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



AUDIT & ASSESSMENT OF QUALITY OF SERVICE CELLULAR MOBILE TELEPHONE SERVICE (CMTS)

(JULY TO SEPTEMBER 2016)

NORTH ZONE – JAMMU & KASHMIR CIRCLE

PREPARED BY:

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1. INTRODUCTION

1.1. ABOUT TRAI

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

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

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

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

1.2. ABOUT PHISTREAM CONSULTING PRIVATE LIMITED

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

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

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

1.3. OBJECTIVES

The primary objective of the Audit module is to:

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

1.4. COVERAGE

The audit was conducted in Jammu & Kashmir Circle covering all SSAs (Secondary Switching Areas).

Image Source: Wikipedia

1.5. SSA LIST

S. No.	Circle	SSA Name
1	JK	Jammu
2	JK	Leh
3	JK	Rajouri
4	JK	Srinagar
5	JK	Udhampur

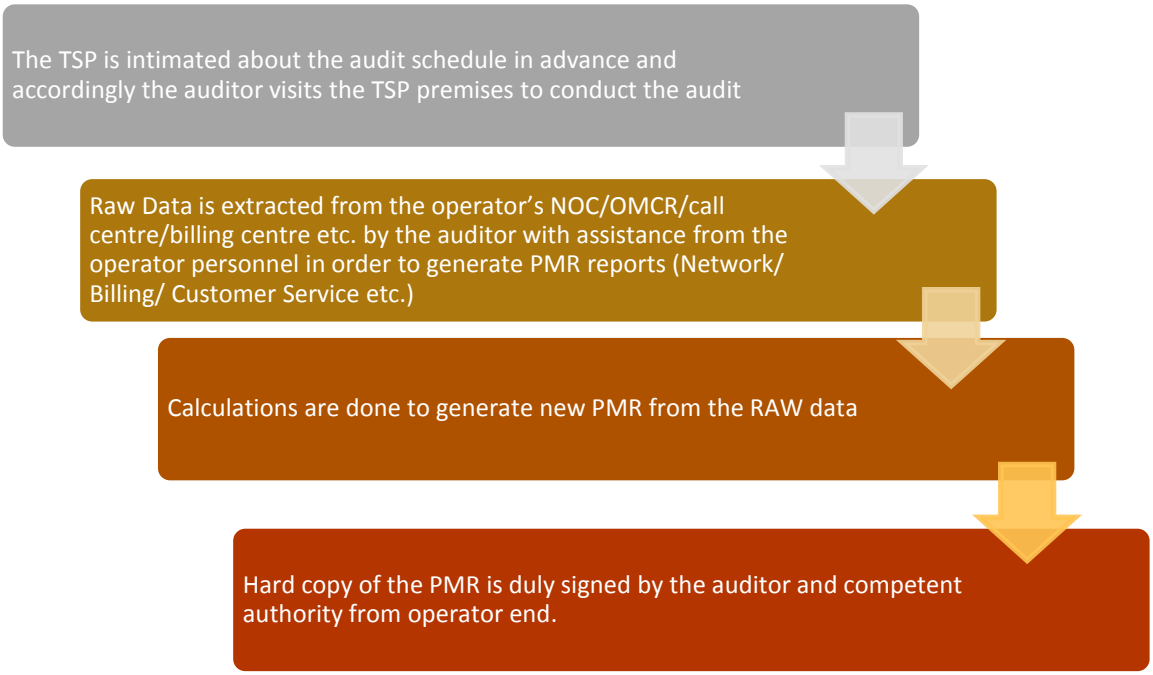
1.6. FRAMEWORK USED

Audit Activities

PMR Reports	Drive Test	CSD Audit (Quarterly)	Wireline & Broadband (Quarterly)	Inter Operator Call Assessment
Monthly PMR	Operator Assisted	Billing Complain	Billing Complain	
3 Days Live Data	Independent	Service request	Service Request	
	Level 1 Service	Customer Service	Level 1 Service/Inter Operator	
			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, Sep 2016 audit data was collected in the month of Oct 2016.

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

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

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

Let us understand these formats in details.

2.1. MONTHLY PMR

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

Parameters includes:

Network Availability

- BTS accumulated downtime
- Worst affected BTS due to downtime

Connection Establishment (Accessibility)

- Call Set Up success Rate (CSSR)

Network Congestion Parameters

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

Connection Maintenance

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

Voice Quality

- % Connections with good voice quality

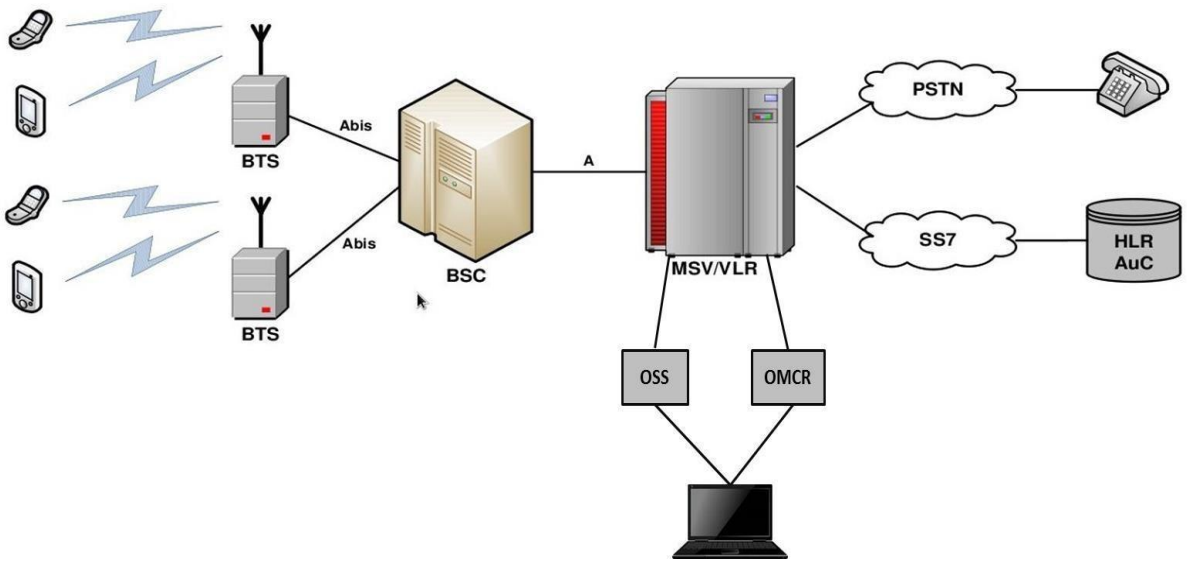
2.2. AUDIT PARAMETER: NETWORK

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

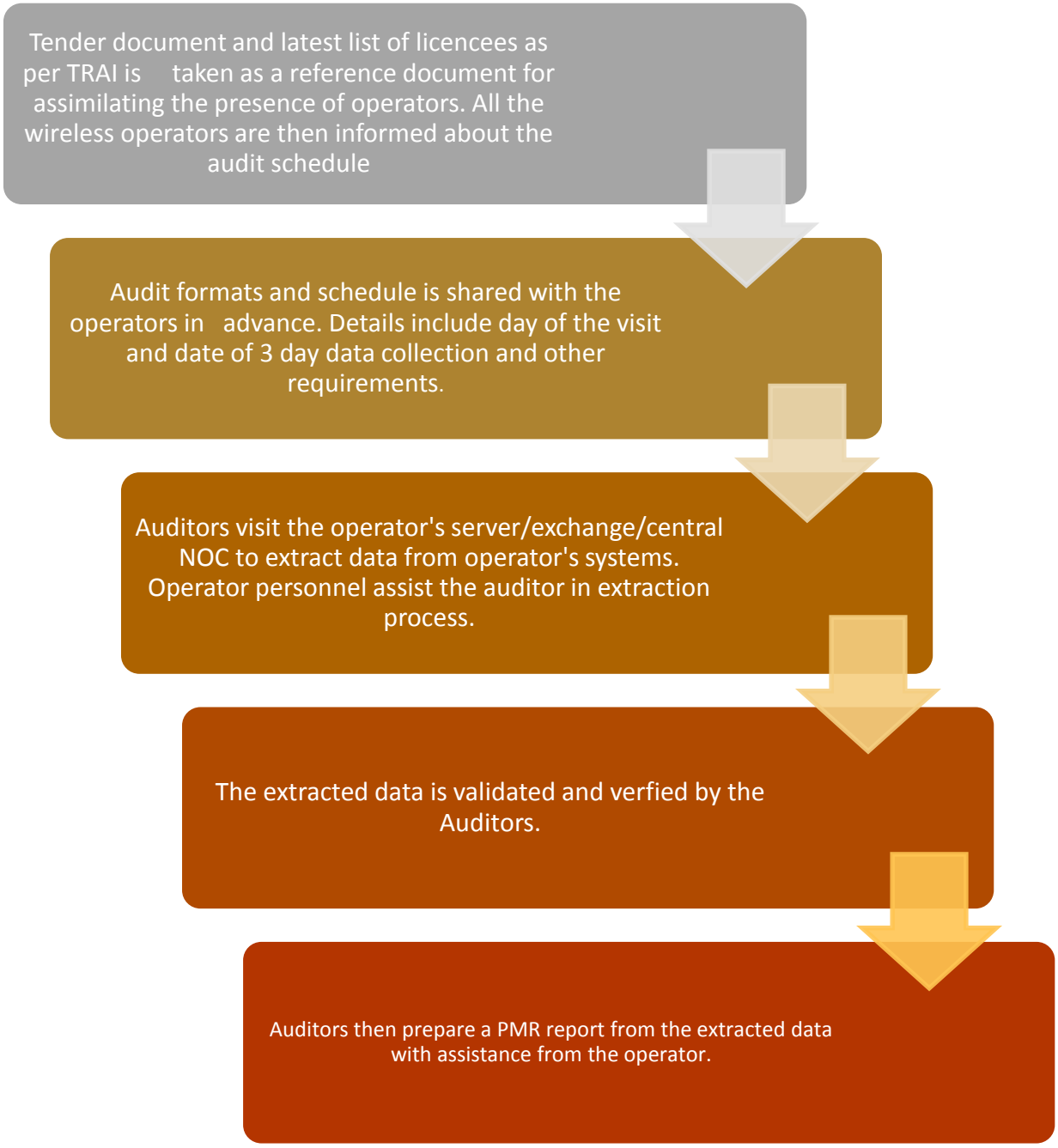
Network Availability	
BTSs Accumulated downtime (not available for service)	≤ 2%
Worst affected BTSs due to downtime	≤ 2%
Connection Establishment (Accessibility)	
Call Set-up Success Rate (within licensee's own network)	≥ 95%
SDCCH/ Paging Channel Congestion	≤ 1 %
TCH Congestion	≤ 2%
Connection Maintenance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

2.3. DATA EXTRACTION POINTS

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



2.4. AUDIT PROCEDURE



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

2.5. NETWORK CALCULATION METHODOLOGY

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

2.6. 3G VOICE

S. No.	Name of Parameter	Definition	Formula	Benchmark
1	Network Availability			
a.	Total no. of Node B's in LSA	Total no. of Node B's Licensed in LSA		
b.	Total downtime of all Node B's	When all the sector(s) of a Node B's are down for > 60 minutes at an instant in a whole day		
c.	No. of Worst Affected Node B's	Node B'ss having more than 24 hours of Downtime in 3 Days	No. of Node B's having accumulated downtime of >24 hours in a month	*<=2%*
			((No. of Node B's having Accumulated Downtime of > 24 hrs in a month) / Total no. of BTSs in the licensed service area)*100	
d.	Node B's accumulated downtime	Node B's downtime more than 24 hr in 3 days	Total no. of Node B's in the Licensed Service Area	*<=2%*
			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.	RAB Attempts (RAB Setup Access) (C)	*<=2%*

		of RAB Failed Calls to the Total no. of RAB Assigned Calls	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	POI			
	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 >=0.5% POI congestion	
			Name of POI not meeting the benchmark (having >=0.5% POI congestion)	

2.7. 2G & 3G WIRELESS

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

3. 3 DAYS LIVE DATA

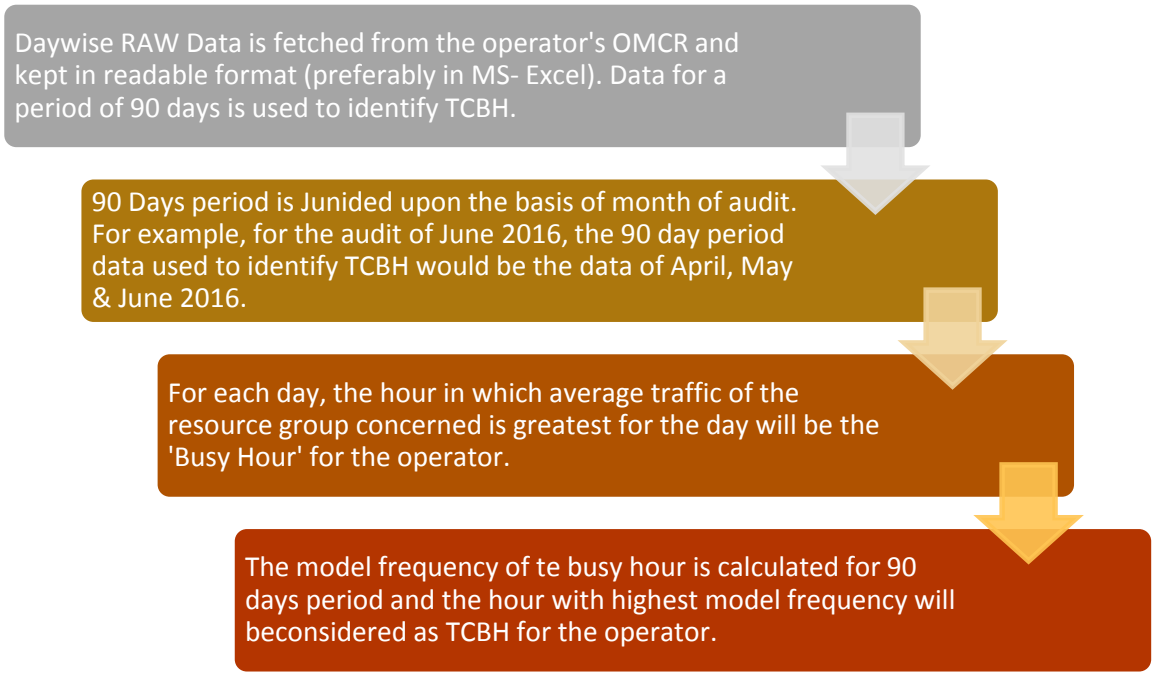
The main purpose of 3 day live measurement is to evaluate the network parameters on intraday basis. While the monthly PMR report provides an overall view of the performance of QoS parameters, the 3 day live data helps looking at intraday performance on the network parameters discussed earlier. All the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

The 3 day live data provides a sample of 9 days in a quarter (3 days each month of a quarter) with hourly performance, which enables the auditor to identify and validate intraday issues for an operator on the 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

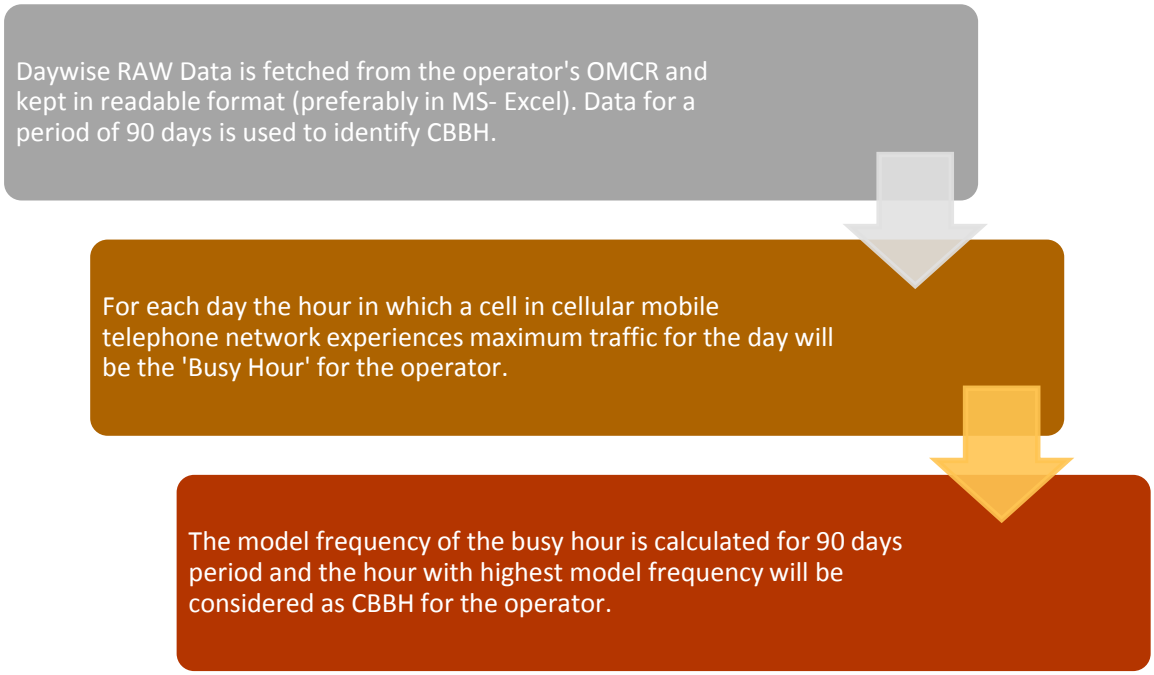
As per QoS regulations 2009 (7 of 2009), Time Consistent Busy Hour" or "TCBH" means the one hour period starting at the same time each day for which the average traffic of the resource group concerned is greatest over the days under consideration and such Time Consistent Busy Hour shall be established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



3.2. CBBH: SIGNIFICANCE AND SELECTION METHODOLOGY

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

Step by step procedure to identify CBBH for an operator:



4. CUSTOMERSERVICE 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 September 2016 was collected in the month of October 2016. To extract the data for customer service parameters for the purpose of audit, auditors primarily visit the following locations/ departments/ offices at the operator's end.

- Central Billing Center
- Central Customer Service Center

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

The Customer Service Quality Parameters include the following:

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

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

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

4.1. AUDIT PARAMETERS: CUSTOMER SERVICE

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

4.2. CALCULATION METHODOLOGY: CUSTOMER SERVICE PARAMETER

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

4.3. LIVE CALLING: SIGNIFICANCE AND METHODOLOGY

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 numbersis 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 QE September 2016. The data considered for live calling was for the month prior to the month in which the live calling activity was being conducted. In this case, data of September 2016 was considered for live calling activity conducted in October 2016.
A detailed explanation of each parameter is explained below:

4.4. BILLING COMPLAINTS

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

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

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

All the complaints related to billing as per clause 3.7.2 of QoS regulation of 20th June, 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 April, May and June'15, auditor has tried contacting the list of Level 1 services provided by TRAI as per the NNP (National Numbering Plan).

4.7. PROCESS TO TEST LEVEL 1 SERVICE

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

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

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

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

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

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

Sr. No.	Level-1 (Emergency) Helpline Number Details
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 Help Line for Passengers
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 Alert (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)
27	10740 Central Pollution Control Board
28	10741 Pollution Control Board
29	1511 Police Related Service for all Metro Railway Project
30	1512 Prevention of Crime in Railway
31	1514 National Career Service(NCS)
32	15100 Free Legal Service Helpline
33	155304 Municipal Corporations
34	155214 Labour Helpline
35	1903 Sashastra Seema Bal (SSB)
36	1909 National Do Not Call Registry
37	1912 Complaint of Electricity
38	1916 Drinking Water Supply
39	1950 Election Commission of India

4.8. CUSTOMER CARE

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

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

The process for this parameter is stated below:

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

4.9. INTER OPERATOR CALL ASSESSMENT

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

Inter Operator Call Assessment	Aircel	Airtel	BSNL	Idea	Reliance GSM	Vodafone
Aircel	-	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%
BSNL	100%	100%	-	100%	100%	100%
Idea	100%	100%	100%	-	100%	100%
Reliance GSM	100%	100%	100%	100%	-	100%
Vodafone	100%	100%	100%	100%	100%	-

5. DRIVE TEST: SIGNIFICANCE AND METHODOLOGY

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

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

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

There are two types of drive test as mentioned below:

- Operator Assisted Drive Test
- Independent Drive Test

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

5.1. OPERATOR ASSISTED DRIVE TEST

Jammu & Kashmir circle consists of total 5 SSA's and each SSA needs to be audit in the span of 12 months.

The methodology adopted for the drive test:

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

5.2. INDEPENDENT DRIVE TEST

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

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

5.3. PARAMETERS EVALUATED DURING DRIVE TEST

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

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

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

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

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

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

- Blocked calls
  - 100% - Call Set up Rate

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

6. EXECUTIVE SUMMARY

The executive summary put in a nutshell the key findings of the Audit by providing: -

- *"Service provider performance report"* for Cellular mobile, Basic (wire line) and Broadband services , which gives a foretaste of the performance of various operators against the benchmark specified by TRAI, during the months in which the Audit was carried out by PhiStream Consulting Pvt. Ltd. Auditors.

- *"Parameter wise critical findings"* for Cellular mobile, Basic (wire line) and Broadband services: This indicates key observations and findings from different activities carried out during the Audit process.

- PhiStream conducted audit involved a 3 stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. On the basis of the three days live measurement, the auditors checked the busy hour of the day for the service provider and collected the data for this busy hour for the month in which the audit was conducted Finally, the performance of the service providers was also gauged by conducting drive tests in three select SSAs per service provider per quarter.

- The three stage audit / verification viz audit of the records, live measurements and drive tests of all the cellular mobile operators was repeated every month. In case of Basic (Wire line) and Broadband, this exercise is required to be carried out on quarterly basis.

6. GENERAL INFORMATION

6.1. OPERATORS COVERED & ACTIVE SUBSCRIBER BASE

Name of Operator	Number of Subscriber (Up to September 30, 2016)
AIRCEL	2688796
AIRTEL	3072866
BSNL	1421240
IDEA	439938
RCOM GSM	966307
VODAFONE	831343

6.2 . SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:									
Sr.No.	**Name of Service Provider**	**No. of cells**	**BTS**	**BSC**	**MSC+GMSC**	**NSS make**	**BSS make**	**Node B**	**RNC**
1	Aircel	6988	2359	22	7	Ericsson	Ericsson	767	5
2	Airtel	7921	2944	35	12	Ericsson	Ericsson	265	5
3	BSNL	3437	1155	21	8	M/s EIL & M/s ZTE	M/s EIL, M/s NSN & M/s ZTE	392	7
4	IDEA	3810	1300	9	2	Ericsson	Ericsson	556	2
5	RCOM GSM	2558	854	5	2	MSC-Huawei	Huawei	454	2
6	VODAFONE	5176	1713	17	2	Nokia	Nokia	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.

DNA: Data not available

6.3. BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	Aircel	September-16	20:00 - 21:00
2	Airtel	September-16	19:00 - 20:00
3	BSNL	September-16	19:00 - 20:00
4	IDEA	September-16	21:00 - 22:00
5	RCOM GSM	September-16	22:00 - 23:00
6	VODAFONE	September-16	22:00 - 23:00

The TCBH reported by all the service providers matched the network busy hour calculated by Phistream auditors for the Jammu & Kashmir circle.

6.4. AUDIT SCHEDULE

Sl. No.	Service Provider	Dates of live measurement Audit			
Operators		July-16	Aug-16	Sept-16	Audit Location
1	AIRCEL	5 to 7 July 2016	3 to 5 August 2016	6 to 8 September 2016	Dishnet Wireless Limited , 2nd floor North Block Bahu Plaza Jammu
2	AIRTEL	14, 15 & 18 July 2016	22 to 24 August 2016	21 to 23 September 2016	Bharti Airtel Campus, Plot No 21, Rajiv Gandhi Information and Technilogy Park, Chandigarh, 160101
3	BSNL	12 to 14 July 2016	8 to 10 August 2016	8, 9 & 12 September 2016	BSNL 4th floor, Rail Head Complex Jammu
4	IDEA	6 to 8 July 2016	4, 5 & 8 August 2016	5 to 7 September 2016	Idea Office Phase -7 Industrial Area, Mohali
7	RCOM GSM	6 to 8 July 2016	4 to 8 August 2016	9, 12 &13 September 2016	Reliance Communication Limited Narwal KC Business Park Jammu
10	VODAFONE	11 to 13 July 2016	17 to 19 August 2016	6 to 8 September 2016	Vodafone Spacetel Ltd. 4th floor (B) , North Block Bahu Plaza Complex Jammu-180004

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

Colour codes to read the report:

	Not meeting the benchmark
N/A	Not applicable
DNA	Data not available (At TSP premises)
NP	Not Provided by TSP

6.5. 2G VOICE QOS PERFORMANCE OF MONTHLY PMR – JULY 2016 MONTH

July								
Network Parameters		Name of Service Provider						
		Benchmark	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.52%	0.13%	1.59%	0.21%	0.10%	0.46%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	3.59%	0.14%	0.95%	0.56%	1.44%	3.44%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	96.59%	98.17%	98.75%	98.78%	95.73%	99.33%
	SDDCH/Paging chl. Congestion	≤ 1%	0.09%	0.94%	0.64%	0.64%	0.29%	0.16%
	TCH Congestion	≤ 2%	1.92%	1.33%	1.25%	0.83%	0.13%	0.67%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.38%	1.67%	0.85%	1.30%	0.19%	0.64%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	12.15%	0.58%	2.65%	1.83%	0.48%	2.18%
	%age of connection with good voice quality	≥ 95%	95.24%	95.74%	96.70%	97.47%	99.06%	98.50%

6.6. 2G VOICE QOS PERFORMANCE OF MONTHLY PMR – AUGUST 2016 MONTH

Aug-16								
Network Parameters		Name of Service Provider						
		Benchmark	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.60%	0.15%	1.21%	0.16%	0.19%	1.94%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	5.10%	0.18%	0.26%	0.56%	0.00%	14.13%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	94.37%	96.82%	98.72%	98.68%	97.04%	99.58%
	SDDCH/Paging chl. Congestion	≤ 1%	0.56%	10.80%	0.63%	1.22%	0.13%	0.07%
	TCH Congestion	≤ 2%	5.10%	2.56%	1.24%	0.91%	0.15%	0.42%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.59%	1.99%	0.83%	1.51%	0.28%	0.84%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	13.67%	0.62%	2.47%	2.06%	1.32%	2.49%
	%age of connection with good voice quality	≥ 95%	95.52%	95.76%	96.70%	96.21%	98.74%	98.31%

6.7. 2G VOICE QOS PERFORMANCE OF MONTHLY PMR – SEPTEMBER 2016 MONTH

Sep-16								
Network Parameters		Name of Service Provider						
		Benchmark	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.63%	0.18%	1.59%	0.07%	0.16%	1.55%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.59%	0.27%	0.78%	0.08%	0.00%	10.57%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.44%	96.98%	98.74%	98.43%	98.08%	99.04%
	SDDCH/Paging chl. Congestion	≤ 1%	0.26%	5.67%	0.59%	0.08%	0.13%	0.09%
	TCH Congestion	≤ 2%	1.96%	2.31%	1.25%	1.09%	0.41%	0.96%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.34%	1.83%	0.80%	1.50%	0.32%	0.95%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	11.02%	0.52%	2.32%	2.01%	1.25%	2.54%
	%age of connection with good voice quality	≥ 95%	95.82%	95.79%	96.58%	95.40%	98.61%	98.52%

6.8. 2G VOICE QOS PERFORMANCE OF PMR QE – SEPTEMBER 2016 MONTH

Consolidated								
Network Parameters		Name of Service Provider						
		Benchmark	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.59%	0.15%	1.46%	0.15%	0.15%	1.32%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	3.09%	0.20%	0.66%	0.40%	0.48%	9.38%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	96.13%	97.32%	98.74%	98.63%	96.95%	99.31%
	SDDCH/Paging chl. Congestion	≤ 1%	0.31%	5.80%	0.62%	0.65%	0.18%	0.11%
	TCH Congestion	≤ 2%	3.00%	2.07%	1.25%	0.94%	0.23%	0.69%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.43%	1.83%	0.83%	1.43%	0.27%	0.81%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	12.28%	0.57%	2.48%	1.97%	1.02%	2.40%
	%age of connection with good voice quality	≥ 95%	95.53%	95.76%	96.66%	96.36%	98.80%	98.44%

Comments:

- Aircel has parameter value of 3.09% and failed to meet the benchmark of ≤ 2% No. of BTSs having accumulated downtime of >24 hours in a month
- Aircel has parameter value of 2.99% and failed to meet the benchmark of ≤ 2% TCH Congestion
- Aircel has parameter value of 12.28% and failed to meet the benchmark of ≤ 3% Worst Affected cell having more than 3% TCH drop
- AIRTEL has parameter value of 5.8% and failed to meet the benchmark of ≤ 1% SDDCH/Paging chl. Congestion

6.9. 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.

6.10. 2G VOICE 3 DAYS LIVE DATA: JULY

Jul-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.25%	0.08%	1.51%	0.45%	0.09%	0.23%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.43%	0.16%	0.00%	0.00%	0.00%	0.12%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.72%	98.59%	98.62%	98.60%	99.69%	98.56%
	SDDCH/Paging chl. Congestion	≤ 1%	0.38%	1.22%	0.49%	0.09%	0.09%	0.54%
	TCH Congestion	≤ 2%	1.73%	0.97%	1.38%	1.09%	0.06%	1.44%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.31%	1.55%	0.81%	1.31%	0.11%	0.63%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	12.34%	0.34%	1.93%	1.90%	0.42%	2.66%
	%age of connection with good voice quality	≥ 95%	94.70%	96.45%	96.66%	97.53%	99.02%	98.77%

6.11. 2G VOICE 3 DAYS LIVE DATA: AUGUST

Aug-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	2.83%	0.09%	1.72%	0.22%	0.31%	0.13%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	2.42%	0.00%	0.00%	0.08%	0.00%	0.12%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	89.58%	97.21%	98.69%	99.06%	100.00%	99.57%
	SDDCH/Paging chl. Congestion	≤ 1%	0.14%	1.03%	0.54%	0.06%	0.07%	0.05%
	TCH Congestion	≤ 2%	9.93%	2.20%	1.31%	0.62%	0.07%	0.43%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.54%	1.85%	0.81%	1.44%	0.20%	0.91%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	14.52%	0.61%	2.53%	1.60%	1.51%	1.44%
	%age of connection with good voice quality	≥ 95%	95.34%	95.94%	96.79%	98.29%	99.12%	98.13%

6.12. 2G VOICE 3 DAYS LIVE DATA: SEPTEMBER

Sep-16								
Network Parameters		Name of Service Provider						
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.10%	0.12%	1.41%	0.04%	0.11%	0.24%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.00%	2.10%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.24%	97.63%	98.90%	98.69%	97.62%	99.25%
	SDDCH/Paging chl. Congestion	≤ 1%	0.34%	0.22%	0.45%	0.08%	0.11%	0.01%
	TCH Congestion	≤ 2%	2.31%	1.74%	1.10%	0.95%	0.22%	0.75%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.34%	1.76%	0.00%	1.37%	0.31%	0.88%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	12.90%	0.47%	2.20%	2.06%	1.12%	2.79%
	%age of connection with good voice quality	≥ 95%	95.97%	96.01%	96.76%	95.85%	98.66%	98.53%

6.13. 2G 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated								
Network Parameters		Name of Service Provider						
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.39%	0.10%	1.55%	0.24%	0.17%	0.20%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.95%	0.05%	0.00%	0.03%	0.00%	0.78%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	94.85%	97.81%	98.74%	98.78%	99.10%	99.13%
	SDDCH/Paging chl. Congestion	≤ 1%	0.29%	0.82%	0.49%	0.08%	0.09%	0.20%
	TCH Congestion	≤ 2%	4.66%	1.64%	1.26%	0.89%	0.12%	0.87%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.40%	1.72%	0.54%	1.37%	0.20%	0.81%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	13.25%	0.48%	2.22%	1.86%	1.02%	2.30%
	%age of connection with good voice quality	≥ 95%	95.34%	96.14%	96.74%	97.22%	98.94%	98.48%

Comments :

- AIRCEL has parameter value of 94.84% and failed to meet the benchmark of ≥ 95% Call Set-up Success Rate (Within Licensee own network
- AIRCEL has parameter value of 4.65% and failed to meet the benchmark of ≤ 2% TCH Congestion
- AIRCEL has parameter value of 13.25% and failed to meet the benchmark of ≤ 3% Worst Affected cell having more than 3% TCH drop

6.14. 3G VOICE PMR: JULY

Jul-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.68%	0.10%	0.23%	0.22%	0.80%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	4.95%	0.30%	0.25%	0.36%	1.53%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.51%	99.50%	98.42%	99.54%	96.16%
	RRC Congestion:	≤ 1%	0.59%	0.00%	0.56%	0.32%	0.14%
	RAB Congestion:	≤ 2%	0.15%	0.00%	0.54%	0.22%	0.21%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	1.48%	0.66%	0.85%	1.13%	0.13%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	12.30%	0.72%	2.19%	1.80%	0.55%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	97.67%	98.96%	97.09%	97.12%	DNA

6.15. 3G VOICE PMR: AUGUST

Aug-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.35%	0.38%	1.37%	0.19%	1.49%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	2.76%	0.50%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.35%	99.05%	97.08%	99.67%	99.99%
	RRC Congestion:	≤ 1%	0.08%	0.08%	0.33%	0.08%	0.03%
	RAB Congestion:	≤ 2%	0.02%	0.09%	0.30%	0.09%	0.01%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	1.40%	1.25%	0.74%	1.18%	0.07%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	13.99%	3.41%	2.83%	1.67%	1.21%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	97.41%	98.38%	96.16%	97.43%	99.84%

6.16. 3G VOICE PMR: SEPTEMBER

Sep-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.25%	0.35%	1.82%	0.02%	1.08%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	1.08%	0.38%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.25%	99.17%	96.94%	99.53%	99.85%
	RRC Congestion:	≤ 1%	0.19%	0.00%	0.35%	0.31%	0.04%
	RAB Congestion:	≤ 2%	0.10%	0.00%	0.62%	0.32%	0.01%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	1.34%	1.24%	1.03%	1.12%	0.11%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	6.04%	2.80%	2.83%	1.28%	1.14%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.95%	98.61%	96.16%	96.93%	99.83%

6.17. 3G VOICE PMR: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.43%	0.28%	1.14%	0.14%	1.12%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	2.93%	0.39%	0.08%	0.12%	0.51%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.70%	99.24%	97.48%	99.58%	98.67%
	RRC Congestion:	≤ 1%	0.29%	0.03%	0.41%	0.24%	0.07%
	RAB Congestion:	≤ 2%	0.09%	0.03%	0.49%	0.21%	0.07%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	1.40%	1.05%	0.87%	1.14%	0.11%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	10.78%	2.31%	2.62%	1.58%	0.96%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.01%	98.65%	96.47%	97.16%	99.83%

Comments:

- AIRCEL has parameter value of 2.92% and failed to meet the benchmark of ≤ 2% No.

of BTSs having accumulated downtime of >24 hours in a month.

- AIRCEL has parameter value of 10.77% and failed to meet the benchmark of ≤ 3% Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

6.18. 3G VOICE 3 DAYS LIVE DATA: JULY

Jul-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.75%	0.02%	1.59%	0.27%	3.71%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.42%	0.30%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.24%	99.76%	97.49%	99.48%	96.58%
	RRC Congestion:	≤ 1%	0.65%	0.00%	0.83%	0.58%	0.17%
	RAB Congestion:	≤ 2%	0.21%	0.00%	1.35%	0.32%	0.19%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	1.60%	0.63%	1.20%	1.29%	0.16%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	16.16%	0.61%	2.55%	1.54%	1.38%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	97.63%	99.02%	96.56%	97.01%	DNA

6.19. 3G VOICE 3 DAYS LIVE DATA: AUGUST

Aug-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.34%	0.71%	1.63%	0.17%	1.07%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.51%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.15%	99.01%	96.27%	99.67%	100.00%
	RRC Congestion:	≤ 1%	0.06%	0.07%	0.78%	0.17%	0.03%
	RAB Congestion:	≤ 2%	0.02%	0.02%	1.23%	0.17%	0.02%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	2.39%	1.28%	1.27%	1.57%	0.05%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	13.85%	3.13%	2.06%	2.12%	0.34%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	97.65%	98.47%	97.19%	97.85%	99.83%

6.20. 3G VOICE 3 DAYS LIVE DATA: SEPTEMBER

Sep-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.26%	0.91%	1.59%	0.02%	1.81%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.82%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.51%	99.05%	98.01%	99.72%	99.99%
	RRC Congestion:	≤ 1%	0.47%	0.00%	0.34%	0.03%	0.01%
	RAB Congestion:	≤ 2%	0.26%	0.00%	0.59%	0.02%	0.00%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	2.57%	1.24%	1.39%	1.10%	0.04%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	6.87%	2.78%	2.85%	1.49%	0.22%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	99.10%	98.66%	DNA	96.73%	99.83%

6.21. 3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.78%	0.55%	1.60%	0.15%	2.20%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.41%	0.27%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.30%	99.27%	97.26%	99.62%	98.86%
	RRC Congestion:	≤ 1%	0.39%	0.02%	0.65%	0.26%	0.07%
	RAB Congestion:	≤ 2%	0.16%	0.01%	1.06%	0.17%	0.07%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	2.19%	1.05%	1.29%	1.32%	0.08%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	12.29%	2.17%	2.49%	1.72%	0.65%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.13%	98.72%	96.87%	97.20%	99.83%

Comments:

- AIRCEL has parameter value of 2.18% and failed to meet the benchmark of ≤ 2% Circuit Switched Voice Drop Rate.
- AIRCEL has parameter value of 12.29% and failed to meet the benchmark of ≤ 3% Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

6.22. 2G Wireless Data: July

Jul-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		161012	DNA	2159	29049	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		160252	DNA	2159	29044	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.53%	DNA	100.00%	99.98%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		276794059	43635607	383685	18688215	DNA	989034.5484
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		276392713	43619681	378449.3927	18683271	DNA	988887.5161
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.86%	99.96%	98.64%	99.97%	99	99.99%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		10952271	2.84732E+11	802929125	398375921	7432463	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		690340369	403732758	22493697	2854114	311763308	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.59%	0.14%	2.80%	0.72%	2.38%	DNA

6.23. 2G Wireless Data: August

Aug-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		931183	DNA	3607	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		925799	DNA	3607	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.42%	DNA	100.00%	DNA	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		262504540	4340307	500779	22390834	DNA	38174655
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		262475133	4336497	498508	22383504	DNA	38156944
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.99%	99.91%	99.55%	99.97%	99.29%	99.95%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		720898948	1170015810	578612354	536779144	366125102	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		10165766	16377368	11505197	3511775	10427743	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.41%	1.40%	1.99%	0.65%	2.85%	3.88%

6.24. 2G WIRELESS DATA: SEPTEMBER

Sep-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		937370	DNA	3590	22420	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		931115	DNA	3590	22420	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.33%	DNA	100.00%	100.00%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		243751397	3926762	478640	20454178	DNA	35183044
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		243747456	3926490	476903	20450194	DNA	35162845
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.99%	99.64%	99.98%	98.88%	99.94%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		652337067	1022222279	1229178282	468314578	342701692	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		7601937	13526290	32838696	2994501	9883258	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.17%	1.32%	2.67%	0.64%	2.88%	3.91%

6.25. 2G WIRELESS DATA: CONSOLIDATED

Consolidated								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		676521.6667	DNA	3118.666667	25734.5	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		672388.6667	DNA	3118.666667	25732	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	0.994275012	DNA	1	0.999913939	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		261016665.3	17300892	454368	20511075.67	DNA	24782244.52
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		260871767.3	17294222.67	451286.7976	20505656.33	DNA	24769558.84
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	0.999473942	0.999562645	0.992730148	0.999737768	33.557095	0.999604426
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		461396095.3	95641535034	870239920.3	467823214.3	238753085.7	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		236036024	144545472	22279196.67	3120130	110691436.3	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	0.013873311	0.009549246	0.024871548	0.006700297	0.027053564	0.03895959

6.26. 2G Wireless 3 Days Live Data: July

Jul-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
	Total No. of Subscribers for Service Activation (A)		DNA	DNA	250	3316	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	250	3315	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.00%	99.97%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		57508518	4308936	51467	5167899	DNA	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		57506907	4308182	50318	5166746	DNA	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.98%	97.77%	99.98%	98.59%	DNA
3	Drop Rate							
i)	TBF originated PS Domain Iu Connection Setup Success (A)		160032884	26654797898	189641917.00	115808511	82715715	DNA
ii)	TBF originated PS Domain Iu Connection Release (B)		2371479	38092634	5780489.00	825961	1757441	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.48%	0.14%	3.05%	0.71%	2.12%	DNA

6.27. 2G Wireless 3 Days Live Data: August

Aug-16								
Cellular Mobile Telephone Services								
S.No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	408	2128	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	408	2128	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.00%	100.00%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		14867545	402146	43225	1726364	DNA	4028079
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		14867299	401845	43006	1725731	DNA	4024888
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.93%	99.49%	99.96%	99.43%	99.92%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		74429395	111289325	117199058.00	51335216	29900369	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		1226118	1504104	3142645.00	348560	836364	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.65%	1.35	2.68%	0.68%	2.80%	3.84%

6.28. 2G WIRELESS 3 DAYS LIVE DATA: SEPTEMBER

Sep-16								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	424	2498	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	424	2498	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.00%	100.00%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		25197474	399576	52970	2133108	DNA	3609956
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		25197249	399550	52819	2132678	DNA	3608176
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.99%	99.71%	99.98%	98.62%	99.95%
3	Drop Rate							
i)	RNC originated PS Domain Iu Connection Setup Success (A)		66781619	106359821	112980867.00	47637362	28484015	DNA
ii)	RNC originated PS Domain Iu Connection Release (B)		816071	1381164	3030707.00	300864	800836	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.22%	1.30%	2.68%	0.63%	2.81%	3.78%

6.29. 2G WIRELESS 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated								
Cellular Mobile Telephone Services								
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Service Quality Parameter								
1	Service Activation/ Provisioning							
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	360.6666667	2647.3333	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	360.6666667	2647	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.00%	99.99%	DNA	DNA
2	PDP Context Activation Success Rate							
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		32524512.33	1703552.667	49220.66667	3009123.7	DNA	3819017.5
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		32523818.33	1703192.333	48714.35066	3008385	DNA	3816532
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.97%	98.99%	99.97%	98.88%	99.94%
3	Drop Rate							
i)	TBF originated PS Domain Iu Connection Setup Success (A)		100414632.7	8957482348	139940614	71593696	47033366	DNA
ii)	TBF originated PS Domain Iu Connection Release (B)		1471222.667	13659300.67	3984613.667	491795	1131547	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	1.45%	45.53%	2.80%	0.67%	2.58%	3.81%

6.30. 3G WIRELESS DATA: JULY

Jul-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		161012	DNA	2159	DNA	9750
ii)	Total Service Activations provided within 4 Hours (B)		160252	DNA	2159	DNA	9857
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.53%	DNA	100.00%	DNA	98.91%
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		276794059	9446550	136910.77	5704882.00	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		276392713	9422396	132816.92	5650823.00	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.86%	99.74%	97.01%	99.05%	99.19%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		27988750	509763319	451239775.00	19344978.00	294993
ii)	RNC originated PS Domain Iu Connection Release (B)		788549	189707	9393149.00	360651.00	40657539
iii)	Drop Rate = (B/A) * 100	<=5%	2.82%	0.04%	2.08%	1.86%	0.73%

6.31. 3G WIRELESS DATA: AUGUST

Aug-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		931183	DNA	3607	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		925799	DNA	3607	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.42%	DNA	100.00%	DNA	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		262504540	286492	307595	4968810	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		262475133	286430	298251	4866298	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.99%	99.98%	96.96%	97.94%	97.94%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		37175506	20143179	549300801	357041.00	32081688
ii)	RNC originated PS Domain Iu Connection Release (B)		1429050	179653	10639437	8163.00	300835
iii)	Drop Rate = (B/A) * 100	<=5%	3.84%	0.89%	1.94%	2.29%	0.94%

6.32. 3G WIRELESS DATA: SEPTEMBER

Sep-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		937370	DNA	3590	22420	DNA
ii)	Total Service Activations provided within 4 Hours (B)		931115	DNA	3590	22420	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	99.33%	DNA	100.00%	100.00%	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		243751397	291957	296186.07	4242541.00	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		243747456	291956	287229.93	4215751.00	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	100.00%	96.98%	99.37%	99.33%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		42602159	25518317	530460271.00	12001960.00	25695378
ii)	RNC originated PS Domain Iu Connection Release (B)		630885	258849	10697593.00	218491.00	190073
iii)	Drop Rate = (B/A) * 100	<=5%	1.48%	1.01%	2.02%	1.82%	0.74%

6.33. 3G WIRELESS DATA: CONSOLIDATED

Consolidated							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		676521.6667	DNA	3118.666667	22420	9750
ii)	Total Service Activations provided within 4 Hours (B)		672388.6667	DNA	3118.666667	22420	9857
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	0.994275012	DNA	1	1	0.98914477
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		261016665.3	3341666.333	246897.2149	4972077.667	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		260871767.3	3333594	239432.7279	4910957.333	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	0.999473942	0.999074417	0.969828102	0.987859457	0.988185817
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		35922138.33	185141605	510333615.7	10567993	19357353
ii)	RNC originated PS Domain Iu Connection Release (B)		949494.6667	209403	10243393	195768.3333	13716149
iii)	Drop Rate = (B/A) * 100	<=5%	0.027141058	0.006478201	0.020117331	0.019903555	0.008009959

6.34. 3G Wireless 3 Days Live Data: July

Jul-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	**Service Activation/ Provisioning**						
	Total No. of Subscribers for Service Activation (A)		DNA	DNA	250	3316	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	250	3315	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.0%	99.97%	DNA
2	**PDP Context Activation Success Rate**						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		57508518	933985	22392	1775130	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		57506907	931656	21730	1758076	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	99.75%	97.04%	99.04%	99.16%
3	**Drop Rate**						
i)	TBF originated PS Domain Iu Connection Setup Success (A)		DNA	50176287	55561730.00	6867629	DNA
ii)	TBF originated PS Domain Iu Connection Release (B)		DNA	15870	2239715.00	141716	DNA
iii)	Drop Rate = (B/A) * 100	<=5%	2.14%	0.03%	4.03%	2.06%	0.47%

6.35. 3G Wireless 3 Days Live Data: August

Aug-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	**Service Activation/ Provisioning**						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	408	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	408	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.00%	DNA	DNA
2	**PDP Context Activation Success Rate**						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		14867545	24203	25588	533601	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		14867299	24203	24833	509387	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	100.00%	97.05%	95.46%	94.58%
3	**Drop Rate**						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	1660487	40125727.00	1206243	5355098
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	16517	1263827.00	27499	60372
iii)	Drop Rate = (B/A) * 100	<=5%	3.86%	0.99%	3.15%	2.28	1.13%

6.36. 3G Wireless 3 Days Live Data: September

Sep-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	**Service Activation/ Provisioning**						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	424	2498	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	424	2498	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	100.00%	100.00%	DNA
2	**PDP Context Activation Success Rate**						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		25197474	30690	33442.472	403890.00	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		25197249	30690	32358.343	401670.00	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	100.00%	96.76%	99.45%	99.35%
3	**Drop Rate**						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		DNA	3432968	45376786	1169092.00	2100895
ii)	RNC originated PS Domain Iu Connection Release (B)		DNA	27323	1704022	20787.00	19079
iii)	Drop Rate = (B/A) * 100	<=5%	1.42%	0.80%	3.76%	1.78%	0.91%

6.37. 3G Wireless 3 Days Live Data: Consolidated

Consolidated							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Service Quality Parameter							
1	**Service Activation/ Provisioning**						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	360.6666667	2907	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	360.6666667	2906.5	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	1	0.9998492	DNA
2	**PDP Context Activation Success Rate**						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		32524512	329626	27141.02477	904207	DNA
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		32523818	328849.67	26307.20836	889711	DNA
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	0.9999822	0.9991688	0.96950004	0.9798393	0.9769786
3	**Drop Rate**						
i)	TBF originated PS Domain Iu Connection Setup Success (A)		DNA	18423247	47021414.33	3080988	3727996.5
ii)	TBF originated PS Domain Iu Connection Release (B)		DNA	19903.333	1735854.667	63334	39725.5
iii)	Drop Rate = (B/A) * 100	<=5%	0.0247282	0.0060741	0.036453264	0.772713	0.0083517

6.38. POI CONGESTION: JULY

Jul-16						
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service						
Name of Parameter	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Total No. of POI's in Month having < = 0.5% POI congestion						
Total No. of call attempts on POI	1561212	800206	859914	185837	339108	692387
Total traffic served on all POIs (Erlang)	27814	19221	14168	6091	5686	13466
Total No. of circuits on all individual POIs	70672	54038	29938	12806	10508	42199
Total number of working POI Service Area wise	47	34	23	12	9691	56
Capacity of all POIs	67888	53497	20957	12361	20	41021
No. of all POI's having >=0.5% POI congestion	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)	NIL	NIL	NIL	NIL	NIL	NIL

6.39. POI CONGESTION: AUGUST

Aug-16						
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service						
Name of Parameter	AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Total No. of POI's in Month having < = 0.5% POI congestion						
Total No. of call attempts on POI	1262545	696839	629142	142338	319627	533108
Total traffic served on all POIs (Erlang)	27007	19374	12259	5669	6413	12346
Total No. of circuits on all individual POIs	70671	54320	29938	12435	10511	41981
Total number of working POI Service Area wise	47	34	23	11	9636	53
Capacity of all POIs	67885	53777	20957	12022	20	40840
No. of all POI's having >=0.5% POI congestion	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)	NIL	NIL	NIL	NIL	NIL	NIL

6.40. POI CONGESTION: SEPTEMBER

Sep-16						
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service						
Name of Parameter	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM**	**VODAFONE**
Total No. of POI's in Month having < = 0.5% POI congestion						
Total No. of call attempts on POI	1264297	787167	852836	131726	336517	571950
Total traffic served on all POIs (Erlang)	29137	23096	15727	5728	7116	13642
Total No. of circuits on all individual POIs	70748	54413	29938	12692	10511	42268
Total number of working POI Service Area wise	49	34	23	12	9660	56
Capacity of all POIs	67931	53869	20957	12256	20	41085
No. of all POI's having >=0.5% POI congestion	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)	NIL	NIL	NIL	NIL	NIL	NIL

6.41. POI CONGESTION: CONSOLIDATED

Consolidated						
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service						
Name of Parameter	**AIRCEL**	**AIRTEL**	**BSNL**	**IDEA**	**RCOM**	**VODAFONE**
Total No. of POI's in Month having < = 0.5% POI congestion						
Total No. of call attempts on POI	1362685	761404	780631	153301	331751	599148
Total traffic served on all POIs (Erlang)	27986	20564	14051	5829	6405	13151
Total No. of circuits on all individual POIs	70697	54257	29938	12644	10510	42149
Total number of working POI Service Area wise	48	34	23	12	9662	55
Capacity of all POIs	67901	53714	20957	12213	20	40982
No. of all POI's having >=0.5% POI congestion	0	0	0	0	0	0
Name of POI not meeting the benchmark (having >=0.5% POI congestion)	NIL	NIL	NIL	NIL	NIL	NIL

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS

7. CUSTOMER SERVICE DELIVERY

7.1. QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY TO SEPTEMBER- 2016 MONTHS AUDITED DATA):

S.No	PARAMETERS	SUB-PARAMETERS	Benchmark	CUSTOMER SERVICE DELIVERY AUDITS					
				AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	VODAFONE
1	**Metering and Billing Credibility (Post Paid) – Benchmark (**Not more than 0.1% of bills issued should be disputed over a billing cycle**)**	No. of bills issued during the period (A)		422794	506663	940799	95021	220849	187167
		No. of bills disputed including billing complaints over a billing cycle (B)		3	87	92	6	194	22
		Billing Compliant (%) = B/A*100	***<= 0.1%***	**0.00%**	**0.02%**	**0.01%**	**0.01%**	**0.09%**	**0.01%**
2	**Metering and Billing Credibility (Pre-Paid) – Benchmark** (Not more than 1 complaint per 1000 customers i.e. 0.1% complaints for metering, charging, credit, and validity)	Total No. of Pre-paid customers at the end of the month (A)		2531536	3267121	1032734	564767	879801	925095
		Total No. of complaints relating to charging, Credit and Validity during a month (B)		5	903	32	18	762	19
		Pre-paid Charging Complaints (%) = B/A*100	***<= 0.1%***	**0.00%**	**0.03%**	**0.00%**	**0.00%**	**0.09%**	**0.00%**
3	**Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints Benchmark: (**Resolution ≥ 98% within 4 weeks & 100% within 6 weeks and Credit/Waiver within one week of resolution of complaints)	No. of Billing/Charging/Credit/Validity Complaints received during the month		8	990	124	374	956	41
		No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the month		8	990	124	374	956	41
		No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the month		8	990	124	374	956	41
		% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	***>=98% within 4 weeks***	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
		% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	***100% within 6 weeks***	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
		Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints (In **DAYS**)	***<=1 week***	**7**	**7**	**7**	**7**	**7**	**7**
4	**Termination / Closures (**Customer care promptness in attending to	No. of Requests for Termination/ Closure of service (A)		1049	1475	1194	1668	545	759
		No. of requested handled within 7 days (B)		1049	1475	1194	1668	545	759

	customers request)	% of Termination/ Closure of service within 7 days (B*100/A)	<=7days	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
5	**Time taken for refund of deposits after closures: Benchmark** (100% within 60 days)	No. of Payments/ Refunds due (A)		1259	84	584	285	949	868
		Cleared over a period of <60 days (B)		1259	84	584	285	949	868
		Refunds Successfull Completion (B/A)*100	100% within 60 days	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
6	**Response time to customer assistance Benchmark:** (Accessibility of call center >=95% and Calls answered by operator within 90 seconds i.e. Voice to Voice >=95%)	Total no of calls attempted to customer care/Call center(A)		11157104	841628	157522	977044	3598556	1531418
		Total no. of calls successfully established to customer care/Call center (B)		10240779	841628	157522	949910	3564602	1531418
		% Accessibility of Call centre /customer Care (B *100/ A)	>=95%	91.79%	100.00%	100.00%	97.22%	99.06%	100.00%
		Total Calls reached to operator for Voice to Voice (C)		1732977	1555811	570113	341160	537832	446820
		Total number of calls answered by the operator (Voice to voice) within 90 seconds (D)		1347302	1314188	557111	335406	408562	416695
		% age of calls answered by the operators (voice to voice) within 90 seconds (D *100/ C)	>=95%	77.74%	84.47%	97.72%	98.31%	75.96%	93.26%
7	**Customer Care & Grievances Redressal**	Total no of complaints received in the call centre (Tech+ Non Tech)		15841	0	570113	28666	1656	3809
		Total no of complaints addressed at call center level		15818	0	565569	27524	1656	3809
		% of complaints addressed at call center level		99.85%	NA	99.20%	96.02%	100.00%	100.00%
		Total no of appeals received by the appellate authority		0	10	0	0	43	0
		Total no of complaints addressed by Appellate authority		0	10	0	0	43	0
		% of complaints addressed by Appellate authority		NA	100.00%	NA	NA	100.00%	NA
8	**Subscribers Base**	**POSTPAID**		188339	199269	378213	38756	129819	118332
		PREPAID		2500457	2928536	1043027	401182	836488	713011

7.2. 3 DAY LIVE CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY TO SEPTEMBER- 2016 MONTHS AUDITED DATA):

Response Time to Customer Assistance						
OPERATOR	Total no of calls attempted to customer care/Call center	Total no. of calls successfully established to customer care/Call center	% age of Accessibility of Call centre	Total Calls reached to operator for (Voice to Voice)	Total number of calls answered by the operator (Voice to voice) within 90 seconds	% age calls answered by the operator within 90 seconds
OPERATOR			>=95%			>=95%
AIRCEL	398590	389568	97.74%	71314	68482	96.03%
AIRTEL	41174	41174	100.00%	50383	47260	93.80%
BSNL	7956	7956	100.00%	2044	2044	100.00%
IDEA	33821	33123	97.94%	11840	11671	98.57%
RCOM GSM	156032	155064	99.38%	21555	15003	69.60%
VODAFONE	54936	54936	100.00%	18309	18288	99.89%

8. CUSTOMER SERVICE DELIVERY (SUMMARY)

Name of Service Provider	Metering and Billing credibility		Billing Complaints			Termination & Closures	Time taken for refund of deposits after closures: Benchmark	Response time to customer for assistance	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints resolved within 6 weeks	%age of where credit/waiver is received within one week	% of Termination / Closure of service within 7 days (100 %)	Cleared over a period of <60 days (100%)	%age of calls answered by the IVR	%age of call answered by the operators (voice to voice)
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%	91.79%	77.74%
AIRTEL	0.02%	0.03%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	84.47%
BSNL	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.72%
IDEA	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.22%	98.31%
RCOM GSM	0.09%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	99.06%	75.96%
VODAFONE	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	93.26%

Name of Service Provider	Customer Care & Grievances Redressal	
	% of Complaints addressed at call center level	% of Complaints addressed by Appellate Authority
AIRCEL	99.85%	100.00%
AIRTEL	NA	100.00%
BSNL	99.20%	100.00%
IDEA	96.02%	100.00%
RCOM GSM	100.00%	100.00%
VODAFONE	100.00%	100.00%

LIVE CALLING ASSESSMENT

9. LIVE CALLING ASSESSMENT:

9.1. INTER OPERATOR CALLS ASSESSMENT:

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in Jammu & Kashmir service area during the time 1100 to 1400 Hrs and 1600 to 1900 was carried out by Phistream auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators. While doing this exercise, the radio part, the switch part and POI in between the two operators are involved. Congestion in any of these network elements could result in congestion in the network.

Inter Operator Call Assessment	Aircel	Airtel	BSNL	Idea	Reliance GSM	Vodafone
Aircel	-	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%
BSNL	100%	100%	-	100%	100%	100%
Idea	100%	100%	100%	-	100%	100%
Reliance GSM	100%	100%	100%	100%	-	100%
Vodafone	100%	100%	100%	100%	100%	-

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

10. CUSTOMER CARE / HELPLINE ASSESSMENT & BILLING COMPLAINTS:

LIVE CALLING TO CALL CENTRE						
Parameter	**Aircel**	**Airtel**	**BSNL**	**IDEA**	**RCOM GSM**	**Vodafone**
Total No. of calls Attempted	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempt)	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	100	100	100	100	100	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempt)	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**	**100.00%**

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, 100% calls were connected to the Operator within 90 seconds.

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS						
Parameter	**Aircel**	**Airtel**	**BSNL**	**IDEA**	**RCOM GSM**	**VODAFONE**
Total No. of calls Attempted	3	87	92	6	100	22
Total No. of calls Answered	1	65	71	2	86	14
Cases resolved within 4 weeks	1	65	71	2	86	14
%age of cases resolved	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

To test the Service Providers performance on billing related complaints and their resolutions, PhiStream auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, some of the customers did not attend the calls, so shortfall was made good by taking other complaints to make verification of 100 Complaints. However, most of the customers reported their satisfaction on resolution of the billing complaints.

11. LEVEL -1 CALLING ASSESSMENT:

NOTE: As no drive test was conducted in Jammu & Kashmir circle due to unrest so Level-1 calling was also not conducted.

DRIVE TEST

12. OPERATOR ASSISTED DRIVE TEST

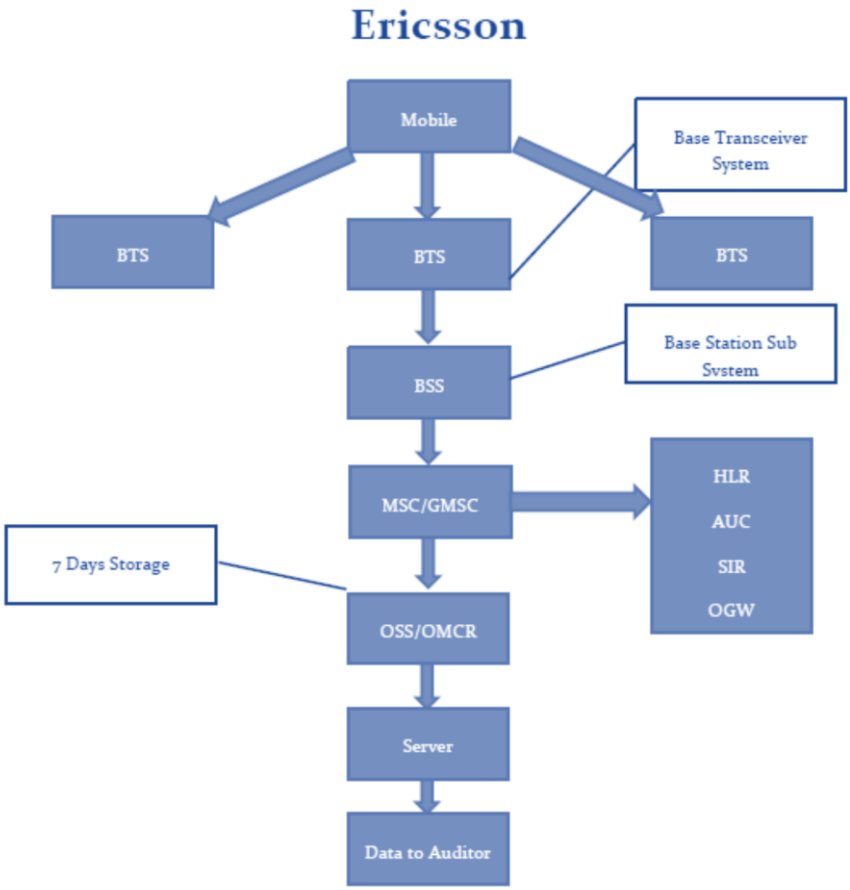
The drive test was conducted simultaneously for all the operators present in Jammu & Kashmir circle. As per the new directive given by TRAI headquarters, drive test for the month of July, August and September, 2016 were conducted at SSA level. Drive test was conducted for three days in each SSA and the 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 Jammu & Kashmir circle.

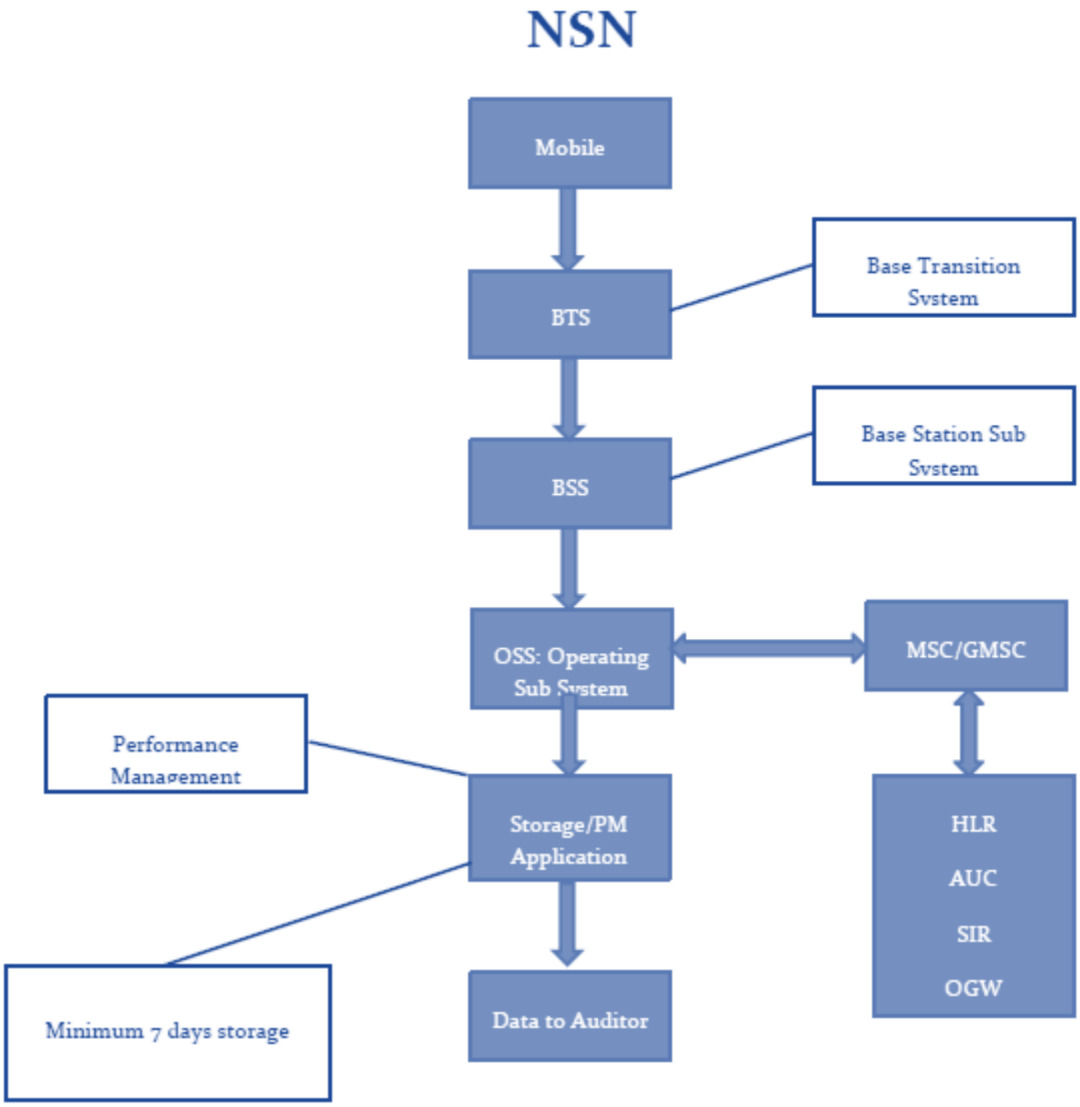
NOTE: Due to unrest in the region, no drive test was conducted.

13. BLOCK SCHEMATIC DIAGRAM

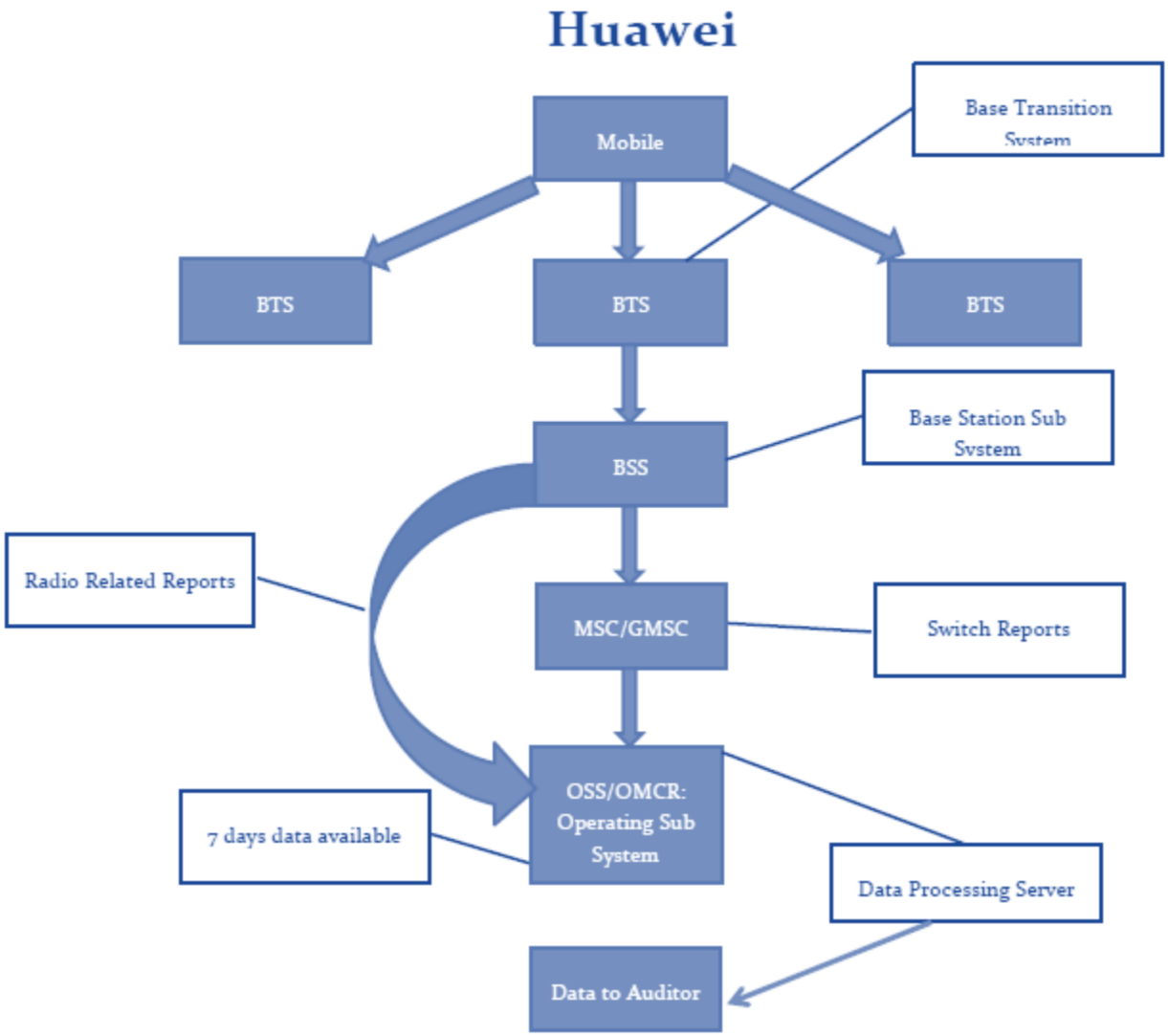
13.1. ERICSSON



13.2. NSN


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

13.3. HUAWEI


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

14. 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
- SSA – Secondary Switching Area
- NOC – Network Operation Center
- OMC – Operations and Maintenance Center
- MSC – Mobile Switching Center
- PMR – Performance Monitoring Reports
- TCBH – Time Consistent Busy Hour
- CBBH - Cell Bouncing Busy Hour
- BTS – Base Transceiver Station
- CSSR – Call Setup Success Rate
- TCH – Traffic Channel
- SDCCH – Standalone Dedicated Control Channel
- CDR – Call Drop Rate
- FER – Frame Error Rate
- SIM – Subscriber Identity Module
- GSM – Global System for Mobile
- CDMA – Code Division Multiple Access
- NA – Not Applicable
- NC – Non Compliance
- POI – Point of Interconnection
- IVR – Interactive Voice Response
- STD – Standard Trunk Dialling
- ISD – International Subscriber Dialling

15. ANNEXURE

15.1.1. 2G VOICE PMR DATA: CONSOLIDATED

Consolidated								
Network Parameters		Name of Service Provider						
		Benchmark	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.59%	0.15%	1.46%	0.15%	0.15%	1.32%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	3.09%	0.20%	0.66%	0.40%	0.48%	9.38%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	96.13%	97.32%	98.74%	98.63%	96.95%	99.31%
	SDDCH/Paging chl. Congestion	≤ 1%	0.31%	5.80%	0.62%	0.65%	0.18%	0.11%
	TCH Congestion	≤ 2%	3.00%	2.07%	1.25%	0.94%	0.23%	0.69%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.43%	1.83%	0.83%	1.43%	0.27%	0.81%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	12.28%	0.57%	2.48%	1.97%	1.02%	2.40%
	%age of connection with good voice quality	≥ 95%	95.53%	95.76%	96.66%	96.36%	98.80%	98.44%

- AIRCEL has parameter value of 3.00% and failed to meet the benchmark of ≤ 2% Connection Establishment (Accessibility) TCH Congestion.
- AIRTEL has parameter value of 2.07% and failed to meet the benchmark of ≤ 2% Connection Establishment (Accessibility) TCH Congestion.
- AIRCEL has parameter value of 12.28% and failed to meet the benchmark of ≤ 3% Worst Affected cell having more than 3% TCH drop.
- AIRTEL has parameter value of 5.80% and failed to meet the benchmark of ≤ 1% Connection Establishment (Accessibility) SDDCH Congestion.
- AIRCEL has parameter value of 3.09% and failed to meet the benchmark of ≤ 2% No. of BTSs having accumulated downtime of >24 hours in a month.
- VODAFONE has parameter value of 9.38% and failed to meet the benchmark of ≤ 2% No. of BTSs having accumulated downtime of >24 hours in a month.

15.1.2. 3G VOICE PMR: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.43%	0.28%	1.14%	0.14%	1.12%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	2.93%	0.39%	0.08%	0.12%	0.51%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.70%	99.24%	97.48%	99.58%	98.67%
	RRC Congestion:	≤ 1%	0.29%	0.03%	0.41%	0.24%	0.07%
	RAB Congestion:	≤ 2%	0.09%	0.03%	0.49%	0.21%	0.07%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	1.40%	1.05%	0.87%	1.14%	0.11%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	10.78%	2.31%	2.62%	1.58%	0.96%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.01%	98.65%	96.47%	97.16%	99.83%

- AIRCEL has parameter value of 10.78% and failed to meet the benchmark of ≤ 3% Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

15.1.3. BILLING AND CUSTOMER CARE

Name of Service Provider	Metering and Billing credibility		Billing Complaints			Termination & Closures	Time taken for refund of deposits after closures: Benchmark	Response time to customer for assistance		Customer Care & Grievances Redressal	
	Postpaid Subscribers	Prepaid Subscribers	%age complaints resolved within 4 weeks	%age complaints resolved within 6 weeks	%age of where credit/waiver is received within one week	% of Termination/ Closure of service within 7 days (100 %)	Cleared over a period of <60 days (100%)	%age of calls answered by the IVR	%age of call answered by the operators (voice to voice) within 90 seconds	% 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%	91.79%	77.74%	99.85%	100.00%
AIRTEL	0.02%	0.03%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	84.47%	NILL	100.00%
BSNL	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.72%	99.20%	100.00%
IDEA	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.22%	98.31%	96.02%	100.00%
RCOM GSM	0.09%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	99.06%	75.96%	100.00%	100.00%
VODAFONE	0.01%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	93.26%	100.00%	100.00%

- AIRCEL has parameter value of 91.79% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of calls answered by the IVR.
- AIRCEL has parameter value of 77.74% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.
- AIRTEL has parameter value of 84.47% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.
- RCOM GSM has parameter value of 75.96% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.
- VODAFONE has parameter value of 93.26% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.

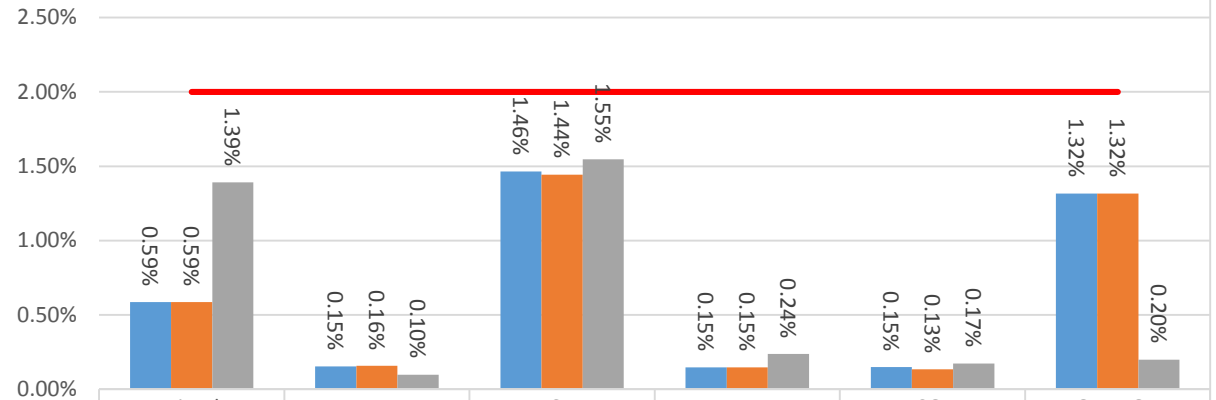
15.1.4. 2G-PMR COMPARISON (TSP VS. AUDIT AGENCY): NETWORK PARAMETERS

2G-PMR Report Comparison between Audit Agency and TSP

Network Parameters		Name of Service Provider							
		Benchmark		AIRCEL	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.59%	0.15%	1.46%	0.15%	0.15%	1.32%
			TSP	0.59%	0.16%	1.44%	0.15%	0.13%	1.32%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	3.09%	0.20%	0.66%	0.40%	0.48%	9.38%
			TSP	3.09%	0.20%	0.66%	0.40%	0.93%	9.38%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	96.13%	97.32%	98.74%	98.63%	96.95%	99.31%
			TSP	96.13%	96.86%	98.74%	98.63%	96.88%	99.32%
	SDDCH/Paging chl. Congestion	≤ 1%	Agency	0.31%	5.80%	0.62%	0.65%	0.18%	0.11%
			TSP	0.31%	9.52%	0.62%	0.65%	0.18%	0.11%
	TCH Congestion	≤ 2%	Agency	3.00%	2.07%	1.25%	0.94%	0.23%	0.69%
			TSP	3.00%	2.50%	1.25%	0.94%	0.23%	0.68%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	Agency	1.43%	1.83%	0.83%	1.43%	0.27%	0.81%
			TSP	1.43%	1.95%	0.83%	1.43%	0.27%	0.81%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	Agency	12.28%	0.57%	2.48%	1.97%	1.02%	2.40%
			TSP	12.28%	0.59%	2.48%	1.97%	1.04%	2.40%
	%age of connection with good voice quality	≥ 95%	Agency	95.53%	95.76%	96.66%	96.36%	98.80%	98.44%
			TSP	95.53%	95.77%	96.67%	96.36%	98.80%	98.44%

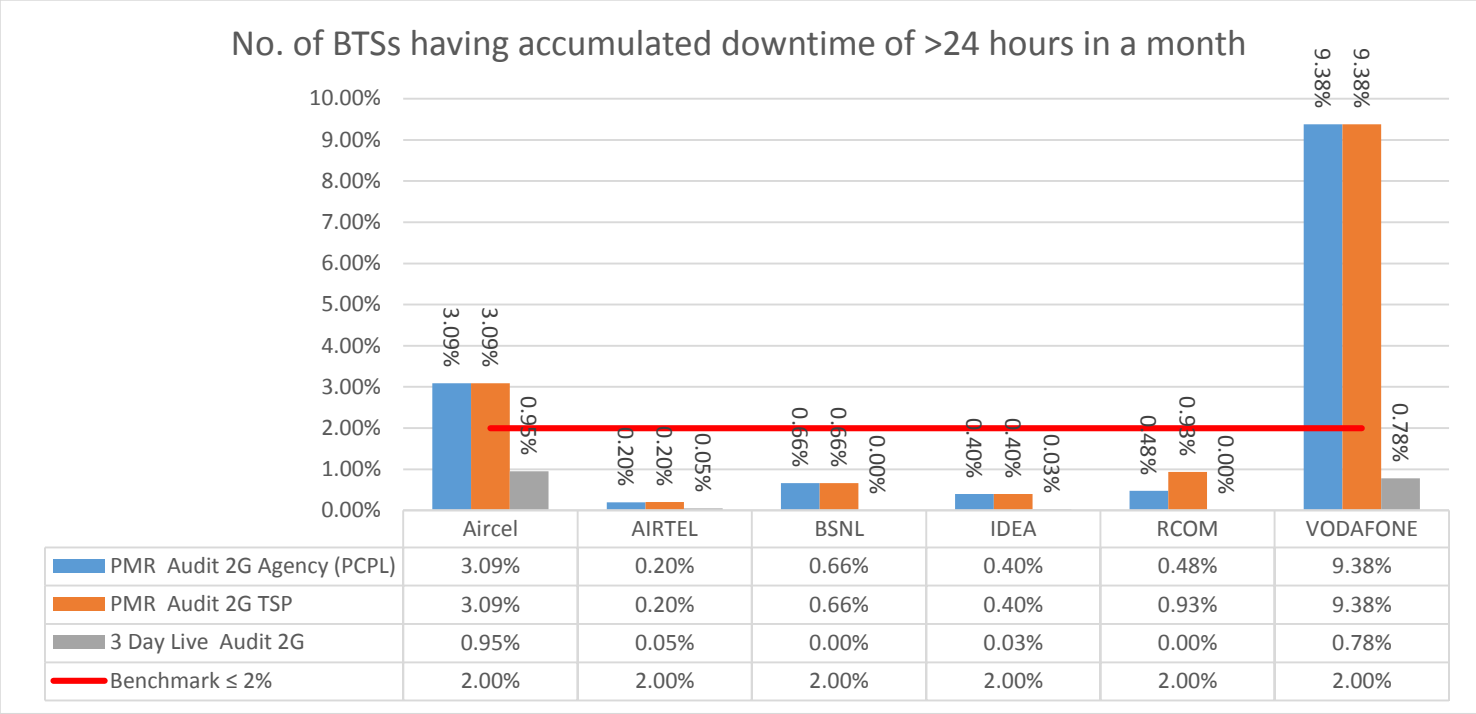
15.1.5. SUM OF DOWNTIME OF BTSS IN A MONTH IN HRS. IN THE LICENSED SERVICE

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



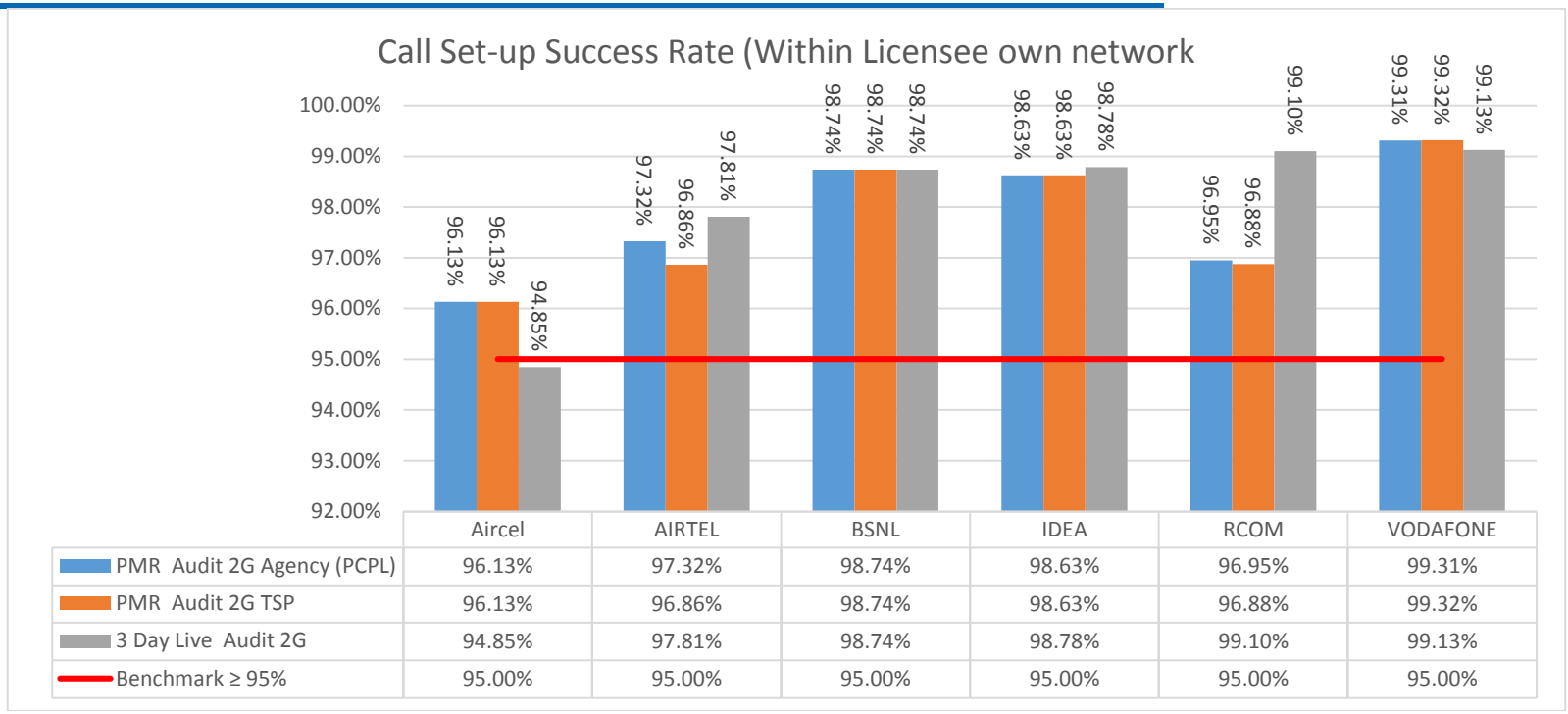
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	0.59%	0.15%	1.46%	0.15%	0.15%	1.32%
PMR Audit 2G TSP	0.59%	0.16%	1.44%	0.15%	0.13%	1.32%
3 Day Live Audit 2G	1.39%	0.10%	1.55%	0.24%	0.17%	0.20%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

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



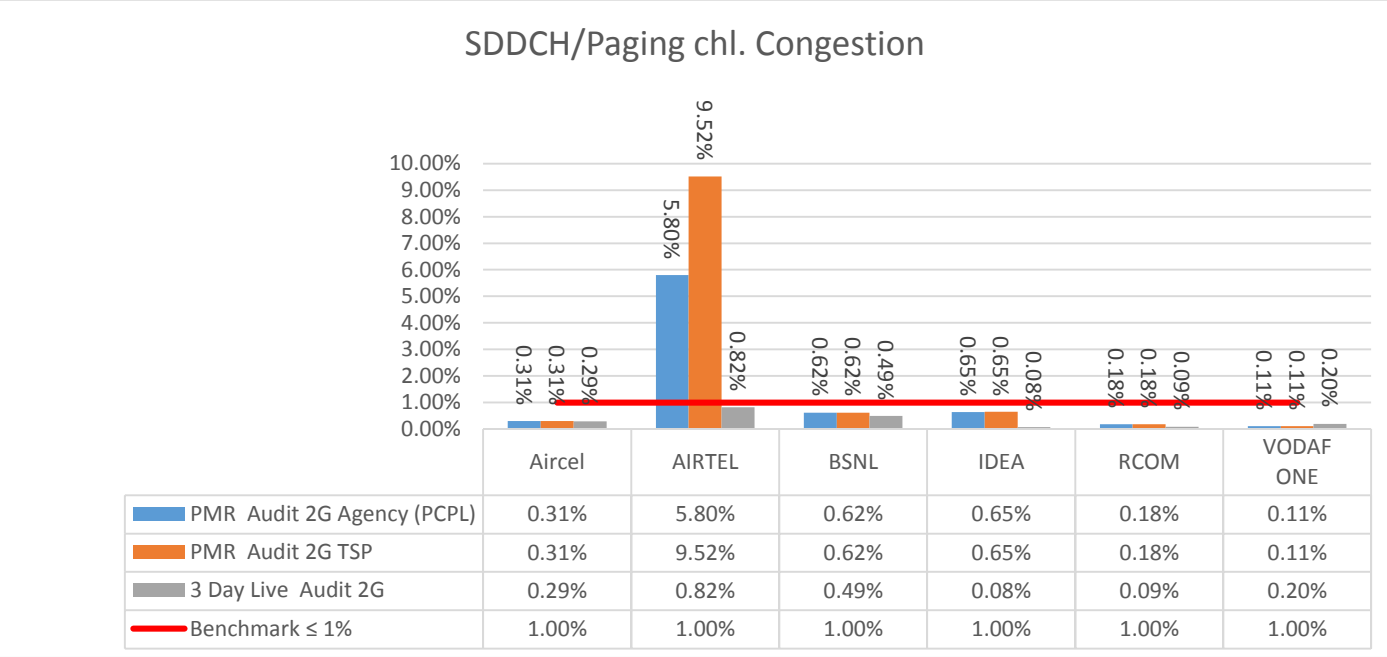
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	3.09%	0.20%	0.66%	0.40%	0.48%	9.38%
PMR Audit 2G TSP	3.09%	0.20%	0.66%	0.40%	0.93%	9.38%
3 Day Live Audit 2G	0.95%	0.05%	0.00%	0.03%	0.00%	0.78%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

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



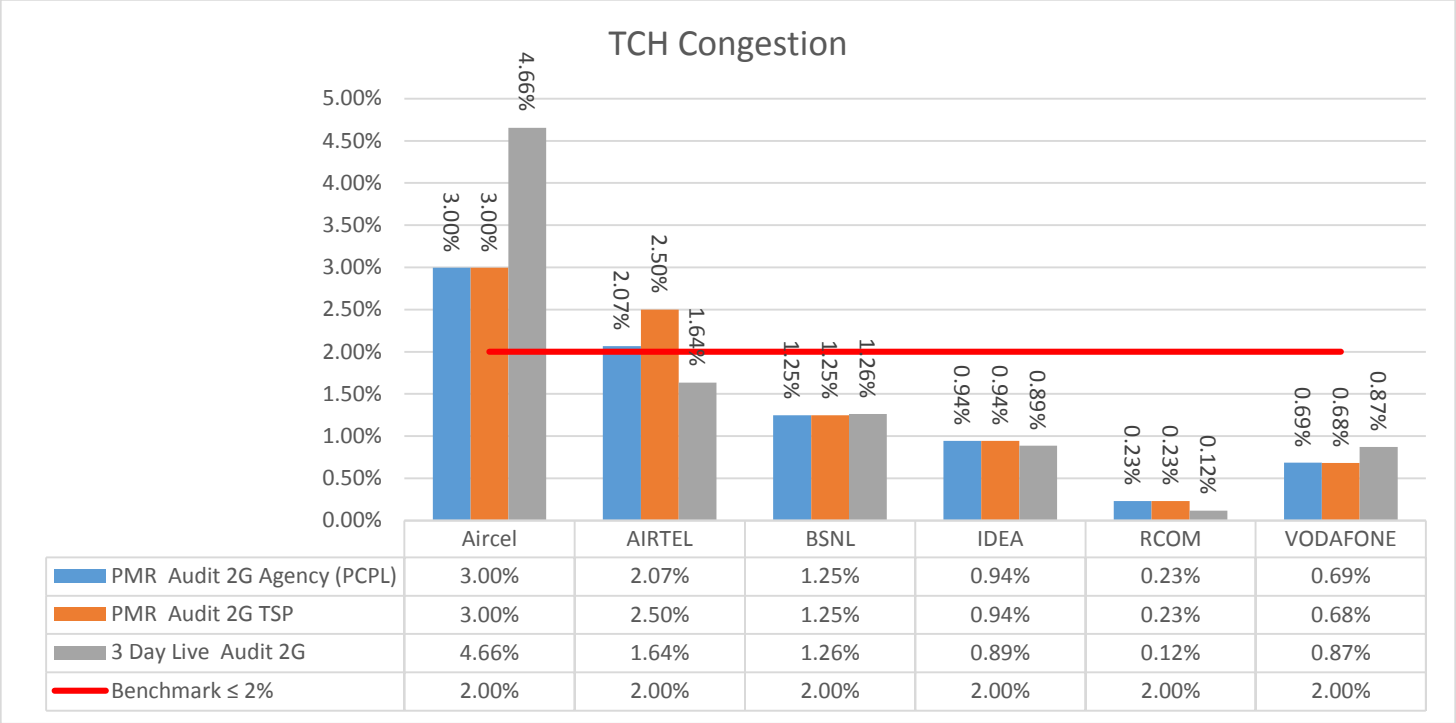
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	96.13%	97.32%	98.74%	98.63%	96.95%	99.31%
PMR Audit 2G TSP	96.13%	96.86%	98.74%	98.63%	96.88%	99.32%
3 Day Live Audit 2G	94.85%	97.81%	98.74%	98.78%	99.10%	99.13%
Benchmark ≥ 95%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%

15.1.8. SDDCH/PAGING CHL. CONGESTION



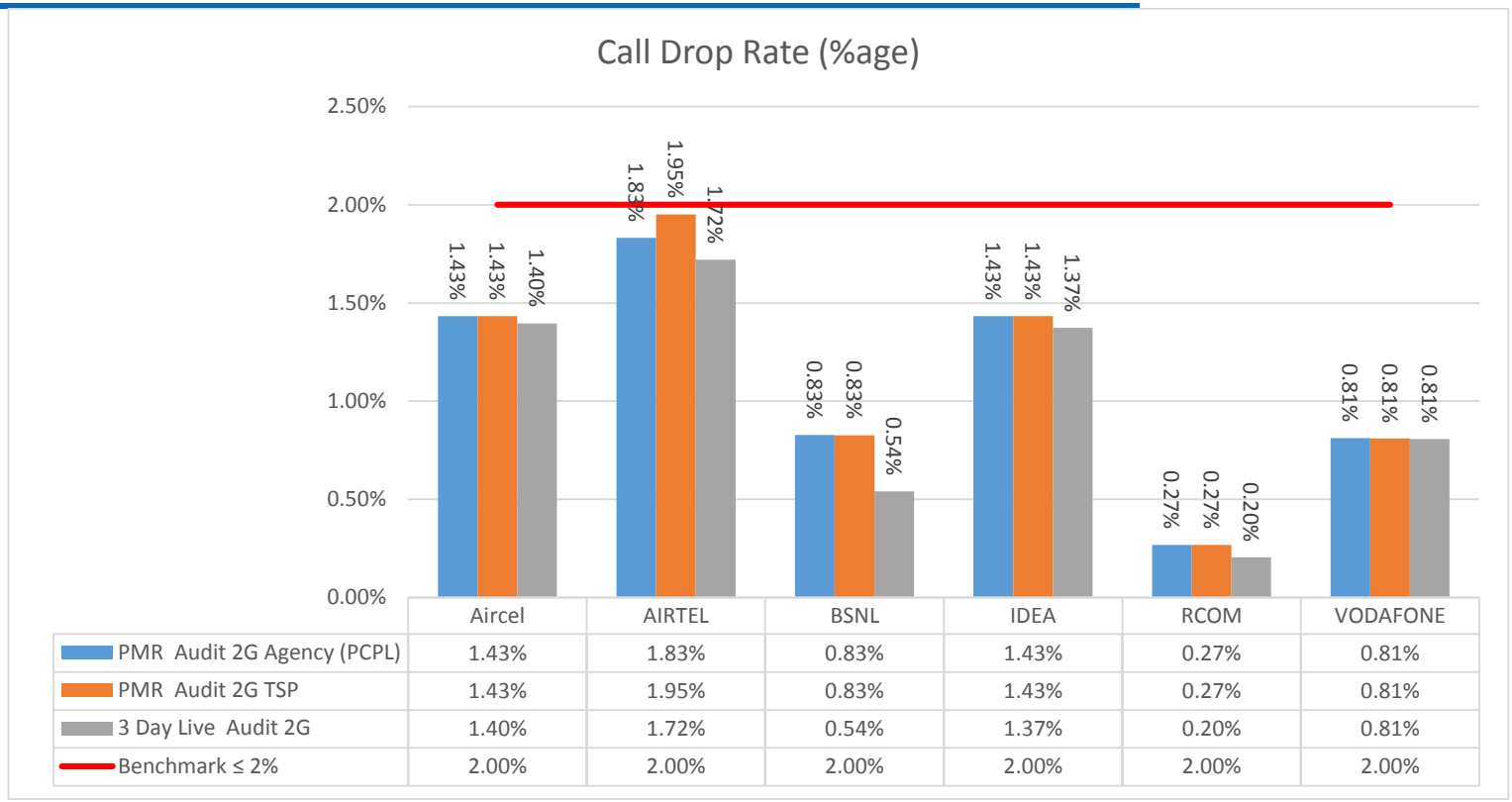
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	0.31%	5.80%	0.62%	0.65%	0.18%	0.11%
PMR Audit 2G TSP	0.31%	9.52%	0.62%	0.65%	0.18%	0.11%
3 Day Live Audit 2G	0.29%	0.82%	0.49%	0.08%	0.09%	0.20%
Benchmark ≤ 1%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

15.1.9. TCH CONGESTION



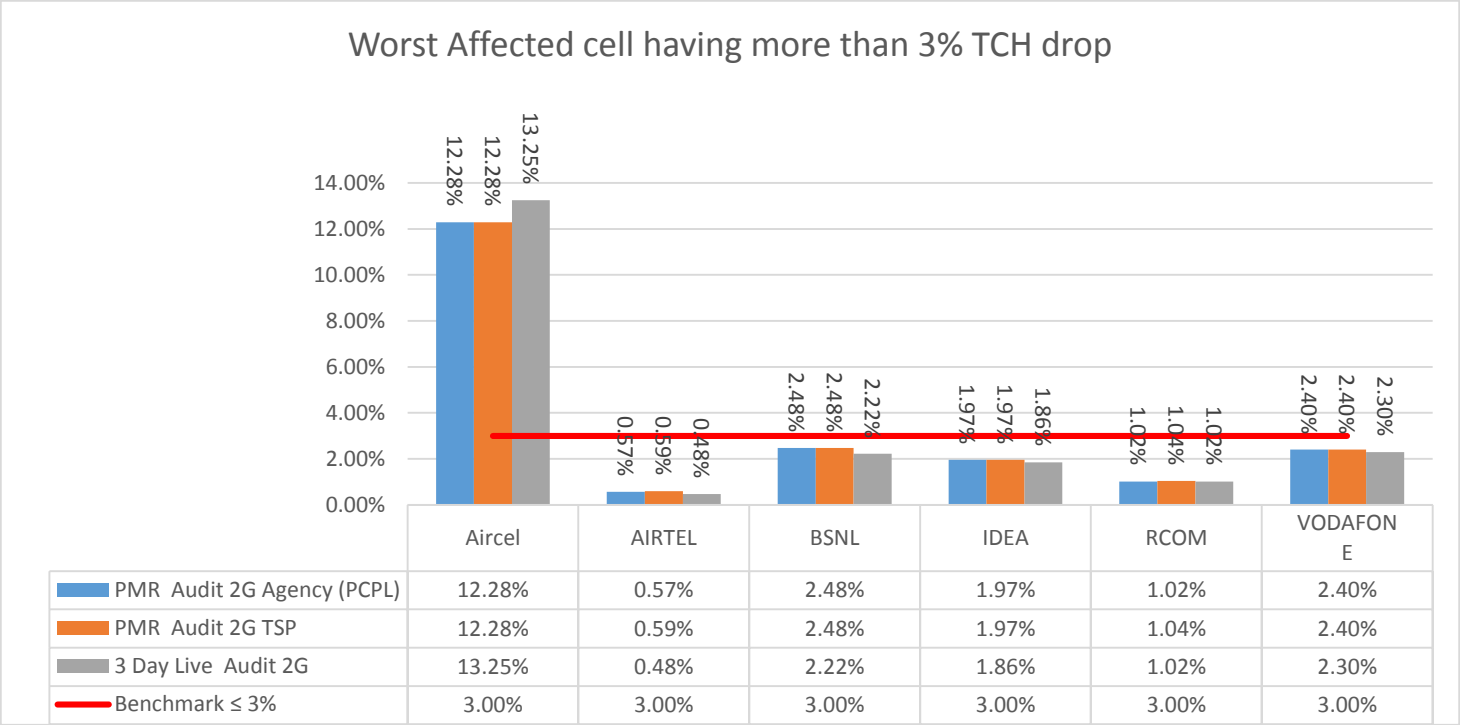
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	3.00%	2.07%	1.25%	0.94%	0.23%	0.69%
PMR Audit 2G TSP	3.00%	2.50%	1.25%	0.94%	0.23%	0.68%
3 Day Live Audit 2G	4.66%	1.64%	1.26%	0.89%	0.12%	0.87%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

15.1.10. CALL DROP RATE (%AGE)



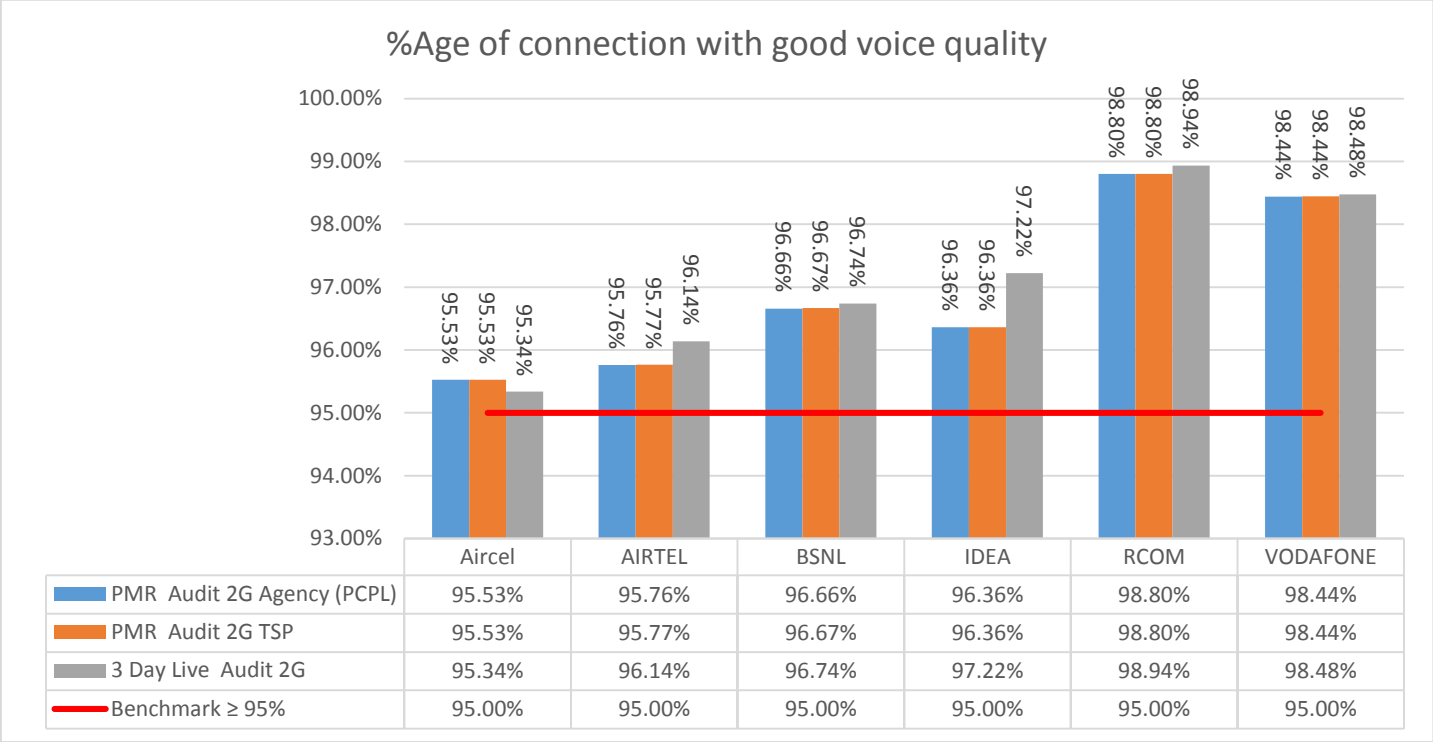
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	1.43%	1.83%	0.83%	1.43%	0.27%	0.81%
PMR Audit 2G TSP	1.43%	1.95%	0.83%	1.43%	0.27%	0.81%
3 Day Live Audit 2G	1.40%	1.72%	0.54%	1.37%	0.20%	0.81%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

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



	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	12.28%	0.57%	2.48%	1.97%	1.02%	2.40%
PMR Audit 2G TSP	12.28%	0.59%	2.48%	1.97%	1.04%	2.40%
3 Day Live Audit 2G	13.25%	0.48%	2.22%	1.86%	1.02%	2.30%
Benchmark ≤ 3%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%

15.1.12. %AGE OF CONNECTION WITH GOOD VOICE QUALITY



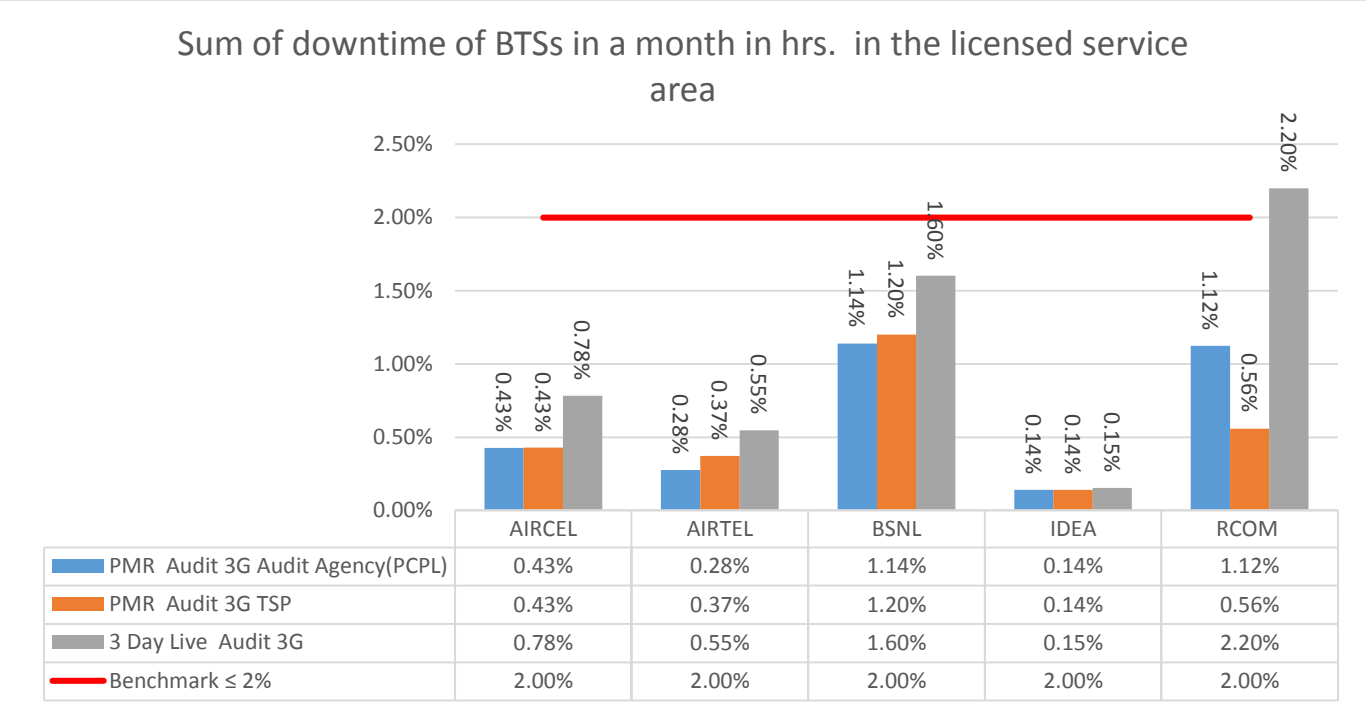
	Aircel	AIRTEL	BSNL	IDEA	RCOM	VODAFONE
PMR Audit 2G Agency (PCPL)	95.53%	95.76%	96.66%	96.36%	98.80%	98.44%
PMR Audit 2G TSP	95.53%	95.77%	96.67%	96.36%	98.80%	98.44%
3 Day Live Audit 2G	95.34%	96.14%	96.74%	97.22%	98.94%	98.48%
Benchmark ≥ 95%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%

15.2.1. 3G-PMR Comparison (TSP vs. Audit Agency): Network Parameters

PMR Report Comparison between Audit Agency and TSP	
Network Parameters	**Name of Service Provider**

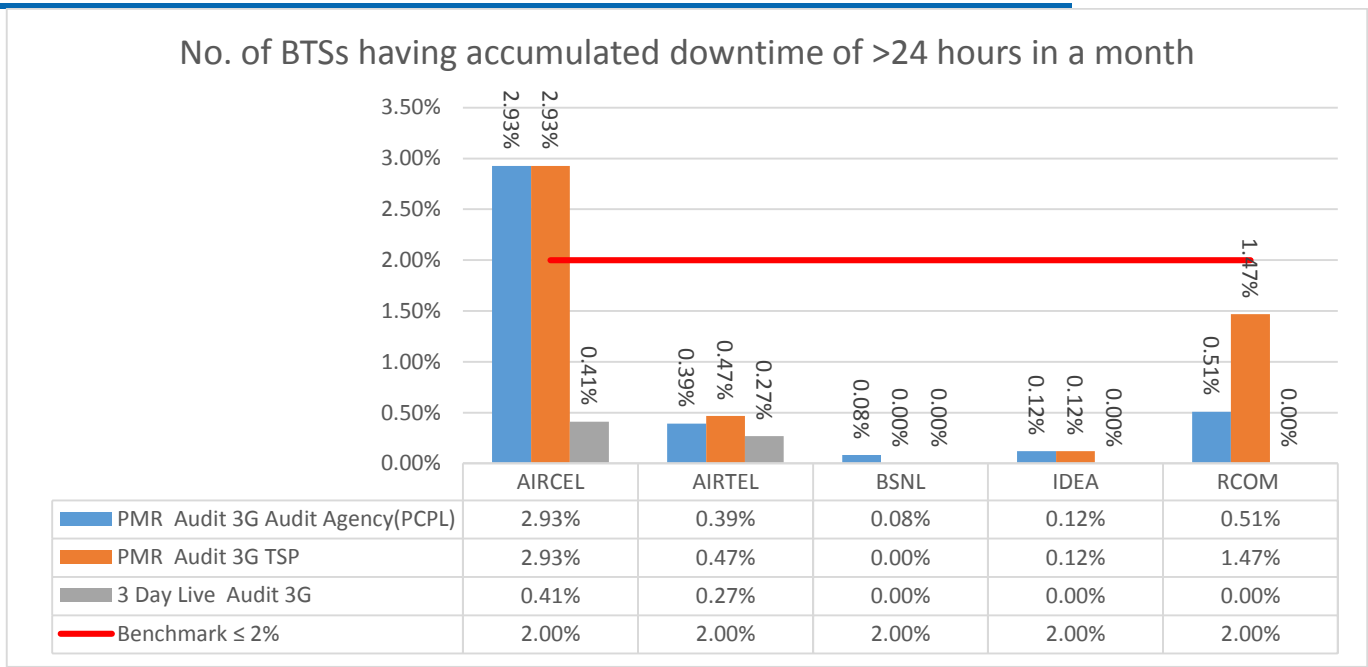
		Benchmark		AIRCEL	AIRTEL	BSNL	IDEA	RCOM
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.43%	0.28%	1.14%	0.14%	1.12%
			TSP	0.43%	0.37%	1.20%	0.14%	0.56%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	2.93%	0.39%	0.08%	0.12%	0.51%
			TSP	2.93%	0.47%	0.00%	0.12%	1.47%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	97.70%	99.24%	97.48%	99.58%	98.67%
			TSP	97.70%	99.08%	97.33%	99.58%	99.86%
	RRC Congestion:	≤ 1%	Agency	0.29%	0.03%	0.41%	0.24%	0.07%
			TSP	0.29%	0.06%	0.37%	0.24%	0.06%
	RAB Congestion:	≤ 2%	Agency	0.09%	0.03%	0.49%	0.21%	0.07%
			TSP	0.09%	0.07%	0.47%	0.21%	0.06%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	Agency	1.40%	1.05%	0.87%	1.14%	0.11%
			TSP	1.40%	1.25%	0.83%	1.14%	0.09%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	Agency	10.78%	2.31%	2.62%	1.58%	0.96%
			TSP	10.78%	3.26%	2.83%	1.58%	0.86%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	Agency	98.01%	98.65%	96.47%	97.16%	99.83%
			TSP	98.01%	98.44%	96.47%	97.16%	99.85%

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



	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	0.43%	0.28%	1.14%	0.14%	1.12%
PMR Audit 3G TSP	0.43%	0.37%	1.20%	0.14%	0.56%
3 Day Live Audit 3G	0.78%	0.55%	1.60%	0.15%	2.20%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

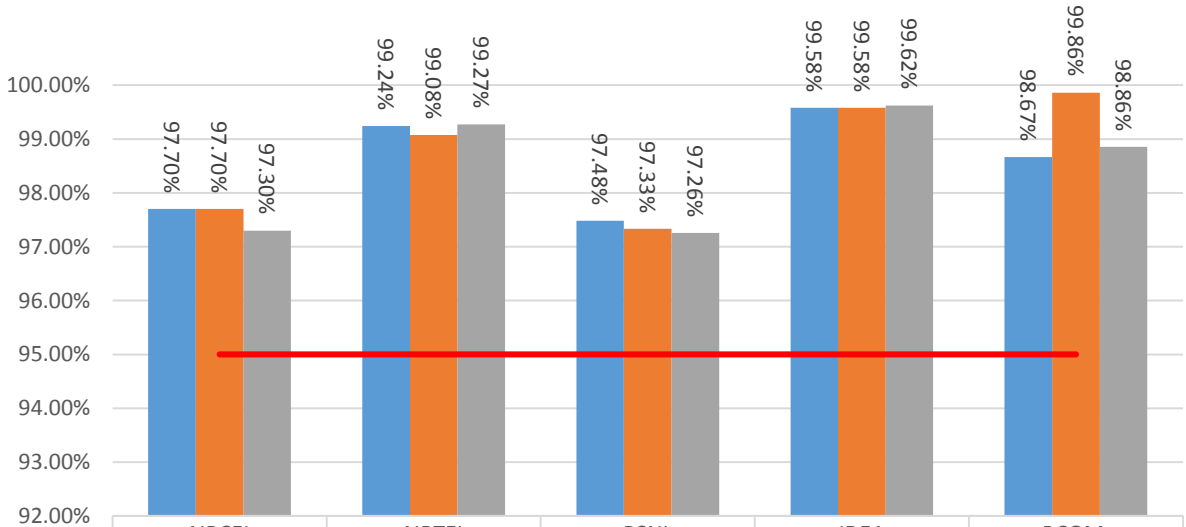
15.2.3. NO. OF BTSS HAVING ACCUMULATED DOWNTIME OF >24 HOURS IN A MONTH



	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	2.93%	0.39%	0.08%	0.12%	0.51%
PMR Audit 3G TSP	2.93%	0.47%	0.00%	0.12%	1.47%
3 Day Live Audit 3G	0.41%	0.27%	0.00%	0.00%	0.00%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

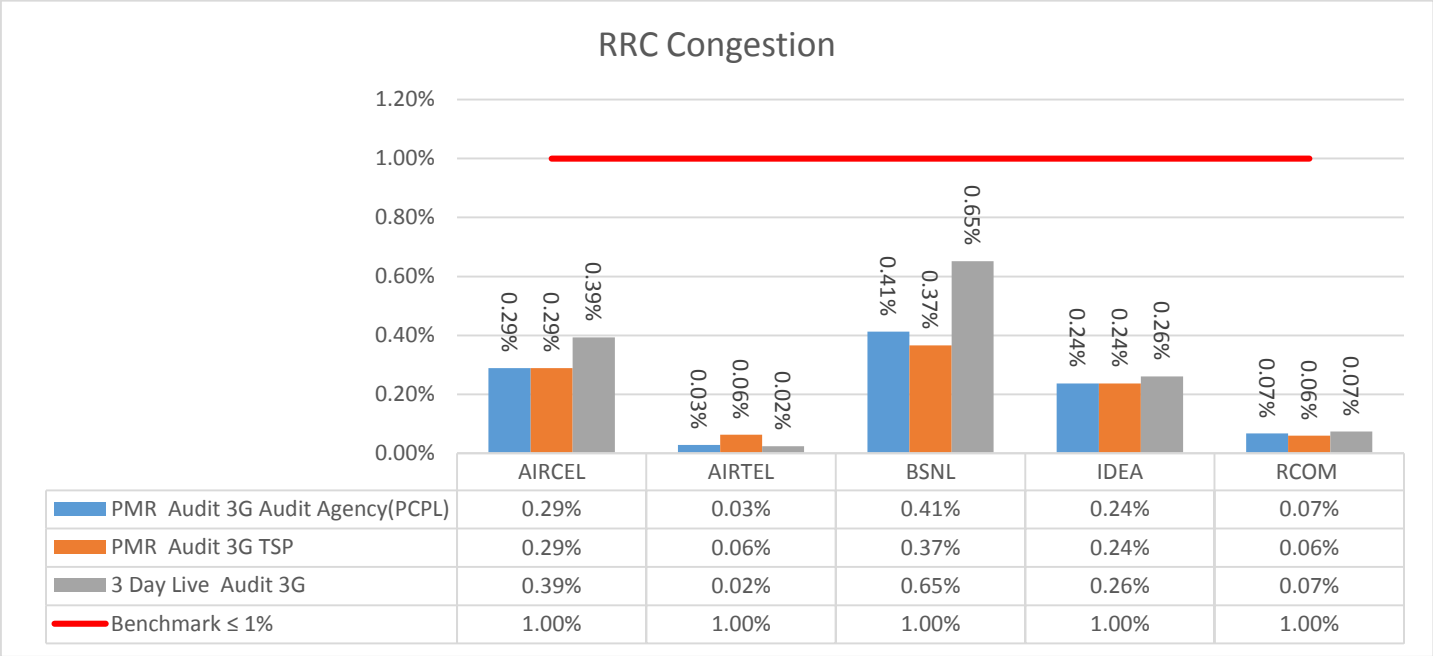
15.2.4. CALL SET-UP SUCCESS RATE (WITHIN LICENSEE OWN NETWORK)

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



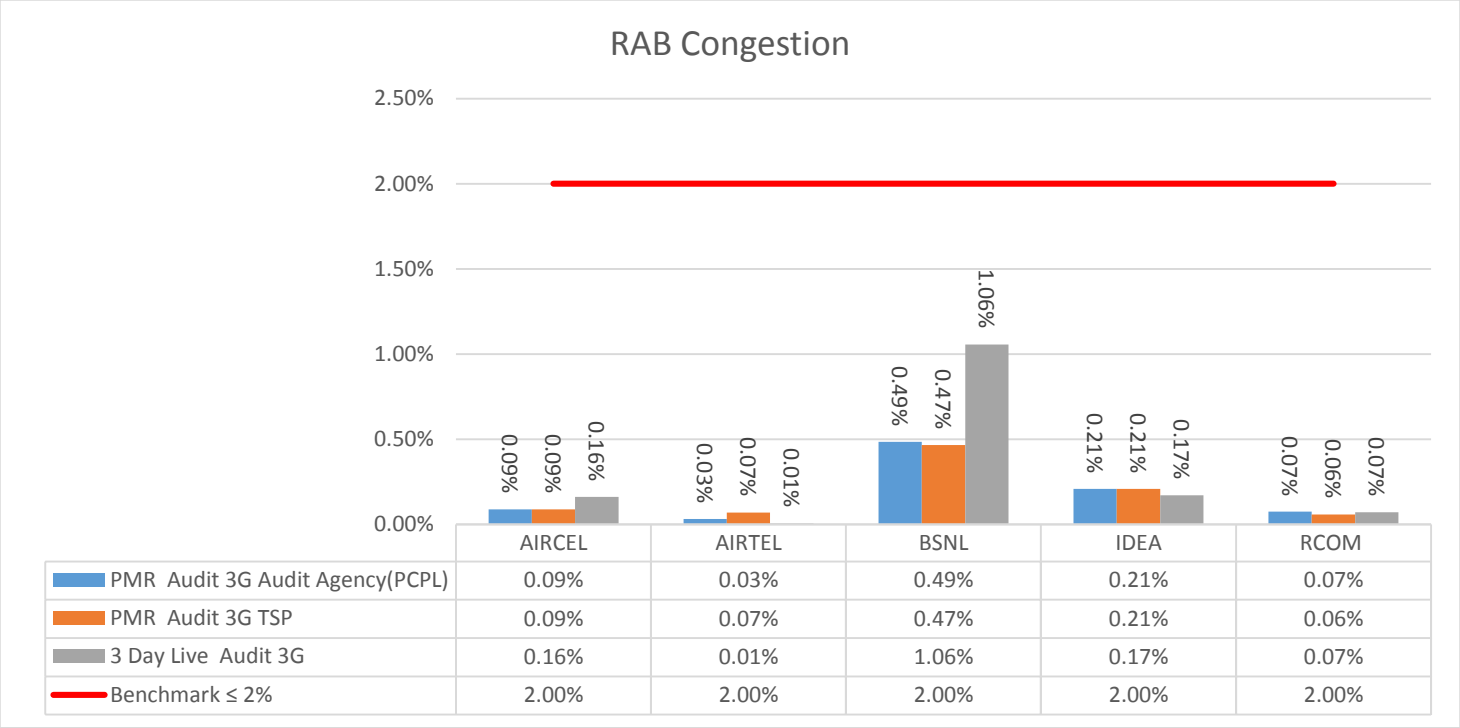
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	97.70%	99.24%	97.48%	99.58%	98.67%
PMR Audit 3G TSP	97.70%	99.08%	97.33%	99.58%	99.86%
3 Day Live Audit 3G	97.30%	99.27%	97.26%	99.62%	98.86%
Benchmark ≥ 95%	95.00%	95.00%	95.00%	95.00%	95.00%

15.2.5. RRC CONGESTION



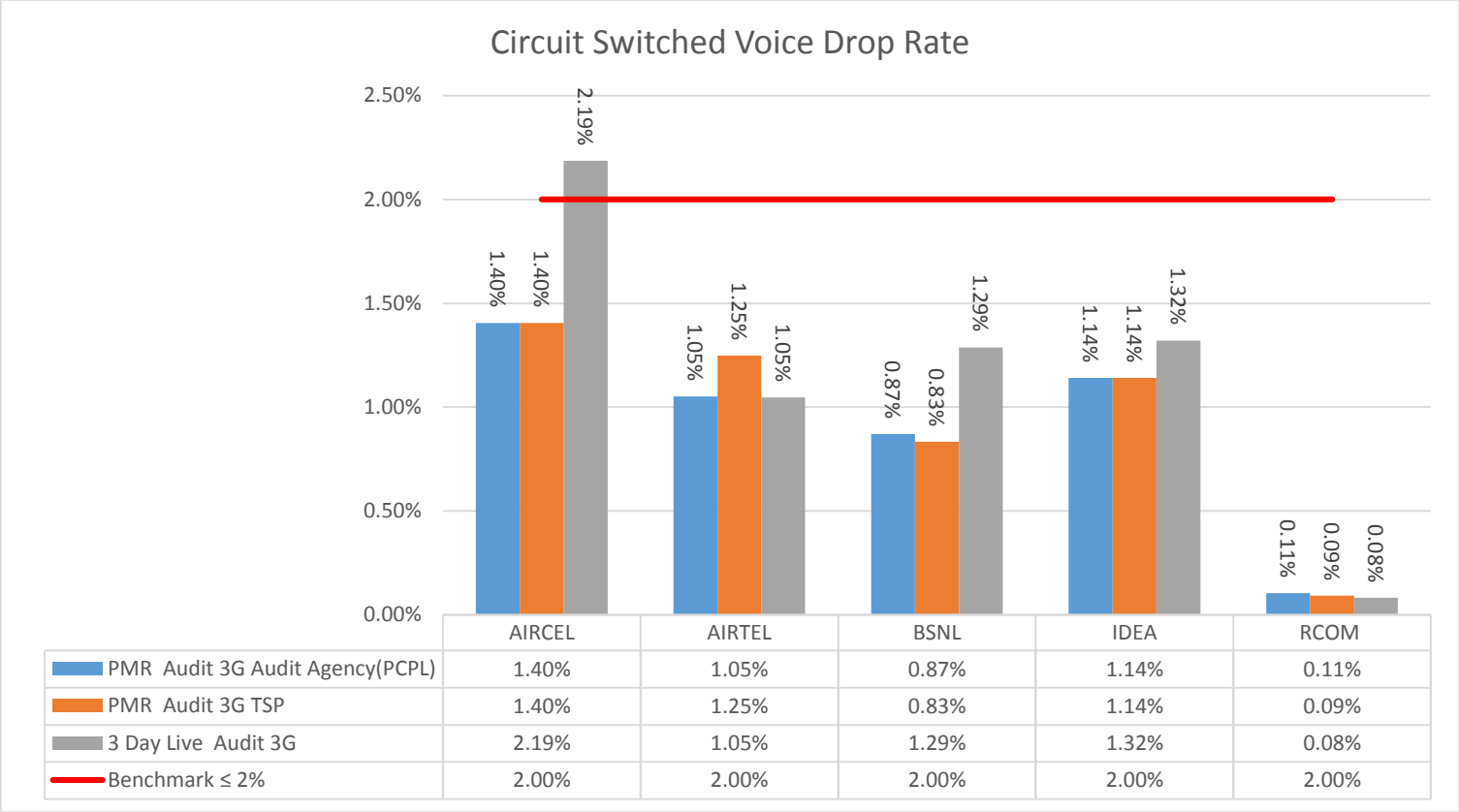
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	0.29%	0.03%	0.41%	0.24%	0.07%
PMR Audit 3G TSP	0.29%	0.06%	0.37%	0.24%	0.06%
3 Day Live Audit 3G	0.39%	0.02%	0.65%	0.26%	0.07%
Benchmark ≤ 1%	1.00%	1.00%	1.00%	1.00%	1.00%

15.2.6. RAB CONGESTION



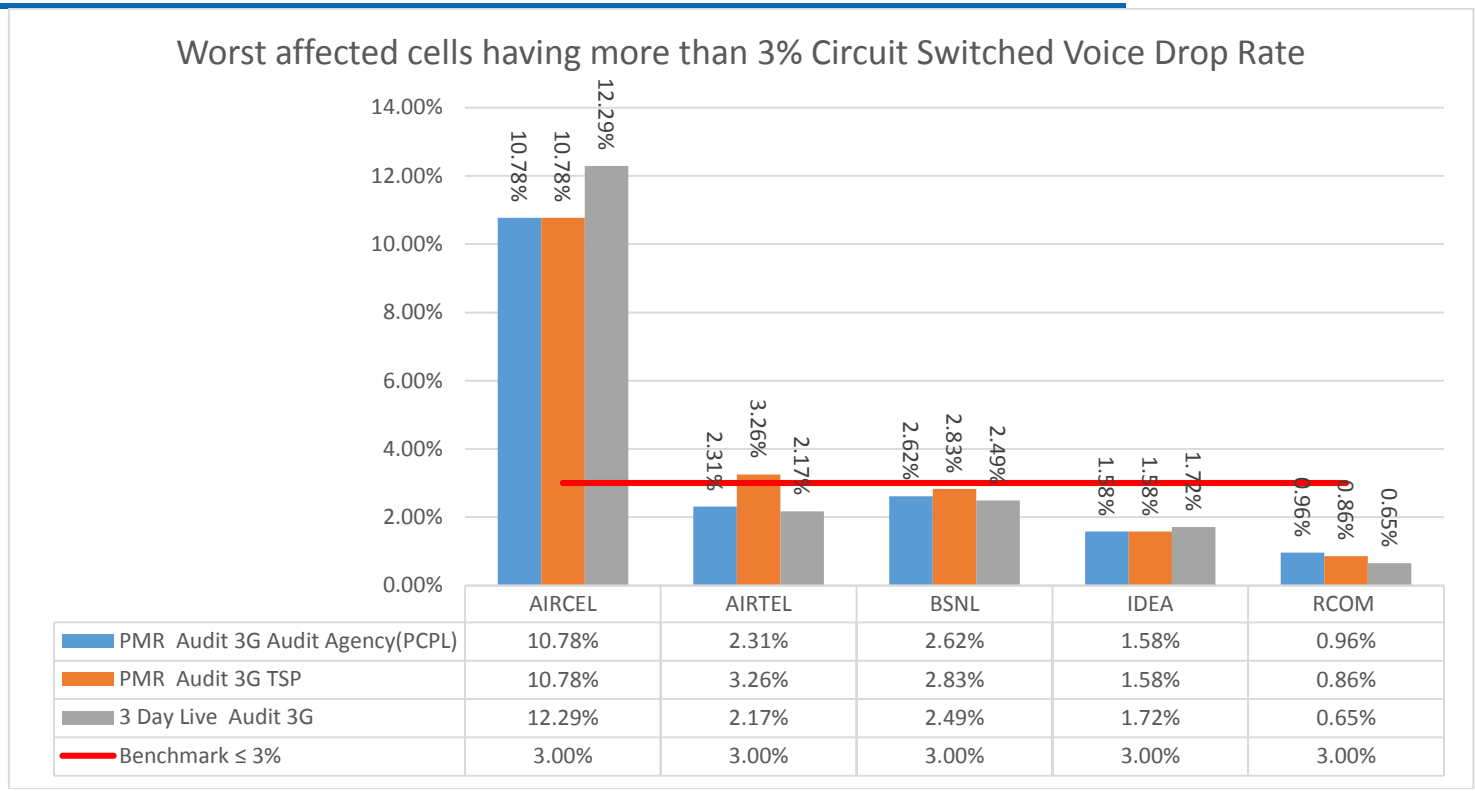
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	0.09%	0.03%	0.49%	0.21%	0.07%
PMR Audit 3G TSP	0.09%	0.07%	0.47%	0.21%	0.06%
3 Day Live Audit 3G	0.16%	0.01%	1.06%	0.17%	0.07%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

15.2.7. CIRCUIT SWITCHED VOICE DROP RATE



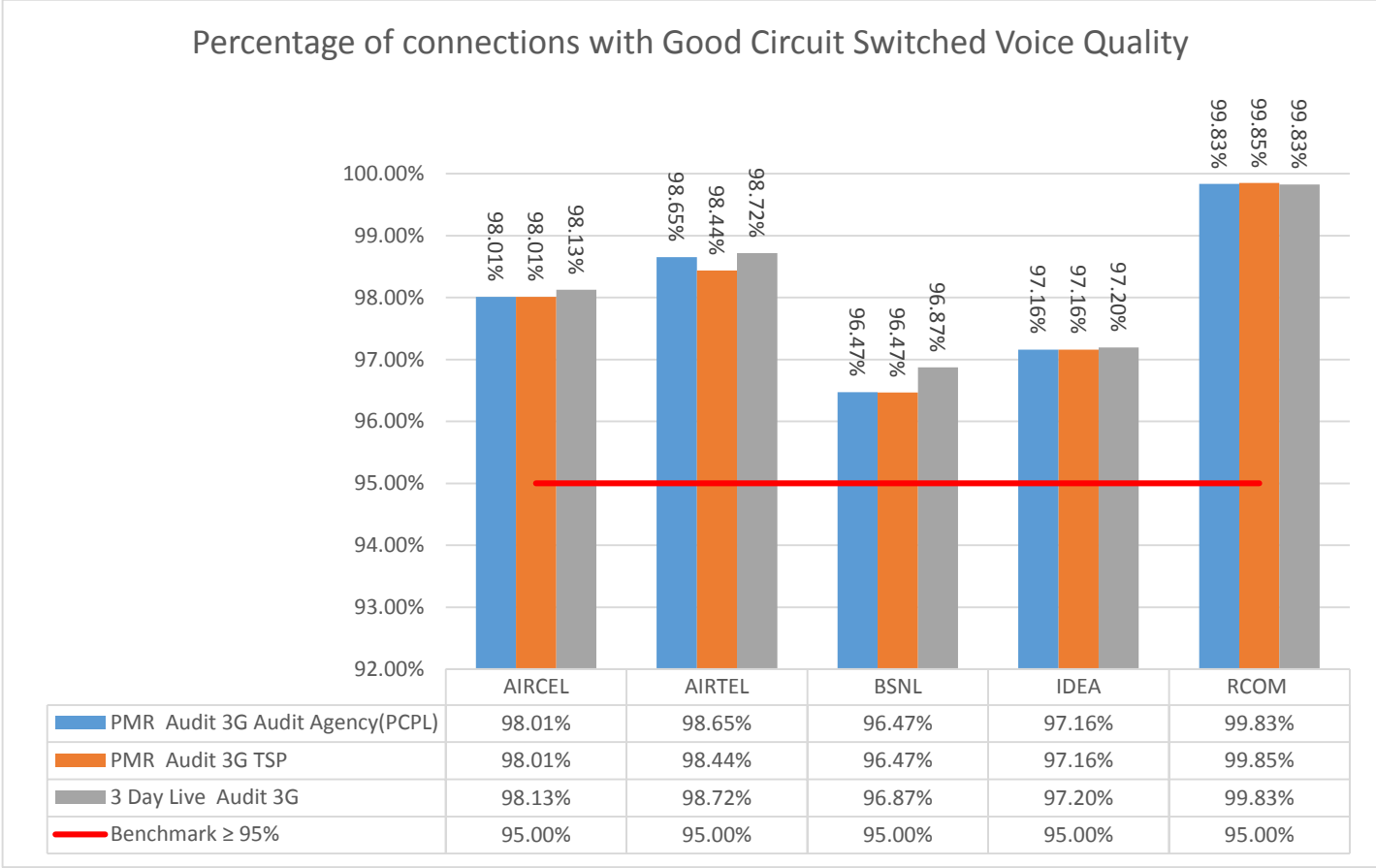
	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	1.40%	1.05%	0.87%	1.14%	0.11%
PMR Audit 3G TSP	1.40%	1.25%	0.83%	1.14%	0.09%
3 Day Live Audit 3G	2.19%	1.05%	1.29%	1.32%	0.08%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

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



	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	10.78%	2.31%	2.62%	1.58%	0.96%
PMR Audit 3G TSP	10.78%	3.26%	2.83%	1.58%	0.86%
3 Day Live Audit 3G	12.29%	2.17%	2.49%	1.72%	0.65%
Benchmark ≤ 3%	3.00%	3.00%	3.00%	3.00%	3.00%

15.2.9. PERCENTAGE OF CONNECTIONS WITH GOOD CIRCUIT SWITCHED VOICE QUALITY

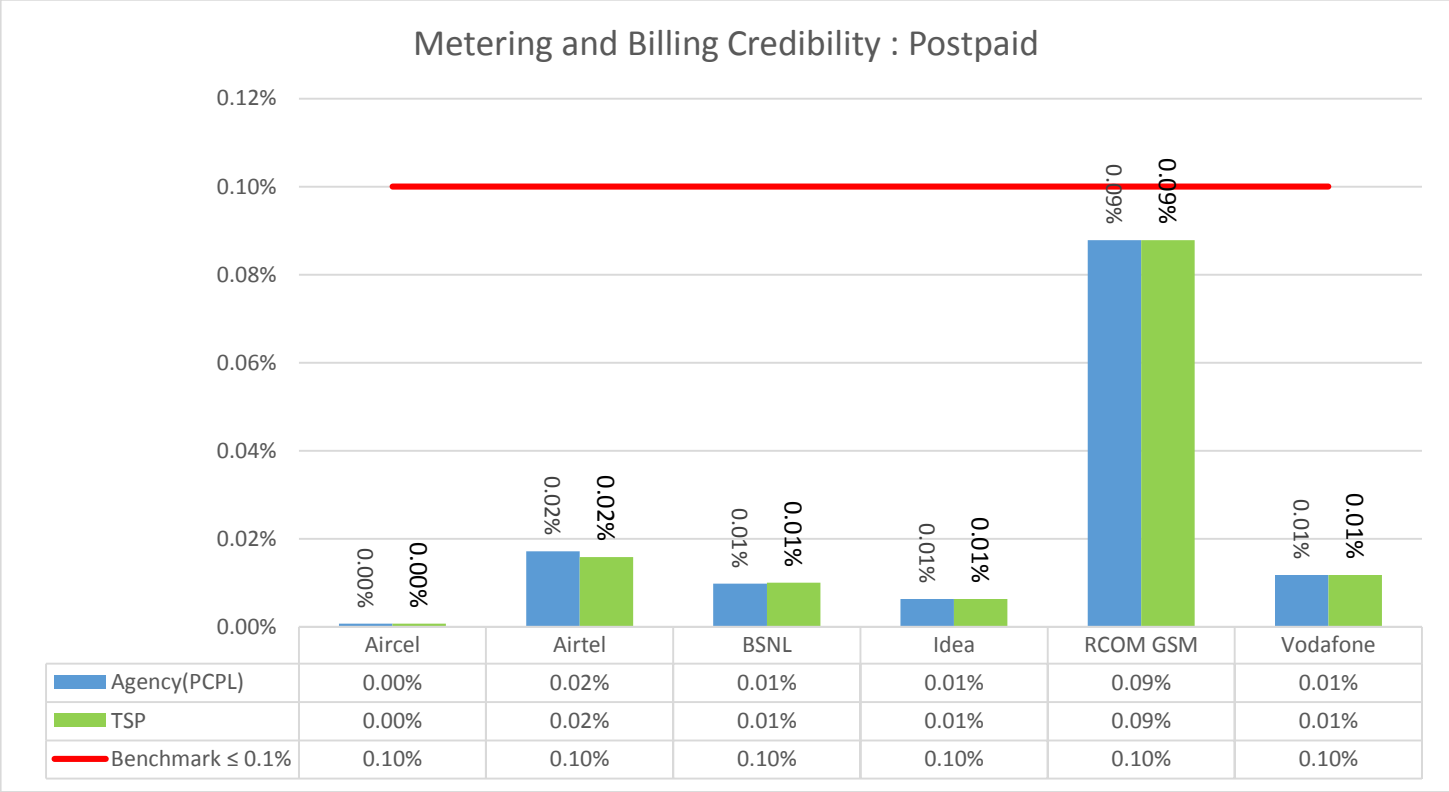


	AIRCEL	AIRTEL	BSNL	IDEA	RCOM
PMR Audit 3G Audit Agency(PCPL)	98.01%	98.65%	96.47%	97.16%	99.83%
PMR Audit 3G TSP	98.01%	98.44%	96.47%	97.16%	99.85%
3 Day Live Audit 3G	98.13%	98.72%	96.87%	97.20%	99.83%
Benchmark ≥ 95%	95.00%	95.00%	95.00%	95.00%	95.00%

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

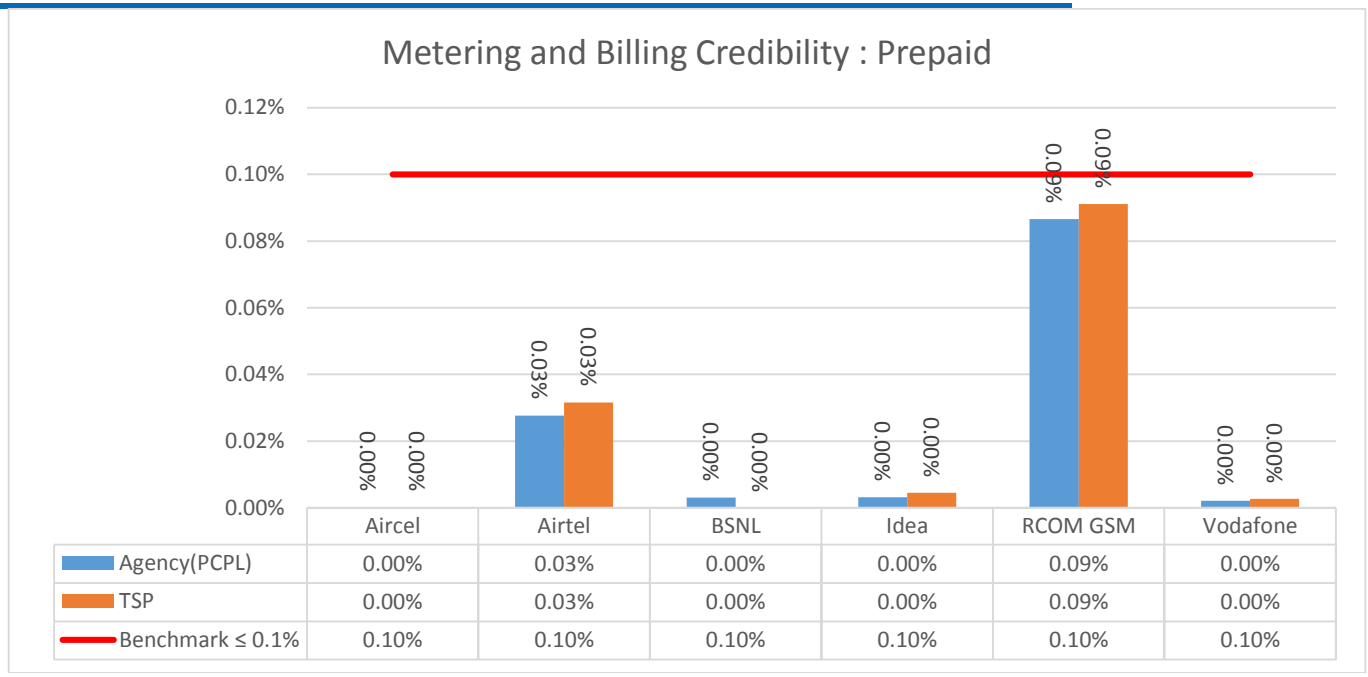
Name of Service Provider	Metering and Billing credibility				Billing Complaints						Termination & Closures		Time taken for refund of		Response time to customer for assistance			
	Postpaid Subscribers		Prepaid Subscribers		%age complaints resolved within 4 weeks		%age complaints resolved within 6 weeks		%age of where credit/waiver is received within one week		% of Termination/ Closure of service within 7 days (100 %)		Cleared over a period of <60 days (100%)		%age of calls answered by the IVR		%age of call answered by the operators (voice to voice)	
Benchmark	≤ 0.1%		≤ 0.1%		≥ 98%		= 100%		= 100%		= 100%		= 100%		≥ 95%		≥ 95%	
	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP	Agency	TSP
AIRCEL	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	91.79%	91.79%	77.74%	77.74%
AIRTEL	0.02%	0.02%	0.03%	0.03%	100.00%	99.90%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	84.47%	84.47%
BSNL	0.01%	0.01%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.72%	99.00%
IDEA	0.01%	0.01%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	97.22%	97.22%	98.31%	98.31%
RCOM GSM	0.09%	0.09%	0.09%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.06%	99.06%	75.96%	75.96%
VODAFONE	0.01%	0.01%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	93.26%	93.39%

15.3.2. METERING AND BILLING CREDIBILITY: POSTPAID



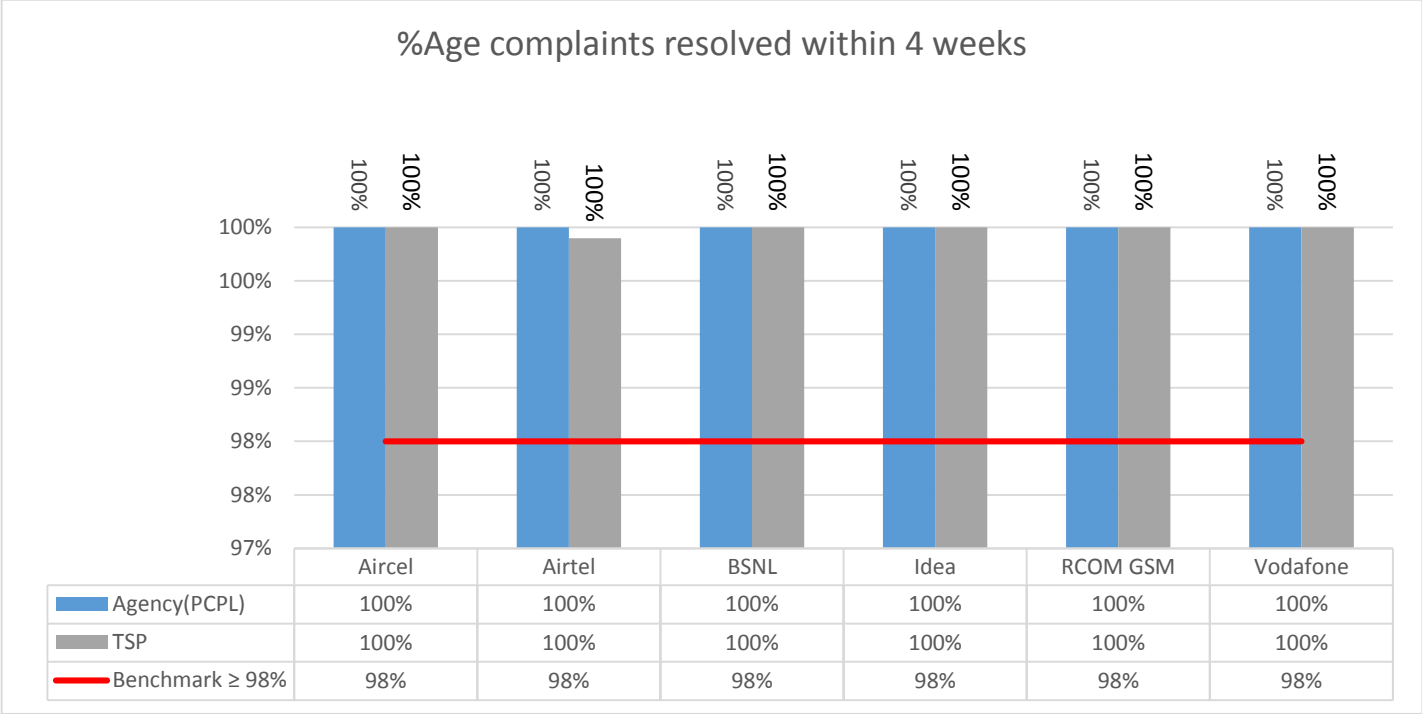
	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	0.00%	0.02%	0.01%	0.01%	0.09%	0.01%
TSP	0.00%	0.02%	0.01%	0.01%	0.09%	0.01%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

15.3.3. METERING AND BILLING CREDIBILITY : PREPAID

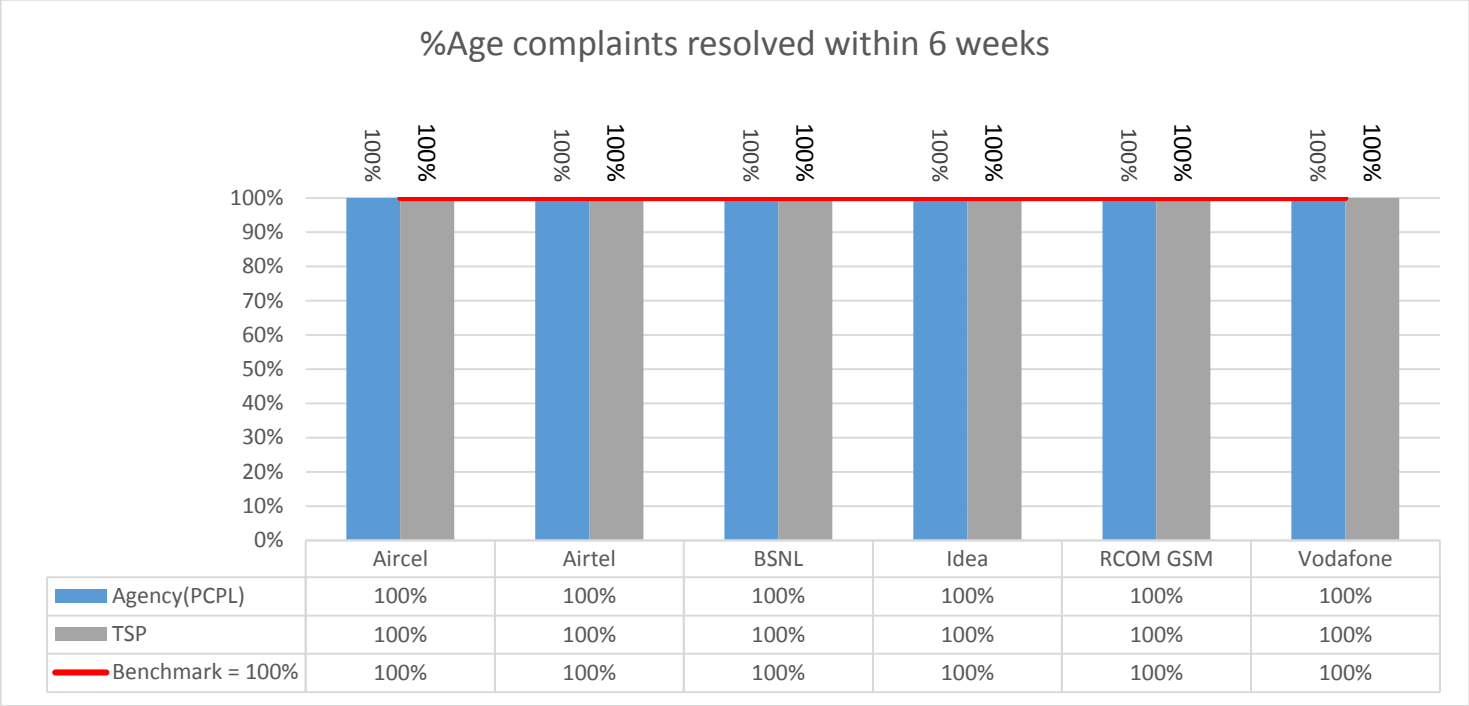


	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	0.00%	0.03%	0.00%	0.00%	0.09%	0.00%
TSP	0.00%	0.03%	0.00%	0.00%	0.09%	0.00%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

15.3.4. %AGE COMPLAINT RESOLVED WITHIN 4 WEEKS

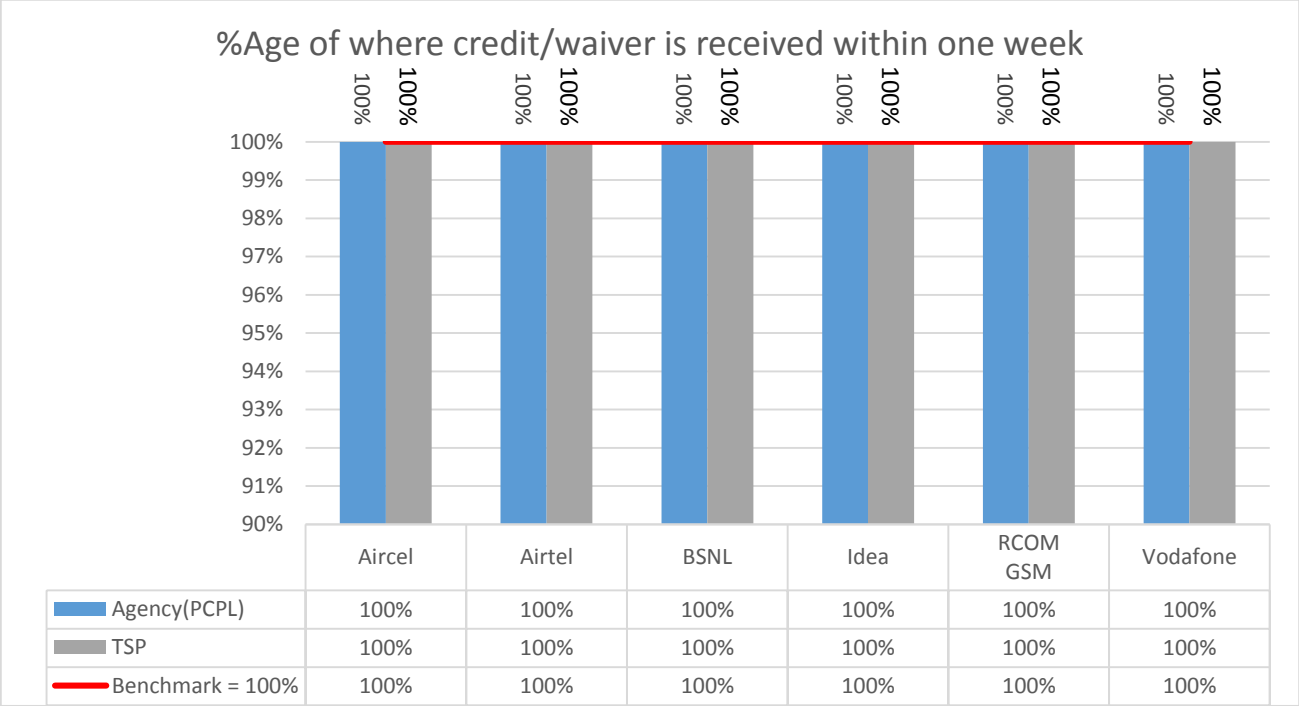


15.3.5. %AGE COMPLAINTS RESOLVED WITHIN 6 WEEKS

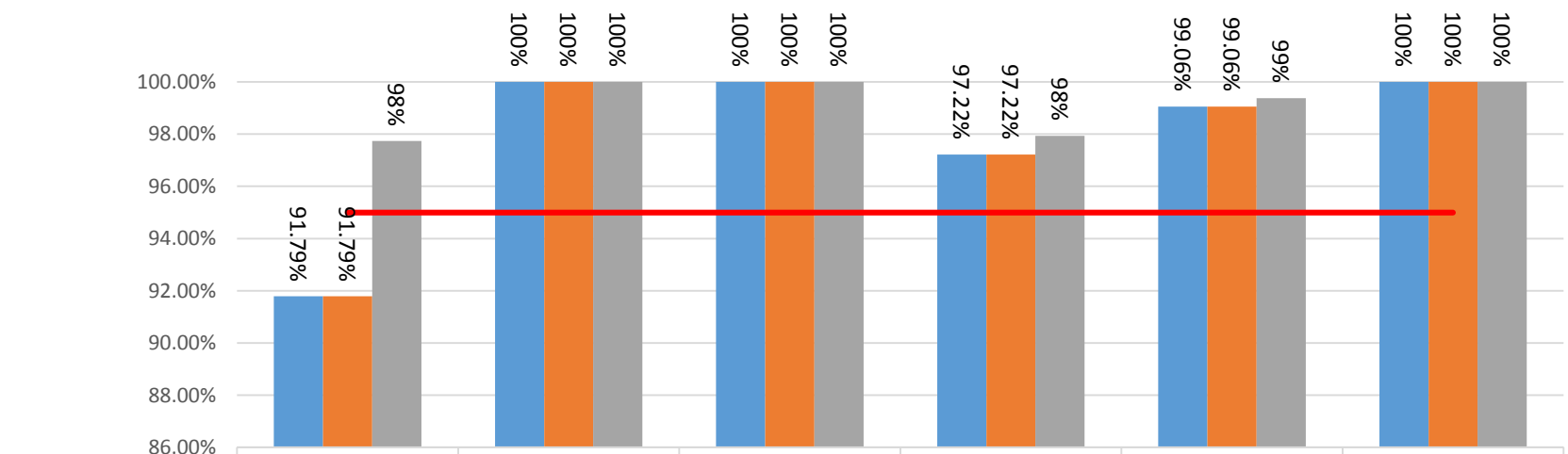


	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	100%	100%	100%	100%	100%	100%
TSP	100%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%

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

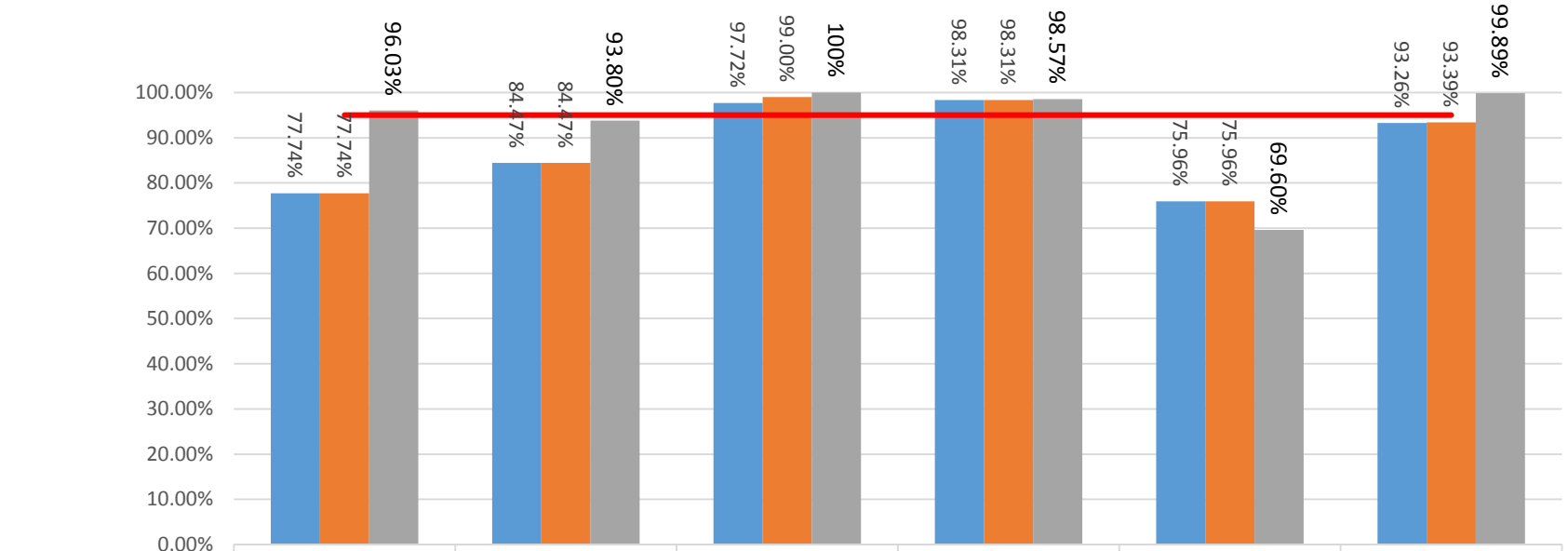


15.3.7. %AGE OF CALLS ANSWERED BY THE IVR



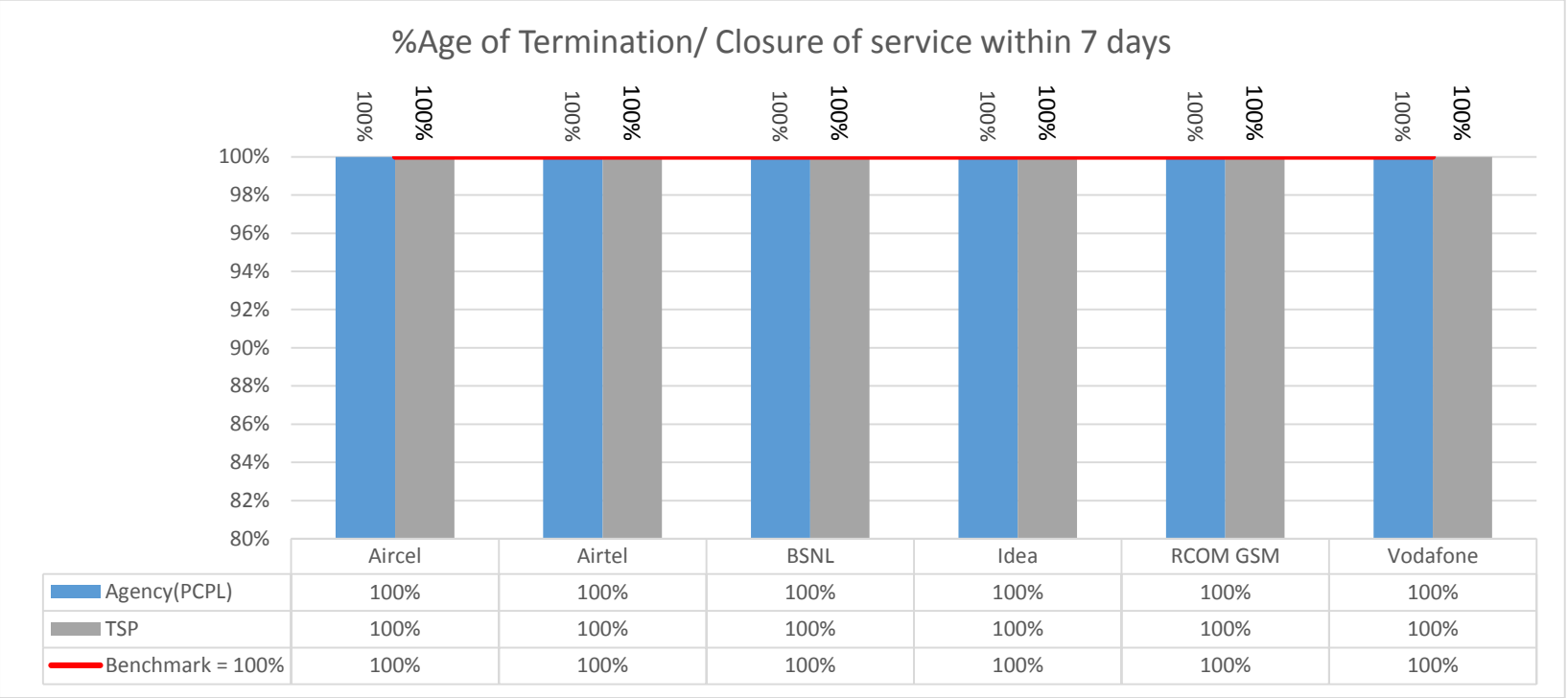
	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	91.79%	100%	100%	97.22%	99.06%	100%
TSP	91.79%	100%	100%	97.22%	99.06%	100%
Live Calling	98%	100%	100%	98%	99%	100%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%

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



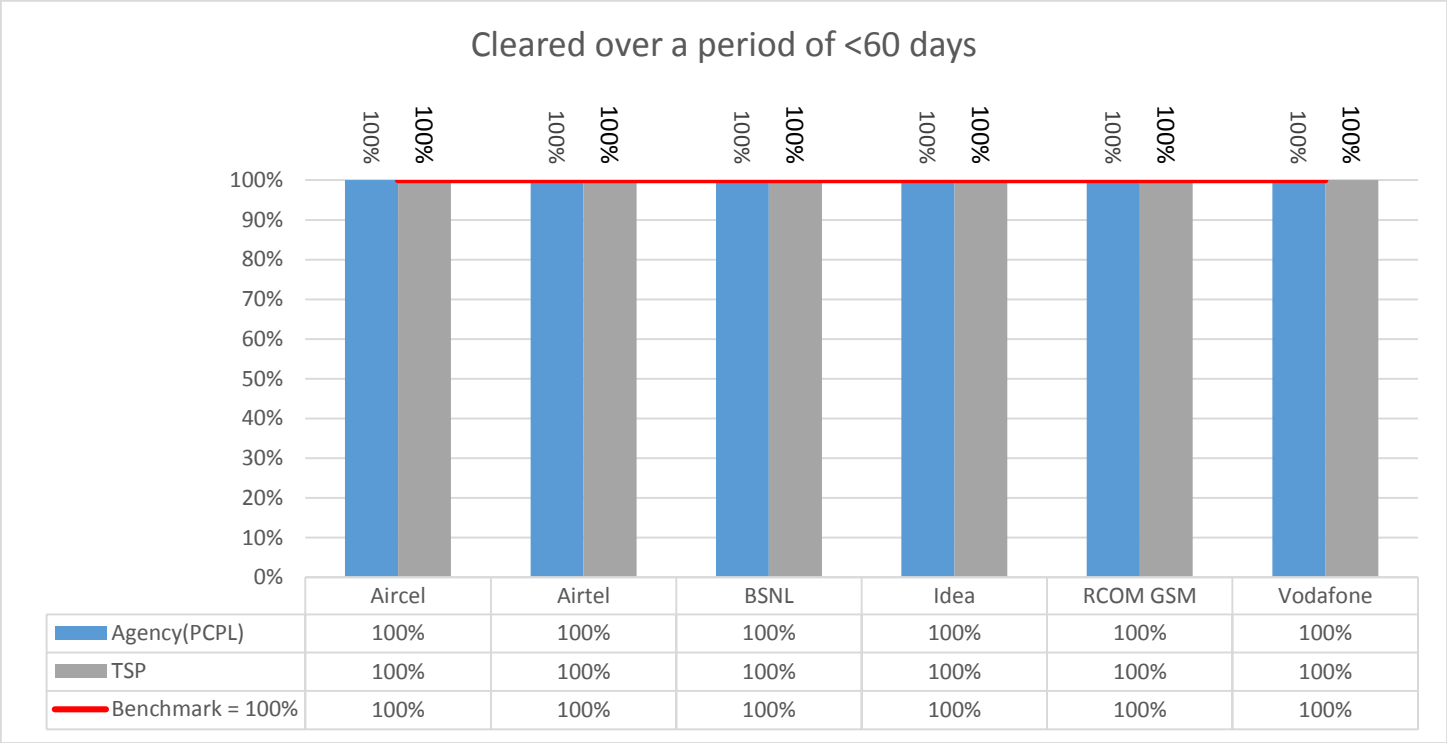
	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	77.74%	84.47%	97.72%	98.31%	75.96%	93.26%
TSP	77.74%	84.47%	99.00%	98.31%	75.96%	93.39%
Live Calling	96.03%	93.80%	100%	98.57%	69.60%	99.89%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%

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



	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	100%	100%	100%	100%	100%	100%
TSP	100%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%

15.3.10. CLEARED OVER A PERIOD OF <60 DAYS



	Aircel	Airtel	BSNL	Idea	RCOM GSM	Vodafone
Agency(PCPL)	100%	100%	100%	100%	100%	100%
TSP	100%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%

16. KEY FINDINGS

16.3. 2G VOICE PMR – CONSOLIDATED

- AIRCEL has parameter value of 3.00% and failed to meet the benchmark of ≤ 2% Connection Establishment (Accessibility) TCH Congestion.
- AIRTEL has parameter value of 2.07% and failed to meet the benchmark of ≤ 2% Connection Establishment (Accessibility) TCH Congestion.
- AIRCEL has parameter value of 12.28% and failed to meet the benchmark of ≤ 3% Worst Affected cell having more than 3% TCH drop.
- AIRTEL has parameter value of 5.80% and failed to meet the benchmark of ≤ 1% Connection Establishment (Accessibility) SDDCH Congestion.
- AIRCEL has parameter value of 3.09% and failed to meet the benchmark of ≤ 2% No. of BTSs having accumulated downtime of >24 hours in a month.
- VODAFONE has parameter value of 9.38% and failed to meet the benchmark of ≤ 2% No. of BTSs having accumulated downtime of >24 hours in a month.

16.4. 3G VOICE PMR - CONSOLIDATED

- AIRCEL has parameter value of 10.78% and failed to meet the benchmark of ≤ 3% Worst affected cells having more than 3% Circuit Switched Voice Drop Rate.

16.5. BILLING AND CUSTOMER CARE

- AIRCEL has parameter value of 91.79% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of calls answered by the IVR.
- AIRCEL has parameter value of 77.74% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.
- AIRTEL has parameter value of 84.47% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.
- RCOM GSM has parameter value of 75.96% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second.
- VODAFONE has parameter value of 93.26% and failed to meet the benchmark of ≥95% Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 second