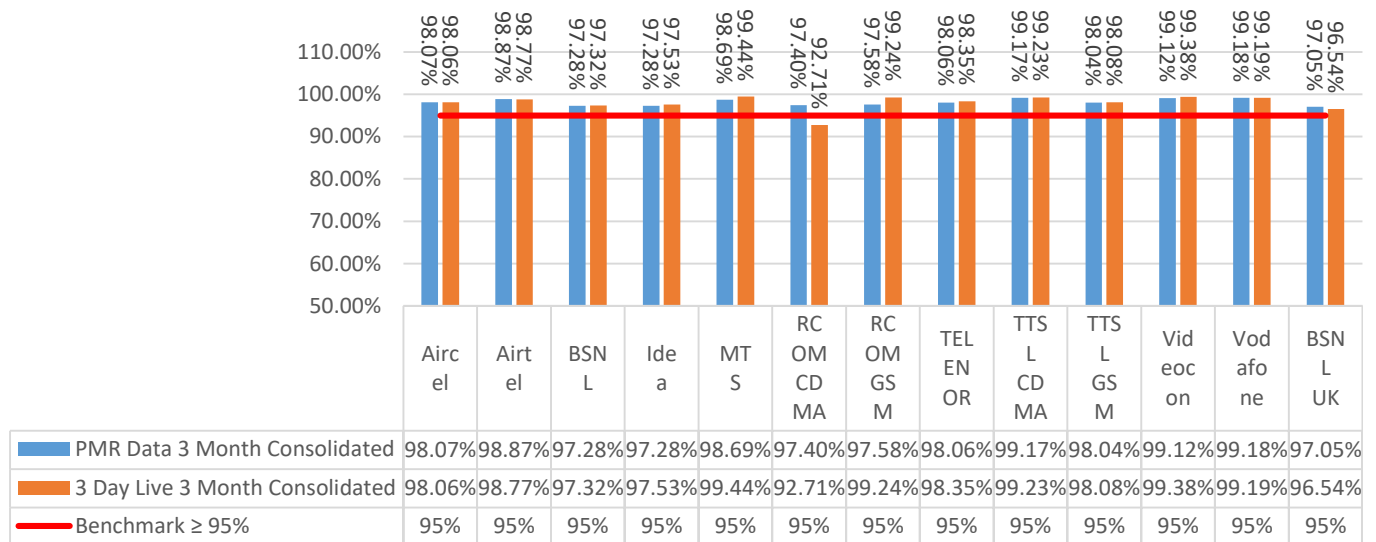
Calls established means the following events happened in call setup:

- Call attempt is made.
 - The TCH is allocated.
 - The call is routed to the outward path of the concerned MSC.
- TRAI Benchmark $\geq 95\%$
 - Audit Procedure:
 - The cell-wise data generated through counters/ MMC available in the switch for traffic measurements.
 - CSSR calculation should be measured using OMC generated data only.
 - Measurement should be only in Time Consistent Busy Hour (CBBH) period for all days of the week.
 - Counter data is extracted from the NOC of the operators.
 - Total calls established include all calls established excluding Signaling blocking, TCH Drop and TCH blocking.

The numerator and denominator values are derived from adding the counter values from the MSC.

8.3.1. KEY FINDINGS: CALL SETUP SUCCESS RATE: CONSOLIDATED

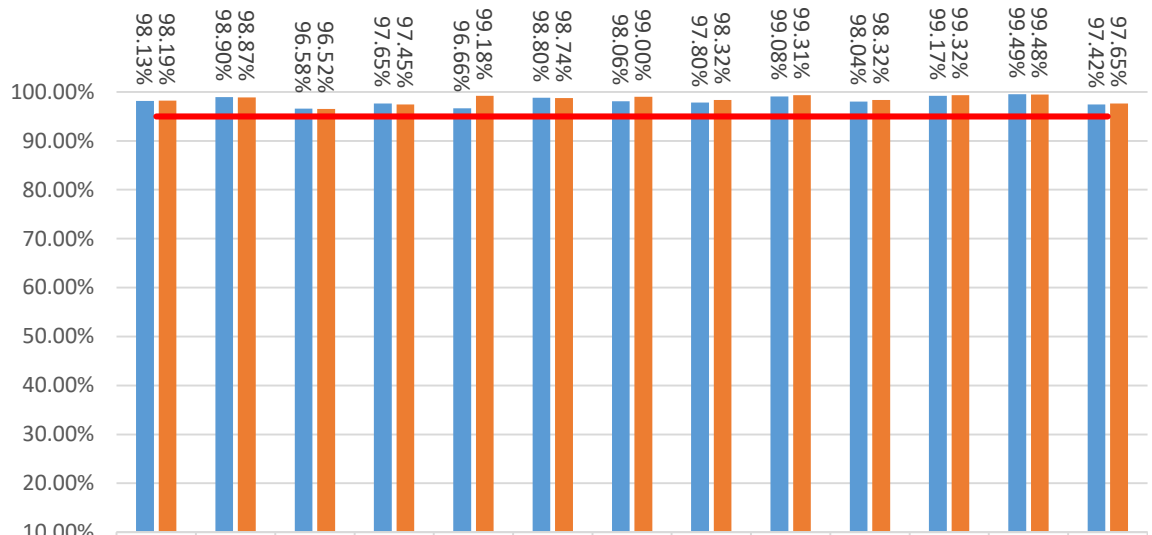
Call Set-up Success Rate (Within Licensee own network)



- RCOM CDMA has parameter value of **92.71%** and failed to meet the benchmark of $\geq 95\%$ for Call Set-up Success Rate (Within Licensee own network).

8.3.2. KEY FINDINGS: CALL SETUP SUCCESS RATE: OCTOBER

Call Set-up Success Rate (Within Licensee own network)

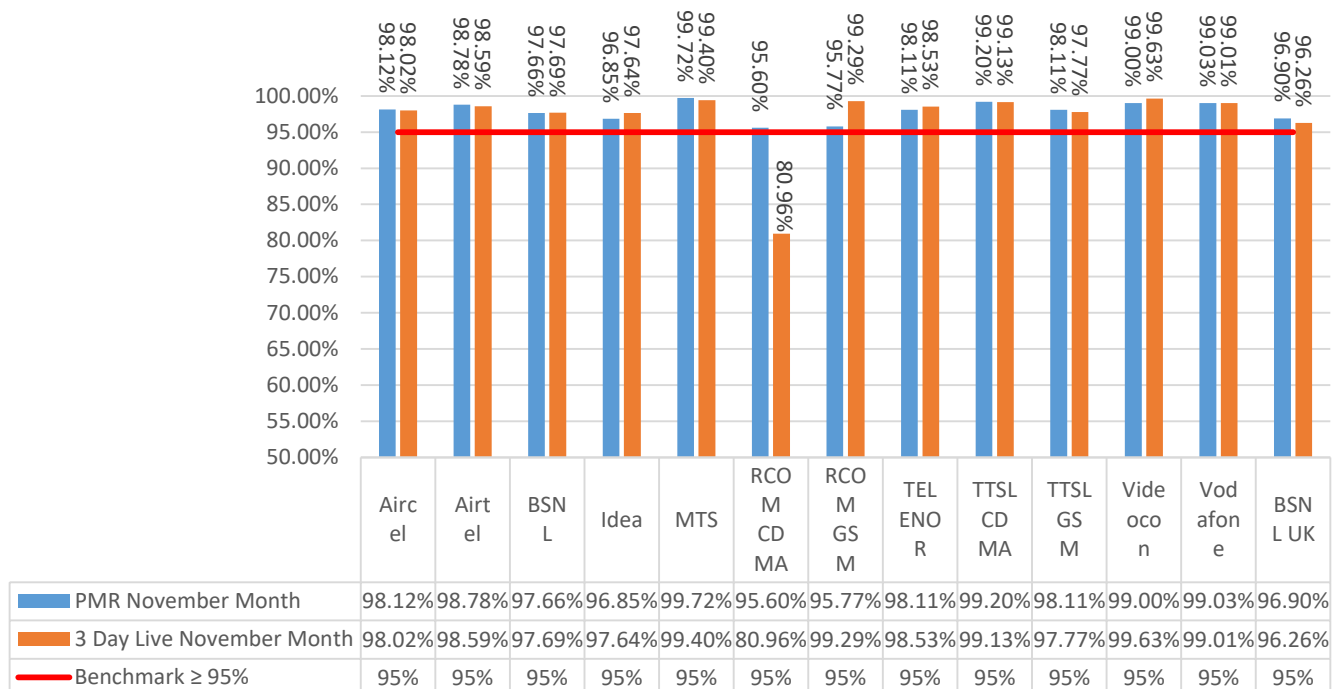


PMR October Month	98.13%	98.90%	96.58%	97.65%	96.66%	98.80%	98.06%	97.80%	99.08%	98.04%	99.17%	99.49%	97.42%
3 Day Live October Month	98.19%	98.87%	96.52%	97.45%	99.18%	98.74%	99.00%	98.32%	99.31%	98.32%	99.32%	99.48%	97.65%
Benchmark $\geq 95\%$	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%

- It is clear from the analysis that all the operators are within benchmark.

8.3.3. KEY FINDINGS: CALL SETUP SUCCESS RATE: NOVEMBER

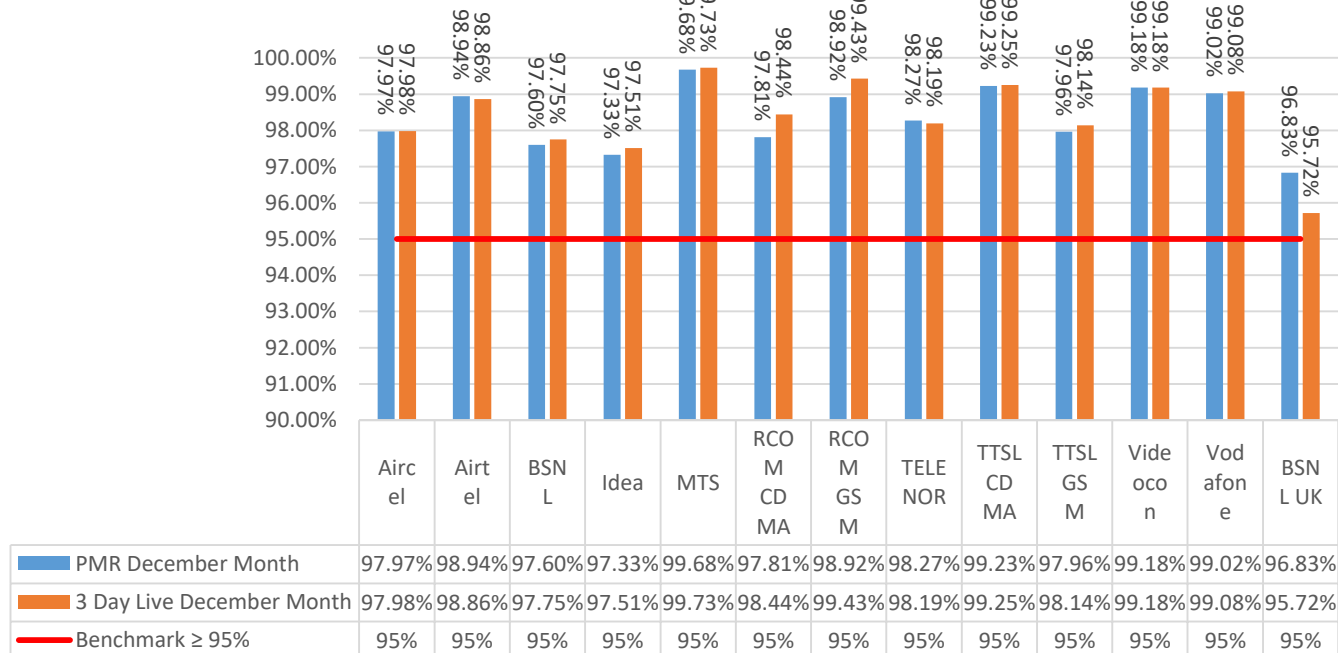
Call Set-up Success Rate (Within Licensee own network)



- RCOM CDMA has parameter value of **80.96%** and failed to meet the benchmark of $\geq 95\%$ for Call Set-up Success Rate (Within Licensee own network).

8.3.4. KEY FINDINGS: CALL SETUP SUCCESS RATE: DECEMBER

Call Set-up Success Rate (Within Licensee own network)



- It is clear from the analysis that all the operators are within benchmark.

8.4. NETWORK CHANNEL CONGESTION: PAGING CHANNEL/ TCH CONGESTION/ POI

- Definition: It means a call is not connected because there is no free channel to serve the call attempt. This parameter represents congestion in the network. It happens at three levels:

- SDCCH Level: Stand-alone dedicated control channel
- TCH Level: Traffic Channel
- POI Level: Point of Interconnect.

- Computational Methodology:

$$\text{SDCCH / TCH Congestion\%} = \frac{(A1 \times C1) + (A2 \times C2) + \dots + (An \times Cn)}{(A1 + A2 + \dots + An)}$$

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
- 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

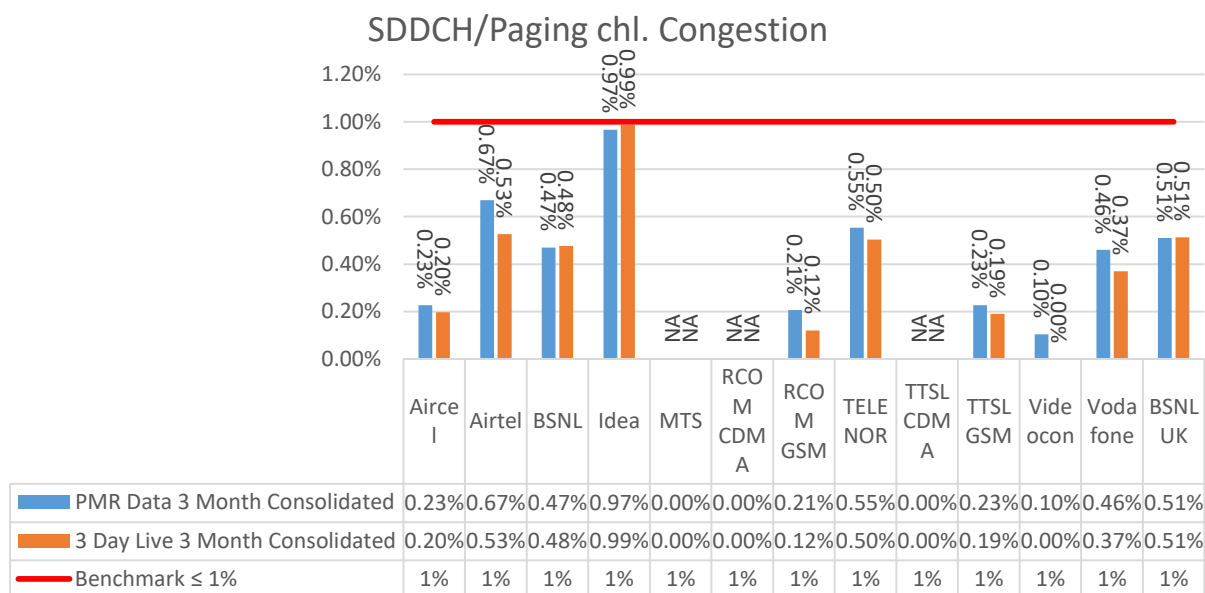
$$\text{POI Congestion\%} = \frac{[(A1 \times C1) + (A2 \times C2) + \dots + (An \times Cn)]}{(A1 + A2 + \dots + An)}$$

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

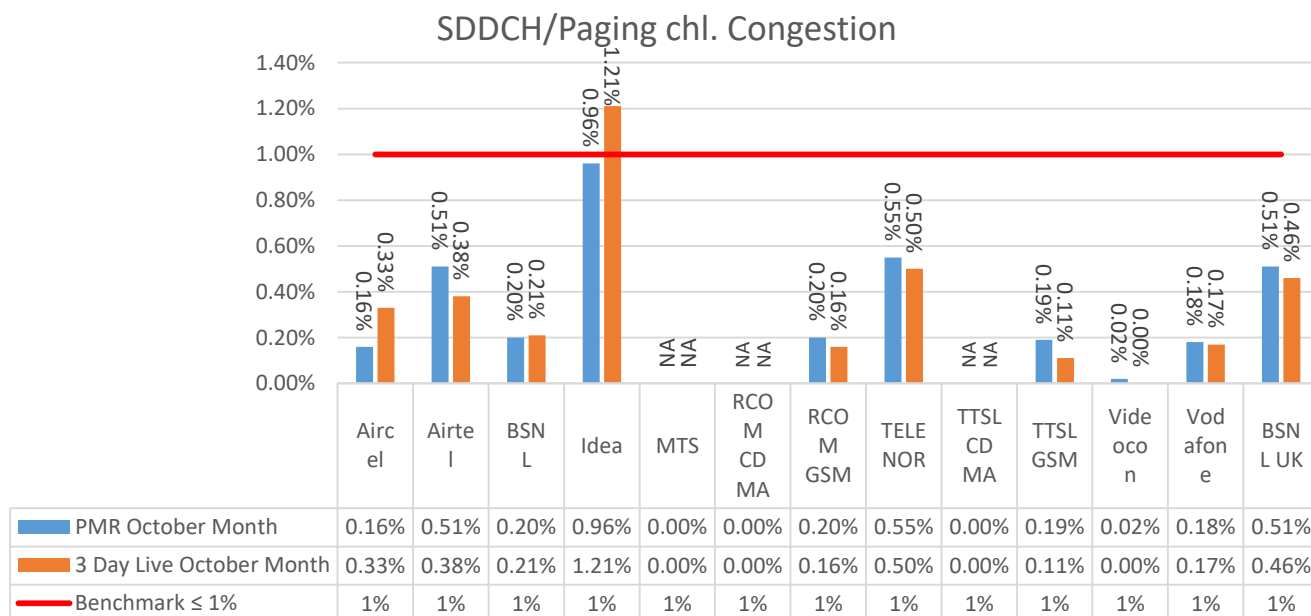
- Benchmark: SDCCH Congestion: ≤ 1%, TCH Congestion: ≤ 2%, POI Congestion: ≤ 0.5%
- Audit Procedure –
 - Audit of the details of SDCCH and TCH congestion percentages computed by the operator (using OMC–Switch data only) would be conducted.
 - The operator should be measuring this parameter during Time consistent busy hour (TCBH) only SDCCH.

8.4.1. KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: CONSOLIDATED



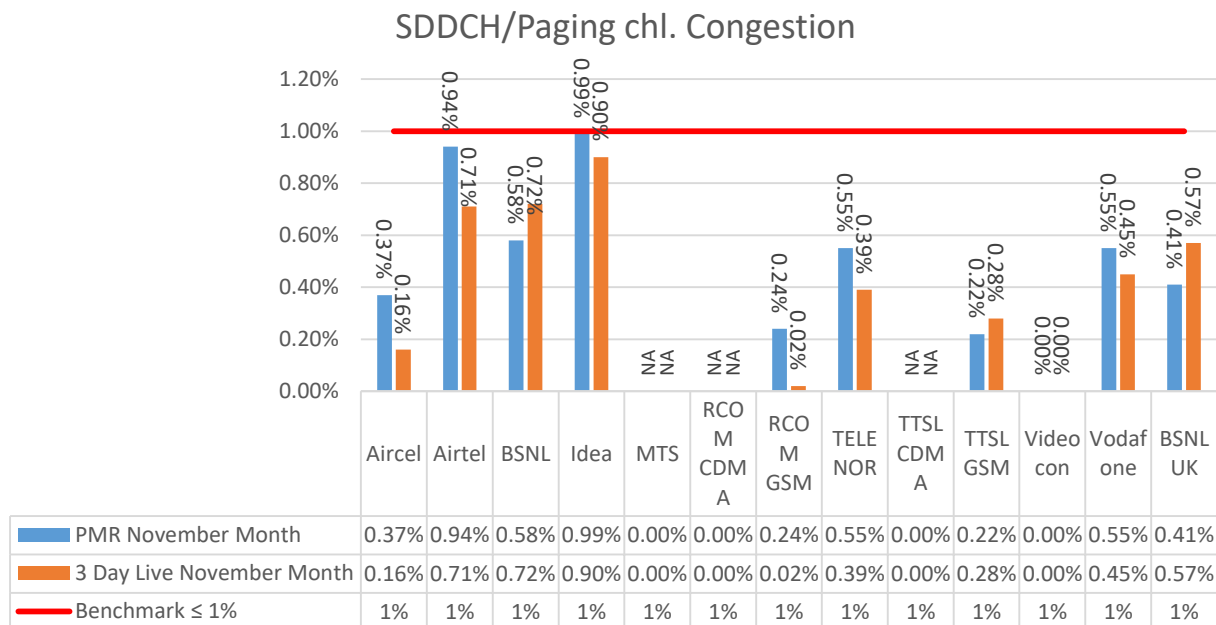
- It is clear from the analysis that all the operators are within benchmark.

8.4.2. KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: OCTOBER



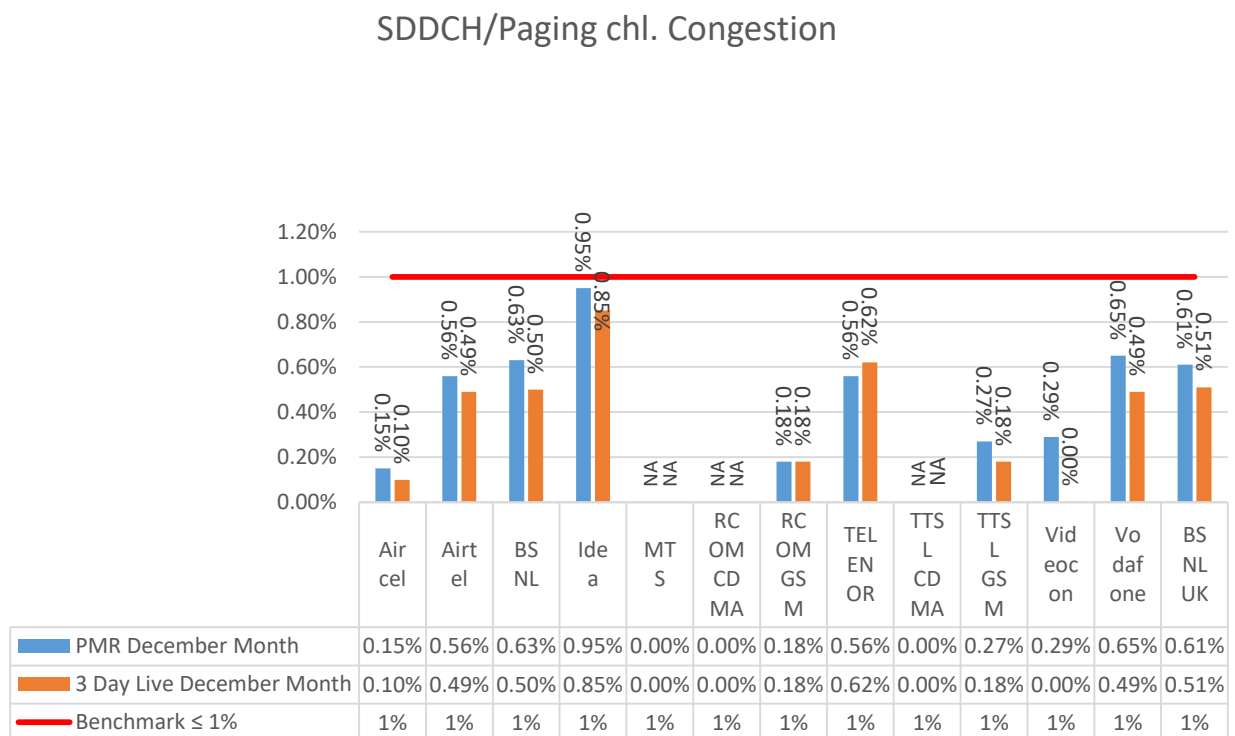
- Idea has parameter value of **1.21%** and failed to meet the benchmark of ≤ 1% for SDDCH/Paging chl. Congestion.

8.4.3. KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: NOVEMBER



- It is clear from the analysis that all the operators are within benchmark.

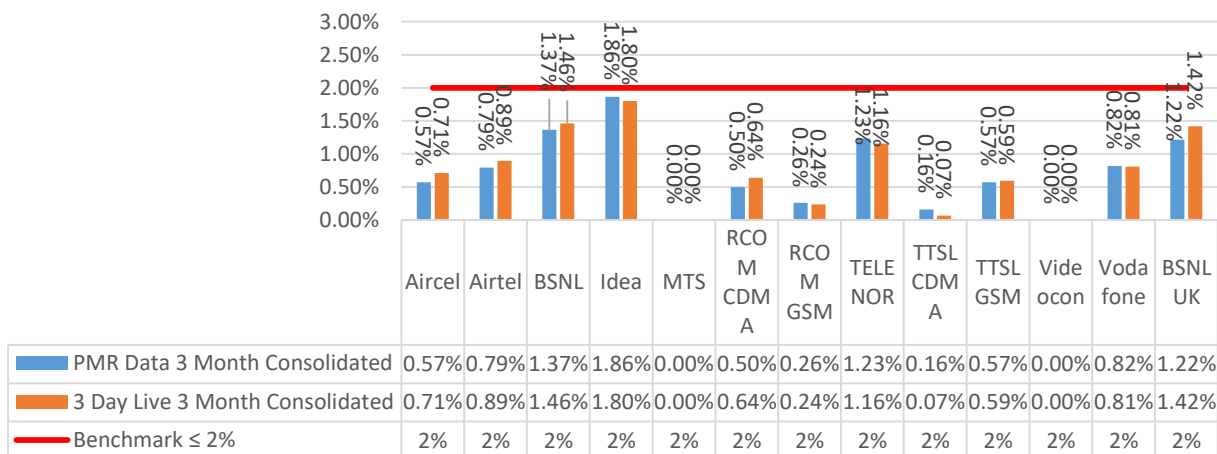
8.4.4. KEY FINDINGS: SDCC/ PAGING CHANNEL CONGESTION: DECEMBER



- It is clear from the analysis that all the operators are within benchmark.

8.4.5. KEY FINDINGS: TCH CONGESTION: CONSOLIDATED

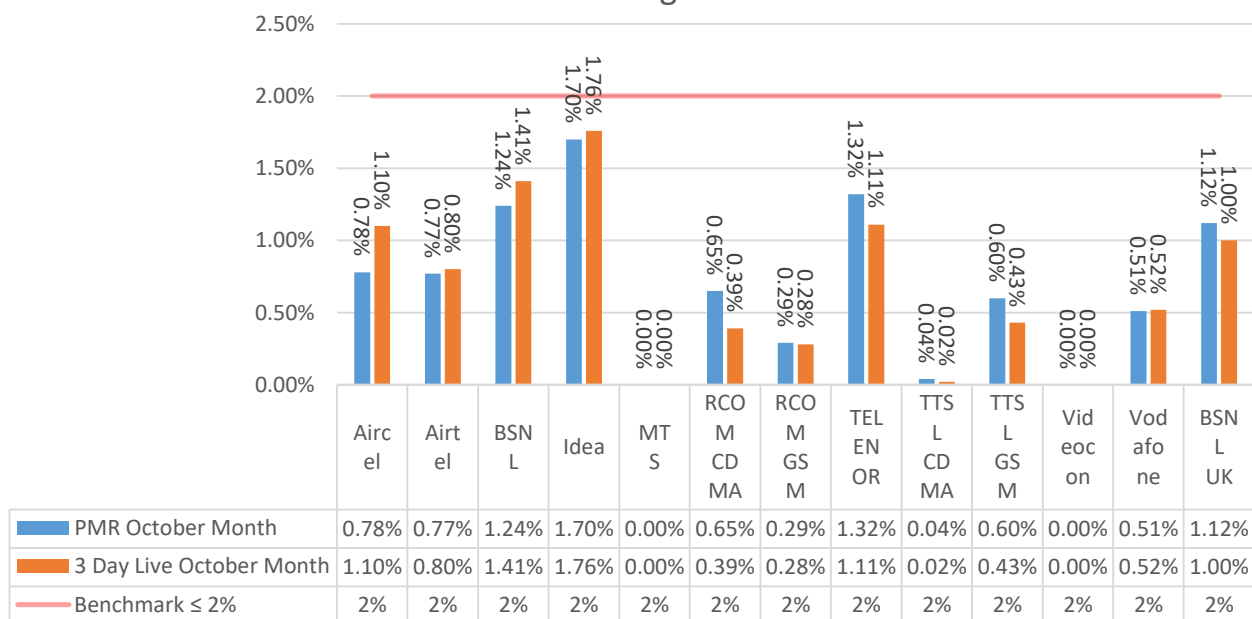
TCH Congestion



- It is clear from the analysis that all the operators are within benchmark.

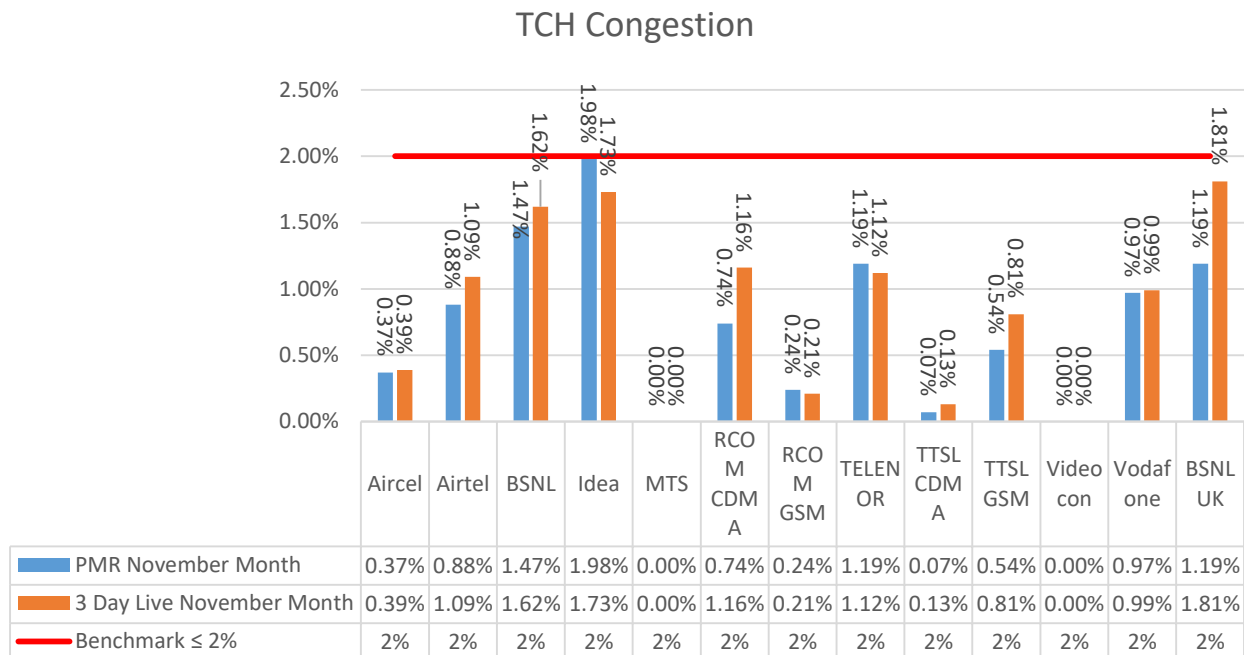
8.4.6. KEY FINDINGS: TCH CONGESTION: OCTOBER

TCH Congestion



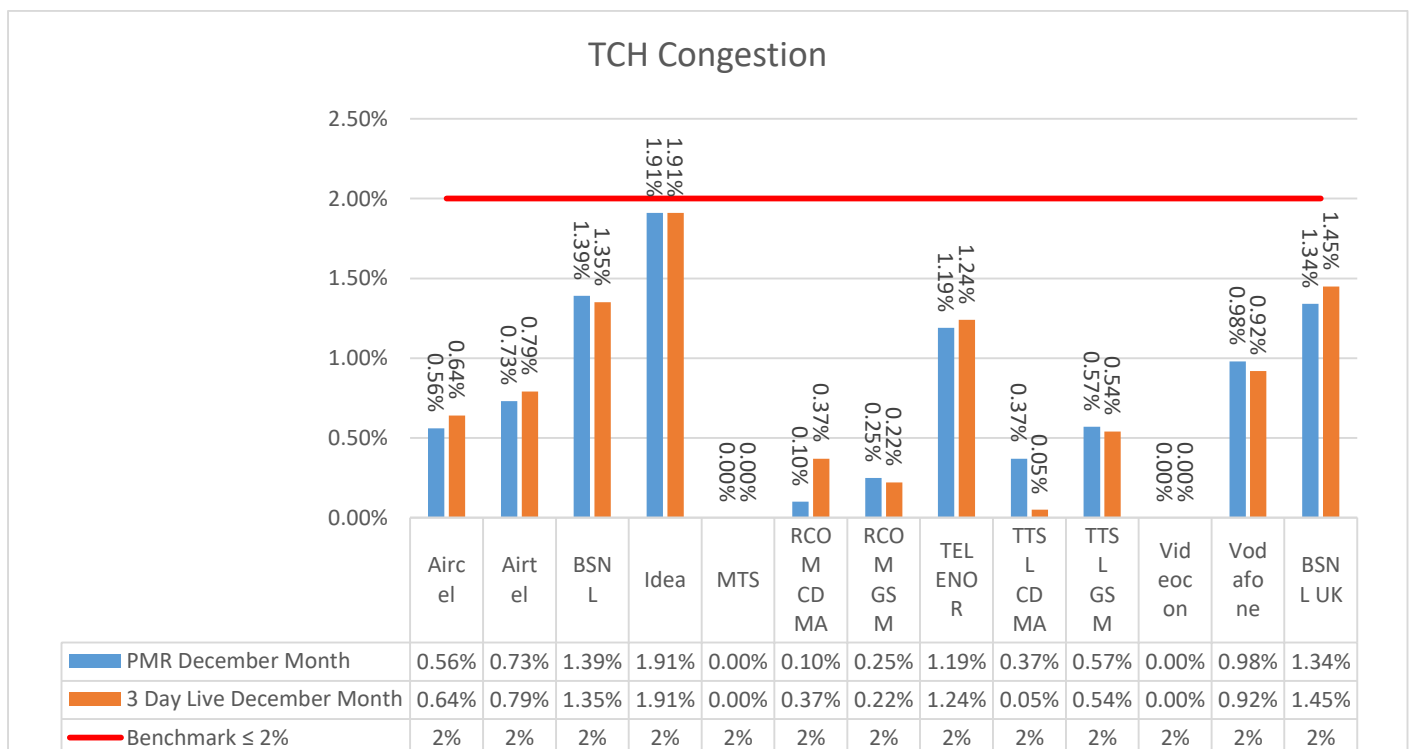
- It is clear from the analysis that all the operators are within benchmark.

8.4.7. KEY FINDINGS: TCH CONGESTION: NOVEMBER



- It is clear from the analysis that all the operators are within benchmark.

8.4.8. KEY FINDINGS: TCH CONGESTION: DECEMBER



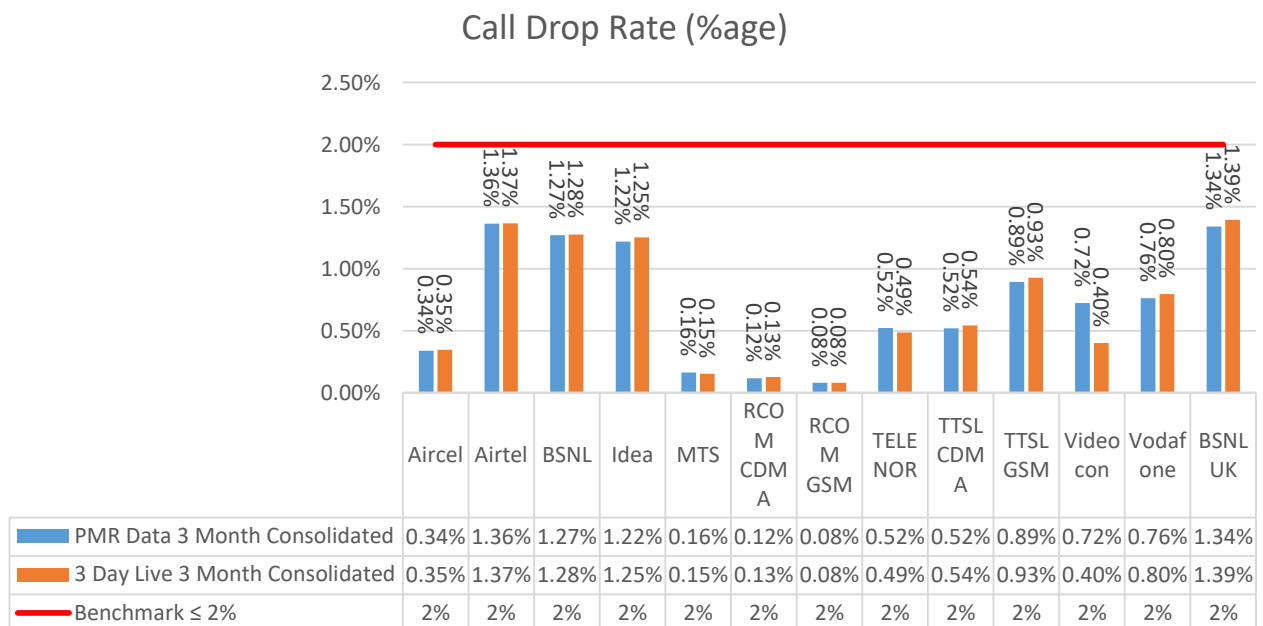
- It is clear from the analysis that all the operators are within benchmark.

8.5. CALL DROP RATE

- Definition - The dropped call rate is the ratio of successfully originated calls that were found to drop to the total number of successfully originated calls that were correctly released.
 - Total calls dropped = All calls ceasing unnaturally i.e. due to handover or due to radio loss
 - Total calls established = All calls that have TCH allocation during busy hour
- Computational Methodology: $\frac{\text{Total Calls Dropped}}{\text{Total Calls Established}} * 100$
- TRAI Benchmark: Call drop rate $\leq 2\%$
- Audit Procedure:
 - Audit of traffic data of the relevant quarter kept in OMC-R at MSCs and used for arriving at CDR was used.

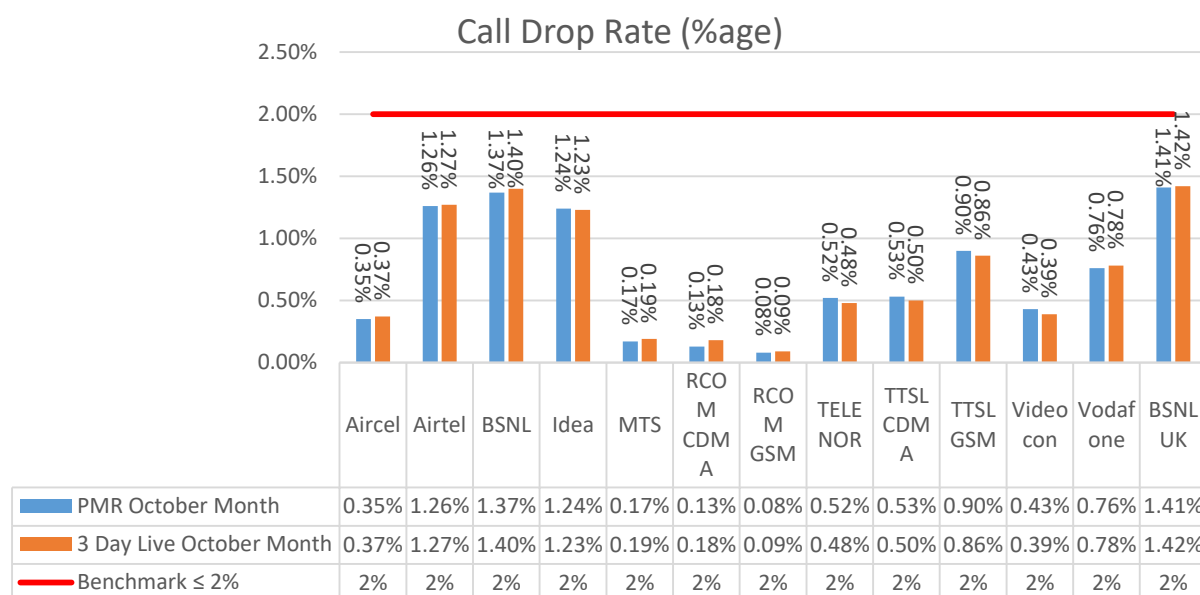
The operator should only be considering those calls which are dropped during Time consistent busy hour (TCBH) for all days of the relevant quarter.

8.5.1. KEY FINDINGS: CALL DROP RATE: CONSOLIDATED



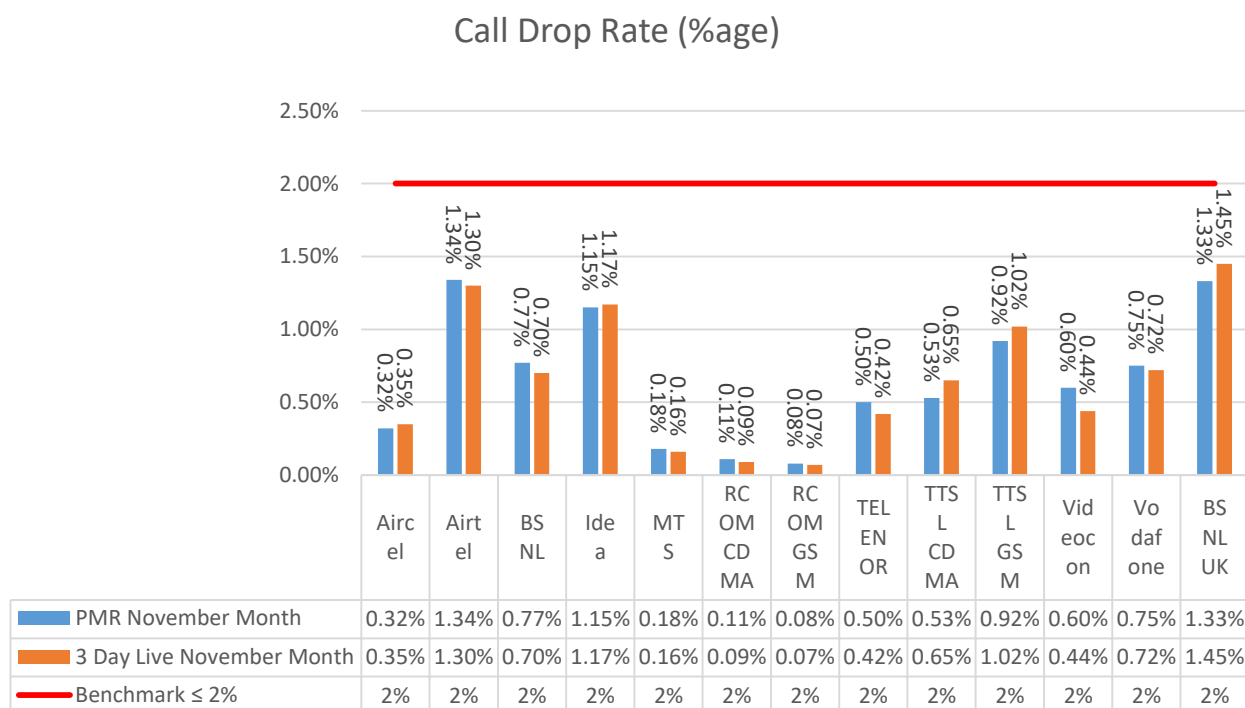
- It is clear from the analysis that all the operators are within benchmark.

8.5.2. KEY FINDINGS: CALL DROP RATE: OCTOBER



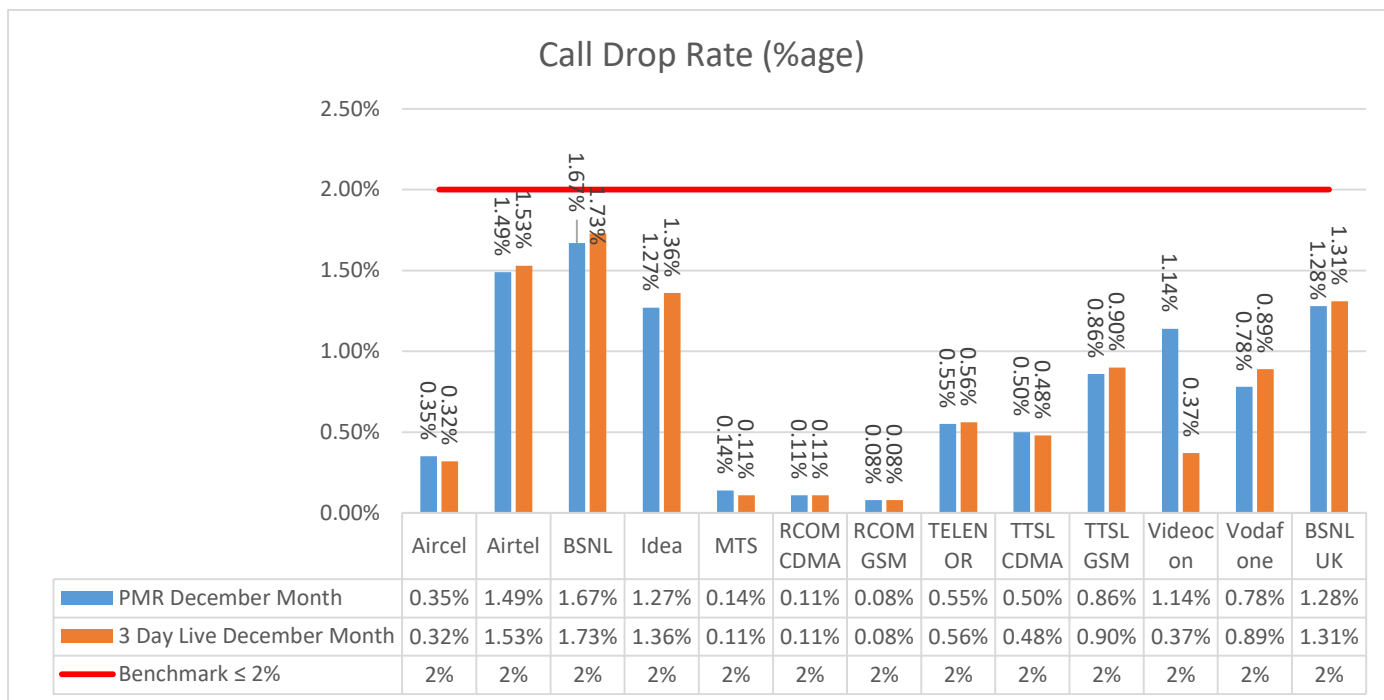
- It is clear from the analysis that all the operators are within benchmark.

8.5.3. KEY FINDINGS: CALL DROP RATE: NOVEMBER



- It is clear from the analysis that all the operators are within benchmark.

8.5.4. KEY FINDINGS: CALL DROP RATE: DECEMBER



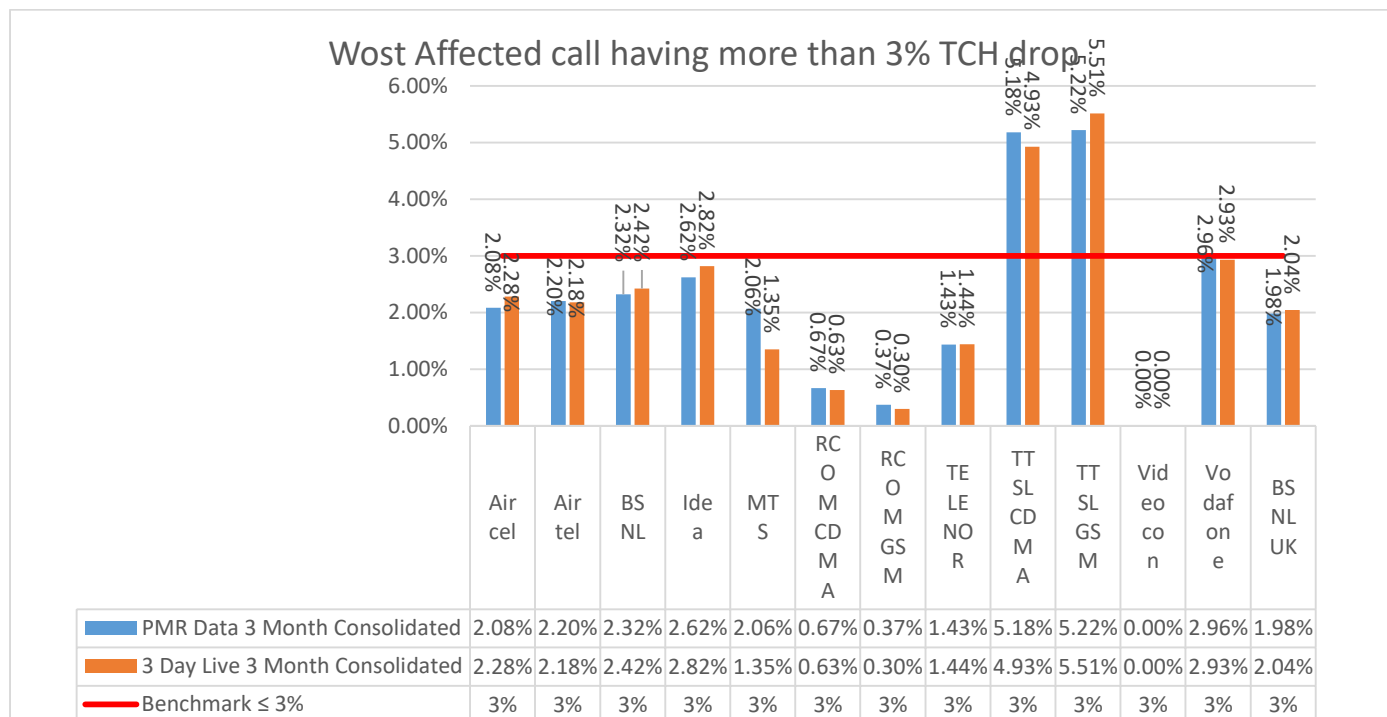
- It is clear from the analysis that all the operators are within benchmark.

8.6. CELLS HAVING GREATER THAN 3% TCH DROP

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

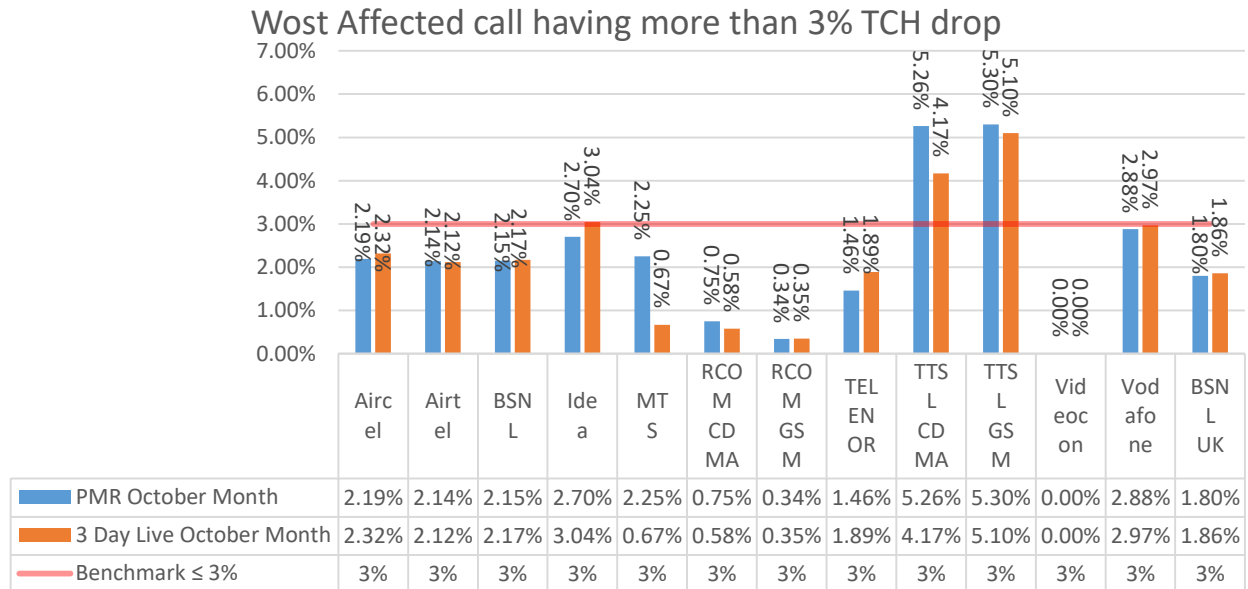
The operator should only be considering those calls which are dropped during Cell Bouncing Busy hour (CBBH) for all days of the relevant quarter.

8.6.1. KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: CONSOLIDATED



- TTSL CDMA has parameter value of **5.18%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.22%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL CDMA has parameter value of **4.93%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.51%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

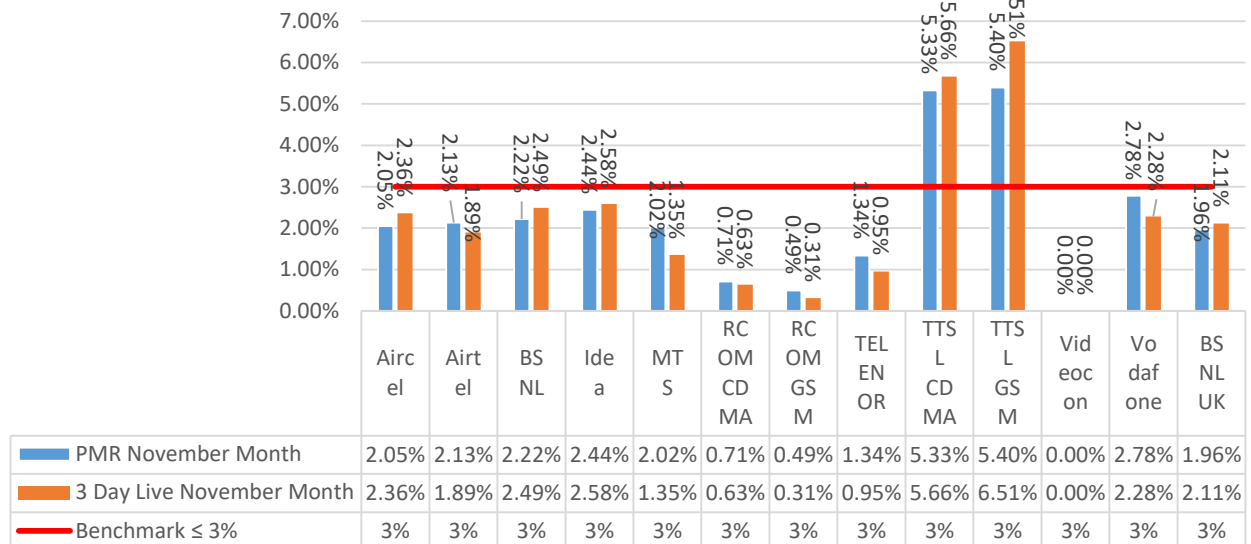
8.6.2. KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: OCTOBER



- TTSL CDMA has parameter value of **5.26%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.
- TTSL GSM has parameter value of **5.30%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.
- TTSL CDMA has parameter value of **4.17%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.10%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- IDEA has parameter value of **3.04%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

8.6.3. KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: NOVEMBER

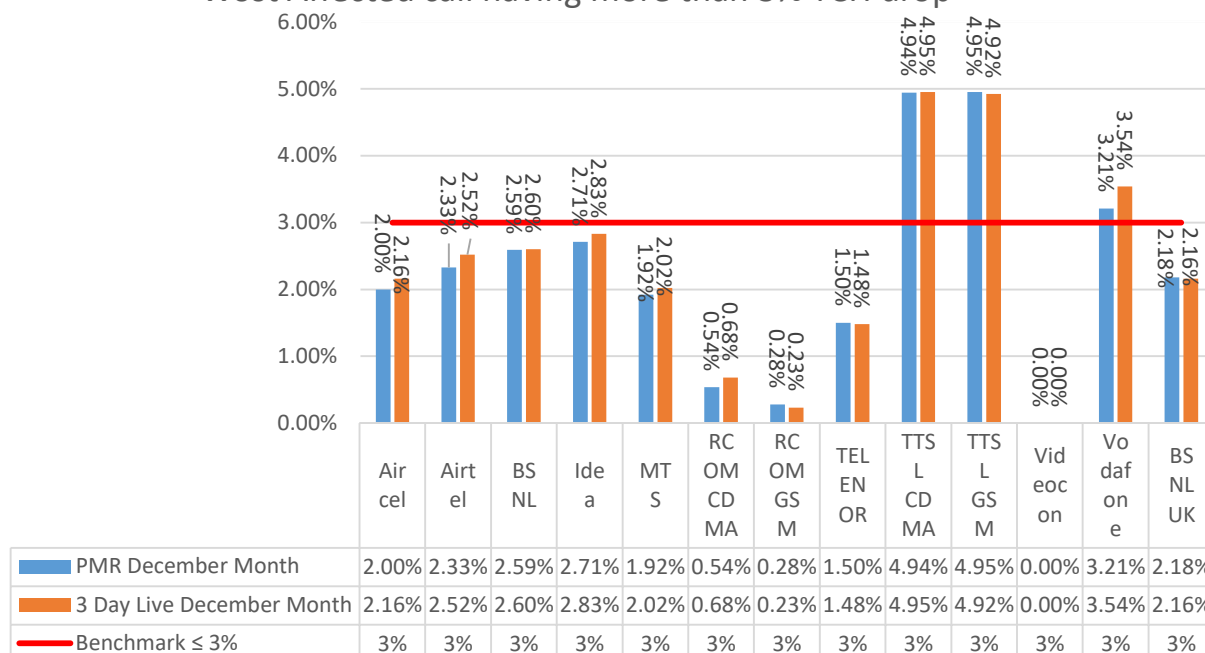
Worst Affected call having more than 3% TCH drop



- TTSL CDMA has parameter value of **5.33%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.
- TTSL GSM has parameter value of **5.40%** and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.
- TTSL CDMA has parameter value of **5.66%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **6.51%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

8.6.4. KEY FINDINGS: CELLS HAVING MORE THAN 3% TCH DROP: DECEMBER

Worst Affected call having more than 3% TCH drop



- TTSL CDMA has parameter value of **4.94%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **4.95%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL CDMA has parameter value of **4.95%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **4.92%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- Vodafone has parameter value of **3.21%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- Vodafone has parameter value of **3.54** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

8.7. VOICE QUALITY

- Definition:
 - For GSM service providers the calls having a value of 0 –5 are considered to be of good quality (on a seven point scale)
 - For CDMA the measure of voice quality is Frame Error Rate (FER). FER is the probability that a transmitted frame will be received incorrectly. Good voice quality of a call is considered when it FER value lies between 0 – 4 %

- Computational Methodology:

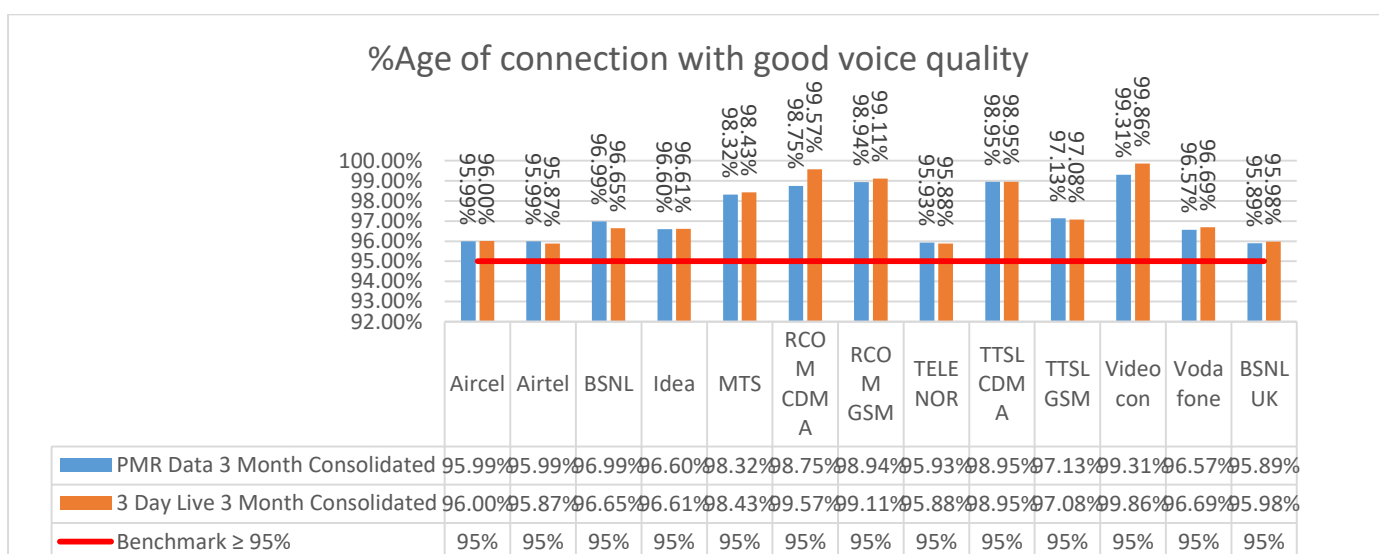
$$\% \text{ Connections with good voice quality} = \frac{\text{No. of voice samples with good voice quality}}{\text{Total number of samples}} * 100$$

- TRAI Benchmark: $\geq 95\%$

- Audit Procedure –

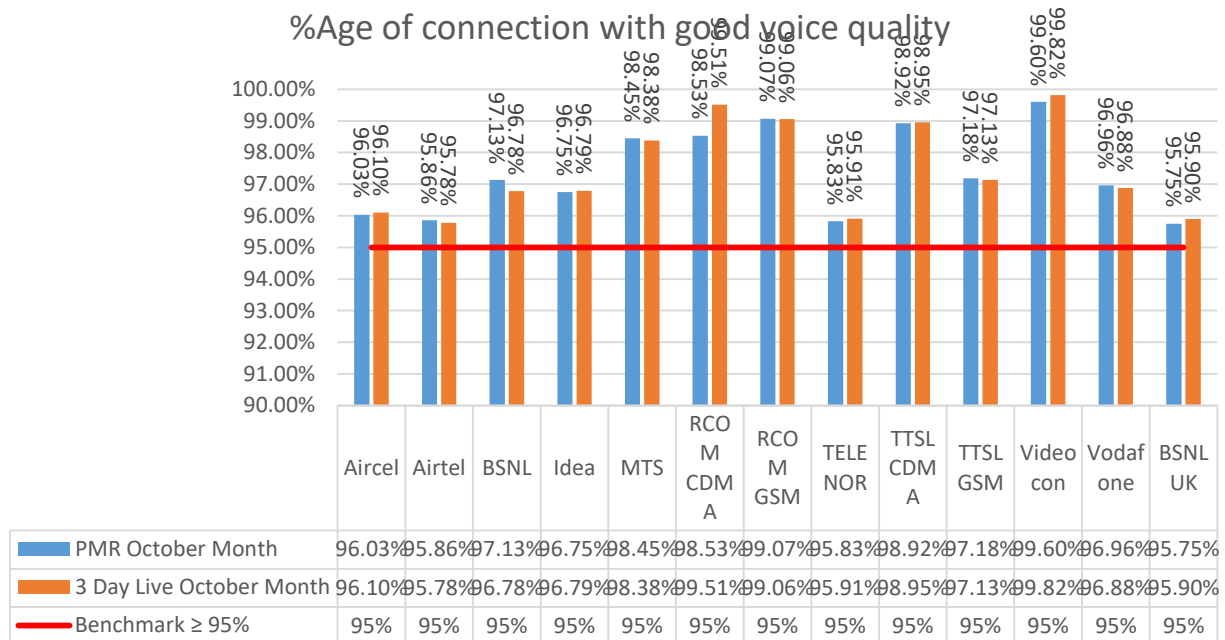
- A sample of calls would be taken randomly from the total calls established.
- The operator should only be considering those calls which are meeting the desired benchmark of good voice quality.

8.7.1. KEY FINDINGS: VOICE QUALITY: CONSOLIDATED



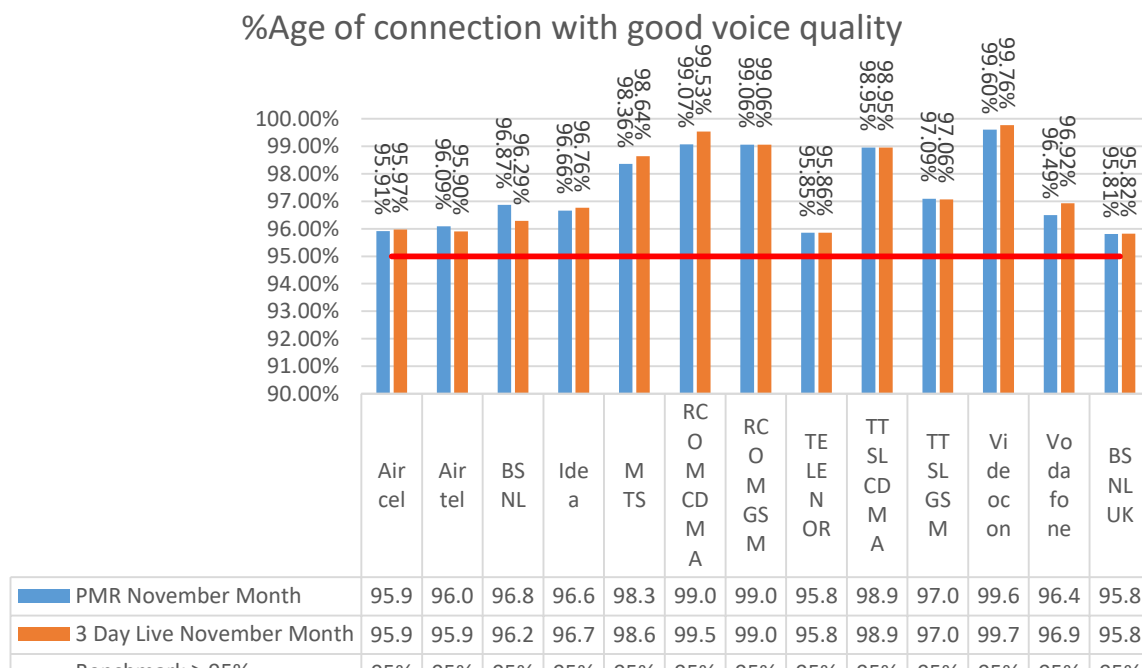
- It is clear from the analysis that all the operators are within benchmark.

8.7.2. KEY FINDINGS: VOICE QUALITY: OCTOBER



- It is clear from the analysis that all the operators are within benchmark.

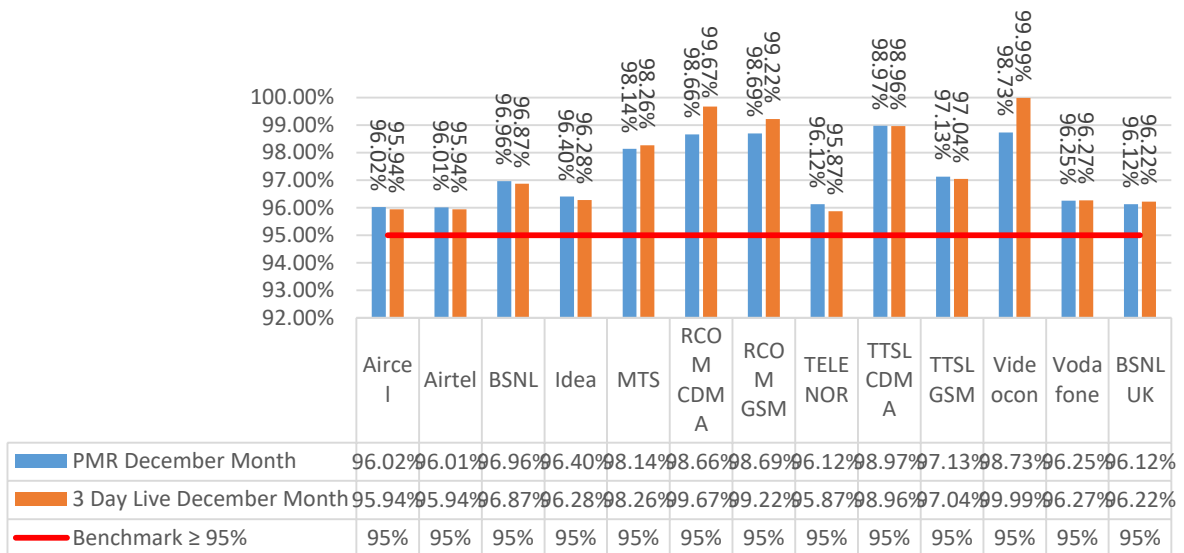
8.7.3. KEY FINDINGS: VOICE QUALITY: NOVEMBER



- It is clear from the analysis that all the operators are within benchmark.

8.7.4. KEY FINDINGS: VOICE QUALITY: DECEMBER

%Age of connection with good voice quality



- It is clear from the analysis that all the operators are within benchmark.

8.8. POI CONGESTION: CONSOLIDATED

POI Congestion: PMR Consolidated													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELE NOR	VIDEOCON
		2G	2G	2G	2G	2G	2G	2G	2G	2G	2G	2G	2G
Total No. of call attempts on POI		220118	2453003	209701	25448	4888	414599	752014	684830	552775	2664627	2761677	109
Total traffic served on all POIs (Erlang)		4009.619122	105844.8857	15544.3667	488.333333	78.5864416	7735.417372	15007.65333	18776.95826	10059.07226	49287	60330	3
Total No. of circuits on all individual POIs		9728.986663	185673.8333	61134.3333	1303.33333	154.67	30041.94624	40060.98889	52181.33333	20352.33333	132070	114243.6667	391
Total number of working POI Service Area wise		44	45	37	148.666667	50	102.3333333	53	150.6666667	32	111.666667	35.33333333	13
Capacity of all POIs		8423.67452	178829.9918	45850.6667	1257.33333	135.71	26933.11698	37542.10518	48042.15204	18697.85877	130847.667	139569.6667	281
No. of all POIs having >=0.5% POI congestion	≤ 0.5%	0	1	0	0	#VALUE!	0.037791622	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NA	Rampur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POI Congestion: 3 Days Live Consolidated													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELE NOR	VIDEOCON
		2G	2G	2G	2G	2G	2G	2G	2G	2G	2G	2G	2G
Total No. of call attempts on POI	241793	1706449	218588	25664	5039	407023	730042	663979	530629	3997542	2602877	104	0
Total traffic served on all POIs (Erlang)	4781.436667	71615.83667	16233.63333	495	81.5166667	7606.48626	14320.66554	18638.35	9769.568889	76290.77778	59381.3333	2.943333333	0
Total No. of circuits on all individual POIs	11278.33333	120006.6667	61820	1304	154.67	30708	40086.33333	52257	20352	144983.3333	147541.667	412.6666667	0
Total number of working POI Service Area wise	51.33333333	44.66666667	37	154	50	102.333333	53	151	32	119	35	12	0
Capacity of all POIs	9791.819736	121693.4964	46365	1258	135.71	27568.7882	37550.71662	48109.47	18697.82992	142279.4444	140471	251	0
No. of all POIs having >=0.5% POI congestion	0	0	0	0	0	0	0	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0

8.9. POI CONGESTION: OCTOBER

POI Congestion: PMR October													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELENOR	VIDEOCON
		2G	2G & 3G	2G & 3G	2G & 3G	2G	2G	2G	2G	2G & 3G	2G	2G	2G
Total No. of call attempts on POI		255730	2444174	15906	25527	5259	405045	781519	893761	590370	3286210	2749016	158
Total traffic served on all POIs (Erlang)		4045.4	106987	15906	490	84.99	7649	15726	19718.96	10578.46	58918	61941	4
Total No. of circuits on all individual POIs		9723.193548	186756	61335	1302	154.67	29140	40164	52018	20353	155284	47438	391
Total number of working POI Service Area wise		44	45	37	153	50	102	53	150	32	125	34	13
Capacity of all POIs		8414.83	179909	46001	1256	135.71	25841	37491	47896.26	18698	152404	138162	281
No. of all POIs having $\geq 0.5\%$ POI congestion	$\leq 0.5\%$	0	1	0	0	0	0	0	0	0	0	0	0
Name of POI not meeting the benchmark (having $\geq 0.5\%$ POI congestion)		NA	Rampur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POI Congestion: 3 Days Live October													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELENOR	VIDEOCON
		2G	2G	2G	2G	2G	2G	2G	2G	2G	2G	2G	2G
Total No. of call attempts on POI		199449	199449	16940	27139	5333	417807	752896	811103	518740	105787	2472769	125
Total traffic served on all POIs (Erlang)		3965.38	3965.38	16940	513	86.48	7749.458791	14860.99662	18143.85	9604	2032.33333	59157	3.47
Total No. of circuits on all individual POIs		9667	9667	61335	1304	154.67	31042	40177	52257	20352	155960	147437	322
Total number of working POI Service Area wise		44	44	37	153	50	102	53	151	32	125	34	10
Capacity of all POIs		8392.989208	8392.989208	46001	1258	135.71	27654.36464	37456.14985	48109.47	18697	153098.333	140167	210
No. of all POIs having $\geq 0.5\%$ POI congestion	$\leq 0.5\%$	0	0	0	0	0	0	0	0	0	0	0	0
Name of POI not meeting the benchmark (having $\geq 0.5\%$ POI congestion)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

8.10. POI CONGESTION: NOVEMBER

POI Congestion: PMR November													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELENOR	VIDEOCON
		2G	2G & 3G	2G & 3G	2G & 3G	2G	2G	2G	2G	2G & 3G	2G	2G	2G
Total No. of call attempts on POI		203226	2484783	596386	25583	4970	425486	741622	846113	545451	2339090	2447967	60
Total traffic served on all POIs (Erlang)		3911.54	105527	13915	487	80.13	7827	14479	18467.4	9870.12	43938	56749	2
Total No. of circuits on all individual POIs		9718.67	185081	59832	1297	154.67	30413	40046	52257	20352	121899	147584	390
Total number of working POI Service Area wise		44	45	37	155	50	102	53	151	32	107	36	13
Capacity of all POIs		8411.12	178239	44874	1251	135.71	27408	37604	48109.47	18698	119520	140575	281
No. of all POIs having $\geq 0.5\%$ POI congestion	$\leq 0.5\%$	0	1	0	0	0	0	0	0	0	0	0	0
Name of POI not meeting the benchmark (having $\geq 0.5\%$ POI congestion)		NA	Rampur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POI Congestion: 3 Days Live November													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELENOR	VIDEOCON
		2G	2G & 3G	2G & 3G	2G & 3G	2G	2G	2G	2G	2G & 3G	2G	2G	2G
Total No. of call attempts on POI		301054	2426213	622176	24098	4972.85	378424	689803	850793.33	548937	9463239	2520907	110
Total traffic served on all POIs (Erlang)		6016.18	103176	15118	473	81.02	7064	13092	19151.22	10216	180755	57110	3.41
Total No. of circuits on all individual POIs		14501	185189	61889	1301	154.67	30399	40002	52257	20352	155909	147561	458
Total number of working POI Service Area wise		66	45	37	155	50	102	53	151	32	125	35	13
Capacity of all POIs		12589.48	178346	46417	1255	135.71	27396	37567	48109.47	18698	153057	140781	262
No. of all POIs having >=0.5% POI congestion	≤ 0.5%	0	1	0	0	0	0	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NA	Rampur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

8.11. POI CONGESTION: DECEMBER

POI Congestion: PMR December													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELENOR	VIDEOCON
		2G	2G & 3G	2G & 3G	2G & 3G	2G	2G	2G	2G	2G & 3G	2G	2G	2G
Total No. of call attempts on POI		201399	2430053	16812	25233	4435.24	413265	732900	314616	522503	2368582	3088047	NA
Total traffic served on all POIs (Erlang)		4071.919032	105021	16812.1	488	70.6393248	7730.252115	14818	18144.51477	9728.636774	45005	62300	NA
Total No. of circuits on all individual POIs		9745.096774	185185	62236	1311	154.67	30572.83871	39973	52269	20352	119027	147709	NA
Total number of working POI Service Area wise		44	45	37	138	50	103	53	151	32	103	36	NA
Capacity of all POIs		8445.08	178342	46677	1265	135.71	27550.35095	37531	48120.72611	18697.57632	120619	139972	NA
No. of all POIs having >=0.5% POI congestion	≤ 0.5%	0	1	0	0	NA	0.113374866	0	0	0	0	0	NA
Name of POI not meeting the benchmark (having >=0.5% POI congestion)		NA	Rampur	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

POI Congestion : 3 Days Live December													
POI Congestion	Benchmark	Aircel	Airtel	BSNL	Idea	MTS	RCOM CDMA	RCOM GSM	TATA CDMA	TATA GSM	Vodafone	TELENOR	VIDEOCON
		2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G	2G & 3G
Total No. of call attempts on POI		224876	2493684	16647	25754	4810	424837	747427	330041	524209	2423600	2814956	76
Total traffic served on all POIs (Erlang)		4362.75	107706.1	16642.9	499	77.05	8006	15009	18619.98	9489	46085	61877	1.95
Total No. of circuits on all individual POIs		9667	165164	62236	1307	154.67	30683	40080	52257	20352	123081	147627	458
Total number of working POI Service Area wise		44	45	37	154	50	103	53	151	32	107	36	13
Capacity of all POIs		8392.99	178341.5	46677	1261	135.71	27656	37629	48109.47	18698	120683	140465	281
No. of all POIs having >=0.5% POI congestion	≤ 0.5%	0	0	0	0	0	0	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)		0	0	0	0	0	0	0	0	0	0	0	0

9. L1 CALLING DATA

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

- Almora: 25th Nov to 27th Nov 2015
- Aligarh: 2nd Dec 2015 to 4th Dec 2015

9.1. Airtel

SR. NO.	EMERGENCY NUMBER	Almora	Bageshwar	Pithoragarh	Champawat	Aligarh	Hathras	Khair	Atrauli	Sikandraro
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	10740	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	10741	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	15100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
38	155214	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	155304	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9.2. BSNL

SR. NO.	EMERGENCY NUMBER	KHAIR	ATRAULI	SIKANDRARAO
1	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	101	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	102	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	104	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	108	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	138	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	149	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	181	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	182	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	1033	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	1037	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	1056	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	1060	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	1063	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	1064	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	1070	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	1071	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	1072	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
19	1073	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	1077	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	1090	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
22	1091	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	1097	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	1099	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	1511	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	1512	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27	1514	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	1903	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
29	1909	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	1912	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
31	1916	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	1950	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

33	10580	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
34	10589	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
35	10740	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
36	10741	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
37	15100	✓	✓	✓
38	155214	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
39	155304	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

9.3. Idea

SR NO	EMERGENCY NUMBER	ALIGARH	HATHRAS	KHAIR	ATRAULI	SIKENDRA RO	Almora	Bageshwar	Pithoragarh	Champanawat
1	100	✓	✓	✓	✓	✓	✓	<input checked="" type="checkbox"/>	✓	✓
2	101	✓	✓	✓	✓	✓	✓	<input checked="" type="checkbox"/>	✓	✓
3	102	✓	✓	✓	✓	✓	✓	<input checked="" type="checkbox"/>	✓	✓
4	104	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	108	✓	✓	✓	✓	✓	✓	✓	✓	✓
6	138	✓	✓	✓	✓	✓	✓	✓	✓	✓
7	149	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	181	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9	182	✓	✓	✓	✓	✓	✓	✓	✓	✓
10	1033	✓	✓	✓	✓	✓	✓	✓	✓	✓
11	1037	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12	1056	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13	1060	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
14	1063	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	<input checked="" type="checkbox"/>	✓	✓
15	1064	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
16	1070	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓	✓	✓
17	1071	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
18	1072	✓	✓	✓	✓	✓	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
19	1073	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓	✓	✓
20	1077	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓	✓	✓
21	1090	✓	✓	✓	✓	✓	✓	✓	✓	✓
22	1091	✓	✓	✓	✓	✓	✓	✓	✓	✓
23	1097	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
24	1099	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
25	1511	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
26	1512	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27	1514	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
28	1903	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓	✓	✓
29	1909	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓	✓	✓
30	1912	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	✓	✓	✓	✓
31	1916	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

32	1950	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33	10580	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	10589	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	10740	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	10741	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37	15100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	155214	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	155304	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9.4. MTS

SR. NO.	EMERGENCY NUMBER	Almora	Bijnore	Chandpur	Dhampur	Nazibabad
1	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	101	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	102	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	104	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	108	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	138	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	149	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	181	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	182	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	1033	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	1037	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	1056	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	1060	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	1063	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	1064	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	1070	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17	1071	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	1072	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	1073	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	1077	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	1090	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
22	1091	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	1097	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	1099	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	1511	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	1512	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	1514	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	1903	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	1909	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	1912	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	1916	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

32	1950	✓	☒	☒	☒	☒
33	10580	☒	☒	☒	☒	☒
34	10589	☒	☒	☒	☒	☒
35	10740	☒	☒	☒	☒	☒
36	10741	☒	☒	☒	☒	☒
37	15100	☒	✓	✓	✓	☒
38	155214	☒	☒	☒	☒	☒
39	155304	☒	☒	☒	☒	☒

9.5. RCOM CDMA

SR. NO.	EMERGENCY NUMBER	Aligarh	Hathras	Khair/Atrauli
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	☒	☒	☒

9.6. RCOM GSM

SR. NO.	EMERGENCY NUMBER	Aligarh	Hathras	Khair/Atrauli
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	☒	☒	☒

9.7. TATA CDMA

SR. NO.	EMERGENCY NUMBER	ALIGARH	HATHRAS	KHAIR	ATRAULI	SIKANDRARAO
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	1916	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32	1950	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
33	10580	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34	10589	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35	10740	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36	10741	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
37	15100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38	155214	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39	155304	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9.8. TATA GSM

SR. NO.	EMERGENCY NUMBER	ALIGARH	HATHRAS	KHAIR	ATRAULI	SIKANDRARAO
1	100	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	101	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	102	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	104	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	108	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	138	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	149	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	181	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	182	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	1033	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
11	1037	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	1056	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	1060	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	1063	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	1064	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	1070	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
17	1071	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
18	1072	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	1073	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	1077	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	1090	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
22	1091	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	1097	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
24	1099	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	1511	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	1512	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	1514	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	1903	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

29	1909	✓	✓	✓	✓	✓
30	1912	☒	☒	☒	☒	☒
31	1916	☒	☒	☒	☒	☒
32	1950	☒	☒	☒	☒	☒
33	10580	☒	☒	☒	☒	☒
34	10589	☒	☒	☒	☒	☒
35	10740	☒	☒	☒	☒	☒
36	10741	☒	☒	☒	☒	☒
37	15100	✓	✓	✓	✓	✓
38	155214	☒	☒	☒	☒	☒
39	155304	☒	☒	☒	☒	☒

9.9. Telenor

SR. NO.	EMERGENCY NUMBER	KHAIR	ATRAULI	SIKANDRARAO
1	100 Police	✓	✓	✓
2	101 Fire	✓	✓	✓
3	102 Ambulance	✓	✓	✓
4	104 Health Information Helpline	☒	☒	☒
5	108 Emergency and Disaster Management Helpline	✓	✓	✓
6	138 All India Helpline for Passangers	☒	☒	☒
7	149 Public Road Transport Utility Service	✓	✓	✓
8	181 Chief Minister Helpline	☒	☒	☒
9	182 Indian Railway Security Helpline	☒	☒	✓
10	1033 Road Accident Management Service	☒	☒	☒
11	1037 Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal Helpline'	☒	☒	☒
12	1056 Emergency Medical Services	☒	☒	☒
13	106X State of the Art Hospitals - AIIMS	☒	☒	☒
14	1063 Public Grievance Cell DoT Hq	☒	☒	☒
15	1064 Anti Corruption Helpline	☒	☒	☒
16	1070 Relief Commission for Natural Calamities	☒	☒	☒
17	1071 Air Accident Helpline	☒	☒	☒
18	1072 Rail Accident Helpline	✓	✓	☒
19	1073 Road Accident Helpline	☒	☒	☒
20	1077 Control Room for District Collector	☒	☒	☒
21	1090 Call Alart (Crime Branch)	✓	✓	✓
22	1091 Women Helpline	☒	☒	☒
23	1097 National AIDS Helpline to NACO	☒	☒	☒
24	1099 Central Accident and Trauma Services (CATS)	☒	☒	☒
25	10580 Educational& Vocational Guidance and Counselling	☒	☒	☒

26	10589 Mother and Child Tracking (MCTH)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
27	10740 Central Pollution Control Board	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
28	10741 Pollution Control Board	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
29	1511 Police Related Service for all Metro Railway Project	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
30	1512 Prevention of Crime in Railway	✓	✓	✓
31	1514 National Career Service(NCS)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
32	15100 Free Legal Service Helpline	✓	✓	✓
33	155304 Municipal Corporations	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
34	155214 Labour Helpline	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
35	1903 Sashastra Seema Bal (SSB)	✓	✓	✓
36	1909 National Do Not Call Registry	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
37	1912 Complaint of Electricity	✓	✓	✓
38	1916 Drinking Water Supply	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
39	1950 Election Commission of India	✓	✓	✓

9.10. Vodafone

SR. NO.	EMERGENCY NUMBER	PITHORAGARH
1	100	✓
2	101	✓
3	102	<input checked="" type="checkbox"/>
4	104	<input checked="" type="checkbox"/>
5	108	✓
6	138	<input checked="" type="checkbox"/>
7	149	<input checked="" type="checkbox"/>
8	181	<input checked="" type="checkbox"/>
9	182	<input checked="" type="checkbox"/>
10	1033	<input checked="" type="checkbox"/>
11	1037	<input checked="" type="checkbox"/>
12	1056	<input checked="" type="checkbox"/>
13	1060	<input checked="" type="checkbox"/>
14	1063	<input checked="" type="checkbox"/>
15	1064	<input checked="" type="checkbox"/>
16	1070	<input checked="" type="checkbox"/>
17	1071	<input checked="" type="checkbox"/>
18	1072	<input checked="" type="checkbox"/>
19	1073	<input checked="" type="checkbox"/>
20	1077	<input checked="" type="checkbox"/>
21	1090	✓
22	1091	<input checked="" type="checkbox"/>
23	1097	<input checked="" type="checkbox"/>

24	1099	<input checked="" type="checkbox"/>
25	1511	<input checked="" type="checkbox"/>
26	1512	<input checked="" type="checkbox"/>
27	1514	<input checked="" type="checkbox"/>
28	1903	<input checked="" type="checkbox"/>
29	1909	<input checked="" type="checkbox"/>
30	1912	<input checked="" type="checkbox"/>
31	1916	<input checked="" type="checkbox"/>
32	1950	<input checked="" type="checkbox"/>
33	10580	<input checked="" type="checkbox"/>
34	10589	<input checked="" type="checkbox"/>
35	10740	<input checked="" type="checkbox"/>
36	10741	<input checked="" type="checkbox"/>
37	15100	<input checked="" type="checkbox"/>
38	155214	<input checked="" type="checkbox"/>
39	155304	<input checked="" type="checkbox"/>

10. NON NETWORK PARAMETERS: DESCRIPTION AND DETAILED FINDINGS

10.1. METERING AND BILLING CREDIBILITY

The billing complaints for post-paid are calculated by averaging over one billing cycle in a quarter. For example, there are three billing cycles in a quarter, the data for each billing cycle is calculated separately and then averaged over.

The charging complaints for prepaid are calculated by taking all complaints in a quarter.

Parameter Description

All the complaints related to billing/ charging as per clause 3.7.2 of QoS regulation of 20th June, 2009 were covered. The types of billing complaints covered are listed below.

1. Payments made and not credited to the subscriber account
2. Payment made on time but late payment charge levied wrongly
3. Wrong roaming charges
4. Double charges
5. Charging for toll free services
6. Local calls charged/billed as STD/ISD or vice versa
7. Calls or messages made disputed
8. Validity related complaints
9. Credit agreed to be given in resolution of complaint, but not accounted in the bill
10. Charging for services provided without consent
11. Charging not as per tariff plans or top up vouchers/ special packs etc.
12. Overcharging or undercharging

In addition to the above, any billing complaint which leads to billing error, waiver, refund, credit, or any adjustment is also considered as valid billing complaint for calculating the number of disputed bills.

- Computational Methodology:
 - Metering and billing credibility (Post-paid)

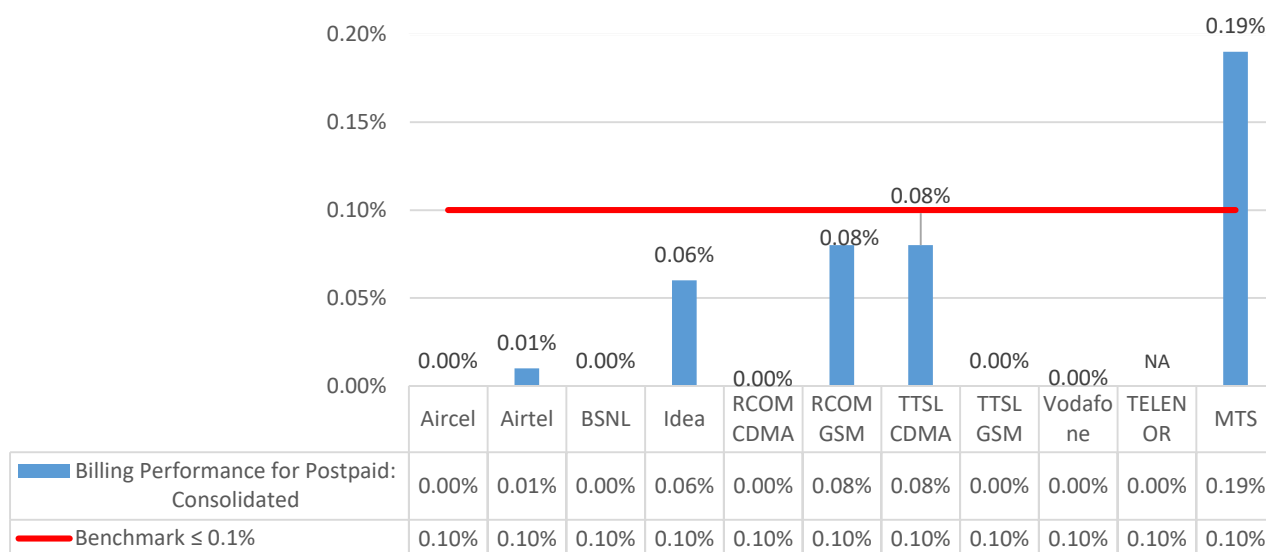
$$= \frac{\text{Total billing complaints* received during the relevant billing cycle}}{\text{Total bills generated* during the relevant billing cycle}} * 100$$
 - Operator to include all types of bills generated for customers. This would include printed bills, online bills and any other forms of bills generated
 - Billing complaints here shall include only dispute related issues (including those that may arise because of a lack of awareness at the subscribers' end). It does not include any provisional issues (such as delayed dispatch of billing statements, etc.) in which the operator has opened a ticket internally.
 - Metering and billing credibility (Prepaid)

$$= \frac{\text{Total charging complaints received during the quarter}}{\text{Total number of subscribers reported by the operator at the end of the quarter}} * 100$$
- TRAI Benchmark: $\leq 0.1\%$
- Audit Procedure:

- Audit of billing complaint details for the complaints received during the quarter and used for arriving at the benchmark reported to TRAI would be conducted
- For Post-paid, the total billing complaints would be audited by averaging over billing cycles in a quarter.
- For Prepaid, the data of total charging complaints in a quarter would be taken for the purpose of audit.

10.1.1. KEY FINDINGS: METERING AND BILLING CREDIBILITY: POST – PAID

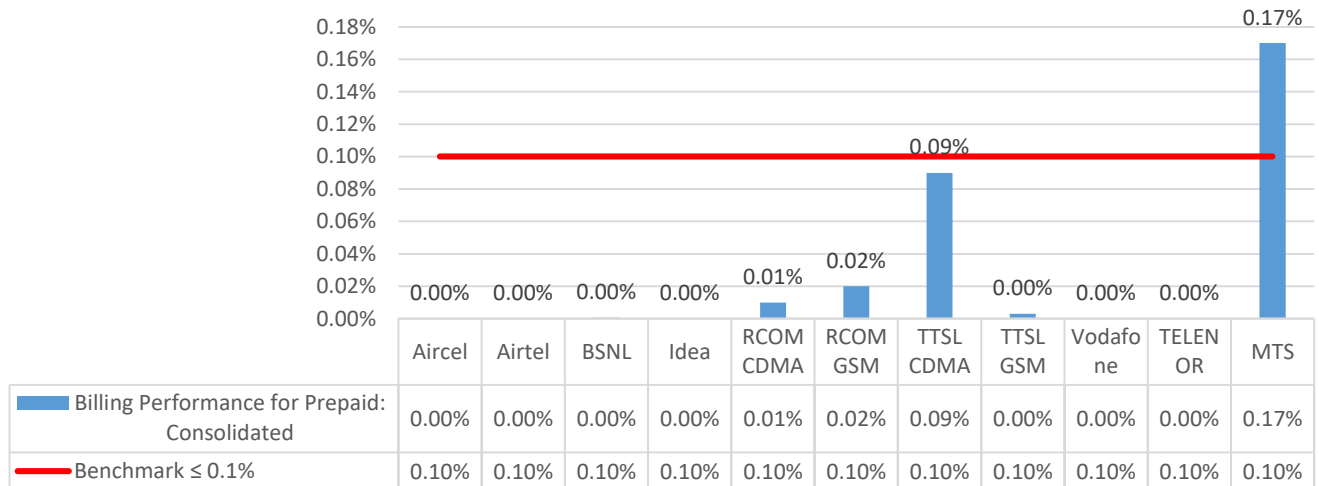
Metering and Billing Credibility: Postpaid



- Vodafone has parameter value of **0.19%** and failed to meet the benchmark of $\leq 0.1\%$ Metering and Billing Credibility (Post-paid Subscribers).

10.1.2. KEY FINDINGS: METERING AND BILLING CREDIBILITY: PREPAID

Metering and Billing Credibility: Prepaid



- Vodafone has parameter value of **0.17%** and failed to meet the benchmark of $\leq 0.1\%$ Metering and Billing Credibility (Prepaid Subscribers).

10.2. RESOLUTION OF BILLING COMPLAINTS

Calculation of Percentage resolution of billing complaints: The calculation methodology (given below) as per QoS regulations 2009 (7 of 2009) was followed to calculate resolution of billing complaints.

Resolution of billing complaints within 4 weeks:

%age of billing complaints (for post-paid customers)/ charging, credit & validity (for pre-paid customers) resolved within 4 weeks =

number of billing complaints for post-paid customers/charging, credit/ validity complaints for pre-paid customers resolved within 4 weeks during the quarter X 100

number of billing/charging, credit / validity complaints received during the quarter

Resolution of billing complaints within 6 weeks:

%age of billing complaints (for post-paid customers)/ charging, credit & validity (for pre-paid customers) resolved within 6 weeks =

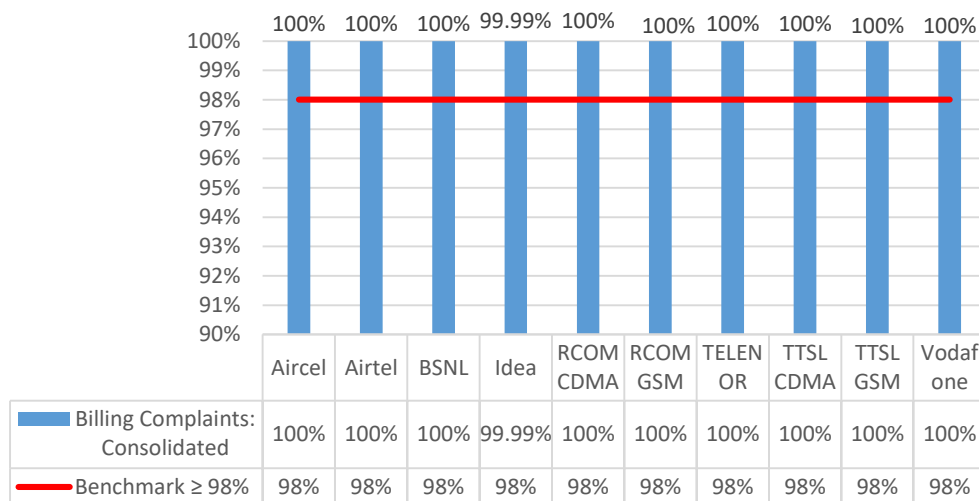
number of billing complaints for post-paid customers/charging, credit/ validity complaints for pre-paid customers resolved within 6 weeks during the quarter X 100

number of billing/charging, credit / validity complaints received during the quarter

- Billing complaints here shall include only dispute related issues (including those that may arise because of a lack of awareness at the subscribers' end). It does not include any provisional issues (such as delayed dispatch of billing statements, etc.) in which the operator has opened a ticket internally. Complaints raised by the consumers to operator are only considered as part of the calculation.
- Date of resolution in this case would refer to the date when a communication has taken place from the operator's end to inform the complainant about the final resolution of the issue / dispute.
- Benchmark: 98% complaints resolved within 4 weeks, 100% within 6 weeks.

10.2.1. KEY FINDINGS: BILLING COMPLAINTS RESOLUTION WITHIN 4 WEEKS

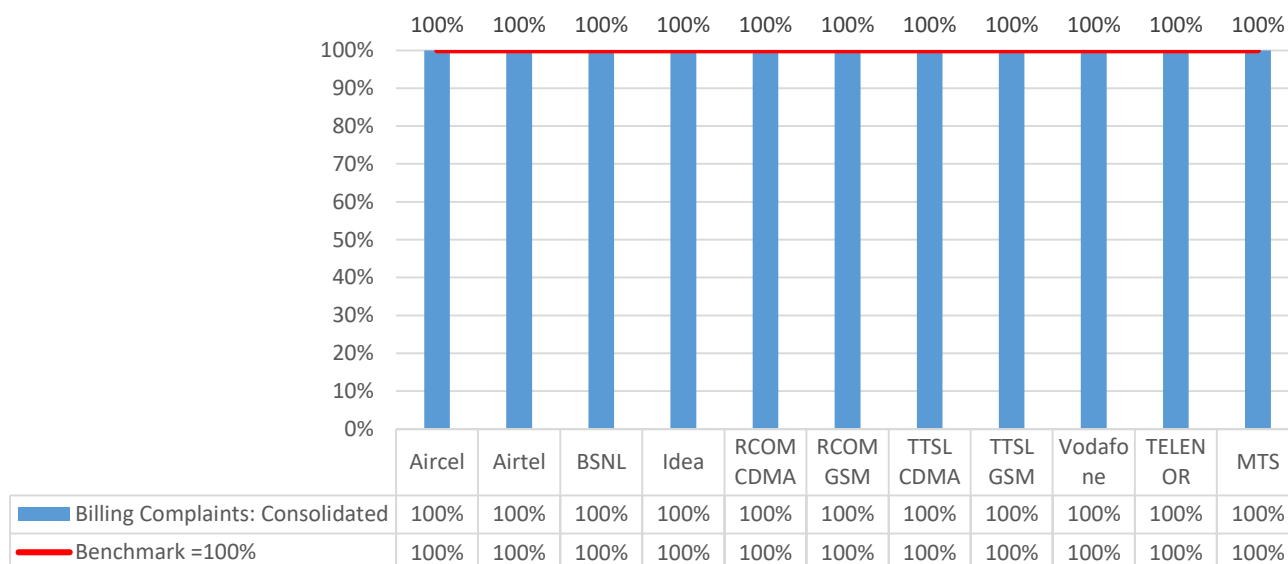
Complaints resolved within 4 weeks



- It is clear from the analysis that all the operators are within benchmark.

10.2.2. KEY FINDINGS: BILLING COMPLAINTS RESOLUTION WITHIN 6 WEEKS

Complaints resolved within 6 weeks



- It is clear from the analysis that all the operators are within benchmark.

10.3. PERIOD OF APPLYING CREDIT / WAIVER

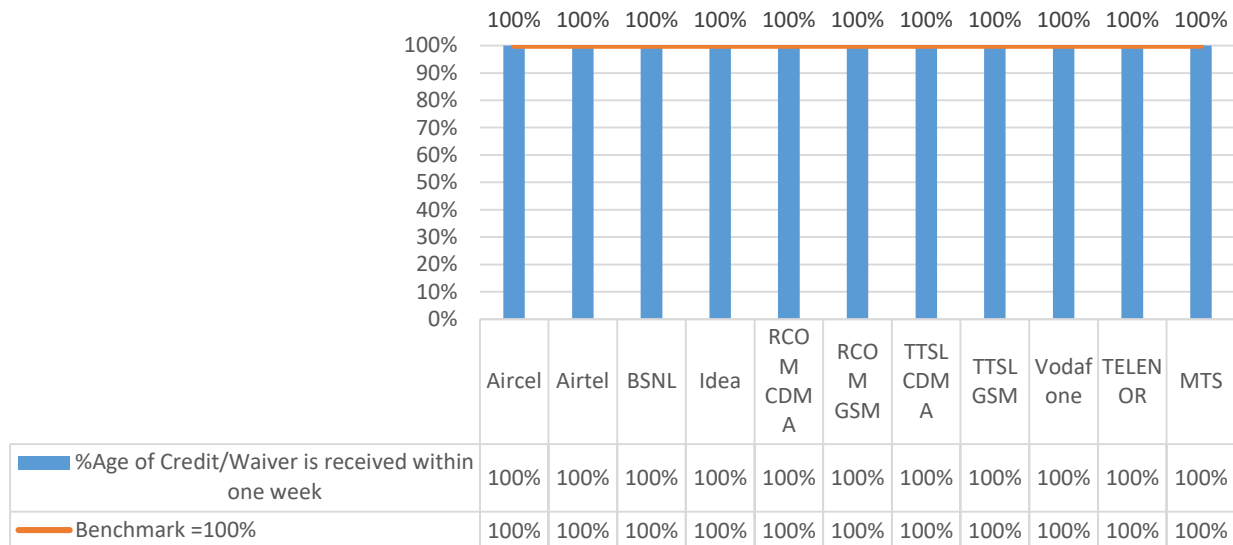
- Computational Methodology:

$$\text{Period of applying credit waiver} = \frac{\text{number of cases where credit waiver is applied within 7 days}}{\text{total number of cases eligible for credit waiver}} * 100$$

- TRAI Benchmark: Period of applying credit waiver within 7 days: 100%
- Audit Procedure:
 - Operator to provide details of:-
 - List of all eligible cases along with
 - Date of applying credit waiver to all the eligible cases
 - Date of resolution of complaint for all eligible cases

10.3.1. KEY FINDINGS

Credit/Waiver is received within one week



- It is clear from the analysis that all the operators are within benchmark.

10.4. CALL CENTRE PERFORMANCE: IVR

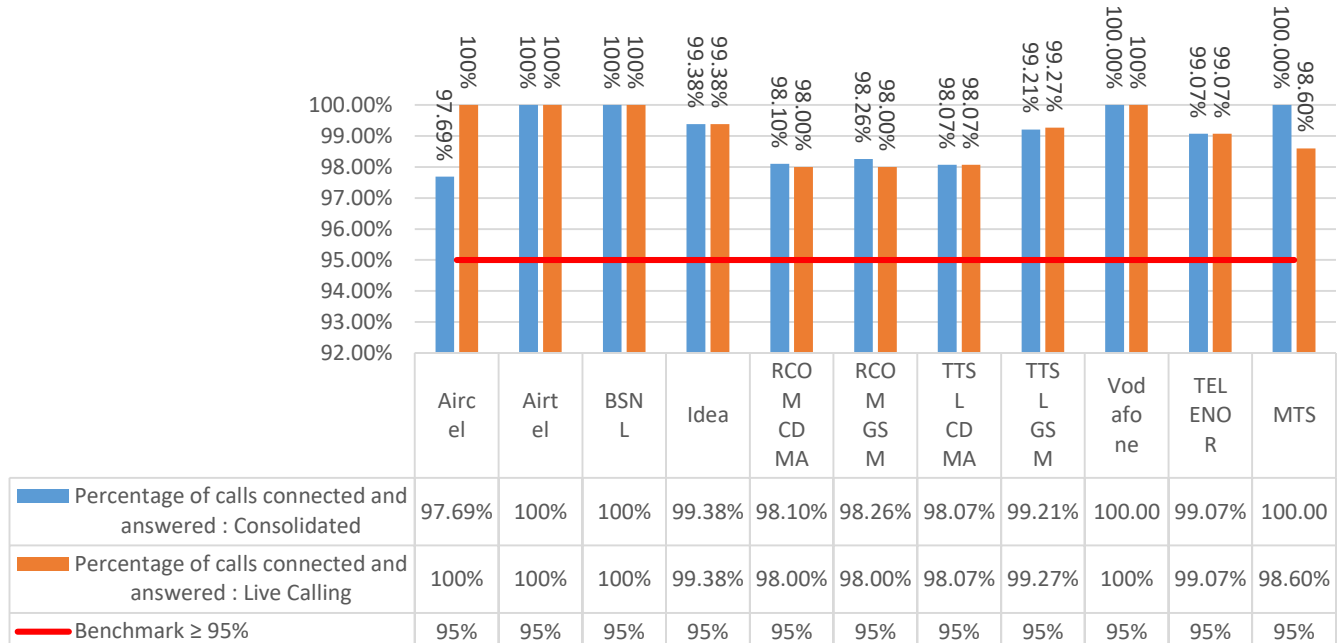
- Computational Methodology:

$$\text{Call centre performance IVR} = \frac{\text{Number of calls connected and answered by IVR}}{\text{All calls attempted to IVR}} * 100$$

- TRAI Benchmark: $\geq 95\%$
- Audit Procedure:
 - Operators provide details of the following from their central call centre/ customer service database:
 - Total calls connected and answered by IVR
 - Total calls attempted to IVR
 - Also live calling is done to test the calls connected and answered by IVR

10.4.1. KEY FINDINGS

Call Centre Performance: IVR



- It is clear from the analysis that all the operators are within benchmark.

10.5. CALL CENTER PERFORMANCE: VOICE TO VOICE

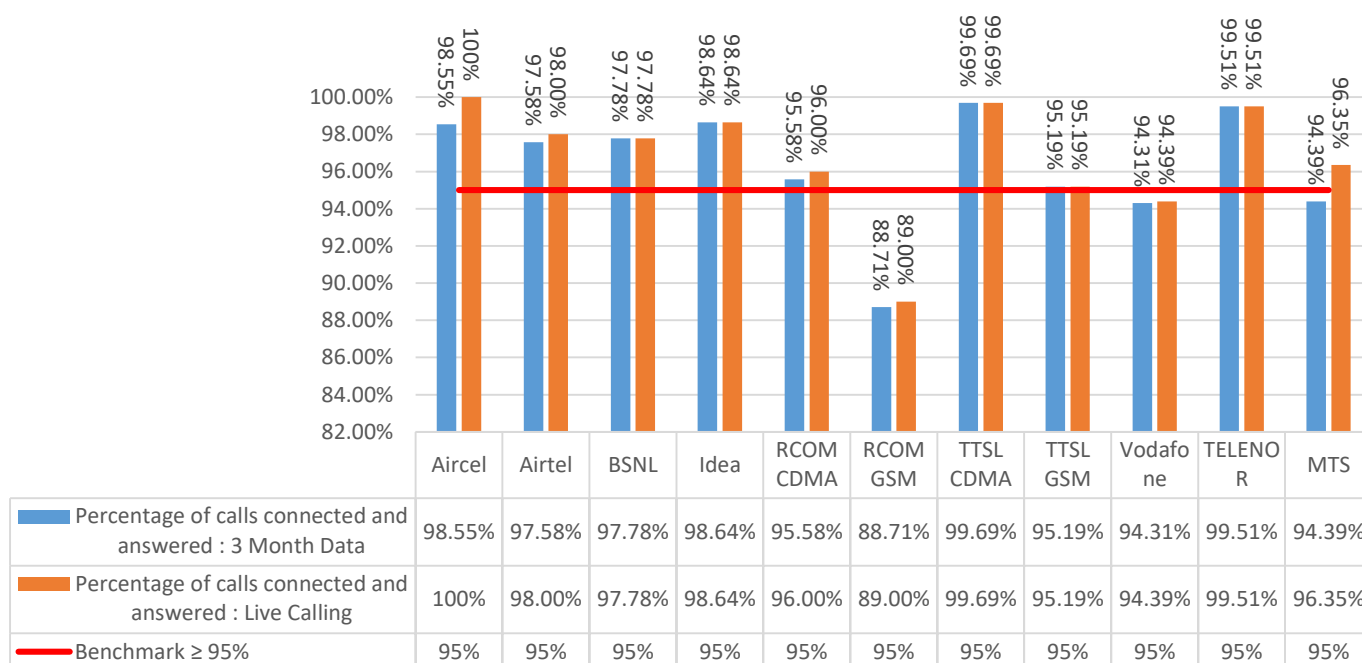
- Computational Methodology:

$$\text{Call centre performance Voice to Voice} = \frac{\text{Number of calls answered by operator within 90 seconds}}{\text{All calls attempted to connect to the operator}} * 100$$

- Audit Procedure:
 - Operators provide details of the following from their central call centre/ customer service database:
 - Total calls connected and answered by operator within 90 seconds
 - Total calls attempted to connect to the operator
 - Also live calling was done to test the calls answered within 90 seconds by the operator
- Benchmark: 95% calls to be answered within 90 seconds.

10.5.1. KEY FINDINGS

Call Centre Performance: Voice to Voice



- RCOM GSM has parameter value of **89.00%** and failed to meet the benchmark of ≥ 95% %age of call answered by the operators (voice to voice) within 90 seconds.
- TTSL CDMA has parameter value of **88.71%** and failed to meet the benchmark of ≥ 95% %age of call answered by the operators (voice to voice) within 90 seconds.
- VODAFONE has parameter value of **94.31%** and failed to meet the benchmark of ≥ 95% %age of call answered by the operators (voice to voice) within 90 seconds.
- VODAFONE has parameter value of **94.39%** and failed to meet the benchmark of ≥ 95% %age of call answered by the operators (voice to voice) within 90 seconds.
- MTS has parameter value of **94.39%** and failed to meet the benchmark of ≥ 95% %age of call answered by the operators (voice to voice) within 90 seconds.

10.6. TERMINATION OR CLOSURE OF SERVICE

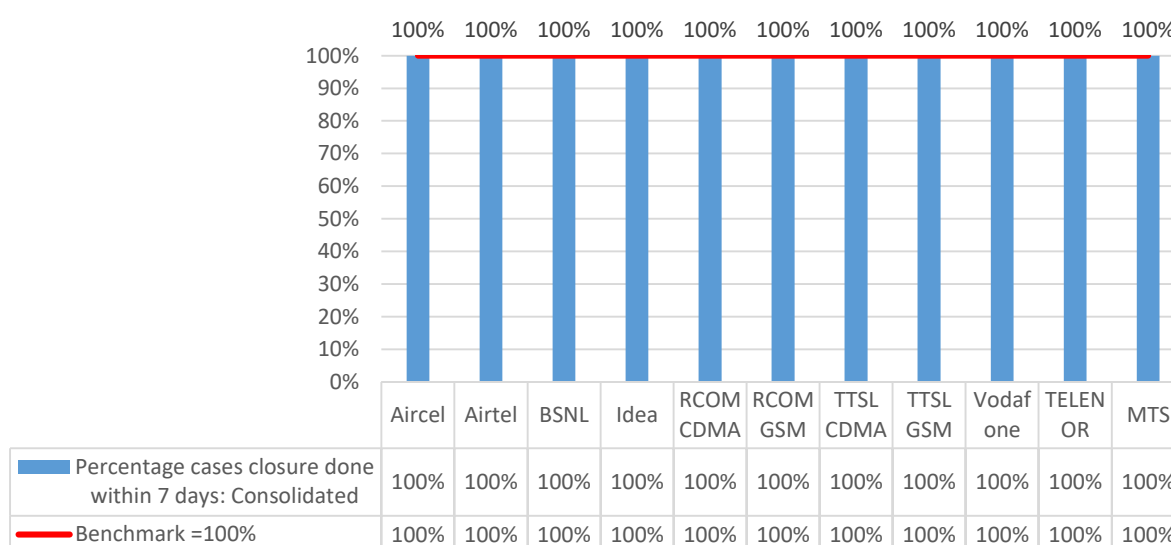
- Computational Methodology:

$$\text{Time taken for closure of service} = \frac{\text{number of closures done within 7 days}}{\text{total number of closure requests}} * 100$$

- TRAI Benchmark: Termination/Closure of Service: ≤7 days
- Audit Procedure:
 - Operator provide details of the following from their central billing/CS database:
 - Date of lodging the closure request (all requests in given period)
 - Date of closure of service

10.6.1. KEY FINDINGS

Termination/ Closure of service within 7 days



- It is clear from the analysis that all the operators are within benchmark.

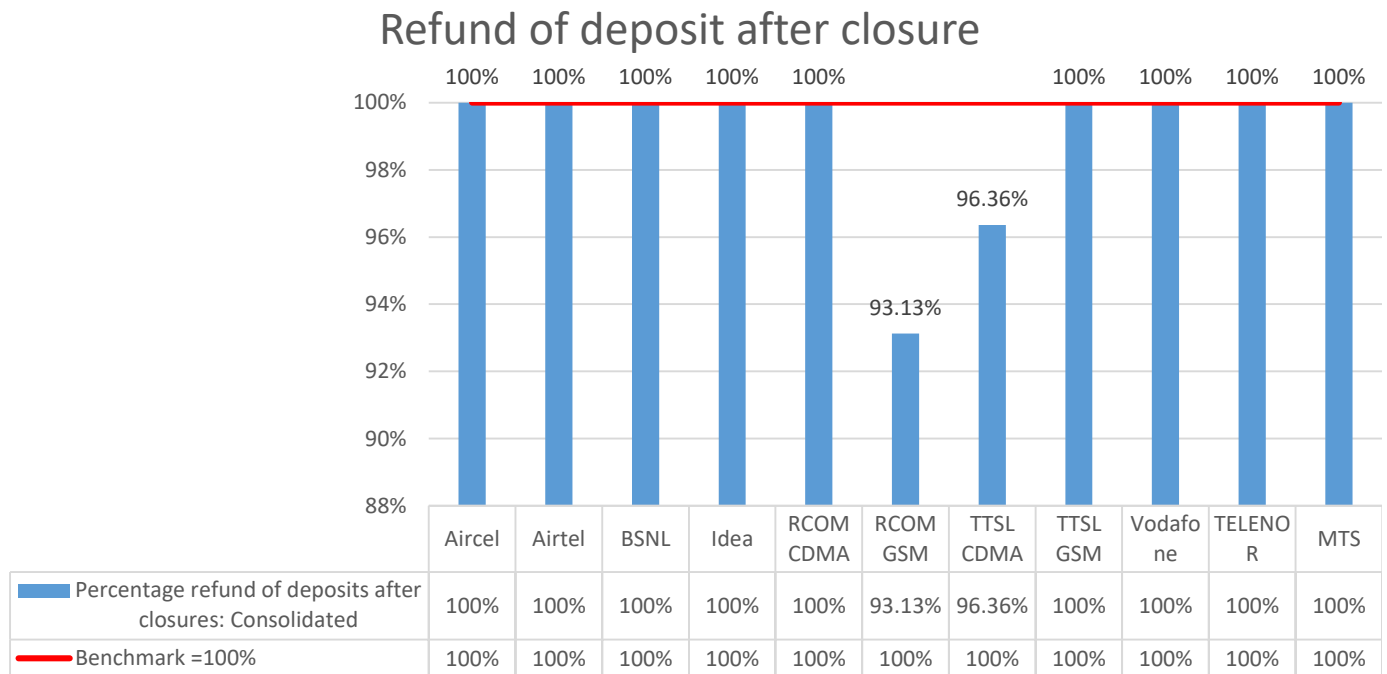
10.7. REFUND OF DEPOSIT AFTER CLOSURE

- Computational Methodology:

$$\text{Time taken for refund for deposit after closures} = \frac{\text{number of cases of refund after closure done within 60 days}}{\text{total number of cases of refund after closure}} * 100$$

- Any case where the operators need to return the amount back to consumers post closure of service in form of cheque/cash is considered to be refund.
- TRAI Benchmark: Time taken for refund for deposit after closures: 100% within 60 days
- Audit Procedure:
 - Operator provide details of the following from their central billing/refund database:
 - Dates of completion of all 'closure requests' resulting in requirement of a refund by the operator.
 - Dates of refund pertaining to all closure request received during relevant quarter

10.7.1. KEY FINDINGS



- It is clear from the analysis that all the operators are within benchmark.

11. CRITICAL FINDINGS

2G VOICE PMR DATA: OCTOBER

- TTSL CDMA has parameter value of 5.26% and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.
- TTSL GSM has parameter value of 5.30% and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.

2G VOICE PMR DATA: NOVEMBER

- TTSL CDMA has parameter value of 5.33% and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.
- TTSL GSM has parameter value of 5.40% and failed to meet the benchmark for Worst Affected cell having more than 3% TCH drop as it is pre-defined at $\leq 3\%$.

2G VOICE PMR DATA: DECEMBER

- TTSL CDMA has parameter value of 4.94% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of 4.95% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- Vodafone has parameter value of **3.21%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

2G VOICE PMR DATA: CONSOLIDATED

- TTSL CDMA has parameter value of 5.18% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of 5.22% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

2G VOICE 3 DAYS LIVE DATA: OCTOBER

- Idea has parameter value of 1.21% and failed to meet the benchmark of $\leq 1\%$ for SDDCH/Paging chl. Congestion.
- TTSL CDMA has parameter value of 4.17% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of 5.10% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- Idea has parameter value of 3.04% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

2G VOICE 3 DAYS LIVE DATA: NOVEMBER

- RCOM CDMA has parameter value of 80.96% and failed to meet the benchmark of $\geq 95\%$ for Call Set-up Success Rate (Within Licensee own network).

- TTSL CDMA has parameter value of 5.66% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of 6.51% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

2G VOICE 3 DAYS LIVE DATA: DECEMBER

- TTSL CDMA has parameter value of 4.95% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of 4.92% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- Vodafone has parameter value of 3.54 and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

3 DAYS LIVE DATA: CONSOLIDATED

- TTSL CDMA has parameter value of 4.93% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of 5.51% and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- RCOM CDMA has parameter value of 92.71% and failed to meet the benchmark of $\geq 95\%$ for Call Set-up Success Rate (Within Licensee own network).

3G VOICE PMR: CONSOLIDATED

- BSNL UK has parameter value of 1.34% and failed to meet the benchmark of $\leq 1\%$ for RRC Congestion.
- TATA GSM has parameter value of **3.15%** and failed to meet the benchmark of $\leq 3\%$ for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate
- BSNL UK has not provided data for %age of connections with Good Circuit Switched Voice Quality. Kindly refer to the audit report(s).

3G VOICE PMR: OCTOBER

- TATA GSM has parameter value of 3.32% and failed to meet the benchmark of $\leq 3\%$ for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

3G VOICE PMR: NOVEMBER

- BSNL UK has parameter value of 1.78% and failed to meet the benchmark of $\leq 1\%$ for RRC Congestion.
- BSNL UK has not provided data for %age of connections with Good Circuit Switched Voice Quality. Kindly refer to the audit report(s) for the month of November 2015.

3G VOICE PMR: DECEMBER

- BSNL UK has not provided data for %age of connections with Good Circuit Switched Voice Quality. Kindly refer to the audit report(s) for the month of December 2015

3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

- TATA GSM has parameter value of 3.25% and failed to meet the benchmark of $\leq 3\%$ for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

3G VOICE 3 DAYS LIVE DATA: NOVEMBER

- TATA GSM has parameter value of 3.40% and failed to meet the benchmark of $\leq 3\%$ for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.
- BSNL UK has parameter value of 1.02% and failed to meet the benchmark of $\leq 1\%$ for RRC Congestion.

3G VOICE 3 DAYS LIVE DATA: DECEMBER

- TATA GSM has parameter value of 3.01% and failed to meet the benchmark of $\leq 3\%$ for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

Billing and Customer Care

- Vodafone has parameter value of 0.19% and failed to meet the benchmark of $\leq 0.1\%$ Metering and Billing Credibility (Post-paid Subscribers).
- Vodafone has parameter value of 0.17% and failed to meet the benchmark of $\leq 0.1\%$ for Metering and Billing Credibility (Prepaid Subscribers).
- TTSL CDMA has parameter value of 88.77% and failed to meet the benchmark of $\geq 95\%$ for %age of call answered by the operators (voice to voice) within 90 seconds.

Live Calling Data: Consolidated

- RCOM GSM has parameter value of 89.00% and failed to meet the benchmark of $\geq 95\%$ for %age of call answered by the operators (voice to voice) within 90 seconds.
- Vodafone has parameter value of 94.39% and failed to meet the benchmark of $\geq 95\%$ for %age of call answered by the operators (voice to voice) within 90 seconds.

3 Days Live Call Centre Data

- Airtel has parameter value of 94.90% and failed to meet the benchmark of $\geq 95\%$ for %age calls answered by the operator within 90 seconds.

12. PMR COMPARISON (AGENCY VS TSP)

12.1. Network Parameters

Name of Service Provider	Network Availability				Connection Establishment (Accessibility)						Connection Maintenance (Retainability)					
	Sum of downtime of BTSs in a month in hrs. in the licensed service area		No. of BTSs having accumulated downtime of >24 hours in a month		Call Set-up Success Rate (Within Licensee own network)		SDDCH/Paging chl. Congestion		TCH Congestion		Call Drop Rate (%age)		Worst Affected call having more than 3% TCH drop		%age of connection with good voice quality	
Benchmark	≤ 2%		≤ 2%		≥ 95%		≤ 1%		≤ 2%		≤ 2%		≤ 3%		≥ 95%	
	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP
Aircel	0.14%	0.14%	0.61%	0.61%	98.07%	98.07%	0.23%	0.23%	0.57%	0.57%	0.34%	0.23%	2.08%	2.08%	95.99%	96.05%
Airtel	1.07%	1.07%	1.09%	1.16%	98.87%	98.87%	0.67%	0.67%	0.79%	0.79%	1.36%	1.36%	2.20%	2.20%	95.99%	95.92%
BSNL	1.41%	1.26%	1.81%	1.82%	97.28%	97.17%	0.47%	0.49%	1.37%	1.29%	1.27%	1.31%	2.32%	2.16%	96.99%	96.44%
Idea	0.13%	0.14%	0.24%	0.24%	97.28%	97.28%	0.97%	0.97%	1.86%	1.86%	1.22%	1.22%	2.62%	2.61%	96.60%	96.60%
MTS	0.03%	0.03%	0.00%	0.00%	98.69%	98.69%	NA	0.00%	0.00%	0.00%	0.16%	0.16%	2.06%	2.06%	98.32%	98.32%
RCOM CDMA	0.04%	0.04%	0.27%	0.27%	97.40%	97.39%	NA	0.00%	0.50%	0.72%	0.12%	0.12%	0.67%	0.67%	98.75%	98.72%
RCOM GSM	0.21%	0.04%	0.30%	0.30%	97.58%	97.58%	0.21%	0.21%	0.26%	0.26%	0.08%	0.08%	0.37%	0.37%	98.94%	98.94%
TELENOR	0.22%	0.22%	0.45%	0.45%	98.06%	98.06%	0.55%	0.56%	1.23%	1.23%	0.52%	0.52%	1.43%	1.44%	95.93%	95.93%
TTSL CDMA	0.15%	0.15%	0.36%	0.36%	99.17%	99.17%	NA	0.00%	0.16%	0.16%	0.52%	0.52%	5.18%	5.19%	98.95%	98.95%
TTSL GSM	0.22%	0.22%	0.54%	0.54%	98.04%	98.04%	0.23%	0.23%	0.57%	0.57%	0.89%	0.89%	5.22%	5.22%	97.13%	97.13%
Videocon	0.18%	0.28%	0.00%	0.00%	99.12%	99.46%	0.10%	0.07%	0.00%	0.05%	0.72%	0.51%	0.00%	0.00%	99.31%	99.53%
Vodafone	0.43%	0.64%	0.77%	0.77%	99.18%	99.18%	0.46%	0.46%	0.82%	0.82%	0.76%	0.76%	2.96%	2.96%	96.57%	96.57%
BSNL UK	1.12%	DNA	1.86%	DNA	97.05%	DNA	0.51%	DNA	1.22%	DNA	1.34%	DNA	1.98%	DNA	95.89%	DNA

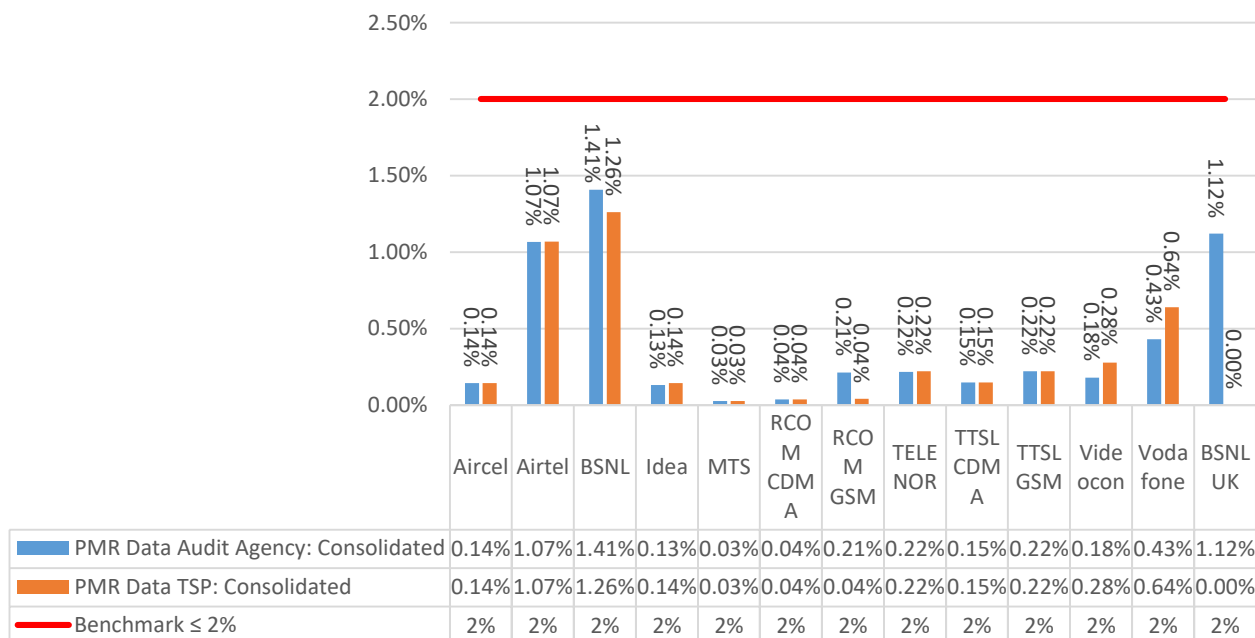
- **For each instance of "DNA (Data Not Available)", please refer the respective hard copy of audit report(s).

12.2. CSD Parameters

Name of Service Provider	Metering and Billing credibility				Billing Complaints						Termination & Closures		Time taken for refund of deposits after closures: Benchmark		Customer Care			
	Postpaid Subscribers		Prepaid Subscribers		%age complaints resolved within 4 weeks		%age complaints resolved within 6 weeks		%age of credit/weiver is received within one week		% of Termination/ Closure of service within 7 days (100 %)		Cleared over a period of <60 days (100%)		%age of calls answered by the IVR		%age of call answered by the operators (voice to voice) within 90 seconds	
Benchmark	≤ 0.1%		≤ 0.1%		≥ 98%		= 100%		= 100%		= 100%		= 100%		≥ 95%		≥ 95%	
	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP
Aircel	0.00%	0.00%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.69%	97.69%	98.55%	98.55%
Airtel	0.01%	0.01%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.58%	97.58%
BSNL	0.00%	0.01%	0.00%	0.01%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.78%	98.18%
Idea	0.06%	0.06%	0.00%	0.00%	99.99%	99.99%	100%	100%	100%	100%	100%	100%	100%	100%	99.38%	99.38%	98.64%	98.64%
MTS	0.00%	0.00%	0.01%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.00%	98.10%	94.39%	95.58%
RCOM CDMA	0.08%	0.08%	0.02%	0.02%	100%	100%	100%	100%	100%	100%	100%	100%	100.00%	93.13%	98.10%	98.26%	95.58%	96.20%
RCOM GSM	0.08%	0.08%	0.09%	0.09%	100%	100%	100%	100%	100%	100%	100%	100%	93.13%	96.36%	98.26%	98.37%	88.71%	88.77%
TELENOR	NA	NA	0.00%	0.01%	100%	100%	100%	100%	100%	NA	100%	NA	100%	NA	99.07%	99.07%	99.51%	99.51%
TTSL CDMA	0.00%	0.00%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	96%	100%	98.07%	98.07%	99.69%	99.69%
TTSL GSM	0.00%	0.00%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.21%	99.27%	95.19%	95.19%
Vodafone	0.19%	0.19%	0.17%	0.17%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	94.31%	94.39%

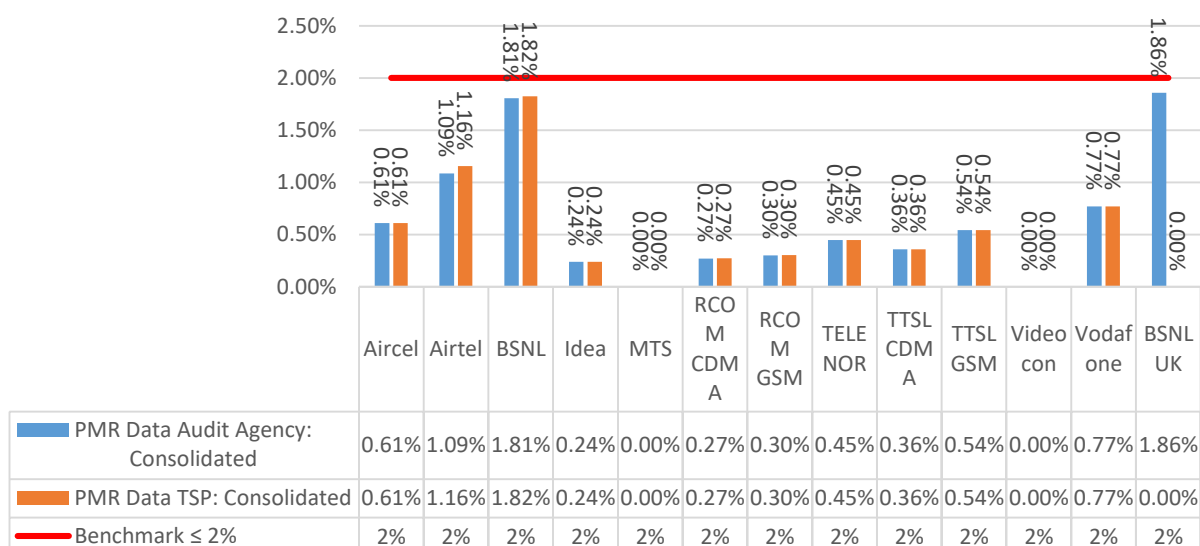
12.3. Key findings: BTS Accumulated Downtime

BTSs Accumulated downtime (not available for service) (%age)



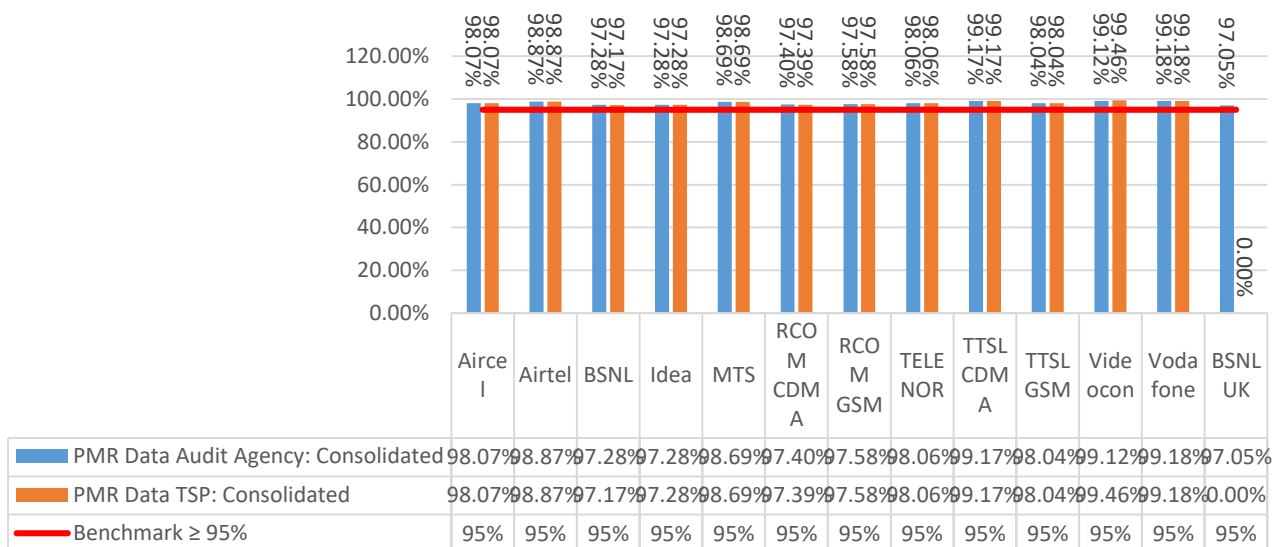
12.4. Key findings: Worst Affected BTSs due to Downtime

Worst affected BTSs due to downtime (%age)

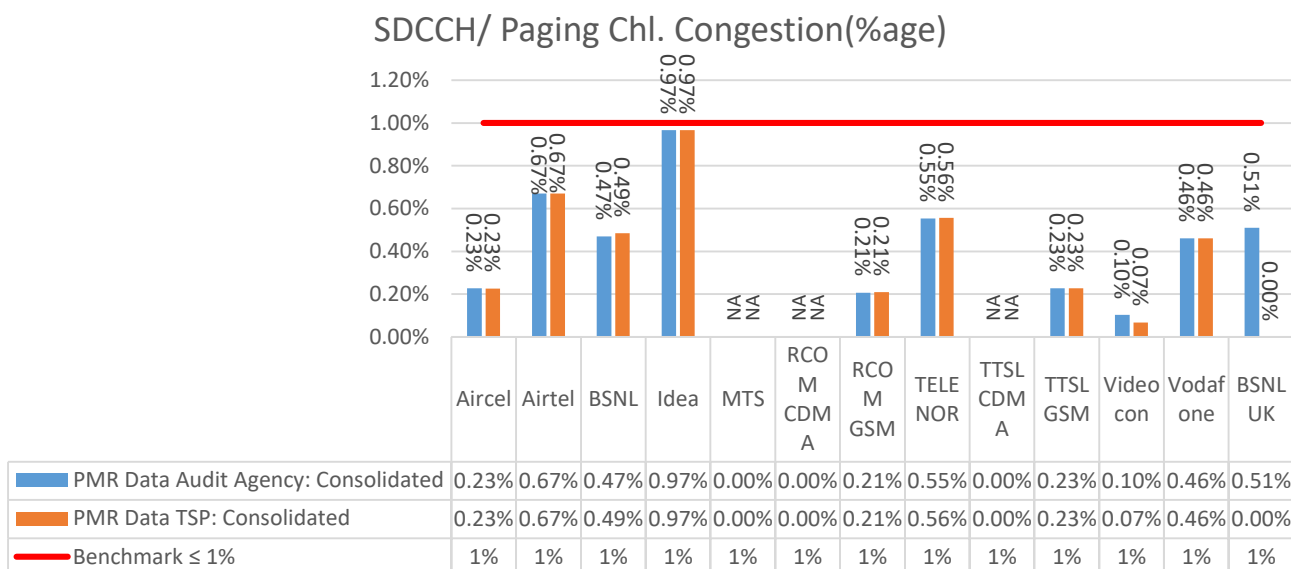


12.5. Key findings: Call Setup Success Rate

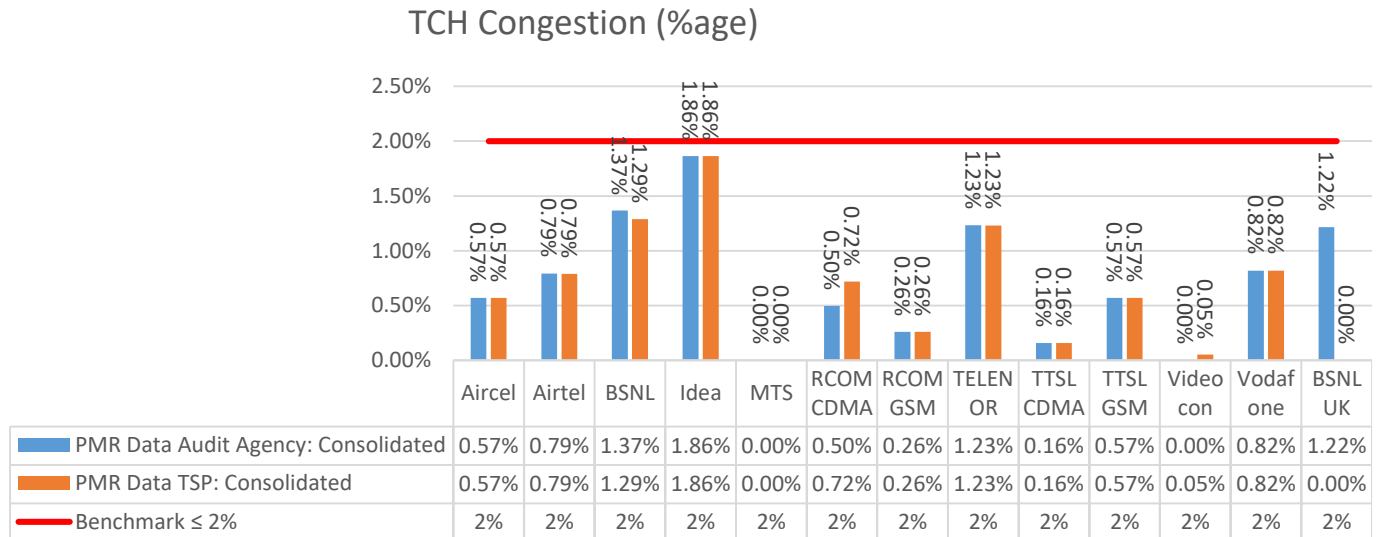
Call Set-up Success Rate (within licensee's own network)



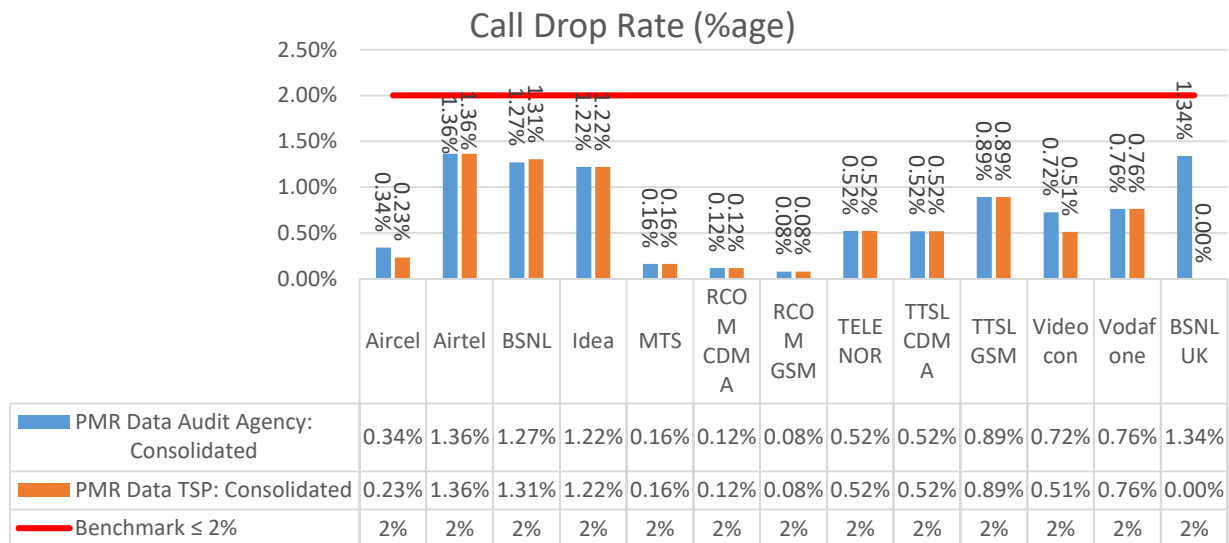
12.6. Key findings: SDCCH / Paging Chl. Congestion



12.7. Key findings: TCH Congestion

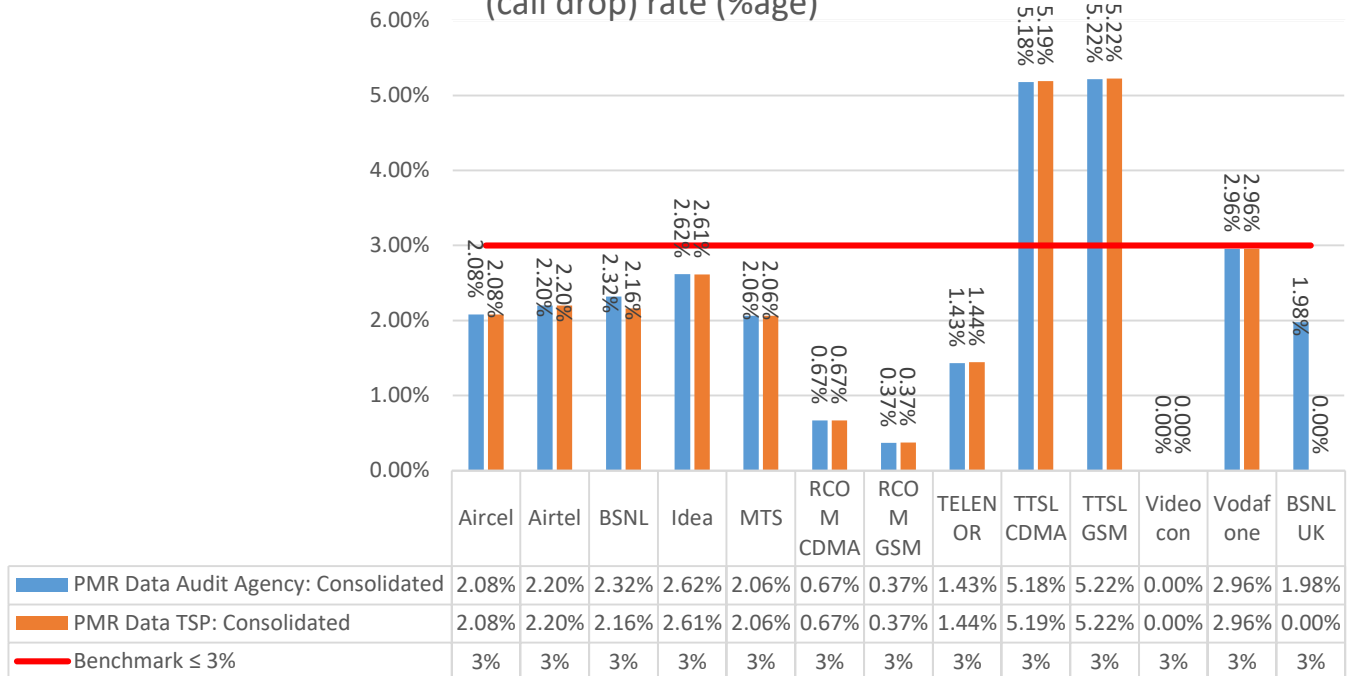


12.8. Key findings: Call Drop Rate



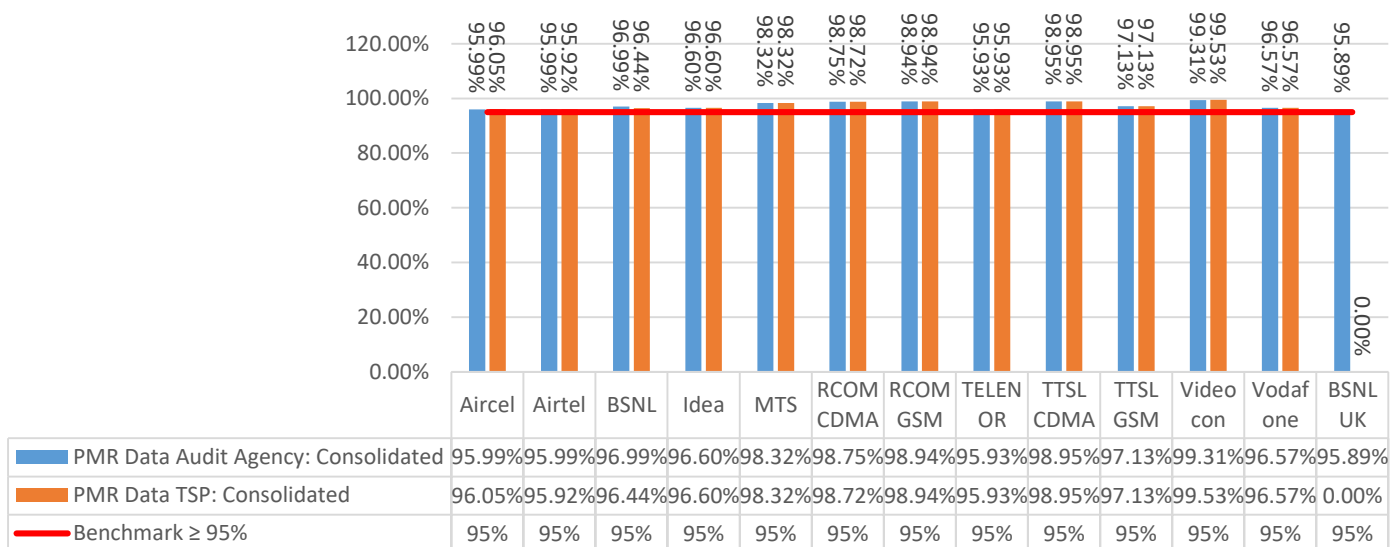
12.9. Key findings: Worst effected cell more than 3% TCH drop

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



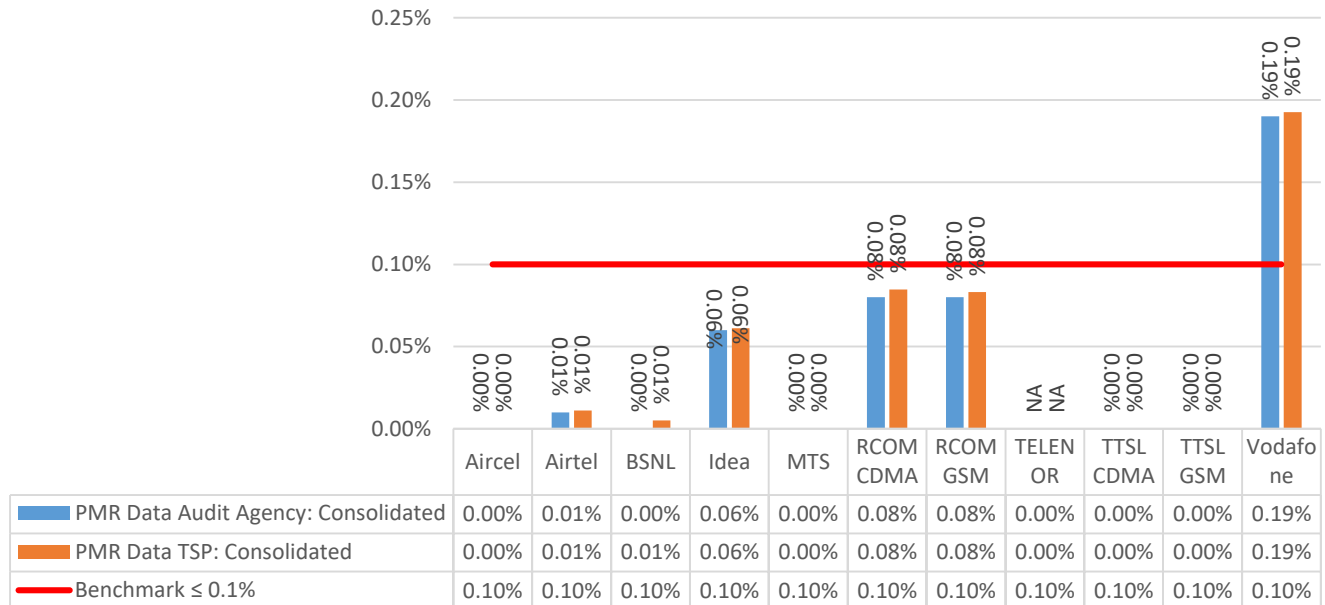
12.10. Key findings: Connection with good voice quality

Connection with good voice quality



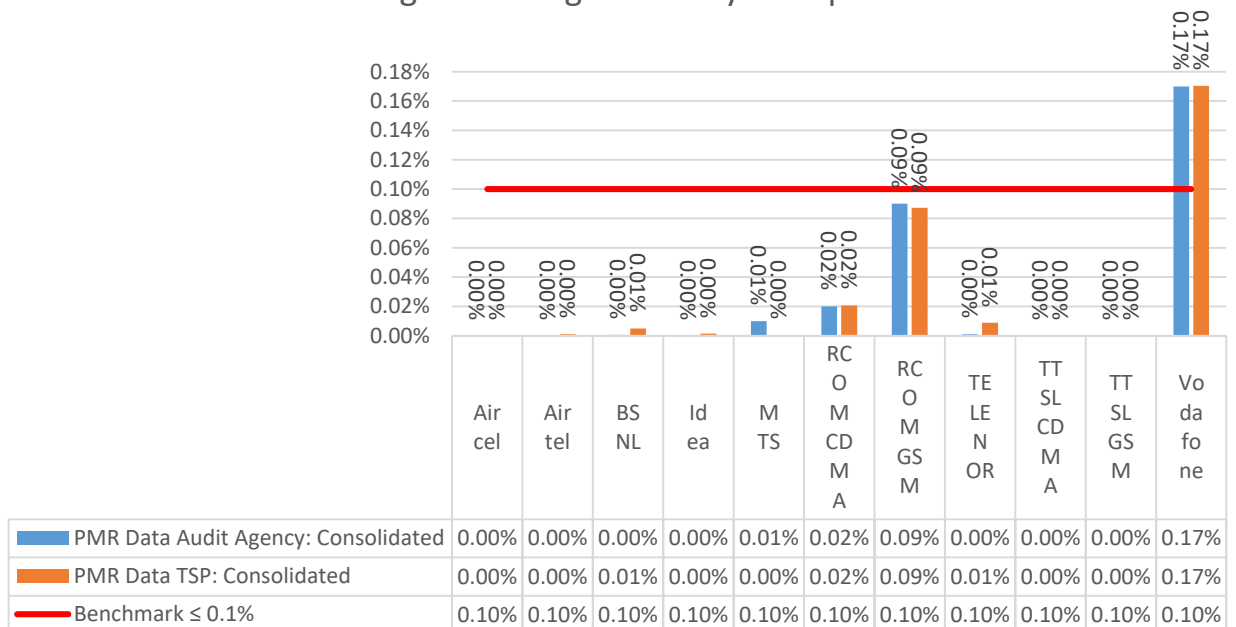
12.11. Key findings: Metering and Billing Credibility: Post Paid

Metering and billing credibility - Post paid



12.12. Key findings: Metering and Billing Credibility: Prepaid

Metering and billing credibility - Pre paid



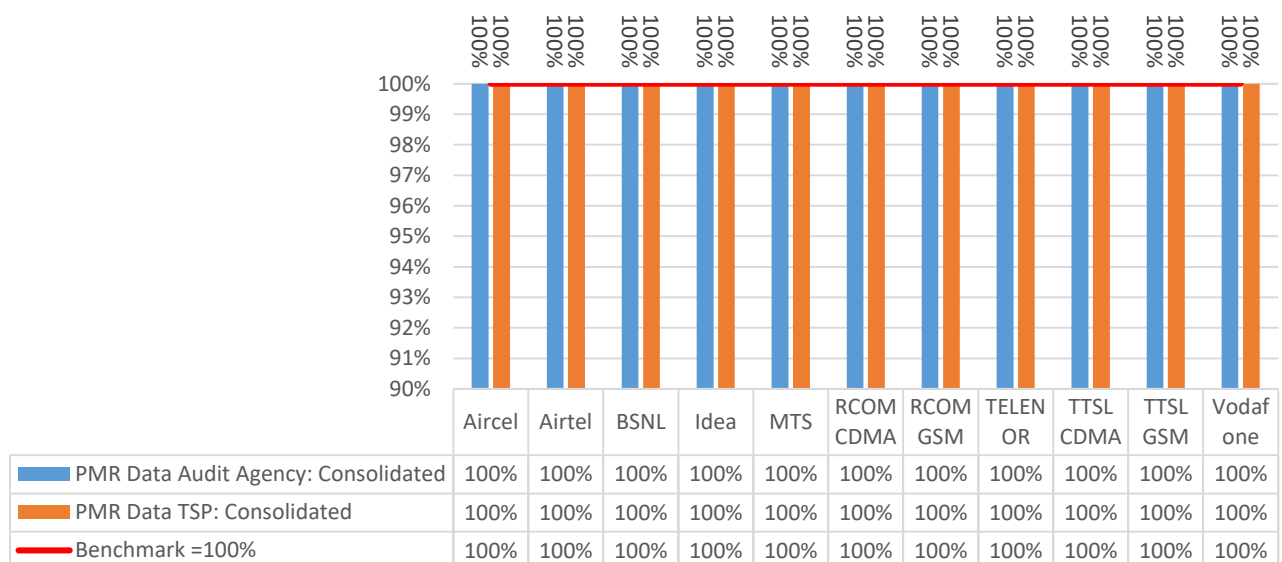
12.13. Key findings: Resolution of billing/charging complaints within 4 weeks

Resolution of billing/charging complaints within 4 weeks



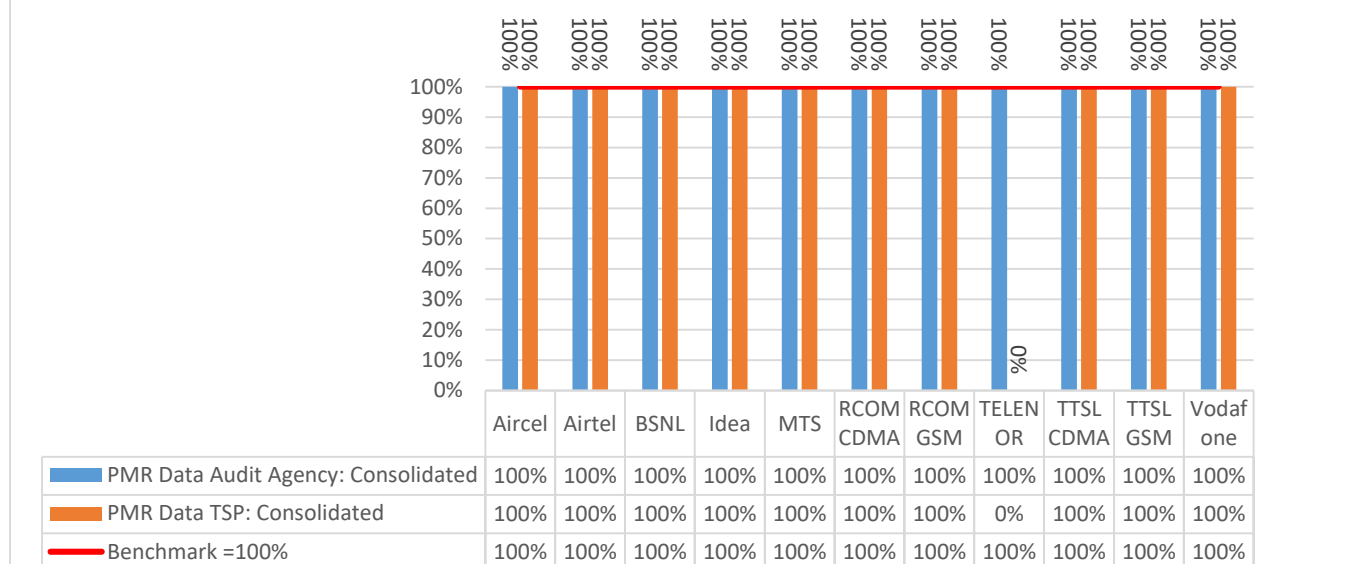
12.14. Key findings: Resolution of billing/charging complaints within 6 weeks

Resolution of billing/charging complaints within 6 weeks



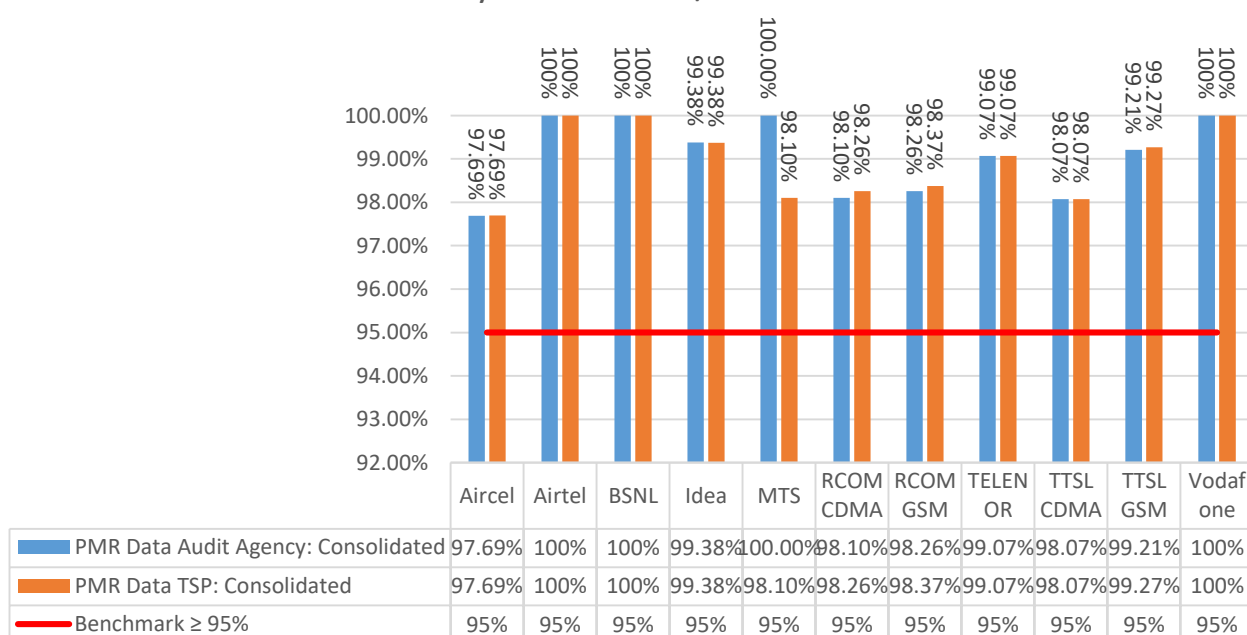
12.15. Key findings: Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints

Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints



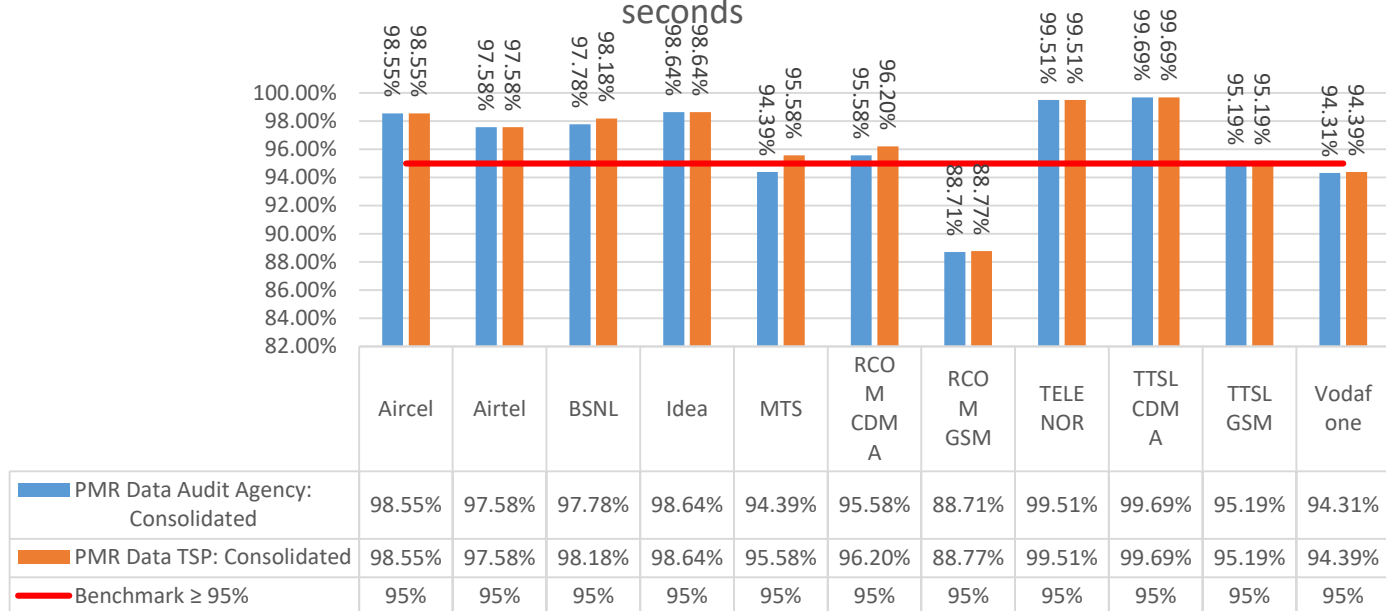
12.16. Key findings: Accessibility of call centre/ customer care

Accessibility of call centre/ customer care



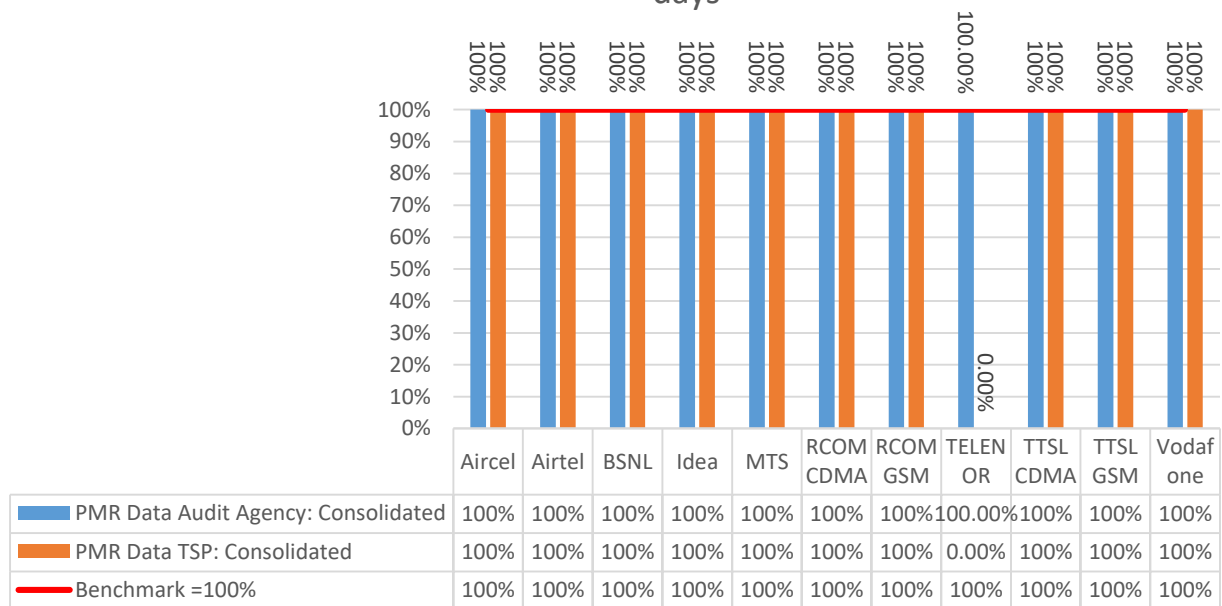
12.17. Key findings: Percentage of calls answered by the operators (voice to voice) within 90 seconds

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



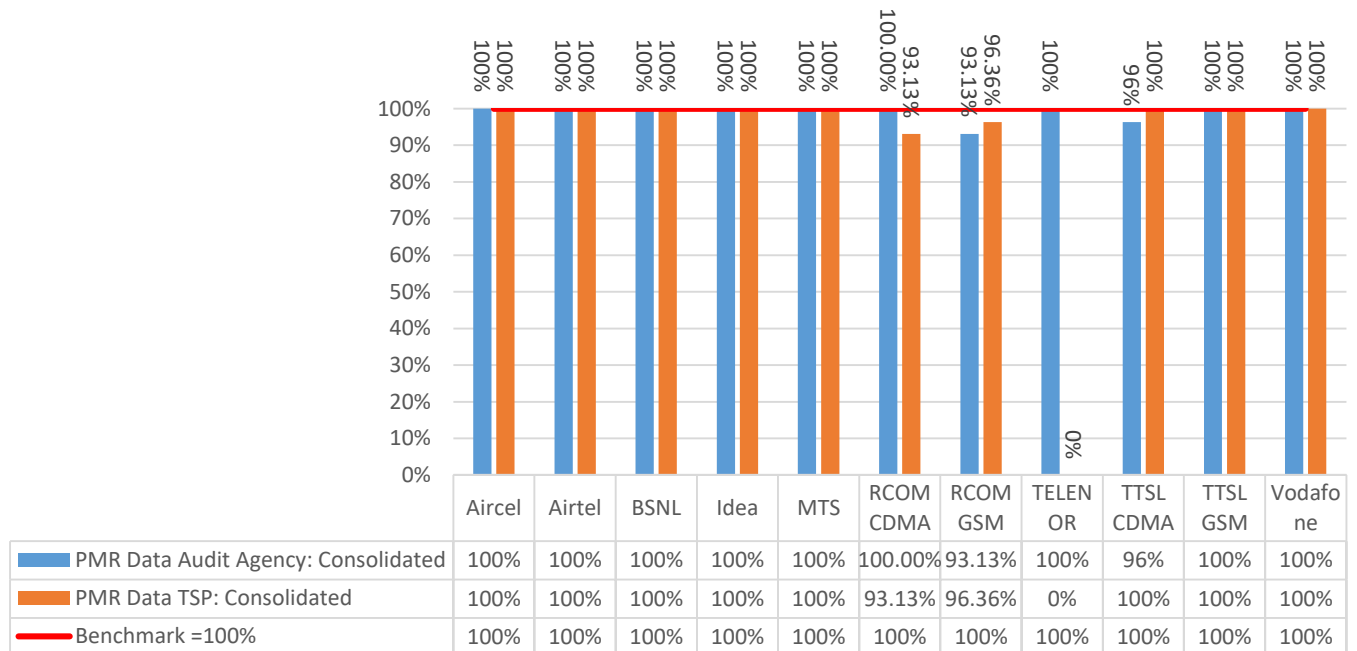
12.18. Key findings: Percentage requests for Termination / Closure of service complied within 7 days

%Age Requests for Termination / Closure of service complied within 7 days



12.19. Key findings: Time taken for refund of deposits after closures within 60 days

Time taken for refund of deposits after closures within 60 days



13. 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 October, November and December, 2015 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.

13.1. NOVEMBER: ALMORA SSA

Month	Name of SSA covered	Drive Test Schedule
November 2015	ALMORA	November 26, 2015 to November 28, 2015

Note: BSNL has not provided the drive test log files and reports within the speculated time and hence their respective reports are not included in the below mentioned drive test report.

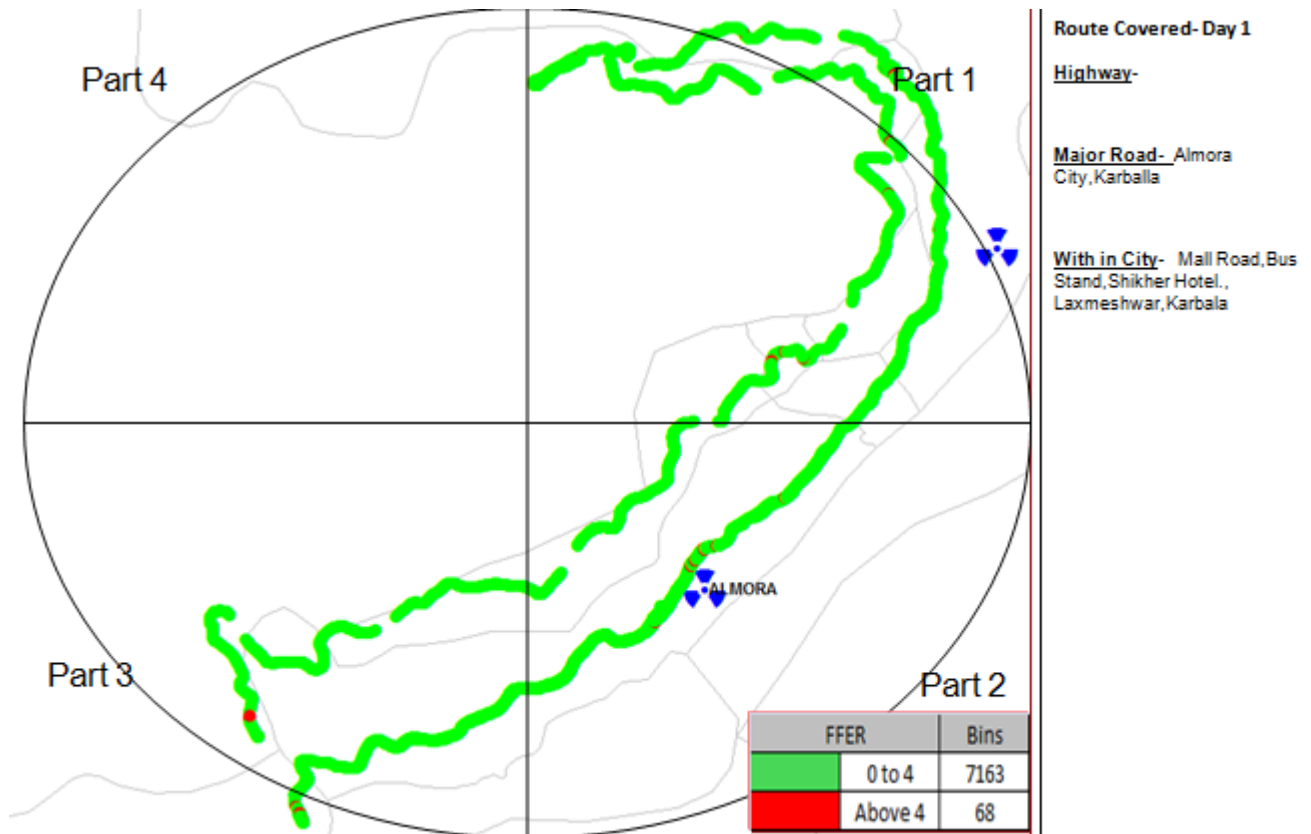
13.2. DISTANCE COVERED: ALMORA SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
Almora SSA	123 km	110 km	80km

13.3. ROUTE MAP: ALMORA SSA: DAY 1

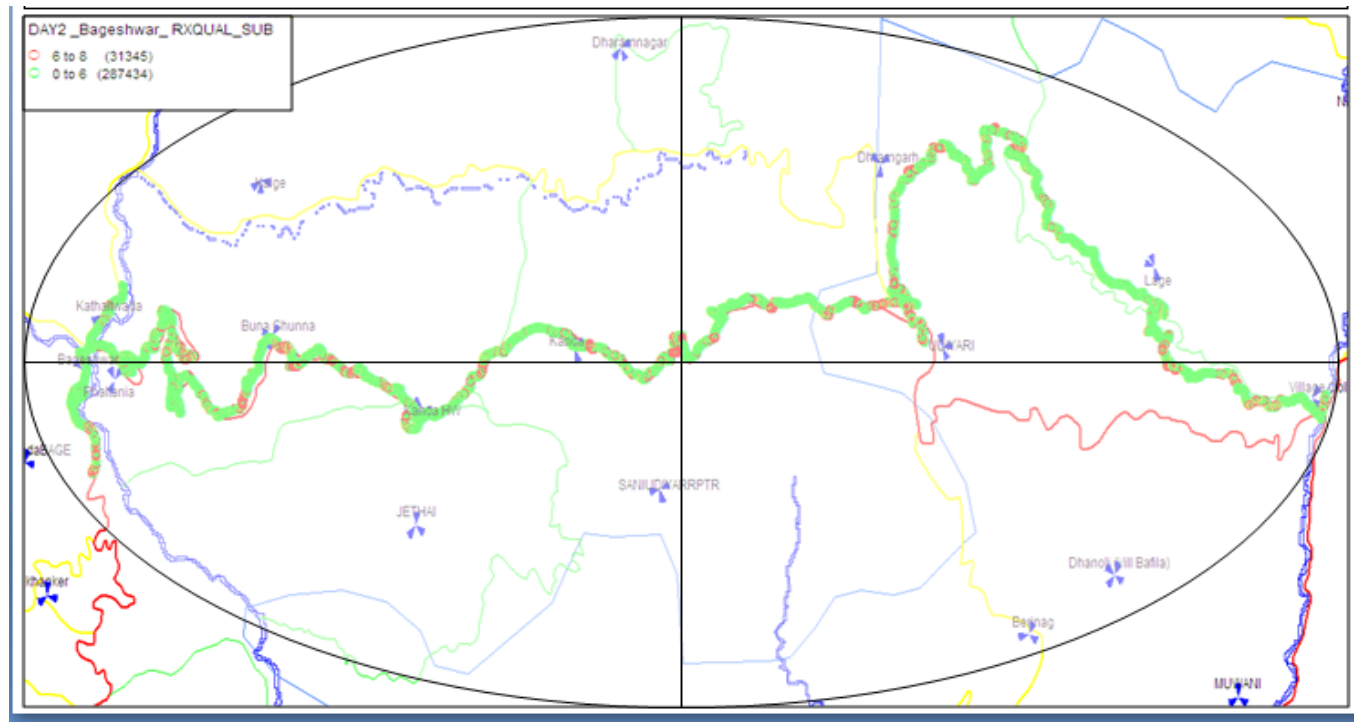
SSA: Delhi
Outdoor
Route Name
KARBALA-MALL ROAD-POST OFFICE-BUS STAND-SHIKHAR HOTEL-
GAS GODAM-LAXAMESHWAR-LOWER MALL ROAD-BASE HOSPITAL-
KARBALA-DHARANAULA-AWAS VIKAS-LAXAMESHWAR-KOSI-MANAN-
Indoor
Route Name

SHIKHAR HOTEL ALMORA
SIDDHARTHA HOTEL BAGESHWAR



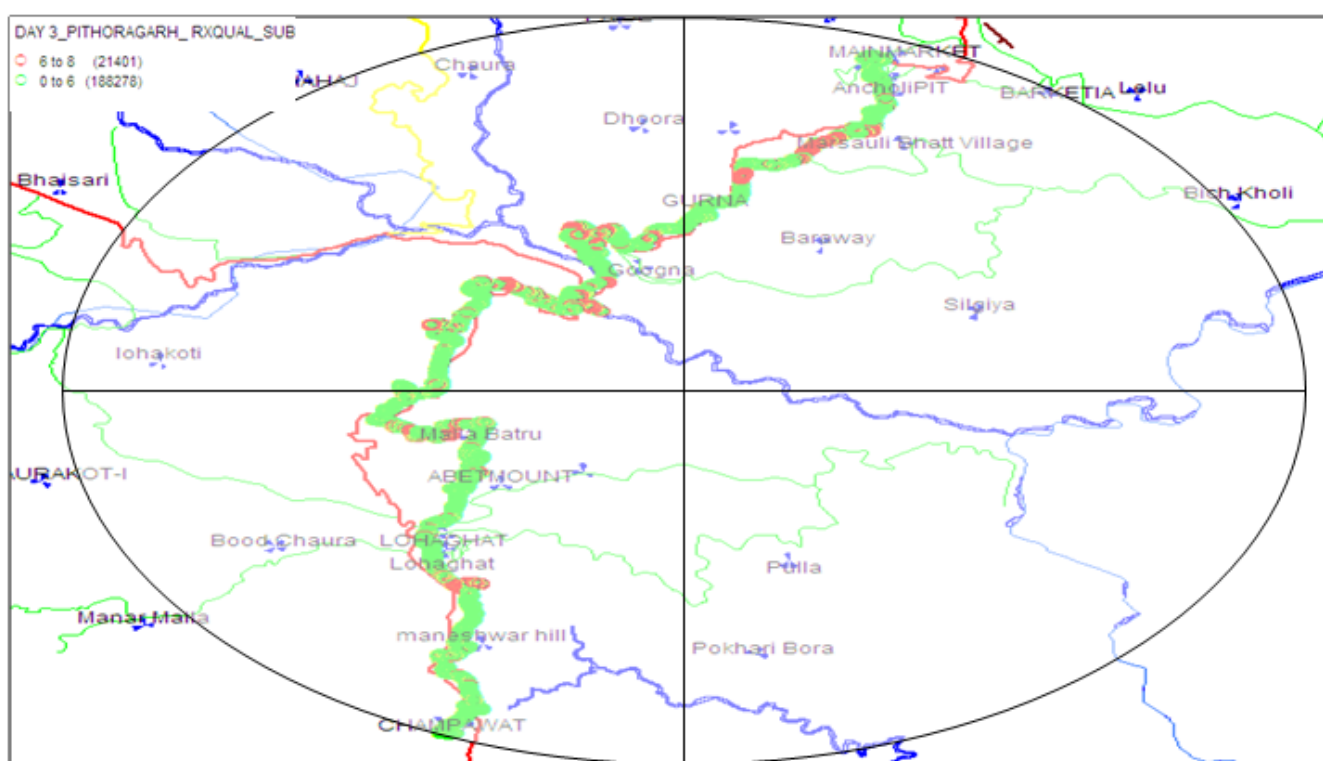
SSA: Almora	
Outdoor	
Route Name	
BAGESHWAR SIDDHARTHA HOTEL-BUS STAND-TRC-BILONA-PINDARI ROAD-	
KANDA ROAD -VIJAYPUR-KAMERIDEVI-KOTMANYA-PANKHU-	
THAL-JAJARDEVAL PITHORAGARH-ITBP-SILTHAM CHAURAH-	
BANK ROAD-PANDEYGAON-ROADWAYS-BIN ROAD-SILTHAM BANK ROAD	
BAGESHWAR SIDDHARTHA HOTEL-BUS STAND-TRC-BILONA-PINDARI ROAD-	
Indoor	
Route Name	
HOTEL MEHTA/PETROL PUMP,THAL	
JYONAR HOTEL PITHORAGARH	

13.4. ROUTE MAP: BAGHESHWAR SSA: DAY 2



13.5. ROUTE MAP: ALMORA SSA: DAY 3

SSA: pithoragarh	
Outdoor	
Route Name	
PITHORAGARH - AINCHOLI-GURNA-GHAT-BAPRU-MARORAKHAN	
LOHAGHAT-MANESHWAR-CHHATARPUL-CHAMPAWAT-	
BUS STOP-TRC CHAMPAWAT-JAYEKA HOTEL	
Indoor	
Route Name	
JYONAR HOTEL PITHORAGARH	
JAYEKA HOTEL CHAMPAWAT	



13.6. DRIVE REPORT ANALYSIS

13.6.1. AIRTEL DAY 1:

SSA (Urban/Rural)-Day 1			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	44240	50212	88.11
$1 \leq S < 2$	846	50212	1.68
$2 \leq S < 3$	941	50212	1.87
$3 \leq S < 4$	917	50212	1.83
$4 \leq S < 5$	837	50212	1.67
$5 \leq S < 6$	936	50212	1.86
$6 \leq S$	1495	50212	2.98
RxLev	Samples	Total	%
0 to ≥ -75	22408	53855	41.61
0 to ≥ -85	37380	53855	69.41
0 to ≥ -95	49172	53855	91.3

Office Complex SSA (Urban/Rural)- Day 1			
RxQual	Samples (S)	Total	%

$0 \leq S < 1$	6320	6360	99.37
$1 \leq S < 2$	5	6360	0.08
$2 \leq S < 3$	9	6360	0.14
$3 \leq S < 4$	4	6360	0.06
$4 \leq S < 5$	4	6360	0.06
$5 \leq S < 6$	3	6360	0.05
$6 \leq S$	15	6360	0.24
RxLev	Samples	Total	%
0 to ≥ -75	5700	6552	87
0 to ≥ -85	6334	6552	96.67
0 to ≥ -95	6550	6552	99.97

Over All SSA Drive Test Details Day-1			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	54123	56572	95.67
Total Call Attempt	238		
Blocked Call Rate ($\leq 3\%$)	0.00%		
Dropped Call Rate ($\leq 2\%$)	0.84%		
Call Setup Success Rate ($\geq 95\%$)	98.32%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		
RxLev	Samples	Total	%
0 to ≥ -75	28108	60407	46.53
0 to ≥ -85	43714	60407	72.37
0 to ≥ -95	55722	60407	92.24

13.6.2. AIRTEL DAY 2:

SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	31381	37192	84.38	
$1 \leq S < 2$	751	37192	2.02	
$2 \leq S < 3$	776	37192	2.09	
$3 \leq S < 4$	772	37192	2.08	
$4 \leq S < 5$	719	37192	1.93	
$5 \leq S < 6$	909	37192	2.44	
$6 \leq S$	1884	37192	5.07	
RxLev	Samples	Total	%	
0 to ≥ -75	18733	38994	48.04	
0 to ≥ -85	26010	38994	66.7	
0 to ≥ -95	33358	38994	85.55	

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5043	6395	78.86	
$1 \leq S < 2$	159	6395	2.49	
$2 \leq S < 3$	172	6395	2.69	
$3 \leq S < 4$	196	6395	3.06	
$4 \leq S < 5$	176	6395	2.75	
$5 \leq S < 6$	236	6395	3.69	
$6 \leq S$	413	6395	6.46	
RxLev	Samples	Total	%	
0 to ≥ -75	6866	6869	99.96	
0 to ≥ -85	6869	6869	100	
0 to ≥ -95	6869	6869	100	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	40145	43587	92.1	
Total Call Attempt	179			
Blocked Call Rate (<=3%)	0.00%			

Dropped Call Rate ($\leq 2\%$)	1.68%		
Call Setup Success Rate ($\geq 95\%$)	99.44%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		
RxLev	Samples	Total	%
0 to ≥ -75	25599	45863	55.82
0 to ≥ -85	32879	45863	71.69
0 to ≥ -95	40227	45863	87.71

13.6.3. AIRTEL DAY 3:

SSA (Urban/Rural)-Day 3				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	211658	308539	68.6	
$1 \leq S < 2$	11791	308539	3.82	
$2 \leq S < 3$	12146	308539	3.94	
$3 \leq S < 4$	13079	308539	4.24	
$4 \leq S < 5$	14236	308539	4.61	
$5 \leq S < 6$	16022	308539	5.19	
$6 \leq S$	29607	308539	9.6	
RxLev	Samples	Total	%	
0 to ≥ -75	162732	167966	96.88	
0 to ≥ -85	166154	167966	98.92	
0 to ≥ -95	167239	167966	99.57	

Office Complex SSA (Urban/Rural)- Day 3				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	4739	6441	73.58	
$1 \leq S < 2$	304	6441	4.72	
$2 \leq S < 3$	290	6441	4.5	
$3 \leq S < 4$	317	6441	4.92	
$4 \leq S < 5$	271	6441	4.21	
$5 \leq S < 6$	269	6441	4.18	
$6 \leq S$	251	6441	3.9	
RxLev	Samples	Total	%	

0 to > = -75	5911	6695	88.29
0 to > = -85	6689	6695	99.91
0 to > = -95	6695	6695	100

Over All SSA Drive Test Details Day-3				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	285122	314980	90.52	
Total Call Attempt	221			
Blocked Call Rate (<=3%)	0.90%			
Dropped Call Rate (<=2%)	0.46%			
Call Setup Success Rate (>=95%)	99.25%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.35%			
RxLev	Samples	Total	%	
0 to > = -75	168643	174661	96.55	
0 to > = -85	172843	174661	98.96	
0 to > = -95	173934	174661	99.58	

13.6.4. AIRTEL OVERALL

Over All SSA Details				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	117549	134217	87.58	
$1 \leq S < 2$	2161	134217	1.61	
$2 \leq S < 3$	2316	134217	1.73	
$3 \leq S < 4$	2352	134217	1.75	
$4 \leq S < 5$	2187	134217	1.63	
$5 \leq S < 6$	2637	134217	1.96	
$6 \leq S$	5015	134217	3.74	
RxLev	Samples	Total	%	
0 to > = -75	74163	141504	52.41	
0 to > = -85	104799	141504	74.06	
0 to > = -95	129335	141504	91.4	

Total Calls Attempt (A)	554
Total Calls Blocked (B)	2
Blocked Call Rate in % (B*100/A)	0.36%
Total Calls Established ('C)	548
Total Calls Drop (D)	5
Dropped Calls Rate in % (D*100/C)	0.91%
Call Setup Success Rate in % (C*100/A)	98.92%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%

13.6.5. MTS CDMA: DAY 1

SSA (Urban/Rural)-Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5536	7231	76.56	
$1 \leq S < 2$	1065	7231	14.73	
$2 \leq S < 3$	293	7231	4.05	
$3 \leq S < 4$	217	7231	3	
$4 \leq S < 5$	71	7231	0.98	
$5 \leq S < 6$	24	7231	0.33	
$6 \leq S$	25	7231	0.35	
RxLev	Samples	Total	%	
0 to ≥ -75	7376	8153	90.47	
0 to ≥ -85	7776	8153	95.38	
0 to ≥ -95	8087	8153	99.19	

Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	1741	3016	57.73	
$1 \leq S < 2$	932	3016	30.9	
$2 \leq S < 3$	17	3016	0.56	
$3 \leq S < 4$	255	3016	8.45	
$4 \leq S < 5$	42	3016	1.39	

$5 \leq S < 6$	16	3016	0.53	
$6 \leq S$	13	3016	0.43	
RxLev	Samples	Total	%	
0 to ≥ -75	3308	3381	97.84	
0 to ≥ -85	3334	3381	98.61	
0 to ≥ -95	3359	3381	99.35	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	10110	10247	98.66	
0-5 (with frequency hopping				
Total Call Attempt	84			
Blocked Call Rate (<=3%)	0.00%			
Dropped Call Rate (<=2%)	0.00%			
Call Setup Success Rate (>=95%)	100.00%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%			
RxLev	Samples	Total	%	
0 to > = -75	10684	11534	92.63	
0 to > = -85	11110	11534	96.32	
0 to > = -95	11446	11534	99.24	

13.6.6. MTS OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	7277	10247	71.02
$1 \leq S < 2$	1997	10247	19.49
$2 \leq S < 3$	310	10247	3.03
$3 \leq S < 4$	472	10247	4.61
$4 \leq S < 5$	113	10247	1.1

$5 \leq S < 6$	40	10247	0.39
$6 \leq S$	38	10247	0.37
RxLev	Samples	Total	%
0 to ≥ -75	10684	11534	92.63
0 to ≥ -85	11110	11534	96.32
0 to ≥ -95	11446	11534	99.24

Total Calls Attempt (A)	84
Total Calls Blocked (B)	0
Blocked Call Rate in % ($B \times 100/A$)	0.00%
Total Calls Established ('C)	84
Total Calls Drop (D)	0
Dropped Calls Rate in % ($D \times 100/C$)	0.00%
Call Setup Success Rate in % ($C \times 100/A$)	100.00%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%

13.6.7. IDEA: DAY 1

SSA (Urban/Rural)-Day 1					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S < 1$	37118	53357	69.57		
$1 \leq S < 2$	2919	53357	5.47		
$2 \leq S < 3$	3262	53357	6.11		
$3 \leq S < 4$	0	53357	0		
$4 \leq S < 5$	3900	53357	7.31		
$5 \leq S < 6$	0	53357	0		
$6 \leq S$	6158	53357	11.54		
RxLev	Samples	Total	%		
0 to ≥ -75	38292	55526	68.96		
0 to ≥ -85	53293	55526	95.98		
0 to ≥ -95	55464	55526	99.89		

Office Complex SSA (Urban/Rural)- Day 1					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S < 1$	4854	6458	75.16		
$1 \leq S < 2$	446	6458	6.91		
$2 \leq S < 3$	441	6458	6.83		
$3 \leq S < 4$	0	6458	0		

$4 \leq S < 5$	474	6458	7.34	
$5 \leq S < 6$	0	6458	0	
$6 \leq S$	243	6458	3.76	
RxLev	Samples	Total	%	
0 to ≥ -75	6800	6815	99.78	
0 to ≥ -85	6815	6815	100	
0 to ≥ -95	0	6815	0	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	53414	59815	89.3	
Total Call Attempt	235			
Blocked Call Rate (<=3%)	0.85%			
Dropped Call Rate (<=2%)	2.13%			
Call Setup Success Rate (>=95%)	97.45%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.96%			
RxLev	Samples	Total	%	
0 to > = -75	45092	62341	72.33	
0 to > = -85	60108	62341	96.42	
0 to > = -95	62279	62341	99.9	

13.6.8. IDEA: DAY 2

SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	27443	37340	73.49	
$1 \leq S < 2$	1700	37340	4.55	

$2 \leq S < 3$	1787	37340	4.79	
$3 \leq S < 4$	0	37340	0	
$4 \leq S < 5$	2233	37340	5.98	
$5 \leq S < 6$	0	37340	0	
$6 \leq S$	4177	37340	11.19	
RxLev	Samples	Total	%	
0 to ≥ -75	32152	39054	82.33	
0 to ≥ -85	38458	39054	98.47	
0 to ≥ -95	39036	39054	99.95	

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5615	6454	87	
$1 \leq S < 2$	311	6454	4.82	
$2 \leq S < 3$	266	6454	4.12	
$3 \leq S < 4$	0	6454	0	
$4 \leq S < 5$	156	6454	2.42	
$5 \leq S < 6$	0	6454	0	
$6 \leq S$	106	6454	1.64	
RxLev	Samples	Total	%	
0 to ≥ -75	6347	6726	94.37	
0 to ≥ -85	6700	6726	99.61	
0 to ≥ -95	6726	6726	100	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	38511	42538	90.53	
Total Call Attempt	173			
Blocked Call Rate ($\leq 3\%$)	4.62%			
Dropped Call Rate ($\leq 2\%$)	0.58%			
Call Setup Success Rate ($\geq 95\%$)	95.38%			

Handover Success Rate % (total HO Success * 100/Total HO attempt)	98.55%		
RxLev	Samples	Total	%
0 to > = -75	37644	44494	84.6
0 to > = -85	43900	44494	98.66
0 to > = -95	44481	44494	99.97

13.6.9. IDEA: DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	23361	29368	79.55
1 ≤ S < 2	1269	29368	4.32
2 ≤ S < 3	1358	29368	4.62
3 ≤ S < 4	0	29368	0
4 ≤ S < 5	1419	29368	4.83
5 ≤ S < 6	0	29368	0
6 ≤ S	1961	29368	6.68
RxLev	Samples	Total	%
0 to > = -75	23711	30875	76.8
0 to > = -85	29961	30875	97.04
0 to > = -95	30851	30875	99.92

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	5714	6442	88.7
1 ≤ S < 2	232	6442	3.6
2 ≤ S < 3	230	6442	3.57
3 ≤ S < 4	0	6442	0
4 ≤ S < 5	176	6442	2.73
5 ≤ S < 6	0	6442	0
6 ≤ S	90	6442	1.4
RxLev	Samples	Total	%
0 to > = -75	6959	6962	99.96
0 to > = -85	6962	6962	100
0 to > = -95	0	6962	0

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	33759	35810	94.27
Total Call Attempt	145		
Blocked Call Rate (<=3%)	1.38%		
Dropped Call Rate (<=2%)	0.00%		
Call Setup Success Rate (>=95%)	97.93%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	93.48%		
RxLev	Samples	Total	%
0 to > = -75	30670	37837	81.06
0 to > = -85	36923	37837	97.58
0 to > = -95	37813	37837	99.94

13.6.10. IDEA: OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	103316	138163	74.78
1 ≤ S < 2	6821	138163	4.94
2 ≤ S < 3	7281	138163	5.27
3 ≤ S < 4	0	138163	0
4 ≤ S < 5	8266	138163	5.98
5 ≤ S < 6	0	138163	0
6 ≤ S	12479	138163	9.03
RxLev	Samples	Total	%
0 to > = -75	113406	144672	78.40%
0 to > = -85	27525	144672	19.00%
0 to > = -95	3642	144672	2.50%

Total Calls Attempt (A)	553
Total Calls Blocked (B)	12
Blocked Call Rate in % (B*100/A)	2.17%
Total Calls Established (C)	536

Total Calls Drop (D)	6
Dropped Calls Rate in % (D*100/C)	1.12%
Call Setup Success Rate in % (C*100/A)	96.93%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.30%

13.6.11. RCOM GSM: DAY 1

SSA (Urban/Rural)-Day 1			
RxQual	Samples (S)	Total	%
$0 \leq S \leq 1$	87807	96140	91.33
$1 < S \leq 2$	1186	96140	1.23
$2 < S \leq 3$	1291	96140	1.34
$3 < S \leq 4$	1185	96140	1.23
$4 < S \leq 5$	1275	96140	1.33
$5 < S \leq 6$	1395	96140	1.45
> 6	2001	96140	2.08
RxLev	Samples	Total	%
0 to $> = -75$	33315	45017	74.01
0 to $> = -85$	41289	45017	91.72
0 to $> = -95$	44915	45017	99.77

Office Complex SSA (Urban/Rural)- Day 1			
RxQual	Samples (S)	Total	%
$0 \leq S \leq 1$	39101	39237	99.65
$1 < S \leq 2$	42	39237	0.11
$2 < S \leq 3$	50	39237	0.13
$3 < S \leq 4$	20	39237	0.05
$4 < S \leq 5$	0	39237	0
$5 < S \leq 6$	19	39237	0.05
> 6	5	39237	0.01
RxLev	Samples	Total	%
0 to $> = -75$	18820	19033	98.88
0 to $> = -85$	19033	19033	100
0 to $> = -95$	19033	19033	100

Over All SSA Drive Test Details Day-1			
RxQual	Samples (S)	Total	%

0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	131957	135377	97.47
Total Call Attempt	87		
Blocked Call Rate ($\leq 3\%$)	0		
Dropped Call Rate ($\leq 2\%$)	0		
Call Setup Success Rate ($\geq 95\%$)	100		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100		
RxLev	Samples	Total	%
0 to ≥ -75	52135	64050	81.4
0 to ≥ -85	60322	64050	94.18
0 to ≥ -95	63948	64050	99.84

13.6.12. RCOM GSM :OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
$0 \leq S \leq 1$	126908	135377	93.74
$1 < S \leq 2$	1228	135377	0.91
$2 < S \leq 3$	1341	135377	0.99
$3 < S \leq 4$	1205	135377	0.89
$4 < S \leq 5$	1275	135377	0.94
> 5	1414	135377	1.04
RxLev	Samples	Total	%
0 to ≥ -75 dbm	52135	64050	81.4
0 to ≥ -85 dbm	60322	64050	94.18
0 to ≥ -95 dbm	63948	64050	99.84

Total Calls Attempt (A)	87
Total Calls Blocked (B)	0
Blocked Call Rate in % ($B*100/A$)	0
Total Calls Established (C)	87
Total Calls Drop (D)	0
Dropped Calls Rate in % ($D*100/C$)	0
Call Setup Success Rate in % ($C*100/A$)	100

Handover Success Rate % (total HO Success * 100/Total HO attempt)

100

13.6.13. RCOM CDMA: DAY 1

SSA (Urban/Rural)-Day 1				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	166714	182065	91.57	
$1 < S \leq 2$	8445	182065	4.64	
$2 < S \leq 3$	3367	182065	1.85	
$3 < S \leq 4$	1272	182065	0.7	
$4 < S \leq 5$	439	182065	0.24	
$5 < S \leq 6$	209	182065	0.11	
> 6	1619	182065	0.89	
RxLev	Samples	Total	%	
0 to ≥ -75	135672	182065	74.52	
0 to ≥ -85	164481	182065	90.34	
0 to ≥ -95	181461	182065	99.67	

Office Complex SSA (Urban/Rural)- Day 1				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	77384	77717	99.57	
$1 < S \leq 2$	126	77717	0.16	
$2 < S \leq 3$	50	77717	0.06	
$3 < S \leq 4$	157	77717	0.2	
$4 < S \leq 5$	0	77717	0	
$5 < S \leq 6$	0	77717	0	
> 6	0	77717	0	
RxLev	Samples	Total	%	
0 to ≥ -75	77717	77717	100	
0 to ≥ -85	77717	77717	100	
0 to ≥ -95	77717	77717	100	

Over All SSA Drive Test Details Day-1				
FER	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	257515	259782	99.13	

0-5 (with frequency hopping				
Total Call Attempt	89			
Blocked Call Rate ($\leq 3\%$)	0			
Dropped Call Rate ($\leq 2\%$)	0			
Call Setup Success Rate ($\geq 95\%$)	100			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100			
RxLev	Samples	Total	%	
0 to ≥ -75	213389	259782	82.14	
0 to ≥ -85	242198	259782	93.23	
0 to ≥ -95	259178	259782	99.77	

13.6.14. RCOM OVERALL

Over All SSA Details			
FER	Samples (S)	Total	%
$0 \leq S \leq 1$	244098	259782	93.96
$1 < S \leq 2$	8571	259782	3.3
$2 < S \leq 3$	3417	259782	1.32
$3 < S \leq 4$	1429	259782	0.55
$4 < S \leq 5$	439	259782	0.17
$5 < S \leq 6$	209	259782	0.08
> 6	1619	259782	0.62
RxLev	Samples	Total	%
0 to ≥ -75 dbm	213389	259782	82.14
0 to ≥ -85 dbm	242198	259782	93.23
0 to ≥ -95 dbm	259178	259782	99.77

Total Calls Attempt (A)	89
Total Calls Blocked (B)	0
Blocked Call Rate in % ($B*100/A$)	0
Total Calls Established (C)	89
Total Calls Drop (D)	0
Dropped Calls Rate in % ($D*100/C$)	0
Call Setup Success Rate in % ($C*100/A$)	100

Handover Success Rate % (total HO Success * 100/Total HO attempt)

100

13.6.15. VODAFONE:DAY:1

SSA (Urban/Rural)-Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	28654	43003	66.63	
$1 < S \leq 2$	1977	43003	4.6	
$2 < S \leq 3$	2112	43003	4.91	
$3 < S \leq 4$	2382	43003	5.54	
$4 < S \leq 5$	2924	43003	6.8	
> 5	4954	43003	11.52	
RxLev	Samples	Total	%	
0 to $> = -75$	14440	24679	58.51	
0 to $> = -85$	21864	24679	88.59	
0 to $> = -95$	24033	24679	97.38	

Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	5326	6419	82.97	
$1 < S \leq 2$	227	6419	3.54	
$2 < S \leq 3$	229	6419	3.57	
$3 < S \leq 4$	218	6419	3.4	
$4 < S \leq 5$	243	6419	3.79	
> 5	176	6419	2.74	
RxLev	Samples	Total	%	
0 to $> = -75$	3498	3500	99.94	
0 to $> = -85$	3500	3500	100	
0 to $> = -95$	3500	3500	100	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary

0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	44292	49422	89.62	
Total Call Attempt	211			
Blocked Call Rate (<=3%)	3.317535545			
Dropped Call Rate (<=2%)	3.431372549			
Call Setup Success Rate (>=95%)	96.68246445			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.24137931			
RxLev	Samples	Total	%	
0 to > = -75	17938	28179	63.66	
0 to > = -85	25364	28179	90.01	
0 to > = -95	27533	28179	97.71	

13.6.16. VODAFONE:DAY 2

SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	27486	39349	69.85	
$1 < S \leq 2$	1387	39349	3.52	
$2 < S \leq 3$	1607	39349	4.08	
$3 < S \leq 4$	1706	39349	4.34	
$4 < S \leq 5$	2343	39349	5.95	
> 5	4820	39349	12.25	
RxLev	Samples	Total	%	
0 to > = -75	16072	23066	69.68	
0 to > = -85	21574	23066	93.53	
0 to > = -95	22880	23066	99.19	

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	5333	6396	83.38	
$1 < S \leq 2$	235	6396	3.67	
$2 < S \leq 3$	213	6396	3.33	
$3 < S \leq 4$	199	6396	3.11	

$4 < S \leq 5$	232	6396	3.63
> 5	184	6396	2.88
RxLev	Samples	Total	%
0 to ≥ -75	1435	1443	99.45
0 to ≥ -85	1443	1443	100
0 to ≥ -95	1443	1443	100

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	40741	45745	89.06	
Total Call Attempt	202			
Blocked Call Rate (<=3%)	5.445544554			
Dropped Call Rate (<=2%)	6.806282723			
Call Setup Success Rate (>=95%)	94.55445545			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.32142857			
RxLev	Samples	Total	%	
0 to > = -75	17507	24509	71.43	
0 to > = -85	23017	24509	93.91	
0 to > = -95	24323	24509	99.24	

13.6.17. VODAFONE:DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S \leq 1$	16488	25243	65.32
$1 < S \leq 2$	1129	25243	4.47
$2 < S \leq 3$	1219	25243	4.83
$3 < S \leq 4$	1289	25243	5.11

$4 < S \leq 5$	1684	25243	6.67
> 5	3434	25243	13.6
RxLev	Samples	Total	%
0 to ≥ -75	8504	14017	60.67
0 to ≥ -85	12469	14017	88.96
0 to ≥ -95	13951	14017	99.53

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S \leq 1$	5289	6312	83.79
$1 < S \leq 2$	233	6312	3.69
$2 < S \leq 3$	228	6312	3.61
$3 < S \leq 4$	215	6312	3.41
$4 < S \leq 5$	213	6312	3.37
> 5	134	6312	2.12
RxLev	Samples	Total	%
0 to ≥ -75	1425	1425	100
0 to ≥ -85	1425	1425	100
0 to ≥ -95	1425	1425	100

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	27987	31555	88.69
Total Call Attempt	132		
Blocked Call Rate ($\leq 3\%$)	2.27		
Dropped Call Rate ($\leq 2\%$)	5.426356589		
Call Setup Success Rate ($\geq 95\%$)	97.73		

Handover Success Rate % (total HO Success * 100/Total HO attempt)	98.86		
RxLev	Samples	Total	%
0 to > = -75	9929	15442	64.3
0 to > = -85	13894	15442	89.98
0 to > = -95	15376	15442	99.57

13.6.18. VODAFONE: OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
0 ≤ S ≤ 1	88576	126722	69.9
1 < S ≤ 2	5188	126722	4.09
2 < S ≤ 3	5608	126722	4.43
3 < S ≤ 4	6009	126722	4.74
4 < S ≤ 5	7639	126722	6.03
> 5	13702	126722	10.81
RxLev	Samples	Total	%
0 to > = -75 dbm	45374	68130	66.6
0 to > = -85 dbm	62275	68130	91.41
0 to > = -95 dbm	67232	68130	98.68

Total Calls Attempt (A)	545
Total Calls Blocked (B)	21
Blocked Call Rate in % (B*100/A)	3.85
Total Calls Established ('C)	524
Total Calls Drop (D)	27
Dropped Calls Rate in % (D*100/C)	5.15
Call Setup Success Rate in % (C*100/A)	96.15
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.68

13.7. DRIVE TEST OUTCOME SUMMERY

	Airtel	MTS	Idea	RCOM GSM	RCOM CDMA	Vodafone
Total Calls Attempt (A)	554	84	553	87	89	545
Total Calls Blocked (B)	2	0	12	0	0	21
Blocked Call Rate in % (B*100/A)	0.0036	0.00%	2.17%	0%	0%	3.85%
Total Calls Established (C)	548	84	536	87	89	524
Total Calls Drop (D)	5	0	6	0	0	27
Dropped Calls Rate in % (D*100/C)	0.0091	0.00%	1.12%	0%	0%	5.15
Call Setup Success Rate in % (C*100/A)	0.9892	100.00%	96.93%	100%	100%	96.15%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	1	100.00%	97.30%	100%	100%	97.68%

13.8. DECEMBER: ALIGARH SSA

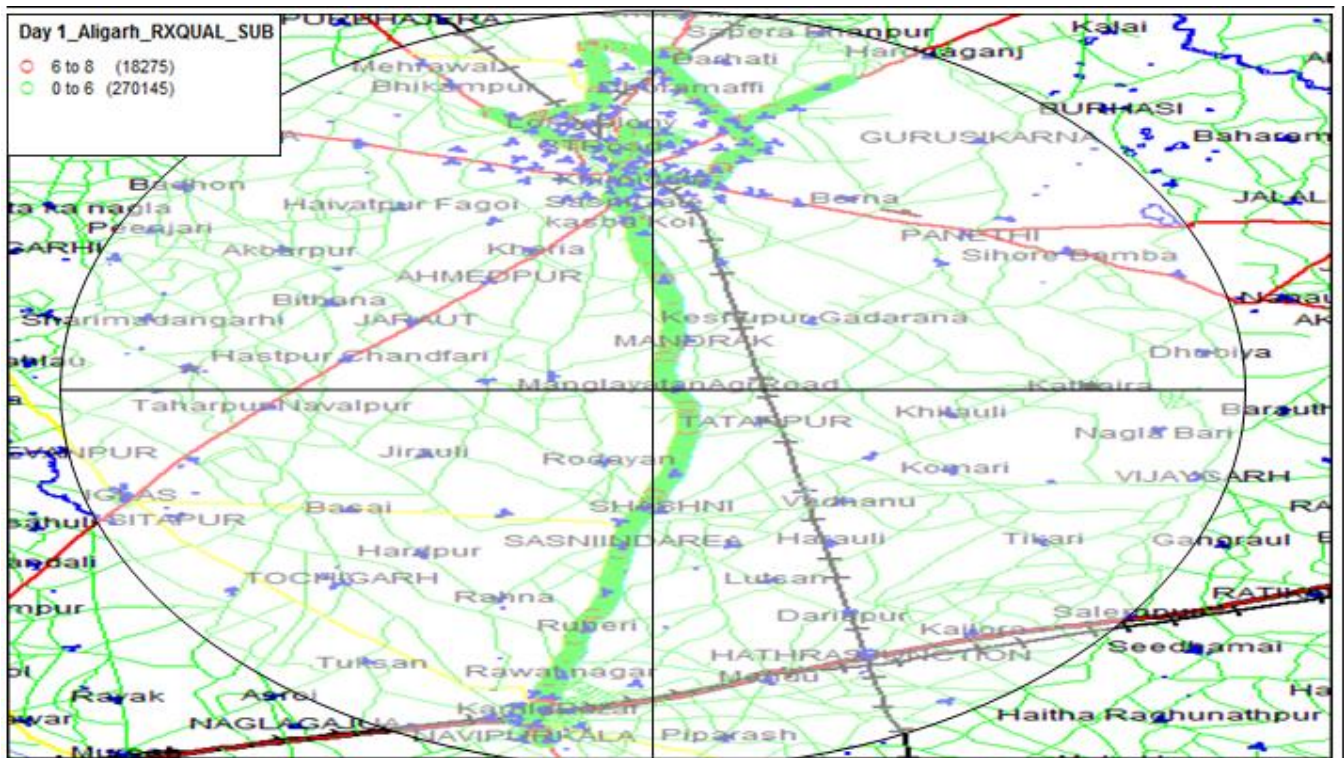
Month	Name of SSA covered	Drive Test Schedule
December 2015	Aligarh	November 26, 2015 to November 28, 2015

13.9. DISTANCE COVERED: ALIGARH SSA

Drive Test Distance Covered	Day 1	Day 2	Day 3
Aligarh SSA	140 km	126 km	110

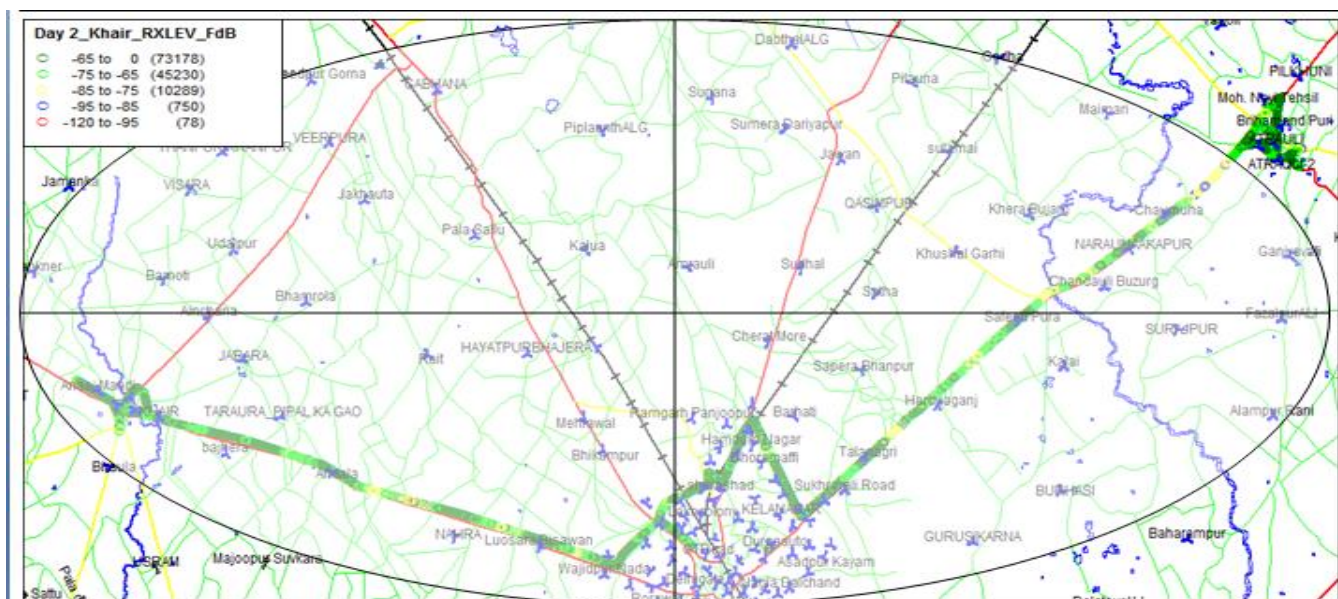
13.10. ROUTE MAP: ALIGARH SSA: DAY 1

SSA: Aligarh
Outdoor
Route Name
With In City:-Aligarh, Numaish Maidan,Banna devi,Baneta Bypass,Nagla patrari, Bagla degree collage,Hathras, Hathars bus adda,Sasni ,Ghandhi pass, gate,Laldiggi,Madar gate.
Highway:-Aligar to hathras highway, aligarh to ramghat highway, aligarh to anoop sahar highway.
Mojoir Road:--Anoopshahar Road,Dhora Bypass,Dhora Bypass, Ruran ghas,Ramghat road.
With In City:-Aligarh, Numaish Maidan,Banna devi,Baneta Bypass,Nagla patrari, Bagla degree collage,Hathras, Hathars bus adda,Sasni ,Ghandhi pass, gate,Laldiggi,Madar gate.
Indoor
Route Name
Auhaja eye centre,Ramghat Road, Aligarh, Bagla degree collage,Hathras



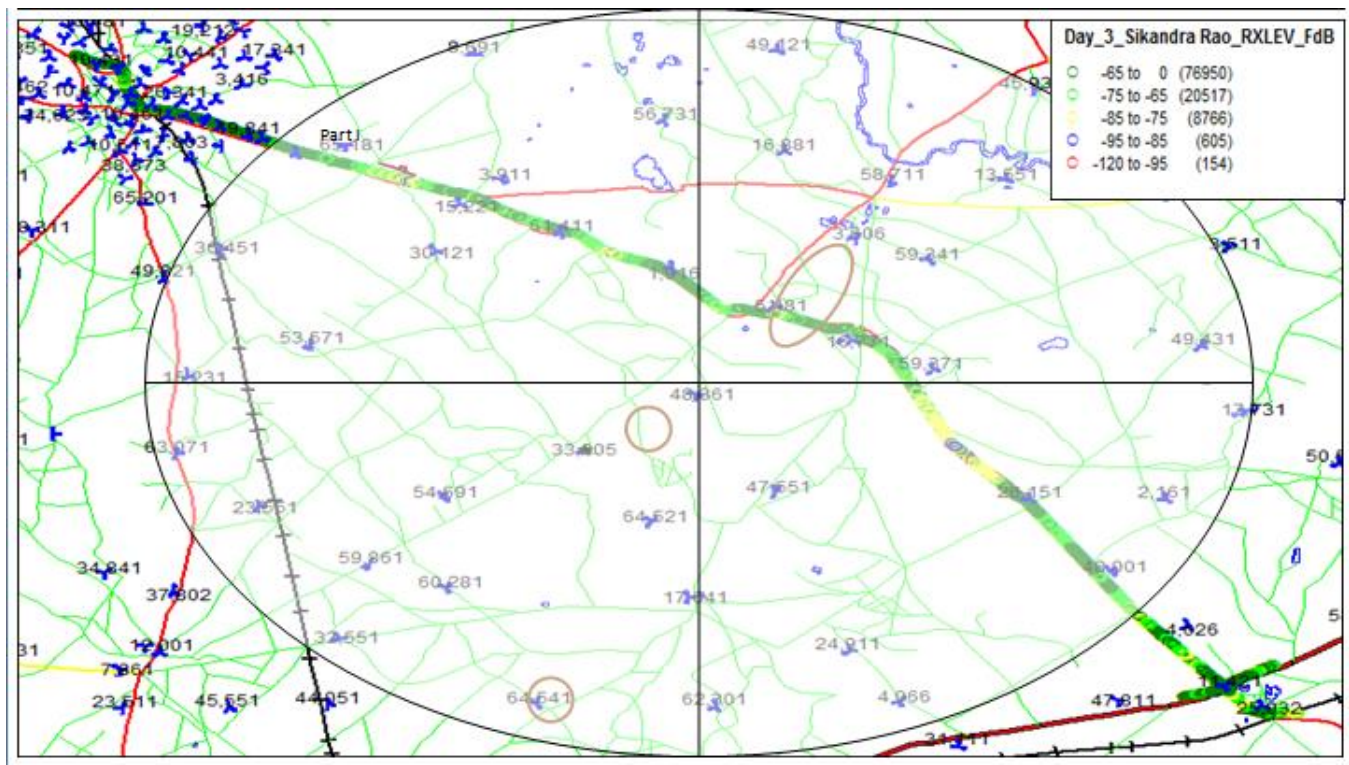
13.11. ROUTE MAP: ALIGARH SSA: DAY 2

SSA: Aligarh
Outdoor
Route Name
Highway:-Aligarh to meerut highway, aligarh to khair highway, Gd Road highway, aligarh to atroli highway.
With In City:-khair bypass, andla, awarsi, atroli, Gazi rur, Tanga stand, katra bazar.
Mojor Road:-Meerut Road, Aligar pahad road, ,taffijar bypass road, main khair road, sommna road, GT road, AMU road, jamd Rur ,Awarsi bypass, rd, ramghat rd, atroli, chari road, chara road, ramghat road.
Indoor
Route Name
State bank, khair, primary helth centre atroli



13.12. ROUTE MAP: ALIGARH SSA: DAY 3

SSA: Aligarh
Outdoor
Route Name
Highway:-aligarh to etha highway ,sikandra to hathras highway, sikandra to bareilly highway
With In City:-Tawalpuri, dharai pur,sindholi,paneti,Akrabad,Gopo,Dant rosd, railway station sikandra rau,Agra bypass, Numaish Maindan, Aligarh
Mojoir Rd:-GT road, Raharganj road, etaha bypass road, sikandraraou Road.
Indoor
Route Name
Kacheri,Sikandra Rao



13.13. DRIVE TEST ANALYSIS

13.13.1 AIRTEL: DAY 1

SSA (Urban/Rural)-Day 1					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S < 1$	40817	49674	82.17		
$1 \leq S < 2$	1574	49674	3.17		
$2 \leq S < 3$	1408	49674	2.83		
$3 \leq S < 4$	1802	49674	3.63		
$4 \leq S < 5$	1694	49674	3.41		
$5 \leq S < 6$	1463	49674	2.95		
$6 \leq S$	916	49674	1.84		
RxLev	Samples	Total	%		
0 to ≥ -75	40007	51162	78.2		
0 to ≥ -85	49967	51162	97.66		
0 to ≥ -95	51137	51162	99.95		

Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5543	6195	89.48	

$1 \leq S < 2$	142	6195	2.29	
$2 \leq S < 3$	119	6195	1.92	
$3 \leq S < 4$	133	6195	2.15	
$4 \leq S < 5$	121	6195	1.95	
$5 \leq S < 6$	104	6195	1.68	
$6 \leq S$	33	6195	0.53	
RxLev	Samples	Total	%	
0 to $> = -75$	4090	6436	63.55	
0 to $> = -85$	6309	6436	98.03	
0 to $> = -95$	6436	6436	100	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	54920	55869	98.3	
Total Call Attempt	228			
Blocked Call Rate (<=3%)	0.00%			
Dropped Call Rate (<=2%)	0.00%			
Call Setup Success Rate (>=95%)	100.00%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.59%			
RxLev	Samples	Total	%	
0 to > = -75	44097	57598	76.56	
0 to > = -85	56276	57598	97.7	
0 to > = -95	57573	57598	99.96	

13.13.2 AIRTEL: DAY 2

SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	37876	45482	83.28	

$1 \leq S < 2$	1076	45482	2.37	
$2 \leq S < 3$	918	45482	2.02	
$3 \leq S < 4$	1287	45482	2.83	
$4 \leq S < 5$	1358	45482	2.99	
$5 \leq S < 6$	1303	45482	2.86	
$6 \leq S$	1664	45482	3.66	
RxLev	Samples	Total	%	
0 to ≥ -75	26603	47181	56.38	
0 to ≥ -85	40645	47181	86.15	
0 to ≥ -95	46621	47181	98.81	

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	4942	6377	77.5	
$1 \leq S < 2$	193	6377	3.03	
$2 \leq S < 3$	164	6377	2.57	
$3 \leq S < 4$	202	6377	3.17	
$4 \leq S < 5$	191	6377	3	
$5 \leq S < 6$	236	6377	3.7	
$6 \leq S$	449	6377	7.04	
RxLev	Samples	Total	%	
0 to ≥ -75	1774	6564	27.03	
0 to ≥ -85	4278	6564	65.17	
0 to ≥ -95	6477	6564	98.67	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	49746	51859	95.93	
Total Call Attempt	218			
Blocked Call Rate ($\leq 3\%$)	0.00%			
Dropped Call Rate ($\leq 2\%$)	0.46%			

Call Setup Success Rate ($\geq 95\%$)	99.54%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		
RxLev	Samples	Total	%
0 to ≥ -75	28377	53745	52.8
0 to ≥ -85	44923	53745	83.59
0 to ≥ -95	53098	53745	98.8

13.13.3 AIRTEL: DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	31082	36316	85.59
$1 \leq S < 2$	874	36316	2.41
$2 \leq S < 3$	763	36316	2.1
$3 \leq S < 4$	1011	36316	2.78
$4 \leq S < 5$	1001	36316	2.76
$5 \leq S < 6$	847	36316	2.33
$6 \leq S$	738	36316	2.03
RxLev	Samples	Total	%
0 to ≥ -75	24984	37485	66.65
0 to ≥ -85	33835	37485	90.26
0 to ≥ -95	37273	37485	99.43

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	6205	6366	97.47
$1 \leq S < 2$	44	6366	0.69
$2 \leq S < 3$	34	6366	0.53
$3 \leq S < 4$	38	6366	0.6
$4 \leq S < 5$	25	6366	0.39
$5 \leq S < 6$	15	6366	0.24
$6 \leq S$	5	6366	0.08
RxLev	Samples	Total	%
0 to ≥ -75	4761	6628	71.83
0 to ≥ -85	6465	6628	97.54

0 to > = -95	6628	6628	100
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Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	41939	42682	98.26
Total Call Attempt	172		
Blocked Call Rate (<=3%)	0.00%		
Dropped Call Rate (<=2%)	0.00%		
Call Setup Success Rate (>=95%)	100.00%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		
RxLev	Samples	Total	%
0 to > = -75	29745	44113	67.43
0 to > = -85	40300	44113	91.36
0 to > = -95	43901	44113	99.52

13.13.4 AIRTEL: OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	126465	150410	84.08
1 ≤ S < 2	3903	150410	2.59
2 ≤ S < 3	3406	150410	2.26
3 ≤ S < 4	4473	150410	2.97
4 ≤ S < 5	4390	150410	2.92
5 ≤ S < 6	3968	150410	2.64
6 ≤ S	3805	150410	2.53
RxLev	Samples	Total	%
0 to > = -75	102219	155456	65.75
0 to > = -85	141499	155456	91.02
0 to > = -95	154572	155456	99.43

Total Calls Attempt (A)	618
Total Calls Blocked (B)	0
Blocked Call Rate in % (B*100/A)	0.00%
Total Calls Established ('C)	617
Total Calls Drop (D)	1
Dropped Calls Rate in % (D*100/C)	0.16%
Call Setup Success Rate in % (C*100/A)	99.84%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.81%

13.13.5 RCOM GSM: DAY 1

SSA (Urban/Rural)-Day 1					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S \leq 1$	156107	215334	72.5		
$1 < S \leq 2$	6803	215334	3.16		
$2 < S \leq 3$	6885	215334	3.2		
$3 < S \leq 4$	8045	215334	3.74		
$4 < S \leq 5$	8672	215334	4.03		
$5 < S \leq 6$	11021	215334	5.12		
> 6	17801	215334	8.27		
RxLev	Samples	Total	%		
0 to ≥ -75	68420	106450	64.27		
0 to ≥ -85	88652	106450	83.28		
0 to ≥ -95	101417	106450	95.27		

Office Complex SSA (Urban/Rural)- Day 1					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S \leq 1$	32671	41182	79.33		
$1 < S \leq 2$	1312	41182	3.19		
$2 < S \leq 3$	1377	41182	3.34		
$3 < S \leq 4$	1462	41182	3.55		
$4 < S \leq 5$	1276	41182	3.1		
$5 < S \leq 6$	1617	41182	3.93		
> 6	1467	41182	3.56		

RxLev	Samples	Total	%
0 to > = -75	19040	19075	99.82
0 to > = -85	19075	19075	100
0 to > = -95	19075	19075	100

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	224610	256516	87.56	
Total Call Attempt	168			
Blocked Call Rate (<=3%)	4.76			
Dropped Call Rate (<=2%)	0			
Call Setup Success Rate (>=95%)	95.24			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.17			
RxLev	Samples	Total	%	
0 to > = -75	87460	125525	69.68	
0 to > = -85	107727	125525	85.82	
0 to > = -95	120492	125525	95.99	

13.13.6 RCOM GSM: DAY 2

SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	125854	163541	76.96	
$1 < S \leq 2$	5283	163541	3.23	
$2 < S \leq 3$	4828	163541	2.95	
$3 < S \leq 4$	5515	163541	3.37	
$4 < S \leq 5$	5273	163541	3.22	
$5 < S \leq 6$	6717	163541	4.11	
> 6	10071	163541	6.16	
RxLev	Samples	Total	%	
0 to > = -75	42034	86326	48.69	
0 to > = -85	68580	86326	79.44	

0 to > = -95	81832	86326	94.79	
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Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S ≤ 1	42986	45444	94.59	
1 < S ≤ 2	582	45444	1.28	
2 < S ≤ 3	427	45444	0.94	
3 < S ≤ 4	435	45444	0.96	
4 < S ≤ 5	328	45444	0.72	
5 < S ≤ 6	266	45444	0.59	
> 6	420	45444	0.92	
RxLev	Samples	Total	%	
0 to > = -75	17326	22518	76.94	
0 to > = -85	22113	22518	98.2	
0 to > = -95	22518	22518	100	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	191511	208985	91.64	
Total Call Attempt	147			
Blocked Call Rate (<=3%)	4.76			
Dropped Call Rate (<=2%)	0			
Call Setup Success Rate (>=95%)	95.24			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	95.2			
RxLev	Samples	Total	%	
0 to > = -75	59360	108844	54.54	
0 to > = -85	90693	108844	83.32	
0 to > = -95	104350	108844	95.87	

13.13.7 RCOM GSM: DAY 3

SSA (Urban/Rural)-Day 3				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	68520	107755	63.59	
$1 < S \leq 2$	3397	107755	3.15	
$2 < S \leq 3$	4123	107755	3.83	
$3 < S \leq 4$	5372	107755	4.99	
$4 < S \leq 5$	6134	107755	5.69	
$5 < S \leq 6$	7637	107755	7.09	
> 6	12572	107755	11.67	
RxLev	Samples	Total	%	
0 to $> = -75$	21577	56665	38.08	
0 to $> = -85$	44883	56665	79.21	
0 to $> = -95$	54610	56665	96.37	

Office Complex SSA (Urban/Rural)- Day 3				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	26414	42516	62.13	
$1 < S \leq 2$	1076	42516	2.53	
$2 < S \leq 3$	1550	42516	3.65	
$3 < S \leq 4$	2471	42516	5.81	
$4 < S \leq 5$	2967	42516	6.98	
$5 < S \leq 6$	3316	42516	7.8	
> 6	4722	42516	11.11	
RxLev	Samples	Total	%	
0 to $> = -75$	959	20176	4.75	
0 to $> = -85$	18096	20176	89.69	
0 to $> = -95$	20164	20176	99.94	

Over All SSA Drive Test Details Day-3				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	122024	150271	81.2	
Total Call Attempt	99			
Blocked Call Rate (<=3%)	4.04			
Dropped Call Rate (<=2%)	0			

Call Setup Success Rate ($\geq 95\%$)	95.96		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	93.68421053		
RxLev	Samples	Total	%
0 to ≥ -75	22536	76841	29.33
0 to ≥ -85	62979	76841	81.96
0 to ≥ -95	74774	76841	97.31

13.13.8 RCOM GSM: OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
$0 \leq S \leq 1$	452552	615772	73.49
$1 < S \leq 2$	18453	615772	3
$2 < S \leq 3$	19190	615772	3.12
$3 < S \leq 4$	23300	615772	3.78
$4 < S \leq 5$	24650	615772	4
$5 < S \leq 6$	30574	615772	4.97
> 6	47053	615772	7.64
RxLev	Samples	Total	%
0 to ≥ -75 dbm	169356	311210	54.42
0 to ≥ -85 dbm	261399	311210	83.99
0 to ≥ -95 dbm	299616	311210	96.27

Total Calls Attempt (A)	414
Total Calls Blocked (B)	19
Blocked Call Rate in % ($B*100/A$)	4.59
Total Calls Established (C)	395
Total Calls Drop (D)	0
Dropped Calls Rate in % ($D*100/C$)	0
Call Setup Success Rate in % ($C*100/A$)	95.41
Handover Success Rate % (total HO Success * 100/Total HO attempt)	2.58

13.13.9 RCOM CDMA: DAY 1

SSA (Urban/Rural)-Day 1				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	285314	297613	95.87	
$1 < S \leq 2$	4640	297613	1.56	
$2 < S \leq 3$	865	297613	0.29	
$3 < S \leq 4$	433	297613	0.15	
$4 < S \leq 5$	144	297613	0.05	
$5 < S \leq 6$	103	297613	0.03	
> 6	6114	297613	2.05	
RxLev	Samples	Total	%	
0 to ≥ -75	246989	297727	82.96	
0 to ≥ -85	288838	297727	97.01	
0 to ≥ -95	297727	297727	100	

Office Complex SSA (Urban/Rural)- Day 1				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	47831	47831	100	
$1 < S \leq 2$	0	47831	0	
$2 < S \leq 3$	0	47831	0	
$3 < S \leq 4$	0	47831	0	
$4 < S \leq 5$	0	47831	0	
$5 < S \leq 6$	0	47831	0	
> 6	0	47831	0	
RxLev	Samples	Total	%	
0 to ≥ -75	47752	47831	99.83	
0 to ≥ -85	47831	47831	100	
0 to ≥ -95	47831	47831	100	

Over All SSA Drive Test Details Day-1				
FER	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	339083	345444	98.16	
0-5 (with frequency hopping				
Total Call Attempt	174			
Blocked Call Rate (<=3%)	1.72			

Dropped Call Rate (<=2%)	0			
Call Setup Success Rate (>=95%)	98.28			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100			
RxLev	Samples	Total	%	
0 to > = -75	294741	345558	85.29	
0 to > = -85	336669	345558	97.43	
0 to > = -95	345558	345558	100	

13.13.10 RCOM CDMA: DAY 2

SSA (Urban/Rural)-Day 2				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	278377	298474	93.27	
$1 < S \leq 2$	9717	298474	3.26	
$2 < S \leq 3$	2602	298474	0.87	
$3 < S \leq 4$	876	298474	0.29	
$4 < S \leq 5$	565	298474	0.19	
$5 < S \leq 6$	84	298474	0.03	
> 6	6253	298474	2.09	
RxLev	Samples	Total	%	
0 to ≥ -75	189068	298474	63.34	
0 to ≥ -85	260842	298474	87.39	
0 to ≥ -95	293304	298474	98.27	

Office Complex SSA (Urban/Rural)- Day 2				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	66910	67405	99.27	
$1 < S \leq 2$	465	67405	0.69	
$2 < S \leq 3$	30	67405	0.04	
$3 < S \leq 4$	0	67405	0	
$4 < S \leq 5$	0	67405	0	
$5 < S \leq 6$	0	67405	0	
> 6	0	67405	0	

RxLev	Samples	Total	%	
0 to > = -75	67237	67405	99.75	
0 to > = -85	67405	67405	100	
0 to > = -95	67405	67405	100	

Over All SSA Drive Test Details Day-2				
FER	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	358977	365879	98.11	
0-5 (with frequency hopping				
Total Call Attempt	157			
Blocked Call Rate (<=3%)	4.46			
Dropped Call Rate (<=2%)	0			
Call Setup Success Rate (>=95%)	95.54			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100			
RxLev	Samples	Total	%	
0 to > = -75	256305	365879	70.05	
0 to > = -85	328247	365879	89.71	
0 to > = -95	360709	365879	98.59	

13.13.11 RCOM CDMA: DAY 3

SSA (Urban/Rural)-Day 3				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	183027	198471	92.22	
$1 < S \leq 2$	8263	198471	4.16	
$2 < S \leq 3$	3052	198471	1.54	
$3 < S \leq 4$	1214	198471	0.61	
$4 < S \leq 5$	654	198471	0.33	
$5 < S \leq 6$	286	198471	0.14	
> 6	1975	198471	1	
RxLev	Samples	Total	%	
0 to > = -75	131987	196525	67.16	

0 to > = -85	186890	196525	95.1	
0 to > = -95	196491	196525	99.98	
Office Complex SSA (Urban/Rural)- Day 3				
FER	Samples (S)	Total	%	Summary
$0 \leq S \leq 1$	66984	67141	99.77	
$1 < S \leq 2$	114	67141	0.17	
$2 < S \leq 3$	0	67141	0	
$3 < S \leq 4$	0	67141	0	
$4 < S \leq 5$	0	67141	0	
$5 < S \leq 6$	43	67141	0.06	
> 6	0	67141	0	
RxLev	Samples	Total	%	
0 to > = -75	50966	67141	75.91	
0 to > = -85	67096	67141	99.93	
0 to > = -95	67141	67141	100	

Over All SSA Drive Test Details Day-3				
FER	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	262654	265612	98.89	
0-5 (with frequency hopping				
Total Call Attempt	100			
Blocked Call Rate (<=3%)	3			
Dropped Call Rate (<=2%)	1.03			
Call Setup Success Rate (>=95%)	97			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100			
RxLev	Samples	Total	%	
0 to > = -75	182953	263666	69.39	
0 to > = -85	253986	263666	96.33	
0 to > = -95	263632	263666	99.99	

13.13.12 RCOM CDMA: OVERALL

Over All SSA Details			
FER	Samples (S)	Total	%
$0 \leq S \leq 1$	928443	976935	95.04
$1 < S \leq 2$	23199	976935	2.37
$2 < S \leq 3$	6549	976935	0.67
$3 < S \leq 4$	2523	976935	0.26
$4 < S \leq 5$	1363	976935	0.14
$5 < S \leq 6$	516	976935	0.05
> 6	14342	976935	1.47
RxLev	Samples	Total	%
0 to ≥ -75 dbm	733999	975103	75.27
0 to ≥ -85 dbm	918902	975103	94.24
0 to ≥ -95 dbm	969899	975103	99.47

Total Calls Attempt (A)	431
Total Calls Blocked (B)	13
Blocked Call Rate in % ($B*100/A$)	3.02
Total Calls Established ('C)	418
Total Calls Drop (D)	1
Dropped Calls Rate in % ($D*100/C$)	0.24
Call Setup Success Rate in % ($C*100/A$)	96.98
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100

13.13.13 TTSL CDMA:DAY 1

SSA (Urban/Rural)-Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	14388	21809	66	
$1 \leq S < 2$	5040	21809	23.1	
$2 \leq S < 3$	317	21809	1.5	
$3 \leq S < 4$	1383	21809	6.3	
>4	681	21809	3.1	
RxLev			%	
0 to ≥ -75	20147	24542	82.1	

0 to > = -85	23372	24542	95.2	
0 to > = -95	24498	24542	99.8	

Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	1839	2985	61.6	
$1 \leq S < 2$	860	2985	28.8	
$2 \leq S < 3$	38	2985	1.3	
$3 \leq S < 4$	182	2985	6.1	
>4	66	2985	2.2	
RxLev	Samples	Total	%	
0 to > = -75	3339	3339	100	
0 to > = -85	3339	3339	100	
0 to > = -95	3339	3339	100	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	24027	24774	97	
0-5 (with frequency hopping				
Total Call Attempt	219			
Blocked Call Rate (<=3%)	0.00%			
Dropped Call Rate (<=2%)	0.00%			
Call Setup Success Rate (>=95%)	100.00%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%			
RxLev	Samples	Total	%	
0 to > = -75	23486	27881	84.2	

0 to > = -85	26711	27881	95.8	
0 to > = -95	27837	27881	99.8	

13.13.14 TTSL CDMA:DAY 2

SSA (Urban/Rural)-Day 2			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	13013	15197	85.6
$1 \leq S < 2$	1456	15197	9.6
$2 \leq S < 3$	137	15197	0.9
$3 \leq S < 4$	369	15197	2.4
>4	222	15197	1.5
RxLev	Samples	Total	%
0 to > = -75	12178	17292	70.4
0 to > = -85	16652	17292	96.3
0 to > = -95	17292	17292	100

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	2904	3012	96.4	
$1 \leq S < 2$	76	3012	2.5	
$2 \leq S < 3$	6	3012	0.2	
$3 \leq S < 4$	16	3012	0.5	
>4	10	3012	0.3	
RxLev	Samples	Total	%	
0 to > = -75	2756	3378	81.6	
0 to > = -85	3367	3378	99.7	
0 to > = -95	3378	3378	100	

Over All SSA Drive Test Details Day-2			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA	17977	18209	98.7
0-5 (with frequency hopping)			
Total Call Attempt	160		
Blocked Call Rate (<=3%)	0.00%		
Dropped Call Rate (<=2%)	0.00%		
Call Setup Success Rate (>=95%)	100.00%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		
RxLev	Samples	Total	%
0 to > = -75	14934	20670	72.2
0 to > = -85	20019	20670	96.9
0 to > = -95	20670	20670	100

13.13.15 TTSL CDMA :DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	8953	13557	66
$1 \leq S < 2$	2986	13557	22
$2 \leq S < 3$	305	13557	2.2
$3 \leq S < 4$	879	13557	6.5
>4	434	13557	3.2
RxLev	Samples	Total	%
0 to > = -75	12653	15226	83.1
0 to > = -85	14885	15226	97.8
0 to > = -95	15222	15226	100

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	1932	2980	64.8
$1 \leq S < 2$	736	2980	24.7

$2 \leq S < 3$	39	2980	1.3
$3 \leq S < 4$	195	2980	6.5
>4	78	2980	2.6
RxLev	Samples	Total	%
0 to ≥ -75	3344	3350	99.8
0 to ≥ -85	3350	3350	100
0 to ≥ -95	3350	3350	100

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA	16025	16537	96.9
0-5 (with frequency hopping			
Total Call Attempt	145		
Blocked Call Rate ($\leq 3\%$)	0.00%		
Dropped Call Rate ($\leq 2\%$)	0.00%		
Call Setup Success Rate ($\geq 95\%$)	100.00%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		
RxLev	Samples	Total	%
0 to ≥ -75	15997	18576	86.1
0 to ≥ -85	18235	18576	98.2
0 to ≥ -95	18572	18576	100

13.13.16 TTSL CDMA: OVERALL

Over All SSA Details				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	43029	59540	72.3	
$1 \leq S < 2$	11154	59540	18.7	

$2 \leq S < 3$	842	59540	1.4
$3 \leq S < 4$	3024	59540	5.1
>4	1491	59540	2.5
RxLev	Samples	Total	%
0 to ≥ -75	54417	67127	81.1
0 to ≥ -85	64965	67127	96.8
0 to ≥ -95	67079	67127	99.9

Total Calls Attempt (A)	524
Total Calls Blocked (B)	0
Blocked Call Rate in % ($B*100/A$)	0.00%
Total Calls Established ('C)	524
Total Calls Drop (D)	0
Dropped Calls Rate in % ($D*100/C$)	0.00%
Call Setup Success Rate in % ($C*100/A$)	100.00%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%

13.13.17 TTSL GSM:DAY 1

SSA (Urban/Rural)-Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	29671	34627	85.69	
$1 \leq S < 2$	577	34627	1.67	
$2 \leq S < 3$	601	34627	1.74	
$3 \leq S < 4$	654	34627	1.89	
$4 \leq S < 5$	704	34627	2.03	
$5 \leq S < 6$	887	34627	2.56	
$6 \leq S$	1533	34627	4.43	
RxLev	Samples	Total	%	
0 to ≥ -75	47906	54959	87.17	
0 to ≥ -85	54277	54959	98.76	
0 to ≥ -95	54915	54959	99.92	

Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5966	6400	93.22	
$1 \leq S < 2$	77	6400	1.20	

$2 \leq S < 3$	60	6400	0.94	
$3 \leq S < 4$	74	6400	1.16	
$4 \leq S < 5$	72	6400	1.13	
$5 \leq S < 6$	75	6400	1.17	
$6 \leq S$	76	6400	1.19	
RxLev	Samples	Total	%	
0 to ≥ -75	7427	8218	90.37	
0 to ≥ -85	8147	8218	99.14	
0 to ≥ -95	8218	8218	100.00	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	39418	41027	96.10	
Total Call Attempt	159			
Blocked Call Rate (<=3%)	0.00%			
Dropped Call Rate (<=2%)	0.00%			
Call Setup Success Rate (>=95%)	100.00%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%			
RxLev	Samples	Total	%	
0 to > = -75	56053	63177	88.72	
0 to > = -85	62495	63177	98.92	
0 to > = -95	63133	63177	99.93	

13.13.18 TTSL GSM: 2 DAY				
SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	31282	33399	93.66	
$1 \leq S < 2$	339	33399	1.02	
$2 \leq S < 3$	383	33399	1.15	
$3 \leq S < 4$	346	33399	1.04	
$4 \leq S < 5$	295	33399	0.88	
$5 \leq S < 6$	320	33399	0.96	
$6 \leq S$	434	33399	1.30	
RxLev	Samples	Total	%	
0 to ≥ -75	37302	53960	69.13	
0 to ≥ -85	50217	53960	93.06	

0 to > = -95	53789	53960	99.68	
Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S < 1	6219	6400	97.17	
1 ≤ S < 2	36	6400	0.56	
2 ≤ S < 3	40	6400	0.63	
3 ≤ S < 4	30	6400	0.47	
4 ≤ S < 5	29	6400	0.45	
5 ≤ S < 6	23	6400	0.36	
6 ≤ S	23	6400	0.36	
RxLev	Samples	Total	%	
0 to > = -75	4395	10250	42.88	
0 to > = -85	8944	10250	87.26	
0 to > = -95	10210	10250	99.61	
Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	39342	39799	98.85	
Total Call Attempt	157			
Blocked Call Rate (<=3%)	0.00%			
Dropped Call Rate (<=2%)	0.00%			
Call Setup Success Rate (>=95%)	100.00%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%			
RxLev	Samples	Total	%	
0 to > = -75	41697	64210	64.94	
0 to > = -85	59161	64210	92.14	
0 to > = -95	63999	64210	99.67	

13.13.19 TTSL GSM:DAY 3

SSA (Urban/Rural)-Day 3				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S < 1	21836	26514	82.36	
1 ≤ S < 2	627	26514	2.36	
2 ≤ S < 3	661	26514	2.49	
3 ≤ S < 4	825	26514	3.11	
4 ≤ S < 5	790	26514	2.98	
5 ≤ S < 6	816	26514	3.08	

$6 \leq S$	959	26514	3.62	
RxLev	Samples	Total	%	
0 to ≥ -75	28780	41585	69.21	
0 to ≥ -85	39285	41585	94.47	
0 to ≥ -95	41379	41585	99.50	
Office Complex SSA (Urban/Rural)- Day 3				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5209	6474	80.46	
$1 \leq S < 2$	160	6474	2.47	
$2 \leq S < 3$	189	6474	2.92	
$3 \leq S < 4$	238	6474	3.68	
$4 \leq S < 5$	229	6474	3.54	
$5 \leq S < 6$	234	6474	3.61	
$6 \leq S$	215	6474	3.32	
RxLev	Samples	Total	%	
0 to ≥ -75	8051	10522	76.52	
0 to ≥ -85	10456	10522	99.37	
0 to ≥ -95	10521	10522	99.99	
Over All SSA Drive Test Details Day-3				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	31814	32988	96.44	
Total Call Attempt	127			
Blocked Call Rate ($\leq 3\%$)	0.00%			
Dropped Call Rate ($\leq 2\%$)	0.00%			
Call Setup Success Rate ($\geq 95\%$)	100.00%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.91%			
RxLev	Samples	Total	%	
0 to ≥ -75	36831	52107	70.68	
0 to ≥ -85	49741	52107	95.46	
0 to ≥ -95	51900	52107	99.60	

13.13.20 TTSL GSM:OVERALL

Over All SSA Details				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	82789	94540	87.57	
$1 \leq S < 2$	1543	94540	1.63	

$2 \leq S < 3$	1645	94540	1.74
$3 \leq S < 4$	1825	94540	1.93
$4 \leq S < 5$	1789	94540	1.89
$5 \leq S < 6$	2023	94540	2.14
$6 \leq S$	2926	94540	3.09
RxLev	Samples	Total	
0 to ≥ -75	113988	150504	75.74
0 to ≥ -85	143779	150504	95.53
0 to ≥ -95	150083	150504	99.72
Total Calls Attempt (A)	443		
Total Calls Blocked (B)	0		
Blocked Call Rate in % ($B*100/A$)	0.00%		
Total Calls Established ('C)	443		
Total Calls Drop (D)	0		
Dropped Calls Rate in % ($D*100/C$)	0.00%		
Call Setup Success Rate in % ($C*100/A$)	100.00%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.6%		

13.13.21 MTS CDMA:DAY 2

SSA (Urban/Rural)-Day 2					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S < 1$	14082	14745	95.5		
$1 \leq S < 2$	325	14745	2.2		
$2 \leq S < 3$	181	14745	1.23		
$3 \leq S < 4$	78	14745	0.53		
$4 \leq S < 5$	43	14745	0.29		
$5 \leq S < 6$	14	14745	0.09		
$6 \leq S$	22	14745	0.15		
RxLev	Samples	Total	%		
0 to ≥ -75	10417	16711	62.34		
0 to ≥ -85	15449	16711	92.45		
0 to ≥ -95	16570	16711	99.16		

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	3008	3024	99.47	
$1 \leq S < 2$	6	3024	0.2	
$2 \leq S < 3$	7	3024	0.23	

$3 \leq S < 4$	2	3024	0.07	
$4 \leq S < 5$	1	3024	0.03	
$5 \leq S < 6$	0	3024	0	
$6 \leq S$	0	3024	0	
RxLev	Samples	Total	%	
0 to ≥ -75	2807	3396	82.66	
0 to ≥ -85	3274	3396	96.41	
0 to ≥ -95	3354	3396	98.76	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA	17729	17769	99.77	
0-5 (with frequency hopping				
Total Call Attempt	147			
Blocked Call Rate (<=3%)	0.00%			
Dropped Call Rate (<=2%)	0.00%			
Call Setup Success Rate (>=95%)	99.42%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%			
RxLev	Samples	Total	%	
0 to > = -75	13224	20107	65.77	
0 to > = -85	18723	20107	93.12	
0 to > = -95	19924	20107	99.09	

13.13.22 MTS CDMA:DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	9907	10444	94.86
$1 \leq S < 2$	262	10444	2.51
$2 \leq S < 3$	142	10444	1.36
$3 \leq S < 4$	62	10444	0.59
$4 \leq S < 5$	42	10444	0.4

$5 \leq S < 6$	13	10444	0.12
$6 \leq S$	16	10444	0.15
RxLev	Samples	Total	%
0 to ≥ -75	7606	11937	63.72
0 to ≥ -85	11469	11937	96.08
0 to ≥ -95	11844	11937	99.22

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	3036	3045	99.7
$1 \leq S < 2$	6	3045	0.2
$2 \leq S < 3$	1	3045	0.03
$3 \leq S < 4$	2	3045	0.07
$4 \leq S < 5$	0	3045	0
$5 \leq S < 6$	0	3045	0
$6 \leq S$	0	3045	0
RxLev	Samples	Total	%
0 to ≥ -75	1247	3480	35.83
0 to ≥ -85	3407	3480	97.9
0 to ≥ -95	3434	3480	98.68

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA	13454	13489	99.74
0-5 (with frequency hopping)			
Total Call Attempt	110		
Blocked Call Rate ($\leq 3\%$)	0.00%		
Dropped Call Rate ($\leq 2\%$)	0.00%		
Call Setup Success Rate ($\geq 95\%$)	100.00%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%		

RxLev	Samples	Total	%
0 to ≥ -75	8853	15417	57.42
0 to ≥ -85	14876	15417	96.49
0 to ≥ -95	15278	15417	99.1

13.13.23 MTS CDMA: OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	48005	50233	95.56
$1 \leq S < 2$	1079	50233	2.15
$2 \leq S < 3$	584	50233	1.16
$3 \leq S < 4$	271	50233	0.54
$4 \leq S < 5$	145	50233	0.29
$5 \leq S < 6$	62	50233	0.12
$6 \leq S$	87	50233	0.17
RxLev	Samples	Total	%
0 to ≥ -75	42427	57177	74.2
0 to ≥ -85	55065	57177	96.31
0 to ≥ -95	56806	57177	99.35

Total Calls Attempt (A)	412
Total Calls Blocked (B)	0
Blocked Call Rate in % ($B \times 100/A$)	0.00%
Total Calls Established ('C)	411
Total Calls Drop (D)	0
Dropped Calls Rate in % ($D \times 100/C$)	0.00%
Call Setup Success Rate in % ($C \times 100/A$)	99.76%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100.00%

13.13.24 BSNL CDMA:DAY 2

SSA (Urban/Rural)-Day 2					
RxQual	Samples (S)	Total	%	Summary	
$0 \leq S < 1$	9706	18312	53		
$1 \leq S < 2$	1506	18312	8.22		
$2 \leq S < 3$	1771	18312	9.67		
$3 \leq S < 4$	1782	18312	9.73		

$4 \leq S < 5$	1652	18312	9.02	
$5 \leq S < 6$	1219	18312	6.66	
$6 \leq S$	676	18312	3.69	
RxLev	Samples	Total	%	
0 to ≥ -75	9413	19394	48.53	
0 to ≥ -85	15287	19394	78.82	
0 to ≥ -95	18536	19394	95.57	

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	210	330	63.64	
$1 \leq S < 2$	12	330	3.64	
$2 \leq S < 3$	19	330	5.76	
$3 \leq S < 4$	38	330	11.52	
$4 \leq S < 5$	26	330	7.88	
$5 \leq S < 6$	24	330	7.27	
$6 \leq S$	1	330	0.3	
RxLev	Samples	Total	%	
0 to ≥ -75	1630	2535	64.3	
0 to ≥ -85	2483	2535	97.95	
0 to ≥ -95	2535	2535	100	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	305	330	92.42	
Total Call Attempt	184			
Blocked Call Rate ($\leq 3\%$)	2.72%			
Dropped Call Rate ($\leq 2\%$)	1.68%			
Call Setup Success Rate ($\geq 95\%$)	97.28%			

Handover Success Rate % (total HO Success * 100/Total HO attempt)	95.77%		
RxLev	Samples	Total	%
0 to > = -75	11043	21929	50.36
0 to > = -85	17770	21929	81.03
0 to > = -95	21071	21929	96.09

13.13.25 BSNL CDMA:DAY 3

SSA (Urban/Rural)-Day 3			
	Samples (S)	Total	%
	9146	15155	60.35
RxQual	1212	15155	8
0 ≤ S < 1	1496	15155	9.87
3 ≤ S < 4	1380	15155	9.11
4 ≤ S < 5	1110	15155	7.32
5 ≤ S < 6	597	15155	3.94
6 ≤ S	214	15155	1.41
RxLev	Samples	Total	%
0 to > = -75	11118	16841	66.01
0 to > = -85	14981	16841	88.95
0 to > = -95	16568	16841	98.37

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	1109	1729	64.14
1 ≤ S < 2	131	1729	7.58
2 ≤ S < 3	165	1729	9.54
3 ≤ S < 4	163	1729	9.43
4 ≤ S < 5	95	1729	5.49
5 ≤ S < 6	52	1729	3.01
6 ≤ S	14	1729	0.81
RxLev	Samples	Total	%
0 to > = -75	884	2771	31.9
0 to > = -85	2733	2771	98.63
0 to > = -95	2771	2771	100

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping	1663	1729	96.18
Total Call Attempt	162		
Blocked Call Rate (<=3%)	1.85%		
Dropped Call Rate (<=2%)	0.00%		
Call Setup Success Rate (>=95%)	98.15%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	96.90%		
RxLev	Samples	Total	%
0 to > = -75	12002	19612	61.2
0 to > = -85	17714	19612	90.32
0 to > = -95	19339	19612	98.61

13.13.26 BSNL CDMA:OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	20171	35526	56.77813
$1 \leq S < 2$	2861	35526	8.053257
$2 \leq S < 3$	3451	35526	9.714012
$3 \leq S < 4$	3363	35526	9.466306
$4 \leq S < 5$	2883	35526	8.115183
$5 \leq S < 6$	1892	35526	5.325677
$6 \leq S$	905	35526	2.54743
RxLev	Samples	Total	%
0 to > = -75	23045	41541	55.48
0 to > = -85	35484	41541	85.42
0 to > = -95	40410	41541	97.28

Total Calls Attempt (A)	346
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Total Calls Blocked (B)	8
Blocked Call Rate in % ($B \times 100 / A$)	2.31
Total Calls Established ('C')	338
Total Calls Drop (D)	3
Dropped Calls Rate in % ($D \times 100 / C$)	0.89
Call Setup Success Rate in % ($C \times 100 / A$)	97.69
Handover Success Rate % (total HO Success * 100/Total HO attempt)	96.19

13.13.27 BSNL GSM:DAY 2

SSA (Urban/Rural)-Day 2			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	9706	18312	53
$1 \leq S < 2$	1506	18312	8.22
$2 \leq S < 3$	1771	18312	9.67
$3 \leq S < 4$	1782	18312	9.73
$4 \leq S < 5$	1652	18312	9.02
$5 \leq S < 6$	1219	18312	6.66
$6 \leq S$	676	18312	3.69
RxLev	Samples	Total	%
0 to ≥ -75	9413	19394	48.53
0 to ≥ -85	15287	19394	78.82
0 to ≥ -95	18536	19394	95.57

Office Complex SSA (Urban/Rural)- Day 2			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	210	330	63.64
$1 \leq S < 2$	12	330	3.64
$2 \leq S < 3$	19	330	5.76
$3 \leq S < 4$	38	330	11.52
$4 \leq S < 5$	26	330	7.88
$5 \leq S < 6$	24	330	7.27
$6 \leq S$	1	330	0.3
RxLev	Samples	Total	%
0 to ≥ -75	1630	2535	64.3
0 to ≥ -85	2483	2535	97.95
0 to ≥ -95	2535	2535	100

Over All SSA Drive Test Details Day-2			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping	305	330	92.42
Total Call Attempt	184		
Blocked Call Rate (<=3%)	2.72%		
Dropped Call Rate (<=2%)	1.68%		
Call Setup Success Rate (>=95%)	97.28%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	95.77%		
RxLev	Samples	Total	%
0 to > = -75	11043	21929	50.36
0 to > = -85	17770	21929	81.03
0 to > = -95	21071	21929	96.09

13.13.28 BSNL GSM:DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	9146	15155	60.35
1 ≤ S < 2	1212	15155	8
2 ≤ S < 3	1496	15155	9.87
3 ≤ S < 4	1380	15155	9.11
4 ≤ S < 5	1110	15155	7.32
5 ≤ S < 6	597	15155	3.94
6 ≤ S	214	15155	1.41
RxLev	Samples	Total	%
0 to > = -75	11118	16841	66.01
0 to > = -85	14981	16841	88.95
0 to > = -95	16568	16841	98.37

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%

$0 \leq S < 1$	1109	1729	64.14
$1 \leq S < 2$	131	1729	7.58
$2 \leq S < 3$	165	1729	9.54
$3 \leq S < 4$	163	1729	9.43
$4 \leq S < 5$	95	1729	5.49
$5 \leq S < 6$	52	1729	3.01
$6 \leq S$	14	1729	0.81
RxLev	Samples	Total	%
0 to ≥ -75	884	2771	31.9
0 to ≥ -85	2733	2771	98.63
0 to ≥ -95	2771	2771	100

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	1663	1729	96.18
Total Call Attempt	162		
Blocked Call Rate ($\leq 3\%$)	1.85%		
Dropped Call Rate ($\leq 2\%$)	0.00%		
Call Setup Success Rate ($\geq 95\%$)	98.15%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	96.90%		
RxLev	Samples	Total	%
0 to ≥ -75	12002	19612	61.2
0 to ≥ -85	17714	19612	90.32
0 to ≥ -95	19339	19612	98.61

13.13.29 BSNL GSM:OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
$0 \leq S < 1$	20171	35526	56.77813
$1 \leq S < 2$	2861	35526	8.053257
$2 \leq S < 3$	3451	35526	9.714012

$3 \leq S < 4$	3363	35526	9.466306
$4 \leq S < 5$	2883	35526	8.115183
$5 \leq S < 6$	1892	35526	5.325677
$6 \leq S$	905	35526	2.54743
RxLev	Samples	Total	%
0 to ≥ -75	23045	41541	55.48
0 to ≥ -85	35484	41541	85.42
0 to ≥ -95	40410	41541	97.28

Total Calls Attempt (A)	346
Total Calls Blocked (B)	8
Blocked Call Rate in % ($B*100/A$)	2.31
Total Calls Established (C)	338
Total Calls Drop (D)	3
Dropped Calls Rate in % ($D*100/C$)	0.89
Call Setup Success Rate in % ($C*100/A$)	97.69
Handover Success Rate % (total HO Success * 100/Total HO attempt)	96.19

13.13.30 VODAFONE:DAY 1

SSA (Urban/Rural)-Day 1				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S < 1	30610	38272	79.98	
1 ≤ S < 2	1249	38272	3.26	
2 ≤ S < 3	1356	38272	3.54	
3 ≤ S < 4	1373	38272	3.59	
4 ≤ S < 5	1573	38272	4.11	
5 ≤ S < 6	2111	38272	5.52	
6 ≤ S				
RxLev	Samples	Total	%	
0 to > = -75	15630	17333	90.17	
0 to > = -85	17105	17333	98.68	
0 to > = -95	17284	17333	99.72	
Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S < 1	4745	6655	71.30	
1 ≤ S < 2	507	6655	7.62	
2 ≤ S < 3	486	6655	7.30	
3 ≤ S < 4	414	6655	6.22	
4 ≤ S < 5	322	6655	4.84	

5 ≤ S < 6	181	6655	2.72	
6 ≤ S				
RxLev	Samples	Total	%	
0 to > = -75	3726	3726	100.00	
0 to > = -85	3726	3726	100.00	
0 to > = -95	3726	3726	100.00	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	42635	44927	94.90	
Total Call Attempt	215			
Blocked Call Rate (<=3%)	1.39			
Dropped Call Rate (<=2%)	0.966			
Call Setup Success Rate (>=95%)	98.604			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	98.940			
RxLev	Samples	Total	%	
0 to > = -75	19356	21059	91.91	
0 to > = -85	20831	21059	98.92	
0 to > = -95	21010	21059	99.77	

13.13.31 VODAFONE :DAY 2

A				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S < 1	35378	42677	82.90	
1 ≤ S < 2	1190	42677	2.79	
2 ≤ S < 3	1365	42677	3.20	
3 ≤ S < 4	1359	42677	3.18	
4 ≤ S < 5	1515	42677	3.55	
5 ≤ S < 6	1870	42677	4.38	
6 ≤ S				
RxLev	Samples	Total	%	
0 to > = -75	21332	23689	90.05	
0 to > = -85	23504	23689	99.22	
0 to > = -95	23673	23689	99.93	
Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary

0 ≤ S < 1	4952	5897	83.97	
1 ≤ S < 2	199	5897	3.37	
2 ≤ S < 3	218	5897	3.70	
3 ≤ S < 4	193	5897	3.27	
4 ≤ S < 5	181	5897	3.07	
5 ≤ S < 6	154	5897	2.61	
6 ≤ S				
RxLev	Samples	Total	%	
0 to > = -75	3869	3885	99.59	
0 to > = -85	3885	3885	100.00	
0 to > = -95	3885	3885	100.00	
Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	46550	48574	95.83	
Total Call Attempt	195			
Blocked Call Rate (<=3%)	0			
Dropped Call Rate (<=2%)	0			
Call Setup Success Rate (>=95%)	100			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100			
RxLev	Samples	Total	%	
0 to > = -75	25201	27574	91.39	
0 to > = -85	27389	27574	99.33	
0 to > = -95	27558	27574	99.94	

13.13.32 VODAFONE:DAY 3

SSA (Urban/Rural)-Day 3				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	28762	35647	80.69	
$1 \leq S < 2$	1084	35647	3.04	
$2 \leq S < 3$	1265	35647	3.55	
$3 \leq S < 4$	1281	35647	3.59	
$4 \leq S < 5$	1399	35647	3.92	
$5 \leq S < 6$	1856	35647	5.21	
$6 \leq S$				

RxLev	Samples	Total	%	
0 to > = -75	17541	19552	89.71	
0 to > = -85	19398	19552	99.21	
0 to > = -95	19523	19552	99.85	
Office Complex SSA (Urban/Rural)- Day 3				
RxQual	Samples (S)	Total	%	Summary
0 ≤ S < 1	5853	6677	87.66	
1 ≤ S < 2	172	6677	2.58	
2 ≤ S < 3	182	6677	2.73	
3 ≤ S < 4	173	6677	2.59	
4 ≤ S < 5	182	6677	2.73	
5 ≤ S < 6	115	6677	1.72	
6 ≤ S				
RxLev	Samples	Total	%	
0 to > = -75	3692	3693	99.97	
0 to > = -85	3693	3693	100.00	
0 to > = -95	3693	3693	100.00	
Over All SSA Drive Test Details Day-3				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	40353	42324	95.34	
Total Call Attempt	158			
Blocked Call Rate (<=3%)	0			
Dropped Call Rate (<=2%)	0			
Call Setup Success Rate (>=95%)	100			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	100			
RxLev	Samples	Total	%	
0 to > = -75	21233	23245	91.34	
0 to > = -85	23091	23245	99.34	
0 to > = -95	23216	23245	99.88	

13.13.33 VODAFONE:OVERALL

Over All SSA Details					
RxQual	Samples (S)	Total	%	Summary	
0 ≤ S < 1	110300	135825	81.21		

$1 \leq S < 2$	4401	135825	3.24
$2 \leq S < 3$	4872	135825	3.59
$3 \leq S < 4$	4793	135825	3.53
$4 \leq S < 5$	5172	135825	3.81
$5 \leq S < 6$	6287	135825	4.63
$6 \leq S$		0	
RxLev	Samples	Total	%
0 to ≥ -75	65790	71878	91.53
0 to ≥ -85	71311	71878	99.21
0 to ≥ -95	71784	71878	99.87

Total Calls Attempt (A)	568
Total Calls Blocked (B)	3
Blocked Call Rate in % ($B \times 100/A$)	0.53%
Total Calls Established (C)	552
Total Calls Drop (D)	2
Dropped Calls Rate in % ($D \times 100/C$)	0.36%
Call Setup Success Rate in % ($C \times 100/A$)	99.47%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.6%

13.13.34 TELENOR:DAY 1

SSA (Urban/Rural)-Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	26928	40606	66.32	
$1 \leq S < 2$	1456	40606	3.59	
$2 \leq S < 3$	1553	40606	3.82	
$3 \leq S < 4$	1795	40606	4.42	
$4 \leq S < 5$	1973	40606	4.86	
$5 \leq S < 6$	2521	40606	6.21	
$6 \leq S$	4380	40606	10.79	
RxLev	Samples	Total	%	
0 to ≥ -75	26757	33321		
0 to ≥ -85	31632	33321		
0 to ≥ -95	32864	33321		

Office Complex SSA (Urban/Rural)- Day 1				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	3993	6041	66.1	
$1 \leq S < 2$	260	6041	4.3	
$2 \leq S < 3$	257	6041	4.25	

$3 \leq S < 4$	339	6041	5.61	
$4 \leq S < 5$	387	6041	6.41	
$5 \leq S < 6$	417	6041	6.9	
$6 \leq S$	388	6041	6.42	
RxLev	Samples	Total	%	
0 to ≥ -75	6722	6917	97.18	
0 to ≥ -85	6890	6917	99.61	
0 to ≥ -95	6913	6917	99.94	

Over All SSA Drive Test Details Day-1				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping	41879	46647	89.78	
Total Call Attempt	201			
Blocked Call Rate (<=3%)	5.97%			
Dropped Call Rate (<=2%)	0.52%			
Call Setup Success Rate (>=95%)	96.52%			
Handover Success Rate % (total HO Success * 100/Total HO attempt)	95.68%			
RxLev	Samples	Total	%	
0 to > = -75	33479	40238	83.20%	
0 to > = -85	38522	40238	95.70%	
0 to > = -95	39777	40238	98.90%	

13.13.35 TELENOR:DAY 2

SSA (Urban/Rural)-Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	29813	40736	73.19	
$1 \leq S < 2$	1195	40736	2.93	
$2 \leq S < 3$	1334	40736	3.27	
$3 \leq S < 4$	1538	40736	3.78	

$4 \leq S < 5$	1609	40736	3.95	
$5 \leq S < 6$	1967	40736	4.83	
$6 \leq S$	3280	40736	8.05	
RxLev	Samples	Total	%	
0 to ≥ -75	16751	26954	62.15	
0 to ≥ -85	24108	26954	89.44	
0 to ≥ -95	26560	26954	98.54	

Office Complex SSA (Urban/Rural)- Day 2				
RxQual	Samples (S)	Total	%	Summary
$0 \leq S < 1$	5391	6149	87.67	
$1 \leq S < 2$	112	6149	1.82	
$2 \leq S < 3$	116	6149	1.89	
$3 \leq S < 4$	146	6149	2.37	
$4 \leq S < 5$	134	6149	2.18	
$5 \leq S < 6$	149	6149	2.42	
$6 \leq S$	101	6149	1.64	
RxLev	Samples	Total	%	
0 to ≥ -75	2060	3515	58.61	
0 to ≥ -85	3388	3515	96.39	
0 to ≥ -95	3515	3515	100	

Over All SSA Drive Test Details Day-2				
RxQual	Samples (S)	Total	%	Summary
0-4 (w/o frequency hopping)/CDMA				
0-5 (with frequency hopping)	43504	46885	92.79	
Total Call Attempt	209			
Blocked Call Rate ($\leq 3\%$)	1.44%			
Dropped Call Rate ($\leq 2\%$)	0.00%			
Call Setup Success Rate ($\geq 95\%$)	98.56%			

Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.78%		
RxLev	Samples	Total	%
0 to > = -75	18811	30469	61.70%
0 to > = -85	27496	30469	90.20%
0 to > = -95	30075	30469	98.70%

13.13.36 TELELOR:DAY 3

SSA (Urban/Rural)-Day 3			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	19283	26701	72.22
1 ≤ S < 2	769	26701	2.88
2 ≤ S < 3	858	26701	3.21
3 ≤ S < 4	970	26701	3.63
4 ≤ S < 5	1070	26701	4.01
5 ≤ S < 6	1438	26701	5.39
6 ≤ S	2313	26701	8.66
RxLev	Samples	Total	%
0 to > = -75	13164	17828	73.84
0 to > = -85	16080	17828	90.2
0 to > = -95	17559	17828	98.49

Office Complex SSA (Urban/Rural)- Day 3			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	5240	6399	81.89
1 ≤ S < 2	158	6399	2.47
2 ≤ S < 3	175	6399	2.73
3 ≤ S < 4	197	6399	3.08
4 ≤ S < 5	189	6399	2.95
5 ≤ S < 6	228	6399	3.56
6 ≤ S	212	6399	3.31
RxLev	Samples	Total	%
0 to > = -75	2952	3594	82.14
0 to > = -85	3556	3594	98.94
0 to > = -95	3593	3594	99.97

Over All SSA Drive Test Details Day-3			
RxQual	Samples (S)	Total	%
0-4 (w/o frequency hopping)/CDMA			
0-5 (with frequency hopping)	30575	33100	92.37
Total Call Attempt	143		
Blocked Call Rate (<=3%)	2.80%		
Dropped Call Rate (<=2%)	0.70%		
Call Setup Success Rate (>=95%)	97.20%		
Handover Success Rate % (total HO Success * 100/Total HO attempt)	98.88%		
RxLev	Samples	Total	%
0 to > = -75	16116	21422	75.20%
0 to > = -85	19636	21422	91.70%
0 to > = -95	21152	21422	98.70%

13.13.37 TELENOR:OVERALL

Over All SSA Details			
RxQual	Samples (S)	Total	%
0 ≤ S < 1	90648	126632	71.58
1 ≤ S < 2	3950	126632	3.12
2 ≤ S < 3	4293	126632	3.39
3 ≤ S < 4	4985	126632	3.94
4 ≤ S < 5	5362	126632	4.23
5 ≤ S < 6	6720	126632	5.31
6 ≤ S	10674	126632	8.43
RxLev	Samples	Total	%
0 to > = -75	68406	92129	74.25
0 to > = -85	85654	92129	92.97
0 to > = -95	91004	92129	98.78

Total Calls Attempt (A)	553
Total Calls Blocked (B)	19

Blocked Call Rate in % (B*100/A)	3.44%
Total Calls Established ('C)	539
Total Calls Drop (D)	2
Dropped Calls Rate in % (D*100/C)	0.37%
Call Setup Success Rate in % (C*100/A)	97.47%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	97.20%

13.14. DRIVE TEST OUTCOME SUMMERY

	Airte I	RCOM GSM	RCOM CDMA	TTSL CDMA	TTSL GSM	MTS	BSN L	Vodaf one	Tele nor
Total Calls Attempt (A)	618	414	431	524	443	412	346	568	553
Total Calls Blocked (B)	0	19	13	0	0	0	8	3	19
Blocked Call Rate in % (B*100/A)	0.00 %	4.59%	3.02%	0.00%	0.00%	0.00 %	2.31 %	0.53 %	3.44 %
Total Calls Established ('C)	617	395	418	524	443	411	338	552	539
Total Calls Drop (D)	1	0	1	0	0	0	3	2	2
Dropped Calls Rate in % (D*100/C)	0.16 %	0%	0.24%	0.00%	0.00%	0.00 %	0.89 %	0.36 %	0.37 %
Call Setup Success Rate in % (C*100/A)	99.8 4%	95.41%	96.98%	100.00 %	100.00 %	99.76 %	97.6 9	99.47 %	97.4 7%
Handover Success Rate % (total HO Success * 100/Total HO attempt)	99.8 1%	2.58%	100%	100.00 %	99.60 %	100.0 0%	96.1 9%	99.60 %	97.2 0%

14. COUNTER DETAILS

SI No.	KPI	Formula with Counter Description
1	CSSR= (No of established Calls / No of Attempted Calls)%	<i>No of established Calls</i> = ([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)])/ <i>No of Attempted Calls</i> = ([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)%	<i>SDCCH Failure</i> = ([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)])/ <i>SDCCH attempts</i> = ([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)%	<i>TCH Failures</i> = ([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)])/ <i>TCH Attempts</i> = ([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)	<i>The total no of dropped calls</i> = ([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])/ <i>Total no of calls successfully established (where traffic channel is allotted)</i> = ([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)%	<p><i>Connection with good quality voice</i> = ((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)) / <i>Total voice samples</i> = ((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))</p>

14.1. Ericsson

SI 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)%	<p>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)</p>

Ericsson Counters

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

QUAL30DL	Number of quality 3 reported on downlink.
QUAL40DL	Number of quality 4 reported on downlink.
QUAL50DL	Number of quality 5 reported on downlink.
QUAL60DL	Number of quality 6 reported on downlink.
QUAL70DL	Number of quality 7 reported on downlink.

14.2. NSN (Nokia Siemens Network)

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

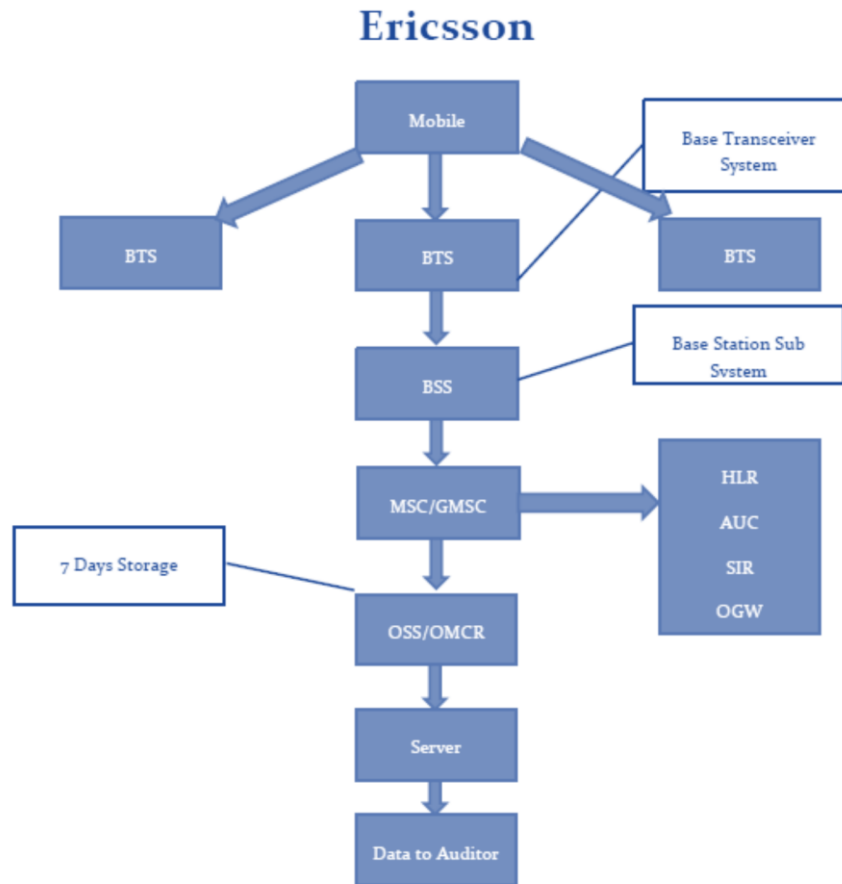
14.3. Huawei

SR NO	KPI	HUAWEI FORMULA
1	CALL SETUP SUCCES (NUM)	$[Successful\ CS\ IS-95\ Orig\ Call\ Setups + Successful\ CS\ IS-2000\ Orig\ Call\ Setups + Successful\ CS\ IS-95\ Term\ Call\ Setups + Successful\ CS\ IS-2000\ Term\ Call\ Setups] \times 100 / ([1157628567] + [1157628587] + [1157628568] + [1157628588])$
2	CALL SETUP SUCCES (DEN)	$[CS\ IS-95\ Orig\ Attempts + CS\ IS-2000\ Orig\ Attempts + CS\ IS-95\ Term\ Attempts + CS\ IS-2000\ Term\ Attempts] \times 100 / ([1157628553] + [1157628573] + [1157628554] + [1157628574])$
3	CALL SETUP SUCCESS RATE (%)	$CALL\ SETUP\ SUCCES\ (NUM) / CALL\ SETUP\ SUCCES\ (DEN) * 100$
4	CALL DROP RATE (NUM)	$[CS\ IS-95\ Call\ Drops\ (Too\ many\ Erasure\ frames) + CS\ IS-2000\ Call\ Drops\ (Too\ many\ Erasure\ frames) + CS\ IS-95\ Call\ Drops\ (No\ reverse\ frame\ received) + CS\ IS-2000\ Call\ Drops\ (No\ reverse\ frame\ received) + CS\ IS-95\ Call\ Drops\ (Abis\ interface\ abnormal) + CS\ IS-2000\ Call\ Drops\ (Abis\ interface\ abnormal) + CS\ IS-95\ Call\ Drops\ (A2\ interface\ abnormal) + CS\ IS-2000\ Call\ Drops\ (A2\ interface\ abnormal) + CS\ IS-95\ Call\ Drops\ (HHO\ fail) + CS\ IS-2000\ Call\ Drops\ (HHO\ fail) + CS\ IS-95\ Call\ Drops\ (Other\ causes) + CS\ IS-2000\ Call\ Drops\ (Other\ causes)] \times 100 / ([1157628608] + [1157628614] + [1157628609] + [1157628615] + [1157628610] + [1157628616] + [1157628611] + [1157628617] + [1157628612] + [1157628618] + [1157628613] + [1157628619])$
5	CALL DROP RATE (DEN)	$[Successful\ CS\ IS-95\ Orig\ Call\ Setups + Successful\ CS\ IS-2000\ Orig\ Call\ Setups + Successful\ CS\ IS-95\ Term\ Call\ Setups + Successful\ CS\ IS-2000\ Term\ Call\ Setups + CS\ IS-95\ Successful\ Incoming\ Hard\ HOs + CS\ IS-2000\ Successful\ Incoming\ Hard\ HOs] \times 100 / ([1157628619] + [1157628567] + [1157628587] + [1157628568] + [1157628588] + [1157628569] + [1157628589])$
6	Call DROP Rate	$CALL\ DROP\ RATE\ (NUM) / CALL\ DROP\ RATE\ (DEN) * 100$

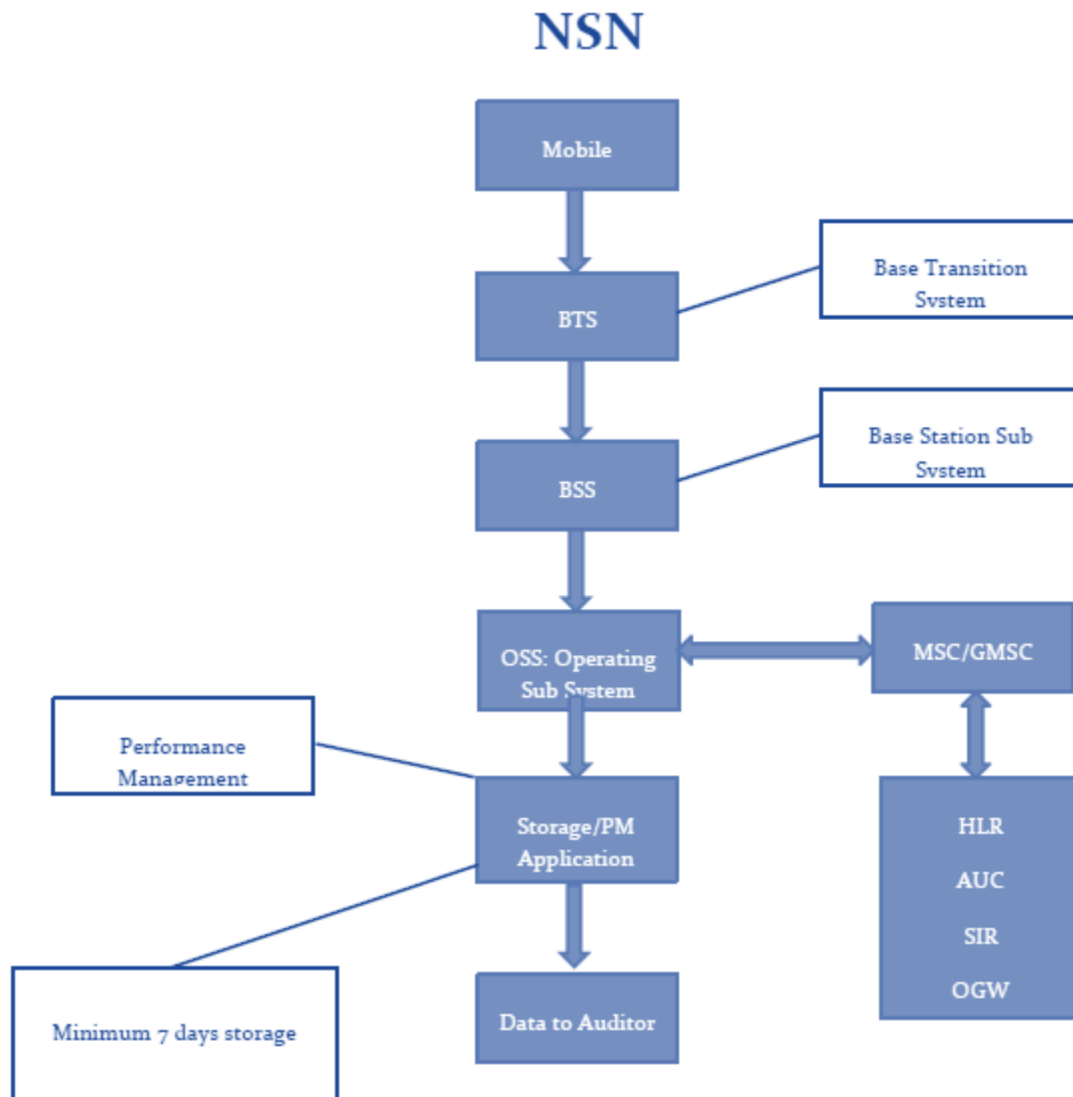
7	RF BLOCK RATE (NUM)	{[(TCH Assignment Requests-CS Orig-IS95[Times] + TCH Assignment Requests-CS Orig-IS2000[Times] + TCH Assignment Requests-CS Term-IS95[Times] + TCH Assignment Requests-CS Term-IS2000[Times]) - (Successful TCH Assignments-CS Orig-IS95[Times] + Successful TCH Assignments-CS Orig-IS2000[Times] + 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[%

15. BLOCK SCHEMATIC DIAGRAM

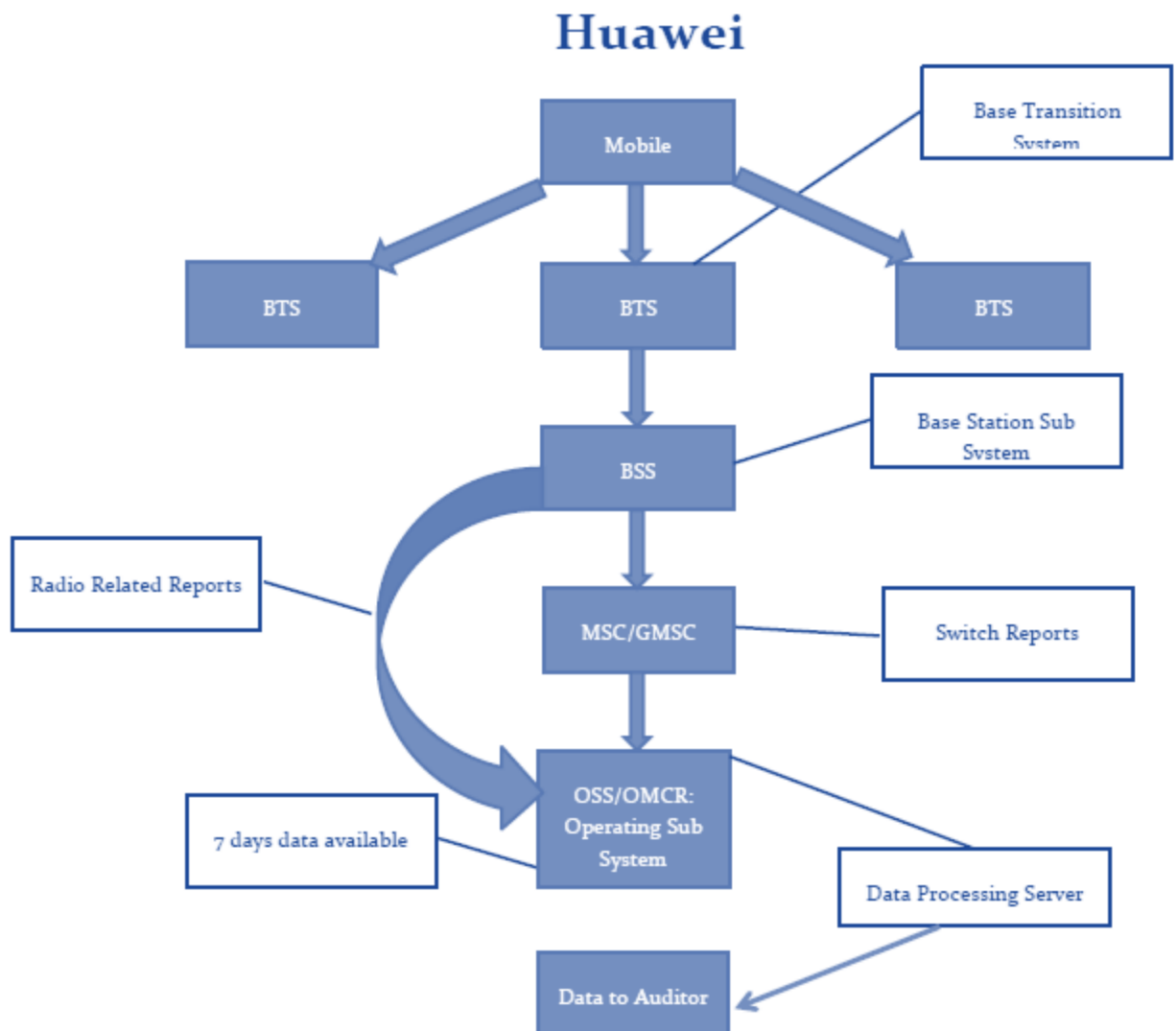
13.7. Ericsson



13.8. NSN



13.9. Huawei



16. 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
- QND'15 – Refers to the quarter of October, November and December 2015
- 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

17 ANNEXURE

17.1. 2G Voice PMR Data: Consolidated

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of BTSs in a month in hrs. in the licensed service area	No. of BTSs having accumulated downtime of >24 hours in a month	Call Set-up Success Rate (Within Licensee own network)	SDDCH/Paging chl. Congestion	TCH Congestion	Call Drop Rate (%age)	Worst Affected cell having more than 3% TCH drop	%age of connection with good voice quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	0.14%	0.61%	98.07%	0.23%	0.57%	0.34%	2.08%	95.99%
Airtel	1.07%	1.09%	98.87%	0.67%	0.79%	1.36%	2.20%	95.99%
BSNL	1.41%	1.81%	97.28%	0.47%	1.37%	1.27%	2.32%	96.99%
Idea	0.13%	0.24%	97.28%	0.97%	1.86%	1.22%	2.62%	96.60%
MTS	0.03%	0.00%	98.69%	NA	0.00%	0.16%	2.06%	98.32%
RCOM CDMA	0.04%	0.27%	97.40%	NA	0.50%	0.12%	0.67%	98.75%
RCOM GSM	0.21%	0.30%	97.58%	0.21%	0.26%	0.08%	0.37%	98.94%
TELENOR	0.22%	0.45%	98.06%	0.55%	1.23%	0.52%	1.43%	95.93%
TTSL CDMA	0.15%	0.36%	99.17%	NA	0.16%	0.52%	5.18%	98.95%
TTSL GSM	0.22%	0.54%	98.04%	0.23%	0.57%	0.89%	5.22%	97.13%
Videocon	0.18%	0.00%	99.12%	0.10%	0.00%	0.72%	0.00%	99.31%
Vodafone	0.43%	0.77%	99.18%	0.46%	0.82%	0.76%	2.96%	96.57%
BSNL UK	1.12%	1.86%	97.05%	0.51%	1.22%	1.34%	1.98%	95.89%

- TTSL CDMA has parameter value of **5.18%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.
- TTSL GSM has parameter value of **5.22%** and failed to meet the benchmark of $\leq 3\%$ for Worst Affected cell having more than 3% TCH drop.

17.2. 3G Voice PMR: Consolidated

Name of Service Provider	Network Availability		Connection Establishment (Accessibility)			Connection Maintenance (Retainability)		
	Sum of downtime of Node B's in a month in hrs	No. of Node B's having Accumulated Downtime of > 24 hrs in a month	Call Set-up Success Rate (Within Licensee own network)	RRC Congestion	RAB Congestion	Circuit Switched Voice Drop Rate	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate	%age of connections with Good Circuit Switched Voice Quality
Benchmark	≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%
Aircel	NA	NA	NA	NA	NA	NA	NA	NA
Airtel	1.32%	1.34%	99.48%	0.11%	0.00%	0.60%	1.19%	98.76%
BSNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
Idea	0.37%	1.36%	99.25%	0.96%	0.42%	0.27%	2.37%	99.23%
MTS	NA	NA	NA	NA	NA	NA	NA	NA
RCOM CDMA	NA	NA	NA	NA	NA	NA	NA	NA
RCOM GSM	NA	NA	NA	NA	NA	NA	NA	NA
TATA CDMA	NA	NA	NA	NA	NA	NA	NA	NA
TATA GSM	0.24%	0.53%	98.26%	0.50%	1.47%	0.40%	3.15%	99.13%
Vodafone	NA	NA	NA	NA	NA	NA	NA	NA
BSNL UK	1.27%	0.53%	96.45%	1.34%	1.29%	1.33%	2.66%	DNA

- BSNL UK has parameter value of **1.34%** and failed to meet the benchmark of ≤1% for RRC Congestion.
- TATA GSM has parameter value of **3.15%** and failed to meet the benchmark of ≤ 3% for Worst affected cells having more than 3% Circuit Switched Voice Drop Rate
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

17.3. 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	Customer Care		Customer Care & Grievances Redressal	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints resolved within 6 weeks	%age of credit/weiver 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	% of complaints addressed at call center level.	% of complaints addressed by Appellate authority.
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%	97.69%	98.55%	100.00%	100.00%
Airtel	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.58%	98.70%	1.33%
BSNL	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.78%	65.53%	NIL
Idea	0.06%	0.00%	99.99%	100.00%	100.00%	100.00%	100.00%	99.38%	98.64%	37.12%	0.00%
RCOM CDMA	0.08%	0.02%	100.00%	100.00%	100.00%	100.00%	100.00%	98.10%	95.58%	100.00%	100.00%
RCOM GSM	0.08%	0.09%	100.00%	100.00%	100.00%	100.00%	93.13%	98.26%	96.20%	100.00%	100.00%
TTSL CDMA	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	96.36%	98.37%	88.77%	99.51%	100.00%
TTSL GSM	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.07%	99.51%	98.17%	100.00%
Vodafone	0.19%	0.17%	100.00%	100.00%	100.00%	100.00%	100.00%	98.07%	99.69%	100.00%	100.00%
TELENOR	NIL	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.27%	95.19%	DNA	100.00%
MTS	0	0.01%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	94.39%	22.02%	0.00%

- Vodafone has parameter value of **0.19%** and failed to meet the benchmark of ≤0.1% for Metering and Billing Credibility (Post-paid Subscribers).

- Vodafone has parameter value of **0.17%** and failed to meet the benchmark of $\leq 0.1\%$ for Metering and Billing Credibility (Prepaid Subscribers).
- TTSL CDMA has parameter value of **88.77%** and failed to meet the benchmark of $\geq 95\%$ for %age of call answered by the operators (voice to voice) within 90 seconds.
- Postpaid subscribers are not available with Telenor.
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

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

Name of Service Provider	Network Availability				Connection Establishment (Accessibility)						Connection Maintenance (Retainability)					
	Sum of downtime of BTSs in a month in hrs. in the licensed service area		No. of BTSs having accumulated downtime of >24 hours in a month		Call Set-up Success Rate (Within Licensee own network)		SDDCH/Paging chl. Congestion		TCH Congestion		Call Drop Rate (%age)		Worst Affected call having more than 3% TCH drop		%age of connection with good voice quality	
Benchmark	≤ 2%		≤ 2%		≥ 95%		≤ 1%		≤ 2%		≤ 2%		≤ 3%		≥ 95%	
	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP
Aircel	0.14%	0.14%	0.61%	0.61%	98.07%	98.07%	0.23%	0.23%	0.57%	0.57%	0.34%	0.23%	2.08%	2.08%	95.99%	96.05%
Airtel	1.07%	1.07%	1.09%	1.16%	98.87%	98.87%	0.67%	0.67%	0.79%	0.79%	1.36%	1.36%	2.20%	2.20%	95.99%	95.92%
BSNL	1.41%	1.26%	1.81%	1.82%	97.28%	97.17%	0.47%	0.49%	1.37%	1.29%	1.27%	1.31%	2.32%	2.16%	96.99%	96.44%
Idea	0.13%	0.14%	0.24%	0.24%	97.28%	97.28%	0.97%	0.97%	1.86%	1.86%	1.22%	1.22%	2.62%	2.61%	96.60%	96.60%
MTS	0.03%	0.03%	0.00%	0.00%	98.69%	98.69%	NA	0.00%	0.00%	0.00%	0.16%	0.16%	2.06%	2.06%	98.32%	98.32%
RCOM CDMA	0.04%	0.04%	0.27%	0.27%	97.40%	97.39%	NA	0.00%	0.50%	0.72%	0.12%	0.12%	0.67%	0.67%	98.75%	98.72%
RCOM GSM	0.21%	0.04%	0.30%	0.30%	97.58%	97.58%	0.21%	0.21%	0.26%	0.26%	0.08%	0.08%	0.37%	0.37%	98.94%	98.94%
TELENOR	0.22%	0.22%	0.45%	0.45%	98.06%	98.06%	0.55%	0.56%	1.23%	1.23%	0.52%	0.52%	1.43%	1.44%	95.93%	95.93%
TTSL CDMA	0.15%	0.15%	0.36%	0.36%	99.17%	99.17%	NA	0.00%	0.16%	0.16%	0.52%	0.52%	5.18%	5.19%	98.95%	98.95%
TTSL GSM	0.22%	0.22%	0.54%	0.54%	98.04%	98.04%	0.23%	0.23%	0.57%	0.57%	0.89%	0.89%	5.22%	5.22%	97.13%	97.13%
Videocon	0.18%	0.28%	0.00%	0.00%	99.12%	99.46%	0.10%	0.07%	0.00%	0.05%	0.72%	0.51%	0.00%	0.00%	99.31%	99.53%
Vodafone	0.43%	0.64%	0.77%	0.77%	99.18%	99.18%	0.46%	0.46%	0.82%	0.82%	0.76%	0.76%	2.96%	2.96%	96.57%	96.57%
BSNL UK	1.12%	DNA	1.86%	DNA	97.05%	DNA	0.51%	DNA	1.22%	DNA	1.34%	DNA	1.98%	DNA	95.89%	DNA

- **For each instance of "DNA (Data Not Available)", please refer the respective hard copy of audit report(s).

17.5. 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		Customer Care			
	Postpaid Subscribers		Prepaid Subscribers		%age complaints resolved within 4 weeks		%age complaints resolved within 6 weeks		%age of credit/weiver is received within one week		% of Termination/ Closure of service within 7 days (100 %)		Cleared over a period of <60 days (100%)		%age of calls answered by the IVR		%age of call answered by the operators (voice to voice) within 90 seconds	
Benchmark	≤ 0.1%		≤ 0.1%		≥ 98%		= 100%		= 100%		= 100%		= 100%		≥ 95%		≥ 95%	
	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP
Aircel	0.00%	0.00%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.69%	97.69%	98.55%	98.55%
Airtel	0.01%	0.01%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.58%	97.58%
BSNL	0.00%	0.01%	0.00%	0.01%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	97.78%	98.18%
Idea	0.06%	0.06%	0.00%	0.00%	99.99%	99.99%	100%	100%	100%	100%	100%	100%	100%	100%	99.38%	99.38%	98.64%	98.64%
MTS	0.00%	0.00%	0.01%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.00%	98.10%	94.39%	95.58%
RCOM CDMA	0.08%	0.08%	0.02%	0.02%	100%	100%	100%	100%	100%	100%	100%	100%	100.00%	93.13%	98.10%	98.26%	95.58%	96.20%
RCOM GSM	0.08%	0.08%	0.09%	0.09%	100%	100%	100%	100%	100%	100%	100%	100%	93.13%	96.36%	98.26%	98.37%	88.71%	88.77%
TELENOR	NA	NA	0.00%	0.01%	100%	100%	100%	100%	100%	NA	100%	NA	100%	NA	99.07%	99.07%	99.51%	99.51%
TTSL CDMA	0.00%	0.00%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	96%	100%	98.07%	98.07%	99.69%	99.69%
TTSL GSM	0.00%	0.00%	0.00%	0.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.21%	99.27%	95.19%	95.19%
Vodafone	0.19%	0.19%	0.17%	0.17%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	94.31%	94.39%