



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
NORTH ZONE – UTTAR PRADESH (WEST) SERVICE AREA
(APRIL 2014 – JUNE 2014)

PREPARED FOR:

TELECOM REGULATORY AUTHORITY OF INDIA
MAHANAGAR DOORSANCHAR BHAWAN
JAWAHAR LAL NEHRU MARG
NEW DELHI-110002

SUBMITTED BY:

TÜV SÜD SOUTH ASIA PVT LTD.
C-153/1, OKHLA INDUSTRIAL AREA
PHASE – 1, NEW DELHI - 110020
TEL: +91 11 30889611, FAX: +91-11-30889595

PREFACE

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

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

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **UP (W) 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 (WIRELINE) SERVICES	12
3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS	12
4. EXECUTIVE SUMMARY	14
5. PMR AUDIT REPORTS:.....	16
5.1 MONTHLY PMR:	16
5.1.1 BUSY HOUR OF VARIOUS SERVICE PROVIDERS:.....	16
5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:	17
5.1.3 QOS PERFORMANCE OF MONTHLY PMR – APRIL-14 MONTH:.....	18
5.1.4 QOS PERFORMANCE OF MONTHLY PMR – MAY-14 MONTH:.....	19
5.1.5 QOS PERFORMANCE OF MONTHLY PMR – JUNE-14 MONTH:	20
5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- JUNE-14 (APRIL TO JUNE 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-14 MONTH:	25
5.2.2 LIVE MEASUREMENT DATA (3-DAYS) – MAY-14 MONTH:.....	26
5.2.3 LIVE MEASUREMENT DATA (3-DAYS) – JUNE-14 MONTH:	27
5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF APRIL TO JUNE).....	28
5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:	28
5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:	29
5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS-QE JUNE-14:	39
5.3.1 CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-JUNE 2014):.....	39
5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-JUNE 2014):.....	42
5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS	43

6.	LIVE CALLING ASSESSMENT:.....	45
6.1	INTER OPERATOR CALLS ASSESSMENT:.....	45
6.2	CUSTOMER CARE / HELPLINE ASSESSMENT:.....	46
6.3	LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:	47
6.4	LEVEL -1 CALLING ASSESSMENT:	47
7.	OPERATOR ASSISTED DRIVE TEST	49
7.1	OPERATOR ASSISTED DRIVE TEST: BIJNORE SSA (APRIL-14)	50
7.2	OPERATOR ASSISTED DRIVE TEST: MATHURA SSA (MAY-14).....	53
7.3	OPERATOR ASSISTED DRIVE TEST: MEERUT SSA (JUNE-14).....	56
7.4	DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:	59
7.5	SSA WISE DRIVE TEST OBSERVATION:	61
7.6	KEY FINDINGS ON DRIVE TEST:.....	64
8.	GRAPHICAL REPRESENTATION:	66



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

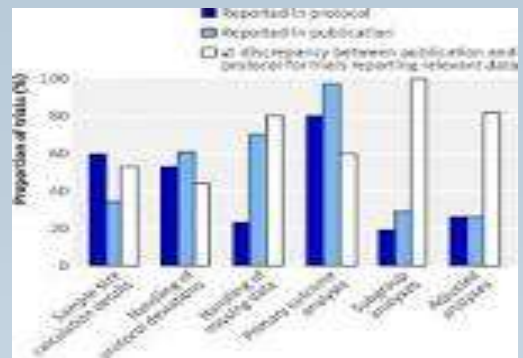
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service is 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 is also undertaken for Punjab, Rajasthan & Gujarat circles during the quarter April – June 2014.**

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(W) circle

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location/Address
		April-14	May-14	June-14	
GSM Operators					
1	AIRCEL	1 to 3 April-14	9 to 11 May-14	2 to 4 June-14	325/1,DISHNET WIRELESS LTD. SHIKHAR TOWER,MANGAL PANDEY NAGAR, GARH ROAD, MEERUT
2	AIRTEL	21 to 23 April-14	11 to 13 May-14	6, 9 to 10 June-14	BHARTI AIRTEL LTD., DIVIDER CHOWK,GANGANAGAR,MWANA ROAD, MEERUT
3	BSNL (UK)	16 to 18 April-14	13 to 15 May-14	7, 9 to 10 June-14	BSNL TELEPHONE EXCHANGE,PATEL NAGAR NEAR LAL PUL,DEHRADUN UK.
5	BSNL (UPW)	8 to 10 April-14	12 to 14 May-14	10 to 12 June-14	BSNL TELEPHONE EXCHANGE,BRAHAMPURI,DELHI ROAD,MEERUT
4	IDEA	28 to 30 April-14	22 to 23, 26 May-14	23 to 25 June-14	IDEA CELLULAR LIMITED, FIRST FLOOR A-68, SECTOR-64, NOIDA (UP)
6	RCOM GSM	11 to 13 April-14	5 to 7 May-14	11 to 13 June-14	RCOM LTD.,VILL-JATAULI,NEAR KRISHNA PUBLIC SCHOOL,BYPASS ROAD MEERUT
7	UNINOR	21 to 23 April-14	15 to 16, 19 May-14	9 to 11 June-14	TELEWINGS COMMUNICATIONS SERVICES PVT LTD. (UNINOR) WELLDONE TECHNOLOGY PARK SEC-48 SOHANA ROAD GURGAON
8	TATA GSM	5 to 7 April-14	5 to 7 May-14	6 to 8 June-14	TTSL,NEAR CCS UNIVERSITY, MEERUT
9	VODAFONE	18 to 20 April-14	9 to 11 May-14	4 to 6 June-14	VODAFONE SOUTH LTD.,NISHYAM KUNJ BUILDING,NEAR KAILASH PRKASH STADIUM,CIVIL LINES,MEERUT
CDMA Operators					
10	MTS	4 to 6 April-14	4 to 6 May-14	3 to 5 June-14	SSTL,NEAR SRI RAM PLAZA,OPP.CCS UNIVERSITY, MEERUT
11	RCOM CDMA	11 to 13 April-14	5 to 7 May-14	11 to 13 June-14	RCOM LTD.,VILL-JATAULI,NEAR KRISHNA PUBLIC SCHOOL,BYPASS ROAD MEERUT
12	TATA CDMA	5 to 7 April-14	5 to 7 May-14	6 to 8 June-14	TTSL,NEAR CCS UNIVERSITY, MEERUT

For all the above operators, audit was conducted in all the three months of the Quarter ended June 2014.

3.2 SAMPLING FOR BASIC (WIRELIN) 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. **However, QoS audit for basic (wireline) service was not required to be done for UP (W) Circle in the quarter ended June-14.**

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. **However, the QoS audit for Broadband service was not required to be done for UP (W) Circle in the quarter ended June- 2014.**

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:

(i) From month audit & 3 days live findings, it was concluded that on an average, performance of the operators in the UP (W) service area was satisfactory for **Network Parameters** as most of the parameters were found to be in compliance during monthly QoS audit except only one parameter namely **‘Worst affected cells having > 3% TCH drop’** which could not be met by **Aircel, Tata (GSM) and Tata (CDMA)** in all the three months of the quarter. Their quarterly average performance with respect to this parameter was **5.07%, 5.81% and 3.45%** respectively. **Uninor** remained under performed for parameter **‘Voice Quality’** with its average performance as **94.76%**.

(ii) In case of 3 days live measurements also, **similar non-compliance of these operators was observed for these parameters in all the three months of the quarter.**

(iii) With regard to the **Customer Service Quality Parameters**, all service providers were found to have complied with the most of the parameters. All service providers were in compliance with respect to the parameter ‘Accessibility of call center’. However, **Airtel, BSNL (UK and UP-W) and Tata (GSM)** have failed to meet the benchmark of **‘calls answered by Operators (voice to voice) within 60 seconds’**. Their achievement for this parameter was **85.20%, 23.72%, 21.58% and 84.47%** respectively against the benchmark of > 90%. Thus performance of BSNL was very poor with respect to this parameter. The call center is common for BSNL (Uttarakhand) and BSNL (UPW).

In case of parameter **‘Termination/Closure’**, only **Idea** has failed to settle the closure within the benchmark of 7 days with its performance of **99.36%**.

(iv) **Drive Test** finding revealed that the parameters **Voice Quality, CDR and CSSR** remained non-complied by some of the service providers namely **BSNL, RCOM (GSM), (CDMA), Uninor and MTS** in different parts of the three SSAs where drive tests were conducted during the quarter ended June 2014. However, the parameter **‘Voice Quality’** remained main area of concern for all the above mentioned operators. The service providers need to improve their network quality with respect to these parameters.

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-14	20:00 - 21:00
2	AIRTEL	June-14	20:00 - 21:00
3	BSNL (UP-W)	June-14	19:00 - 20:00
4	BSNL UTTRAKHAND	June-14	20:00 - 21:00
5	IDEA	June-14	20:00 - 21:00
6	RCOM GSM	June-14	19:00 - 20:00
7	TATA GSM	June-14	20:00 - 21:00
8	UNINOR	June-14	21:00 - 22:00
9	VODAFONE	June-14	20:00 - 21:00
CDMA Operators			
10	MTS	June-14	20:00 - 21:00
11	RCOM CDMA	June-14	19:00 - 20:00
12	TATA CDMA	June-14	20:00 - 21:00

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

The data generated by monthly PMR and 3-days live measurements audit for the period April 2014 to June 2014 has been successfully uploaded to the server located at TRAI premises.

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	2	7	628	ZTE	ZTE
2	AIRTEL	19	71	6562	Ericsson	Ericsson
3	BSNL (UP-W)	11	32	2302	Ericsson, NSN & ZTE	Ericsson, NSN & ZTE
4	BSNL UTTRAKHAND	5	14	853	Ericsson & ZTE	Ericsson, NSN & ZTE
5	IDEA	16	56	7315	NSN	NSN
6	RCOM GSM	4	14	2368	Huawei	Huawei
7	TATA GSM	3	18	1836	NSN	NSN
8	UNINOR	10	23	3172	Ericsson	Ericsson
9	VODAFONE	11	86	6141	NSN	NSN
CDMA Operators						
10	MTS	1	1	323	Huawei	Huawei
11	RCOM CDMA	3	4	1267	Huawei & Lucent	Huawei & Lucent
12	TATA CDMA	5	4	587	Huawei & Ericsson	Huawei & Motorola

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – APRIL-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES- UP(W) CIRCLE- APRIL 14 MONTH

PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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-14	0.14%	0.19%	1.18%	0.67%	0.21%	0.19%	0.15%	0.61%	0.16%	0.05%	0.22%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Apr-14	0.32%	0.47%	1.95%	0.00%	0.01%	0.38%	0.38%	1.90%	1.04%	0.00%	0.23%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-14	99.41%	98.20%	97.67%	97.08%	99.98%	99.59%	99.06%	96.57%	99.25%	99.62%	98.09%	99.13%
	b) SDCCH/PAGING Channel congestion	<=1%	Apr-14	0.39%	0.41%	0.59%	0.74%	0.68%	0.03%	0.06%	0.67%	0.24%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-14	1.11%	0.83%	1.54%	1.70%	1.18%	0.06%	0.11%	1.87%	0.75%	0.00%	0.02%	0.05%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Apr-14	0.48%	0.98%	0.71%	1.55%	0.88%	0.26%	0.64%	0.55%	0.72%	0.36%	0.26%	0.38%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Apr-14	3.59%	1.80%	2.33%	2.57%	2.35%	0.02%	4.88%	2.38%	2.51%	1.00%	1.37%	3.26%
	c) Connections with good voice quality	>=95%	Apr-14	97.79%	97.82%	96.84%	96.78%	96.07%	98.77%	98.04%	94.61%	97.68%	99.23%	99.79%	98.94%
4	No. of POI's having >=0.5% POI congestion		Apr-14	0	0	0	0	0	0	0	0	0	0	0	0



5.1.4 QOS PERFORMANCE OF MONTHLY PMR – MAY-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(W) CIRCLE- MAY-14 MONTH

PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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-14	0.23%	0.31%	1.20%	0.64%	0.24%	0.23%	0.27%	0.52%	0.21%	0.04%	0.50%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	May-14	0.48%	1.66%	1.84%	0.00%	0.81%	0.71%	0.38%	1.92%	0.93%	0.00%	1.84%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	May-14	99.36%	98.38%	96.71%	97.04%	99.98%	99.54%	98.71%	96.79%	99.27%	99.48%	98.69%	99.06%
	b) SDCCH/PAGING Channel congestion	<=1%	May-14	0.67%	0.36%	0.52%	0.51%	0.97%	0.03%	0.12%	0.76%	0.36%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	May-14	0.96%	0.67%	1.13%	1.55%	1.52%	0.07%	0.24%	1.63%	0.73%	0.00%	0.02%	0.05%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	May-14	0.54%	0.94%	0.82%	1.55%	0.92%	0.29%	0.78%	0.58%	0.71%	0.40%	0.28%	0.44%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	May-14	5.75%	1.68%	1.60%	2.47%	2.45%	0.02%	5.99%	2.37%	1.87%	0.97%	1.24%	3.25%
	c) Connections with good voice quality	>=95%	May-14	97.68%	97.84%	96.82%	96.79%	96.07%	98.73%	97.69%	94.82%	97.70%	99.19%	99.78%	98.91%
4	No. of POI's having >=0.5% POI congestion		May-14	0	0	0	0	0	0	0	0	0	0	0	0

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – JUNE-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(W) CIRCLE- JUNE-14 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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-14	0.26%	0.82%	1.17%	0.66%	0.27%	0.34%	0.27%	0.47%	0.30%	0.04%	0.38%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Jun-14	0.64%	1.55%	1.82%	1.87%	0.94%	1.44%	0.98%	1.83%	0.85%	0.00%	1.42%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Jun-14	99.29%	97.75%	96.43%	97.40%	99.98%	99.47%	98.68%	97.61%	99.41%	99.64%	98.03%	99.01%
	b) SDCCH/PAGING Channel congestion	<=1%	Jun-14	0.63%	0.43%	0.52%	0.66%	0.85%	0.06%	0.10%	0.82%	0.29%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jun-14	0.92%	1.33%	0.81%	1.39%	1.69%	0.08%	0.31%	1.36%	0.59%	0.00%	0.04%	0.07%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Jun-14	0.59%	1.18%	0.77%	1.53%	0.97%	0.34%	0.85%	0.56%	0.82%	0.44%	0.35%	0.45%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jun-14	5.88%	2.29%	0.97%	2.49%	2.44%	0.03%	6.56%	2.15%	2.36%	1.29%	2.32%	3.83%
	c) Connections with good voice quality	>=95%	Jun-14	97.59%	97.81%	96.95%	96.41%	95.88%	98.71%	97.49%	94.84%	97.44%	99.21%	99.78%	98.91%
4	No. of POI's having >=0.5% POI congestion		Jun-14	0	0	0	0	0	0	0	0	0	0	0	0

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- JUNE-14 (APRIL TO JUNE MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-JUNE-14) OF UP (W) CIRCLE															
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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%	0.44%	1.18%	0.66%	0.24%	0.25%	0.23%	0.53%	0.22%	0.04%	0.37%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.48%	1.23%	1.87%	0.62%	0.59%	0.84%	0.58%	1.88%	0.94%	0.00%	1.16%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.35%	98.11%	96.94%	97.17%	99.98%	99.53%	98.82%	96.99%	99.31%	99.58%	98.27%	99.07%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.56%	0.40%	0.54%	0.64%	0.83%	0.04%	0.09%	0.75%	0.30%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	1.00%	0.94%	1.16%	1.55%	1.46%	0.07%	0.22%	1.62%	0.69%	0.00%	0.03%	0.06%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.54%	1.03%	0.77%	1.54%	0.92%	0.30%	0.76%	0.56%	0.75%	0.40%	0.30%	0.42%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	5.07%	1.92%	1.63%	2.51%	2.41%	0.02%	5.81%	2.30%	2.25%	1.09%	1.64%	3.45%
	c) Connections with good voice quality	>=95%	Quarterly	97.69%	97.82%	96.87%	96.66%	96.01%	98.74%	97.74%	94.76%	97.61%	99.21%	99.78%	98.92%
4	No. of POI's having >=0.5% POI congestion		Quarterly	0	0	0	0	0	0	0	0	0	0	0	0

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

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

TUV-SUD 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.**

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(W) circle, **all the operators were found meeting benchmark of the above parameters** 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter.

- **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 found to be calculating the parameter as per the TRAI's specified norms.**

All the operators were meeting the benchmark successfully of 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 pegging channel in CDMA system.

With respect to this parameter, the performance of the operators is quite satisfactory as **all operators met the TRAI specified benchmarks on the congestion parameters.** There was no congestion on individual POI links between a service provider vis-à-vis other service providers.

- **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 0.30%) was for RCOM (CDMA) / (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 **Aircel, Tata (GSM) and Tata (CDMA)**. These operators failed to meet the benchmark in all the three months of the quarter. Their quarterly average performance with respect to this parameter was **5.07%, 5.81% and 3.45%** respectively.

- iii. Connections with good voice quality:

The audit results for this parameter indicates that all operators have met the bench mark during the quarter except **Uninor**, remained underperformed with its average performance as **94.76%**.

**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-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES- UP(W) CIRCLE- APRIL-14 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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%	0.18%	1.19%	1.08%	0.36%	0.15%	0.11%	0.19%	0.23%	0.05%	0.14%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.03%	1.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.37%	98.99%	97.17%	98.37%	99.98%	99.62%	99.10%	95.79%	99.31%	99.62%	98.52%	98.98%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.41%	0.20%	0.47%	0.68%	1.37%	0.02%	0.04%	0.48%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.09%	0.37%	1.62%	1.72%	1.35%	0.06%	0.09%	1.93%	0.69%	0.00%	0.01%	0.18%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.47%	0.68%	0.85%	1.56%	0.97%	0.25%	0.60%	0.53%	0.73%	0.38%	0.25%	0.41%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	5.73%	2.02%	2.48%	2.71%	2.48%	0.00%	5.04%	1.93%	2.45%	0.91%	1.55%	3.65%
	c) Connections with good voice quality	>=95%	Live data	97.85%	97.81%	97.27%	97.23%	95.83%	98.87%	98.12%	94.60%	97.66%	99.25%	99.76%	98.93%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

5.2.2 LIVE MEASUREMENT DATA (3-DAYS) – MAY-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- MAY-14 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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	0.13%	0.22%	1.26%	0.87%	0.54%	0.22%	0.13%	0.46%	0.22%	0.00%	0.85%	0.03%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.09%	1.19%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.25%	99.12%	97.36%	97.41%	99.98%	99.57%	98.74%	96.00%	99.08%	99.67%	98.46%	99.14%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.55%	0.17%	0.55%	0.81%	1.07%	0.03%	0.20%	0.75%	0.41%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.31%	0.29%	1.37%	1.65%	1.58%	0.07%	0.17%	1.84%	0.92%	0.00%	0.02%	0.02%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.51%	0.66%	0.91%	1.37%	0.94%	0.27%	0.72%	0.56%	0.70%	0.41%	0.27%	0.42%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	5.64%	2.01%	2.51%	2.47%	2.42%	0.01%	4.32%	2.07%	2.33%	0.72%	1.78%	2.96%
	c) Connections with good voice quality	>=95%	Live data	97.67%	97.81%	96.67%	97.20%	95.94%	98.81%	97.81%	94.99%	97.70%	99.23%	99.76%	98.92%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0



5.2.3 LIVE MEASUREMENT DATA (3-DAYS) – JUNE-14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE- JUNE-14 MONTH

S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators		
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Live data	0.19%	1.66%	1.25%	0.82%	0.18%	0.39%	0.25%	0.62%	0.32%	0.06%	0.48%	0.12%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.85%	1.19%	0.00%	0.00%	0.00%	0.00%	0.06%	0.08%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.29%	98.92%	96.30%	97.27%	99.99%	99.50%	98.40%	97.36%	99.26%	99.66%	98.04%	99.04%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.86%	0.27%	0.76%	0.75%	1.01%	0.03%	0.12%	0.94%	0.42%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	1.15%	0.35%	1.44%	1.50%	1.60%	0.08%	0.49%	1.54%	0.74%	0.00%	0.03%	0.06%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.62%	0.71%	0.80%	1.42%	0.94%	0.28%	1.04%	0.65%	0.83%	0.41%	0.42%	0.45%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	6.59%	2.14%	1.76%	2.41%	2.72%	0.03%	8.92%	2.77%	2.55%	1.08%	2.30%	4.24%
	c) Connections with good voice quality	>=95%	Live data	97.65%	97.83%	96.83%	97.10%	95.95%	98.78%	97.45%	94.66%	97.29%	99.21%	99.74%	98.91%
4	No. of POI having >=0.5% congestion		Live data	0	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)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE-JUNE-14) – UP (W) CIRCLE															
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UP-W)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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	0.17%	0.69%	1.23%	0.92%	0.36%	0.25%	0.16%	0.42%	0.26%	0.04%	0.49%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.32%	1.16%	0.00%	0.00%	0.00%	0.00%	0.02%	0.05%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.30%	99.01%	96.94%	97.68%	99.98%	99.56%	98.75%	96.38%	99.22%	99.65%	98.34%	99.05%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.61%	0.21%	0.59%	0.75%	1.15%	0.03%	0.12%	0.72%	0.34%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.85%	0.34%	1.48%	1.62%	1.51%	0.07%	0.25%	1.77%	0.78%	0.00%	0.02%	0.09%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.53%	0.68%	0.85%	1.45%	0.95%	0.27%	0.79%	0.58%	0.75%	0.40%	0.31%	0.43%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	5.99%	2.06%	2.25%	2.53%	2.54%	0.01%	6.09%	2.26%	2.44%	0.90%	1.88%	3.62%
	c) Connections with good voice quality	>=95%	Quarterly	97.72%	97.82%	96.92%	97.18%	95.91%	98.82%	97.79%	94.75%	97.55%	99.23%	99.75%	98.92%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days live assessment, it was found that the performance of the operators was in compliance for most of the parameters except for the parameter ‘Worst affected cells> 3 % TCH drops’ which could not be met by **Aircel**, **Tata (GSM)** and **Tata (CDMA)** in all the three months of the quarter with their average performance as **5.99%**, **6.09%** and **3.62%** respectively. **Uninor** failed to meet the bench mark of ‘Voice Quality’ with its performance as **94.75%**. The similar non-compliance of these operators was also observed in the monthly audit.

Idea failed to meet the benchmark for the parameter “SDCCH Channel congestion” with its performance as **1.15%**.



5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- April 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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-14	628	6603	2256	840	7251	2391	1827	3158	6118	323	1305	591
	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-14	625	8819	19100	4029	10722	3233	2038	13932	7023	117	2043	111
	c) BTS Accumulated Downtime	<=2%	Apr-14	0.14%	0.19%	1.18%	0.67%	0.21%	0.19%	0.15%	0.61%	0.16%	0.05%	0.22%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Apr-14	2	31	44	0	1	9	7	60	64	0	3	0
	e) Worst affected BTSs due to downtime	<=2%	Apr-14	0.32%	0.47%	1.95%	0.00%	0.01%	0.38%	0.38%	1.90%	1.04%	0.00%	0.23%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-14	99.41%	98.20%	97.67%	97.08%	99.98%	99.59%	99.06%	96.57%	99.25%	99.62%	98.09%	99.13%
	b) SDCCCH/PAGING Congestion	<=1%	Apr-14	0.39%	0.41%	0.59%	0.74%	0.68%	0.03%	0.06%	0.67%	0.24%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-14	1.11%	0.83%	1.54%	1.70%	1.18%	0.06%	0.11%	1.87%	0.75%	0.00%	0.02%	0.05%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Apr-14	0.48%	0.98%	0.71%	1.55%	0.88%	0.26%	0.64%	0.55%	0.72%	0.36%	0.26%	0.38%
	b) Worst affected cells>3% TCH drop	<=3%	Apr-14	3.59%	1.80%	2.33%	2.57%	2.35%	0.02%	4.88%	2.38%	2.51%	1.00%	1.37%	3.26%
	c) % of connections with good voice quality	>=95%	Apr-14	97.79%	97.82%	96.84%	96.78%	96.07%	98.77%	98.04%	94.61%	97.68%	99.23%	99.79%	98.94%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Apr-14	68	352	159	65	512	1	271	226	464	10	54	61
	e) Total no. of cells (Sector) in the licensed service area		Apr-14	1892	19597	6799	2528	21791	7173	5558	9479	18532	1029	3915	1856
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		Apr-14	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the		Apr-14	0	0	0	0	0	0	0	0	0	0	0	0



Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- April 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators		
	benchmark														
5	Network Data														
	a) Equipped Capacity of Network in Erlang		Apr-14	28571	190163	133953	118000	289058	122000	114774	157991	271336	21000	86000	103812
	b) Total traffic in TCBH in erlang (Avg.)		Apr-14	209	146093	37316	298170	310600	107963	34311	204377	257717	2955	30695	23585
	c) Total no. of customers served (as per VLR) on last day of the month		Apr-14	21025	6389149	1543705	782189	11417037	4239650	1654333	4842410	9635691	121927	1385659	430165

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(W) Circle- April -14 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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	628	6589	2254	840	7251	2391	1822	3142	6118	323	1306	591
	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	85	840	1931	655	1893	257	150	435	1008	12	127	6
	c) BTS Accumulated Downtime	<=2%	Live data	0.19%	0.18%	1.19%	1.08%	0.36%	0.15%	0.11%	0.19%	0.23%	0.05%	0.14%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	2	25	0	0	0	0	0	4	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.03%	1.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.07%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.37%	98.99%	97.17%	98.37%	99.98%	99.62%	99.10%	95.79%	99.31%	99.62%	98.52%	98.98%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.41%	0.20%	0.47%	0.68%	1.37%	0.02%	0.04%	0.48%	0.19%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	1.09%	0.37%	1.62%	1.72%	1.35%	0.06%	0.09%	1.93%	0.69%	0.00%	0.01%	0.18%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Live data	0.47%	0.68%	0.85%	1.56%	0.97%	0.25%	0.60%	0.53%	0.73%	0.38%	0.25%	0.41%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	5.73%	2.02%	2.48%	2.71%	2.48%	0.00%	5.04%	1.93%	2.45%	0.91%	1.55%	3.65%
	c) % of connections with good voice quality	>=95%	Live data	97.85%	97.81%	97.27%	97.23%	95.83%	98.87%	98.12%	94.60%	97.66%	99.25%	99.76%	98.93%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	108	394	166	68	544	0	280	183	454	9	61	68
e) Total no. of cells (Sector) in the licensed service area		Live data	1892	19565	6712	2512	21959	7168	5545	9480	18515	1029	3907	1856	
4	No. of POI's having >=0.5% POI congestion														
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0	0

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- May 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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-14	628	6565	2282	853	7284	2391	1835	3183	6118	323	1305	591
	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-14	1091	15024	20439	4053	12959	4005	3752	12406	9519	92	4880	373
	c) BTS Accumulated Downtime	<=2%	May-14	0.23%	0.31%	1.20%	0.64%	0.24%	0.23%	0.27%	0.52%	0.21%	0.04%	0.50%	0.08%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		May-14	3	109	42	0	59	17	7	61	57	0	24	0
	e) Worst affected BTSs due to downtime	<=2%	May-14	0.48%	1.66%	1.84%	0.00%	0.81%	0.71%	0.38%	1.92%	0.93%	0.00%	1.84%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	May-14	99.36%	98.38%	96.71%	97.04%	99.98%	99.54%	98.71%	96.79%	99.27%	99.48%	98.69%	99.06%
	b) SDCCH/PAGING Congestion	<=1%	May-14	0.67%	0.36%	0.52%	0.51%	0.97%	0.03%	0.12%	0.76%	0.36%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	May-14	0.96%	0.67%	1.13%	1.55%	1.52%	0.07%	0.24%	1.63%	0.73%	0.00%	0.02%	0.05%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	May-14	0.54%	0.94%	0.82%	1.55%	0.92%	0.29%	0.78%	0.58%	0.71%	0.40%	0.28%	0.44%
	b) Worst affected cells>3% TCH drop	<=3%	May-14	5.75%	1.68%	1.60%	2.47%	2.45%	0.02%	5.99%	2.37%	1.87%	0.97%	1.24%	3.25%
	c) % of connections with good voice quality	>=95%	May-14	97.68%	97.84%	96.82%	96.79%	96.07%	98.73%	97.69%	94.82%	97.70%	99.19%	99.78%	98.91%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		May-14	109	330	108	63	542	1	334	226	343	10	48	60
	e) Total no. of cells (Sector) in the licensed service area		May-14	1892	19590	6771	2550	22086	7173	5579	9533	18372	1014	3915	1856
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		May-14	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		May-14	0	0	0	0	0	0	0	0	0	0	0	0



Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- May 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA	
				GSM Operators									CDMA Operators			
5	Network Data															
	a) Equipped Capacity of Network in Erlang		May-14	28645	191532	134761	118000	289170	122000	115229	160706	274760	21000	86000	103812	
	b) Total traffic in TCBH in erlang (Avg.)		May-14	235	150571	39624	298371	315819	101113	37497	209318	263079	2985	27682	26254	
	c) Total no. of customers served (as per VLR) on last day of the month		May-14	23064	6428352	1547424	791164	11924144	3935325	1784254	4960108	9592018	119963	1324441	409843	



TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(W) Circle- May 14 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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	628	6603	2274	847	7254	2391	1829	3178	6118	323	1306	591
	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	61	1057	2070	529	2824	382	169	1042	967	0	800	15
	c) BTS Accumulated Downtime	<=2%	Live data	0.13%	0.22%	1.26%	0.87%	0.54%	0.22%	0.13%	0.46%	0.22%	0.00%	0.85%	0.03%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	6	27	0	1	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.09%	1.19%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.25%	99.12%	97.36%	97.41%	99.98%	99.57%	98.74%	96.00%	99.08%	99.67%	98.46%	99.14%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.55%	0.17%	0.55%	0.81%	1.07%	0.03%	0.20%	0.75%	0.41%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.31%	0.29%	1.37%	1.65%	1.58%	0.07%	0.17%	1.84%	0.92%	0.00%	0.02%	0.02%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.51%	0.66%	0.91%	1.37%	0.94%	0.27%	0.72%	0.56%	0.70%	0.41%	0.27%	0.42%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	5.64%	2.01%	2.51%	2.47%	2.42%	0.01%	4.32%	2.07%	2.33%	0.72%	1.78%	2.96%
	c) % of connections with good voice quality	>=95%	Live data	97.67%	97.81%	96.67%	97.20%	95.94%	98.81%	97.81%	94.99%	97.70%	99.23%	99.76%	98.92%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	107	394	169	63	535	1	240	198	430	7	69	55
	e) Total no. of cells (Sector) in the licensed service area		Live data	1892	19578	6740	2550	22100	7168	5568	9597	18455	1014	3906	1856
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0	0

TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- June 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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-14	628	6562	2302	853	7315	2368	1836	3172	6141	323	1267	587
	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-14	1189	38729	19465	4057	14039	5757	3625	10816	13444	102	3484	234
	c) BTS Accumulated Downtime	<=2%	Jun-14	0.26%	0.82%	1.17%	0.66%	0.27%	0.34%	0.27%	0.47%	0.30%	0.04%	0.38%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jun-14	4	102	42	16	69	34	18	58	52	0	18	0
	e) Worst affected BTSs due to downtime	<=2%	Jun-14	0.64%	1.55%	1.82%	1.87%	0.94%	1.44%	0.98%	1.83%	0.85%	0.00%	1.42%	0.00%
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Jun-14	99.29%	97.75%	96.43%	97.40%	99.98%	99.47%	98.68%	97.61%	99.41%	99.64%	98.03%	99.01%
	b) SDCCH/PAGING Congestion	<=1%	Jun-14	0.63%	0.43%	0.52%	0.66%	0.85%	0.06%	0.10%	0.82%	0.29%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jun-14	0.92%	1.33%	0.81%	1.39%	1.69%	0.08%	0.31%	1.36%	0.59%	0.00%	0.04%	0.07%
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Jun-14	0.59%	1.18%	0.77%	1.53%	0.97%	0.34%	0.85%	0.56%	0.82%	0.44%	0.35%	0.45%
	b) Worst affected cells>3% TCH drop	<=3%	Jun-14	5.88%	2.29%	0.97%	2.49%	2.44%	0.03%	6.56%	2.15%	2.36%	1.29%	2.32%	3.83%
	c) % of connections with good voice quality	>=95%	Jun-14	97.59%	97.81%	96.95%	96.41%	95.88%	98.71%	97.49%	94.84%	97.44%	99.21%	99.78%	98.91%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jun-14	111	452	66	64	543	2	367	207	436	13	88	71
	e) Total no. of cells (Sector) in the licensed service area		Jun-14	1892	19753	6788	2556	22281	7104	5589	9606	18485	1014	3801	1846
4	No. of POI's having >=0.5% POI congestion														
	No. of POI's having >=0.5% POI congestion		Jun-14	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jun-14	0	0	0	0	0	0	0	0	0	0	0	0



Detailed Network Data Assessment of Cellular Mobile Telephone Services- UP(W) Circle- June 14 month

S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA	
				GSM Operators									CDMA Operators			
5	Network Data															
	a) Equipped Capacity of Network in Erlang		Jun-14	28212	190132	136685	118000	292967	122000	115202	164536	275581	21000	86000	103197	
	b) Total traffic in TCBH in erlang (Avg.)		Jun-14	234	147554	37715	300492	316762	105549	40935	205276	260754	2748	28735	25622	
	c) Total no. of customers served (as per VLR) on last day of the month		Jun-14	23118	5542168	1545964	769616	11836190	3931302	1785409	4961752	9499377	115436	1310462	399798	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- UP(W) Circle- June 14 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL (UPW)	BSNL (UK)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	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	628	6565	2274	853	7297	2368	1835	3179	6141	323	1267	587
	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	85	7823	2042	506	951	662	333	1427	1393	13	434	49
	c) BTS Accumulated Downtime	<=2%	Live data	0.19%	1.66%	1.25%	0.82%	0.18%	0.39%	0.25%	0.62%	0.32%	0.06%	0.48%	0.12%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	56	27	0	0	0	0	2	5	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.85%	1.19%	0.00%	0.00%	0.00%	0.00%	0.06%	0.08%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.29%	98.92%	96.30%	97.27%	99.99%	99.50%	98.40%	97.36%	99.26%	99.66%	98.04%	99.04%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.86%	0.27%	0.76%	0.75%	1.01%	0.03%	0.12%	0.94%	0.42%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	1.15%	0.35%	1.44%	1.50%	1.60%	0.08%	0.49%	1.54%	0.74%	0.00%	0.03%	0.06%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Live data	0.62%	0.71%	0.80%	1.42%	0.94%	0.28%	1.04%	0.65%	0.83%	0.41%	0.42%	0.45%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	6.59%	2.14%	1.76%	2.41%	2.72%	0.03%	8.92%	2.77%	2.55%	1.08%	2.30%	4.24%
	c) % of connections with good voice quality	>=95%	Live data	97.65%	97.83%	96.83%	97.10%	95.95%	98.78%	97.45%	94.66%	97.29%	99.21%	99.74%	98.91%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	125	419	121	62	610	2	498	266	471	11	99	78
e) Total no. of cells (Sector) in the licensed service area		Live data	1892	19625	6886	2554	22409	6484	5586	9605	18485	1014	4320	1846	
4	No. of POI's having >=0.5% POI congestion														
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS





5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS-QE JUNE-14:

5.3.1 CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-JUNE 2014):

CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES-QE JUNE-14															
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
S / N	Name of Parameter			GSM Operators									CDMA Operators		
Customer Service Quality Parameters															
1	Metering & Billing Credibility -Post Paid														
	A) No. of bills issued during the quarter		UPW	19	120124	15974	35173	338137	18604	35779	NA	226933	7620	56118	29315
	B) No. of bills disputed including billing complaints during the quarter		UPW	0	28	0	2	68	14	1	NA	136	7	51	1
	C)% of billing complaints during the quarter	<= 0.1%	UPW	0.00%	0.02%	0.00%	0.01%	0.02%	0.08%	0.00%	NA	0.06%	0.09%	0.09%	0.00%
2	Metering & Billing Credibility -Pre Paid														
	A) Total No. of Pre-paid customers at the end of the quarter		UPW	109132	6903297	875414	3391803	11569635	4057446	3295159	6130061	9733133	209391	1290068	591844
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		UPW	0	368	4	18	2047	4043	0	426	4641	32	391	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	UPW	0.00%	0.01%	0.00%	0.00%	0.02%	0.10%	0.00%	0.01%	0.05%	0.02%	0.03%	0.00%
3	Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints														
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		UPW	0	396	4	19	2047	4058	465	426	4777	156	443	23
	B) No. of billing complaints for Post paid customers/Charging /Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		UPW	0	396	4	19	2047	4058	465	426	4777	156	443	23
	C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid	100 % within 4 week	UPW	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES-QE JUNE-14															
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
S / N	Name of Parameter			GSM Operators										CDMA Operators	
	customer) resolved within 4 weeks														
	D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	UPW	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	Response time to customers for assistance														
	A) Total no of calls attempted to customer care/Call center		UPW	19076	663331	389897	1232022	9797642	1910824	313237	10332756	9542251	162706	742463	34643
	B) Total no. of calls successfully established to customer care/Call center		UPW	18630	663331	389897	1232022	9753922	1875177	311113	9909613	9542251	157126	728658	34344
	C) % Accessibility of Call centre /customer Care (Total call successfully established*100/Total call attempt)	>=95 %	UPW	97.66%	100%	100%	100%	99.55%	98.13%	99.32%	95.90%	100%	96.57%	98.14%	99.14%
	D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		UPW	3348	1613344	160790	558807	2898207	343381	447458	1861402	2837470	4705	101867	37670
	E) Total number of calls answered by the operator (Voice to voice) within 60 seconds		UPW	3182	1374589	38137	120597	2810718	319550	377950	1794915	2756536	4515	95882	35075
	F) % age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec.*100/Total call attempt)	>=90 %	UPW	95.03%	85.20%	23.72%	21.58%	96.98%	93.06%	84.47%	96.43%	97.15%	95.96%	94.12%	93.11%
5	Termination/closure of service														
	A) Total No. of requests for Termination / Closure of service received during the quarter		UPW	0	664	6	160	990	31	275	NA	830	96	199	96

CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES-QE JUNE-14															
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
S / N	Name of Parameter			GSM Operators										CDMA Operators	
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		UPW	0	664	6	160	984	31	275	NA	830	96	199	96
	C) % of Termination/ Closure of service within 7 days	<=7d ays	UPW	NA	100%	100%	100%	99.36%	100%	100%	NA	100%	100%	100%	100.0%
6	Time taken for refunds of deposits after closures.														
	A) No. of Payments/ Refunds due during the quarter		UPW	0	275	3	50	1269	90	170	NA	147	NA	228	197
	B) No. of Payments/ Refunds Cleared during the quarter		UPW	0	275	3	50	1269	90	170	NA	147	NA	228	197
	C) Time taken for refunds of deposits after closures.	100 % withi n 60 days	UPW	NA	100%	100%	100%	100%	100%	100%	NA	100%	NA	100%	100%

*NA-Not Applicable

5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE-JUNE 2014):

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES-QE-JUNE-14

3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UPW)	IDEA	RCOM GSM	TATA (GSM)	UNINOR	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators										CDMA Operators	
RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE															
1	Total no of calls attempted to customer care/Call center		UP West	1831	20137	11966	40542	336679	49396	10806	338364	312867	4517	27750	1102
	Total no. of calls successfully established to customer care/Call center		UP West	1803	20137	11966	40542	335127	47939	10735	325850	312867	4430	27078	1094
	% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempt)	>=95%	UP West	98.47%	100%	100%	100%	99.54%	97.05%	99.34%	96.30%	100%	98.07%	97.58%	99.27%
2	Total Calls reached to agent desk for Voice to Voice (Total call attempt)		UP West	423	53078	4900	18279	101188	8742	15313	66693	95380	1054	3337	1194
	Total number of calls answered by the operator (Voice to voice) within 60 seconds		UP West	402	48579	1052	3259	99765	8507	13767	63497	93602	1046	3212	1102
	% age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec. *100 / Total call attempt)	>=90%	UP West	95.04%	91.52%	21.47%	17.83%	98.59%	97.31%	89.91%	95.21%	98.14%	99.24%	96.25%	92.29%

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 $\leq 0.1\%$. Uninor was not having the post paid customers.

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 were found to have met the benchmarks for the above parameters.

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 were in compliance with respect to the parameter 'Accessibility of call center'. **Airtel, BSNL (UK and UP-W) and Tata (GSM)** have failed to meet the benchmark of 'calls answered by Operators (voice to voice) within 60 seconds'. Their achievement for this parameter was **85.20%, 23.72%, 21.58%** and **84.47%** respectively against the benchmark of $> 90\%$. Thus performance of BSNL was very poor with respect to this parameter. The call center is common for BSNL (Uttarakhand) and BSNL (UPW).

4. Termination/Closure of Service

In case of this parameters also, all service providers (**except Idea**) have settled the closure within the benchmark of 7 days. Only Idea failed to meet the benchmark with its achievement for this parameter as **99.36%**,

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.

The results of three days live measurements reveal that all service providers were in compliance with respect to the parameter accessibility of call center. **BSNL (UP-W and UK) and Tata (GSM)** have failed to meet the benchmark of calls answered by Operators (voice to voice within 60 Sec). Their achievement for this parameter was **21.47%, 17.83%** and **89.91%** respectively. Thus performance of BSNL was very poor with respect to this parameter as also revealed from the quarterly audit.

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(W) 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 (UK)	BSNL (UP-W)	IDEA	RCOM GSM	TATA GSM	UNINOR	VODAFONE	MTS	RCOM CDMA	TATA CDMA
AIRCEL	UPW	--	100%	100%	100%	97%	95%	98%	100%	100%	100%	100%	100%
AIRTEL	UPW	100%	--	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL (UK)	UPW	100%	100%	--	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL (UP-W)	UPW	100%	100%	100%	--	100%	100%	100%	100%	100%	100%	100%	100%
IDEA	UPW	98%	100%	100%	100%	--	95%	100%	100%	100%	100%	100%	100%
RCOM GSM	UPW	97%	100%	100%	100%	100%	--	95%	100%	100%	100%	100%	100%
TATA GSM	UPW	100%	100%	100%	100%	98%	100%	--	100%	100%	97%	100%	100%
UNINOR	UPW	100%	100%	100%	100%	100%	100%	100%	--	100%	100%	100%	100%
VODAFONE	UPW	100%	100%	100%	100%	100%	100%	100%	100%	--	100%	100%	100%
MTS	UPW	100%	100%	100%	100%	100%	100%	95%	100%	100%	--	100%	100%
RCOM CDMA	UPW	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA CDMA	UPW	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory. However, in case where Calls attempted from Aircel to Idea, RCOM GSM & Tata GSM successful interconnection was 97.0%, 95% and 98% respectively, Idea to Aircel & RCOM GSM was 98% and 95%, RCOM GSM to Aircel & Tata GSM was 97% and 95%, Tata GSM to Idea & MTS was 98% and 97%, MTS to Tata GSM was 95%. Thus there was no remarkable problem in interconnection from one operator to other operators.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE													
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UPW)	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	UP West	100	100	100	100	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	UP West	100	100	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	UP West	100	100	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total calls successfully established*100/ Total call attempt)	UP West	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	UP West	100	100	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 60 seconds	UP West	94	90	43	51	100	99	100	97	100	100	100	98
% age of calls answered by operator(voice to voice) (Total calls successfully established within 60 Sec.*100/ Total call attempt)	UP West	94.00%	90.00%	43.00%	51.00%	100%	99.00%	100%	97.00%	100%	100%	100%	98.00%

In case of calls answered by operators (voice to voice) within 60 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, BSNL (UP-W), BSNL (UK), Uninor, Tata GSM and Tata CDMA they can achieve its performance as 94.00%, 90.00%, 51.00%, 43.00%, 99.00%, 97.00% and 98.00% respectively.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS

Parameter	Circle Name	AIRCEL	AIRTEL	BSNL (UK)	BSNL (UPW)	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	UPW	0	100	12	58	100	100	100	100	100	100	100	69
Total No. of calls Answered	UPW	0	91	12	58	91	88	78	90	81	83	74	69
Cases resolved within 4 weeks	UPW	0	91	12	58	91	88	78	90	81	83	74	69
%age of cases resolved	UPW	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING

Emergency no.	Circle Name	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	MTS	VODAFONE	UNINOR
100,101,102,108,1090	UPW	Bijnor	Bijnor	10	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Bijnor	Chandpur	10	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Bijnor	Nagina	10	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Bijnor	Dhampur	10	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1098	UPW	Bijnor	Najibabad	10	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Mathura	Mathura	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Mathura	Kosi	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Mathura	Vrindavan	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,102,108,1090	UPW	Mathura	Sadabad	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,108,1090,1098	UPW	Meerut	Meerut	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,108,1090,1098	UPW	Meerut	Baraut	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,108,1090,1098	UPW	Meerut	Sardhan	15	NS	√	√	√	√	√	√	√	√	√	√
100,101,108,1090,1098	UPW	Meerut	Mwana	15	NS	√	√	√	√	√	√	√	√	√	√

*NS: No Service

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 (West) service areas, the emergency services as mentioned in the above table were found functional in the networks of all the service providers.

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 SSA's namely **Bijnore, Mathura and Meerut** in the months of April, May and June 2014 respectively. The total route Kms covered during the drive tests in respective SSAs was **300 Kms, 330 Kms and 355 Kms**. 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: BIJNORE SSA (APRIL-14)

DRIVE TEST TABLE – 1

S/N	Parameter	Days of drive test	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR
1	Call Attempts	Day 1	99	20	103	22	95	20	96	20	83	20	88	20	90	20	101	20	79	20	93	20	
		Day 2	88	20	96	33	79	20	89	20	75	20	81	20	93	20	85	20	ND	ND	72	20	
		Day 3	86	20	96	35	101	20	75	20	73	20	74	20	98	20	77	20	73	20	80	20	
		Overall SSA	273	60	295	90	275	60	260	60	231	60	243	60	281	60	263	60	152	40	245	60	
2	Blocked Call Rate	Day 1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.41%	0.00%	1.14%	0.00%	0.00%	0.00%	0.00%	0.00%	1.27%	0.00%	0.00%	0.00%	
		Day 2	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.23%	5.00%	0.00%	0.00%	0.00%	0.00%	ND	ND	0.00%	0.00%	
		Day 3	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.37%	0.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Overall SSA	0.37%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	0.00%	1.65%	1.67%	0.00%	0.00%	0.00%	0.00%	0.66%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Day 1	0.00%	0.00%	1.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Day 2	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	ND	0.00%	0.00%	
		Day 3	0.00%	0.00%	2.11%	0.00%	0.00%	0.00%	0.00%	0.00%	1.39%	0.00%	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%	2.05%	0.00%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
4	Percentage connections with good voice quality (=>95%)																						
	(a) 0-4 (w/o)	Day 1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.46%	99.92%	95.07%	83.78%	97.58%	98.94%	

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

S/N	Parameter	Days of drive test	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		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)	Day 2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.62%	99.96%	ND	ND	98.26%
	Day 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.60%	100%	98.51%	93.55%	98.62%	99.43%		
	Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.17%	99.96%	96.73%	86.67%	98.13%	99.09%		
(b) 0-5 (with frequency hopping for GSM Operators)	Day 1	96.92%	99.33%	98.89%	97.39%	96.64%	98.27%	95.32%	98.29%	94.01%	97.70%	87.85%	94.56%	97.49%	97.96%	NA	NA	NA	NA	NA	NA		
	Day 2	96.21%	99.76%	99.25%	98.44%	95.67%	98.89%	95.35%	98.72%	93.39%	96.00%	89.17%	91.82%	97.45%	98.90%	NA	NA	NA	NA	NA	NA		
	Day 3	95.69%	99.44%	99.27%	99.77%	95.59%	98.14%	95.45%	99.46%	93.96%	100%	87.38%	95.77%	97.09%	99.29%	NA	NA	NA	NA	NA	NA		
	Overall SSA	96.31%	99.51%	99.18%	98.57%	96.05%	98.43%	95.37%	98.84%	93.80%	98.11%	88.07%	94.11%	97.36%	98.72%	NA	NA	NA	NA	NA	NA		
5	Service Coverage																						
	In door (>= -75dBm)	Day 1	69.21%	70.94%	47.48%	57.15%	96.40%	100%	67.50%	99.51%	81.87%	94.64%	63.04%	83.42%	57.95%	83.30%	80.89%	92.06%	81.71%	100%	82.44%	100%	
		Day 2	62.51%	99.52%	64.22%	54.81%	96.85%	100%	54.96%	55.11%	70.04%	0.00%	47.32%	60.05%	60.41%	78.20%	68.73%	92.14%	ND	ND	67.80%	100%	
		Day 3	68.82%	88.63%	70.47%	60.28%	98.01%	100%	67.26%	100%	72.81%	100%	64.12%	87.08%	59.21%	85.66%	80.51%	88.93%	73.65%	100%	65.57%	99.89%	
		Overall SSA	67.01%	86.35%	61.33%	57.87%	97.01%	100%	62.86%	77.05%	75.28%	82.91%	58.66%	77.28%	59.12%	82.40%	76.86%	91.04%	77.90%	100%	72.47%	99.96%	
	In-vehicle (>= -85dBm)	Day 1	92.96%	98.34%	95.41%	94.88%	99.62%	100%	91.63%	100%	97.71%	100%	89.37%	99.66%	85.86%	97.09%	90.61%	92.10%	95.86%	100%	94.19%	100%	
		Day 2	92.63%	99.98%	96.36%	94.68%	99.90%	100%	88.98%	96.65%	92.94%	35.71%	83.86%	99.54%	84.19%	95.05%	85.59%	92.25%	ND	ND	86.94%	100%	
		Day 3	93.17%	99.94%	98.12%	95.19%	99.92%	100%	89.73%	100%	90.69%	100%	91.18%	99.87%	86.01%	97.55%	91.06%	92.10%	94.13%	100%	83.12%	100%	
Overall SSA		92.92%	99.42%	96.62%	94.96%	99.79%	100%	90.13%	98.30%	93.93%	90.95%	88.35%	99.69%	85.38%	96.56%	89.13%	92.15%	95.04%	100%	88.35%	100%		

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

S/N	Parameter	Days of drive test	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			6	Outdoor-in city (>= 95dBm)	Day 1	99.74%	100%	99.56%	98.29%	99.98%	100%	100%	100%	99.91%	100%	99.52%	100%	98.06%	99.53%	92.17%	92.10%	100%
Day 2	99.59%	100%			99.60%	98.82%	99.98%	100%	100%	100%	98.45%	100%	98.12%	100%	96.97%	98.62%	91.39%	92.25%	ND	ND	99.51%	100%
Day 3	99.61%	100%			99.46%	99.62%	100%	100%	100%	100%	98.10%	100%	99.06%	100%	98.19%	99.28%	92.51%	92.10%	100%	100%	98.37%	100%
Overall SSA	99.65%	100%			99.54%	99.03%	99.99%	100%	100%	100%	98.87%	100%	98.93%	100%	97.76%	99.14%	92.09%	92.15%	100%	100%	99.16%	100%
6	Call Setup Success Rate (>=95%)	Day 1	100%	100%	99.03%	100%	100%	100%	100%	100%	97.59%	100%	98.86%	100%	100%	100%	100%	100%	98.73%	100%	100%	100%
		Day 2	97.73%	100%	98.96%	100%	100%	100%	100%	100%	100%	100%	98.77%	95.00%	100%	100%	100%	100%	ND	ND	100%	100%
		Day 3	98.84%	100%	98.96%	100%	100%	100%	100%	100%	98.63%	100%	97.30%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	98.90%	100%	98.98%	100%	100%	100%	100%	100%	98.70%	100%	98.35%	98.33%	100%	100%	100%	100%	99.34%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Day 1	100%	100%	98.33%	100%	100%	100%	100%	100%	100%	100%	96.08%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Day 2	98.59%	100%	97.79%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	ND	ND	100%	100%
		Day 3	100%	100%	98.65%	100%	100%	100%	100%	100%	99.05%	100%	99.32%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	99.57%	100%	98.27%	100%	100%	100%	100%	100%	99.72%	100%	98.61%	100%	100%	100%	100%	100%	100%	100%	100%	100%

- Aircel is not having coverage in whole SSA
- ND: Not done - RCOM CDMA did not turn up for drive test due to fiber cut.
- NA: Not Applicable

7.2 OPERATOR ASSISTED DRIVE TEST: MATHURA SSA (MAY-14)

DRIVE TEST TABLE – 2

S/N	Parameter	Classification of routes covered	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		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	103	25	79	25	93	25	74	25	84	25	82	25	81	25	96	25	79	25	60	28
		Highway	306	25	234	28	286	25	224	25	144	25	235	28	269	32	147	15	144	25	163	25
		Within City	118	25	75	26	90	25	125	25	74	20	99	29	125	26	127	25	82	ND	78	26
		Overall SSA	527	75	388	79	469	75	423	75	302	70	416	82	475	83	370	65	305	50	301	79
2	Blocked Call Rate	Major Road	0.00%	0.00%	1.27%	8.00%	0.00%	0.00%	0.00%	0.00%	3.61%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	1.27%	0.00%	0.00%	0.00%
		Highway	0.00%	0.00%	6.41%	0.00%	0.00%	0.00%	0.00%	0.00%	1.39%	0.00%	0.43%	0.00%	0.74%	0.00%	0.00%	0.00%	0.69%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	1.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.22%	ND	0.00%	0.00%
		Overall SSA	0.00%	0.00%	4.38%	2.53%	0.00%	0.00%	0.00%	0.00%	1.66%	0.00%	0.48%	0.00%	0.42%	0.00%	0.00%	0.00%	0.98%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	1.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Highway	0.00%	0.00%	6.39%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.38%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	1.37%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.01%	0.00%	0.00%	0.00%	0.00%	0.00%	1.23%	ND	0.00%	0.00%
		Overall SSA	0.00%	0.00%	4.34%	1.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.24%	0.00%	0.21%	0.00%	0.00%	0.00%	0.66%	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	97.95%	97.69%	99.38%	100%	97.77%	98.46%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
5	frequency hopping for CDMA Operators)	Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93.12%	91.03%	99.14%	100%	96.35%	99.48%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93.19%	98.14%	99.74%	ND	97.70%	99.44%
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94.39%	96.32%	99.37%	100%	96.94%	99.11%
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	95.43%	99.48%	77.48%	79.88%	98.43%	98.66%	96.03%	100%	90.49%	88.62%	89.83%	99.17%	94.51%	97.69%	NA	NA	NA	NA	NA	NA	NA
		Highway	95.64%	97.35%	77.74%	79.78%	97.34%	99.40%	96.67%	99.76%	93.27%	94.00%	92.95%	98.96%	95.74%	98.58%	NA	NA	NA	NA	NA	NA	NA
		Within City	96.50%	99.59%	86.47%	94.22%	98.44%	98.67%	95.85%	98.76%	94.13%	95.88%	93.91%	96.64%	96.75%	95.91%	NA	NA	NA	NA	NA	NA	NA
		Overall SSA	95.80%	98.81%	79.44%	82.98%	97.90%	98.91%	96.31%	99.51%	92.60%	92.58%	92.67%	98.25%	95.80%	97.52%	NA	NA	NA	NA	NA	NA	NA
	Service Coverage																						
	In door (>= - 75dBm)	Major Road	75.51%	57.14%	35.38%	2.15%	96.38%	99.20%	69.76%	100%	58.44%	51.88%	45.31%	94.55%	51.25%	70.85%	60.69%	64.14%	54.61%	76.32%	55.24%	54.40%	
		Highway	67.90%	51.28%	34.77%	5.19%	95.67%	91.80%	67.03%	80.42%	62.61%	53.68%	56.09%	49.83%	61.54%	64.41%	63.78%	0.00%	72.98%	66.39%	70.22%	74.65%	
Within City		67.90%	88.21%	45.43%	90.46%	97.46%	96.90%	78.98%	90.79%	77.02%	66.40%	71.76%	32.81%	73.33%	25.81%	71.86%	7..75%	83.37%	ND	78.81%	78.92%		
Overall SSA		69.43%	65.58%	37.04%	22.74%	96.31%	95.95%	71.14%	90.96%	67.70%	56.19%	58.10%	57.39%	62.89%	55.01%	65.79%	51.55%	70.15%	70.49%	69.41%	68.88%		
In-vehicle (>= - 85dBm)	Major Road	92.69%	94.73%	72.94%	68.73%	97.77%	100%	92.06%	100%	84.22%	74.04%	81.89%	99.67%	84.46%	96.17%	95.26%	82.16%	90.11%	97.09%	97.75%	95.46%		
	Highway	92.91%	98.45%	69.72%	60.12%	99.79%	100%	92.45%	100%	93.23%	67.87%	87.71%	83.43%	90.55%	88.74%	93.26%	100%	92.10%	89.92%	96.61%	99.60%		
	Within City	91.74%	96.28%	89.27%	99.89%	99.83%	100%	98.85%	98.94%	93.43%	68.78%	94.59%	79.94%	94.43%	77.27%	97.21%	98.93%	96.87%	ND	96.59%	99.62%		
	Overall SSA	92.59%	96.48%	74.34%	71.96%	99.79%	100%	94.30%	99.68%	90.87%	69.62%	88.40%	87.11%	90.53%	87.60%	95.14%	92.63%	92.60%	92.88%	96.83%	98.14%		

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
	Outdoor-in city (>= 95dBm)	Major Road	99.55%	99.94%	96.90%	99.84%	100%	100%	99.89%	100%	99.09%	91.79%	98.30%	100%	7.87%	99.90%	99.98%	100%	99.89%	99.96%	99.96%	100%
		Highway	99.69%	100%	92.25%	99.10%	100%	100%	99.27%	100%	99.64%	93.66%	98.98%	98.77%	98.64%	98.71%	99.80%	100%	99.73%	99.74%	99.93%	100%
		Within City	98.71%	100%	99.21%	100%	100%	100%	99.90%	99.70%	99.10%	94.34%	99.58%	99.40%	99.41%	91.01%	99.61%	100%	100%	ND	99.93%	100%
		Overall SSA	99.43%	99.98%	94.65%	99.57%	100%	100%	99.58%	99.91%	99.39%	93.35%	99.01%	99.36%	98.71%	96.80%	99.78%	100%	99.84%	99.83%	99.93%	100%
6	Call Setup Success Rate (>=95%)	Major Road	100%	100%	97.47%	92.00%	100%	100%	100%	100%	96.43%	100%	98.78%	100%	100%	100%	100%	100%	98.73%	100%	100%	100%
		Highway	99.35%	100%	93.59%	100%	100%	100%	100%	100%	98.61%	100%	99.57%	100%	98.51%	100%	100%	100%	99.31%	100%	100%	100%
		Within City	98.31%	100%	97.33%	96.15%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.78%	ND	100%	100%
		Overall SSA	99.24%	100%	95.10%	96.20%	100%	100%	100%	100%	98.34%	100%	99.52%	100%	99.16%	100%	100%	100%	99.02%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Road	99.57%	100%	95.86%	100%	100%	100%	98.44%	100%	96.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highway	99.86%	100%	85.76%	100%	100%	100%	99.58%	100%	100%	100%	96.97%	100%	99.63%	100%	100%	100%	100%	100%	100%	100%
		Within City	99.41%	100%	98.70%	100%	99.28%	100%	100%	100%	100%	100%	99.42%	99.00%	100%	100%	100%	100%	100%	ND	100%	100%
		Overall SSA	99.73%	100%	90.34%	100%	99.85%	100%	99.48%	100%	99.48%	100%	98.13%	97.22%	99.74%	100%	100%	100%	100%	100%	100%	100%

- Aircel is not having coverage in whole SSA
- ND: Indoor drive test for RCOM CDMA was not conducted on day 3 due to fiber cut.
- NA: Not Applicable

7.3 OPERATOR ASSISTED DRIVE TEST: MEERUT SSA (JUNE-14)

DRIVE TEST TABLE – 3

S/N	Parameter	Classification of routes covered	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		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	138	26	74	30	111	24	149	25	126	25	120	25	143	25	139	25	149	26	136	25
		Highway	177	29	265	36	278	24	165	25	153	25	177	25	181	25	163	25	164	25	182	25
		Within City	169	25	180	28	169	28	194	25	150	27	181	25	176	25	188	25	148	26	160	25
		Overall SSA	484	80	519	94	558	76	508	75	429	77	478	75	500	75	490	75	461	77	478	75
2	Blocked Call Rate	Major Road	0.72%	0.00%	8.11%	0.00%	0.90%	0.00%	0.00%	0.00%	0.79%	4.00%	1.67%	0.00%	0.00%	0.00%	0.00%	0.00%	1.34%	0.00%	0.00%	0.00%
		Highway	0.00%	0.00%	7.92%	2.78%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.56%	0.00%	0.00%	0.00%	0.00%	0.00%	1.83%	0.00%	0.55%	0.00%
		Within City	0.00%	0.00%	12.22%	0.00%	0.59%	0.00%	0.00%	0.00%	0.67%	0.00%	2.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.00%
		Overall SSA	0.21%	0.00%	9.44%	1.06%	0.36%	0.00%	0.00%	0.00%	0.47%	1.30%	1.67%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	0.00%	0.21%	0.00%
3	Dropped Call Rate (<=2%)	Major Road	0.00%	0.00%	2.94%	3.33%	0.00%	0.00%	0.00%	0.00%	1.60%	4.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.00%
		Highway	0.00%	0.00%	4.51%	0.00%	0.36%	0.00%	0.00%	0.00%	0.65%	0.00%	0.58%	0.00%	0.00%	0.00%	0.00%	0.00%	1.24%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	6.96%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	1.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	5.11%	1.08%	0.18%	0.00%	0.00%	0.00%	0.94%	1.32%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.88%	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	97.84%	99.90%	89.07%	90.00%	97.14%	99.12%

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
5	frequency hopping for CDMA Operators)	Highway	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.06%	97.37%	88.25%	95.12%	97.51%	96.89%	
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.67%	99.93%	89.93%	97.30%	97.93%	98.78%
		Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.56%	99.07%	88.90%	92.70%	97.55%	98.26%
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Road	94.87%	98.58%	85.42%	99.63%	97.19%	98.64%	94.64%	98.07%	89.50%	91.54%	88.42%	88.81%	95.89%	97.12%	NA	NA	NA	NA	NA	NA	
		Highway	94.92%	99.60%	80.96%	97.63%	97.13%	98.15%	95.85%	97.76%	94.77%	95.06%	83.63%	93.25%	96.22%	98.60%	NA	NA	NA	NA	NA	NA	
		Within City	96.50%	99.45%	84.83%	99.57%	97.41%	98.03%	96.70%	99.25%	94.12%	93.85%	89.22%	97.72%	97.16%	97.93%	NA	NA	NA	NA	NA	NA	
		Overall SSA	95.46%	99.23%	83.03%	98.88%	97.23%	98.25%	95.83%	98.37%	92.99%	93.12%	86.95%	93.27%	96.46%	97.88%	NA	NA	NA	NA	NA	NA	
	Service Coverage																						
		In door (>= - 75dBm)	Major Road	87.41%	99.60%	29.06%	33.33%	97.91%	100%	59.86%	71.00%	80.45%	100%	49.12%	16.07%	60.97%	83.80%	77.15%	77.14%	89.64%	100%	88.39%	98.80%
			Highway	85.73%	73.69%	25.80%	32.29%	95.19%	96.82%	45.61%	41.50%	45.83%	63.27%	24.58%	34.02%	48.29%	73.00%	52.98%	46.97%	62.91%	97.06%	58.92%	92.26%
			Within City	91.23%	100%	27.57%	32.92%	96.64%	99.95%	51.15%	67.60%	78.16%	64.86%	38.14%	27.11%	48.70%	24.30%	77.23%	95.48%	83.44%	70.15%	90.02%	96.95%
			Overall SSA	88.09%	91.36%	27.09%	32.81%	96.19%	98.88%	51.58%	58.73%	65.93%	80.32%	35.71%	25.52%	51.99%	60.16%	68.83%	73.20%	76.75%	92.58%	77.72%	96.01%
In-vehicle (>= - 85dBm)		Major Road	98.05%	100%	64.04%	66.67%	99.82%	100%	94.34%	99.10%	94.42%	100%	78.38%	85.34%	89.52%	98.30%	92.65%	99.17%	96.62%	100%	97.49%	100%	
		Highway	97.66%	99.75%	62.00%	66.12%	99.50%	99.85%	86.30%	91.40%	74.39%	100%	59.46%	59.00%	83.96%	93.90%	88.97%	93.37%	91.18%	100%	84.90%	98.27%	
		Within City	98.97%	100%	63.32%	66.46%	99.79%	100%	91.77%	99.30%	92.89%	64.86%	76.22%	71.82%	78.56%	55.80%	96.57%	100%	98.13%	71.64%	99.47%	100%	
		Overall SSA	98.22%	99.92%	62.87%	66.39%	99.65%	99.95%	90.60%	96.31%	85.95%	91.75%	70.46%	72.38%	83.59%	82.51%	92.80%	97.52%	94.90%	93.87%	93.36%	99.42%	

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

S/N	Parameter	Classification of routes covered	AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		UNINOR		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
	Outdoor-in city (>= 95dBm)	Major Road	99.58%	100%	100%	100%	99.98%	100%	99.28%	100%	99.23%	100%	96.75%	99.98%	98.46%	100%	99.21%	99.24%	99.84%	100%	99.94%	100%
		Highway	99.74%	100%	100%	100%	99.96%	100%	98.99%	99.60%	95.29%	100%	92.73%	98.22%	97.49%	99.00%	99.08%	99.77%	99.12%	100%	99.25%	100%
		Within City	99.88%	100%	100%	100%	99.99%	100%	99.55%	100%	99.76%	93.24%	96.86%	94.79%	95.63%	89.10%	99.81%	100%	99.99%	100%	100%	100%
		Overall SSA	99.74%	100%	100%	100%	99.97%	100%	99.29%	99.85%	97.84%	98.41%	95.29%	97.65%	97.10%	95.99%	99.38%	99.67%	99.60%	100%	99.70%	100%
6	Call Setup Success Rate (>=95%)	Major Road	99.28%	100%	91.89%	100%	99.10%	100%	100%	100%	99.21%	96.00%	95.83%	100%	100%	100%	100%	100%	98.66%	100%	100%	100%
		Highway	100%	100%	92.08%	97.22%	100%	100%	100%	100%	100%	100%	97.74%	100%	100%	100%	100%	100%	98.17%	100%	99.45%	100%
		Within City	100%	100%	87.78%	100%	99.41%	100%	100%	100%	99.33%	100%	97.79%	100%	100%	100%	100%	100%	99.32%	100%	100%	100%
		Overall SSA	99.79%	100%	90.56%	98.94%	99.64%	100%	100%	100%	99.53%	98.70%	97.28%	100%	100%	100%	100%	100%	100%	98.70%	100%	99.79%
7	Hand Over Success Rate (HOSR)	Major Road	98.35%	100%	98.50%	100%	97.87%	100%	98.74%	100%	99.53%	100%	99.00%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highway	99.47%	100%	95.62%	100%	100%	100%	100%	100%	98.41%	100%	99.45%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	99.67%	100%	94.39%	100%	98.99%	100%	98.95%	100%	98.90%	100%	98.85%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	99.14%	100%	95.86%	100%	99.05%	100%	99.26%	100%	99.04%	100%	99.07%	100%	100%	100%	100%	100%	100%	100%	100%	100%

- Aircel is not having coverage in whole SSA.
- NA: Not Applicable

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Name of SSA	Month	Day 1		Day 2		Day 3	
		Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered
BIJNOR	Apr-14	Bijnor & Chandpur / 100km	Bsnl T/E-Vk Garden-Mandawar Road-Judgi Chowk-Shakti Talkis-Najibabad Road-Mandawar Road-Judgi Chowk-Shakti Talkis-Civil Lines-Bus Stand Bijnor-Dm Office-Chandpur Chungi-Srs Mall-Ganj Tiraha-Chandpur Road Ganj-Heempur Deepa-Rohnia-Bus Stand Chandpur-Pheena Road-Dhanora Road-Basta Road-Peepalshana-Noorpur Bus Stand Main Market-Bijnor Road Indoor: Vira Engg. College Gulab Singh Hindu Inter College Chandpur	Nagina & Dhampur /100km	T/E Bijnor-Vk Puram-Sunderpur-Barookee-Kotwali-Lal Sarai Nagina-Munim Chowk-Station Road Nagina--Tibri-Dhampur Degree College-Durgavihar-Indira Nagar-Sherkot-Dhampur Mooradabad Road-Rani Bagh-Sugar Mill Dhampur-Railway Station Dhampur-Jaitra-Nindru-Dhampur Main Chowk Indoor: Goel Public School(Nagina) Rsm Inter College Dhampur	Najibabad /100km	Bijnor T/E-Kiratpur- Kiratpur Block Office-Main Market Kiratpur -Bhaneda-Mochipura-Bus Stand Najibabad-Akashwani Njbd-Chandanpura-Badiya-Kisan Sugar Mill-Sahanpur-Mandawali-Ajmal Khan Road Njbd-Njbd Kotwali Road-Adarsh Nagar - Indian Oil Depot Njbd Indoor: Ghai Motel & Reastaurant
MATHURA	May-14	Mathura /110 Km	Within City:-Railway Stn.,Sbi Chowk,Dindayal Nagar,Tank Chouraha,Sadar Road,Holi Gate,Kotwali,Deeg Gate,Masani, Major Roads:-Agarsen Chowk,Masani,Jaisingh Pura,Varindavan Road,Vanshivala Restaurant,Agarsen Chowk, Highways:-Agarsen Chowk,Nh-2,Chandan Van,Refinery,Toll Plaza,Farah,Raipura Jat,Agarwal Dhaba, Govardhan Chowk,Krishna Nagar,Bhuteshwar,Laxmi Nagar,Raya(On Aligarh Road).	Chhata (Kosikalan), Mant (Vrindavan)/115 Km	Within City:-Shriji Mkt.,Chata,Sabji Mandi,Shergadh Road,Link Road Kosi,Kosi Bus Stand,Railway Stn.,Nandgaon Road,Industrial Estate, Highways:-Govardhan Chowk,Nh-2(Towards Chata),Jait,Choumua,Chata,Kosi,G.L.A. University,Chatikara Major Roads:-Chatikara,Prem Mandir,Kishor Pura,C.F.C.Chowk,Pani Gaon,Manth,Sanskar City. Indoor: Sagar Ratna (Near Kosi), Sanskar City (Varindavan)	Sadabad /105 Km	Within City:-Jawahar Bazar, Sadabad, Main Mkt., Hathras Road, Block Office, Sdps, Sdm Court Highways:-Railway Stn., Mathura,Tank Chowk, Laxmi Nagar,Raya,Madaim,Nagora, Uncha Gaon,Kajrothi,Sadabad,Naugao, Visavar,J Arotha,Baldev,Mahavan, Gokul, Major Roads:-Sadabad-Jalesar Road, Vinobha Nagar, Mursan Road, Roadways Bus Stand,

AUDIT & ASSESSMENT OF QOS FOR QE-JUNE-2014-UP (WEST) CIRCLE

			<p>Indoor: Agarwal Dhaba,Nh-(Mathura), Highway Plaza,Nh-2 (Mathura)</p>			<p>Jatai.</p> <p>Indoor: Sbi Sadabad (Sadabad), Honda Showroom (Sadabad)</p>
MEERUT	Jun-14	Meerut / 105km	<p>1) Within City--> Ccs University,Medical,Radha Govind,Pvs Mall,Hapur Chungi,Hapur Adda, Bhumia Ka Pull,Hrs Chowk,Partapur, 2) Major Roads-->Modipuram,Roorkee Road,Begum Bridge,Metro Plaza,Bhagpat Road,Ghantaghar,Saket,Ccs University,Begum Bridge, Hapur Adda,Sohrab Gate,Nayi Sadak,Shastri Nagar,Ccs University, 3) Highways-->Partapur, Moddinpur,Sugar Mill,Meerut Bypass,Subharti,Miet,Maliyana, Sardhana Bypass,Venketeshwara,Bikanerwala, Modipuram, Milange Mall.</p> <p>Indoor: Milange Mall, Marwadi Bhoj (Metro Plaza)</p>	<p>Baghpat-2 (Baraut) & Sardhana/ 130 Km</p>	<p>1) Highways-->Rohta Flyover Bypass, Lakhwaya, Puthkhas, Rohta, Barnawa, Binauli,Johri, Bajidpur,Baraut, Barnawa, Main Putthi,Bhuni, Sardhana, Dabathua. 2) Within City--> Railway Crossing, Jain Temple Baraut, Bhagwan Mahavir Marg, Gangaram Marg, Baraut Railway Road,Sanjay Murti, Naya Bajar, Kotana Road, Baraut Bypass,Sneh Farm. 3) Major Roads-->Baraut-Saharanpur Road, Nayi Basti, Bawli Road, Jatt College ,Bijroli Road,Govt. Hospital, Sarai Road.</p> <p>Indoor: Lal Haveli(Baraut), Sardhana Church</p>	<p>Mawana / 120km</p> <p>1) Highways-->Saket Chowk, Ganga Nagar, Rajpura, Incholi, Saini, Phijkari, Chota Mawana, Jhunjhuni, Behsuma, Hastinapur, Chota Mawana,Saket Chowk. 2) Within City-->Govt.College,Main Road Hastinapur, Gol Mkt.,District Sehkari Bank, Valmiki Chowk, Manoharpur School, Manoharpur Vill., Block Office Hastinapur, Ganeshpur Shiv Chowk, Mawana ,Rambagh, Tehsil Gate, Makdumpur Road, Pritam Nagar, Bhagat Singh Chowk, Kotwali Mawana, Kila Bus Stand, Mill Road, Mawana Sugar Mill, Greater Mawana, Maa Bhadrakali Road, Saket. 3) Major Roads-->Ganeshpur-Mawana, Mawana-Chota Mawana.</p>

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF BIJNOR SSA - APRIL-14

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	Bijnor, Chandpur	No Coverage	Dhampur, Nagina	No Coverage	Najibabad	No Coverage
2	AIRTEL		Poor Level & Quality at Bijnor Outer, Nijamatpur Outer		Poor Level near Krishi Kendra, Dhampur Outer		Poor Level & Quality near Sultanpur Sadat, Aurangpur Outer
3	BSNL		Poor Level & Quality at Bijnor Outer, Nijamatpur Outer, Chandpur, Viral		Poor Level & Quality near Lalchipur Khangru, Krishi Kendra, Majikheda Sakru, Ahatmali		Poor Quality near Najibabad
4	TATA GSM		No coverage between Bijnor to Nijamatpur Vilah, Chandpur to Noorpur, Poor Level & Quality near Bijnor Outer, Chandpur Outer		No Coverage between Manjikheda to Nagina, Poor Level & Quality at Nagina Outer, Ghansulpur, Krishi Kendra		No Coverage between Sultanpur Sadat to Auragpur Fatehbad, Poor Level & Quality near Bakhatpur, Sultanpur Sadat Outer
5	TATA CDMA		They have coverage only in SDCAs or Major Town with Poor Level or Quality at Outer		They have coverage only in SDCAs or Major Town with Poor Level or Quality at Outer		No Coverage between Aurangpur Fateh khan to Najibabad, Poor Level near Ismail ka Nagli, Sulatanpur Sadat, Najibabad Outer
6	IDEA		Poor Level & Quality near Nijamatpur Vilah		---		---
7	RCOM GSM		Poor level & Quality near Gyan Vihar Ring Rd, Taimoorpur, SD Puram, No coverage between Bijnor to Nijamatpur Vilah, Shahpur to Chandpur, Chandpur to Noorpur, Poor Quality near Sarai Rafiq Chandpur		No Coverage between Momanpur to Lalchipur, Bhartiya krishi Anusandhan Kendra, Ghansulpur Amroli, Manjheda to Nagina, Nagina to Ahatmali, Poor Quality near Kotwali, near Suhagpur-Dhampur		No Coverage between Suvaher, Ismail Ka Nagli, Sultanpur Sadat, Auragpur Fatehbad, Poor Level & Quality near Bakhatpur, Sultanpur Sadat Outer
8	RCOM CDMA		Poor level & Quality near Nijamatpur Vilah Outer, No coverage between Bijnor to Nijamatpur Vilah, Shahpur to Chandpur, Chandpur to Noorpur, Poor Quality near Sarai Rafiq Chandpur		All Sites was down due to fiber cut		No Coverage between Suvaher, Ismail Ka Nagli, Sultanpur Sadat, Auragpur Fatehbad, Poor Level & Quality near Bakhatpur, Sultanpur Sadat Outer, Kotdwar Rd
9	MTS		They have coverage only in SDCAs with Poor Level or Quality at Outer		They have coverage only in SDCAs with Poor Level or Quality at Outer		They have coverage only in SDCAs with Poor Level or Quality at Outer
10	UNINOR		Poor level & Quality near Gyan Vihar Ring Rd, Taimoorpur, SD Puram, No coverage between Bijnor to Nijamatpur Vilah, Shahpur to Chandpur, Chandpur to Noorpur		No Coverage at Mominpur, Chakk Tigri, pipal Thana, Alipura, Poor Quality near krishi kendra, Dhampur Outer, Mominpur		No Coverage at Manda, Raipur, Poor Level & Quality near Pedda, Nangla, Najibabad Outer, Jaswant Nagar
11	VODAFONE		Poor Level & Quality near Bijnor Outer, Nijamatpur, Chanpur Outer		Poor Level & Quality near Lalchipur Khangru, Krishi Kendra, Majikheda Sakru		Poor Level & Quality near Sultanpur Sadat, Najibabad Outer

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF MATHURA SSA – MAY 14

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	Mathura	No Coverage	Chhata (Kosikalan), Mant (Vrindavan)	No Coverage	Sadabad	No Coverage
2	AIRTEL		Poor Level & Quality at mathura outer towards Vrindavan Rd, Laxmi nagar		Poor Level & Quality near Bhakti Vedanta Swami marg		Poor Level & Quality near Mahaban, Raya Rd, Raya Outer
3	BSNL		Poor Level & Quality at mathura outer towards Vrindavan Rd, Laxmi nagar		Poor Level & Quality near Bhakti Vedanta Swami marg, Chatikara outer		Poor Level & Quality between Raya to Sadabad, mathura outer
4	TATA GSM		Poor Level & Quality near Laxminagar, No Coverage between Diwankala to Malahi		No Coverage between to Chatikara to Sanskar City, Yamuna Bridge to Mant, Poor Level & Quality near Chatikara Outer, near Dautara		No Coverage between Sadabad to Bisawar, Bisawar to Baldev, Baldev to Mahadev, Diwankala to Malahi, Raya to Sadabad, Poor Level & Quality at Sadabad Outer, Raya Outer
5	TATA CDMA		No Coverage between laxmi nagar to Raya Flyover, Mathjra Toll to Farah, Poor Level & Quality near mathura Outer		Poor Level & Quality near Dautara, Chatikara, No Coverage between GLA University to Chatikara, Panigaon, Math		No Coverage between Sadabad to Bisawar, Bisawar to Shriji Cold Storage, Mazar to Yamuna Expway
6	IDEA						
7	RCOM GSM		Poor Level & Quality near Mant Moola & Hathras Rd, Laxminagar		Poor Level & Quality near Bhakti Vedanta Swami marg, Yamuna Expway, Jatikara, Piproli Khadar		Poor Level & Quality near Badpur, Refinery, Milikh Bagichi, No Coverage at Mahaban, Jarotha, Arotha
8	RCOM CDMA		Poor Level & Quality near Laxminagar		Poor Level near Dautana, between Chahta to Chaumuha, Chatikara		Poor Level near Raya, Navada, Mahaban, No Coverage between Mahaban to Sadabad
9	MTS		Poor Level & Quality near Railway Station, Laxminagar		Poor Level & Quality at Chhata Outer, kosi Outer, GLA University Outer		Poor Level & Quality at Raya Outer, No coverage between Raya to Sadabad, Mathura to Raya
10	UNINOR		No Coverage at Lohavan towards Raya, Poor Quality at Mathura outer		No Coverage between Chatikara to Vrindavan, Panigaon to Math,		No Coverage between Raya to Sadabad, Lohavan to Raya, Gokul Mahavan, Mahavan Dauji, Sadabad to Bisawar, Bisawar to Mahadev, Poor Level & Quality at Raya Outer towards Sadabad Rd
11	VODAFONE		Poor Level & Quality near Gaurav Kendra, Laxmi nagar		Poor Level & Quality near Chatikara, Link Rd		Poor Level & Quality at Sadabad Outer, Raya Outer

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF MEERUT SSA – JUNE 14

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	Meerut	No Coverage	Baghpat-2 (Baraut) & Sardhana	No Coverage	Mawana	No Coverage
2	AIRTEL		Poor Level & Quality near Cantt Area, Railway Station		Poor Quality near Sardhana		Poor Level & Quality near Mawana
3	BSNL		Poor Level & Quality near Pallavpuram, Cantt Area, Subharti University, Partapur		Poor Level & Quality near Wazidpur, Suroorpur Khurd, Chowk Bazar, Dabthhawa, Sindhwali, Purian Mohalla		Poor Level & Quality near JP Institute, Main Marjet Mawana, Ganeshpur, Behsuma
4	TATA GSM		Poor Level & Quality near Cantt Area, Shastri Nagar, Rajivpuram, Rintani, Bhagwati Nagar		No Coverage Nanoo to Bubakpur, Dabathua to Sardhana Chowk, Dilwara to Rasulpur Rohta, Suroorpur to Sardhana Mod, at Barnawa, Johdi to Charan singh Vihar, Poor Quality at Sardhan, Subhash Nagar		Poor Level near Yashodha Kunj, incholi, Mawana khurd Outer, Mawana Outer, Bahsuma
5	TATA CDMA		---		No Coverage between Harra to Suroorpur Khurd, Rohta to Kinoni Mill, Poor Level & Quality Barut Outer		No Coverage Bahsuma, Poor Level & Quality near Yashoda Kunj, Mawana Khurd, Mawana Outer
6	IDEA		Poor Level & Quality near Cantt Area		---		Poor Quality pacth at Barut Outer
7	RCOM GSM		Poor Level & Quality near shridapuri, Tripti Nagar, Cantt Area, Bypass, Mohiddinpur, University Rd, South Islamabad, Transport Nagar Delhi Rd		Poor Level & Quality near Barut Bypass, Binauli, Khiwai, Pasulpur Pohta, Sardhana outer		Poor Level near Incholi, Chhota Mawana, Bahsuma, Mawana Outer, Hastinapur outer
8	RCOM CDMA		Poor Level & Quality near Tripti Enclave, Cantt Area, Partapur		Poor Level & Quality near Banauli, Khiwai, Rasulpur Rohta, Sardhan Outer		Poor Level & Quality near Incholi, Bahsuma, Mawana Outer, Ganeshpur, Mawana Outer
9	MTS		Poor Level & Quality near Cantt Area, Mohiddinpur		Poor Level & Quality near, Sardhana outer, Barnawa to Binauli, Barut Outer, No Coverage between Binauli to Barut		Poor Level & Quality near Hastinapur outer, Mawana outer, No coverage to Mawana to Hastinapur
10	UNINOR		Poor Level & Quality near Cantt Area, near Railway Station, Pallavpuram, Medical College		Poor Level & Quality near Bypass, Juledha, Barut to Sardhana HW, Meerut Khiwai Rd		Poor Level & Quality near Bhojpur, Atora, Tajpura, Mawana Tehsil
11	VODAFONE		Poor Quality near Dabka, Jain Nagar, Rethani, Jagrati Vihar		Poor Level & Quality near mainaputhi, Lahurgarh to Kheri Nizd, Lakhwaya		Poor Level & Quality near NH119 Tigri, Mawana Khurd, Jhunihuri, Rehmapur, Ganeshpur

7.6 KEY FINDINGS ON DRIVE TEST:

The key observations that could be derived from the results of the drive tests are as under –

Aircel was not having its coverage in any of the 3 SSAs namely Bijnore, Mathura and Meerut.

- (i) **In the Month of April-14**, drive tests were conducted across **Bijnore** SSA. **RCOM (CDMA)** did not turn up on day-2 for drive test due to fiber cut. The performance of service providers was largely satisfied. However, on SSA level, **BSNL** is non-complied for the parameter '**Call Drop Rate**' with its performance **2.05%** (Outdoor). **RCOM (GSM)** and **Uninor** remained underperformed for parameter '**Voice quality**' with their performance as **93.80%** and **88.07% (outdoor), 94.11% (Indoor)** respectively. **RCOM (CDMA)** also could not do well for Indoor location with its performance for '**Voice Quality**' as **86.67%**.
- (ii) **In the Month of May-14**, drive test was conducted across **Mathura** SSA. The results of the drive tests carried out in this month revealed that performance of **BSNL** was not in compliance with respect to the parameters **Call Drop rate, Voice Quality** and **Blocked call rate** with its performance as **4.34%** (Outdoor), **79.44%** (Outdoor) / **82.98%** (Indoor) and **4.38%** respectively. **RCOM (GSM), Uninor** and **MTS** were also non-compliant for parameter **Voice Quality** with their performance as **92.60%, 92.67% and 94.39%** respectively.
- (iii) **In the month of June-14**, drive test was conducted across **Meerut** SSA. The drive test results exposed that **BSNL** was the only operator that could not meet the benchmarks of all the key network parameters namely **Call drop rate (5.11%), Voice Quality (83.03%-way below the benchmark), Call Setup Success rate (90.56%)** and **Blocked call rate (9.44%)**. The performance of **RCOM (GSM), Uninor** and **RCOM (CDMA)** also remained non-complied for parameter '**Voice Quality**' with their achieved values as **92.99%** (Outdoor) / **93.12%** (Indoor), **86.95%** (Outdoor) / **93.27%** (Indoor) and **88.90%** (Outdoor) / **92.70%** (Indoor) respectively.

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

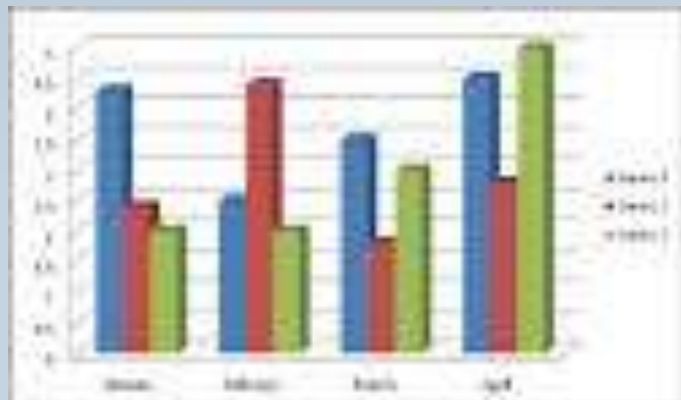
Thus, the parameters Voice Quality, CDR and CSSR remained non-compliant by some of the service providers namely BSNL, RCOM (GSM), (CDMA) and Uninor in different parts of the three SSAs where drive tests were conducted during the quarter ended June 2014. However, the parameter 'Voice Quality' remained main area of concern for all the above mentioned operators. The service providers need to improve their network quality with respect to these parameters.

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

AVERAGED QUARTERLY 3-DAYS LIVE MEASUREMENT

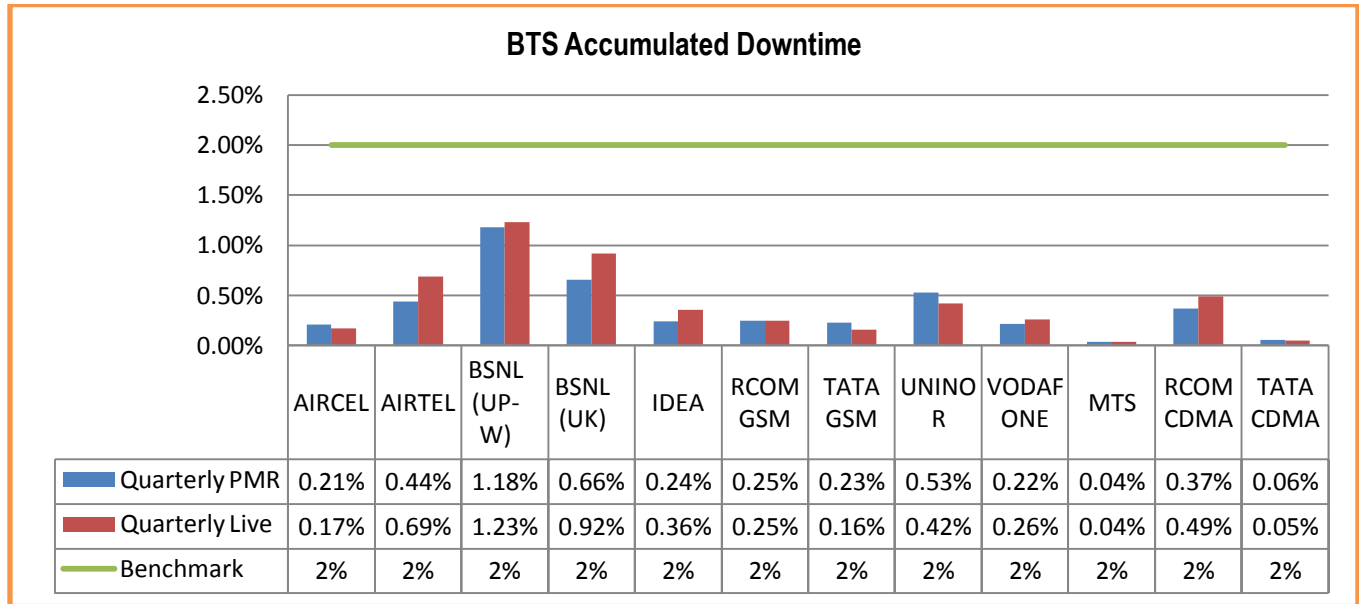




8. GRAPHICAL REPRESENTATION:

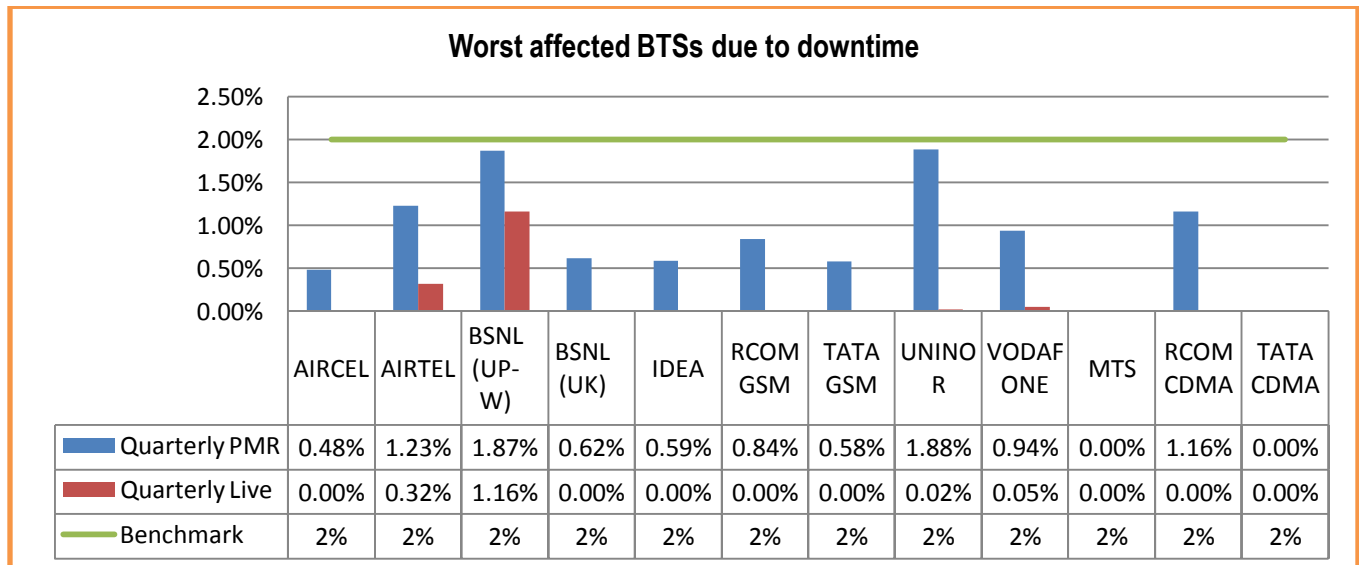
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME :



All operators are meeting the benchmarks.

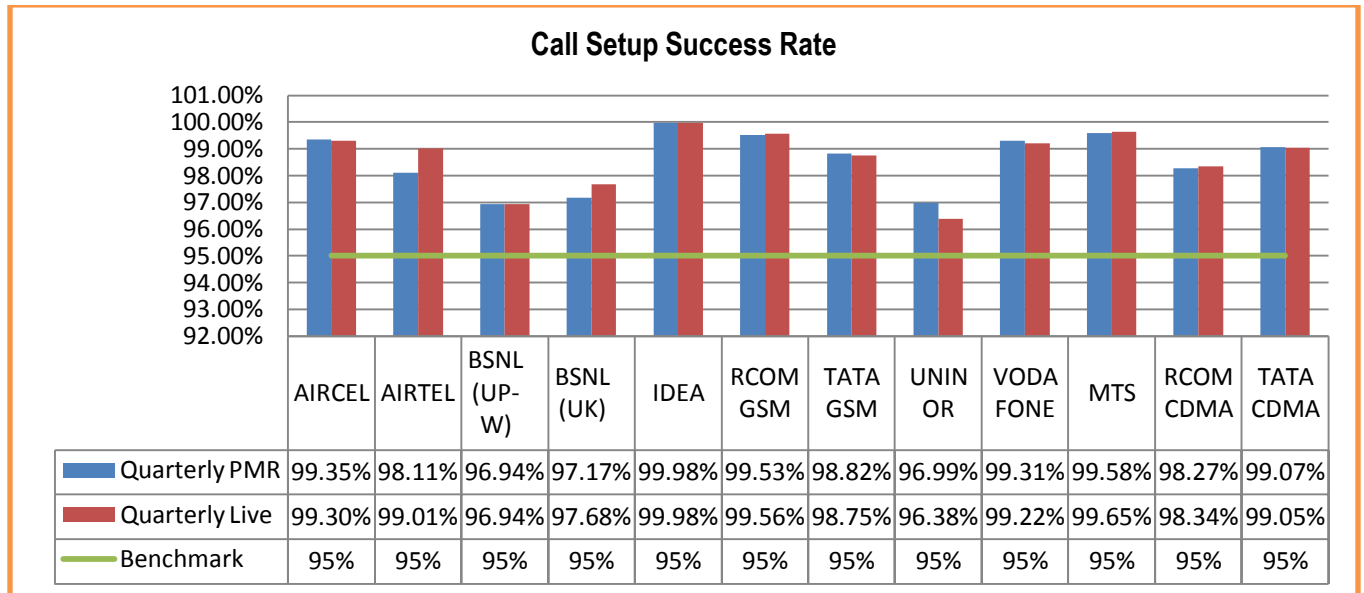
2) WORST AFFECTED BTSs DUE TO DOWNTIME :



All operators are meeting the benchmarks.

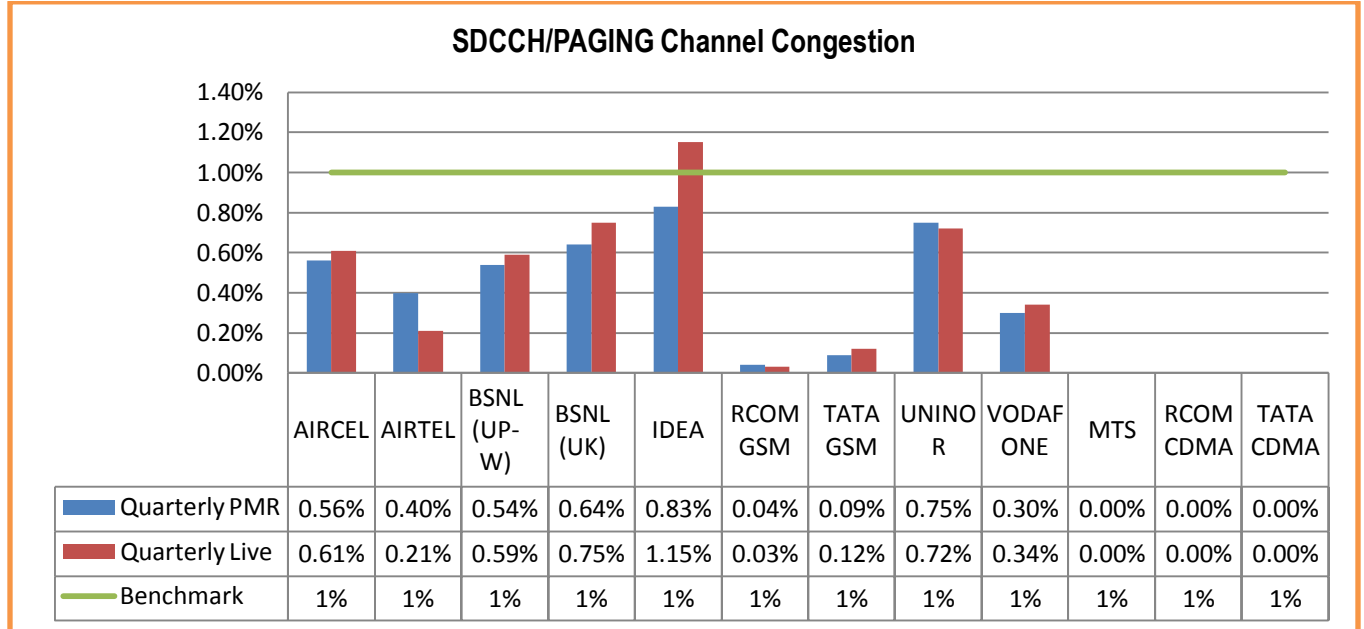


3) CALL SETUP SUCCESS RATE :



All operators are meeting the benchmarks.

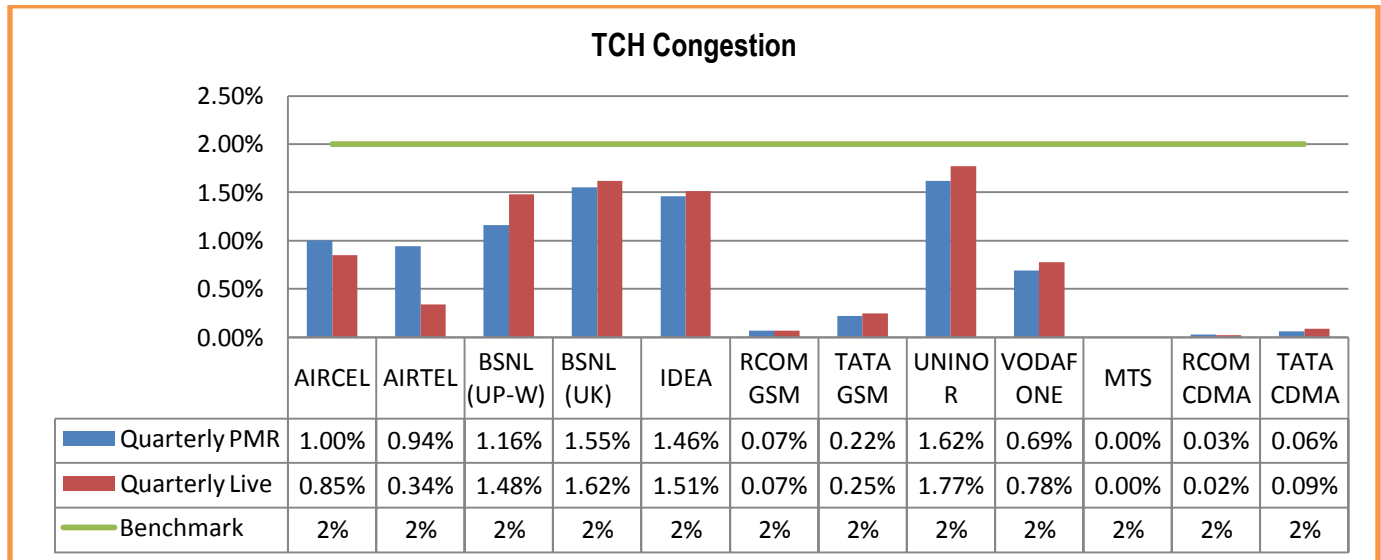
4) SDCCH/PAGING CHANNEL CONGESTION :



All operators are meeting the benchmarks except Idea (3 days live).

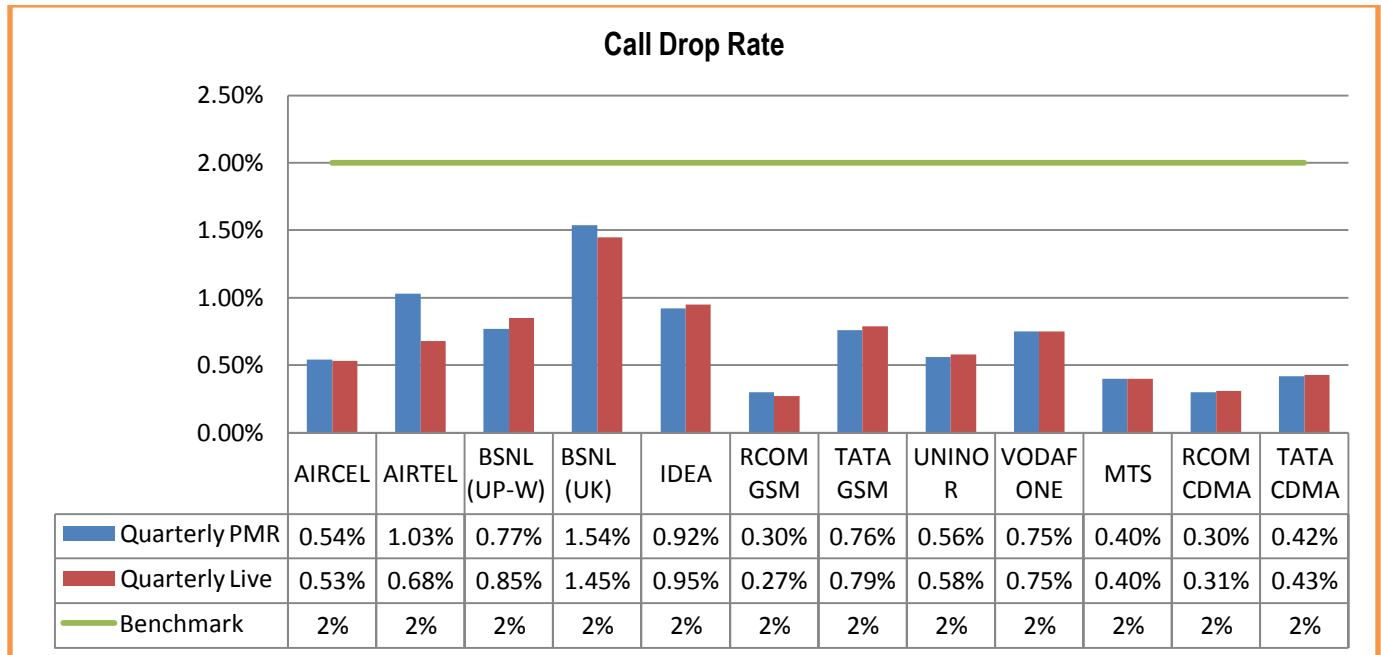


5) TCH CONGESTION:



All operators are meeting the benchmarks.

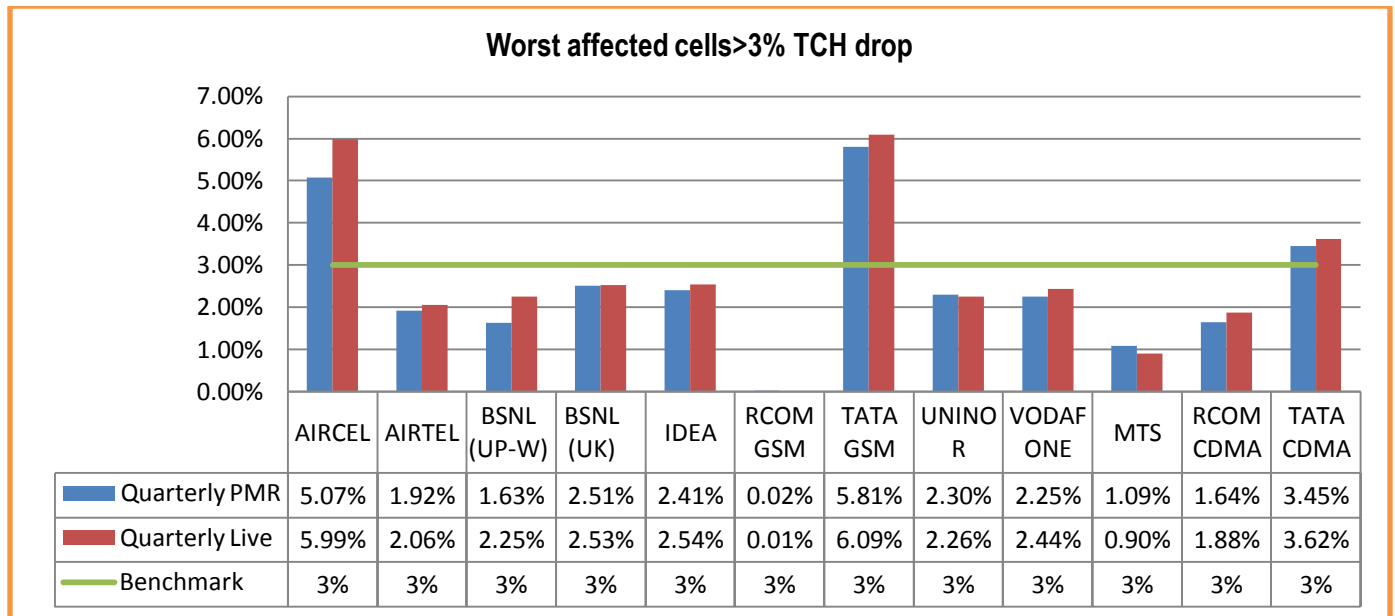
6) CALL DROP RATE :



All operators are meeting the benchmarks.

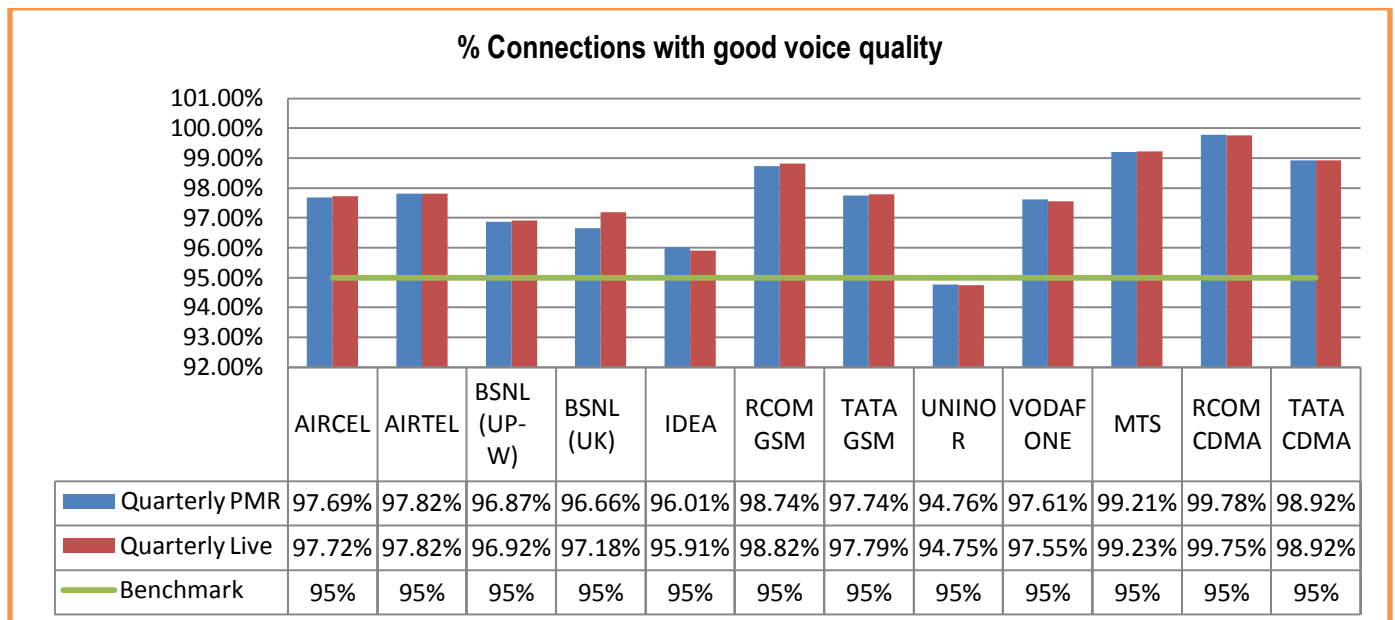


7) **WORST AFFECTED CELLS>3% TCH DROP :**



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

8) **PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :**



All operators are meeting the benchmarks except Uninor.