



**Audit & Assessment of Quality of Service
Of
Cellular Mobile Telephone Service
For
Telecom Regulatory Authority of India**

**North Zone – UP (East) Service Area
(January 2015 – March 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.

Table of Contents

1.	BACKGROUND	6
2.	OBJECTIVES AND METHODOLOGY	9
3.	SAMPLE SIZE	11
3.1	SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS	11
3.2	SAMPLING FOR BASIC (WIRE LINE) SERVICES	12
3.3	SAMPLING FOR BROADBAND SERVICE PROVIDERS.....	12
4.	EXECUTIVE SUMMARY	14
5.	PMR AUDIT REPORTS:	17
5.1	MONTHLY PMR:	17
5.1.1	BUSY HOUR OF VARIOUS SERVICE PROVIDERS:	17
5.1.2	SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:	17
5.1.3	QOS PERFORMANCE OF MONTHLY PMR – JANUARY 15 MONTH:	18
5.1.4	QOS PERFORMANCE OF MONTHLY PMR – FEBRUARY 15 MONTH:	19
5.1.5	QOS PERFORMANCE OF MONTHLY PMR – MARCH 15 MONTH	20
5.1.6	QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- MARCH 15 (JAN TO MAR 2015 MONTHS AUDITED DATA).....	21
5.1.7	KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:	22
5.2	LIVE MEASUREMENT DATA (3-DAYS) FOR CELLULAR MOBILE SERVICE PROVIDERS (NETWORK SERVICE QUALITY PARAMETER):	25
5.2.1	LIVE MEASUREMENT DATA (3-DAYS) – JANUARY 15 MONTH:.....	25
5.2.2	LIVE MEASUREMENT DATA (3-DAYS) – FEBRUARY 15 MONTH:	26
5.2.3	LIVE MEASUREMENT DATA (3-DAYS) – MARCH 15 MONTH:.....	27
5.2.4	QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JANUARY TO MARCH 2015 MONTHS).....	28
5.2.5	KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:	28
5.2.6	DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:.....	29
5.3	CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS - QE MAR 15:.....	36
5.3.1	QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JANUARY TO MARCH 2015 MONTHS AUDITED DATA):	36
5.3.2	3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-MARCH 2015):	38
5.3.3	KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS.....	39
6.	LIVE CALLING ASSESSMENT:.....	41
6.1	INTER OPERATOR CALLS ASSESSMENT:.....	41
6.2	CUSTOMER CARE / HELPLINE ASSESSMENT:.....	42
6.3	LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:	42
6.4	LEVEL -1 CALLING ASSESSMENT:.....	43
7.	OPERATOR ASSISTED DRIVE TEST	47

7.1 OPERATOR ASSISTED DRIVE TEST: AZAMGARH SSA (JANUARY-15)	48
7.2 OPERATOR ASSISTED DRIVE TEST: BALLIA SSA (FEBRUARY-15)	51
7.3 OPERATOR ASSISTED DRIVE TEST: BARABANKI SSA (MARCH-15).....	54
7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:	57
7.5 SSA WISE DRIVE TEST OBSERVATION:.....	59
7.6 KEY FINDINGS ON DRIVE TEST:	65
8. GRAPHICAL REPRESENTATION (CMTS):.....	67



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

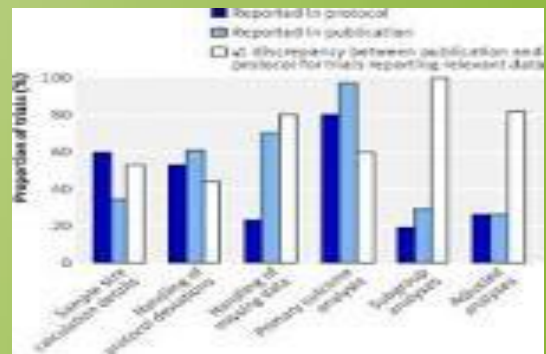
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 Himanchal Pradesh, J&K and Maharashtra & Goa circles during the quarter January 2015 – March 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
		January-15	February-15	March-15	
GSM Operators					
1	AIRCEL	26 to 28 Jan-15	23 to 25 Feb-15	19 to 21 Mar-15	3rd floor, Ratan Square, Hajratganj, Lucknow
2	AIRTEL	6 to 8 Jan-15	9 to 11 Feb-15	11 to 13 Mar-15	TCG 7/7, vibhuti khand, Gomti Nagar, Lucknow
3	BSNL	12 to 14 Jan-15	23 to 25 Feb-15	16 to 18 Mar-15	BSNL, Mahanager, Lucknow
4	IDEA	12 to 14 Jan-15	16 to 18 Feb-15	16 to 18 Mar-15	Idea Cellular Ltd., Fortuna Towers, 10 Rana Pratap Road, Lucknow-226001
5	RCOM GSM	12 to 14 Jan-15	4 to 6 Feb-15	16 to 18 Mar-15	House No. 12, C/O BTC House Eldeco Greens, Gomti Nagar, Lucknow-226010
6	VODAFONE	16, 19 & 20 Jan-15	4 to 6 Feb-15	18 to 20 Mar-15	Shalimar Titanium, Vibhuti Khand, Gomti Nagar, Lucknow
7	UNINOR	21 to 23 Jan-15	23 to 25 Feb-15	12, 13 & 16 Mar-15	Telewings Communications Services Pvt Ltd. (Uninor) Welldone Technology Park Sec-48 Sohana Road Gurgaon
8	TATA GSM	6 to 8 Jan-15	4 to 6 Feb-15	9 to 11 Mar-15	Tata Teleservices Ltd., Prem Plaza Building 2, RF Bahadurji Marg, Lucknow
CDMA Operators					
9	RCOM CDMA	12 to 14 Jan-15	4 to 6 Feb-15	16 to 18 Mar-15	House No. 12, C/O BTC House Eldeco Greens, Gomti Nagar, Lucknow-226010
10	TATA CDMA	6 to 8 Jan-15	4 to 6 Feb-15	9 to 11 Mar-15	Tata Teleservices Ltd., Prem Plaza Building 2, RF Bahadurji Marg, Lucknow

NB: Videocon has re-started its services during the month of February 2015 and MTS has discontinued its services in 2013, so their audit is not done for QE March 2015.

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

The data generated by monthly PMR and 3-days live measurements audit for the period January 2015 to March 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. Based on this criterion, QoS audit for basic (wire line) service was not required to be done for UP (E) Circle in the quarter ended March- 2015.**

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. Based on this criterion, the QoS audit for Broadband service was not required to be done for UP (E) Circle in the quarter ended March- 2015.**

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 **Tata (GSM), Tata (CDMA), Vodafone** which failed to meet the benchmarks of the parameter **Worst affected cells > 3% TCH drop** with their quarterly average performance as **6.71%, 8.44% and 3.88%** respectively. Further, **Uninor** lagged behind the benchmark of parameter **Voice Quality** having achieved the value of **93.55%**.

(ii) Three days live assessment revealed that the operators were meeting the benchmark of most of the parameters. However, **Tata (GSM), Tata (CDMA) and Vodafone** failed to meet the benchmark for the parameter **“worst affected Cell > 3% TCH Drop”**. Their average performance for this parameter was **6.24%, 8.66% and 3.16%** respectively. Further, **Uninor** lagged behind the benchmark for the parameter **‘Voice Quality’** in all the three months of the quarter with its average performance as **93.65%**.

Similar non-compliance of **Tata (GSM), Tata (CDMA), Vodafone and Uninor** with respect to above indicated parameters was also observed in monthly PMR audit.

(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, **Aircel, Airtel and RCOM CDMA** remained non-complied for parameter '**Calls answered by Operators (Voice to Voice)**' with their performance as **94.49%, 94.23 and 89.17% respectively**.

Idea also remained under performed for parameter "%age requests for Termination / Closure of service" with its performance as **96.82%**.

The results for three days live measurements revealed that all service providers were in compliance with respect to the parameter '**Accessibility of call center**'. However, **Aircel** remained under performed for parameter '**calls answered by operators (voice to voice)**' against the benchmark of $\geq 95\%$ with its performance as **88.34%**.

(iv) With regard to the **Drive Test** results, it was revealed that the performance of the operators namely **BSNL, Idea, Tata (GSM)/ Tata (CDMA), RCOM (CDMA), Uninor and Airtel** was not satisfactory as they failed to meet the benchmarks of some of the parameters. The drive test results further suggest that **BSNL** needs to pay special attention to improve their network quality in respect the prime network parameters **Call Drop rate, Voice Quality, Call Setup success rate and Blocked Call rate**. However, for other service providers also, the network parameters **Voice Quality and Call Drop rate** were the areas of concern.

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	March-15	20:00 - 21:00
2	AIRTEL	March-15	19:00 - 20:00
3	BSNL	March-15	20:00 - 21:00
4	IDEA	March-15	20:00 - 21:00
5	RCOM GSM	March-15	20:00 - 21:00
6	UNINOR	March-15	20:00 - 21:00
7	TATA GSM	March-15	19:00 - 20:00
8	VODAFONE	March-15	20:00 - 21:00
CDMA Operators			
9	RCOM CDMA	March-15	20:00 - 21:00
10	TATA CDMA	March-15	19:00 - 20:00

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	27	3401	ZTE	ZTE
2	AIRTEL	48	110	10037	Ericsson	Ericsson
3	BSNL	26	79	6405	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	11	44	7351	NSN	NSN
5	RCOM GSM	4	19	2101	Huawei	Huawei
6	UNINOR	14	34	4809	Ericsson	Ericsson
7	TATA GSM	4	22	2309	NSN	NSN
8	VODAFONE	18	140	9778	NSN	NSN
CDMA Operators						
9	RCOM CDMA	8	11	1142	Huawei & Lucent	Huawei & Lucent
10	TATA CDMA	4	6	321	Huawei & Ericsson	Huawei, ZTE & Motorola

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JANUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- JANUARY 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Jan-15	0.09%	0.30%	1.82%	0.19%	0.31%	0.22%	0.10%	0.08%	0.44%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Jan-15	0.21%	0.93%	1.84%	0.69%	0.57%	1.20%	0.21%	0.28%	1.74%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	98.89%	98.63%	98.36%	98.14%	99.47%	97.87%	97.19%	98.88%	98.24%	98.64%
	b) SDCCH/PAGING Channel congestion	<=1%	Jan-15	0.60%	0.46%	0.81%	0.43%	0.05%	0.29%	0.27%	0.23%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.68%	0.40%	1.69%	1.87%	0.08%	0.95%	1.36%	1.11%	0.04%	0.04%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Jan-15	0.50%	0.68%	1.38%	1.14%	0.26%	0.63%	0.98%	1.09%	0.27%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jan-15	2.37%	2.81%	2.59%	2.75%	0.01%	1.38%	7.17%	4.34%	1.27%	8.91%
	c) Connections with good voice quality	>=95%	Jan-15	98.39%	97.52%	96.50%	96.75%	98.94%	93.36%	97.04%	96.98%	99.84%	99.23%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Jan-15	0	0	0	0	0	0	0	0	0	0

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – FEBRUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE - FEBRUARY 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Feb-15	0.08%	0.25%	1.06%	0.18%	0.32%	0.28%	0.13%	0.06%	0.59%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Feb-15	0.24%	0.74%	1.90%	0.58%	0.95%	1.06%	0.39%	0.17%	1.58%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	98.82%	98.66%	97.51%	96.51%	99.40%	97.37%	96.69%	98.74%	98.87%	98.45%
	b) SDCCH/PAGING Channel congestion	<=1%	Feb-15	0.62%	0.38%	0.88%	0.61%	0.02%	0.30%	0.24%	0.28%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-15	1.01%	0.43%	1.50%	1.82%	0.09%	1.47%	1.81%	1.26%	0.01%	0.06%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Feb-15	0.55%	0.61%	1.91%	1.10%	0.25%	0.59%	0.86%	1.05%	0.27%	0.52%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Feb-15	2.40%	2.79%	2.77%	2.82%	0.04%	1.31%	5.98%	3.78%	1.47%	7.95%
	c) Connections with good voice quality	>=95%	Feb-15	97.68%	97.76%	96.50%	96.53%	98.85%	93.36%	96.95%	96.76%	99.84%	99.21%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Feb-15	0	0	0	0	0	0	0	0	0	0

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – MARCH 15 MONTH

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- MARCH 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Mar-15	0.12%	0.18%	1.72%	0.19%	0.28%	0.34%	0.13%	0.08%	0.48%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Mar-15	0.53%	0.72%	1.83%	0.41%	0.52%	1.12%	0.30%	0.26%	1.66%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	98.67%	98.82%	98.42%	95.44%	99.40%	97.02%	96.35%	98.31%	97.78%	98.29%
	b) SDCCH/PAGING Channel congestion	<=1%	Mar-15	0.73%	0.31%	0.99%	0.80%	0.02%	0.35%	0.53%	0.28%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-15	1.23%	0.35%	1.47%	1.90%	0.09%	1.94%	1.88%	1.69%	0.04%	0.05%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Mar-15	0.55%	0.56%	1.08%	1.14%	0.21%	0.50%	0.90%	0.95%	0.29%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Mar-15	2.42%	2.76%	2.15%	2.90%	0.02%	1.12%	6.97%	3.53%	1.61%	8.46%
	c) Connections with good voice quality	>=95%	Mar-15	97.16%	97.96%	96.50%	96.51%	98.84%	93.93%	96.93%	96.62%	99.84%	99.20%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Mar-15	0	0	0	0	0	0	0	0	0	0

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- MARCH 15 (JAN TO MAR 2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-MARCH-15) OF UP(E) CIRCLE													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.10%	0.24%	1.53%	0.19%	0.30%	0.28%	0.12%	0.07%	0.50%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.33%	0.80%	1.86%	0.56%	0.68%	1.13%	0.30%	0.24%	1.66%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	98.79%	98.70%	98.10%	96.70%	99.42%	97.42%	96.74%	98.64%	98.30%	98.46%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.65%	0.38%	0.89%	0.61%	0.03%	0.31%	0.35%	0.26%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.97%	0.39%	1.55%	1.86%	0.09%	1.45%	1.68%	1.35%	0.03%	0.05%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.53%	0.62%	1.46%	1.13%	0.24%	0.57%	0.91%	1.03%	0.28%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.40%	2.79%	2.50%	2.82%	0.02%	1.27%	6.71%	3.88%	1.45%	8.44%
	c) Connections with good voice quality	>=95%	Quarterly	97.74%	97.75%	96.50%	96.60%	98.88%	93.55%	96.97%	96.79%	99.84%	99.21%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0

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 the operators were meeting the benchmark on this parameter.

- **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 met the TRAI specified benchmarks** on the congestion parameters.

▪ **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 0.24%) 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 **Tata (GSM), Tata (CDMA) and Vodafone** which remained non-complied in all the 3 months of the quarter. The quarterly average performance level of **Tata (GSM), Tata (CDMA) and Vodafone** was **6.71 %, 8.44% and 3.88%** 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 **93.55%**.

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) – JANUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE- JANUARY 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCON GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.17%	0.39%	1.96%	0.20%	0.27%	0.26%	0.02%	0.37%	0.45%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.24%	0.22%	0.01%	0.00%	0.02%	0.00%	0.10%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.83%	98.76%	98.10%	98.41%	99.48%	97.38%	97.41%	98.83%	98.16%	98.87%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.51%	0.37%	0.66%	0.26%	0.02%	0.34%	0.15%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.62%	0.37%	0.65%	1.58%	0.09%	1.04%	1.19%	1.17%	0.04%	0.02%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.50%	0.69%	1.59%	1.12%	0.25%	0.73%	0.94%	1.06%	0.30%	0.51%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.27%	2.84%	0.36%	2.74%	0.02%	1.57%	7.10%	4.02%	1.36%	8.31%
	c) Connections with good voice quality	>=95%	Live data	98.36%	97.54%	96.70%	96.78%	98.97%	93.04%	97.02%	97.13%	99.84%	99.24%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE – FEBRUARY 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators									CDMA Operators
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.27%	1.98%	0.18%	0.31%	0.28%	0.13%	0.24%	0.67%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.17%	0.31%	0.04%	0.00%	0.04%	0.09%	0.01%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.74%	98.74%	98.04%	95.73%	99.43%	97.09%	96.59%	99.08%	98.67%	98.48%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.51%	0.34%	0.76%	0.75%	0.02%	0.35%	0.33%	0.19%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.01%	0.36%	1.65%	1.89%	0.08%	1.93%	1.85%	0.92%	0.03%	0.03%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.55%	0.60%	0.36%	1.07%	0.25%	0.52%	0.87%	0.92%	0.24%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.69%	2.78%	0.13%	2.82%	0.01%	1.36%	5.43%	2.70%	1.41%	9.44%
	c) Connections with good voice quality	>=95%	Live data	97.22%	97.74%	96.61%	96.47%	98.87%	93.98%	96.99%	97.06%	99.84%	99.23%
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	1	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE - MARCH 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators								CDMA Operators	
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.10%	1.94%	0.15%	0.17%	0.40%	0.09%	0.28%	0.47%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.05%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.55%	98.85%	97.88%	95.31%	99.37%	96.74%	96.82%	98.20%	97.53%	98.33%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.81%	0.26%	0.66%	0.64%	0.02%	0.34%	0.26%	0.20%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.44%	0.34%	0.65%	1.85%	0.10%	2.31%	1.74%	1.80%	0.06%	0.09%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.57%	0.57%	1.39%	1.07%	0.21%	0.50%	0.84%	0.96%	0.32%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.62%	2.85%	0.08%	2.72%	0.02%	0.99%	6.18%	2.77%	1.34%	8.23%
	c) Connections with good voice quality	>=95%	Live data	97.05%	97.88%	96.70%	96.72%	98.81%	93.93%	96.94%	96.73%	99.84%	99.21%
4	No. of POI having >=0.5% congestion	<0.5%	Live data	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 JANUARY TO MARCH 2015 MONTHS)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE- MARCH 15) – UP (E) CIRCLE													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.10%	0.25%	1.96%	0.18%	0.25%	0.31%	0.08%	0.30%	0.53%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.01%	0.15%	0.27%	0.02%	0.00%	0.02%	0.03%	0.04%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	98.71%	98.78%	98.01%	96.48%	99.43%	97.07%	96.94%	98.70%	98.12%	98.56%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.61%	0.32%	0.69%	0.55%	0.02%	0.34%	0.25%	0.26%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	1.36%	0.36%	0.98%	1.77%	0.09%	1.76%	1.59%	1.30%	0.04%	0.05%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.54%	0.62%	1.11%	1.09%	0.24%	0.58%	0.88%	0.98%	0.29%	0.53%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.53%	2.82%	0.19%	2.76%	0.02%	1.31%	6.24%	3.16%	1.37%	8.66%
	c) Connections with good voice quality	>=95%	Quarterly	97.54%	97.72%	96.67%	96.66%	98.88%	93.65%	96.98%	96.97%	99.84%	99.23%
4	No. of POI having >=0.5% congestion	<0.5%	Quarterly	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, **Tata (GSM), Tata (CDMA) and Vodafone** failed to meet the benchmark for the parameter “**worst affected Cell > 3% TCH Drop**”. Their average performance for this parameter was **6.24%, 8.66%** and **3.16%** respectively. Further, **Uninor** lagged behind the benchmark for the parameter ‘**Voice Quality**’ in all the three months of the quarter with its average performance as **93.65%**.

Similar non-compliance of **Tata (GSM), Tata (CDMA), Vodafone and Uninor** with respect to above indicated parameters was also observed in monthly PMR audit.

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 - January 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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		Jan-15	3388	9935	6405	7285	2102	4817	2334	9593	1147	321
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jan-15	2383.30	21930.83	86728.82	9910.95	4843.82	8035.66	1747.13	5925.00	3795.68	86.63
	c) BTS Accumulated Downtime	<=2%	Jan-15	0.09%	0.30%	1.82%	0.19%	0.31%	0.22%	0.10%	0.08%	0.44%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jan-15	7	92	118	50	12	58	5	27	20	0
e) Worst affected BTSs due to downtime	<=2%	Jan-15	0.21%	0.93%	1.84%	0.69%	0.57%	1.20%	0.21%	0.28%	1.74%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	98.89%	98.63%	98.36%	98.14%	99.47%	97.87%	97.19%	98.88%	98.24%	98.64%
	b) SDCCH/PAGING Congestion	<=1%	Jan-15	0.60%	0.46%	0.81%	0.43%	0.05%	0.29%	0.27%	0.23%	0.00%	0.00%
c) TCH congestion	<=2%	Jan-15	0.68%	0.40%	1.69%	1.87%	0.08%	0.95%	1.36%	1.11%	0.04%	0.04%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Jan-15	0.50%	0.68%	1.38%	1.14%	0.26%	0.63%	0.98%	1.09%	0.27%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Jan-15	2.37%	2.81%	2.59%	2.75%	0.01%	1.38%	7.17%	4.34%	1.27%	8.91%
	c) % of connections with good voice quality	>=95%	Jan-15	98.39%	97.52%	96.50%	96.75%	98.94%	93.36%	97.04%	96.98%	99.84%	99.23%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jan-15	243	839	154	605	1	200	502	1296	44	86
e) Total no. of cells (Sector) in the licensed service area		Jan-15	10215	29882	5946	21984	6275	14506	7004	29841	3451	967	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Jan-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jan-15	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Jan-15	150801	554875	469000	216369	140000	258635	136087	578422	176000	51455
	b) Total traffic in TCBH in erlang (Avg.)		Jan-15	109136	490984	218837	220064	102820	327273	63473	457765	50725	3928
c) Total no. of customers served (as per VLR) on last day of the month		Jan-15	4086588	17305688	4594165	9441139	5466751	7928918	2740977	16667990	2308003	121606	

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle – January 15 month													
S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		Live data	3387	9903	6405	7291	2102	4815	2352	9593	1147	321
	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	426.70	2776.02	9057.17	1062.85	409.70	908.40	36.30	2569.86	372.12	11.13
	c) BTS Accumulated Downtime	<=2%	Live data	0.17%	0.39%	1.96%	0.20%	0.27%	0.26%	0.02%	0.37%	0.45%	0.05%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	24	14	1	0	1	0	10	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.24%	0.22%	0.01%	0.00%	0.02%	0.00%	0.10%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.83%	98.76%	98.10%	98.41%	99.48%	97.38%	97.41%	98.83%	98.16%	98.87%
	b) SDCC/PAGING Congestion	<=1%	Live data	0.51%	0.37%	0.66%	0.26%	0.02%	0.34%	0.15%	0.40%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.62%	0.37%	0.65%	1.58%	0.09%	1.04%	1.19%	1.17%	0.04%	0.02%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.50%	0.69%	1.59%	1.12%	0.25%	0.73%	0.94%	1.06%	0.30%	0.51%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.27%	2.84%	0.36%	2.74%	0.02%	1.57%	7.10%	4.02%	1.36%	8.31%
	c) % of connections with good voice quality	>=95%	Live data	98.36%	97.54%	96.70%	96.78%	98.97%	93.04%	97.02%	97.13%	99.84%	99.24%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	231	844	22	601	1	227	500	1200	47	80
	e) Total no. of cells (Sector) in the licensed service area		Live data	10212	29749	5946	21980	6275	14514	7043	29841	3451	967
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Live data	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

TABLE: 3

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Feb-15	3398	9980	6405	7303	2101	4814	2310	9730	1142	321
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Feb-15	1891.86	16578.40	45596.33	8837.55	4543.17	8997.46	2006.76	3835.89	4524.60	27.27
	c) BTS Accumulated Downtime	<=2%	Feb-15	0.08%	0.25%	1.06%	0.18%	0.32%	0.28%	0.13%	0.06%	0.59%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Feb-15	8	74	122	42	20	51	9	17	18	0
e) Worst affected BTSs due to downtime	<=2%	Feb-15	0.24%	0.74%	1.90%	0.58%	0.95%	1.06%	0.39%	0.17%	1.58%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	98.82%	98.66%	97.51%	96.51%	99.40%	97.37%	96.69%	98.74%	98.87%	98.45%
	b) SDCCH/PAGING Congestion	<=1%	Feb-15	0.62%	0.38%	0.88%	0.61%	0.02%	0.30%	0.24%	0.28%	0.00%	0.00%
c) TCH congestion	<=2%	Feb-15	1.01%	0.43%	1.50%	1.82%	0.09%	1.47%	1.81%	1.26%	0.01%	0.06%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Feb-15	0.55%	0.61%	1.91%	1.10%	0.25%	0.59%	0.86%	1.05%	0.27%	0.52%
	b) Worst affected cells>3% TCH drop	<=3%	Feb-15	2.40%	2.79%	2.77%	2.82%	0.04%	1.31%	5.98%	3.78%	1.47%	7.95%
	c) % of connections with good voice quality	>=95%	Feb-15	97.68%	97.76%	96.50%	96.53%	98.85%	93.36%	96.95%	96.76%	99.84%	99.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Feb-15	246	837	165	621	3	190	414	1128	51	77
e) Total no. of cells (Sector) in the licensed service area		Feb-15	10247	30046	5946	21980	6263	14522	6933	29849	3438	964	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Feb-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Feb-15	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Feb-15	149449	567750	469000	215633	140000	264072	135278	578422	176000	51455
	b) Total traffic in TCBH in erlang (Avg.)		Feb-15	122020	542985	224910	250605	109481	354912	70567	457765	44373	4196
c) Total no. of customers served (as per VLR) on last day of the month		Feb-15	4408598	17632465	4622626	9869389	5651692	8138491	2802636	17063777	2299574	119369	

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - UP(E) Circle - February 15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	3398	9935	6405	7285	2101	4815	2310	9593	1142	321
	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	185.54	1932.02	9137.82	951.67	472.77	965.86	210.32	1689.79	554.00	4.03
	c) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.27%	1.98%	0.18%	0.31%	0.28%	0.13%	0.24%	0.67%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	17	20	3	0	2	2	1	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.17%	0.31%	0.04%	0.00%	0.04%	0.09%	0.01%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.74%	98.74%	98.04%	95.73%	99.43%	97.09%	96.59%	99.08%	98.67%	98.48%
	b) SDCC/PAGING Congestion	<=1%	Live data	0.51%	0.34%	0.76%	0.75%	0.02%	0.35%	0.33%	0.19%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	1.01%	0.36%	1.65%	1.89%	0.08%	1.93%	1.85%	0.92%	0.03%	0.03%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.55%	0.60%	0.36%	1.07%	0.25%	0.52%	0.87%	0.92%	0.24%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.69%	2.78%	0.13%	2.82%	0.01%	1.36%	5.43%	2.70%	1.41%	9.44%
	c) % of connections with good voice quality	>=95%	Live data	97.22%	97.74%	96.61%	96.47%	98.87%	93.98%	96.99%	97.06%	99.84%	99.23%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	275	829	8	621	0	197	377	806	48	91
e) Total no. of cells (Sector) in the licensed service area		Live data	10247	29882	5946	21977	6263	14519	6938	29841	3438	964	
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	1	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	Airtel ICR	0	0

TABLE: 5

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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		Mar-15	3401	10037	6405	7351	2101	4809	2309	9778	1142	321
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Mar-15	3076.18	13506.35	81968.48	10274.98	4420.47	12282.15	2296.77	5456.20	4078.78	85.36
	c) BTS Accumulated Downtime	<=2%	Mar-15	0.12%	0.18%	1.72%	0.19%	0.28%	0.34%	0.13%	0.08%	0.48%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Mar-15	18	72	117	30	11	54	7	25	19	0
e) Worst affected BTSs due to downtime	<=2%	Mar-15	0.53%	0.72%	1.83%	0.41%	0.52%	1.12%	0.30%	0.26%	1.66%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	98.67%	98.82%	98.42%	95.44%	99.40%	97.02%	96.35%	98.31%	97.78%	98.29%
	b) SDCCH/PAGING Congestion	<=1%	Mar-15	0.73%	0.31%	0.99%	0.80%	0.02%	0.35%	0.53%	0.28%	0.00%	0.00%
c) TCH congestion	<=2%	Mar-15	1.23%	0.35%	1.47%	1.90%	0.09%	1.94%	1.88%	1.69%	0.04%	0.05%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Mar-15	0.55%	0.56%	1.08%	1.14%	0.21%	0.50%	0.90%	0.95%	0.29%	0.55%
	b) Worst affected cells>3% TCH drop	<=3%	Mar-15	2.42%	2.76%	2.15%	2.90%	0.02%	1.12%	6.97%	3.53%	1.61%	8.46%
	c) % of connections with good voice quality	>=95%	Mar-15	97.16%	97.96%	96.50%	96.51%	98.84%	93.93%	96.93%	96.62%	99.84%	99.20%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Mar-15	248	834	128	640	1	163	482	1054	56	82
e) Total no. of cells (Sector) in the licensed service area		Mar-15	10256	30174	5946	22094	6263	14502	6913	29886	3438	964	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Mar-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Mar-15	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Mar-15	146600	578868	469000	216136	140000	267461	134904	570934	176000	51455
	b) Total traffic in TCBH in erlang (Avg.)		Mar-15	126530	552408	244212	262871	117457	363891	69218	513043	45876	4276
c) Total no. of customers served (as per VLR) on last day of the month		Mar-15	4426024	17079803	4611188	10125751	5717997	8181807	2825852	17116800	2302981	116355	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - UP(E) Circle - March 15 month													
S/N	Name of Parameter	Bench-mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	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	3400	10022	6405	7303	2101	4815	2309	9741	1142	320
	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	144.66	725.92	8960.10	796.33	256.07	1401.75	149.33	1965.27	384.45	0.00
	c) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.10%	1.94%	0.15%	0.17%	0.40%	0.09%	0.28%	0.47%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	5	17	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.05%	0.27%	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	98.55%	98.85%	97.88%	95.31%	99.37%	96.74%	96.82%	98.20%	97.53%	98.33%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.81%	0.26%	0.66%	0.64%	0.02%	0.34%	0.26%	0.20%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	1.44%	0.34%	0.65%	1.85%	0.10%	2.31%	1.74%	1.80%	0.06%	0.09%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.57%	0.57%	1.39%	1.07%	0.21%	0.50%	0.84%	0.96%	0.32%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.62%	2.85%	0.08%	2.72%	0.02%	0.99%	6.18%	2.77%	1.34%	8.23%
	c) % of connections with good voice quality	>=95%	Live data	97.05%	97.88%	96.70%	96.72%	98.81%	93.93%	96.94%	96.73%	99.84%	99.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	269	861	5	600	1	143	428	827	46	79
e) Total no. of cells (Sector) in the licensed service area		Live data	10253	30166	5946	22028	6263	14516	6918	29886	3438	964	
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
	Name of POI not meeting the benchmark		Live data	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 MAR 15:

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

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

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators								CDMA Operators	
Customer Service Quality Parameters													
Metering & Billing Credibility -Post Paid													
1	A) No. of bills issued during the quarter		UPE	5285	460533	256120	259384	60211	96064	NA	1335495	206103	19206
	B) No. of bills disputed including billing complaints during the quarter		UPE	0	89	102	184	40	0	NA	1111	189	0
	C)% of billing complaints during the quarter	<= 0.1%	UPE	0.00%	0.02%	0.04%	0.07%	0.07%	0.00%	NA	0.08%	0.09%	0.00%
Metering & Billing Credibility -Pre Paid													
2	A) Total No. of Pre-paid customers at the end of the quarter		UPE	6310716	18115763	7276008	9594397	5770331	4824311	10717946	17143047	2362268	274635
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		UPE	2	347	7481	2959	5055	0	551	4459	2097	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	UPE	0.00%	0.002%	0.103%	0.03%	0.09%	0.00%	0.01%	0.03%	0.09%	0.00%
Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints													
3	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		UPE	2	436	7481	12690	5095	277	551	5570	2286	17
	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	2	436	7481	12690	5095	277	551	5570	2286	17
	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	2	436	7481	12690	5095	277	551	5570	2286	17
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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



	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Response time to customers for assistance													
4	A) Total no of calls attempted to customer care/Call center		UPE	23583017	7710258	5919338	24859785	6186826	3982397	36410304	37911257	3494991	44742
	B) Total no. of calls successfully established to customer care/Call center.		UPE	23119895	7710258	5847029	24836177	6090697	3932929	36024424	37911257	3426015	44383
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	UPE	98.04%	100.00%	98.78%	99.91%	98.45%	98.76%	98.94%	100.00%	98.03%	99.20%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		UPE	5115429	8538473	3072344	7742975	1366200	1776718	10899788	9331776	477143	37859
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UPE	4833352	8046061	3007340	7733047	1301684	1697781	10816419	9175482	425486	37144
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	UPE	94.49%	94.23%	97.88%	99.87%	95.28%	95.56%	99.24%	98.33%	89.17%	98.11%
Termination/closure of service													
5	A) Total No. of requests for Termination / Closure of service received during the quarter		UPE	70	1633	48420	944	174	1273	NA	7203	713	351
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		UPE	70	1633	48420	914	174	1273	NA	7203	713	351
	C) % of Termination/ Closure of service within 7 days	<=7days	UPE	100.00%	100.00%	100.00%	96.82%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
Time taken for refunds of deposits after closures.													
6	A) No. of Payments/ Refunds due during the quarter		UPE	136	580	62	1703	392	495	NA	12151	1115	108
	B) No. of Payments/ Refunds Cleared during the quarter		UPE	136	580	62	1703	392	495	NA	12151	1115	108
	C) Time taken for refunds of deposits after closures.	100% within 60 days	UPE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

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

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE- MARCH 15													
3 days live CSD Audit Data		Bench-mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/N	Name of Parameter			GSM Operators									
RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE													
1	A) Total no of calls attempted to customer care/Call center		UP East	746827	311499	176646	5875794	1333601	188369	365111	1317666	81742	1696
	B) Total no. of calls successfully established to customer care/Call center.		UP East	733720	311499	176040	5875288	1320528	186748	352528	1317666	79532	1694
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	UP East	98.24%	100.00%	99.66%	99.99%	99.02%	99.14%	96.55%	100.00%	97.30%	99.88%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		UP East	172137	294192	97120	250826	389911	42715	51727	342607	14617	811
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UP East	152061	286842	96205	250542	377906	40999	49735	336251	14118	788
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	UP East	88.34%	97.50%	99.06%	99.89%	96.92%	95.98%	96.15%	98.14%	96.59%	97.16%

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance 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 **BSNL** remained marginally beyond the benchmark of **billing credibility (Pre-paid)** with its performance as **0.103%**

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, **Aircel, Airtel and RCOM CDMA** remained non-complied for parameter '**Calls answered by Operators (Voice to Voice)**' with their performance as **94.49%, 94.23 and 89.17% 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. However, **Idea** remained under performed for this parameter with its performance as **96.82%**.

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.

Live Measurements

The results for three days live measurements revealed that all service providers were in compliance with respect to the parameter '**Accessibility of call center**'. However, **Aircel** remained under performed for parameter '**calls answered by operators (voice to voice)**' against the benchmark of $\geq 95\%$ with its performance as **88.34%**.

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	UNINOR
AIRCEL	UP-E	---	100%	99%	100%	100%	100%	100%	96%	100%	97%
AIRTEL	UP-E	100%	---	98%	100%	100%	100%	100%	100%	100%	100%
BSNL	UP-E	100%	100%	---	100%	95%	96%	100%	100%	100%	96%
IDEA	UP-E	100%	100%	100%	---	100%	100%	100%	99%	100%	100%
RCOM GSM	UP-E	100%	100%	95%	100%	---	100%	100%	96%	100%	100%
RCOM CDMA	UP-E	100%	99%	100%	100%	100%	---	100%	100%	100%	99%
TATA GSM	UP-E	100%	100%	100%	100%	100%	96%	---	100%	100%	100%
TATA CDMA	UP-E	100%	100%	99%	100%	100%	97%	100%	---	100%	99%
VODAFONE	UP-E	100%	100%	100%	100%	100%	100%	100%	100%	---	100%
UNINOR	UP-E	97%	100%	98%	100%	98%	100%	100%	100%	100%	---

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. However, in case where calls attempted from Aircel to BSNL, Tata CDMA and Uninor, successful interconnection was 99%, 96% and 97%, Airtel to BSNL was 98%, BSNL to RCOM(GSM), RCOM (CDMA) and Uninor was 95%, 96% and 96%, RCOM (GSM) to BSNL and Tata CDMA was 95% and 96%, RCOM (CDMA) to Airtel and Uninor was 99% and 99%, Tata (GSM) to RCOM CDMA was 96%, Tata (CDMA) to BSNL, RCOM (CDMA) and Uninor was 99%, 97% and 99%, and Uninor to Aircel, BSNL and RCOM (CDMA) was 97%, 98% and 98%. 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	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total no of calls attempted to customer care/Call center	UP East	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	UP East	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total call successfully established*100/ Total call attempt)	UP East	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	UP East	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	UP East	95	99	100	100	99	98	98	99	99	99
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100/ Total call attempts)	UP East	95.00%	99.00%	100.00%	100.00%	99.00%	98.00%	98.00%	99.00%	99.00%	99.00%

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, Airtel, Uninor, RCOM (GSM), Tata (GSM), Vodafone, RCOM (CDMA) and Tata (CDMA) could achieve their performance as 95.00%, 99.00%, 99.00%, 98.00%, 98.00%, 99.00%, 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)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	UP East	2	136	183	126	151	129	177	170	186	17
Total No. of calls Answered	UP East	2	100	100	100	100	100	100	100	100	17
Cases resolved within 4 weeks	UP East	2	100	100	100	100	100	100	100	100	17
%age of cases resolved	UP East	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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																				
Emergency no.	Circle Name	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE	UNINOR						
100	UP-EAST	AZAMGARH	AZAMGARH	2	√	√	√	√	X	X	√	√	√	√						
101				2	√	√	√	√	√	X	X	√	√	√	√					
102				2	√	√	√	√	√	√	X	X	√	√	√	√				
108				2	√	√	√	√	√	√	√	√	√	√	√	√				
1090				2	√	√	√	√	√	√	√	√	√	√	√	√				
100	UP-EAST		AZAMGARH	GHOSI	2	√	√	√	√	X	X	√	X	√	√					
101					2	X	√	√	√	√	X	X	√	X	√	√				
102					2	√	√	√	√	√	√	X	X	√	X	√	√			
108					2	√	√	√	√	√	√	√	√	√	X	√	√			
1090					2	√	√	√	√	√	√	√	√	√	X	√	√			
100	UP-EAST			AZAMGARH	LALGANJ	2	√	√	√	√	X	X	√	√	√	√				
101						2	√	√	√	√	√	X	X	√	√	√	√			
102						2	√	√	√	√	√	√	X	X	√	√	√	√		
108						2	√	√	√	√	√	√	√	√	√	√	√	√		
1090						2	√	√	√	√	√	√	√	√	√	√	√	√		
100	UP-EAST				AZAMGARH	MAUNATHBHANJAN	2	√	√	√	√	X	X	√	√	√	√			
101							2	√	√	√	√	√	X	X	√	√	√	√		
102							2	√	√	√	√	√	√	X	X	√	√	√	√	
108							2	√	√	√	√	√	√	√	√	√	√	√	√	
1090							2	√	√	√	√	√	√	√	√	√	√	√	√	
100	UP-EAST					AZAMGARH	PHULPUR-I (PHULPUR)	2	√	√	√	√	X	X	√	√	√	√		
101								2	√	√	√	√	√	X	X	√	√	√	√	
102								2	√	√	√	√	√	√	X	X	√	√	√	√
108								2	√	√	√	√	√	√	√	√	√	√	√	√
1090								2	X	√	√	√	√	√	√	√	√	√	√	√
100	UP-EAST	AZAMGARH					PHULPUR-II (ATRAWLIA)	2	X	√	√	√	X	X	√	√	√	√		
101								2	√	√	√	√	√	X	X	√	√	√	√	
102								2	√	√	√	√	√	√	X	X	√	√	√	√
108								2	√	√	√	√	√	√	√	√	√	√	√	√
1090								2	√	√	√	√	√	√	√	√	√	√	√	√
100	UP-EAST		AZAMGARH				SAGRI	2	X	√	√	√	X	X	√	X	√	√		
101								2	√	√	√	√	√	X	X	√	X	√	√	

LEVEL 1 LIVE CALLING																		
Emergency no.	Circle Name	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE	UNINOR				
102				2	√	√	√	√	X	X	√	X	√	√				
108				2	√	√	√	√	√	√	√	X	√	√				
1090				2	√	√	√	√	√	√	√	X	√	√				
100	UP-EAST	BALLIA	BALLIA	2	√	√	√	√	√	√	√	√	√	√				
101				2	√	√	√	√	√	√	√	√	√	√	√			
102				2	√	√	√	√	√	√	√	√	√	√	√			
108				2	√	√	√	√	√	√	√	√	√	√	√			
1090				2	√	√	√	√	√	√	√	√	√	√	√			
100				2	√	√	√	√	√	√	√	√	√	X	√	√		
101	UP-EAST		BALLIA	RANIGANJ	2	√	√	√	√	√	√	√	X	√	√			
102					2	√	√	√	√	√	√	√	√	X	√	√		
108					2	√	√	√	√	√	√	√	√	X	√	√		
1090					2	√	√	√	√	√	√	√	√	X	√	√		
100	UP-EAST			BALLIA	RASARA	2	√	√	√	√	√	√	√	X	√	√		
101						2	√	√	√	√	√	√	√	√	X	√	√	
102						2	√	√	√	√	√	√	√	√	X	√	√	
108						2	√	√	√	√	√	√	√	√	X	√	√	
1090	2				√	√	√	√	√	√	√	√	√	X	√	√		
100	UP-EAST				BALLIA	BANSDEEH	2	√	√	√	√	√	√	√	X	√	√	
101							2	√	√	√	√	√	√	√	√	X	√	√
102							2	√	√	√	√	√	√	√	√	X	√	√
108		2					√	√	√	√	√	√	√	√	X	√	√	
1090		2					√	√	√	√	√	√	√	√	√	X	√	√
100	UP-EAST	BARABANKI				BARABANKI	2	√	√	√	√	√	√	√	√	√	√	
101							2	X	X	X	X	X	X	X	X	X	X	X
102							2	√	√	√	√	X	X	√	√	√	√	√
108							2	√	√	√	√	X	X	√	√	√	√	√
1090			2				√	√	√	√	X	X	√	√	√	√	√	
100	UP-EAST		BARABANKI			FATEHPUR	2	√	√	√	√	√	√	√	X	√	√	
101							2	X	X	X	X	X	X	X	X	X	X	X
102							2	√	√	√	√	X	X	√	X	√	√	
108				2			√	√	√	√	X	X	√	X	√	√		
1090				2			√	√	√	√	X	X	√	X	√	√		

LEVEL 1 LIVE CALLING																
Emergency no.	Circle Name	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE	UNINOR		
100	UP-EAST		HAIDERGARH	2	√	√	√	√	√	√	√	√	√	√		
101				2	X	X	X	X	X	X	X	X	X	X	X	
102				2	√	√	√	√	X	X	√	√	√	√	√	
108				2	√	√	√	√	X	X	√	√	√	√	√	
1090				2	√	√	√	√	X	X	√	√	√	√	√	
100	UP-EAST			RAMSANEHI GHAT	2	√	√	√	√	√	√	√	X	√	√	
101					2	X	X	X	X	X	X	X	X	X	X	X
102					2	√	√	√	√	X	X	√	X	√	√	
108					2	√	√	√	√	X	X	√	X	√	√	
1090					2	√	√	√	√	X	X	√	X	√	√	

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 **Azamgarh, Ballia and Barabanki** in the months of January, February and March 2015 respectively. The total route Kms covered during the drive tests in respective SSAs was **470 Kms, 335 Kms and 350 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: AZAMGARH SSA (JANUARY-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	104	24	141	25	176	25	177	25	60	26	83	27	119	26	158	26	74	33	37	28
		Highway	174	26	191	25	167	25	128	25	100	26	87	26	174	28	175	26	105	33	65	28
		Within City	175	25	155	25	170	25	196	25	189	28	193	26	153	26	262	32	251	33	114	28
		Overall SSA	453	75	487	75	513	75	501	75	349	80	363	79	446	80	595	84	430	99	216	84
2	Blocked Call Rate	Major Road	0.96%	0.00%	0.00%	0.00%	0.57%	0.00%	0.00%	0.00%	0.00%	0.00%	3.61%	3.70%	0.84%	3.85%	1.27%	0.00%	6.76%	0.00%	0.00%	0.00%
		Highway	0.57%	0.00%	1.05%	0.00%	0.60%	0.00%	1.56%	0.00%	1.00%	0.00%	1.15%	0.00%	0.00%	0.00%	0.57%	0.00%	1.90%	0.00%	0.00%	0.00%
		Within City	2.29%	0.00%	0.00%	0.00%	1.18%	0.00%	0.00%	0.00%	0.53%	0.00%	1.04%	0.00%	1.31%	0.00%	0.00%	0.00%	0.80%	0.00%	0.00%	0.00%
		Overall SSA	1.32%	0.00%	0.41%	0.00%	0.78%	0.00%	0.40%	0.00%	0.57%	0.00%	1.65%	1.27%	0.67%	1.25%	0.50%	0.00%	2.09%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.00%	0.00%	4.57%	0.00%	1.15%	0.00%	1.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	0.00%	0.00%	0.53%	0.00%	2.70%	0.00%	0.78%	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%
		Within City	0.00%	0.00%	0.00%	0.00%	1.78%	0.00%	1.03%	0.00%	0.00%	0.00%	0.52%	0.00%	0.00%	0.00%	0.00%	0.00%	1.61%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.21%	0.00%	3.05%	0.00%	1.01%	0.00%	0.29%	0.00%	0.28%	0.00%	0.00%	0.00%	0.17%	0.00%	0.95%	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	85.06%	100%	96.05%	94.95%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-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
			frequency hopping for CDMA Operators)	Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.90%
	Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.26%	100%	95.63%	98.40%
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.08%	99.71%	95.38%	96.72%
(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	96.34%	98.81%	95.70%	96.86%	87.85%	99.36%	93.09%	97.19%	95.11%	99.10%	99.85%	99.85%	96.26%	95.71%	95.75%	98.07%	NA	NA	NA	NA	
	Highway	94.90%	99.38%	95.79%	96.50%	86.60%	96.80%	90.11%	99.73%	95.30%	99.40%	99.44%	99.94%	93.57%	99.62%	95.52%	99.17%	NA	NA	NA	NA	
	Within City	96.67%	95.77%	95.47%	96.92%	93.24%	95.20%	94.42%	97.17%	95.72%	96.85%	99.58%	99.97%	95.07%	97.94%	97.80%	98.65%	NA	NA	NA	NA	
	Overall SSA	95.97%	98.16%	95.66%	96.76%	89.33%	97.15%	92.88%	97.97%	95.50%	98.43%	99.59%	99.92%	94.79%	97.82%	96.59%	98.63%	NA	NA	NA	NA	
5	Service Coverage																					
	In door (>= - 75dBm)	Major Road	57.16%	15.13%	52.42%	47.52%	43.13%	87.10%	71.78%	100%	78.00%	76.97%	60.16%	84.20%	44.72%	100%	84.63%	100%	53.93%	99.99%	55.28%	98.53%
		Highway	43.54%	14.86%	56.59%	87.99%	40.44%	79.34%	71.53%	100%	39.26%	86.64%	31.93%	94.27%	39.49%	100%	87.69%	100%	43.31%	100%	36.65%	93.01%
		Within City	73.52%	74.60%	48.55%	87.65%	64.64%	35.65%	78.31%	100%	75.93%	99.71%	55.19%	82.49%	67.30%	100%	96.24%	100%	62.83%	100%	48.93%	99.68%
		Overall SSA	58.49%	30.96%	52.96%	73.38%	49.76%	67.73%	74.32%	100%	65.75%	87.93%	50.53%	88.41%	51.13%	100%	90.69%	100%	56.49%	100%	46.27%	97.07%
	In-vehicle (>= - 85dBm)	Major Road	75.35%	96.84%	86.59%	98.78%	73.28%	99.46%	91.88%	100%	89.05%	94.62%	79.57%	99.94%	74.29%	100%	98.96%	100%	81.11%	100%	78.94%	100%
		Highway	72.72%	81.23%	89.18%	98.64%	72.18%	97.82%	96.27%	100%	64.04%	99.67%	65.43%	99.87%	78.55%	100%	99.80%	100%	76.90%	100%	87.49%	100%
		Within City	95.90%	98.44%	89.40%	99.96%	90.83%	96.49%	98.44%	100%	95.74%	100%	87.17%	100%	94.24%	100%	100%	100%	85.82%	100%	93.68%	100%
		Overall SSA	81.90%	93.03%	88.60%	99.13%	79.02%	97.94%	95.59%	100%	85.52%	98.12%	80.29%	99.92%	83.09%	100%	99.67%	100%	82.82%	100%	89.34%	100%
	Outdoor-in city (>= - 95dBm)	Major Road	91.80%	100%	99.24%	100%	93.90%	99.85%	99.88%	100%	98.17%	100%	96.47%	100%	96.28%	100%	100%	100%	96.37%	100%	99.98%	100%
		Highway	90.85%	99.92%	99.35%	100%	95.78%	99.97%	100%	100%	92.77%	100%	95.63%	100%	97.47%	100%	100%	100%	98.40%	100%	99.94%	100%
		Within	99.03%	100%	99.84%	100%	99.48%	99.92%	100%	100%	99.56%	100%	98.52%	100%	99.94%	100%	100%	100%	96.48%	100%	99.97%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-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	94.09%	99.98%	99.48%	100%	96.40%	99.91%	99.96%	100%	97.38%	100%	97.39%	100%	98.04%	100%	100%	100%	96.93%	100%	99.96%	100%
6	Call Setup Success Rate (>=95%)	Major Road	99.04%	100%	100%	100%	99.43%	100%	98.31%	100%	100%	100%	96.39%	96.30%	99.16%	96.15%	98.10%	100%	93.24%	100%	94.59%	100%
		Highway	99.43%	100%	98.95%	100%	88.62%	100%	97.66%	100%	99.00%	100%	98.85%	100%	100%	100%	99.43%	100%	98.10%	100%	98.46%	100%
		Within City	97.71%	100%	100%	100%	99.41%	100%	99.49%	100%	99.47%	96.43%	98.96%	100%	98.69%	100%	99.62%	100%	99.20%	100%	99.12%	100%
		Overall SSA	98.68%	100%	99.59%	100%	95.91%	100%	98.60%	100%	99.43%	98.75%	98.35%	98.73%	99.33%	98.75%	99.16%	100%	97.91%	100%	98.15%	100%
7	Hand Over Success Rate (HOSR)	Major Road	100%	100%	98.11%	100%	94.18%	100%	96.17%	100%	100%	100%	100%	100%	98.51%	100%	98.06%	100%	100%	100%	100%	100%
		Highway	98.33%	100%	100%	100%	94.31%	97.06%	98.19%	100%	95.24%	100%	100%	100%	98.69%	100%	99.49%	100%	100%	100%	100%	100%
		Within City	99.35%	100%	100%	100%	97.73%	100%	95.42%	100%	100%	100%	100%	100%	99.65%	100%	98.28%	100%	100%	100%	100%	100%
		Overall SSA	99.30%	100%	99.57%	100%	95.02%	97.65%	96.67%	100%	98.23%	100%	100%	100%	99.21%	100%	98.72%	100%	100%	100%	100%	100%

NA: Not Applicable

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

7.2 OPERATOR ASSISTED DRIVE TEST: BALLIA SSA (FEBRUARY-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	112	27	109	25	137	28	148	25	26	24	43	27	103	25	148	25	76	34	16	25
		Highway	114	29	161	25	127	NP	151	24	46	26	35	26	96	25	142	25	64	33	13	36
		Within City	130	28	95	25	117	31	95	25	40	27	99	26	115	25	182	25	149	35	53	26
		Overall SSA	356	84	365	75	381	59	394	74	112	77	177	79	314	75	472	75	289	102	82	87
2	Blocked Call Rate	Major Road	0.89%	0.00%	0.00%	0.00%	4.38%	0.00%	2.70%	0.00%	3.85%	0.00%	2.33%	0.00%	0.97%	0.00%	0.68%	0.00%	10.53%	0.00%	0.00%	0.00%
		Highway	0.00%	0.00%	0.00%	0.00%	2.36%	NP	0.66%	0.00%	0.00%	0.00%	8.57%	0.00%	1.04%	0.00%	2.11%	0.00%	1.56%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	2.56%	0.00%	0.00%	0.00%	0.00%	0.00%	1.01%	0.00%	0.87%	0.00%	0.55%	0.00%	0.67%	2.86%	0.00%	0.00%
		Overall SSA	0.28%	0.00%	0.00%	0.00%	3.15%	0.00%	1.27%	0.00%	0.89%	0.00%	2.82%	0.00%	0.96%	0.00%	1.06%	0.00%	3.46%	0.98%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.92%	0.00%	3.79%	0.00%	1.39%	0.00%	0.00%	0.00%	2.38%	0.00%	0.00%	0.00%	0.00%	0.00%	10.29%	0.00%	0.00%	0.00%
		Highway	0.88%	0.00%	1.24%	0.00%	4.84%	NP	1.33%	0.00%	0.00%	0.00%	3.13%	0.00%	0.00%	0.00%	0.00%	0.00%	6.35%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	1.05%	0.00%	0.88%	0.00%	0.00%	0.00%	2.50%	0.00%	1.02%	0.00%	0.00%	0.00%	0.56%	0.00%	2.70%	0.00%	0.00%	0.00%
		Overall SSA	0.28%	0.00%	1.10%	0.00%	3.24%	0.00%	1.03%	0.00%	0.90%	0.00%	1.74%	0.00%	0.00%	0.00%	0.22%	0.00%	5.38%	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	92.19%	99.20%	94.89%	97.71%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-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
			frequency hopping for CDMA Operators)	Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.92%
	Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.58%	99.85%	94.81%	96.63%
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.77%	99.68%	94.96%	98.30%
(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	95.43%	98.63%	96.12%	99.72%	87.59%	84.28%	94.52%	96.80%	87.20%	99.45%	98.79%	99.69%	92.44%	95.15%	94.75%	93.83%	NA	NA	NA	NA	
	Highway	94.01%	97.22%	97.35%	98.21%	81.68%	NP	94.72%	96.01%	93.31%	99.16%	98.92%	99.97%	93.82%	98.77%	93.71%	98.16%	NA	NA	NA	NA	
	Within City	96.40%	98.23%	96.34%	99.02%	86.89%	99.00%	96.58%	98.14%	94.78%	99.28%	99.69%	99.08%	94.06%	97.44%	96.70%	99.04%	NA	NA	NA	NA	
	Overall SSA	95.34%	98.01%	96.66%	98.98%	85.44%	92.14%	95.11%	97.01%	92.54%	99.29%	99.34%	99.58%	93.46%	97.12%	95.20%	97.01%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Major Road	50.14%	28.04%	56.40%	99.98%	7.69%	0.00%	70.91%	79.20%	33.92%	97.72%	35.85%	64.15%	51.84%	99.97%	87.77%	100%	8.61%	70.25%	57.72%	99.82%
		Highway	55.27%	99.44%	48.02%	99.95%	2.24%	NP	71.43%	100%	24.96%	90.08%	14.10%	100%	48.14%	98.67%	84.41%	100%	2.44%	100%	55.68%	99.59%
		Within City	92.83%	99.84%	66.98%	98.16%	26.10%	94.01%	90.65%	68.89%	51.45%	65.71%	78.38%	99.63%	88.27%	100%	95.05%	100%	57.05%	99.99%	48.31%	97.32%
		Overall SSA	65.92%	69.02%	56.48%	99.36%	11.67%	50.35%	76.07%	81.69%	36.36%	83.90%	55.74%	88.66%	61.69%	99.55%	89.61%	100%	35.01%	90.05%	51.34%	98.98%
In-vehicle (>= - 85dBm)	Major Road	78.79%	99.00%	92.17%	99.98%	13.98%	65.29%	96.35%	99.50%	59.03%	100%	76.12%	99.81%	84.47%	100%	99.61%	100%	28.54%	100%	92.31%	100%	
	Highway	82.19%	100%	84.79%	100%	9.87%	NP	96.55%	100%	53.57%	99.97%	50.17%	100%	83.00%	100%	99.68%	100%	10.57%	100%	79.50%	100%	
	Within City	99.72%	100%	97.10%	100%	36.83%	99.86%	99.30%	98.36%	86.31%	100%	96.75%	100%	98.40%	100%	99.88%	100%	79.45%	100%	96.63%	99.83%	
	Overall SSA	86.81%	99.57%	90.70%	99.99%	19.78%	83.80%	97.16%	99.33%	66.43%	99.99%	82.74%	99.94%	88.22%	100%	99.74%	100%	54.06%	100%	93.01%	99.95%	
Outdoor-in city (>= - 95dBm)	Major Road	97.81%	100%	99.83%	100%	38.50%	99.79%	99.85%	100%	87.15%	100%	94.82%	100%	98.41%	100%	100%	100%	62.17%	100%	100%	100%	
	Highway	98.14%	100%	99.83%	100%	47.69%	NP	99.76%	100%	89.33%	100%	93.64%	100%	97.31%	100%	100%	100%	63.07%	100%	99.83%	100%	
	Within City	100%	100%	99.66%	100%	57.66%	0.00%	99.88%	100%	99.53%	100%	99.92%	100%	99.93%	100%	100%	100%	95.85%	100%	100%	100%	

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-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	98.64%	100%	99.77%	100%	47.47%	99.90%	99.82%	100%	92.48%	100%	97.49%	100%	98.53%	100%	100%	100%	81.52%	100%	99.97%
6	Call Setup Success Rate (>=95%)	Major Road	99.11%	100%	100%	100%	96.35%	100%	97.30%	100%	96.15%	100%	97.67%	100%	99.03%	100%	99.32%	100%	89.47%	100%	100%	100%
		Highway	100%	100%	100%	100%	96.06%	NP	99.34%	100%	100%	100%	91.43%	100%	98.96%	100%	97.89%	100%	98.44%	100%	100%	100%
		Within City	100%	100%	100%	100%	96.58%	100%	100%	100%	100%	100%	98.99%	100%	98.26%	100%	98.35%	100%	99.33%	97.14%	100%	100%
		Overall SSA	99.72%	100%	100%	100%	96.33%	100%	98.73%	100%	99.11%	100%	97.18%	100%	98.73%	100%	98.52%	100%	96.54%	99.02%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Road	98.21%	100%	99.10%	100%	96.59%	97.56%	97.89%	100%	100%	100%	100%	100%	99.43%	100%	100%	100%	100%	100%	100%	100%
		Highway	100%	100%	98.60%	100%	95.49%	NP	99.24%	100%	100%	100%	100%	100%	100%	100%	96.19%	100%	100%	100%	100%	100%
		Within City	100%	100%	98.97%	100%	94.87%	100%	94.44%	100%	97.14%	100%	98.31%	95.33%	96.58%	100%	98.73%	100%	100%	100%	100%	100%
		Overall SSA	99.44%	100%	98.82%	100%	95.77%	97.58%	97.68%	100%	98.59%	100%	98.69%	96.84%	98.68%	100%	98.30%	100%	100%	100%	100%	100%

NA: Not Applicable

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

7.3 OPERATOR ASSISTED DRIVE TEST: BARABANKI SSA (MARCH-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	92	28	153	30	96	29	101	24	99	26	46	28	87	26	113	25	46	29	26	31
		Highway	93	30	113	25	92	25	97	25	96	26	39	26	99	31	113	25	42	26	42	47
		Within City	170	25	168	25	84	25	112	25	138	20	144	26	123	30	143	25	146	26	82	33
		Overall SSA	355	83	434	80	272	79	310	74	333	72	229	80	309	87	369	75	234	81	150	111
2	Blocked Call Rate	Major Road	4.35%	0.00%	1.31%	0.00%	10.42%	13.79%	0.99%	0.00%	0.00%	0.00%	0.00%	0.00%	1.15%	0.00%	0.88%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	6.45%	0.00%	0.00%	0.00%	8.70%	0.00%	1.03%	0.00%	0.00%	0.00%	2.56%	0.00%	1.01%	0.00%	0.00%	0.00%	2.38%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.60%	0.00%	9.52%	0.00%	0.89%	0.00%	0.00%	0.00%	0.69%	0.00%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.00%
		Overall SSA	2.82%	0.00%	0.69%	0.00%	9.56%	5.06%	0.97%	0.00%	0.00%	0.00%	0.87%	0.00%	0.65%	0.00%	0.27%	0.00%	0.85%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.00%	0.00%	5.88%	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%	0.00%
		Highway	3.45%	0.00%	0.00%	0.00%	5.95%	0.00%	0.00%	0.00%	2.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.44%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.72%	5.00%	0.00%	0.00%	0.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.87%	0.00%	0.00%	0.00%	4.05%	0.00%	0.00%	0.00%	0.90%	1.39%	0.00%	0.00%	0.33%	0.00%	0.00%	0.00%	0.43%	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	99.97%	99.97%	87.22%	97.78%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-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	99.07%	100%	96.27%	99.07%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.97%	100%	96.63%	100%	
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.86%	99.99%	95.11%	98.99%	
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	95.95%	99.19%	93.61%	92.24%	46.39%	88.35%	89.74%	98.28%	95.17%	98.33%	99.90%	99.92%	96.35%	99.19%	97.39%	98.23%	NA	NA	NA	NA	
		Highway	97.50%	99.51%	95.22%	97.43%	91.13%	91.49%	96.96%	98.08%	95.16%	98.57%	99.62%	99.91%	95.59%	99.29%	97.23%	96.30%	NA	NA	NA	NA	
		Within City	98.90%	99.69%	96.07%	96.53%	92.61%	96.24%	96.51%	99.37%	93.58%	99.62%	99.33%	99.73%	96.05%	99.06%	97.09%	98.40%	NA	NA	NA	NA	
		Overall SSA	97.85%	99.46%	94.97%	95.17%	76.23%	92.03%	94.66%	98.57%	94.50%	98.75%	99.49%	99.86%	95.99%	99.18%	97.24%	97.64%	NA	NA	NA	NA	
	Service Coverage																						
	In door (>= - 75dBm)	Major Road	27.96%	7.90%	64.50%	97.07%	33.44%	23.81%	56.95%	5.16%	62.60%	6.03%	78.00%	0.05%	37.19%	66.36%	88.03%	99.88%	27.02%	0.00%	41.06%	99.59%	
		Highway	37.14%	59.40%	82.33%	100%	49.72%	99.79%	65.99%	32.09%	56.15%	99.73%	40.27%	100%	37.59%	97.24%	92.05%	100%	31.35%	99.87%	46.55%	99.95%	
		Within City	65.47%	99.53%	85.92%	99.71%	61.75%	89.45%	87.05%	62.50%	74.55%	83.34%	75.69%	99.79%	62.27%	65.65%	98.58%	100%	86.46%	97.86%	80.10%	95.60%	
		Overall SSA	47.66%	57.65%	77.48%	98.80%	48.02%	70.21%	71.30%	33.24%	65.71%	61.26%	70.17%	64.52%	47.31%	76.84%	93.07%	99.96%	69.59%	63.14%	65.80%	98.64%	
In-vehicle (>= - 85dBm)	Major Road	56.67%	80.39%	96.34%	99.97%	67.32%	95.77%	83.38%	90.91%	82.90%	94.26%	93.81%	54.06%	63.85%	98.39%	99.27%	100%	88.67%	1.25%	67.97%	100%		
	Highway	60.52%	99.30%	98.44%	100%	82.93%	99.93%	98.53%	90.48%	85.29%	100%	78.77%	100%	80.65%	99.99%	99.95%	100%	80.80%	100%	87.27%	100%		
	Within City	90.45%	100%	98.44%	100%	90.29%	99.52%	99.91%	96.50%	90.85%	88.88%	93.26%	100%	92.34%	97.45%	100%	100%	98.05%	100%	96.08%	96.54%		
	Overall SSA	73.27%	94.08%	97.72%	99.99%	79.95%	98.36%	94.59%	92.61%	86.88%	94.98%	90.92%	83.73%	80.29%	98.62%	99.74%	100%	94.17%	64.33%	89.56%	99.04%		
Outdoor-in city (>= -	Major Road	85.70%	99.84%	99.88%	100%	95.26%	99.83%	95.08%	99.90%	97.34%	99.96%	99.84%	99.89%	92.76%	100%	100%	100%	99.35%	99.73%	93.39%	100%		
	Highway	92.86%	99.98%	99.95%	100%	99.10%	100%	100%	99.96%	98.27%	100%	98.76%	100%	97.60%	100%	100%	100%	97.84%	100%	99.42%	100%		

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-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
			95dBm)	Within City	98.75%	100%	99.98%	100%	99.72%	99.81%	100%	99.96%	99.54%	99.84%	99.59%	100%	99.78%	99.96%	100%	100%	99.88%	100%
	Overall SSA	93.59%	99.95%	99.94%	100%	97.98%	99.88%	98.55%	99.94%	98.52%	99.94%	99.50%	99.96%	97.02%	99.99%	100%	100%	99.51%	99.90%	98.61%	99.92%	
6	Call Setup Success Rate (>=95%)	Major Road	95.65%	100%	98.69%	100%	88.54%	82.76%	93.07%	100%	100%	100%	100%	100%	98.85%	100%	96.46%	100%	100%	100%	100%	
		Highway	93.55%	100%	100%	100%	91.30%	100%	88.66%	100%	100%	100%	97.44%	100%	98.99%	100%	100%	100%	97.62%	100%	100%	97.87%
		Within City	100%	100%	99.40%	100%	92.86%	100%	91.96%	100%	100%	100%	99.31%	100%	99.19%	100%	100%	100%	99.32%	100%	100%	100%
		Overall SSA	97.18%	100%	99.31%	100%	90.81%	93.67%	91.29%	100%	100%	100%	99.13%	100%	99.03%	100%	98.92%	100%	99.15%	100%	100%	99.10%
7	Hand Over Success Rate (HOSR)	Major Road	97.78%	100%	98.96%	100%	93.71%	100%	97.75%	100%	100%	100%	100%	100%	97.78%	100%	98.40%	100%	100%	100%	100%	100%
		Highway	89.38%	100%	99.07%	100%	88.46%	97.22%	94.38%	100%	100%	100%	100%	100%	96.49%	100%	99.19%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	99.40%	100%	100%	100%	100%	100%	100%	100%	93.95%	100%	99.20%	100%	100%	100%	100%	100%
		Overall SSA	95.37%	100%	99.32%	100%	94.00%	98.72%	97.25%	100%	100%	100%	100%	100%	95.03%	100%	98.93%	100%	100%	100%	100%	100%

NA: Not Applicable

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

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
AZAMGARH	Lalganj & Phulpur /140 Kms	<p>MAJOR ROADS : Lalganj Tehsil-Teekagarh-Dularganj-Bherra Bazar-Sarai Mohan-Bakshpur-Muktipur-Martinganj-Nonari Bazar-Chiittepur-Phulpur;</p> <p>HIGHWAY: Belaisa-Kotwa farm-Rani ki Sarai-Checkpoint-Kotila-Lahbariya-Mohammadpur-Bindra Bazar-Muzzaffarpur-Rohua Mustafabad-Rasoolpur-Gosai ki Bazar-Maseerpur.</p> <p>WITHIN CITY: Lalganj Market, Lalganj Tehsil, Lalganj Telephone Exchange, Phulpur City and phulpur Market.</p> <p>INDOOR: BSNL Office Azamgarh</p>	Azamgarh , Sagri & Atrawlia / 210 Kms	<p>MAJOR ROADS: Jeeyanpur Market-Andakhor-Belariganj-Parasurampur-Maharajganj-Baudhiha-devipur Tiraha-Boodhanpur-Baans Gaon-Atrawlia.</p> <p>HIGHWAY: Balrampur Chauraha-Ukraura-Bankhat-Anjanshahid-Jeeyanpur Sagri-Atrawlia-Budhanpur-Kauriya-Kashipur-Captaanganj-Mandhuri-Kandrapur-Sehda-Bhawarnath Mandir-Kartalpur-Bawali) ;</p> <p>WITHIN CITY: Azamgarh City: (Railway Station-Pahalwan Maruti-Naruli-Sidhari-NagarPalika-Pan day Bzr-Shibil college-Arajibagh-Bilariya ki chungi-Heerapatti-Lacchiram-Balrampur Chauraha) ; Sagri CITY: (Jeeyanpur Market-sagri Tehsil) ; Atrawlia City: (Atrawlia Bus station-Atrawlia Market-Govt.Guest House Atrawlia-PHC Atrawlia)</p> <p>INDOOR: Railway Station Azamgarh</p>	Ghosi & Maunathbhanjan / 120 Kms	<p>MAJOR ROADS: Mohammadabad-Bhatkol-Devlash-Nadwasarai-Ghosi) ;</p> <p>HIGHWAY: Ghosi-Kalyanpur-Kopaganj-Bhujauti-Sahroj Moad-Baragaon-Khurhat-Mohammadabad</p> <p>WITHIN CITY: Ghosi City: (Nawapurwa-Kasbakhas-Maidapur-Samastpur-Railway Station-Roadways-Baragaon-Dharauli) ; Maunathbhanjan City : (Bhujauti_Bhiti Chauraha-Railway Station-Roadways-Munsipura-Raghunathpura-Mirzahadipura-Domanpura)</p> <p>INDOOR: Mau Railway Station</p>

<p>BALLIA</p>	<p>Raniganj & Bansdeeh / 105 Kms</p>	<p>MAJOR ROAD: Raniganj bazar-Madhubani-Shri bagar-Reoti-Sahatwar-Kewara-Bansdeeh-Rajpur-Bansdeeh road-Ballia.</p> <p>HIGHWAY: Ballia Rly station-Dubahar-Haldi-Ramgarh-Raniganj.</p> <p>WITHIN CITY: Raniganj City: (Raniganj Bazaar- Bairia Tiraha - Suremanpur) ; Bansdeeh City: (Bansdeeh Tiraha & Bansdeeh Market)</p> <p>INDOOR: Railway Station Ballia</p>	<p>Rasara / 130 Kms</p>	<p>MAJOR ROADS: Belthra road-Ubhaw thana-Maldah-Navratanpur-Sikandarpur-Khejuri-Sukhpura-Ballia</p> <p>HIGHWAY: Ballia-Rasara-nagra-Belthra road.</p> <p>WITHIN CITY: Rasara City: (Rasara city and Rasara Market)</p> <p>INDOOR: BSNL Exchange Tikhampur , Ballia</p>	<p>Ballia / 100 Kms</p>	<p>MAJOR ROAD: Ballia-Garwar-Kureji-Salempur-Nagra.</p> <p>HIGHWAY: Nagra-Salempur-Garwar-Phephna-Ballia.</p> <p>WITHIN CITY: Ballia City: (C S Nagar-Baheri-Bishunipur-Subhash nagar-Japlinganj-Bhrigu ashram-Kadam chauraha-Targhar Exchange-Ashoka hotel-NCC Tiraha)</p> <p>INDOOR: Ashoka palace hotel</p>
<p>BARABANKI</p>	<p>Ramsanehi Ghat / 130 Kms</p>	<p>MAJOR ROAD: Bhitariya, Bhikarpur Road, Deviganj road.</p> <p>HIGHWAY: Gonda Tiraha, Rasauli, Safdarganj,Toll Plaza,kotwa sarak, Udhali.</p> <p>WITHIN CITY: Ramsanehi Ghat City: (Bhitariya chauraha, Kotwali,Tehsil Dariyabad road,S.P.Office,Bhikarpur,Deviganj Road, Mahindra Company)</p> <p>INDOOR: Break Point Restaurant</p>	<p>Fatehpur & Barabanki / 100 Kms</p>	<p>MAJOR ROADS: Barabanki , Dewa.</p> <p>HIGHWAY: Dewa, Fatehpur.</p> <p>WITHIN CITY: Barabanki City: (Railway station, Chhaya Chauraha,Durgapuri,laiyyamandi sattibazar,Peer Batawannaka paisar,Dasahrabagh) ; Fatehpur City: (Main Market, PatelChauraha, Belahra Road, Exchange Road,Ram Nagar Road, S.P.Office,Tehsil Colony)</p> <p>INDOOR: Barabanki Railway Station</p>	<p>Haiderganj / 120 Kms</p>	<p>MAJOR ROADS: R S Ghat Road,New Sadak Road, Exchange Road.</p> <p>HIGHWAY: Gauriganj, Trivediganj, Haidergarh Tehsil.</p> <p>WITHIN CITY: Haiderganj City: (S.P. Office, Telephone Exchange, Pokhra Road,ew Sarak,Railway Crossing,Main Market)</p> <p>INDOOR: Haiderganj Tehsil</p>

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF AZAMGARH SSA – JANUARY 15

S NO	Name of SP	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	Lalganj & Phulpur	Poor Level & Quality near Sikraur, Lalpur, Mahujnewada, Azamlalganj, Mohannadpur, Sanjerpur	Azamgarh, Sagri & Atrawlia	Poor Level & Quality near Leharpur, Jolahpur, Bibipur, Maldari, Belariganj, Bharauli	Ghosi & Maunath bhanjan	Poor Level & Quality near Walidpur, Mahamdabad, Badagaonmau, Dandikhas, Maukopaganj
2	AIRTEL		Poor Level & Quality near Sikraur, Lalpur, Mahujnewada, Azamlalganj, Mohannadpur, Sanjerpur		Poor Level & Quality near Leharpur, Jolahpur, Bibipur, Maldari, Belariganj, Bharauli		Poor Level & Quality near Walidpur, Mahamdabad, Badagaonmau, Dandikhas, Maukopaganj
3	BSNL		Poor Level & Quality near Sikraur, Lalpur, Mahujnewada, Azamlalganj, Mohannadpur, Sanjerpur		Poor Level & Quality near Leharpur, Jolahpur, Bibipur, Maldari, Belariganj, Bharauli		Poor Level & Quality near Walidpur, Mahamdabad, Badagaonmau, Dandikhas, Maukopaganj
4	TATA GSM		No coverage between Azamgarh to Phulpur, Poor Level & Quality near Saraipaltu, Sarawan, Poor Level near Phulpur outer, Kotila, Gosaibazar		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		No coverage between Ghosi to Saidpur, Poor Level & Quality near Mohamdabad, Badagaonmau, Khurahat
5	TATA CDMA		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers
6	IDEA		Poor Quality near Saraimachan, Sarawan, Azmalganj, Kotila		Poor Quality near Belariganj, Bharauli, Bhawarnath, Bibipur		Poor Quality near Mohamdabad, Badagaonmau, Dandikhas, Nandusarai
7	RCOM GSM		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers
8	RCOM CDMA		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers
9	UNINOR		Poor Level & Quality near Mandra, Bhormau, Kaurai, Bheera, Gosainbazar, Kotila		Poor Level & Quality near Ashrafpur, Khanpur, Samaspur, Daulatpur, Baragaon, Kolha Charmau, Amepur		Poor Level & Quality near Nandusarai, Mohamdabad, Khurahat
10	VODAFONE		Poor Quality near Jagdishpur, Bhormau, Mahunjinewada, Saraimir, Senduri, Barserwa, Azamlalganj, Phariha		No coverage between Azamgarh to Bharauli, Poor Quality near Maldari, Jijanpur, Anjansahid		Poor Quality near Surhurpur, Saidpur, Mohamdabad, Kanheli, Dandikhas, Badagaonmau

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF BALLIA SSA – FEBRUARY 15

S NO	Name of SP	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	Raniganj & Bansdeeh	Poor Level & Quality near Rajpur, Jitaura, Gajghat, Nagwa, Poor Quality near Haldi, Kaharpur, Taghrauli	Rasara	Poor Level & Quality near Rasra outer, Shishwarkalan, Sikandarpur, Khejuri	Ballia	Poor Level & Quality near Bachahaipur, Saraya, Barwan, Poor Quality near Midha
2	AIRTEL		Poor Level & Quality near Rajpur, Jitaura, Gajghat, Nagwa, Poor Quality near Haldi, Kaharpur, Taghrauli		Poor Level & Quality near Rasra outer, Shishwarkalan, Sikandarpur, Khejuri		Poor Level & Quality near Bachahaipur, Saraya, Barwan, Poor Quality near Midha
3	BSNL		Poor Level & Quality near Bansdih Market, Kewara, Wajahi, Shivrampur		Poor Level & Quality near Malda, Rasra outer, Farsatar, Chalkar, Basantpur, Tikona, Nawaratanpur		Poor Level & Quality near Salempur, Kureji, Rattu, Midha, Jagdishpur
4	TATA GSM		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers
5	TATA CDMA		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers
6	IDEA		Poor Level & Quality near Taghrauli, Sahatwar, Chapra, Belhari, Kaharpur		Poor Level & Quality near Rasra outer, Fefna, Nasirbad, Maldeh, Rudarwar, Khejuri		Poor Level & Quality near Rekunasirpur, Kukraha, Barwan, Nasirbad
7	RCOM GSM		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in Ballia Town on day 3 drive test
8	RCOM CDMA		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in SDCA's & Major Towns with Poor Level & Quality at outers		They have coverage only in Ballia Town on day 3 drive test
9	UNINOR		Poor Level & Quality near Tirkalpur, Arara, Majhaua, Rajpur, Karwa		Poor Level & Quality near Gotwa, Khalipur, Masaha, Karni		Poor Level & Quality near Sonaripur, Chanderhar, Arazi mafiwali, Bachaipur, Haldi, Midha
10	VODAFONE		Poor Quality near Harpur, Balliaouter, Belhari, Haldi, Kaharpur		Poor Quality near Bekhan, ChilKahar, Bharatpur, Kothiachatti, Halrampur		Poor Quality near Bachaipur, Garwar, Midha

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF BARABANKI SSA – MARCH 15

S NO	Name of SP	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	Ramsanehi Ghat	Poor Level & Quality near Yaqutganj, Pithaurkalan, Sersa, Behreladih, Sanuli, Kotwasadak, Safdarganj	Fatehpur & Barabanki	Poor Level & Quality near Fatehpur outer, Pavaibad, Palta, Industrial Area	Haiderganj	Poor Level & Quality near Satrikh, Saidanpur, Lakhupur, Meerapur, Gotuana, Shivnam, Aukhandi
2	AIRTEL		Poor Level & Quality near Yaqutganj, Pithaurkalan, Sersa, Behreladih, Sanuli, Kotwasadak, Safdarganj		Poor Level & Quality near Fatehpur outer, Pavaibad, Palta, Industrial Area		Poor Level & Quality near Satrikh, Saidanpur, Lakhupur, Meerapur, Gotuana, Shivnam, Aukhandi
3	BSNL		Poor Level & Quality near Narendi, Barel, Rasoli, Yaqutganj, Jaidpur, Sersa, Deviganj, Sanuli, Kotwasadak		Poor Level & Quality near Fatehpur outer, Deva, Palta, industrial Area, Harsani		Poor Level & Quality near Mauthari, Mohana, Saidanpur, Meerapur, Chaktara, Haidargarh, Bhelwal
4	TATA GSM		Poor Level & Quality near Narendi, Barel, Rasoli, Yaqutganj, Jaidpur, Sersa, Deviganj, Sanuli, Kotwasadak		Poor Level & Quality near Fatehpur outer, Deva, Palta, industrial Area, Harsani, No coverage between deva to Barabanki Industrial Area		They have coverage only in SCDA's & Major Tonws with Poor Level at outers
5	TATA CDMA		They have coverage only in SCDA's & Major Tonws with Poor Level at outers		They have coverage only in SCDA's & Major Tonws with Poor Level at outers		They have coverage only in SCDA's & Major Tonws with Poor Level at outers
6	IDEA		Poor Level & Quality near Binipur, Behrelhadih, Sersa		Poor Level & Quality near Fatehpur outer, Bishunpur, Deva, Palta		Poor Level & Quality near Mohana, Saidanpur, Chaktara
7	RCOM GSM		They have coverage only in SCDA's & Major Tonws with Poor Level at outers		They have coverage only in SCDA's & Major Tonws with Poor Level at outers		They have coverage only in SCDA's & Major Tonws with Poor Level at outers
8	RCOM CDMA		They have coverage only in SCDA's & Major Tonws with Poor Level at outers		They have coverage only in SCDA's & Major Tonws with Poor Level at outers		They have coverage only in SCDA's & Major Tonws with Poor Level at outers
9	UNINOR		Poor Level & Quality near Safedabad, Barel, Jalapur, Bhetaura Lkhan, Hazipur, Kashipur, Sersa, Deviganj		Poor Level & Quality near Fatehpur outer, Bishunpur, Deva, Palta, Dandiyanmau		Poor Level & Quality near Saidanpur, Meerapur, Gotauna, Aukhandi, Shivnam, Kotwa, Jalalpur
10	VODAFONE		Poor Level & Quality near Binipur, Sersa, Poor Quality near Rasoli		Poor Level & Quality near Palta, Poor Quality near Pavaibad, Abhaynagar, Harsani		Poor Quality near Mohana, Saidanpur, Lakhupur, Gotauna, Tejwapur

DRIVE TEST TABLE: 8

NO NETWORK COVERAGE STATUS OF DRIVE TEST – JANUARY TO MARCH 15

Sr. No.	Month	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
1	Jan'15	AIRCEL	AZAMGARH	GHOSI	KOTHIYA & SAKRANDA	NO
				LALGANJ	NONARI	NO
				SAGRI	KURTHIPUR	NO
		AIRTEL		AZAMGARH, GHOSI, LALGANJ, PHULPUR-I, PHULPUR-II, SAGRI & MAUNATHBHANJAN	No Coverage Issue	NO
		BSNL		AZAMGARH, GHOSI, LALGANJ, PHULPUR-I, PHULPUR-II, SAGRI & MAUNATHBHANJAN	No Coverage Issue	NO
		IDEA		AZAMGARH, GHOSI, LALGANJ, PHULPUR-I, PHULPUR-II, SAGRI & MAUNATHBHANJAN	No Coverage Issue	NO
		RCOM (GSM)		AZAMGARH	BANKAT,ANZAN SHAHEED,MALTARI,PARSHURAMPUR,	ICR WITH AIRCEL
				GHOSHI	HAZIPUR, KALYANPUR	ICR WITH AIRCEL
				LALGANJ	DULARGANJ,BHIRA BAZAR,THEKMA,RANI KI SARIAI,BINDRE BAZAR,	ICR WITH AIRCEL
				MAUNATHBHANJAN	KURHAT	ICR WITH AIRCEL
				PHULPUR-I (PHULPUR)	REHMATGANJ,SANJARPUR,FARIA,KAURA GAHNI,SIKRAUR BAZAR,	ICR WITH AIRCEL
				PHULPUR-II (ATRAWLIA))	RAJENDRA NAGAR,SARIYAN,DEORPUR,KOTHIPUR,	ICR WITH AIRCEL
				SAGRI	KAPTANGAJ,KABIRUDDINPUR,	ICR WITH AIRCEL
		TATA (GSM)		LALGANJ	MAJER ROAD-(DULER GANJ-BHERRA-SARIMOHAN- MARTIN GANJ), HIGHWAY-(NONARI BAZAR)	NO
				MAUNATHBHANJAN	MAJER ROAD-(DEUEPUR- BHIKHARIPUR), HIGHWAY-(HAJIPUR)	NO
				PHULPUR-II (ATRAWLIA)	MAJER ROAD-(MALATRI-ANJAN SAHID-PSARAMPUR-SARAIYA-BUDHANPUR-ATRAWLIA),HIGHWAY-(BANKAT BAZAR-PAUSURAMPUR)	NO
				SAGRI	SAGRI	NO
		VODAFONE		AZAMGARH, GHOSI, LALGANJ, PHULPUR-I, PHULPUR-II, SAGRI & MAUNATHBHANJAN	No Coverage Issue	NO
		UNINOR		AZAMGARH	GAYASPUR VILLAGE & HASANPUR VILLAGE	NO
				LALGANJ	DEDUAR VILLAGE	NO
				MAUNATHBHANJAN	HEGARPATTI VILLAGE	NO
				PHULPUR-1 (PHULPUR)	HARIKISANPUR VILLAGE , BATHINPARA VILLAGE , KAURA VILLAGE , ASPATPUR VILLAGE , JAFARPUR VILLAGE	NO
				PHULPUR-2 (ATRAWLIA)	BAUDIHA VILLAGE	NO
		RCOM (CDMA)		AZAMGARH	BANKAT,ANZAN SHAHEED,MALTARI,PARSHURAMPUR,	NO
				GHOSHI	HAZIPUR, KALYANPUR,NADWA SARIA	NO
				LALGANJ	DULARGANJ,BHIRA BAZAR,THEKMA,RANI KI SARIAI,BINDRE BAZAR,	NO
				MAUNATHBHANJAN	KURHAT	NO
				PHULPUR-I (PHULPUR)	REHMATGANJ,SANJARPUR,FARIA,KAURA GAHNI,SIKRAUR BAZAR,	NO
PHULPUR-II (ATRAWLIA))	RAJENDRA NAGAR,SARIYAN,DEORPUR,KOTHIPUR,		NO			
SAGRI	KAPTANGAJ,KABIRUDDINPUR,		NO			

Sr. No.	Month	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
2	Feb'15	TATA (CDMA)	BALLIA	AZAMGARH	RANI KI SARIYAN-MOHMMADPUR-BINDRA BAZAR-MARTIN GANJ	NO
				GHOSI	DEVKALI-BHIKHARIPUR- DVLASH- NADWASARIYAN- BARAGAON	NO
				LALGANJ	BHEERA-SARIYANMEER-SIKROR-ANAND NAGAR-MUSTAFABAD-RASSOLPUR	ICR WITH RCOM
				PHULPUR-I (PHULPUR)	REHMATGANJ-KORAGANJ-FARIYHA	ICR WITH RCOM
				PHULPUR-II (ATRAWLIA)	ATROWLI-BOODHANPUR-KAPTTANGANJ	NO
				SAGRI	SAGRI-MALLATRI-PAKYAHAR- BANKHAT-JEEYANPUR	NO
		AIRCEL		BALLIA	SINHACHAWAR	NO
				RANIGANJ	UDAHA, KUSHAR	NO
				RASARA	PARSIA, JAI NAGAR	NO
				BANSDEEH	MALHORIA	NO
		AIRTEL		BALLIA, RASARA, BANSDEEH, RANIGANJ	No Coverage Issue	NO
		BSNL		BALLIA, RASARA, BANSDEEH, RANIGANJ	No Coverage Issue	NO
		IDEA		BALLIA, RASARA, BANSDEEH, RANIGANJ	No Coverage Issue	NO
		RCOM (GSM)		BALLIA RANIGANJ	BARIYA, SHRI NAGAR.	ICR WITH AIRCEL
				BANSDEEH	KEWRA TALUKA BANSDEEH,MALDA, NAWANAGAR,HALDIRAMPUR.	ICR WITH AIRCEL
				BALLIA-I(BALLIA)	PHEPHNA, GARWAR, HALDI, DUBHAR, DIGHAR, MADADIH.	ICR WITH AIRCEL
				RASARA	CHILKAHAR, NAGRA.	ICR WITH AIRCEL
		TATA (GSM)		RANIGANJ	MADHUBANI-SHRI BAZAR-REOTI-SHAHATWAR-KEWARA-RAJPUR-RAMGARH-SUREMANPUR	NO
				RASARA	BELTHRA ROAD-UBHAW THANA-MALDAH-NAVRATANPUR-SIKANDRAPUR-KHEJURI	NO
				BANSDEEH	BANSDEEH TIRAHA	NO
		VODAFONE		BALLIA, RASARA, BANSDEEH, RANIGANJ	No Coverage Issue	NO
		UNINOR		BALLIA	ARARA VILLAGE & MALDEPUR MOR VILLAGE	NO
				RANIGANJ	SHRIKANTPUR VILLAGE	NO
				RASARA	HALDIRAMPUR VILLAGE , BRAWAN VILLAGE , NARANPATTI VILLAGE	NO
		RCOM (CDMA)		BALLIA RANIGANJ	BARIYA,SHRI NAGAR.	NO
				BANSDEEH	KEWRA TALUKA BANSDEEH,MALDA, NAWANAGAR,HALDIRAMPUR.	NO
				BALLIA-I(BALLIA)	PHEPHNA,GARWAR,HALDI,DUBHAR,DIGHAR, MADADIH.	NO
RASARA	CHILKAHAR,NAGRA.		NO			
TATA (CDMA)	RANIGANJ	RANIGANJ BAZAR-MADHUBANI-SHRI BAZAR-REOTI-SHAHATWAR-KEWARA-RAJPUR-RAMGARH-SUREMANPUR	NO			
	RASARA	RASARA-NAGARA-BELTHRA ROAD-UBHAW THANA-MALDAH-NAVRATANPUR-SIKNDERPUR-KHEJURI-SUKHPURA-RASARA CITY-RASARA MARKET	NO			
	BANSDEEH	BANSDEEH THANA-BANSDEEH MARKET-BANSDEEH -RAJPUR-BANSDEEH ROAD	NO			

Sr. No.	Month	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
3	Mar'15	AIRCEL	BARABANKI	BARABANKI	INGHOLIA, KHAJURIHA, PITAURALKN, ISREHNA, NYOLI, HARAKH, NANMAU	NO
				FATEHPUR	DANDIYAMAU, MOHMMADPUR, ISRALI, PALTA	NO
				HAIDERGARH	BHELWAL, DATAULI, INAYATPUR, MUBARAK PUR	NO
				RAMSANEHI GHAT	DHUNAU LI THAKURAN, SERSA	NO
		AIRTEL		BARABANKI, FATEHPUR, HAIDERGARH, RAMSANEHIGHAT	No Coverage Issue	NO
		BSNL		BARABANKI, FATEHPUR, HAIDERGARH, RAMSANEHIGHAT	No Coverage Issue	NO
		IDEA		BARABANKI, FATEHPUR, HAIDERGARH, RAMSANEHIGHAT	No Coverage Issue	NO
		RCOM (GSM)		BARABANKI	RASOLI	ICR WITH AIRCEL
				FATEHPUR	VISHUNPUR CHAUKI, PALTA	ICR WITH AIRCEL
				HAIDERGARH	BHELWAL, MANGALPUR, BAHARA, TRIVEDIGANJ, KOTHI, BHANMAU, FATEHGANJ, MEERAPUR	ICR WITH AIRCEL
				RAMSANEHI GHAT	RAMSANEHIGHAT, UDAULI, KOTHWAL ROAD, DEVIGANJ, SIDDHAUR	ICR WITH AIRCEL
		TATA (GSM)		BARABANKI	BARABANKI TO DEVA SARIF	NO
				FATEHPUR	No Coverage Issue	ICR WITH RCOM
				RAMSANEHI GHAT	RAM SANHI GHAT-BHANPUR CHAURAHA-BANRALLA BZR-DEVIGANJ CHAURAHA	NO
		VODAFONE		BARABANKI, FATEHPUR, HAIDERGARH, RAMSANEHIGHAT	No Coverage Issue	NO
		UNINOR		BARABANKI, FATEHPUR, HAIDERGARH, RAMSANEHIGHAT	No Coverage Issue	NO
		RCOM (CDMA)		BARABANKI	RASOLI	NO
				FATEHPUR	VISHUNPUR CHAUKI, PALTA	NO
				HAIDERGARH	BHELWAL, MANGALPUR, BAHARA, TRIVEDIGANJ, KOTHI, BHANMAU, FATEHGANJ, MEERAPUR	NO
				RAMSANEHI GHAT	RAMSANEHIGHAT, UDAULI, KOTHWAL ROAD, DEVIGANJ, SIDDHAUR	NO
		TATA (CDMA)		BARABANKI	PULHARI-KOTWADHAM	NO
				FATEHPUR	DEVA SARIF	NO
				RAMSANEHI GHAT	RAMSANHI GHAT-BHANPUR CHURAHA-BAHERDLA BZR-BHITHIRYA BZR-DEVIGANJ CHURAHA-SIDHOOR-JAIDPUR-SAFDERGANJ-TOLL PLAZA	NO

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 January-15**, drive tests were conducted across **Azamgarh SSA** covering Lalganj, Phulpur, Azamgarh, Sagri, Atrawlia, Ghosi and Maunathbhanjan 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 (3.05%), Voice Quality (89.33%). Thus the performance of BSNL was poor in respect of the above parameters.

Idea: Voice Quality (92.88%)

- (ii) **In the Month of February-15**, drive tests were conducted across **Ballia SSA** covering Raniganj, Bansdeeh, Rasra and Ballia SDCAs. The performance of some of the service providers on SSA level remained under performed for different network parameters. On SSA level, **non-compliance** of the service providers was as follows:

BSNL: Call Drop rate (3.24%), Voice Quality (85.44% - Outdoor) / (92.14% - Indoor) and Blocked Call rate (3.15%- Outdoor) .

RCOM CDMA: Call Drop Rate (5.38%), Block Call rate (3.46%).

Tata GSM, Tata CDMA and Uninor: Voice Quality (92.54%), (94.96%) and (93.46%) respectively.

- (iii) **In the month of March-15**, drive tests were conducted across **Barabanki SSA** covering Ram sanehi, Ghat, Fatehpur, Barabanki and Haider ganj SDCAs. On SSA level, **non-compliance** of the service providers was as follows:

BSNL: Call Drop rate (4.05%), Voice Quality (76.23%-outdoor) / (92.03%-Indoor), and CSSR (90.81%-Outdoor) / (93.67%-Indoor) and Blocked Call rate (9.56 -Outdoor) / (5.06%-Indoor).

Airtel and Tata (GSM) : Voice Quality – (94.97% and 94,50% respectively).

Idea: Voice Quality (94.66%), CSSR (91.29%)

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.

The detail of Network coverage and Intra Circle Roaming (ICR) status of different service providers at various locations in the three SSAs is given in table-8.

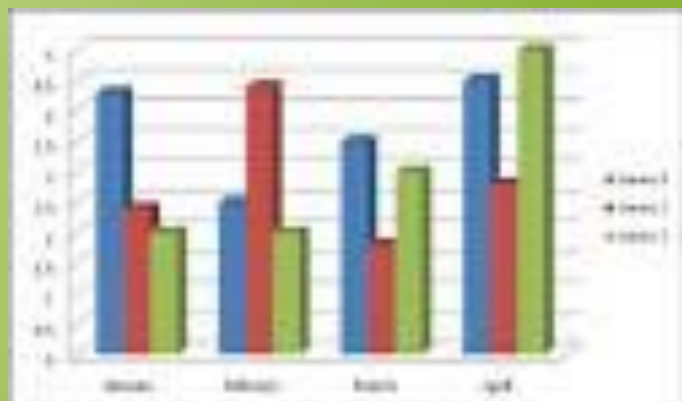
*Thus, the performance of the operators namely **BSNL, Idea, Tata (GSM)/ Tata (CDMA), RCOM (CDMA), Uninor and Airtel** was not satisfactory with respect to some of the parameters as mentioned above. The drive test results further suggest that **BSNL** needs to pay special attention to improve their network quality in respect the prime network parameters **Call Drop rate, Voice Quality, Call Setup success rate and Blocked Call rate**. However, for other service providers also, the network parameters **Voice Quality and Call Drop rate** were the areas of concern.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

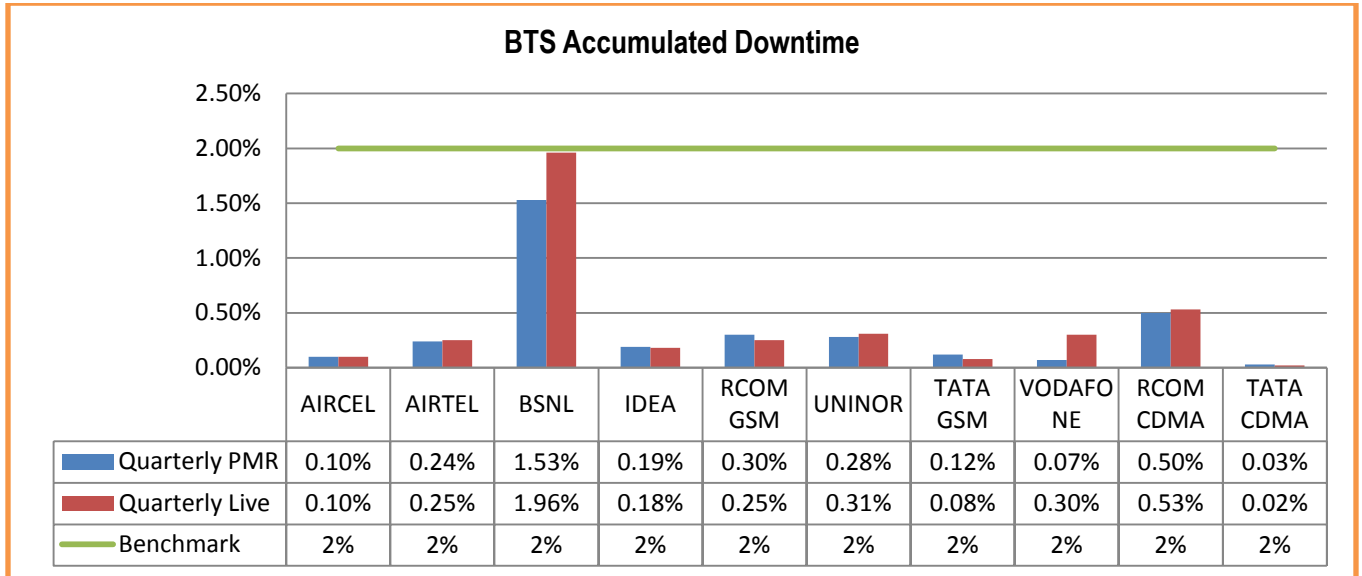
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION (CMTS):

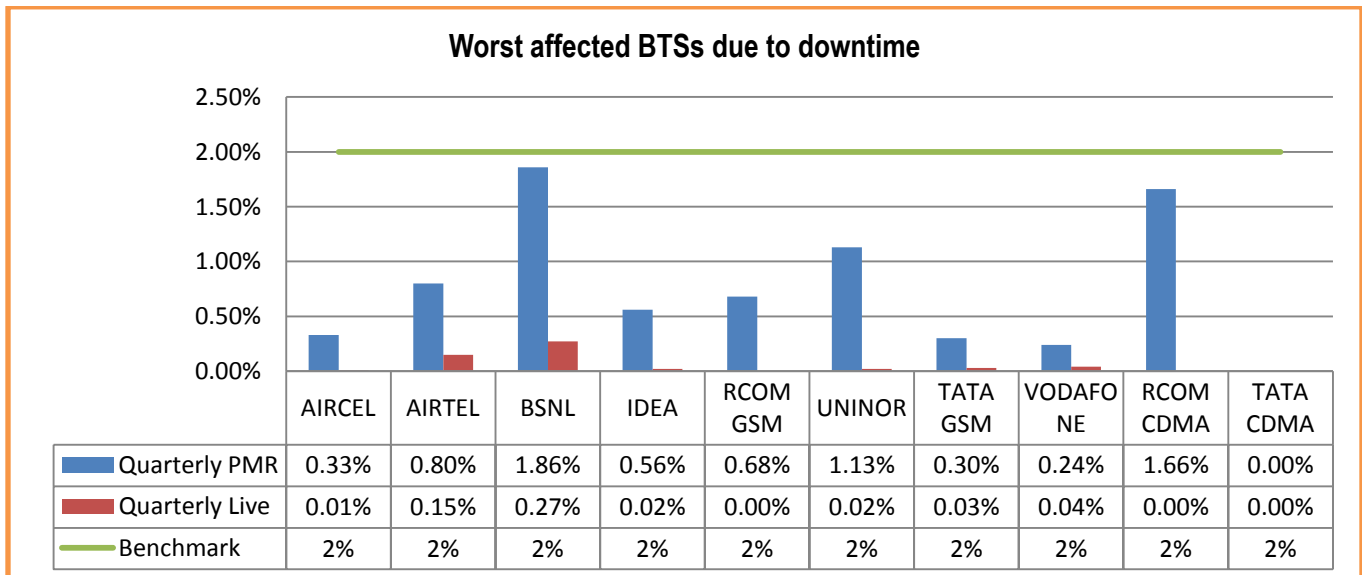
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIMES:



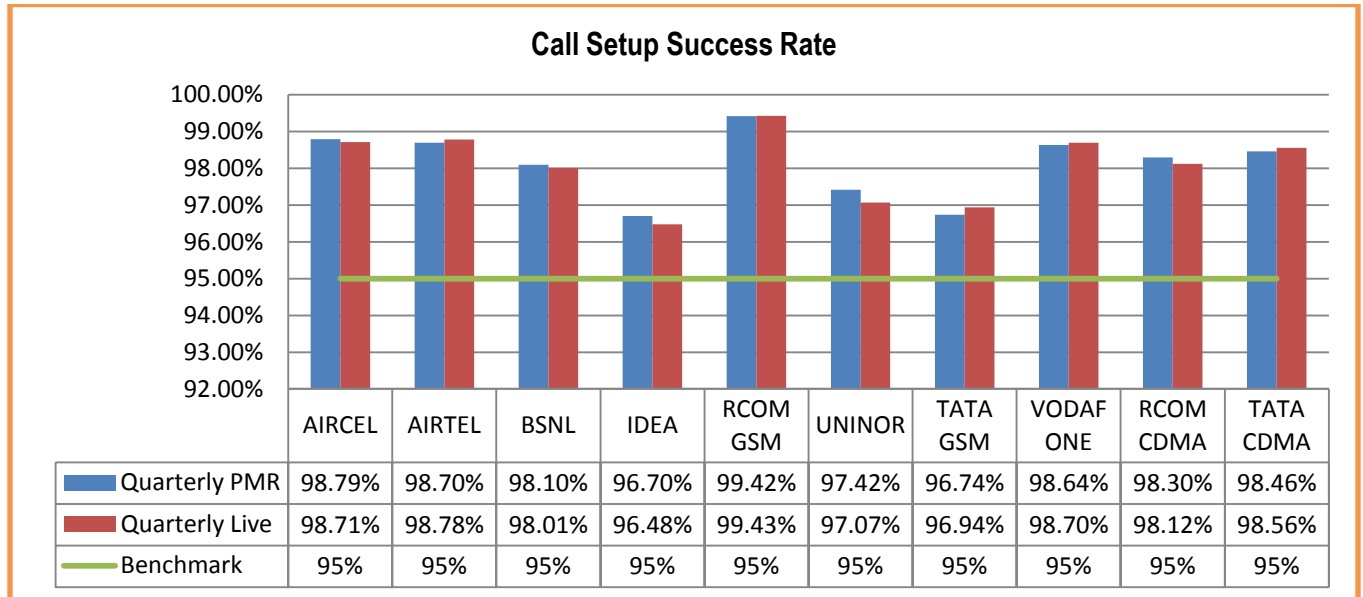
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSs DUE TO DOWNTIME:



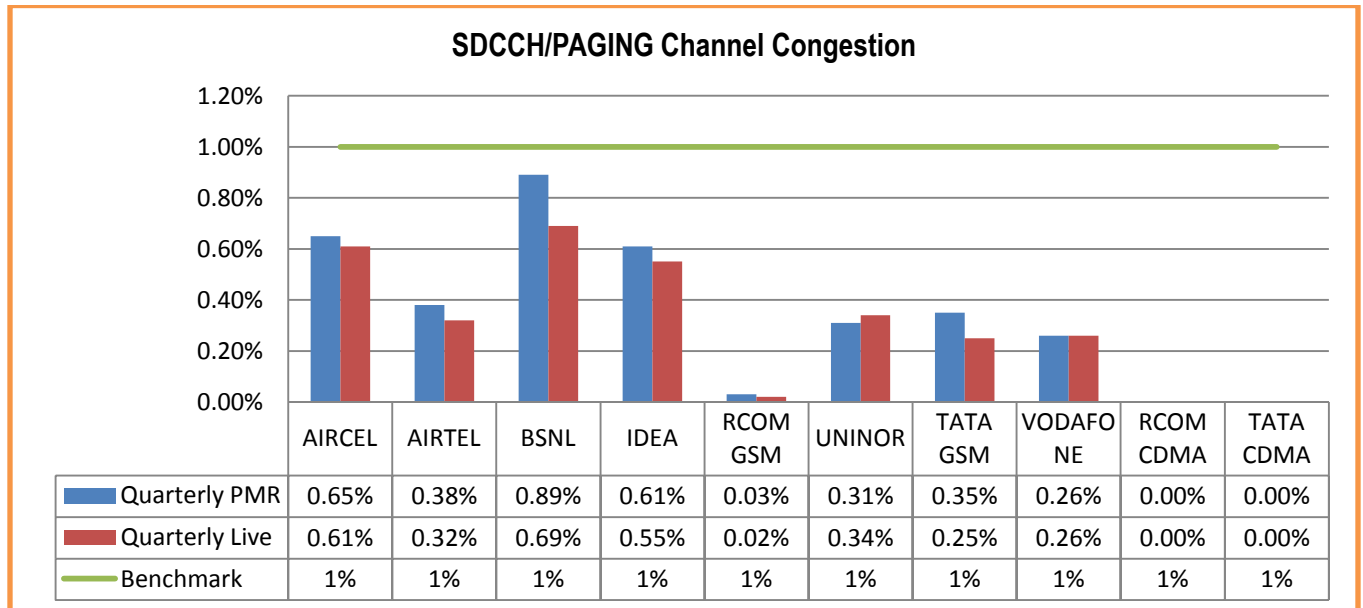
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE:



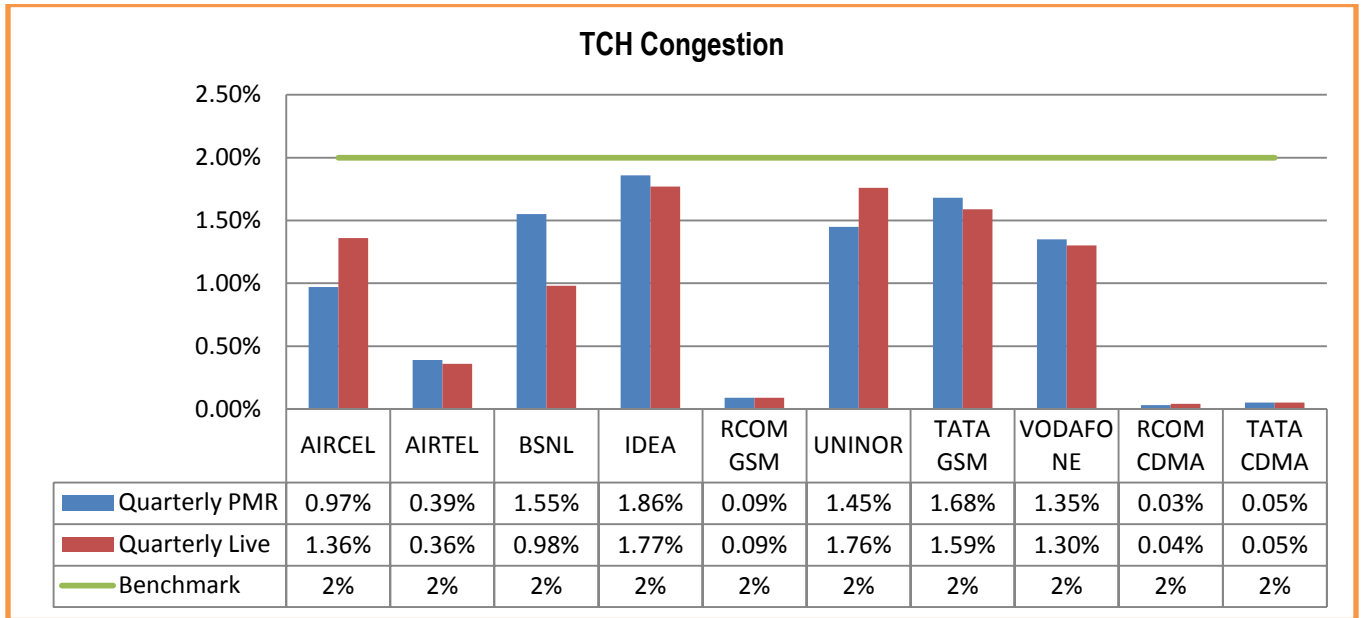
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:



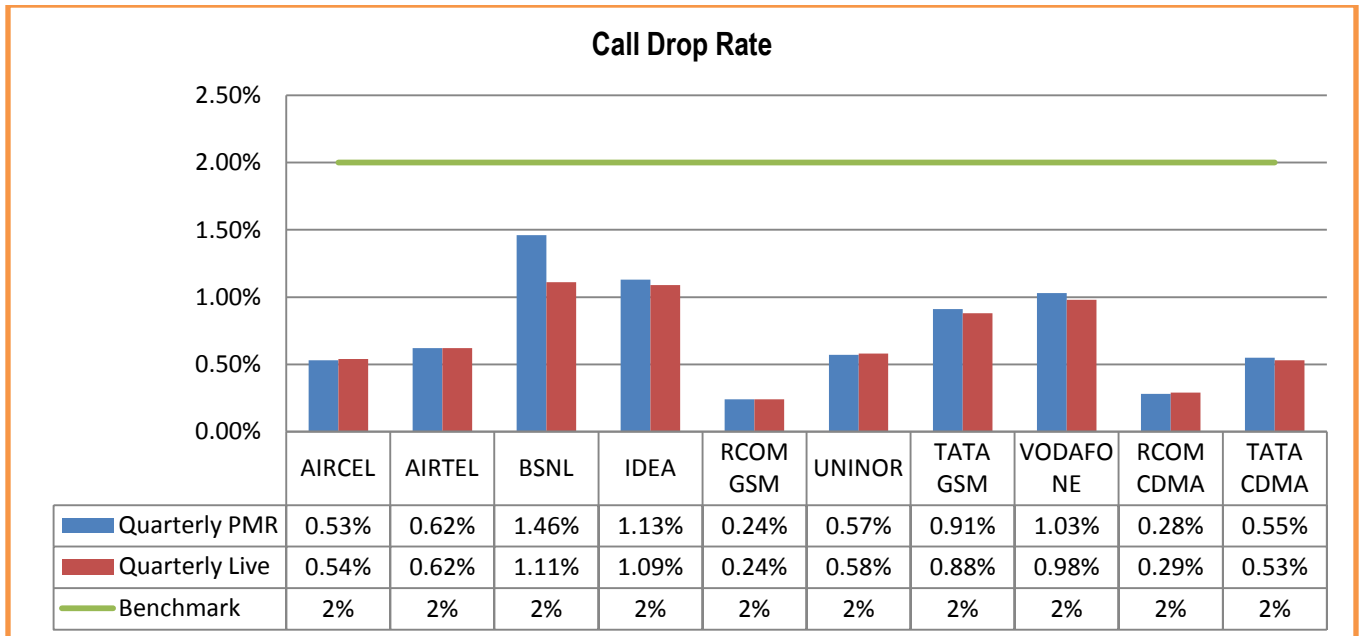
All operators are meeting the benchmarks.

5) TCH CONGESTION:



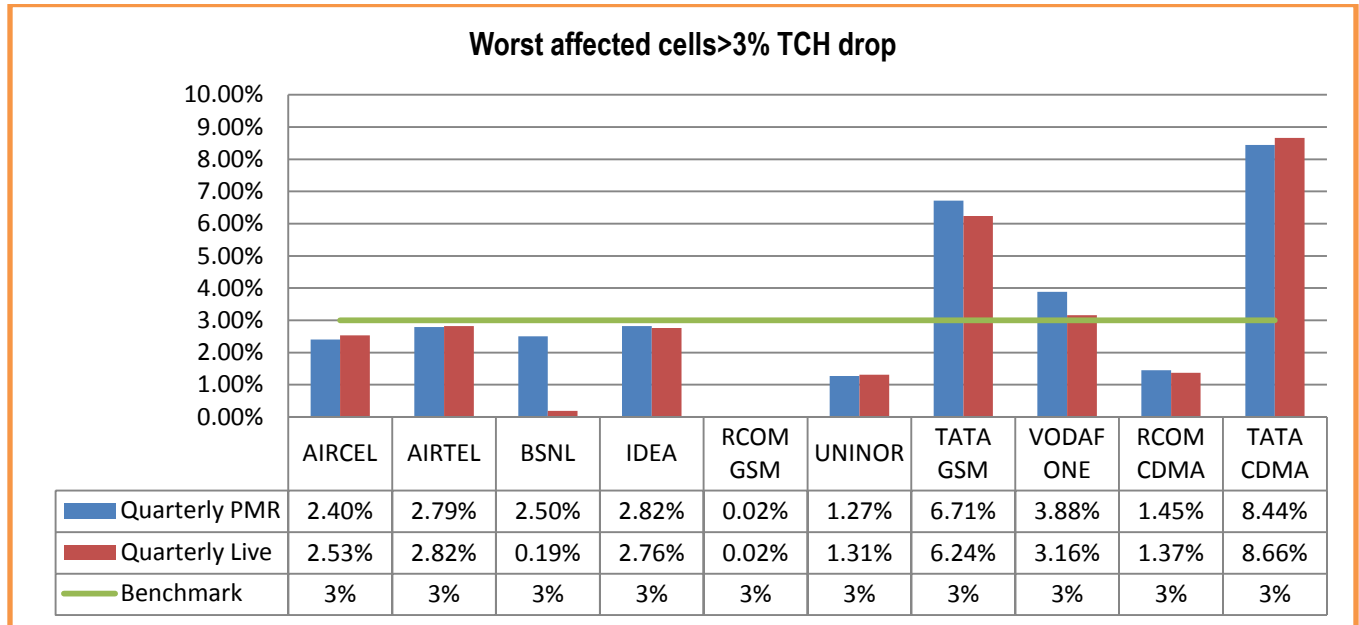
All operators are meeting the benchmarks.

6) CALL DROP RATE:



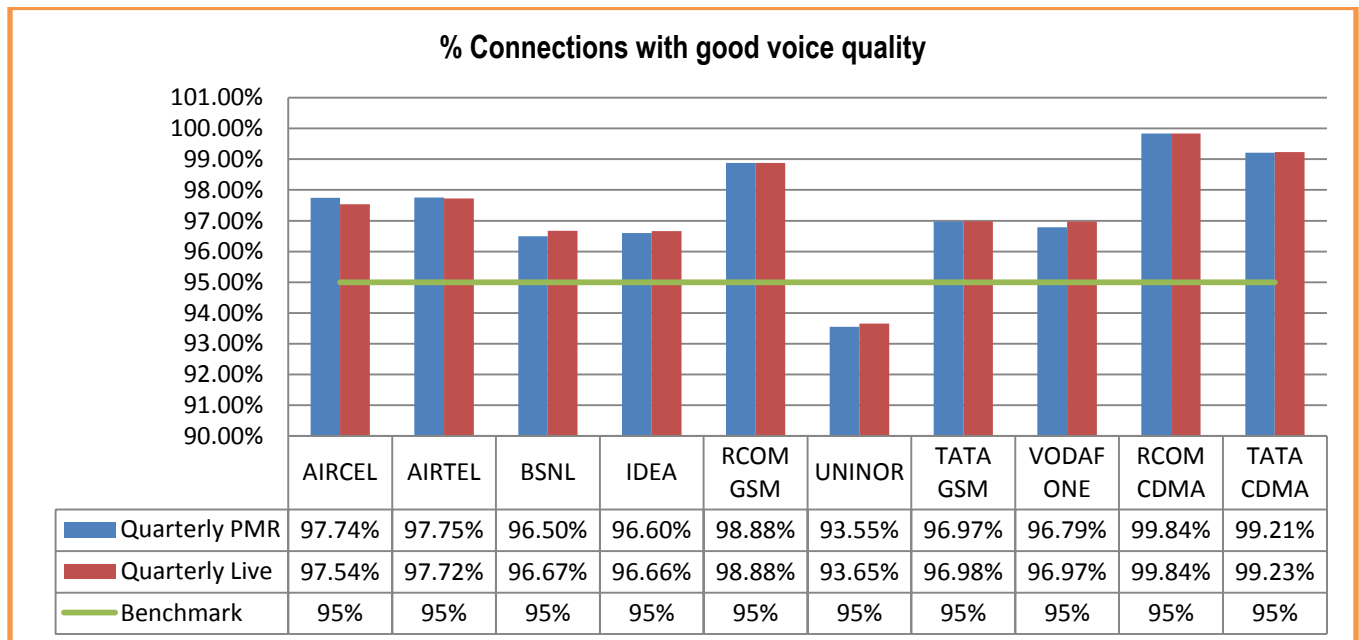
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Tata GSM, Vodafone and Tata CDMA.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks except Uninor.