



**Audit & Assessment of Quality of Service
Of
Cellular Mobile Telephone Service
For
Telecom Regulatory Authority of India
North Zone – Haryana Service Area
(July 2014 – September 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 **Haryana circle** against the QoS bench marks laid down by TRAI in the respective regulations.



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1. BACKGROUND



1. BACKGROUND

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

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

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

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

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

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



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

2. OBJECTIVES AND METHODOLOGY



2. OBJECTIVES AND METHODOLOGY

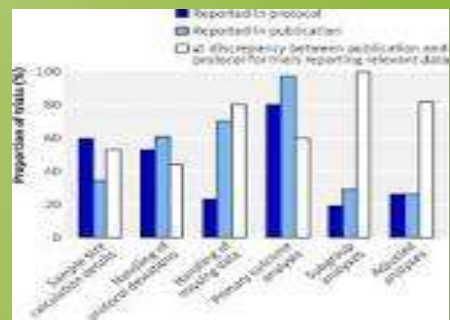
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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

| Sl. No. | Name of Service Provider | Dates of live measurement Audit | | | Audit Location |
|-----------------------|--------------------------|---------------------------------|--------------------|----------------------|--|
| | | July-14 | August-14 | September-14 | |
| GSM Operators | | | | | |
| 1 | AIRCEL | 14 to 16 Jul-14 | 7 to 8 & 11 Aug-14 | 17 to 19 Sep-14 | Green Buleward Building, NSN office, Sector-62, Noida (UP) |
| 2 | AIRTEL | 13 to 15 Jul-14 | 8, 11 to 12 Aug-14 | 8 to 10 Sep-14 | Bharti Airtel Ltd, Plot No. 21, Rajiv Gandhi Chandigarh Technology Park, Chandigarh. |
| 3 | BSNL | 14 to 16 Jul-14 | 21 to 23 Aug-14 | 17 to 19 Sep-14 | AGM (PG) Cum Nodal Officer (TRAI) O/o CGMT Haryana, Ambala (HR) |
| 4 | VIDEOCON | 15 to 17 Jul-14 | 11 to 13 Aug-14 | 12 to 13 & 15 Sep-14 | Videocon Telecommunication Ltd, Golden Palace, Near Vita Milk Plant, Jasmeet Nagar, Ambala City-134007 |
| 5 | TATA GSM | 16 to 18 Jul-14 | 20 to 22 Aug-14 | 10 to 12 Sep-14 | Tata Teleservices Limited, 5 - Jasmeet Nagar, Near Vita Milk Plant Gt Road, Ambala, Ambala-134001, India |
| 6 | IDEA | 16 to 18 Jul-14 | 26 to 28 Aug-14 | 24 to 26 Sep-14 | Idea Cellular Limited, E-5, Sector-63, Noida (UP) |
| 7 | RCOM GSM | 9 to 11 Jul-14 | 6 to 8 Aug-14 | 8 to 10 Sep-14 | Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188. |
| 8 | VODAFONE | 14 to 16 Jul-14 | 8, 11 to 12 Aug-14 | 22 to 24 Sep-14 | Vodafone Digilink Limited, 173 HSIDC Industrial Area, Sector-3, Karnal (Har.) |
| CDMA Operators | | | | | |
| 9 | RCOM CDMA | 9 to 11 Jul-14 | 6 to 8 Aug-14 | 8 to 10 Sep-14 | Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188. |
| 10 | TATA CDMA | 16 to 18 Jul-14 | 20 to 22 Aug-14 | 10 to 12 Sep-14 | Tata Teleservices Limited, 5, Jasmeet Nagar, Near Vita Milk Plant Gt Road, Ambala, Ambala-134001, India |

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

Transfer of data generated by monthly PMR and 3-days live measurements audit for the period July 2014 to September 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 was to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles once in a year. **However, QoS audit for basic (wire line) service was not required to be done for Haryana Circle in the quarter ended September 2014, as it has already been done in the QE December 2013.**

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. **However, the QoS audit for Broadband service was not required to be done for Haryana Circle in the quarter ended September 2014, as it has already been done in the QE March 2014.**

4. EXECUTIVE SUMMARY



4. EXECUTIVE SUMMARY

The executive summary put in a nutshell the key findings of the Audit by providing: -

- “Service provider performance report” for Cellular mobile, Basic (wire line) and Broadband services , which gives a foretaste of the performance of various operators against the benchmark specified by TRAI, during the months in which the Audit was carried out by TUV-SUD Auditors.
- “Parameter wise critical findings” for Cellular mobile, Basic (wire line) and Broadband services: This indicates key observations and findings from different activities carried out during the Audit process.
- TUV-SUD conducted audit involved a 3 stage verification process which consisted of auditing the records of the service providers and verifying the data submitted to TRAI. The second step involved a three day live measurement of all the network parameters. On the basis of the three days live measurement, the auditors checked the busy hour of the day for the service provider and collected the data for this busy hour for the month in which the audit was conducted Finally, the performance of the service providers was also gauged by conducting drive tests in three select SSAs per service provider per quarter.
- The three stage audit / verification viz audit of the records, live measurements and drive tests of all the cellular mobile operators was repeated every month. In case of Basic (Wire line) and Broadband, this exercise is required to be carried out on quarterly basis.

- **Essence of compliance report of service providers with respect to the QoS:**

(i) Based on monthly audit, it was concluded that the performance of the service providers was fairly satisfactory for **Network Parameters** in Haryana service area as they were found to have largely met the benchmarks of the parameters during the quarter. However, **Tata (GSM) and Tata (CDMA)** failed to meet the benchmark of the parameters ‘**Worst affected Cells > 3% TCH drops**’ with their average performance as **4.21% and 6.10%** respectively. Whereas, **Aircel** could not meet the benchmark of parameter ‘**Call drop rate (CDR)**’ with its quarterly average performance of **3.20%**.

(ii) From three days assessment, it is found that the performance of all operators is satisfactory as they have largely met the benchmarks except the parameter ‘**Worst affected cells> 3 % TCH drops**’ and **CDR**, which could not be complied with by **Tata (GSM), Tata (CDMA)** and **Aircel** in all the three months of this quarter. The average performance of **Tata (GSM)** and **Tata (CDMA)** for parameter ‘**Worst affected cells> 3 % TCH drops**’ was **4.50% and 6.69%** respectively. **The similar non-compliance of Tata (GSM) and Tata (CDMA) for this parameter was also observed for monthly audit of the quarter.** The average performance of **Aircel** in respect of parameter **CDR** remained **10.83% (way beyond the benchmark of < 2%)**.

(iii) With regard to the **Customer Service Quality Parameters**, the service providers were found in well compliance of most of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds. Only **RCOM (GSM)** failed to meet the benchmark of the parameter ‘**% Billing Complaints – Pre-paid**’ with its

performance as **0.30%**. With regard to the parameter '**Resolution of Billing Complaints within 4 weeks**', only **Tata (GSM)** remained marginally below the benchmark as it could resolve **99.91%** of billing complaints. For parameter '**Time taken for refunds**', **Tata GSM** and **Tata CDMA** could settle **99.56%** and **99.89%** cases of refunds respectively against the benchmark of 100%. With regard to the parameter "**% calls answered by Operators (voice to voice)**", Only **Tata (GSM)** has not met the benchmark of **calls answered by Operators (voice to voice) within 90 seconds** as they provided the data for 90 seconds. **Tata (GSM)** achieved its performance as **94.00%** against the benchmark of $\geq 95\%$.

(iv) With regard to **Drive Tests**, **BSNL and RCOM (GSM)** were **non-complied** with respect to the parameter '**Voice Quality**' in **Karnal and Ambala SSAs**. The underperformed operators need to improve their network performance in respect of this parameter.

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 | Sept-14 | 20:00 - 21:00 |
| 2 | AIRTEL | Sept-14 | 20:00 - 21:00 |
| 3 | BSNL | Sept-14 | 21:00 - 22:00 |
| 4 | VIDEOCON | Sept-14 | 20:00 - 21:00 |
| 5 | TATA GSM | Sept-14 | 11:00 - 12:00 |
| 6 | IDEA | Sept-14 | 20:00 - 21:00 |
| 7 | RCOM GSM | Sept-14 | 19:00 - 20:00 |
| 8 | VODAFONE | Sept-14 | 20:00 - 21:00 |
| CDMA Operators | | | |
| 9 | RCOM CDMA | Sept-14 | 20:00 - 21:00 |
| 10 | TATA CDMA | Sept-14 | 11:00 - 12:00 |

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the Haryana circle.

5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:

| Sl. No. | Name of Service Provider | No. of MSC + GMSC | No. of BSC | No. of BTS | NSS make | BSS make |
|-----------------------|--------------------------|-------------------|------------|------------|-------------------|---------------------|
| GSM Operators | | | | | | |
| 1 | AIRCEL | NA* | 1 | 28 | NSN | NSN |
| 2 | AIRTEL | 4 | 24 | 2781 | Ericsson | Ericsson |
| 3 | BSNL | 9 | 27 | 1926 | Ericsson & ZTE | Ericsson, NSN & ZTE |
| 4 | IDEA | 5 | 29 | 3038 | NSN | NSN |
| 5 | RCOM GSM | 1 | 8 | 900 | Huawei | Huawei |
| 6 | TATA GSM | 2 | 12 | 1498 | NSN | NSN |
| 7 | VIDEOCON | 1 | 8 | 1312 | Huawei | Huawei |
| 8 | VODAFONE | 7 | 46 | 2821 | NSN | NSN |
| CDMA Operators | | | | | | |
| 9 | RCOM CDMA | 3 | NA | 552 | Lucent & ZTE | Lucent |
| 10 | TATA CDMA | 4 | 6 | 417 | Ericsson & Huawei | ZTE & Motorola |

NA*: Aircel is having one MSC at Gurgaon (NCR)

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JULY 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - JULY 14 MONTH | | | | | | | | | | | | | |
|---|--|-------------|--------------|---------------|--------|--------|---------|----------|--------|----------|----------|----------------|-----------|
| PMR Generation Data | | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDECON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | | CDMA Operators | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | July-14 | 0.59% | 0.10% | 1.10% | 0.29% | 0.05% | 0.01% | 0.57% | 0.04% | 0.50% | 0.10% |
| | b) Worst affected BTSS due to downtime | <=2% | July-14 | 3.57% | 0.11% | 1.38% | 1.38% | 0.00% | 0.00% | 1.78% | 0.07% | 1.63% | 0.66% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | July-14 | 98.15% | 99.22% | 96.96% | 98.60% | 98.40% | 99.99% | 99.39% | 99.78% | 98.35% | 98.43% |
| | b) SDCCH/PAGING Channel congestion | <=1% | July-14 | 0.00% | 0.13% | 0.29% | 0.12% | 0.06% | 0.33% | 0.03% | 0.10% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | July-14 | 0.00% | 0.20% | 1.03% | 0.11% | 0.51% | 0.32% | 0.06% | 0.22% | 0.13% | 0.07% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | July-14 | 3.77% | 0.31% | 1.30% | 0.60% | 0.71% | 0.64% | 0.42% | 0.74% | 0.12% | 0.55% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | July-14 | 0.92% | 0.77% | 1.07% | 0.87% | 3.94% | 2.07% | 0.05% | 1.88% | 0.65% | 6.21% |
| | c) Connections with good voice quality | >=95% | July-14 | 98.78% | 99.11% | NP | 98.02% | 96.99% | 98.18% | 98.98% | 97.78% | 99.75% | NP |
| 4 | No. of POI's having >=0.5% POI congestion | <=0.5% | July-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – AUGUST 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - AUGUST 14 MONTH | | | | | | | | | | | | | |
|---|--|-------------|--------------|---------------|--------|--------|---------|----------|--------|----------|----------|-----------|----------------|
| PMR Generation Data | | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDECON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | | | CDMA Operators |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Aug-14 | 0.20% | 0.07% | 0.95% | 0.15% | 0.02% | 0.00% | 0.28% | 0.04% | 0.21% | 0.06% |
| | b) Worst affected BTSs due to downtime | <=2% | Aug-14 | 0.00% | 0.14% | 1.31% | 0.46% | 0.00% | 0.00% | 0.33% | 0.00% | 0.18% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Aug-14 | 98.93% | 99.29% | 96.96% | 98.57% | 98.57% | 99.99% | 99.74% | 99.85% | 98.59% | 98.35% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Aug-14 | 0.60% | 0.09% | 0.25% | 0.13% | 0.06% | 0.33% | 0.02% | 0.08% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Aug-14 | 0.00% | 0.16% | 1.04% | 0.10% | 0.45% | 0.23% | 0.04% | 0.15% | 0.08% | 0.32% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Aug-14 | 1.72% | 0.31% | 1.42% | 0.61% | 0.71% | 0.67% | 0.37% | 0.75% | 0.09% | 0.54% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Aug-14 | 2.07% | 0.75% | 1.71% | 0.93% | 4.02% | 2.02% | 0.07% | 2.13% | 0.15% | 6.23% |
| | c) Connections with good voice quality | >=95% | Aug-14 | 98.64% | 99.09% | NP | 98.00% | 97.04% | 98.08% | 99.11% | 97.78% | 99.74% | NP |
| 4 | No. of POI's having >=0.5% POI congestion | <=0.5% | Aug-14 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – SEPTEMBER 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - SEPTEMBER 14 MONTH | | | | | | | | | | | | | |
|--|--|-------------|--------------|---------------|--------|--------|---------|----------|--------|----------|----------|----------------|-----------|
| PMR Generation Data | | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDECON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | | CDMA Operators | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Sep-14 | 0.33% | 0.07% | 1.04% | 0.12% | 0.02% | 0.01% | 0.19% | 0.04% | 0.16% | 0.05% |
| | b) Worst affected BTSs due to downtime | <=2% | Sep-14 | 0.00% | 0.07% | 1.40% | 0.23% | 0.00% | 0.00% | 0.11% | 0.04% | 0.18% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Sep-14 | 98.94% | 99.21% | 96.81% | 98.63% | 98.48% | 99.96% | 99.60% | 99.81% | 98.18% | 98.71% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Sep-14 | 0.20% | 0.12% | 0.23% | 0.15% | 0.09% | 0.33% | 0.02% | 0.09% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Sep-14 | 0.00% | 0.19% | 1.28% | 0.13% | 0.41% | 0.50% | 0.04% | 0.19% | 0.18% | 0.01% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Sep-14 | 4.12% | 0.34% | 1.54% | 0.65% | 0.83% | 0.65% | 0.37% | 0.79% | 0.06% | 0.43% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Sep-14 | 5.20% | 0.86% | 1.69% | 1.01% | 4.66% | 1.87% | 0.01% | 2.29% | 0.16% | 5.87% |
| | c) Connections with good voice quality | >=95% | Sep-14 | 98.06% | 99.08% | NP | 97.69% | 96.98% | 97.95% | 99.12% | 97.72% | 99.73% | NP |
| 4 | No. of POI's having >=0.5% POI congestion | <=0.5% | Sep-14 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- SEPTEMBER 14 (JULY – AUGUST – SEPTEMBER 2014 MONTHS AUDITED DATA)

| QUARTERLY QOS PERFORMANCE (AVERAGE OF QE - SEPTEMBER 14) OF HARYANA CIRCLE | | | | | | | | | | | | | |
|--|--|-------------|--------------|---------------|--------|--------|---------|----------|--------|----------|----------|-----------|----------------|
| PMR Generation Data | | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDECON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | | | CDMA Operators |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Quarterly | 0.37% | 0.08% | 1.03% | 0.19% | 0.03% | 0.01% | 0.35% | 0.04% | 0.29% | 0.07% |
| | b) Worst affected BTSs due to downtime | <=2% | Quarterly | 1.19% | 0.11% | 1.36% | 0.69% | 0.00% | 0.00% | 0.74% | 0.04% | 0.66% | 0.22% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Quarterly | 98.67% | 99.24% | 96.91% | 98.60% | 98.48% | 99.98% | 99.58% | 99.81% | 98.37% | 98.50% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Quarterly | 0.27% | 0.11% | 0.26% | 0.13% | 0.07% | 0.33% | 0.02% | 0.09% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Quarterly | 0.00% | 0.18% | 1.12% | 0.11% | 0.46% | 0.35% | 0.05% | 0.19% | 0.13% | 0.13% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Quarterly | 3.20% | 0.32% | 1.42% | 0.62% | 0.75% | 0.65% | 0.39% | 0.76% | 0.09% | 0.51% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Quarterly | 2.73% | 0.79% | 1.49% | 0.94% | 4.21% | 1.99% | 0.04% | 2.10% | 0.32% | 6.10% |
| | c) Connections with good voice quality | >=95% | Quarterly | 98.49% | 99.09% | NP | 97.90% | 97.00% | 98.07% | 99.07% | 97.76% | 99.74% | NP |
| 4 | No. of POI's having >=0.5% POI congestion | <=0.5% | Quarterly | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit for cellular mobile service providers was conducted at their respective MSCs in the circle.

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

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 Haryana circle, all the operators (**except Aircel**) found meeting benchmark on the above parameters 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter. **Aircel** lagged behind in meeting the benchmark for parameter '**worst affected BTSs due to down time**' with its performance as **3.57%** against the benchmark of $\leq 2\%$ in the month of July 2014. However, its average quarterly performance was within the benchmark.

- **Connection Establishment (Accessibility)**
 - i. Call Set-up Success Rate(CSSR)

CSSR includes complete signaling in the call set up process and does not aim to measure the performance of the called exchange or that of the Point of Interconnection (POI). CSSR was established as the ratio of total number of successful call attempts (establishment) to the total number of call attempts made. All the operators were found to be calculating the parameter as per the TRAI's specified norms.

All the operators were well performed on this parameter.

- **Parameters related to Network Congestion:**

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

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

With respect to this parameter, the performance of the operators is quite satisfactory as **all operators have met the TRAI specified benchmarks on TCH congestion parameters.**

- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

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

The audit with respect to this parameter revealed that all the operators (except **Aircel**) met the benchmark for this parameter. **Aircel** failed to meet the benchmark with its quarterly average performance as **3.20%**.

- 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 Tele Services (TTSL). **Tata GSM** and **CDMA** failed to meet the benchmark in all the three months of the quarter with their quarterly average performance as **4.21%** and **6.10%** respectively.

- iii. Connections with good voice quality:

Most of the Operators were measuring this parameter through the system generated data at their switches. BSNL & Tata CDMA have not provided the data for this parameter. **The audit results for this parameter indicate that all operators have met the bench mark during the quarter.**

- iv. POI's having $\geq 0.5\%$ POI congestion

BSNL was having congestion more than 0.5% on **two** POIs.

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



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

5.2.1 LIVE MEASUREMENT DATA (3-DAYS) – JULY 14 MONTH:

| CELLULAR MOBILE TELEPHONE SERVICES - HARYANA CIRCLE - JULY 14 MONTH | | | | | | | | | | | | | |
|---|--|-------------|-------------------|---------------|--------|--------|----------|----------|--------|----------|----------------|-----------|-----------|
| Live measurement Data | | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | CDMA Operators | | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Live data | 1.61% | 0.03% | 1.47% | 0.26% | 0.05% | 0.03% | 0.87% | 0.05% | 0.85% | 0.09% |
| | b) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.00% | 0.43% | 0.23% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 88.89% | 99.22% | 96.91% | 98.60% | 99.25% | 99.99% | 99.71% | 99.85% | 98.08% | 98.41% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Live data | 0.00% | 0.15% | 0.27% | 0.16% | 0.07% | 0.75% | 0.03% | 0.05% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.00% | 0.20% | 0.85% | 0.13% | 0.64% | 0.45% | 0.04% | 0.15% | 0.18% | 0.08% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Live data | 12.50% | 0.27% | 1.13% | 0.56% | 0.75% | 0.64% | 0.37% | 0.63% | 0.14% | 0.58% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Live data | 0.79% | 0.65% | 1.06% | 1.01% | 4.04% | 2.04% | 0.00% | 1.12% | 0.76% | 6.33% |
| | c) Connections with good voice quality | >=95% | Live data | 100% | 99.15% | NP | 98.15% | 97.12% | 98.28% | 98.99% | 98.06% | 99.75% | NP |
| 4 | No. of POI having >=0.5% congestion | <0.5% | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided data for this parameter.

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

| CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - AUGUST 14 MONTH | | | | | | | | | | | | | |
|---|--|-------------|-------------------|---------------|--------|--------|----------|----------|--------|----------|----------------|-----------|-----------|
| Live measurement Data | | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | CDMA Operators | | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Live data | 0.07% | 0.03% | 1.55% | 0.12% | 0.01% | 0.01% | 0.40% | 0.02% | 0.31% | 0.10% |
| | b) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.00% | 0.21% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 100% | 99.31% | 96.66% | 98.67% | 98.84% | 99.99% | 99.69% | 99.92% | 98.68% | 96.72% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Live data | 0.00% | 0.09% | 0.18% | 0.03% | 0.03% | 0.47% | 0.02% | 0.07% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.00% | 0.14% | 1.01% | 0.10% | 0.26% | 0.36% | 0.03% | 0.08% | 0.06% | 1.79% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Live data | 13.04% | 0.34% | 1.42% | 0.58% | 0.80% | 0.73% | 0.38% | 0.74% | 0.09% | 0.62% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Live data | 1.59% | 0.79% | 1.80% | 0.95% | 4.58% | 2.47% | 0.00% | 1.81% | 0.16% | 6.97% |
| | c) Connections with good voice quality | >=95% | Live data | 98.83% | 99.09% | NP | 98.01% | 97.05% | 98.01% | 99.06% | 97.77% | 99.75% | NP |
| 4 | No. of POI having >=0.5% congestion | <0.5% | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided the data for this parameter.

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

| CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE- SEPTEMBER 14 MONTH | | | | | | | | | | | | | |
|---|--|-------------|-------------------|---------------|--------|--------|----------|----------|--------|----------|----------|-----------|----------------|
| Live measurement Data | | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | | | CDMA Operators |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Live data | 2.31% | 0.05% | 1.53% | 0.20% | 0.01% | 0.00% | 0.19% | 0.02% | 0.12% | 0.00% |
| | b) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.00% | 0.10% | 0.08% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.29% | 99.13% | 96.95% | 98.70% | 98.64% | 99.98% | 99.76% | 99.87% | 98.52% | 98.74% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Live data | 0.01% | 0.19% | 0.19% | 0.13% | 0.06% | 0.08% | 0.02% | 0.03% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.00% | 0.18% | 1.24% | 0.15% | 0.22% | 0.36% | 0.03% | 0.13% | 0.11% | 0.01% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Live data | 6.96% | 0.39% | 1.58% | 0.65% | 0.86% | 0.55% | 0.37% | 0.75% | 0.05% | 0.54% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Live data | 4.37% | 0.96% | 1.89% | 0.95% | 4.88% | 1.46% | 0.00% | 2.30% | 0.14% | 6.76% |
| | c) Connections with good voice quality | >=95% | Live data | 99.01% | 99.06% | NP | 97.75% | 96.98% | 97.98% | 99.08% | 97.69% | 99.72% | NP |
| 4 | No. of POI having >=0.5% congestion | <0.5% | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* NP-Not Provided: BSNL and Tata CDMA having no direct counter to provide the data for the parameter "Connections with good voice quality", hence they have not provided by data for this parameter.

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JULY – AUGUST – SEPTEMBER 2014 AUDITED DATA)

| QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF THREE MONTHS) – HARYANA CIRCLE | | | | | | | | | | | | | |
|---|--|-------------|-------------------|---------------|--------|--------|----------|----------|--------|----------|----------|-----------|----------------|
| Live measurement Data | | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| S/N | Name of Parameter | | | GSM Operators | | | | | | | | | CDMA Operators |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) BTS Accumulated Downtime | <=2% | Quarterly | 1.33% | 0.04% | 1.52% | 0.19% | 0.02% | 0.01% | 0.49% | 0.03% | 0.43% | 0.06% |
| | b) Worst affected BTSs due to downtime | <=2% | Quarterly | 0.00% | 0.00% | 0.25% | 0.10% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Quarterly | 95.73% | 99.22% | 96.84% | 98.66% | 98.91% | 99.99% | 99.72% | 99.88% | 98.43% | 97.96% |
| | b) SDCCH/PAGING Channel congestion | <=1% | Quarterly | 0.00% | 0.14% | 0.21% | 0.11% | 0.05% | 0.43% | 0.02% | 0.05% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Quarterly | 0.00% | 0.17% | 1.03% | 0.13% | 0.37% | 0.39% | 0.03% | 0.12% | 0.12% | 0.63% |
| Connection maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) CDR (Call Drop Rate) | <=2% | Quarterly | 10.83% | 0.33% | 1.38% | 0.60% | 0.80% | 0.64% | 0.37% | 0.71% | 0.09% | 0.58% |
| | b) Worst affected cells>3% TCH drop (Call drop) rate | <=3% | Quarterly | 2.25% | 0.80% | 1.58% | 0.97% | 4.50% | 1.99% | 0.00% | 1.74% | 0.35% | 6.69% |
| | c) Connections with good voice quality | >=95% | Quarterly | 99.28% | 99.10% | NP | 97.97% | 97.05% | 98.09% | 99.04% | 97.84% | 99.74% | NP |
| 4 | No. of POI having >=0.5% congestion | <0.5% | Quarterly | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days assessment, it is found that the performance of all operators is satisfactory as they have largely met the benchmarks except the parameter ‘Worst affected cells> 3 % TCH drops’ and CDR, which could not be complied with by Tata (GSM), Tata (CDMA) and Aircel in all the three months of this quarter. The average performance of Tata (GSM) and Tata (CDMA) for parameter ‘Worst affected cells> 3 % TCH drops’ was 4.50% and 6.69% respectively. The similar non-compliance of Tata (GSM) and Tata (CDMA) for this parameter was also observed for monthly audit of the quarter. Whereas the average performance of Aircel in respect of parameter CDR remained 10.83% (way beyond the benchmark of < 2%).



5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

| Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- July 14 month | | | | | | | | | | | | | |
|---|---|-------------|--------------|---------------|---------|---------|----------|----------|---------|----------|----------|-----------|-----------|
| S/N | Name of Parameter | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| | | | | GSM Operators | | | | | | | | | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) Total no. of BTSs in the licensed service area | | July-14 | 28 | 2759 | 1882 | 1306 | 1503 | 3032 | 897 | 2772 | 552 | 455 |
| | b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | July-14 | 123 | 2066 | 15452 | 2848 | 524 | 159 | 3826 | 773 | 2072 | 326 |
| | c) BTS Accumulated Downtime | <=2% | July-14 | 0.59% | 0.10% | 1.10% | 0.29% | 0.05% | 0.01% | 0.57% | 0.04% | 0.50% | 0.10% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | July-14 | 1 | 3 | 26 | 18 | 0 | 0 | 16 | 2 | 9 | 3 |
| | e) Worst affected BTSs due to downtime | <=2% | July-14 | 3.57% | 0.11% | 1.38% | 1.38% | 0.00% | 0.00% | 1.78% | 0.07% | 1.63% | 0.66% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | July-14 | 98.15% | 99.22% | 96.96% | 98.60% | 98.40% | 99.99% | 99.39% | 99.78% | 98.35% | 98.43% |
| | b) SDCCH/PAGING Congestion | <=1% | July-14 | 0.00% | 0.13% | 0.29% | 0.12% | 0.06% | 0.33% | 0.03% | 0.10% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | July-14 | 0.00% | 0.20% | 1.03% | 0.11% | 0.51% | 0.32% | 0.06% | 0.22% | 0.13% | 0.07% |
| Connection Maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) Call Drop Rate (CDR) | <=2% | July-14 | 3.77% | 0.31% | 1.30% | 0.60% | 0.71% | 0.64% | 0.42% | 0.74% | 0.12% | 0.55% |
| | b) Worst affected cells>3% TCH drop | <=3% | July-14 | 0.92% | 0.77% | 1.07% | 0.87% | 3.94% | 2.07% | 0.05% | 1.88% | 0.65% | 6.21% |
| | c) % of connections with good voice quality | >=95% | July-14 | 98.78% | 99.11% | NP | 98.02% | 96.99% | 98.18% | 98.98% | 97.78% | 99.75% | NP |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | July-14 | 1 | 63 | 59 | 35 | 179 | 190 | 1 | 158 | 11 | 85 |
| | e) Total no. of cells (Sector) in the licensed service area | | July-14 | 84 | 8236 | 5515 | 3992 | 4549 | 9182 | 2685 | 8398 | 1656 | 1363 |
| No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | |
| 4 | No. of POI's having >=0.5% POI congestion | | July-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the benchmark | | July-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Network Data | | | | | | | | | | | | | |
| 5 | a) Equipped Capacity of Network in Erlang | | July-14 | 212 | 78464 | 200000 | 58676 | 100372 | 104738 | 50000 | 137241 | 56000 | 94054 |
| | b) Total traffic in TCBH in erlang (Avg.) | | July-14 | 0.24 | 63458 | 80369 | 23172 | 41478 | 106615 | 30833 | 124340 | 11899 | 14534 |
| | c) Total no. of customers served (as per VLR) on last day of the month | | July-14 | 150 | 2293746 | 1645476 | 765909 | 1522481 | 4092547 | 1508565 | 4598701 | 388073 | 215350 |

TABLE: 2

| Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- July 14 month | | | | | | | | | | | | | |
|---|---|-------------|-------------------|---------------|--------|--------|----------|--------------|--------|----------|----------|----------------|--------------|
| S/N | Name of Parameter | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| | | | | GSM Operators | | | | | | | | CDMA Operators | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) Total no. of BTSs in the licensed service area | | Live data | 28 | 2747 | 1878 | 1303 | 1506 | 3032 | 897 | 2753 | 552 | 455 |
| | 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 | 58 | 1991 | 245 | 53 | 60 | 563 | 91 | 338 | 30 |
| | c) BTS Accumulated Downtime | <=2% | Live data | 1.61% | 0.03% | 1.47% | 0.26% | 0.05% | 0.03% | 0.87% | 0.05% | 0.85% | 0.09% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Live data | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| | e) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.00% | 0.43% | 0.23% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 88.89% | 99.22% | 96.91% | 98.60% | 99.25% | 99.99% | 99.71% | 99.85% | 98.08% | 98.41% |
| | b) SDCCH/PAGING Congestion | <=1% | Live data | 0.00% | 0.15% | 0.27% | 0.16% | 0.07% | 0.75% | 0.03% | 0.05% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.00% | 0.20% | 0.85% | 0.13% | 0.64% | 0.45% | 0.04% | 0.15% | 0.18% | 0.08% |
| Connection Maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) Call Drop Rate (CDR) | <=2% | Live data | 12.50% | 0.27% | 1.13% | 0.56% | 0.75% | 0.64% | 0.37% | 0.63% | 0.14% | 0.58% |
| | b) Worst affected cells>3% TCH drop | <=3% | Live data | 0.79% | 0.65% | 1.06% | 1.01% | 4.04% | 2.04% | 0.00% | 1.12% | 0.76% | 6.33% |
| | c) % of connections with good voice quality | >=95% | Live data | 100% | 99.15% | NP | 98.15% | 97.12% | 98.28% | 98.99% | 98.06% | 99.75% | NP |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Live data | 1 | 53 | 59 | 40 | 184 | 186 | 0 | 94 | 13 | 86 |
| | e) Total no. of cells (Sector) in the licensed service area | | Live data | 84 | 8193 | 5671 | 3991 | 4550 | 9146 | 2685 | 8340 | 1656 | 1363 |
| No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | |
| 4 | No. of POI's having >=0.5% POI congestion | | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the benchmark | | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- August 14 month

| S/N | Name of Parameter | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
|---|---|-------------|--------------|---------------|---------|---------------------------------|----------|--------------|---------|----------|----------|----------------|--------------|
| | | | | GSM Operators | | | | | | | | CDMA Operators | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) Total no. of BTSs in the licensed service area | | Aug-14 | 28 | 2776 | 1906 | 1309 | 1502 | 3032 | 900 | 2787 | 552 | 455 |
| | b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | Aug-14 | 41 | 1534 | 13455 | 1477 | 217 | 86 | 1899 | 753 | 874 | 195 |
| | c) BTS Accumulated Downtime | <=2% | Aug-14 | 0.20% | 0.07% | 0.95% | 0.15% | 0.02% | 0.00% | 0.28% | 0.04% | 0.21% | 0.06% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Aug-14 | 0 | 4 | 25 | 6 | 0 | 0 | 3 | 0 | 1 | 0 |
| | e) Worst affected BTSs due to downtime | <=2% | Aug-14 | 0.00% | 0.14% | 1.31% | 0.46% | 0.00% | 0.00% | 0.33% | 0.00% | 0.18% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Aug-14 | 98.93% | 99.29% | 96.96% | 98.57% | 98.57% | 99.99% | 99.74% | 99.85% | 98.59% | 98.35% |
| | b) SDCCH/PAGING Congestion | <=1% | Aug-14 | 0.60% | 0.09% | 0.25% | 0.13% | 0.06% | 0.33% | 0.02% | 0.08% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Aug-14 | 0.00% | 0.16% | 1.04% | 0.10% | 0.45% | 0.23% | 0.04% | 0.15% | 0.08% | 0.32% |
| Connection Maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) Call Drop Rate (CDR) | <=2% | Aug-14 | 1.72% | 0.31% | 1.42% | 0.61% | 0.71% | 0.67% | 0.37% | 0.75% | 0.09% | 0.54% |
| | b) Worst affected cells>3% TCH drop | <=3% | Aug-14 | 2.07% | 0.75% | 1.71% | 0.93% | 4.02% | 2.02% | 0.07% | 2.13% | 0.15% | 6.23% |
| | c) % of connections with good voice quality | >=95% | Aug-14 | 98.64% | 99.09% | NP | 98.00% | 97.04% | 98.08% | 99.11% | 97.78% | 99.74% | NP |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Aug-14 | 2 | 62 | 97 | 37 | 182 | 185 | 2 | 180 | 3 | 85 |
| | e) Total no. of cells (Sector) in the licensed service area | | Aug-14 | 84 | 8286 | 5666 | 4004 | 4516 | 9186 | 2687 | 8444 | 1656 | 1363 |
| No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | |
| 4 | No. of POI's having >=0.5% POI congestion | | Aug-14 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the benchmark | | Aug-14 | 0 | 0 | RIL MOBILE, RIL BASIC & RIL GSM | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Network Data | | | | | | | | | | | | | |
| 5 | a) Equipped Capacity of Network in Erlang | | Aug-14 | 212 | 78188 | 240000 | 59222 | 98980 | 104319 | 50000 | 136881 | 56000 | 94054 |
| | b) Total traffic in TCBH in erlang (Avg.) | | Aug-14 | 0.92 | 61963 | 84420 | 22730 | 41377 | 106451 | 35815 | 124726 | 12442 | 11203 |
| | c) Total no. of customers served (as per VLR) on last day of the month | | Aug-14 | 4561 | 1125389 | 1692184 | 803825 | 1554577 | 4141099 | 1529464 | 4618789 | 382809 | 209374 |



TABLE: 4

| Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Aug 14 month | | | | | | | | | | | | | |
|--|---|-------------|-------------------|---------------|--------|--------|----------|--------------|--------|----------|----------|----------------|--------------|
| S/N | Name of Parameter | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| | | | | GSM Operators | | | | | | | | CDMA Operators | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| 1 | Network Availability | | | | | | | | | | | | |
| | a) Total no. of BTSs in the licensed service area | | Live data | 28 | 2759 | 1900 | 1307 | 1504 | 3032 | 897 | 2784 | 552 | 455 |
| | 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 | 1 | 61 | 2126 | 115 | 13 | 13 | 260 | 49 | 123 | 33 |
| | c) BTS Accumulated Downtime | <=2% | Live data | 0.07% | 0.03% | 1.55% | 0.12% | 0.01% | 0.01% | 0.40% | 0.02% | 0.31% | 0.10% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Live data | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| e) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.00% | 0.21% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 100% | 99.31% | 96.66% | 98.67% | 98.84% | 99.99% | 99.69% | 99.92% | 98.68% | 96.72% |
| | b) SDCCH/PAGING Congestion | <=1% | Live data | 0.00% | 0.09% | 0.18% | 0.03% | 0.03% | 0.47% | 0.02% | 0.07% | 0.00% | 0.00% |
| c) TCH congestion | <=2% | Live data | 0.00% | 0.14% | 1.01% | 0.10% | 0.26% | 0.36% | 0.03% | 0.08% | 0.06% | 1.79% | |
| 3 | Connection Maintenance (Retainability) | | | | | | | | | | | | |
| | a) Call Drop Rate (CDR) | <=2% | Live data | 13.04% | 0.34% | 1.42% | 0.58% | 0.80% | 0.73% | 0.38% | 0.74% | 0.09% | 0.62% |
| | b) Worst affected cells>3% TCH drop | <=3% | Live data | 1.59% | 0.79% | 1.80% | 0.95% | 4.58% | 2.47% | 0.00% | 1.81% | 0.16% | 6.97% |
| | c) % of connections with good voice quality | >=95% | Live data | 98.83% | 99.09% | NP | 98.01% | 97.05% | 98.01% | 99.06% | 97.77% | 99.75% | NP |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Live data | 1 | 65 | 102 | 38 | 206 | 227 | 0 | 153 | 3 | 95 |
| e) Total no. of cells (Sector) in the licensed service area | | Live data | 84 | 8236 | 5683 | 4004 | 4506 | 9187 | 2685 | 8434 | 1656 | 1363 | |
| 4 | No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | |
| | No. of POI's having >=0.5% POI congestion | | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the benchmark | | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



TABLE: 5

| Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- September 14 month | | | | | | | | | | | | | |
|--|---|-------------|--------------|---------------|---------|---------------------|----------|----------|---------|----------|----------|-----------|-----------|
| S/N | Name of Parameter | Bench- mark | Audit Period | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| | | | | GSM Operators | | | | | | | | | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| 1 | Network Availability | | | | | | | | | | | | |
| | a) Total no. of BTSs in the licensed service area | | Sep-14 | 28 | 2781 | 1926 | 1312 | 1498 | 3038 | 900 | 2821 | 552 | 417 |
| | b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month | | Sep-14 | 67 | 1357 | 14488 | 1118 | 205 | 128 | 1239 | 743 | 617 | 141 |
| | c) BTS Accumulated Downtime | <=2% | Sep-14 | 0.33% | 0.07% | 1.04% | 0.12% | 0.02% | 0.01% | 0.19% | 0.04% | 0.16% | 0.05% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Sep-14 | 0 | 2 | 27 | 3 | 0 | 0 | 1 | 1 | 1 | 0 |
| e) Worst affected BTSs due to downtime | <=2% | Sep-14 | 0.00% | 0.07% | 1.40% | 0.23% | 0.00% | 0.00% | 0.11% | 0.04% | 0.18% | 0.00% | |
| 2 | Connection Establishment (Accessibility) | | | | | | | | | | | | |
| | a) CSSR (Call Setup Success Rate) | >=95% | Sep-14 | 98.94% | 99.21% | 96.81% | 98.63% | 98.48% | 99.96% | 99.60% | 99.81% | 98.18% | 98.71% |
| | b) SDCCH/PAGING Congestion | <=1% | Sep-14 | 0.20% | 0.12% | 0.23% | 0.15% | 0.09% | 0.33% | 0.02% | 0.09% | 0.00% | 0.00% |
| c) TCH congestion | <=2% | Sep-14 | 0.00% | 0.19% | 1.28% | 0.13% | 0.41% | 0.50% | 0.04% | 0.19% | 0.18% | 0.01% | |
| 3 | Connection Maintenance (Retainability) | | | | | | | | | | | | |
| | a) Call Drop Rate (CDR) | <=2% | Sep-14 | 4.12% | 0.34% | 1.54% | 0.65% | 0.83% | 0.65% | 0.37% | 0.79% | 0.06% | 0.43% |
| | b) Worst affected cells>3% TCH drop | <=3% | Sep-14 | 5.20% | 0.86% | 1.69% | 1.01% | 4.66% | 1.87% | 0.01% | 2.29% | 0.16% | 5.87% |
| | c) % of connections with good voice quality | >=95% | Sep-14 | 98.06% | 99.08% | NP | 97.69% | 96.98% | 97.95% | 99.12% | 97.72% | 99.73% | NP |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Sep-14 | 4 | 72 | 95 | 41 | 206 | 172 | 0 | 196 | 3 | 76 |
| e) Total no. of cells (Sector) in the licensed service area | | Sep-14 | 84 | 8319 | 5619 | 4012 | 4431 | 9203 | 2694 | 8551 | 1656 | 1302 | |
| 4 | No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | |
| | No. of POI's having >=0.5% POI congestion | | Sep-14 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the benchmark | | Sep-14 | 0 | 0 | Reliance GSM & Idea | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5 | Network Data | | | | | | | | | | | | |
| | a) Equipped Capacity of Network in Erlang | | Sep-14 | 212 | 77794 | 240000 | 59444 | 96180 | 104396 | 50000 | 136362 | 56000 | 72315 |
| | b) Total traffic in TCBH in erlang (Avg.) | | Sep-14 | 2 | 63330 | 84571 | 25823 | 42035 | 109748 | 36811 | 127016 | 12899 | 10072 |
| c) Total no. of customers served (as per VLR) on last day of the month | | Sep-14 | 5421 | 2362107 | 2056138 | 851750 | 1578589 | 4204892 | 1542444 | 4656228 | 375468 | 202813 | |



TABLE: 6

| Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Sep 14 month | | | | | | | | | | | | | |
|--|---|-------------|-------------------|---------------|--------|--------|----------|----------|--------|----------|----------|----------------|-----------|
| S/N | Name of Parameter | Bench- mark | Average of 3 Days | AIRCEL | AIRTEL | BSNL | VIDEOCON | TATA GSM | IDEA | RCOM GSM | VODAFONE | RCOM CDMA | TATA CDMA |
| | | | | GSM Operators | | | | | | | | CDMA Operators | |
| Network Service Quality Parameter | | | | | | | | | | | | | |
| Network Availability | | | | | | | | | | | | | |
| 1 | a) Total no. of BTSs in the licensed service area | | Live data | 28 | 2776 | 1918 | 1309 | 1501 | 3038 | 900 | 2784 | 552 | 417 |
| | 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 | 47 | 108 | 2116 | 186 | 14 | 6 | 124 | 32 | 46 | 0 |
| | c) BTS Accumulated Downtime | <=2% | Live data | 2.31% | 0.05% | 1.53% | 0.20% | 0.01% | 0.00% | 0.19% | 0.02% | 0.12% | 0.00% |
| | d) No. of BTSs having accumulated downtime of >24 hours in a month | | Live data | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | e) Worst affected BTSs due to downtime | <=2% | Live data | 0.00% | 0.00% | 0.10% | 0.08% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| Connection Establishment (Accessibility) | | | | | | | | | | | | | |
| 2 | a) CSSR (Call Setup Success Rate) | >=95% | Live data | 98.29% | 99.13% | 96.95% | 98.70% | 98.64% | 99.98% | 99.76% | 99.87% | 98.52% | 98.74% |
| | b) SDCCCH/PAGING Congestion | <=1% | Live data | 0.01% | 0.19% | 0.19% | 0.13% | 0.06% | 0.08% | 0.02% | 0.03% | 0.00% | 0.00% |
| | c) TCH congestion | <=2% | Live data | 0.00% | 0.18% | 1.24% | 0.15% | 0.22% | 0.36% | 0.03% | 0.13% | 0.11% | 0.01% |
| Connection Maintenance (Retainability) | | | | | | | | | | | | | |
| 3 | a) Call Drop Rate (CDR) | <=2% | Live data | 6.96% | 0.39% | 1.58% | 0.65% | 0.86% | 0.55% | 0.37% | 0.75% | 0.05% | 0.54% |
| | b) Worst affected cells>3% TCH drop | <=3% | Live data | 4.37% | 0.96% | 1.89% | 0.95% | 4.88% | 1.46% | 0.00% | 2.30% | 0.14% | 6.76% |
| | c) % of connections with good voice quality | >=95% | Live data | 99.01% | 99.06% | NP | 97.75% | 96.98% | 97.98% | 99.08% | 97.69% | 99.72% | NP |
| | d) Total No. of cells exceeding 3% TCH drop (call drop) | | Live data | 4 | 80 | 109 | 38 | 217 | 134 | 0 | 195 | 2 | 88 |
| | e) Total no. of cells (Sector) in the licensed service area | | Live data | 84 | 8286 | 5738 | 4010 | 4446 | 9206 | 2694 | 8495 | 1656 | 1302 |
| No. of POI's having >=0.5% POI congestion | | | | | | | | | | | | | |
| 4 | No. of POI's having >=0.5% POI congestion | | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Name of POI not meeting the benchmark | | Live data | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



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

5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY TO SEPTEMBER 2014 MONTHS AUDITED DATA):

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 14

| Quarterly Averaged CSD Audit Data | | Bench- mark | Circle Name | AIRCEL | AIRTEL | BSNL | IDEA | RCOM GSM | TATA GSM | VIDEOCON | VODAFONE | RCOM CDMA | TATA CDMA |
|--|---|---------------------|-------------|---------------|---------|---------|----------|----------|----------|----------|----------------|-----------|-----------|
| S/ N | Name of Parameter | | | GSM Operators | | | | | | | CDMA Operators | | |
| Customer Service Quality Parameters | | | | | | | | | | | | | |
| 1 | Metering & Billing Credibility -Post Paid | | | | | | | | | | | | |
| | A) No. of bills issued during the quarter | | Haryana | 12 | 271742 | 59304 | 504495 | 63405 | 122656 | NA* | 452313 | 119275 | 86791 |
| | B) No. of bills disputed including billing complaints during the quarter | | Haryana | 0 | 205 | NP | 341 | 53 | 2 | NA | 389 | 110 | 1 |
| | C)% of billing complaints during the quarter | <= 0.1% | Haryana | 0.00% | 0.08% | NP | 0.07% | 0.08% | 0.00% | NA | 0.09% | 0.09% | 0.00% |
| 2 | Metering & Billing Credibility -Pre Paid | | | | | | | | | | | | |
| | A) Total No. of Pre-paid customers at the end of the quarter | | Haryana | 3546 | 2247531 | 3193191 | 4030429 | 1529444 | 2268437 | 1675502 | 4818973 | 357428 | 381767 |
| | B) Total No. of complaints relating to charging, Credit and Validity during the quarter | | Haryana | 0 | 47 | NP | 247 | 4537 | 2 | 9 | 1018 | 348 | 0 |
| | C) % of Pre-paid Charging Complaints | <= 0.1% | Haryana | 0.00% | 0.00% | NP | 0.01% | 0.30% | 0.00% | 0.00% | 0.02% | 0.10% | 0.00% |
| 3 | Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints | | | | | | | | | | | | |
| | A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter | | Haryana | 0 | 252 | NP | 4480 | 4590 | 2211 | 9 | 1407 | 458 | 178 |
| | B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter | | Haryana | 0 | 252 | NP | 4480 | 4590 | 2209 | 9 | 1407 | 458 | 178 |
| | C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks | 100 % within 4 week | | 100.00% | 100.00% | NP | 100.00% | 100.00% | 99.91% | 100.00% | 100.00% | 100.00% | 100.00% |
| | D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints | <=1 week | | 100.00% | 100.00% | NP | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| 4 | Response time to customers for assistance | | | | | | | | | | | | |
| | A) Total no of calls attempted to customer care/Call center | | Haryana | 6468 | 750565 | NP | 12391508 | 4639551 | 802073 | 469728 | 13640433 | 468444 | 61383 |



QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 14

| Quarterly Averaged CSD Audit Data | | Bench- mark | Circle Name | AIRCEL | AIRTEL | BSNL | IDEA | RCOM GSM | TATA GSM | VIDEOCON | VODAFONE | RCOM CDMA | TATA CDMA |
|-----------------------------------|--|-----------------------------------|-------------|---------------|---------|---------|----------|----------|----------|----------|----------|----------------|-----------|
| S/ N | Name of Parameter | | | GSM Operators | | | | | | | | CDMA Operators | |
| | B) Total no. of calls successfully established to customer care/Call center | | Haryana | 6207 | 750565 | NP | 12391181 | 4581757 | 796380 | 469728 | 13639392 | 462445 | 59641 |
| | C) % Accessibility of Call centre /customer Care (Total call successfully established *100/ Total call attempt) | >=95% | | 95.96% | 100.00% | NP | 100.00% | 98.75% | 99.29% | 100.00% | 99.99% | 98.72% | 97.16% |
| | D) Total Calls reached to agent desk for Voice to Voice (Total call attempt) | | | 1355 | 1876180 | NP | 3398070 | 399939 | 1169259 | 1502226 | 3769216 | 116487 | 88782 |
| | E) Total number of calls answered by the operator (Voice to voice) within 60/90 seconds | | | 1283 | 1806343 | NP | 3302472 | 383879 | 1099099 | 1369715 | 3743697 | 110677 | 87223 |
| | F) % age of calls answered by operator (voice to voice) (Total call successfully established within 60 Sec/90 sec *100/ Total call attempt.) | >=90% (60 Sec.) & >=95% (90 Sec.) | | 94.69% | *96.28% | NP | 97.19% | *95.98% | *94.00% | 91.18% | *99.32% | 95.01% | *98.24% |
| 5 | Termination/closure of service | | | | | | | | | | | | |
| | A) Total No. of requests for Termination / Closure of service received during the quarter | | Haryana | 0 | 798 | 272 | 5862 | 733 | 1186 | NA | 1548 | 943 | 898 |
| | B) No. of requests for Termination / Closure of service complied within 7 days during the quarter | | Haryana | 0 | 798 | 272 | 5862 | 733 | 1186 | NA | 1548 | 943 | 898 |
| | C) % of Termination/ Closure of service within 7 days | <=7days | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | NA | 100.00% | 100.00% | 100.00% |
| 6 | Time taken for refunds of deposits after closures. | | | | | | | | | | | | |
| | A) No. of Payments/ Refunds due during the quarter | | Haryana | 0 | 229 | 259 | 1404 | 799 | 689 | NA | 363 | 685 | 928 |
| | B) No. of Payments/ Refunds Cleared during the quarter | | Haryana | 0 | 229 | 259 | 1404 | 799 | 686 | NA | 363 | 685 | 927 |
| | C) Time taken for refunds of deposits after closures. | 100% within 60 days | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 99.56% | NA | 100.00% | 100.00% | 99.89% |

(i) NA* Videocon has no post paid subscribers, so no billing complaints.

(ii) NP: Data not provided: BSNL was having some technical problem in fetching the data related to the billing and call centre, as their new Call centre was under commissioning, so they did not provide the data for this quarter

(iii)*Data pertaining to the parameter "% age of calls answered by operator (voice to voice) within 90 seconds as per TRAI QoS Regulation (Third amendment) dated 21st August 2014.

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

| CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE - SEPTEMBER 14 | | | | | | | | | | | | | |
|---|---|-----------------------------------|----------------|---------------|---------|------|---------|------------|------------|----------|----------|-------------|-------------------|
| 3 days live CSD Audit Data | | Bench- mark | Circle Name | AIRCEL | AIRTEL | BSNL | IDEA | RCOM (GSM) | TATA (GSM) | VIDEOCON | VODAFONE | RCOM (CDMA) | TATA (CDMA) |
| S/ N | Name of Parameter | | | GSM Operators | | | | | | | | | CDMA Operators |
| Response time to customers for assistance | | | | | | | | | | | | | |
| 1 | Total no of calls attempted to customer care/Call center | | Haryana | 38 | 27736 | NP | 390234 | 110624 | 28056 | 15923 | 427703 | 13918 | 1896 |
| | Total no. of calls successfully established to customer care/Call center | | Haryana | 38 | 27736 | NP | 390228 | 109297 | 27851 | 15923 | 427695 | 13742 | 1855 |
| | % Accessibility of Call centre /customer Care (Total calls successfully established*100/ Total call attempt) | >=95% | Haryana | 100.00% | 100.00% | NP | 100.00% | 98.80% | 99.27% | 100.00% | 100.00% | 98.74% | 97.84% |
| 2 | Total Calls reached to agent desk for Voice to Voice (Total call attempt) | | Haryana | 16 | 59921 | NP | 104736 | 10571 | 44102 | 55669 | 120784 | 2732 | 2533 |
| | Total number of calls answered by the operator (Voice to voice) within 60/90 seconds | | Haryana | 16 | 59098 | NP | 104645 | 10284 | 43521 | 52190 | 120115 | 2581 | 2491 |
| | % age of calls answered by operator(voice to voice) (Total calls successfully established within 60 Sec/90 sec*100/ Total call attempt) | >=90% (60 Sec.) & >=95% (90 Sec.) | Haryana | 100.00% | 98.63% | NP | 99.91% | *97.29% | *98.68% | 93.75% | *99.45% | 94.47% | *98.34% |

(i) NP: Data not provided: BSNL was having some technical problem in fetching the data related to the billing and call centre, as their new Call centre was under commissioning, so they did not provide the data for this quarter

(ii)*Data pertaining to the parameter “% age of calls answered by operator (voice to voice) within 90 seconds as per TRAI QoS Regulation (Third amendment) dated 21st August 2014.

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid is well within the prescribed bench mark of $\leq 0.1\%$. Only **RCOM (GSM)** failed to meet the benchmark of the parameter '% Billing Complaints – Pre-paid' with its performance as **0.30%**. Videocon is not having the post-paid customer in Haryana circle.

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 (**except Tata GSM**) have 100% resolved the billing complaints within stipulated period of 4 weeks. In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % refund in one week. Only **Tata (GSM)** remained marginally below the bench as it could resolve **99.91%** of billing complaints.

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' and '% Calls answered by operator (voice to voice)' except **Tata (GSM)**. However, Only **Tata (GSM)** has not met the benchmark of **calls answered by Operators (voice to voice) within 90 seconds** as they provided the data for 90 seconds. **Tata (GSM)** achieved its performance as **94.00%** against the benchmark of $\geq 95\%$.

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

All operators (except Tata GSM and Tata CDMA) were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure. **Tata GSM** and **Tata CDMA** could settle the cases of refunds **99.56%** and **99.89%** respectively against the benchmark of 100%.

Live Measurements

The results for three days live measurements reveal that all operators have met the benchmarks for the parameters 'Accessibility to call center' and call connection to operators (Voice to voice) within 60 seconds.

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 Haryana 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 | AIRTEL | BSNL | IDEA | RCOM GSM | RCOM CDMA | TATA GSM | TATA CDMA | VIDEOCON | VODAFONE |
| AIRTEL | Haryana | --- | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| BSNL | Haryana | 100.00% | --- | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| IDEA | Haryana | 100.00% | 100.00% | --- | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| RCOM GSM | Haryana | 100.00% | 100.00% | 100.00% | --- | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| RCOM CDMA | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | --- | 100.00% | 100.00% | 100.00% | 100.00% |
| TATA GSM | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | --- | 100.00% | 100.00% | 100.00% |
| TATA CDMA | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | --- | 100.00% | 100.00% |
| VIDEOCON | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | --- | 100.00% |
| VODAFONE | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | --- |

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

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

| LIVE CALLING TO CALL CENTRE | | | | | | | | | | | |
|---|-------------|---------|---------|---------|---------|------------|------------|----------|----------|-------------|-------------|
| Parameter | Circle Name | AIRCEL | AIRTEL | BSNL | IDEA | RCOM (GSM) | TATA (GSM) | VIDEOCON | VODAFONE | RCOM (CDMA) | TATA (CDMA) |
| Total No. of calls Attempted | Haryana | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total no of calls attempted to customer care/Call center | Haryana | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total no. of calls successfully established to customer care/Call center | Haryana | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| % Accessibility of Call centre /customer Care (Total calls successfully established * 100 / Total call attempts) | Haryana | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| Total Calls reached to agent desk for Voice to Voice (Total call attempt) | Haryana | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Total number of calls answered by the operator (Voice to voice) within 90 seconds | Haryana | 100 | 100 | 94 | 100 | 100 | 100 | 98 | 98 | 100 | 100 |
| % age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total calls attempts) | Haryana | 100.00% | 100.00% | 94.00% | 100.00% | 100.00% | 100.00% | 98.00% | 98.00% | 100.00% | 100.00% |

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers. BSNL, Videocon and Vodafone could connect 94%, 98% and 98% of calls to the operator within 60 Seconds.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:

| TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS | | | | | | | | | | | |
|---|-------------|---------|---------|------|---------|------------|------------|----------|----------|-------------|-------------|
| Parameter | Circle Name | AIRCEL | AIRTEL | BSNL | IDEA | RCOM (GSM) | TATA (GSM) | VIDEOCON | VODAFONE | RCOM (CDMA) | TATA (CDMA) |
| Total No. of calls Attempted | Haryana | 0 | 100 | ND | 100 | 100 | 100 | 9 | 100 | 100 | 100 |
| Total No. of calls Answered | Haryana | 0 | 80 | ND | 72 | 64 | 69 | 7 | 78 | 61 | 77 |
| Cases resolved within 4 weeks | Haryana | 0 | 80 | ND | 72 | 64 | 69 | 7 | 78 | 61 | 77 |
| %age of cases resolved | Haryana | 100.00% | 100.00% | ND | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

ND: Not done due to BSNL not provided the detail of billing complaints.

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. For some operators, the call made were 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 they don't exactly remember about the resolution of complaints. However, Majority of the customers reported that the billing complaints were resolved to their satisfaction.

6.4 LEVEL -1 CALLING ASSESSMENT:

| LEVEL 1 LIVE CALLING | | | | | | | | | | | | | | |
|----------------------|-------------|----------|-------------|-------------------|--------|------|------|------------|------------|----------|----------|-------------|-------------|---|
| Emergency no. | Circle Name | SSA Name | SDCA Name | No. of calls made | AIRTEL | BSNL | IDEA | RCOM (GSM) | TATA (GSM) | VIDEOCON | VODAFONE | RCOM (CDMA) | TATA (CDMA) | |
| 100, 101, 102, 1091 | Haryana | Karnal | Panipat | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Gharaunda | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | Kamal | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | Kaithal | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | Cheeka | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | Pehowa | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | Kurukshetra | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| | | | Nilokheri | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | √ |
| 100, 101, 102, 1091 | Haryana | Ambala | Ambala | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Barara | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Chachrauli | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Jagadhari | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Kalka | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Naraingarh | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| 100, 101, 102, 1091 | Haryana | Sonipat | Sonipat | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |
| | | | Gohana | 8 | √ | √ | √ | √ | √ | √ | √ | √ | √ | |

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various mobile service providers, the calls were made from mobile phones provided by the service providers. In Haryana service area, these services were found functional in the networks of all the service providers.

7. DRIVE TEST



7. OPERATOR ASSESTID 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 **Karnal, Ambala and Sonipat** in the months of July, August and September 2014 respectively. The total route Kms covered during the drive tests in respective SSAs was **425 Kms, 505 Kms and 465 Kms**. The performance of the operators has been highlighted below in the tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour.

For measuring voice quality, Rx Qual samples on a scale from 0 to 7 for GSM operators and Frame Error Rate (FERs) for CDMA service providers were measured. As per the QoS norms, Rx Qual between 0- 5 for GSM operators and between 0-4% FER value for CDMA operators is considered to be good, where as Rx Qual beyond this benchmark is considered to be bad. Call drops were measured by the number of calls that were dropped to the total number of calls established during the drive test. Similarly CSSR was measured as the ratio of total calls established to the total call attempts made. Signal strength was measured in dBm at street level with strength ≥ -75 dBm for in-door coverage and ≥ -85 dBm for in-vehicle.

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

**DRIVE TEST TABLE – 1
OPERATOR-ASSISTED DRIVE TEST AT KARNAL SSA IN JULY 14 MONTH- HARYANA CIRCLE**

| S/N | Parameter | Classification of routes covered | AIRCEL | | AIRTEL | | BSNL | | TATA GSM | | IDEA | | RCOM GSM | | VIDEOCON | | VODAFONE | | TATA CDMA | | RCOM CDMA | | |
|--|--|----------------------------------|-----------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--|
| | | | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Call Attempts | Major Roads | NC | NC | 154 | 25 | 168 | 25 | 164 | 25 | 155 | 25 | 164 | 27 | 144 | 25 | 152 | 25 | 165 | 25 | 165 | 27 | |
| | | Highways | NC | NC | 115 | 30 | 79 | 25 | 97 | 25 | 107 | 25 | 116 | 27 | 104 | 25 | 111 | 25 | 100 | 25 | 117 | 27 | |
| | | Within City | NC | NC | 197 | 25 | 261 | 25 | 254 | 25 | 232 | 25 | 247 | 25 | 238 | 25 | 248 | 25 | 256 | 25 | 250 | 25 | |
| | | Overall SSA | NC | NC | 466 | 80 | 508 | 75 | 515 | 75 | 494 | 75 | 527 | 79 | 486 | 75 | 511 | 75 | 521 | 75 | 532 | 79 | |
| 2 | Blocked Call Rate | Major Roads | NC | NC | 0.65%P | 0.00% | 1.19% | 0.00% | 1.22% | 0.00% | 0.65% | 0.00% | 0.61% | 0.00% | 0.69% | 0.00% | 0.00% | 0.00% | 0.61% | 0.00% | 0.00% | 0.00% | |
| | | Highways | NC | NC | 0.87% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.90% | 0.00% | 3.00% | 0.00% | 0.00% | 0.00% | |
| | | Within City | NC | NC | 1.02% | 0.00% | 1.53% | 0.00% | 0.79% | 0.00% | 0.00% | 0.00% | 0.40% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| | | Overall SSA | NC | NC | 0.86% | 0.00% | 1.18% | 0.00% | 0.78% | 0.00% | 0.20% | 0.00% | 0.38% | 0.00% | 0.00% | 0.00% | 0.20% | 0.00% | 0.77% | 0.00% | 0.00% | 0.00% | |
| 3 | Dropped Call Rate (<=2%) | Major Roads | NC | NC | 0.65% | 0.00% | 1.81% | 0.00% | 1.23% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.61% | 0.00% | 1.21% | 0.00% | | |
| | | Highways | NC | NC | 0.00% | 0.00% | 1.27% | 0.00% | 1.03% | 0.00% | 0.00% | 0.00% | 1.72% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 2.06% | 0.00% | 0.85% | 0.00% | |
| | | Within City | NC | NC | 0.00% | 4.00% | 0.39% | 0.00% | 0.80% | 0.00% | 0.00% | 0.00% | 0.81% | 0.00% | 0.00% | 0.00% | 1.61% | 0.00% | 0.00% | 0.00% | 2.00% | 0.00% | |
| | | Overall SSA | NC | NC | 0.22% | 1.25% | 1.00% | 0.00% | 0.98% | 0.00% | 0.00% | 0.00% | 0.76% | 0.00% | 0.00% | 0.00% | 0.78% | 0.00% | 0.58% | 0.00% | 1.50% | 0.00% | |
| Percentage connections with good voice quality (=>95%) | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | (a) 0-4 (w/o frequency hopping for CDMA Operators) | Major Roads | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.36% | 97.48% | 99.80% | 100% | |
| | | Highways | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.70% | 99.05% | 99.87% | 100% | |
| | | Within City | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.01% | 99.13% | 99.92% | 100% | |
| | | Overall SSA | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.24% | 98.84% | 99.88% | 100% | |
| | (b) 0-5 (with frequency hopping for GSM Operators) | Major Roads | NC | NC | 96.02% | 99.61% | 92.24% | 98.14% | 95.46% | 98.20% | 94.63% | 98.08% | 93.19% | 96.14% | 95.21% | 97.25% | 96.01% | 97.53% | NA | NA | NA | NA | |
| | | Highways | NC | NC | 96.08% | 97.47% | 95.25% | 91.23% | 95.56% | 95.27% | 95.54% | 98.31% | 94.49% | 96.74% | 95.57% | 99.23% | 96.51% | 98.12% | NA | NA | NA | NA | |
| | | Within City | NC | NC | 95.84% | 96.68% | 95.58% | 97.56% | 94.90% | 95.07% | 96.19% | 98.68% | 95.76% | 99.47% | 95.51% | 98.88% | 95.91% | 97.84% | NA | NA | NA | NA | |
| | | Overall SSA | NC | NC | 95.96% | 98.13% | 94.43% | 95.00% | 95.22% | 96.34% | 95.65% | 98.35% | 94.73% | 97.49% | 95.43% | 98.44% | 96.08% | 97.82% | NA | NA | NA | NA | |
| 5 | Service Coverage | | | | | | | | | | | | | | | | | | | | | | |

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

DRIVE TEST TABLE – 1
OPERATOR-ASSISTED DRIVE TEST AT KARNAL SSA IN JULY 14 MONTH- HARYANA CIRCLE

| S/N | Parameter | Classification of routes covered | AIRCEL | | AIRTEL | | BSNL | | TATA GSM | | IDEA | | RCOM GSM | | VIDEOCON | | VODAFONE | | TATA CDMA | | RCOM CDMA | |
|---|--------------------|----------------------------------|------------------------------|---------------|---------------|---------------|---------------|---------------|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|---------------|---------------|---------------|---------------|--------|
| | | | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR |
| | | | In door (≥ -75 dBm) | Major Roads | NC | NC | 65.07% | 99.89% | 43.49% | 99.88% | 59.36% | 100% | 74.75% | 100% | 39.86% | 3.51% | 84.95% | 99.64% | 94.75% | 100% | 41.77% | 100% |
| Highways | NC | NC | | 67.33% | 55.97% | 60.30% | 3.62% | 75.17% | 100% | 88.71% | 100% | 42.55% | 0.13% | 88.71% | 100% | 96.71% | 100% | 61.47% | 60.48% | 96.81% | 93.88% | |
| Within City | NC | NC | | 61.88% | 96.94% | 69.13% | 100% | 85.66% | 100% | 94.87% | 98.51% | 56.29% | 100% | 94.78% | 100% | 96.01% | 100% | 83.28% | 65.48% | 97.85% | 100% | |
| Overall SSA | NC | NC | | 64.37% | 82.29% | 59.15% | 69.28% | 74.84% | 100% | 88.64% | 99.49% | 48.52% | 36.18% | 90.36% | 99.88% | 95.74% | 100% | 65.48% | 68.89% | 96.90% | 97.72% | |
| In-vehicle (≥ -85 dBm) | Major Roads | NC | NC | 81.37% | 100% | 81.71% | 100% | 87.47% | 100% | 98.01% | 100% | 67.52% | 92.97% | 96.95% | 99.65% | 99.39% | 100% | 80.22% | 100% | 97.90% | 100% | |
| | Highways | NC | NC | 86.95% | 98.39% | 90.73% | 95.60% | 96.33% | 100% | 98.92% | 100% | 70.80% | 19.41% | 97.55% | 100% | 99.27% | 100% | 93.64% | 100% | 98.86% | 96.34% | |
| | Within City | NC | NC | 85.58% | 100% | 93.97% | 100% | 97.64% | 100% | 99.66% | 100% | 84.42% | 100% | 99.56% | 100% | 99.69% | 100% | 98.92% | 100% | 99.37% | 100% | |
| | Overall SSA | NC | NC | 84.36% | 99.39% | 89.36% | 98.60% | 94.00% | 100% | 99.10% | 100% | 76.54% | 72.60% | 98.30% | 99.88% | 99.50% | 100% | 91.78% | 100% | 98.88% | 98.64% | |
| Outdoor-in city (≥ -95 dBm) | Major Roads | NC | NC | 96.11% | 100% | 98.25% | 100% | 98.26% | 100% | 99.65% | 100% | 94.13% | 99.96% | 99.65% | 100% | 99.89% | 100% | 98.23% | 100% | 99.98% | 100% | |
| | Highways | NC | NC | 98.05% | 99.96% | 98.80% | 99.93% | 99.74% | 100% | 99.83% | 100% | 92.40% | 92.69% | 99.65% | 100% | 99.87% | 100% | 99.74% | 100% | 99.99% | 100% | |
| | Within City | NC | NC | 98.53% | 100% | 99.90% | 100% | 99.52% | 100% | 99.93% | 100% | 97.86% | 100% | 99.87% | 100% | 99.94% | 100% | 99.95% | 100% | 99.98% | 100% | |
| | Overall SSA | NC | NC | 97.53% | 99.99% | 99.17% | 99.98% | 99.14% | 100% | 99.84% | 100% | 95.59% | 97.72% | 99.75% | 100% | 99.91% | 100% | 99.35% | 100% | 99.98% | 100% | |
| 6 Call Setup Success Rate ($\geq 95\%$) | Major Roads | NC | NC | 99.35% | 100% | 98.81% | 100% | 98.78% | 100% | 99.35% | 100% | 99.39% | 100% | 99.31% | 100% | 100% | 100% | 99.39% | 100% | 100% | 100% | |
| | Highways | NC | NC | 99.13% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 99.10% | 100% | 97.00% | 100% | 100% | 100% | |
| | Within City | NC | NC | 98.98% | 100% | 98.47% | 100% | 98.03% | 100% | 100% | 100% | 99.60% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | |
| | Overall SSA | NC | NC | 99.14% | 100% | 98.82% | 100% | 98.64% | 100% | 99.80% | 100% | 99.62% | 100% | 99.79% | 100% | 99.80% | 100% | 99.23% | 100% | 100% | 100% | |
| 7 Hand Over Success Rate (HOSR) | Major Roads | NC | NC | 98.73% | 100% | 95.88% | 100% | 98.28% | 100% | 100% | 100% | 100% | 100% | 99.14% | 100% | 100% | 100% | 98.86% | 100% | 100% | 100% | |
| | Highways | NC | NC | 98.21% | 100% | 97.79% | 100% | 98.08% | 100% | 97.79% | 100% | 100% | 100% | 100% | 100% | 99.57% | 100% | 97.14% | 100% | 100% | 100% | |
| | Within City | NC | NC | 99.20% | 100% | 99.57% | 100% | 98.65% | 100% | 100% | 100% | 99.53% | 100% | 100% | 100% | 99.30% | 100% | 98.19% | 100% | 100% | 100% | |
| | Overall SSA | NC | NC | 98.82% | 100% | 98.28% | 100% | 98.45% | 100% | 99.47% | 100% | 99.69% | 100% | 99.77% | 100% | 99.54% | 100% | 98.20% | 100% | 100% | 100% | |

- NC-No Coverage
- NA-Not Applicable

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

DRIVE TEST TABLE – 2
OPERATOR-ASSISTED DRIVE TEST AT AMBALA SSA IN AUGUST 14 MONTH- HARYANA CIRCLE

| S/N | Parameter | Classification of routes covered | AIRCEL | | AIRTEL | | BSNL | | TATA GSM | | IDEA | | RCOM GSM | | VIDEOCON | | VODAFONE | | TATA CDMA | | RCOM CDMA | | |
|--|--|----------------------------------|-----------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|--------------|
| | | | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Call Attempts | Major Roads | NC | NC | 153 | 25 | 152 | 25 | 178 | 25 | 160 | 25 | 113 | 26 | 88 | 25 | 152 | 25 | 154 | 25 | 112 | 26 | |
| | | Highways | NC | NC | 141 | 25 | 122 | 25 | 135 | 25 | 110 | 25 | 91 | 25 | 90 | 25 | 125 | 25 | 126 | 25 | 91 | 25 | |
| | | Within City | NC | NC | 179 | 25 | 177 | 25 | 244 | 25 | 196 | 25 | 212 | 26 | 189 | 25 | 198 | 25 | 189 | 25 | 212 | 26 | |
| | | Overall SSA | NC | NC | 473 | 75 | 451 | 75 | 557 | 75 | 466 | 75 | 416 | 77 | 367 | 75 | 475 | 75 | 469 | 75 | 415 | 77 | |
| 2 | Blocked Call Rate | Major Roads | NC | NC | 0.00% | 0.00% | 2.63% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.88% | 0.00% | 0.00% | 4.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| | | Highways | NC | NC | 0.00% | 0.00% | 3.28% | 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% | |
| | | Within City | NC | NC | 0.00% | 0.00% | 1.69% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.53% | 0.00% | 0.00% | 0.00% | 2.12% | 0.00% | 0.00% | 0.00% | |
| | | Overall SSA | NC | NC | 0.00% | 0.00% | 2.44% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.24% | 0.00% | 0.27% | 1.33% | 0.00% | 0.00% | 0.85% | 0.00% | 0.00% | 0.00% |
| 3 | Dropped Call Rate (<=2%) | Major Roads | NC | NC | 0.00% | 0.00% | 2.03% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.89% | 0.00% | 0.00% | 0.00% | 1.32% | 0.00% | 1.30% | 0.00% | 0.00% | 0.00% | |
| | | Highways | NC | NC | 0.00% | 0.00% | 0.85% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 1.10% | 0.00% | 0.00% | 0.00% | 0.80% | 0.00% | 1.59% | 0.00% | 0.00% | 0.00% | |
| | | Within City | NC | NC | 0.00% | 0.00% | 0.57% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.51% | 0.00% | 0.54% | 0.00% | 0.00% | 0.00% | |
| | | Overall SSA | NC | NC | 0.00% | 0.00% | 1.14% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.48% | 0.00% | 0.00% | 0.00% | 0.84% | 0.00% | 1.08% | 0.00% | 0.00% | 0.00% |
| Percentage connections with good voice quality (=>95%) | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | (a) 0-4 (w/o frequency hopping for CDMA Operators) | Major Roads | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.17% | 99.13% | 99.80% | 100% | |
| | | Highways | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.23% | 97.94% | 99.78% | 100% | |
| | | Within City | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.15% | 98.97% | 99.98% | 100% | |
| | | Overall SSA | NC | NC | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.17% | 98.64% | 99.90% | 100% | |
| | (b) 0-5 (with frequency hopping for GSM Operators) | Major Roads | NC | NC | 96.61% | 98.68% | 93.86% | 99.72% | 95.89% | 97.84% | 95.68% | 98.19% | 95.66% | 99.92% | 96.87% | 98.65% | 95.29% | 99.35% | NA | NA | NA | NA | |
| | | Highways | NC | NC | 96.35% | 97.21% | 90.61% | 93.85% | 95.22% | 99.37% | 94.33% | 97.94% | 90.85% | 98.18% | 96.72% | 95.19% | 95.94% | 98.04% | NA | NA | NA | NA | |
| | | Within City | NC | NC | 95.96% | 97.46% | 94.01% | 96.23% | 95.03% | 99.53% | 95.42% | 98.97% | 95.64% | 98.57% | 96.90% | 98.53% | 95.51% | 92.25% | NA | NA | NA | NA | |
| | | Overall SSA | NC | NC | 96.30% | 97.78% | 93.03% | 94.99% | 95.32% | 98.95% | 95.26% | 98.34% | 94.63% | 98.87% | 96.85% | 97.34% | 95.57% | 96.60% | NA | NA | NA | NA | |
| 5 | Service Coverage | | | | | | | | | | | | | | | | | | | | | | |

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

DRIVE TEST TABLE – 2
OPERATOR-ASSISTED DRIVE TEST AT AMBALA SSA IN AUGUST 14 MONTH- HARYANA CIRCLE

| S/N | Parameter | Classification of routes covered | AIRCEL | | AIRTEL | | BSNL | | TATA GSM | | IDEA | | RCOM GSM | | VIDEOCON | | VODAFONE | | TATA CDMA | | RCOM CDMA | |
|--------------------------------------|--|----------------------------------|------------------------------|---------------|---------------|---------------|---------------|---------------|-------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|
| | | | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR |
| | | | In door (≥ -75 dBm) | Major Roads | NC | NC | 74.73% | 80.21% | 62.28% | 100% | 66.07% | 100% | 89.53% | 99.54% | 45.50% | 32.74% | 86.78% | 72.11% | 94.82% | 100% | 38.64% | 7.65% |
| Highways | NC | NC | | 78.87% | 99.36% | 63.53% | 99.53% | 71.00% | 100% | 94.36% | 100% | 47.03% | 99.23% | 86.85% | 99.38% | 94.84% | 100% | 41.93% | 99.95% | 97.44% | 100% | |
| Within City | NC | NC | | 93.10% | 92.93% | 86.43% | 99.01% | 91.20% | 100% | 98.57% | 100% | 70.31% | 100% | 96.93% | 95.29% | 98.63% | 100% | 84.86% | 70.68% | 99.85% | 100% | |
| Overall SSA | NC | NC | | 82.44% | 90.92% | 72.60% | 99.45% | 79.24% | 100% | 94.50% | 99.87% | 58.89% | 78.10% | 92.48% | 89.27% | 96.12% | 100% | 59.74% | 62.00% | 98.88% | 99.99% | |
| In-vehicle (≥ -85 dBm) | Major Roads | NC | NC | 95.08% | 99.78% | 93.14% | 100% | 84.21% | 100% | 98.64% | 100% | 72.70% | 81.15% | 96.39% | 99.44% | 99.65% | 100% | 67.67% | 99.97% | 99.62% | 100% | |
| | Highways | NC | NC | 95.49% | 100% | 93.26% | 100% | 93.51% | 100% | 99.30% | 100% | 77.11% | 100% | 95.85% | 100% | 99.15% | 100% | 75.67% | 100% | 99.65% | 100% | |
| | Within City | NC | NC | 99.68% | 99.98% | 98.11% | 100% | 98.78% | 100% | 99.87% | 100% | 94.78% | 100% | 99.45% | 100% | 99.71% | 100% | 94.87% | 83.65% | 100% | 100% | |
| | Overall SSA | NC | NC | 96.84% | 99.92% | 95.23% | 100% | 93.30% | 100% | 99.31% | 100% | 85.26% | 93.94% | 97.99% | 99.82% | 99.54% | 100% | 81.60% | 93.68% | 99.84% | 100% | |
| Outdoor-in city (≥ -95 dBm) | Major Roads | NC | NC | 99.87% | 100% | 99.86% | 100% | 97.25% | 100% | 99.80% | 100% | 95.18% | 100% | 99.89% | 100% | 99.95% | 100% | 96.91% | 100% | 100% | 100% | |
| | Highways | NC | NC | 99.62% | 100% | 99.88% | 100% | 99.75% | 100% | 99.89% | 100% | 96.61% | 100% | 99.47% | 100% | 99.73% | 100% | 97.56% | 100% | 100% | 100% | |
| | Within City | NC | NC | 99.99% | 100% | 99.99% | 100% | 99.79% | 100% | 99.95% | 100% | 99.99% | 100% | 99.98% | 100% | 99.88% | 100% | 99.07% | 97.24% | 100% | 100% | |
| | Overall SSA | NC | NC | 99.84% | 100% | 99.92% | 100% | 99.03% | 100% | 99.88% | 100% | 98.02% | 100% | 99.85% | 100% | 99.86% | 100% | 98.02% | 98.93% | 100% | 100% | |
| 6 | Call Setup Success Rate ($\geq 95\%$) | Major Roads | NC | NC | 100% | 100% | 97.37% | 100% | 100% | 100% | 100% | 100% | 99.12% | 100% | 100% | 96.00% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Highways | NC | NC | 100% | 100% | 96.72% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | NC | NC | 100% | 100% | 98.31% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 99.47% | 100% | 100% | 100% | 97.88% | 100% | 100% | 100% |
| | | Overall SSA | NC | NC | 100% | 100% | 97.56% | 100% | 100% | 100% | 100% | 100% | 99.76% | 100% | 99.73% | 98.67% | 100% | 100% | 99.15% | 100% | 100% | 100% |
| 7 | Hand Over Success Rate (HOSR) | Major Roads | NC | NC | 99.53% | 100% | 96.44% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Highways | NC | NC | 99.44% | 100% | 95.22% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 99.58% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | NC | NC | 99.62% | 100% | 99.70% | 99.61% | 100% | 100% | 99.44% | 100% | 99.52% | 100% | 99.66% | 88.89% | 100% | 100% | 100% | 100% | 100% | 100% |
| | | Overall SSA | NC | NC | 99.55% | 100% | 98.08% | 99.73% | 100% | 100% | 99.73% | 100% | 99.64% | 100% | 99.77% | 97.56% | 99.86% | 100% | 100% | 100% | 100% | 100% |

NC-No Coverage; NA-Not Applicable

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

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

**DRIVE TEST TABLE – 3
OPERATOR-ASSISTED DRIVE TEST AT SONIPAT SSA IN SEPTEMBER 14 MONTH- HARYANA CIRCLE**

| S/N | Parameter | Classification of routes covered | AIRCEL | | AIRTEL | | BSNL | | TATA GSM | | IDEA | | RCOM GSM | | VIDEOCON | | VODAFONE | | TATA CDMA | | RCOM CDMA | | |
|--|--|----------------------------------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|--------------|---------------|---------------|---------------|--------------|----|
| | | | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | |
| | | | 1 | Call Attempts | Major Roads | NC | NC | 181 | 28 | 225 | 25 | 262 | 25 | 219 | 25 | 161 | 25 | 149 | 25 | 216 | 25 | 219 | 25 |
| | | Highways | NC | NC | 129 | 26 | 133 | 25 | 88 | 25 | 131 | 25 | 83 | 25 | 100 | 25 | 138 | 25 | 116 | 25 | 84 | 25 | |
| | | Within City | NC | NC | 152 | 28 | 160 | 25 | 131 | 25 | 155 | 25 | 186 | 27 | 148 | 25 | 161 | 25 | 139 | 25 | 187 | 27 | |
| | | Overall SSA | NC | NC | 462 | 82 | 518 | 75 | 481 | 75 | 505 | 75 | 430 | 77 | 397 | 75 | 515 | 75 | 474 | 75 | 436 | 78 | |
| 2 | Blocked Call Rate | Major Roads | NC | NC | 0.55% | 0.00% | 0.00% | 0.00% | 0.76% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.67% | 0.00% | 0.00% | 0.00% | 0.46% | 0.00% | 0.00% | 0.00% | |
| | | Highways | NC | NC | 0.00% | 0.00% | 1.50% | 0.00% | 1.14% | 0.00% | 1.53% | 0.00% | 1.20% | 0.00% | 1.00% | 0.00% | 0.00% | 0.00% | 0.86% | 0.00% | 0.00% | 0.00% | |
| | | Within City | NC | NC | 0.66% | 0.00% | 0.63% | 0.00% | 0.76% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.62% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | |
| | | Overall SSA | NC | NC | 0.43% | 0.00% | 0.58% | 0.00% | 0.83% | 0.00% | 0.40% | 0.00% | 0.23% | 0.00% | 0.50% | 0.00% | 0.19% | 0.00% | 0.42% | 0.00% | 0.00% | 0.00% | |
| 3 | Dropped Call Rate (<=2%) | Major Roads | NC | NC | 0.56% | 0.00% | 0.44% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 0.46% | 0.00% | 1.38% | 0.00% | 0.00% | 0.00% | |
| | | Highways | NC | NC | 0.00% | 0.00% | 0.00% | 0.00% | 2.30% | 0.00% | 0.00% | 0.00% | 1.22% | 0.00% | 0.00% | 0.00% | 0.00% | 0.00% | 2.61% | 0.00% | 1.19% | 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% | 0.63% | 0.00% | 0.00% | 0.00% | 1.07% | 0.00% | |
| | | Overall SSA | NC | NC | 0.22% | 0.00% | 0.19% | 0.00% | 0.42% | 0.00% | 0.00% | 0.00% | 0.23% | 0.00% | 0.00% | 0.00% | 0.39% | 0.00% | 1.27% | 0.00% | 0.69% | 0.00% | |
| Percentage connections with good voice quality (=>95%) | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | (a) 0-4 (w/o frequency hopping for CDMA Operators) | Major Roads | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 96.52% | 98.66% | 99.88% | 100% | |
| | | Highways | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.74% | 99.60% | 99.85% | 100% | |
| | | Within City | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 95.75% | 98.87% | 99.97% | 100% | |
| | | Overall SSA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 96.00% | 99.05% | 99.92% | 100% | |
| | (b) 0-5 (with frequency hopping for GSM Operators) | Major Roads | NC | NC | 95.92% | 95.55% | 95.31% | 99.35% | 96.67% | 97.34% | 95.32% | 99.43% | 97.97% | 99.83% | 96.11% | 99.74% | 95.45% | 98.97% | NA | NA | NA | NA | |
| | Highways | NC | NC | 96.46% | 95.45% | 93.20% | 100% | 95.60% | 95.81% | 94.06% | 98.20% | 96.65% | 100% | 95.72% | 95.07% | 95.76% | 98.90% | NA | NA | NA | NA | | |
| | Within City | NC | NC | 95.81% | 99.52% | 97.19% | 99.00% | 96.15% | 98.14% | 96.15% | 99.50% | 97.96% | 99.93% | 96.44% | 99.57% | 95.57% | 96.61% | NA | NA | NA | NA | | |
| | Overall SSA | NC | NC | 96.03% | 96.13% | 95.37% | 99.28% | 96.04% | 97.09% | 95.37% | 99.07% | 97.72% | 99.92% | 96.14% | 98.04% | 95.57% | 98.10% | NA | NA | NA | NA | | |
| 5 | Service Coverage | | | | | | | | | | | | | | | | | | | | | | |

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

**DRIVE TEST TABLE – 3
OPERATOR-ASSISTED DRIVE TEST AT SONIPAT SSA IN SEPTEMBER 14 MONTH- HARYANA CIRCLE**

| S/N | Parameter | Classification of routes covered | AIRCEL | | AIRTEL | | BSNL | | TATA GSM | | IDEA | | RCOM GSM | | VIDEOCON | | VODAFONE | | TATA CDMA | | RCOM CDMA | |
|--------------------------------------|--|----------------------------------|------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|-------------|
| | | | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR | OUTDOOR | INDOOR |
| | | | In door (≥ -75 dBm) | Major Roads | NC | NC | 80.75% | 66.59% | 78.53% | 100% | 25.25% | 6.43% | 94.82% | 100% | 48.63% | 11.64% | 84.32% | 99.90% | 95.38% | 100% | 17.71% | 24.42% |
| Highways | NC | NC | | 76.11% | 45.12% | 74.01% | 99.14% | 41.17% | 55.31% | 94.26% | 100% | 48.06% | 68.71% | 85.95% | 82.66% | 96.18% | 100% | 34.56% | 99.97% | 97.49% | 100% | |
| Within City | NC | NC | | 73.49% | 86.71% | 93.13% | 54.29% | 58.37% | 99.67% | 98.77% | 100% | 70.06% | 100% | 93.46% | 95.33% | 99.16% | 99.42% | 80.34% | 59.49% | 99.07% | 99.81% | |
| Overall SSA | NC | NC | | 77.55% | 62.13% | 81.99% | 83.53% | 41.18% | 54.40% | 96.18% | 100% | 58.36% | 58.73% | 88.18% | 92.35% | 96.64% | 99.78% | 41.62% | 60.83% | 97.91% | 99.95% | |
| In-vehicle (≥ -85 dBm) | Major Roads | NC | NC | 96.28% | 89.22% | 96.48% | 100% | 56.27% | 93.90% | 99.09% | 100% | 84.91% | 98.92% | 95.34% | 100% | 99.33% | 100% | 54.61% | 43.49% | 98.27% | 100% | |
| | Highways | NC | NC | 96.00% | 82.82% | 95.63% | 100% | 67.03% | 88.60% | 98.72% | 100% | 81.23% | 100% | 96.29% | 99.50% | 99.53% | 100% | 76.65% | 100% | 99.01% | 100% | |
| | Within City | NC | NC | 95.67% | 97.78% | 99.75% | 93.82% | 88.80% | 100% | 99.84% | 100% | 95.28% | 100% | 99.28% | 100% | 99.83% | 99.81% | 94.61% | 100% | 99.94% | 100% | |
| | Overall SSA | NC | NC | 96.04% | 88.29% | 97.30% | 97.81% | 70.36% | 92.00% | 99.29% | 100% | 88.98% | 99.62% | 97.06% | 99.82% | 99.53% | 99.93% | 72.53% | 80.76% | 99.17% | 100% | |
| Outdoor-in city (≥ -95 dBm) | Major Roads | NC | NC | 99.79% | 99.32% | 99.82% | 100% | 95.72% | 99.88% | 99.73% | 100% | 98.12% | 100% | 99.25% | 100% | 99.86% | 100% | 97.12% | 100% | 99.86% | 100% | |
| | Highways | NC | NC | 99.81% | 99.65% | 99.85% | 100% | 97.74% | 95.42% | 99.48% | 100% | 98.16% | 100% | 99.54% | 99.99% | 99.92% | 100% | 97.34% | 100% | 99.88% | 100% | |
| | Within City | NC | NC | 99.95% | 99.65% | 100% | 100% | 96.35% | 95.42% | 99.96% | 100% | 99.94% | 100% | 99.91% | 99.99% | 99.98% | 100% | 98.81% | 100% | 100% | 100% | |
| | Overall SSA | NC | NC | 99.84% | 99.54% | 99.89% | 100% | 96.57% | 97.26% | 99.76% | 100% | 98.96% | 100% | 99.57% | 100% | 99.91% | 99.99% | 97.71% | 100% | 99.93% | 100% | |
| 6 | Call Setup Success Rate ($\geq 95\%$) | Major Roads | NC | NC | 99.45% | 100% | 100% | 100% | 99.24% | 100% | 100% | 100% | 100% | 100% | 99.33% | 100% | 100% | 100% | 99.54% | 100% | 100% | 100% |
| | | Highways | NC | NC | 100% | 100% | 98.50% | 100% | 98.86% | 100% | 98.47% | 100% | 98.80% | 100% | 99.00% | 100% | 100% | 100% | 99.14% | 100% | 100% | 100% |
| | | Within City | NC | NC | 99.34% | 100% | 99.38% | 100% | 99.24% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 99.38% | 100% | 100% | 100% | 100% | 100% |
| | | Overall SSA | NC | NC | 99.57% | 100% | 99.42% | 100% | 99.17% | 100% | 99.60% | 100% | 99.77% | 100% | 99.50% | 100% | 99.81% | 100% | 99.58% | 100% | 100% | 100% |
| 7 | Hand Over Success Rate (HOSR) | Major Roads | NC | NC | 99.17% | 100% | 99.14% | 100% | 96.74% | 100% | 100% | 100% | 100% | 100% | 99.01% | 100% | 98.98% | 100% | 100% | 100% | 100% | 100% |
| | | Highways | NC | NC | 100% | 100% | 98.47% | 100% | 95.24% | 100% | 100% | 100% | 96.20% | 100% | 100% | 100% | 99.17% | 100% | 100% | 100% | 100% | 100% |
| | | Within City | NC | NC | 100% | 100% | 100% | 100% | 98.91% | 100% | 99.02% | 100% | 100% | 100% | 100% | 100% | 99.34% | 100% | 100% | 100% | 100% | 100% |
| | | Overall SSA | NC | NC | 99.71% | 100% | 99.34% | 100% | 97.08% | 100% | 99.65% | 100% | 99.18% | 100% | 99.63% | 100% | 99.15% | 100% | 100% | 100% | 100% | 100% |

NA-Not Applicable

NC: No Coverage

7.1 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

| Name of SSA | Month of Drive Test | Day 1 | | Day 2 | | Day 3 | |
|---------------|---------------------|--|--|--|---|---|--|
| | | Name of SDCA Covered | Route Covered | Name of SDCA Covered | Route Covered | Name of SDCA Covered | Route Covered |
| KARNAL | July-14 | Karnal, Panipat, Gharaunda / 118KM | 1) Karnal City: BSNL Exchange - Meeraghati-Sadar Bazaar- Railway Road- Mall Road 2) Panipat City: Sec-13-Sec-17- Bus Stand- Sanjay Chowkn- Sec-11- Sec-12 3) NH1- Tau Devi Lal-Madhuban- Gharaunda - Kohand 4) Toll Tax Panipat- Kohand-Salwa- Arrandha- Jaisinghpur- Jundla- Jalmana. INDOOR: Civil Hospital Panipat | Nilokheri, Karnal, Jyotisar / 137KM | 1) Nilokheri- Umri- Sec-13-Sec-2 Sec-4 Sec-3- Sec-7- Sec-2-Sec-13 2) Aggrasain Chowkn- Ambedkar Chowkn- Patel Chowkn- Gate-3 KUK- Railway Road- Proffessor Colony- Shanti Nagar- Pehowa 3) Karnal Liberty Chowkn- Trawari- Nilokheri-Umri 4) Jyotisar- Pehowa- Dhand- Kaul- Sawli- Shoga-chachuwa- Karnal. INDOOR: KUK | Pundri, Kaithal, Pehova / 170KM | 1) Pundri- Kaithal Jaat School- Pehowa Chowkn- Model Town- Sec-20- Sec-19- Anaj Mandi- Hsb- New Bus Stand- Ambedkar Chowkn-Cheekha Gulha 2)Kaithal- Mall Road- Nissing- Pundri-Naua- Kaithal 3) Kaithal- Siman- Kanthali- Peedal- Cheekha- Gulha- 4) Patiala Road- Pehowa- Baghdad-Ballagarh. Indoor: Medical College Kaithal |
| AMBALA | Aug-14 | Ambala City, Ambala Cantt, Dhurkhra, Balana,Saha, Mulana, Barara,Sarakpur, Methapur./ 170KM | 1) Bsnl Exchange, Mall Road, Kalka Road,Manav Chowk,Sec9,Model Town. 2) Dhurkhra,Prem Nagar,Sec-7, Jansui, Mohra, Kesari. 3) Saha, Mulana, Barara, | Yamunanagar, Jagadhari, Mustafabad, Thana Chappar / 175KM | 1) Jagadhari Bus Stand, Bherthal, Bilaspur, Ledhi, Khizrabad,Chachrauli 2) Manakpur, Chachrauli Road,Budiya Chowk, Aggrasian Chowk,Sec-18,Kanhaiya Chowk 3) Fountain Chowk, Vishwakarma Chowk, Saharanpur Road,Sugar Mill,Kamani Chowk. 4) Sec-18, Sec-17, Durga Garden, Professor Colony, Dhana Chappar, Mustafabad. | Kalka, Pinjore, Naraingarh / 160KM | 1) Chacho Majra, Bharog, Patwi, Dhananashahjadpur, Choti Bhasi, Nariyan Garh. 2) Bus Stand, Nariyan Garh, Sec-4,Grain Market, Laacha, Bhurewala, Raipurani. 3) Tabar, Barbola, Sultanpur ,Naggal, Itbp Bhanu, Ramgarh, Hmt, Lower Bazaar. 4) Gandhi Chowk, Railway |

AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER 2014 - HARYANA CIRCLE

| | | | | | | | |
|----------------|--------|---|--|---|--|--|---|
| | | | <p>Sarakpur, Methapur 4) Brahm Kumari Chowk, S.D College, Sadra Bazaar, Sigligarh Moholla.</p> <p>INDOOR: MIET College</p> | | <p>INDOOR: Madhu Hotel (Yamuna Nagar)</p> | | <p>Road, Model Town, Lohgarh, Jangipur, Kona.</p> <p>INDOOR: Ramgarh Fort, Pinjore Garden</p> |
| SONIPAT | Sep-14 | <p>Gannaur, Murthal, Bahalgarh, Kundli / 160KM</p> | <p>1) sec-5, sec-12, Bahalgarh, Khewra, jhundpur, jakholi, rai, kundli 2) Bahalgarh, murthal, DCR, Haweli, Ganour, Begha, Ghsoli, Malikpur, Bighan 3) Kami, Ganour City, Khubru Road, Ahir Majra, Kheri Gujjar, Ganour.</p> <p>INDOOR: DCR University</p> | <p>Kharkhoda, Sonipat, Saidpur / 145KM</p> | <p>1) sec-14, chintpurni mandir, Adarsh Nagar, Bus stand, Geeta Bhawan, Subhash Chowk, kache Quarter, Old dc road 2) ITI chowk, Bandepur, Rathdhana, Jagdishpur. AK Barota, chhtera 3) Nahra, Saidpur, Shoti, Phladpur, kharkhoda city, sisana, silana, Bidian, Bhatgaon, Mehlana, Sonipat.</p> <p>INDOOR: Tehsil Kharkhoda</p> | <p>Barota, sarai Namdar, Mahra, Rukhi, Gohana City, Ahulana, Kathura. / 160KM</p> | <p>1) Kalupur, Sec-23, Jain Bagh, Mayur Vihar, Indian Colony, Barwasni, Mohana, pinana 2) Barota, sarai Namdar, Mahra, Rukhi, Gohana City, Ahulana, Kathura. 3) Dhanana, Ridhana, garwal, Nuran Khera, gangana, Jagsi, Chetra, Chidana, mudlana, shamri sisan, Khanpur, jouli, Lath.</p> <p>INDOOR: Bus Stand Gohana</p> |

7.2 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF KARNAL SSA (JULY-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 | AIRTEL | Karnal & Panipat | Poor Level & Quality near Jundla, Salwan, Asans Outer, Panipat Outer | Kurukshetra, Pehowa, Dhand & Karnal | Poor Level & Quality near Kachwa and Poor Quality near Pehwa, Umri, Liberty Chowk Karnal, Kaul | Kaithal | Poor Quality near Kangthali, Kaithal Outer |
| 2 | BSNL | | Poor Level & Quality near Phaprana, Jundla | | Poor Level & Quality near Pehgwa, Sakra, Kegwa | | Poor Level & Quality near Siwan, Manjura |
| 3 | TATA GSM | | Poor Level & Quality near Salwan, Sekhpura, Dudlana, Jundla | | Poor Level & Quality near Umaicha, Loharmaira, Sambhali, Sakra | | Poor Level & Quality near Lalpur, Diwana, Mundhri |
| 4 | TATA CDMA | | Poor Level & Quality near Jalmana | | Poor Level & Quality near Pehowa Outer, Umri Outer | | Poor Level near Bhagal, Mundhri, |
| 5 | IDEA | | Poor Level & Quality near Jundla | | Poor Level & Quality near Pehowa Outer, Dhand, Sambhali, Kalampura, Tarawari | | Poor Quality near Kaithal Outer |
| 6 | RCOM GSM | | Poor Level & Quality near Shekhpura, Bazida Jatan, Babarpur, Balla | | Poor Level & Quality near Josar, Dhand Outer, Kurukshetra university, Jindal Park, Raipur Roran, Kachwa, Shamgarh, Tarawari, Sambhali, Sakra | | Poor Level & Quality near Polar, Cheeka Outer, Diwana, SaidanThrota, Kuchpura, Kaithal Outer |
| 7 | RCOM CDMA | | ---- | | Poor Level & Quality near Batheri, Saidan, Sambhali, Umri | | Poor Level near Kangthali, Cheeka, Teontha |
| 8 | VIDEOCON | | Poor Level & Quality between Peont to Jundla, Poor Quality near Madhuban, Devi lal Chowk | | Poor Level & Quality near Nilokheri, Umri, No coverage between Pehowa to Dhand | | Poor Level & Quality near Kangthali, Kaithal Bypass, Mohna |
| 9 | VODAFONE | | Poor Quality near Jundla, Rairkalan, Salwan | | Poor Quality near Murtazapur, Kachwa, Uchana | | Poor Quality patches near Shahpur, Mundri |
| 10 | AIRCEL | | NC | | NC | | NC |

NC: No Coverage

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF AMBALA SSA (AUGUST 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 | AIRTEL | Ambala & Barara | Poor Level & Quality near Jansui, Dhurkra, Barara | Chhachhrauli & Jagadhari | Poor Level & Quality near Bilaspur, Sugarmill Jagadhari | Naraingarh & Kalka | Poor Level & Quality near Chajumajra, Chhachhrauli Outer, Dhanana |
| 2 | BSNL | | Poor Level & Quality near Hasanpur Nagal, Bada Khuda | | Poor Quality & Level near Bilaspur, Yakubpur | | Poor Level & Quality near Karanpur, Shahjadpur, Naraingarh Outer |
| 3 | TATA GSM | | Poor Level & Quality near Sarangpur, Pattinahar, Salarheri, Ghaseetpur, Khanpur, between Dhanori to Segta | | Poor Level & Quality near Kakrauli, Mamli, Kurewada, Baroli majra, Gulabgarh, Panjeton, Kanharikhurd, Mehranwali | | Poor Level & Quality near Dhamala, Badi Khori, Chautan, Kheri, Shahjadpur |
| 4 | TATA CDMA | | Poor Level & Quality near Barara Outer, near Jansui | | Poor Level near Chhachhrauli Outer | | Poor Level near Raipurani, Barwala |
| 5 | IDEA | | Poor Level & Quality near Mohri, Model Town | | Poor Level & Quality near Jagadhari Outer, Khajirabad, Hafizpur, Khera | | Poor Level & Quality near Marwakalan, Pinjore Outer, Barwala |
| 6 | RCOM GSM | | Poor Level & Quality near Balana, Jandli, Kesri, Kalpi, Nurpur, Sahibpura, Mathedi | | Poor Level & Quality near Chappar, Bilaspur, Mandkheri, Fadahpur, Kail, Sherpur | | Poor Level & Quality near Barwala, Shahjadpur, Rehawar, Mauli, Kiratpur |
| 7 | RCOM CDMA | | Poor Quality near Bihta, Hassanpur, Sahibpura | | Poor Level patches near Sherpur | | Poor Level near Raipurani |
| 8 | VIDEOCON | | Poor Quality near Ghaseetpur | | --- | | Poor Quality patches near Balwala, Kona |
| 9 | VODAFONE | | Poor Quality patches near Bulana, Rajuli, Matheri | | Poor Quality near Khera market | | Poor Quality near Dhamala, Dhanana, Raipurani |
| 10 | AIRCEL | | NC | | NC | | NC |

NC: No Coverage

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF SONIPAT SSA (SEPTEMBER 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 | AIRTEL | Sonipat | Poor Level & Quality near Begha, Raai, Kundali Outer, Khedwa and Poor Quality near Gannaur, Murthal | Sonipat | Poor Level near Rathdhana, Saidpur, Kharkhoda Outer | Sonipat & Gohana | Poor Level & Quality near Kathura, Gohana Outer |
| 2 | BSNL | | Poor Level & Quality near Bhigan | | Poor Level & Quality near Rathdhana, Mehlana, Saidpur, Poor Quality near Farmanah, Nahara | | Poor Quality near Ahdana, Pinana |
| 3 | TATA GSM | | Poor Level & Quality patches near Kheri Gujjar, Begha, Khevada | | Poor Level & Quality near Farmanah, Sisana, Jagdishpur, Saidpur, Rohana | | Poor Level near Bhainsawa khurd, Lath, Karewari, Pinana |
| 4 | TATA CDMA | | Poor Level patches near Kheri Gujjar, Begha, Bahalgarh | | Poor Level near Nahra, Saidpur | | Poor Level near Baroda, Mohana, Dhamana, Sisan |
| 5 | IDEA | | Poor Level & Quality near Gannaur, Kundali Outer | | Poor Level & Quality near Jasrana, Salimsar | | Poor Level & Quality near Mohana, Rindhana |
| 6 | RCOM GSM | | Poor Level & Quality near Gannaur Outer, Datauli, Bahalgarh, Rai, Rasoi, Srinagar | | Poor Level & Quality patches near Farmanah, Gorar, Rathdhana, Sisana | | Poor Level & Quality near Gohana Outer, Mohana |
| 7 | RCOM CDMA | | Poor Level & Quality near Gannaur Outer | | Poor Level near Faramnah, Kharkhoda Ouer | | Poor Level near Gohana Outer, Jasia |
| 8 | VIDEOCON | | Poor Quality near Kheri Gujjar, Badkhalsa | | Poor Quality near Chhtera, Rampur | | Poor Quality near Katwal, Gohana Outer |
| 9 | VODAFONE | | Poor Quality near Kheri Gujjar, Dhatauri, jhundpur, Manet | | Poor Level & Quality near Farmana, Mehlana, Kundal, Rohana | | Poor Quality near Mehra, M oi Hooda |
| 10 | AIRCEL | | NC | | NC | | NC |

NC: No Coverage

7.3 KEY FINDINGS ON DRIVE TEST:

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

- (i) Aircel has no coverage in all the SSAs where drive tests were conducted during the quarter. In fact, Aircel is having its very limited presence in Haryana circle with only 28 BTSs in entire Haryana service area.
- (i) **In the Month of July -14** drive tests were conducted across **Karnal SSA** covering Karnal, Panipat, Gharanda, Nilokheri, Karnal Jyotisar, Pundri, Kaithal and Pehova SDCAs during three consecutive days. The overall performance of **BSNL** and **RCOM (GSM)** with regard to the parameter **Voice Quality** was **94.43% (Outdoor)** and **94.73% (Outdoor)** respectively. The performance of all other service providers was in general satisfactory.
- (ii) **In the Month of August-14**, drive tests were conducted across **Ambala SSA** covering Ambala, Dhurkhra, Balna, Saha, Mulana, Barara, Sarakpur, Methapur, Yamunanagar, Jagadhari, Mustafabad, Thana Chappar, Kalka, Pinjore and Naraingarh SDCAs during three consecutive days of drive test. In this SSA, the performance of **BSNL** and **RCOM (GSM)** remained short of benchmark for parameter **Good Voice Quality** with their achieved value of **93.03% (Outdoor) / 94.99% (Indoor)** and **94.63%** respectively. The performance of all other service providers was in general satisfactory.
- (iii) **In the month of September-14**, drive tests were conducted across **Sonipat SSA** covering Gannaur, Murthal, Bahalgarh, Kharkhoda, Soniupat, Saidpur, Barota, Sarai Namdar, Mahra, Rukhi, Gohana City, Ahulana and Kathura SDCAs. In Sonipat SSA, the overall performance of all the Service providers was well within the benchmark for all the parameters.

The deficiencies with respect to adequate coverage and voice quality, observed on the drive tests plots, at the various places are summarized in the table-5, table-6 and table -7 (above) respectively for three SSAs.

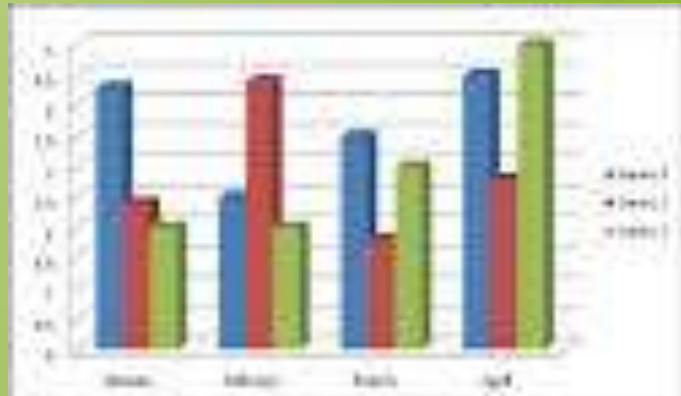
*Thus **BSNL** and **RCOM (GSM)** were **non-compliant** with respect to the parameter ‘**Voice Quality**’ in Karnal and Ambala SSAs. The underperformed operators need to improve their network performance in respect of this parameter.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

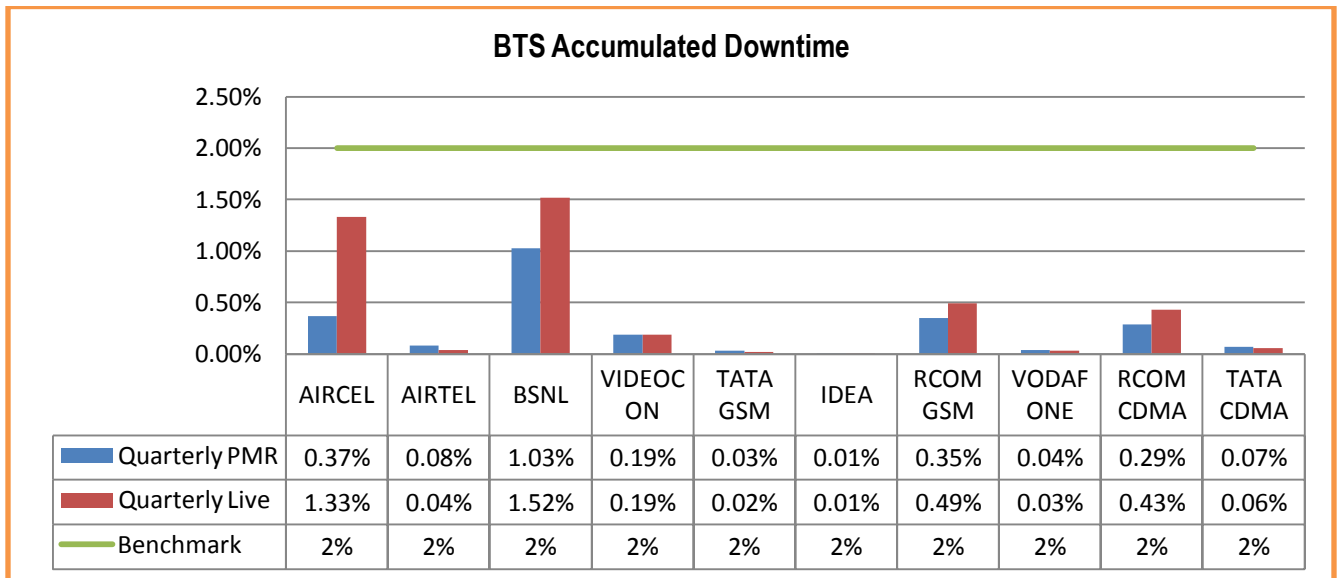
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION:

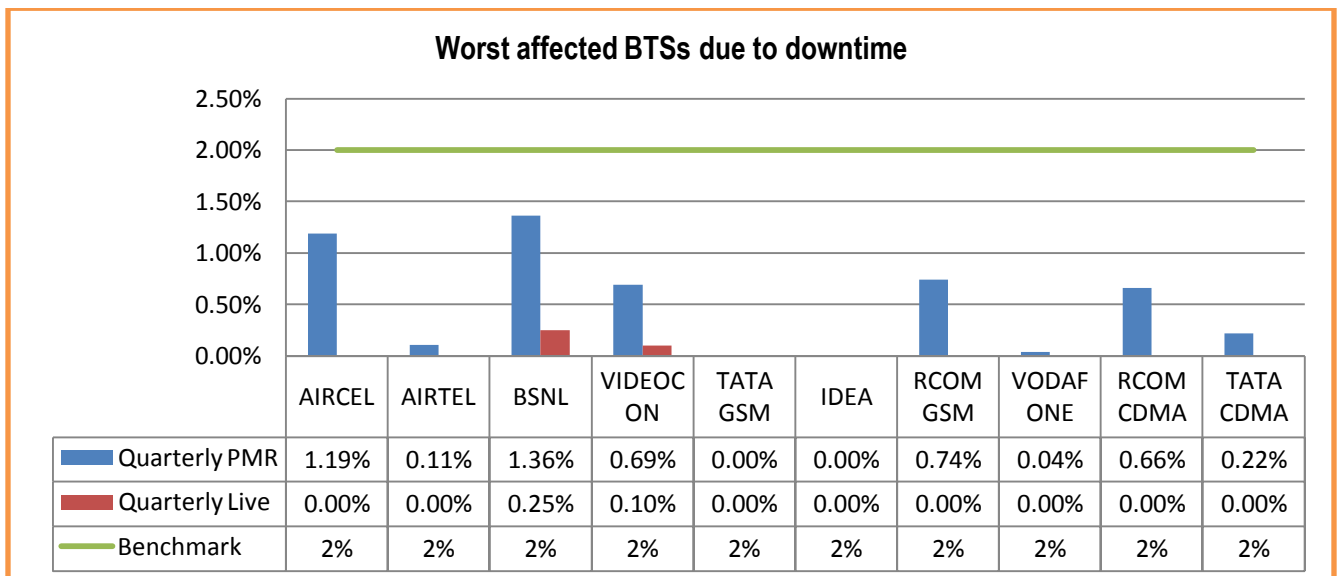
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME:



All operators are meeting the benchmarks.

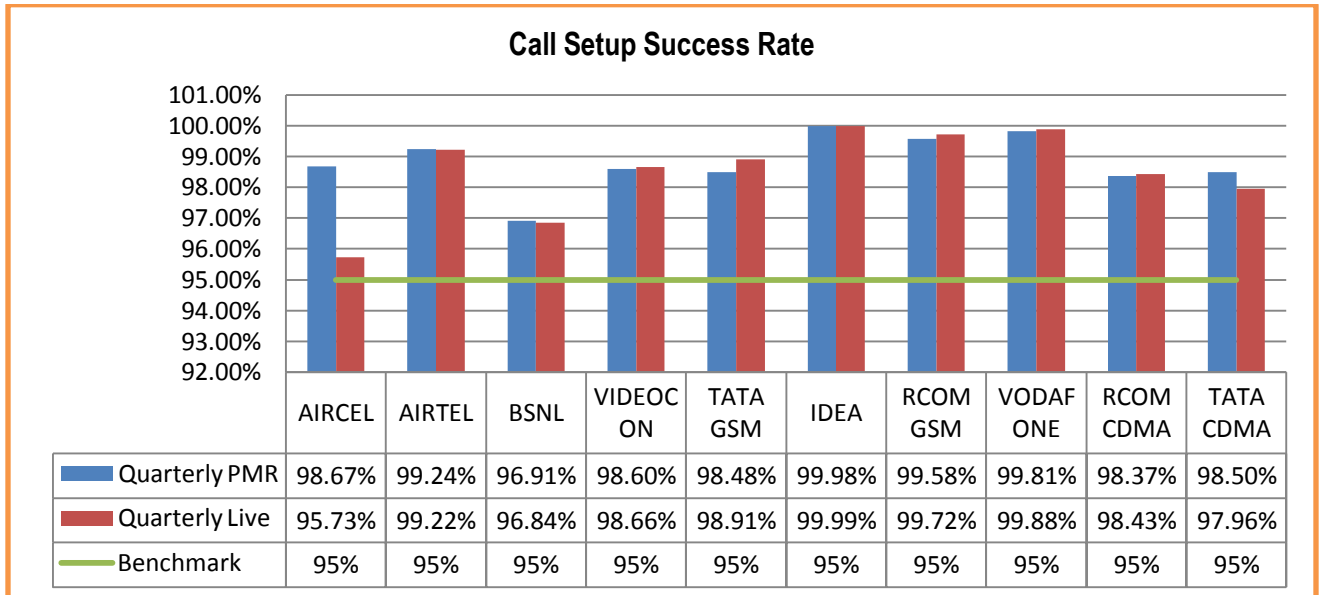
2) WORST AFFECTED BTSS DUE TO DOWNTIME:



All operators are meeting the benchmarks.

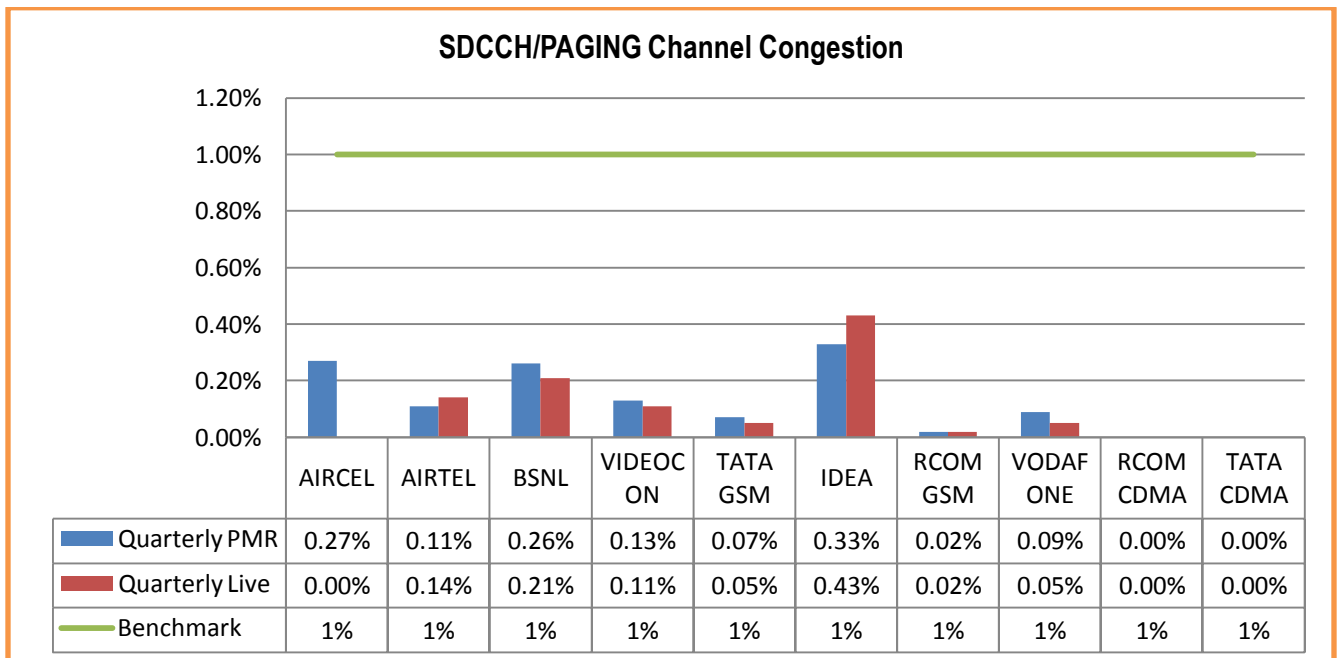


3) CALL SETUP SUCCESS RATE:



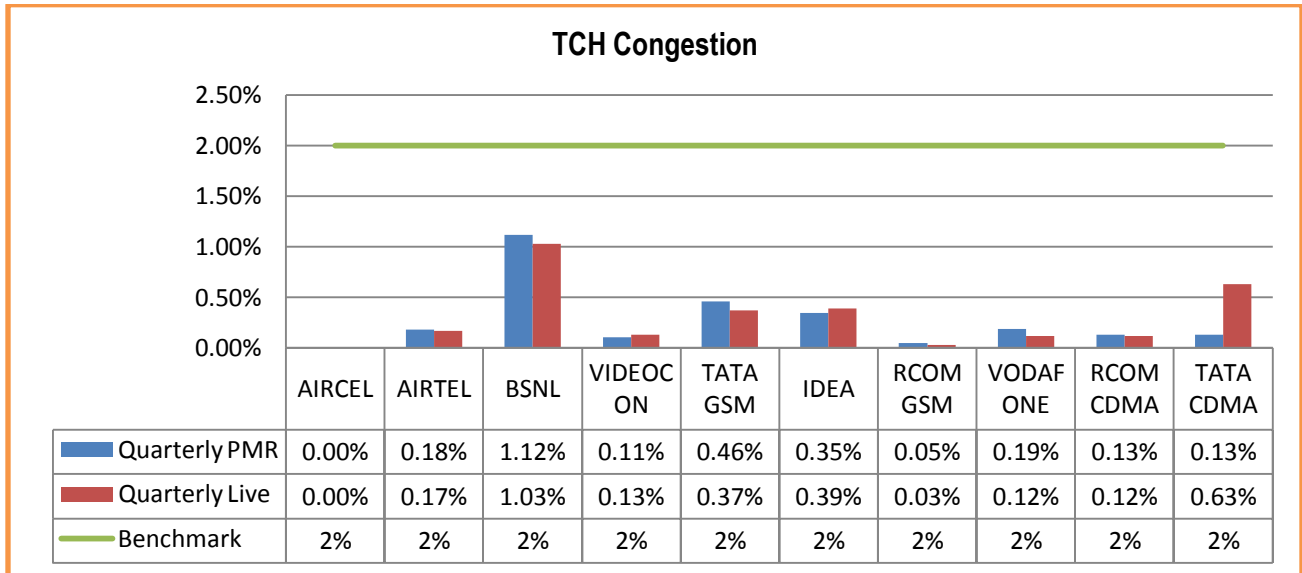
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:



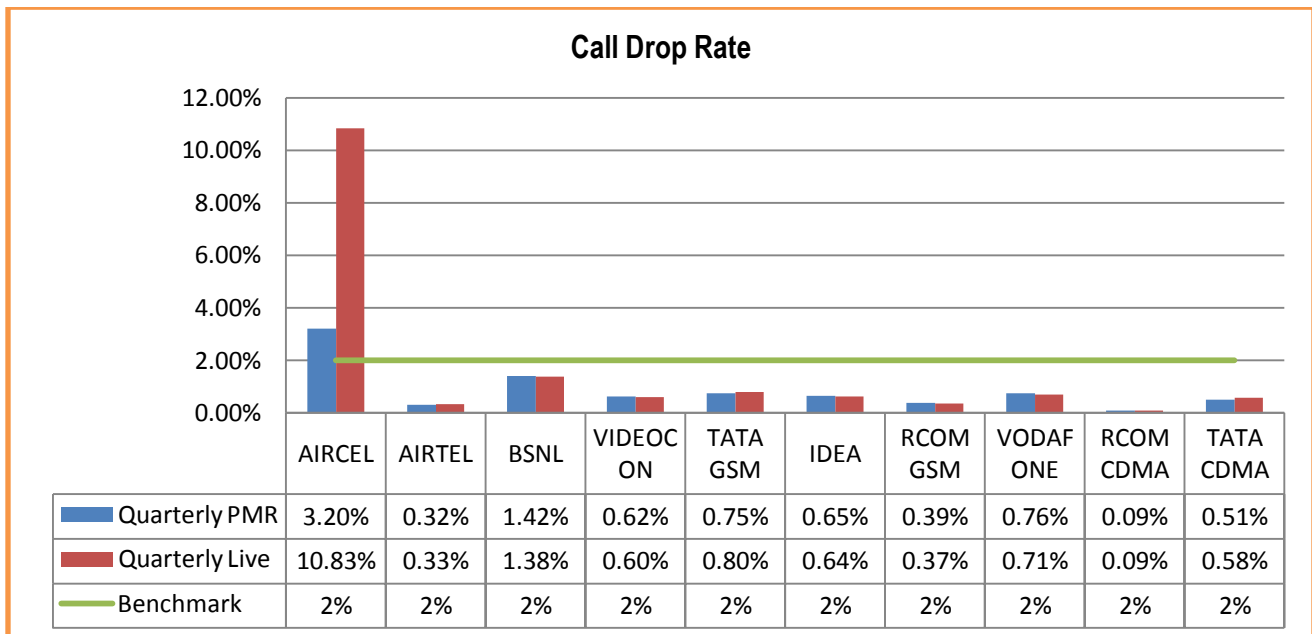
All operators are meeting the benchmarks.

5) TCH CONGESTION:



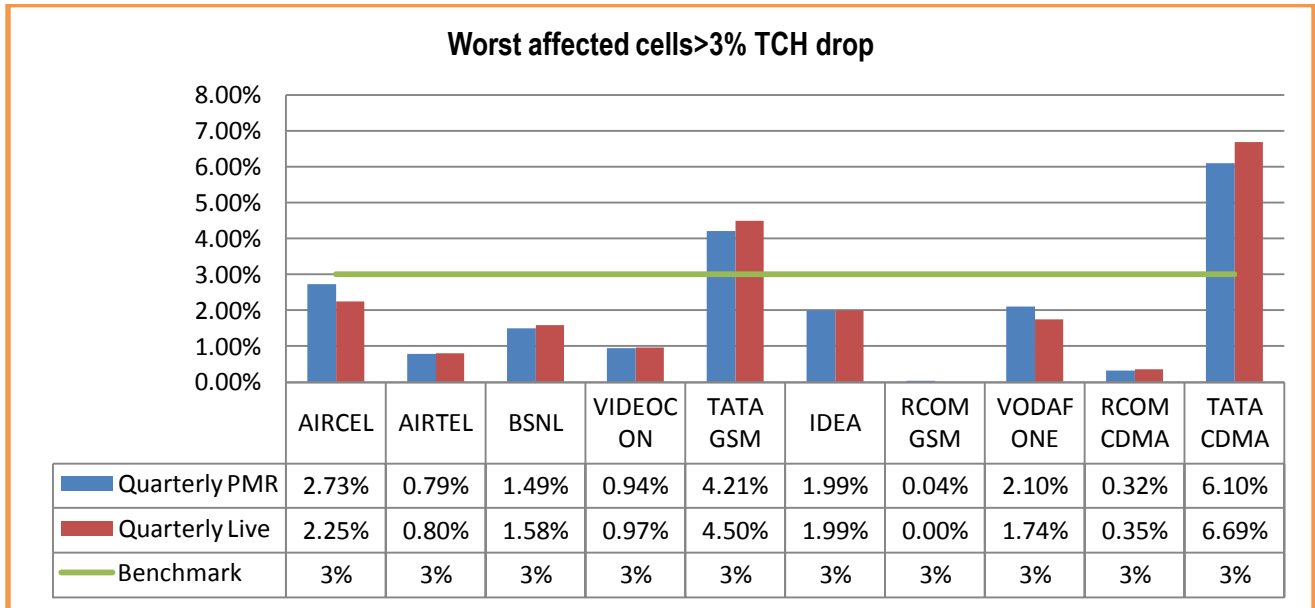
All operators are meeting the benchmarks.

6) CALL DROP RATE:



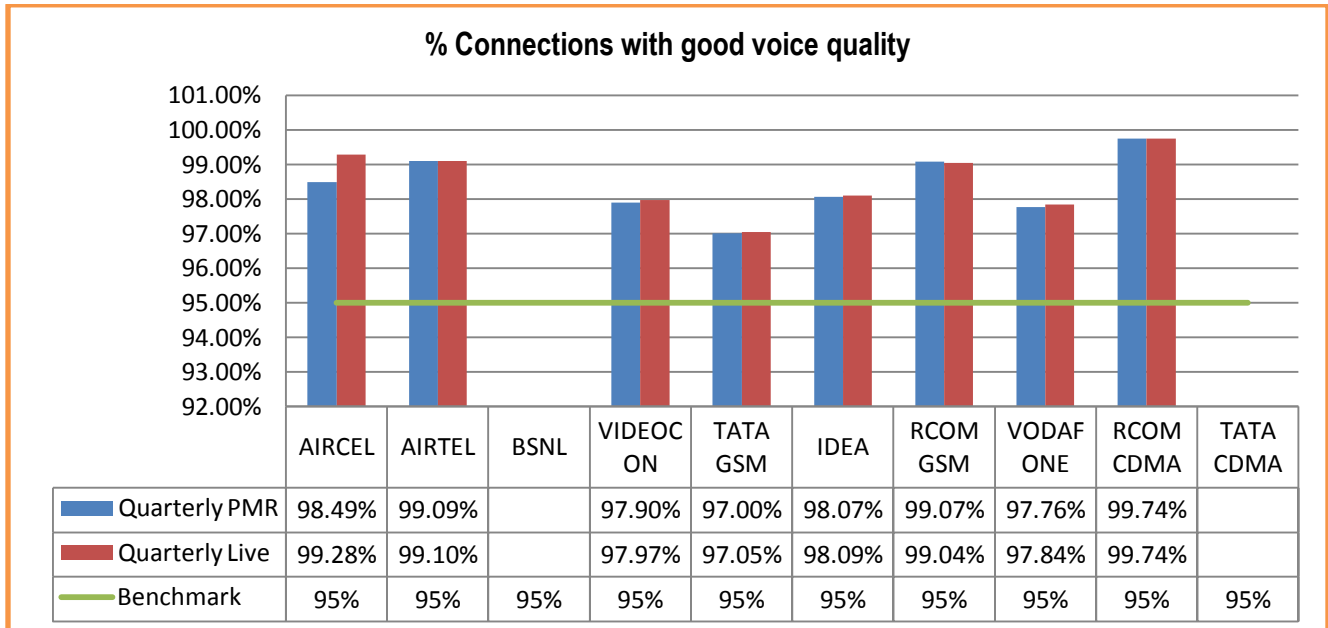
All operators are meeting the benchmarks except Aircel.

7) WORST AFFECTED CELLS>3% TCH DROP:



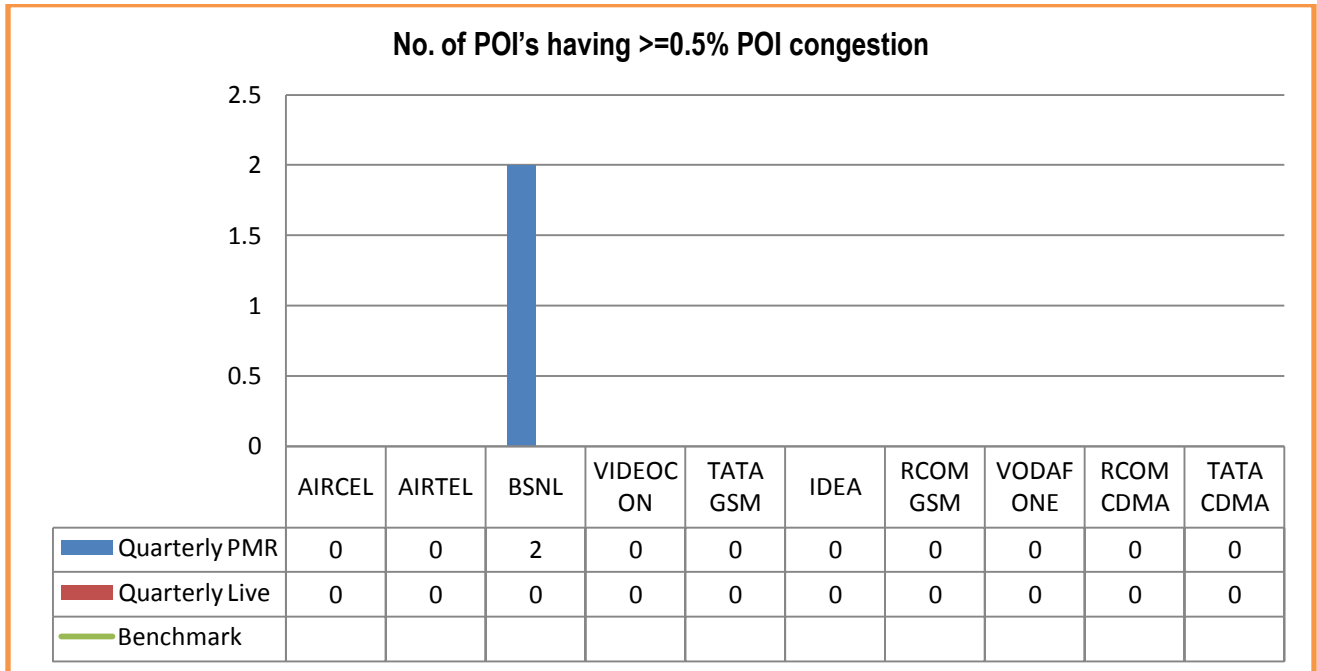
All operators are meeting the benchmarks except Tata GSM & Tata CDMA.

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks. BSNL and Tata CDMA are not having the system generated data for VQ, so not provided the data.

9) POI CONGESTION:



All operators are meeting the benchmarks except BSNL.