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



AUDIT & ASSESSMENT OF QUALITY OF SERVICE

NORTH ZONE – DELHI CIRCLE

WIRELINE & BROADBAND SERVICES (JULY TO SEP 2016)

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.

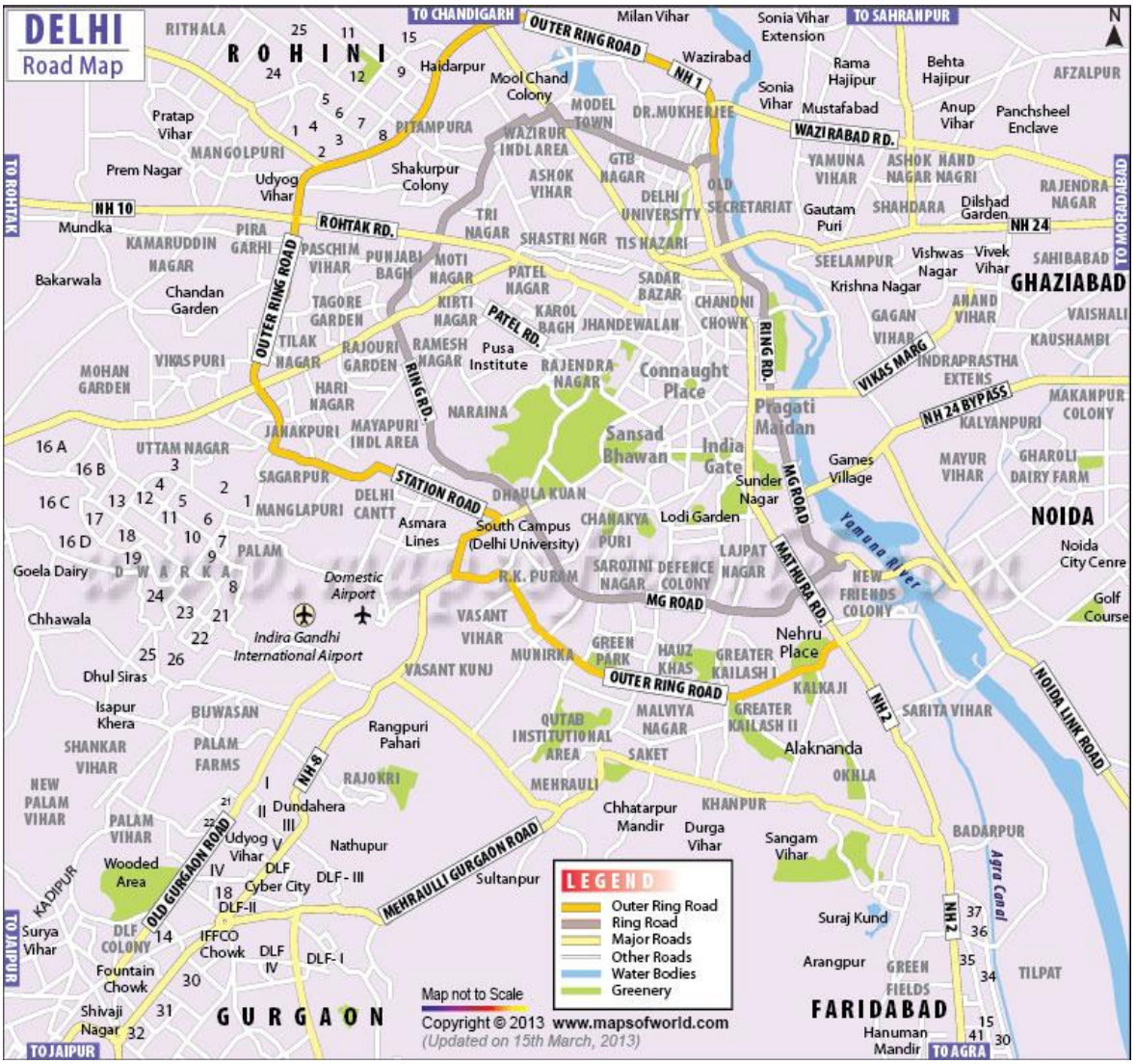
1.3. OBJECTIVES

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).

1.4. COVERAGE

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



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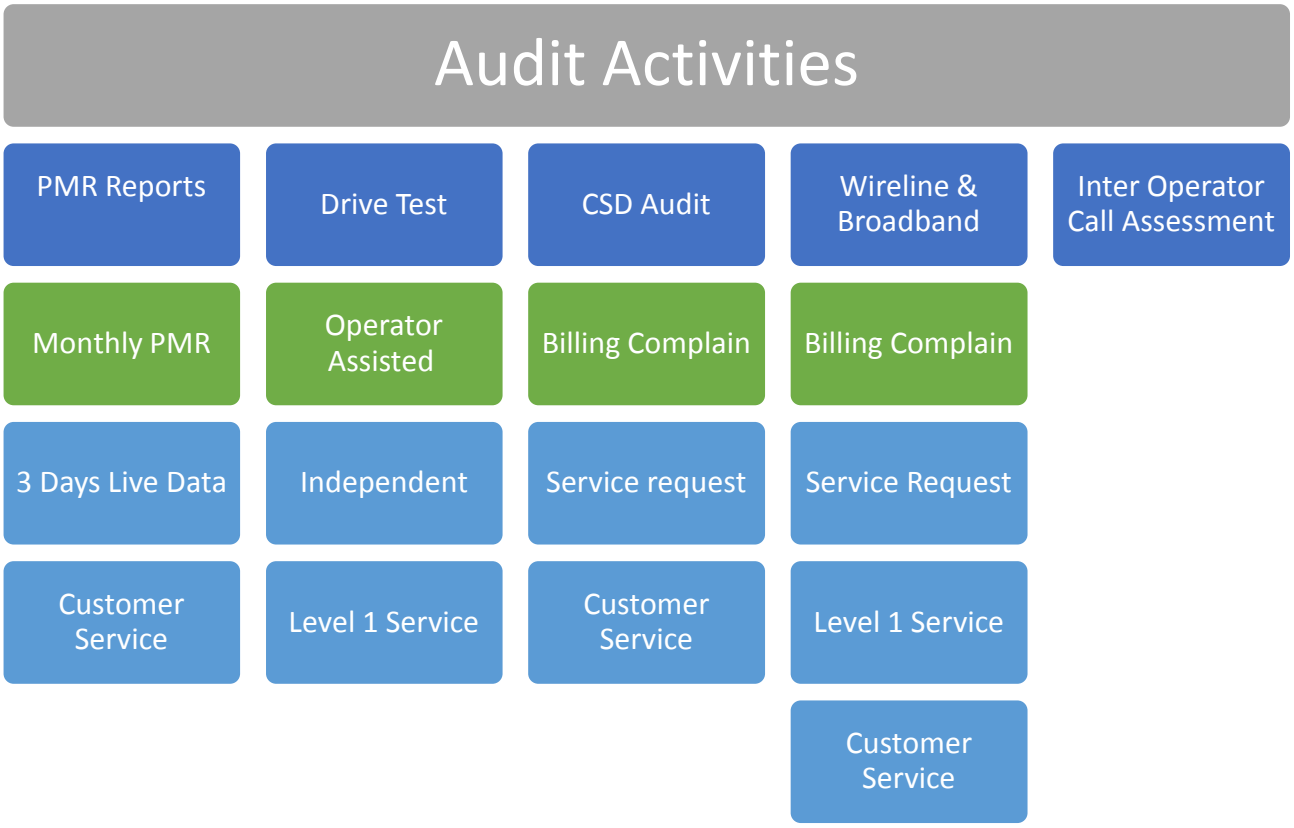
1.5. FRAMEWORK USED



2. Basic Telephone Service (Wireline) and Broadband Services

2.1. Wireline Service Parameter

S. No.	Name of Parameter	Benchmark
1	Fault incidences (Fault incidences subscribers / month)	≤ 7
2	Fault repair by next working day	For urban areas: By next working day: ≥85% and within 5 days: 100%. For rural and hilly areas: By next working day: ≥75% and within 7days: 100%. Rent Rebate: Faults pending for >3 days and ≤7 days: Rent rebate for 7 days. Faults pending for >7 days and ≤15 days: Rent rebate for 15 days. Faults pending for> 15 days: rent rebate for one month.
3	Mean Time To Repair (MTTR)	≤ 10 Hrs
4	Point of Interconnection (POI) Congestion (on individual POI)	≤ 0.5%
5	Metering and billing credibility – post paid	Not more than 0.1% of bills issued should be disputed over a billing cycle
6	Metering and billing credibility –- pre-paid	Not more than 1 complaint per 1000 customers, i.e. 0.1% complaints for metering, charging, credit, and validity
7	Resolution of billing / charging complaints	≥ 98% within 4 weeks 100% within 6 weeks
8	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	Within one week of resolution of complaint
9	Response Time to the customer for assistance	
	(a) Accessibility of call centre/ customer care	≥ 95%
	(b)Percentage of calls answered by the operators (voice to voice) within 60 seconds	≥ 95%
10	Termination/ closure of service	≤ 7
11	Time taken for refund of deposits after closures	100% within 60 days.

2.2. BROADBAND SERVICE PARAMETER

S. No.	Name of Parameter	Benchmark
1	Service provisioning\ Activation	100% cases in ≤ 15 working days (subject to technical feasibility). In all cases where payment towards installation charge & security deposit is taken and the Broadband connection is not provided within 15 working days, a credit at the rate ofRs.10/ per day, subject to a maximum of installation charge or equivalent usage allowance shall be given to the customer, at the time of issue of first bill.
2	Fault Repair\Restoration Time	By next working day: > 90% and within 3 working days: 99% Rebate: (a) Faults Pending for > 3 working days and < 7 working days: rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance (b) Faults Pending for > 7 working days and < 15 working days: rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance (c) Faults Pending for > 15 working to one month of minimum monthly usage allowance.
3	Billing Performance	
	• Billing complaints per 100 bills issued	<2%
	• %age of Billing Complaints Resolved	100% within 4 weeks
	• Time taken for refund of deposits after closure	100% within 60 days
4	Response time to the customer assitance	% age of calls answered by operator (Voice to Voice) Within 60 seconds > 60% Within 90 seconds > 80%
5	Bandwidth Utilization/ throughput	
	a) Bandwidth Utilization	
	i) POP to ISP Gateway Node (Intra – Network) Links.	<80% link(s)/route bandwidth utilization during peak hours (TCBH).
	ii) ISP Gateway Node to IGSP / NIXI upstream links for international connectivity.	
	b) Broadband connection speed (download).	Subscribed Broadband Connection Speed to be met >80% from ISP Node to User.
6	Service Availability / Uptime for all users	> 98%

7	Packet Loss (for wired broadband access)	<1%
8	Network Latency (for wired broadband access)	
	• User reference point at POP\ ISP gateway node to international gateway.	<120 msec
	• User reference point at ISP Gateway Node to international nearest NAP port abroad.	<350 msec
	• User reference point at ISP Gateway Node to international nearest NAP port abroad	<800 msec
9	Customer perception of services	
a	% satisfied with the provision of services.	>90%
b	% satisfied with the billing performance.	>90%
c	% satisfied with help services	>90%
d	% satisfied with network performance, reliability and availability	>85%
e	% satisfied with maintainability	>85%
f	% satisfied with Overall customer satisfaction	>85%
g	% satisfied Customer satisfaction with offered supplementary services such as allocation of static/fixed IP addresses, email-id's.	>85%

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

Basic Telephone (Wire line) Service

3. EXECUTIVE SUMMARY : BASIC (WIRELINE)

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

3.1. BASIC (WIRELINE)

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

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

Sr. No	Service Provider	Circle	Address	No. of Urban Exchanges Covered for Audit
3	RCL	Delhi	Maharaja Ranjit Singh Marg, New Delhi. -110001/DAKC Mumbai	1
5	TTL		Tata Teleservices Ltd VSB Road New Delhi	1
Total Exchanges				**2**

*MTNL: Due to expiry of contract agreement MTNL not allow Phistream auditors for the Qos audit 2016.

*Airtel : Not submitted , even so many follow up has been taken by audit team.

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

AVERAGED AUDITED DATA FOR WIRELINE (BASIC) SERVICES – DELHI CIRCLE					
Sl. No.	**Parameters**	**Benchmark**	**Period**	**RELIANCE**	**TTSL**
1	**Fault incidences**				
	(No. of faults/100 subscribers /month)	< 7%	*Quarterly*	**0.04%**	**3.12%**
2	**Faults Repair/Restoration Time**				
	Fault repair by next working day(Urban Area)	>85%	*Quarterly*	**100.00%**	**96.00%**
	% of fault repair within 5 days (Urban Area)	100%	*Quarterly*	**100.00%**	**100.00%**
	Fault repair by next working day(Rural & hilly Area)	>75%	*Quarterly*	**NA**	**NA**
	% of fault repair within 7 days(Rural & hilly Area)	100%	*Quarterly*	**NA**	**NA**
	Mean time to Repair(MTTR)	≤10 Hrs	*Quarterly*	**4.7**	**11.76**
3	**Rent Rebate**				
	Fault pending > 3 days & <7 days	Rebate for 7 days	*Quarterly*	0	1
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	*Quarterly*	0	0
	Fault pending > 15 days	Rebate for 1 month	*Quarterly*	0	0
4	**Metering & Billing Performance**				
	% of disputed Bills over bills issued (Post Paid)	< 0.1%	*Quarterly*	**0.02%**	**0.05%**
	% of Pre-paid Charging Complaints	< 0.1%	*Quarterly*	**NA**	**NA**
	% of billing complaints resolved within 4 weeks	98% within 4 weeks	*Quarterly*	**100.00%**	**100.00%**
	% of billing complaints resolved within 6 weeks	100% within 6 weeks	*Quarterly*	**100.00%**	**100.00%**
	Period of all refunds/payments from the date of resolution of complaints within 1weeks	<=1 week	*Quarterly*	**100.00%**	**100.00%**
5	**POI Congestion**				
	No. of POI's having congestion >0.5%	>0.5%	*Quarterly*	0	0
6	**Response Time to customer for assistance**				
	Accessibility of Call centre/customer Care	>=95%	*Quarterly*	**98.88%**	**98.80%**
	% age of calls answered by operator(voice to voice) within 90 seconds	>=95%	*Quarterly*	**99.63%**	**100.00%**
7	**Customer care(promptness in attending to customers request)**				
	Termination / Closures	100%	*Quarterly*	**100.00%**	**100.00%**

	Time taken for refunds of deposit after closures	100%	*Quarterly*	**100.00%**	**100.00%**

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

3 DAYS LIVE MEASUREMENT DATA FOR WIRELINE (BASIC) SERVICES - DELHI CIRCLE					
Sl No.	**Parameters**	**Benchmark**	**Period**	**RCL**	**TTSL**
1	**POI Congestion**				
	No. of POI's having congestion >0.5%	≤0.5%	Quarterly	0	0
2	**Response Time to customer for assistance**				
	Accessibility of Call centre/customer Care	≥95%	Quarterly	**98.65%**	**100.00%**
	% age of calls answered by operator(voice to voice) within 90 seconds	≥95%	Quarterly	**99.70%**	**97.00%**

3.4. KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINE)

Fault Incidences: - The audit of the service providers revealed that the performance of all service providers was well within the benchmark.

Fault Repair/Restoration Time: - The audit of the service providers revealed that the performance of all service providers was well within the benchmark.

Mean Time to Repair: - The audit of the service providers revealed that the performance of all service providers was well within the benchmark.

Metering and Billing performance: - For this parameter, all operators were meeting the benchmark except **TTSL** as showing MTTR **11.76** Hrs. against the benchmark **<=10 Hrs**.

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

Response Time to Customer for assistance: - For this parameter, all operators were meeting the benchmark.
Termination/Closures: All operators were found meeting the benchmark for this parameter.

3.5. INTER OPERATOR CALL ASSESSMENT (WIRELINE SERVICES)

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

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT				
Calling Operators	Circle Name	Total No. of calls Made	RCL	TTSL
RCL	Rajasthan	100	--	100%
TTSL	Rajasthan	100	100%	--

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

3.6. LEVEL-1 LIVE CALLING (WIRELINE SERVICES)

Level 1 Live Calling			
PUT x FOR UNSUCCESSFUL CALL AND TICK FOR SUCCESSFUL CALL			
S. NO.	L1 Service Number	CIRCLE NAME:Delhi	
	Details	Reliance (RCL)	TATA Teleservices (TTL)
1	100 Police	√	√
2	101 Fire	√	√
3	102 Ambulance	√	√
4	104 Health Information Helpline	x	x
5	108 Emergency and Disaster Management Helpline	x	x
6	138 All India Helpine for Passangers	x	x
7	149 Public Road Transport Utility Service	x	x
8	181 Chief Minister Helpline	√	√
9	182 Indian Railway Security Helpline	√	√
10	1033 Road Accident Management Service	x	x
11	1037 Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal Helpline'	x	x
12	1056 Emergency Medical Services	x	x
13	106X State of the Art Hospitals	x	x
14	1063 Public Grievance Cell DoT Hq	√	√
15	1064 Anti Corruption Helpline	√	√
16	1070 Relief Commission for Natural Calamities	√	√
17	1071 Air Accident Helpline	x	x
18	1072 Rail Accident Helpline	√	√
19	1073 Road Accident Helpline	x	x
20	1077 Control Room for District Collector	√	√

21	1090 Call Alart (Crime Branch)	√	√
22	1091 Women Helpline	√	√
23	1097 National AIDS Helpline to NACO	x	x
24	1099 Central Accident and Trauma Services (CATS)	x	x
25	10580 Educational& Vocational Guidance and Counselling	√	√
26	10589 Mother and Child Tracking (MCTH)	x	x
27	10740 Central Pollution Control Board	x	x
28	10741 Pollution Control Board	x	x
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	x	x
38	1916 Drinking Water Supply	√	√
39	1950 Election Commission of India	√	√

To assess the availability and efficiency of level 1 service such as police, fire, ambulance (emergency services), the calls were made from telephone provided by service providers , these services were found functional in the networks of all the service providers.

3.7. CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)

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

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

AUDIT & ASSESSMENT OF QUALITY OF SERVICE

Broadband Service

4. EXECUTIVE SUMMARY : BROADBAND

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

4.1. QUALITY OF SERVICE AUDIT OF BROADBAND SERVICE PROVIDERS

Phistream has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area as per TRAI guideline; Sampling shall be done for each service provider separately. In an LSA, sample shall include all POPs located in 10% of SDCAs in the LSA or 10 SDCAs, whichever is more, subject to maximum of the number of SDCAs covered by the service provider in the LSA. SDCAs selected should be evenly spread over the LSA and shall include major population centers. List and details of POPs shall be obtained from NOC/ISP Node of the operators. A service areal circle in the contracted Zone shall be audited only once in a year.

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

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

Sl. No.	Name of Broadband Service Providers	Subscriber Base	Location of Audit
1	DEN Network	85910	DEN Network ,Okhla, Phase III, New Delhi
2	Broadband Pacenet India Pvt. Ltd.	5000	Broadband Pacenet India Pvt.Ltd. Subhash Nagar,Delhi.
3	Tikona Digital Network Pvt Ltd,	26803	B-31 1st Floor,Okhla Industrial Estate,Phase 1,New Delhi-110020
4	HATHWAY CABLE AND DATACOM LTD	5844	Hathway Cable & Datacom LTD,AB-17,FF,Safdarjung Enclave, Delhi
5	Tata Teleservices Ltd	10214	TTL, AL-AQMAR BUILDING, 5- GANESHKHIND,ROAD,SHIVAJI NAGAR,PUNE,MHG
6	Reliance Communication Ltd.	14398	RCL DAKC, MUMBAI

4.2. Service Provider Performance Report Based On Quarterly Measurement Data Verification For Broadband Service Providers

AVERAGED QUARTERLY (JULY TO SEP-16) AUDIT DATA FOR BROADBAND SERVICES

Broadband Audit Data		Benchmark	Circle Name	DEN Network	Broadband Pacenet India Pvt.	Tikona Digital Network Pvt	HATHWAY CABLE AND DATACOM LTD	TTL	RCL
S/N	Name of Parameter								
1	Service Provisioning/Activation Time								
	A) No of connections registered during the period			23946	616	8945	17468	1512	970
	B) Total number of connections provided within 15 days of registration on demand during the period			23946	616	8945	17151	1512	970
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	<15 days		100.00%	100.00%	100.00%	98.19%	100.00%	100.00%
	D)Total number of connections provided after 15 days of registration on demand			0	0	0	0	0	0
	E) %age of connections provided after 15 days of registration on demand			0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	F) In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/ per day.		NA	NA	NA	NA	NA	NA
2	Fault Repair/Restoration Time								
	A) Total number of faults registered during the period			59305	1223	7591	26454	4579	1039
	B) Total number of faults repaired by next working day			53328	1201	6935	25855	4184	1039
	C) % age of faults repaired by next working day	>90%		89.92%	100.00%	91.36%	97.73%	91.37%	100.00%
	D) Total number of faults repaired within three working days			58756	1223	7569	26274	4524	1039
	E)% age of faults repaired within three working days	≥99%		99.07%	100.00%	99.71%	99.31%	98.80%	100.00%
3	Rent Rebate								
	A) Faults Pending for > 3 working days and < 7,working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)			0	0	473	45	16	0
	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)			0	0	212	5	0	0
	C) Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)			0	0	133	50	0	0
4	Billing Performance								
	A) Total bills generated during period			NA (Prepaid Model)	2634	113556	NA (Prepaid Model)	10214	39922
	B) Total complaints received from customers/ Bills disputed			NA	0	309	NA	112	53
	C) Billing complaints per 100 bills issued	<2%		NA	0.00%	0.27%	NA	1.10%	0.13%
	D) Total number of complaints resolved in 4 weeks from date of receipt			NA	NA	309	NA	112	53
	E) %age billing complaints resolved in 4 weeks	100%		NA	NA	100.00%	NA	100.00%	100.00%
	F) Total number of cases requiring refund of deposits after closure			NA	NA	59	NA	3	10
	G) Total number of cases where refund was made in <60 days			NA	NA	59	NA	3	10
	H) Percentage cases in which refund received within 60 days	100%		NA	NA	100.00%	NA	100.00%	100.00%
5	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)								
	A) Total number of calls received by the operator			291025	62	249505	246159	7921	86286
	B) Total number of calls answered by the operator within			263095	62	155228	177419	7261	84783

	60 seconds								
	C) % age calls answered by the operator in 60 seconds	>60%		92.13%	100.00%	62.21%	72.07%	91.67%	98.33%
	D) Total number of calls answered by the operator within 90 seconds			270032	62	203921	214071	7508	84953
	E) % age calls answered by the operator within 90 seconds	>80%		94.55%	100.00%	81.73%	86.96%	94.79%	98.52%
6	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).								
6.1	POP to ISP Gateway Node [Intra-network] Link(s)								
	A) Total Bandwidth Available at the link for the period days			19530	4605	29217	64625	9216	21000
	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)			15930	2431.61	21893.78	35510	2808	549
	C) % age Bandwidth utilized during the period	<80%		81.57%	52.80%	74.94%	54.95%	30.47%	2.61%
6.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity								
	A) Total number of upstream links for Inter International connectivity			16	DNA	12	13	3	33
	B) Number of Links having Bandwidth utilization > 90% during TCBH			16	DNA	0	0	0	0
	C) Total Internationall bandwidth available from ISP Node to IGSP/NIXI/DNAP			19530	DNA	12150	31342	82305	330000
	D) Total International bandwidth utilization during peak hours (TCBH) in Mpbs			15950	DNA	9522.7	19800	67072	129417
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%		81.67%	DNA	78.37	63.17%	81.49%	39.22%
6.3	Broadband Connection Speed (download) - from ISP Node to User								
	A) Total committed download speed to the sample subscribers (In mpbs)			30	22	12288	63	NA	300
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)			30	22	10701.51	60.55	NA	260.43
	C) % age subscribed speed available to the subscriber during TCBH	>80%		100.00%	100.00%	87.09%	96.11%	92.70%	86.81%
7	Service Availability/Uptime								
	A) Total operational Hours			4392	2208	2208	2208	46368	2208
	B) Total downtime (In hours)			2.34	10	2194.11	9.45	192	15.92
	C) Total time when the service was available (In Hrs)			4389.66	2198	13.88	2198.55	46176	2192.08
	D) % age of Service availability uptime	>98%		99.95%	99.55%	99.37	99.57%	99.59%	99.28%
8	Packet Loss								
	A) Total number of ping packets transmitted			6000	3000	3000	3000	15000	92000
	B) Total number of ping packets lost			0	10	0	0	31	471
	C) % age packet loss	<1%		0.00%	0.33%	0.00%	0.00%	0.21%	0.51%
9	Network latency (for wired broadband access)								
9.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway								
	A) Total number of ping packets transmitted			6000	DNA	DNA	3000	15000	3000
	B) Average round trip tip time for all the ping transmitted	<120 ms		46	DNA	DNA	7.66	33.4	1
9.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)								
	A) Total number of ping packets transmitted			6000	3000	DNA	3000	3600	3000
	B) Average round trip tip time for all the ping transmitted	<350 ms		54.50	70.33	DNA	166.66	60.8	6.67
9.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)								
	A) Total number of ping packets transmitted			NA	NA	NA	NA	NA	NA
	B) Average round trip tip time for all the ping transmitted	<800 ms		NA	NA	NA	NA	NA	NA

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

3 DAYS LIVE DATA FOR BROADBAND SERVICES

S/N	3 days live Broadband Audit Data — Name of Parameter	Bench- mark	Circle name	DEN Network	Broadband Pacenet India Pvt. Ltd.	Tikona Digital Network Pvt Ltd,	HATHWAY CABLE AND DATACOM LTD	TTL	RCL
1	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)								
	A) Total number of calls received by the operator			8820	4	6860	8384	197	3103
	B) Total number of calls answered by the operator within 60 seconds			7995	4	4458	5412	194	3042
	C) % age calls answered by the operator in 60 seconds	>60%		92.38%	100.00%	64.99%	64.55%	98.48%	98.03%
	D) Total number of calls answered by the operator within 90 seconds			8201	4	5758	6967	195	3051
	E) % age calls answered by the operator within 90 seconds	>80%		95.81%	100.00%	83.94%	83.10%	98.98%	98.32%
2	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).								
2.1	POP to ISP Gateway Node [Intra-network] Link(s)								
	A) Total Bandwidth Available at the link for the period days			19530	4605	29103	71925	9216	21000
	B) Total Bandwidth utilized during the period during TCBH (In Mpbs)			18104	2475	20856.42	48200	3233	668
	C) % age Bandwidth utilized during the period	<80%		92.70%	53.75%	71.66%	67.01%	35.08%	3.18%
2.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity								
	A) Total number of upstream links for International connectivity			5	DNA	12	13	3	33
	B) Number of Links having Bandwidth utilization > 90% during TCBH			5	DNA	0	0	0	0
	C) Total International bandwidth available from ISP Node to IGSP/NIXI/DNAP			19530	DNA	12150	33807	82305	330000
	D) Total international bandwidth utilization during peak hours (TCBH) in Mpbs			18104	DNA	9283.62	25020	61700	158963
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%		92.70%	DNA	76.41%	74.01%	74.97%	48.17%
2.3	Broadband Connection Speed (download) - from ISP Node to User								
	A) Total committed download speed to the sample subscribers (In mpbs)			30	19	12288	63	NA	6
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)			29.91	19	10799.25	58.12	NA	5.97

	C) % age subscribed speed available to the subscriber during TCBH	>80%		99.70%	100.00%	87.88%	92.25%	95.56%	99.50%
3	Packet Loss								
	A) Total number of ping packets transmitted			6000	6000	3000	3000	15000	3000
	B) Total number of ping packets lost			0	10	0	0	51	0
	C) % age packet loss	<1%		0.00%	0.17%	0.00%	0.00%	0.34%	0.00%
4	Network latency (for wired broadband access)								
4.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway								
	A) Total number of ping packets transmitted			6000	DNA	DNA	3000	15000	3000
	B) Average round trip tip time for all the ping transmitted	<120 ms		29.5	DNA	DNA	8.6	40.93	1.84
4.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)								
	A) Total number of ping packets transmitted			9000	3000	DNA	3000	3600	3000
	B) Average round trip tip time for all the ping transmitted	<350 ms		31.83	89	DNA	185	60.00	1.37
4.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)								
	A) Total number of ping packets transmitted			NA	NA	NA	NA	NA	NA
	B) Average round trip tip time for all the ping transmitted	<800 ms		NA	NA	NA	NA	NA	NA
5	Service Availability/Uptime								
	A) Total operatioDNAl Hours			72	72	2160	72	1512	72
	B) Total downtime (In hours)			0.3	0	4.68	0.2	7	0
	C) Total time when the service was available (In Hrs)			71.7	72	2140.12	71.8	1505	72
	D) % age of Service availability uptime	>98%		99.58%	100.00%	99.35%	99.72%	99.54%	100.00%

4.4. KEY FINDINGS: BROADBAND SERVICES

Service Provisioning / Activation Time: The audit of the service providers revealed that all Broadband service providers were well within the benchmark

Fault Repair/Restoration Time: With regards to this parameter the performance of the service providers was within TRAI norms except **DEN Networks** , its achievement level was **89.92%** for parameter **Fault Repair by next working day**. Further, TTL remained under performed for parameter **Faults repaired within three working days** with its performance as **98.80%.**

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

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

Bandwidth Utilization/ Throughput: All the service providers were found using Multiple Router Traffic Grapher (MRTG) and also it was observed that all service providers were reporting combined bandwidth utilization for corporate customers and household customers. The performance of service providers with respect of these parameters was found satisfactory i.e. within benchmark except **Den Network** & TTSL as performance is **81.57% (92.70%Live) and 81.49%** respectively against the benchmark of <80%.

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

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

However, the ping test conducted during live measurement revealed that all service providers were meeting the benchmark prescribed by TRAI.

4.5. CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE FOR BROADBAND SERVICES							
Parameter	Circle Name	DEN Network	Broadband Pacenet India Pvt. Ltd	Tikona Digital Network Pvt Ltd	HATHWAY CABLE AND DATACOM	TTL	RCL
Total No. of calls Attempted	Delhi	100	25	100	100	100	100
Total number of calls answered by the operator within 60 seconds		100	25	100	99	100	100
% age calls answered by the operator in 60 seconds		**100.00%**	**100.00%**	**100.00%**	**99.00%**	**100.00%**	**100.00%**
Total number of calls answered by the operator within 90 seconds		100	25	100	100	100	100
% age calls answered by the operator within 90 seconds		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

4.6. LIVE CALLING FOR BILLING COMPLAINTS

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS								
Parameter	Circle Name		DEN Network	Broadband Pacenet India Pvt. Ltd.	Tikona Digital Network Pvt Ltd,	HATHWAY CABLE AND DATACOM LTD	TTL	RCL
Total No. of calls Attempted	Delhi		NA (Prepaid Model)	NA	100	NA (Prepaid Model)	100	53
Total No. of calls Answered			NA	NA	81	NA	80	42
Cases resolved within 4 weeks			NA	NA	81	NA	80	42
%age of cases resolved			**NA**	**NA**	**100%**	**NA**	**100%**	**100%**

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

5. ABBREVIATIONS

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

- TRAI – Telecom Regulatory Authority of India
- QoS – Quality of Service
- AMJ16 – Refers to the quarter of April, May and June 2016
- SSA – Secondary Switching Area
- NOC – Network Operation Center
- OMC – Operations and Maintenance Center
- MSC – Mobile Switching Center
- PMR – Performance Monitoring Reports
- TCBH – Time Consistent Busy Hour
- CBBH - Cell Bouncing Busy Hour
- BTS – Base Transceiver Station
- CSSR – Call Setup Success Rate
- TCH – Traffic Channel
- SDCCH – Standalone Dedicated Control Channel
- CDR – Call Drop Rate
- FER – Frame Error Rate
- SIM – Subscriber Identity Module
- GSM – Global System for Mobile
- CDMA – Code Division Multiple Access
- NA – Not Applicable
- NC – Non Compliance
- POI – Point of Interconnection
- IVR – Interactive Voice Response
- STD – Standard Trunk Dialing
- ISD – International Subscriber Dialing

PHISTREAM
EMPOWERING LEADERSHIP, TRANSFORMING BUSINESS

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



AUDIT & ASSESSMENTOFQUALITY OF SERVICE CELLULAR MOBILE TELEPHONE SERVICE (CMTS)

(JULY TO SEPTEMBER2016)

NORTH ZONE –DELHI 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 Delhi circle.

1.4. COVERAGE

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

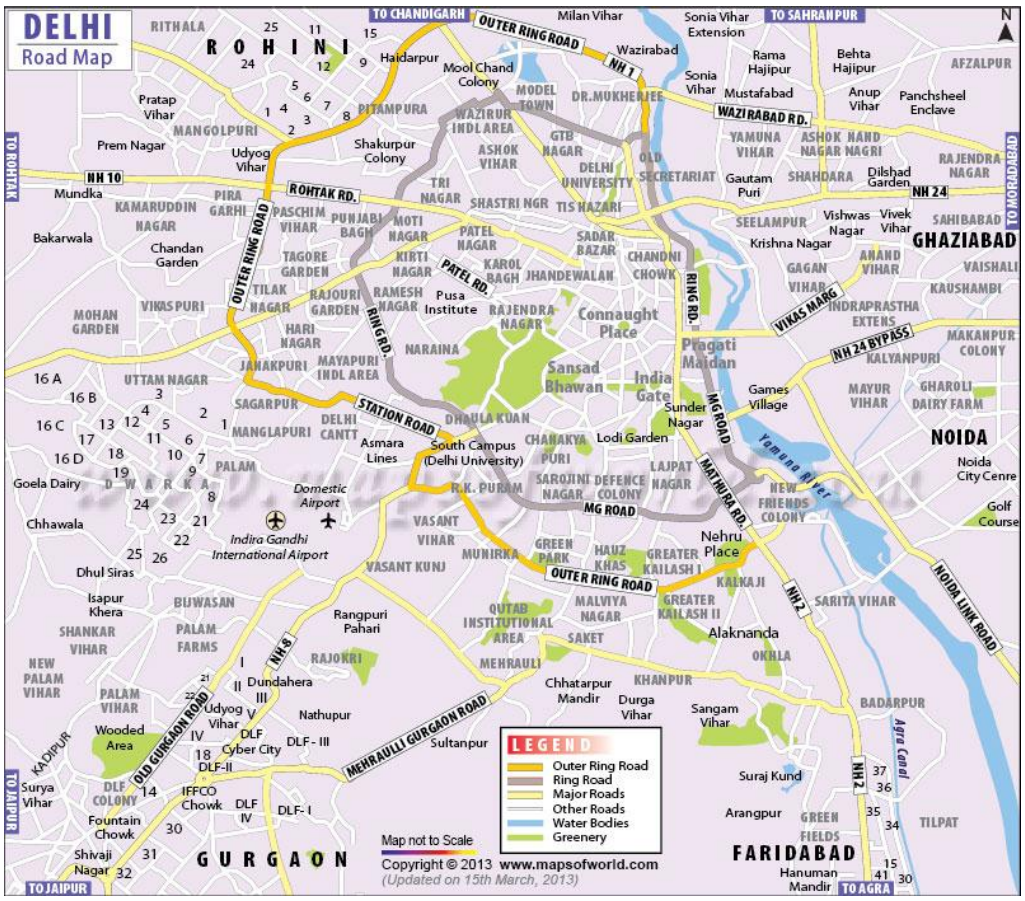


Image Source: Wikipedia

1.5. SSA LIST

S. No.	Circle	SSA Name
1	New Delhi	NEW DELHI

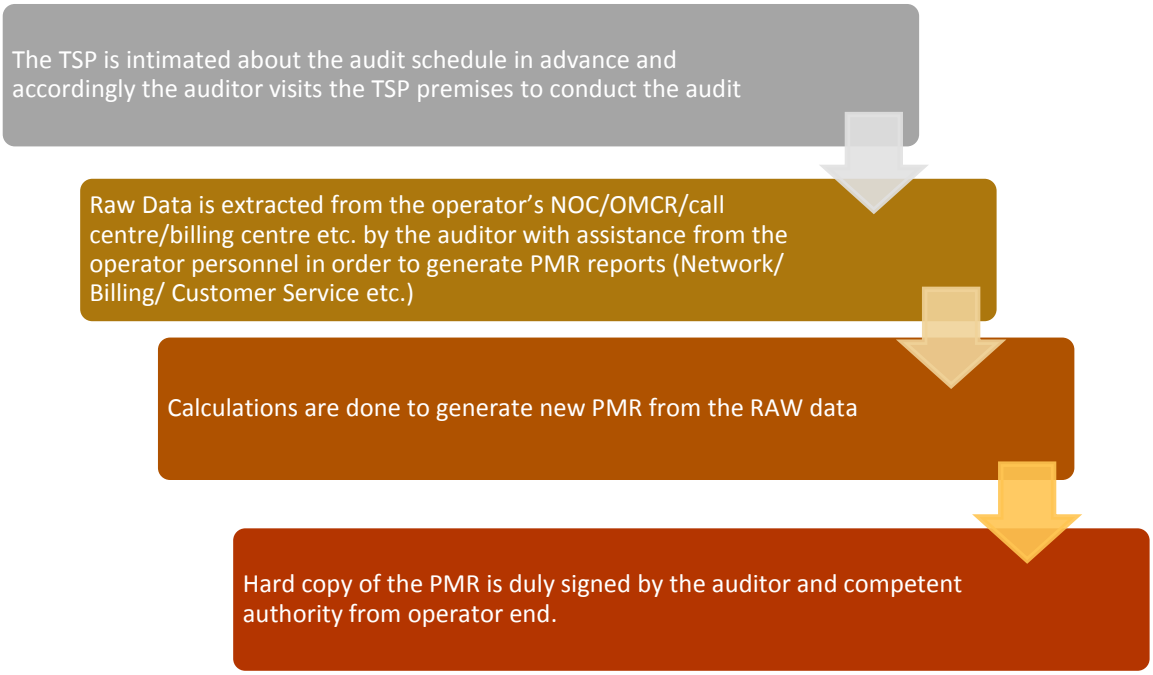
1.6. FRAMEWORK USED

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 thebenchmarks.

Parameters includes:

Network Availability

- BTS accumulated downtime
- Worst affected BTS due to downtime

Connection Establishment (Accessibility)

- Call Set Up success Rate (CSSR)

Network Congestion Parameters

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

Connection Maintenance

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

Voice Quality

- % Connections with good voice quality

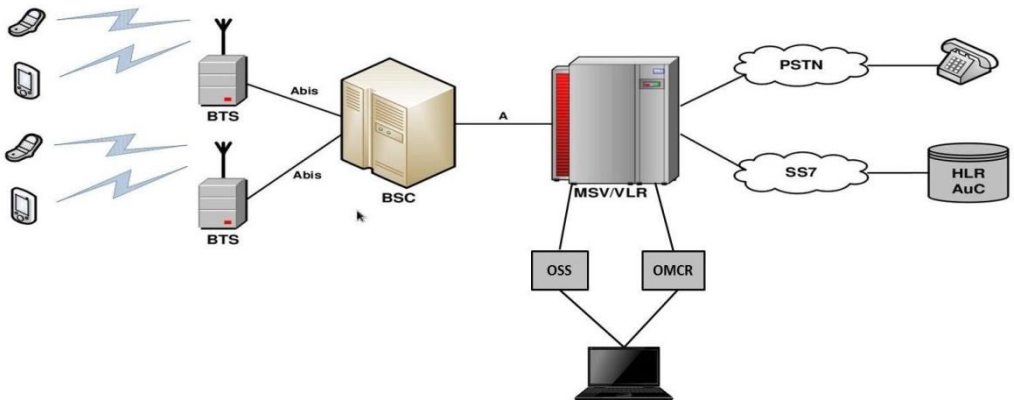
2.2. AUDIT PARAMETER: NETWORK

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

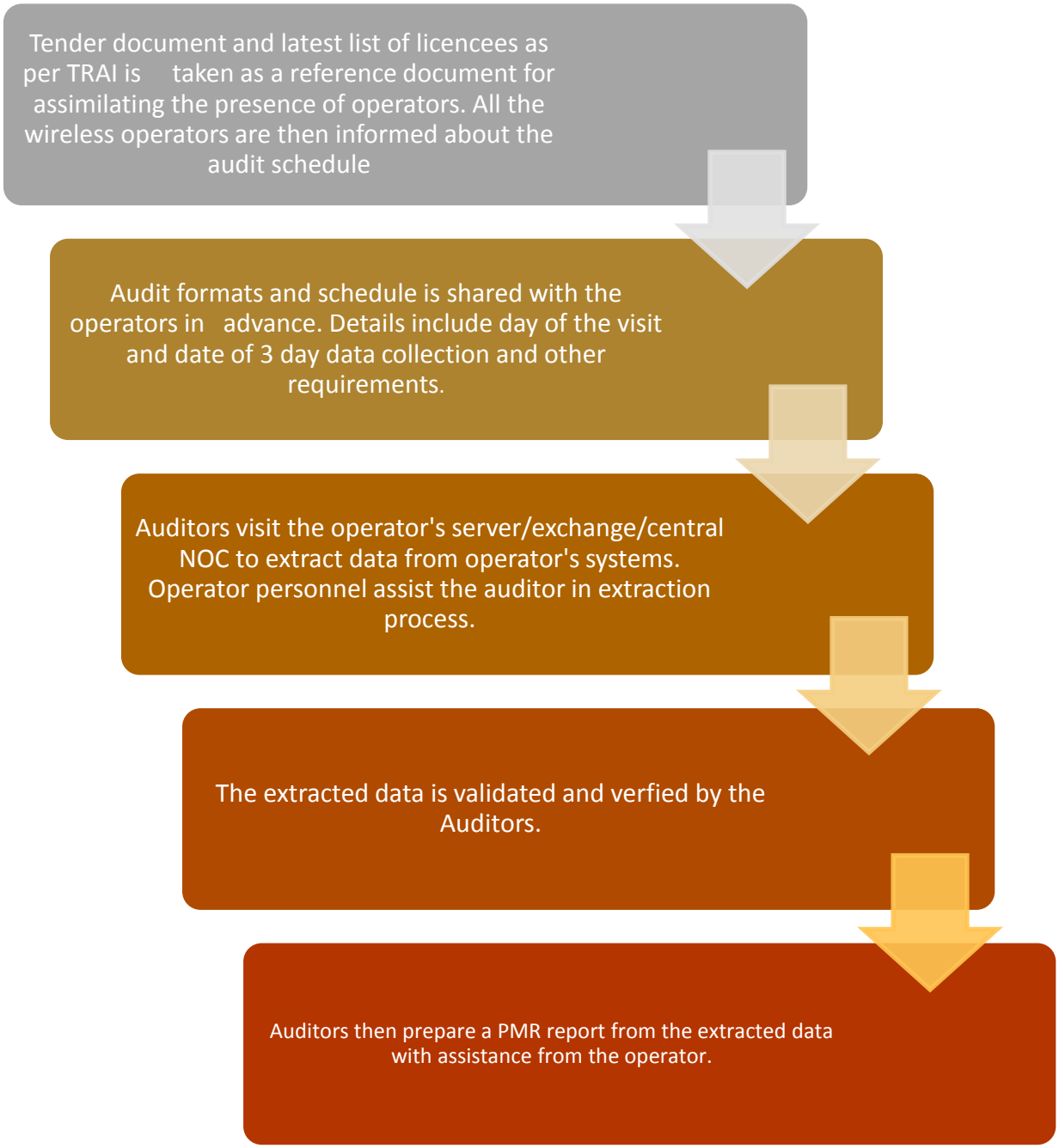
Network Availability	
BTSs Accumulated downtime (not available for service)	≤ 2%
Worst affected BTSs due to downtime	≤ 2%
Connection Establishment (Accessibility)	
Call Set-up Success Rate (within licensee's own network)	≥ 95%
SDCCH/ Paging Channel Congestion	≤ 1 %
TCH Congestion	≤ 2%
Connection Maintenance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

2.3. DATA EXTRACTION POINTS

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



2.4. AUDIT PROCEDURE



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

2.5. NETWORK CALCULATION METHODOLOGY

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

2.6. 3G VOICE

S. No.	Name of Parameter	Definition	Formula	Benchmark
1	Network Availability			
a.	Total no. of Node B's in LSA	Total no. of Node B's Licensed in LSA		
b.	Total downtime of all Node B's	When all the sector(s) of a Node B's are down for > 60 minutes at an instant in a whole day		
c.	No. of Worst Affected Node B's	Node B'ss having more than 24 hours of Downtime in 3 Days	No. of Node B's having accumulated downtime of >24 hours in a month	*<=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. of RAB Failed Calls to the Total no. of RAB Assigned Calls	RAB Attempts (RAB Setup Access) (C)	*<=2%*
			RAB Failed (RAB Setup Access Failed) (D)	
			RAB Congestion (%) [D/C]*100	
3	Connection Maintenance (Retainability)			
a.	Circuit Switched Voice Drop Rate	It is the % of total no. of Dropped Calls to the total no. of Calls Established	Total Established Calls (A)	*<=2%*
			Calls Dropped after Establishment (B)	
			Call Drop Rate [B/A]*100	
b.	Worst affectedcells 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

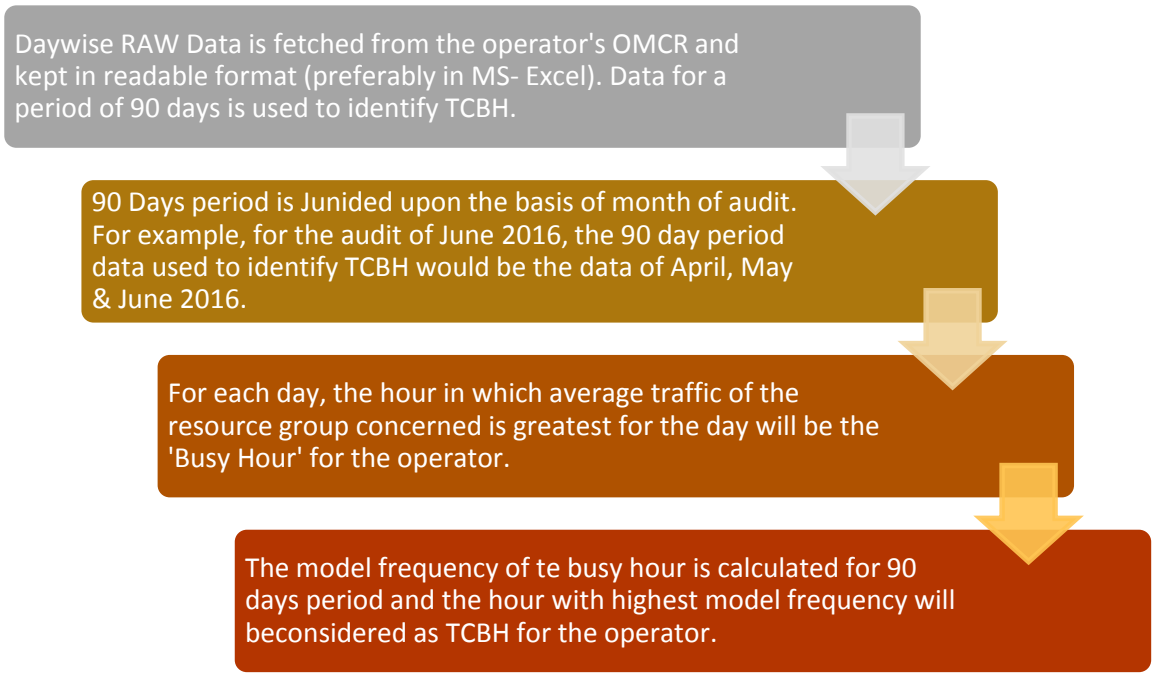
The main purpose of 3 day live measurement is to evaluate the network parameters on intraday basis. While the monthly PMR report provides an overall view of the performance of QoS parameters, the 3 day live data helps looking at intraday performance on the network parameters discussed earlier. All the 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 Q0S network parameters. For example, network congestion being faced by an operator during busy/peak hours.

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

3.1. TCBH: SIGNIFICANCE AND SELECTION METHODOLOGY

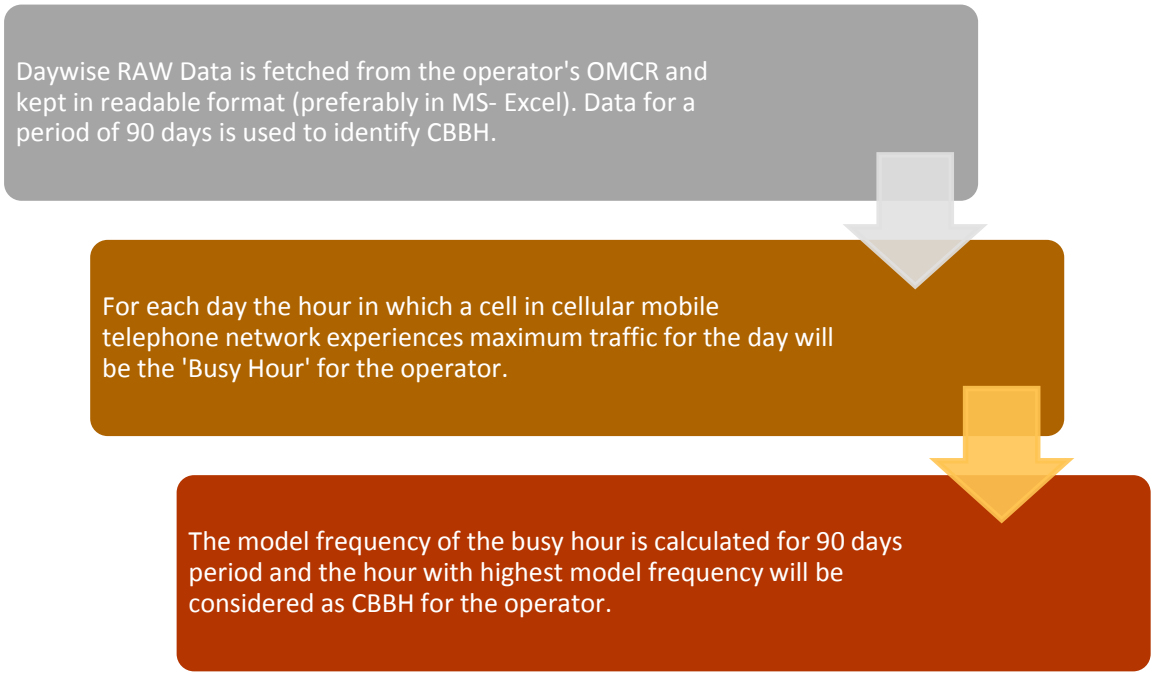
As per QoS regulations 2009 (7 of 2009), Time Consistent Busy Hour" or "TCBH" means the one hour period starting at the same time each day for which the average traffic of the resource group concerned is greatest over the days under consideration and such Time Consistent Busy Hour shall be established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



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.

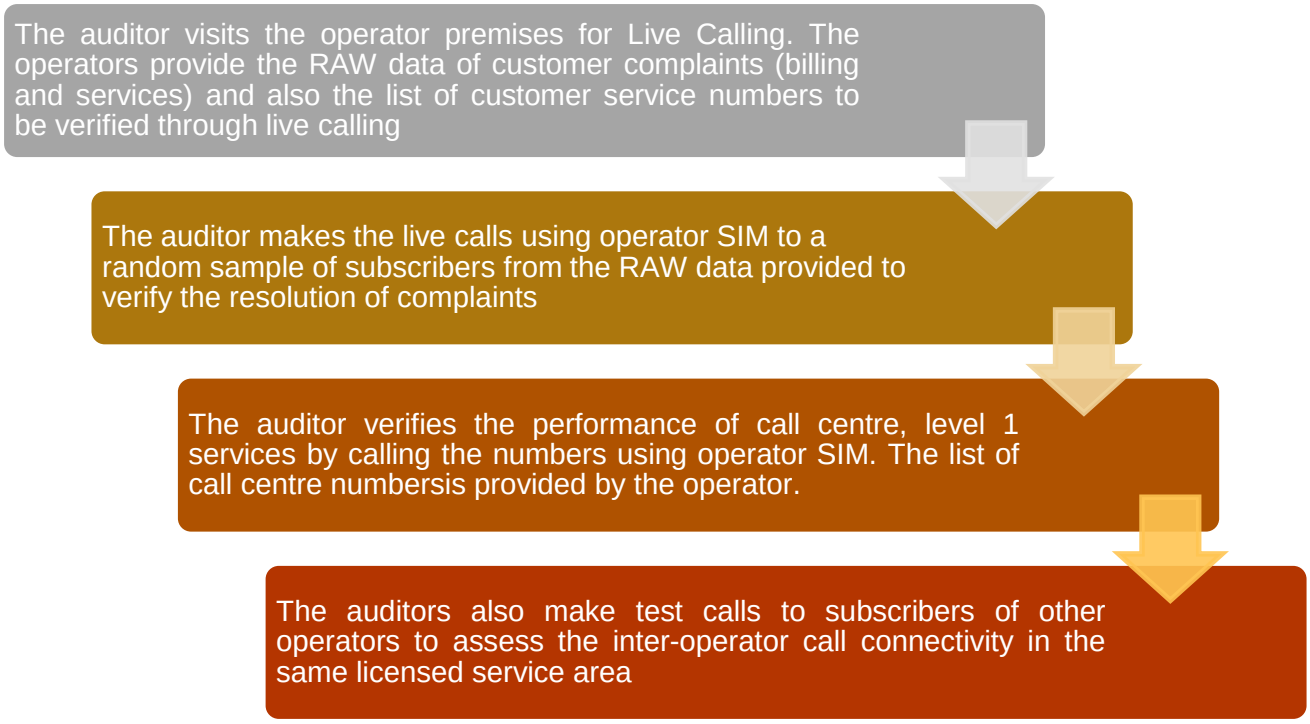
4.1. AUDIT PARAMETERS: CUSTOMER SERVICE

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



Live calling activity was carried out during the period of QE September2016. 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 September2016 was considered for live calling activity conducted in October2016.

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 July, August and September 2016, 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 Helpline 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 SashastraSeemaBal (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	MTNL	Idea	RCOM GSM	TTSL CDMA	Vodafone	MTS
Aircel	-	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%
MTNL	100%	100%	-	100%	100%	100%	100%	100%
Idea	100%	100%	100%	-	100%	100%	100%	100%
RCOM GSM	100%	100%	100%	100%	-	100%	100%	100%
TTSL CDMA	100%	100%	100%	100%	100%	-	100%	100%
VODAFONE	100%	100%	100%	100%	100%	100%	-	100%
MTS	100%	100%	100%	100%	100%	100%	100%	-

5. Drive Test: Significance and Methodology

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

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

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

There are two types of drive test as mentioned below.

- Operator Assisted Drive Test
- Independent Drive Test

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

5.1. Operator Assisted Drive Test

Delhi circle consist of total 1 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 Subscribers (Up to September 30, 2016)
AIRCEL	6616495
AIRTEL	11432142
MTNL	2238203
IDEA	6260193
MTS	808382
RCOM GSM	5539409
TTSL CDMA	2320908
VODAFONE	10423973

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	11996	4102	23	5+1	Nokia	Nokia	NA	NA
2	Airtel	18129	6730	54	23+10	Ericsson	Ericsson	6791	28
3	MTNL	3175	1114	31	4+2	Huawei (MSCs & Media Gateways)	Motorola	NA	NA
4	IDEA	15129	5186	39	6+3	Nokia	Nokia &Ericsson	3603	3
5	RCOM GSM	7283	2504	14	4+1	Huawei	Huawei	NA	NA
6	TTSL CDMA	5103	1464	8	4+4	Ericsson, Huawei& ZTE	Huawei	NA	NA
7	MTS	4055	1038	6	1	ZTE	ZTE	NA	NA
8	VODAFONE	16971	6463	58	6+9	Ericsson	Ericsson	6198	25

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	20:00 - 21:00
3	MTNL	September-16	20:00 - 21:00
4	IDEA	September-16	20:00 - 21:00
5	RCOM GSM	September-16	20:00 - 21:00
6	TTSL CDMA	September-16	20:00 - 21:00
7	MTS	September-16	20:00 - 21:00
8	VODAFONE	September-16	20:00 - 21:00

The TCBH reported by all the service providers matched the network busy hour calculated by Phistream auditors for the Delhicircle.

6.4. AUDIT SCHEDULE

Sr. No.	Service Provider	Dates of live measurement Audit			
GSM Operators		July-16	Aug-16	Sept-16	Audit Location
1	AIRCEL	4 to 6 July 2016	1 to 3 Aug 2016	5 to 7 Sept 2016	Aircel Ltd, Near SaritaVihar Metro Station, New Delhi
2	AIRTEL	1, 4 &5July 2016	9 to 11 Aug 2016	7 to 9 Sept 2016	Plot No 16 UdhyogVihar Ph-4 Gurgaon Haryana.
3	MTNL	18 to 20 July 2016	9 to 11Aug 2016	7 to 9 Sept 2016	MTNL Exchange Karol Bagh Near Rajendra Place Metro Stn.New Delhi.
4	IDEA	1, 4 &5 July 2016	17 to 19 Aug 2016	7 to 9 Sept 2016	Idea Cellular Limited, E-5, Sector-63, Noida (UP)
5	MTS	4 to 6 July 2016	1 to 3 Aug 2016	1 to 3 Sept 2016	A-194 Okhla Phase 1 New Delhi
6	RCOM GSM	4 to 6July 2016	8 to 10 Aug 2016	1 to 3 Sept 2016	Reliance Center Maharaja Ranjit Singh Hotel, Maharaja Ranjit Singh Marg New Delhi.
7	TATA CDMA	1 to 3 July 2016	1 to 3 Aug 2016	1 to 3 Sept 2016	TTSL 2 A Old Iswar Nagar Near NFC New Delhi
8	VODAFONE	4 to 6 July 2016	1 to 3 Aug 2016	1 to 3 Sept 2016	A-19 Mohan Cooperative Industrial Estates, Mathura Road New Delhi.

Note: Audit schedule mentioned above is for the 3 day live audit for the quarter ending September 2016.

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

Jul-16									
Network Parameters		Name of Service Provider							
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.07%	0.01%	0.04%	0.12%	0.04%	0.08%	0.11%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.24%	0.00%	0.00%	0.00%	0.00%	0.72%	0.34%	1.11%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	96.75%	98.99%	99.07%	96.85%	98.92%	98.41%	99.04%	98.89%
	SDDCH/Paging chl. Congestion	≤ 1%	0.33%	0.04%	0.40%	0.54%	NA	0.27%	0.00%	0.07%
	TCH Congestion	≤ 2%	1.38%	0.01%	0.30%	1.68%	0.10%	1.08%	0.24%	1.11%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.07%	0.85%	0.79%	1.77%	0.39%	0.21%	0.35%	1.32%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.93%	1.78%	2.68%	2.53%	2.07%	0.36%	1.62%	2.73%
	%age of connection with good voice quality	≥ 95%	95.39%	98.85%	98.21%	97.28%	99.15%	98.60%	99.11%	97.64%

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

Aug-16									
Network Parameters		Name of Service Provider							
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.12%	0.01%	0.04%	0.13%	0.03%	0.14%	0.05%	0.16%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.15%	0.00%	0.00%	0.45%	0.00%	0.77%	0.07%	0.88%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.46%	98.90%	98.99%	96.77%	99.08%	97.89%	97.89%	97.89%
	SDDCH/Paging chl. Congestion	≤ 1%	0.26%	0.03%	0.40%	0.54%	NA	0.11%	0.00%	0.13%
	TCH Congestion	≤ 2%	1.42%	0.01%	0.31%	1.71%	0.04%	0.77%	0.15%	1.21%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.91%	0.86%	0.80%	1.74%	0.38%	0.16%	0.32%	1.43%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.06%	1.71%	2.71%	2.54%	1.93%	0.76%	1.29%	2.65%
	%age of connection with good voice quality	≥ 95%	96.49%	99.06%	98.40%	97.16%	99.15%	99.04%	96.34%	97.41%

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

Sep-16									
Network Parameters		Name of Service Provider							
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.08%	0.01%	0.03%	0.11%	0.03%	0.03%	0.05%	0.17%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.24%	0.00%	0.00%	0.18%	0.00%	0.04%	0.27%	0.89%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.78%	99.29%	99.14%	96.86%	99.16%	99.51%	99.33%	98.90%
	SDDCH/Paging chl. Congestion	≤ 1%	0.15%	0.02%	0.29%	0.60%	NA	0.07%	0.00%	0.22%
	TCH Congestion	≤ 2%	1.32%	0.00%	0.22%	1.75%	0.02%	0.61%	0.06%	1.10%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.80%	0.74%	0.71%	1.79%	0.32%	0.28%	0.25%	1.27%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	4.39%	1.54%	2.22%	2.51%	1.86%	0.00%	1.30%	2.53%
	%age of connection with good voice quality	≥ 95%	96.61%	99.20%	98.54%	97.14%	99.17%	98.04%	99.11%	97.42%

6.8. 2G VOICE QOS PERFORMANCE OF PMR – QE SEPTEMBER2016

Consolidated										
Network Parameters		Name of Service Provider								
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.09%	0.01%	0.03%	0.12%	0.03%	0.08%	0.07%	0.17%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.21%	0.00%	0.00%	0.21%	0.00%	0.51%	0.23%	0.96%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.33%	99.06%	99.06%	96.83%	99.05%	98.60%	98.75%	98.56%
	SDDCH/Paging chl. Congestion	≤ 1%	0.25%	0.03%	0.36%	0.56%	0.00%	0.15%	0.00%	0.14%
	TCH Congestion	≤ 2%	1.37%	0.01%	0.28%	1.71%	0.05%	0.82%	0.15%	1.14%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.93%	0.82%	0.77%	1.77%	0.36%	0.21%	0.31%	1.34%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.13%	1.68%	2.54%	2.53%	1.95%	0.37%	1.41%	2.64%
	%age of connection with good voice quality	≥ 95%	96.16%	99.04%	98.38%	97.19%	99.16%	98.56%	98.18%	97.49%

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	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.14%	0.01%	0.05%	0.11%	0.03%	0.09%	0.07%	0.06%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	96.29%	99.08%	99.06%	97.03%	98.54%	97.95%	99.36%	99.05%
	SDDCH/Paging chl. Congestion	≤ 1%	0.46%	0.09%	0.54%	0.58%	NA	0.31%	0.00%	0.12%
	TCH Congestion	≤ 2%	1.29%	0.01%	0.32%	1.72%	0.40%	0.90%	0.02%	0.95%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	1.10%	0.84%	0.60%	1.76%	0.41%	0.20%	0.23%	1.24%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.64%	1.82%	2.54%	2.69%	2.12%	0.46%	2.41%	2.57%
	%age of connection with good voice quality	≥ 95%	95.18%	98.83%	98.25%	97.45%	99.13%	98.63%	99.19%	97.71%

6.11. 2G VOICE 3 DAYS LIVE DATA: AUGUST

Aug-16									
Network Parameters		Name of Service Provider							
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	1.29%	0.01%	0.03%	0.12%	0.03%	0.03%	0.07%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.05%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.46%	98.69%	99.00%	96.76%	98.87%	98.03%	99.15%	98.70%
	SDDCH/Paging chl. Congestion	≤ 1%	0.26%	0.02%	0.66%	0.58%	NA	0.16%	0.00%	6.86%
	TCH Congestion	≤ 2%	1.42%	0.02%	0.29%	1.66%	0.06%	1.08%	0.14%	1.30%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.91%	0.92%	0.76%	1.80%	0.43%	0.22%	0.40%	1.57%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.06%	2.00%	2.58%	2.60%	2.12%	0.30%	1.71%	2.71%
	%age of connection with good voice quality	≥ 95%	96.49%	98.89%	98.40%	97.21%	99.14%	98.57%	98.93%	97.39%

6.12. 2G VOICE 3 DAYS LIVE DATA: SEPTEMBER

Sep-16									
Network Parameters		Name of Service Provider							
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.10%	0.01%	0.02%	0.10%	0.02%	0.05%	0.06%	0.08%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.73%	99.22%	99.21%	96.99%	98.99%	99.20%	98.99%	98.69%
	SDDCH/Paging chl. Congestion	≤ 1%	0.13%	0.03%	0.26%	0.51%	NA	0.14%	0.00%	0.24%
	TCH Congestion	≤ 2%	1.10%	0.00%	0.17%	1.66%	0.02%	0.63%	0.29%	1.31%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.96%	0.77%	0.72%	1.71%	0.38%	0.32%	0.42%	1.48%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.04%	1.66%	2.16%	2.57%	2.02%	0.62%	1.14%	2.49%
	%age of connection with good voice quality	≥ 95%	96.61%	99.18%	98.56%	97.07%	99.15%	97.91%	99.05%	97.33%

6.13. 2G 3 Days Live Data: Consolidated

Consolidated									
Network Parameters		Name of Service Provider							
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.51%	0.01%	0.04%	0.11%	0.02%	0.06%	0.06%	0.11%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.16%	99.00%	99.09%	96.93%	98.80%	98.40%	99.16%	98.81%
	SDDCH/Paging chl. Congestion	≤ 1%	0.29%	0.05%	0.49%	0.00%	#DIV/0!	0.20%	0.00%	2.41%
	TCH Congestion	≤ 2%	1.27%	0.01%	0.26%	1.68%	0.16%	0.87%	0.15%	1.19%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.99%	0.85%	0.69%	1.76%	0.41%	0.25%	0.35%	1.43%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.25%	1.82%	2.43%	2.62%	2.09%	0.46%	1.75%	2.59%
	%age of connection with good voice quality	≥ 95%	96.09%	98.96%	98.40%	97.24%	99.14%	98.37%	99.06%	97.48%

6.14. 3G Voice PMR: July

Jul-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.08%	0.13%	0.10%	0.20%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.94%	0.61%	1.00%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.43%	99.85%	96.32%	99.99%	99.53%
	RRC Congestion:	≤ 1%	0.22%	0.07%	0.67%	0.01%	0.20%
	RAB Congestion:	≤ 2%	0.14%	0.01%	1.67%	0.00%	0.19%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.51%	0.27%	DNA	0.18%	0.62%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.65%	1.74%	1.99%	0.54%	2.71%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.74%	98.50%	DNA	99.74%	98.90%

6.15. 3G Voice PMR: August

Aug-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.10%	0.13%	0.06%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.80%	0.18%	0.98%
Connection Establishment (Accessibi	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.91%	99.85%	96.71%	99.93%	99.37%
	RRC Congestion:	≤ 1%	0.12%	0.05%	0.66%	0.01%	0.26%
	RAB Congestion:	≤ 2%	0.22%	0.01%	1.65%	0.01%	0.33%
Connection Maintenance (Retainabil ity)	Circuit Switched Voice Drop Rate	≤ 2%	0.53%	0.39%	1.68%	0.19%	0.66%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.81%	2.23%	2.08%	0.90%	2.65%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.81%	DNA	DNA	99.73%	98.88%

6.16. 3G VOICE PMR: SEPTEMBER

Sep-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.08%	0.13%	0.46%	0.18%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.67%	1.67%	0.78%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.17%	99.80%	97.15%	99.96%	99.45%
	RRC Congestion:	≤ 1%	0.03%	0.06%	0.59%	0.00%	0.19%
	RAB Congestion:	≤ 2%	0.03%	0.03%	1.55%	0.00%	0.24%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.48%	0.46%	1.65%	0.26%	0.66%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.47%	2.43%	2.23%	1.47%	2.64%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.72%	98.35%	DNA	99.73%	98.92%

6.17. 3G VOICE PMR: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.09%	0.13%	0.20%	0.19%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.80%	0.82%	0.92%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.17%	99.83%	96.73%	99.96%	99.45%
	RRC Congestion:	≤ 1%	0.12%	0.06%	0.64%	0.01%	0.22%
	RAB Congestion:	≤ 2%	0.13%	0.02%	1.62%	0.00%	0.25%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.51%	0.37%	1.67%	0.21%	0.65%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.64%	2.14%	2.10%	0.97%	2.67%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.76%	98.43%	DNA	99.73%	98.90%

6.18. 3G VOICE 3 DAYS LIVE DATA: JULY

Jul-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.12%	0.10%	0.10%	1.96%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.83%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.50%	99.86%	97.57%	99.99%	99.64%
	RRC Congestion:	≤ 1%	0.12%	0.01%	0.60%	0.01%	0.20%
	RAB Congestion:	≤ 2%	0.27%	0.01%	1.56%	0.01%	0.12%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.49%	0.34%	1.60%	0.11%	0.62%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.33%	2.18%	1.67%	0.58%	2.72%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.75%	98.49%	DNA	99.73%	99.99%

6.19. 3G VOICE 3 DAYS LIVE DATA: AUGUST

Aug-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.07%	0.12%	0.05%	0.21%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.00%	0.00%	0.05%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.95%	99.84%	97.53%	100.00%	99.42%
	RRC Congestion:	≤ 1%	0.15%	0.00%	0.66%	0.01%	0.26%
	RAB Congestion:	≤ 2%	0.17%	0.00%	1.67%	0.00%	0.30%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.59%	0.35%	1.56%	0.11%	0.74%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	3.17%	1.98%	1.88%	0.48%	2.68%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.69%	98.48%	DNA	99.74%	98.89%

6.20. 3G VOICE 3 DAYS LIVE DATA: SEPTEMBER

Sep-16							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.03%	0.09%	0.11%	1.33%	0.09%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.00%	1.05%	0.03%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	98.94%	99.78%	97.22%	99.84%	99.14%
	RRC Congestion:	≤ 1%	0.02%	0.14%	0.67%	0.00%	0.31%
	RAB Congestion:	≤ 2%	0.03%	0.06%	1.63%	0.01%	0.38%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.53%	0.42%	1.58%	0.36%	0.81%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.78%	2.09%	1.91%	2.15%	2.71%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.71%	98.34%	DNA	99.72%	98.88%

6.21. 3G VOICE 3 DAYS LIVE DATA: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.03%	0.09%	0.11%	0.49%	0.75%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.00%	0.35%	0.30%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.13%	99.83%	97.44%	99.94%	99.40%
	RRC Congestion:	≤ 1%	0.10%	0.05%	0.64%	0.01%	0.26%
	RAB Congestion:	≤ 2%	0.15%	0.02%	1.62%	0.01%	0.26%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.53%	0.37%	1.58%	0.19%	0.72%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.76%	2.08%	1.82%	1.07%	2.70%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.72%	98.44%	DNA	99.73%	99.25%

6.22. 2G WIRELESS DATA: JULY

Jul-16										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		490354	DNA	DNA	DNA	12595	DNA	DNA	37396
ii)	Total Service Activations provided within 4 Hours (B)		481321	DNA	DNA	DNA	12595	DNA	DNA	96
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	98.16%	DNA	DNA	DNA	100.00%	DNA	DNA	0.26%
2	PDP Context Activation Success Rate									
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		188131982	1125458528	294993181	DNA	5765117	DNA	7734119	10327557
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		179222844	1123945269	294268494	DNA	5734029	DNA	7501942	10317581
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	95.26%	99.87%	99.75%	DNA	99.46%	98.77%	97.00%	99.90%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		9932183246	6723196325	1.1803E+10	DNA	105423388	DNA	60754159	3582664811
ii)	RNC originated PS Domain Iu Connection Release (B)		171528235	77898589	42713917	DNA	1368790	DNA	875190	30262552
iii)	Drop Rate = (B/A) * 100	<=5%	1.73%	1.16%	0.36%	DNA	1.30%	DNA	1.44%	0.84%

6.23. 2G WIRELESS DATA: AUGUST

Aug-16										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		1265621	DNA	DNA	DNA	821	DNA	DNA	1361
ii)	Total Service Activations provided within 4 Hours (B)		1250074	DNA	DNA	DNA	821	DNA	DNA	1358
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	98.77%	DNA	DNA	DNA	100%	DNA	DNA	100%
2	PDP Context Activation Success Rate									
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		180062182	DNA	235668995	DNA	6811433	DNA	7173013	336503
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		172292097	DNA	234917225	DNA	6666204	DNA	6938908	336272
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	95.68%	99.90%	99.68%	DNA	97.87%	DNA	96.74%	99.93%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		9968488036	DNA	13076602563	DNA	107277497	DNA	53530288	3639761894
ii)	RNC originated PS Domain Iu Connection Release (B)		154925607	DNA	41877064	DNA	1759845	DNA	734677	27355269
iii)	Drop Rate = (B/A) * 100	<=5%	1.55%	1.04%	0.32%	DNA	1.64%	DNA	1.37%	0.75%

6.24. 2G WIRELESS DATA: SEPTEMBER

Sep-16										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	134	DNA	DNA	35598
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	134	DNA	DNA	35470
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	100.00%	DNA	DNA	99.64%
2	PDP Context Activation Success Rate									
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		170022999	984241870	202036231	DNA	4435513	DNA	4791634	9324456
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		163192098	983323288	200890915	DNA	4414792	DNA	4636405	9317328
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	95.98%	99.91%	99.43%	DNA	99.53%	98.87%	96.76%	99.92%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		9585880770	6047445166	13469580518	DNA	93831619	DNA	2973612	3418642839
ii)	RNC originated PS Domain Iu Connection Release (B)		150856840	58060808	35668143	DNA	1393089	DNA	32492	18678174
iii)	Drop Rate = (B/A) * 100	<=5%	1.57%	0.96%	0.26%	DNA	1.48%	DNA	1.09%	0.55%

6.25. 2G WIRELESS DATA: CONSOLIDATED

Consolidated										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		877988	DNA	DNA	DNA	4517	DNA	DNA	24785
ii)	Total Service Activations provided within 4 Hours (B)		865698	DNA	DNA	DNA	4517	DNA	DNA	12308
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	98.46%	DNA	DNA	DNA	100.00%	DNA	DNA	66.54%
2	PDP Context Activation Success Rate									
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		179405721	1054850199	244232802	DNA	5670688	DNA	6566255	6662839
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		171569013	1053634279	243358878	DNA	5605008	DNA	6359085	6657060
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	95.64%	99.89%	99.62%	DNA	98.95%	98.82%	96.83%	99.92%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		9828850684	6385320746	12782998560	DNA	102177501	DNA	39086020	2362889095
ii)	RNC originated PS Domain Iu Connection Release (B)		159103561	67979699	40086375	DNA	1507241	DNA	547453	1209566085
iii)	Drop Rate = (B/A) * 100	<=5%	1.62%	1.05%	0.32%	DNA	1.47%	DNA	1.30%	0.71%

6.26. 2G Wireless 3 Days Live Data: July

Jul-16										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	2331	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	2331	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	100.00%	DNA	DNA	DNA
2	PDP Context Activation Success Rate									
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		18511913	111107248	28935735	DNA	584999.00	DNA	258680	3782181
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		17852898	110924229	28867405	DNA	580450.00	DNA	250844.667	3727578
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	96.44%	99.84%	99.76%	DNA	99.22%	99.09%	96.97%	98.56%
3	Drop Rate									
i)	TBF originated PS Domain Iu Connection Setup Success (A)		9.82E+08	729163726	1100905382	DNA	11058411	DNA	1890872	267527200
ii)	TBF originated PS Domain Iu Connection Release (B)		16623442	8261385	4043642	DNA	140479	DNA	26128	332786405
iii)	Drop Rate = (B/A) * 100	<=5%	1.69%	1.13%	0.37%	DNA	1.27%	DNA	1.38%	1.24%

6.27. 2G Wireless 3 Days Live Data: August

Aug-16										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		1265621	DNA	DNA	DNA	364	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1250074	DNA	DNA	DNA	364	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	98.77%	DNA	DNA	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)		180062182	112153889	21640421	DNA	533007	DNA	741014	1054880
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		172292097	111956995	21574464	DNA	531047	DNA	716699	1053751
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	95.68%	99.82%	99.70%	DNA	99.63%	99.58%	96.72%	99.89%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		9968488036	664031350	1.16E+09	DNA	11457132	DNA	5976069	363803759
ii)	RNC originated PS Domain Iu Connection Release (B)		154925607	8043589	3547824	DNA	224840	DNA	84590	302761100
iii)	Drop Rate = (B/A) * 100	<=5%	1.55%	1.21%	0.31%	DNA	1.96%	DNA	1.42%	83.22%

6.28. 2G WIRELESS 3 DAYS LIVE DATA: SEPTEMBER

Sep-16										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	5	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	5	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	100.00%	DNA	DNA	DNA
2	PDP Context Activation Success Rate									
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		17491670	2793094	23096656	DNA	460498	DNA	675972	996801
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		16568044	2793047	22962758	DNA	458673	DNA	653804	996166
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	94.72%	100.00%	99.42%	DNA	99.60%	99.12%	96.72%	99.94%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		9.52E+08	120619944	1359459355	DNA	10100115	DNA	5346435	325599911
ii)	RNC originated PS Domain Iu Connection Release (B)		15480712	772448	4033055	DNA	160199	DNA	74941	279119300
iii)	Drop Rate = (B/A) * 100	<=5%	1.63%	0.64%	0.30%	DNA	1.59%	DNA	1.40%	85.72%

6.29. 2G WIRELESS 3 DAYS LIVE DATA: CONSOLIDATED

Cconsolidated										
Cellular Mobile Telephone Services										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Service Quality Parameter										
1	Service Activation/ Provisioning									
i)	Total No. of Subscribers for Service Activation (A)		1265621	DNA	DNA	DNA	900	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		1250074	DNA	DNA	DNA	900	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	98.77%	DNA	DNA	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)		72021922	75351410	24557604	DNA	526168	DNA	558555	1944621
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		68904346	75224757	24468209	DNA	523390	DNA	540449	1925832
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	95.61%	99.89%	99.63%	DNA	99.49%	99.26%	96.80%	99.46%
3	Drop Rate									
i)	RNC originated PS Domain Iu Connection Setup Success (A)		3967640125	504605007	1207033594	DNA	10871886	DNA	4404458.78	318976957
ii)	RNC originated PS Domain Iu Connection Release (B)		62343253.7	5692474	3874840.33	DNA	175172.667	DNA	61886.3333	304888935
iii)	Drop Rate = (B/A) * 100	<=5%	1.62%	0.99%	0.32%	DNA	1.61%	DNA	1.40%	56.73%

6.30. 3G WIRELESS DATA: JULY

Jul-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	34208
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	265
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	0.77%
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		25874461	182847515	DNA	DNA	3371016
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		25874361	179452023	DNA	DNA	3309236
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.14%	DNA	95.27%	98.17%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1.154E+09	463949669	DNA	DNA	120455008
ii)	RNC originated PS Domain Iu Connection Release (B)		6839949	3377950	DNA	DNA	1924623
iii)	Drop Rate = (B/A) * 100	<=5%	0.59%	0.73%	DNA	DNA	1.60%

6.31. 3G WIRELESS DATA: AUGUST

Aug-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	7359.870968
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	7339.064516
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	99.72%
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		28420765	167365278	DNA	DNA	632303.9032
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		28420666	165519217	DNA	DNA	622210.2258
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.90%	DNA	95.39%	98.40%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1090124386	530077906	DNA	DNA	21613741.23
ii)	RNC originated PS Domain Iu Connection Release (B)		7158587	4509575	DNA	DNA	357019.1613
iii)	Drop Rate = (B/A) * 100	<=5%	0.66%	0.85%	DNA	DNA	1.65%

6.32. 3G WIRELESS DATA: SEPTEMBER

Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	284277
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	283644
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	99.78%
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		24796938	137777502	DNA	DNA	17672622
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		24796862	136116979	DNA	DNA	17410523
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.79%	DNA	95.39%	98.52%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1153672191	596112936	DNA	DNA	650509115
ii)	RNC originated PS Domain Iu Connection Release (B)		6997260	5677960	DNA	DNA	7877873
iii)	Drop Rate = (B/A) * 100	<=5%	0.61%	0.95%	DNA	DNA	1.21%

6.33. 3G WIRELESS DATA: CONSOLIDATED

Consolidated							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	108615
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	97083
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	66.76%
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		26364055	162663432	DNA	DNA	7225314
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		26363963	160362740	DNA	DNA	7113990
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.61%	DNA	95.35%	98.36%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1132553355	530046837	DNA	DNA	264192621
ii)	RNC originated PS Domain Iu Connection Release (B)		6998599	4521828	DNA	DNA	3386505
iii)	Drop Rate = (B/A) * 100	<=5%	0.62%	0.84%	DNA	DNA	1.49%

6.34. 3G Wireless 3 Days Live Data: July

Jul-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		2408150	17608764	DNA	DNA	4392311.00
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		2408150	17385621	DNA	DNA	4321346.00
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.73%	DNA	97.57%	98.38%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		1.07E+08	44926720	DNA	DNA	72037948
ii)	RNC originated PS Domain Iu Connection Release (B)		562307	300662	DNA	DNA	1138980
iii)	Drop Rate = (B/A) * 100	<=5%	0.52%	0.67%	DNA	DNA	1.58%

6.35. 3G Wireless 3 Days Live Data: August

Aug-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		2869235	14620121	DNA	DNA	1994408
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		2869233	14467351	DNA	DNA	1970538
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.96%	DNA	95.59%	98.80%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		8916664	47903574	DNA	DNA	67188255
ii)	RNC originated PS Domain Iu Connection Release (B)		65209	376844	DNA	DNA	1146165
iii)	Drop Rate = (B/A) * 100	<=5%	0.73%	0.79%	DNA	DNA	1.71%

6.36. 3G WIRELESS 3 DAYS LIVE DATA: SEPTEMBER

Sep-16							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		108161734	13666124	DNA	DNA	1809961
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		108156209	13491910	DNA	DNA	1783170
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	99.99%	98.73%	DNA	DNA	98.52%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		631267841	58483341	DNA	DNA	67188255
ii)	RNC originated PS Domain Iu Connection Release (B)		6021282	555333	DNA	DNA	995948
iii)	Drop Rate = (B/A) * 100	<=5%	0.95%	0.95%	DNA	DNA	1.48%

6.37. 3G WIRELESS 3 DAYS LIVE DATA: CONSOLIDATED

CONSOLIDATED							
Cellular Mobile Telephone Services							
S. No.	Name of Parameter	Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Service Quality Parameter							
1	Service Activation/ Provisioning						
i)	Total No. of Subscribers for Service Activation (A)		DNA	DNA	DNA	DNA	DNA
ii)	Total Service Activations provided within 4 Hours (B)		DNA	DNA	DNA	DNA	DNA
iii)	Service Activation / Provisioning = (B/A) * 100	*Within 4 Hours with 95% Success Rate*	DNA	DNA	DNA	DNA	DNA
2	PDP Context Activation Success Rate						
i)	Total No. of PDP Context Activation Requests (from SGSN to GGSN) (A)		37813040	15298336	DNA	DNA	2732227
ii)	Total No. of PDP Context Activation Success (path created b/w SGSN and GGSN) (B)		37811197	15114961	DNA	DNA	2691685
iii)	PDP Context Activation Success Rate =(B/A) *100	>=95%	100.00%	98.80%	DNA	96.58%	98.57%
3	Drop Rate						
i)	RNC originated PS Domain Iu Connection Setup Success (A)		249155362	50437878	DNA	DNA	68804819
ii)	RNC originated PS Domain Iu Connection Release (B)		2216266	410946	DNA	DNA	1093698
iii)	Drop Rate = (B/A) * 100	<=5%	0.74%	0.80%	DNA	DNA	1.59%

6.38. POI CONGESTION: JULY

Jul-16										
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
1	**Total No. of POI's in Month**									
	Total No. of call attempts on POI		4296839	11015714	40957	DNA	216974	658663	647222	11389710
	Total traffic served on all POIs (Erlang)		88358	247329	1655	DNA	5185	10817	24384	243228
	Total No. of circuits on all individual POIs		157482	395073	221218	DNA	25952	16501	104286	424084
	Total number of working POI Service Area wise		183	16	90	DNA	51	24	35	392
	Capacity of all POIs		153413	383757	218368	DNA	25955	14429	99357	428270
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		0	0	0	0	0	0	0	0

6.39. POI CONGESTION: AUGUST

Aug-16										
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
1	**Total No. of POI's in Month**									
	Total No. of call attempts on POI		4385771	585100744	40060	12143	6173283	658663	881621	11347295
	Total traffic served on all POIs (Erlang)		208585	36613441	2962	245	157518	10817	28191	245485
	Total No. of circuits on all individual POIs		158612	12205576	220623	56885	803837	16501	101545	422713
	Total number of working POI Service Area wise		184	16	89	91	51	24	35	386
	Capacity of all POIs		154512	383684	217812	56885	803915	14429	96890	426884
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		0	0	nil	0	0	NA	0	0

6.40. POI CONGESTION: SEPTEMBER

Sep-16										
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
1	**Total No. of POI's in Month**									
	Total No. of call attempts on POI		4370640.7	11297588	39910	11832.83739	189197	663335	907751	246244249
	Total traffic served on all POIs (Erlang)		215951.9662	259487	1665	252.0980073	4818	10913	28917	5419902
	Total No. of circuits on all individual POIs		161021.4667	395507	220328	56885	25695	17459	102455	9728909
	Total number of working POI Service Area wise		184.7333333	16	87	91	51	23.9	38	8690
	Capacity of all POIs		156771	383553	217580	56885	25697	15420	97774	9825026
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	2
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		0	0	0	0	0	0	0	0

6.41. POI CONGESTION: CONSOLIDATED

Consolidated										
Monthly TRAI Network Performance Report of Cellular Mobile Telephone Service - Network Service										
S. No.	Name of Parameter	Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
1	**Total No. of POI's in Month having < = 0.5% POI congestion**									
	Total No. of call attempts on POI		4351083	202471349	40309	11988	2193151	660220	812198	89660418
	Total traffic served on all POIs (Erlang)		170965	12373419	2094	249	55840	10849	27164	1969538
	Total No. of circuits on all individual POIs		159039	4332052	220723	56885	285162	16820	102762	3525235
	Total number of working POI Service Area wise		184	16	89	91	51	24	36	3156
	Capacity of all POIs		154898	383665	217920	56885	285189	14760	98007	3560060
	No. of all POI's having >=0.5% POI congestion		0	0	0	0	0	0	0	1
	Name of POI not meeting the benchmark (having >=0.5% POI congestion)		0	0	0	0	0	0	0	0

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	CUSTOMER SERVICE DELIVERY AUDITS							
			AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
1	**Metering and Billing Credibility (Post Paid) – Benchmark** (Not more than 0.1% of bills issued should be disputed over a billing	No. of bills issued during the period (A)	216874	5759851	2548722	DNA	230167	963214	312048	6770070
		No. of bills disputed including billing complaints over a billing	1	1518	2129	DNA	43	862	14	5341
		Billing Compliant (%) = B/A*100	0.0%	0.03%	0.08%	DNA	0.02%	0.09%	0.00%	0.08%
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	Total No. of Pre-paid customers at the end of the month (A)	6349044	8674936	5272782	DNA	827727	4776336	2210500	8060978
		Total No. of complaints relating to charging, Credit and Validity during a month (B)	68	170	3314	DNA	141	4606	1	1840
		Pre-paid Charging Complaints (%) = B/A*100	0.00%	0.00%	0.06%	DNA	0.02%	0.10%	0.00%	0.02%
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	69	1688	50647	DNA	184	5468	15	7181
		No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the month	69	1688	50647	DNA	184	5468	15	7181
		No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the month	69	1688	50647	DNA	184	5468	15	7181
		% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100.00%	100.00%	100.00%	DNA	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	100.00%	100.00%	100.00%	DNA	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	7	7	DNA	7	7	7	7
4	**Termination / Closures** (Customer care promptness in attending to customers request)	No. of Requests for Termination/ Closure of service (A)	2557	37124	26263	DNA	10273	3272	3819	13954
		No. of requested handled within 7 days (B)	2557	37121	26263	DNA	10273	3272	3819	13954
		% of Termination/ Closure of service within 7 days (B*100/A	100.00%	99.99%	100.00%	DNA	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)	5014	2045	9533	DNA	2019	9367	402	49512
		Cleared over a period of <60 days (B)	5014	2045	9533	DNA	2019	7746	402	49512
		Refunds Successfull Completion (B/A)*100	100.00%	100.00%	100.00%	DNA	100.00%	82.69%	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)	25163274	1460536	24891351	DNA	1757318	11314047	261187	21711197
		Total no. of calls successfully established to customer care/Call center (B)	22921242	1460075	24539988	DNA	1737415	11263733	256963	21711188
		% Accessibility of Call centre /customer Care (B *100/ A)	91.09%	99.97%	98.59%	DNA	98.87%	99.56%	98.38%	100.00%
		Total Calls reached to operator for Voice to Voice (C)	4454316	6427282	5685694	DNA	2852836	3027249	364460	8139120
		Total number of calls answered by the operator (Voice to voice) within 90 seconds (D)	4269860	5700622	5661788	DNA	2720699	2617738	355957	7824702
		% age of calls answered by the operators (voice to voice) within 90 seconds (D *100/ C)	95.86%	88.69%	99.58%	DNA	95.37%	86.47%	97.67%	96.14%
7	**Customer Care & Grievances Redressal**	Total no of complaints received in the call centre (Tech+ Non	49209	228721	83260	DNA	16408	19148	11299	56672
		Total no of complaints addressed at call center level	49209	194417	16154	DNA	3494	19148	11125	52772
		% of complaints addressed at call center level	100.00%	85.00%	19.40%	DNA	21.29%	100.00%	98.46%	93.12%
		Total no of appeals received by the appellate authority	0	119	24	DNA	3	551	176	18
		Total no of complaints addressed by Appellate authority	0	92	24	DNA	3	551	167	2
		% of complaints addressed by Appellate authority	NA	77.31%	100.00%	DNA	100.00%	100.00%	94.89%	11.11%
8	**Subscribers Base**	**POSTPAID**	175909	2728235	890581	DNA	59416	392469	192729	22,54,003
		PREPAID	6440586	8703907	5369612	DNA	748966	5146940	2128179	81,69,970

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	665086	654907	98.47%	123677	122457	99.01%
AIRTEL	63019	63019	100.00%	187518	179573	95.76%
MTNL	DNA	DNA	DNA	DNA	DNA	DNA
IDEA	443726	434872	98.00%	159454	159220	99.85%
MTS	37795	36986	97.86%	7467	7331	98.18%
RCOM-GSM	0	0	DNA	0	0	DNA
TTSL-CDMA	10561	10541	99.81%	10480	10389	99.13%
VODAFONE	737317	737317	100.00%	271930	256242	94.23%

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) within 90 seconds
Benchmark	≤ 0.1%	≤ 0.1%	≥ 98%	= 100%	= 100%	= 100%	= 100%	≥ 95%	≥ 95%
AIRCEL	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	91.09%	95.86%
AIRTEL	0.03%	0.00%	100.00%	100.00%	700.00%	99.99%	100.00%	99.97%	88.69%
IDEA	0.08%	0.06%	100.00%	100.00%	700.00%	100.00%	100.00%	98.59%	99.58%
MTNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
MTS	0.02%	0.02%	100.00%	100.00%	700.00%	100.00%	100.00%	98.87%	95.37%
RCOM GSM	0.09%	0.10%	100.00%	100.00%	700.00%	100.00%	82.69%	99.56%	86.47%
TTSL-CDMA	0.00%	0.00%	100.00%	100.00%	700.00%	100.00%	100.00%	98.38%	97.67%
VODAFONE	0.08%	0.02%	100.00%	100.00%	700.00%	100.00%	100.00%	100.00%	96.14%

Name of Service Provider	Customer Care & Grievances Redressal	
	% of Complaints addressed at call center level	% of Complaints addressed by Appellate Authority
AIRCEL	100.00%	NA
AIRTEL	85.00%	77.31%
IDEA	19.40%	100.00%
MTNL	DNA	DNA
MTS	21.29%	100.00%
RCOM GSM	100.00%	100.00%
TTSL-CDMA	98.46%	94.89%
VODAFONE	93.12%	11.11%

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 Delhi 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	MTNL	Idea	RCOM GSM	TTSL CDMA	Vodafone	MTS
Aircel	-	100%	100%	100%	100%	100%	100%	100%
Airtel	100%	-	100%	100%	100%	100%	100%	100%
MTNL	100%	100%	-	100%	100%	100%	100%	100%
Idea	100%	100%	100%	-	100%	100%	100%	100%
RCOM GSM	100%	100%	100%	100%	-	100%	100%	100%
TTSL CDMA	100%	100%	100%	100%	100%	-	100%	100%
VODAFONE	100%	100%	100%	100%	100%	100%	-	100%
MTS	100%	100%	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 COMPAINTS:

LIVE CALLING TO CALL CENTRE								
Parameter	**Aircel**	**Airtel**	**MTNL**	**IDEA**	**RCOM GSM**	**TTSL CDMA**	**MTS**	**Vodafone**
Total No. of calls Attempted	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	100	100	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%**	**100.00%**	**100.00%**
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	100	100	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	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%**	**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	**Circle Name**	**Aircel**	**Airtel**	**MTNL**	**IDEA**	**RCOM GSM**	**TTSL CDMA**	**MTS**	**VODAFONE**
Total No. of calls Attempted	Delhi	1	100	DNA	100	100	14	43	100
Total No. of calls Answered	Delhi	1	86	DNA	75	82	9	32	74
Cases resolved within 4 weeks	Delhi	1	86	DNA	75	82	9	32	74
%age of cases resolved	Delhi	**100%**	**100%**	**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:

Level 1 Live Calling								
DATE:	22, 23, 24 September 2016							
CIRCLE:	Delhi							
TYPE:	CELLULAR/BASIC SERVICE PROVIDER							
PUT x FOR UNSUCCESSFUL CALL AND TICK FOR SUCCESSFUL CALL								
S. NO.	**L1 Service Number**	**SSA: Delhi**						
	Details	**Aircel**	**Airtel**	**MTNL**	**Idea**	**RCOM GSM**	**TTSL CDMA**	**Vodafone**
1	100 Police	✓	✓	✓	✓	✓	✓	✓
2	101 Fire	✓	✓	✓	✓	✓	✓	✓
3	102 Ambulance	✓	✓	✓	✓	✓	✓	✓
4	104 Health Information Helpline	X	X	X	X	X	X	X
5	108 Emergency and Disaster Management Helpline	X	X	✓	X	✓	X	X
6	138 All India Helpine for Passangers	✓	X	✓	✓	X	X	✓
7	149 Public Road Transport Utility Service	X	X	X	X	X	X	X
8	181 Chief Minister Helpline	✓	✓	✓	✓	✓	✓	✓
9	182 Indian Railway Security Helpline	✓	✓	✓	✓	X	X	X
10	1033 Road Accident Management Service	✓	X	✓	✓	X	✓	✓
11	1037 Public Grievance Cell DoT HQ as 'Telecom Consumer Grievance Redressal Helpline'	X	X	X	X	X	X	X
12	1056 Emergency Medical Services	X	X	X	X	X	X	X
13	106X State of the Art Hospitals	X	X	✓	✓	✓	X	X
14	1063 Public Grievance Cell DoT Hq	X	X	✓	✓	✓	X	✓
15	1064 Anti Corruption Helpline	X	✓	✓	X	✓	✓	✓
16	1070 Relief Commission for Natural Calamities	✓	X	✓	X	X	✓	✓
17	1071 Air Accident Helpline	X	X	X	X	✓	X	X
18	1072 Rail Accident Helpline	✓	X	✓	✓	✓	✓	✓
19	1073 Road Accident Helpline	X	X	✓	X	X	X	✓
20	1077 Control Room for District Collector	✓	✓	✓	X	X	✓	✓

S. NO.	L1 Service Number	SSA: Delhi						
	Details	Aircel	Airtel	MTNL	Idea	RCOM GSM	TTSL CDMA	Vodafone
21	1090 Call Alart (Crime Branch)	✓	X	✓	✓	✓	✓	X
22	1091 Women Helpline	✓	✓	✓	✓	✓	✓	✓
23	1097 National AIDS Helpline to NACO	X	✓	✓	✓	X	✓	✓
24	1099 Central Accident and Trauma Services (CATS)	X	X	✓	X	X	X	X
25	10580 Educational& Vocational Guidance and Counselling	X	X	✓	✓	X	X	✓
26	10589 Mother and Child Tracking (MCTH)	X	X	X	X	X	X	✓
27	10740 Central Pollution Control Board	X	X	X	X	X	X	X
28	10741 Pollution Control Board	X	X	X	X	X	X	X
29	1511 Police Related Service for all Metro Railway Project	✓	X	✓	✓	✓	✓	✓
30	1512 Prevention of Crime in Railway	✓	✓	✓	✓	✓	X	✓
31	1514 National Career Service(NCS)	X	X	X	X	✓	X	X
32	15100 Free Legal Service Helpline	X	X	✓	✓	✓	✓	✓
33	155304 Municipal Corporations	X	X	X	X	X	X	✓
34	155214 Labour Helpline	✓	✓	✓	✓	X	✓	✓
35	1903 Sashastra Seema Bal (SSB)	✓	X	✓	X	✓	X	✓
36	1909 National Do Not Call Registry	✓	✓	✓	✓	X	✓	✓
37	1912 Complaint of Electricity	X	X	X	X	X	X	✓
38	1916 Drinking Water Supply	✓	✓	✓	✓	✓	✓	✓
39	1950 Election Commission of India	✓	✓	✓	✓	✓	✓	✓

Test calls will be made from all the levels working in a particular SDCA (Short Distance Charging Area) visited. (300 calls per licence service area per service per Quarter)

DRIVE TEST

12. OPERATOR ASSISTED DRIVE TEST

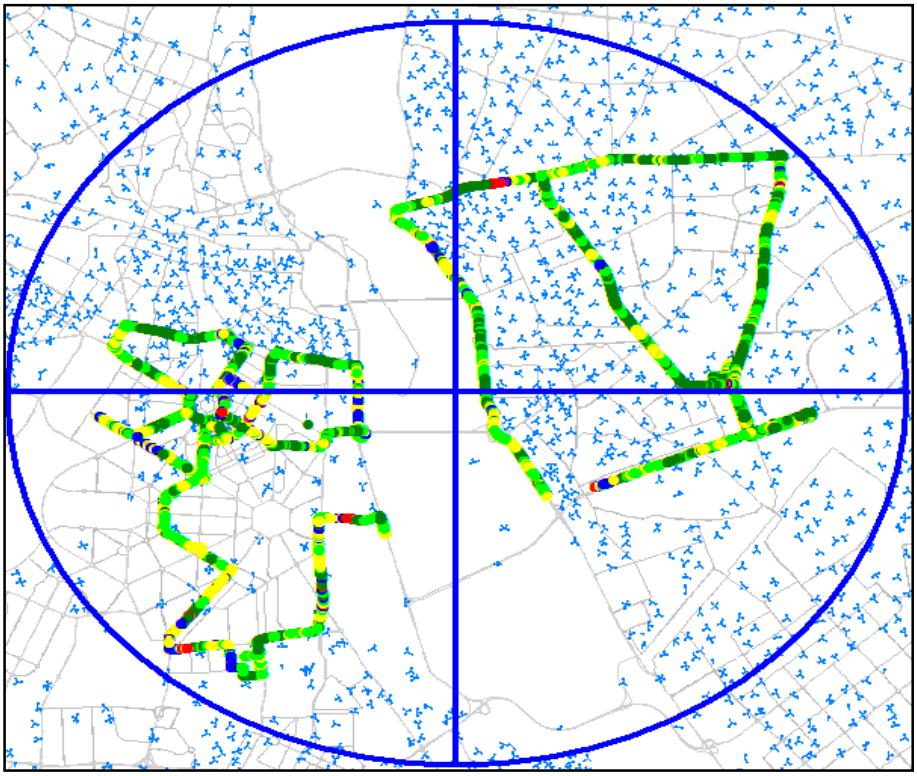
The drive test was conducted simultaneously for all the operators present in Delhi circle. As per the new directive given by TRAI headquarters, drive test for the month of July, August and September, 2016 were conducted at SSA level. Drive test was conducted for three days in each SSA and the selection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

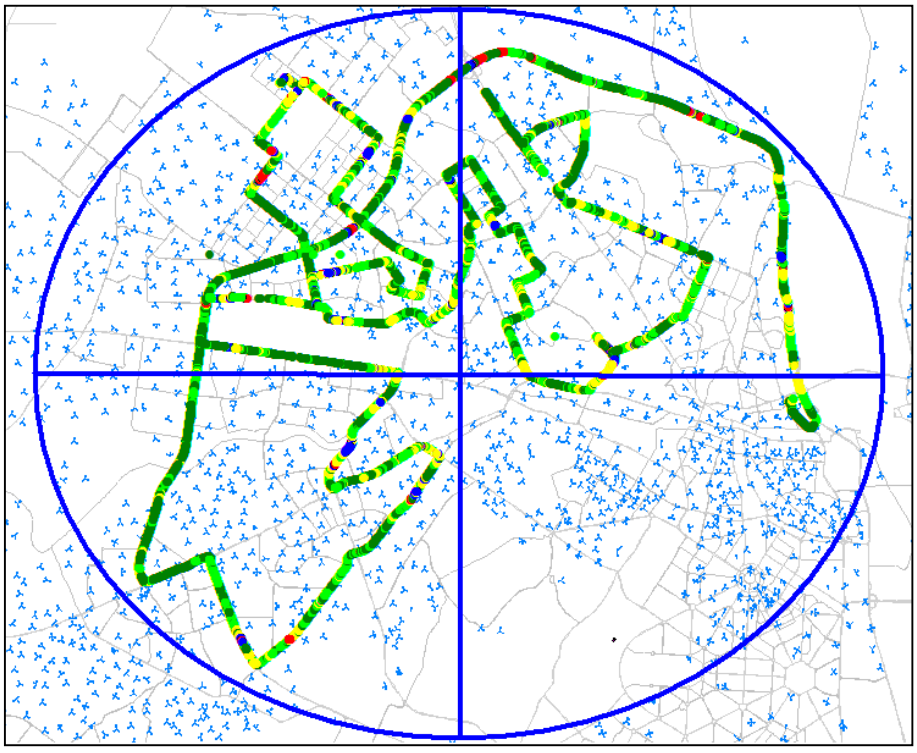
Drive Test		
Sr.No.	**Date**	**Name of SSA**
1	22nd to 24th September	Delhi

Date	Name of SSA	Day 1		Day 2		Day 3	
		Name of SDCA & KM Covered	Route Covered (Outdoor/Indoor)	Name of SDCA & KM Covered	Route Covered (Outdoor/Indoor)	Name of SDCA & KM Covered	Route Covered (Outdoor/Indoor)
22nd to 24th September, 2016	Delhi	Central & East - 110 KM	Outdoor: MAJOR ROAD:- CP , ITO , PAHARGANJ , PRAGATI MAIDAN HIGHWAY:- NH24 , ANAND VIHAR , AKSHARDHAM , DILSHAD GARDEN WITHIN CITY:- ASHOKA ROAD , LODHI ROAD , INDIA GATE, JANPATH , RACE COURSE , PM HOUSE Indoor: INDIA HABITAT & CULTURE CENTRE	North & West - 150 KM	Outdoor: MAJOR ROAD:- AZADPUR , NETAJI PLACE, MEERA BAGH , DU, PASHCIM VIHAR, TILAK NAGAR HIGHWAY :- KASHMERI GATE, MUKARBA CHOWK , PUNJABI BAGH, SUNDAR APARTMENT WITHIN CITY :- ROHINI, SHAKATI VIHAR, MAYAPURI , SAKARPUR, JJ COLONY , ASHOK VIHAR Indoor: HOTEL CROWN PLAZA NEAR RITHALA METRO STATION	South - 95 KM	Outdoor: MAJOR ROAD :- HAYAT, IIT, PANCHSHEEL, KALKAJI, R.K PURAM, VASANT KUNJ HIGHWAY :- SARITA VIHAR METRO, LAJPAT NAGAR, HAYAT, DEFENCE COLONY, KALKAJI , CHATARPUR , KUTUB MINAR, MAHIPALPUR WITHIN CITY :- SARITA VIHAR, OKHLA PHASE I , PHASE II , TUGHLAKA BAD , GK Indoor: DOMINOS KALKAJI

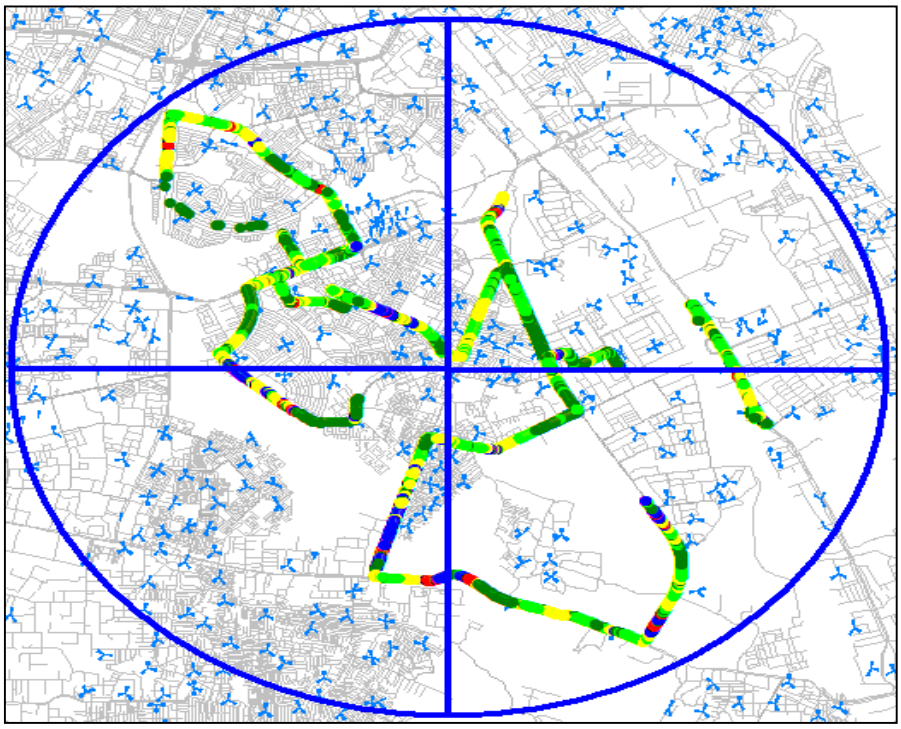
12.1. Route Cover Map: Delhi SSA: Day 1



12.2. Route Map: Delhi SSA: Day 2



12.3. ROUTE MAP: DELHI SSA: DAY 3

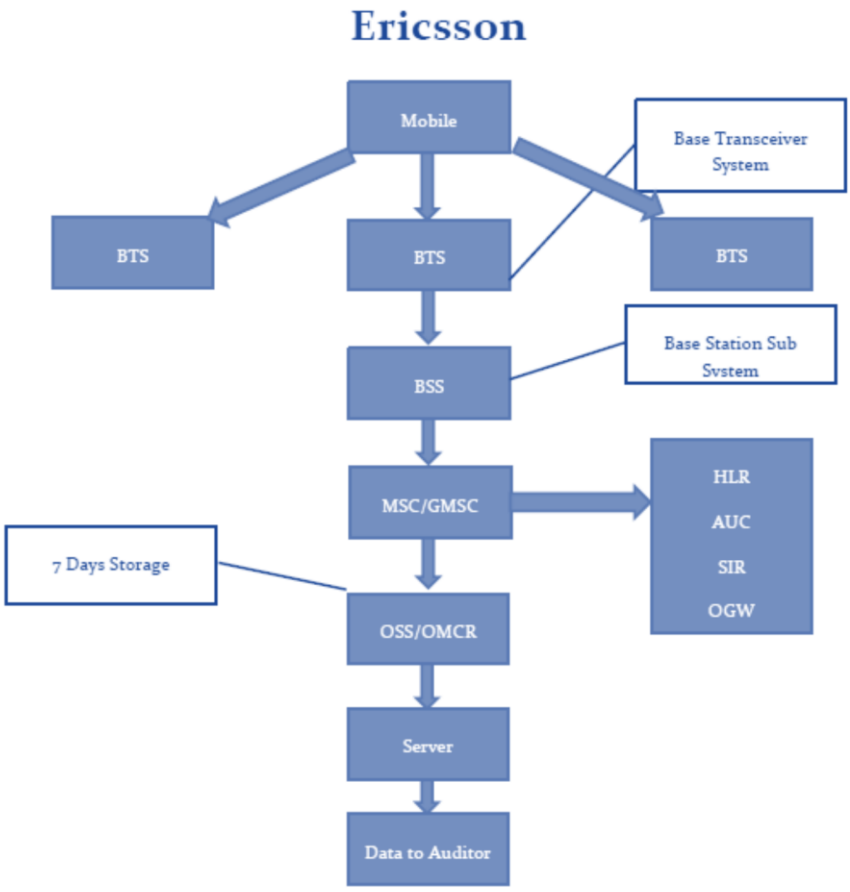


12.4. DRIVE TEST OUTCOME

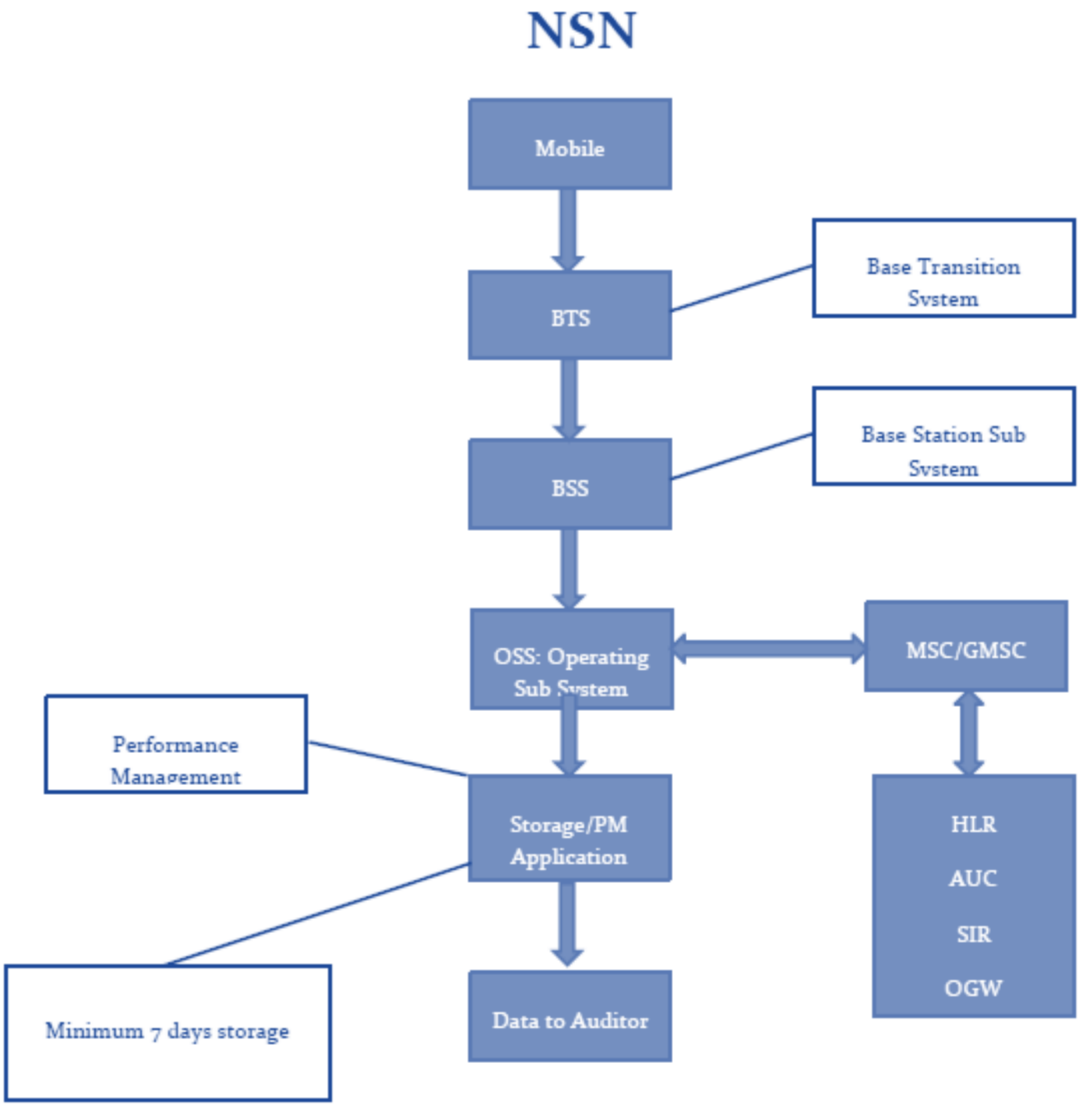
Sr.No.	Parameter	Aircel	Airtel	Idea	MTNL	MTS	RCOM GSM	TTSL CDMA	Vodafone
1	Total Calls Attempt (A)	663	643	504	745	Absent	641	662	606
2	Total Calls Blocked (B)	13	1	4	41	Absent	15	2	11
3	Blocked Call Rate in % (B*100/A)	1.96%	0.16%	0.79%	5.50%	Absent	2.34%	0.30%	1.82%
4	Total Calls Established ('C)	645	642	498	840	Absent	626	660	595
5	Total Calls Drop (D)	6	1	2	64	Absent	7	4	7
6	Dropped Calls Rate in % (D*100/C)	0.93	0.16	0.40	7.62	Absent	1.12	0.61	1.18
7	Call Setup Success Rate in % (C*100/A)	97.29	99.84	98.81	93.16	Absent	97.66	99.70	98.18
8	Handover Success Rate % (total HO Success * 100/Total HO attempt)	95.85	98.56	97.55	79.48%	Absent	95.96%	100.00%	98.84%
9	%age samples with good voice quality = (b/a) x 100	90.14%	95.65%	94.37%	91.43%	Absent	94.26%	97.67%	94.77%

13. BLOCK SCHEMATIC DIAGRAM

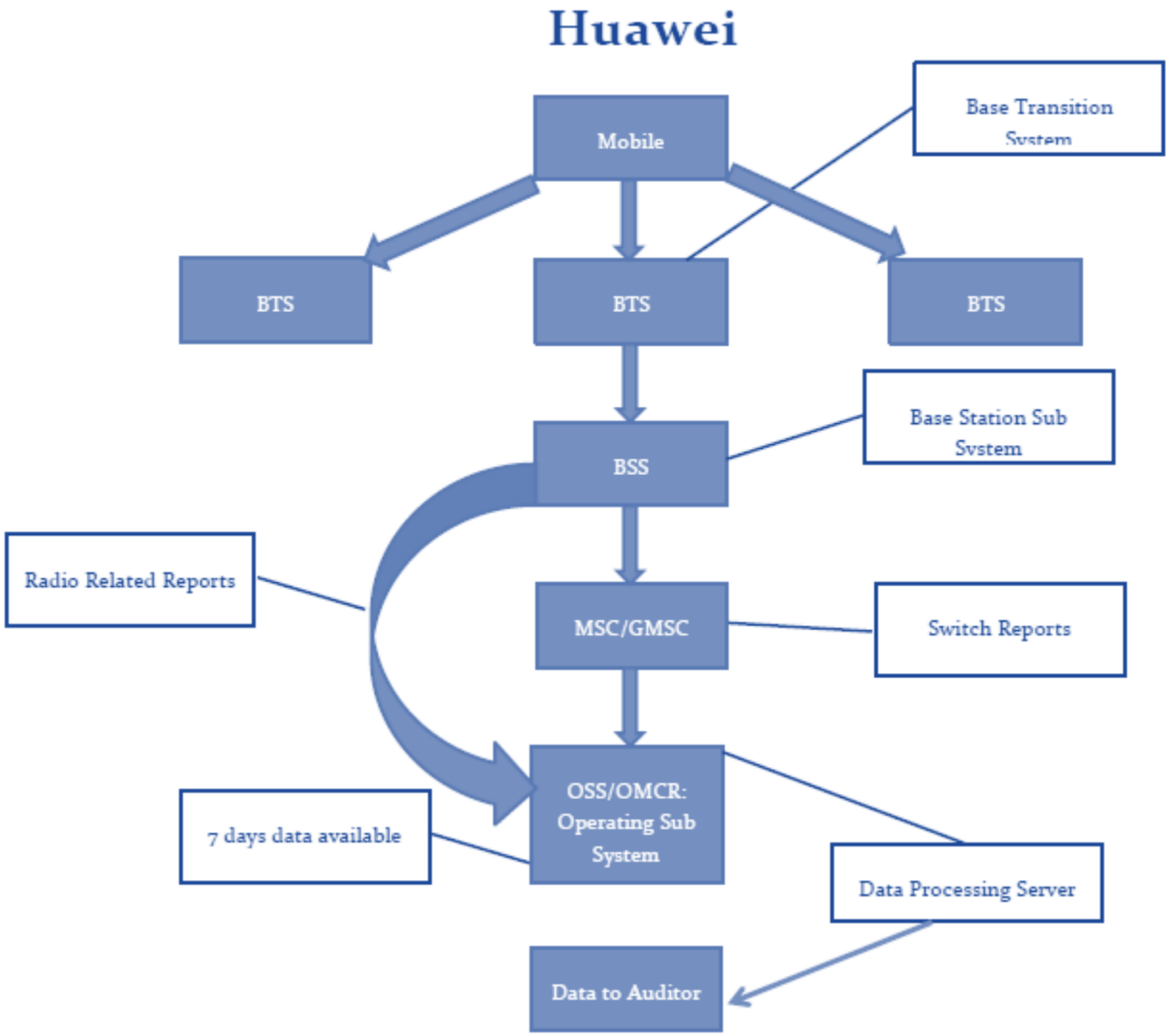
13.1. ERICSSON



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
- AMJ16 – Refers to the quarter of April, May and June2016
- SSA – Secondary Switching Area
- NOC – Network Operation Centre
- OMC – Operations and Maintenance Centre
- MSC – Mobile Switching Centre
- 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. 2G VOICE PMR DATA: CONSOLIDATED

Consolidated										
Network Parameters		Name of Service Provider								
		Benchmark	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.09%	0.01%	0.03%	0.12%	0.03%	0.08%	0.07%	0.17%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.21%	0.00%	0.00%	0.21%	0.00%	0.51%	0.23%	0.96%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	97.33%	99.06%	99.06%	96.83%	99.05%	98.60%	98.75%	98.56%
	SDDCH/Paging chl. Congestion	≤ 1%	0.25%	0.03%	0.36%	0.56%	0.00%	0.15%	0.00%	0.14%
	TCH Congestion	≤ 2%	1.37%	0.01%	0.28%	1.71%	0.05%	0.82%	0.15%	1.14%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	0.93%	0.82%	0.77%	1.77%	0.36%	0.21%	0.31%	1.34%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	5.13%	1.68%	2.54%	2.53%	1.95%	0.37%	1.41%	2.64%
	%age of connection with good voice quality	≥ 95%	96.16%	99.04%	98.38%	97.19%	99.16%	98.56%	98.18%	97.49%

- AIRCEL has parameter value of 5.13% and failed to meet the benchmark of <=3% Connection Maintenance (Retainability) of Worst Affected cell having more than 3% TCH drop.

15.2. 3G VOICE PMR: CONSOLIDATED

Consolidated							
Network Parameters		Name of Service Provider					
		Benchmark	AIRTEL	IDEA	MTNL	RCOM GSM	VODA
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	0.02%	0.09%	0.13%	0.20%	0.19%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	0.00%	0.00%	0.80%	0.82%	0.92%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	99.17%	99.83%	96.73%	99.96%	99.45%
	RRC Congestion:	≤ 1%	0.12%	0.06%	0.64%	0.01%	0.22%
	RAB Congestion:	≤ 2%	0.13%	0.02%	1.62%	0.00%	0.25%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	0.51%	0.37%	1.67%	0.21%	0.65%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	2.64%	2.14%	2.10%	0.97%	2.67%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	98.76%	98.43%	DNA	99.73%	98.90%

15.3. 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%	91.09%	95.86%	100.00%	NA
AIRTEL	0.03%	0.00%	100.00%	100.00%	100.00%	99.99%	100.00%	99.97%	88.69%	85.00%	77.31%
IDEA	0.08%	0.06%	100.00%	100.00%	100.00%	100.00%	100.00%	98.59%	99.58%	19.40%	100.00%
MTNL	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA	DNA
MTS	0.02%	0.02%	100.00%	100.00%	100.00%	100.00%	100.00%	98.87%	95.37%	21.29%	100.00%
RCOM GSM	0.09%	0.10%	100.00%	100.00%	100.00%	100.00%	82.69%	99.56%	86.47%	100.00%	100.00%
TTSL-CDMA	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.38%	97.67%	98.46%	94.89%
VODAFONE	0.08%	0.02%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.14%	93.12%	11.11%

- RCOM has parameter value of 82.69% and failed to meet the benchmark of =100% time taken for refund of deposits after closures which is cleared over period of <60 days.
- IDEA has a parameter value of 0.26% and failed to meet the benchmark of ≤ 0.1% metering and billing credibility for prepaid subscriber.
  AIRCEL has a parameter value of 91.09% and failed to meet the benchmark of ≥ 95% for Response time to customer for assistance %age of calls answered by the IVR.
- RCOM has a parameter value of 86.47% and failed to meet the benchmark of ≥ 95% for Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 seconds.
- AIRTEL has a parameter value of 88.69% and failed to meet the benchmark of ≥ 95% for Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 seconds.

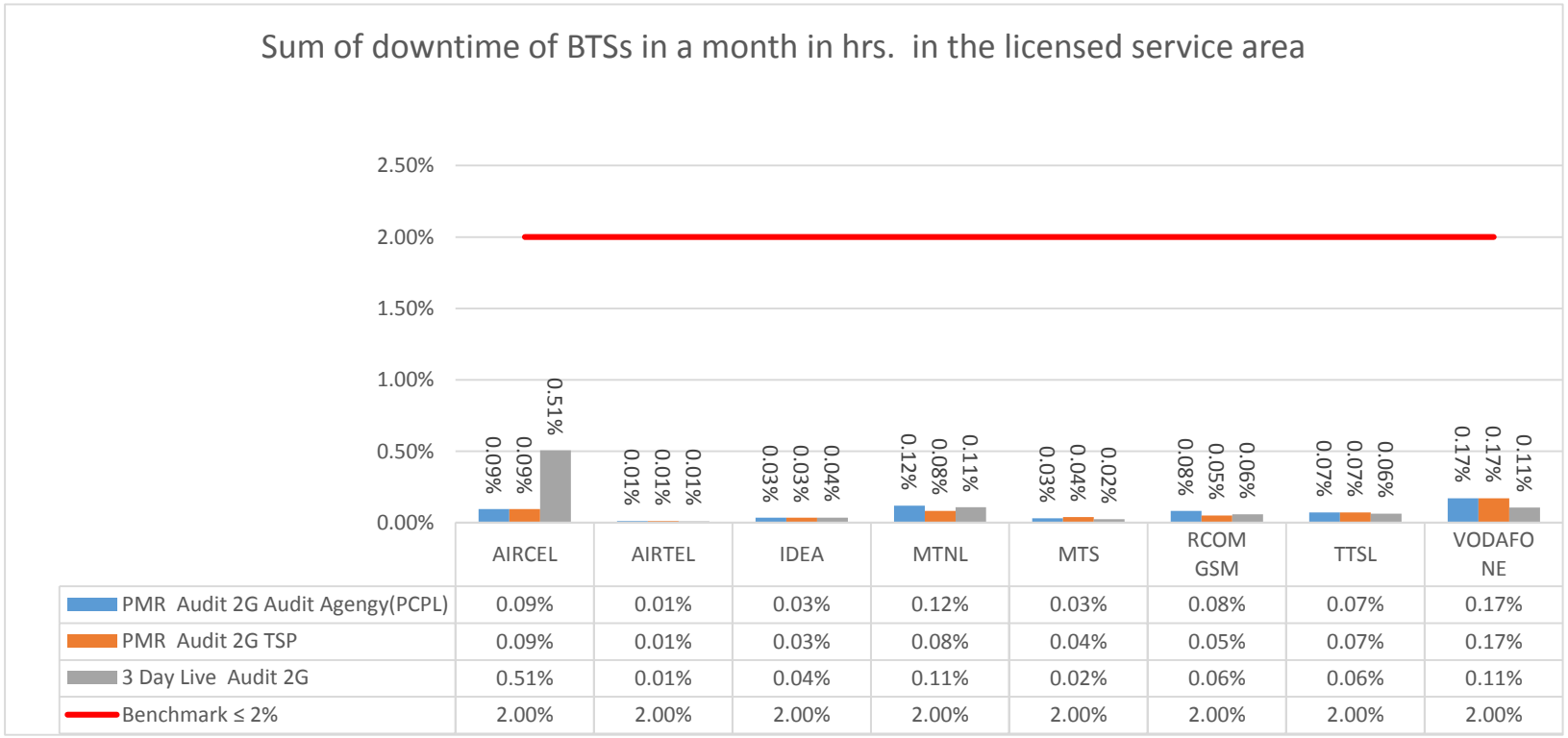
15.4. PMR Comparison (TSP vs. Audit Agency): Network Parameters

PMR Report Comparison between Audit Agency and TSP										
Network Parameters	Name of Service Provider									
	Benchmark		AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM-GSM	TTSL	VODAFONE

Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.09%	0.01%	0.03%	0.12%	0.03%	0.08%	0.07%	0.17%
			TSP	0.09%	0.01%	0.03%	0.08%	0.04%	0.05%	0.07%	0.17%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	0.21%	0.00%	0.00%	0.21%	0.00%	0.51%	0.23%	0.96%
			TSP	0.21%	0.00%	0.00%	0.21%	0.00%	0.28%	0.23%	0.96%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	97.33%	99.06%	99.06%	96.83%	99.05%	98.60%	98.75%	98.56%
			TSP	97.33%	98.99%	99.06%	96.83%	99.09%	98.67%	99.19%	98.85%
	SDDCH/Paging chl. Congestion	≤ 1%	Agency	0.25%	0.03%	0.36%	0.56%	0.00%	0.15%	0.00%	0.14%
			TSP	0.24%	0.03%	0.36%	0.56%	0.00%	0.16%	0.00%	0.14%
	TCH Congestion	≤ 2%	Agency	1.37%	0.01%	0.28%	1.71%	0.05%	0.82%	0.15%	1.14%
			TSP	1.38%	0.01%	0.28%	1.71%	0.03%	0.86%	0.15%	1.14%
Connection Maintenance (Retainability)	Call Drop Rate (%age)	≤ 2%	Agency	0.93%	0.82%	0.77%	1.77%	0.36%	0.21%	0.31%	1.34%
			TSP	0.93%	0.84%	0.77%	1.79%	0.36%	0.25%	0.31%	1.34%
	Worst Affected cell having more than 3% TCH drop	≤ 3%	Agency	5.13%	1.68%	2.54%	2.53%	1.95%	0.37%	1.41%	2.64%
			TSP	5.13%	1.72%	2.54%	2.53%	1.95%	0.62%	1.41%	2.64%
	%age of connection with good voice quality	≥ 95%	Agency	96.16%	99.04%	98.38%	97.19%	99.16%	98.56%	98.18%	97.49%
			TSP	96.16%	99.00%	98.38%	97.19%	99.16%	98.29%	99.09%	97.49%

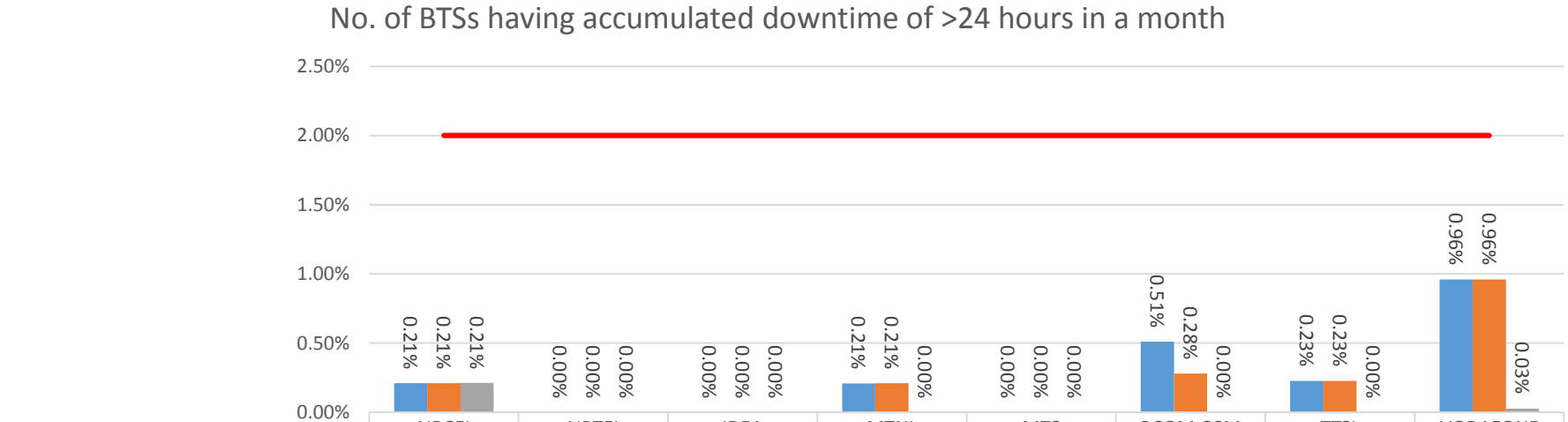
- **For each instance of “DNA (Data Not Available)”, please refer the respective hard copy of audit report(s).

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



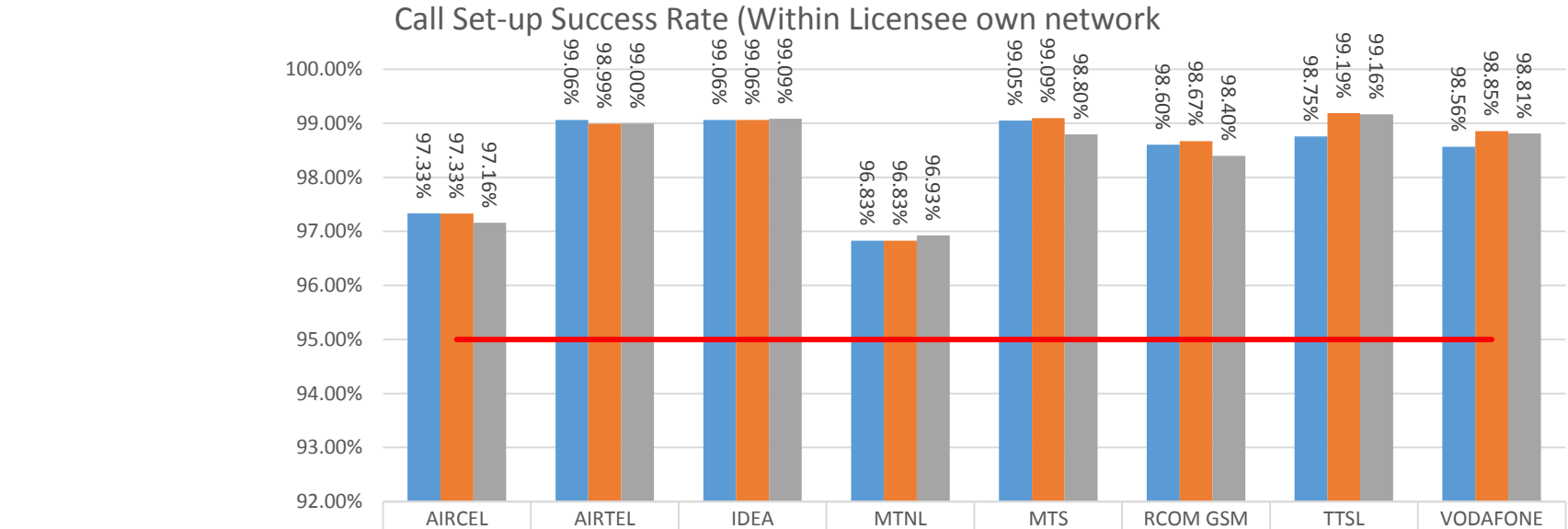
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	0.09%	0.01%	0.03%	0.12%	0.03%	0.08%	0.07%	0.17%
PMR Audit 2G TSP	0.09%	0.01%	0.03%	0.08%	0.04%	0.05%	0.07%	0.17%
3 Day Live Audit 2G	0.51%	0.01%	0.04%	0.11%	0.02%	0.06%	0.06%	0.11%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

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



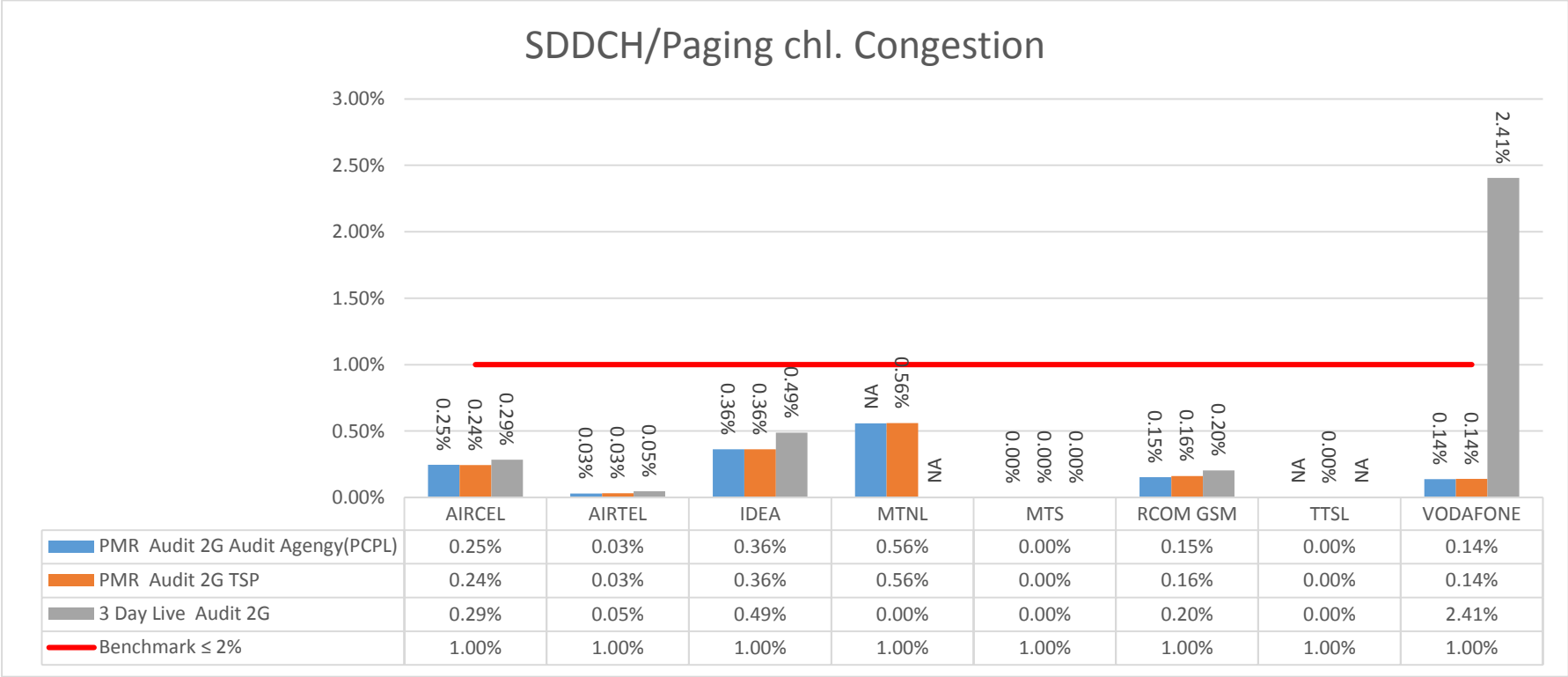
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	0.21%	0.00%	0.00%	0.21%	0.00%	0.51%	0.23%	0.96%
PMR Audit 2G TSP	0.21%	0.00%	0.00%	0.21%	0.00%	0.28%	0.23%	0.96%
3 Day Live Audit 2G	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.03%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

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



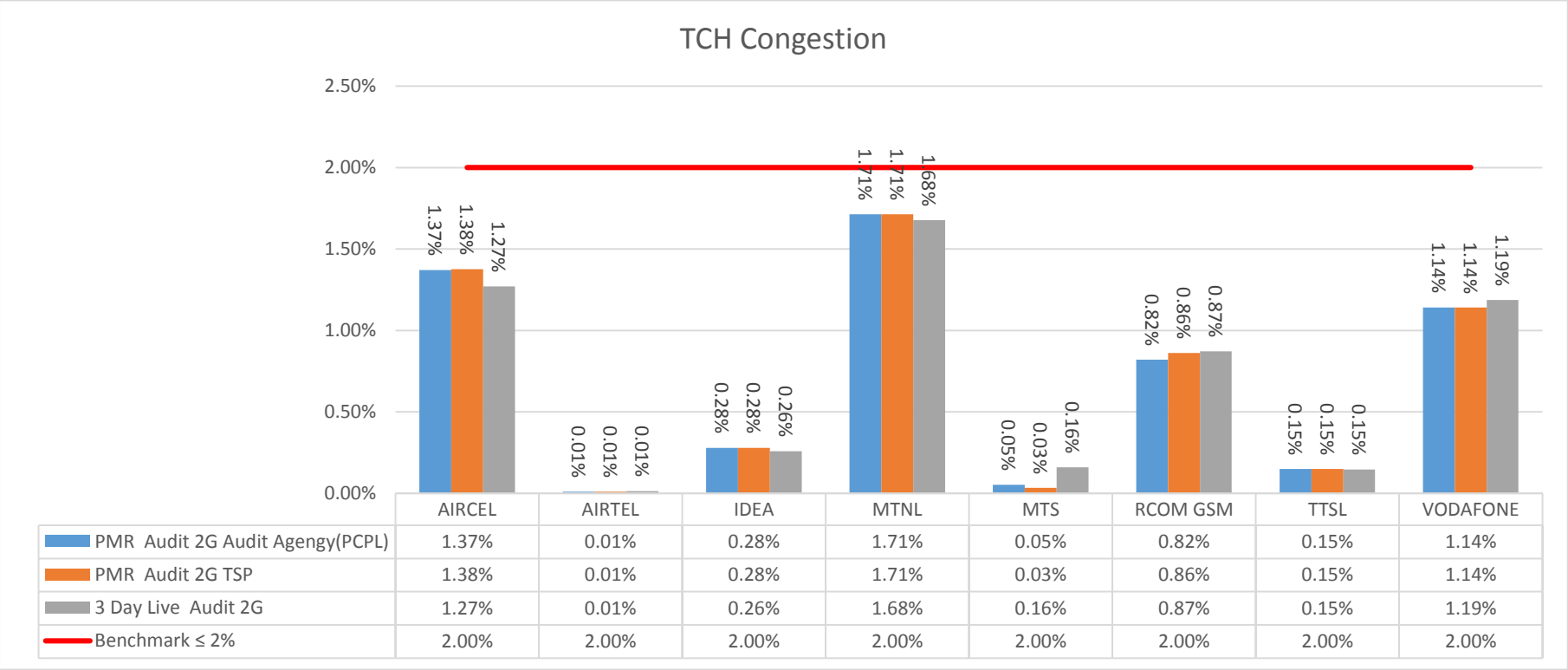
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	97.33%	99.06%	99.06%	96.83%	99.05%	98.60%	98.75%	98.56%
PMR Audit 2G TSP	97.33%	98.99%	99.06%	96.83%	99.09%	98.67%	99.19%	98.85%
3 Day Live Audit 2G	97.16%	99.00%	99.09%	96.93%	98.80%	98.40%	99.16%	98.81%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%

15.4.4. SDDCH/PAGING CHL. CONGESTION



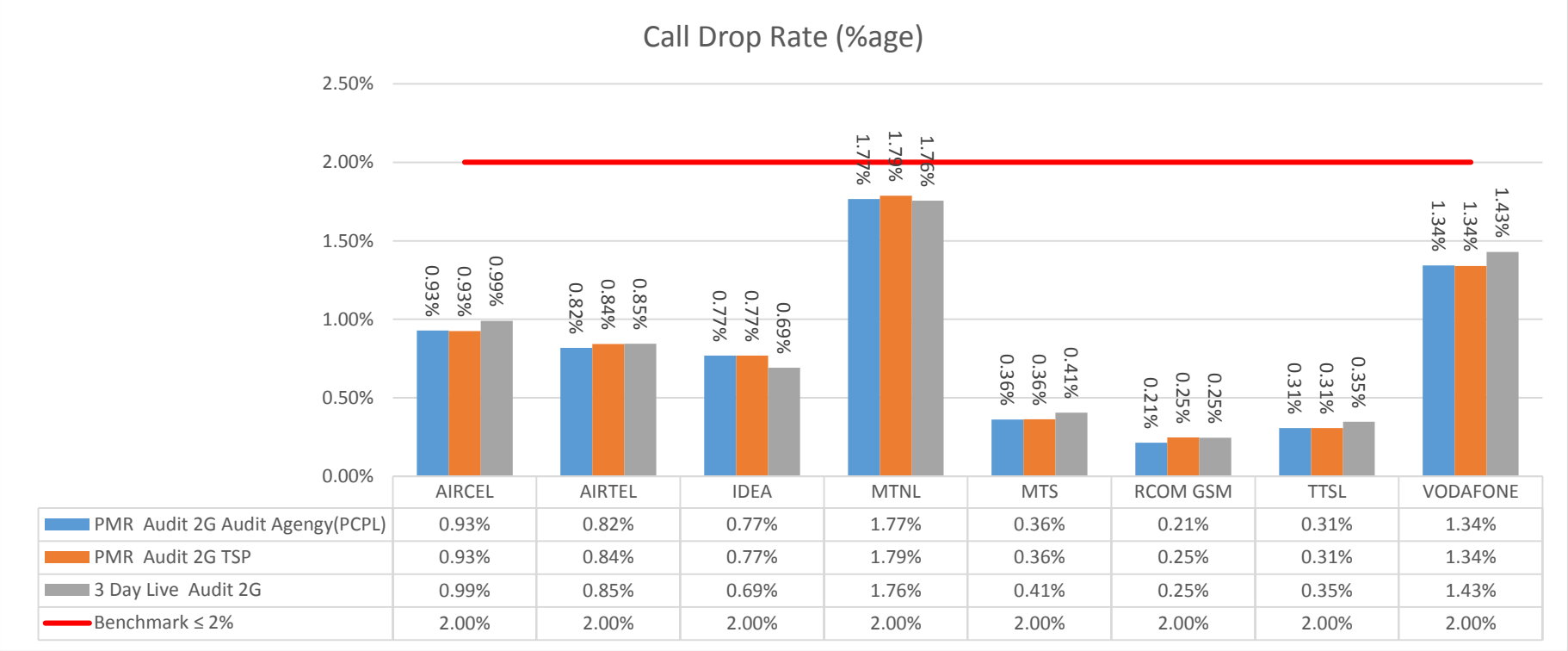
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	0.25%	0.03%	0.36%	0.56%	0.00%	0.15%	0.00%	0.14%
PMR Audit 2G TSP	0.24%	0.03%	0.36%	0.56%	0.00%	0.16%	0.00%	0.14%
3 Day Live Audit 2G	0.29%	0.05%	0.49%	0.00%	0.00%	0.20%	0.00%	2.41%
Benchmark ≤ 2%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

15.4.5. TCH CONGESTION



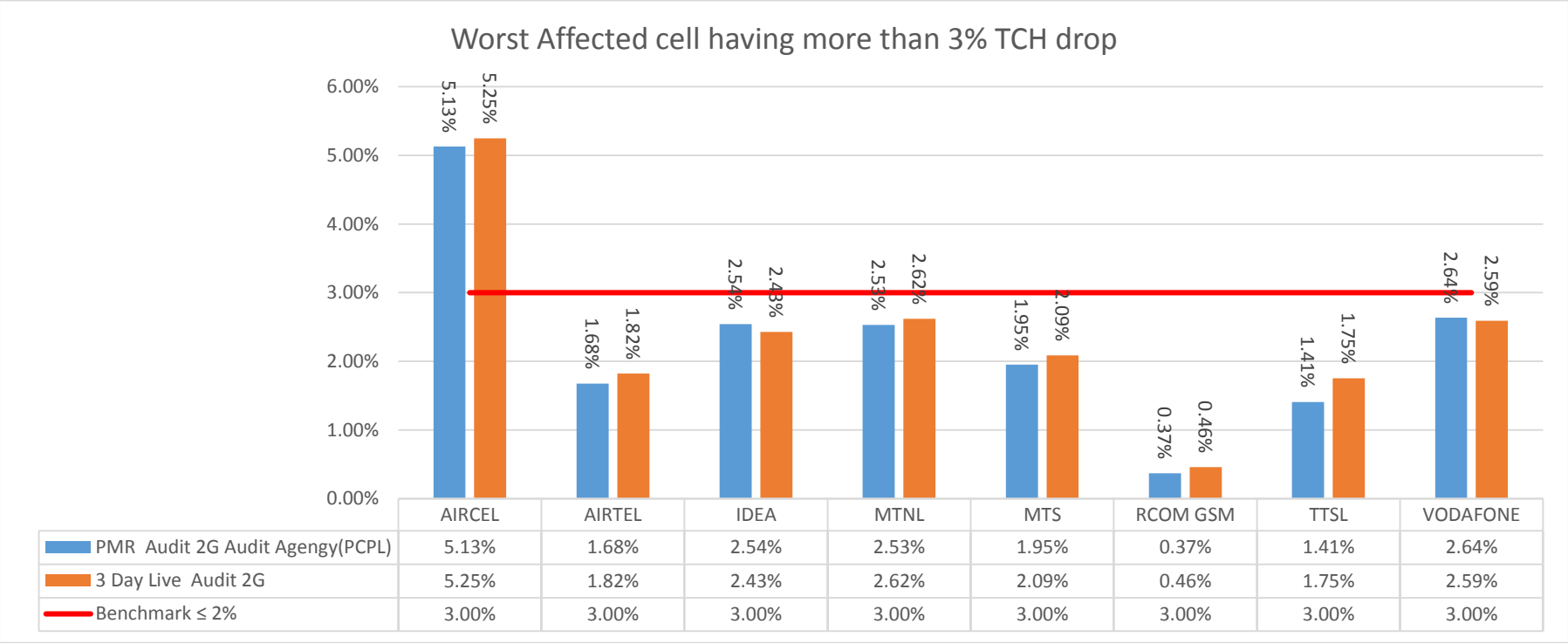
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	1.37%	0.01%	0.28%	1.71%	0.05%	0.82%	0.15%	1.14%
PMR Audit 2G TSP	1.38%	0.01%	0.28%	1.71%	0.03%	0.86%	0.15%	1.14%
3 Day Live Audit 2G	1.27%	0.01%	0.26%	1.68%	0.16%	0.87%	0.15%	1.19%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

15.4.6. CALL DROP RATE (%AGE)



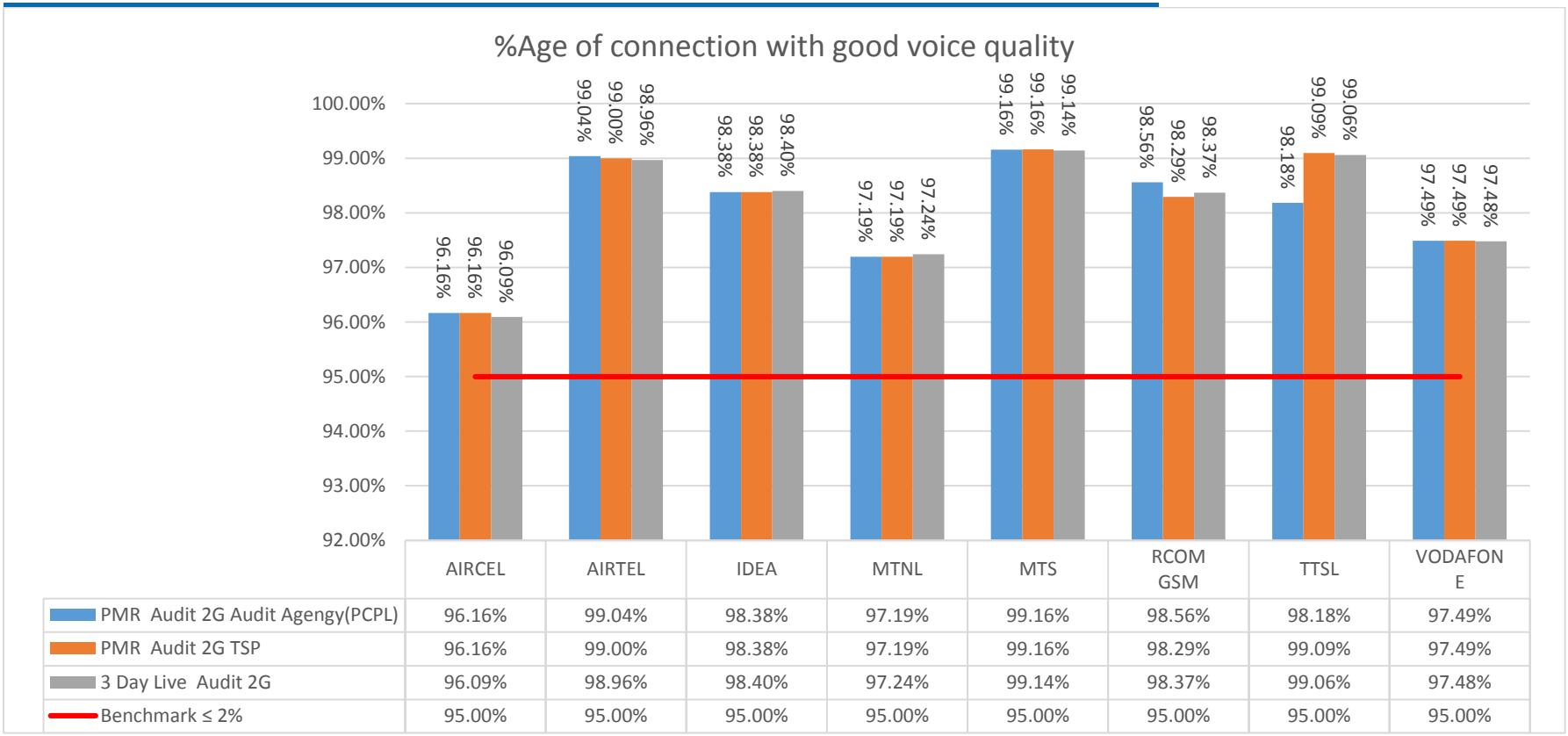
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	0.93%	0.82%	0.77%	1.77%	0.36%	0.21%	0.31%	1.34%
PMR Audit 2G TSP	0.93%	0.84%	0.77%	1.79%	0.36%	0.25%	0.31%	1.34%
3 Day Live Audit 2G	0.99%	0.85%	0.69%	1.76%	0.41%	0.25%	0.35%	1.43%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

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



	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	5.13%	1.68%	2.54%	2.53%	1.95%	0.37%	1.41%	2.64%
3 Day Live Audit 2G	5.25%	1.82%	2.43%	2.62%	2.09%	0.46%	1.75%	2.59%
Benchmark ≤ 2%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%

15.4.8. %AGE OF CONNECTION WITH GOOD VOICE QUALITY

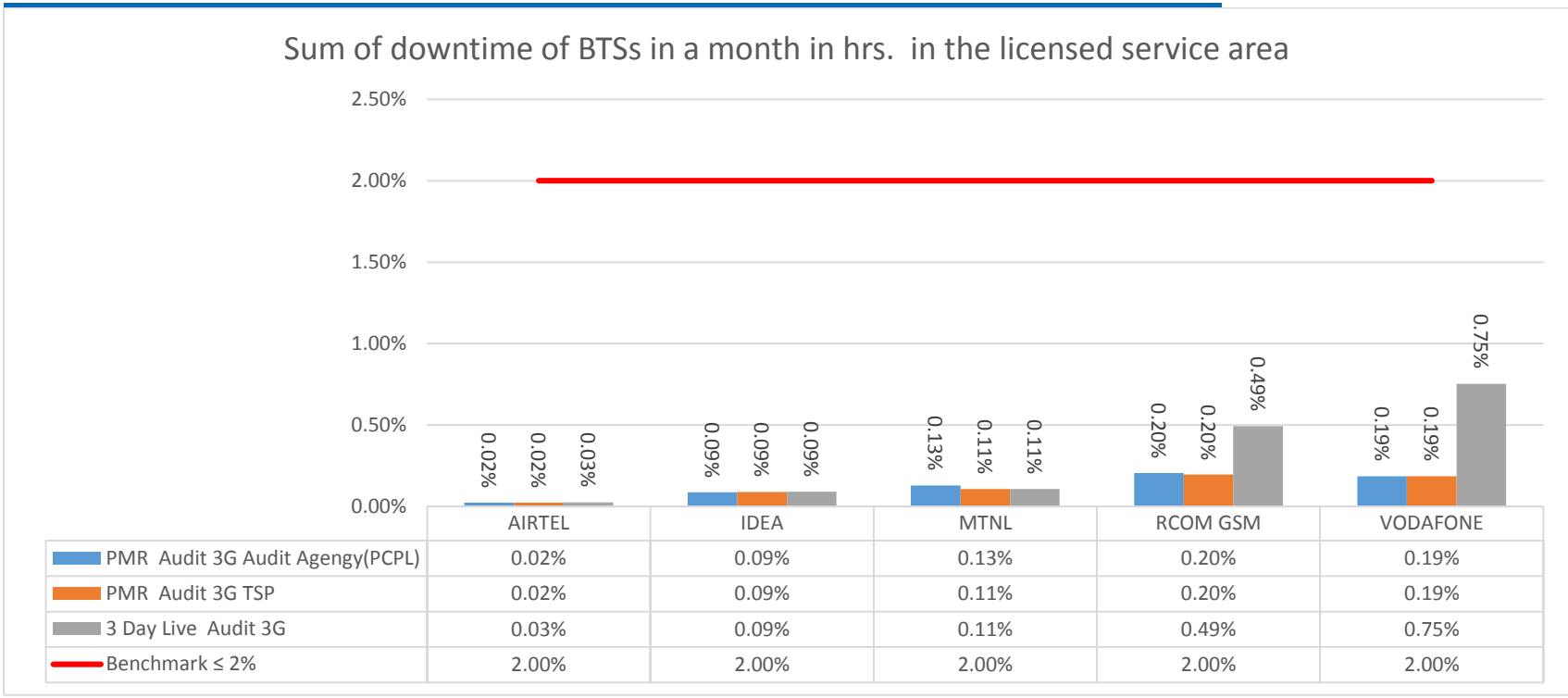


	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL	VODAFONE
PMR Audit 2G Audit Agengy(PCPL)	96.16%	99.04%	98.38%	97.19%	99.16%	98.56%	98.18%	97.49%
PMR Audit 2G TSP	96.16%	99.00%	98.38%	97.19%	99.16%	98.29%	99.09%	97.49%
3 Day Live Audit 2G	96.09%	98.96%	98.40%	97.24%	99.14%	98.37%	99.06%	97.48%
Benchmark ≤ 2%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%	95.00%

15.5.1. 3G PMR Comparison (TSP vs. Audit Agency): Network Parameters

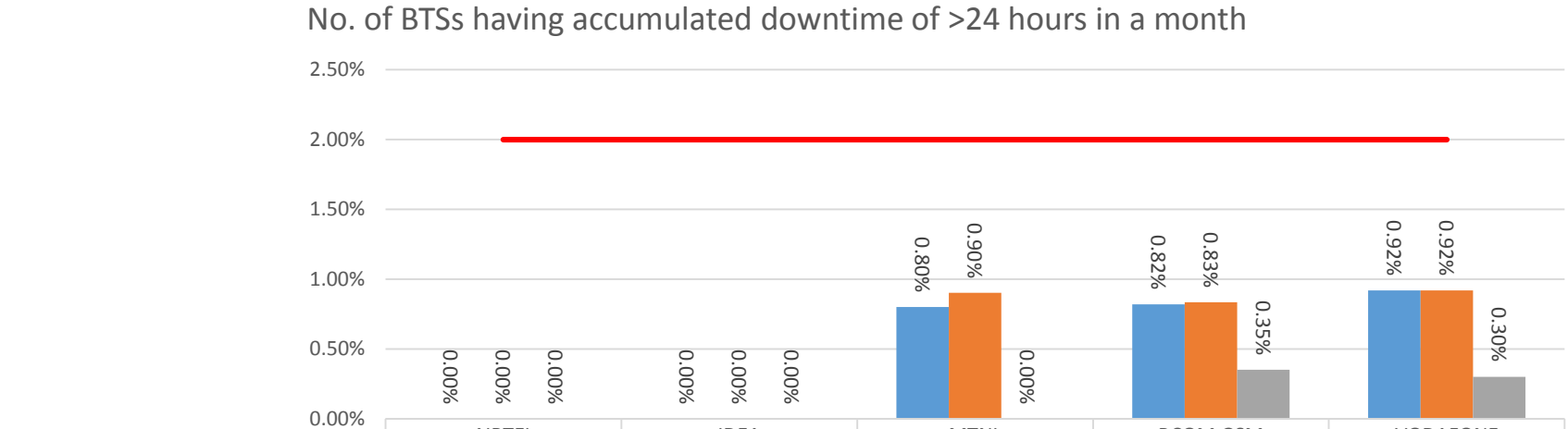
3G PMR Report Comparison between Audit Agency and TSP								
Network Parameters		Name of Service Provider						
		Benchmark		AIRTEL	IDEA	MTNL	RCOM-GSM	VODAFONE
Network Availability	Sum of downtime of BTSs in a month in hrs. in the licensed service area	≤ 2%	Agency	0.02%	0.09%	0.13%	0.20%	0.19%
			TSP	0.02%	0.09%	0.11%	0.20%	0.19%
	No. of BTSs having accumulated downtime of >24 hours in a month	≤ 2%	Agency	0.00%	0.00%	0.80%	0.82%	0.92%
			TSP	0.00%	0.00%	0.90%	0.83%	0.92%
Connection Establishment (Accessibility)	Call Set-up Success Rate (Within Licensee own network	≥ 95%	Agency	99.17%	99.83%	96.73%	99.96%	99.45%
			TSP	98.98%	99.83%	96.85%	99.96%	99.43%
	RRC Congestion:	≤ 1%	Agency	0.12%	0.06%	0.64%	0.01%	0.22%
			TSP	0.15%	0.06%	0.61%	0.01%	0.21%
	RAB Congestion:	≤ 2%	Agency	0.13%	0.02%	1.62%	0.00%	0.25%
			TSP	0.16%	0.02%	1.67%	0.01%	0.25%
Connection Maintenance (Retainability)	Circuit Switched Voice Drop Rate	≤ 2%	Agency	0.51%	0.37%	1.67%	0.21%	0.65%
			TSP	0.52%	0.37%	1.70%	0.20%	0.64%
	Worst affected cells having more than 3% Circuit Switched Voice Drop Rate:	≤ 3%	Agency	2.64%	2.14%	2.10%	0.97%	2.67%
			TSP	2.70%	2.13%	2.07%	0.95%	2.67%
	Percentage of connections with Good Circuit Switched Voice Quality	≥ 95%	Agency	98.76%	98.43%	DNA	99.73%	98.90%
			TSP	98.78%	98.44%	96.30%	96.61%	98.91%

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



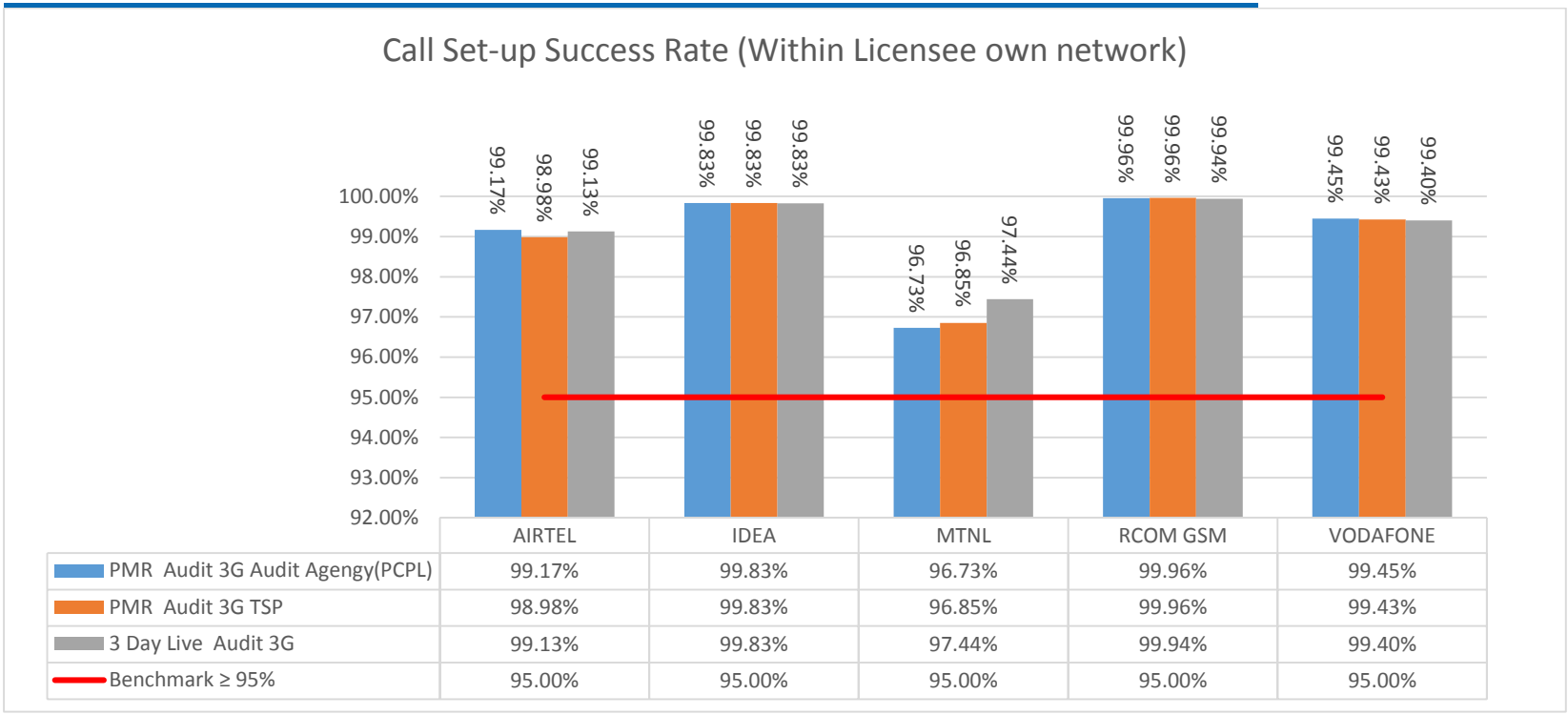
	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	0.02%	0.09%	0.13%	0.20%	0.19%
PMR Audit 3G TSP	0.02%	0.09%	0.11%	0.20%	0.19%
3 Day Live Audit 3G	0.03%	0.09%	0.11%	0.49%	0.75%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

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



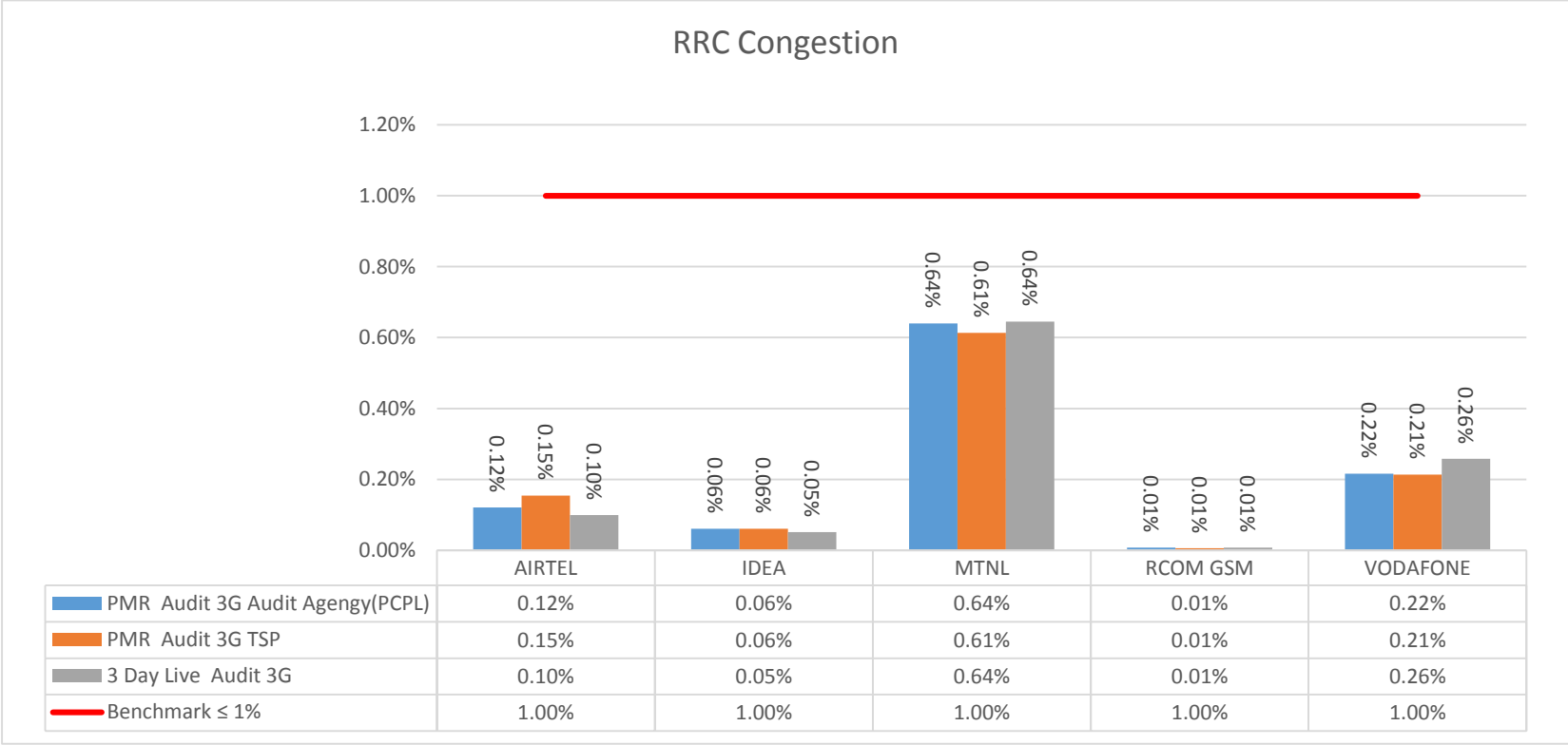
	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	0.00%	0.00%	0.80%	0.82%	0.92%
PMR Audit 3G TSP	0.00%	0.00%	0.90%	0.83%	0.92%
3 Day Live Audit 3G	0.00%	0.00%	0.00%	0.35%	0.30%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

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



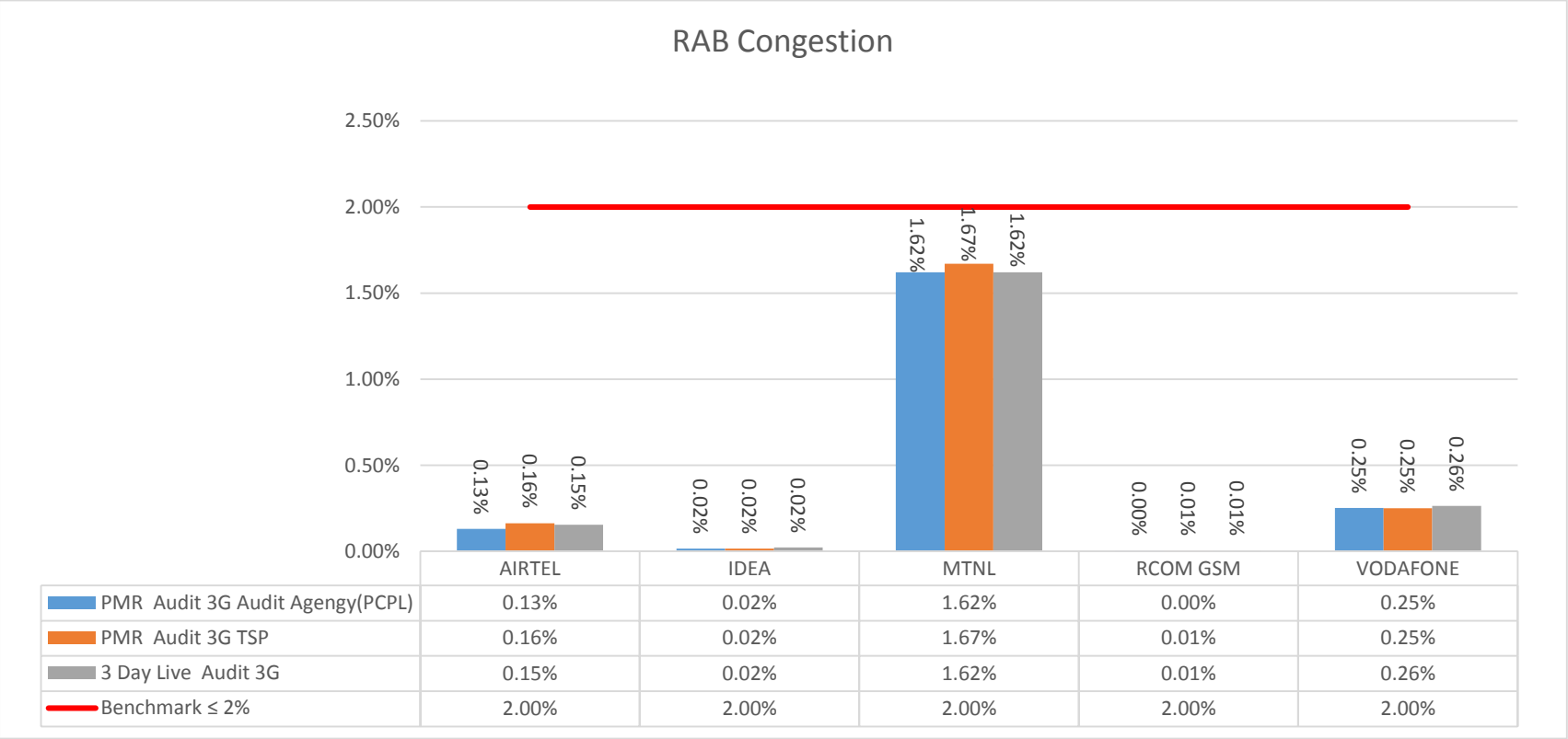
	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	99.17%	99.83%	96.73%	99.96%	99.45%
PMR Audit 3G TSP	98.98%	99.83%	96.85%	99.96%	99.43%
3 Day Live Audit 3G	99.13%	99.83%	97.44%	99.94%	99.40%
Benchmark ≥ 95%	95.00%	95.00%	95.00%	95.00%	95.00%

15.5.5. RRC CONGESTION



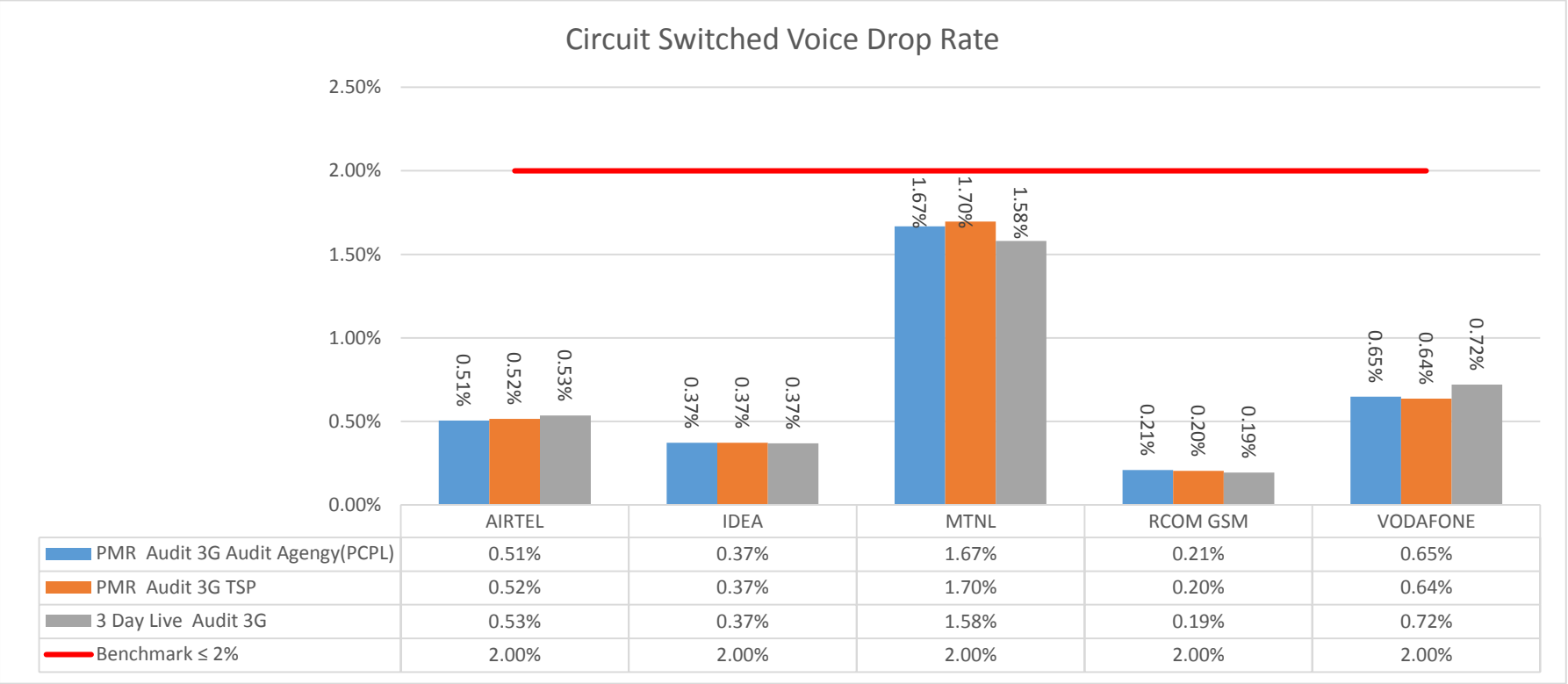
	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	0.12%	0.06%	0.64%	0.01%	0.22%
PMR Audit 3G TSP	0.15%	0.06%	0.61%	0.01%	0.21%
3 Day Live Audit 3G	0.10%	0.05%	0.64%	0.01%	0.26%
Benchmark ≤ 1%	1.00%	1.00%	1.00%	1.00%	1.00%

15.5.6. RAB CONGESTION



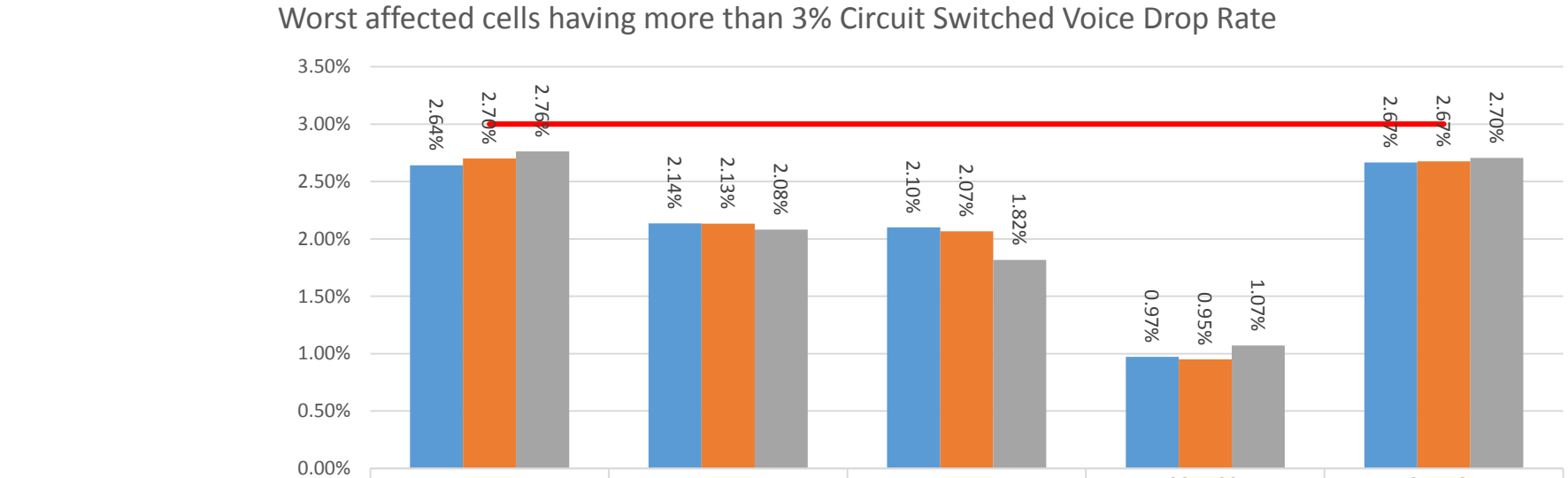
	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	0.13%	0.02%	1.62%	0.00%	0.25%
PMR Audit 3G TSP	0.16%	0.02%	1.67%	0.01%	0.25%
3 Day Live Audit 3G	0.15%	0.02%	1.62%	0.01%	0.26%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

15.5.7. CIRCUIT SWITCHED VOICE DROP RATE



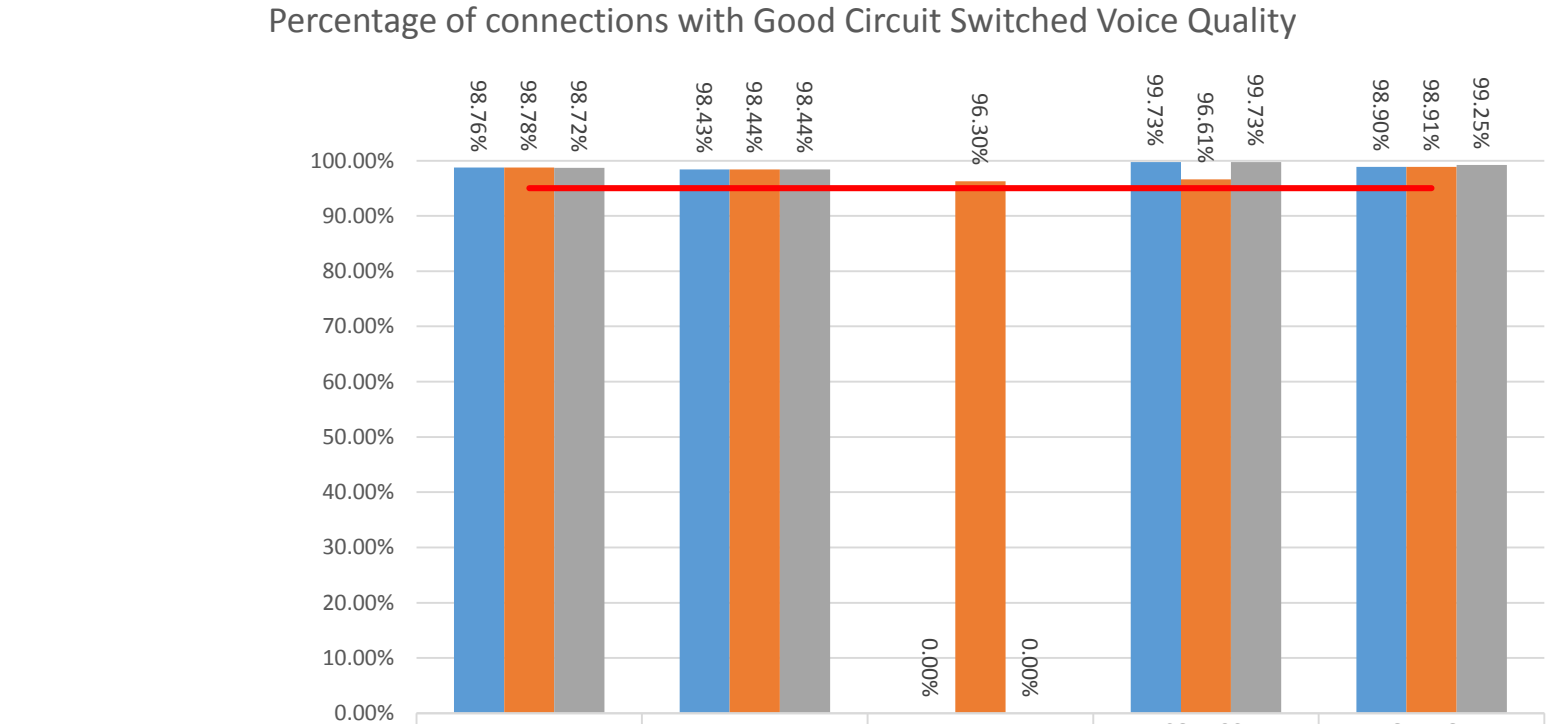
	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	0.51%	0.37%	1.67%	0.21%	0.65%
PMR Audit 3G TSP	0.52%	0.37%	1.70%	0.20%	0.64%
3 Day Live Audit 3G	0.53%	0.37%	1.58%	0.19%	0.72%
Benchmark ≤ 2%	2.00%	2.00%	2.00%	2.00%	2.00%

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



	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	2.64%	2.14%	2.10%	0.97%	2.67%
PMR Audit 3G TSP	2.70%	2.13%	2.07%	0.95%	2.67%
3 Day Live Audit 3G	2.76%	2.08%	1.82%	1.07%	2.70%
Benchmark ≤ 3%	3.00%	3.00%	3.00%	3.00%	3.00%

15.5.9. PERCENTAGE OF CONNECTIONS WITH GOOD CIRCUIT SWITCHED VOICE QUALITY

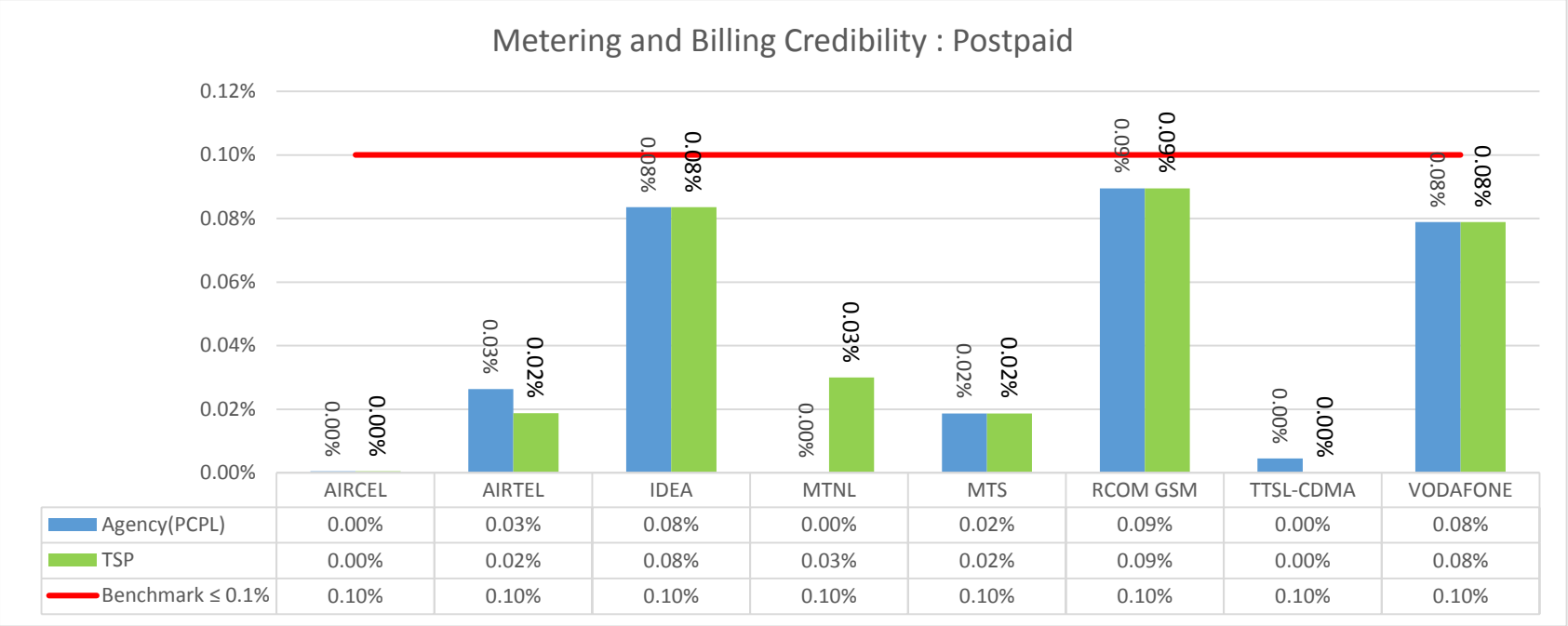


	AIRTEL	IDEA	MTNL	RCOM GSM	VODAFONE
PMR Audit 3G Audit Agengy(PCPL)	98.76%	98.43%	0.00%	99.73%	98.90%
PMR Audit 3G TSP	98.78%	98.44%	96.30%	96.61%	98.91%
3 Day Live Audit 3G	98.72%	98.44%	0.00%	99.73%	99.25%
Benchmark ≥ 95%	95.00%	95.00%	95.00%	95.00%	95.00%

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

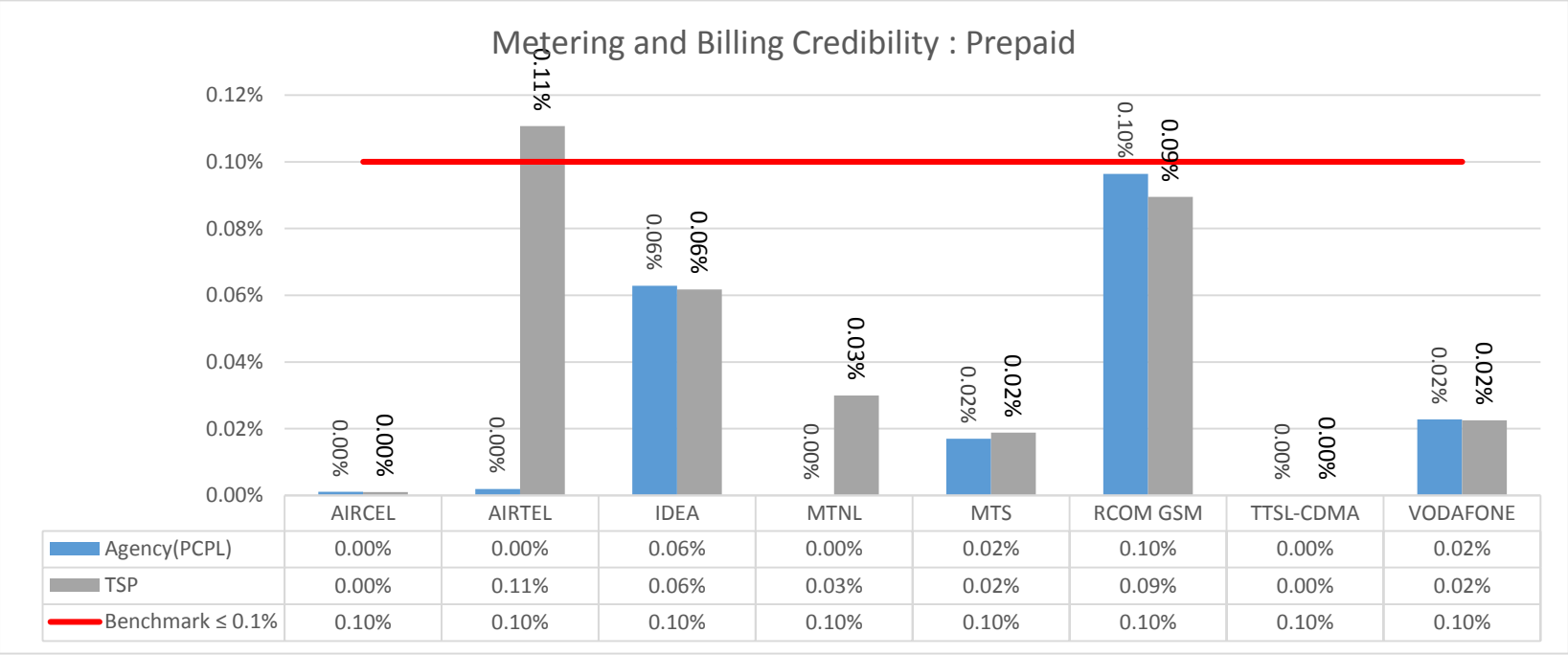
Name of Service Provider	Metering and Billing				Billing Complaints						rmination & Closu		Time taken for		Response time to customer for			
	Postpaid Subscribers		Prepaid Subscribers		%age complaints resolved within 4 weeks		%age complaints resolved within 6 weeks		%age of where credit/waiver is received within one week		% of Termination/ Closure of service within 7		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%	91.09%	91.09%	95.86%	95.86%
AIRTEL	0.03%	0.02%	0.00%	0.11%	100.00%	99.97%	100.00%	100.00%	100.00%	100.00%	99.99%	100.00%	100.00%	100.00%	99.97%	99.97%	88.69%	88.69%
IDEA	0.08%	0.08%	0.06%	0.06%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.59%	98.59%	99.58%	99.58%
MTNL	DNA	0.03%	DNA	0.03%	DNA	100.00%	DNA	100.00%	DNA	100.00%	DNA	100.00%	DNA	100.00%	DNA	96.50%	DNA	96.72%
MTS	0.02%	0.02%	0.02%	0.02%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.87%	98.87%	95.37%	95.37%
RCOM GSM	0.09%	0.09%	0.10%	0.09%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	82.69%	82.69%	99.56%	99.56%	86.47%	86.47%
TTSL-CDMA	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	98.38%	98.48%	97.67%	97.67%
VODAFONE	0.08%	0.08%	0.02%	0.02%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.14%	96.92%

15.6.2. METERING AND BILLING CREDIBILITY : POSTPAID



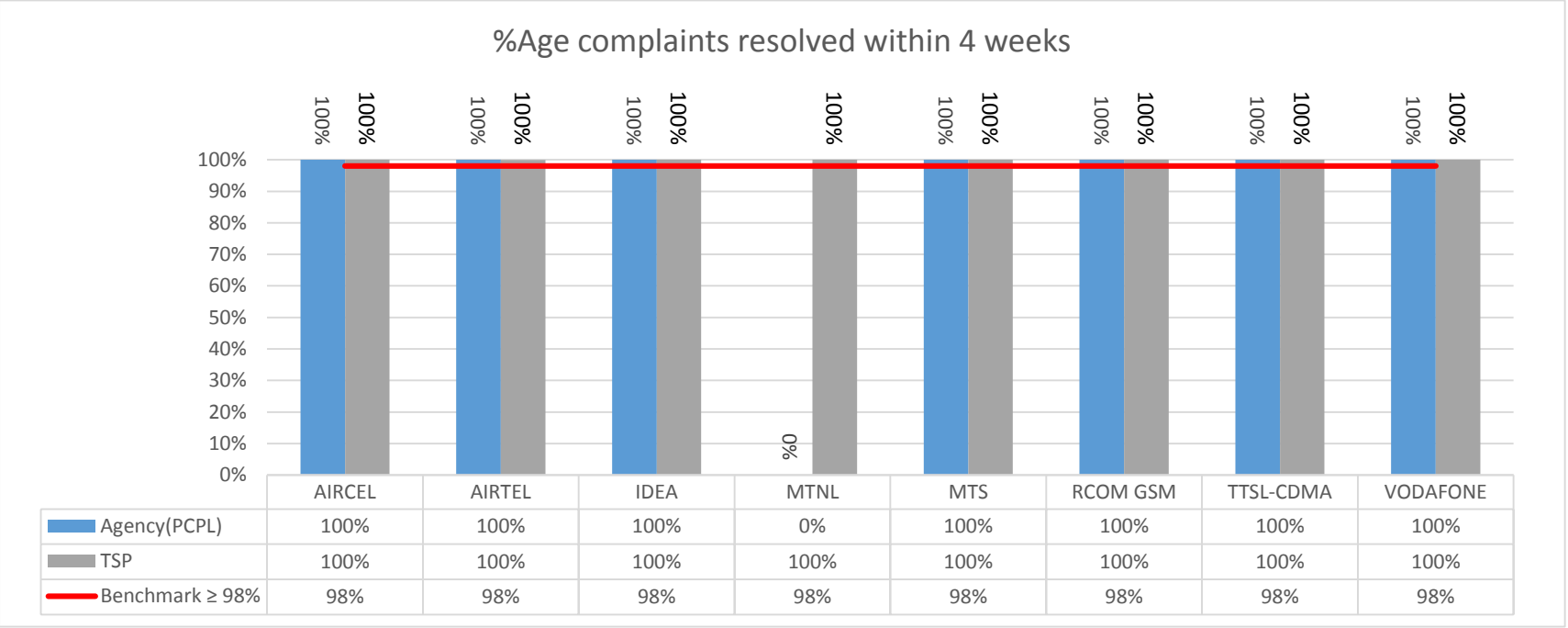
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	0.00%	0.03%	0.08%	0.00%	0.02%	0.09%	0.00%	0.08%
TSP	0.00%	0.02%	0.08%	0.03%	0.02%	0.09%	0.00%	0.08%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

15.6.3. METERING AND BILLING CREDIBILITY : PREPAID



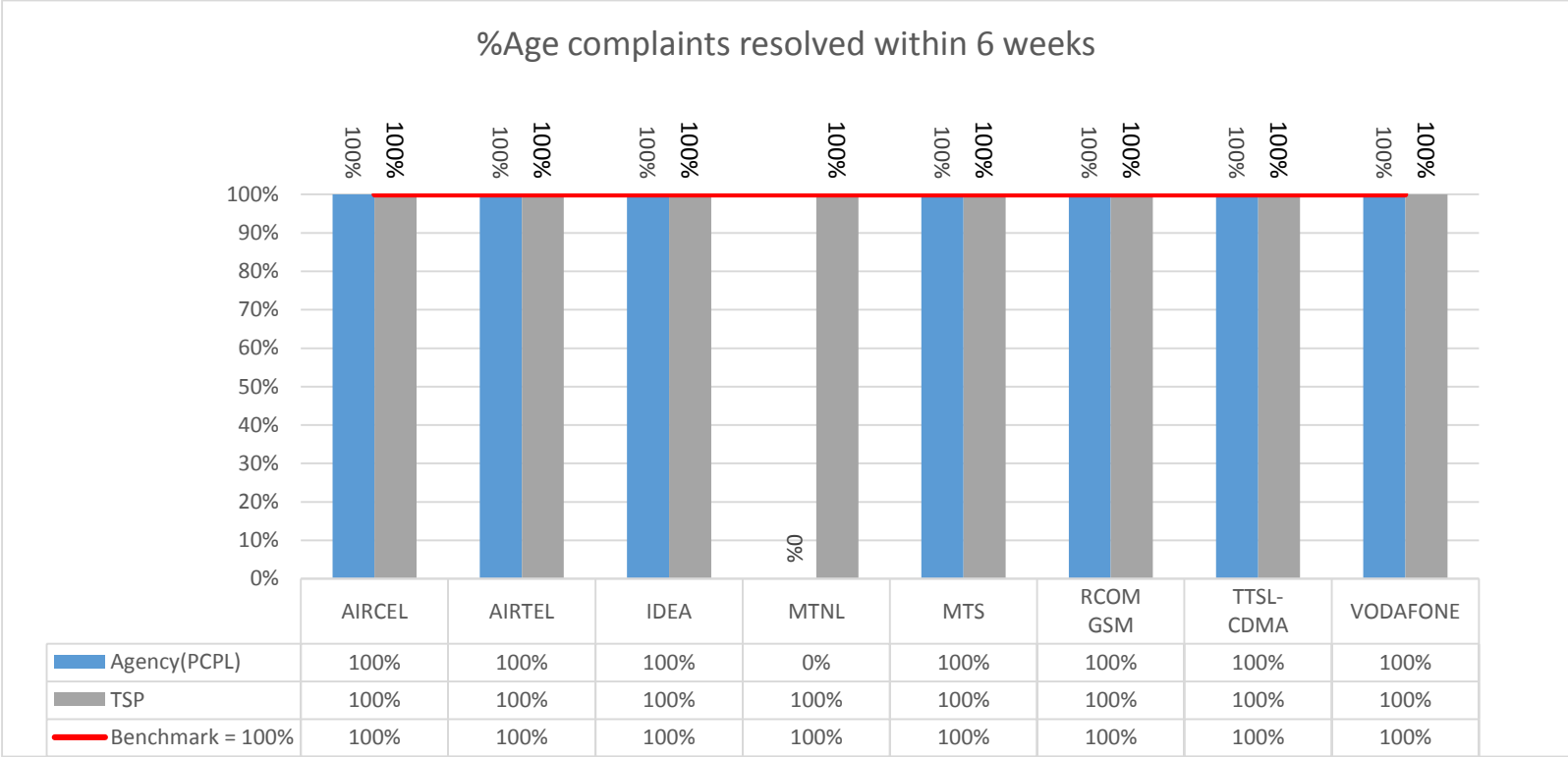
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	0.00%	0.00%	0.06%	0.00%	0.02%	0.10%	0.00%	0.02%
TSP	0.00%	0.11%	0.06%	0.03%	0.02%	0.09%	0.00%	0.02%
Benchmark ≤ 0.1%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%

15.6.4. %AGE COMPLAINT RESOLVED WITHIN 4 WEEKS



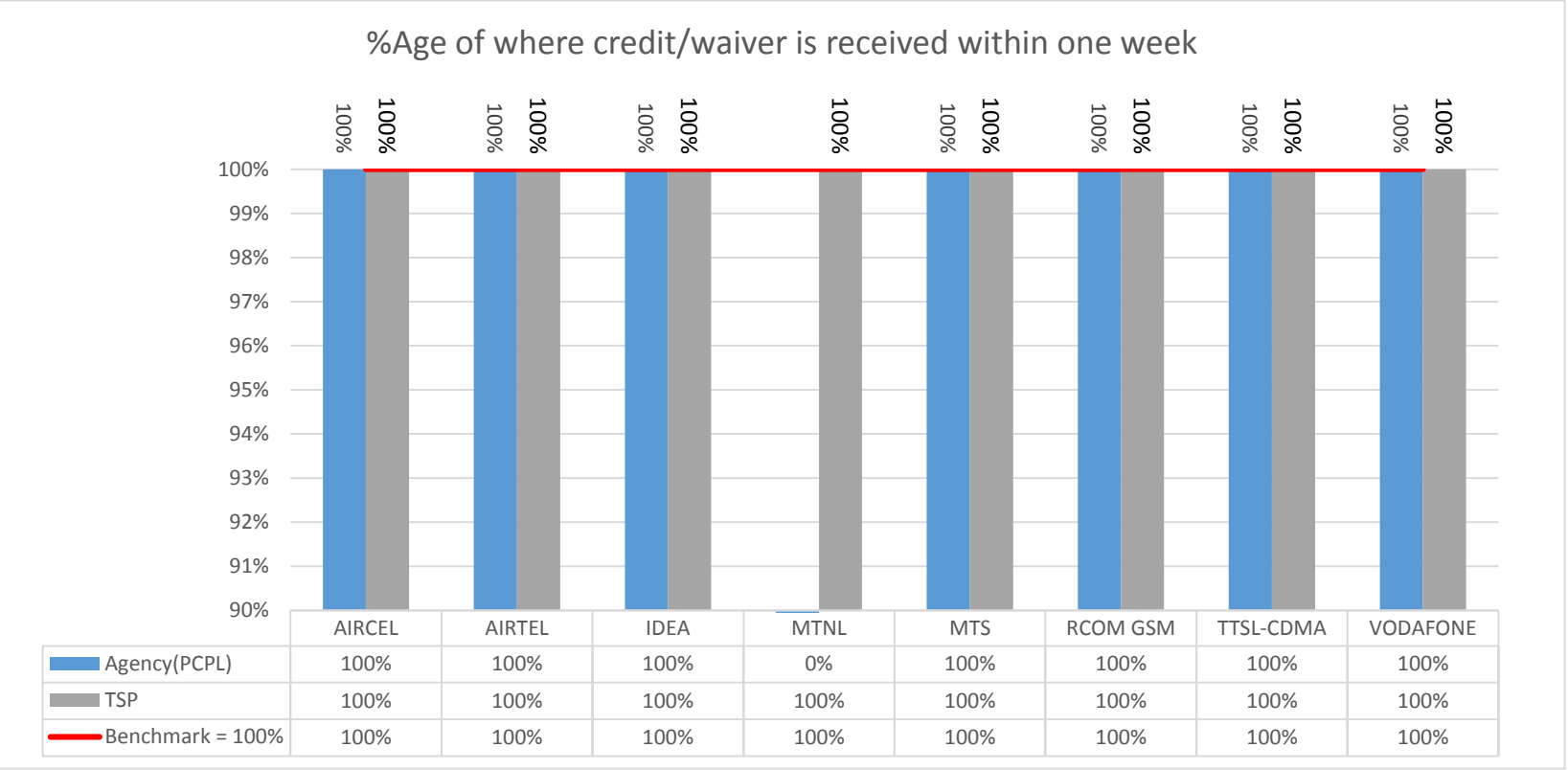
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	100%	100%	100%	0%	100%	100%	100%	100%
TSP	100%	100%	100%	100%	100%	100%	100%	100%
Benchmark ≥ 98%	98%	98%	98%	98%	98%	98%	98%	98%

15.6.5. %AGE COMPLAINTS RESOLVED WITHIN 6 WEEKS

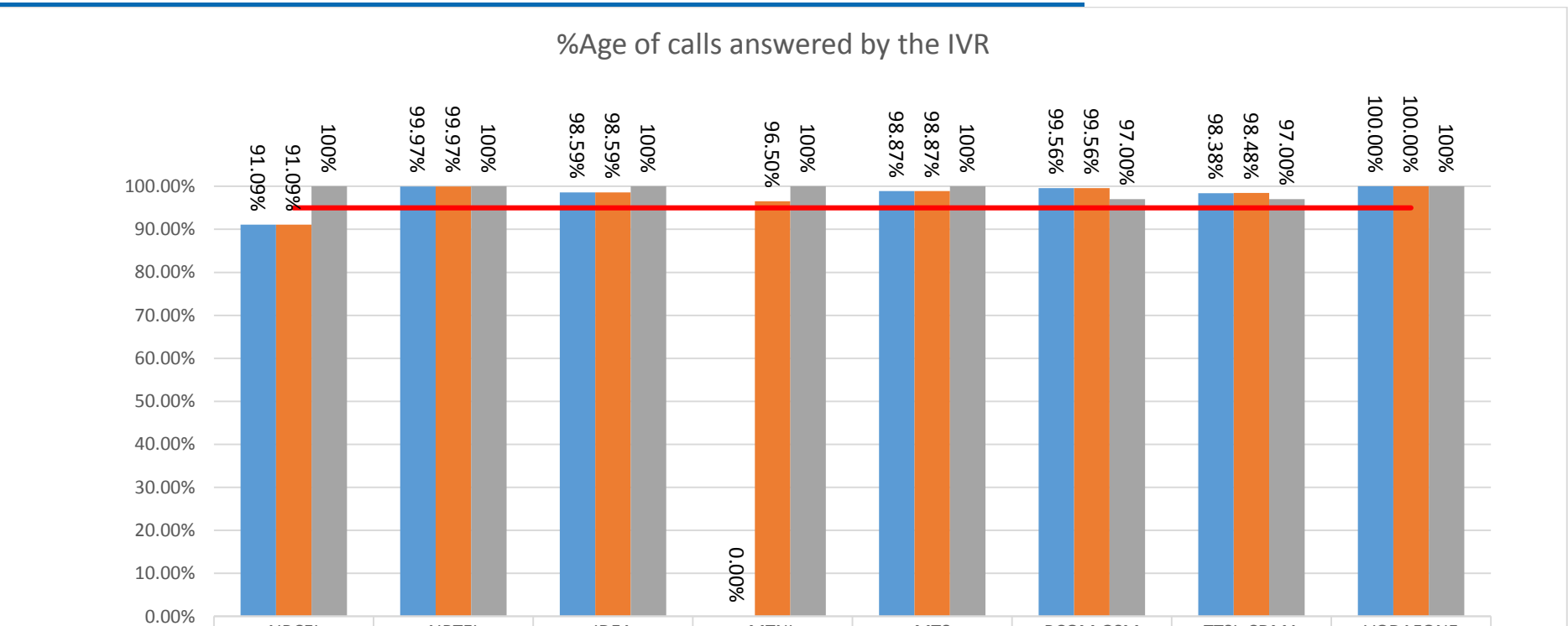


	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	100%	100%	100%	0%	100%	100%	100%	100%
TSP	100%	100%	100%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%

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

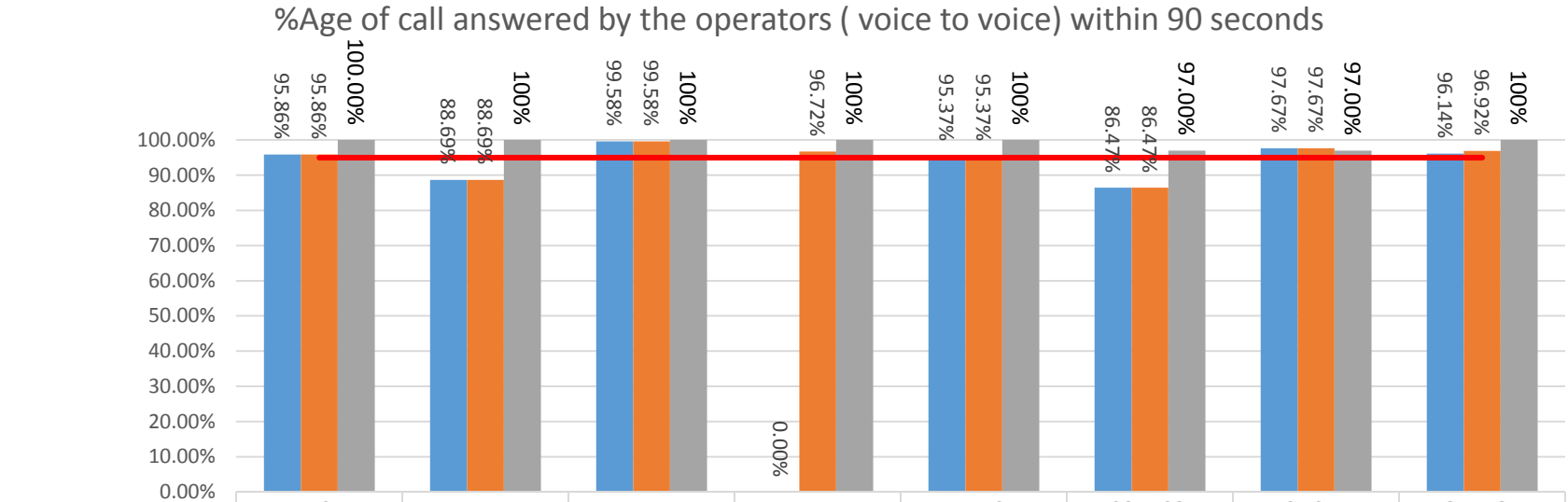


15.6.7. %AGE OF CALLS ANSWERED BY THE IVR



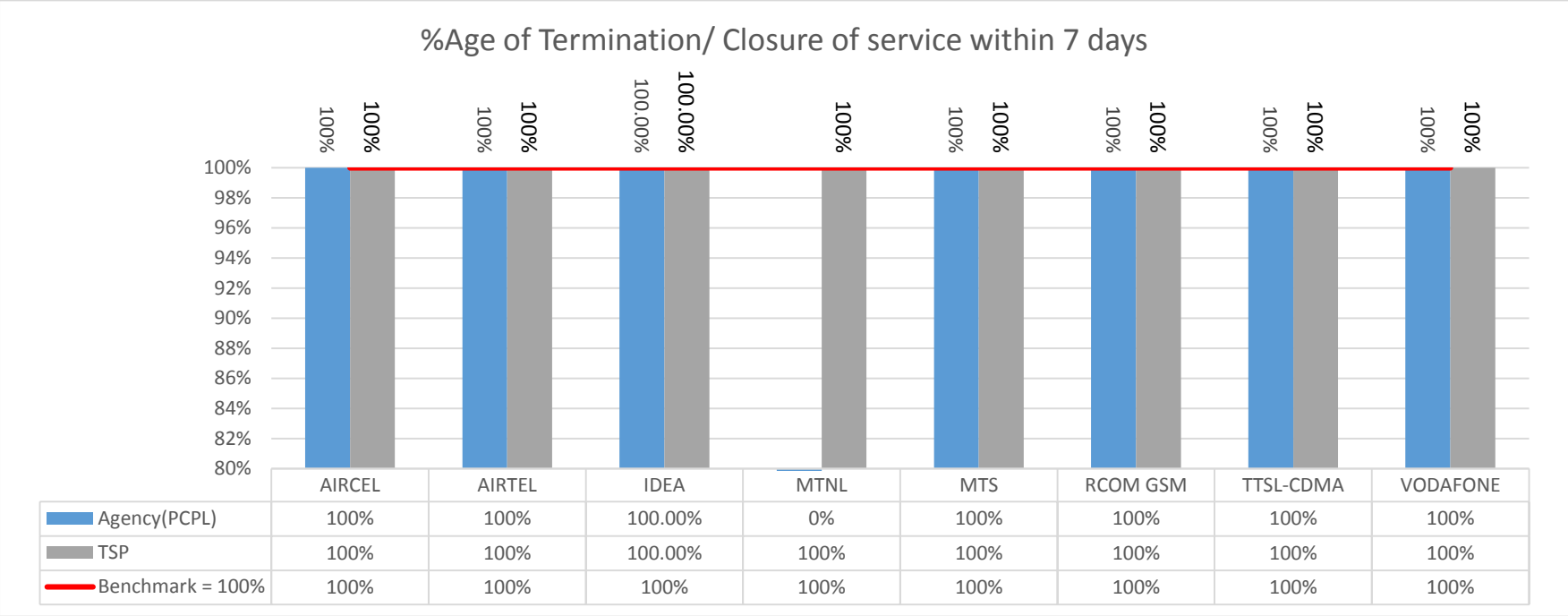
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	91.09%	99.97%	98.59%	0.00%	98.87%	99.56%	98.38%	100.00%
TSP	91.09%	99.97%	98.59%	96.50%	98.87%	99.56%	98.48%	100.00%
Live Calling	100%	100%	100%	100%	100%	97.00%	97.00%	100%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%	95%	95%

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



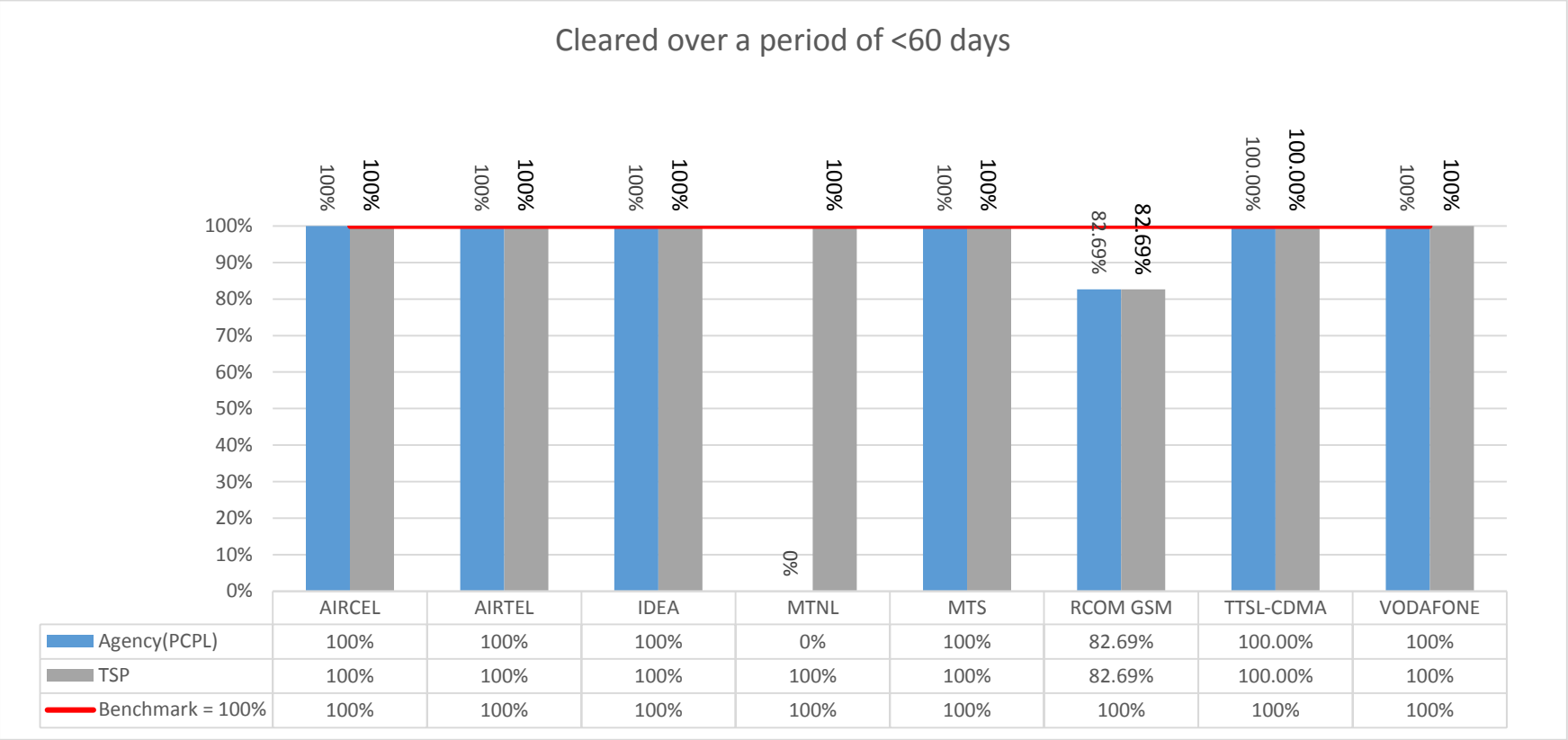
	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	95.86%	88.69%	99.58%	0.00%	95.37%	86.47%	97.67%	96.14%
TSP	95.86%	88.69%	99.58%	96.72%	95.37%	86.47%	97.67%	96.92%
Live Calling	100.00%	100%	100%	100%	100%	97.00%	97.00%	100%
Benchmark ≥ 95%	95%	95%	95%	95%	95%	95%	95%	95%

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



	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	100%	100%	100.00%	0%	100%	100%	100%	100%
TSP	100%	100%	100.00%	100%	100%	100%	100%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%

15.6.10. CLEARED OVER A PERIOD OF <60 DAYS



	AIRCEL	AIRTEL	IDEA	MTNL	MTS	RCOM GSM	TTSL-CDMA	VODAFONE
Agency(PCPL)	100%	100%	100%	0%	100%	82.69%	100.00%	100%
TSP	100%	100%	100%	100%	100%	82.69%	100.00%	100%
Benchmark = 100%	100%	100%	100%	100%	100%	100%	100%	100%

16. KEY FINDINGS

12.1. BILLING AND CUSTOMER CARE

- RCOM has parameter value of 82.69% and failed to meet the benchmark of =100% time taken for refund of deposits after closures which is cleared over period of <60 days.
- IDEA has a parameter value of 0.26% and failed to meet the benchmark of ≤ 0.1% metering and billing credibility for prepaid subscriber.
  AIRCEL has a parameter value of 91.09% and failed to meet the benchmark of ≥ 95% for Response time to customer for assistance %age of calls answered by the IVR.
- RCOM has a parameter value of 86.47% and failed to meet the benchmark of ≥ 95% for Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 seconds.
- AIRTEL has a parameter value of 88.69% and failed to meet the benchmark of ≥ 95% for Response time to customer for assistance %age of call answered by the operators (voice to voice) within 90 seconds.