



**Audit & Assessment of Quality of Service
Of
Cellular Mobile Telephone Service
Basic Telephone (Wire line) Service
&
Broadband Service
For
Telecom Regulatory Authority of India**

**North Zone – UP (East) Service Area
(July 2015 – September 2015)**

Prepared by

**TÜV SÜD SOUTH ASIA PVT. LTD,
C-153/1, Okhla Industrial Estate,
Phase-1, New Delhi – 110020
Telephone 011- 30889611
Fax: 011-30889595**

PREFACE

The Telecom Regulatory Authority of India (TRAI) was established in 1997 by an Act of Parliament, called the Telecom Regulatory Authority of India Act, 1997, to regulate telecom services. The Authority's mission is to ensure that the interest of consumers are protected and at the same time to nurture conditions for growth of telecommunications, broadcasting and cable services in a manner and at a pace which will enable India to play a leading role in emerging global information society.

The Authority, in exercise of its functions as per the provisions in the TRAI Act, has been entrusted to measure the Quality of Service provided by the Service Providers from time to time and to compare them with the benchmarks so as to assess the level of performance. In pursuance of this, TRAI has appointed **M/s TUV-SUD South Asia Pvt. Ltd.** to carry out "Audit and Assessment of Quality of Service" provided by Basic (Wire line), Cellular Mobile and Broadband service providers in terms of the benchmarks specified in the respective regulations, in North and West Zones.

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **UP (E) circle** against the QoS bench marks laid down by TRAI in the respective regulations.

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1. BACKGROUND



1. BACKGROUND

Telecom Regulatory Authority of India has been entrusted to “lay down the standards of quality of service to be provided by the service providers and ensure the quality of service and conduct the periodical survey of such service provided by the service providers so as to protect interest of the consumers of telecommunication services” vide sub-clause (v) of clause (b) of sub-section (1) of section 11 of the Telecom Regulatory Authority of India Act, 1997 (24 of 1997).

The purpose of laying down Quality of Service Parameters is to:

- i) Create conditions for consumer satisfaction by making known the quality of service, which the Service provider is required to provide, and the user has a right to expect.
- ii) Measure the Quality of Service provided by the Service Providers from time to time and to compare them with the norms so as to assess the level of performance.
- iii) Generally protect the interests of consumers of telecommunication services.

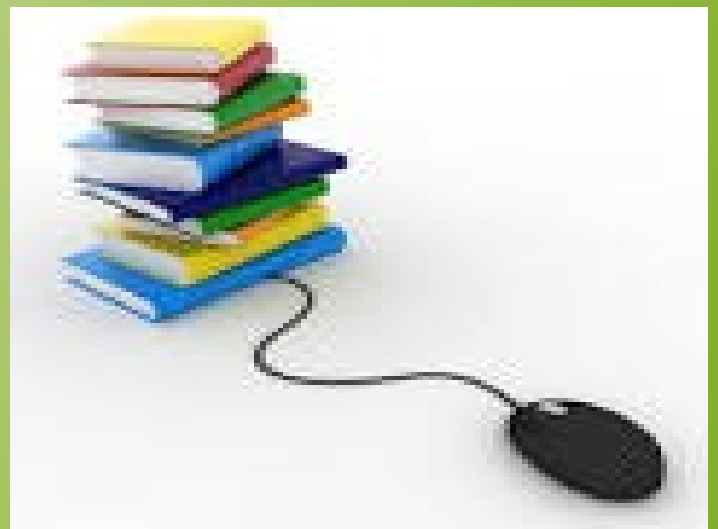
TRAI, the regulatory watch dog for the Quality of Service for the telecom services – Basic (Wire line), Cellular Mobile (Wireless) and Broadband has commissioned **M/s TUV-SUD South Asia Pvt. Ltd.** for conducting audit and assessment of quality of service of service providers, in terms of the benchmarks specified in the “The Standards of Quality of Service of Basic Telephone Service (Wire line) and Cellular Mobile Telephone Service Regulations, 2009 (7 of 2009) dated 20th March, 2009 and the Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6th October, 2006 on zonal basis for **North Zone and West Zone** comprising of the following Telecom Circles/Metro Service Areas:

North Zone: Delhi, Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Uttar Pradesh-East and Uttar Pradesh-West (including Uttarakhand). For the cellular mobile telephone service the service area of Delhi includes Ghaziabad, Faridabad, Noida and Gurgaon.

West Zone: Mumbai, Maharashtra (including Goa and excluding Mumbai), Gujarat and Madhya Pradesh (including Chhattisgarh).

The Audit exercise would assess the Quality of Service of telecom operators providing Basic (Wire line), Cellular Mobile (Wireless) and Broadband services by auditing the relevant QoS records maintained by the operators, conducting drive tests as well as live measurements and comparing them with quality of service benchmarks stipulated by TRAI. The audit would be carried out by **TUV-SUD South Asia** every quarter across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. However, in respect of Basic telephone service (wireline) and Broadband service, a circle would be audited once in a year.

2. OBJECTIVES AND METHODOLOGY



2. OBJECTIVES AND METHODOLOGY

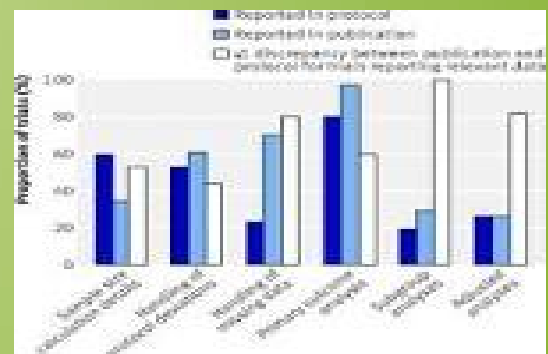
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for UP (E), UP (W), and MP&CG circles during the quarter July 2015 – September 2015.**

The Scope of work as per the Terms of Reference (TOR) includes the following:

- i) Preparation of Performance Monitoring reports (PMRs) and uploading in the system.
- ii) Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days during each audit.
- iii) Monthly audit based on one month data of the SPs.
- iv) Drive test of the RF networks.
- v) Audit of the performance of call centers with respect to their accessibility and percentage of calls answered by the operators and random customer feedback by calling the customers to get feedback of the services provided by the service providers.
- vi) Transfer of data generated by the RF drive test/Live measurements / PMR/ monthly audit to the server located at TRAI premises on real time basis.

3. SAMPLE SIZE



3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

- 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centers (MSC's) of all the Cellular Mobile Service Providers or Unified Access Service Providers (UASP) were covered for audit in specified circles/service areas. Following are the various operators covered in UP(E) circle

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location/Address
GSM Operators		July-15	August -15	September -15	
1	AIRCEL	27 to 29 Jul-15	21 to 23 Aug-15	1 to 3 Sep-15	3rd floor,Ratan Square,Hajratganj,Lucknow
2	AIRTEL	15 to 17 Jul-15	10 to 12 Aug-15	7 to 9 Sep-15	TCG 7/7, vibhuti khand, Gomti Nagar,Lucknow
3	BSNL	23 to 25 Jul-15	24 to 26 Aug-15	14 to 16 Sep-15	BSNL, Mahanager , Lucknow
4	IDEA	13 to 15 Jul-15	20 to 22 Aug-15	16 to 18 Sep-15	Idea Cellular Ltd., Fortuna Towers, 10 Rana Pratap Road, Lucknow-226001
5	RCOM GSM	20 to 22 Jul-15	24 to 26 Aug-15	1 to 3 Sep-15	House No. 12, C/O BTC House Eldeco Greens, Gomti Nagar, Lucknow-226010
6	VIDEOCON	9, 10 & 13 Jul-15	19 to 21 Aug-15	4, 7 & 8 Sep-15	Videocon Telecommunications Limited, SS Plaza CP-1, First Floor, Sector-I, LDA colony, Ashiyana, Lucknow-226012
7	VODAFONE	21 to 23 Jul-15	18 to 20 Aug-15	1 to 3 Sep-15	Shalimar Titanium , Vibhuti Khand, Gomti Nagar, Lucknow
8	UNINOR	21 to 23 Jul-15	20, 21 & 24 Aug-15	17, 18 & 21 Sep-15	Telewings Communications Services Pvt Ltd. (Uninor), Welldone Technology Park Sec-48 Sohana Road Gurgaon
9	TATA GSM	1 to 3 Jul-15	3 to 5 Aug-15	7 to 9 Sep-15	Tata Teleservices Ltd., Prem Plaza Building 2, RF Bahadurji Marg, Lucknow
CDMA Operators					
10	RCOM CDMA	ND	24 to 26 Aug-15	1 to 3 Sep-15	House No. 12, C/O BTC House Eldeco Greens, Gomti Nagar, Lucknow-226010
11	TATA CDMA	1 to 3 Jul-15	3 to 5 Aug-15	7 to 9 Sep-15	Tata Teleservices Ltd., Prem Plaza Building 2, RF Bahadurji Marg, Lucknow

ND: Not done: Data not provided by RCOM (CDMA) due to TTI sever issue.

For all the above operators, audit was conducted in all the three months of the Quarter ended Sept. 2015.

The data generated by monthly PMR and 3-days live measurements audit for the period July 2015 to September 2015 has been successfully uploaded to the server located at TRAI premises.

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles **once in a year**. As per the current list of the exchanges provided by BSNL, there are total 2142 exchanges in UPE Circle. Out of **2142**, **audit was done for sampled 26 (Urban) and 76 (Rural) exchanges** of BSNL (List of BSNL exchanges undertaken for QoS audit attached as **Annex-1**), One exchange each of Bharti-Airtel, RCL, TTL and Vodafone.

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

TUV-SUD South Asia 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, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle **once in a year**. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

Discussion with the private broadband service providers revealed 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

4. EXECUTIVE SUMMARY



4. 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 TUV-SUD 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
- TUV-SUD 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.
- **Essence of compliance report of service providers with respect to the QoS:**

Cellular Mobile

(i) From monthly audit findings, it was concluded that the service providers largely met the benchmarks except **Vodafone, Tata (GSM), Tata (CDMA) and Uninor**. **Vodafone, Tata (CDMA)/Tata (GSM)** failed to meet the benchmarks of the parameter **Worst affected cells> 3% TCH drop** with their quarterly average performance as **3.89%, 8.79% and 8.81%** respectively. Further, **Tata GSM** and **Uninor** also lagged behind the benchmark of parameter **TCH congestion/CSSR** and **Voice Quality** having achieved level as **3.03%/94.69%** and **93.43%** respectively.

(ii) Three days live assessment revealed that the operators were meeting the benchmark of most of the parameters. However, **Aircel, Tata (GSM), Vodafone** and **Tata (CDMA)** failed to meet the benchmark for the parameter **“worst affected Cell > 3% TCH Drop”**. Their average performance for this parameter was **3.06%, 8.53%, 3.65% and 9.50%** respectively. Further, **Tata (GSM)** also remained non-complied in respect of parameters **CSSR** and **TCH congestion** with its performance as **94.56% and 3.23%** and **Uninor** lagged behind the benchmark for the parameter **‘Voice Quality’** with its average performance as **93.63%**.

(iii) With regard to the **Customer Service Quality Parameters**, it was revealed that most of the operators were in well compliance of the parameters on Metering and Billing Credibility, Termination of Service and Time taken for refunds. However, , **Vodafone** remained non complied for billing complaint (post-paid) and **Idea** for billing complaints (pre-paid) with their performance as **0.14%** and **0.34%** respectively.

In respect of the parameters 'Response Time to Customer for assistance', all service providers are in compliance with respect to the parameter **Accessibility of call center**. Whereas, **RCOM GSM** and **RCOM CDMA** remained non-complied for parameter '**Calls answered by Operators (Voice to Voice)**' with their performance as **73.75%** and **85.94%** respectively.

(iv) With regard to the **Drive Test** results, the performance of the operators namely **BSNL, Tata (GSM)/ Tata (CDMA), Idea, Airtel and Uninor** was not satisfactory with respect to some of the parameters such as **Voice Quality, Call drop rate**.

(v) Basic (Wire line):

From the audit of Basic (wire line), it was concluded that the performance of all the operators was within the benchmark except **Bharti Airtel** could not meet the benchmark for parameter **Calls answered by Operators**. **BSNL** also failed to meet the parameter "**Time taken for refund of deposit after closures**".

(vi) Broadband Service:

The broadband audit revealed that all operators were in well compliance of the benchmarks except **Broadband Pacenet** could not meet the benchmark of the parameter **Bandwidth utilization** with its achieved level as **82.31%**. **BSNL** also could not meet the benchmark for the parameter "**Time taken for refund of deposit after closures**" with their performance as **91.49%** against the benchmark of 100% within 60 days.

5. PMR AUDIT REPORT



5. PMR AUDIT REPORTS:

5.1 MONTHLY PMR:

5.1.1 BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	AIRCEL	September -15	20:00 - 21:00
2	AIRTEL	September -15	20:00 - 21:00
3	BSNL	September -15	20:00 - 21:00
4	IDEA	September -15	20:00 - 21:00
5	RCOM GSM	September -15	19:00 - 20:00
6	UNINOR	September -15	20:00 - 21:00
7	TATA GSM	September -15	20:00 - 21:00
8	VIDEOCON	September -15	20:00 - 21:00
9	VODAFONE	September -15	20:00 - 21:00
CDMA Operators			
10	RCOM CDMA	September -15	19:00 - 20:00
11	TATA CDMA	September -15	20:00 - 21:00

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the UP (E) circle.

5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRCEL	5	28	3433	ZTE	ZTE
2	AIRTEL	48	110	10233	Ericsson	Ericsson
3	BSNL	28	79	6405	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	12	44	8037	NSN	NSN
5	RCOM GSM	4	19	2092	Huawei	Huawei
6	UNINOR	14	34	4812	Ericsson	Ericsson
7	TATA GSM	4	21	2306	NSN	NSN
8	VIDEOCON	1	1	7	Huawei	Huawei
9	VODAFONE	18	140	9936	NSN	NSN
CDMA Operators						
10	RCOM CDMA	8	9	1142	Huawei & Lucent	Huawei & Lucent
11	TATA CDMA	4	5	314	Huawei & Ericsson	Huawei, ZTE & Motorola

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JULY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- JULY 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	July-15	0.14%	0.31%	1.78%	0.47%	0.23%	0.49%	0.18%	0.34%	0.18%	*NP	0.29%
	b) Worst affected BTSs due to downtime	<=2%	July-15	0.26%	1.07%	1.84%	1.92%	0.10%	1.89%	1.69%	0.00%	0.56%	*NP	1.91%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	July-15	98.60%	96.29%	98.77%	98.31%	99.32%	97.52%	93.87%	98.50%	98.41%	*NP	98.13%
	b) SDCCH/PAGING Channel congestion	<=1%	July-15	0.73%	0.42%	0.85%	0.83%	0.03%	0.47%	0.82%	0.19%	0.35%	*NP	0.00%
	c) TCH congestion	<=2%	July-15	1.75%	0.58%	1.75%	1.62%	0.11%	1.22%	3.64%	0.76%	1.59%	*NP	0.22%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	July-15	0.63%	0.93%	1.53%	1.42%	0.22%	0.58%	1.23%	1.12%	0.94%	*NP	0.70%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	July-15	2.82%	2.89%	2.37%	2.73%	0.05%	1.61%	8.99%	0.15%	3.45%	*NP	9.13%
	c) Connections with good voice quality	>=95%	July-15	96.92%	96.87%	96.50%	96.91%	98.73%	93.52%	96.63%	98.71%	96.51%	*NP	99.19%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	July-15	0	0	0	0	0	0	0	0	0	*NP	0

*NP: Data not provided by RCOM (CDMA) due to TTI sever issue in the month of July 2015

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – AUGUST 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- AUGUST 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	Aug-15	0.14%	0.08%	1.86%	0.45%	0.12%	0.49%	0.18%	0.24%	0.15%	0.14%	0.11%
	b) Worst affected BTSs due to downtime	<=2%	Aug-15	0.35%	0.42%	1.78%	1.94%	0.62%	1.96%	0.39%	0.00%	0.37%	0.44%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Aug-15	98.60%	96.36%	97.70%	98.11%	99.36%	96.26%	95.03%	98.87%	98.82%	99.12%	98.38%
	b) SDCCH/PAGING Channel congestion	<=1%	Aug-15	0.71%	0.33%	0.83%	0.91%	0.03%	0.72%	0.59%	0.51%	0.31%	0.00%	0.00%
	c) TCH congestion	<=2%	Aug-15	1.47%	0.54%	1.90%	1.89%	0.10%	2.40%	2.75%	0.40%	1.18%	0.01%	0.06%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	Aug-15	0.68%	0.98%	1.97%	1.45%	0.18%	0.80%	1.21%	1.14%	0.95%	0.21%	0.68%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Aug-15	3.00%	2.93%	2.54%	2.73%	0.04%	3.58%	8.96%	0.00%	4.27%	0.95%	9.12%
	c) Connections with good voice quality	>=95%	Aug-15	96.89%	96.84%	96.50%	96.66%	98.79%	93.44%	96.66%	98.20%	96.41%	99.85%	99.21%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Aug-15	0	0	0	0	0	0	0	0	0	0	0

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – SEPTEMBER 15 MONTH

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- SEPTEMBER 15 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
S/N	Name of Parameter			GSM Operators										CDMA Operators	
Network Service Quality Parameter															
1	Network Availability														
	a) BTS Accumulated Downtime	<=2%	Sep-15	0.15%	0.32%	1.95%	0.48%	0.22%	0.49%	0.22%	0.31%	0.17%	0.10%	0.13%	
	b) Worst affected BTSs due to downtime	<=2%	Sep-15	0.58%	1.91%	1.87%	1.82%	0.53%	1.97%	0.39%	0.00%	0.62%	0.09%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Sep-15	98.69%	96.39%	98.20%	97.84%	99.37%	97.17%	95.16%	99.15%	99.15%	98.83%	98.61%	
	b) SDCCH/PAGING Channel congestion	<=1%	Sep-15	0.43%	0.77%	0.93%	0.93%	0.03%	0.73%	0.58%	0.53%	0.22%	0.00%	0.00%	
	c) TCH congestion	<=2%	Sep-15	0.95%	0.54%	1.95%	1.64%	0.10%	1.49%	2.71%	0.14%	0.85%	0.01%	0.12%	
3	Connection maintenance (Retainability)														
	a) CDR (Call Drop Rate)	<=2%	Sep-15	0.62%	1.04%	1.88%	1.64%	0.21%	0.64%	1.17%	0.88%	0.89%	0.22%	0.61%	
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Sep-15	2.83%	2.92%	2.71%	2.83%	0.02%	1.70%	8.41%	0.00%	3.95%	1.02%	8.19%	
	c) Connections with good voice quality	>=95%	Sep-15	96.98%	96.86%	96.50%	96.47%	98.84%	93.33%	96.70%	98.93%	96.31%	99.85%	99.21%	
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Sep-15	0	0	0	0	0	0	0	0	0	0	0	

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- SEPT. 15 (JULY TO SEPT 2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-SEPTEMBER-15) OF UP(E) CIRCLE														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	Quarterly	0.14%	0.24%	1.86%	0.47%	0.19%	0.49%	0.19%	0.30%	0.17%	0.12%	0.18%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.40%	1.13%	1.83%	1.89%	0.42%	1.94%	0.82%	0.00%	0.52%	0.27%	0.64%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	98.63%	96.35%	98.22%	98.09%	99.35%	96.98%	94.69%	98.84%	98.79%	98.98%	98.37%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.62%	0.51%	0.87%	0.89%	0.03%	0.64%	0.66%	0.41%	0.29%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	1.39%	0.55%	1.87%	1.72%	0.10%	1.70%	3.03%	0.43%	1.21%	0.01%	0.13%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.64%	0.98%	1.79%	1.50%	0.20%	0.67%	1.20%	1.05%	0.93%	0.22%	0.66%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.88%	2.91%	2.54%	2.76%	0.04%	2.30%	8.79%	0.05%	3.89%	0.99%	8.81%
	c) Connections with good voice quality	>=95%	Quarterly	96.93%	96.86%	96.50%	96.68%	98.79%	93.43%	96.66%	98.61%	96.41%	99.85%	99.20%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0	0

NB: Calculation for RCOM (CDMA) is done on the basis of two months (Aug & Sept 15) average data.

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit of network related parameters for cellular mobile service providers was conducted at their respective MSCs in the circles.

TUV conducted audit for cellular mobile operators based on **three stage audit / verification viz audit of the records, live measurements and drive tests. This exercise has been repeated every month for CMSPs.**

The audit for BSNL has been done for the network coming under jurisdiction of GM / BSNL/ Lucknow in all the three months.

Network Service Quality Parameters:

- **Network Availability**

- i. BTS Accumulated Downtime (Not Available for Service):
- ii. Worst affected BTSs due to downtime

For measuring the performance against the benchmark for this parameter, down time of each BTS lasting for more than 1 hour at a time in a day during the period of a month has been taken for computation.

In UP(E) circle, **all the operators were found meeting benchmark on the above parameters 'BTS accumulated downtime' and 'worst affected BTSs due to down time' .**

- **Connection Establishment (Accessibility)**

- i. Call Set-up Success Rate(CSSR)

CSSR includes complete signaling in the call set up process and does not aim to measure the performance of the called exchange or that of the Point of Interconnection (POI). CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made.

All operators, except Tata GSM were meeting the benchmark on this parameter. Tata GSM could achieve the score for this parameter as 94.69%

- **Parameters related to Network Congestion:**

The parameters namely SDCCH / Paging Channel Congestion, TCH and POI are prescribed with the aim of measuring the congestion in the network.

In CDMA system, there is no direct counter defined for reporting Paging Channel Congestion as reported by Tata Teleservices. However, they have a defined counter for Paging Channel Occupancy Ratio (**PCH Average Using Ratio**) which is used to determine the Paging Channel Occupancy which on an average is < 50% on all sites in the network. When the value of this parameter is less than 100%, it is counted as 0% congestion. Thus, there is no congestion on the paging channel in CDMA system.

With respect to this parameter, **the performance of the operators is quite satisfactory as all operators (except Tata GSM) met the TRAI specified benchmarks** on the congestion parameters.

Only Tata (GSM) failed to meet the benchmark of the parameter TCH Congestion with its performance as 3.03%.

- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

This parameter gives a reliable measurement of the mobile network used by the service provider for maintaining a call once it has been correctly established. Failures in coverage, network congestion and network failures have important impact on this parameter.

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, **all the service providers were found to be meeting the TRAI specified benchmark**. The lowest call drop rate (average 0.20%) was for RCOM GSM during the quarter.

- ii. Worst affected cells having more than 3% TCH drops

Worst affected cells are defined as cells in which the call drop rate exceeds 3% during cell Bouncing Busy Hour (CBBH) or at any other hour of a day.

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter except **Vodafone, Tata (GSM) and Tata (CDMA)** remained non-complied in all the 3 months of the quarter. The quarterly average performance level of **Vodafone, Tata (GSM) and Tata (CDMA) was 3.89%, 8.79 % and 8.81%** respectively.

- iii. Connections with good voice quality:

The audit results for this parameter indicates that all operators have met the bench mark for the parameter except **Uninor**. **Uninor** failed to meet the benchmark with its average performance of **93.43%**.

- vi. No. of POI's having $\geq 0.5\%$ POI congestion:

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter as there was no individual POI having congestion $> 0.5\%$.

**3-DAYS LIVE MEASUREMENT DATA VERIFICATION FOR
CELLULAR MOBILE SERVICE PROVIDERS
(NETWORK SERVICE QUALITY PARAMETER)**



5.2 LIVE MEASUREMENT DATA (3-DAYS) FOR CELLULAR MOBILE SERVICE PROVIDERS (NETWORK SERVICE QUALITY PARAMETER):

5.2.1 LIVE MEASUREMENT DATA (3-DAYS) – JULY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE - JULY15 MONTH														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	Live data	0.09%	0.49%	1.93%	0.41%	NP	0.40%	0.17%	0.00%	0.54%	NP	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.12%	0.22%	0.07%	NP	0.02%	0.00%	0.00%	0.00%	NP	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.59%	96.07%	97.31%	98.54%	99.31%	97.44%	93.32%	98.82%	98.64%	NP	98.22%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.67%	0.38%	0.62%	0.83%	0.02%	0.45%	0.84%	0.10%	0.32%	NP	0.00%
	c) TCH congestion	<=2%	Live data	1.65%	0.60%	1.67%	1.45%	0.10%	1.18%	4.14%	0.49%	1.36%	NP	0.13%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	Live data	0.62%	0.99%	0.36%	1.47%	0.22%	0.54%	1.23%	1.33%	0.91%	NP	0.74%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.56%	2.91%	0.25%	2.88%	0.05%	1.51%	8.53%	0.00%	2.87%	NP	12.06%
	c) Connections with good voice quality	>=95%	Live data	96.81%	96.69%	96.61%	96.80%	98.76%	93.74%	96.59%	98.51%	96.84%	NP	99.21%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Live data	0	0	0	0	0	0	0	0	0	NP	0

*NP: Data not provided by RCOM (GSM & CDMA) due to TTI sever issue in the month of July 2015

5.2.2 LIVE MEASUREMENT DATA (3-DAYS) – AUGUST 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE - AUGUST 15 MONTH														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.15%	1.84%	0.35%	0.14%	0.37%	0.13%	0.00%	0.73%	0.20%	0.18%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.09%	0.19%	0.10%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.54%	96.31%	97.88%	98.10%	99.35%	97.31%	94.68%	97.26%	98.96%	99.11%	98.02%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	1.01%	0.38%	0.81%	0.90%	0.02%	0.58%	0.17%	0.51%	0.22%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.53%	0.53%	1.14%	1.88%	0.10%	1.43%	2.87%	1.54%	1.04%	0.04%	0.03%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	Live data	0.68%	1.00%	0.40%	1.38%	0.21%	0.56%	1.18%	1.29%	0.86%	0.23%	0.61%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.99%	2.90%	0.17%	2.74%	0.04%	1.43%	8.61%	0.00%	3.73%	1.11%	8.58%
	c) Connections with good voice quality	>=95%	Live data	96.86%	96.78%	96.64%	96.90%	98.81%	93.51%	96.69%	97.40%	96.65%	99.80%	99.25%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Live data	0	0	0	0	0	0	0	0	0	0	0

5.2.3 LIVE MEASUREMENT DATA (3-DAYS) – SEPTEMBER 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP (E) CIRCLE – SEPTEMBER 15 MONTH														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	Live data	0.20%	0.48%	1.91%	0.61%	0.00%	0.55%	0.27%	0.00%	0.29%	0.00%	0.12%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.06%	0.19%	0.16%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.61%	96.46%	96.91%	97.79%	99.32%	97.27%	95.68%	98.95%	99.15%	98.46%	98.27%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.70%	0.30%	0.78%	0.95%	0.03%	0.69%	0.52%	0.56%	0.22%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.09%	0.52%	1.63%	1.85%	0.10%	1.45%	2.69%	0.48%	0.85%	0.02%	0.12%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	Live data	0.68%	1.09%	0.84%	1.19%	0.22%	0.62%	1.10%	0.59%	0.99%	0.27%	0.63%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.63%	2.90%	0.39%	2.91%	0.03%	1.67%	8.45%	0.00%	4.36%	1.21%	7.87%
	c) Connections with good voice quality	>=95%	Live data	96.85%	96.66%	96.67%	96.99%	98.79%	93.65%	96.63%	98.83%	95.89%	99.86%	99.27%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Live data	0	0	0	0	0	0	0	0	0	0	0

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JULY TO SEPTEMBER 2015 MONTHS)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE- SEPT 15) – UP (E) CIRCLE														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
	Network Service Quality Parameter													
1	Network Availability													
	a) BTS Accumulated Downtime	<=2%	Quarterly	0.12%	0.37%	1.89%	0.46%	0.07%	0.44%	0.19%	0.00%	0.52%	0.10%	0.10%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.03%	0.13%	0.19%	0.10%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	98.58%	96.28%	97.37%	98.14%	99.33%	97.34%	94.56%	98.34%	98.92%	98.79%	98.17%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.79%	0.35%	0.74%	0.89%	0.02%	0.57%	0.51%	0.39%	0.25%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	1.42%	0.55%	1.48%	1.73%	0.10%	1.35%	3.23%	0.84%	1.08%	0.03%	0.09%
3	Connection maintenance (Retainability)													
	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.66%	1.03%	0.53%	1.35%	0.22%	0.57%	1.17%	1.07%	0.92%	0.25%	0.66%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	3.06%	2.90%	0.27%	2.84%	0.04%	1.54%	8.53%	0.00%	3.65%	1.16%	9.50%
	c) Connections with good voice quality	>=95%	Quarterly	96.84%	96.71%	96.64%	96.90%	98.79%	93.63%	96.64%	98.25%	96.46%	99.83%	99.24%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

Three days live assessment revealed that the operators were meeting the benchmark of most of the parameters. However, **Aircel, Tata (GSM), Vodafone and Tata (CDMA)** failed to meet the benchmark for the parameter “**worst affected Cell > 3% TCH Drop**”. Their average performance for this parameter was **3.06%, 8.53%, 3.65% and 9.50%** respectively. Further, **Tata (GSM)** also remained non-complied in respect of parameters **CSSR** and **TCH congestion** with its performance as **94.56% and 3.23%** and **Uninor** lagged behind the benchmark for the parameter ‘**Voice Quality**’ with its average performance as **93.63%**.

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(E) Circle - July 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators	
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		July-15	3401	10223	6405	7773	2093	4811	2305	7	9927	ND	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		July-15	3458	23513	84833	27225	3637	17640	3136	18	12969	ND	668
	c) BTS Accumulated Downtime	<=2%	July-15	0.14%	0.31%	1.78%	0.47%	0.23%	0.49%	0.18%	0.34%	0.18%	ND	0.29%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		July-15	9	109	118	149	2	91	39	0	56	ND	6
	e) Worst affected BTSs due to downtime	<=2%	July-15	0.26%	1.07%	1.84%	1.92%	0.10%	1.89%	1.69%	0.00%	0.56%	ND	1.91%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	July-15	98.60%	96.29%	98.77%	98.31%	99.32%	97.52%	93.87%	98.50%	98.41%	ND	98.13%
	b) SDCCH/PAGING Congestion	<=1%	July-15	0.73%	0.42%	0.85%	0.83%	0.03%	0.47%	0.82%	0.19%	0.35%	ND	0.00%
	c) TCH congestion	<=2%	July-15	1.75%	0.58%	1.75%	1.62%	0.11%	1.22%	3.64%	0.76%	1.59%	ND	0.22%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	July-15	0.63%	0.93%	1.53%	1.42%	0.22%	0.58%	1.23%	1.12%	0.94%	ND	0.70%
	b) Worst affected cells>3% TCH drop	<=3%	July-15	2.82%	2.89%	2.37%	2.73%	0.05%	1.61%	8.99%	0.15%	3.45%	ND	9.13%
	c) % of connections with good voice quality	>=95%	July-15	96.92%	96.87%	96.50%	96.91%	98.73%	93.52%	96.63%	98.71%	96.51%	ND	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		July-15	289	890	141	636	3	233	620	0	1026	ND	86
	e) Total no. of cells (Sector) in the licensed service area		July-15	10275	30790	5946	23311	6246	14450	6900	21	29771	ND	940

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(E) Circle - July 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
GSM Operators													CDMA Operators	
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		July-15	0	0	0	0	0	0	0	0	0	ND	0
	Name of POI not meeting the benchmark		July-15	0	0	0	0	0	0	0	0	0	ND	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang		July-15	143990	588103	469000	230812	140000	287497	134625	222	595705	176000	42500
	b) Total traffic in TCBH in erlang (Avg.)		July-15	132138	513735	217876	250188	119841	376063	74511	24	498039	34440	3812
	c) Total no. of customers served (as per VLR) on last day of the month		July-15	4512664	18426912	4551385	10369098	5826891	8483380	2850218	3989	17027258	2173938	100550

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle – July 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	3401	10221	6405	7622	2093	4809	2309	7	9909	ND	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	211	3630	8886	2277	NP	1371	282	0	3837	ND	3
	c) BTS Accumulated Downtime	<=2%	Live data	0.09%	0.49%	1.93%	0.41%	NP	0.40%	0.17%	0.00%	0.54%	ND	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	12	14	5	NP	1	0	0	0	ND	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.12%	0.22%	0.07%	NP	0.02%	0.00%	0.00%	0.00%	ND	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.59%	96.07%	97.31%	98.54%	99.31%	97.44%	93.32%	98.82%	98.64%	ND	98.22%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.67%	0.38%	0.62%	0.83%	0.02%	0.45%	0.84%	0.10%	0.32%	ND	0.00%
	c) TCH congestion	<=2%	Live data	1.65%	0.60%	1.67%	1.45%	0.10%	1.18%	4.14%	0.49%	1.36%	ND	0.13%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.62%	0.99%	0.36%	1.47%	0.22%	0.54%	1.23%	1.33%	0.91%	ND	0.74%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.56%	2.91%	0.25%	2.88%	0.05%	1.51%	8.53%	0.00%	2.87%	ND	12.06%
	c) % of connections with good voice quality	>=95%	Live data	96.81%	96.69%	96.61%	96.80%	98.76%	93.74%	96.59%	98.51%	96.84%	ND	99.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	263	897	15	664	3	218	588	0	854	ND	113
	e) Total no. of cells (Sector) in the licensed service area		Live data	10275	30790	5946	23065	6246	14461	6898	21	29735	ND	940
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	ND	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	ND	0

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(E) Circle - August 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
GSM Operators													CDMA Operators	
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Aug-15	3431	10233	6405	7885	2091	4806	2306	7	9929	1141	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Aug-15	3489	6378	88635	26286	1939	17637	3121	12	11111	1163	254
	c) BTS Accumulated Downtime	<=2%	Aug-15	0.14%	0.08%	1.86%	0.45%	0.12%	0.49%	0.18%	0.24%	0.15%	0.14%	0.11%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Aug-15	12	43	114	153	13	94	9	0	37	5	0
	e) Worst affected BTSs due to downtime	<=2%	Aug-15	0.35%	0.42%	1.78%	1.94%	0.62%	1.96%	0.39%	0.00%	0.37%	0.44%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Aug-15	98.60%	96.36%	97.70%	98.11%	99.36%	96.26%	95.03%	98.87%	98.82%	99.12%	98.38%
	b) SDCCH/PAGING Congestion	<=1%	Aug-15	0.71%	0.33%	0.83%	0.91%	0.03%	0.72%	0.59%	0.51%	0.31%	0.00%	0.00%
	c) TCH congestion	<=2%	Aug-15	1.47%	0.54%	1.90%	1.89%	0.10%	2.40%	2.75%	0.40%	1.18%	0.01%	0.06%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Aug-15	0.68%	0.98%	1.97%	1.45%	0.18%	0.80%	1.21%	1.14%	0.95%	0.21%	0.68%
	b) Worst affected cells>3% TCH drop	<=3%	Aug-15	3.00%	2.93%	2.54%	2.73%	0.04%	3.58%	8.96%	0.00%	4.27%	0.95%	9.12%
	c) % of connections with good voice quality	>=95%	Aug-15	96.89%	96.84%	96.50%	96.66%	98.79%	93.44%	96.66%	98.20%	96.41%	99.85%	99.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Aug-15	311	902	151	641	3	517	619	0	1272	32	86
	e) Total no. of cells (Sector) in the licensed service area		Aug-15	10368	30817	5946	23532	6242	14450	6909	21	29765	3433	940
4	No. of POI's having >=0.5% POI congestion													

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(E) Circle - August 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators	
	No. of POI's having >=0.5% POI congestion		Aug-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Aug-15	0	0	0	0	0	0	0	0	0	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang		Aug-15	145792	592216	469000	233434	140000	293528	134730	222	598881	176000	42500
	b) Total traffic in TCBH in erlang (Avg.)		Aug-15	131376	515640	235601	252379	NP	386553	73843	24	491413	NP	3433
	c) Total no. of customers served (as per VLR) on last day of the month		Aug-15	4511347	18587635	4741596	10437657	NP	8512080	2838169	1686	17025415	NP	66924

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle – August 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	3422	10235	6405	7773	2091	4805	2306	7	9933	1141	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	190	1102	8487	1945	212	1286	215	0	5247	168	41
	c) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.15%	1.84%	0.35%	0.14%	0.37%	0.13%	0.00%	0.73%	0.20%	0.18%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	9	12	8	0	0	0	0	1	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.09%	0.19%	0.10%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.54%	96.31%	97.88%	98.10%	99.35%	97.31%	94.68%	97.26%	98.96%	99.11%	98.02%
	b) SDCCH/PAGING Congestion	<=1%	Live data	1.01%	0.38%	0.81%	0.90%	0.02%	0.58%	0.17%	0.51%	0.22%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.53%	0.53%	1.14%	1.88%	0.10%	1.43%	2.87%	1.54%	1.04%	0.04%	0.03%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.68%	1.00%	0.40%	1.38%	0.21%	0.56%	1.18%	1.29%	0.86%	0.23%	0.61%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.99%	2.90%	0.17%	2.74%	0.04%	1.43%	8.61%	0.00%	3.73%	1.11%	8.58%
	c) % of connections with good voice quality	>=95%	Live data	96.86%	96.78%	96.64%	96.90%	98.81%	93.51%	96.69%	97.40%	96.65%	99.80%	99.25%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	309	894	10	646	2	206	594	0	1112	38	81
	e) Total no. of cells (Sector) in the licensed service area		Live data	10350	30818	5946	23530	6242	14435	6905	21	29779	3433	940
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0

TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(E) Circle – Sept. 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Sep-15	3433	10233	6405	8037	2092	4812	2306	7	9936	1142	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Sep-15	3602	23778	89934	27649	2955	17115	3667	16	12297	863	288
	c) BTS Accumulated Downtime	<=2%	Sep-15	0.15%	0.32%	1.95%	0.48%	0.22%	0.49%	0.22%	0.31%	0.17%	0.10%	0.13%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Sep-15	20	195	120	146	11	95	9	0	62	1	0
	e) Worst affected BTSs due to downtime	<=2%	Sep-15	0.58%	1.91%	1.87%	1.82%	0.53%	1.97%	0.39%	0.00%	0.62%	0.09%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Sep-15	98.69%	96.39%	98.20%	97.84%	99.37%	97.17%	95.16%	99.15%	99.15%	98.83%	98.61%
	b) SDCCH/PAGING Congestion	<=1%	Sep-15	0.43%	0.77%	0.93%	0.93%	0.03%	0.73%	0.58%	0.53%	0.22%	0.00%	0.00%
	c) TCH congestion	<=2%	Sep-15	0.95%	0.54%	1.95%	1.64%	0.10%	1.49%	2.71%	0.14%	0.85%	0.01%	0.12%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Sep-15	0.62%	1.04%	1.88%	1.64%	0.21%	0.64%	1.17%	0.88%	0.89%	0.22%	0.61%
	b) Worst affected cells>3% TCH drop	<=3%	Sep-15	2.83%	2.92%	2.71%	2.83%	0.02%	1.70%	8.41%	0.00%	3.95%	1.02%	8.19%
	c) % of connections with good voice quality	>=95%	Sep-15	96.98%	96.86%	96.50%	96.47%	98.84%	93.33%	96.70%	98.93%	96.31%	99.85%	99.21%

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(E) Circle – Sept. 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators	
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Sep-15	293	901	161	675	1	245	581	0	1177	35	77
	e) Total no. of cells (Sector) in the licensed service area		Sep-15	10380	30880	5946	23861	6245	14442	6901	21	29778	3436	940
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Sep-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Sep-15	0	0	0	0	0	0	0	0	0	0	0
5	Network Data													
	a) Equipped Capacity of Network in Erlang		Sep-15	146334	590587	529000	232308	140000	300236	134506	222	598849	176000	42500
	b) Total traffic in TCBH in erlang (Avg.)		Sep-15	130187	523654	229367	248819	124901	388390	72962	17	490646	33736	3022
	c) Total no. of customers served (as per VLR) on last day of the month		Sep-15	4501820	18582697	4740027	10430598	5920848	8603747	2832697	2112	16855578	2166377	64230

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle – Sept. 15 month

S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators	
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	3431	10236	6405	7885	2091	4801	2306	7	9929	1141	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	485	3559	8826	3483	0	1906	447	0	2101	0	28
	c) BTS Accumulated Downtime	<=2%	Live data	0.20%	0.48%	1.91%	0.61%	0.00%	0.55%	0.27%	0.00%	0.29%	0.00%	0.12%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	2	19	10	10	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.06%	0.19%	0.16%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.61%	96.46%	96.91%	97.79%	99.32%	97.27%	95.68%	98.95%	99.15%	98.46%	98.27%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.70%	0.30%	0.78%	0.95%	0.03%	0.69%	0.52%	0.56%	0.22%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.09%	0.52%	1.63%	1.85%	0.10%	1.45%	2.69%	0.48%	0.85%	0.02%	0.12%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.68%	1.09%	0.84%	1.19%	0.22%	0.62%	1.10%	0.59%	0.99%	0.27%	0.63%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.63%	2.90%	0.39%	2.91%	0.03%	1.67%	8.45%	0.00%	4.36%	1.21%	7.87%
	c) % of connections with good voice quality	>=95%	Live data	96.85%	96.66%	96.67%	96.99%	98.79%	93.65%	96.63%	98.83%	95.89%	99.86%	99.27%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	376	894	23	694	2	242	583	0	1297	42	74
	e) Total no. of cells (Sector) in the licensed service area		Live data	10368	30843	5946	23819	6242	14445	6902	21	29778	3436	940
4	No. of POI's having >=0.5% POI congestion													
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS - QE SEPT 15:

5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY TO SEPTEMBER 2015 MONTHS AUDITED DATA):

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE SEPTEMBER 15														
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators										CDMA Operators
Customer Service Quality Parameters														
1	Metering & Billing Credibility -Post Paid													
	A) No. of bills issued during the quarter		UPE	4640	472935	NP	301749	55590	89876	NA	NA	1462033	185395	15625
	B) No. of bills disputed including billing complaints during the quarter		UPE	0	49	NP	139	47	0	NA	NA	2064	170	0
	C)% of billing complaints during the quarter	<= 0.1%	UPE	0.00%	0.01%	NP	0.05%	0.08%	0.00%	NA	NA	0.14%	0.09%	0.00%
2	Metering & Billing Credibility -Pre Paid													
	A) Total No. of Pre-paid customers at the end of the quarter		UPE	6889558	18751451	7688477	9856785	6006150	5135929	11322378	23806	17099794	2327403	264549
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		UPE	0	217	2888	33629	5367	0	2275	0	9018	1782	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	UPE	0.00%	0.001%	0.04%	0.34%	0.09%	0.00%	0.02%	0.00%	0.05%	0.08%	0.00%
3	Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints													
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		UPE	0	266	2888	46798	5414	0	2275	0	11082	1952	0
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		UPE	0	266	2888	46798	5414	0	2275	0	11082	1952	0

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE SEPTEMBER 15

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators										CDMA Operators
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		UPE	0	266	2888	46798	5414	0	2275	0	11082	1952	0
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	Response time to customers for assistance													
	A) Total no of calls attempted to customer care/Call center		UPE	25378085	6654886	8477732	26790448	2601410	971140	38656879	536	35955343	801484	37345
	B) Total no. of calls successfully established to customer care/Call center.		UPE	24820567	6654886	8419080	26608804	2570225	964696	38300863	536	35955343	783738	37140
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	UPE	97.80%	100%	99.31%	99.32%	98.80%	99.34%	99.08%	100%	100%	97.79%	99.45%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		UPE	5444177	8529673	3354144	7786073	1406086	1367286	11568962	10041	9900855	444384	28906

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE SEPTEMBER 15														
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators										CDMA Operators
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UPE	5241043	8120653	3278587	7770284	1036956	1336480	11414860	9660	9732490	381891	28163
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	UPE	96.27%	95.20%	97.75%	99.80%	73.75%	97.75%	98.67%	96.21%	98.30%	85.94%	97.43%
Termination/closure of service														
5	A) Total No. of requests for Termination / Closure of service received during the quarter		UPE	89	2012	55314	2407	20	1258	NA	NA	2300	243	343
	B) No. of requests for Termination /Closure of service complied within 7 days during the quarter		UPE	89	2012	55314	2407	20	1258	NA	NA	2300	243	343
	C) % of Termination/ Closure of service within 7 days	<=7days	UPE	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%
Time taken for refunds of deposits after closures.														
6	A) No. of Payments/ Refunds due during the quarter		UPE	112	522	1652	1209	59	412	NA	NA	12375	149	119
	B) No. of Payments/ Refunds Cleared during the quarter		UPE	112	522	1652	1209	59	412	NA	NA	12375	149	119
	C) Time taken for refunds of deposits after closures.	100% within 60 days	UPE	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%

NA-Not Applicable as Uninor is not having Post paid connections.

NB: Accessibility of call center / Customer care data of RCOM (GSM & CDMA) are based on average of two months' data i.e. August & September 15 as July-15 month data was not provided by RCOM (GSM & CDMA) due to TTI server issue.

5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-SEPT 2015):

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE- SEPTEMBER 15

3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	UNINOR	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators										CDMA Operators
RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE														
1	A) Total no of calls attempted to customer care/Call center		UPE	770850	226100	275125	813551	NP	32085	1464057	26	1029443	NP	1396
	B) Total no. of calls successfully established to customer care/Call center.		UPE	758708	226100	274654	813551	NP	31859	1453299	26	1029443	NP	1395
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	UPE	98.42%	100%	99.83%	100%	NP	99.30%	99.27%	100%	100%	NP	99.93%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		UPE	171030	265920	96131	257906	51280	36808	422788	213	305427	15175	360
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UPE	166769	265010	95764	257740	49326	36330	422108	207	304213	15019	359
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	UPE	97.51%	99.66%	99.62%	99.94%	96.19%	98.70%	99.84%	97.18%	99.60%	98.97%	99.72%

NP: RCOM (GSM & CDMA) has not provided data for the parameter "Accessibility of call center / Customer care" due to TTI server issue.

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

1. Metering and billing credibility-(Post paid & Pre-paid)

The performance of most of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid is well within the prescribed bench mark of $\leq 0.1\%$. However, **Vodafone** remained non-complied for billing complaint (post-paid) and **Idea** for billing complaints (pre-paid) with their performance as **0.14%** and **0.34%** respectively.

2. Resolution of Billing complaints and applying credits -

- i. Resolution of billing /charging complaints
- ii. Period of applying credit/waiver/adjustment to customer's account from the date of resolution of complaints

All operators have 100 % resolved the billing complaints within stipulated period of 4 weeks and within 6 weeks. In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % refund in one week.

3. Response Time to the Customer for assistance

- i. Accessibility of call centre/customer care
- ii. Percentage of calls answered by Operators (Voice to Voice)

All service providers are in compliance with respect to the parameter Accessibility of call center. Whereas, **RCOM GSM** and **RCOM CDMA** remained non-complied for parameter 'Calls answered by Operators (Voice to Voice)' with their performance as **73.75%** and **85.94%** respectively.

4. Termination/Closure of Service

In case of this parameters also, **all service providers have settled the closure/termination within the benchmark of 7 days.**

5. Time Taken for Refund of deposits after closures

All operators were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure.

6. LIVE CALLING ASSESSMENT



6. LIVE CALLING ASSESSMENT:

6.1 INTER OPERATOR CALLS ASSESSMENT:

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in UP (E) service area during the time 1100 to 1400 Hrs and 1600 to 1900 was carried out by TUV 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 BASED ON LIVE MEASUREMENT												
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE	VIDEOCON	UNINOR
AIRCEL	UPE	----	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AIRTEL	UPE	100%	----	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	UPE	100%	100%	----	100%	100%	100%	100%	100%	100%	100%	100%
IDEA	UPE	100%	100%	100%	----	100%	100%	100%	100%	100%	100%	100%
RCOM GSM	UPE	100%	100%	100%	100%	----	100%	100%	100%	100%	100%	100%
RCOM CDMA	UPE	100%	100%	100%	100%	100%	----	100%	100%	100%	100%	100%
TATA GSM	UPE	100%	100%	100%	100%	100%	100%	----	100%	100%	100%	100%
TATA CDMA	UPE	100%	100%	100%	100%	100%	100%	100%	----	100%	100%	100%
VODAFONE	UPE	100%	100%	100%	100%	100%	100%	100%	100%	----	100%	100%
VIDEOCON	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	----	100%
UNINOR	UPE	100%	100%	100%	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.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE											
Parameter	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	UNINOR	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	100	100	100	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	100	100	100
Total no. of calls successfully established to customer care/Call center	100	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total call successfully established*100/ Total call attempt)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	100	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	96	100	100	100	97	99	100	100	100	98	99
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100/ Total call attempt)	96%	100%	100%	100%	97%	99%	100%	100%	100%	98%	99%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, all operators were able to connect the calls with their call center operators/agents successfully. However, Aircel, RCOM (GSM), Tata (GSM), RCOM (CDMA) and Tata (CDMA) could achieve their performance as 96.00%, 97.00%, 99.00%, 98.00% and 99.00% respectively.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS												
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	UP East	0	266	120	115	0	135	0	0	120	127	0
Total No. of calls Answered	UP East	0	180	100	100	0	100	0	0	100	100	0
Cases resolved within 4 weeks	UP East	0	180	100	100	0	100	0	0	100	100	0
%age of cases resolved	UP East	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD 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 where the complaints were more than 100.

Some of the complainants reported that they didn't exactly remember about the duration of resolution of complaints. However, the customers reported that the billing complaints were resolved to their satisfaction.

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING															
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made per operator	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA CDMA	TATA GSM	UNINOR	VODAFONE
July'15	UPE	Jhansi	Jhansi	100	2	√	√	√	√	√	√	√	√	√	√
				101	3	x	√	√	√	√	√	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Talbehat	100	2	√	√	√	√	x	x	√	√	√	√
				101	3	x	√	√	√	x	x	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Lalitpur	100	2	x	√	√	√	√	√	√	√	√	√
				101	3	x	√	√	√	√	√	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Mehrauni	100	2	x	√	√	√	x	x	√	√	√	√
				101	3	x	√	√	√	x	x	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Chirgaon	100	2	√	√	√	√	x	x	√	√	√	√
				101	3	x	√	√	√	x	x	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Moth	100	2	x	√	√	√	√	√	√	√	√	√
				101	3	x	√	√	√	x	x	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Mauranipur	100	2	√	√	√	√	√	√	√	√	√	√
				101	3	√	√	√	√	x	x	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Garautha	100	2	√	√	√	√	√	√	√	√	√	√
				101	3	√	√	√	√	x	x	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√

LEVEL 1 LIVE CALLING															
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made per operator	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA CDMA	TATA GSM	UNINOR	VODAFONE
				1090	5	√	√	√	√	√	√	√	√	√	√
Aug'15	UPE	Mirzapur	Mirzapur	100	2	√	√	√	√	√	√	√	√	√	√
				101	5	√	√	√	√	√	√	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√
			Halia	100	2	NC	√	√	√	√	√	√	√	√	√
				101	5	NC	√	√	√	√	√	√	√	√	√
				102	5	NC	√	√	√	√	√	√	√	√	√
				108	5	NC	√	√	√	√	√	√	√	√	√
				1090	5	NC	√	√	√	√	√	√	X	√	√
			Chunar	100	2	x	√	√	√	√	√	X	√	√	√
				101	5	x	√	√	√	√	√	X	√	√	√
				102	5	x	√	√	√	√	√	X	√	√	√
				108	5	√	√	√	√	√	√	X	√	√	√
				1090	5	√	√	√	√	√	√	X	√	√	√
			Robertsganj	100	2	x	√	√	√	√	√	X	√	√	√
				101	5	x	√	√	√	√	√	√	√	√	√
				102	5	x	√	√	√	√	√	√	√	√	√
				108	5	x	√	√	√	√	√	√	√	√	√
				1090	5	x	√	√	√	√	√	√	√	√	√
			Pipri	100	2	x	√	√	√	√	√	√	√	√	√
				101	5	x	√	√	√	√	√	√	√	√	√
				102	5	x	√	√	√	√	√	√	√	√	√
				108	5	x	√	√	√	√	√	√	√	√	√
				1090	5	x	√	√	√	√	√	√	√	√	√
			Duddhi	100	2	NC	√	√	√	√	√	√	√	√	√
				101	5	NC	√	√	√	√	√	√	√	√	√
				102	5	NC	√	√	√	√	√	√	√	√	√
				108	5	NC	√	√	√	√	√	√	√	√	√
				1090	5	NC	√	√	√	√	√	√	√	√	√
			Obra	100	2	x	√	√	√	√	√	√	√	√	√
				101	5	x	√	√	√	√	√	√	√	√	√
				102	5	x	√	√	√	√	√	√	√	√	√
				108	5	x	√	√	√	√	√	√	√	√	√
				1090	5	x	√	√	√	√	√	√	√	√	√
Sep'15	UPE	Pratapgarh	Pratapgarh	100	10	√	√	√	√	√	√	√	√	√	√
				101	10	x	√	√	√	√	√	√	√	√	√
				102	10	√	√	√	√	√	√	√	√	√	√
				108	10	√	√	√	√	√	√	√	√	√	√
				1090	10	√	√	√	√	√	√	√	√	√	√

LEVEL 1 LIVE CALLING															
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made per operator	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA CDMA	TATA GSM	UNINOR	VODAFONE
			Kunda	100	10	√	√	√	√	√	√	√	√	√	√
				101	10	x	√	√	√	√	√	√	√	√	√
				102	10	√	√	√	√	√	√	√	√	√	√
				108	10	√	√	√	√	√	√	√	√	√	√
				1090	10	√	√	√	√	√	√	√	√	√	√
			Patti	100	10	√	√	√	√	√	√	√	√	√	√
				101	10	x	√	√	√	√	√	√	√	√	√
				102	10	√	√	√	√	√	√	√	√	√	√
				108	10	√	√	√	√	√	√	√	√	√	√
				1090	10	√	√	√	√	√	√	√	√	√	√

NB: Videocon is not having their coverage in entire Jhansi, Mirzapur and Pratapgarh SSAs, hence not included in the above table.

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various mobile service providers in the SDCAs where drive tests were conducted, the calls were made from mobile phones provided by the service providers. In these SDCAs of UP (East) service areas, the emergency services as mentioned in the above table were found functional in the networks of all the service providers except at some places marked 'X' in the table above.

7. DRIVE TEST



7. OPERATOR ASSISTED DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three select SSA's namely, **Jhansi, Mirzapur and Pratapgarh** in the months of July, August and September 2015 respectively. The total route Kms covered during the drive tests in respective SSAs was **372 Kms, 450 Kms and 304 Kms** respectively. The performance of the operators has been highlighted below in the tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour.

For measuring voice quality, Rx Qual samples on a scale from 0 to 7 for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. As per the QoS norms, Rx Qual between 0- 5 for GSM operators and between 0-4% FER value for CDMA operators is considered to be good, where as Rx Qual beyond this benchmark is considered to be 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 at street level with strength ≥ -75 dBm for in-door coverage and ≥ -85 dBm for in-vehicle.

7.1 OPERATOR ASSISTED DRIVE TEST: JHANSI SSA (JULY-15)

DRIVE TEST TABLE: 1

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Road	59	25	151	25	160	27	181	25	49	28	13	25	134	26	147	25	13	25	30	NC
		Highway	52	25	227	25	150	25	243	25	39	26	42	25	159	23	177	25	48	26	34	26
		Within City	151	25	162	25	153	25	159	25	153	25	115	NC	132	26	160	25	115	NC	118	25
		Overall SSA	262	75	540	75	463	77	583	75	241	79	170	50	425	75	484	75	176	51	182	51
2	Blocked Call Rate	Major Road	1.69%	0.00%	3.31%	0.00%	2.50%	0.00%	0.00%	0.00%	8.16%	3.57%	0.00%	0.00%	2.99%	0.00%	2.72%	0.00%	0.00%	0.00%	3.33%	NC
		Highway	1.92%	0.00%	0.00%	0.00%	0.67%	0.00%	0.41%	0.00%	7.69%	0.00%	0.00%	0.00%	1.89%	0.00%	2.26%	0.00%	2.08%	0.00%	0.00%	0.00%
		Within City	1.99%	0.00%	0.00%	0.00%	1.96%	0.00%	0.63%	0.00%	1.31%	0.00%	0.87%	NC	1.52%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%
		Overall SSA	1.91%	0.00%	0.93%	0.00%	1.73%	0.00%	0.34%	0.00%	3.73%	1.27%	0.59%	0.00%	2.12%	0.00%	1.65%	0.00%	0.57%	0.00%	0.55%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.68%	0.00%	6.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC
		Highway	1.96%	0.00%	0.00%	0.00%	2.22%	0.00%	0.84%	0.00%	13.89%	0.00%	0.00%	0.00%	1.28%	0.00%	1.17%	0.00%	2.13%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.62%	0.00%	0.78%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	NC	1.55%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	0.00%
		Overall SSA	0.39%	0.00%	0.37%	0.00%	3.37%	0.00%	0.35%	0.00%	3.42%	0.00%	0.00%	0.00%	0.97%	0.00%	0.42%	0.00%	0.57%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o	Major Road	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.26%	99.23%	92.05%	NC

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
5	frequency hopping for CDMA Operators)	Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.75%	99.07%	91.84%	94.25%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.92%	NC	97.12%	93.62%
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.63%	99.15%	95.42%	93.93%
		Major Road	96.71%	99.53%	98.48%	98.40%	88.96%	98.56%	95.82%	98.91%	97.26%	96.58%	99.70%	99.94%	94.86%	99.77%	95.94%	98.54%	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Highway	94.97%	99.61%	94.19%	98.38%	92.02%	99.77%	96.11%	97.79%	88.37%	99.57%	99.74%	99.79%	96.48%	99.34%	95.61%	98.29%	NA	NA	NA	NA
		Within City	97.11%	98.87%	93.83%	98.07%	92.18%	99.65%	95.65%	92.64%	94.92%	99.18%	98.81%	NC	94.75%	99.73%	97.89%	97.27%	NA	NA	NA	NA
		Overall SSA	96.61%	99.34%	95.45%	98.28%	90.99%	99.31%	95.90%	96.45%	94.44%	98.42%	99.11%	99.86%	95.43%	99.62%	96.49%	98.03%	NA	NA	NA	NA
		Major Road	29.29%	43.20%	70.54%	97.91%	30.25%	49.40%	63.99%	100%	17.43%	2.13%	53.95%	45.73%	20.34%	95.75%	65.09%	80.40%	61.30%	0.00%	13.56%	NC
	In door (>= - 75dBm)	Highway	16.49%	99.86%	71.25%	99.91%	35.52%	15.20%	78.97%	100%	25.64%	81.90%	34.58%	99.74%	45.08%	99.58%	70.85%	100%	42.75%	100%	9.72%	86.49%
		Within City	57.34%	99.90%	78.40%	99.98%	46.28%	18.30%	90.81%	99.90%	48.61%	94.21%	62.70%	NC	58.74%	99.88%	94.76%	100%	70.92%	NC	46.14%	48.63%
		Overall SSA	37.06%	77.47%	73.14%	99.27%	37.08%	28.25%	77.67%	99.97%	37.99%	58.59%	55.64%	64.15%	39.23%	97.97%	77.00%	93.62%	62.78%	49.00%	35.06%	67.73%
		Major Road	64.46%	99.82%	95.21%	99.95%	59.05%	97.30%	92.92%	100%	62.71%	56.59%	81.39%	100%	58.91%	99.94%	95.70%	100%	85.44%	0.19%	45.43%	NC
	In-vehicle (>= - 85dBm)	Highway	32.14%	100%	96.06%	100%	67.65%	90.90%	95.64%	100%	42.75%	100%	69.50%	100%	82.79%	99.98%	97.54%	100%	66.97%	100%	22.61%	99.94%
		Within City	86.74%	100%	96.74%	100%	80.66%	88.30%	99.04%	100%	81.60%	100%	85.18%	NC	91.58%	100%	99.90%	100%	92.35%	NC	73.58%	94.97%
		Overall SSA	63.78%	99.93%	95.98%	99.98%	68.74%	92.31%	95.75%	100%	70.75%	85.16%	81.31%	100%	75.96%	99.97%	97.76%	100%	85.13%	49.10%	60.71%	97.48%
		Major Road	83.32%	100%	99.62%	99.98%	84.19%	99.90%	99.38%	100%	91.49%	100%	98.60%	100%	91.10%	99.99%	100%	100%	98.75%	86.14%	73.08%	NC
	Outdoor-in city (>= - 95dBm)	Highway	69.70%	100%	99.86%	100%	91.07%	99.20%	99.83%	100%	75.96%	100%	97.98%	100%	97.47%	100%	100%	100%	84.95%	100%	44.20%	100%
		Within	97.80%	100%	99.96%	100%	98.21%	99.30%	99.94%	100%	97.10%	100%	97.85%	NC	99.52%	100%	100%	100%	99.35%	NC	90.03%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
		City																				
		Overall SSA	85.16%	100%	99.81%	99.99%	90.90%	99.48%	99.72%	100%	92.18%	100%	97.93%	100%	95.57%	100%	100%	100%	95.46%	92.93%	79.71%	100%
6	Call Setup Success Rate (>=95%)	Major Road	98.31%	100%	96.69%	100%	95.63%	100%	97.79%	100%	97.96%	96.43%	100%	100%	95.52%	100%	95.92%	100%	100%	100%	96.67%	NC
		Highway	98.08%	100%	100%	100%	90.00%	100%	97.94%	100%	92.31%	100%	100%	100%	98.11%	100%	96.61%	100%	97.92%	100%	100%	100%
		Within City	98.01%	100%	100%	100%	83.66%	100%	98.11%	100%	98.04%	100%	99.13%	NC	97.73%	100%	100%	100%	100%	NC	100%	100%
		Overall SSA	98.09%	100%	99.07%	100%	89.85%	100%	97.94%	100%	97.10%	98.73%	99.41%	100%	97.18%	100%	97.52%	100%	99.43%	100%	99.45%	100%
7	Hand Over Success Rate (HOSR)	Major Road	100%	100%	96.46%	100%	86.44%	100%	97.09%	100%	100%	100%	100%	100%	96.12%	100%	95.00%	100%	100%	100%	100%	NC
		Highway	100%	100%	98.94%	100%	96.09%	100%	100%	100%	100%	100%	100%	100%	94.85%	100%	96.55%	100%	100%	100%	100%	100%
		Within City	100%	100%	98.22%	100%	97.55%	99.12%	100%	100%	100%	100%	100%	NC	90.64%	100%	100%	100%	100%	NC	100%	100%
		Overall SSA	100%	100%	98.02%	100%	94.02%	99.43%	99.17%	100%	100%	100%	100%	100%	93.40%	100%	97.27%	100%	100%	100%	100%	100%

NA: Not Applicable; NC: No Coverage

The service providers having block call rate more than 3% have been shaded in yellow colour.

Videocon is not having their coverage in entire Jhansi SSA, hence not included in the above table.

7.2 OPERATOR ASSISTED DRIVE TEST: MIRZAPUR SSA (AUGUST-15)

DRIVE TEST TABLE: 2

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Road	15	NC	118	25	NP	NP	109	25	8	NC	10	NC	106	25	184	26	13	NC	12	NC
		Highway	46	25	214	28	NP	NP	153	25	44	26	20	26	167	25	247	31	18	32	14	31
		Within City	106	25	196	25	NP	NP	170	25	171	25	137	26	149	25	191	27	179	34	88	NC
		Overall SSA	167	50	528	78	NP	NP	432	75	223	51	167	52	422	75	622	84	210	66	114	31
2	Blocked Call Rate	Major Road	0.00%	NC	0.00%	0.00%	NP	NP	2.75%	0.00%	0.00%	NC	0.00%	NC	0.94%	0.00%	1.09%	0.00%	0.00%	NC	0.00%	NC
		Highway	0.00%	0.00%	0.93%	0.00%	NP	NP	1.31%	0.00%	0.00%	0.00%	0.00%	0.00%	2.99%	0.00%	0.40%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.94%	0.00%	0.00%	0.00%	NP	NP	0.59%	0.00%	0.58%	0.00%	1.46%	0.00%	1.34%	0.00%	0.52%	0.00%	0.00%	0.00%	0.00%	NC
		Overall SSA	0.60%	0.00%	0.38%	0.00%	NP	NP	1.39%	0.00%	0.45%	0.00%	1.20%	0.00%	1.90%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	NC	0.00%	0.00%	NP	NP	3.81%	0.00%	0.00%	NC	0.00%	NC	0.00%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	NC
		Highway	0.00%	0.00%	2.36%	0.00%	NP	NP	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	1.85%	0.00%	0.41%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.59%	0.00%	2.96%	0.00%	0.00%	0.00%	0.00%	0.00%	2.79%	0.00%	0.00%	NC
		Overall SSA	0.00%	0.00%	0.95%	0.00%	NP	NP	1.90%	0.00%	0.45%	0.00%	2.42%	0.00%	0.73%	0.00%	0.16%	0.00%	2.38%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o)	Major Road	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.89%	NC	96.75%	NC

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
5	frequency hopping for CDMA Operators)	Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.87%	99.97%	91.93%	93.33%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.23%	100%	96.09%	NC
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.31%	99.99%	95.75%	93.33%
		Major Road	97.00%	NC	91.46%	99.23%	NP	NP	93.61%	99.04%	97.56%	NC	98.03%	NC	90.85%	99.73%	97.34%	99.20%	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Highway	98.22%	98.80%	93.69%	98.76%	NP	NP	93.53%	96.36%	97.67%	99.84%	95.99%	99.43%	94.84%	98.57%	96.92%	92.09%	NA	NA	NA	NA
		Within City	98.20%	99.78%	95.84%	98.24%	NP	NP	97.91%	98.59%	94.38%	99.77%	96.90%	100%	91.65%	99.25%	96.40%	99.81%	NA	NA	NA	NA
		Overall SSA	98.07%	99.30%	93.91%	98.74%	NP	NP	95.32%	98.00%	95.15%	99.80%	96.94%	99.52%	92.78%	99.18%	96.87%	96.51%	NA	NA	NA	NA
		Service Coverage																				
	In door (>= - 75dBm)	Major Road	26.95%	NC	73.44%	99.26%	NP	NP	61.23%	100%	65.18%	NC	35.32%	NC	34.82%	98.78%	83.29%	100%	50.85%	NC	0.00%	NC
		Highway	27.08%	98.16%	70.11%	99.95%	NP	NP	73.89%	100%	65.24%	86.64%	63.60%	16.42%	44.71%	100%	81.96%	51.60%	70.16%	99.20%	0.69%	0.00%
		Within City	23.50%	77.31%	84.51%	99.97%	NP	NP	88.86%	100%	59.52%	100%	68.99%	99.66%	56.22%	100%	86.85%	100%	61.22%	0.00%	10.96%	NC
		Overall SSA	25.37%	87.59%	76.02%	99.74%	NP	NP	76.82%	100%	60.87%	93.19%	66.19%	45.06%	46.17%	99.59%	83.98%	80.37%	61.38%	9.23%	8.36%	0.00%
	In-vehicle (>= - 85dBm)	Major Road	63.53%	NC	93.41%	99.98%	NP	NP	83.12%	100%	88.67%	NC	61.23%	NC	63.66%	100%	98.67%	100%	71.98%	NC	4.65%	NC
		Highway	55.22%	100%	91.54%	100%	NP	NP	90.02%	100%	90.76%	99.96%	85.08%	87.83%	71.54%	100%	95.82%	100%	94.37%	100%	9.50%	0.32%
		Within City	58.03%	91.24%	98.03%	100%	NP	NP	98.57%	100%	93.80%	100%	90.25%	100%	90.81%	100%	99.56%	100%	84.54%	3.06%	30.69%	NC
		Overall SSA	57.59%	95.56%	94.29%	100%	NP	NP	91.77%	100%	93.01%	99.98%	87.80%	92.02%	76.20%	100%	97.92%	100%	84.66%	12.07%	24.85%	0.32%
	Outdoor-in city (>= - 95dBm)	Major Road	86.68%	NC	99.67%	99.98%	NP	NP	96.22%	100%	99.86%	NC	85.54%	NC	88.16%	100%	100%	100%	97.89%	NC	85.29%	NC
		Highway	84.22%	100%	98.69%	100%	NP	NP	98.58%	100%	99.67%	100%	99.03%	99.97%	93.49%	100%	99.76%	100%	99.62%	100%	67.26%	64.03%
		Within City	90.47%	97.47%	99.74%	100%	NP	NP	99.89%	100%	99.72%	100%	97.95%	100%	98.45%	100%	100%	100%	96.64%	100%	76.47%	NC

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Overall SSA	87.50%	98.72%	99.30%	100%	NP	NP	98.54%	100%	99.71%	100%	97.18%	99.98%	93.85%	100%	99.91%	100%	96.94%	100%	76.71%
6	Call Setup Success Rate (>=95%)	Major Road	100%	NC	100%	100%	NP	NP	96.33%	100%	100%	NC	100%	NC	99.06%	100%	98.91%	96.15%	100%	NC	91.67%	NC
		Highway	100%	100%	99.07%	100%	NP	NP	96.73%	100%	100%	100%	100%	100%	97.01%	100%	99.19%	100%	100%	100%	92.86%	100%
		Within City	99.06%	100%	100%	100%	NP	NP	99.41%	100%	99.42%	100%	98.54%	100%	97.32%	100%	99.48%	100%	100%	100%	96.59%	NC
		Overall SSA	99.40%	100%	99.62%	100%	NP	NP	97.69%	100%	99.55%	100%	98.80%	100%	97.63%	100%	99.20%	98.81%	100%	100%	95.61%	100%
7	Hand Over Success Rate (HOSR)	Major Road	100%	NC	98.58%	100%	NP	NP	94.29%	100%	100%	NC	100%	NC	98.67%	100%	100%	100%	100%	NC	100%	NC
		Highway	100%	100%	97.70%	100%	NP	NP	96.77%	100%	100%	100%	100%	100%	100%	100%	98.25%	100%	100%	100%	100%	100%
		Within City	98.44%	100%	97.95%	100%	NP	NP	100%	100%	96.94%	100%	100%	100%	98.98%	100%	98.74%	100%	100%	100%	100%	NC
		Overall SSA	98.96%	100%	98.02%	100%	NP	NP	98.18%	100%	97.54%	100%	100%	100%	99.06%	100%	98.80%	100%	100%	100%	100%	100%

NA: Not Applicable, NP: Not Provided: BSNL has not provided the drive test report despite our best efforts.

Videocon is not having their coverage in entire Mirzapur SSA, hence not included in the above table.

7.3 OPERATOR ASSISTED DRIVE TEST: PRATAPGARH SSA (SEPTEMBER-15)

DRIVE TEST TABLE: 3

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Road	30	28	118	27	NP	NP	62	24	22	26	14	26	53	25	72	25	18	34	11	29
		Highway	105	NC	248	26	NP	NP	196	25	110	NC	48	NC	141	26	190	25	61	NC	52	NC
		Within City	92	25	149	25	NP	NP	71	25	51	47	76	27	121	30	127	32	96	35	75	28
		Overall SSA	227	53	515	78	NP	NP	329	74	183	73	138	53	315	81	389	82	175	69	138	57
2	Blocked Call Rate	Major Road	6.67%	0.00%	0.85%	0.00%	NP	NP	3.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.39%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	1.90%	NC	0.81%	0.00%	NP	NP	2.55%	0.00%	4.55%	NC	2.08%	NC	3.55%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	NC
		Within City	3.26%	0.00%	1.34%	0.00%	NP	NP	2.82%	0.00%	0.00%	0.00%	1.32%	0.00%	2.48%	0.00%	0.00%	3.13%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	3.08%	0.00%	0.97%	0.00%	NP	NP	2.74%	0.00%	2.73%	0.00%	1.45%	0.00%	2.54%	0.00%	0.26%	1.22%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	0.00%	NC	0.41%	0.00%	NP	NP	1.05%	0.00%	0.95%	NC	0.00%	NC	0.74%	0.00%	0.00%	0.00%	0.00%	NC	0.00%	NC
		Within City	0.00%	0.00%	0.68%	0.00%	NP	NP	1.47%	0.00%	0.00%	0.00%	1.33%	0.00%	1.69%	0.00%	0.00%	0.00%	1.04%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.39%	0.00%	NP	NP	0.94%	0.00%	0.56%	0.00%	0.74%	0.00%	1.30%	0.00%	0.00%	0.00%	0.57%	0.00%	0.00%	0.00%

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
4	Percentage connections with good voice quality (>=95%)																						
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Road	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.53%	98.66%	94.30%	98.52%	
		Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.76%	NC	93.51%	NC	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.07%	97.31%	94.50%	99.83%	
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.63%	97.97%	94.16%	99.29%	
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	98.36%	98.30%	96.97%	96.90%	NP	NP	90.91%	98.93%	93.70%	99.62%	97.97%	93.26%	96.52%	93.88%	97.11%	98.63%	NA	NA	NA	NA	
		Highway	96.92%	NC	92.11%	98.51%	NP	NP	88.91%	89.08%	92.68%	NC	95.10%	NC	94.50%	99.18%	96.97%	97.95%	NA	NA	NA	NA	
		Within City	95.15%	98.41%	95.52%	99.41%	NP	NP	90.51%	86.99%	97.72%	99.67%	96.93%	99.74%	94.65%	97.84%	97.09%	99.47%	NA	NA	NA	NA	
		Overall SSA	96.38%	98.35%	94.45%	98.23%	NP	NP	89.51%	91.55%	94.41%	99.65%	96.41%	96.56%	94.97%	97.07%	97.03%	98.75%	NA	NA	NA	NA	
5	Service Coverage																						
	In door (>= -75dBm)	Major Road	30.33%	51.27%	52.80%	77.65%	NP	NP	19.45%	2.45%	12.73%	99.74%	49.56%	77.20%	38.87%	90.23%	81.99%	100%	77.38%	72.65%	75.66%	84.27%	
		Highway	33.62%	NC	48.25%	99.97%	NP	NP	20.08%	77.78%	38.73%	NC	52.95%	NC	32.31%	0.33%	88.87%	100%	54.90%	NC	20.38%	NC	
		Within City	56.28%	69.58%	70.39%	97.52%	NP	NP	28.74%	23.18%	47.51%	47.70%	75.77%	99.83%	49.18%	99.88%	96.73%	100%	86.70%	96.04%	55.38%	0.02%	
		Overall SSA	41.99%	59.17%	56.04%	91.42%	NP	NP	21.81%	34.65%	38.46%	67.05%	65.66%	88.72%	39.50%	64.23%	90.19%	100%	81.16%	84.56%	45.48%	35.08%	
	In-vehicle (>= -85dBm)	Major Road	54.05%	87.64%	78.27%	94.59%	NP	NP	59.57%	53.83%	44.44%	100%	73.16%	97.50%	66.21%	99.86%	98.55%	100%	96.01%	99.52%	85.78%	99.75%	
		Highway	61.51%	NC	82.99%	100%	NP	NP	54.21%	99.92%	64.22%	NC	72.20%	NC	59.01%	98.86%	71.82%	100%	84.46%	NC	50.16%	NC	
		Within City	77.24%	95.69%	91.41%	99.91%	NP	NP	69.25%	95.36%	81.10%	95.44%	98.17%	100%	92.23%	100%	56.06%	100%	97.95%	100%	82.52%	89.59%	
		Overall	66.53%	91.11%	84.49%	98.09%	NP	NP	58.06%	83.43%	67.16%	97.13%	87.14%	98.77%	71.93%	99.58%	71.51%	100%	95.69%	99.77%	72.07%	93.82%	

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
		SSA																				
	Outdoor-in city (>= 95dBm)	Major Road	85.68%	98.79%	98.20%	99.92%	NP	NP	88.35%	98.43%	70.45%	100%	95.94%	100%	92.73%	99.97%	100%	100%	100%	100%	98.30%	100%
		Highway	87.90%	NC	97.97%	100%	NP	NP	86.81%	99.98%	82.83%	NC	94.65%	NC	90.59%	99.97%	100%	100%	96.76%	NC	92.81%	NC
		Within City	97.94%	99.09%	99.31%	100%	NP	NP	91.69%	100%	97.13%	99.95%	99.97%	100%	99.24%	100%	100%	100%	99.98%	100%	98.50%	100%
		Overall SSA	91.49%	98.92%	98.43%	99.97%	NP	NP	88.03%	99.48%	85.82%	99.97%	97.81%	100%	94.01%	99.98%	100%	100%	99.47%	100%	96.60%	100%
6	Call Setup Success Rate (>=95%)	Major Road	93.33%	100%	99.15%	100%	NP	NP	96.77%	100%	100%	100%	100%	100%	100%	100%	98.61%	100%	100%	100%	100%	100%
		Highway	98.10%	NC	99.19%	100%	NP	NP	96.94%	100%	95.45%	NC	97.92%	NC	96.45%	100%	100%	100%	100%	NC	96.15%	NC
		Within City	96.74%	100%	98.66%	100%	NP	NP	95.77%	100%	100%	97.87%	98.68%	100%	97.52%	100%	100%	96.88%	100%	100%	98.67%	96.43%
		Overall SSA	96.92%	100%	99.03%	100%	NP	NP	96.66%	100%	97.27%	98.63%	98.55%	100%	97.46%	100%	99.74%	98.78%	100%	100%	97.83%	98.25%
7	Hand Over Success Rate (HOSR)	Major Road	100%	100%	100%	100%	NP	NP	100%	100%	92.86%	100%	100%	100%	100%	100%	98.08%	100%	100%	100%	100%	100%
		Highway	100%	NC	99.62%	100%	NP	NP	95.00%	100%	98.04%	NC	100%	NC	99.12%	100%	98.40%	100%	100%	NC	100%	NC
		Within City	100%	100%	98.43%	100%	NP	NP	97.50%	100%	100%	100%	100%	100%	96.72%	100%	98.78%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	99.41%	100%	NP	NP	96.37%	100%	97.99%	100%	100%	100%	98.03%	100%	98.45%	100%	100%	100%	100%	100%

NA: Not Applicable, NP: Not Provided

BSNL has not provided the drive test report despite best efforts.

The service providers having block call rate more than 3% have been shaded in yellow colour.

Videocon is not having their coverage in entire Pratapgarh SSA, hence not included in the above table.

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Name of SSA	Day 1		Day 2		Day 3	
	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
Jhansi	Lalitpur, Mahraun, Talbehat / 102	Highway: (Bijauli-Bhel-Babina-Badaura Chauraha-Talbehat-Bansi-Lalitpur-Masorakhurd-) Major Roads : (Hansari-Rajgarh-Bijauli-Growth Center-Shan A Punjab Dhaba-Mirchwara-Patsemra-Khitwans-Silavan Within City : Talbehat City (Poora Kalan Stand-Bus Stand Petrol Pump-Tlb Exchange-Tehsil-Thana-Station-Gas Godam) Lalitpur City (Elite Chauraha-Jail-Bus Stand -P& T Colony-Dm Office-Vikash Bhavan-Rly Station-Gandhi Nagar-Varni Chauraha-Te Ltp Exchange -Sadan Kanta-Ghantaghar-Sabarkar Chok-Laxmipura-Nadipar) Mehrauni City (Mehrauni Exchange-Indira Chauraha-Main Market-Banpur Road-Madawra Road)	Jhansi, Chirgaon / 170 Km	Highway: (Konchhabhanwar-Biet-Gora Machiya-Badagaon-Parichha-Chirgaon-Amargarh-Month) Major Roads : (Chirgaon Rly Station-Chirgaon-Bankwa Road) Within City : Jhansi City (Medical-Bus Stand-Sadar Bazar-Jhansi Club-Kachehari Chauraha-Jhokan Bagh-Govind Chauraha-New Road-Minerva Chauraha-Jhansi Fort-Laxmi Bai Park-Tehsil-Lvm College-Ashik Chauraha-Bkd Chauraha-Vikash Bhavan-Jda Office-Circuit House-Sita Hotel-Station Road-Allahabad Bank Chauraha-Elite Chauraha-Jeevan Shah Chauraha-Bsni E10B Exchange) Within City : Chirgaon City (Thana-Market-Post Office) Within City : Moth City (Bus Stand-Market-Post Office-Tehsil-Bsni Telephone Exchange)	Garauth, Mauranipur, Moth / 100 Km	Highway: (Sesa- Poonch-Amrokh-Month) Major Roads : (Garautha Road-Dhawakar-Markuwan-Gursarain-Erich) Within City : Mauranipur City (Rly Crossing-Ambekar Chauraha-Nadipar-Dhanushdhari Mandir-Degree College--Tehsil-Bsni Telephone Exchange-Garautha Chauraha-Post Office-Teekam Garh Bus Stand-Dubey Chok) Within City : Garautha City (Thana-Market)

AUDIT & ASSESSMENT OF QOS FOR QE-SEPTEMBER -2015-UP (EAST) CIRCLE



Name of SSA	Day 1		Day 2		Day 3	
	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
Mirzapur	Hallia, Chunar / 150 Km	Within City:Mirzapur (Railway Station-Pili Kothi-Bathua Lohandi Kala) & Chunar(Railway Crossing-Railway Station-Fort-Jami-Chechari -Rly Station) Highway (Mirzapur-Lahangpur-Lalganj & Mirzapur-Aamghat-Aghwar-Padri-Chunar) Major Roads: (Bastara Turn-Katai-Halia--Mahugarhdramalganj Via Haliya)	Mirzapur, Robertsganj, Obra / 150 Km	Within City: (Murdhawa-Hindalco Factory-Railey Stn-Pipri Dam), Robertsganj,Mirzapur City Major Roads Mirzapur -Marihan-Rajgarh- Hindwari) Highway: (Robertsganj-Dala-Hathinala- Kharpathar)	Dudhi, Obra / 150 Km	Within City: (Rajkhar-Duddhi Market-Amwar Turn),Obra(Bajrang Nagar-Obra Market-Power House-Vip-Ramlila Maidan-Te) Major Roads (Murdhawa-Katauli-Dumhan-Rajkhar)& (Dala -Billi Junction- Bajrang Nagar) Highway: (Duddhi - Wyndhamgank-Kavhnarwa-Kone-Kota- Dala)
Pratapgarh	Pratapgarh/102	Major Roads : (Sahabganj - Tejgarh - Antor) Within City : (Pratapgarh Railway Station - Bhagua Chungi - Treasury Chauraha - Company Garden- Meera Bhawan - Pratapgarh City - Chilbila - Chowk - Bhagua Chung Within City : (Pratapgarh Railway Station - Bhagua Chungi - Treasury Chauraha - Company Garden- Meera Bhawan - Pratapgarh City - Chilbila - Chowk - Bhagua Chungi)	Kunda/105	Major Roads : (Manngarh Bsnl Exchange - Manngarh Asharam) Highway : (Sukhpal Nagar - Mohanganj - Lalganj - Sangramgarh - Manngarh - Maheshgank - Derwa - Jethwara - Mohanganj) Within City: Pratapgarh(Bsnl Office:Dahilamau) Within City: Kunda(Ambedkar Chauraha - Katara Road - Kunda City)	Patti/97	Major Roads : (Patti - Uraiyadih - Jamtali - Lacchipur - Raniganj) Highway : (Mahuli - Rakha - Deewanganj - Patti - Raniganj - Prithvganj - Bhupia Mau - Bhagua Chungi) Within City : Pratapgarh(Bsnl Office:Dahila Mau - Rajpal Chauraha - Sadar Mod - Chilbila Tiraha) Within City : Patti (Patti Chauraha - Maurya Nagar - Patti Main Market)

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF JHANSI SSA – JULY 15

S NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	Aircel	July'15	Jhansi	Lalitpur, Mahraun, Talbehat	Poor Rx Level and Rx Quality in Jhansi, Babina, Lalitpur SDCA.	Jhansi, Chirgaon,	Poor Rx Level and Rx Quality in All Covered SDCA's on Day 2.	Garauth, Mauranipur, Moth	Poor Rx Level and Rx Quality In Mauranipur SDCA.
2	Airtel				Poor Rx Level and Rx Quality In Lalitpur SDCA.		Overall Good Coverage and Quality On Day2.		Poor Rx level and Rx Quality Near Moth, Markuan, Garautha SDCA.
3	BSNL				NP		NP		NP
4	TATA GSM				Poor Rx Level and Rx Quality Patches Observed in Most of the Covered SDCA's.		Poor Rx level and Rx Quality In Moth SDCA.		NC
5	TATA CDMA				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
6	Idea				Poor Rx Quality in Babina and Mehrauni.		Poor Rx Quality in Jhansi City.		Overall Good Coverage and Quality On Day 3.
7	RCOM GSM				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
8	RCOM CDMA				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
9	Uninor				Poor Rx Level and Rx Quality Near Dogri Village, Bijoli Village, Chharpat Village.		Poor Rx Level and Rx Quality Near Maheba, Pahari Bujurg Village.		Poor Rx Level and Rx Quality Near Eskil, Buzurg, Naikera, Sagauli, Bargain Ahir Village and Pahari Buzurg.
10	Vodafone				Poor Rx Level and Rx Quality Near Talbehat and Lalitpur.		Overall Good Coverage and Quality On Day2.		Overall Good Coverage and Quality On Day 3

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF MIRZAPUR SSA – AUGUST 15

S NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	Aircel	Aug'15	Mirzapur	Hallia, Chunar	Poor Rx Level and Rx Quality Near Chunar, Semerakalan, Hallia.	Mirzapur, Robertsganj, Obra	Poor Rx Level and Rx Quality in All Covered SDCA's on Day 2.	Dudhi, Obra	Poor Rx Level and Rx Quality in All Covered SDCA's on Day 2.
2	Airtel				Poor Rx Quality Near Hallia SDCA.		Overall Good Coverage and Quality On Day2.		Poor Rx Quality Near Harra.
3	BSNL				NP		NP		NP
4	TATA GSM				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
5	TATA CDMA				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
6	Idea				Poor Rx Level and Rx Quality Near Semrakalan, Chunar.		Poor rx Level and Rx Quality Near Marihan.		Poor Rx Level and Rx Quality Near Harra SDCA.
7	RCOM GSM				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
8	RCOM CDMA				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
9	Uninor				Poor Rx Level and Rx Quality Near Dadri, Gambhirpur Village, Bargad, Katai, Lalpur, Galara, Bhata.		Poor Rx Level and Rx Quality Near Bela, Loosa, Dilahi.		Poor Rx Level and Rx quality Near Padrach, Harra high Hill Area, Mahuli.
10	Vodafone				Overall Good Coverage and Quality On Day1.		Poor Rx Level and Rx Quality Near Obra SDCA.		Poor Rx Level and Rx Quality Near Harra SDCA.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF PRATAPGARH SSA – SEPTEMBER 15

S NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	Aircel	Sep'15	Pratapgarh	Pratapgarh	Poor Rx Level and Rx Quality Near Pratapgarh, Mohanlalganj, Antu and Sunderpur.	Kunda	Poor rx Level and Rx Quality Near Jethwara, Kunda.	Patti	Poor Rx Level and Rx Quality in All Covered SDCA's on Day 3.
2	Airtel				Poor Rx Level And Rx Quality Near Antu.		Overall Good Coverage and Quality On Day2.		Poor Rx Level and Rx Quality Between Pratapgarh and Patti SDCA.
3	BSNL				NP		NP		NP
4	TATA GSM				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
5	TATA CDMA				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
6	Idea				Poor Rx Level and Rx Quality in All Covered SDCA's on Day 1.		Poor Rx Level and Rx Quality in All Covered SDCA's on Day 1.		Overall Good Coverage and Quality On Day 3.
7	RCOM GSM				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
8	RCOM CDMA				They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.		They have Coverage in Major SDCA's with Poor Rx level and Rx Quality at Outer.
9	Uninor				They have coverage in Major SDCA's only.		They have coverage in Major SDCA's only.		They have coverage in Major SDCA's only.
10	Vodafone				Poor Rx Level and Rx Quality Near Sunderpur,		Overall Good Coverage and Quality On Day2.		Overall Good Coverage and Quality On Day3.

7.6 KEY FINDINGS ON DRIVE TEST:

The key observations derived from the results of the drive tests were as under –

- (i) **In the Month of July-15**, drive test was conducted across **Jhansi SSA** covering Lalitpur, Mahraun, Talbehat, Jhansi, Chirgaon, Garauth, Mauranipur and Moth SDCAs. The performance of some of the operators was not satisfactory as they failed to meet the benchmarks of some of the parameters. On SSA level, **Non-compliance** of the service providers was as follows:

BSNL: Call drop rate: **3.37% (outdoor)**, Voice Quality (**90.99%**- outdoor), CSSR (**89.85%**).

Tata (GSM): Call drop rate: **3.42% (outdoor)**, Voice Quality (**94.44%**), Block Call rate: **3.73% (outdoor)**

Tata (CDMA): Voice Quality: **93.93%**.

- (ii) **In the Month of August -15**, drive test was conducted across **Mirzapur SSA** covering Hallia, Chunar, Mirzapur, Robertsganj, Obra and Dudh SDCAs. The performance of some of the service providers on SSA level remained under performed for different network parameters. BSNL has not provided the drive test reports; hence no data is entered in the table. On SSA level, **Non-compliance** of the service providers was as follows:

RCOM GSM / RCOM GSM: Drop Call rate (**2.42 %**) / (**2.38%**).

Airtel, Tata CDMA and Uninor: Voice Quality (**93.91%**), (**93.33% - indoor**) and (**92.78%**) respectively.

- (iii) **In the month of September-15**, drive test was conducted across **Pratapgarh SSA** covering Pratapgarh, Kunda and Patti SDCAs. BSNL has not provided the drive test reports, hence no data is entered in the table. On SSA level, **Non-compliance** of the service providers was as follows:

Airtel, Idea, Tata (GSM), Uninor and Tata (CDMA): Voice Quality – **94.45%, 89.51%, 94.41%, 94.97% and 94.16%** respectively.

The deficiencies with respect to adequate coverage and voice quality, encountered by different Service providers at various places as per drive tests plots, are detailed in the above table.-5, table-6 and table-7.

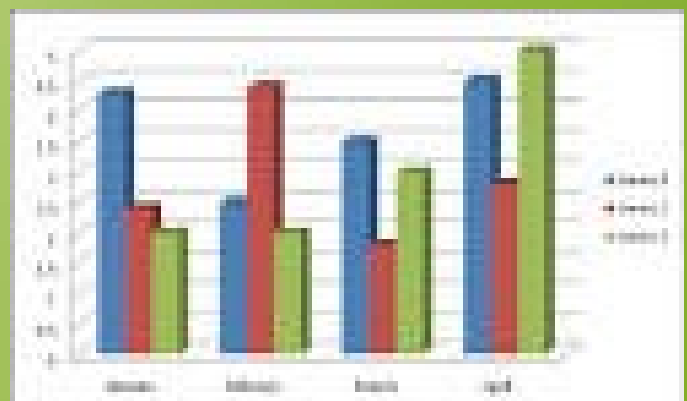
*Thus, the performance of the operators namely **BSNL, Tata (GSM)/ Tata (CDMA), Idea, Airtel and Uninor** was not satisfactory with respect to some of the parameters such as **Voice Quality, Call drop rate**.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

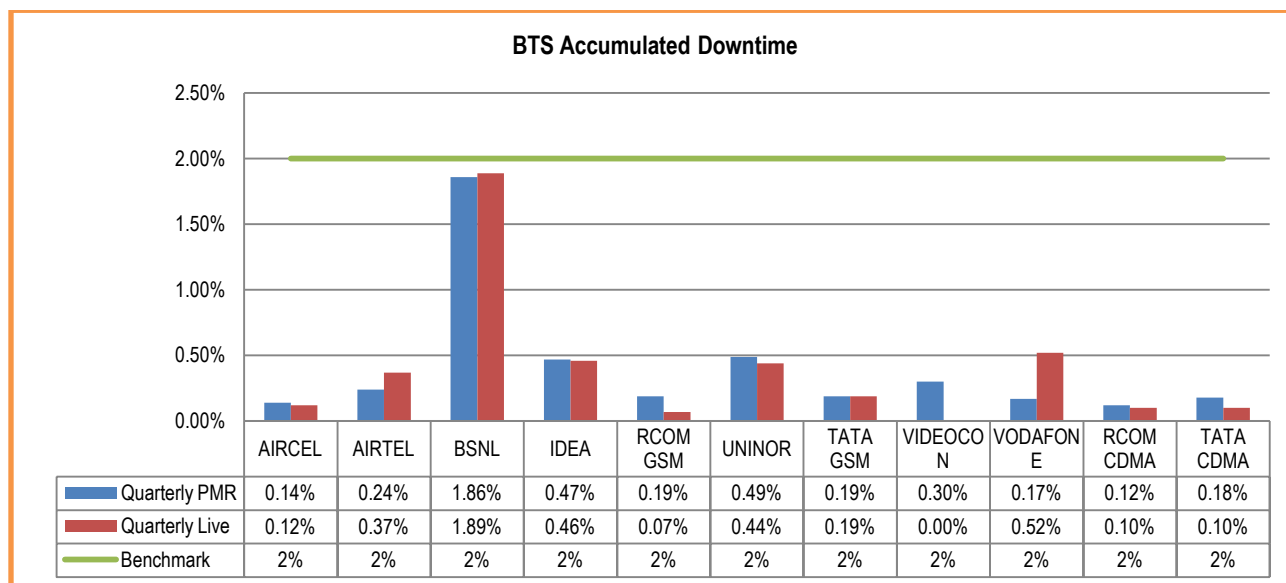
AVERAGED QUARTERLY 3-DAYS LIVE MEASUREMENT



8. GRAPHICAL REPRESENTATION (CMTS):

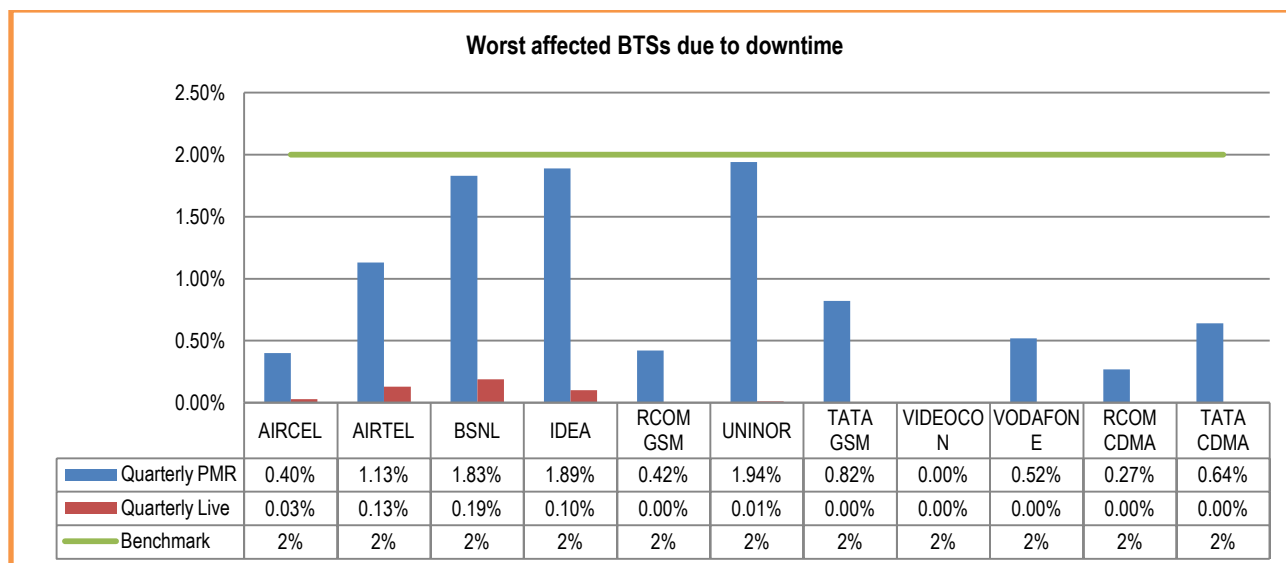
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIMES:



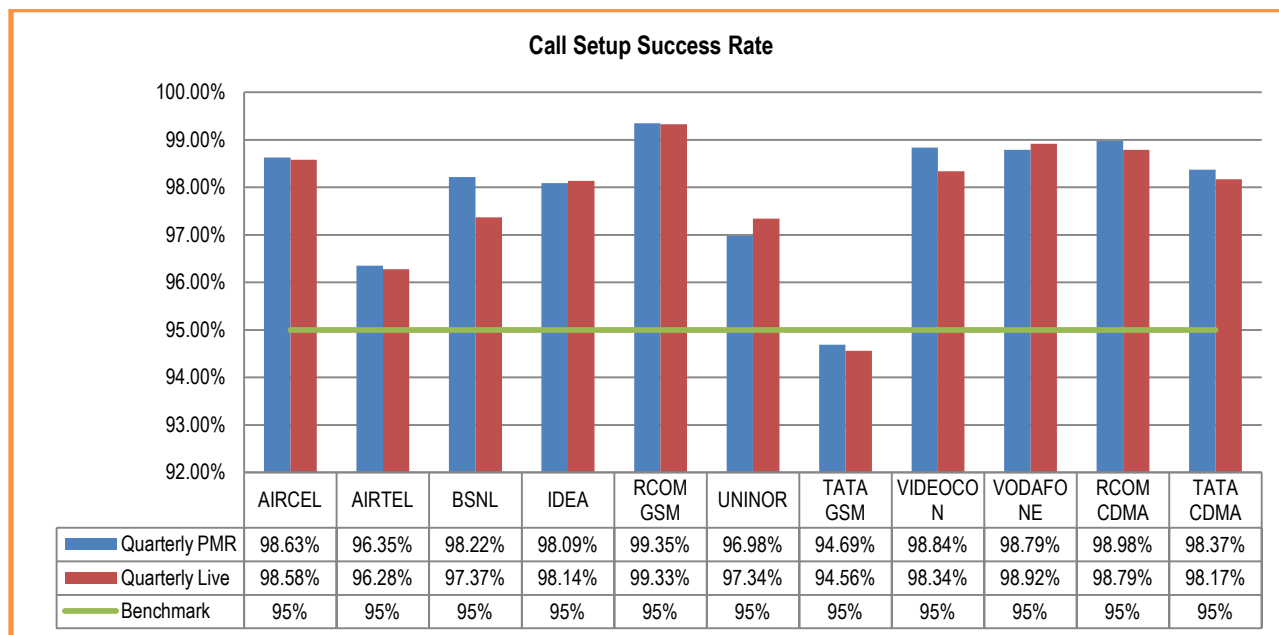
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSs DUE TO DOWNTIME:



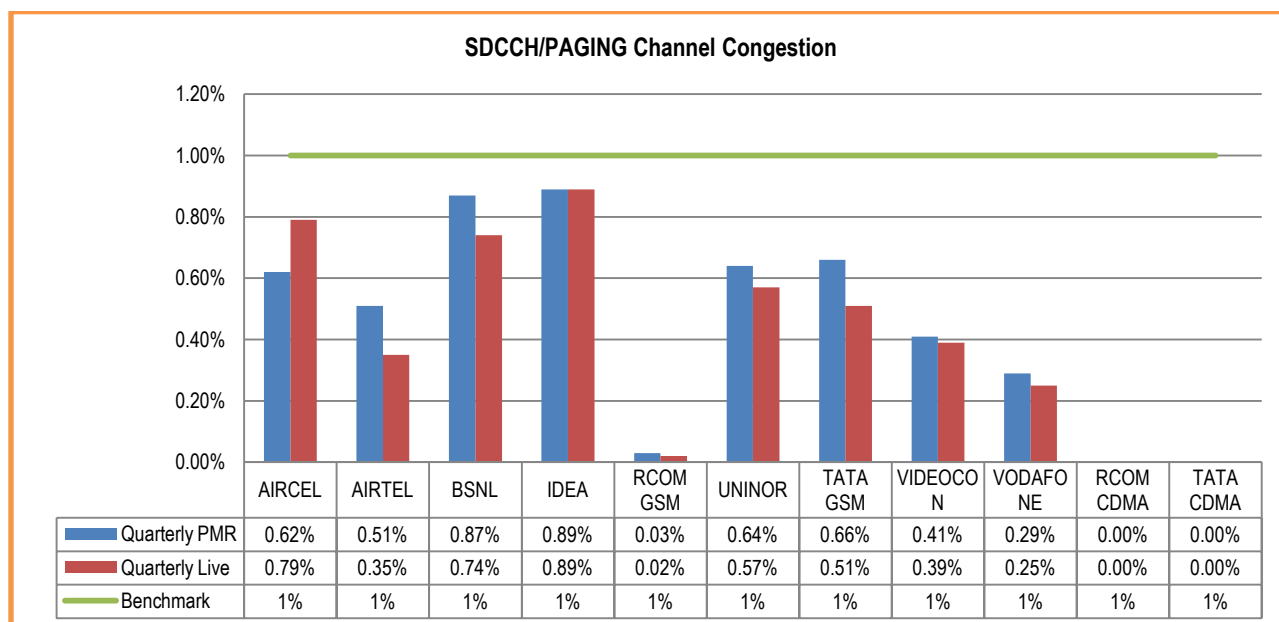
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE:



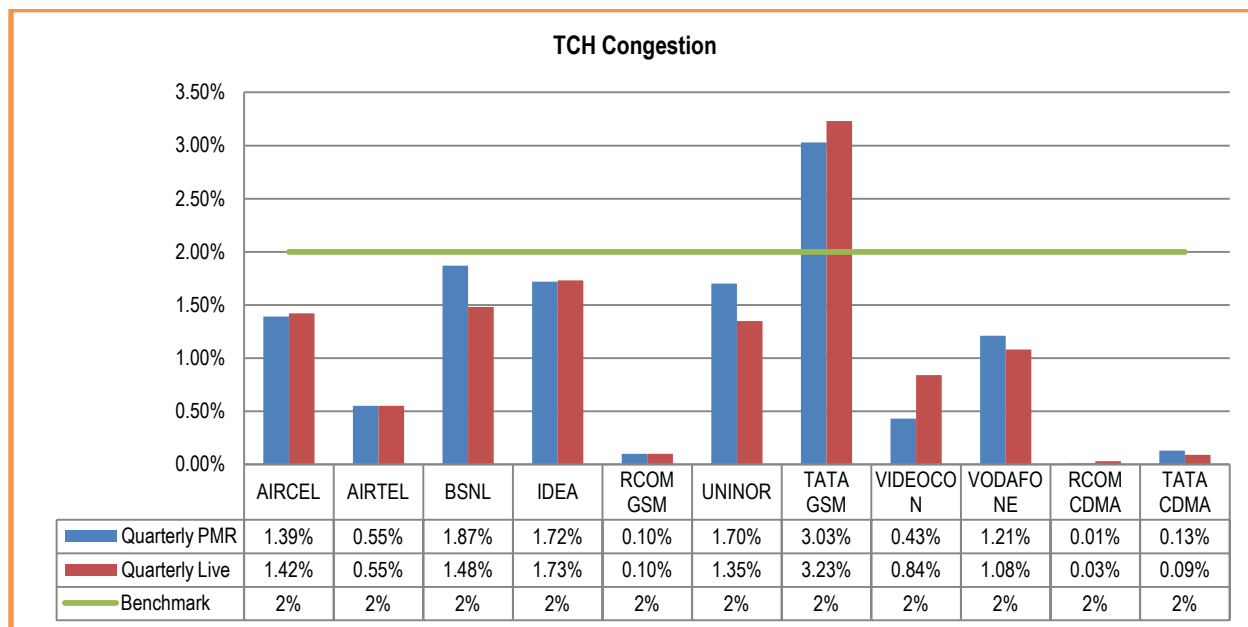
All operators are meeting the benchmarks except Tata GSM.

4) SDCCH/PAGING CHANNEL CONGESTION:



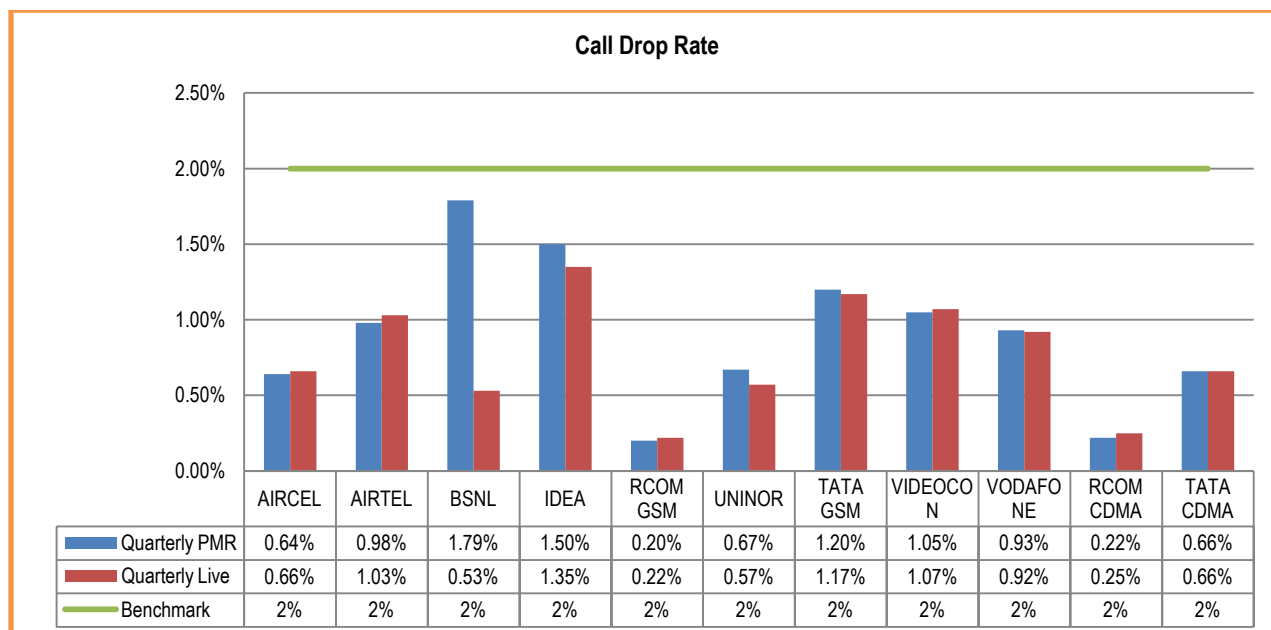
All operators are meeting the benchmarks.

5) TCH CONGESTION:



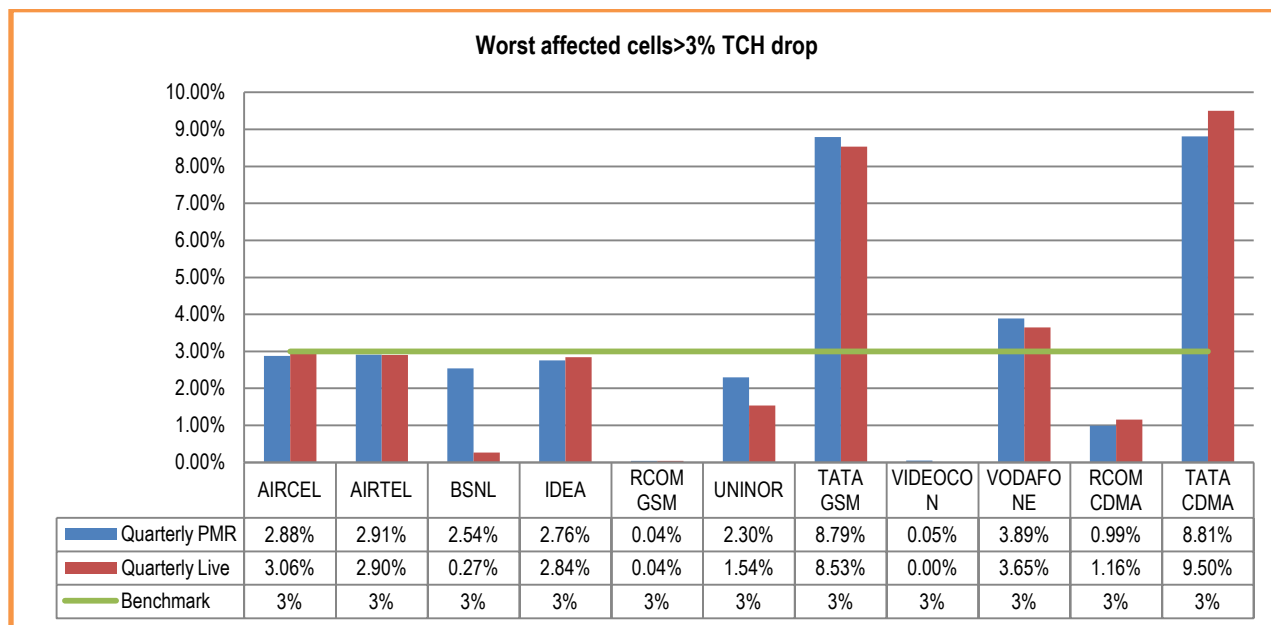
All operators are meeting the benchmarks except Tata GSM.

6) CALL DROP RATE:



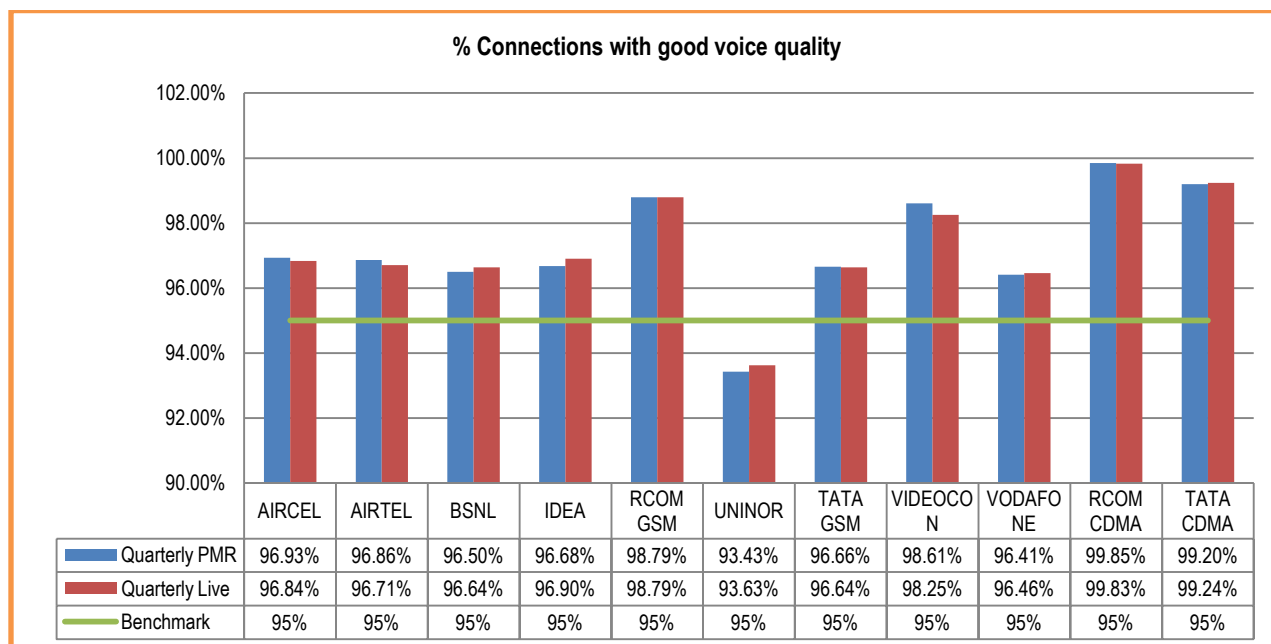
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Aircel (during 3 days live), Tata GSM, Vodafone and Tata CDMA.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks except Uninor.

9. QOS AUDIT OF BASIC (WIRELINE) SERVICE PROVIDERS



9. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINER)

The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. Based on this criterion, the QoS audit for basic (wire line) service was undertaken for assessment of quarterly performance of the service providers for quarter ended September-2015. **Out of 2142 (Present no. of BSNL exchanges), audit was done for 102 sampled (26-Urban and 76-Rural) exchanges**, and one exchange each of Bharti-Airtel, RCL, RCL & Vodafone. As UPE Circle is having 163 SDCAs in, so 102 BSNL exchanges spread over 17 SDCAs in UPE (10% of total 163 SDCAs) have been taken for audit. List of all exchanges taken for QoS audit is attached as **Annex-1**.

Sr. No	Service Provider	Circle	Urban Exchange	Rural Exchange	Total Exchange	No. of Urban Exchanges Covered for audit	No. of Rural Exchanges Covered for audit	Total Exchanges Covered for audit
1	Bharti-Airtel	UPE	1	0	1	1	0	1
2	RCL		1	0	1	1	0	1
3	TTL		1	0	1	1	0	1
4	Vodafone		1	0	1	1	0	1
5	BSNL		578	1564	2142	26	76	102
Total Exchanges at present			582	1564	2146	30	76	106

NB: The audit of BSNL has been conducted in **Faizabad, Barabanki and Lakhimpur Kheri SSAs** and data not provided by Barabanki and Lakhimpur Kheri SSAs despite our best efforts so calculation of BSNL wire line audit data are based on Faizabad SSA only.

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

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

AVERAGED QUARTERLY (JUL TO SEP 15) AUDIT DATA FOR WIRELINE (BASIC) SERVICES – UPE CIRCLE								
Wireline Audit Data		Benchmark	Audit Period	BHARTI AIRTEL	BSNL	RCL	TTL	VODAFONE
S/N	Name of Parameter			WIRELINE SERVICE PROVIDERS				
1	Fault incidences							
	% of (No. of faults/100 subscribers /month)	< 7%	Quarterly	6.68%	3.70%	0.03%	2.33%	1.50%
2	Faults Repair/Restoration Time							
	% of fault repair by next working day (Urban Area)	>85%	Quarterly	87.89%	90%	100%	100%	100%
	% of fault repair Within 5 days (Urban Area)	100%	Quarterly	100%	100%	100%	100%	100%
	% of fault repair by next working day (Rural & hilly Area)	>75%	Quarterly	NA	90%	NA	NA	NA
	% of fault repair Within 7 days (Rural & hilly Area)	100%	Quarterly	NA	100%	NA	NA	NA
	Mean time to Repair(MTTR)	≤10 Hrs	Quarterly	6.11	NP	4.53	1.35	4.02
3	Rent Rebate							
	Fault pending > 3 days & <7 days	Rebate for 7 days	Quarterly	263	0	0	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Quarterly	0	0	0	0	0
	Fault pending > 15 days	Rebate for 1 month	Quarterly	0	0	0	0	0
4	Metering & Billing Credibility							
	% of disputed Bills over bills issued (Post Paid)	< 0.1%	Quarterly	0.01%	0.00%	0.01%	0.00%	0.00%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA	NA	NA	NA
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	98% within 4 weeks	Quarterly	100%	100%	100%	100%	100%
	% of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	Quarterly	100%	100%	100%	100%	100%
	Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	Quarterly	100%	100%	100%	100%	100%
5	POI Congestion							
	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0	0
6	Response Time to customer for assistance							
	% Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Quarterly	100%	97.95%	98.98%	100%	99.50%
	% age of calls answered by the operators (voice to voice) within 90 seconds.	>=95%	Quarterly	93.78%	97.80%	NP	100%	100%
7	Customer care(promptness in attending to customers request)							
	Termination / Closures	100% within <=7days	Quarterly	100%	100%	100%	100%	100%
	Time taken for refunds of deposit after closures	100% within 60 days	Quarterly	100%	91.49%	100%	100%	100%

- NA-Not Applicable
- NP: Data not provided by the service providers despite our best efforts.

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

3 DAYS LIVE DATA FOR WIRELINE (BASIC) SERVICES – UPE CIRCLE									
<u>3 days live Wireline Audit Data</u>		Benchmark	Audit Period	BHARTI AIRTEL	BSNL	RCL	TTL	VODAFONE	
S/ N	Name of Parameter			WIRELINE SERVICE PROVIDERS					
1	POI Congestion								
	No. of POI's having congestion >0.5%		Live	0	0	0	0	0	
2	Response Time to customer for assistance								
	A) Total no of calls attempted to customer care /Call center		Live	3955	10192	1154	0	1009	
	B) Total no. of calls successfully established to customer care/Call center		Live	3955	9982	1134	0	1006	
	C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Live	100%	97.94%	98.27%	100%	99.70%	
	D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		Live	436	1701	1134	0	1006	
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Live	432	1698	1134	0	1006	
	F) % age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	>=95%	Live	99.08%	99.82%	100%	100%	100%	

9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINE)

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

Fault Repair/Restoration Time: All Operators met the benchmark on this parameter. BSNL did not provide the data despite our best efforts.

Mean Time to Repair: All operators met the benchmark for MTTR. BSNL did not provide the data despite our best efforts.

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

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

Response Time to Customer for assistance: For percentage of calls getting connected to call center, the performance of all service providers was within the benchmark of >95%.

With respect to the parameter of **calls answered by operator (voice to voice)**, **Bharti Airtel** could not meet the benchmark with their performance as **93.78%** against the benchmark of >= 95%.

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

Time taken for refund of deposit: In respect of this parameter, all operators complied with the benchmark except **BSNL**. **BSNL** could not meet the benchmark with their performance as **91.49%** against the benchmark of 100% within 60 days.

*Thus, from the above findings, it was concluded that the performance of all the operators was within the benchmark except **Bharti Airtel** could not meet the benchmark for parameter **Calls answered by Operators**. BSNL also failed to meet the parameter "Time taken for refund of deposit after closures".*

9.4 INTER OPERATOR CALL ASSESSMENT (WIRELINE)

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

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

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

9.5 LEVEL-1 LIVE CALLING (WIRELINE)

LEVEL 1 LIVE CALLING							
Emergency no.	Circle Name	No. of calls made	BHARTI AIRTEL	BSNL	RCL	TTL	VODAFONE
100	UPE	2	√	√	√	√	√
101	UPE	2	√	√	√	√	√
108	UPE	2	√	√	√	√	√
1095	UPE	2	√	√	√	√	√
1098	UPE	2	√	√	√	√	√

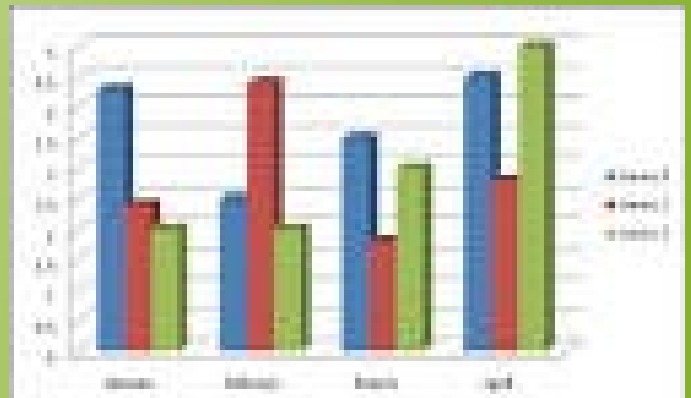
To assess the availability and efficiency of level 1 service such as police, fire, ambulance (emergency services) offered by BSNL, Bharti Airtel, Reliance, TTL and Vodafone, the calls were made from telephone provided by service providers, these services were found functional in the networks of all the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

9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)

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

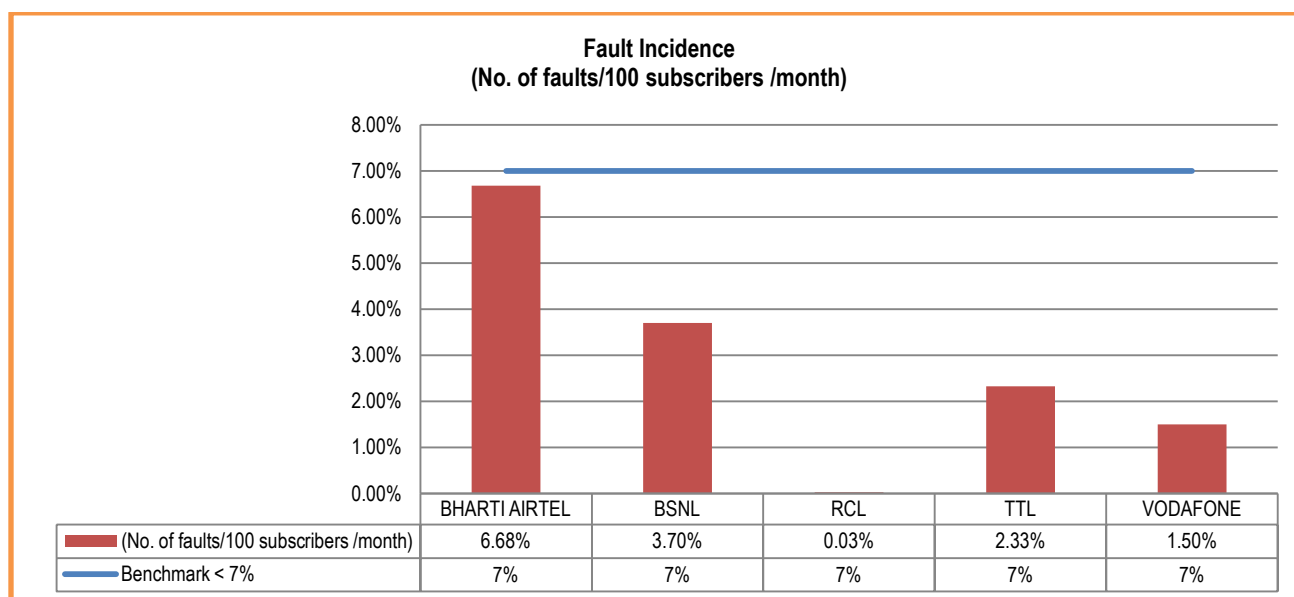
In case of calls answered by operators (voice to voice), when test calls were made to the call centers of different service providers, 100% of calls were answered by the call center operators within stipulated time in the network of Airtel, RCL, Vodafone, BSNL and TTL.

GRAPHICAL REPRESENTATION OF BASIC (WIRELINE) SERVICES



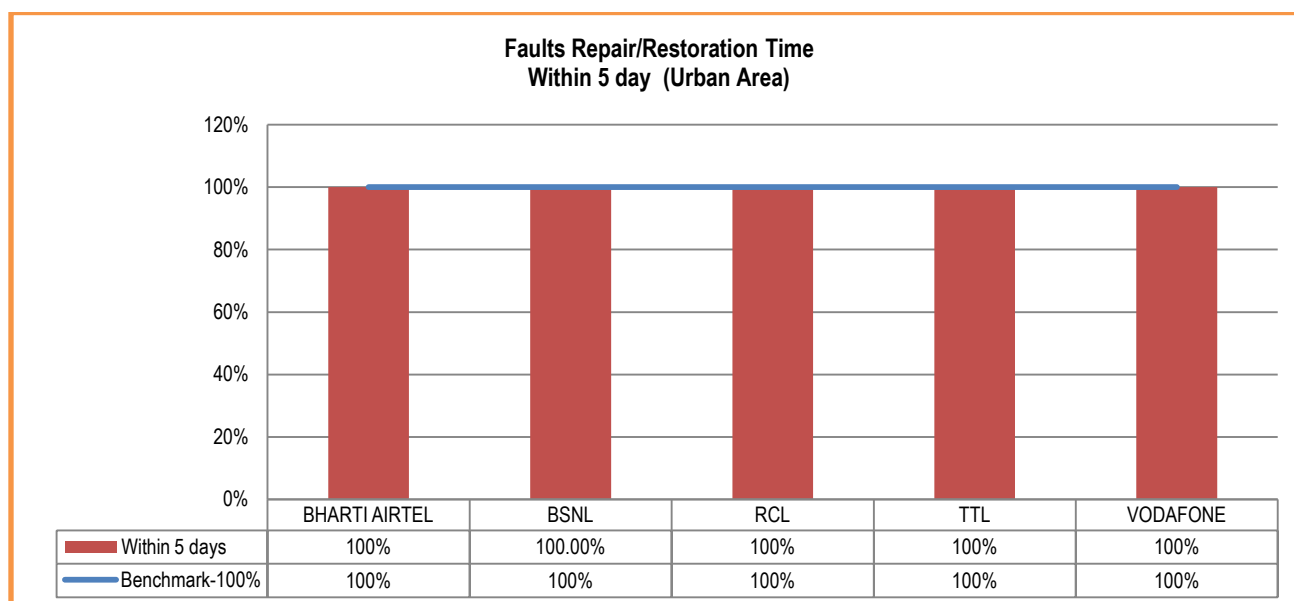
9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:

1) FAULT INCIDENCE:



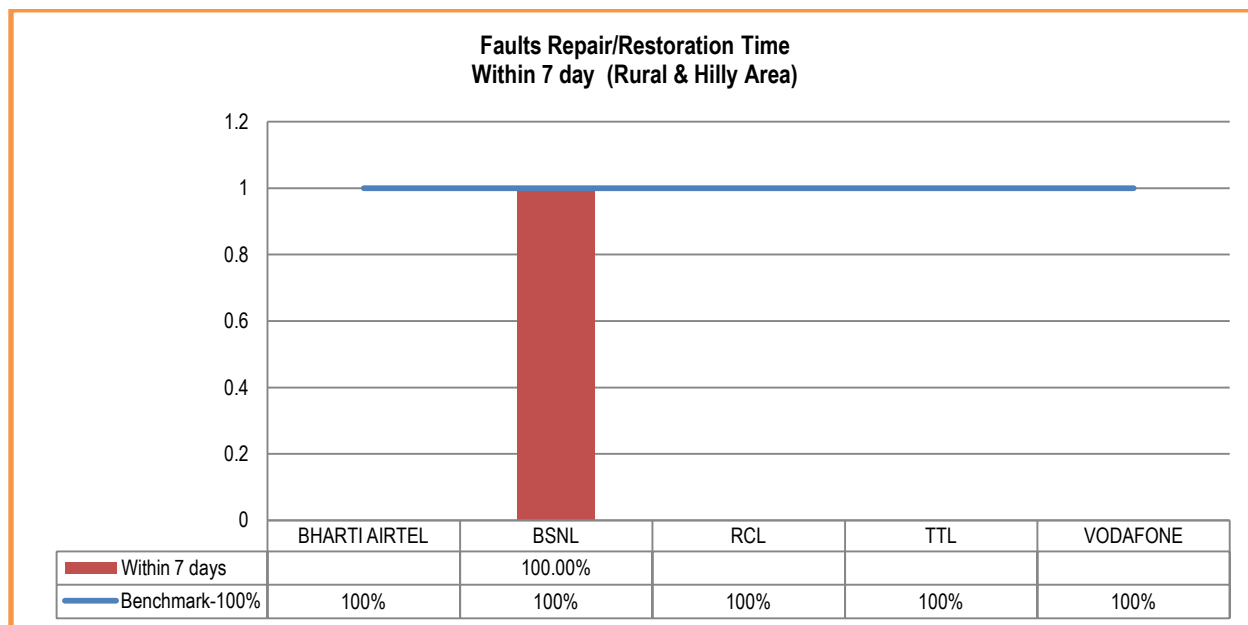
All Operators are meeting the benchmarks.

2) FAULTS REPAIR/RESTORATION TIME:



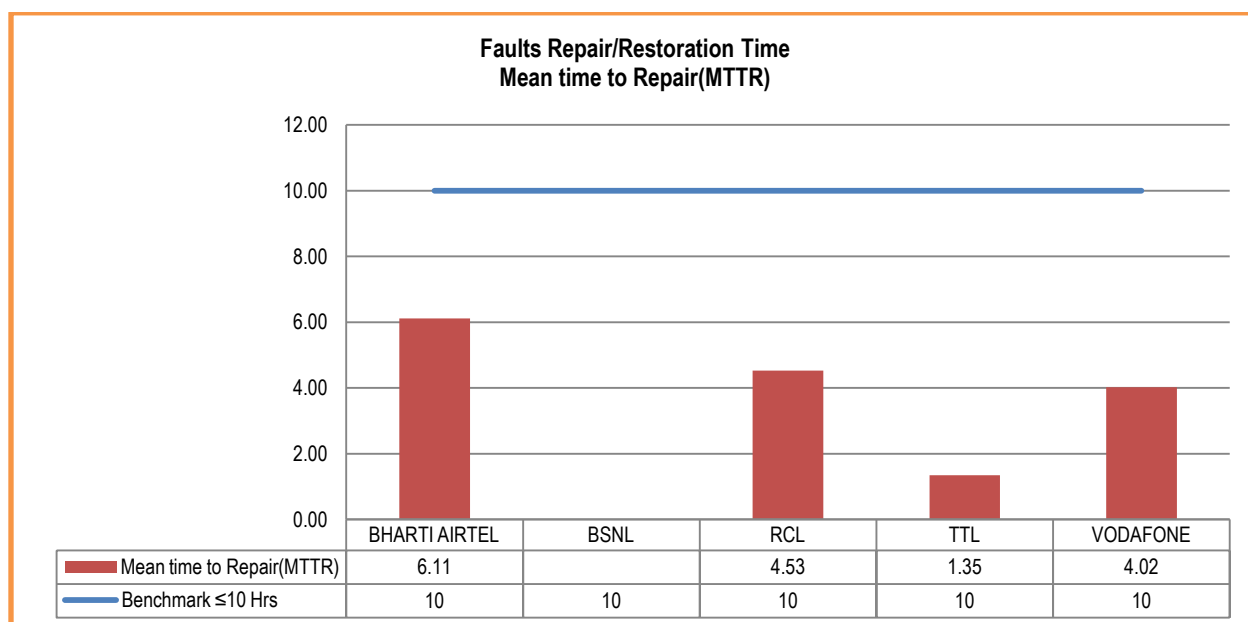
All Operators are meeting the benchmarks.

3) FAULTS REPAIR/RESTORATION TIME WITHIN 7 DAYS:



All Operators are meeting the benchmarks.

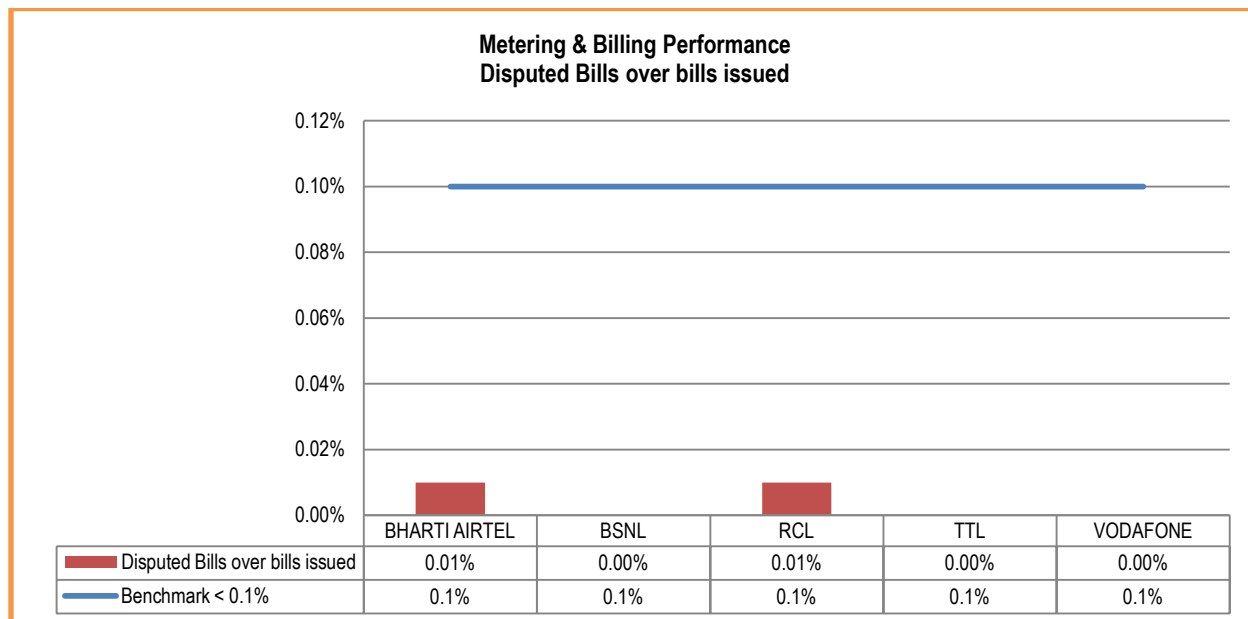
4) MEAN TIME TO REPAIR (MTTR):



All Operators are meeting the benchmarks.

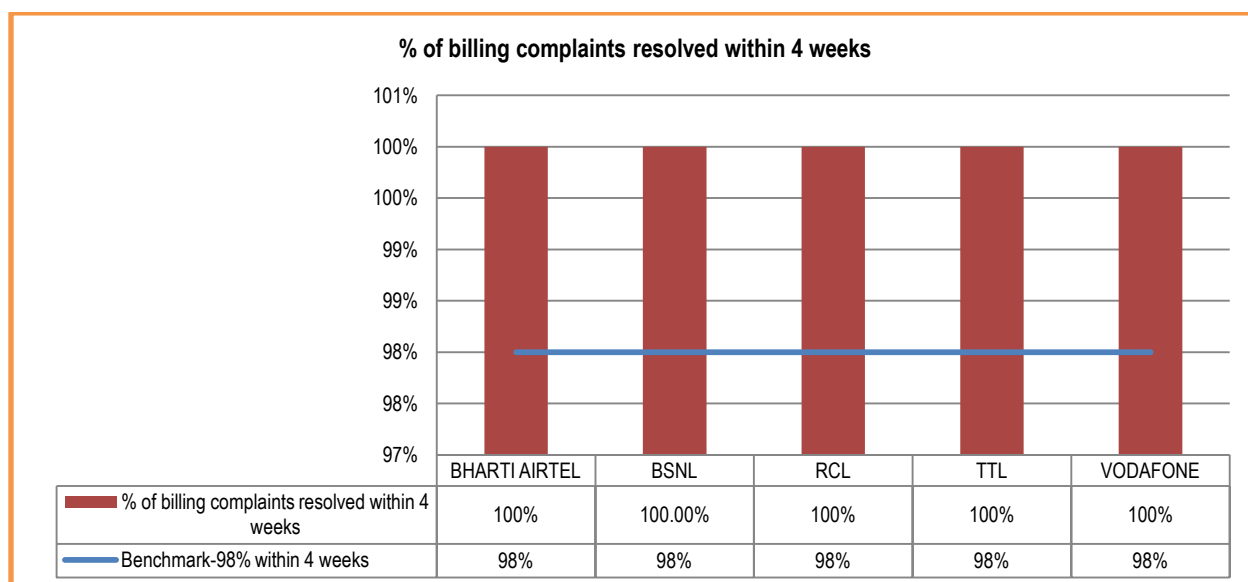
5) METERING & BILLING PERFORMANCE:

a) DISPUTED BILLS OVER BILL ISSUED :



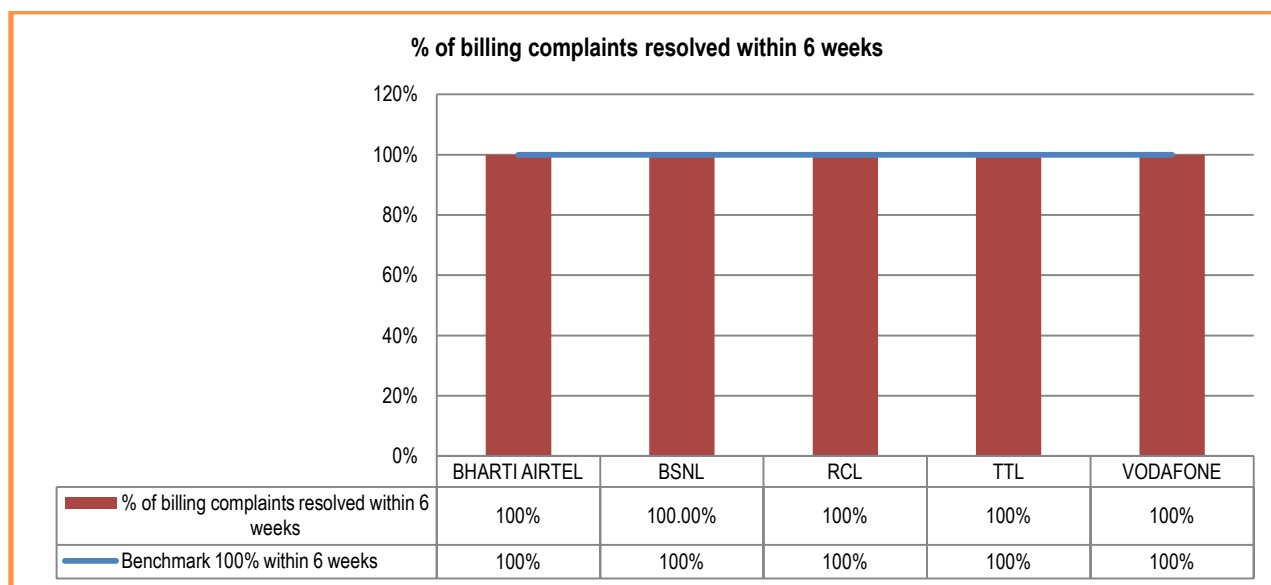
All Operators are meeting the benchmarks.

b) BILLING COMPLAINT RESOLUTION WITHIN 4 WEEKS:



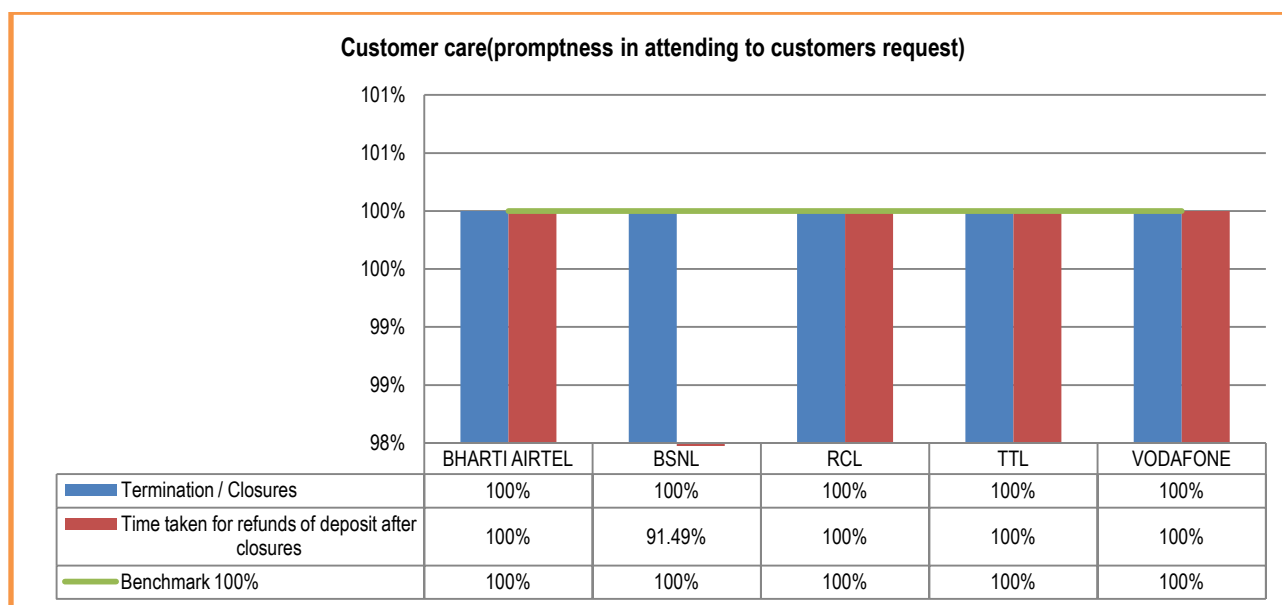
All Operators are meeting the benchmarks.

c) BILLING COMPLAINT RESOLUTION WITHIN 6 WEEKS:



All Operators are meeting the benchmarks.

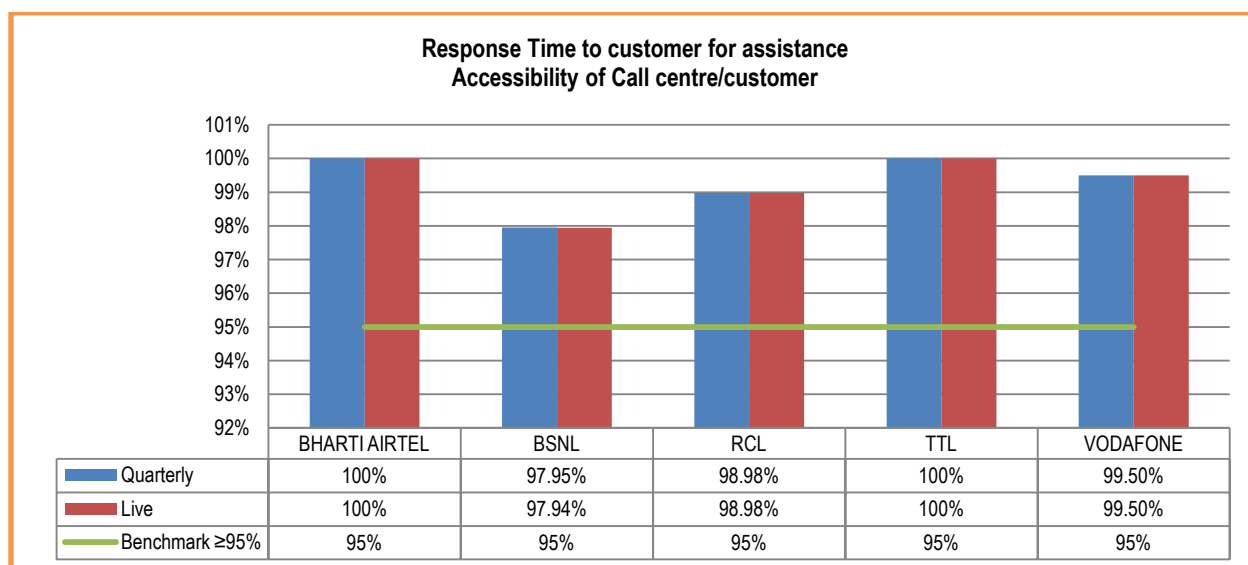
6) TERMINATION & CLOSURES:



All Operators are meeting the benchmarks except BSNL.

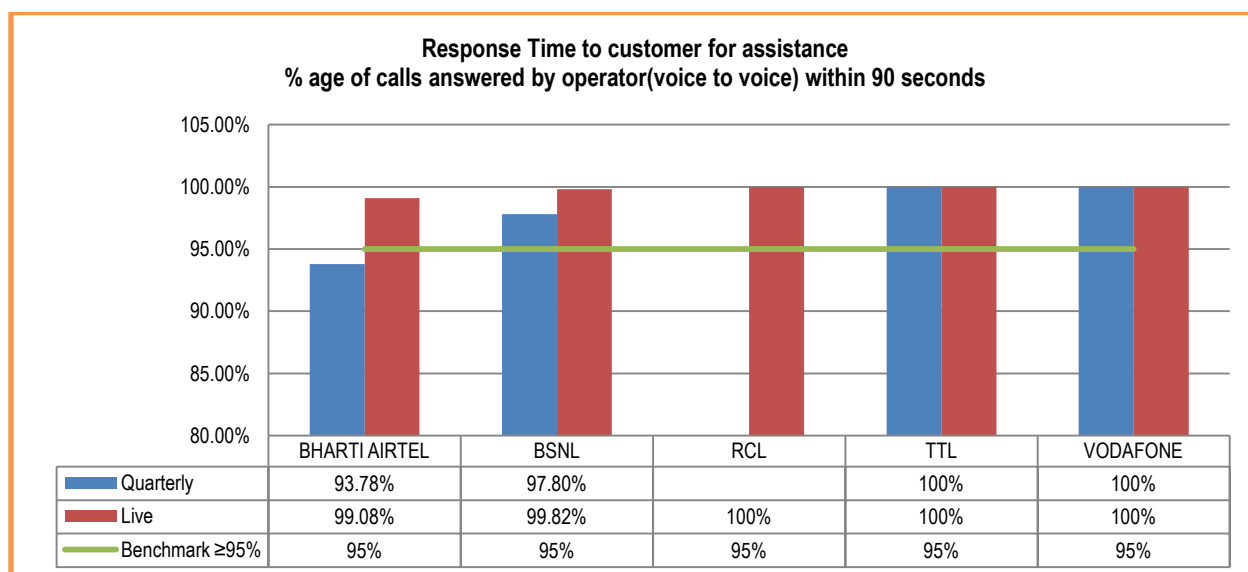
9.8 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE (ACCESSIBILITY OF CALL CENTRE/CUSTOMER CARE):



All Operators are meeting the benchmarks.

2) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE (CALL ANSWERED BY OPERATOR):



All Operators are meeting the benchmarks except Bharti Airtel and RCL (Quarterly data) have not provided for this parameter.

10. QOS AUDIT OF BROADBAND SERVICE PROVIDERS



10. QOS AUDIT OF BROADBAND SERVICE PROVIDERS

TUV-SUD South Asia was required to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who were having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle. Location of PoPs, covered for QoS audit is attached below.

Discussion with the broadband service providers revealed that they are maintaining their networks data on centralized basis so audit has been done for the centralized data. The following Broadband service providers were covered for QoS audit --

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

TTL and TCL have no services in UP(E) as per their communications.

NB: The Broadband audit of BSNL has been conducted in **Faizabad, Barabanki and Lakhimpur Kheri SSAs** and data not provided by Barabanki and Lakhimpur Kheri SSAs despite our best efforts so calculation of BSNL broadband audit data are based on Faizabad SSA only.

10.1 QUARTERLY MEASUREMENT DATA FOR BROADBAND SERVICE PROVIDERS:

AVERAGED QUARTERLY (JUL TO SEP-15) AUDIT DATA FOR BROADBAND SERVICES								
Broadband Audit Data		Bench- mark	Circle Name	BHARTI- AIRTEL	BSNL	RCL	TIKONA	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS				
1	Service Provisioning/Activation Time							
	A) No of connections registered during the period		UPE	3414	232	303	5483	211
	B) Total number of connections provided within 15 days of registration on demand during the period		UPE	3414	232	303	5483	211
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	<15 days	UPE	100.00%	100.00%	100.00%	100.00%	100.00%
	D)Total number of connections provided after 15 days of registration on demand		UPE	0	0	0	0	0
	E) %age of connections provided after 15 days of registration on demand		UPE	0.00%	0.00%	0.00%	0.00%	0.00%
	F) In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/ per day.	UPE	0	0	0	0	0
2	Fault Repair/Restoration Time							
	A) Total number of faults registered during the period		UPE	6063	470	261	11752	116
	B) Total number of faults repaired by next working day		UPE	5550	447	261	10609	114
	C) % age of faults repaired by next working day	>90%	UPE	91.54%	95.11%	100.00%	90.27%	98.28%
	D) Total number of faults repaired within three working days		UPE	6005	470	261	11693	116
	E)% age of faults repaired within three working days	≥99%	UPE	99.04%	100.00%	100.00%	99.50%	100.00%
3	Rent Rebate							
	A) Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		UPE	0	0	0	567	0
	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		UPE	0	0	0	204	0
	C) Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		UPE	0	0	0	68	0

AVERAGED QUARTERLY (JUL TO SEP-15) AUDIT DATA FOR BROADBAND SERVICES								
Broadband Audit Data		Bench- mark	Circle Name	BHARTI- AIRTEL	BSNL	RCL	TIKONA	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS				
4	Billing Performance							
	A) Total bills generated during period		UPE	116505	8242	18798	NA	231
	B) Total complaints received from customers/ Bills disputed		UPE	14	0	54	NA	2
	C) Billing complaints per 100 bills issued	<2%	UPE	0.01%	0.00%	0.29%	NA	0.87%
	D) Total number of complaints resolved in 4 weeks from date of receipt		UPE	14	0	54	NA	2
	E) %age billing complaints resolved in 4 weeks	100%	UPE	100.00%	100.00%	100.00%	NA	100.00%
	F) Total number of cases requiring refund of deposits after closure		UPE	9	47	3	NA	0
	G) Total number of cases where refund was made in <60 days		UPE	9	43	3	NA	0
	H) Percentage cases in which refund received within 60 days	100%	UPE	100.00%	91.49%	100.00%	NA	100.00%
5	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)							
	A) Total number of calls received by the operator		UPE	54707	81360	100752	112446	30
	B) Total number of calls answered by the operator within 60 seconds		UPE	43946	77490	99083	76463	28
	C) % age calls answered by the operator in 60 seconds	>60%	UPE	80.33%	95.24%	98.34%	68.00%	93.33%
	D) Total number of calls answered by the operator within 90 seconds		UPE	46902	79607	99382	96175	30
	E) % age calls answered by the operator within 90 seconds	>80%	UPE	85.73%	97.85%	98.64%	85.53%	100.00%
6	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).							
6.1	POP to ISP Gateway Node [Intra-network] Link(s)							
	A) Total Bandwidth Available at the link for the period days		UPE	335783	NP	6000	6000	1351
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		UPE	16220.74	NP	1361	4270.32	1112
	C) % age Bandwidth utilized during the period	<80%	UPE	4.83%	NP	22.68%	71.17%	82.31%
6.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity							
	A) Total number of upstream links for International connectivity		UPE	3	NP	11	18	NA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		UPE	0	NP	0	0	NA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		UPE	3000	NP	318000	5310	NA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		UPE	2154.01	NP	184521	4082.93	NA
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	UPE	71.80%	NP	58.03%	76.89%	NA

AVERAGED QUARTERLY (JUL TO SEP-15) AUDIT DATA FOR BROADBAND SERVICES								
Broadband Audit Data		Bench- mark	Circle Name	BHARTI- AIRTEL	BSNL	RCL	TIKONA	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS				
6.3	Broadband Connection Speed (download) - from ISP Node to User							
	A) Total committed download speed to the sample subscribers (In mpbs)		UPE	6	NP	2	12288	9
	B) Total average download speed observed for the sample subscribers during TCBH (In Mbps)		UPE	6	NP	1.95	11134	8.80
	C) % age subscribed speed available to the subscriber during TCBH	>80%	UPE	100.00%	NP	97.50%	90.61%	97.78%
7	Service Availability/Uptime							
	A) Total operational Hours		UPE	2208	2208	2208	2208	2208
	B) Total downtime (In hours)		UPE	0.32	32	17.07	5.29	43.07
	C) Total time when the service was available (In Hrs)		UPE	2207.68	2176	2190.93	2202.71	2164.93
	D) % age of Service availability uptime	>98%	UPE	99.99%	98.55%	99.23%	99.76%	98.05%
8	Packet Loss							
	A) Total number of ping packets transmitted		UPE	3000	92000	92000	3000	3000
	B) Total number of ping packets lost		UPE	0	0	419	0	0
	C) % age packet loss	<1%	UPE	0.00%	0.00%	0.46%	0.00%	0.00%
9	Network latency (for wired broadband access)							
9.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway							
	A) Total number of ping packets transmitted		UPE	3000	92000	3000	NA	3000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	34	59	34	NA	89
	C) Average round trip tip time for all the ping transmitted	<120 ms	UPE	34	59	34	NA	51
9.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)							
	A) Total number of ping packets transmitted		UPE	3000	1000	3000	NA	3000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	101	91	25	NA	232
	C) Average round trip tip time for all the ping transmitted	<350 ms	UPE	101	91	25	NA	72
9.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)							
	A) Total number of ping packets transmitted		UPE	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		UPE	NA	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	UPE	NA	NA	NA	NA	NA

NA: Not applicable

NP: Data not provided

Tikona: Tikona does not have Postpaid services so no billing data is not applicable for them.

TTL and TCL have no services in UP(E) as per their communications.

10.2 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS MEASUREMENT DATA VERIFICATION FOR BROADBAND SERVICE PROVIDERS:

3 DAYS LIVE DATA FOR BROADBAND SERVICES								
3 days live Broadband Audit Data		Bench- mark	Circle Name	BHARTI- AIRTEL	BSNL	RCL	TIKONA	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS				
1	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)							
	A) Total number of calls received by the operator		UPE	1736	3869	2693	4216	6
	B) Total number of calls answered by the operator within 60 seconds		UPE	1675	3850	2645	2635	6
	C) % age calls answered by the operator in 60 seconds	>60%	UPE	96.49%	99.51%	98.22%	62.50%	100.00%
	D) Total number of calls answered by the operator within 90 seconds		UPE	1706	3867	2645	3483	6
	E) % age calls answered by the operator within 90 seconds	>80%	UPE	98.27%	99.95%	98.22%	82.61%	100.00%
2	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).							
2.1	POP to ISP Gateway Node [Intra-network] Link(s)							
	A) Total Bandwidth Available at the link for the period days		UPE	335895	NP	2000	6480	1371
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		UPE	18063	NP	534	4337.78	1072
	C) % age Bandwidth utilized during the period	<80%	UPE	5.38%	NP	26.70%	66.94%	78.19%
2.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity							
	A) Total number of upstream links for International connectivity		UPE	3	NP	11	18	NA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		UPE	0	NP	0	0	NA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		UPE	3000	NP	106000	5310	NA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		UPE	2291.16	NP	70269.13	4034.93	NA
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	UPE	76.37%	NP	66.29%	75.99%	NA
2.3	Broadband Connection Speed (download) - from ISP Node to User							
	A) Total committed download speed to the sample subscribers (In mpbs)		UPE	6	NP	1.5	12288	10
	B) Total average download speed observed for the sample subscribers during TCBH (In Mbps)		UPE	6	NP	1.43	11135	8.94
	C) % age subscribed speed available to the subscriber during TCBH	>80%	UPE	100.00%	NP	95.33%	90.62%	89.40%

3 DAYS LIVE DATA FOR BROADBAND SERVICES								
3 days live Broadband Audit Data		Bench- mark	Circle Name	BHARTI- AIRTEL	BSNL	RCL	TIKONA	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS				
3	Packet Loss							
	A) Total number of ping packets transmitted		UPE	1000	1000	1000	1000	1000
	B) Total number of ping packets lost		UPE	0	0	0	0	4
	C) % age packet loss	<1%	UPE	0.00%	0.00%	0.00%	0.00%	0.40%
4	Network latency (for wired broadband access)							
4.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway							
	A) Total number of ping packets transmitted		UPE	1000	1000	1000	NA	1000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	36	50	2	NA	27
	C) Average round trip tip time for all the ping transmitted	<120 ms	UPE	36	50	2	NA	27
4.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)							
	A) Total number of ping packets transmitted		UPE	1000	1000	1000	NA	1000
	B) Total round trip time for all the ping packets transmitted during the period		UPE	87	215	1	NA	211
	C) Average round trip tip time for all the ping transmitted	<350 ms	UPE	87	215	1	NA	211
4.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)							
	A) Total number of ping packets transmitted		UPE	NA	NP	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		UPE	NA	NP	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	UPE	NA	NP	NA	NA	NA
5	Service Availability/Uptime							
	A) Total operational Hours		UPE	72	72	72	72	72
	B) Total downtime (In hours)		UPE	0	0	0	0	0
	C) Total time when the service was available (In Hrs)		UPE	72	72	72	72	72
	D) % age of Service availability uptime	>98%	UPE	100.00%	100.00%	100.00%	100.00%	100.00%

NA: Not applicable
NP: Data not provided

10.3 KEY FINDINGS: BROADBAND SERVICES

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

Fault Repair/Restoration Time: With regards to the fault related parameters, the performance of the service providers was within TRAI . **BSNL** not provided the data despite our best efforts.

Billing Performance: For this parameter the performance of the service providers was found well within the compliance benchmarks. **BSNL** could not meet the benchmark for the parameter "**Time taken for refund of deposit after closures**". with their performance as **91.49%** against the benchmark of 100% within 60 days.

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 during quarterly audit as well as 3 days live measurement except **Broadband Pacenet** could not meet the benchmark with its achieved level as **82.31%**.

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

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

10.4 CUSTOMER CARE / HELPLINE ASSESSMENT

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

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

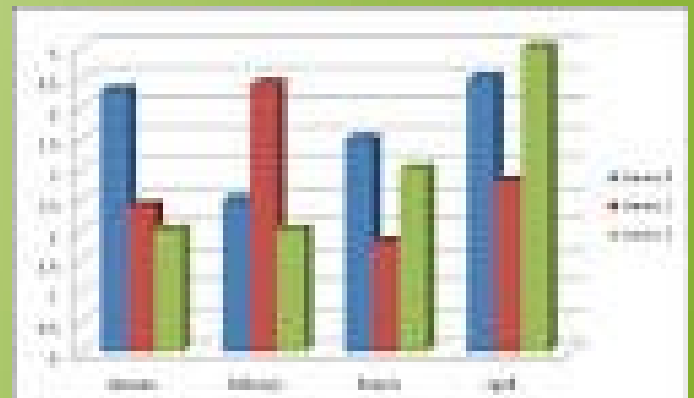
10.5 LIVE CALLING FOR BILLING COMPLAINTS

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS						
	Circle Name	BHARTI-AIRTEL	BSNL	RCL	TIKONA	PACENET
Total No. of calls Attempted	UPE	14	NP	54	NA	2
Total No. of calls Answered	UPE	14	NP	4	NA	2
Cases resolved within 4 weeks	UPE	14	NP	4	NA	2
%age of cases resolved	UPE	100.00%	NP	100.00%	NA	100.00%

NA: Not applicable due to Pre-Paid model.

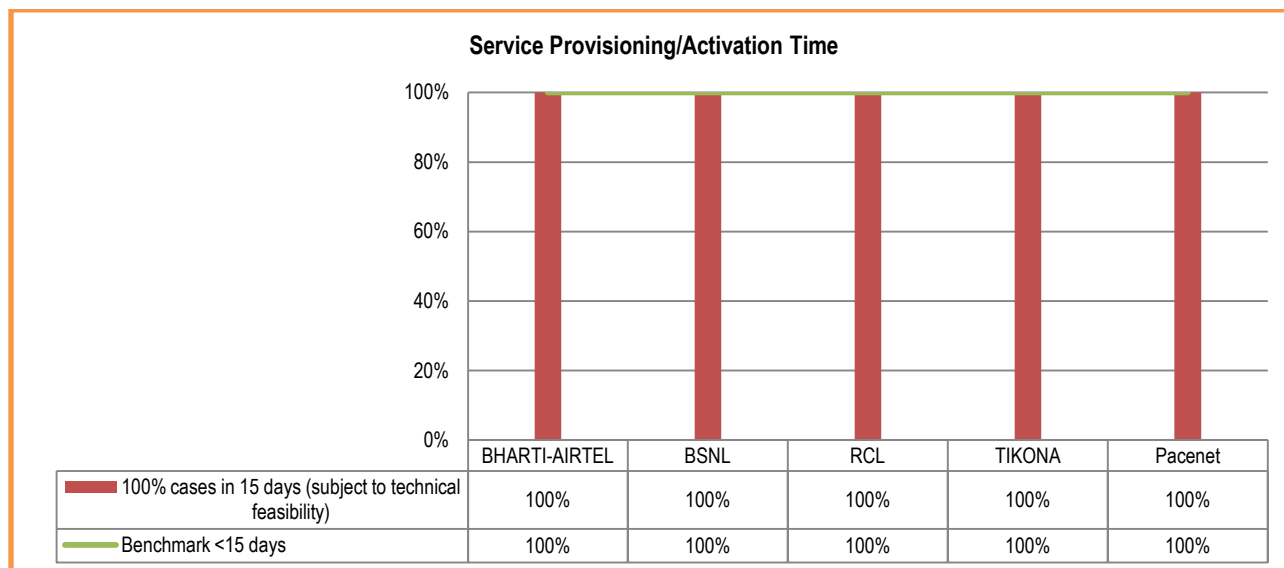
To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, some of the customers did not attend the calls while few others reported that their 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.

GRAPHICAL REPRESENTATION OF BROADBAND SERVICES



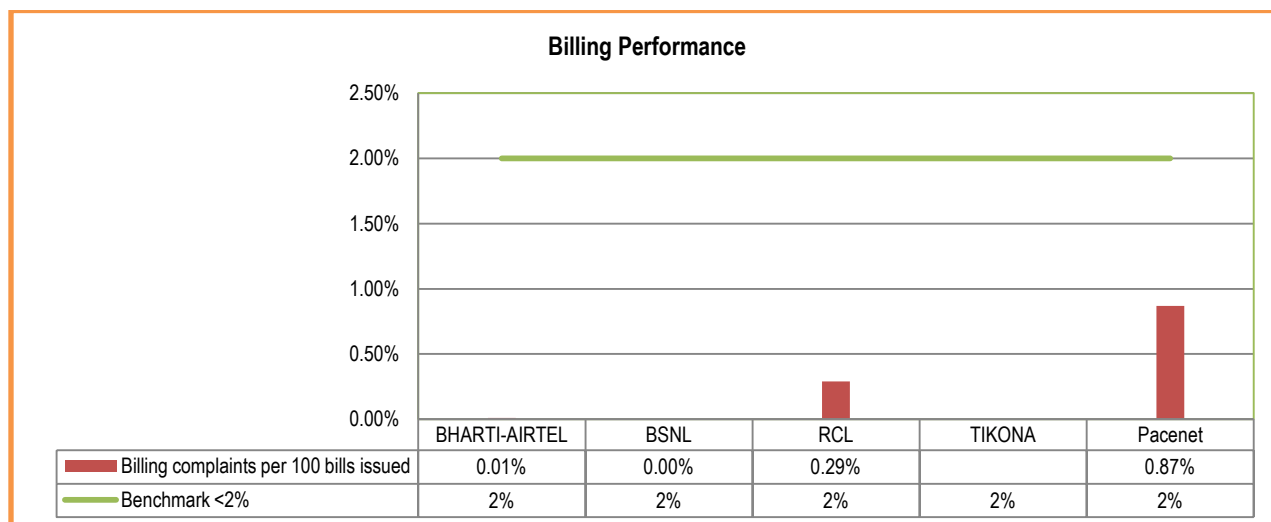
10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:

1. SERVICE PROVISIONING/ACTIVATION TIME:



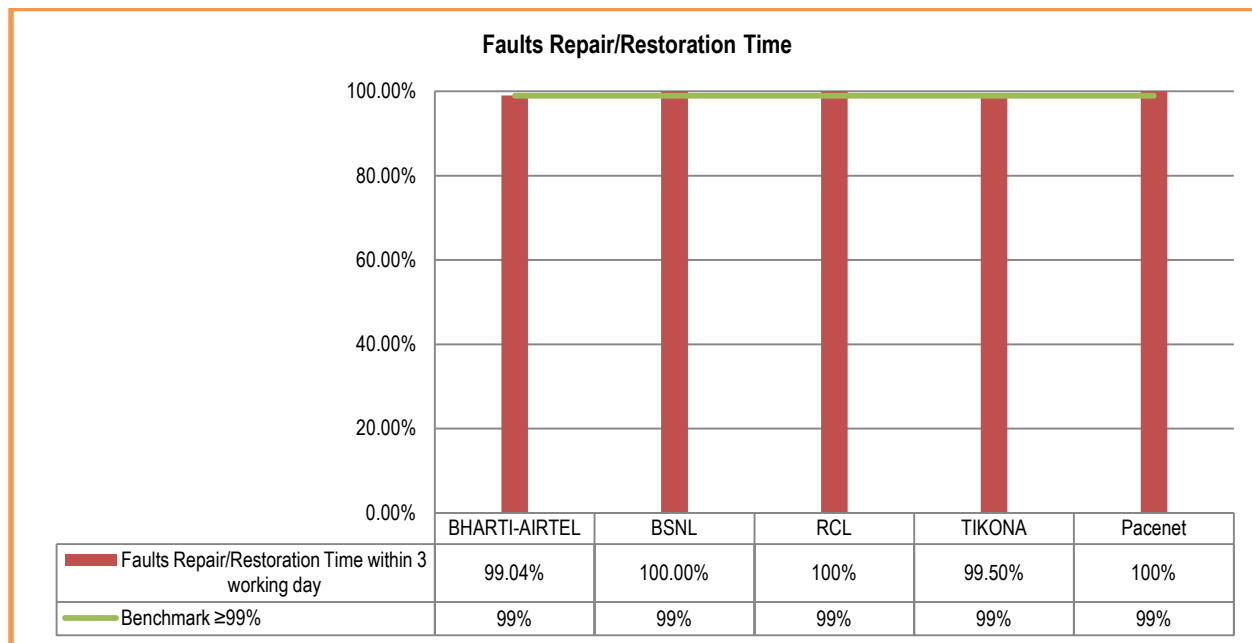
All Operators are meeting the benchmarks.

2. BILLING PERFORMANCE:



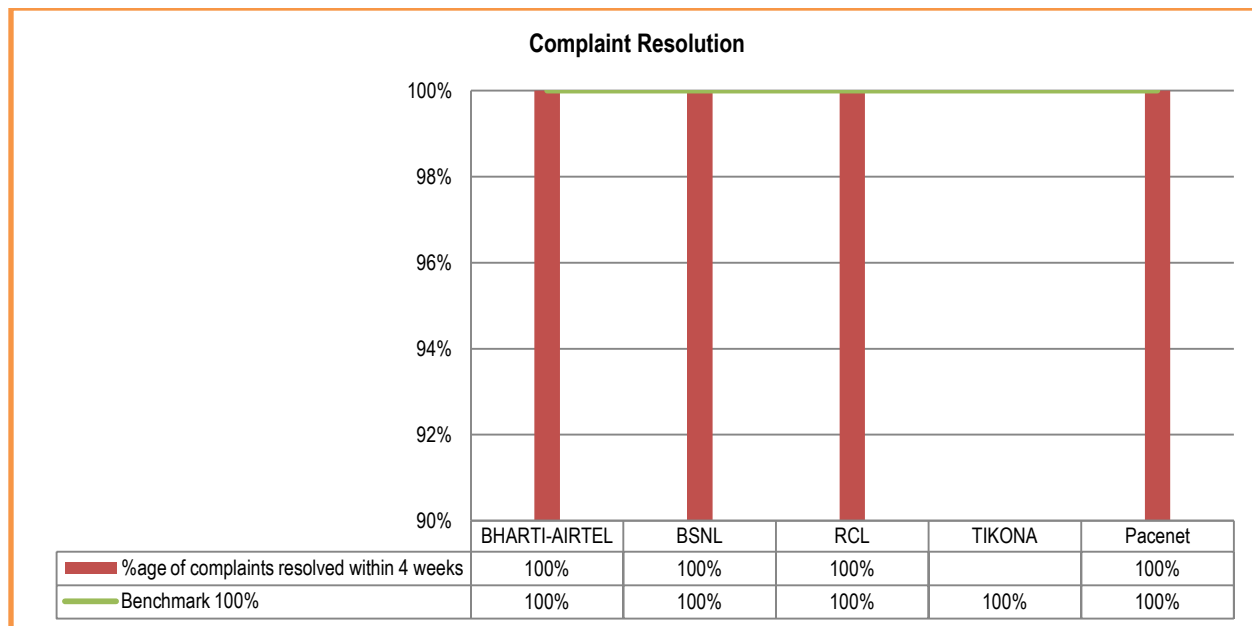
All Operators are meeting the benchmarks. In case of Tikona, they do not have postpaid services.

3. FAULTS REPAIR/RESTORATION TIME:



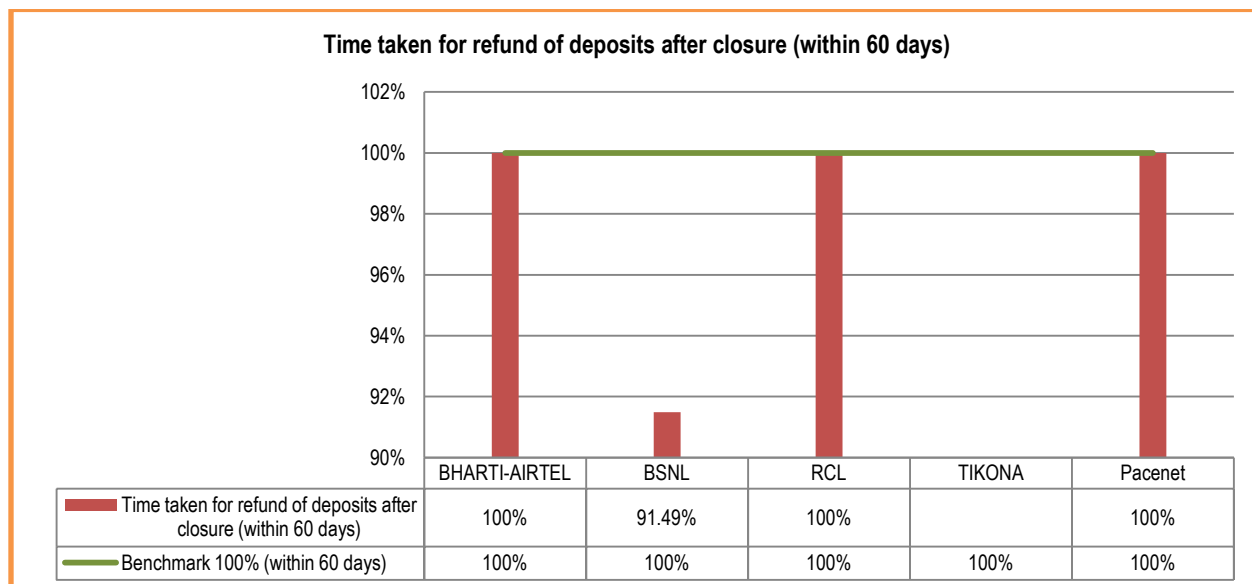
All Operators are meeting the benchmarks.

4. COMPLAINT RESOLUTION:



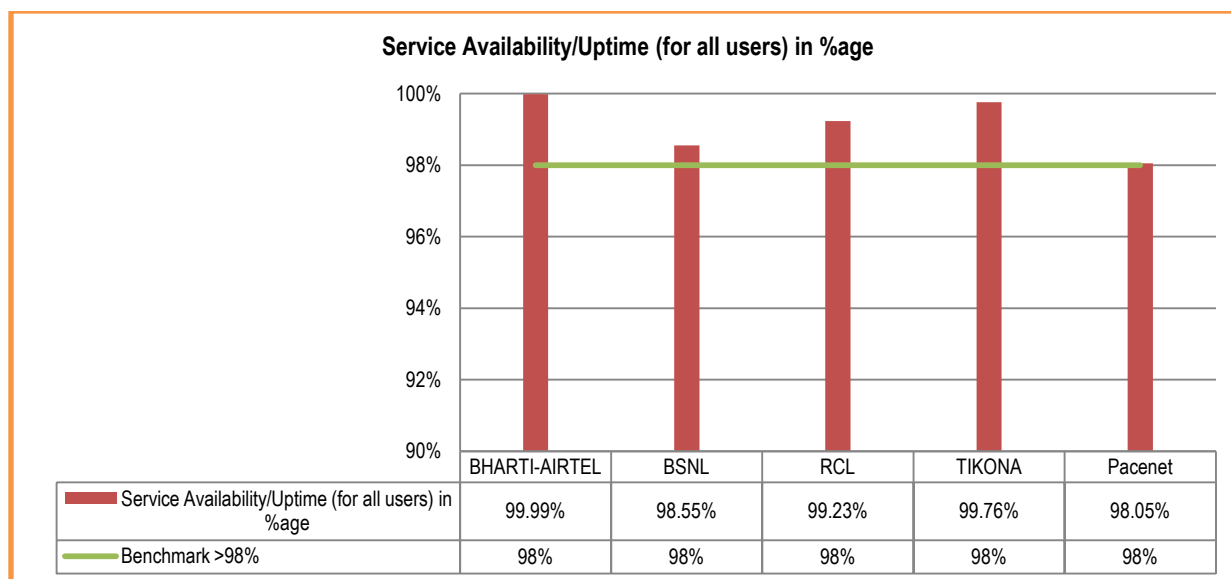
All Operators are meeting the benchmarks. In case of Tikona, they do not have postpaid services.

5. REFUND:



All Operators are meeting the benchmarks except BSNL. In case of Tikona, they do not have postpaid services.

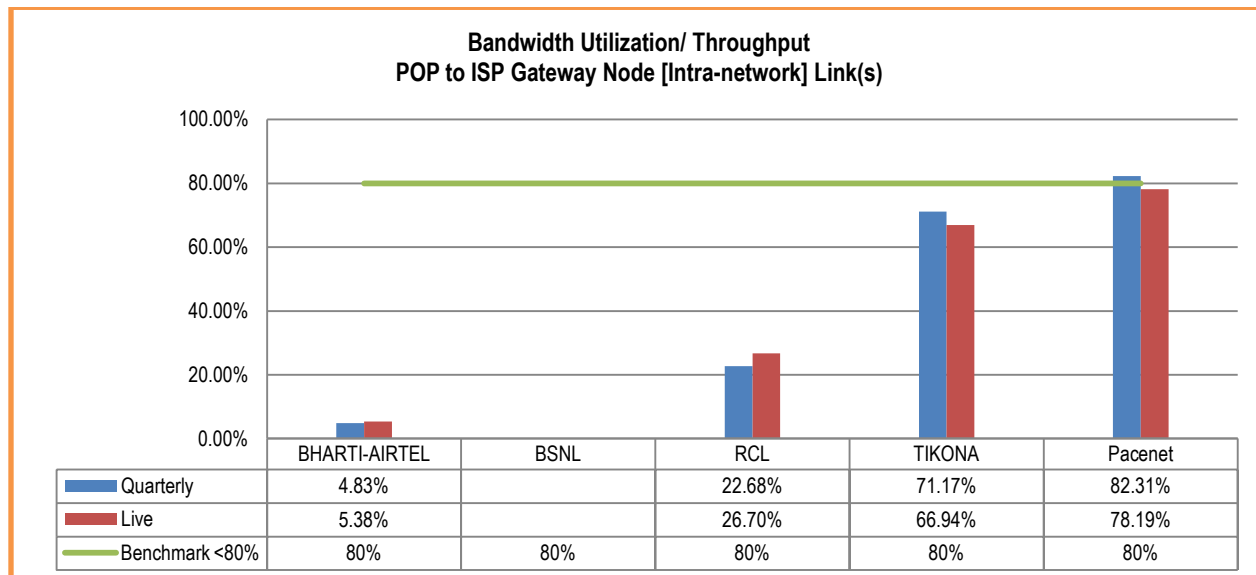
6. SERVICE AVAILABILITY/UPTIME:



All Operators are meeting the benchmarks.

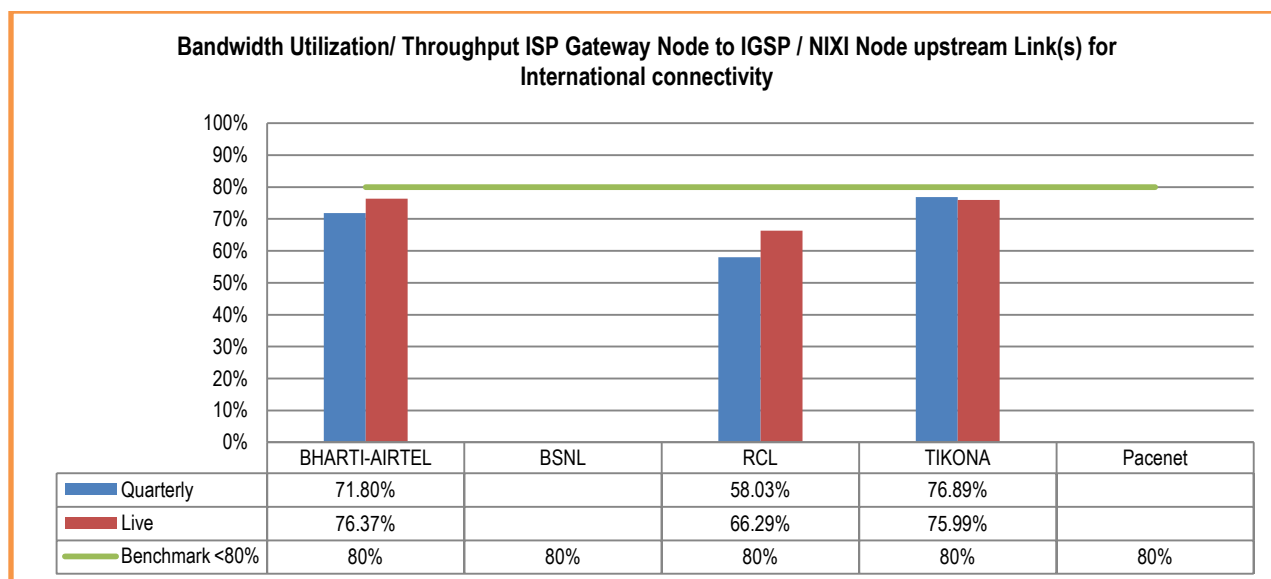
10.7 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BROADBAND SERVICE PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1. BROADBAND UTILIZATION/THROUGHPUT POP TO ISP GATEWAY NODE:



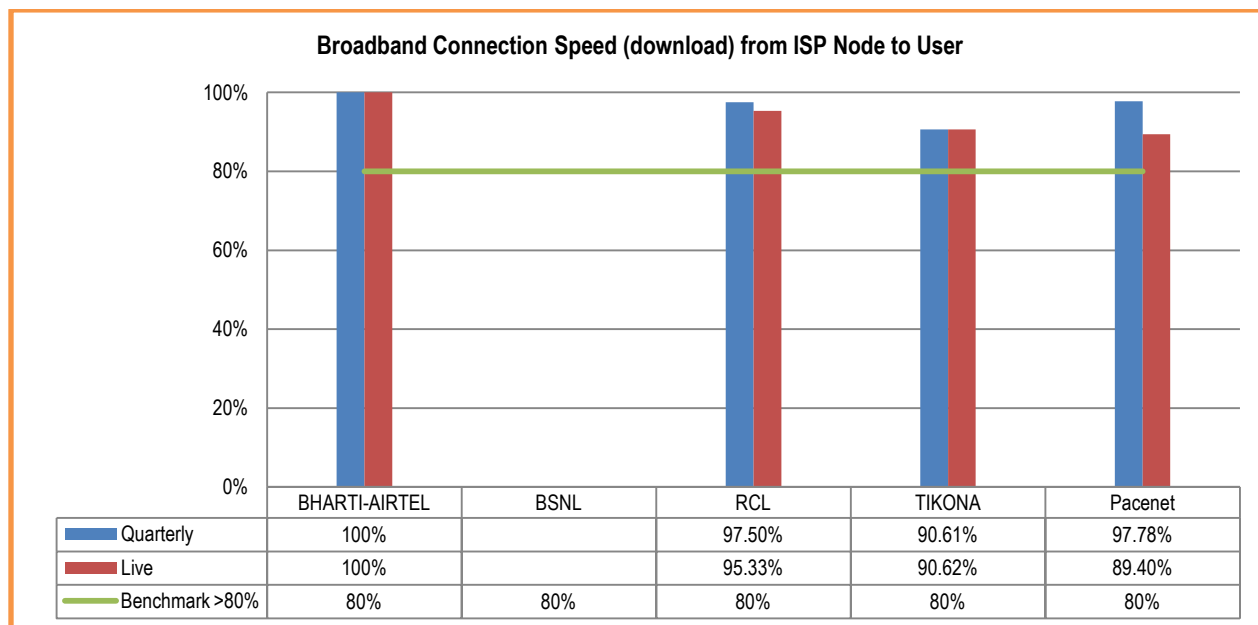
All Operators are meeting the benchmarks except Pacenet during quarterly audit.

2. BROADBAND UTILIZATION/THROUGHPUT ISP GATEWAY NODE TO IGSP/NIXI NODE:



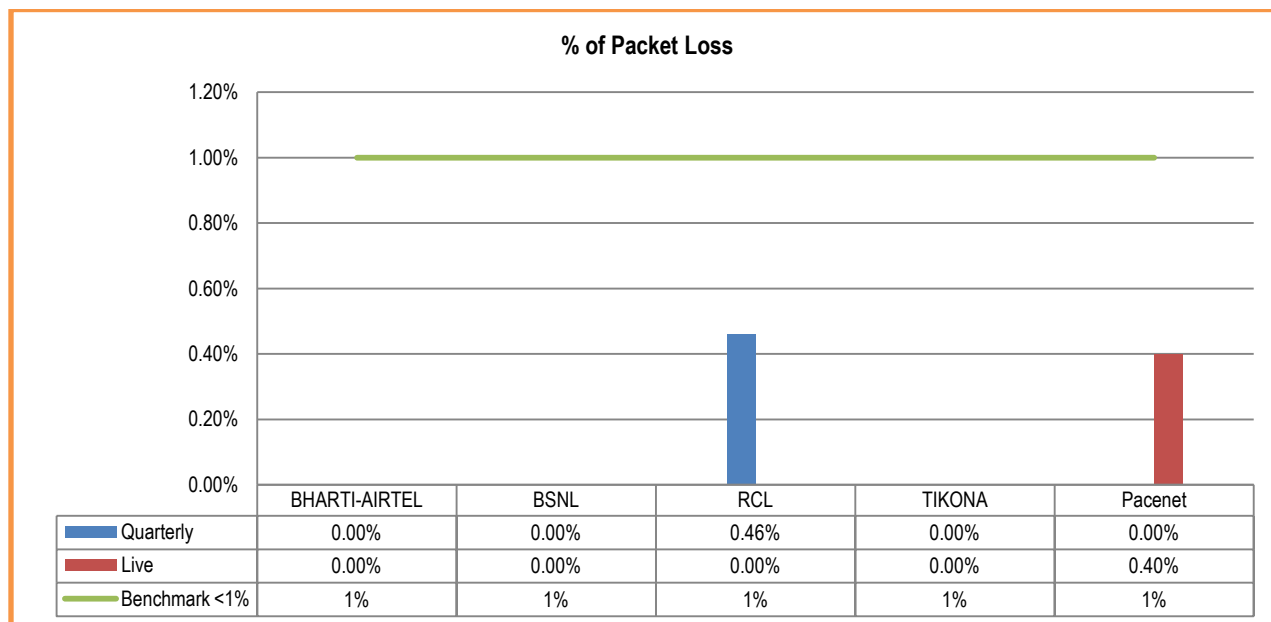
All Operators are meeting the benchmarks.

3. BROADBAND CONNECTION SPEED (DOWNLOAD) FROM ISP NODE TO USER:



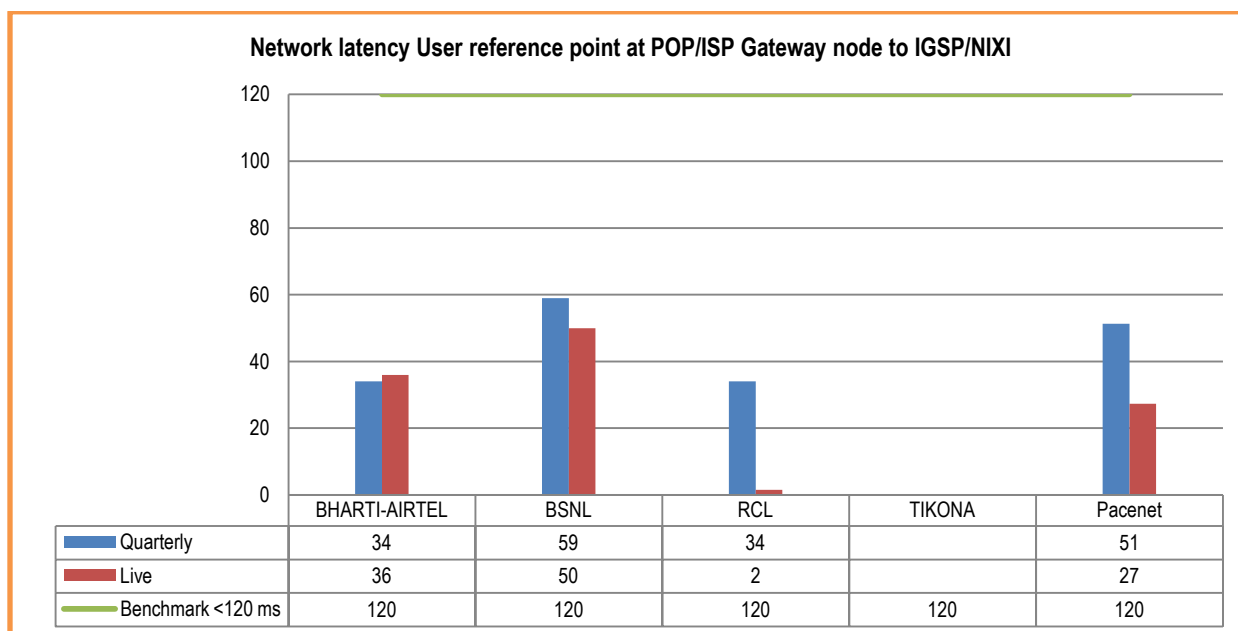
All Operators are meeting the benchmarks.

4. PACKET LOSS:



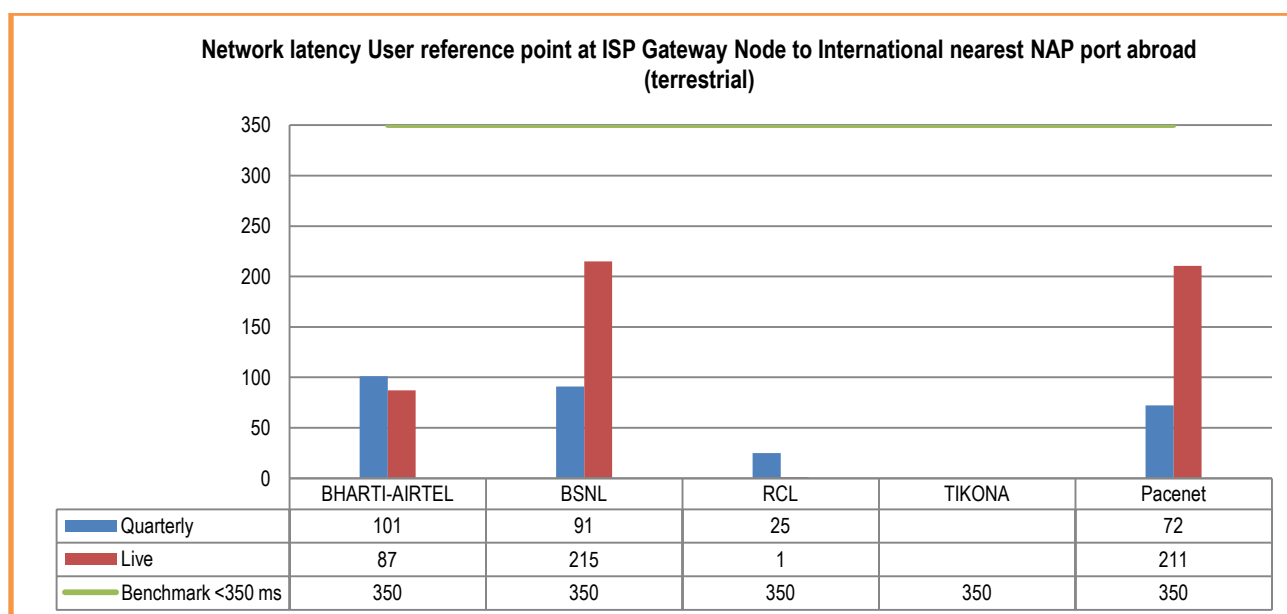
All Operators are meeting the benchmarks.

5. NETWORK LATENCY USER REFERENCE POINT AT POP/ISP GATEWAY NODE TO IGSP/NIXI:



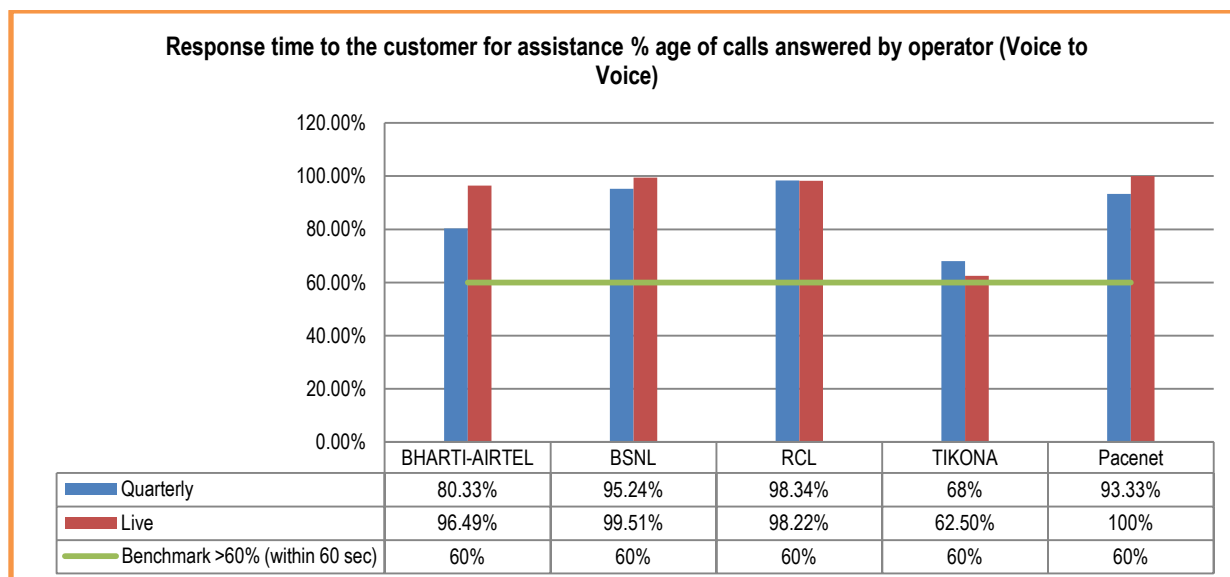
All Operators are meeting the benchmarks.

6. NETWORK LATENCY USER REFERENCE POINT AT ISP GATEWAY NODE TO INTERNATIONAL NEAREST NAP PORT ABROAD (TERRESTRIAL):



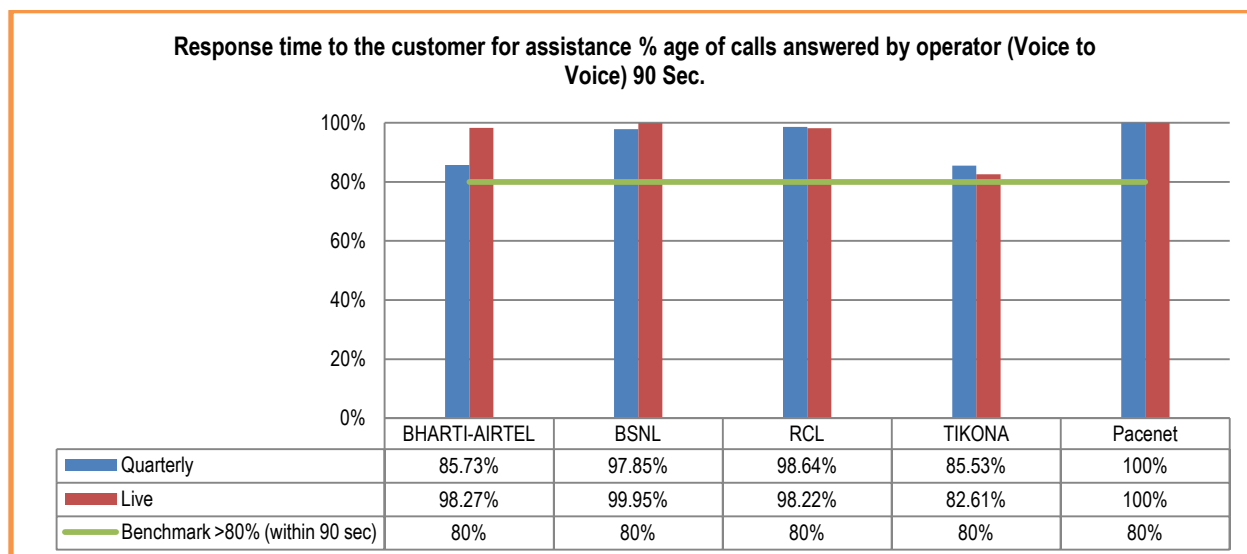
All Operators are meeting the benchmarks.

7. RESPONSE TIME TO THE CUSTOMER FOR ASSISTANCE ACCESSIBILITY BY OPERATOR WITHIN 60 SECONDS:



All Operators are meeting the benchmarks.

8. RESPONSE TIME TO THE CUSTOMER FOR ASSISTANCE ACCESSIBILITY BY OPERATOR WITHIN 90 SECONDS:



All Operators are meeting the benchmarks.

11. PMR VERIFICATION TABLE:

(i) NETWORK RELATED PARAMETERS:

Name of Service Provider	Parameter	BTS Accumulated Downtime	Worst affected BTSs due to downtime	CSSR (Call Setup Success Rate)	SDCCH / PAGING Channel congestion	TCH congestion	CDR (Call Drop Rate)	Worst affected cells>3% TCH drop (Call drop) rate	Connections with good voice quality	No. of POI's having >=0.5% POI congestion
Benchmark		≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.5%
AIRCEL	Reported	0.14	0.40	98.63	0.62	1.39	0.64	2.88	96.93	0
	Verified	0.14%	0.40%	98.63%	0.62%	1.39%	0.64%	2.88%	96.93%	0
AIRTEL	Reported	0.21	0.87	96.33	0.42	0.56	0.97	2.91	96.86	0
	Verified	0.24%	1.13%	96.35%	0.51%	0.55%	0.98%	2.91%	96.86%	0
BSNL	Reported	1.86	1.83	98.22	0.87	1.87	1.79	2.53	96.50	0
	Verified	1.86%	1.83%	98.22%	0.87%	1.87%	1.79%	2.54%	96.50%	0
IDEA	Reported	0.47	1.89	98.09	0.59	1.09	1.03	2.76	96.68	0
	Verified	0.47%	1.89%	98.09%	0.89%	1.72%	1.50%	2.76%	96.68%	0
RCOM GSM	Reported	0.20	0.41	99.35	0.03	0.10	0.20	0.04	98.79	0
	Verified	0.19%	0.42%	99.35%	0.03%	0.10%	0.20%	0.04%	98.79%	0
UNINOR	Reported	0.49	1.94	96.98	0.64	1.70	0.68	2.29	93.43	0
	Verified	0.49%	1.94%	96.98%	0.64%	1.70%	0.67%	2.30%	93.43%	0
TATA GSM	Reported	0.19	0.82	94.69	0.66	3.03	1.20	8.79	96.67	0
	Verified	0.19%	0.82%	94.69%	0.66%	3.03%	1.20%	8.79%	96.66%	0
VIDEOCON	Reported	0.25	0.00	98.89	0.39	0.42	1.05	0.05	98.62	0
	Verified	0.30%	0.00%	98.84%	0.41%	0.43%	1.05%	0.05%	98.61%	0
VODAFONE	Reported	0.17	0.52	98.79	0.30	1.21	0.93	3.89	96.41	0
	Verified	0.17%	0.52%	98.79%	0.29%	1.21%	0.93%	3.89%	96.41%	0
RCOM CDMA	Reported	0.13	0.23	98.88	0.00	0.01	0.23	1.00	99.84	0
	Verified	0.12%	0.27%	98.98%	0.00%	0.01%	0.22%	0.99%	99.85%	0
TATA CDMA	Reported	0.17	0.00	98.38	0.00	0.13	0.66	8.80	99.20	0
	Verified	0.18%	0.64%	98.37%	0.00%	0.13%	0.66%	8.81%	99.20%	0

- The above data is averaged for three months of the quarter ending September-2015.
- The PMR data provided by the service providers is largely matching with verified (audited) data. However the variation in data has been indicated by yellow colour.
- Vodafone, Tata GSM and Tata CDMA have not met the benchmark for the parameter "Worst affected cells>3% TCH drop".
- Tata GSM has not met the benchmark for the parameters "CSSR (Call Setup Success Rate)" and "TCH congestion".
- Uninor has not met the benchmark for the parameter "Connections with good voice quality".

(ii) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

Name of Service Provider	Parameter	Metering and billing credibility - post paid	Metering and billing credibility - pre paid	Resolution of billing /charging complaints	Resolution of billing /charging complaints	Period of applying credit / waiver/ adjustment to customer's account from the date of resolution of complaints	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 90 seconds	%age requests for Termination / Closure of service	Time taken for refund of deposits after closures
Benchmark		<= 0.1%	<= 0.1%	98% within 4 weeks	100% within 6 weeks	within 1 week of resolution of complaint	>=95%	≥ 95%	100% within <=7days	100% within 60 days
AIRCEL	Reported	0.00	0.00	100.00	100.00	100.00	97.80	96.27	100.00	100.00
	Verified	0.00%	0.00%	100%	100%	100%	97.80%	96.27%	100%	100%
AIRTEL	Reported	0.01	0.00	100.00	100.00	100.00	100.00	95.20	100.00	100.00
	Verified	0.01%	0.00%	100%	100%	100%	100%	95.20%	100%	100%
BSNL	Reported	0.09	0.09	98.90	100.00	100.00	99.00	97.76	100.00	100.00
	Verified	NP	0.04%	100%	100%	100%	99.31%	97.75%	100%	100%
IDEA	Reported	0.05	0.34	100.00	100.00	100.00	99.32	99.80	100.00	100.00
	Verified	0.05%	0.34%	100%	100%	100%	99.32%	99.80%	100%	100%
RCOM (GSM)	Reported	0.08	0.09	100.00	100.00	100.00	98.80	73.75	100.00	100.00
	Verified	0.08%	0.09%	100%	100%	100%	98.80%	73.75%	100%	100%
TATA (GSM)	Reported	0.00	0.00	100.00	100.00	100.00	99.34	97.75	100.00	100.00
	Verified	0.00%	0.00%	100%	100%	100%	99.34%	97.75%	100%	100%
UNINOR	Reported	NA	0.02	100.00	100.00	NA	99.07	98.67	NA	NA
	Verified	NA	0.02%	100%	100%	NA	99.08%	98.67%	NA	NA
VIDEOCON	Reported	NA	0.00	100.00	100.00	NA	100.00	96.51	NA	100.00
	Verified	NA	0.00%	100%	100%	100%	100%	96.21%	NA	100.00%
VODAFONE	Reported	0.00	0.00	100.00	100.00	100.00	100.00	98.30	100.00	100.00
	Verified	0.14%	0.05%	100%	100%	100%	100%	98.30%	100%	100%
RCOM (CDMA)	Reported	0.09	0.08	100.00	100.00	100.00	97.79	85.94	100.00	100.00
	Verified	0.09%	0.08%	100%	100%	100%	97.79%	85.94%	100%	100%
TATA (CDMA)	Reported	0.00	0.00	100.00	100.00	100.00	99.45	97.43	100.00	100.00
	Verified	0.00%	0.00%	100%	100%	100%	99.45%	97.43%	100%	100%

- The above data is average for three months of the quarter ending September-2015.
- The PMR data provided by the service providers is largely matching with verified (audited) data. However the variation in data has been indicated by yellow colour.
- RCOM GSM and RCOM CDMA have not met the benchmark for the parameter “% call answered by operators (voice to voice) within 90 sec”.
- Vodafone has not met the benchmark for the parameter “Metering and billing credibility - Post Paid”
- Idea has not met the benchmark for the parameter “Metering and billing credibility - Pre Paid”
- .NA: Not Applicable - Uninor has no post paid connection, so no billing complaints for post-paid.

Annex-1

S. NO.	CIRCLE	NAME OF EXCHANGE	SSA	SDCA	TYPE OF EXCHANGE	ACTIVITY
1	UPE	BARABANKI	Barabanki	Barabanki	Urban	WL Audit
2	UPE	BANKI	Barabanki	Barabanki	Urban	WL Audit
3	UPE	BARABANKI 'B'	Barabanki	Barabanki	Urban	WL Audit
4	UPE	DEWA-SHARIF	Barabanki	Barabanki	Urban	WL Audit
5	UPE	Somaiyanagar	Barabanki	Barabanki	Urban	WL Audit
6	UPE	ZAIDPUR	Barabanki	Barabanki	Urban	WL Audit
7	UPE	BAREITHI	Barabanki	Barabanki	Rural	WL Audit
8	UPE	BHANMAU I + II	Barabanki	Barabanki	Rural	WL Audit
9	UPE	HARAKH	Barabanki	Barabanki	Rural	WL Audit
10	UPE	JAHANGIRABAD	Barabanki	Barabanki	Rural	WL Audit
11	UPE	JATA BARAULI	Barabanki	Barabanki	Rural	WL Audit
12	UPE	KOLA	Barabanki	Barabanki	Rural	WL Audit
13	UPE	MASALI	Barabanki	Barabanki	Rural	WL Audit
14	UPE	FATEHPUR	Barabanki	Fatehpur	Urban	WL Audit
15	UPE	BADDUPUR	Barabanki	Fatehpur	Rural	WL Audit
16	UPE	BELAHARA	Barabanki	Fatehpur	Rural	WL Audit
17	UPE	BHAGALI	Barabanki	Fatehpur	Rural	WL Audit
18	UPE	BISHUNPUR	Barabanki	Fatehpur	Rural	WL Audit
19	UPE	HAIDERGARH	Barabanki	Haidergarh	Urban	WL Audit
20	UPE	ASANDHRA	Barabanki	Haidergarh	Rural	WL Audit
21	UPE	BHILWAL	Barabanki	Haidergarh	Rural	WL Audit
22	UPE	FATEHGANJ DAIRY	Barabanki	Haidergarh	Rural	WL Audit
23	UPE	KOTHI	Barabanki	Haidergarh	Rural	WL Audit
24	UPE	RUDALI	Barabanki	RSG	Urban	WL Audit
25	UPE	ALIABAD	Barabanki	RSG	Rural	WL Audit
26	UPE	BABABAZAR	Barabanki	RSG	Rural	WL Audit
27	UPE	DEVIGUNJ	Barabanki	RSG	Rural	WL Audit
28	UPE	DULLAPUR(MWI VIL.)	Barabanki	RSG	Rural	WL Audit
29	UPE	Lakhimpur –(M)	Lakhimpur	Lakhimpur	Urban	WL Audit
30	UPE	Lakhimpur –(M)	Lakhimpur	Lakhimpur	Urban	WL Audit
31	UPE	Andes Nager	Lakhimpur	Lakhimpur	Rural	WL Audit
32	UPE	Badagaun	Lakhimpur	Lakhimpur	Rural	WL Audit
33	UPE	Behjam	Lakhimpur	Lakhimpur	Rural	WL Audit
34	UPE	Chahmalpur	Lakhimpur	Lakhimpur	Rural	WL Audit
35	UPE	Daudpur	Lakhimpur	Lakhimpur	Rural	WL Audit
36	UPE	Kala Aam	Lakhimpur	Lakhimpur	Rural	WL Audit

S. NO.	CIRCLE	NAME OF EXCHANGE	SSA	SDCA	TYPE OF EXCHANGE	ACTIVITY
37	UPE	Aliganj	Lakhimpur	Bhira	Rural	WL Audit
38	UPE	Amritapur	Lakhimpur	Bhira	Rural	WL Audit
39	UPE	Bankeyganj	Lakhimpur	Bhira	Rural	WL Audit
40	UPE	Bhanpur	Lakhimpur	Bhira	Rural	WL Audit
41	UPE	Aira	Lakhimpur	Dhaurahra	Rural	WL Audit
42	UPE	Dhakherwa	Lakhimpur	Dhaurahra	Rural	WL Audit
43	UPE	Dhaurahra	Lakhimpur	Dhaurahra	Rural	WL Audit
44	UPE	Isanager	Lakhimpur	Dhaurahra	Rural	WL Audit
45	UPE	Ajwapur	Lakhimpur	Maigalganj	Rural	WL Audit
46	UPE	Aurangabad	Lakhimpur	Maigalganj	Rural	WL Audit
47	UPE	Barwer	Lakhimpur	Maigalganj	Rural	WL Audit
48	UPE	J.B. Ganj	Lakhimpur	Maigalganj	Rural	WL Audit
49	UPE	Mohammadi	Lakhimpur	Mohmadi	Urban	WL Audit
50	UPE	Ajan	Lakhimpur	Mohmadi	Rural	WL Audit
51	UPE	Amir Nager	Lakhimpur	Mohmadi	Rural	WL Audit
52	UPE	Behtiafghan	Lakhimpur	Mohmadi	Rural	WL Audit
53	UPE	Gola	Lakhimpur	Mohmadi	Rural	WL Audit
54	UPE	Palia	Lakhimpur	Palia	Urban	WL Audit
55	UPE	Chandan Chauki	Lakhimpur	Palia	Rural	WL Audit
56	UPE	Khajuria	Lakhimpur	Palia	Rural	WL Audit
57	UPE	Mahangapur	Lakhimpur	Palia	Rural	WL Audit
58	UPE	Majhgain	Lakhimpur	Palia	Rural	WL Audit
59	UPE	Bamhanpur	Lakhimpur	Tikonia	Rural	WL Audit
60	UPE	Belapersuwa	Lakhimpur	Tikonia	Rural	WL Audit
61	UPE	Belrayan	Lakhimpur	Tikonia	Rural	WL Audit
62	UPE	Jasnager	Lakhimpur	Tikonia	Rural	WL Audit
63	UPE	AKBARPUR	Faizabad	Akbarpur	Urban	WL Audit
64	UPE	SAHAJADPUR	Faizabad	Akbarpur	Urban	WL Audit
65	UPE	BHITI	Faizabad	Akbarpur	Rural	WL Audit
66	UPE	MAHRUVA	Faizabad	Akbarpur	Rural	WL Audit
67	UPE	BASKHARI	Faizabad	Baskhari	Urban	WL Audit
68	UPE	DEORIA BAZAR	Faizabad	Baskhari	Rural	WL Audit
69	UPE	GARHWAL	Faizabad	Baskhari	Rural	WL Audit
70	UPE	GIRAIYA BAZAR	Faizabad	Baskhari	Rural	WL Audit
71	UPE	INDAIPUR	Faizabad	Baskhari	Rural	WL Audit
72	UPE	BIKAPUR	Faizabad	Bikapur	Urban	WL Audit
73	UPE	DEOGAON	Faizabad	Bikapur	Rural	WL Audit
74	UPE	HAIDERGANJ	Faizabad	Bikapur	Rural	WL Audit

S. NO.	CIRCLE	NAME OF EXCHANGE	SSA	SDCA	TYPE OF EXCHANGE	ACTIVITY
75	UPE	KHANDASA	Faizabad	Bikapur	Rural	WL Audit
76	UPE	KUCEHERA	Faizabad	Bikapur	Rural	WL Audit
77	UPE	AYODHYA	Faizabad	Faizabad	Urban	WL Audit
78	UPE	BHADARSA	Faizabad	Faizabad	Urban	WL Audit
79	UPE	DHARA ROAD	Faizabad	Faizabad	Urban	WL Audit
80	UPE	FAIZABAD	Faizabad	Faizabad	Urban	WL Audit
81	UPE	GOSAIGANJ	Faizabad	Faizabad	Urban	WL Audit
82	UPE	NIRALA NAGAR	Faizabad	Faizabad	Urban	WL Audit
83	UPE	SAHADATGANJ	Faizabad	Faizabad	Urban	WL Audit
84	UPE	ARWAT	Faizabad	Faizabad	Rural	WL Audit
85	UPE	DARSHAN NAGAR	Faizabad	Faizabad	Rural	WL Audit
86	UPE	DEORHI BAZAR	Faizabad	Faizabad	Rural	WL Audit
87	UPE	DILASIGANJ	Faizabad	Faizabad	Rural	WL Audit
88	UPE	MAYA	Faizabad	Faizabad	Rural	WL Audit
89	UPE	MEHBOOBGANJ	Faizabad	Faizabad	Rural	WL Audit
90	UPE	MOTI NAGAR	Faizabad	Faizabad	Rural	WL Audit
91	UPE	MUBARKGANJ	Faizabad	Faizabad	Rural	WL Audit
92	UPE	MUSTAFABAD(BGN)	Faizabad	Faizabad	Rural	WL Audit
93	UPE	JALALPUR	Faizabad	Jalalpur	Urban	WL Audit
94	UPE	MALIPUR	Faizabad	Jalalpur	Rural	WL Audit
95	UPE	NEWADA	Faizabad	Jalalpur	Rural	WL Audit
96	UPE	PARUYA ASHRAM	Faizabad	Jalalpur	Rural	WL Audit
97	UPE	RAFIGANJ	Faizabad	Jalalpur	Rural	WL Audit
98	UPE	TANDA	Faizabad	Tanda	Urban	WL Audit
99	UPE	HANSWAR	Faizabad	Tanda	Rural	WL Audit
100	UPE	HAZLAPUR	Faizabad	Tanda	Rural	WL Audit
101	UPE	HIRAPUR	Faizabad	Tanda	Rural	WL Audit
102	UPE	ILFATGANJ(ANAVA)	Faizabad	Tanda	Rural	WL Audit
103	UPE	BHARTI-AIRTEL	Lucknow	---	Urban	WL Audit
104	UPE	RCL	DAKC, Mumbai	---	Urban	WL Audit
105	UPE	TTL	Lucknow	---	Urban	WL Audit
106	UPE	VODAFONE	Lucknow	---	Urban	WL Audit

Annex-2

S .NO.	Circle	PoPS Location	SSA	SDCA	Activity
1	UPE	BARABANKI	Barabanki	Barabanki	BB Audit
2	UPE	BANKI	Barabanki	Barabanki	BB Audit
3	UPE	BARABANKI 'B'	Barabanki	Barabanki	BB Audit
4	UPE	DEWA-SHARIF	Barabanki	Barabanki	BB Audit
5	UPE	Somaiyanagar	Barabanki	Barabanki	BB Audit
6	UPE	ZAIDPUR	Barabanki	Barabanki	BB Audit
7	UPE	BAREITHI	Barabanki	Barabanki	BB Audit
8	UPE	BHANMAU I + II	Barabanki	Barabanki	BB Audit
9	UPE	HARAKH	Barabanki	Barabanki	BB Audit
10	UPE	JAHANGIRABAD	Barabanki	Barabanki	BB Audit
11	UPE	JATA BARAULI	Barabanki	Barabanki	BB Audit
12	UPE	KOLA	Barabanki	Barabanki	BB Audit
13	UPE	MASAUJI	Barabanki	Barabanki	BB Audit
14	UPE	FATEHPUR	Barabanki	Fatehpur	BB Audit
15	UPE	BADDUPUR	Barabanki	Fatehpur	BB Audit
16	UPE	BELAHARA	Barabanki	Fatehpur	BB Audit
17	UPE	BHAGAULI	Barabanki	Fatehpur	BB Audit
18	UPE	BISHUNPUR	Barabanki	Fatehpur	BB Audit
19	UPE	HAIDERGARH	Barabanki	Haidergarh	BB Audit
20	UPE	ASANDHRA	Barabanki	Haidergarh	BB Audit
21	UPE	BHILWAL	Barabanki	Haidergarh	BB Audit
22	UPE	FATEHGANJ DAIRY	Barabanki	Haidergarh	BB Audit
23	UPE	KOTHI	Barabanki	Haidergarh	BB Audit
24	UPE	RUDAULI	Barabanki	RSG	BB Audit
25	UPE	ALIABAD	Barabanki	RSG	BB Audit
26	UPE	BABABAZAR	Barabanki	RSG	BB Audit
27	UPE	DEVIGUNJ	Barabanki	RSG	BB Audit
28	UPE	DULLAPUR(MWI VIL.)	Barabanki	RSG	BB Audit
29	UPE	Lakhimpur –(M)	Lakhimpur	Lakhimpur	BB Audit
30	UPE	Lakhimpur –(M)	Lakhimpur	Lakhimpur	BB Audit
31	UPE	Andes Nager	Lakhimpur	Lakhimpur	BB Audit
32	UPE	Badagaun	Lakhimpur	Lakhimpur	BB Audit
33	UPE	Behjam	Lakhimpur	Lakhimpur	BB Audit
34	UPE	Chahmalpur	Lakhimpur	Lakhimpur	BB Audit
35	UPE	Daudpur	Lakhimpur	Lakhimpur	BB Audit
36	UPE	Kala Aam	Lakhimpur	Lakhimpur	BB Audit

S .NO.	Circle	PoPS Location	SSA	SDCA	Activity
37	UPE	Aliganj	Lakhimpur	Bhira	BB Audit
38	UPE	Amritapur	Lakhimpur	Bhira	BB Audit
39	UPE	Bankeyganj	Lakhimpur	Bhira	BB Audit
40	UPE	Bhanpur	Lakhimpur	Bhira	BB Audit
41	UPE	Aira	Lakhimpur	Dhaurahra	BB Audit
42	UPE	Dhakherwa	Lakhimpur	Dhaurahra	BB Audit
43	UPE	Dhaurahra	Lakhimpur	Dhaurahra	BB Audit
44	UPE	Isanager	Lakhimpur	Dhaurahra	BB Audit
45	UPE	Ajwapur	Lakhimpur	Maigalganj	BB Audit
46	UPE	Aurangabad	Lakhimpur	Maigalganj	BB Audit
47	UPE	Barwer	Lakhimpur	Maigalganj	BB Audit
48	UPE	J.B. Ganj	Lakhimpur	Maigalganj	BB Audit
49	UPE	Mohammadi	Lakhimpur	Mohmadi	BB Audit
50	UPE	Ajan	Lakhimpur	Mohmadi	BB Audit
51	UPE	Amir Nager	Lakhimpur	Mohmadi	BB Audit
52	UPE	Behtiafghan	Lakhimpur	Mohmadi	BB Audit
53	UPE	Gola	Lakhimpur	Mohmadi	BB Audit
54	UPE	Palia	Lakhimpur	Palia	BB Audit
55	UPE	Chandan Chauki	Lakhimpur	Palia	BB Audit
56	UPE	Khajuria	Lakhimpur	Palia	BB Audit
57	UPE	Mahangapur	Lakhimpur	Palia	BB Audit
58	UPE	Majhgain	Lakhimpur	Palia	BB Audit
59	UPE	Bamhanpur	Lakhimpur	Tikonia	BB Audit
60	UPE	Belapersuwa	Lakhimpur	Tikonia	BB Audit
61	UPE	Belrayan	Lakhimpur	Tikonia	BB Audit
62	UPE	Jasnager	Lakhimpur	Tikonia	BB Audit
63	UPE	AKBARPUR	Faizabad	Akbarpur	BB Audit
64	UPE	SAHAJADPUR	Faizabad	Akbarpur	BB Audit
65	UPE	BHITI	Faizabad	Akbarpur	BB Audit
66	UPE	MAHRUVA	Faizabad	Akbarpur	BB Audit
67	UPE	BASKHARI	Faizabad	Baskhari	BB Audit
68	UPE	DEORIA BAZAR	Faizabad	Baskhari	BB Audit
69	UPE	GARHWAL	Faizabad	Baskhari	BB Audit
70	UPE	GIRAIYA BAZAR	Faizabad	Baskhari	BB Audit
71	UPE	INDAIPUR	Faizabad	Baskhari	BB Audit
72	UPE	BIKAPUR	Faizabad	Bikapur	BB Audit
73	UPE	DEOGAON	Faizabad	Bikapur	BB Audit
74	UPE	HAIDERGANJ	Faizabad	Bikapur	BB Audit

S .NO.	Circle	PoPS Location	SSA	SDCA	Activity
75	UPE	KHANDASA	Faizabad	Bikapur	BB Audit
76	UPE	KUCEHERA	Faizabad	Bikapur	BB Audit
77	UPE	AYODHYA	Faizabad	Faizabad	BB Audit
78	UPE	BHADARSA	Faizabad	Faizabad	BB Audit
79	UPE	DHARA ROAD	Faizabad	Faizabad	BB Audit
80	UPE	FAIZABAD	Faizabad	Faizabad	BB Audit
81	UPE	GOSAIGANJ	Faizabad	Faizabad	BB Audit
82	UPE	NIRALA NAGAR	Faizabad	Faizabad	BB Audit
83	UPE	SAHADATGANJ	Faizabad	Faizabad	BB Audit
84	UPE	ARWAT	Faizabad	Faizabad	BB Audit
85	UPE	DARSHAN NAGAR	Faizabad	Faizabad	BB Audit
86	UPE	DEORHI BAZAR	Faizabad	Faizabad	BB Audit
87	UPE	DILASIGANJ	Faizabad	Faizabad	BB Audit
88	UPE	MAYA	Faizabad	Faizabad	BB Audit
89	UPE	MEHBOOBGANJ	Faizabad	Faizabad	BB Audit
90	UPE	MOTI NAGAR	Faizabad	Faizabad	BB Audit
91	UPE	MUBARKGANJ	Faizabad	Faizabad	BB Audit
92	UPE	MUSTAFABAD(BGN)	Faizabad	Faizabad	BB Audit
93	UPE	JALALPUR	Faizabad	Jalalpur	BB Audit
94	UPE	MALIPUR	Faizabad	Jalalpur	BB Audit
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96	UPE	PARUYA ASHRAM	Faizabad	Jalalpur	BB Audit
97	UPE	RAFIGANJ	Faizabad	Jalalpur	BB Audit
98	UPE	TANDA	Faizabad	Tanda	BB Audit
99	UPE	HANSWAR	Faizabad	Tanda	BB Audit
100	UPE	HAZLAPUR	Faizabad	Tanda	BB Audit
101	UPE	HIRAPUR	Faizabad	Tanda	BB Audit
102	UPE	ILFATGANJ(ANAVA)	Faizabad	Tanda	BB Audit
103	UPE	BHARTI-AIRTEL	Lucknow	---	BB Audit
104	UPE	RCL	DAKC, Mumbai	---	BB Audit
105	UPE	PACENET	Lucknow	---	BB Audit
106	UPE	TIKONA	Lucknow	---	BB Audit