



**Audit & Assessment of Quality of Service
Of
Cellular Mobile Telephone Service
For
Telecom Regulatory Authority of India
North Zone – UP (West) Service Area
(October 2014 – December 2014)**

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PREFACE

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

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

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

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1. BACKGROUND



1. BACKGROUND

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

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

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

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

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

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

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

2. OBJECTIVES AND METHODOLOGY



2. OBJECTIVES AND METHODOLOGY

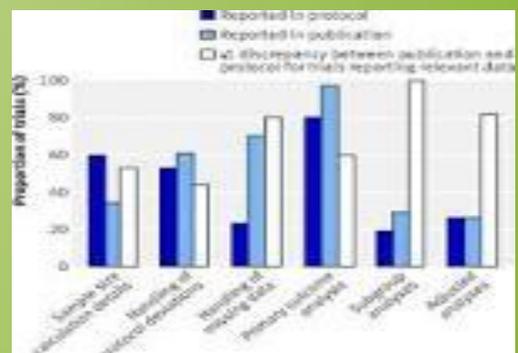
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for Delhi, Haryana and Mumbai circles during the quarter October – December 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 |
|-----------------------|--------------------------|---------------------------------|--------------------|--------------------|--|
| | | October-14 | November-14 | December-14 | |
| GSM Operators | | | | | |
| 1 | AIRCEL | 15 to 17 Oct-14 | 6, 7 & 10 Nov-14 | 3 to 5 Dec-14 | 325/1, Dishnet Wireless Ltd. Shikhar Tower, Mangal Pandey Nagar, Garh Road, Meerut |
| 2 | AIRTEL | 15 to 17 Oct-14 | 7, 10 & 11 Nov-14 | 6, 8 & 9 Dec-14 | Bharti Airtel Ltd., Divider Chowk, Ganganagar, Mwana Road, Meerut |
| 3 | BSNL (UK) | 7 to 9 Oct-14 | 11 to 13 Nov-14 | 9 to 11 Dec-14 | BSNL Telephone Exchange, Patel Nagar Near Lal Pul, Dehradun UK. |
| 5 | BSNL (UPW) | 16 to 18 Oct-14 | 11 to 13 Nov-14 | 18 to 20 Dec-14 | BSNL Telephone Exchange, Brahampuri, Delhi Road, Meerut |
| 4 | IDEA | 28 to 30 Oct-14 | 13, 14 & 17 Nov-14 | 11, 12 & 15 Dec-14 | Idea Cellular Limited, First Floor A-68, Sector-64, Noida (UP) |
| 6 | RCOM GSM | 15 to 17 Oct-14 | 19 to 21 Nov-14 | 10 to 12 Dec-14 | Rcom Ltd., Vill-Jatauli, Near Krishna Public School, Bypass Road Meerut |
| 7 | UNINOR | 22 to 24 Oct-14 | 13, 14 & 17 Nov-14 | 5, 8 & 9 Dec-14 | Telewings Communications Services Pvt Ltd. (Uninor) Welldone Technology Park Sec-48 Sohna Road Gurgaon |
| 8 | TATA GSM | 10, 13 & 14 Oct-14 | 5 to 7 Nov-14 | 4, 5 & 8 Dec-14 | TTSL, Near CCS University, Meerut |
| 9 | VODAFONE | 8 to 10 Oct-14 | 6, 7 & 10 Nov-14 | 4, 5 & 8 Dec-14 | Vodafone South Ltd., Nishyam Kunj Building, Near Kailash Prakash Stadium, Civil Lines, Meerut |
| CDMA Operators | | | | | |
| 10 | MTS | 10, 13 & 14 Oct-14 | 14 to 16 Nov-14 | 3 to 5 Dec-14 | SSTL, Near Sri Ram Plaza, Opp. Ccs University, Meerut |
| 11 | RCOM CDMA | 15 to 17 Oct-14 | 19 to 21 Nov-14 | 10 to 12 Dec-14 | RCOM Ltd. , Vill-Jatauli, Near Krishna Public School, Bypass Road Meerut |
| 12 | TATA CDMA | 10, 13 & 14 Oct-14 | 5 to 7 Nov-14 | 4, 5 & 8 Dec-14 | TTSL, Near CCS University, Meerut |

- For all the above operators, audit was conducted in all the three months of the Quarter ended Dec - 2014.
- The data generated by monthly PMR and 3-days live measurements audit for the period October 2014 to December 2014 has been successfully uploaded to the server located at TRAI premises.

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles only **once in a year**. **Based on this criterion, QoS audit for basic (wire line) service was not required to be done for UP (W) Circle in the quarter ended December- 2014.**

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV–SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle **once in a year**. **Based on this criterion, the QoS audit for Broadband service was not required to be done for UP (W) Circle in the quarter ended December- 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:**

1) Cellular Mobile Service:

(i) From monthly PMR audit 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 with the benchmarks except for parameter namely **‘Worst affected cells having > 3% TCH drop’** which could not be complied with by Tata (**GSM**) and Tata (**CDMA**) in all the three months of the quarter. Their quarterly average performance with respect to this parameter was **4.87%** and **4.89%** respectively. **Uninor** remained under performed for parameter **‘Voice Quality’** with its average performance as **94.64%**.

(ii) 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 **Tata (GSM)** and **Tata (CDMA)** in all the three months of the quarter with their average performance as **4.52%** and **4.68%** respectively. **Uninor** failed to meet the bench mark of **‘Voice Quality’** with its performance as **94.71%**. **The similar non-compliance of these operators was also observed in the monthly audit. Aircel and Vodafone** also failed to meet the benchmark of parameter **Worst Affected Cell > 3 % TCH drops** in the month of October -14, however their

average quarterly performance was well within the norms. The similar non-compliance of Tata (GSM) and Tata (CDMA) was also observed in the monthly audit.

Further, **Idea** remained marginally beyond the benchmark of parameter **TCH Congestion** with quarterly average performance as **2.06%**.

(iii) With regard to the **Customer Service Quality Parameters**, all service providers were found to have complied with the most of the parameters. However, **RCOM GSM and Tata GSM** have failed to meet the benchmark of '**Calls answered by Operators (voice to voice) within 90 seconds**'. Their achievement for this parameter was **93.79% and 94.35%** respectively.

In case of parameter '**Time taken for refunds of deposit**', only **BSNL (UK)** have failed to settle the 100% refund cases with their achieved level as **97.56%**.

During 3 days live measurement, all service providers were in compliance with respect to the parameter **Accessibility** of call center except **MTS** with its achieved value as **93.07%**. **Aircel** has also failed to meet the benchmark of 'calls answered by Operators (voice to voice) within **90 seconds** having achieved its performance as **94.79%** against the benchmark of $\geq 95\%$.

(iv) **Drive Test** results revealed that the parameters **Voice Quality** remained the area of concern as the same could not be complied with by **RCOM (GSM), Uninor, Vodafone and RCOM CDMA** across all the three SSAs namely Moradabad, Muzaffarnagar and Bareilly, where the drive tests were conducted during the quarter ended December 2014. 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 | Dec.-14 | 20:00 - 21:00 |
| 2 | AIRTEL | Dec.-14 | 20:00 - 21:00 |
| 3 | BSNL (UP-W) | Dec.-14 | 19:00 - 20:00 |
| 4 | BSNL (UTTRAKHAND) | Dec.-14 | 20:00 - 21:00 |
| 5 | IDEA | Dec.-14 | 19:00 - 20:00 |
| 6 | RCOM GSM | Dec.-14 | 19:00 - 20:00 |
| 7 | TATA GSM | Dec.-14 | 19:00 - 20:00 |
| 8 | UNINOR | Dec.-14 | 19:00 - 20:00 |
| 9 | VODAFONE | Dec.-14 | 19:00 - 20:00 |
| CDMA Operators | | | |
| 10 | MTS | Dec.-14 | 20:00 - 21:00 |
| 11 | RCOM CDMA | Dec.-14 | 19:00 - 20:00 |
| 12 | TATA CDMA | Dec.-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 October 2014 to December 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 | 631 | ZTE | ZTE |
| 2 | AIRTEL | 19 | 69 | 6576 | Ericsson | Ericsson |
| 3 | BSNL (UP-W) | 12 | 32 | 2384 | Ericsson, NSN & ZTE | Ericsson, NSN & ZTE |
| 4 | BSNL UTTRAKHAND | 5 | 14 | 888 | Ericsson & ZTE | Ericsson, NSN & ZTE |
| 5 | IDEA | 18 | 56 | 7661 | NSN | NSN |
| 6 | RCOM GSM | 4 | 14 | 1679 | Huawei | Huawei |
| 7 | TATA GSM | 3 | 18 | 1830 | NSN | NSN |
| 8 | UNINOR | 12 | 26 | 3916 | Ericsson | Ericsson |
| 9 | VODAFONE | 11 | 88 | 6516 | NSN | NSN |
| CDMA Operators | | | | | | |
| 10 | MTS | 1 | 1 | 337 | Huawei | Huawei |
| 11 | RCOM CDMA | 3 | 4 | 1000 | Huawei & Lucent | Huawei & Lucent |
| 12 | TATA CDMA | 5 | 4 | 586 | Huawei & Ericsson | Huawei & Motorola |

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – OCTOBER 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(W) CIRCLE - OCTOBER 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% | Oct-14 | 0.12% | 0.82% | 1.19% | 0.58% | 0.12% | 0.31% | 0.19% | 0.34% | 0.20% | 0.02% | 0.33% | 0.05% |
| | b) Worst affected BTSs due to downtime | <=2% | Oct-14 | 0.48% | 1.11% | 1.86% | 1.83% | 0.32% | 0.89% | 0.60% | 1.55% | 0.82% | 0.00% | 0.90% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Oct-14 | 98.88% | 97.53% | 97.71% | 96.96% | 99.98% | 99.62% | 98.65% | 98.02% | 99.53% | 99.56% | 98.88% | 99.17% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Oct-14 | 0.21% | 0.73% | 0.48% | 0.51% | 0.78% | 0.02% | 0.11% | 0.31% | 0.19% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Oct-14 | 0.56% | 1.22% | 1.34% | 1.53% | 1.88% | 0.04% | 0.38% | 1.22% | 0.47% | 0.00% | 0.06% | 0.06% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Oct-14 | 0.56% | 1.42% | 1.24% | 1.55% | 0.99% | 0.36% | 0.81% | 0.49% | 0.85% | 0.45% | 0.21% | 0.52% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Oct-14 | 3.53% | 2.53% | 1.98% | 2.43% | 2.12% | 0.02% | 4.88% | 1.93% | 2.83% | 1.78% | 1.42% | 4.95% |
| | c) Connections with good voice quality | >=95% | Oct-14 | 97.06% | 95.78% | 96.93% | 96.20% | 95.61% | 98.79% | 97.26% | 94.63% | 97.33% | 99.08% | 99.78% | 98.93% |
| 4 | No. of POI's having >=0.5% POI congestion | | Oct-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – NOVEMBER 14 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - UP(W) CIRCLE – NOVEMBER 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% | Nov-14 | 0.10% | 0.42% | 1.18% | 0.59% | 0.10% | 0.41% | 0.10% | 0.17% | 0.15% | 0.02% | 0.48% | 0.06% |
| | b) Worst affected BTSs due to downtime | <=2% | Nov-14 | 0.48% | 1.29% | 1.81% | 1.92% | 0.25% | 1.97% | 0.11% | 0.28% | 0.81% | 0.00% | 1.80% | 0.17% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Nov-14 | 98.72% | 97.54% | 98.11% | 97.32% | 99.98% | 99.59% | 98.44% | 98.57% | 99.55% | 99.45% | 98.89% | 99.16% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Nov-14 | 0.25% | 0.89% | 0.44% | 0.50% | 0.87% | 0.02% | 0.14% | 0.45% | 0.30% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Nov-14 | 0.77% | 1.19% | 1.23% | 1.44% | 1.97% | 0.05% | 0.43% | 0.88% | 0.45% | 0.00% | 0.01% | 0.12% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Nov-14 | 0.25% | 1.49% | 1.15% | 1.39% | 0.94% | 0.35% | 0.80% | 0.47% | 0.77% | 0.47% | 0.21% | 0.51% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Nov-14 | 1.61% | 2.39% | 1.54% | 2.38% | 1.92% | 0.01% | 4.93% | 1.77% | 2.96% | 1.63% | 1.08% | 4.45% |
| | c) Connections with good voice quality | >=95% | Nov-14 | 96.90% | 97.88% | 96.53% | 96.37% | 96.01% | 98.79% | 97.31% | 94.68% | 97.42% | 99.06% | 99.78% | 98.96% |
| 4 | No. of POI's having >=0.5% POI congestion | | Nov-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – DECEMBER 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES - UP(W) CIRCLE – DECEMBER 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% | Dec-14 | 0.18% | 0.67% | 1.18% | 0.59% | 0.06% | 0.47% | 0.13% | 0.18% | 0.61% | 0.01% | 0.61% | 0.07% |
| | b) Worst affected BTSs due to downtime | <=2% | Dec-14 | 1.90% | 1.26% | 1.80% | 1.91% | 0.08% | 1.85% | 0.38% | 0.38% | 0.80% | 0.00% | 1.80% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Dec-14 | 98.75% | 97.96% | 97.70% | 97.55% | 97.60% | 99.63% | 98.49% | 98.42% | 99.60% | 99.46% | 99.20% | 99.22% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Dec-14 | 0.30% | 0.71% | 0.59% | 0.63% | 0.77% | 0.01% | 0.12% | 0.33% | 0.19% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Dec-14 | 0.73% | 0.95% | 1.14% | 1.27% | 1.93% | 0.04% | 0.41% | 0.93% | 0.40% | 0.00% | 0.01% | 0.05% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Dec-14 | 0.31% | 1.34% | 1.18% | 1.36% | 0.95% | 0.29% | 0.79% | 0.46% | 0.80% | 0.57% | 0.18% | 0.52% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Dec-14 | 1.84% | 2.06% | 1.46% | 2.42% | 1.86% | 0.03% | 4.81% | 1.48% | 2.96% | 1.77% | 0.95% | 5.28% |
| | c) Connections with good voice quality | >=95% | Dec-14 | 96.95% | 97.77% | 96.82% | 96.41% | 96.40% | 98.82% | 97.24% | 94.61% | 97.52% | 99.18% | 99.79% | 98.95% |
| 4 | No. of POI's having >=0.5% POI congestion | | Dec-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- DECEMBER 14 (OCT. TO DEC. 2014 MONTHS AUDITED DATA)

| QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-DECEMBER-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 | 0.13% | 0.64% | 1.18% | 0.59% | 0.09% | 0.40% | 0.14% | 0.23% | 0.32% | 0.02% | 0.47% | 0.06% |
| | b) Worst affected BTSs due to downtime | <=2% | Quarterly | 0.95% | 1.22% | 1.82% | 1.89% | 0.22% | 1.57% | 0.36% | 0.74% | 0.81% | 0.00% | 1.50% | 0.06% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Quarterly | 98.78% | 97.68% | 97.84% | 97.28% | 99.19% | 99.61% | 98.53% | 98.34% | 99.56% | 99.49% | 98.99% | 99.18% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Quarterly | 0.25% | 0.78% | 0.50% | 0.55% | 0.81% | 0.02% | 0.12% | 0.36% | 0.23% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Quarterly | 0.69% | 1.12% | 1.24% | 1.41% | 1.93% | 0.04% | 0.41% | 1.01% | 0.44% | 0.00% | 0.03% | 0.08% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Quarterly | 0.37% | 1.42% | 1.19% | 1.43% | 0.96% | 0.33% | 0.80% | 0.47% | 0.81% | 0.50% | 0.20% | 0.52% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Quarterly | 2.33% | 2.33% | 1.66% | 2.41% | 1.97% | 0.02% | 4.87% | 1.73% | 2.92% | 1.73% | 1.15% | 4.89% |
| | c) Connections with good voice quality | >=95% | Quarterly | 96.97% | 97.14% | 96.76% | 96.33% | 96.01% | 98.80% | 97.27% | 94.64% | 97.42% | 99.11% | 99.78% | 98.95% |
| 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 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 paging channel in CDMA system.

With respect to this parameter, the performance of the operators is quite satisfactory as **all operators met the TRAI specified benchmarks on the congestion parameters.** 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 0.20%) was for RCOM (CDMA) during the quarter.

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

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

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter except **Tata (GSM)** and **Tata (CDMA)**. 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 **4.87%** and **4.89%** 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 **94.64%**.

**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) – OCTOBER 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES - UP(W) CIRCLE - OCTOBER 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 | 0.23% | 0.89% | 1.21% | 1.12% | 0.04% | 0.28% | 0.24% | 0.11% | 0.25% | 0.01% | 0.27% | 0.10% |
| | b) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.75% | 1.86% | 0.00% | 0.00% | 0.06% | 0.00% | 0.00% | 0.09% | 0.00% | 0.10% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.87% | 98.14% | 97.67% | 97.39% | 99.98% | 99.64% | 98.61% | 98.48% | 99.57% | 99.50% | 99.19% | 99.08% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Live data | 0.07% | 0.34% | 0.43% | 0.65% | 0.65% | 0.01% | 0.13% | 0.20% | 0.27% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.33% | 1.07% | 1.68% | 1.42% | 2.06% | 0.04% | 0.33% | 0.96% | 0.43% | 0.00% | 0.81% | 0.10% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Live data | 0.60% | 1.46% | 1.27% | 1.43% | 1.00% | 0.36% | 0.79% | 0.44% | 0.91% | 0.48% | 0.18% | 0.49% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Live data | 3.84% | 2.66% | 2.22% | 2.45% | 1.78% | 0.03% | 4.92% | 1.59% | 3.24% | 1.61% | 1.11% | 4.58% |
| | c) Connections with good voice quality | >=95% | Live data | 97.05% | 97.75% | 96.34% | 97.10% | 95.61% | 98.78% | 97.36% | 94.62% | 97.33% | 99.02% | 99.78% | 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) – NOVEMBER 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE - NOVEMBER 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 | 0.07% | 1.04% | 1.21% | 1.10% | 0.09% | 0.35% | 0.09% | 0.18% | 0.14% | 0.02% | 0.40% | 0.08% |
| | b) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.94% | 1.90% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.79% | 97.80% | 98.09% | 97.38% | 99.98% | 99.63% | 98.19% | 98.65% | 99.44% | 99.62% | 99.30% | 99.22% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Live data | 0.24% | 0.68% | 0.32% | 0.53% | 0.99% | 0.01% | 0.26% | 0.32% | 0.56% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 1.06% | 1.06% | 1.49% | 1.39% | 2.06% | 0.04% | 0.64% | 0.87% | 0.56% | 0.00% | 0.00% | 0.04% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Live data | 0.25% | 1.49% | 1.26% | 1.51% | 0.95% | 0.33% | 0.80% | 0.48% | 0.75% | 0.44% | 0.16% | 0.56% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Live data | 1.95% | 2.56% | 2.09% | 2.58% | 1.70% | 0.03% | 4.26% | 1.93% | 2.83% | 1.86% | 1.36% | 4.62% |
| | c) Connections with good voice quality | >=95% | Live data | 96.97% | 97.85% | 97.19% | 96.30% | 96.03% | 98.81% | 97.27% | 94.73% | 97.36% | 99.22% | 99.79% | 98.94% |
| 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) – DECEMBER 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES UP(W) CIRCLE - DECEMBER 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 | 0.21% | 0.83% | 1.28% | 1.11% | 0.16% | 0.59% | 0.10% | 0.25% | 0.16% | 0.02% | 0.69% | 0.12% |
| | b) Worst affected BTSs due to downtime | <=2% | Live data | 0.16% | 0.03% | 1.39% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.50% | 98.25% | 97.74% | 97.34% | 99.98% | 99.61% | 98.42% | 98.32% | 99.68% | 99.47% | 99.37% | 99.15% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Live data | 0.11% | 0.50% | 0.35% | 0.43% | 0.73% | 0.01% | 0.12% | 0.31% | 0.16% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.27% | 0.71% | 0.84% | 1.46% | 2.07% | 0.04% | 0.53% | 0.89% | 0.32% | 0.01% | 0.00% | 0.12% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Live data | 0.28% | 1.35% | 1.18% | 1.34% | 0.94% | 0.33% | 0.73% | 0.43% | 0.72% | 0.58% | 0.15% | 0.50% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Live data | 1.91% | 2.44% | 1.85% | 2.47% | 1.68% | 0.01% | 4.37% | 1.49% | 2.62% | 1.49% | 0.84% | 4.85% |
| | c) Connections with good voice quality | >=95% | Live data | 96.82% | 97.85% | 96.97% | 96.59% | 96.48% | 98.84% | 97.26% | 94.77% | 97.58% | 99.20% | 99.80% | 98.96% |
| 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 OCTOBER TO DECEMBER 2014)

| QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE -DECEMBER 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% | 0.92% | 1.23% | 1.11% | 0.10% | 0.41% | 0.14% | 0.18% | 0.18% | 0.02% | 0.45% | 0.10% |
| | b) Worst affected BTSs due to downtime | <=2% | Quarterly | 0.05% | 0.57% | 1.72% | 0.00% | 0.00% | 0.02% | 0.00% | 0.00% | 0.06% | 0.00% | 0.03% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Quarterly | 98.72% | 98.06% | 97.83% | 97.37% | 99.98% | 99.63% | 98.41% | 98.49% | 99.56% | 99.53% | 99.29% | 99.15% |
| | b) SDCCCH/PAGING Channel congestion | <=1% | Quarterly | 0.14% | 0.51% | 0.37% | 0.54% | 0.79% | 0.01% | 0.17% | 0.28% | 0.33% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Quarterly | 0.55% | 0.95% | 1.34% | 1.42% | 2.06% | 0.04% | 0.50% | 0.91% | 0.44% | 0.00% | 0.27% | 0.09% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Quarterly | 0.38% | 1.43% | 1.24% | 1.43% | 0.96% | 0.34% | 0.77% | 0.45% | 0.79% | 0.50% | 0.16% | 0.52% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Quarterly | 2.57% | 2.55% | 2.05% | 2.50% | 1.72% | 0.02% | 4.52% | 1.67% | 2.90% | 1.65% | 1.10% | 4.68% |
| | c) Connections with good voice quality | >=95% | Quarterly | 96.95% | 97.82% | 96.83% | 96.66% | 96.04% | 98.81% | 97.30% | 94.71% | 97.42% | 99.15% | 99.79% | 98.94% |
| 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:

The live assessment revealed that the performance of the operators was largely in compliance for most of the parameters except for the parameter **‘Worst affected cells> 3 % TCH drops’** which could not be met by **Tata (GSM)** and **Tata (CDMA)** in all the three months of the quarter with their average performance as **4.52% and 4.68%** respectively. **Uninor** failed to meet the bench mark of **‘Voice Quality’** with its performance as **94.71%**. **Aircel and Vodafone** also failed to meet the benchmark of parameter **Worst Affected Cell> 3 % TCH drops** in the month of October -14, however their average quarterly performance was well within the norms. The similar non-compliance of **Tata (GSM)** and **Tata (CDMA)** was also observed in the monthly audit.

Further, **Idea** remained marginally beyond the benchmark of parameter **TCH Congestion** with quarterly average performance as **2.06%**.

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 - Oct 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 | | Oct-14 | 630 | 6572 | 2366 | 873 | 7487 | 1679 | 1826 | 3871 | 6318 | 333 | 1000 | 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 | | Oct-14 | 574.85 | 40077.00 | 21005.00 | 3765.26 | 6707.43 | 3927.97 | 2558.57 | 9797.74 | 9238.89 | 51.24 | 2448.68 | 212.69 |
| | c) BTS Accumulated Downtime | <=2% | Oct-14 | 0.12% | 0.82% | 1.19% | 0.58% | 0.12% | 0.31% | 0.19% | 0.34% | 0.20% | 0.02% | 0.33% | 0.05% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Oct-14 | 3 | 73 | 44 | 16 | 24 | 15 | 11 | 60 | 52 | 0 | 9 | 0 |
| e) Worst affected BTSs due to downtime | <=2% | Oct-14 | 0.48% | 1.11% | 1.86% | 1.83% | 0.32% | 0.89% | 0.60% | 1.55% | 0.82% | 0.00% | 0.90% | 0.00% | |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | Oct-14 | 98.88% | 97.53% | 97.71% | 96.96% | 99.98% | 99.62% | 98.65% | 98.02% | 99.53% | 99.56% | 98.88% | 99.17% |
| | b) SDCCH/PAGING Congestion | <=1% | Oct-14 | 0.21% | 0.73% | 0.48% | 0.51% | 0.78% | 0.02% | 0.11% | 0.31% | 0.19% | 0.00% | 0.00% | 0.00% |
| c) TCH congestion | <=2% | Oct-14 | 0.56% | 1.22% | 1.34% | 1.53% | 1.88% | 0.04% | 0.38% | 1.22% | 0.47% | 0.00% | 0.06% | 0.06% | |
| 3 | Connection Maintenance (Retainability) | | | | | | | | | | | | | | |
| | a) Call Drop Rate (CDR) | <=2% | Oct-14 | 0.56% | 1.42% | 1.24% | 1.55% | 0.99% | 0.36% | 0.81% | 0.49% | 0.85% | 0.45% | 0.21% | 0.52% |
| | b) Worst affected cells>3% TCH drop | <=3% | Oct-14 | 3.53% | 2.53% | 1.98% | 2.43% | 2.12% | 0.02% | 4.88% | 1.93% | 2.83% | 1.78% | 1.42% | 4.95% |
| | c) % of connections with good voice quality | >=95% | Oct-14 | 97.06% | 95.78% | 96.93% | 96.20% | 95.61% | 98.79% | 97.26% | 94.63% | 97.33% | 99.08% | 99.78% | 98.93% |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Oct-14 | 67 | 496 | 136 | 63 | 477 | 1 | 271 | 221 | 539 | 20 | 42 | 91 |
| e) Total no. of cells (Sector) in the licensed service area | | Oct-14 | 1899 | 19630 | 6872 | 2604 | 22539 | 5040 | 5559 | 11434 | 19024 | 1102 | 2981 | 1843 | |
| 4 | No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | | |
| | No. of POI's having >=0.5% POI congestion | | Oct-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the | | Oct-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

Detailed Network Data Assessment of Cellular Mobile Telephone Services - UP(W) Circle - Oct 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 | | Oct-14 | 28306 | 185669 | 134897 | 118000 | 293916 | 122000 | 114636 | 186907 | 281558 | 21000 | 86000 | 101926 |
| | b) Total traffic in TCBH in erlang (Avg.) | | Oct-14 | 2006 | 144282 | 37301 | 255106 | 306964 | 95580 | 40258 | 203825 | 251564 | 2046 | 23066 | 22584 |
| | c) Total no. of customers served (as per VLR) on last day of the month | | Oct-14 | 93199 | 6537097 | 1579849 | 771272 | 12245071 | 3929289 | 1881795 | 5345431 | 9895203 | 106628 | 1191612 | 348090 |

TABLE: 2

| Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - UP(W) Circle – Oct 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 | 630 | 6550 | 2366 | 863 | 7465 | 1679 | 1826 | 3859 | 6318 | 334 | 1000 | 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 | 105.68 | 4175.00 | 2054 | 696.04 | 198.00 | 332.83 | 321.53 | 316.60 | 1150.25 | 3.00 | 193.33 | 42.23 |
| | c) BTS Accumulated Downtime | <=2% | Live data | 0.23% | 0.89% | 1.21% | 1.12% | 0.04% | 0.28% | 0.24% | 0.11% | 0.25% | 0.01% | 0.27% | 0.10% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Live data | 0 | 49 | 44 | 0 | 0 | 1 | 0 | 0 | 6 | 0 | 1 | 0 |
| e) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.75% | 1.86% | 0.00% | 0.00% | 0.06% | 0.00% | 0.00% | 0.09% | 0.00% | 0.10% | 0.00% | |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.87% | 98.14% | 97.67% | 97.39% | 99.98% | 99.64% | 98.61% | 98.48% | 99.57% | 99.50% | 99.19% | 99.08% |
| | b) SDCCH/PAGING Congestion | <=1% | Live data | 0.07% | 0.34% | 0.43% | 0.65% | 0.65% | 0.01% | 0.13% | 0.20% | 0.27% | 0.00% | 0.00% | 0.00% |
| c) TCH congestion | <=2% | Live data | 0.33% | 1.07% | 1.68% | 1.42% | 2.06% | 0.04% | 0.33% | 0.96% | 0.43% | 0.00% | 0.81% | 0.10% | |
| 3 | Connection Maintenance (Retainability) | | | | | | | | | | | | | | |
| | a) Call Drop Rate (CDR) | <=2% | Live data | 0.60% | 1.46% | 1.27% | 1.43% | 1.00% | 0.36% | 0.79% | 0.44% | 0.91% | 0.48% | 0.18% | 0.49% |
| | b) Worst affected cells>3% TCH drop | <=3% | Live data | 3.84% | 2.66% | 2.22% | 2.45% | 1.78% | 0.03% | 4.92% | 1.59% | 3.24% | 1.61% | 1.11% | 4.58% |
| | c) % of connections with good voice quality | >=95% | Live data | 97.05% | 97.75% | 96.34% | 97.10% | 95.61% | 98.78% | 97.36% | 94.62% | 97.33% | 99.02% | 99.78% | 98.93% |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Live data | 73 | 520 | 162 | 64 | 404 | 2 | 273 | 185 | 616 | 18 | 33 | 84 |
| e) Total no. of cells (Sector) in the licensed service area | | Live data | 1899 | 19558 | 7299 | 2602 | 22733 | 5040 | 5560 | 11635 | 19024 | 1099 | 2981 | 1843 | |
| 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- November 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 | | Nov-14 | 630 | 6571 | 2377 | 885 | 7595 | 1679 | 1828 | 3883 | 6424 | 334 | 1001 | 588 |
| | b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | Nov-14 | 433.63 | 19663.42 | 20222 | 3747.81 | 5481.74 | 4918.73 | 1260.76 | 4773.39 | 7018.19 | 54.23 | 3440.48 | 246.49 |
| | c) BTS Accumulated Downtime | <=2% | Nov-14 | 0.10% | 0.42% | 1.18% | 0.59% | 0.10% | 0.41% | 0.10% | 0.17% | 0.15% | 0.02% | 0.48% | 0.06% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Nov-14 | 3 | 85 | 43 | 17 | 19 | 33 | 2 | 11 | 52 | 0 | 18 | 1 |
| | e) Worst affected BTSs due to downtime | <=2% | Nov-14 | 0.48% | 1.29% | 1.81% | 1.92% | 0.25% | 1.97% | 0.11% | 0.28% | 0.81% | 0.00% | 1.80% | 0.17% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Nov-14 | 98.72% | 97.54% | 98.11% | 97.32% | 99.98% | 99.59% | 98.44% | 98.57% | 99.55% | 99.45% | 98.89% | 99.16% |
| | b) SDCCH/PAGING Congestion | <=1% | Nov-14 | 0.25% | 0.89% | 0.44% | 0.50% | 0.87% | 0.02% | 0.14% | 0.45% | 0.30% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Nov-14 | 0.77% | 1.19% | 1.23% | 1.44% | 1.97% | 0.05% | 0.43% | 0.88% | 0.45% | 0.00% | 0.01% | 0.12% |
| Connection Maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) Call Drop Rate (CDR) | <=2% | Nov-14 | 0.25% | 1.49% | 1.15% | 1.39% | 0.94% | 0.35% | 0.80% | 0.47% | 0.77% | 0.47% | 0.21% | 0.51% |
| | b) Worst affected cells>3% TCH drop | <=3% | Nov-14 | 1.61% | 2.39% | 1.54% | 2.38% | 1.92% | 0.01% | 4.93% | 1.77% | 2.96% | 1.63% | 1.08% | 4.45% |
| | c) % of connections with good voice quality | >=95% | Nov-14 | 96.90% | 97.88% | 96.53% | 96.37% | 96.01% | 98.79% | 97.31% | 94.68% | 97.42% | 99.06% | 99.78% | 98.96% |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Nov-14 | 31 | 467 | 104 | 63 | 437 | 1 | 274 | 207 | 572 | 18 | 32 | 82 |
| | e) Total no. of cells (Sector) in the licensed service area | | Nov-14 | 1899 | 19516 | 6752 | 2659 | 22781 | 5040 | 5568 | 11702 | 19345 | 1111 | 2994 | 1846 |
| No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | | | |
| 4 | No. of POI's having >=0.5% POI congestion | | Nov-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the | | Nov-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- November 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 | | Nov-14 | 28429 | 186711 | 115986 | 118000 | 298347 | 122000 | 114406 | 193231 | 284725 | 21000 | 86000 | 102138 | |
| | b) Total traffic in TCBH in erlang (Avg.) | | Nov-14 | 2361 | 145664 | 38643 | 21959 | 318358 | 92950 | 42951 | 210524 | 255099 | 2205 | 19525 | 21637 | |
| | c) Total no. of customers served (as per VLR) on last day of the month | | Nov-14 | 105598 | 6713728 | 1584970 | 761729 | 11774363 | 3812840 | 1924748 | 5475238 | 9850384 | 109030 | 1168693 | 345795 | |

TABLE: 4

| Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - UP(W) Circle - Nov 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 | 630 | 6572 | 2374 | 877 | 7504 | 1680 | 1827 | 3888 | 6424 | 333 | 1001 | 588 |
| | 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 | 32.90 | 4940.00 | 2075.00 | 682.79 | 477.00 | 426.60 | 124.40 | 491.87 | 645.25 | 4.13 | 291.32 | 33.53 |
| | c) BTS Accumulated Downtime | <=2% | Live data | 0.07% | 1.04% | 1.21% | 1.10% | 0.09% | 0.35% | 0.09% | 0.18% | 0.14% | 0.02% | 0.40% | 0.08% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Live data | 0 | 62 | 45 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| | e) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.94% | 1.90% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.79% | 97.80% | 98.09% | 97.38% | 99.98% | 99.63% | 98.19% | 98.65% | 99.44% | 99.62% | 99.30% | 99.22% |
| | b) SDCCH/PAGING Congestion | <=1% | Live data | 0.24% | 0.68% | 0.32% | 0.53% | 0.99% | 0.01% | 0.26% | 0.32% | 0.56% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 1.06% | 1.06% | 1.49% | 1.39% | 2.06% | 0.04% | 0.64% | 0.87% | 0.56% | 0.00% | 0.00% | 0.04% |
| Connection Maintenance (Retainability) | | | | | | | | | | | | | | | |
| 3 | a) Call Drop Rate (CDR) | <=2% | Live data | 0.25% | 1.49% | 1.26% | 1.51% | 0.95% | 0.33% | 0.80% | 0.48% | 0.75% | 0.44% | 0.16% | 0.56% |
| | b) Worst affected cells>3% TCH drop | <=3% | Live data | 1.95% | 2.56% | 2.09% | 2.58% | 1.70% | 0.03% | 4.26% | 1.93% | 2.83% | 1.86% | 1.36% | 4.62% |
| | c) % of connections with good voice quality | >=95% | Live data | 96.97% | 97.85% | 97.19% | 96.30% | 96.03% | 98.81% | 97.27% | 94.73% | 97.36% | 99.22% | 99.79% | 98.94% |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Live data | 37 | 507 | 137 | 68 | 391 | 1 | 237 | 227 | 548 | 21 | 41 | 85 |
| | e) Total no. of cells (Sector) in the licensed service area | | Live data | 1899 | 19816 | 6561 | 2644 | 23044 | 5043 | 5567 | 11757 | 19345 | 1109 | 2994 | 1846 |
| 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 - December 14 month

| S/N | Name of Parameter | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL (JPW) | 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 | | Dec-14 | 631 | 6576 | 2384 | 895 | 7661 | 1679 | 1830 | 3916 | 6516 | 337 | 1000 | 586 |
| | b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | Dec-14 | 848.27 | 31650.62 | 20965.00 | 3877.70 | 3248.98 | 5818.52 | 1717.61 | 52.96.84 | 29526.10 | 37.40 | 4541.17 | 303.47 |
| | c) BTS Accumulated Downtime | <=2% | Dec-14 | 0.18% | 0.67% | 1.18% | 0.59% | 0.06% | 0.47% | 0.13% | 0.18% | 0.61% | 0.01% | 0.61% | 0.07% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Dec-14 | 12 | 83 | 43 | 17 | 6 | 31 | 7 | 15 | 52 | 0 | 18 | 0 |
| | e) Worst affected BTSs due to downtime | <=2% | Dec-14 | 1.90% | 1.26% | 1.80% | 1.91% | 0.08% | 1.85% | 0.38% | 0.38% | 0.80% | 0.00% | 1.80% | 0.00% |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | Dec-14 | 98.75% | 97.96% | 97.70% | 97.55% | 97.60% | 99.63% | 98.49% | 98.42% | 99.60% | 99.46% | 99.20% | 99.22% |
| | b) SDCCH/PAGING Congestion | <=1% | Dec-14 | 0.30% | 0.71% | 0.59% | 0.63% | 0.77% | 0.01% | 0.12% | 0.33% | 0.19% | 0.00% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Dec-14 | 0.73% | 0.95% | 1.14% | 1.27% | 1.93% | 0.04% | 0.41% | 0.93% | 0.40% | 0.00% | 0.01% | 0.05% |
| 3 | Connection Maintenance (Retainability) | | | | | | | | | | | | | | |
| | a) Call Drop Rate (CDR) | <=2% | Dec-14 | 0.31% | 1.34% | 1.18% | 1.36% | 0.95% | 0.29% | 0.79% | 0.46% | 0.80% | 0.57% | 0.18% | 0.52% |
| | b) Worst affected cells>3% TCH drop | <=3% | Dec-14 | 1.84% | 2.06% | 1.46% | 2.42% | 1.86% | 0.03% | 4.81% | 1.48% | 2.96% | 1.77% | 0.95% | 5.28% |
| | c) % of connections with good voice quality | >=95% | Dec-14 | 96.95% | 97.77% | 96.82% | 96.41% | 96.40% | 98.82% | 97.24% | 94.61% | 97.52% | 99.18% | 99.79% | 98.95% |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Dec-14 | 35 | 404 | 104 | 65 | 428 | 2 | 268 | 165 | 579 | 20 | 29 | 97 |
| | e) Total no. of cells (Sector) in the licensed service area | | Dec-14 | 1901 | 19580 | 7109 | 2669 | 23052 | 5040 | 5576 | 11180 | 19546 | 1123 | 2991 | 1841 |
| 4 | No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | | |
| | No. of POI's having >=0.5% POI congestion | | Dec-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 - December 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 | | | |
| | Name of POI not meeting the benchmark | | Dec-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Network Data | | | | | | | | | | | | | | |
| | a) Equipped Capacity of Network in Erlang | | Dec-14 | 28710 | 184512 | 135338 | 118000 | 310497 | 122000 | 114355 | 186779 | 285911 | 21000 | 86000 | 101803 |
| | b) Total traffic in TCBH in erlang (Avg.) | | Dec-14 | 2528 | 139227 | 39805 | 265989 | 311633 | 90283.56 | 43311 | 203485 | 249037 | 1778 | 20947.64 | 19875 |
| | c) Total no. of customers served (as per VLR) on last day of the month | | Dec-14 | 119342 | 6662492 | 1572210 | 743204 | 11328491 | 3847883 | 1963875 | 5639438 | 9714555 | 97488 | 1191000 | 313922 |

TABLE: 6

| Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live - UP(W) Circle - December 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 | 630 | 6571 | 2381 | 885 | 7595 | 1679 | 1830 | 3903 | 6516 | 335 | 1000 | 586 |
| | 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 | 95.11 | 3927.14 | 2186.00 | 707.98 | 881.00 | 718.27 | 135.36 | 692.11 | 761.62 | 4.09 | 496.13 | 50.06 |
| | c) BTS Accumulated Downtime | <=2% | Live data | 0.21% | 0.83% | 1.28% | 1.11% | 0.16% | 0.59% | 0.10% | 0.25% | 0.16% | 0.02% | 0.69% | 0.12% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Live data | 1 | 2 | 33 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| e) Worst affected BTSs due to downtime | <=2% | Live data | 0.16% | 0.03% | 1.39% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.05% | 0.00% | 0.00% | 0.00% | |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.50% | 98.25% | 97.74% | 97.34% | 99.98% | 99.61% | 98.42% | 98.32% | 99.68% | 99.47% | 99.37% | 99.15% |
| | b) SDCCH/PAGING Congestion | <=1% | Live data | 0.11% | 0.50% | 0.35% | 0.43% | 0.73% | 0.01% | 0.12% | 0.31% | 0.16% | 0.00% | 0.00% | 0.00% |
| c) TCH congestion | <=2% | Live data | 0.27% | 0.71% | 0.84% | 1.46% | 2.07% | 0.04% | 0.53% | 0.89% | 0.32% | 0.01% | 0.00% | 0.12% | |
| 3 | Connection Maintenance (Retainability) | | | | | | | | | | | | | | |
| | a) Call Drop Rate (CDR) | <=2% | Live data | 0.28% | 1.35% | 1.18% | 1.34% | 0.94% | 0.33% | 0.73% | 0.43% | 0.72% | 0.58% | 0.15% | 0.50% |
| | b) Worst affected cells>3% TCH drop | <=3% | Live data | 1.91% | 2.44% | 1.85% | 2.47% | 1.68% | 0.01% | 4.37% | 1.49% | 2.62% | 1.49% | 0.84% | 4.85% |
| | c) % of connections with good voice quality | >=95% | Live data | 96.82% | 97.85% | 96.97% | 96.59% | 96.48% | 98.84% | 97.26% | 94.77% | 97.58% | 99.20% | 99.80% | 98.96% |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Live data | 36 | 477 | 134 | 66 | 393 | 1 | 244 | 176 | 512 | 17 | 25 | 89 |
| e) Total no. of cells (Sector) in the licensed service area | | Live data | 1899 | 19528 | 7241 | 2663 | 23458 | 5040 | 5573 | 11764 | 19546 | 1117 | 2991 | 1841 | |
| 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 DEC-14:

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

| QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES- QE DECEMBER 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 | | | | | | | | | | | | | | | |
| Metering & Billing Credibility -Post Paid | | | | | | | | | | | | | | | |
| 1 | A) No. of bills issued during the quarter | | UPW | 50 | 420849 | 43037 | 105402 | 1071749 | 46528 | 117386 | NA | 683643 | 54909 | 134610 | 58846 |
| | B) No. of bills disputed including billing complaints during the quarter | | UPW | 0 | 87 | 0 | 8 | 505 | 12 | 0 | NA | 597 | 26 | 38 | 1 |
| | C) % of billing complaints during the quarter | <= 0.1% | UPW | 0.00% | 0.02% | 0.00% | 0.01% | 0.05% | 0.03% | 0.00% | NA | 0.09% | 0.05% | 0.03% | 0.002% |
| Metering & Billing Credibility -Pre Paid | | | | | | | | | | | | | | | |
| 2 | A) Total No. of Pre-paid customers at the end of the quarter | | UPW | 164122 | 6995846 | 862467 | 2434627 | 12136458 | 3882492 | 3670927 | 7567877 | 10194359 | 194565 | 1216935 | 500177 |
| | B) Total No. of complaints relating to charging, Credit and Validity during the quarter | | UPW | 0 | 253 | 65 | 148 | 784 | 3497 | 1 | 1433 | 7922 | 49 | 761 | 0 |
| | C) % of Pre-paid Charging Complaints | <= 0.1% | UPW | 0.00% | 0.004% | 0.01% | 0.01% | 0.01% | 0.09% | 0.00% | 0.02% | 0.08% | 0.03% | 0.06% | 0.00% |
| Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints | | | | | | | | | | | | | | | |
| 3 | A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter | | UPW | 0 | 340 | 65 | 156 | 30093 | 3509 | 2232 | 1433 | 8519 | 465 | 799 | 56 |
| | 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 | 340 | 65 | 156 | 30093 | 3509 | 2232 | 1433 | 8519 | 465 | 799 | 56 |

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES- QE DECEMBER 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 | |
| | C) No. of billing complaints for Post paid customers/Charging /Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter | | UPW | 0 | 340 | 65 | 156 | 30093 | 3509 | 2232 | 1433 | 8519 | 465 | 799 | 56 |
| | D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks | >=98 % within 4 weeks | UPW | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks | 100 % within 6 weeks | UPW | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints | <=1 week | UPW | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| Response time to customers for assistance | | | | | | | | | | | | | | | |
| 4 | A) Total no of calls attempted to customer care/Call center | | UPW | 389747 | 3168835 | 978009 | 2968295 | 27973544 | 5230088 | 1095542 | 25801517 | 28034369 | 387921 | 1942265 | 96759 |
| | B) Total no. of calls successfully established to customer care/Call center. | | UPW | 372398 | 3168833 | 978009 | 2968295 | 27822196 | 5112109 | 1084749 | 25264985 | 28034369 | 370595 | 1894223 | 95842 |
| | C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts) | >=95 % | UPW | 95.55% | 100.00% | 100.00% | 100.00% | 99.46% | 97.74% | 99.01% | 97.92% | 100.00% | 95.53% | 97.53% | 99.05% |

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

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES- QE DECEMBER 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 | |
| | D) Total Calls reached to operator for Voice to Voice (Total call attempts) | | UPW | 82099 | 414777 | 392600 | 1234986 | 8136452 | 744493 | 1663326 | 6760678 | 8179609 | 55421 | 189060 | 91323 |
| | E) Total number of calls answered by the operator (Voice to voice) within 90 seconds | | UPW | 79132 | 3989272 | 379560 | 1196616 | 7992735 | 698253 | 1569269 | 6653504 | 8073857 | 54812 | 181205 | 88418 |
| | F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts) | >=95 % | UPW | 96.39% | 96.18% | 96.68% | 96.89% | 98.23% | 93.79% | 94.35% | 98.41% | 98.71% | 98.90% | 95.85% | 96.82% |
| Termination/closure of service | | | | | | | | | | | | | | | |
| | A) Total No. of requests for Termination / Closure of service received during the quarter | | UPW | 0 | 1304 | 25 | 420 | 3821 | 68 | 1439 | NA | 2346 | 636 | 423 | 432 |
| 5 | B) No. of requests for Termination / Closure of service complied within 7 days during the quarter | | UPW | 0 | 1304 | 25 | 420 | 3821 | 68 | 1439 | NA | 2346 | 636 | 423 | 432 |
| | C) % of Termination/ Closure of service within 7 days | <=7d ays | UPW | 100% | 100% | 100% | 100% | 100% | 100% | 100% | NA | 100% | 100% | 100% | 100% |
| Time taken for refunds of deposits after closures. | | | | | | | | | | | | | | | |
| | A) No. of Payments/ Refunds due during the quarter | | UPW | 0 | 675 | 41 | 177 | 4315 | 636 | 175 | NA | 1691 | 0 | 1359 | 155 |
| 6 | B) No. of Payments/ Refunds Cleared during the quarter | | UPW | 0 | 675 | 40 | 177 | 4315 | 636 | 175 | NA | 1691 | 0 | 1359 | 155 |
| | C) Time taken for refunds of deposits after closures. | 100 % withi n 60 days | UPW | 100% | 100% | 97.56% | 100% | 100% | 100% | 100% | NA | 100% | 100% | 100% | 100% |

NA: Uninor has no post-paid customers, so data for parameters related to post-paid bills not applicable for them.

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE – DECEMBER 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 | A) Total no of calls attempted to customer care/Call center | | UP West | 14195 | 127321 | 34829 | 91899 | 1120215 | 149444 | 35834 | 840465 | 874043 | 13895 | 56117 | 2634 |
| | B) Total no. of calls successfully established to customer care/Call center. | | UP West | 13973 | 127321 | 34829 | 91899 | 1114371 | 146068 | 35604 | 832768 | 874043 | 12932 | 54744 | 2610 |
| | C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts) | >=95% | UP West | 98.44% | 100.00% | 100.00% | 100.00% | 99.48% | 97.74% | 99.36% | 99.08% | 100.00% | 93.07% | 97.55% | 99.09% |
| 2 | D) Total Calls reached to operator for Voice to Voice (Total call attempts) | | UP West | 3435 | 138625 | 13380 | 44977 | 303910 | 25145 | 56351 | 249060 | 248886 | 2033 | 5020 | 2551 |
| | E) Total number of calls answered by the operator (Voice to voice) within 90 seconds | | UP West | 3256 | 136694 | 13047 | 44071 | 298864 | 24184 | 54399 | 248879 | 247278 | 1980 | 4881 | 2512 |
| | F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts) | >=95% | UP West | 94.79% | 98.61% | 97.51% | 97.99% | 98.34% | 96.18% | 96.54% | 99.93% | 99.35% | 97.39% | 97.23% | 98.47% |

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 was well within the prescribed bench mark of $\leq 0.1\%$.

2. Resolution of Billing complaints and applying credits -

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

All operators 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'. However, **RCOM GSM and Tata GSM** have failed to meet the benchmark of '**Calls answered by Operators (voice to voice) within 90 seconds**'. Their achievement for this parameter was **93.79% and 94.35%** respectively.

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

All operators were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure except **BSNL (UK)** with their performance of **97.56%** failed to settle 100% refund cases.

Live Measurement

The results of three days live measurements revealed that all service providers were in compliance with respect to the parameter **Accessibility** of call center except **MTS** with its achieved value as **93.07%**. **Aircel** has failed to meet the benchmark of '**calls answered by Operators (voice to voice) within 90 seconds**' having achieved its performance as **94.79%** against the benchmark of $\geq 95\%$.

6. LIVE CALLING ASSESSMENT



6. LIVE CALLING ASSESSMENT:

6.1 INTER OPERATOR CALLS ASSESSMENT:

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in UP(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% | 100% | 100% | 100% | 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 | 100% | 100% | 100% | 100% | -- | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| RCOM GSM | UPW | 100% | 100% | 100% | 100% | 100% | -- | 100% | 100% | 100% | 100% | 100% | 100% |
| TATA GSM | UPW | 100% | 100% | 100% | 100% | 100% | 100% | -- | 100% | 100% | 100% | 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% | 100% | 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. 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 90 seconds | UP West | 95 | 99 | 100 | 100 | 100 | 100 | 98 | 98 | 100 | 100 | 99 | 98 |
| % age of calls answered by operator(voice to voice) (Total calls successfully established within 90 Sec.*100/ Total call attempt) | UP West | 95% | 99% | 100% | 100% | 100% | 100% | 98% | 98% | 100% | 100% | 99% | 98% |

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, all operators were able to connect the calls with their call center operators/agents successfully. However Aircel, Airtel, RCOM (GSM), Tata GSM, RCOM (CDMA) and Tata CDMA remained under performance 95%, 99%, 98%, 98%, 99% and 98% 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 | 65 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 56 |
| Total No. of calls Answered | UPW | 0 | 57 | 32 | 45 | 51 | 59 | 64 | 53 | 67 | 49 | 40 | 27 |
| Cases resolved within 4 weeks | UPW | 0 | 57 | 32 | 45 | 51 | 59 | 64 | 53 | 67 | 49 | 40 | 27 |
| %age of cases resolved | UPW | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, some of the customers did not attend the calls while few others reported that there 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, 1098 | UPW | MORADABAD | MORADABAD | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | SAMBHAL | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | BILARI | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | AMROHA | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | HASANPUR | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 100,101, 102 / 108 , 1090, 1098 | UPW | MUZAFFARNAGAR | MUZAFFARNAGAR | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | KAIRANA(SHAMLI) | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | BHUDANA | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | JANSATH (KHATAULI) | 10 | NC | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 100,101, 102 / 108 , 1090, 1098 | UPW | BARIELLY | BARIELLY | 10 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | PITAMBERPUR | 10 | √ | √ | √ | √ | x | x | √ | √ | √ | √ | √ | |
| | | | BAHERI | 10 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | NWABGANJ | 10 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | AONLA-I | 10 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | AONLA-II | 10 | NC | √ | √ | √ | √ | NC | NC | NC | √ | NC | √ | √ |

*NC: No Coverage

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 except at Pitamberpur , where the emergency Calls were not matured on the networks RCOM(GSM)/CDMA and at other places due to no coverage of some of the service providers as marked NC.

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 **Moradabad, Muzaffarnagar and Bareilly** in the months of October, November and December 2014 respectively. The total route Kms covered during the drive tests in respective SSAs was **355 Kms, 430 Kms and 395 Kms**. The performances 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: MORADABAD SSA (OCTOBER-14)

DRIVE TEST TABLE - 1

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Call Attempts | Major Road | NC | NC | 136 | 25 | ND | ND | 123 | 25 | 114 | 25 | 104 | 28 | 124 | 25 | 112 | 26 | 108 | 25 | 104 | 29 | 117 | 25 | | |
| | | Highway | NC | NC | 227 | 25 | ND | ND | 216 | 25 | 124 | 25 | 155 | 27 | 159 | 25 | 188 | 29 | 137 | 25 | 171 | 27 | 172 | 25 | | |
| | | Within City | NC | NC | 131 | 25 | ND | ND | 122 | 25 | 111 | 25 | 143 | 29 | 105 | 25 | 86 | 26 | 106 | 25 | 144 | 29 | 99 | 25 | | |
| | | Overall SSA | NC | NC | 494 | 75 | ND | ND | 461 | 75 | 349 | 75 | 402 | 84 | 388 | 75 | 386 | 81 | 351 | 75 | 419 | 85 | 388 | 75 | | |
| 2 | Blocked Call Rate | Major Road | NC | NC | 0.00% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 3.23% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| | | Highway | NC | NC | 0.44% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.65% | 3.70% | 2.52% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| | | Within City | NC | NC | 0.00% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.70% | 3.45% | 0.95% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| | | Overall SSA | NC | NC | 0.20% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.50% | 2.38% | 2.32% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| 3 | Dropped Call Rate (<=2%) | Major Road | NC | NC | 0.00% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.96% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| | | Highway | NC | NC | 0.00% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.94% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| | | Within City | NC | NC | 0.00% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.99% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | | |
| | | Overall SSA | NC | NC | 0.00% | 0.00% | ND | ND | 0.00% | 0.00% | 0.00% | 0.00% | 0.25% | 0.00% | 1.06% | 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%) | | | | | | | | | | | | | | | | | | | | | | | | | |

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

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR | |
| | | | (a) 0-4 (w/o frequency hopping for CDMA Operators) | Major Road | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.89% | 99.41% | 89.78% | 90.57% | 97.26% |
| Highway | NA | NA | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.11% | 99.53% | 88.40% | 95.24% | 97.72% | 99.41% | | |
| Within City | NA | NA | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.72% | 99.23% | 90.35% | 94.44% | 97.77% | 97.68% | | |
| Overall SSA | NA | NA | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.54% | 99.39% | 89.44% | 93.13% | 97.59% | 98.61% | | |
| (b) 0-5 (with frequency hopping for GSM Operators) | Major Road | NC | NC | 95.18% | 99.49% | ND | ND | 96.82% | 98.93% | 95.97% | 98.87% | 74.45% | 96.00% | 92.80% | 99.38% | 95.61% | 97.40% | NA | NA | NA | NA | NA | NA | | |
| | Highway | NC | NC | 95.35% | 99.67% | ND | ND | 95.70% | 99.18% | 97.02% | 98.12% | 80.32% | 91.53% | 96.19% | 98.43% | 95.27% | 99.57% | NA | NA | NA | NA | NA | NA | | |
| | Within City | NC | NC | 95.21% | 99.72% | ND | ND | 96.39% | 96.09% | 96.52% | 98.62% | 79.31% | 88.46% | 94.00% | 99.34% | 96.78% | 98.32% | NA | NA | NA | NA | NA | NA | | |
| | Overall SSA | NC | NC | 95.26% | 99.62% | ND | ND | 96.28% | 98.10% | 96.51% | 98.54% | 78.49% | 91.93% | 94.75% | 99.05% | 95.79% | 98.45% | NA | NA | NA | NA | NA | NA | | |
| 5 | Service Coverage | | | | | | | | | | | | | | | | | | | | | | | | |
| | In door (>= - 75dBm) | Major Road | NC | NC | 68.29% | 48.87% | ND | ND | 99.92% | 100% | 69.72% | 62.50% | 58.53% | 44.78% | 60.88% | 94.18% | 41.01% | 34.80% | 65.42% | 7.11% | 94.02% | 94.03% | 84.93% | 89.03% | |
| | | Highway | NC | NC | 61.23% | 84.21% | ND | ND | 99.51% | 100% | 42.19% | 57.40% | 54.76% | 100% | 38.99% | 93.10% | 27.15% | 71.60% | 39.51% | 92.06% | 66.30% | 100% | 56.05% | 98.58% | |
| | | Within City | NC | NC | 71.10% | 88.74% | ND | ND | 99.93% | 99.40% | 50.38% | 48.80% | 73.50% | 100% | 60.50% | 82.95% | 39.71% | 53.20% | 65.22% | 96.12% | 91.57% | 91.18% | 84.54% | 99.89% | |
| | | Overall SSA | NC | NC | 65.88% | 74.75% | ND | ND | 99.78% | 99.80% | 54.12% | 56.09% | 62.28% | 81.03% | 50.06% | 90.09% | 34.41% | 53.56% | 55.20% | 65.10% | 81.46% | 94.87% | 72.03% | 95.82% | |
| | In-vehicle (>= - 85dBm) | Major Road | NC | NC | 91.88% | 76.25% | ND | ND | 99.96% | 100% | 96.53% | 98.80% | 92.29% | 97.01% | 93.86% | 99.94% | 75.77% | 83.10% | 91.22% | 90.79% | 99.80% | 100% | 99.21% | 100% | |
| | | Highway | NC | NC | 87.09% | 99.79% | ND | ND | 100% | 100% | 82.43% | 98.90% | 89.12% | 100% | 78.67% | 99.71% | 60.19% | 84.80% | 81.03% | 100% | 93.04% | 100% | 85.95% | 100% | |
| Within City | | NC | NC | 93.90% | 97.32% | ND | ND | 99.97% | 99.90% | 86.84% | 72.50% | 96.63% | 100% | 92.52% | 94.75% | 72.42% | 83.70% | 92.89% | 99.94% | 99.87% | 100% | 98.40% | 100% | | |

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

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR |
| | | | Overall SSA | NC | NC | 90.27% | 91.36% | ND | ND | 99.98% | 99.97% | 88.60% | 89.70% | 92.51% | 98.97% | 86.09% | 98.14% | 67.90% | 83.88% | 87.72% | 96.91% | 96.97% | 100% | 93.13% |
| 6 | Outdoor-in city (>= 95dBm) | Major Road | NC | NC | 97.65% | 99.45% | ND | ND | 100% | 100% | 99.76% | 99.80% | 63.85% | 97.01% | 99.67% | 99.98% | 97.12% | 99.00% | 99.93% | 100% | 100% | 100% | 100% | 100% |
| | | Highway | NC | NC | 97.52% | 99.98% | ND | ND | 100% | 100% | 98.14% | 99.80% | 91.24% | 100% | 97.30% | 100% | 94.00% | 98.60% | 98.53% | 100% | 96.09% | 100% | 99.78% | 100% |
| | | Within City | NC | NC | 99.33% | 99.98% | ND | ND | 100% | 100% | 99.13% | 99.80% | 96.63% | 100% | 99.63% | 100% | 95.66% | 98.60% | 99.97% | 100% | 99.87% | 100% | 99.96% | 100% |
| | | Overall SSA | NC | NC | 98.05% | 99.47% | ND | ND | 100% | 100% | 99.00% | 98.65% | 86.91% | 98.97% | 98.50% | 99.90% | 95.36% | 98.93% | 99.39% | 100% | 98.31% | 100% | 99.89% | 100% |
| | | Major Road | NC | NC | 97.79% | 100% | ND | ND | 100% | 100% | 100% | 100% | 100% | 100% | 96.77% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 6 | Call Setup Success Rate (>=95%) | Highway | NC | NC | 99.56% | 100% | ND | ND | 100% | 100% | 100% | 100% | 99.35% | 96.30% | 97.48% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | NC | NC | 100% | 100% | ND | ND | 100% | 100% | 100% | 100% | 99.30% | 96.55% | 96.19% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Overall SSA | NC | NC | 99.19% | 100% | ND | ND | 100% | 100% | 100% | 100% | 99.50% | 97.62% | 96.91% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Major Road | NC | NC | 100% | 100% | ND | ND | 99.02% | 100% | 100% | 100% | 99.39% | 100% | 96.18% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 7 | Hand Over Success Rate (HOSR) | Highway | NC | NC | 98.55% | 100% | ND | ND | 100% | 100% | 97.10% | 100% | 100% | 100% | 98.69% | 100% | 97.47% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | NC | NC | 98.13% | 100% | ND | ND | 100% | 100% | 100% | 100% | 99.15% | 100% | 96.62% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Overall SSA | NC | NC | 98.82% | 100% | ND | ND | 99.73% | 100% | 99.15% | 100% | 99.43% | 100% | 97.16% | 100% | 98.82% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Major Road | NC | NC | 100% | 100% | ND | ND | 99.02% | 100% | 100% | 100% | 99.39% | 100% | 96.18% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

- NA: Not Applicable
- NC: No Coverage
- The service Providers having block call rate more than 3% have been shaded in yellow colour.
- ND: BSNL did not turn up the drive test in Moradabad SSA due to Network realignment.

7.2 OPERATOR ASSISTED DRIVE TEST: MUZAFFARNAGAR SSA (NOVEMBER-14)

DRIVE TEST TABLE – 2

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Call Attempts | Major Road | NC | NC | 66 | 25 | 50 | 25 | 76 | 27 | 70 | 25 | 62 | 25 | 65 | 25 | 67 | 26 | 65 | 25 | 62 | 26 | 90 | 25 |
| | | Highway | NC | NC | 313 | 25 | 248 | 25 | 329 | 25 | 218 | 25 | 209 | 25 | 293 | 25 | 311 | 25 | 219 | 25 | 211 | 25 | 198 | 25 |
| | | Within City | NC | NC | 139 | 25 | 131 | 25 | 125 | 25 | 116 | 25 | 113 | 25 | 112 | 25 | 115 | 24 | 139 | 25 | 116 | 25 | 138 | 25 |
| | | Overall SSA | NC | NC | 518 | 75 | 429 | 75 | 530 | 77 | 404 | 75 | 384 | 75 | 470 | 75 | 493 | 75 | 423 | 75 | 389 | 76 | 426 | 75 |
| 2 | Blocked Call Rate | Major Road | NC | NC | 0.00% | 0.00% | 4.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 3.08% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | | Highway | NC | NC | 0.00% | 0.00% | 1.61% | 0.00% | 0.61% | 0.00% | 0.00% | 0.00% | 0.48% | 0.00% | 0.34% | 4.00% | 0.32% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | | Within City | NC | NC | 0.72% | 0.00% | 0.76% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 4.00% | 0.89% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| | | Overall SSA | NC | NC | 0.19% | 0.00% | 1.63% | 0.00% | 0.38% | 0.00% | 0.00% | 0.00% | 0.26% | 1.33% | 0.85% | 1.33% | 0.20% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 3 | Dropped Call Rate (<=2%) | Major Road | NC | NC | 0.00% | 0.00% | 2.08% | 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 | NC | NC | 0.00% | 0.00% | 0.41% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.03% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.95% | 0.00% | 0.00% | 0.00% |
| | | Within City | NC | NC | 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% | 0.86% | 0.00% | 0.73% | 0.00% |
| | | Overall SSA | NC | NC | 0.00% | 0.00% | 0.47% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.65% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.77% | 0.00% | 0.24% | 0.00% |

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

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR | |
| Percentage connections with good voice quality (=>95%) | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | (a) 0-4 (w/o frequency hopping for CDMA Operators) | Major Road | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.00% | 98.17% | 95.53% | 96.39% | 97.49% | 97.91% | |
| | | Highway | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.38% | 98.21% | 95.96% | 99.66% | 97.70% | 98.69% |
| | | Within City | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.16% | 99.18% | 94.89% | 98.29% | 98.16% | 99.28% |
| | | Overall SSA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.25% | 98.51% | 95.56% | 98.62% | 97.80% | 98.63% |
| | (b) 0-5 (with frequency hopping for GSM Operators) | Major Road | NC | NC | 95.60% | 99.33% | 98.40% | 100% | 96.68% | 95.57% | 95.99% | 99.50% | 83.23% | 100% | 87.60% | 98.95% | 96.19% | 96.45% | NA | NA | NA | NA | NA | NA | |
| | | Highway | NC | NC | 95.19% | 99.26% | 98.60% | 99.64% | 96.79% | 98.43% | 96.64% | 99.59% | 91.70% | 94.20% | 90.32% | 98.45% | 95.74% | 98.76% | NA | NA | NA | NA | NA | NA | |
| | | Within City | NC | NC | 95.86% | 98.95% | 98.46% | 100% | 96.13% | 95.28% | 94.68% | 99.19% | 83.60% | 92.22% | 88.50% | 99.01% | 96.15% | 96.93% | NA | NA | NA | NA | NA | NA | |
| | | Overall SSA | NC | NC | 95.42% | 99.18% | 98.54% | 99.86% | 96.66% | 96.61% | 95.92% | 99.43% | 87.91% | 93.92% | 89.51% | 98.81% | 95.91% | 97.38% | NA | NA | NA | NA | NA | NA | |
| Service Coverage | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | In door (>= -75dBm) | Major Road | NC | NC | 84.97% | 100% | 56.47% | 66.84% | 99.26% | 100% | 45.44% | 59.50% | 86.18% | 98.90% | 47.82% | 78.96% | 70.58% | 67.37% | 66.76% | 100% | 81.52% | 100% | 60.63% | 100% | |
| | | Highway | NC | NC | 75.18% | 68.71% | 59.14% | 83.78% | 93.47% | 99.10% | 35.15% | 38.20% | 64.47% | 77.54% | 39.19% | 80.45% | 54.65% | 79.47% | 65.99% | 88.07% | 78.31% | 80.25% | 72.52% | 96.88% | |
| | | Within City | NC | NC | 92.38% | 97.40% | 62.40% | 74.35% | 97.94% | 97.40% | 53.46% | 48.60% | 82.97% | 95.83% | 64.40% | 55.34% | 76.42% | 57.60% | 76.98% | 64.25% | 93.14% | 73.44% | 87.77% | 100% | |
| | | Overall SSA | NC | NC | 80.75% | 88.72% | 59.71% | 75.89% | 95.47% | 98.79% | 42.59% | 49.48% | 73.46% | 88.75% | 46.36% | 71.53% | 62.30% | 68.42% | 69.75% | 84.27% | 83.41% | 79.20% | 74.89% | 98.96% | |
| | In-vehicle (>= -85dBm) | Major Road | NC | NC | 97.83% | 100% | 87.46% | 99.63% | 99.94% | 100% | 91.14% | 97.50% | 98.64% | 100% | 81.60% | 99.44% | 90.91% | 98.37% | 92.03% | 100% | 95.58% | 100% | 89.87% | 100% | |
| | | Highway | NC | NC | 97.49% | 100% | 84.01% | 99.21% | 99.51% | 100% | 81.89% | 96.00% | 90.42% | 90.15% | 75.84% | 99.66% | 84.95% | 93.06% | 91.58% | 98.73% | 93.49% | 97.84% | 94.56% | 100% | |

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

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR | |
| | | | Within City | NC | NC | 99.60% | 100% | 90.77% | 98.73% | 99.82% | 100% | 93.60% | 94.00% | 96.91% | 95.83% | 92.05% | 97.42% | 90.41% | 76.79% | 95.75% | 80.72% | 99.59% | 94.53% | 97.89% | 100% |
| | | Overall SSA | NC | NC | 98.06% | 100% | 86.25% | 99.17% | 99.65% | 100% | 87.13% | 95.94% | 93.66% | 94.00% | 80.48% | 98.84% | 87.20% | 89.80% | 93.03% | 93.28% | 95.71% | 96.49% | 94.64% | 100% | |
| | Outdoor-in city (>= 95dBm) | Major Road | NC | NC | 99.58% | 100% | 97.23% | 100% | 100% | 100% | 98.74% | 99.60% | 100% | 100% | 97.07% | 100% | 99.31% | 100% | 99.88% | 100% | 99.93% | 100% | 99.39% | 100% | |
| Highway | | NC | NC | 99.68% | 100% | 97.09% | 100% | 99.92% | 100% | 96.61% | 99.40% | 99.46% | 100% | 97.43% | 99.98% | 98.57% | 99.08% | 99.74% | 100% | 100% | 100% | 99.81% | 100% | | |
| Within City | | NC | NC | 99.88% | 100% | 98.61% | 100% | 100% | 100% | 99.69% | 99.40% | 99.73% | 100% | 99.59% | 99.98% | 97.58% | 99.08% | 99.98% | 100% | 100% | 100% | 100% | 99.97% | 100% | |
| Overall SSA | | NC | NC | 99.71% | 100% | 97.52% | 100% | 99.95% | 100% | 100% | 97.93% | 99.44% | 99.63% | 100% | 97.90% | 99.96% | 98.47% | 99.33% | 99.84% | 99.19% | 99.99% | 100% | 99.77% | 100% | |
| | | | Major Road | NC | NC | 100% | 100% | 96.00% | 100% | 100% | 100% | 100% | 100% | 100% | 95.38% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 6 | Call Setup Success Rate (>=95%) | Highway | NC | NC | 99.68% | 100% | 98.39% | 100% | 97.57% | 100% | 100% | 100% | 99.52% | 100% | 98.98% | 96.00% | 99.68% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| | | Within City | NC | NC | 97.84% | 100% | 99.24% | 100% | 97.60% | 100% | 100% | 100% | 100% | 96.00% | 97.32% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 99.28% | 100% | |
| | | Overall SSA | NC | NC | 99.23% | 100% | 98.37% | 100% | 97.92% | 100% | 100% | 100% | 100% | 99.74% | 98.67% | 98.09% | 98.67% | 99.80% | 100% | 100% | 100% | 100% | 100% | 99.77% | 100% |
| | | | | Major Road | NC | NC | 100% | 100% | 97.50% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| 7 | Hand Over Success Rate (HOSR) | Highway | NC | NC | 99.69% | 100% | 97.06% | 100% | 99.34% | 100% | 100% | 100% | 100% | 99.81% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| | | Within City | NC | NC | 100% | 100% | 98.82% | 100% | 100% | 100% | 100% | 100% | 99.12% | 100% | 99.63% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| | | Overall SSA | NC | NC | 99.79% | 100% | 97.57% | 100% | 99.60% | 100% | 100% | 100% | 100% | 99.62% | 100% | 99.77% | 100% | 100% |
| | | | | Major Road | NC | NC | 100% | 100% | 97.50% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

- NA: Not Applicable
- NC: No Coverage
- The service Providers having block call rate more than 3% have been shaded in yellow colour.

7.3 OPERATOR ASSISTED DRIVE TEST: BAREILLY SSA (DECEMBER-14)

DRIVE TEST TABLE – 3

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR | |
| 1 | Call Attempts | Major Road | 40 | 25 | 173 | 25 | 117 | 25 | 189 | 25 | 45 | 25 | 56 | 25 | 76 | 25 | 184 | 26 | 47 | 25 | 56 | 25 | 105 | 25 | |
| | | Highway | 74 | 27 | 138 | 25 | 262 | 25 | 138 | 25 | 77 | 25 | 67 | 25 | 101 | 26 | 143 | 26 | 62 | 25 | 67 | 25 | 97 | 25 | |
| | | Within City | 128 | 12 | 189 | 25 | 172 | 25 | 169 | 25 | 159 | 12 | 151 | 13 | 124 | 25 | 186 | 27 | 116 | 12 | 153 | 13 | 198 | 25 | |
| | | Overall SSA | 242 | 64 | 500 | 75 | 551 | 75 | 496 | 75 | 281 | 62 | 274 | 63 | 301 | 76 | 513 | 79 | 225 | 62 | 276 | 63 | 400 | 75 | |
| 2 | Blocked Call Rate | Major Road | 0.00% | 0.00% | 0.00% | 0.00% | 0.85% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.79% | 0.00% | 2.63% | 0.00% | 0.54% | 0.00% | 0.00% | 0.00% | 1.79% | 0.00% | 0.00% | 0.00% | |
| | | Highway | 1.35% | 3.70% | 0.00% | 0.00% | 1.91% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.99% | 3.85% | 6.29% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| | | Within City | 2.34% | 0.00% | 0.00% | 0.00% | 1.74% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.66% | 0.00% | 0.81% | 0.00% | 0.54% | 0.00% | 0.00% | 0.00% | 0.65% | 0.00% | 0.00% | 0.00% | |
| | | Overall SSA | 1.65% | 1.56% | 0.00% | 0.00% | 1.63% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.73% | 0.00% | 1.33% | 1.32% | 2.14% | 0.00% | 0.00% | 0.00% | 0.72% | 0.00% | 0.00% | 0.00% | |
| 3 | Dropped Call Rate (<=2%) | Major Road | 0.00% | 0.00% | 0.00% | 0.00% | 0.86% | 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% | 0.72% | 0.00% | 1.17% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.75% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| | | Within City | 0.00% | 0.00% | 0.00% | 0.00% | 1.78% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.87% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.66% | 0.00% | 0.00% | 0.00% | |
| | | Overall SSA | 0.00% | 0.00% | 0.20% | 0.00% | 1.29% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.35% | 0.00% | 0.20% | 0.00% | 0.00% | 0.00% | 0.37% | 0.00% | 0.00% | 0.00% | |
| 4 | Percentage connections with good voice quality (=>95%) | | | | | | | | | | | | | | | | | | | | | | | | |

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

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR |
| | | | (a) 0-4 (w/o frequency hopping for CDMA Operators) | Major Road | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 97.84% | 98.18% | 90.21% | 100% |
| Highway | NA | NA | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 97.80% | 98.43% | 90.57% | 100% | 96.74% | 99.28% | |
| Within City | NA | NA | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.59% | 98.41% | 96.77% | 100% | 97.95% | 99.18% | |
| Overall SSA | NA | NA | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 98.22% | 98.33% | 93.92% | 100% | 97.58% | 98.54% | |
| (b) 0-5 (with frequency hopping for GSM Operators) | Major Road | 96.38% | | 99.85% | 97.07% | 99.66% | 98.41% | 99.91% | 97.64% | 99.65% | 98.24% | 99.78% | 78.55% | 97.28% | 96.10% | 94.56% | 93.84% | 97.35% | NA | NA | NA | NA | NA | NA |
| | Highway | 97.61% | | 99.69% | 96.18% | 99.67% | 98.62% | 99.73% | 95.92% | 99.35% | 98.36% | 99.83% | 80.62% | 99.58% | 94.65% | 96.18% | 93.86% | 97.37% | NA | NA | NA | NA | NA | NA |
| | Within City | 97.07% | | 99.84% | 97.82% | 99.67% | 98.67% | 99.50% | 97.77% | 99.76% | 98.24% | 99.68% | 81.33% | 99.21% | 93.58% | 99.43% | 95.89% | 98.04% | NA | NA | NA | NA | NA | NA |
| | Overall SSA | 97.11% | | 99.78% | 97.16% | 99.67% | 98.57% | 99.69% | 97.23% | 99.58% | 98.27% | 99.78% | 80.51% | 98.51% | 94.60% | 96.73% | 94.67% | 97.59% | NA | NA | NA | NA | NA | NA |
| 5 | Service Coverage | | | | | | | | | | | | | | | | | | | | | | | |
| | In door (>= - 75dBm) | Major Road | 62.87% | 98.35% | 80.30% | 99.75% | 80.26% | 70.83% | 97.66% | 99.90% | 58.52% | 100% | 35.20% | 0.06% | 54.95% | 50.14% | 61.67% | 93.70% | 42.42% | 94.91% | 29.82% | 96.70% | 56.71% | 100% |
| | | Highway | 65.47% | 79.81% | 75.95% | 73.79% | 78.90% | 72.49% | 98.48% | 100% | 55.31% | 57.80% | 35.03% | 11.38% | 67.19% | 99.06% | 64.38% | 88.00% | 44.85% | 89.65% | 32.06% | 94.84% | 50.92% | 94.63% |
| | | Within City | 86.02% | 99.85% | 90.82% | 99.65% | 80.43% | 77.21% | 99.30% | 99.90% | 60.08% | 95.10% | 63.79% | 77.50% | 77.35% | 70.96% | 73.51% | 61.30% | 77.35% | 59.96% | 57.72% | 93.85% | 86.09% | 48.12% |
| | | Overall SSA | 76.38% | 90.96% | 83.48% | 91.29% | 79.76% | 73.88% | 98.48% | 99.93% | 58.63% | 82.40% | 51.06% | 19.21% | 68.35% | 73.24% | 67.12% | 80.94% | 61.29% | 86.11% | 45.91% | 95.47% | 69.83% | 80.93% |
| | In-vehicle (>= - 85dBm) | Major Road | 88.77% | 100% | 97.17% | 100% | 91.10% | 91.08% | 100% | 100% | 84.46% | 100% | 69.44% | 13.42% | 88.20% | 99.44% | 90.72% | 100% | 69.53% | 100% | 78.70% | 100% | 91.39% | 100% |
| | | Highway | 92.52% | 97.89% | 96.80% | 99.71% | 90.06% | 91.80% | 99.98% | 100% | 85.80% | 97.30% | 65.27% | 65.90% | 92.15% | 99.95% | 87.96% | 98.70% | 86.06% | 96.16% | 70.19% | 100% | 83.10% | 100% |
| | | Within City | 99.03% | 100% | 99.05% | 100% | 90.80% | 93.85% | 99.98% | 100% | 86.02% | 99.80% | 89.73% | 77.50% | 87.98% | 98.49% | 93.14% | 82.40% | 93.91% | 97.48% | 91.30% | 100% | 98.13% | 98.96% |

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

| S/N | Parameter | Classification of routes covered | AIRCEL | | 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 | INDOOR |
| | | | Overall SSA | Major Road | Highway | Within City | Overall SSA | Major Road | Highway | Within City | Overall SSA | Major Road | Highway | Within City | Overall SSA | Major Road | Highway | Within City | Overall SSA | Major Road | Highway | Within City | Overall SSA | Major Road |
| | Outdoor-in city (>= 95dBm) | Overall SSA | 95.50% | 99.12% | 97.84% | 99.91% | 90.58% | 92.40% | 99.99% | 100% | 85.72% | 98.90% | 79.67% | 45.16% | 89.41% | 99.28% | 90.95% | 93.66% | 86.75% | 97.91% | 83.55% | 100% | 92.71% | 99.65% |
| | | Major Road | 97.89% | 100% | 99.82% | 100% | 98.42% | 98.34% | 100% | 100% | 97.80% | 100% | 95.51% | 98.69% | 99.27% | 100% | 99.17% | 100% | 97.93% | 100% | 100% | 100% | 99.93% | 100% |
| | | Highway | 99.33% | 99.96% | 99.69% | 100% | 97.39% | 98.34% | 100% | 100% | 98.56% | 99.90% | 93.70% | 99.81% | 99.63% | 100% | 97.20% | 100% | 99.46% | 96.91% | 99.99% | 100% | 99.93% | 100% |
| | | Within City | 99.94% | 100% | 99.90% | 100% | 98.27% | 98.34% | 100% | 100% | 98.81% | 99.90% | 98.95% | 99.81% | 89.84% | 100% | 99.07% | 100% | 98.45% | 96.91% | 100% | 100% | 99.97% | 100% |
| | | Overall SSA | 99.43% | 99.98% | 99.82% | 100% | 97.95% | 98.08% | 100% | 100% | 98.58% | 99.94% | 96.97% | 99.33% | 95.44% | 99.99% | 98.60% | 99.39% | 98.62% | 98.45% | 100% | 100% | 99.95% | 100% |
| 6 | Call Setup Success Rate (>=95%) | Major Road | 97.50% | 100% | 100% | 100% | 99.15% | 100% | 100% | 100% | 100% | 100% | 98.21% | 100% | 92.11% | 100% | 99.46% | 100% | 100% | 100% | 98.21% | 100% | 100% | 100% |
| | | Highway | 98.65% | 96.30% | 100% | 100% | 98.09% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 96.04% | 96.15% | 93.71% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | 96.88% | 100% | 100% | 100% | 98.26% | 100% | 100% | 100% | 100% | 100% | 99.34% | 100% | 92.74% | 100% | 99.46% | 100% | 100% | 100% | 98.69% | 100% | 100% | 100% |
| | | Overall SSA | 97.52% | 98.44% | 100% | 100% | 98.37% | 100% | 100% | 100% | 100% | 100% | 99.27% | 100% | 93.69% | 98.68% | 97.86% | 100% | 100% | 100% | 98.91% | 100% | 100% | 100% |
| 7 | Hand Over Success Rate (HOSR) | Major Road | 100% | 100% | 99.64% | 100% | 97.66% | 100% | 98.73% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Highway | 100% | 100% | 98.41% | 100% | 97.40% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 97.92% | 100% | 98.58% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | 97.67% | 100% | 99.29% | 100% | 98.92% | 100% | 100% | 100% | 98.13% | 100% | 99.65% | 100% | 95.34% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Overall SSA | 98.74% | 100% | 99.14% | 100% | 97.83% | 100% | 99.65% | 100% | 98.89% | 100% | 99.76% | 100% | 96.86% | 100% | 99.60% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

- NA: Not Applicable
- The service Providers having block call rate more than 3% have been shaded in yellow colour.

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

| Name of SSA | Month | Day 1 | | Day 2 | | Day 3 | |
|-------------|-------------------|---------------------------|---|---------------------------|--|---------------------------|---|
| | | Name of SDCA & KM Covered | Route Covered | Name of SDCA & KM Covered | Route Covered | Name of SDCA & KM Covered | Route Covered |
| MORADABAD | 29 TO 31 OCT-2014 | Moradabad /115km | <p>Within City-Vivekanand Hospital, Vikas Bhawan, Asiyana, Ramganga Vihar, Wave Mall, Sai Temple, Agrasen Chowk, Reserve Police Line, Gaon Chowk, Hanuman Mandir Chowk, Sambhal Chowk, Bus Stand, Budh Bazar, Railway Station, Hotel Drive In-24.</p> <p>Major Roads-Drive In-24, Delhi Rd, Ccs Chowk, Parasnath Plaza, Maharana Pratap Chowk, Pilikothi, Ito Office, Dm Office, Harthala, Sonakpur, Mda, Vivekanand Hospital, Prem Nagar, Mp Shock, Railway Station, Prince Road, Bus Stand</p> <p>Highways-Lakdifazalpur, Rampur Road, Nh-24, Dolatpur, Mundapandey, Rampur-Doraha, Kasipur Road, Sirwa Dorcha</p> <p>Indoor: 1. Chandra Tourist Highway Dhaba 2. Hotel Drive In-24</p> | Bilari, Sambhal/130km | <p>Highways:-Hote Drive In-24, Mini Bypass, Noorpur, Chandausi Road, Dingarpur, Kankpur, Donghar, Kunderkee, Amarpur, Janeta, Narauli, Kheria</p> <p>Major Roads:-Sambhal, Sdm Court Sambhal, Firozpur, Sirsi, Mehmodpur, Mogi, Rto Office, Main Road Bilari, Chandausi Road, Tehsil Bilari, Shashpur, Hind Inter College, Behajole Road Bilari,</p> <p>Within City:-Bilari Roadways, Bus Stand, Maharana Pratap Chowk, Sahbad Road Bilari, Yadav Tourist Dhaba, Bodun Chungi, Iti Bilari</p> <p>Indoor: 1.Yadav Touraist Dhaba Bilari, 2.SBI, Sambhal</p> | Amroha, Hasanpur /110km | <p>Highways:-Nh-24(Towards Amroha, Hotel Holiday, Residency, Pakbara, Tmu, Iftm University, Lodhipur, Siti Energy Ltd., Chodhurpur, Atrasi Kta, Rajabpur, Gajraula, Spiming Hill Gajraula Chopla, Hasanpur, Sihali Jagir, Macd Gajraula</p> <p>Within City:-Sambhal Road Joya, Delhi Road, Dhanora Road, Islam Nagar, Bijnor Road, Atrasi Road, Pakka Bag, Delhi Gate, G.I. College, Block Office Hasanpur, Kotwali Hasanpur</p> <p>Major Roads:-Joya Hasanpur Road, Galaxy Appartment, Sp Office Amroha, Lic, Cmo Office Amroha, Transport Chowk, Bijnor Road Amroha, Ghass Mandi, Collectrate Atrasi.</p> <p>Indoor: 1.SBI, Amroha, 2.Maruti Service Center, Hasanpur</p> |

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

| Name of SSA | Month | Day 1 | | Day 2 | | Day 3 | |
|---------------|-------------------|---------------------------|--|----------------------------------|---|---------------------------|---|
| | | Name of SDCA & KM Covered | Route Covered | Name of SDCA & KM Covered | Route Covered | Name of SDCA & KM Covered | Route Covered |
| MUZAFFARNAGAR | 19 TO 21 NOV-2014 | Muzaffarnagar /135km | <p>With In City:- Railway Station Muzaffar Nagar, Malviya Chowk, Ansari Road, Lic, Abkari Road, Hanuman Chowk, Bhagat Singh Road, Shiv Chowk, Jhansi Ki Rani, Court Road, Roadways Bus Stand, Sai Dham, Mahavir Chowk, Meenakshi Road, Khalapar, Premपुर, Idgah, Budhana More, By Pass, Gokul City, Jansath Road, Almarpur, Dwarikapuri, Gandhi Colony, Vishwakarma Chowk, Naveen Mandi.</p> <p>Highway:-Rampur Tiraha, Deoband Road, Rohanakta Road, Rohana Mill, Khampur, Kotwali, Chapar, N.H.58 Chapar, Barla, G.T. Road Purkaji, Phalvada, Sisona, Gupta Resort.</p> <p>Major Road:- Budhana More By Pass, Rana Chowk, Sujdi Chungi, G.T. Road, D.M. House, Sharde In School, Meenakshi Chowk, Shiv Chowk, City Hospital, Rampuri, Roorkee Chungi.</p> <p>Indoor: Gupta Resort, N.H. 58, Muzaffar Nagar</p> | Kairana(Shamli) , Bhudana /150km | <p>Highway:-Bsni T/E Patel Nagar, Jansath Road, N.H.-58 Bypass, Peena Bypass, Dhadedu Kala, Chartawal, Nagla Rai, Biralsi, Thana Bhawan, Maples Shamli, Maples Academy Budhana, Mahavir Chowk.</p> <p>With In City:- Gurudwara Shamli, Charan Singh Chowk, Peena Bypass, Dhadedu Kala, Chartawal, Nagla Rai, Shiv Chowk, Kairana Road, Jhijnjhina Road, Bsm School Rampuram, Dav Pg College Budhana, Dyanand Chowk, Baraut Road, Peeth Bazar, Bharat Talkies, Nadi, Mandir Road, Mahavir Chowk Budhana,</p> <p>Major Road:- Break Point Restaurant Shamli, Royal Public School Kandla, Rit , Main Road Kabana, Public Inter College, Katshyan Chopal, Kotwali Kairana, Nawab Market, Uncha Gaon, Main Road Kandhla, Mojo Cinema Kandhla, Nai Basti Kandhla, Budhana.</p> <p>Indoor: 1.Break Point Restaurant, Panipat Road, Shamli, 2.Sawariya Restaurant, Tehsil Chowk, Budhana.</p> | Jansath(Khatauli) /145km | <p>Highway :- Bsni T/E Patel Nagar, Bhopa Bypass, Makhiyali, Bindals Paper Mills, Bhopa Main Road, Sugar Mill Morna, Shukratal, Ganga Ghat Shukratal, Jansath Road Morna, Kakroli, Jansath, Salarpur, Sambhalaheda, Mirapur, Khatauli Road, Mehalki, Cheetal Grand Hotel, Dadri, Police Chowk Dadri, Mansurpur, Bsni T/E Muzaffar Nagar</p> <p>With In City :- Jansath, G.T.Road Jansath, Tehsil Jansath, Post Office Jansath, Dav Degree College Jansath, Bsni T/E Jansath.</p> <p>Major Road:-Meerapur, Khatauli Road, Jansath Road, Bus Stand Khatauli, Jansath Road Khatauli, Lic Khatauli, Maple Academy Khatauli, G.T. Road Khatauli, Ganga Bank Khatauli.</p> <p>Indoor: 1.Tehsil, Jansath, 2.Cheetal Restaurant, Khatauli</p> |

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

| Name of SSA | Month | Day 1 | | Day 2 | | Day 3 | |
|-------------|-------------------|---|---|-------------------------------------|---|--------------------------------------|--|
| | | Name of SDCA & KM Covered | Route Covered | Name of SDCA & KM Covered | Route Covered | Name of SDCA & KM Covered | Route Covered |
| BAREILLY | 17 TO 19 DEC-2014 | Bareilly & Pitamberpur / 120km | <p>Within City- Bareilly Railway Station, Choki Chouraha, Rampur Garden, New Civil Lines, Shahjapur Road, Satellite Bus Stand, Pillibheet Bypassroad, University, 100 Foota Road, Delaper, Ivri Road, Izzatnagar Railwat Station, Mini Bypass, Karamchari Nagar, Kilapul, Heartman Road, Premnagar Chowk, Twin Tower, Rajendra Nagar, Delapar Mandi, Airforce Station, Pheonix Mall, Bisalpur Road, Faridpur Main Road, Sbi, Kisan Inter College, Station Road, Faridpur Railway Station, Kacchhari Road, Bisalpur</p> <p>Major Roads- Rajshree Engg. College, Funcity Bareilly, Hotel Park Grand, Rohilkhand Medical College, Sattelite Chowk, Highway Bareilly To Pitamborpur To Faridpur To Bareilly Highway</p> <p>Highways- Sr International School, Lucknow Highway Bypass, Bhuta Road, Bhuta Bareilly Highway.</p> <p>Indoor: Bsnl Telephone Exchange, Bareilly Cantt.</p> | Nawabganj & Baheri/160km | <p>Highways- Airforce Station, Rinvara, Nawabganj, Baheri City, Kiccha Road , Bhojipura, Bareilly Cantt.</p> <p>Major Roads- Nawabganj City, Kundrakothi, Baheri</p> <p>Within City- Nawabganj City, Baheri City</p> <p>Indoor: 1. City Health Centre, Nawabganj. 2. Tehsil, Baheri</p> | Aonla I & Aonla II /115km | <p>Highways- Lal Phatak (Bareilly), Deochara, Bhamora,</p> <p>Within City- Sbi, Aonla-Ramnagar Road, Ramnagar</p> <p>Major Roads- Iffco Chowk, Aonla Sbi, Kargaine Road, Aliganj Gaini, Kaundiarpur Road Bsnl Exchanhge.</p> <p>Indoor: Tehsil-Aonla</p> |

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF MORADABAD SSA – OCTOBER 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 | Moradabad | No Coverage | Sambhal, Chandausi & Bilari | No Coverage | Amroha & Hasanpur | No Coverage |
| 2 | AIRTEL | | Poor Level & Quality near Kashipur Rd, Rampur Rd | | Poor Level & Quality near Shambhal Rd | | Poor Level & Quality near Amroha outer, Devipura, Gairaula Rd |
| 3 | BSNL | | Not Done due to Network Swapping | | Not Done due to Network Swapping | | Not Done due to Network Swapping |
| 4 | TATA GSM | | Poor Level & Quality near Barwara Majra, Ekta Nagar, No Coverage between Umri to Raipur, Pakwara to Nanakwadi, Rampur Tiraha | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer |
| 5 | TATA CDMA | | Poor Level & Quality near Barwara Majra, Ekta Nagar, Budh Vihar | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer |
| 6 | IDEA | | --- | | --- | | --- |
| 7 | RCOM GSM | | Poor Level & Quality near Barwara Majra, Rampur Rd, Poor Quality near Jigar Colony, Budh Vihar | | No Coverage between Kohinoor Tirha to Gurer, Gurer to Sambhal, Sambhal to Chandausi, Gurer to Kundarki, hawla to Akrauli, Poor Level & Quality near Akrauli, Kohinoor Tiraha, Poor Level & Quality near Thawla, Kohinoor Tiraha, Sambhal outer, Lakheri outer | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer |
| 8 | RCOM CDMA | | Poor Level & Quality near Barwara Majra | | No Coverage between Kohinoor Tirha to Gurer, Gurer to Sambhal, Sambhal to Chandausi, Gurer to Kundarki, hawla to Akrauli, Poor Level & Quality near Akrauli, Kohinoor Tiraha | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer |
| 9 | MTS | | Poor Level & Quality near Kashipur Rd, Rampur Rd, Dauraha | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer | | They have coverage obly in SDCA's & Major Towns with Poor level & Quality at outer |
| 10 | UNINOR | | No Coverage at Ladki Fajalpur, Poor Quality near Jigar Colony, Bazar Bagh, Balmeekei Colony, Rampur Rd | | No Coverage at Isapur, Abupur Khurd, Sarthal, Firozpur, Asalatnagar Bagha | | No Coverage at Mangupura, Manota |
| 11 | VODAFONE | | Poor Level & Quality near Kashipur Rd, Moradabad Bypass Rd, Maihola | | Poor Level & Quality near kanakpur, Hasanpur | | Poor Level & Quality near Dhakiya, Sihali Jageer |

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF MUZAFFARNAGAR SSA – NOVEMBER 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 | Muzaffarnagar & Purkaji | No Coverage | Shamli, Kairana, Kadhla & Budhana | No Coverage | Khataulli, Jansath & Shukrataal | No Coverage |
| 2 | AIRTEL | | Poor Quality near Rohana, Muzaffarnagar Bypass | | Poor Quality near Thanabhawan, Kairana outer, Budhana outer, Peena Bypass | | Poor Level & Quality near Khatauli Bypass, Jansath outer |
| 3 | BSNL | | Poor Level near Purkaji, Chaper, Rohanakalan, Rampur Tiraha, Makhyali Bhopa, Vehlana Chowk | | Poor Level near Tawli, Sahapur, Taharpur, Sikka, Biralsi | | Poor Level near Sukra, Morna, Kakroli, Mirapur, Khatauli Bypass |
| 4 | TATA GSM | | No Coverage between Purkaji to Babnagar to Rohana, Rohana to Chapar, Barla to Phaluda, Muzaffarnagar Bypass | | They Coverage only in SDCA's & Major Towns with Poor Level & Quality at outer | | They Coverage only in SDCA's & Major Towns with Poor Level & Quality at outer |
| 5 | TATA CDMA | | No Coverage between Purkaji to Muzaffarnagar Bypas, Rohana to Khampur | | They Coverage only in SDCA's & Major Towns with Poor Level at outer | | They Coverage only in SDCA's & Major Towns with Poor Level at outer |
| 6 | IDEA | | Poor Quality near Rampur Tiraha, Rohana, Muzaffarnagar Bypass | | --- | | --- |
| 7 | RCOM GSM | | Poor Level & Quality near Purkaji, Bagowali, vehlana Chowk, Makhyali Bhopa, Shabudin Nagar, Adarsh Nagar, Muzaffarnagar Bypass | | Poor Level & Quality near Dhadheru Kalan, Budhana outer, Kandhla, Kairana, Barwala, No Coverage between Shamli to Hind, Shamli to Kairana, Thana Bhawan to Bilarsi, Bilarsi to Charthawal, Charthawal to Dhadheru Kalan | | They Coverage only in SDCA's & Major Towns with Poor Level at outer, Poor Quality near Kukda Mandi, TE Khatauli |
| 8 | RCOM CDMA | | No Coverage near Barala, Poor Quality near Vehlana Chowk, Khaderwala | | Poor Level & Quality near Dhadheru Kalan, Budhana outer, Kandhla, Kairana, No Coverage between Shamli to Hind, Shamli to Kairana, Thana Bhawan to Bilarsi, Bilarsi to Charthawal, Charthawal to Dhadheru Kalan | | They Coverage only in SDCA's & Major Towns with Poor Level at outer |
| 9 | MTS | | Poor Level near indira Colony, Rohana, Purkaji, No Coverage between Muzaffarnagar Bypass to Purkaji | | They Coverage only in SDCA's & Major Towns with Poor Level at outer | | They Coverage only in SDCA's & Major Towns with Poor Level at outer |
| 10 | UNINOR | | No Coverage at Mahraipur, Khampur, Poor Quality near Janakpuri, Makhyali Bhopa, Civillines, Jansath Rd | | No Coverage at Jogiya Khera, Poor Quality near Loharli Khurd, Kakra, Jaleshar, Multi Specility Hospital Shamli, Bilarsi | | No Coverage at Talera, Chudiwala, Salarpur, Rasulpur, Poor Quality at Khatauli outer, Vehlana Chowk, Kakroli |
| 11 | VODAFONE | | Poor Level near Khoja Nagla, Khampur, Bhaderi, Poor Quality at Muzaffarnagar outer | | Poor Level & Quality near Bilarsi, Dhadheru Khurd, Meerapur, Vehlana Chowk, Kesarwa | | Poor Level & Quality near Ghasipura, Shukrataal, Beharaha Sadat, Talera |

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF BAREILLY SSA – DECEMBER 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 | Bareilly & Pitambarpur | Poor Level & Quality near Airforce Area, TP Nagar | Nawabganj & Baheri | Poor Level & Quality near Bah, Jadhavpur, Bhojipura, Nawabganj outer | Aonla I & Aonla II | They coverage only in SDCA's and Major Towns with Poor Level & Quality at outers |
| 2 | AIRTEL | | Poor Level & Quality near Airforce Area, Bhoota Rd, Fareedpur outer, Poor Quality near Rly Station | | Poor Level & Quality near Baheri Rd, Poor Quality on Bypass | | Poor Level & Quality near Kargaina Rd, Gaini |
| 3 | BSNL | | Poor Level near Bhutta, Poor Quality Kalari, Kuan Tanda | | Poor Level near Bah, Jadhavpur, Poor Quality near Kundara | | Poor Level near Gaini, Aliganj, Aonla |
| 4 | TATA GSM | | No coevareg between Aminopur to Bareilly Bypass, Padrathpur to Bhutta, Faridpur to Gosganj, Zed Invertis University to Kesharpur, Gotiya | | They have coverage only in SDCA's and Major Towns with Poor Level at outers | | They have coverage only in SDCA's and Major Towns with Poor Level at outers |
| 5 | TATA CDMA | | Poor Level near Bhutta, Faridpur outer, No coverage Bareilly to Puranpur, Rajpur to Faiz Nagar, Paraspur to Swarop Agro Ind. | | Poor Level & Quality near Bah, Deoriyan, Nawabganj outer, Sithra | | Poor Level near Aonla, Aliganj, No coverage between Bhoripur to Mauchanderpur, Kohni to Billari, Bisarathganj to Akha, Bhimpur to Sattar Nagar |
| 6 | IDEA | | Poor Quality near Airforce Area, Mundla, Green Park, Kalari, Patel Nagar | | Poor Quality near Bah, Mundia Nabi, Kundara, Nawabganj outer, Mundla, Jadhavpur, Biharipur | | Poor Quality near Lal Phatak, Aonla outer, Iffco, Ramnagar outer, Chambari, Aliganj, Rajpur Kalan |
| 7 | RCOM GSM | | Poor Level near Bhojapur Rd, Urla Jagir, Civillines, Pilibhit HW, at Faridpur outer, No coverage between Radrathpur to Bareilly & Faridpur | | They have coverage only in SDCA's and Major Towns with Poor Level & Quality at outers | | They have coverage only in SDCA's and Major Towns with Poor Level & Quality at outers |
| 8 | RCOM CDMA | | Poor Level near Bhojapur Rd, Urla Jagir, at Faridpur outer, No coverage between Radrathpur to Bareilly & Faridpur | | They have coverage only in SDCA's and Major Towns with Poor Level & Quality at outers | | They have coverage only in SDCA's and Major Towns with Poor Level & Quality at outers |
| 9 | MTS | | Poor Level near Pilibhit Bypass, Bhunta Rd, No coverage between Faridapur to Bareilly | | They have coverage only in SDCA's and Major Towns with Poor Level at outers | | They have coverage only in SDCA's and Major Towns with Poor Level at outers |
| 10 | UNINOR | | Poor Level & Quality near Airforce Area, Mundla, Kalari, Bhutta, Dhakni, No coverage at Chawer, Lalpur, Uganpur, Khajuria, charpur | | Poor Level & Quality near Mundla, Sarifpur, SRMS College, Nwabganj outer, No coverage at Kalyanpur, Udhamapur, Aspur, Chawer | | They have coverage only in SDCA's and Major Towns with Poor Level & Quality at outers |
| 11 | VODAFONE | | Poor Level near Kuan Danda, Majhua hetram, Poor Quality near Airforce Area, Kumbhra, Ramnagar, Bhutta, Gosganj, Faridpur outer | | Poor Level near Shahpur Dendi, Gopalpur, Faizullahpar, Poor Quality near SRMS, Kudesia, Bhojipura, Girdharour, Mundla, Faizganj | | Poor Level near Ramnagla, Aonil Iffco, Gaini, Poor Quality near Khajuhai, Angori, Aonla Iffco, Gaini |

DRIVE TEST TABLE: 8

NO NETWORK COVERAGE STATUS OF DRIVE TEST – OCTOBER TO DECEMBER 14

| Sr. No | Month | Name of Operator | SSA | SDCA Covered | Status of no network coverage area | ICR Status |
|--------|--------|------------------|-----------|--|---|--|
| 1 | Oct-14 | Tata GSM | Moradabad | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | Moradabad:- Lakdhi Fazalpur Mazhola Road, Pakwaran To Nanakwadi, Umari To Devpur, Niymatpur To Dalputpur To Rampur Doraha , Kashipur Road (Sirsawa Doraha), Bilari:- Lakhdi Fazalpur Noorpur, Damghor To Kundorki, Kundorki To Bilari, Rustome Nagar To Chaundasi, Sambhal:- Narwali To Sambhal, Sambhal To Sirsai, Mohmeodpur mafi To Gurer, Tahjorpur To Gagon Tirha, Hasanpur:- Gajrola To Hasanpur, CL Gupta Export To Dhakiyan To Chaman, Amroha:- Joya To SP Office (Amroha) , Amroha Teshil To Atrasi To (Rusulpur) | NO |
| | | Tata CDMA | | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | Bilari:- Manjhola chowki to Bawa Thair, A.Rehman bricks co. Sambhal:- Sambhal road to Sambhal. Amroha:- Unique college of Law to Didoli, Atrasi to Premdhama, Hasanpur:- Sihali jagir to Manauta. | No |
| | | Reliance GSM | | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | Moradabad:- Sirsawa Doraha- Moonda Pandey, Bilari:- Narupur to Kundarki, Sahrpur to Bilari, Sambhal:- Narauli- Sambhal, Sambhal-Narupur, Amroha:-Lodhipur-Chaudharpur, Hasanpur:- Atrasin RD-Manota. | No |
| | | Reliance CDMA | | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | Sambhal:- Kohinoor to Gurer, Gurer to Sambhal, Bilari:- bilari to akrauli, Amroha:- Joya to Rajabpur, Hasanpur:- Rajabpur to Gajraula, Gajraula to hasanpur | No |
| | | BSNL | | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | Sambhal:- Mehmoodpur Mafi to Nosna shekhoopur, Hasanpur:- Sihali Jageer to hasanpur T.E. | No |
| | | MTS | | Moradabad, Bilari, Amroha, Hasanpur | Bilari:- RTO Moradabad to Bilari to Chandausi, Amroha:- Moradabad to Joya Hasanpur:- Hasanpur to Gajraula | Dalpatpur to Munda Panday, Chandausi, Moradabad to Amroha Highway (ICR with Tata CDMA) |
| | | Airtel | | Moradabad, Amroha, Hasanpur | Moradabad:- Moradabad-rampur highway, Hasanpur:- gajraula-hasanpur highway, Amroha:- amroha-atrasi highway. | Moradabad-rampur highway (ICR with VODAFONE) |
| | | Vodafone | | Moradabad, Bilari, | ----- | No |

| Sr. No | Month | Name of Operator | SSA | SDCA Covered | Status of no network coverage area | ICR Status |
|--------|--------|------------------|---------------|---|--|------------|
| | | Idea | | Sambhal, Amroha, Hasanpur | ----- | No |
| | | UNINOR | | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | Moradabad :-Lakdifazalpur, Bilari :-isapur, abupur khurd, Sambhal :-sarthal, firozpur, asalatnagar bagha, Amroha :-mureedpur, Hasanpur :-manota, mangupura | No |
| | | Aircel | | Moradabad, Bilari, Sambhal, Amroha, Hasanpur | No coverage at whole moradabad ssa | No |
| 2 | Nov-14 | Tata GSM | Muzaffarnagar | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath (Khtauli) | Muzaffarnagar :-Bhavnagar to rahane, shamli by pass, rohane to chhapar, muzaffernagar by pass (delhi road), barla to phalanda, by pass nasirpur, Kairana (Shamli) :- shamli by pass no coverage, jalapur-dhadedu- charthawal, charthawal- kathargarh – thanabhawan,) thanabhawan -harah fathepur, breakpoint restaurant to kandela, kairana to budhana rd., ashadpur to kandhla, Bhudana :- damgrol to jaula, jaula to budhana , sirojpur to shahpur, tharpur to dangrol, Jansath(Khtauli) :-makhiyali to jatmujenda, marnar to shukratal, bhedahedi to bhedasadat, jatwara to jansath, mirapur to churyala to mehalki to khatauli. | No |
| | | Tata CDMA | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath (Khtauli) | Muzaffarnagar :-Khanpur to chapaar to phalanda(purqazi bypass), Kairana (Shamli) :-dadendu to nirdhana village mod, sangam dhaba(charthawal road) to alpine vidyapeeth, harad, fatehpur to sai iti(shamli road), Bhudana :-unchagaon power house to asadpur jidana, bhabhisa tp hp gas godam(budhana road), bhasana to hp petrol pump(shahpur road), khakra to sanjhak. Jansath (Khtauli) :-makhiyali to talda,morna. Salarpur to sabaat mujheda (mirapur road), chudiyala to khatauli, sheetal plaza to moolchand resort. | No |
| | | Reliance GSM | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath (Khtauli) | Muzaffarnagar :-Barla to purkaji highway, Bhudana :-harsoli to shapur,chajpur to bhudana Kairana (Shamli) :-kairana to kandhla, kandhla to rajpur , shamli kairana highway, dhaderuklan to charthawal, charthawal to biralsi, biralsi to thanbhawan, Jansath(Khtauli) :-mansoorpur, bhandura to morna, morna to behran, jansath to mirapur, mirapur to khtauli | No |

| Sr. No | Month | Name of Operator | SSA | SDCA Covered | Status of no network coverage area | ICR Status |
|--------|--------|----------------------|----------|---|---|---|
| | | Reliance CDMA | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath (Khtauli) | Muzaffarnagar: -Barla to purkaji highway, Bhudana: -harsoli to shapur, chajpur to bhudana Kairana (Shamli): -kairana to kandhla, kandhla to rajpur , shamli kairana highway, dhaderuklan to charthawal, charthawal to biralsi, biralsi to thanbhavan, Jansath(Khtauli): -mansoorpur, bhandura to morna, morna to behran, jansath to mirapur, mirapur to khtauli | No |
| | | BSNL | | Kairana (Shamli), Jansath (Khtauli) | Kairana (Shamli): -Kairana to kandhala (new site uncha gao---upcoming), kali nadi to lohari khurd(new site dadhedu upcoming). Jansath(Khtauli): -Mirapur to khatauli | No |
| | | MTS | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath(Khtauli) | Muzaffarnagar: -Chhapar to purkaji, Bhudana: -budhana to shahpur, Jansath(Khtauli): -makhiyali to talda(bhopa road), chudiyala to katauli, salanpur to sabaat miyheda(mirapur road), cheetal plaza to mansoorpur | Whole muzaffarnagar, kairana (except shamli), jansath (khtauli) SDCA with Tata CDMA |
| | | Airtel | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath (Khtauli) | Muzaffarnagar: -Bhudana bypass | No |
| | | Vodafone | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath(Khtauli) | ----- | No |
| | | Idea | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath(Khtauli) | ----- | No |
| | | UNINOR | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath(Khtauli) | Muzaffarnagar: -Bhudana bypass, khanpur, kali nadi, bhudana crossing, Kairana(shamli): - naglarai, akbargarh, khiwari, shamli outer , khedislah, asadpur, jidhana, dungar, karnodi, rankheda, khaikhedi, Jansath(Khtauli): -talera, salarpur, churyala, nayagao, raipur nagli, bhainsi | No |
| | | Aircel | | Muzaffarnagar, Kairana (Shamli), Bhudana, Jansath(Khtauli) | No coverage at whole muzaffarnagar ssa | No |
| 3 | Dec-14 | Tata GSM | Bareilly | Bareilly, Pitamberpur, Nwabganj, Baheri, Aonla-I, Aonla-II | Bareilly: -aminopur to bareilly bye pass, airforce station, bisalpur road to lucknow highway, Pitamberpur: -gotiya to invertis university, zed invertis university to kesharpur , padarthpur to bhuta, zed faridpur to gosganj, Baheri: - baheri to diyaraniyam Nawabganj: -nawabganj to baheri, simkhirato jadaunpur, rithora to hafizganj, hafizganj to nawabganj, airforce station to rithora , atapatti shimli to bhojipura, Aonla-I: -anola1 to maholia, devchara to anola1, rbc college to kandharpur Aonla-II: -Aonla-2, gaini to badaun road, | Whole network on ICR with Aircel |

| Sr. No | Month | Name of Operator | SSA | SDCA Covered | Status of no network coverage area | ICR Status |
|--------|-------|------------------|-----|---|---|---|
| | | Tata CDMA | | Bareilly ,Pitamberpur, Nawabganj, Baheri, Aonla-I, Aonla-li | Bareilly: -bareilly-nainital highway, statae bank of patiala to puranpur, Pitamberpur: -Paraspur village to agro industries, raipur to faiz nagar, bypass , Baheri: -saidpura to durshampur towards baheri,highway (baheri tio bareilly near bhojipura, Aonla-I:- kohni pratappur to radhaswami satsang-billari,bhooripur to mauchandpur, Aonla-II:- bheempur katoti to sattar nagar,bisaratganj to akha | No |
| | | Reliance GSM | | Pitamberpur, Nawabganj, Baheri, Aonla-I, Aonla-li | Pitamberpur: -Padaratpur to faridpur rd, bhuta rd, bhuta to harunagla. Bara bypass to rithora rd, Baheri: -mundia to baheri, Nawabganj: -rithora to nawabgang, bijoria, kundrakothi, Aonla-I:- aonla to ramnagar rd, bhamora to aonla, Aonla-II:- ramnagar-gaini-aliganj.ramnagar | No |
| | | Reliance CDMA | | Pitamberpur, Nawabganj, Baheri,Aonla-I, Aonla-li | Pitamberpur: -Padaratpur to faridpur rd, bhuta rd, bhuta to harunagla. Bara bypass to rithora rd, Baheri: -mundia to baheri, Nwabganj: -rithora to nawabgang, bijoria, kundrakothi, Aonla-I:- aonla to ramnagar rd, bhamora to aonla, Aonla-II:- ramnagar-gaini-aliganj.ramnagar | No |
| | | MTS | | Pitamberpur, Nawabganj, Baheri,Aonla-I, Aonla-li | Pitamberpur: -Pitamberpur to faridpur to bareilly, Baheri: -muriya ahemadnagar to senthal Nawabganj: -gopalpur village to kundra kothi, Aonla-I:- lal phatak to devchara & aonla 1 to bareilly. Aonla-II:- No Coverage. | Highway bareilly to pitamberpur, all city on ICR (nawabganj & baheri), aonla 1 with RCOM CDMA |
| | | BSNL | | | ----- | No |
| | | Airtel | | Bareilly, Pitamberpur, Nawabganj, Baheri, Aonla-I, Aonla-li | ----- | No |
| | | Vodafone | | | ----- | No |
| | | Idea | | | ----- | No |
| | | UNINOR | | Pitamberpur, Nawabganj, Baheri,Aonla-I, Aonla-li | Bareilly: -Chawer, lalpur, uganpur, Pitamberpur: -khajuria, charpur, Nawabganj: -kalyanpur, udharnapur, aspur, chawer, Baheri: -saidpur, bhogpur, shekhpur, Aonla-I:- alampur, antpur, jitaur, Aonla-II:- akha, kudda, ramnagla | No |

| Sr. No | Month | Name of Operator | SSA | SDCA Covered | Status of no network coverage area | ICR Status |
|--------|-------|------------------|-----|---|---|------------|
| | | Aircel | | Pitamberpur, Nawabganj, Baheri, Aonla-I, Aonla-li | <p>Bareilly:-almonipur to lucknow highway to bareilly bypass, airforce station,Bisalpur road to lucknow highway,</p> <p>Pitamberpur:- gotia to invertis university to kaserpur , jed,freedpur to gosganj, padarthpur to bhutta, to rithoura,</p> <p>Nawabganj:- hafizganj to nawabganj, nawabganj to baheri,</p> <p>Aonla-I:- devchara to anola , near rbgi collage kandarpur,</p> <p>Aonla-II:-anola-2 to aliganj, ramnagar to giani to budaun road</p> | No |

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 across 2 SSAs namely Moradabad and Muzaffarnagar.

- (i) **In the Month of October-14**, drive tests were conducted across **Moradabad** SSA covering Moradabad Sambhal, Chandausi, Bilari, Amroha & Hasanpur SDCAs. The performance of some of the Service providers with respect to the parameter **Voice Quality** was not satisfactory. On SSA level, **RCOM (GSM), RCOM (CDMA) and Uninor** failed to meet the benchmark of the parameter **Voice Quality** with their performance as **78.49% (Outdoor) / 91.93% (Indoor), 89.44% (Outdoor) / 93.13% (Indoor) and 94.75% (Outdoor)**. However, in general, the performance of the service providers in respect of other parameters was satisfactory.
- (ii) **In the Month of November-14**, drive test was conducted across **Muzaffarnagar** SSA covering Muzaffarnagar, Purkaji, Shamli, Kairana, Kadhla, Budhana, Khataulli, Jansath & Shukrtaal SDCAs. The results of the drive tests carried out in this SSA revealed that performance of the service providers was satisfactory as they were largely meeting the benchmarks. Only one parameter '**Voice Quality**' remained non-complied with by **RCOM(GSM) and Uninor** with their performance as **87.91% (Outdoor) / 93.92% (Indoor) and 89.51% (Outdoor)** respectively
- (iii) **In the month of December-14**, drive test was conducted across **Bareilly** SSA covering Bareilly & Pitambarpur Nawabganj, Baheri and Aonla SDCAs. The drive test results exposed that only one parameter i.e '**Voice Quality**' could not be performed well by **RCOM (GSM), Uninor, Vodafone and RCOM CDMA** as they could achieve **80.51%, 94.60%, 94.67% and 93.92%** respectively. **Uninor** also failed to meet the benchmark of **CSSR (93.69%)**. The performance of all other service providers was well within the benchmark for most of the parameters on SSA basis.

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.

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

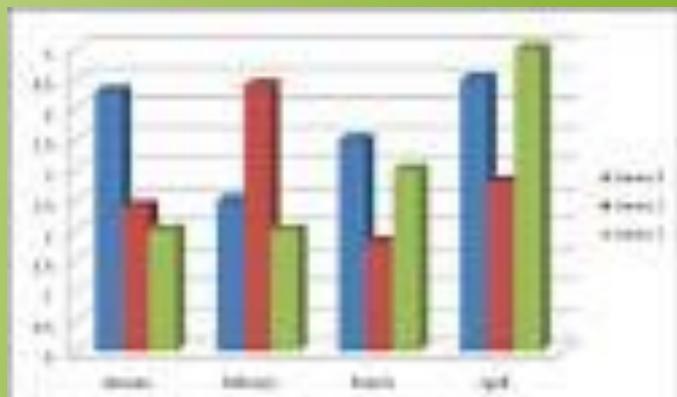
*Thus, the parameters **Voice Quality** remained the area of concern as the same could not be complied with by **RCOM (GSM), Uninor, Vodafone and RCOM CDMA** across all the three SSAs where the drive tests were conducted during the quarter ended December 2014. The service providers need to improve their network quality with respect to these parameters.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

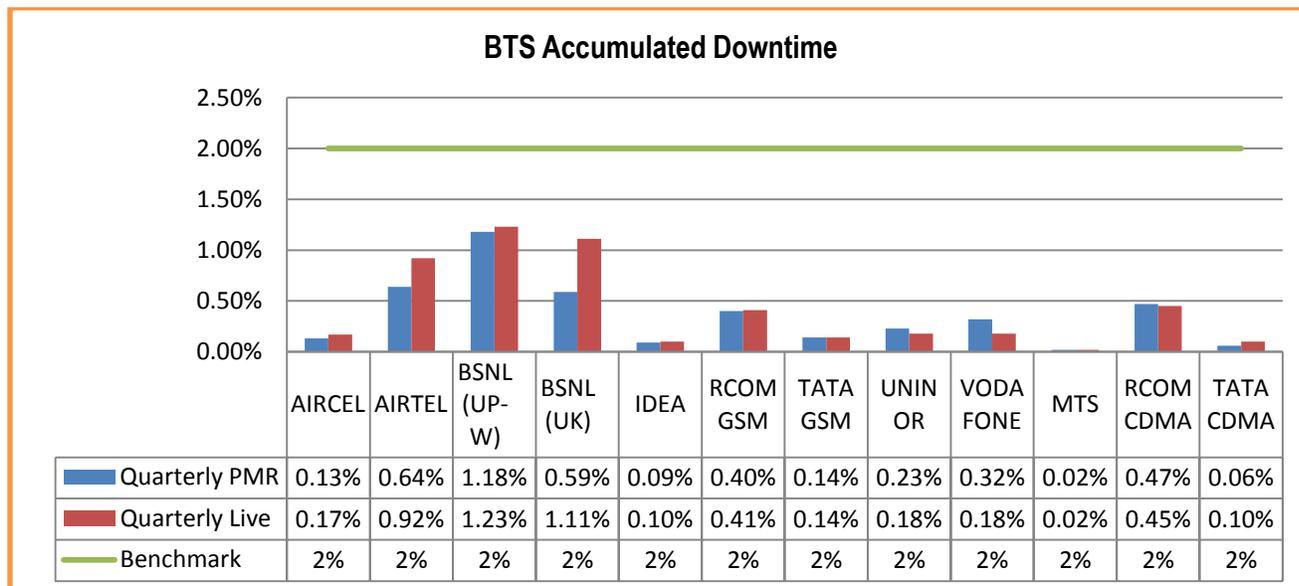
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION:

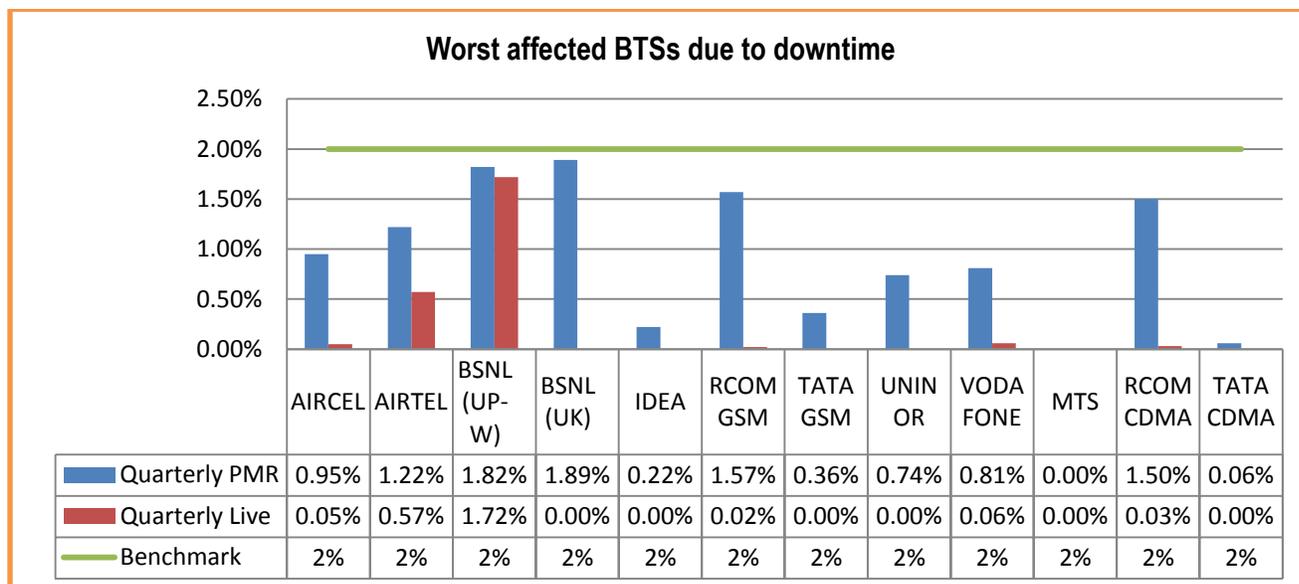
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME :



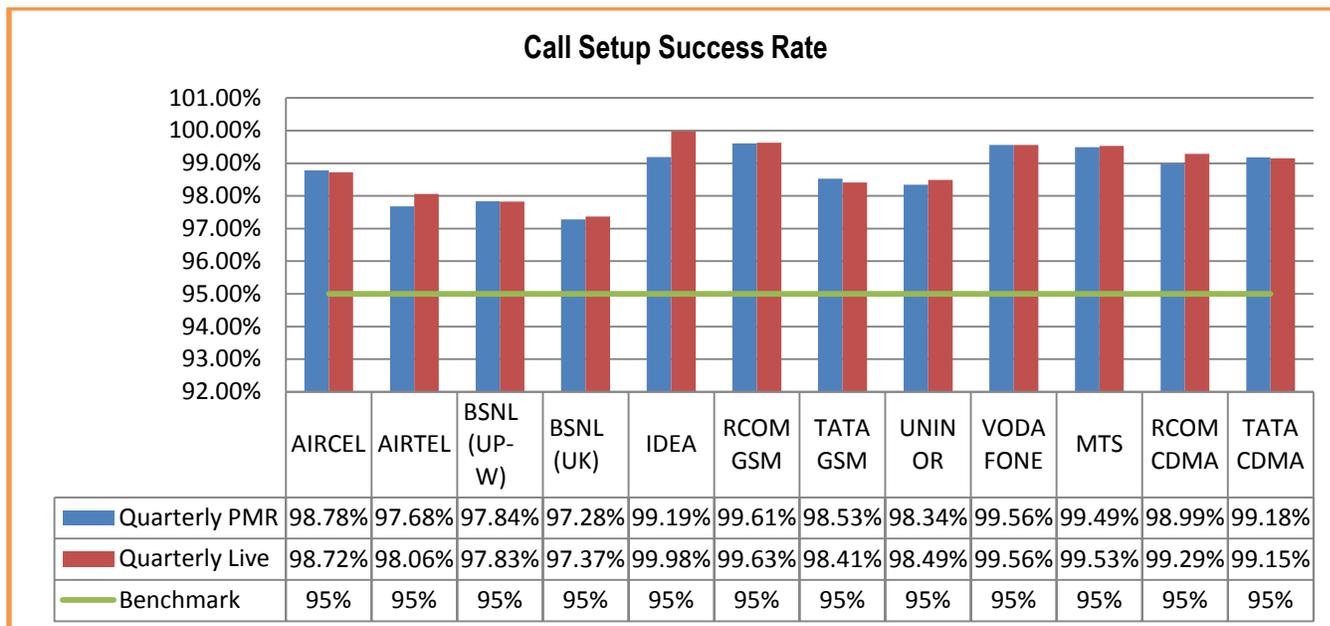
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSs DUE TO DOWNTIME :



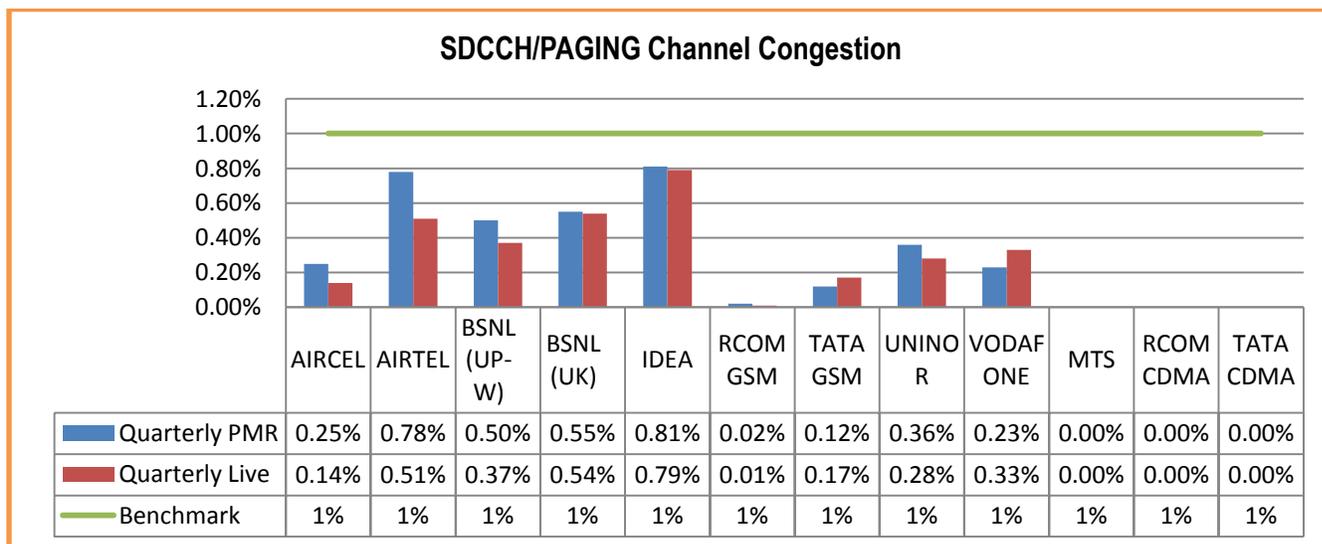
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE :



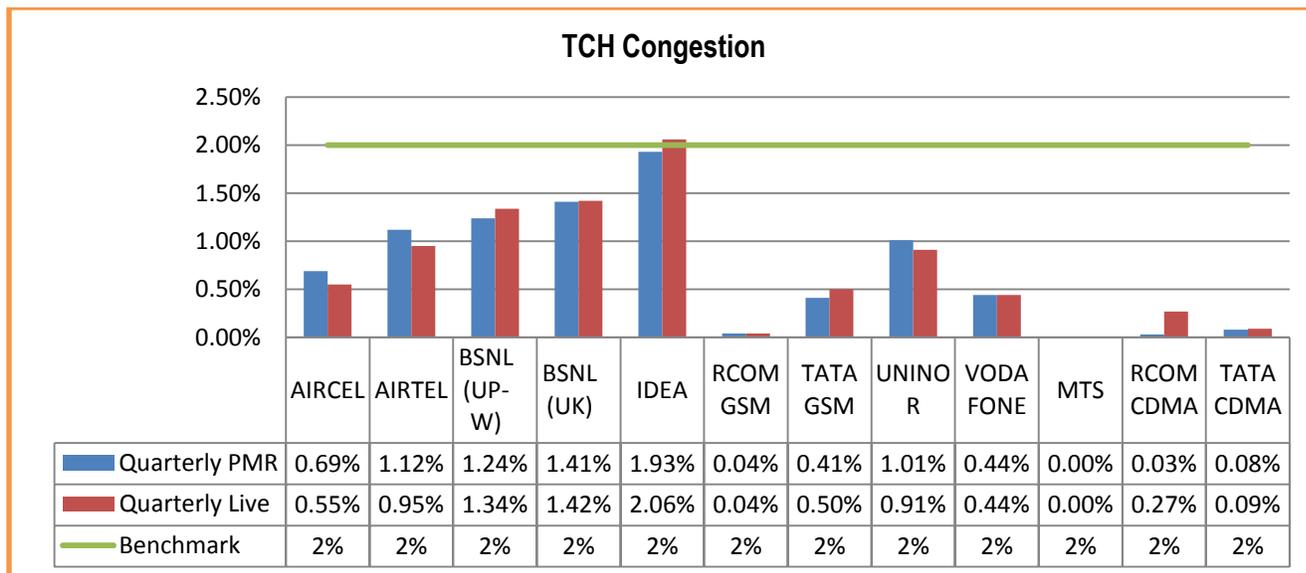
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION :



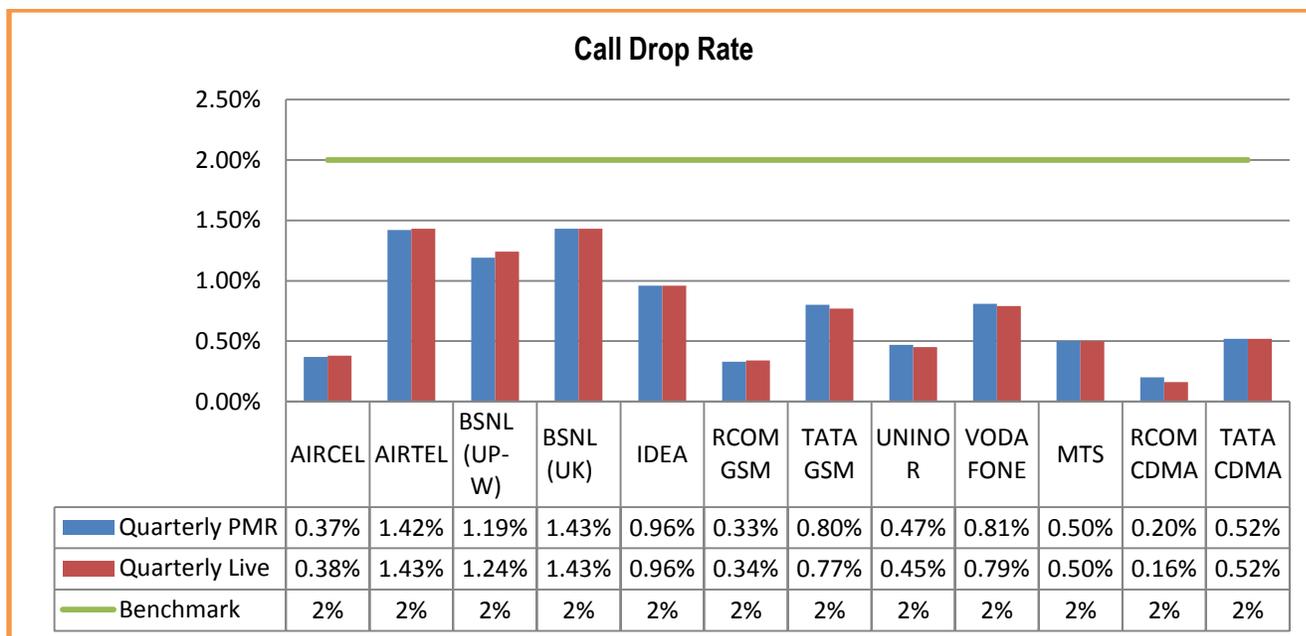
All operators are meeting the benchmarks.

5) TCH CONGESTION:



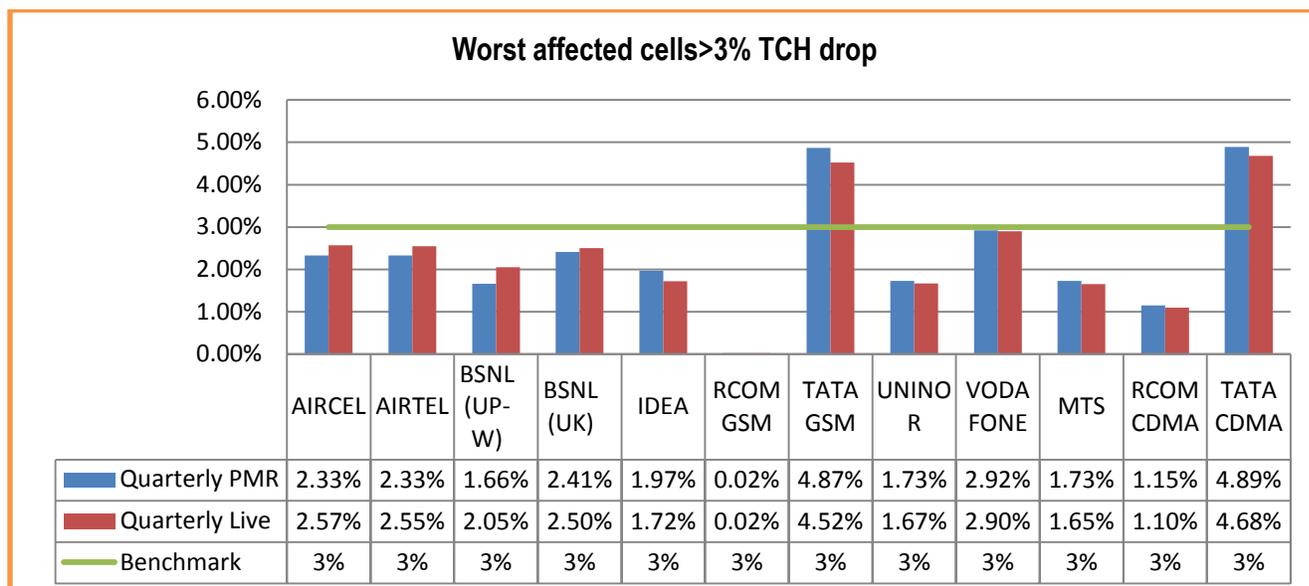
All operators are meeting the benchmarks except Idea (3 days live measurement)

6) CALL DROP RATE :



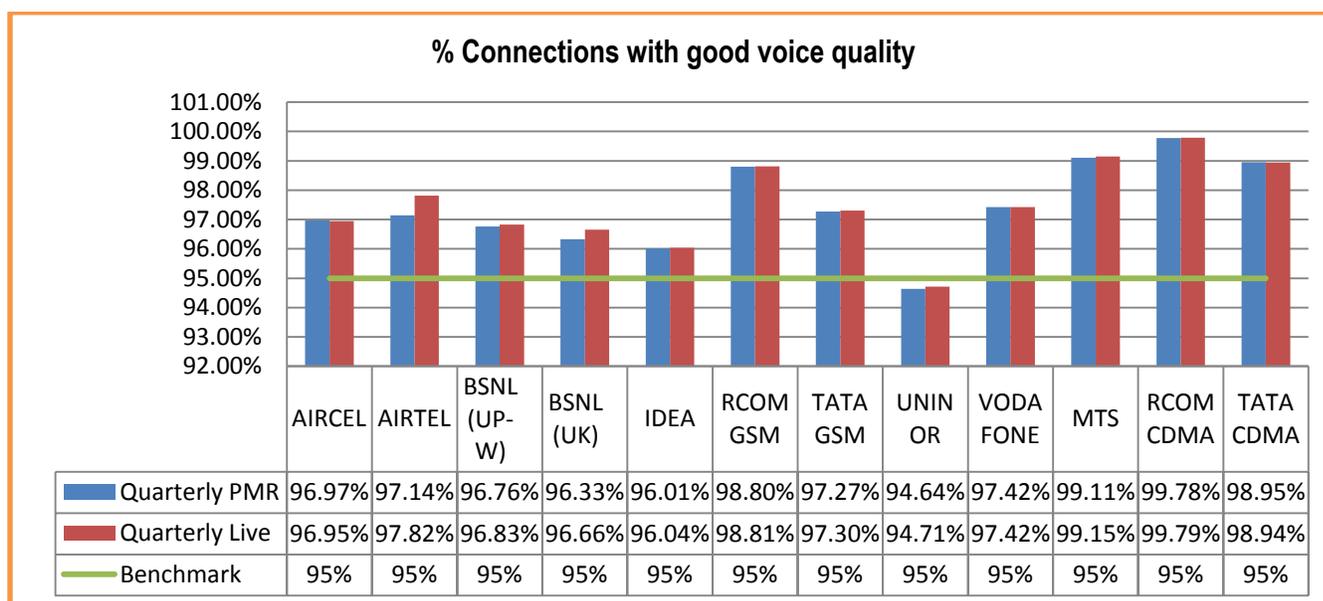
All operators are meeting the benchmarks.

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



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

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



All operators are meeting the benchmarks except Uninor.