



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

**North Zone – UP (East) Service Area
(April 2015 – June 2015)**

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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 – APRIL 15 MONTH:.....	18
5.1.4	QOS PERFORMANCE OF MONTHLY PMR – MAY 15 MONTH:.....	19
5.1.5	QOS PERFORMANCE OF MONTHLY PMR – JUNE 15 MONTH.....	20
5.1.6	QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- JUNE 15 (APRIL TO JUNE 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) – APRIL 15 MONTH:.....	25
5.2.2	LIVE MEASUREMENT DATA (3-DAYS) – MAY 15 MONTH:.....	26
5.2.3	LIVE MEASUREMENT DATA (3-DAYS) – JUNE 15 MONTH:.....	27
5.2.4	QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF APRIL TO JUNE 2015 MONTHS).....	28
5.2.5	KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:.....	29
5.2.6	DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:.....	30
5.3	CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS - QE JUNE 15:.....	40
5.3.1	QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (APRIL TO JUNE 2015 MONTHS AUDITED DATA):.....	40
5.3.2	3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-JUNE 2015):	43
5.3.3	KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS	44
6.	LIVE CALLING ASSESSMENT:.....	46
6.1	INTER OPERATOR CALLS ASSESSMENT:	46
6.2	CUSTOMER CARE / HELPLINE ASSESSMENT:	47

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:.....	47
6.4 LEVEL -1 CALLING ASSESSMENT:.....	48
7. OPERATOR ASSISTED DRIVE TEST	52
7.1 OPERATOR ASSISTED DRIVE TEST: FATEHPUR SSA (APRIL-15)	53
7.2 OPERATOR ASSISTED DRIVE TEST: GONDA SSA (MAY-15).....	56
7.3 OPERATOR ASSISTED DRIVE TEST: JAUNPUR SSA (JUNE-15).....	59
7.5 SSA WISE DRIVE TEST OBSERVATION:	64
7.6 KEY FINDINGS ON DRIVE TEST:.....	71
8. GRAPHICAL REPRESENTATION (CMTS):.....	73



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.

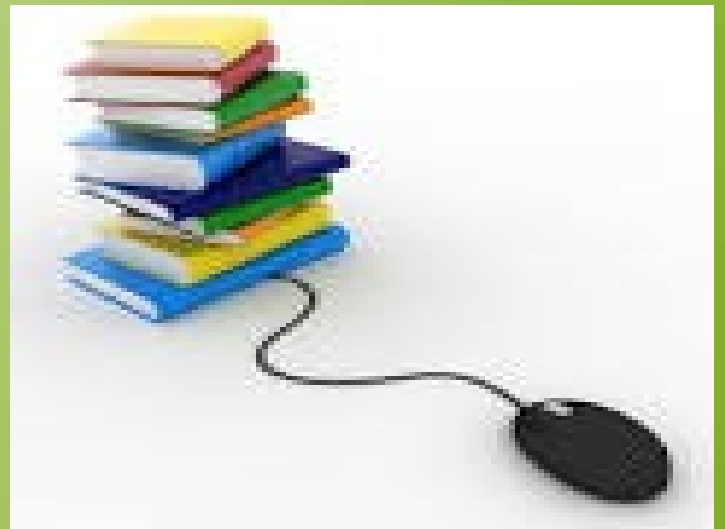
TRAI, the regulatory watch dog for the Quality of Service for the telecom services – Basic (Wire line), Cellular Mobile (Wireless) and Broadband has commissioned **M/s TUV-SUD South Asia Pvt. Ltd.** for conducting audit and assessment of quality of service of service providers, in terms of the benchmarks 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

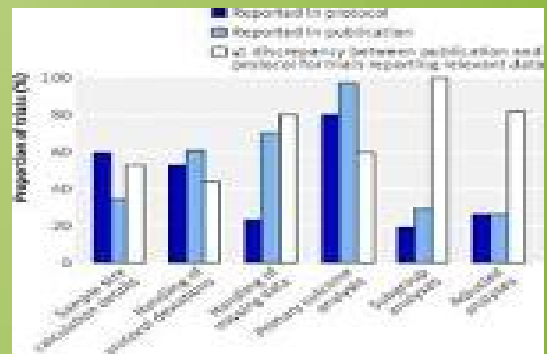
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 Punjab, Rajasthan and Gujarat circles during the quarter April 2015 – June 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
		April -15	May -15	June -15	
GSM Operators					
1	AIRCEL	20 to 22 Apr-15	25 to 27 May-15	12 to 15 Jun-15	3rd floor,Ratan Square,Hajratganj,Lucknow
2	AIRTEL	6 to 8 Apr-15	6 to 8 May-15	8 to 10 Jun-15	TCG 7/7, vibhuti khand, Gomti Nagar,Lucknow
3	BSNL	22 to 24 Apr-15	21 to 23 May-15	24 to 26 Jun-15	BSNL, Mahanager , Lucknow
4	IDEA	13 to 15 Apr-15	11 to 13 may-15	15 to 17 Jun-15	Idea Cellular Ltd., Fortuna Towers, 10 Rana Pratap Road, Lucknow-226001
5	RCOM GSM	20 to 22 Apr-15	18 to 20 May-15	22 to 24 Jun-15	House No. 12, C/O BTC House Eldeco Greens, Gomti Nagar, Lucknow-226010
6	VIDEOCON	*	4 to 6 May-15	17 to 19 Jun-15	Videocon Telecommunications Limited, SS Plaza CP-1, First Floor, Sector-I, LDA colony, Ashiyana, Lucknow-226012
7	VODAFONE	27 to 29 Apr-15	18 to 20 May-15	17 to 19 Jun-15	Shalimar Titanium , Vibhuti Khand, Gomti Nagar, Lucknow
8	UNINOR	20 to 22 Apr-15	13 to 15 May-15	17 to 19 Jun-15	Telewings Communications Services Pvt Ltd. (Uninor), Welldone Technology Park Sec-48 Sohana Road Gurgaon
9	TATA GSM	8 to 10 Apr-15	7 to 9 May-15	1 to 3 Jun-15	Tata Teleservices Ltd., Prem Plaza Building 2, RF Bahadurji Marg, Lucknow
CDMA Operators					
10	RCOM CDMA	20 to 22 Apr-15	18 to 20 May-15	**	House No. 12, C/O BTC House Eldeco Greens, Gomti Nagar, Lucknow-226010
11	TATA CDMA	8 to 10 Apr-15	6 to 8 May-15	1 to 3 Jun-15	Tata Teleservices Ltd., Prem Plaza Building 2, RF Bahadurji Marg, Lucknow

* Live measurements for Videocon could not be done on the month of April 2015 as its restarting of the service could be known, from the PMRs of QE March 2015, received from TRAI in the month of May 2015.They are operating with only 7 BTSs in the entire UP(E) service area.

** Data not provided by RCOM (CDMA) due to TTI sever issue in the month of June 2015.

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

The data generated by monthly PMR and 3-days live measurements audit for the period April 2015 to June 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 June - 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 June - 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) and Uninor** . **Tata (CDMA)/Tata (GSM)** failed to meet the benchmarks of the parameter **Worst affected cells > 3% TCH drop and TCH Congestion** with their quarterly average performance as **7.46%, 6.47% and 2.16%** respectively. Further, **Uninor** lagged behind the benchmark of parameter **Voice Quality** having achieved level as **93.79%**.

(ii) Three days live assessment revealed that the operators were meeting the benchmark of most of the parameters. However, **Tata (GSM)** and **Tata (CDMA)** failed to meet the benchmark for the parameter **“worst affected Cell > 3% TCH Drop”**. Their average performance for this parameter was **6.14% and 6.83%** 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 **93.74%**.

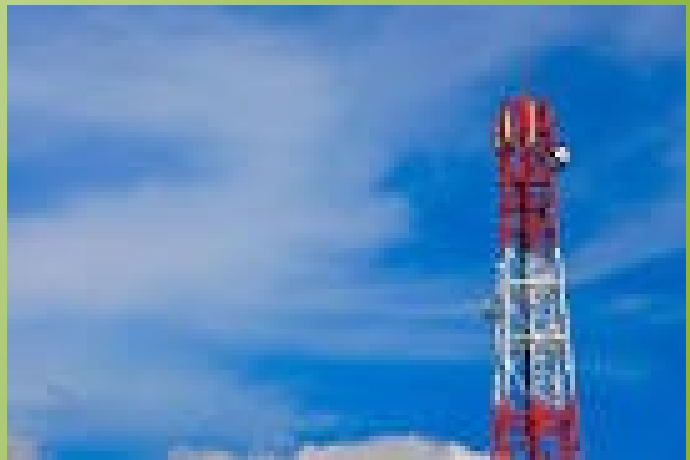
Similar non-compliance of **Tata (GSM), Tata (CDMA) and Uninor** with respect to above indicated parameters was also observed in monthly PMR audit.

(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 GSM** remained non-complied for parameter '**Calls answered by Operators (Voice to Voice)**' with their performance as **92.63%, 90.44 and 90.85%** respectively.

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, **RCOM (GSM) and RCOM (CDMA)** remained under performed for parameter '**calls answered by operators (voice to voice)**' with their performance as **63.53% (way below the benchmark) and 91.08%** against the benchmark of $\geq 95\%$.

(iv) With regard to the **Drive Test** results, the performance of the operators namely **BSNL, Tata (GSM)/ Tata (CDMA), Idea, Airtel and Uninor** was not satisfactory with respect to some of the parameters namely Voice Quality and Blocked Call rate. The drive test results further suggest that **BSNL** needs to pay special attention to improve their network quality in respect the prime network parameters **Voice Quality, Call Setup success rate and Blocked Call rate**. However, for other service providers, the network parameter **Voice Quality** was the area 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	June -15	20:00 - 21:00
2	AIRTEL	June -15	20:00 - 21:00
3	BSNL	June -15	20:00 - 21:00
4	IDEA	June -15	20:00 - 21:00
5	RCOM GSM	June -15	19:00 - 20:00
6	UNINOR	June -15	20:00 - 21:00
7	TATA GSM	June -15	20:00 - 21:00
8	VIDEOCON	June -15	20:00 - 21:00
9	VODAFONE	June -15	20:00 - 21:00
CDMA Operators			
10	RCOM CDMA	June -15	20:00 - 21:00
11	TATA CDMA	June -15	20:00 - 21:00

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

5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRCEL	5	28	3403	ZTE	ZTE
2	AIRTEL	48	110	10181	Ericsson	Ericsson
3	BSNL	26	79	6405	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	12	44	7622	NSN	NSN
5	RCOM GSM	4	19	2093	Huawei	Huawei
6	UNINOR	14	34	4801	Ericsson	Ericsson
7	TATA GSM	4	21	2309	NSN	NSN
8	VIDEOCON	1	1	7	Huawei	Huawei
9	VODAFONE	18	140	9909	NSN	NSN
CDMA Operators						
10	RCOM CDMA	8	11	1140	Huawei & Lucent	Huawei & Lucent
11	TATA CDMA	4	4	314	Huawei & Ericsson	Huawei, ZTE & Motorola

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – APRIL 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- APRIL 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Apr-15	0.15%	0.30%	1.85%	0.31%	0.32%	0.41%	0.11%	0.29%	0.09%	0.49%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Apr-15	0.35%	1.09%	1.87%	1.11%	0.43%	1.81%	0.17%	0.00%	0.20%	1.23%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-15	98.59%	98.95%	97.30%	96.10%	99.38%	98.08%	96.90%	99.11%	98.26%	97.55%	97.47%
	b) SDCCH/PAGING Channel congestion	<=1%	Apr-15	0.81%	0.35%	0.89%	0.94%	0.03%	0.38%	0.31%	0.78%	0.28%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	1.72%	0.27%	1.88%	1.90%	0.10%	0.98%	1.51%	0.57%	1.74%	0.09%	0.53%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Apr-15	0.55%	0.46%	1.60%	1.11%	0.20%	0.48%	0.91%	0.63%	0.72%	0.34%	0.54%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Apr-15	2.38%	2.76%	2.62%	2.83%	0.06%	1.11%	5.99%	0.00%	2.33%	1.78%	7.59%
	c) Connections with good voice quality	>=95%	Apr-15	97.04%	98.34%	96.50%	96.77%	98.81%	93.96%	96.91%	99.28%	96.55%	99.83%	99.22%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	15-Apr	0	0	0	0	0	0	0	0	0	0	0

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – MAY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- MAY 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	May-15	0.18%	0.30%	1.80%	0.39%	0.25%	0.55%	0.20%	0.40%	0.14%	0.48%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	May-15	0.59%	1.26%	1.80%	1.88%	0.38%	1.91%	1.04%	0.00%	0.41%	1.58%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	May-15	98.46%	98.96%	98.22%	95.58%	99.36%	97.70%	96.04%	98.29%	98.39%	97.65%	98.22%
	b) SDCCH/PAGING Channel congestion	<=1%	May-15	0.68%	0.41%	0.62%	0.87%	0.07%	0.71%	0.50%	0.54%	0.39%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	1.82%	0.24%	1.50%	1.85%	0.11%	1.20%	2.04%	0.60%	1.61%	0.05%	0.26%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	May-15	0.61%	0.46%	1.72%	1.16%	0.21%	0.54%	0.96%	0.68%	0.78%	0.33%	0.63%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	May-15	2.69%	2.79%	1.55%	2.73%	0.07%	1.36%	6.64%	0.00%	2.79%	1.97%	5.69%
	c) Connections with good voice quality	>=95%	May-15	96.83%	98.40%	96.50%	96.83%	98.80%	93.69%	96.83%	99.20%	96.26%	99.83%	99.19%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	May-15	0	0	0	0	0	0	0	0	0	0	0

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – JUNE 15 MONTH

CELLULAR MOBILE TELEPHONE SERVICES - UP(E) CIRCLE- JUNE 15 MONTH														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Jun-15	0.22%	0.29%	1.65%	0.47%	NP	0.64%	0.24%	0.12%	0.18%	NP	0.19%
	b) Worst affected BTSS due to downtime	<=2%	Jun-15	0.71%	1.22%	1.69%	1.77%	0.00%	1.96%	0.91%	0.00%	0.63%	NP	1.59%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	98.50%	98.87%	98.50%	96.64%	99.37%	97.23%	95.03%	98.73%	98.53%	NP	97.97%
	b) SDCCH/PAGING Channel congestion	<=1%	Jun-15	0.85%	0.39%	0.71%	0.93%	0.04%	0.70%	0.68%	0.18%	0.34%	NP	0.00%
	c) TCH congestion	<=2%	Jun-15	1.97%	0.36%	1.64%	1.84%	0.11%	1.31%	2.93%	0.66%	1.47%	NP	0.22%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Jun-15	0.60%	0.50%	1.63%	1.16%	0.21%	0.53%	0.95%	0.94%	0.76%	NP	0.63%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jun-15	2.68%	2.79%	2.61%	2.69%	0.03%	1.48%	6.78%	0.48%	2.73%	NP	9.09%
	c) Connections with good voice quality	>=95%	Jun-15	96.94%	98.33%	96.50%	97.24%	98.81%	93.72%	96.98%	98.85%	96.77%	NP	99.20%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Jun-15	0	0	0	0	0	0	0	0	0	NP	0

NP: Data not provided by RCOM (CDMA) due to TTI sever issue.

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- JUNE 15 (APRIL TO JUNE 2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-JUNE-15) OF UP(E) CIRCLE														
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.18%	0.30%	1.77%	0.39%	0.29%	0.53%	0.18%	0.27%	0.14%	0.49%	0.10%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.55%	1.19%	1.79%	1.59%	0.27%	1.89%	0.71%	0.00%	0.41%	1.41%	0.53%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	98.52%	98.93%	98.01%	96.11%	99.37%	97.67%	95.99%	98.71%	98.39%	97.60%	97.89%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.78%	0.38%	0.74%	0.91%	0.05%	0.60%	0.50%	0.50%	0.34%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	1.84%	0.29%	1.67%	1.86%	0.11%	1.16%	2.16%	0.61%	1.61%	0.07%	0.34%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.59%	0.47%	1.65%	1.14%	0.21%	0.52%	0.94%	0.75%	0.75%	0.34%	0.60%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.58%	2.78%	2.26%	2.75%	0.05%	1.32%	6.47%	0.16%	2.62%	1.88%	7.46%
	c) Connections with good voice quality	>=95%	Quarterly	96.94%	98.36%	96.50%	96.95%	98.81%	93.79%	96.91%	99.11%	96.53%	99.83%	99.20%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0	0

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

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

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

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

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

Network Service Quality Parameters:

- **Network Availability**

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

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

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

- **Connection Establishment (Accessibility)**

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

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

All 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 (except Tata GSM) met the TRAI specified benchmarks** on the congestion parameters.

Only Tata (GSM) failed to meet the benchmark of the parameter TCH Congestion with its performance as 2.16%.

▪ **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 0.21%) 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) and Tata (CDMA)**, remained non-complied in all the 3 months of the quarter. The quarterly average performance level of **Tata (GSM) and Tata (CDMA) was 6.47 % and 7.46%** 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 **93.79%**.

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) – APRIL 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE - APRIL 15 MONTH														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.20%	1.96%	0.23%	0.46%	0.52%	0.10%	**	0.53%	0.71%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.06%	0.07%	0.25%	0.00%	0.00%	0.02%	0.09%	--	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.55%	99.06%	97.35%	97.02%	99.38%	98.15%	96.59%	--	98.63%	98.11%	98.39%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.83%	0.28%	0.71%	0.72%	0.03%	0.38%	0.45%	--	0.25%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.88%	0.25%	1.44%	1.91%	0.09%	0.91%	1.61%	--	1.37%	0.03%	0.01%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.58%	0.45%	1.61%	1.22%	0.20%	0.53%	0.90%	--	0.65%	0.49%	0.50%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.21%	2.77%	0.46%	2.73%	0.01%	1.21%	5.98%	--	1.81%	2.15%	8.88%
	c) Connections with good voice quality	>=95%	Live data	96.88%	98.37%	96.65%	96.68%	98.80%	93.70%	97.07%	--	96.57%	99.84%	99.28%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Live data	0	0	0	0	0	0	0	--	0	0	0

** Live measurements for Videocon could not be done in the month of April 2015 as its restarting of the service could be known, from the PMRs of QE March 2015, received from TRAI in the month of May 2015. They are operating with only 7 BTSs in the entire UP (E) service area.

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

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE - MAY 15 MONTH														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.21%	0.33%	1.92%	0.53%	0.27%	0.43%	0.11%	0.00%	0.62%	0.41%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.21%	0.11%	0.22%	0.04%	0.00%	0.02%	0.00%	0.00%	0.12%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.50%	98.93%	98.18%	96.10%	99.38%	97.93%	96.28%	98.55%	98.56%	97.44%	98.38%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.44%	0.40%	0.78%	0.91%	0.03%	0.45%	0.44%	0.31%	0.37%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.85%	0.27%	1.30%	1.90%	0.11%	1.06%	1.97%	1.04%	1.44%	0.05%	0.02%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.59%	0.46%	0.39%	1.15%	0.20%	0.54%	0.91%	0.94%	0.78%	0.48%	0.48%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.43%	2.78%	0.12%	2.87%	0.02%	1.24%	6.24%	0.00%	2.90%	1.97%	3.71%
	c) Connections with good voice quality	>=95%	Live data	96.87%	98.41%	96.65%	97.01%	98.80%	93.73%	96.93%	99.42%	96.35%	99.81%	99.22%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Live data	0	0	0	0	0	0	0	0	1	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES UP(E) CIRCLE - JUNE 15 MONTH														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Live data	0.23%	0.35%	1.95%	0.41%	NP	0.68%	0.23%	0.00%	0.57%	ND	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.21%	0.19%	0.19%	0.05%	0.00%	0.06%	0.22%	0.00%	0.04%	ND	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.56%	98.99%	96.98%	97.11%	99.40%	97.60%	96.37%	99.20%	98.82%	ND	98.14%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	1.19%	0.46%	0.62%	0.85%	0.03%	0.73%	0.42%	0.20%	0.26%	ND	0.00%
	c) TCH congestion	<=2%	Live data	1.91%	0.22%	1.73%	1.93%	0.11%	1.22%	1.98%	0.27%	1.18%	ND	0.08%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.62%	0.41%	0.36%	1.15%	0.20%	0.54%	0.89%	1.75%	0.73%	ND	0.67%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.64%	2.88%	0.13%	2.78%	0.01%	1.53%	6.21%	1.59%	2.43%	ND	7.91%
	c) Connections with good voice quality	>=95%	Live data	96.94%	98.58%	96.61%	97.12%	98.80%	93.80%	97.03%	98.71%	96.91%	ND	99.20%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Live data	0	0	0	0	0	0	0	0	0	0	0

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

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE- JUNE 15) – UP (E) CIRCLE														
Live measurement Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.21%	0.29%	1.94%	0.39%	0.37%	0.54%	0.15%	0.00%	0.57%	0.56%	0.04%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.16%	0.12%	0.22%	0.03%	0.00%	0.03%	0.10%	0.00%	0.05%	0.00%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	98.54%	98.99%	97.50%	96.74%	99.39%	97.89%	96.41%	98.88%	98.67%	97.78%	98.30%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.82%	0.38%	0.70%	0.83%	0.03%	0.52%	0.44%	0.26%	0.29%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	1.88%	0.25%	1.49%	1.91%	0.10%	1.06%	1.85%	0.66%	1.33%	0.04%	0.04%
Connection maintenance (Retainability)														
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.60%	0.44%	0.79%	1.17%	0.20%	0.54%	0.90%	1.35%	0.72%	0.49%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.43%	2.81%	0.24%	2.79%	0.01%	1.33%	6.14%	0.80%	2.38%	2.06%	6.83%
	c) Connections with good voice quality	>=95%	Quarterly	96.90%	98.45%	96.64%	96.94%	98.80%	93.74%	97.01%	99.07%	96.61%	99.83%	99.23%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

Three days live assessment revealed that the operators were meeting the benchmark of most of the parameters. However, **Tata (GSM)** and **Tata (CDMA)** failed to meet the benchmark for the parameter “**worst affected Cell > 3% TCH Drop**”. Their average performance for this parameter was **6.14% and 6.83%** 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 **93.74%**.

Similar non-compliance of **Tata (GSM), Tata (CDMA) 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 - April 15 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Apr-15	3404	10106	6405	7406	2095	4810	2311	7	9808	1139	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Apr-15	3608.39	21571.55	85314.60	16611.53	4791.70	14196.01	1886.67	14.52	6613.07	3982.77	94.11
	c) BTS Accumulated Downtime	<=2%	Apr-15	0.15%	0.30%	1.85%	0.31%	0.32%	0.41%	0.11%	0.29%	0.09%	0.49%	0.04%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Apr-15	12	110	120	82	9	87	4	0	20	14	0
	e) Worst affected BTSs due to downtime	<=2%	Apr-15	0.35%	1.09%	1.87%	1.11%	0.43%	1.81%	0.17%	0.00%	0.20%	1.23%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-15	98.59%	98.95%	97.30%	96.10%	99.38%	98.08%	96.90%	99.11%	98.26%	97.55%	97.47%
	b) SDCCH/PAGING Congestion	<=1%	Apr-15	0.81%	0.35%	0.89%	0.94%	0.03%	0.38%	0.31%	0.78%	0.28%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	1.72%	0.27%	1.88%	1.90%	0.10%	0.98%	1.51%	0.57%	1.74%	0.09%	0.53%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Apr-15	0.55%	0.46%	1.60%	1.11%	0.20%	0.48%	0.91%	0.63%	0.72%	0.34%	0.54%
	b) Worst affected cells>3% TCH drop	<=3%	Apr-15	2.38%	2.76%	2.62%	2.83%	0.06%	1.11%	5.99%	0.00%	2.33%	1.78%	7.59%
	c) % of connections with good voice quality	>=95%	Apr-15	97.04%	98.34%	96.50%	96.77%	98.81%	93.96%	96.91%	99.28%	96.55%	99.83%	99.22%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Apr-15	245	839	156	630	4	161	413	0	696	61	72
	e) Total no. of cells (Sector) in the licensed service area		Apr-15	10272	30441	5946	22270	6249	14505	6894	21	29886	3429	946

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		Apr-15	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Apr-15	0	0	0	0	0	0	0	0	0	0	0
Network Data														
5	a) Equipped Capacity of Network in Erlang		Apr-15	144805	589135	469000	219783	140000	271785	134536	222	569865	176000	51455
	b) Total traffic in TCBH in erlang (Avg.)		Apr-15	126530	542940	224361	271570	123030	370236	73701	21	518671	31243	3768
	c) Total no. of customers served (as per VLR) on last day of the month		Apr-15	4690389	17894183	4631851	10456970	5851865	8319341	2863692	4222	17843582	2318351	113456

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle – April 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	3403	10066	6405	7351	2095	4813	2306	--	9827	1139	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	476.94	1434.43	9051.18	1242.28	699.58	1788.76	165.68	--	3725.58	582.98	19.01
	c) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.20%	1.96%	0.23%	0.46%	0.52%	0.10%	--	0.53%	0.71%	0.08%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	2	7	16	0	0	1	2	--	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.06%	0.07%	0.25%	0.00%	0.00%	0.02%	0.09%	--	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.55%	99.06%	97.35%	97.02%	99.38%	98.15%	96.59%	--	98.63%	98.11%	98.39%
	b) SDCCCH/PAGING Congestion	<=1%	Live data	0.83%	0.28%	0.71%	0.72%	0.03%	0.38%	0.45%	--	0.25%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.88%	0.25%	1.44%	1.91%	0.09%	0.91%	1.61%	--	1.37%	0.03%	0.01%
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.58%	0.45%	1.61%	1.22%	0.20%	0.53%	0.90%	--	0.65%	0.49%	0.50%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.21%	2.77%	0.46%	2.73%	0.01%	1.21%	5.98%	--	1.81%	2.15%	8.88%
	c) % of connections with good voice quality	>=95%	Live data	96.88%	98.37%	96.65%	96.68%	98.80%	93.70%	97.07%	--	96.57%	99.84%	99.28%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	227	840	27	606	0	176	412	--	542	74	84
	e) Total no. of cells (Sector) in the licensed service area		Live data	10269	30322	5946	22182	6249	14508	6896	--	29886	3429	946
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

TABLE: 3

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators	
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		May-15	3404	10147	6405	7508	2095	4808	2306	7	9831	1140	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		May-15	4632.20	22982.33	85775.57	21645.08	3822.12	19503.76	3514.76	20.62	9996.20	4043.05	182.79
	c) BTS Accumulated Downtime	<=2%	May-15	0.18%	0.30%	1.80%	0.39%	0.25%	0.55%	0.20%	0.40%	0.14%	0.48%	0.08%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		May-15	20	128	115	141	8	92	24	0	40	18	0
	e) Worst affected BTSs due to downtime	<=2%	May-15	0.59%	1.26%	1.80%	1.88%	0.38%	1.91%	1.04%	0.00%	0.41%	1.58%	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	May-15	98.46%	98.96%	98.22%	95.58%	99.36%	97.70%	96.04%	98.29%	98.39%	97.65%	98.22%
	b) SDCCH/PAGING Congestion	<=1%	May-15	0.68%	0.41%	0.62%	0.87%	0.07%	0.71%	0.50%	0.54%	0.39%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	1.82%	0.24%	1.50%	1.85%	0.11%	1.20%	2.04%	0.60%	1.61%	0.05%	0.26%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	May-15	0.61%	0.46%	1.72%	1.16%	0.21%	0.54%	0.96%	0.68%	0.78%	0.33%	0.63%
	b) Worst affected cells>3% TCH drop	<=3%	May-15	2.69%	2.79%	1.55%	2.73%	0.07%	1.36%	6.64%	0.00%	2.79%	1.97%	5.69%
	c) % of connections with good voice quality	>=95%	May-15	96.83%	98.40%	96.50%	96.83%	98.80%	93.69%	96.83%	99.20%	96.26%	99.83%	99.19%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		May-15	276	852	92	615	4	197	457	0	835	67	54
	e) Total no. of cells (Sector) in the licensed service area		May-15	10272	30526	5946	22517	6249	14491	6889	21	29886	3432	943

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA	
				GSM Operators										CDMA Operators	
4	No. of POI's having $\geq 0.5\%$ POI congestion														
	No. of POI's having $\geq 0.5\%$ POI congestion		May-15	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		May-15	0	0	0	0	0	0	0	0	0	0	0	0
5	Network Data														
	a) Equipped Capacity of Network in Erlang		May-15	143672	588329	469000	223786	140000	277850	134077	222	592721	176000	42500	
	b) Total traffic in TCBH in erlang (Avg.)		May-15	136161	576453	222708	282796	124298	376920	75342	29	526841	39821	2917	
	c) Total no. of customers served (as per VLR) on last day of the month		May-15	4652111	18228222	4669412	10808512	5826518	8458610	2902340	2403	18288472	2303948	80523	

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(E) Circle – May 15 month														
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Live data	3404	10115	6405	7406	2095	4813	2306	7	9831	1140	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	512.16	2388.00	8855.48	2836.48	412.47	1483.19	182.71	0.00	4390.00	336.18	5.28
	c) BTS Accumulated Downtime	<=2%	Live data	0.21%	0.33%	1.92%	0.53%	0.27%	0.43%	0.11%	0.00%	0.62%	0.41%	0.02%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	7	11	14	3	0	1	0	0	12	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.21%	0.11%	0.22%	0.04%	0.00%	0.02%	0.00%	0.00%	0.12%	0.00%	0.00%	
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.50%	98.93%	98.18%	96.10%	99.38%	97.93%	96.28%	98.55%	98.56%	97.44%	98.38%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.44%	0.40%	0.78%	0.91%	0.03%	0.45%	0.44%	0.31%	0.37%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	1.85%	0.27%	1.30%	1.90%	0.11%	1.06%	1.97%	1.04%	1.44%	0.05%	0.02%	
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Live data	0.59%	0.46%	0.39%	1.15%	0.20%	0.54%	0.91%	0.94%	0.78%	0.48%	0.48%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.43%	2.78%	0.12%	2.87%	0.02%	1.24%	6.24%	0.00%	2.90%	1.97%	3.71%
	c) % of connections with good voice quality	>=95%	Live data	96.87%	98.41%	96.65%	97.01%	98.80%	93.73%	96.93%	99.42%	96.35%	99.81%	99.22%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	250	848	7	645	1	180	430	0	866	68	35
e) Total no. of cells (Sector) in the licensed service area		Live data	10272	30468	5946	22477	6249	14499	6886	21	29886	3432	943	
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	1	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	Uninor UPE	0	0

TABLE: 5

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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
1	Network Availability													
	a) Total no. of BTSs in the licensed service area		Jun-15	3403	10181	6405	7622	2093	4801	2309	7	9909	NP	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jun-15	5438	21483	76097	25708	NP	22237	3987	6	12934	NP	429
	c) BTS Accumulated Downtime	<=2%	Jun-15	0.22%	0.29%	1.65%	0.47%	NP	0.64%	0.24%	0.12%	0.18%	NP	0.19%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jun-15	24	124	108	135	0	94	21	0	62	NP	5
e) Worst affected BTSs due to downtime	<=2%	Jun-15	0.71%	1.22%	1.69%	1.77%	0.00%	1.96%	0.91%	0.00%	0.63%	NP	1.59%	
2	Connection Establishment (Accessibility)													
	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	98.50%	98.87%	98.50%	96.64%	99.37%	97.23%	95.03%	98.73%	98.53%	NP	97.97%
	b) SDCCH/PAGING Congestion	<=1%	Jun-15	0.85%	0.39%	0.71%	0.93%	0.04%	0.70%	0.68%	0.18%	0.34%	NP	0.00%
c) TCH congestion	<=2%	Jun-15	1.97%	0.36%	1.64%	1.84%	0.11%	1.31%	2.93%	0.66%	1.47%	NP	0.22%	
3	Connection Maintenance (Retainability)													
	a) Call Drop Rate (CDR)	<=2%	Jun-15	0.60%	0.50%	1.63%	1.16%	0.21%	0.53%	0.95%	0.94%	0.76%	NP	0.63%
	b) Worst affected cells>3% TCH drop	<=3%	Jun-15	2.68%	2.79%	2.61%	2.69%	0.03%	1.48%	6.78%	0.48%	2.73%	NP	9.09%
c) % of connections with good voice quality	>=95%	Jun-15	96.94%	98.33%	96.50%	97.24%	98.81%	93.72%	96.98%	98.85%	96.77%	NP	99.20%	



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

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jun-15	275	855	155	611	2	214	467	0	811	NP	85
	e) Total no. of cells (Sector) in the licensed service area		Jun-15	10274	30637	5946	22706	6246	14463	6894	21	29735	NP	940
No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion		Jun-15	0	0	0	0	0	0	0	0	0	NP	0
	Name of POI not meeting the benchmark		Jun-15	0	0	0	0	0	0	0	0	0	NP	0
Network Data														
5	a) Equipped Capacity of Network in Erlang		Jun-15	143952	589963	469000	226524	NP	283255	134151	222	590820	NP	42500
	b) Total traffic in TCBH in erlang (Avg.)		Jun-15	135038	546560	228645	275603	NP	375632	75213	26	517327	NP	4188
	c) Total no. of customers served (as per VLR) on last day of the month		Jun-15	4347462	16604447	4619782	10488148	NP	8433868	2850076	5524	17279696	NP	106586

TABLE: 6

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

S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
				GSM Operators										CDMA Operators
Network Service Quality Parameter														
Network Availability														
1	a) Total no. of BTSs in the licensed service area		Live data	3402	10168	6405	7508	2093	4805	2309	7	9861	NP	314
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Live data	556.96	2596.47	8987.96	2224.80	NP	2342.89	384.38	0.00	4068.30	NP	3.13
	c) BTS Accumulated Downtime	<=2%	Live data	0.23%	0.35%	1.95%	0.41%	NP	0.68%	0.23%	0.00%	0.57%	NP	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	7	19	12	4	0	3	5	0	4	NP	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.21%	0.19%	0.19%	0.05%	0.00%	0.06%	0.22%	0.00%	0.04%	NP	0.00%
Connection Establishment (Accessibility)														
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.56%	98.99%	96.98%	97.11%	99.40%	97.60%	96.37%	99.20%	98.82%	NP	98.14%
	b) SDCCH/PAGING Congestion	<=1%	Live data	1.19%	0.46%	0.62%	0.85%	0.03%	0.73%	0.42%	0.20%	0.26%	NP	0.00%
	c) TCH congestion	<=2%	Live data	1.91%	0.22%	1.73%	1.93%	0.11%	1.22%	1.98%	0.27%	1.18%	NP	0.08%
Connection Maintenance (Retainability)														
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.62%	0.41%	0.36%	1.15%	0.20%	0.54%	0.89%	1.75%	0.73%	NP	0.67%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.64%	2.88%	0.13%	2.78%	0.01%	1.53%	6.21%	1.59%	2.43%	NP	7.91%
	c) % of connections with good voice quality	>=95%	Live data	96.94%	98.58%	96.61%	97.12%	98.80%	93.80%	97.03%	98.71%	96.91%	NP	99.20%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	272	881	8	634	1	221	428	1	727	NP	74
	e) Total no. of cells (Sector) in the licensed service area		Live data	10274	30623	5946	22788	6246	14462	6888	21	29886	NP	940
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	NP	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	NP	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



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

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

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE JUNE 15														
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators									CDMA Operators	
Customer Service Quality Parameters														
Metering & Billing Credibility -Post Paid														
1	A) No. of bills issued during the quarter		UPE	4841	463612	257029	280949	58808	92689	NA	NA	1401517	194636	17411
	B) No. of bills disputed including billing complaints during the quarter		UPE	0	104	193	139	43	0	NA	NA	1125	180	0
	C)% of billing complaints during the quarter	<= 0.1%	UPE	0.00%	0.02%	0.08%	0.05%	0.07%	0.00%	NA	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	6394130	18506865	7232154	9996610	5925650	5031974	11567252	25243	17420902	2314554	268503
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		UPE	1	341	2590	5119	5316	0	4835	0	3430	1923	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	UPE	0.00%	0.002%	0.04%	0.05%	0.09%	0.00%	0.04%	0.00%	0.02%	0.08%	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	1	445	2783	15991	5359	0	4835	0	4555	2103	0
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		UPE	1	445	2783	15991	5359	0	4835	0	4555	2103	0



QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE JUNE 15														
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators										CDMA Operators
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		UPE	1	445	2783	15991	5359	0	4835	0	4555	2103	0
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Response time to customers for assistance														
4	A) Total no of calls attempted to customer care/Call center		UPE	22894310	7495934	10047481	26915328	3962814	4220805	35763010	1999	43844035	1634441	48907
	B) Total no. of calls successfully established to customer care/Call center.		UPE	22485498	7495934	9727380	26883412	3910937	4169245	36397200	1999	43844035	1592795	48712
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	UPE	98.21%	100%	96.81%	99.88%	98.69%	98.78%	98.98%	100%	100%	97.45%	99.60%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		UPE	5094587	8544377	3443830	7724407	1380026	1418592	10891385	22455	10001496	447752	35254

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE JUNE 15														
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	UNINOR	VIDEOCON	VODAFONE	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators									CDMA Operators	
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UPE	4718867	7727932	3328468	7711890	1253786	1398586	10793967	21682	9771284	430420	34253
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	UPE	92.63%	90.44%	96.65%	99.84%	90.85%	98.59%	99.11%	96.56%	97.70%	96.13%	97.16%
Termination/closure of service														
5	A) Total No. of requests for Termination / Closure of service received during the quarter		UPE	85	2583	45069	2615	87	1293	NA	NA	1927	699	361
	B) No. of requests for Termination /Closure of service complied within 7 days during the quarter		UPE	85	2583	45069	2615	87	1293	NA	NA	1927	699	361
	C) % of Termination/ Closure of service within 7 days	<=7days	UPE	100%	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%
Time taken for refunds of deposits after closures.														
6	A) No. of Payments/ Refunds due during the quarter		UPE	116	521	2188	1231	226	715	NA	NA	13673	576	174
	B) No. of Payments/ Refunds Cleared during the quarter		UPE	116	521	2188	1231	226	715	NA	NA	13673	576	174
	C) Time taken for refunds of deposits after closures.	100% within 60 days	UPE	100%	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%

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

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

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

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

3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators									CDMA Operators	
RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE														
1	A) Total no of calls attempted to customer care/Call center		UP East	817337	227902	294855	13251151	1128079	NP	31772	26	1462883	NP	1506
	B) Total no. of calls successfully established to customer care/Call center.		UP East	803752	227902	294152	13250173	1116288	NP	31541	26	1462883	NP	1494
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	UP East	98.34%	100%	99.76%	99.99%	98.95%	NP	99.27%	100%	100%	NP	99.20%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		UP East	178194	273777	121727	240132	338611	52328	42765	652	324585	17242	920
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		UP East	176384	264036	119406	240020	337185	33243	41168	639	319144	15704	920
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	UP East	98.98%	96.44%	98.09%	99.95%	99.58%	63.53%	96.27%	98.01%	98.32%	91.08%	100%

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

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of 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 $\leq 0.1\%$

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, **Airtel, Airtel** and **RCOM GSM** remained non-complied for parameter '**Calls answered by Operators (Voice to Voice)**' with their performance as **92.63%, 90.44 and 90.85% respectively.**

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

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

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, **RCOM (GSM) and RCOM (CDMA)** remained under performed for parameter '**calls answered by operators (voice to voice)**' with their performance as **63.53% (way below the benchmark) and 91.08%** against the benchmark of $\geq 95\%$.

6. LIVE CALLING ASSESSMENT



6. LIVE CALLING ASSESSMENT:

6.1 INTER OPERATOR CALLS ASSESSMENT:

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

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT												
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE	VIDEOCON	UNINOR
AIRCEL	UPE	----	100%	100%	100%	100%	100%	100%	96%	100%	100%	100%
AIRTEL	UPE	100%	----	100%	97%	98%	100%	100%	100%	100%	100%	96%
BSNL	UPE	100%	100%	----	100%	100%	100%	100%	100%	100%	100%	100%
IDEA	UPE	100%	100%	100%	----	100%	100%	97%	100%	99%	100%	100%
RCOM GSM	UPE	100%	100%	100%	100%	----	100%	100%	100%	100%	100%	100%
RCOM CDMA	UPE	98%	100%	100%	100%	100%	----	100%	100%	100%	100%	98%
TATA GSM	UPE	100%	100%	100%	95%	100%	99%	----	100%	100%	100%	100%
TATA CDMA	UPE	100%	100%	100%	100%	99%	100%	100%	----	100%	100%	100%
VODAFONE	UPE	100%	100%	100%	100%	100%	100%	100%	100%	----	100%	100%
VIDEOCON	UPE	100%	100%	100%	100%	100%	100%	100%	100%	100%	----	100%
UNINOR	UPE	100%	99%	100%	100%	98%	100%	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 Tata CDMA interconnection was 96%, Airtel to idea, RCOM GSM and Uninor was 97% , 98% & 96% respectively, Idea to Tata GSM, Vodafone was 97% & 99% respectively, RCOM CDMA to Aircel, Uninor was 98%& 98% respectively, Tata GSM to Idea, RCOM CDMA was 95% & 99% respectively, Tata CDMA to RCOM GSM was 99% and Uninor to Airtel, RCOM GSM was 99% & 98% respectively. Thus there was no remarkable problem in interconnection from one operator to other operators.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

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

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, RCOM (GSM), Tata (GSM), RCOM (CDMA) and Tata (CDMA) could achieve their performance as 96.00%, 98.00%, 99.00%, 99.00%, 99.00% and 98.00% 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	1	150	150	150	150	150	0	150	150	0
Total No. of calls Answered	UP East	1	130	125	133	132	119	0	128	121	0
Cases resolved within 4 weeks	UP East	1	130	125	133	132	119	0	128	121	0
%age of cases resolved	UP East	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

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

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING																	
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made per operator	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA CDMA	TATA GSM	UNINOR	VODAFONE		
April'15	UPE	FATEHPUR	FATEHPUR	100	5	x	√	√	√	√	√	√	√	√	√		
				101	5	x	√	√	√	√	√	√	√	√	√	√	
				102	5	√	√	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√
			GAZIPUR	100	5	√	√	√	√	x	x	√	√	√	√	√	√
				101	5	x	√	√	√	x	x	√	√	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√
			BINDKI	100	5	x	√	√	√	x	x	√	√	√	√	√	√
				101	5	x	√	√	√	x	x	√	√	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√
			KHAGA	100	5	x	√	√	√	x	x	√	√	√	√	√	√
				101	5	x	√	√	√	x	x	√	√	√	√	√	√
				102	5	√	√	√	√	x	x	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√
May'15	UPE	GONDA	GONDA	100	5	√	√	√	√	√	√	√	√	√	√		
				101	5	√	√	√	√	√	√	√	√	√	√		
				102	5	√	√	√	√	√	√	√	√	√	√		
				108	5	√	√	√	√	√	√	√	√	√	√		
				1090	5	√	√	√	√	√	√	√	√	√	√		
			BALRAMPUR	100	5	x	√	√	√	√	√	√	√	√	√	√	√
				101	5	x	√	√	√	√	√	√	√	√	√	√	√
				102	5	x	√	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√	√



LEVEL 1 LIVE CALLING																			
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made per operator	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA CDMA	TATA GSM	UNINOR	VODAFONE				
			TULSIPUR	1090	5	√	√	√	√	√	√	√	X	√	√				
				100	5	x	√	√	√	√	√	√	X	√	√	√			
				101	5	x	√	√	√	√	√	√	√	X	√	√	√		
				102	5	x	√	√	√	√	√	√	√	X	√	√	√		
				108	5	√	√	√	√	√	√	√	√	X	√	√	√		
			1090	5	√	√	√	√	√	√	√	√	X	√	√	√	√		
			TARABGANJ	100	5	x	√	√	√	√	√	√	√	√	X	√	√	√	
				101	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				102	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				108	5	√	√	√	√	√	√	√	√	√	√	√	√	√	
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√	√	
			UTRAULA	100	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				101	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				102	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				108	5	√	√	√	√	√	√	√	√	√	√	√	√	√	
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√	√	
			COLONELGANJ	100	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				101	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				102	5	x	√	√	√	√	√	√	√	√	√	√	√	√	
				108	5	√	√	√	√	√	√	√	√	√	√	√	√	√	
				1090	5	√	√	√	√	√	√	√	√	√	√	√	√	√	
			June'15	UPE	JAUNPUR	JAUNPUR	100	5	√	√	√	√	√	√	√	√	√	√	
							101	5	x	√	√	√	√	√	√	√	√	√	√
							102	5	√	√	√	√	√	√	√	√	√	√	√
							108	5	√	√	√	√	√	√	√	√	√	√	√
1090	5	√					√	√	√	√	√	√	√	√	√	√			
KERAKAT	100	5				x	√	√	√	√	√	√	√	√	√	√	√		
	101	5				x	√	√	√	√	√	√	√	√	√	√	√		
	102	5				√	√	√	√	√	√	√	√	√	√	√	√		
	108	5				√	√	√	√	√	√	√	√	√	√	√	√		
	1090	5				√	√	√	√	√	√	√	√	√	√	√	√		

LEVEL 1 LIVE CALLING																
Month	Circle Name	SSA Name	Name of SDCA	Emergency No.	No. of calls made per operator	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA CDMA	TATA GSM	UNINOR	VODAFONE	
			MACHLISHAHAR	100	5	x	√	√	√	√	√	√	√	√	√	
				101	5	x	√	√	√	√	√	√	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√
			MARIYAHU	100	5	x	√	√	√	√	√	√	√	√	√	
				101	5	x	√	√	√	√	√	√	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√
			SHAHGANJ	100	5	x	√	√	√	√	√	√	√	√	√	
				101	5	x	√	√	√	√	√	√	√	√	√	√
				102	5	√	√	√	√	√	√	√	√	√	√	√
				108	5	√	√	√	√	√	√	√	√	√	√	√
				1090	5	√	√	√	√	√	√	√	√	√	√	√

NB: Videocon is not having their coverage in entire Fatehpur, Gonda and Jaunpur SSAs, hence not included in the above table.

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

7. DRIVE TEST



7. OPERATOR ASSISTED DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three select SSA's namely, **Fatehpur, Gonda and Jaunpur** in the months of April, May and June 2015 respectively. The total route Kms covered during the drive tests in respective SSAs was **340 Kms, 445 Kms and 370 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: FATEHPUR SSA (APRIL-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	72	25	107	25	128	27	114	26	68	33	54	NC	96	27	113	28	62	NC	23	NC
		Highway	135	25	126	25	138	22	155	27	110	26	74	26	95	32	132	23	93	34	33	36
		Within City	192	25	187	25	109	29	181	27	178	35	145	25	174	25	130	25	177	25	191	27
		Overall SSA	399	75	420	75	375	78	450	80	356	94	273	51	365	84	375	76	332	59	247	63
2	Blocked Call Rate	Major Road	4.17%	0.00%	0.93%	0.00%	13.28%	3.70%	0.00%	0.00%	1.47%	0.00%	5.56%	NC	0.00%	0.00%	0.88%	0.00%	0.00%	NC	0.00%	NC
		Highway	2.96%	0.00%	1.59%	0.00%	6.52%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.21%	0.00%	0.00%	0.00%	1.08%	0.00%	3.03%	0.00%
		Within City	0.00%	0.00%	0.53%	0.00%	1.83%	0.00%	0.00%	0.00%	0.56%	0.00%	3.45%	0.00%	0.57%	0.00%	1.54%	4.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	1.75%	0.00%	0.95%	0.00%	7.47%	1.28%	0.00%	0.00%	0.56%	0.00%	2.93%	0.00%	1.37%	0.00%	0.80%	1.32%	0.30%	0.00%	0.40%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	2.90%	0.00%	0.00%	0.00%	1.39%	0.00%	0.00%	0.00%	0.00%	0.00%	3.92%	NC	1.04%	0.00%	0.00%	0.00%	1.61%	NC	0.00%	NC
		Highway	0.00%	0.00%	0.00%	0.00%	2.33%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%	0.00%	0.78%	0.00%	2.17%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	0.94%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%	0.00%	0.56%	0.00%	0.00%	0.00%
		Overall SSA	0.51%	0.00%	0.00%	0.00%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	1.51%	0.00%	0.28%	0.00%	0.55%	0.00%	1.21%	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	99.02%	NC	93.20%	NC

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-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	98.29%	99.19%	93.09%	97.81%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.77%	98.38%	95.16%	97.62%
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.13%	98.79%	94.78%	97.73%
		(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	93.60%	99.70%	95.45%	96.46%	92.20%	97.04%	97.23%	99.65%	94.05%	99.81%	97.85%	NC	96.09%	91.81%	96.80%	98.72%	NA	NA	NA
		Highway	96.61%	92.25%	95.91%	99.57%	91.89%	83.76%	98.17%	99.10%	95.25%	99.64%	99.12%	99.29%	95.21%	98.18%	95.96%	93.98%	NA	NA	NA	NA
		Within City	94.76%	97.33%	95.37%	99.85%	91.13%	91.64%	98.44%	98.78%	96.07%	96.85%	98.94%	99.44%	95.78%	99.53%	97.42%	97.54%	NA	NA	NA	NA
		Overall SSA	95.16%	96.43%	95.55%	98.77%	91.95%	91.19%	98.05%	99.17%	95.46%	98.82%	98.80%	99.36%	95.72%	96.58%	96.71%	96.88%	NA	NA	NA	NA
5	Service Coverage																					
	In door (>= - 75dBm)	Major Road	38.35%	99.86%	74.73%	77.06%	36.59%	91.06%	75.64%	83.90%	43.21%	57.83%	13.72%	NC	34.57%	7.04%	93.41%	90.81%	56.94%	NC	15.95%	NC
		Highway	46.94%	78.25%	67.68%	9.43%	30.12%	63.60%	87.00%	100%	63.03%	99.91%	57.87%	79.34%	33.97%	92.19%	95.55%	99.93%	35.36%	100%	18.24%	69.85%
		Within City	63.77%	67.78%	73.03%	15.11%	50.56%	24.83%	88.91%	100%	58.24%	100%	66.54%	97.16%	47.34%	97.77%	99.06%	100%	57.59%	100%	55.46%	99.94%
		Overall SSA	52.87%	81.92%	71.88%	32.06%	39.16%	57.87%	85.02%	94.75%	57.03%	85.50%	54.76%	88.12%	40.62%	67.05%	96.07%	96.64%	51.20%	100%	48.17%	82.76%
	In-vehicle (>= - 85dBm)	Major Road	55.30%	100%	98.02%	99.73%	78.11%	100%	97.51%	100%	72.70%	99.63%	30.26%	NC	64.67%	36.55%	99.94%	100%	79.44%	NC	61.42%	NC
		Highway	70.57%	99.87%	92.67%	60.54%	65.37%	99.60%	99.30%	100%	85.15%	100%	79.35%	100%	76.04%	99.02%	99.92%	100%	85.94%	100%	53.84%	100%
		Within City	96.20%	99.31%	96.58%	98.65%	89.39%	99.19%	99.64%	100%	93.35%	100%	85.57%	100%	92.85%	100%	100%	100%	87.14%	100%	96.49%	100%
		Overall SSA	79.15%	99.73%	95.79%	85.78%	77.43%	99.57%	99.00%	100%	87.09%	99.87%	74.05%	100%	81.26%	79.61%	99.95%	100%	85.53%	100%	88.96%	100%
	Outdoor-in city (>= - 95dBm)	Major Road	80.31%	100%	99.88%	100%	95.37%	100%	99.94%	100%	92.62%	100%	75.75%	NC	93.56%	96.88%	100%	100%	97.83%	NC	89.30%	NC
		Highway	95.33%	100%	99.83%	99.55%	96.76%	100%	99.94%	100%	97.76%	100%	96.32%	100%	96.96%	99.92%	100%	100%	99.29%	100%	97.89%	100%
		Within	99.84%	99.79%	99.94%	99.93%	99.66%	100%	100%	100%	99.34%	100%	97.01%	100%	99.91%	100%	100%	100%	99.50%	100%	99.89%	100%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-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	94.26%	99.93%	99.89%	99.82%	97.40%	100%	99.97%	100%	97.64%	100%	93.06%	100%	97.51%	98.98%	100%	100%	99.16%	100%	98.82%	100%
6	Call Setup Success Rate (>=95%)	Major Road	95.83%	100%	99.07%	100%	94.53%	96.30%	99.12%	100%	98.53%	100%	94.44%	NC	100%	100%	98.23%	100%	100%	NC	100%	NC
		Highway	97.04%	100%	98.41%	100%	93.48%	100%	100%	100%	100%	100%	100%	100%	95.79%	100%	97.73%	95.65%	98.92%	100%	96.97%	100%
		Within City	100%	100%	99.47%	100%	97.25%	100%	99.45%	100%	99.44%	100%	96.55%	100%	99.43%	100%	94.62%	96.00%	100%	100%	100%	100%
		Overall SSA	98.25%	100%	99.05%	100%	94.93%	98.72%	99.56%	100%	99.44%	100%	97.07%	100%	98.63%	100%	96.80%	97.37%	99.70%	100%	99.60%	100%
7	Hand Over Success Rate (HOSR)	Major Road	100%	100%	99.26%	100%	88.20%	100%	100%	100%	100%	100%	100%	NC	98.04%	100%	100%	100%	100%	NC	100%	NC
		Highway	98.18%	100%	100%	100%	90.29%	63.16%	100%	100%	100%	100%	100%	100%	98.80%	100%	96.18%	100%	100%	100%	100%	100%
		Within City	98.11%	100%	99.44%	100%	98.45%	100%	100%	100%	100%	100%	100%	100%	100%	100%	96.43%	100%	100%	100%	100%	100%
		Overall SSA	98.31%	100%	99.57%	100%	91.06%	66.67%	100%	100%	100%	100%	100%	100%	100%	99.60%	100%	97.48%	100%	100%	100%	100%

NA: Not Applicable

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

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

7.2 OPERATOR ASSISTED DRIVE TEST: GONDA SSA (MAY-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	125	26	213	25	NP	NP	190	25	96	32	38	26	194	29	203	25	45	32	63	25	
		Highway	48	26	112	26	NP	NP	111	25	64	26	19	25	126	27	120	25	25	32	38	25	
		Within City	195	25	114	25	NP	NP	172	25	177	26	87	26	144	31	105	25	105	33	156	25	
		Overall SSA	368	77	439	76	NP	NP	473	75	337	84	144	77	464	87	428	75	175	97	257	75	
2	Blocked Call Rate	Major Road	2.40%	0.00%	0.00%	0.00%	NP	NP	2.63%	0.00%	0.00%	0.00%	2.63%	0.00%	1.55%	3.45%	1.97%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highway	8.33%	0.00%	0.00%	0.00%	NP	NP	1.80%	0.00%	0.00%	0.00%	10.53%	0.00%	3.17%	3.70%	0.83%	0.00%	12.00%	0.00%	0.00%	0.00%	
		Within City	0.51%	0.00%	1.75%	0.00%	NP	NP	1.16%	0.00%	0.00%	0.00%	3.45%	0.00%	0.69%	0.00%	0.95%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Overall SSA	2.17%	0.00%	0.46%	0.00%	NP	NP	1.90%	0.00%	0.00%	0.00%	4.17%	0.00%	1.72%	2.30%	1.40%	0.00%	1.71%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.00%	0.00%	NP	NP	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.52%	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highway	0.00%	0.00%	0.89%	0.00%	NP	NP	0.92%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	13.64%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	NP	NP	1.18%	0.00%	0.00%	0.00%	1.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.23%	0.00%	NP	NP	0.86%	0.00%	0.00%	0.00%	0.72%	0.00%	0.22%	0.00%	0.24%	0.00%	1.74%	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	99.51%	100%	96.66%	96.89%	

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-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	99.47%
	Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.71%	100%	96.03%	97.14%
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.63%	100%	96.18%	96.28%
(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	98.46%	99.44%	95.78%	99.72%	NP	NP	94.45%	99.31%	93.76%	99.62%	99.54%	100%	93.77%	99.72%	95.78%	99.02%	NA	NA	NA	NA	
	Highway	99.25%	98.99%	95.22%	99.70%	NP	NP	95.32%	99.77%	91.86%	99.29%	99.64%	100%	93.13%	96.67%	95.42%	96.64%	NA	NA	NA	NA	
	Within City	97.95%	99.72%	97.41%	99.68%	NP	NP	97.43%	98.48%	95.46%	96.46%	99.40%	100%	90.32%	98.42%	96.82%	98.26%	NA	NA	NA	NA	
	Overall SSA	98.28%	99.38%	96.05%	99.70%	NP	NP	95.74%	99.19%	94.31%	98.54%	99.46%	100%	92.55%	98.26%	95.94%	97.97%	NA	NA	NA	NA	
Service Coverage																						
5	In door (>= - 75dBm)	Major Road	36.18%	63.29%	64.95%	99.56%	NP	NP	24.85%	48.36%	39.72%	92.27%	23.55%	64.51%	37.87%	99.60%	86.90%	100%	19.36%	100%	78.14%	100%
		Highway	27.26%	96.63%	66.36%	99.99%	NP	NP	29.87%	47.24%	45.48%	99.44%	29.37%	97.69%	34.12%	58.20%	94.22%	100%	15.51%	99.79%	59.62%	99.64%
		Within City	65.11%	96.44%	87.72%	100%	NP	NP	48.52%	43.94%	69.73%	67.66%	59.42%	100%	60.36%	41.80%	98.48%	100%	58.07%	86.76%	84.68%	99.97%
		Overall SSA	47.23%	85.49%	71.14%	99.85%	NP	NP	34.68%	46.52%	56.76%	86.88%	46.44%	87.49%	43.37%	65.12%	91.83%	100%	42.61%	95.19%	79.31%	99.87%
In-vehicle (>= - 85dBm)	Major Road	60.98%	97.28%	93.24%	99.95%	NP	NP	70.52%	94.89%	71.65%	100%	60.22%	98.75%	67.81%	100%	98.54%	100%	54.43%	100%	98.77%	100%	
	Highway	53.60%	100%	91.97%	100%	NP	NP	80.83%	97.29%	77.83%	100%	65.35%	100%	67.42%	99.50%	99.98%	100%	45.32%	100%	98.22%	100%	
	Within City	92.65%	100%	99.33%	100%	NP	NP	93.62%	97.89%	97.01%	100%	85.39%	100%	91.74%	93.60%	100%	100%	87.08%	100%	99.24%	100%	
	Overall SSA	73.48%	99.10%	94.47%	99.98%	NP	NP	81.39%	96.68%	86.29%	100%	76.42%	99.59%	74.65%	97.48%	99.30%	100%	73.29%	100%	98.97%	100%	
Outdoor-in city (>= - 95dBm)	Major Road	83.87%	99.93%	99.79%	99.98%	NP	NP	94.04%	99.94%	92.75%	100%	90.28%	100%	94.87%	100%	100%	100%	90.63%	100%	99.99%	100%	
	Highway	82.59%	100%	99.75%	100%	NP	NP	98.22%	99.90%	96.15%	100%	93.76%	100%	96.31%	99.90%	100%	100%	90.92%	100%	100%	100%	
	Within City	99.65%	100%	100%	100%	NP	NP	99.67%	99.99%	99.97%	100%	96.35%	100%	98.84%	99.90%	100%	100%	98.87%	100%	100%	100%	

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-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	90.51%	99.98%	99.83%	99.99%	NP	NP	97.08%	99.94%	97.22%	100%	94.47%	100%	96.41%	99.93%	100%	100%	95.72%	100%	100%
6	Call Setup Success Rate (>=95%)	Major Road	97.60%	100%	100%	100%	NP	NP	97.37%	100%	100%	100%	97.37%	100%	98.45%	96.55%	96.55%	100%	100%	100%	98.41%	100%
		Highway	91.67%	100%	100%	100%	NP	NP	98.20%	100%	100%	100%	89.47%	100%	95.24%	96.30%	96.67%	100%	88.00%	100%	100%	100%
		Within City	99.49%	100%	98.25%	100%	NP	NP	98.84%	100%	100%	100%	96.55%	100%	98.61%	100%	99.05%	100%	100%	100%	99.36%	100%
		Overall SSA	97.83%	100%	99.54%	100%	NP	NP	98.10%	100%	100%	100%	95.83%	100%	97.63%	97.70%	97.20%	100%	98.29%	100%	99.22%	100%
7	Hand Over Success Rate (HOSR)	Major Road	100%	100%	99.20%	100%	NP	NP	100%	100%	100%	100%	100%	100%	99.55%	100%	99.54%	100%	100%	100%	100%	100%
		Highway	100%	100%	99.04%	100%	NP	NP	100%	100%	88.41%	100%	100%	100%	98.40%	100%	96.00%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	NP	NP	100%	100%	99.41%	100%	100%	100%	98.30%	100%	98.82%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	99.33%	100%	NP	NP	100%	100%	97.05%	100%	100%	100%	98.72%	100%	98.36%	100%	100%	100%	100%	100%

NA: Not Applicable, NP: Not Provided:

BSNL has not provided the drive test report.

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

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

7.3 OPERATOR ASSISTED DRIVE TEST: JAUNPUR SSA (JUNE-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	70	25	78	25	NP	NP	68	29	68	29	39	26	96	27	82	25	51
Highway	65	25			97	31	NP	NP	95	26	60	27	55	26	95	32	131	25	72	32	31	28
Within City	106	25			130	27	NP	NP	111	25	134	26	130	26	174	25	144	25	163	32	114	35
Overall SSA	241	75			305	83	NP	NP	274	80	262	82	224	78	365	84	357	75	286	97	159	90
2	Blocked Call Rate	Major Road	0.00%	0.00%	2.56%	0.00%	NP	NP	0.00%	0.00%	2.94%	0.00%	0.00%	0.00%	0.00%	0.00%	2.44%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	1.54%	0.00%	3.09%	0.00%	NP	NP	2.11%	0.00%	1.67%	0.00%	0.00%	0.00%	4.21%	0.00%	0.00%	0.00%	1.39%	0.00%	0.00%	0.00%
		Within City	1.89%	0.00%	0.00%	0.00%	NP	NP	0.90%	0.00%	0.00%	0.00%	1.54%	0.00%	0.57%	0.00%	0.00%	0.00%	1.23%	0.00%	0.00%	0.00%
		Overall SSA	1.24%	0.00%	1.64%	0.00%	NP	NP	1.09%	0.00%	1.15%	0.00%	0.89%	0.00%	1.37%	0.00%	0.56%	0.00%	1.05%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.04%	0.00%	1.25%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	1.56%	0.00%	0.00%	0.00%	NP	NP	1.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.77%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.96%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.48%	0.00%	0.88%	0.00%
		Overall SSA	0.84%	0.00%	0.00%	0.00%	NP	NP	0.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.28%	0.00%	0.57%	0.00%	1.41%	0.00%	0.64%	0.00%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-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	
Percentage connections with good voice quality (=>95%)																							
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Road	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.28%	99.68%	98.84%	97.69%	
		Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.73%	99.94%	96.96%	94.37%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.97%	100%	96.45%	100%
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.21%	99.87%	96.72%	97.57%
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	97.80%	97.38%	92.18%	99.59%	NP	NP	89.18%	98.07%	92.62%	98.84%	99.26%	99.91%	96.09%	91.81%	96.34%	99.61%	NA	NA	NA	NA	
		Highway	96.48%	99.38%	93.20%	99.52%	NP	NP	89.25%	97.60%	94.81%	99.68%	99.43%	100%	95.21%	98.18%	95.69%	99.19%	NA	NA	NA	NA	
		Within City	96.88%	97.76%	94.65%	99.30%	NP	NP	94.72%	95.74%	93.03%	99.93%	99.10%	100%	95.78%	99.53%	96.51%	98.72%	NA	NA	NA	NA	
		Overall SSA	97.03%	98.17%	93.56%	99.47%	NP	NP	91.47%	97.19%	93.31%	99.47%	99.21%	99.97%	95.72%	96.58%	96.17%	99.17%	NA	NA	NA	NA	
Service Coverage																							
5	In door (>= -75dBm)	Major Road	37.54%	42.38%	53.12%	92.25%	NP	NP	82.93%	100%	45.71%	75.29%	42.50%	100%	34.57%	7.04%	94.10%	99.80%	16.70%	21.80%	8.10%	95.00%	
		Highway	38.47%	15.29%	55.73%	87.33%	NP	NP	84.33%	100%	28.97%	100%	47.27%	99.72%	33.97%	92.19%	90.63%	100%	18.14%	99.98%	11.94%	0.00%	
		Within City	48.28%	23.68%	69.15%	100%	NP	NP	92.46%	100%	53.21%	52.62%	57.42%	100%	47.34%	97.77%	96.76%	100%	46.17%	0.26%	58.79%	99.97%	
		Overall SSA	42.11%	27.11%	60.72%	93.06%	NP	NP	87.29%	100%	45.98%	76.17%	52.28%	99.90%	40.62%	67.05%	93.94%	99.94%	33.82%	40.34%	46.79%	66.01%	
	In-vehicle (>= -85dBm)	Major Road	68.25%	98.55%	87.30%	99.95%	NP	NP	98.32%	100%	65.08%	99.84%	75.64%	100%	64.67%	36.55%	99.90%	100%	68.59%	98.92%	41.90%	100%	
		Highway	64.51%	95.08%	92.05%	100%	NP	NP	98.39%	100%	64.95%	100%	70.29%	100%	76.04%	99.02%	99.67%	100%	62.73%	100%	60.68%	0.00%	
		Within City	86.08%	98.30%	96.08%	100%	NP	NP	99.27%	100%	89.72%	99.65%	79.92%	100%	92.85%	100%	100%	100%	84.81%	99.14%	95.45%	100%	
		Overall	74.25%	97.31%	92.55%	99.99%	NP	NP	98.73%	100%	77.98%	99.83%	76.85%	100%	81.26%	79.61%	99.86%	100%	76.40%	99.35%	85.27%	68.00%	

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



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			SSA																			
	Outdoor-in city (>= 95dBm)	Major Road	89.55%	100%	99.61%	99.98%	NP	NP	99.59%	100%	97.66%	100.08%	95.14%	100%	93.56%	96.88%	100%	100%	97.21%	100%	86.05%	100%
		Highway	88.13%	99.97%	99.75%	100%	NP	NP	99.65%	100%	94.95%	100%	93.04%	100%	96.96%	99.92%	100%	100%	89.48%	100%	86.64%	51.82%
		Within City	98.10%	100%	99.86%	100%	NP	NP	99.95%	100%	99.64%	100%	97.46%	100%	99.91%	100%	100%	100%	98.30%	100%	99.47%	100%
		Overall SSA	92.54%	99.99%	99.76%	100%	NP	NP	99.76%	100%	98.10%	100.03%	95.98%	100%	97.51%	98.98%	100%	100%	95.96%	100%	96.22%	84.58%
6	Call Setup Success Rate (>=95%)	Major Road	100%	100%	97.44%	100%	NP	NP	98.53%	100%	97.06%	96.55%	100%	100%	100%	100%	97.56%	100%	100%	100%	100%	100%
		Highway	98.46%	100%	96.91%	100%	NP	NP	95.79%	100%	95.00%	100%	100%	100%	95.79%	100%	99.24%	100%	98.61%	100%	93.55%	100%
		Within City	98.11%	100%	100%	100%	NP	NP	99.10%	100%	100%	100%	98.46%	100%	99.43%	100%	99.31%	100%	98.77%	100%	100%	100%
		Overall SSA	98.76%	100%	98.36%	100%	NP	NP	97.81%	100%	98.09%	98.78%	99.11%	100%	98.63%	100%	98.88%	100%	98.95%	100%	98.74%	100%
7	Hand Over Success Rate (HOSR)	Major Road	95.45%	100%	99.05%	100%	NP	NP	96.43%	100%	96.43%	100%	100%	100%	98.04%	100%	100%	100%	100%	100%	100%	100%
		Highway	93.94%	100%	100%	100%	NP	NP	96.77%	100%	95.00%	100%	100%	100%	98.80%	100%	96.55%	100%	100%	100%	100%	100%
		Within City	97.80%	100%	99.52%	100%	NP	NP	98.89%	100%	96.97%	100%	100%	100%	100%	100%	95.73%	100%	100%	100%	100%	100%
		Overall SSA	96.58%	100%	99.57%	100%	NP	NP	97.32%	100%	96.36%	100%	100%	100%	99.60%	100%	97.25%	100%	100%	100%	100%	100%

NA: Not Applicable, NP: Not Provided

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

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

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

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Name of SSA	Day 1		Day 2		Day 3	
	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
FATEHPUR	Khaga & Fatehpur / 120 Kms	<p>Highway (Bilinda, Haswa, Ambapur,Usraina, Sitapur, Thariyaon, Teni) ,</p> <p>Major Roads (Hardo, Vijayeeipur, Sarauli, Kishanpur) ,</p> <p>Fatehpur City (Joniha Bus Stand, Radha Nagar, Deviganj, Hariharganj, Collectorganj, ITI Road, Patel Nagar, DM Awas, Abu Nagar, Lala Bazar, Jwalaganj) ,</p> <p>Khaga City (Bus Stand, Naubasta Road, Sujrahi, Maheshwari Market, Ram Nagar, Railway Station)</p> <p>Indoor: Puttu Dhaba</p>	Bindki & Fatehpur / 100 Kms	<p>Highway (Nauwabag, Allipur, Chitaura, Korai, Saura, UPSIDC, Malwa, Rewari, Guneer, Mauhar, Chaudagara) ,</p> <p>Major Roads (Manjhil Gaon, Bakewar, Kansakhera, Khajuha) ,</p> <p>Bindki City (Khajuha Road, Lalauli Chauraha, Tehsil Compound, Gandhi Chauraha, Jahanpur, Kunwarpur Road) ,</p> <p>Fatehpur City (New Tehsil, Patharkata Chauraha, Bindki Bus Stand, Dak Banglow, Tambeshwar</p> <p>Indoor: BSNL Office (Fatehpur)</p>	Gazipur / 120 Kms	<p>Highway-(Bahuwa, Ladigawa, Khatauli, Shah)</p> <p>Major Roads-(Ramwa, Churiyani,Ayah) ,</p> <p>Gazippur City-(Fatehpur Road, Asother Road, Bahuwa Road)</p> <p>Fatehpur City (Ganga Nagar, PAC Compound, SP Office, Railway Station)</p> <p>Indoor: Railway Station (Fatehpur)</p>
GONDA	Tarabganj & Colonelganj / 115 Kms	<p>Highway (colonelganj-chaori chauraha-balpur-chaupal sagar-portarganj) .</p> <p>Major Road (Gonda-Godwaghat-madhampur-azadnagar-belsar-parsada-tarabganj-mohana paraspur-sisamau-colonelganj)</p> <p>Within City –Tarabganj</p>	Utrawla , Balrampur & Tulsipur / 230 Kms	<p>Highway (tulsipur-laukahwa-shivanagar-bizalipur-balrampur-bloming buds-jaiprabha gram-itiyathok-bahlolpur-subhagpur-jainagar gonda)</p> <p>Major Roads (gonda-salpur-alwal deoriya-dhanepur-babaganj-mahadeyiya-chamrupur-utrawla.</p>	Gonda / 100 Kms	<p>Highway (gonda-mauruti chauraha-mishrauliya-rudrapur munderwa)</p> <p>Major Roads (jankinagar-kuchehri road-kuchehari railway station-pac campus-pant nagar-bsa office-vikas bhawan-jail road-fci chauraha-iti chauraha)</p>

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
		(tarabganj market-thana road-tehsil office-tarabganj block) , Within City – Colonelganj (colonelganj chauraha-huzurpur road-railway station-chauk market) Indoor: Krishi Vibhaag Karyala , Colonelganj		Within City-Utraula (fakkaddas mandir-shyama prasad mukherji chauraha-rafinagar market-badi masjid) , Within City –Tulsipur (balrampur chauraha-harraiya chauraha-lal chauraha-hanumangarhi mandir-nai bazar). Within City-Balrampur (veer vinay chauk-kachehari-sekhuiya chauraha-district hospital-ambedkar tiraha-kotwali-bhagwatiganj) Indoor: Pathik Hotel , Balrampur		Within City : Gonda (Raja Marriage Hal-Gandhi Vidya Mandir-Faizabad Road Tiraha-Gonda chauk-Police Chauki Mahraiganj-Malitola-Fatima College-Avas vikas-Badgaon Police Chauki-Jainarayan chauraha-Jainagra-District Hospital-Jal Kal Office-LBS Chauraha) Indoor: BSNL Office, Gonda
JAUNPUR	Machlishahar & Mariyahu / 150 Kms	Highway (Ibrahimabad, Sikrara, Raiya, Soitha, Subaspur, Ramdayal Ganj). Major Road (Aruawan, Baderi, Belwa, Rajapur). Within City (Bhandari Railwaystation, Jasses Crossing, Vajidpur, Nai Ganj, Olanganj, Machli Sehar, Mariyahu) Indoor: Jaunpur Junction	Shahganj & Jaunpur / 120 Kms	Highway (Khanpur, Purvanchal University, Sarai khajwa, Gurani, Kheta Sarai). Major Road (Kheta Sarai, Guran, Sarai khajwa, Purvanchal University, Khanpur). Within City (Khawajgitola, Shakarmandi, Sahganj Railway station Raod, Kotwali, Shree Ram Nagar Road) Indoor: Purvanchal University, Jaunpur	Kerakat & Jaunpur / 100 Kms	Highway (Chukiya Dham Mod, Dharmapur Bazar, Muftiganj, Murtazabad) , Major Road (Murtazabad, Muftigan, Dharmapur Bazar, Chukiya Dham Mod). Within City (Olanganj, Umerpur, Vajidpur, Line Bazar, Kachahari, Kerakat). Indoor: BSNL Office, Jaunpur

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF FATEHPUR SSA – APRIL 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	Khaga & Fatehpur	Poor Rx Level and Rx Quality in Vijaypur.	Bindki & Fatehpur	Poor Rx Level and Rx Quality Near Shahjahanpur.	Gazipur	Poor Rx Level and Rx Quality in Khatauli Village.
2	AIRTEL		They have Good Rx Level and Rx Quality in Covered SDCA's.		Poor Rx Quality Near Daeri Buzrg.		They have Good Rx Level and Rx Quality in Covered SDCA's.
3	BSNL		NP		NP		NP
4	TATA GSM		Poor Rx Level and Rx Quality in Khaga City.		Poor Rx Level and Rx Quality in Guneer, Sarai Shahzada, Chaudagra.		Poor Rx Level and Rx Quality near Ustraini and Bahua to Sultanpur Highway.
5	TATA CDMA		Poor Rx Level and Rx Quality in Vijayeeपुर & in Khaga City.		Poor Rx Level and Rx Quality in Guneer, Sarai Shahzada, Chaudagra.		Poor Rx Level and Rx Quality near Ustraini and Bahua to Sultanpur highway.
6	IDEA		They have Good Rx Level and Rx Quality in Covered SDCA's.		They have Good Rx Level and Rx Quality in Covered SDCA's.		They have Good Rx Level and Rx Quality in Covered SDCA's.
7	RCOM GSM		Poor Rx Level and Rx Quality in Khaga City.		Poor Rx Level and Rx Quality Near the Outskirts of Bindki.		Poor Rx Level and Rx Quality in Gazipur City and Khatauli.
8	RCOM CDMA		Poor Rx Level and Rx Quality in Vijayeeपुर & in Khaga City.		Poor Rx Quality Near the Outskirts of Bindki.		Poor Rx Level and Rx Quality in Gazipur city and Khatauli.
9	UNINOR		Poor Rx Level and Rx Quality Near Khaga Outskirts.		Poor Rx Level and Rx Quality in Shrikantpur Village.		Poor rx Level and rx Quality in Pakhrauli Village, Lagqawa, Khatoli Village, Churiyani Village and Near Fatehnagar Kaswa Village.
10	VODAFONE		They have Good Rx Level and Rx Quality in Covered SDCA's.		They have Good Rx Level and Rx Quality in Covered SDCA's.		They have Good Rx Level and Rx Quality in Covered SDCA's.

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF GONDA SSA – MAY 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	Tarabganj & Coloneiganj	Poor Rx Level and Rx Quality in Sisai, Jarauli.	Utrawla , Balrampur & Tulsipur	Poor Rx Level and Rx Quality in Sonbarsa to lakhnipur, Baganlahi, Tribhuvan Nagar.	Gonda	Poor Rx Level and Rx Quality in gonda to kurha,Chilbila Kahttipur.
2	AIRTEL		Poor Rx Quality Near Vishnupur Kalan.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.
3	BSNL		NP		NP		NP
4	TATA GSM		Poor Rx Level and Rx Quality in Harshapur, Azad Nagar , Tarabganj & Chakraut Bazar.		Poor Rx Level and Rx Quality in Jharkhandi, Vishunpur, Salpur, Aalawal, Babaganj & Adari, Kaupawa Sherpur, Dari Chaura, Galibpur.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
5	TATA CDMA		Poor Rx Level and Rx Quality in Madhopur , Azadnagar , Belsar & Chaupal Sagar.		Poor Rx Level and Rx Quality in Aiprabhagram-Itiya Thok-Bahloipur-Subhagpur-Jainagara & Alwal Devoriya-Dhanepur-Babaganj.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
6	IDEA		Poor Rx Level and Rx Quality Near Vishnupur Kalan and Ragadganj.		Poor Rx Level and Rx Quality Near Bhakwara.		Poor Rx Level and Rx Quality Near Pahrwa.
7	RCOM GSM		Poor Rx Level and Rx Quality in Ragadganj,tarabganj , chauri chauraha & Balpur.		Poor Rx Level and Rx Quality in Iddharthaganj, Maharajganj, Bijlipur, Itiyathok & Utrawla, Mahadaiya Bazar , Tulsipur, Belha Mode.		Poor Rx Level and Rx Quality in BABAGUNJ & DHANEPUR.

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
8	RCOM CDMA		Poor Rx Level and Rx Quality in Madhopur , Azadnagar , Belsar & Chaupal Sagar.		Poor Rx Level and Rx Quality in Aiprabhagram-Itiya Thok-Bahlolpur-Subhagpur-Jainagara & Alwal Devoriya-Dhanepur-Babaganj.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
9	UNINOR		Poor Rx Lvel and Rx Quality Near Anta Village, Jarauli, Sisal, Dhanpati.		Poor Rx Level and Rx Quality Near Bhawanikhurd and Bhishambar.		Poor Rx Level and Rx Quality Near Pandari Basen and naraura village.
10	VODAFONE		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF JAUNPUR SSA – JUNE 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	Machlishahar & Mariyahu	Poor Rx Level and Rx Quality in Baderi , Bibipur & Gahora.	Shahganj & Jaunpur	Poor Rx Level and Rx Quality in Barganva , Majdeeha.	Kerakat & Jaunpur	Poor Rx Level and Rx Quality in Bhuleamau , Dewkalpur.
2	AIRTEL		They have Overall Good Rx Level and Rx Quality in covered SDCA's.		They have Overall Good Rx Level and Rx Quality in covered SDCA's.		Poor Rx Quality Near Kabbiruddinpur.
3	BSNL		NP		NP		NP
4	TATA GSM		Poor Rx Level and Rx Quality in Fatehgang, Manikpur & Awabria Bazar, Baderi Bazar.		Poor Rx Level and Rx Quality Near Imranganj.		Poor Rx Level and Rx Quality in Rasulpur, Rampur, Muftiganj.
5	TATA CDMA		Poor Rx Level and Rx Quality in Sikrara,Pratapganj & Ramthalganj, BelvaBazar.		Poor Rx Level and Rx Quality in Khanpur,Saryan Khwaza,Koeridhia Chowk.		Poor Rx Level and Rx Quality in Etali Bazar,Muftiganj.
6	IDEA		They have Overall Good Rx Level and Rx Quality in covered SDCA's.		They have Overall Good Rx Level and Rx Quality in covered SDCA's.		They have Overall Good Rx Level and Rx Quality in covered SDCA's.
7	RCOM GSM		Poor Rx Level and Rx Quality in Sikrara & Aruawawa, Jangiganj.		Poor Rx Level and Rx Quality in Kheta Sarai, Sabarhad,Mani Kalan.		Poor Rx Level and Rx Quality in Muftiganj.
8	RCOM CDMA		Poor Rx Level and Rx Quality in Sikrara & Aruawawa, Jangiganj.		Poor Rx Level and Rx Quality in Kheta Sarai, Sabarhad,Mani Kalan.		Poor Rx Level and Rx Quality in Muftiganj.
9	UNINOR		Poor Rx Level and Rx Quality Near Kisunpur Village, Moinuddinpur, Ramdayalganj, Jamalpur.		Poor Rx Level and Rx Quality Near Sindhai Village and Akbarshahpur Village.		Poor Rx Level and Rx Quality Near Kamaruddinpur Village, Kohana Village, Ahan and Jagdishpur Village.
10	VODAFONE		They have Overall Good Rx Level and Rx Quality in covered SDCA's.		They have Overall Good Rx Level and Rx Quality in covered SDCA's.		They have Overall Good Rx Level and Rx Quality in covered SDCA's.

DRIVE TEST TABLE: 8

NO NETWORK COVERAGE STATUS OF DRIVE TEST – APRIL TO JUNE 15

S. No	Month of Drive Test	Name of Operators	SSA	SDCA	No Coverage Area	ICR Status
1	April'15	Aircel	Fatehpur	Bindki, Fatehpur , Gazipur , Khaga	Bindki-(Bakewar, Kunwarpur, Shahjahanpur) , Gazipur-(Khatauli, Jindpur, Chakaskaran, Karsawa) , Khaga-(Vijayeeipur)	No
		TATA CDMA			Bindki - (Allipur, Chitaura, Korai, Saura, Upsidc, Rewari, Guneer, Mauhar, Chaudagara, Khajuha, Khajuha Road) , Fatehpur - (Puttu Dhaba, Usraina, Sitapur, Thariyaon, Teni) , Khaga - (Hardo, Vijayeeipur, Sarauli, Kishanpur)	No
		TATA GSM			Bindki - (Bindki Road , Chaur Dagara, Bakewar, Darbesha Bad, Khajuha, Takaiuli, Mohamdpur) , Gazipur - (Bahua To Sultanpur No Coverage Highway, Sultaanpur To Shah To Taini) , Khaga - (Harishpur, Palia Pur, Trilochanpur, Vijayi Pur)	No
		RCOM CDMA			Bindki - (Akbarabad Bakewar, Khajua, Gandharwi, Araipur, Nandpur, Bazipur, Aliabad) , Gazipur - (Churyani, Gazipur, Bahua, Khatauli, Shah) , Khaga - (Belanda, Chak Barari, Mohammadpur Nawada, Kashimpur, Faridpur, Telahi Buzurg, Vijaypur, Haswa, Kashimpur)	No
		RCOM GSM			Bindki - (Akbarabad, Bakewar, Khajua, Gandharwi, Araipur, Nandpur, Bazipur, Aliabad) , Gazipur - (Churyani, Gazipur, Bahua, Khatauli, Shah) , Khaga - (Belanda, Chak Barari, Mohammadpur Nawada, Kashimpur, Faridpur, Telahi Buzurg, Vijaypur, Haswa, Kashimpur)	ICR With Aircel
		UniNor			Bindki - (Shrikantpur Village) , Fatehpur - (Adgawa Village & Rasulpur Bakewar Village)	No
		Airtel			No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Vodafone			No Coverage Issue	No
		Idea			No Coverage Issue	No
2	May'15	Aircel	Gonda	Balrampur , Tulsipur, Tarabganj, Colonelganj , Utraula , Gonda	Tarabganj - (Persada, Sisai, Jarauli) , Utraula - (Sony Kapoor, Sonbarsa To Lakahnipur, Baganlahi, Tribhuwan Nagar, Mehmood Nagar To Deorawan) , Gonda - (Gonda To Kurha, Chilbila Kahttipur)	No

S. No	Month of Drive Test	Name of Operators	SSA	SDCA	No Coverage Area	ICR Status
		TATA CDMA			Tulsipur - (Tulsipur-Laukahwa-Shivanagar-Bizalipur-Bloming Buds-Jaiprabhagram-Itiya Thok-Bahlolpur-Subhagpur-Jainagara) , Tarabganj - (Godwa Ghat-Madhampur-Azadnagar-Belsar-Parsada-- Mohna-Parasapur-Sisamau) , Colonelganj - (Chauri Chauraha-Balpur-Chaupal Sagar-Portargan) , Utraula - (Salpur-Alwal Devoriya-Dhanepur-Babaganj-Mahadeyiya-Chamrupur)	No
		TATA GSM			Balarampur - (Jharkhandi, Vishunpur, Salpur, Aalawal, Babaganj, Gumari, Mahdeyeya, Chamarupur) , Tulsipur - (Balarampur To Tulsipur Road No Coverage, Ramadih Tulsipur, Devtaha Area Balrampur) , Tarabganj - (Jhanjhari, Belsari Road, Madhawpur, Harshapur, Aajad Nagar.Tarab Gunj, Ragar Gunj, Mohan) , Colonelganj - (Dehras.Basantpur.Chakraut Bazar, Parasa Gaundi, Harsingh Pur, Balpur) , Utraula - (Padari, Kaupawa Sherpur, Dari Chaura, Galibpur)	No
		RCOM CDMA			Balrampur - (Itiathok) , Tulsipur - (Tulsipur) , Utraula - (Utraula &Mahadeya Bazar) , Gonda - (Babaganj & Dhanepur)	No
		RCOM GSM			Gonda - (Dhanepur, Babaganj) , Tarabganj - (Ragadganj, Tarabganj, Paraspur) , Colonelganj - (Chauri Chauraha, Balpur, Chaupal Sagar, Colonelganj) , Balrampur - (Siddharthaganj, Maharajganj, Bijlipur, Itiyathok) , Tulsipur - (Tulsipur, Belha Mod, Ramadih) , Utraula - (Utraula, Mahadaiya Bazar)	ICR With Aircel
		UniNor			Colonelganj - (Didi Kalan Village)	No
		Airtel			No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Vodafone			No Coverage Issue	No
		Idea			No Coverage Issue	No
3	June'15	Aircel	Jaunpur	Jaunpur , Kerakat , Machlishahar , Mariyahu , Shahganj	Kerakat - (Bhuleamau , Dewkalpur) , Machlishahar - (Aruawan , Baderi , Bibipur) , Mariyahu - (Gahora) , Shahganj - (Barganva , Majdeeha)	No
		TATA CDMA			Kerakat - (Etali Bazar, Muftiganj) , Machlishahar - (Lala Bazar, Sikrara, Pratapganj, Samadgan) , Mariyahu - (Setlaganj, Ramthalganj, Belvabazar) , Shahganj - (Khanpur, Saryan Khwaza,	ICR With RCOM In Whole SSA Except Jaunpur City

S. No	Month of Drive Test	Name of Operators	SSA	SDCA	No Coverage Area	ICR Status
					Koeridhia Chowk, Japtapur, Kheta Saryan)	
		TATA GSM			Kerakat - (Rasulpur, Rampur, Muftiganj) , Machlishahar - (Sikrara, Fatehgang, Manikpur, Kulhnamau) , Mariyahu - (Ariwaba Bazar, Baderi Bazar, Jangi Road, Belwa Bazar, Pitambarpur, Rampur Khash, Palli, Shitalganj)	No
		RCOM CDMA			Fahganj, Khwaja Sarai) , Kerakat - (Muftiganj) , Machlishahar - (Sikrara) , Mariyahu - (Aruawawa, Jangiganj, Belwa Bazar) , Shahganj - (Kheta Sarai, Sabarhad, Mani Kalan)	No
		RCOM GSM			Fahganj, Khwaja Sarai) , Kerakat - (Muftiganj) , Machlishahar - (Sikrara) , Mariyahu - (Aruawawa, Jangiganj, Belwa Bazar) , Shahganj - (Kheta Sarai, Sabarhad, Mani Kalan)	ICR With Aircel
		UniNor			Kerakat - (Near Muftiganj) , Shahganj - (B/W Sarai Kajwa To Purvanchal)	No
		Airtel			No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Vodafone			No Coverage Issue	No
		Idea			No Coverage Issue	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 April -15**, drive test was conducted across **Fatehpur SSA** covering Khaga , Fatehpur Bindki and Gazipur 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: Voice Quality (91.95%- outdoor)/ (91.19% - indoor), CSSR (94.93%), Blocked Call rate (7.47%)

Tata (CDMA): Voice Quality (94.78%)

- (ii) **In the Month of May -15**, drive test was conducted across **Gonda SSA** covering Tarabganj , Colonelganj Utrawla , Balrampur , Tulsipur and Gonda SDCAs. The performance of some of the service providers on SSA level remained under performed for different network parameters. BSNL has not provided the drive test reports; hence no data is entered in the table. On SSA level, **Non-compliance** of the service providers was as follows:

RCOM GSM: Block Call rate (4.17%).

Tata GSM, Tata CDMA and Uninor: Voice Quality (94.31%), (94.80% - indoor) and (92.55%) respectively.

- (iii) **In the month of June-15**, drive test was conducted across **Jaunpur SSA covering** Machlishahar, Mariyahu Shahganj & Jaunpur Kerakat & Jaunpur SDCAs. BSNL has not provided the drive test reports, hence no data is entered in the table. On SSA level, **Non-compliance** of the service providers was as follows:

Airtel, Idea, Tata (GSM) and Tata (CDMA): Voice Quality – 93.56%, 91.47%, 93.31% and 94.37% respectively.

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

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.

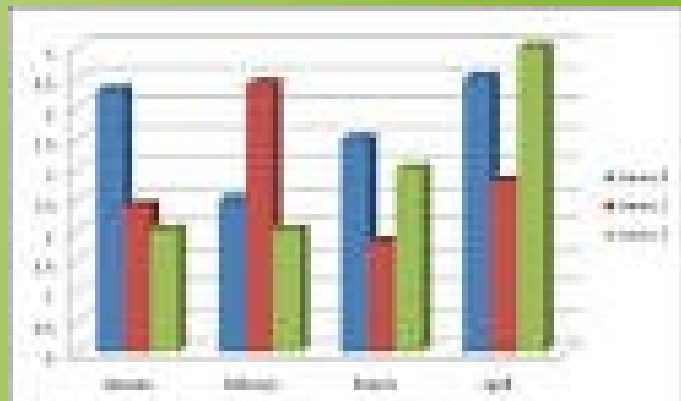
*Thus, the performance of the operators namely **BSNL, Tata (GSM)/ Tata (CDMA), Idea, Airtel and Uninor** was not satisfactory with respect to some of the parameters Voice Quality and Blocked Call rate. The drive test results further suggest that **BSNL** needs to pay special attention to improve their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

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

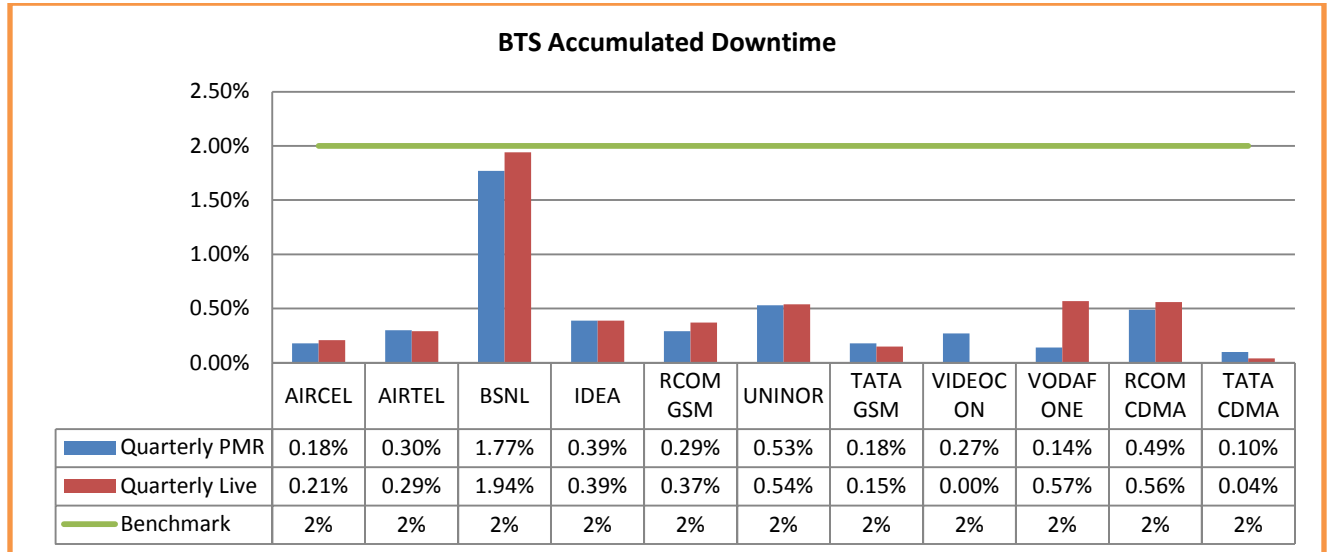
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION (CMTS):

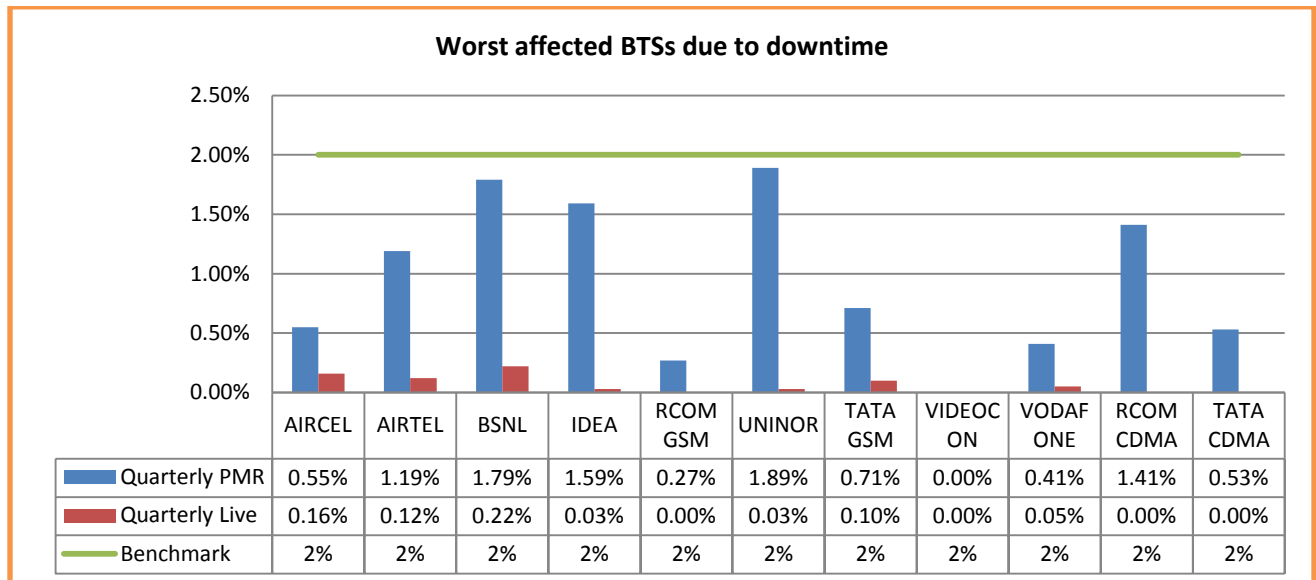
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIMES:



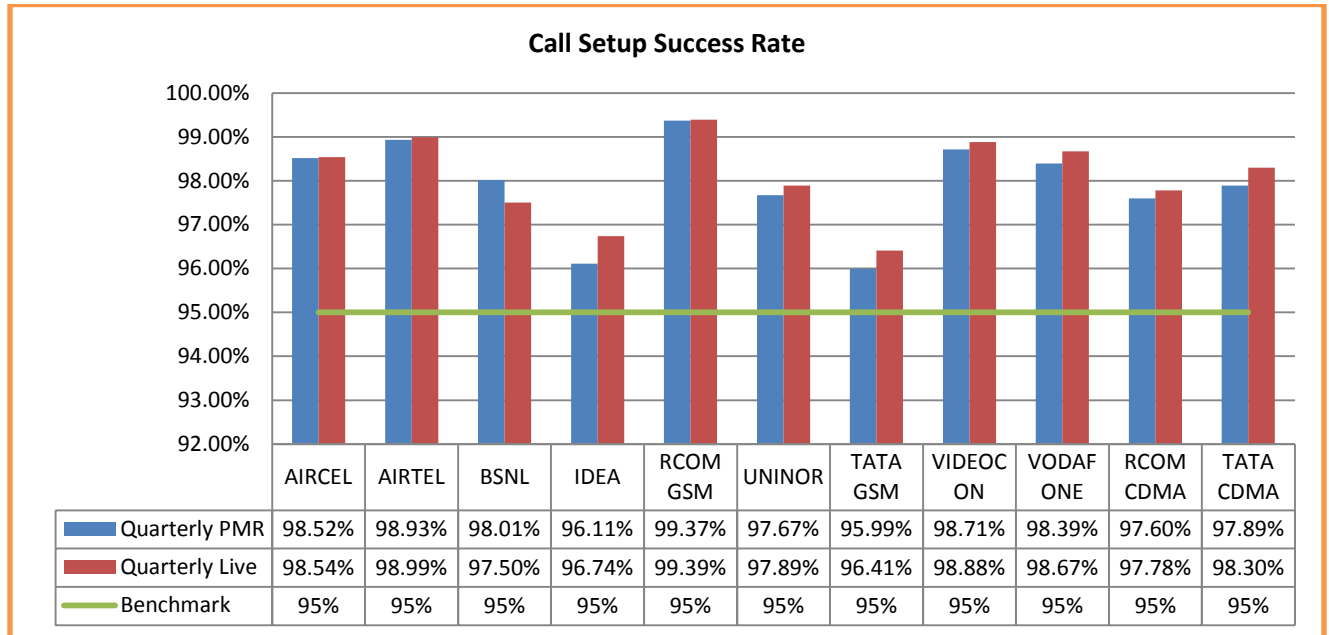
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSs DUE TO DOWNTIME:



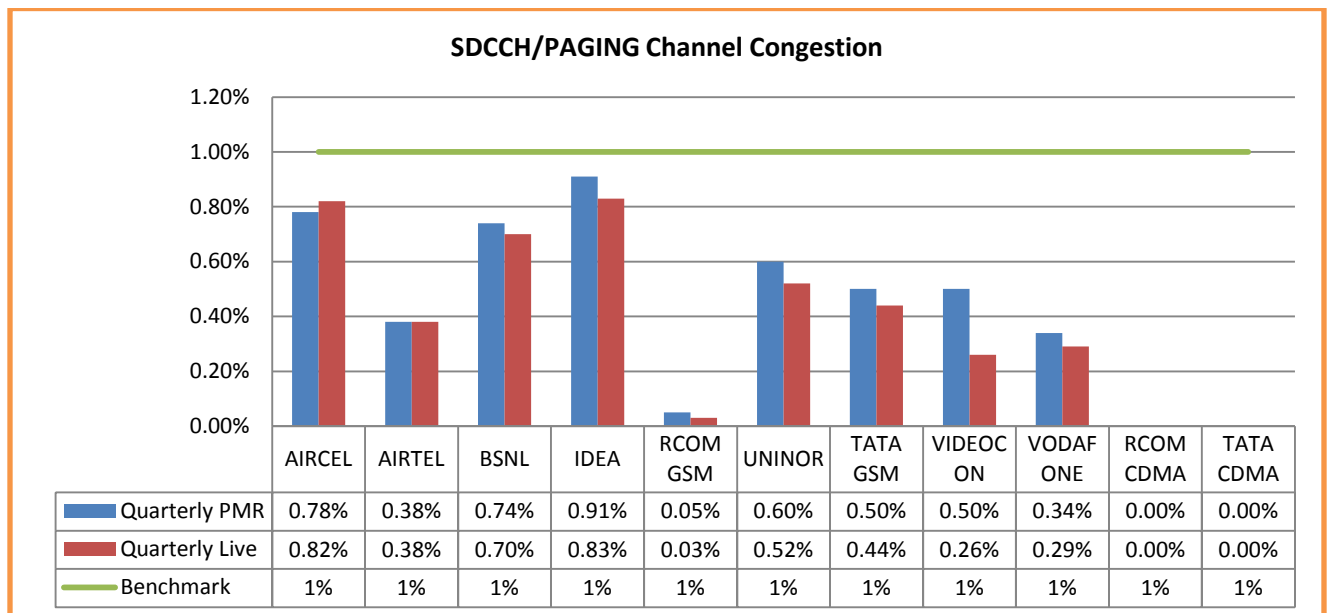
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE:



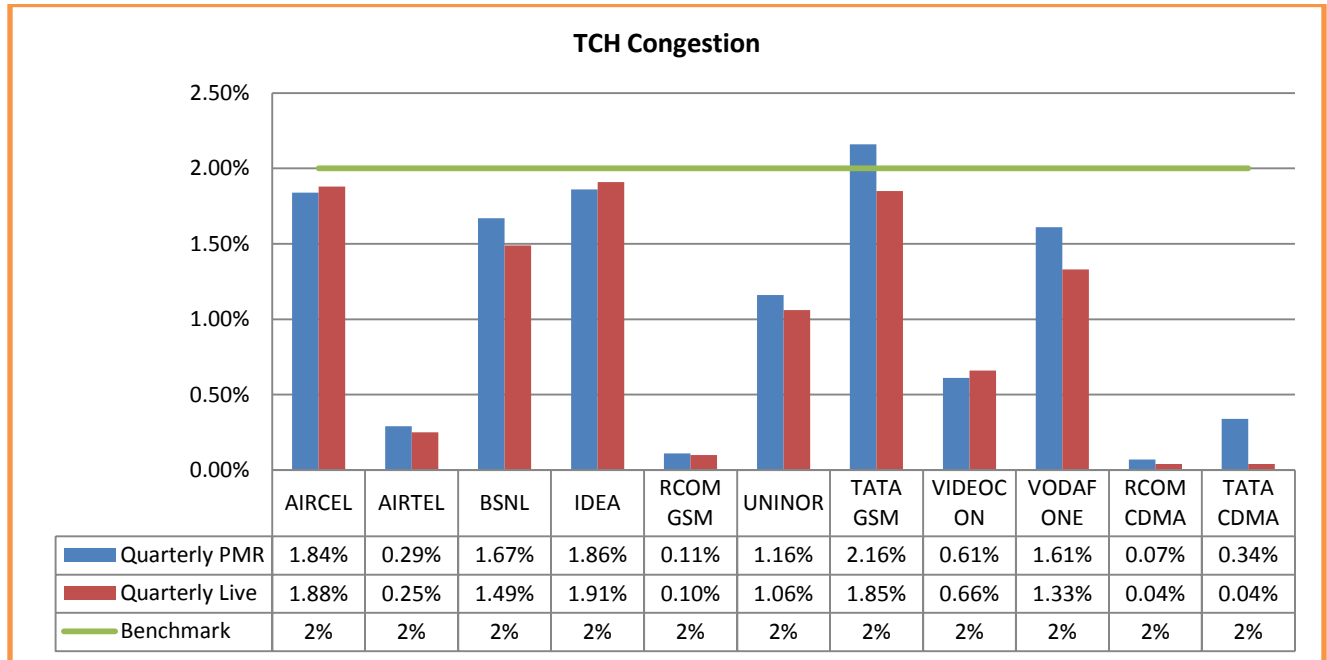
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:



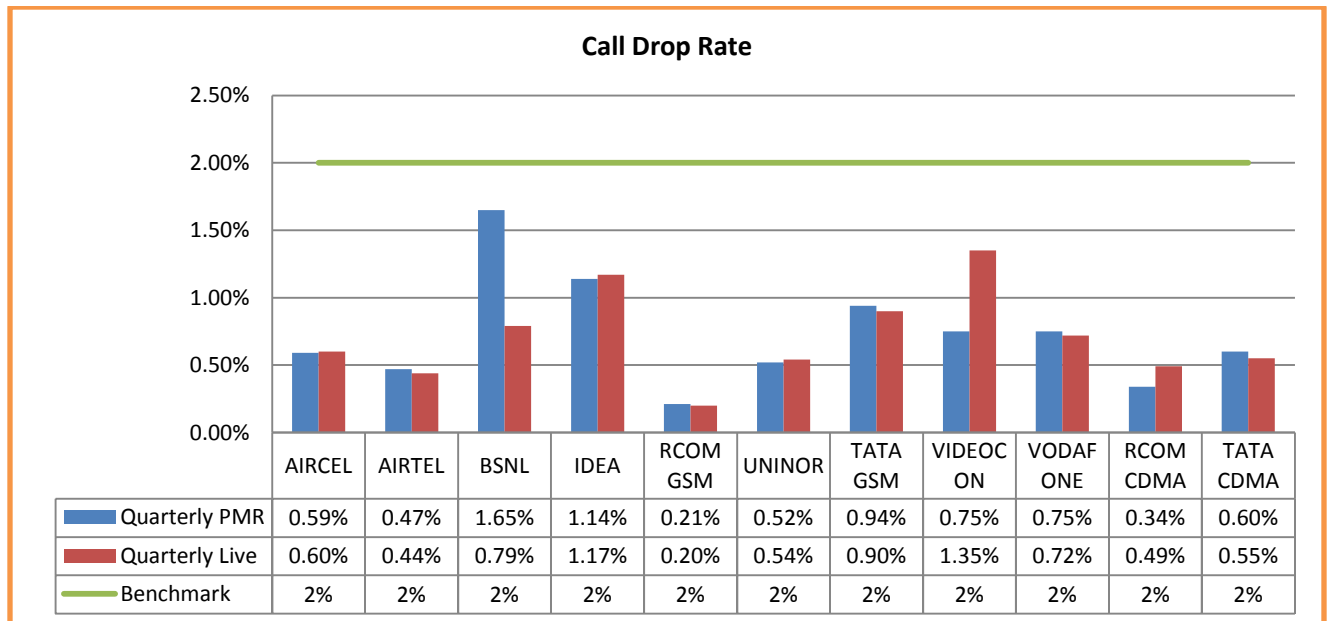
All operators are meeting the benchmarks.

5) TCH CONGESTION:



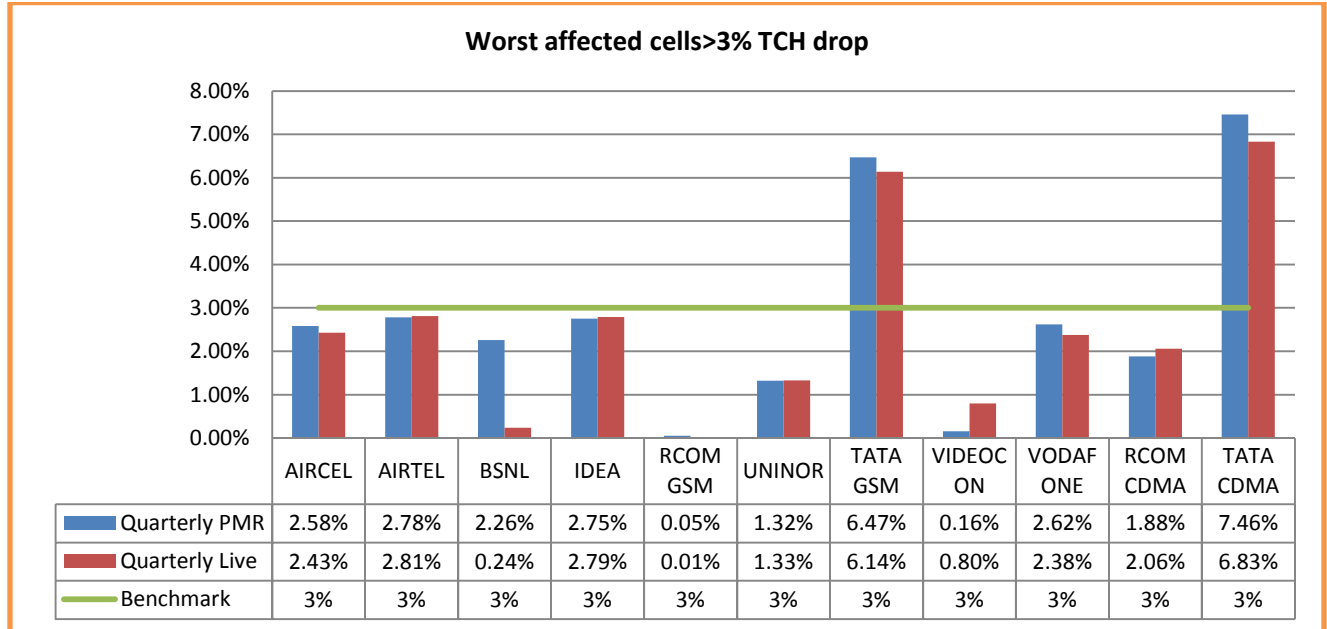
All operators are meeting the benchmarks except Tata GSM (during monthly PMR audit).

6) CALL DROP RATE:



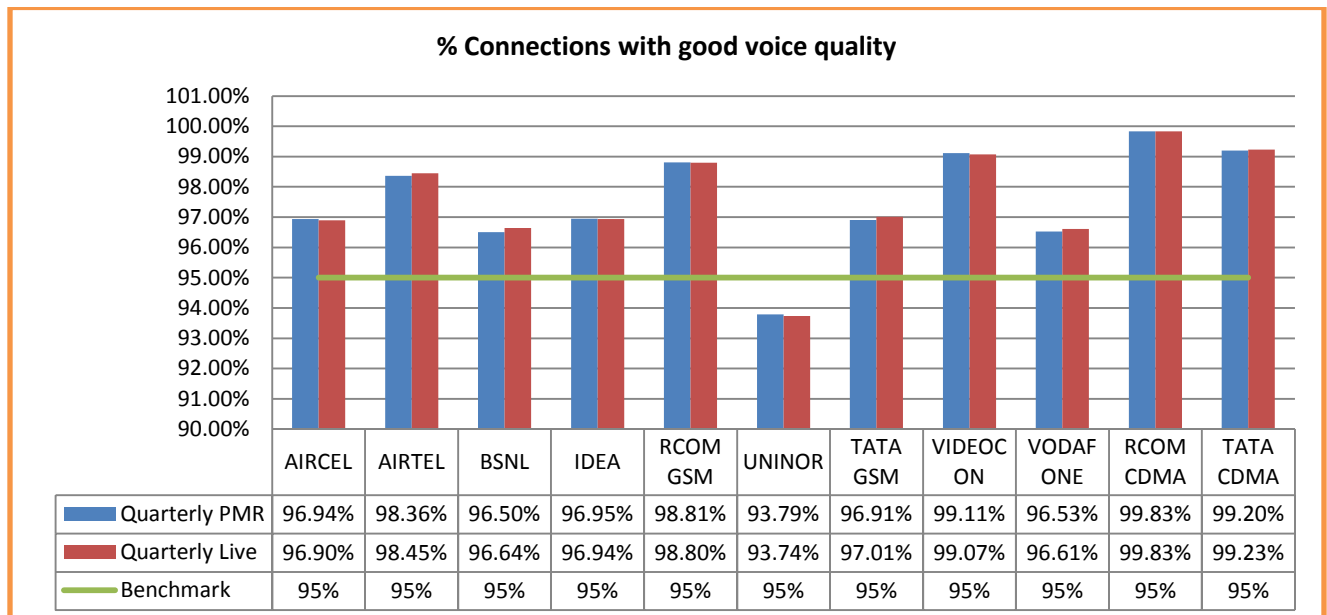
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Tata GSM & Tata CDMA.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks except Uninor.