



**Audit & Assessment of Quality of Service  
Of  
Cellular Mobile Telephone Service  
For  
Telecom Regulatory Authority of India  
North Zone – Haryana Service Area  
(July 2015 – September 2015)**

**Prepared by:-  
TÜV SÜD SOUTH ASIA PVT. LTD,  
C-153/1, Okhla Industrial Estate,  
Phase-1, New Delhi – 110020  
Telephone 011- 30889611  
Fax: 011-30889595**

## PREFACE

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

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

TUV-SUD South Asia carried out QoS audit as per the norms of TRAI in all the eight circles / services areas of the North Zone and four circles of the West Zone. This report details the performance of the various service providers in **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 20<sup>th</sup> March, 2009 and the Quality of Service of Broadband Service Regulations, 2006 (11 of 2006) dated 6<sup>th</sup> 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**





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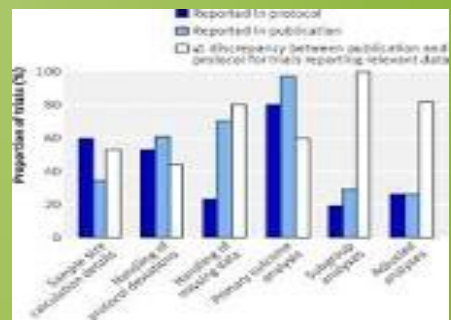
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 2015 – September 2015.**

The Scope of work as per the Terms of Reference (TOR) includes the following:

- i) Preparation of Performance Monitoring reports (PMRs) and uploading in the system.
- ii) Live measurements of the performance of Service Providers (SPs) against the benchmarks for three days during each audit.
- iii) Monthly audit based on one month data of the SPs.
- iv) Drive test of the RF networks.
- v) Audit of the performance of call centers with respect to their accessibility and percentage of calls answered by the operators and random customer feedback by calling the customers to get feedback of the services provided by the service providers.
- vi) Transfer of data generated by the RF drive test/Live measurements / PMR/ monthly audit to the server located at TRAI premises on real time basis.

### 3. SAMPLE SIZE



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#### 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-15	August-15	September -15	
<b>GSM Operators</b>					
1	AIRCEL	20 to 22 Jul-15	12 to 14 Aug-15	7 to 9 Sep-15	Green Buleward Building, NSN office, Sector-62, Noida (UP)
2	AIRTEL	22 to 24 Jul-15	21, 24 & 25 Aug-15	8 to 10 Sep-15	Bharti Airtel Ltd, Plot No. 21, Rajiv Gandhi Chandigarh Technology Park, Chandigarh.
3	BSNL	17, 21 & 22 Jul-15	19 to 21 Aug-15	16 to 18 Sep-15	AGM (PG) Cum Nodal Officer (TRAI) O/o CGMT Haryana, Ambala (HR)
4	VIDEOCON	8 to 10 Jul-15	12 to 14 Aug-15	9 to 11 Sep-15	Videocon Telecommunication Ltd, Golden Palace, Near Vita Milk Plant, Jasmeet Nagar, Ambala City-134007
5	TATA GSM	21 to 23 Jul-15	19 to 21 Aug-15	17, 18 & 21 Sep-15	Tata Teleservices Limited, 5 - Jasmeet Nagar, Near Vita Milk Plant Gt Road, Ambala, Ambala-134001, India
6	IDEA	20 to 22 Jul-15	24 to 26 Aug-15	22 to 24 Sep-15	Idea Cellular Limited, E-5, Sector-63, Noida (UP)
7	RCOM GSM	15 to 17 Jul-15	24 to 26 Aug-15	10, 11 & 14 Sep-15	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
8	VODAFONE	16, 17 & 20 Jul-15	19 to 21 Aug-15	17, 18 & 21 Sep-15	Vodafone Digilink Limited, 173 HSIDC Industrial Area, Sector-3, Karnal (Har.)
<b>CDMA Operators</b>					
9	RCOM CDMA	15 to 17 Jul-15	24 to 26 Aug-15	10, 11 & 14 Sep-15	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
10	TATA CDMA	21 to 23 Jul-15	19 to 21 Aug-15	17, 18 & 21 Sep-15	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. 2015.

The data generated by monthly PMR and 3-days live measurements audit for the period July 2015 to September 2015 has been successfully uploaded to the server located at TRAI premises.

### 3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles only **once in a year. Based on this criterion, QoS audit for basic (wire line) service was not required to be done for Haryana circle in the quarter ended September - 2015, as the same has already been done during QE December 2014.**

### 3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV-SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle only **once in a year. Based on this criterion, the QoS audit for Broadband service was not required to be done for Haryana circle in the quarter ended September - 2015, as the same has already been done during QE December 2014.**

## **4. EXECUTIVE SUMMARY**



## 4. EXECUTIVE SUMMARY

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

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

### Cellular Mobile:

(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, **Aircel, Tata (GSM) and Tata (CDMA)** remained non-complied for the parameter **Worst affected Cells > 3% TCH drops** with their average performance as **3.89%, 4.05% and 7.61%** respectively. Further, **Aircel** also failed to meet the benchmark of the parameters **Call Drop Rate (CDR)** with its achieved levels as **2.53%**.

(ii) From three days assessment, the performance of all operators was found satisfactory as they were largely meeting the benchmarks except the parameters **CDR** and **‘Worst affected cells> 3 % TCH drops’**, which could not be complied with by **Aircel and Tata (GSM) / Tata (CDMA) respectively**. The average performance of **Aircel** for parameter **CDR** was **2.19%** and that of **Tata (GSM)** and **Tata (CDMA)** for parameter **‘Worst affected cells> 3 % TCH drops’** was **3.88%** and **6.96%** respectively.

**The similar non-compliance of Aircel, Tata (GSM) and Tata (CDMA) was also observed for monthly audit of the quarter.**

(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.

All service providers were in compliance with respect to the parameter 'Accessibility of call center' and '% Calls answered by operator (voice to voice)' except **BSNL , RCOM GSM and Tata (GSM)** have not met the benchmark of parameter **calls answered by Operators (voice to voice) within 90 seconds with their performance as 79.17% , 82.57% and 94.98%** against the benchmark of  $\geq 95\%$ . The performance of BSNL and RCOM (GSM) was way below the benchmark.

In case of the parameters Termination and Time taken for refund, only **Idea** failed to meet the benchmark with its performed vales as **97.19% and 98.46%** respectively.

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 90 seconds. Only **BSNL** remained short of benchmark of '**Call answered by operator (Voice to Voice) within 90 seconds**' with its performance of **52.85 %** , way below the benchmark.

(iv) With regard to **Drive Tests**, the overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. However, **BSNL** remained non-compliant with respect to the parameters **Voice Quality and CDR** in the respective SSAs where drive tests were conducted.

## **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
<b>GSM Operators</b>			
1	AIRCEL	September -15	20:00 - 21:00
2	AIRTEL	September -15	19:00 - 20:00
3	BSNL	September -15	20:00 - 21:00
4	VIDEOCON	September -15	20:00 - 21:00
5	TATA GSM	September -15	20:00 - 21:00
6	IDEA	September -15	20:00 - 21:00
7	RCOM GSM	September -15	20:00 - 21:00
8	VODAFONE	September -15	20:00 - 21:00
<b>CDMA Operators</b>			
9	RCOM CDMA	September -15	20:00 - 21:00
10	TATA CDMA	September -15	19:00 - 20:00

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
<b>GSM Operators</b>						
1	AIRCEL	NA*	1	28	NSN	NSN
2	AIRTEL	4	25	2883	Ericsson	Ericsson
3	BSNL	9	29	2085	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	6	31	3282	NSN	NSN
5	RCOM GSM	1	8	901	Huawei	Huawei
6	TATA GSM	2	12	1641	NSN	NSN
7	VIDEOCON	1	8	1426	Huawei	Huawei
8	VODAFONE	7	46	3090	NSN	NSN
<b>CDMA Operators</b>						
9	RCOM CDMA	3	NA	551	Lucent & ZTE	Lucent
10	TATA CDMA	4	6	388	Ericsson & Huawei	ZTE & Motorola

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

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JULY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - JULY 15 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	July-15	0.22%	0.11%	1.35%	0.18%	0.14%	0.00%	0.62%	0.03%	0.18%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	July-15	0.00%	0.07%	1.35%	0.56%	0.31%	0.00%	1.66%	0.10%	0.00%	0.25%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	July-15	99.87%	98.67%	97.56%	98.78%	97.43%	99.97%	99.71%	99.57%	98.41%	97.34%
	b) SDCCH/PAGING Channel congestion	<=1%	July-15	0.00%	0.18%	0.37%	0.09%	0.16%	0.50%	0.02%	0.13%	0.00%	0.00%
	c) TCH congestion	<=2%	July-15	0.00%	0.37%	0.99%	0.06%	1.24%	0.29%	0.04%	0.43%	0.13%	0.66%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	July-15	3.30%	0.49%	1.39%	0.50%	0.85%	0.64%	0.18%	0.69%	0.06%	0.61%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	July-15	3.92%	0.82%	1.98%	0.59%	4.55%	1.91%	0.01%	1.65%	0.21%	7.03%
	c) Connections with good voice quality	>=95%	July-15	99.23%	98.36%	NP	97.04%	96.80%	98.03%	99.30%	97.66%	99.73%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	July-15	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 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - AUGUST 15 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Aug-15	0.09%	0.07%	0.91%	0.05%	0.05%	0.00%	0.40%	0.01%	0.38%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Aug-15	0.00%	0.03%	1.16%	0.00%	0.12%	0.00%	0.56%	0.03%	0.54%	0.25%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Aug-15	99.39%	98.81%	97.45%	98.77%	97.50%	98.56%	99.70%	99.71%	98.45%	96.22%
	b) SDCCH/PAGING Channel congestion	<=1%	Aug-15	0.00%	0.18%	0.22%	0.08%	0.14%	0.27%	0.02%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Aug-15	0.00%	0.30%	1.04%	0.08%	1.26%	0.42%	0.04%	0.29%	0.11%	1.20%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Aug-15	2.85%	0.32%	1.51%	0.55%	0.85%	0.69%	0.13%	0.78%	0.05%	0.68%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Aug-15	4.26%	0.88%	2.20%	0.75%	4.12%	2.45%	0.04%	2.32%	0.11%	8.24%
	c) Connections with good voice quality	>=95%	Aug-15	99.19%	98.68%	NP	97.16%	96.89%	97.82%	99.30%	97.61%	99.72%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Aug-15	0	0	1	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 15 MONTH:**

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - SEPTEMBER 15 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Sep-15	0.12%	0.07%	1.09%	0.08%	0.09%	0.01%	0.38%	0.02%	0.38%	0.11%
	b) Worst affected BTSs due to downtime	<=2%	Sep-15	0.00%	0.00%	1.34%	0.00%	0.06%	0.00%	0.54%	0.00%	0.54%	0.00%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Sep-15	98.95%	98.87%	97.68%	98.70%	97.21%	98.49%	98.52%	99.69%	98.52%	96.60%
	b) SDCCH/PAGING Channel congestion	<=1%	Sep-15	0.01%	0.22%	0.30%	0.18%	0.24%	0.37%	0.00%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Sep-15	0.00%	0.37%	1.01%	0.10%	1.47%	0.73%	0.10%	0.31%	0.10%	0.97%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Sep-15	1.45%	0.26%	1.57%	0.56%	0.79%	0.69%	0.04%	0.74%	0.04%	0.63%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Sep-15	<b>3.49%</b>	0.80%	2.40%	0.73%	<b>3.48%</b>	2.32%	0.13%	2.14%	0.13%	<b>7.56%</b>
	c) Connections with good voice quality	>=95%	Sep-15	99.12%	98.82%	NP	97.20%	96.85%	97.79%	99.74%	97.63%	99.74%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Sep-15	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.

**5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- SEPTEMBER 15 (JULY- AUGUST- SEPTEMBER 2015 MONTHS AUDITED DATA)**

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE - SEPTEMBER 15) 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.14%	0.08%	1.12%	0.10%	0.09%	0.00%	0.47%	0.02%	0.31%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.03%	1.28%	0.19%	0.16%	0.00%	0.92%	0.04%	0.36%	0.17%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.40%	98.78%	97.56%	98.75%	97.38%	99.01%	99.31%	99.66%	98.46%	96.72%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.00%	0.19%	0.30%	0.12%	0.18%	0.38%	0.01%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.00%	0.35%	1.01%	0.08%	1.32%	0.48%	0.06%	0.34%	0.11%	0.94%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	2.53%	0.36%	1.49%	0.54%	0.83%	0.67%	0.12%	0.74%	0.05%	0.64%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	3.89%	0.83%	2.19%	0.69%	4.05%	2.23%	0.06%	2.04%	0.15%	7.61%
	c) Connections with good voice quality	>=95%	Quarterly	99.18%	98.62%	NP	97.13%	96.85%	97.88%	99.45%	97.63%	99.73%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Quarterly	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.

### 5.1.7 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 found meeting benchmark on the parameters** 'BTS accumulated downtime' and 'worst affected BTSs due to down time'.

- **Connection Establishment (Accessibility)**

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

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

**All the operators were 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 (Retain ability)**

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 **3.89%**.

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

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

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter except **Aircel and Tata Tele Services (TTSL)**. **Aircel, Tata GSM** and **Tata CDMA** failed to meet the benchmark in all the three months of the quarter with their quarterly average performance as **3.89%, 4.05%** and **7.61%** 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

**All operators** were having congestion less than 0.5% on individual POI, thus met the benchmark.

**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 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - HARYANA CIRCLE - JULY 15 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		
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Live data	2.26%	0.03%	1.63%	0.16%	0.16%	0.01%	0.72%	0.03%	0.12%	0.15%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100%	98.89%	97.40%	98.79%	97.64%	99.97%	99.61%	98.82%	98.59%	96.79%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.10%	0.32%	0.20%	0.13%	0.19%	0.03%	0.12%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.23%	1.07%	0.04%	1.05%	0.27%	0.04%	1.18%	0.08%	0.56%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.65%	0.49%	1.42%	0.51%	0.89%	0.61%	0.19%	0.76%	0.06%	0.85%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.57%	0.68%	1.93%	0.62%	4.69%	1.72%	0.00%	1.69%	0.22%	7.41%
	c) Connections with good voice quality	>=95%	Live data	99.12%	98.33%	NP	96.98%	96.84%	97.99%	99.25%	97.50%	99.71%	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 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - AUGUST 15 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.03%	1.90%	0.04%	0.06%	0.00%	0.13%	0.01%	0.40%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100%	98.45%	97.31%	98.80%	97.61%	98.58%	99.76%	99.70%	97.81%	95.18%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.56%	0.12%	0.04%	0.09%	0.21%	0.02%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.30%	1.04%	0.06%	1.15%	0.42%	0.03%	0.30%	0.22%	0.18%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Live data	3.55%	0.32%	1.77%	0.55%	0.84%	0.70%	0.16%	0.86%	0.07%	0.65%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.17%	0.87%	2.68%	0.74%	3.60%	2.65%	0.02%	2.50%	0.16%	7.51%
	c) Connections with good voice quality	>=95%	Live data	99.19%	98.65%	NP	97.15%	96.87%	97.81%	99.32%	97.59%	99.73%	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 15 MONTH:**

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE- SEPTEMBER 15 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.05%	1.69%	0.13%	0.12%	0.00%	0.22%	0.02%	0.51%	0.07%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100%	99.19%	97.79%	98.73%	96.35%	98.51%	99.76%	99.65%	98.80%	95.65%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.17%	0.22%	0.17%	0.60%	0.21%	0.01%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.25%	1.03%	0.10%	1.90%	0.69%	0.03%	0.35%	0.04%	0.49%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.38%	0.23%	1.60%	0.53%	0.80%	0.69%	0.16%	0.76%	0.05%	0.62%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.98%	0.74%	2.39%	0.68%	<b>3.34%</b>	2.40%	0.03%	2.19%	0.24%	<b>5.97%</b>
	c) Connections with good voice quality	>=95%	Live data	99.59%	98.86%	NP	97.27%	96.70%	97.92%	99.36%	97.55%	99.74%	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 2015 MONTHS 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
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.75%	0.04%	1.74%	0.11%	0.11%	0.00%	0.36%	0.02%	0.34%	0.08%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.21%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	100%	98.84%	97.50%	98.77%	97.20%	99.02%	99.71%	99.39%	98.40%	95.87%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.00%	0.28%	0.22%	0.14%	0.27%	0.20%	0.02%	0.11%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.00%	0.26%	1.05%	0.07%	1.37%	0.46%	0.03%	0.61%	0.11%	0.41%
<b>Connection maintenance (Retainability)</b>													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	2.19%	0.35%	1.60%	0.53%	0.84%	0.67%	0.17%	0.79%	0.06%	0.71%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	2.91%	0.76%	2.33%	0.68%	3.88%	2.26%	0.02%	2.13%	0.21%	6.96%
	c) Connections with good voice quality	>=95%	Quarterly	99.30%	98.61%	NP	97.13%	96.80%	97.91%	99.31%	97.55%	99.73%	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, the performance of all operators was found satisfactory as they were largely meeting the benchmarks except the parameters **CDR** and **‘Worst affected cells> 3 % TCH drops’**, which could not be complied with by **Aircel and Tata (GSM) / Tata (CDMA) respectively**. The average performance of **Aircel** for parameter **CDR** was **2.19%** and that of **Tata (GSM)** and **Tata (CDMA)** for parameter **‘Worst affected cells> 3 % TCH drops’** was **3.88%** and **6.96%** respectively.

The similar non-compliance of **Aircel, Tata (GSM) and Tata (CDMA)** was also observed during monthly audit of the quarter.

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 15 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									
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) Total no. of BTSs in the licensed service area		July-15	28	2841	2069	1416	1618	3201	901	3061	551	397
	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-15	46.65	2386.06	20786.71	1874.95	1634.12	99.03	4122.77	626.67	723.10	149.30
	c) BTS Accumulated Downtime	<=2%	July-15	0.22%	0.11%	1.35%	0.18%	0.14%	0.00%	0.62%	0.03%	0.18%	0.05%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		July-15	0	2	28	8	5	0	15	2	0	1
	e) Worst affected BTSs due to downtime	<=2%	July-15	0.00%	0.07%	1.35%	0.56%	0.31%	0.00%	1.66%	0.10%	0.00%	0.25%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	July-15	99.87%	98.67%	97.56%	98.78%	97.43%	99.97%	99.71%	99.57%	98.41%	97.34%
	b) SDCCH/PAGING Congestion	<=1%	July-15	0.00%	0.18%	0.37%	0.09%	0.16%	0.50%	0.02%	0.13%	0.00%	0.00%
	c) TCH congestion	<=2%	July-15	0.00%	0.37%	0.99%	0.06%	1.24%	0.29%	0.04%	0.43%	0.13%	0.66%
<b>Connection Maintenance (Retainability)</b>													
3	a) Call Drop Rate (CDR)	<=2%	July-15	3.30%	0.49%	1.39%	0.50%	0.85%	0.64%	0.18%	0.69%	0.06%	0.61%
	b) Worst affected cells>3% TCH drop	<=3%	July-15	3.92%	0.82%	1.98%	0.59%	4.55%	1.91%	0.01%	1.65%	0.21%	7.03%
	c) % of connections with good voice quality	>=95%	July-15	99.23%	98.36%	NP	97.04%	96.80%	98.03%	99.30%	97.66%	99.73%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		July-15	3	71	121	25	221	186	0	153	4	35
	e) Total no. of cells (Sector) in the licensed service area		July-15	84	8575	6096	4336	4867	9701	2697	9275	1653	498
<b>No. of POI's having &gt;=0.5% POI congestion</b>													
4	No. of POI's having >=0.5% POI congestion		July-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		July-15	0	0	0	0	0	0	0	0	0	0
<b>Network Data</b>													
5	a) Equipped Capacity of Network in Erlang		July-15	212	79797	240000	64419	101730	107431	50000	143573	56000	22018
	b) Total traffic in TCBH in erlang (Avg.)		July-15	2	63286	85026	27265	43358	110338	35344	122346	8326	4230
	c) Total no. of customers served (as per VLR) on last day of the month		July-15	190	2346900	1528368	1064770	1656007	4514831	1526055	4952983	299140	118780

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- July 15 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
<b>Network Service Quality Parameter</b>													
1	<b>Network Availability</b>												
	a) Total no. of BTSs in the licensed service area		Live data	28	2842	2069	1414	1613	3191	901	3051	551	397
	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	45.55	54.45	2432.55	161.81	186.68	16.70	466.85	61.76	47.83	41.47
	c) BTS Accumulated Downtime	<=2%	Live data	2.26%	0.03%	1.63%	0.16%	0.16%	0.01%	0.72%	0.03%	0.12%	0.15%
	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%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100.00%	98.89%	97.40%	98.79%	97.64%	99.97%	99.61%	98.82%	98.59%	96.79%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.10%	0.32%	0.20%	0.13%	0.19%	0.03%	0.12%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.00%	0.23%	1.07%	0.04%	1.05%	0.27%	0.04%	1.18%	0.08%	0.56%	
3	<b>Connection Maintenance (Retainability)</b>												
	a) Call Drop Rate (CDR)	<=2%	Live data	1.65%	0.49%	1.42%	0.51%	0.89%	0.61%	0.19%	0.76%	0.06%	0.85%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.57%	0.68%	1.93%	0.62%	4.69%	1.72%	0.00%	1.69%	0.22%	7.41%
	c) % of connections with good voice quality	>=95%	Live data	99.12%	98.33%	NP	96.98%	96.84%	97.99%	99.25%	97.50%	99.71%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	3	59	119	27	229	167	0	157	4	37
e) Total no. of cells (Sector) in the licensed service area		Live data	84	8588	6192	4335	4873	9699	2697	9243	1653	495	
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>												
	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- Aug 15 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	
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) Total no. of BTSs in the licensed service area		Aug-15	28	2865	2074	1420	1633	3252	898	3076	551	397
	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-15	18.29	1458.18	14079.78	539.38	552.78	98.90	2658.13	260.89	1569.33	154.61
	c) BTS Accumulated Downtime	<=2%	Aug-15	0.09%	0.07%	0.91%	0.05%	0.05%	0.00%	0.40%	0.01%	0.38%	0.05%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Aug-15	0	1	24	0	2	0	5	1	3	1
	e) Worst affected BTSs due to downtime	<=2%	Aug-15	0.00%	0.03%	1.16%	0.00%	0.12%	0.00%	0.56%	0.03%	0.54%	0.25%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Aug-15	99.39%	98.81%	97.45%	98.77%	97.50%	98.56%	99.70%	99.71%	98.45%	96.22%
	b) SDCCH/PAGING Congestion	<=1%	Aug-15	0.00%	0.18%	0.22%	0.08%	0.14%	0.27%	0.02%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Aug-15	0.00%	0.30%	1.04%	0.08%	1.26%	0.42%	0.04%	0.29%	0.11%	1.20%
<b>Connection Maintenance (Retainability)</b>													
3	a) Call Drop Rate (CDR)	<=2%	Aug-15	2.85%	0.32%	1.51%	0.55%	0.85%	0.69%	0.13%	0.78%	0.05%	0.68%
	b) Worst affected cells>3% TCH drop	<=3%	Aug-15	4.26%	0.88%	2.20%	0.75%	4.12%	2.45%	0.04%	2.32%	0.11%	8.24%
	c) % of connections with good voice quality	>=95%	Aug-15	99.19%	98.68%	NP	97.16%	96.89%	97.82%	99.30%	97.61%	99.72%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Aug-15	4	75	135	33	203	240	1	216	2	56
	e) Total no. of cells (Sector) in the licensed service area		Aug-15	84	8622	6147	4350	4924	9792	2692	9320	1653	684
<b>No. of POI's having &gt;=0.5% POI congestion</b>													
4	No. of POI's having >=0.5% POI congestion		Aug-15	0	0	1	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Aug-15	0	0	VODMB3(GMSS)	0	0	0	0	0	0	0
<b>Network Data</b>													
5	a) Equipped Capacity of Network in Erlang		Aug-15	212	81098	240000	64793	101978	108387	50000	143801	56000	35878
	b) Total traffic in TCBH in erlang (Avg.)		Aug-15	2	62834	90595	28645	45122	112684	35927	123337	10809	6482
	c) Total no. of customers served (as per VLR) on last day of the month		Aug-15	311	2478107	1631514	1072965	1659389	4500512	1542010	4910222	299135	121437

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Aug 15 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	
<b>Network Service Quality Parameter</b>													
1	<b>Network Availability</b>												
	a) Total no. of BTSs in the licensed service area		Live data	28	2866	2071	1419	1633	3225	898	3074	551	397
	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	0.00	69.00	2837.77	38.81	73.15	7.73	84.55	18.39	157.18	6.00
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.03%	1.90%	0.04%	0.06%	0.00%	0.13%	0.01%	0.40%	0.02%
	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%	0.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100.00%	98.45%	97.31%	98.80%	97.61%	98.58%	99.76%	99.70%	97.81%	95.18%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.56%	0.12%	0.04%	0.09%	0.21%	0.02%	0.11%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.00%	0.30%	1.04%	0.06%	1.15%	0.42%	0.03%	0.30%	0.22%	0.18%	
3	<b>Connection Maintenance (Retainability)</b>												
	a) Call Drop Rate (CDR)	<=2%	Live data	3.55%	0.32%	1.77%	0.55%	0.84%	0.70%	0.16%	0.86%	0.07%	0.65%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.17%	0.87%	2.68%	0.74%	3.60%	2.65%	0.02%	2.50%	0.16%	7.51%
	c) % of connections with good voice quality	>=95%	Live data	99.19%	98.65%	NP	97.15%	96.87%	97.81%	99.32%	97.59%	99.73%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	3	75	166	32	178	260	1	233	3	55
e) Total no. of cells (Sector) in the licensed service area		Live data	84	8653	6202	4350	4932	9823	2690	9314	1653	737	
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>												
	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 15 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	
<b>Network Service Quality Parameter</b>													
1	<b>Network Availability</b>												
	a) Total no. of BTSs in the licensed service area		Sep-15	28	2883	2085	1426	1641	3282	551	3090	551	388
	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-15	24.36	1354.24	16367.72	838.93	1053.43	148.45	1511.82	431.79	1511.82	310.12
	c) BTS Accumulated Downtime	<=2%	Sep-15	0.12%	0.07%	1.09%	0.08%	0.09%	0.01%	0.38%	0.02%	0.38%	0.11%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Sep-15	0	0	28	0	1	0	3	0	3	0
e) Worst affected BTSs due to downtime	<=2%	Sep-15	0.00%	0.00%	1.34%	0.00%	0.06%	0.00%	0.54%	0.00%	0.54%	0.00%	
2	<b>Connection Establishment (Accessibility)</b>												
	a) CSSR (Call Setup Success Rate)	>=95%	Sep-15	98.95%	98.87%	97.68%	98.70%	97.21%	98.49%	98.52%	99.69%	98.52%	96.60%
	b) SDCCH/PAGING Congestion	<=1%	Sep-15	0.01%	0.22%	0.30%	0.18%	0.24%	0.37%	0.00%	0.12%	0.00%	0.00%
c) TCH congestion	<=2%	Sep-15	0.00%	0.37%	1.01%	0.10%	1.47%	0.73%	0.10%	0.31%	0.10%	0.97%	
3	<b>Connection Maintenance (Retainability)</b>												
	a) Call Drop Rate (CDR)	<=2%	Sep-15	1.45%	0.26%	1.57%	0.56%	0.79%	0.69%	0.04%	0.74%	0.04%	0.63%
	b) Worst affected cells>3% TCH drop	<=3%	Sep-15	<b>3.49%</b>	0.80%	2.40%	0.73%	<b>3.48%</b>	2.32%	0.13%	2.14%	0.13%	<b>7.56%</b>
	c) % of connections with good voice quality	>=95%	Sep-15	99.12%	98.82%	NP	97.20%	96.85%	97.79%	99.74%	97.63%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Sep-15	3	70	149	32	172	230	2	200	2	55
e) Total no. of cells (Sector) in the licensed service area		Sep-15	84	8677	6205	4363	4956	9907	1653	9362	1653	729	
4	<b>No. of POI's having &gt;=0.5% POI congestion</b>												
	No. of POI's having >=0.5% POI congestion		Sep-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Sep-15	0	0	0	0	0	0	0	0	0	0
5	<b>Network Data</b>												
	a) Equipped Capacity of Network in Erlang		Sep-15	212	80586	240000	65148	103293	110945	50000	143550	56000	38016
	b) Total traffic in TCBH in erlang (Avg.)		Sep-15	2	63921	94777	31770	47522	116292	35524	125321	10655	8094
c) Total no. of customers served (as per VLR) on last day of the month		Sep-15	205	2582272	1596587	1109576	1693917	4606806	1549111	4947879	294132	131795	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Sept. 15 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	
<b>Network Service Quality Parameter</b>													
<b>Network Availability</b>													
1	a) Total no. of BTSs in the licensed service area		Live data	28	2873	2084	1423	1641	3252	898	3088	551	388
	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	0.00	99.34	2540.92	128.85	139.63	8.22	142.13	46.94	203.23	18.59
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.05%	1.69%	0.13%	0.12%	0.00%	0.22%	0.02%	0.51%	0.07%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	5	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Connection Establishment (Accessibility)</b>													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100.00%	99.19%	97.79%	98.73%	96.35%	98.51%	99.76%	99.65%	98.80%	95.65%
	b) SDCCCH/PAGING Congestion	<=1%	Live data	0.00%	0.17%	0.22%	0.17%	0.60%	0.21%	0.01%	0.09%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.25%	1.03%	0.10%	1.90%	0.69%	0.03%	0.35%	0.04%	0.49%
<b>Connection Maintenance (Retainability)</b>													
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.38%	0.23%	1.60%	0.53%	0.80%	0.69%	0.16%	0.76%	0.05%	0.62%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.98%	0.74%	2.39%	0.68%	3.34%	2.40%	0.03%	2.19%	0.24%	5.97%
	c) % of connections with good voice quality	>=95%	Live data	99.59%	98.86%	NP	97.27%	96.70%	97.92%	99.36%	97.55%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	2	64	149	30	166	238	1	205	4	46
	e) Total no. of cells (Sector) in the licensed service area		Live data	84	8676	6235	4358	4967	9898	2590	9356	1653	765
<b>No. of POI's having &gt;=0.5% POI congestion</b>													
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-15:

#### 5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JULY TO SEPT 2015 MONTHS AUDITED DATA):

#### QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 15

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>Customer Service Quality Parameters</b>													
<b>Metering &amp; Billing Credibility -Post Paid</b>													
1	A) No. of bills issued during the quarter		Haryana	22	268953	57422	809786	39603	180738	NA	584431	86527	57885
	B) No. of bills disputed including billing complaints during the quarter		Haryana	0	41	78	380	32	8	NA	529	78	0
	C) % of billing complaints during the quarter	<= 0.1%	Haryana	0.00%	0.02%	0.14%	0.05%	0.08%	0.004%	NA	0.09%	0.09%	0.00%
<b>Metering &amp; Billing Credibility -Pre Paid</b>													
2	A) Total No. of Pre-paid customers at the end of the quarter		Haryana	3046	2650445	2875031	4351696	1611638	3000160	2090268	5025191	350829	341672
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Haryana	0	36	424	3723	1469	0	19	4920	313	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	Haryana	0.00%	0.001%	0.01%	0.09%	0.09%	0.00%	0.001%	0.10%	0.09%	0.00%
<b>Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints</b>													
3	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		Haryana	0	77	502	16484	1501	8	19	5449	391	0
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		Haryana	0	77	502	16484	1501	8	19	5449	391	0
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		Haryana	0	77	502	16484	1501	8	19	5449	391	0
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	E) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

**QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE SEPTEMBER 15**

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	
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
<b>Response time to customers for assistance</b>													
	A) Total no of calls attempted to customer care/Call center		Haryana	2191	1570297	236277	12704475	548294	597470	487753	10673574	NP	35361
	B) Total no. of calls successfully established to customer care/Call center.		Haryana	2121	1570193	236277	12623013	543292	592177	487753	10673537	NP	34313
4	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	Haryana	96.81%	99.99%	100.00%	99.36%	99.09%	99.11%	100.00%	100.00%	NP	97.04%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		Haryana	880	1467763	1118526	3328482	233584	1144690	1423731	3554842	47804	46337
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Haryana	879	1397553	885484	3312068	192876	1087218	1361253	3525437	46936	45870
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts )	>=95%	Haryana	99.89%	95.22%	79.17%	99.51%	82.57%	94.98%	95.61%	99.17%	98.18%	98.99%
<b>Termination/closure of service</b>													
5	A) Total No. of requests for Termination / Closure of service received during the quarter		Haryana	0	1074	235	8364	188	1716	NA	1811	804	829
	B) No. of requests for Termination /Closure of service complied within 7 days during the quarter		Haryana	0	1074	235	8129	188	1716	NA	1811	804	829
	C) % of Termination/ Closure of service within 7 days	<=7days	Haryana	100.00%	100.00%	100.00%	97.19%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
<b>Time taken for refunds of deposits after closures.</b>													
6	A) No. of Payments/ Refunds due during the quarter		Haryana	0	195	242	2345	218	440	NA	10886	260	441
	B) No. of Payments/ Refunds Cleared during the quarter		Haryana	0	195	242	2309	218	440	NA	10886	260	441
	C)Time taken for refunds of deposits after closures.	100% within 60 days	Haryana	100.00%	100.00%	100.00%	98.46%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

NA\* Videocon has no post paid subscribers, so no billing complaints. NP: Data not provided by RCOM CDMA.

NB: Accessibility of call center / Customer care data of RCOM GSM are based on one month data i.e. August 15 as July-15 & September-15 month's data were not provided by RCOM GSM due to TTI server issue.

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE - SEPT 15													
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
<b>Response time to customers for assistance</b>													
1	A) Total no of calls attempted to customer care/Call center		Haryana	27	20047	8835	382409	NP	10482	15416	320336	NP	1073
	B) Total no. of calls successfully established to customer care/Call center.		Haryana	27	20047	8835	380151	NP	10385	15416	320332	NP	1049
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	Haryana	100.00%	100.00%	100.00%	99.41%	NP	99.07%	100.00%	100.00%	NP	97.76%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		Haryana	416	47329	36479	104902	15870	33755	45138	126415	2195	1171
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Haryana	413	46889	19280	104560	15202	33566	44059	125373	2144	1170
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts )	>=95%	Haryana	99.28%	99.07%	52.85%	99.67%	95.79%	99.44%	97.61%	99.18%	97.68%	99.91%

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

### 5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid is well within the prescribed bench mark of  $\leq 0.1\%$ . Only **BSNL** failed to meet the benchmark of Billing complaints (post-paid) with its performance level of **0.14%**.

#### 2. Resolution of Billing complaints and applying credits -

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

All operators have 100% resolved the billing complaints within stipulated period of 4 weeks and 6 weeks. In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % adjustments in one week.

#### 3. Response Time to the Customer for assistance

- i. Accessibility of call centre/customer care
- ii. Percentage of calls answered by Operators (Voice to Voice)

All service providers were in compliance with respect to the parameter 'Accessibility of call center' and '% Calls answered by operator (voice to voice)' except **BSNL**, **RCOM GSM** and **Tata (GSM)** have not met the benchmark of parameter **calls answered by Operators (voice to voice) within 90 seconds with their performance as 79.17%**, **82.57%** and **94.98%** against the benchmark of  $\geq 95\%$ . The performance of BSNL and RCOM(GSM) was way below the benchmark.

#### 4. Termination/Closure of Service

In case of this parameters, all service providers except Idea have settled the **closure/termination** within the benchmark of 7 days. The performance of **Idea** was **97.19%**.

#### 5. Time Taken for Refund of deposits after closures

All operators except **Idea** were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure. Only **Idea** failed to meet the benchmark with achieved level as **98.46%**.

#### 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 90 seconds. Only **BSNL** remained short of benchmark of '**Call answered by operator (Voice to Voice) within 90 seconds**' with their performance of **52.85%**, way below the benchmark.

## **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%	100%	100%	100%	100%	100%	100%	100%	100%	100%
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	96	100	98	100	100	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%	100%	96%	100%	98%	100%	100%	98%	100%	100%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers BSNL, RCOM GSM and Vodafone could connect 96%, 98% and 98% of calls to the operator.

### 6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

Performance (live calling for billing complaints)											
	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	Haryana	0	77	150	150	150	8	19	150	120	0
Total No. of calls Answered	Haryana	0	68	120	132	122	6	16	135	102	0
Cases resolved within 4 weeks	Haryana	0	68	120	132	122	6	16	135	102	0
%age of cases resolved	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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

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

**6.4 LEVEL -1 CALLING ASSESSMENT:**

LEVEL 1 LIVE CALLING															
Month	Circle Name	SSA Name	SDCA Name	Emergency No.	No. of calls made	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)	
July'15	Haryana	Rohtak	Rohtak	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Bhiwani	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	√
			Bhiwanikhera	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	√
			Tosam	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	√
			Jhajjar	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	√
			Bahdurgarh	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	√
Aug'15	Haryana	Ambala	Ambala	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Chachruli	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Barara	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Jagahdari	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Kalka	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Narayangarh	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
Sep'15	Haryana	Sonipat	Sonipat	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	
			Gohana	100, 101, 108 ,1091,1073,1098	4,5,5,4,4, 4	√	√	√	√	√	√	√	√	√	

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 21<sup>st</sup> 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 **Rohtak, Ambala and Sonipat** in the months of July, August and September 2015 respectively. The total route Kms covered during the drive tests in respective SSAs was **476 Kms, 460 Kms and 489 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  $\geq -75$  dBm for in-door coverage and  $\geq -85$  dBm for in-vehicle.

**AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 1**  
**OPERATOR ASSISTED DRIVE TEST AT ROHTAK SSA IN JULY 15 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	149	25	122	25	94	25	146	25	83	24	84	25	128	25	28	25	95	25
		Highways	NC	NC	116	26	139	25	85	25	113	25	64	23	87	25	115	25	68	25	94	25
		Within City	NC	NC	123	26	125	25	112	25	111	25	118	25	107	25	152	25	162	25	208	26
		<b>Overall SSA</b>	NC	NC	<b>388</b>	<b>77</b>	<b>386</b>	<b>75</b>	<b>291</b>	<b>75</b>	<b>370</b>	<b>75</b>	<b>265</b>	<b>72</b>	<b>278</b>	<b>75</b>	<b>395</b>	<b>75</b>	<b>258</b>	<b>75</b>	<b>397</b>	<b>76</b>
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.19%	0.00%	0.00%	0.00%	<b>3.57%</b>	0.00%	0.00%	0.00%
		Highways	NC	NC	0.00%	0.00%	1.44%	0.00%	0.00%	0.00%	0.00%	0.00%	<b>3.13%</b>	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%	0.00%	0.00%	1.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.48%	0.00%
		<b>Overall SSA</b>	NC	NC	<b>0.00%</b>	<b>0.00%</b>	<b>0.52%</b>	<b>0.00%</b>	<b>0.69%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.75%</b>	<b>0.00%</b>	<b>0.72%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.39%</b>	<b>0.00%</b>	<b>0.25%</b>	<b>0.00%</b>
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	1.64%	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%
		Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.47%	0.00%	<b>2.13%</b>	0.00%
		Within City	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.23%	0.00%	0.97%	0.00%
		<b>Overall SSA</b>	NC	NC	<b>0.00%</b>	<b>0.00%</b>	<b>0.52%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.17%</b>	<b>0.00%</b>	<b>1.01%</b>	<b>0.00%</b>
<b>Percentage connections with good voice quality (=&gt;95%)</b>																						
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	95.48%	95.99%	99.74%	100%
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<b>94.88%</b>	95.37%	99.85%	100%
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.02%	99.67%	99.99%	100%
		<b>Overall SSA</b>	NC	NC	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>95.71%</b>	<b>97.05%</b>	<b>99.90%</b>	<b>100%</b>
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	NC	NC	97.78%	99.58%	<b>86.39%</b>	100%	95.68%	<b>94.49%</b>	96.58%	96.42%	98.50%	98.73%	96.46%	95.08%	97.26%	99.79%	NA	NA	NA	NA
		Highways	NC	NC	97.20%	99.17%	<b>86.74%</b>	99.60%	95.62%	99.39%	96.98%	98.90%	98.38%	99.80%	96.45%	99.96%	97.77%	99.55%	NA	NA	NA	NA
		Within City	NC	NC	96.47%	96.99%	<b>91.81%</b>	97.10%	95.44%	97.39%	95.94%	99.90%	98.48%	99.35%	95.35%	99.24%	97.36%	99.92%	NA	NA	NA	NA
		<b>Overall SSA</b>	NC	NC	<b>97.17%</b>	<b>98.71%</b>	<b>88.33%</b>	<b>97.90%</b>	<b>95.56%</b>	<b>96.99%</b>	<b>96.51%</b>	<b>98.42%</b>	<b>98.46%</b>	<b>99.40%</b>	<b>95.90%</b>	<b>97.12%</b>	<b>97.44%</b>	<b>99.75%</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>

**AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 1**  
**OPERATOR ASSISTED DRIVE TEST AT ROHTAK SSA IN JULY 15 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
<b>Service Coverage</b>																						
5	In door ( $\geq -75$ dBm)	Major Roads	NC	NC	64.26%	99.46%	56.05%	100%	72.77%	99.94%	94.81%	99.95%	34.09%	73.83%	64.21%	94.37%	97.44%	100%	47.68%	11.87%	94.55%	100%
		Highways	NC	NC	65.98%	56.63%	54.87%	80.34%	63.91%	91.32%	96.00%	97.02%	38.14%	2.49%	68.41%	72.92%	97.91%	100%	46.95%	6.55%	95.08%	100%
		Within City	NC	NC	88.06%	99.82%	86.21%	100%	87.40%	100%	98.61%	100%	59.44%	100%	83.77%	96.61%	98.98%	99.83%	31.23%	93.93%	98.63%	99.77%
		<b>Overall SSA</b>	NC	NC	<b>72.64%</b>	<b>82.68%</b>	<b>65.14%</b>	<b>93.88%</b>	<b>76.87%</b>	<b>97.34%</b>	<b>96.36%</b>	<b>99.27%</b>	<b>46.59%</b>	<b>63.87%</b>	<b>75.17%</b>	<b>89.69%</b>	<b>98.04%</b>	<b>99.94%</b>	<b>36.70%</b>	<b>37.18%</b>	<b>96.88%</b>	<b>99.94%</b>
	In-vehicle ( $\geq -85$ dBm)	Major Roads	NC	NC	84.44%	100%	81.04%	100%	97.40%	100%	99.05%	100%	68.64%	100%	91.13%	99.91%	98.42%	100%	81.72%	99.73%	96.08%	100%
		Highways	NC	NC	86.62%	58.55%	85.22%	97.39%	94.59%	98.62%	99.60%	99.91%	73.81%	98.38%	93.71%	99.97%	98.75%	100%	87.66%	84.54%	97.63%	100%
		Within City	NC	NC	97.50%	99.98%	96.44%	100%	97.20%	100%	99.81%	100%	88.08%	100%	97.05%	98.79%	99.06%	100%	90.97%	100%	99.84%	100%
		<b>Overall SSA</b>	NC	NC	<b>89.40%</b>	<b>83.66%</b>	<b>87.58%</b>	<b>99.19%</b>	<b>96.58%</b>	<b>99.58%</b>	<b>99.46%</b>	<b>99.98%</b>	<b>78.72%</b>	<b>99.47%</b>	<b>94.83%</b>	<b>99.66%</b>	<b>98.71%</b>	<b>100%</b>	<b>89.11%</b>	<b>94.74%</b>	<b>98.47%</b>	<b>100%</b>
	Outdoor-in city ( $\geq -95$ dBm)	Major Roads	NC	NC	97.28%	100%	97.57%	100%	99.71%	100%	99.81%	100%	97.02%	100%	99.29%	99.95%	99.83%	100%	97.75%	99.97%	99.16%	100%
		Highways	NC	NC	97.32%	94.38%	98.84%	100%	99.03%	99.66%	99.97%	100%	96.87%	100%	99.24%	100%	99.93%	100%	97.44%	98.43%	99.82%	100%
		Within City	NC	NC	99.84%	100%	100%	100%	99.74%	100%	99.99%	100%	98.40%	100%	99.58%	99.82%	99.89%	100%	98.16%	100%	100%	100%
		<b>Overall SSA</b>	NC	NC	<b>98.14%</b>	<b>97.78%</b>	<b>98.84%</b>	<b>100%</b>	<b>99.55%</b>	<b>99.90%</b>	<b>99.91%</b>	<b>100%</b>	<b>97.61%</b>	<b>100%</b>	<b>99.42%</b>	<b>99.93%</b>	<b>99.87%</b>	<b>100%</b>	<b>97.95%</b>	<b>99.47%</b>	<b>99.77%</b>	<b>100%</b>
6	Call Setup Success Rate ( $\geq 95\%$ )	Major Roads	NC	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.81%	100%	100%	100%	96.43%	100%	100%	100%
		Highways	NC	NC	100%	100%	98.56%	100%	100%	100%	100%	100%	96.88%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	NC	NC	100%	100%	100%	100%	98.21%	100%	100%	100%	100%	100%	99.07%	100%	100%	100%	100%	100%	99.52%	100%
		<b>Overall SSA</b>	NC	NC	<b>100%</b>	<b>100%</b>	<b>99.48%</b>	<b>100%</b>	<b>99.31%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>99.25%</b>	<b>100%</b>	<b>99.28%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>99.61%</b>	<b>100%</b>	<b>99.75%</b>
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.08%	100%	98.99%	100%	100%	100%	99.30%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	NC	NC	100%	100%	99.41%	100%	97.78%	100%	100%	100%	100%	100%	99.08%	100%	100%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.67%	100%	98.72%	100%	98.04%	100%	99.38%	100%	99.48%	100%	99.61%	100%	100%	100%	100%	100%	100%	100%
		<b>Overall SSA</b>	NC	NC	<b>99.61%</b>	<b>100%</b>	<b>99.01%</b>	<b>100%</b>	<b>98.43%</b>	<b>100%</b>	<b>99.55%</b>	<b>100%</b>	<b>99.66%</b>	<b>100%</b>	<b>99.57%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

• 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-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 2  
OPERATOR ASSISTED DRIVE TEST AT AMBALA SSA IN AUGUST 15 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	74	26	148	25	94	25	101	26	49	25	49	25	94	25	65	25	49	25	
		Highways	NC	NC	123	27	90	25	85	25	101	25	61	24	92	25	106	25	62	25	63	24	
		Within City	NC	NC	162	26	132	25	112	25	150	25	165	25	160	25	125	25	135	25	168	25	
		<b>Overall SSA</b>	NC	NC	<b>359</b>	<b>79</b>	<b>370</b>	<b>75</b>	<b>291</b>	<b>75</b>	<b>352</b>	<b>76</b>	<b>275</b>	<b>74</b>	<b>301</b>	<b>75</b>	<b>325</b>	<b>75</b>	<b>262</b>	<b>75</b>	<b>280</b>	<b>74</b>	
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	2.70%	0.00%	0.00%	0.00%	2.97%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	NC	NC	0.00%	0.00%	1.11%	0.00%	0.00%	0.00%	1.98%	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%	2.27%	0.00%	1.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.63%	<b>4.00%</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		<b>Overall SSA</b>	NC	NC	<b>0.00%</b>	<b>0.00%</b>	<b>2.16%</b>	<b>0.00%</b>	<b>0.69%</b>	<b>0.00%</b>	<b>1.42%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.33%</b>	<b>1.33%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	<b>2.07%</b>	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%	
		Highways	NC	NC	0.00%	0.00%	<b>2.27%</b>	0.00%	0.00%	0.00%	0.00%	0.00%	1.64%	<b>4.17%</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	NC	NC	0.00%	0.00%	<b>2.33%</b>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.79%	0.00%	
		<b>Overall SSA</b>	NC	NC	<b>0.00%</b>	<b>0.00%</b>	<b>2.21%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.36%</b>	<b>1.35%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.07%</b>	<b>0.00%</b>
<b>Percentage connections with good voice quality (=&gt;95%)</b>																							
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	97.68%	99.07%	99.96%	100%	
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.37%	98.38%	99.93%	100%	
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.03%	97.49%	99.95%	100%	
		<b>Overall SSA</b>	NC	NC	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>97.74%</b>	<b>98.30%</b>	<b>99.95%</b>	<b>100%</b>	
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	NC	NC	96.02%	95.20%	<b>94.59%</b>	98.96%	95.68%	<b>94.49%</b>	95.22%	98.83%	97.83%	100%	98.18%	95.11%	96.70%	99.59%	NA	NA	NA	NA	
		Highways	NC	NC	96.30%	95.10%	<b>94.28%</b>	99.28%	95.62%	99.39%	95.27%	98.80%	98.31%	99.64%	95.90%	99.19%	97.35%	97.84%	NA	NA	NA	NA	
		Within City	NC	NC	96.11%	98.67%	96.16%	98.12%	95.44%	97.39%	96.27%	99.46%	98.00%	99.63%	95.23%	99.28%	96.79%	99.96%	NA	NA	NA	NA	
		<b>Overall SSA</b>	NC	NC	<b>96.14%</b>	<b>96.27%</b>	<b>95.28%</b>	<b>98.79%</b>	<b>95.56%</b>	<b>96.99%</b>	<b>95.70%</b>	<b>99.03%</b>	<b>98.04%</b>	<b>99.81%</b>	<b>95.81%</b>	<b>97.55%</b>	<b>96.96%</b>	<b>98.98%</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	

**AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 2  
OPERATOR ASSISTED DRIVE TEST AT AMBALA SSA IN AUGUST 15 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
<b>Service Coverage</b>																						
5	In door ( $\geq -75$ dBm)	Major Roads	NC	NC	78.41%	100%	73.63%	9.94%	72.77%	99.94%	63.76%	26.77%	51.51%	100%	57.91%	99.75%	95.32%	100%	24.59%	58.14%	97.08%	99.77%
		Highways	NC	NC	82.71%	88.60%	80.13%	18.82%	63.91%	91.32%	78.50%	96.79%	43.03%	100%	54.61%	93.66%	98.25%	100%	17.19%	68.17%	96.45%	93.88%
		Within City	NC	NC	94.39%	99.91%	97.89%	88.43%	87.40%	100%	97.33%	99.74%	57.19%	80.48%	84.97%	99.78%	99.52%	100%	59.89%	69.15%	99.35%	100%
		<b>Overall SSA</b>	NC	NC	<b>86.68%</b>	<b>96.14%</b>	<b>83.77%</b>	<b>32.84%</b>	<b>76.87%</b>	<b>97.34%</b>	<b>85.80%</b>	<b>52.15%</b>	<b>53.29%</b>	<b>90.60%</b>	<b>73.17%</b>	<b>98.09%</b>	<b>97.88%</b>	<b>100%</b>	<b>42.16%</b>	<b>65.80%</b>	<b>98.50%</b>	<b>99.57%</b>
	In-vehicle ( $\geq -85$ dBm)	Major Roads	NC	NC	96.05%	100%	95.55%	88.40%	97.40%	100%	90.83%	26.82%	80.15%	100%	85.69%	100%	98.14%	100%	77.69%	85.52%	99.21%	99.77%
		Highways	NC	NC	97.81%	99.82%	97.90%	88.12%	94.59%	98.62%	97.54%	100%	68.96%	100%	83.18%	99.90%	99.01%	100%	74.41%	88.99%	98.61%	96.89%
		Within City	NC	NC	99.80%	100%	99.68%	99.94%	97.20%	100%	99.83%	100%	89.41%	99.81%	98.25%	100%	99.70%	100%	87.90%	89.30%	99.76%	100%
		<b>Overall SSA</b>	NC	NC	<b>98.23%</b>	<b>99.94%</b>	<b>97.59%</b>	<b>91.25%</b>	<b>96.58%</b>	<b>99.58%</b>	<b>97.33%</b>	<b>52.81%</b>	<b>83.59%</b>	<b>99.91%</b>	<b>92.52%</b>	<b>99.97%</b>	<b>99.02%</b>	<b>100%</b>	<b>82.49%</b>	<b>88.16%</b>	<b>99.47%</b>	<b>99.73%</b>
	Outdoor-in city ( $\geq -95$ dBm)	Major Roads	NC	NC	99.82%	100%	99.29%	99.86%	99.71%	100%	97.33%	26.82%	98.73%	100%	97.96%	100%	99.77%	100%	99.17%	99.20%	100%	100%
		Highways	NC	NC	99.93%	99.99%	99.71%	99.85%	99.03%	99.66%	99.58%	100%	95.77%	100%	97.13%	100%	99.73%	100%	99.38%	98.54%	99.99%	100%
		Within City	NC	NC	100%	100%	99.89%	100%	99.74%	100%	99.98%	100%	99.04%	100%	99.83%	100%	99.87%	100%	99.42%	98.55%	100%	100%
		<b>Overall SSA</b>	NC	NC	<b>99.93%</b>	<b>100%</b>	<b>99.61%</b>	<b>99.89%</b>	<b>99.55%</b>	<b>99.90%</b>	<b>99.30%</b>	<b>52.81%</b>	<b>98.32%</b>	<b>100%</b>	<b>98.86%</b>	<b>100%</b>	<b>99.80%</b>	<b>100%</b>	<b>99.36%</b>	<b>98.72%</b>	<b>100%</b>	<b>100%</b>
6	Call Setup Success Rate ( $\geq 95\%$ )	Major Roads	NC	NC	100%	100%	97.97%	100%	100%	100%	96.04%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Highways	NC	NC	100%	100%	97.78%	100%	100%	100%	96.04%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Within City	NC	NC	100%	100%	97.73%	100%	98.21%	100%	98.67%	100%	100%	100%	99.38%	96.00%	100%	100%	100%	100%	100%	
		<b>Overall SSA</b>	NC	NC	<b>100%</b>	<b>100%</b>	<b>97.84%</b>	<b>100%</b>	<b>99.31%</b>	<b>100%</b>	<b>97.16%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>99.67%</b>	<b>98.67%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.55%	100%	98.55%	100%	100%	100%	98.06%	100%	96.88%	100%	100%	100%	100%	100%	100%	100%	100%	
		Highways	NC	NC	99.40%	100%	98.32%	100%	97.78%	100%	98.40%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Within City	NC	NC	99.56%	100%	98.77%	100%	98.04%	100%	98.70%	100%	100%	100%	99.41%	100%	100%	100%	100%	100%	100%	
		<b>Overall SSA</b>	NC	NC	<b>99.52%</b>	<b>100%</b>	<b>98.67%</b>	<b>100%</b>	<b>98.43%</b>	<b>100%</b>	<b>98.43%</b>	<b>100%</b>	<b>99.73%</b>	<b>100%</b>	<b>99.61%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

• 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-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 3  
OPERATOR ASSISTED DRIVE TEST AT SONIPAT SSA IN SEPTEMBER 15 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	75	30	67	31	63	25	76	30	45	31	50	30	149	25	35	30	47	31	
		Highways	NC	NC	55	30	60	31	68	25	60	30	57	30	57	30	151	25	52	30	57	31	
		Within City	NC	NC	344	30	363	32	268	25	353	30	239	30	246	30	203	25	227	30	242	30	
		<b>Overall SSA</b>	NC	NC	<b>474</b>	<b>90</b>	<b>490</b>	<b>94</b>	<b>399</b>	<b>75</b>	<b>489</b>	<b>90</b>	<b>341</b>	<b>91</b>	<b>353</b>	<b>90</b>	<b>503</b>	<b>75</b>	<b>314</b>	<b>90</b>	<b>346</b>	<b>92</b>	
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	NC	NC	1.82%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.75%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	NC	NC	0.29%	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%	0.49%	0.00%	0.00%	0.00%	
		<b>Overall SSA</b>	NC	NC	<b>0.42%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.57%</b>	<b>0.00%</b>	<b>0.20%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	NC	NC	0.00%	0.00%	0.00%	0.00%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.44%	0.00%	0.41%	0.00%	
		<b>Overall SSA</b>	NC	NC	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.50%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.32%</b>	<b>0.00%</b>	<b>0.29%</b>	<b>0.00%</b>
4	Percentage connections with good voice quality (=>95%)																						
	(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	NA	98.69%	99.20%	99.95%	100%
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.64%	98.76%	99.88%	100%
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.44%	98.18%	99.92%	100%
		<b>Overall SSA</b>	NC	NC	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>98.39%</b>	<b>98.71%</b>	<b>99.92%</b>	<b>100%</b>
(b) 0-5 (with	Major Roads	NC	NC	97.00%	96.83%	<b>84.79%</b>	<b>94.45%</b>	95.95%	98.96%	95.17%	99.33%	98.24%	100%	96.53%	95.71%	96.62%	99.37%	NA	NA	NA	NA		

**AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 3  
OPERATOR ASSISTED DRIVE TEST AT SONIPAT SSA IN SEPTEMBER 15 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	
			Highways	Within City	Overall SSA	Highways	Within City	Overall SSA	Highways	Within City	Overall SSA	Highways	Within City	Overall SSA	Highways	Within City	Overall SSA	Highways	Within City	Overall SSA	Highways	Within City	Overall SSA
5	frequency hopping for GSM Operators)	Highways	NC	NC	96.70%	97.22%	<b>87.85%</b>	99.51%	96.37%	99.56%	<b>93.97%</b>	99.56%	97.44%	99.69%	95.54%	99.82%	96.64%	99.55%	NA	NA	NA	NA	
		Within City	NC	NC	96.42%	99.49%	<b>88.37%</b>	98.39%	95.33%	97.13%	95.52%	99.57%	97.39%	100%	95.27%	98.05%	96.61%	99.39%	NA	NA	NA	NA	
		Overall SSA	NC	NC	<b>96.57%</b>	<b>97.89%</b>	<b>87.78%</b>	<b>95.64%</b>	<b>95.56%</b>	<b>98.55%</b>	<b>95.29%</b>	<b>99.49%</b>	<b>97.51%</b>	<b>99.91%</b>	<b>95.51%</b>	<b>97.79%</b>	<b>96.62%</b>	<b>99.44%</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	
	<b>Service Coverage</b>																						
	In door (>= -75dBm)	Major Roads	NC	NC	82.62%	78.16%	43.07%	52.74%	52.38%	100%	89.42%	99.91%	46.25%	99.24%	65.90%	60.60%	98.40%	100%	73.20%	70.82%	95.88%	100%	
		Highways	NC	NC	89.25%	99.99%	39.68%	44.42%	48.49%	99.39%	90.76%	100%	45.27%	100%	70.76%	100%	99.44%	100%	53.04%	77.93%	96.10%	97.92%	
		Within City	NC	NC	88.08%	65.14%	55.44%	69.83%	64.64%	74.13%	92.24%	100%	62.26%	100%	70.38%	79.13%	98.14%	100%	54.72%	69.15%	96.97%	100%	
		Overall SSA	NC	NC	<b>87.32%</b>	<b>81.48%</b>	<b>51.84%</b>	<b>55.75%</b>	<b>60.52%</b>	<b>90.43%</b>	<b>91.61%</b>	<b>99.97%</b>	<b>57.37%</b>	<b>99.55%</b>	<b>69.79%</b>	<b>81.64%</b>	<b>98.37%</b>	<b>100%</b>	<b>60.05%</b>	<b>73.21%</b>	<b>96.65%</b>	<b>99.48%</b>	
	In-vehicle (>= -85dBm)	Major Roads	NC	NC	97.42%	99.15%	85.79%	98.78%	89.14%	100%	98.47%	100%	73.06%	100%	91.14%	99.23%	99.23%	100%	93.03%	89.90%	98.35%	100%	
		Highways	NC	NC	99.14%	100%	83.92%	99.63%	85.23%	100%	98.78%	100%	79.06%	100%	95.48%	100%	99.87%	100%	87.26%	92.36%	98.15%	100%	
		Within City	NC	NC	98.55%	78.09%	89.38%	99.81%	90.12%	99.98%	99.24%	100%	86.17%	100%	92.13%	99.78%	99.15%	100%	87.68%	95.47%	99.07%	100%	
		Overall SSA	NC	NC	<b>98.44%</b>	<b>92.15%</b>	<b>88.23%</b>	<b>99.41%</b>	<b>89.21%</b>	<b>99.99%</b>	<b>99.06%</b>	<b>100%</b>	<b>83.28%</b>	<b>100%</b>	<b>92.57%</b>	<b>99.70%</b>	<b>99.27%</b>	<b>100%</b>	<b>89.24%</b>	<b>92.51%</b>	<b>98.79%</b>	<b>100%</b>	
Outdoor-in city (>= -95dBm)	Major Roads	NC	NC	99.99%	100%	98.96%	100%	99.28%	100%	99.53%	100%	98.60%	100%	98.57%	100%	99.70%	100%	99.46%	99.45%	100%	100%		
	Highways	NC	NC	99.98%	100%	98.71%	99.98%	98.74%	100%	99.73%	100%	98.05%	100%	99.57%	100%	99.95%	100%	99.13%	99.49%	99.91%	100%		
	Within City	NC	NC	99.94%	99.90%	99.32%	99.99%	98.87%	100%	99.82%	100%	99.00%	100%	98.66%	100%	99.85%	100%	99.15%	99.14%	100%	100%		
	Overall SSA	NC	NC	<b>99.95%</b>	<b>99.97%</b>	<b>99.20%</b>	<b>99.99%</b>	<b>98.90%</b>	<b>100%</b>	<b>99.76%</b>	<b>100%</b>	<b>98.79%</b>	<b>100%</b>	<b>98.81%</b>	<b>100%</b>	<b>99.84%</b>	<b>100%</b>	<b>99.24%</b>	<b>99.38%</b>	<b>99.98%</b>	<b>100%</b>		
6	Call Setup Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
		Highways	NC	NC	98.18%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.25%	100%	100%	100%	100%	100%	100%	100%	
		Within City	NC	NC	99.71%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.51%	100%	100%	100%	100%	100%	

**AUDIT & ASSESSMENT OF QOS FOR QE- SEPTEMBER-2015 - HARYANA CIRCLE**

**DRIVE TEST TABLE – 3**  
**OPERATOR ASSISTED DRIVE TEST AT SONIPAT SSA IN SEPTEMBER 15 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	
			Overall SSA	NC	NC	99.58%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.43%	100%	99.80%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.37%	100%	100%	100%	100%	100%
		Highways	NC	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.77%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.47%	100%	100%	100%	99.58%	100%	99.75%	100%	99.70%	100%	100%	100%	100%	99.54%	100%	100%	100%	100%	100%
		Overall SSA	NC	NC	99.61%	100%	100%	100%	99.70%	100%	99.83%	100%	99.77%	100%	100%	100%	100%	99.26%	100%	100%	100%	100%	100%

NC-No Coverage; NA-Not Applicable

**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 & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered	Name of SDCA & KM Covered	Route Covered
Rohtak	July-15	Rohtak, Bhiwani/170	Sec-14,sheela by pass,bus satand,Jind by pass,Industrial Area,Madina,Meham,Bhiwani Civil Hospital,Rohtak Chowk,Anaj Mandi,Charkhi Dadri,Kalanaur	Tosam, Bhiwani khera /178km	Bagan wala _A,Kharkhari Makwan,Pataudikalan,Hasa_A,Hanuman Gate,Tits Bhiwani _A,Lahali,Bhali,Budedha,Obra,Singhani,Gignaw,Loharu Infill, Digawamandi,Kurdal,Golagarh,Ohani	Rohtak. Jhajjar /128km	Karountha,Jagdish Colony,Astalbohar Mastnath,Karawar,Rohad Infill_A,VC Hotel, Bahadurgarh Arcade, Tandaheri,Dulhera,Ploytech Col, Dojhana _A, Dighal.
Ambala	Aug-15	Ambala, Barara/130km	BSNL Exchange, Mall road, Kalka chowk, Manav chowk, Sec.9-Model town, manji sahib, Adarsh Nagar,Prem nagar, sec-7, Dhukia, Matheri, Jansui, Monra, resari,Saha, Mulana, Barara, Sarakpur, Mithapur,Brahmkumari chowk, SD college, Sadar bazaar, Sigri mohalla, Ambala cantt.	Yamunanagar, jagadhari /170	Jagadhari bus stand, Bheelal, Bilaspur, Ledi,Maheshpur, Chachhauri road, buria chowk, Aggarsen chowk, Sec-18, Kanhaiya chowk,Fountain chowk, Vishwakarma chowk, Saharnpur road, Sugar mill, Kamani chowk,Sec.-18, Sec.-17, Durga garden, Professor colony, Thana chhapar, mustafabad.	Kalaka, Narayangarh /160km	Chajumajra, Bharog, Patvi, Dharana, Sehadpur, Chotti bassi, Naraingarh,Bus stand, Naraingarh, Sec.-4, Grain market, Lachha, Burewala, Raipurani,Tabar, Barwala, Sultanpur, Naggar, ITBP, Bhanu, Ramgarh, HMTI, Lower bazaar,Gandhi chowk, Railway road, Model town, Lohgarh, Jahngipur, Kona.
Sonipat	Sep-15	Sonipat /153km	Sec-15 market, sec-12, Fazilpur, kumaspur,Dialpur, Bhalgarh, Kherma, Jhundpur,Datali, Begha, Ghasoli, Bhigan, Ghanaur City.	Gohana, Sonipat/154km	Police line, Barwasni, Mohana, Pinana,Mahra, Gohana City, Ahulana, Kathura,Dhanana, Rindhana, Banwara, Garwel, Narendrchaka.	Sonipat /182km	Sec.14 market, Civil hospital, Murthal road, Adarsh nagar, Bus stand, Geeta bhawan, Shani mandir,Pragti nagar, Sec.23, Kakroi road, Kaulpur, Flyover, Atlas road, Model Town,Old DC road, ITI Chowk, Rathdana, AK barota, Nahra, Saidpur,AK Barota, Nahra, Saidpur, Kharkhoda, Sisana, Farmana, Bhatgaon, Mehlana sec-23.

**7.2 SSA WISE DRIVE TEST OBSERVATION:**

**DRIVE TEST TABLE: 5**

**DRIVE TEST OBSERVATION OF ROHTAK SSA (JULY-15)**

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Rohtak, Bhiwani, Charkhidari.	Poor Rx Level and Rx Quality Near Bhiwani Khera.	Bhiwani khera, Jhajjar, Bhadurgarh	Poor Rx Level and Rx Quality Chang Village, Near Khark.	Rohtak, Tosam, Meham	Overall Good Coverage and Quality in Covered SDCA's.
2	BSNL		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.		Poor Rx Level and Rx Quality Bondkalan Village, Near Siwana, Mishri.
3	TATA GSM		Poor Rx Level and Rx Quality Madina, Industrial Area, Near Charki Dadri.		Poor Rx Level and Rx Quality Lohni & Kalanaur, Isarwal, Obra, milan, Lohni, Wlindenpur Village.		Poor Rx Level and Rx Quality Industrial Area Sampla, Bhadurgarh Major road, Digal, sanwar, Kaurianta.
4	TATA CDMA		Poor Rx Level and Rx Quality Madina, Industrial Area, Near Charki Dadri.		Poor Rx Level and Rx Quality Lohni & Kalanaur, Isarwal, Obra, milan, Lohni, Wlindenpur Village.		Poor Rx Level and Rx Quality Industrial Area Sampla, Bhadurgarh Major road, Digal, sanwar, Kaurianta.
5	IDEA		Poor Rx Level and Rx Quality Near Paintawas Kalan, Nirmiwalan to kitlana, Chang to khulawas.		Poor Rx Level and Rx Quality Near Rawladhi to snawar, Sangerwas to bond kalan.		Poor Rx Level and Rx Quality Near Jamalpur to akabarpur, nirmiwalan to kitlana, tosam to obra, Digwa mandi.
6	RCOM GSM		Poor Rx Level and Rx Quality Near Madina, Prem Nagar, Jhakoda, Rohatk-jhajjar road.		Poor Rx Level and Rx Quality Near Rwaladhri nd sanwar, Kaurianta, Jhajjar Road, Bhadurgarh.		Poor Rx Level and Rx Quality Near Lohni, Wlindenpur Village, Loharu, Dhulera.
7	RCOM CDMA		Poor Rx Level and Rx Quality Near Madina, Prem Nagar, Jhakoda, Rohatk-jhajjar road.		Poor Rx Level and Rx Quality Near Rwaladhri nd sanwar, Kaurianta, Jhajjar Road, Bhadurgarh.		Poor Rx Level and Rx Quality Near Lohni, Wlindenpur Village, Loharu, Dhulera.
8	VIDEOCON		Poor Rx Level and Rx Quality Near Paintawas Kalan, Nirmiwalan to kitlana, Chang to khulawas.		Poor Rx Level and Rx Quality Near Rawladhi to snawar, Sangerwas to bond kalan.		Poor Rx Level and Rx Quality Near Jamalpur to Akabarpur, Nirmiwalan to Kitlana, Tosam to Obra, Digwa Mandi.
9	VODAFONE		Overall Good Coverage and Quality in Covered SDCA's.		Poor Rx Level and Rx Quality Near Gujrani to Chang, Missri to Industrial Area.		Overall Good Coverage and Quality in Covered SDCA's.
10	AIRCEL		NC		NC		NC

NC: No coverage

DRIVE TEST TABLE: 6

**DRIVE TEST OBSERVATION OF AMBALA SSA (AUGUST 15)**

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Ambala, Barara	Poor Rx Level and Rx Quality Near Mithapur, Jhansui, Bulana.	Chachrauli, Jagadhri	Poor Rx Level and Rx Quality Near Mulana, Khuda Iohara, Near Bilaspur.	Kalka, Narayangarh	Poor Rx Level and Rx Quality Near Baddi Road.
2	BSNL		Overall Good Coverage and Quality in Covered SDCA's.		Poor Rx Level and Rx Quality Near Chachrauli to jagadhri.		Poor Rx Level and Rx Quality Near Kalka-Pinjore Highway, Kalka Baddi Road.
3	TATA GSM		Poor Rx Level and Rx Quality Near Kalka Road, Dhaukhera, Mehtpur, Near Sadar Bazaar, Lal kurti.		Poor Rx Level and Rx Quality Near Khaizrabad, Chachrauli Road, Mankpur, Mustfrabad, Near Leadhi Village.		Poor Rx Level and Rx Quality Near Raipurani, Bharogh, Kalka pinjore highway.
4	TATA CDMA		Poor Rx Level and Rx Quality Near Kalka Road, Dhaukhera, Mehtpur, Near Sadar Bazaar, Lal kurti.		Poor Rx Level and Rx Quality Near Khaizrabad, Chachrauli Road, Mankpur, Mustfrabad, Near Leadhi Village.		Poor Rx Level and Rx Quality Near Raipurani, Bharogh, Kalka pinjore highway.
5	IDEA		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.
6	RCOM GSM		Poor Rx Level and Rx Quality Near Mullana, Modal Town Hara, Rx quality week near Lal kurti.		Poor Rx Level and Rx Quality Near Ambala jagadhri Road, Jaruda, Near Chachrauli village.		Poor Rx Level and Rx Quality Near Kalka-Pinjore Highway, Rx Quality week near Narangarh, Sultanpur.
7	RCOM CDMA		Poor Rx Level and Rx Quality Near Mullana, Modal Town Hara, Rx quality week near Lal kurti.		Poor Rx Quality Near Ambala jagadhri Road, Jaruda, Near Chachrauli village.		Poor Rx Level and Rx Quality Near Kalka-Pinjore Highway, Rx Quality week near Narangarh, Sultanpur.
8	VIDEOCON		Poor Rx Level and Rx Quality Near Rapu mazra & dhurha, Gobindgarh to dhurana, Nagla & shergarh, Dinarpur.		Poor Rx Level and Rx Quality Near Anrauli & chauron, Malkpur, Taranpur & salempur, Gadhuali, Chachrauli, Gobindpur.		Poor Rx Level and Rx Quality Near Lohgarh khera, Nankpur, Sultanpur Lodi, Manka, Kalka pinjore highway, & Baddi road.
9	VODAFONE		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.
10	AIRCEL		NC		NC		NC

NC: No Coverage



DRIVE TEST TABLE: 7

**DRIVE TEST OBSERVATION OF SONIPAT SSA (SEPTEMBER) 15)**

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Sonipat, Gohana	Poor Rx Level and Rx Quality Near Rai Industrial Area.	Sonipat, Gohana	Poor Rx Level and Rx Quality Near Kundli Industrial Area.	Sonipat, Gohana	Overall Good Coverage and Quality in Covered SDCA's.
2	BSNL		Poor Rx Level and Rx Quality Near saidpur,kharkhoda Village.		Poor Rx Level and Rx Quality Near Kundli Industrial Area,Gsoli Village,Fazilpur,kewda.		Poor Rx Level and Rx Quality Near Jhundpur,Murthal,Dipalpur, Mohana,Pinana.
3	TATA GSM		Poor Rx Level and Rx Quality Near Rai Indutrial area,Kewara.		Poor Rx Level and Rx Quality Near Kundli Industrial Area,Gsoli.		Poor Quality Near Dipalpur & mohana.
4	TATA CDMA		Poor Quality & Level Near Rai Indutrial area,Kewara.		Poor Quality near Kundli Industrial Area,Gsoli.		Poor Quality Near Dipalpur & mohana.
5	IDEA		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.
6	RCOM GSM		Poor Rx Level and Rx Quality Near Datoli,Begha,Week Rx level near Gannur & Datuli,Pnipat Gohana Road,Biansawad Khurd.		Poor Rx Level and Rx Quality Near Jhakuli & Rai,Rohtak Gohana Road.		Poor Rx Level and Rx Quality Near NH-1 & Murthal.
7	RCOM CDMA		Poor Rx Level and Rx Quality Near Datoli,Begha,Week Rx level near Gannur & Datuli,Pnipat Gohana Road,Biansawad Khurd.		Poor Rx Level and Rx Quality Near Jhakuli & Rai,Rohtak Gohana Road.		Poor Rx Level and Rx Quality Near NH-1 & Murthal.
8	VIDEOCON		Poor Rx Level and Rx Quality Near Kmaspur & Dipalpur,Kewara & bhalgarh,Jhunpur.		Poor Rx Level and Rx Quality Near Seoli,Badh Khalsa,Larsoli.		Poor Rx Level and Rx Quality Near Umeadgarh,Ramnagar,anw ali,Dhanana.
9	VODAFONE		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.		Overall Good Coverage and Quality in Covered SDCA's.
10	AIRCEL		NC		NC		NC

NC: No Coverage

DRIVE TEST TABLE: 8

**NO NETWORK COVERAGE STATUS OF DRIVE TEST – JULY TO SEPTEMBER 15**

S. No	Month of Drive Test	Name of Operators	SSA Covered	SDCAs Covered	Status of no network coverage area	ICR Status
1	July-15	Airtel	Rohtak		No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Vodafone			No Coverage Issue	No
		Tata GSM			Bahadurgarh-Jhajjar Highway ,Khardwad Highway ,Miran ,Sisar Khas Road ,Gadhi Khere Village ,Bichri Road ,Dhani Sankar Road ,Pokar Vas , Khuda Road , Gignau , Singani Road	No
		Tata CDMA			Bahadurgarh-Jhajjar Highway ,Khardwad Highway ,Miran ,Sisar Khas Road ,Gadhi Khere Village ,Bichri Road ,Dhani Sankar Road ,Pokar Vas , Khuda Road , Gignau , Singani Road	No
		Reliance GSM			No Coverage Areas On Bahadurgarh - Charra Road Near To Tanda Heri , No Coverage Areas On Bahadurgarh - Rohtak Road ,Bhiwanikhhera - Bhiwani Road ,Bhiwani - Loharu Road ,Bhiwani - Charkhidadri Road ,Jhajjar - Rohtak Road ,Kalanaur Road , Rohtak - Kalanaur Road ,Bhiwani - Loharu Road , Loharu - Tosham Road ,Kherisaad , Bahu Jamalput To Bahu Akbarpur ,	ICR Coverage with Tata is Available On Bahadurgarh - Rohtak Road ,Bhiwanikhhera - Bhiwani Road ,Chang , Aluwa ,Bhiwani - Charkhidadri Road ,Charkhidadri - Kalanaur Road , Rohtak - Kalanaur Road ,Karauntha , Kherisaad , Bahu Akbarpur ,Kharkhari Makhanwala.
Reliance CDMA	No Coverage Areas On Bahadurgarh - Charra Road Near To Tanda Heri , No Coverage Areas On Bahadurgarh - Rohtak Road ,Bhiwanikhhera - Bhiwani Road ,Bhiwani - Loharu Road ,Bhiwani - Charkhidadri Road ,Jhajjar - Rohtak Road ,Kalanaur Road , Rohtak - Kalanaur Road ,Bhiwani - Loharu Road , Loharu - Tosham Road ,Kherisaad , Bahu Jamalput To Bahu Akbarpur ,	No				
Videocon			Pahladgarh Road ,Saral Road ,Paintawas	Nakipur To Obra With		

S. No	Month of Drive Test	Name of Operators	SSA Covered	SDCAs Covered	Status of no network coverage area	ICR Status
					Kalan ,Charkhi Village ,No Service Between Khakara To Meham , Jhanjara Sheoran To Pahari Road ,Salempur To Mansarwas Road ,Khaparbas ,Ladianwali ,Indiwali ,Saral ,Lohani To Dhani	Tata Docomo ,Isharwal With Tata Docomo ,Kharkhri Makhwa With Tata Docomo
		Idea			No Coverage Issue	No
2	Aug-15	Airtel	Ambala		No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Vodafone			No Coverage Issue	No
		Tata GSM			Jansuya To Dorana ,Baroli Majra To Lahsabad ,Kishanpura To Bhelpura ,Dhamla To Nanakpura	No
		Tata CDMA			Jansuya To Dorana ,Baroli Majra To Lahsabad ,Kishanpura To Bhelpura ,Dhamla To Nanakpura	No
		Reliance GSM			Segta To Sahibapura , Landha To Harra , Segta , Bishangarh , Kaleran , Barola ,Chuharpur Kalan To Chachrauli , Chachrauli To Yamunagar , Malakpur , Dadupr Jattan , Leda Khedar , Kotra Kahansingh , Mahab Aliwala , Gurdhanpur , Pipli Majra , Malikpur , Gulabgarh , Piruwala ,Pinjokra To Chajjumajra (Punjab Area) , Dhanana To Shezadpur , Baragarh To Ahemdpur , Husaini To Burewala , Barruna Chotta To Tabar	ICR Coverage With Tata Is Available Between Kudhakalan To Jawahargarh , Mohri , Kesri , Tepla , Khudi , Mitthapur , Mathedi ,Kalpi
		Reliance CDMA			Segta To Sahibapura , Landha To Harra , Segta , Bishangarh , Kaleran , Barola ,Chuharpur Kalan To Chachrauli , Chachrauli To Yamunagar , Malakpur , Dadupr Jattan , Leda Khedar , Kotra Kahansingh , Mahab Aliwala , Gurdhanpur , Pipli Majra , Malikpur , Gulabgarh , Piruwala ,Pinjokra To Chajjumajra (Punjab Area) , Dhanana To Shezadpur , Baragarh To Ahemdpur , Husaini To Burewala , Barruna Chotta To Tabar	No
		Videocon			Mohra To Kesari ,Mithapur ,Jaroda ,Jalalui ,Ghaseetpur ,Lohgarh To Koonaa , Jansui Head To Durana ,Pipali Majra To Urjani ,Kheri To Barwala ,Bilaspur To Khijrabad	No
		Idea			No Coverage Issue	No

S. No	Month of Drive Test	Name of Operators	SSA Covered	SDCAs Covered	Status of no network coverage area	ICR Status
3	Sep-15	Airtel	Sonipat		No Coverage Issue	No
		BSNL			No Coverage Issue	No
		Vodafone			No Coverage Issue	No
		Tata GSM			Pinana to Farmana , Jhundpur to Bahalgarh	No
		Tata CDMA			Sonipat to Rurki Highway.	No
		Reliance GSM			No Coverage Between Muthal To Bighan , Khazirpur Ahir , Gannaur To Datauli , Gorar To Muzamnagar , Mahipr To Mahlana , Barwasi To Mohana ,Tihat Ot Latth , Katwal To Kalhani , Gohana To Garhi Ujale Khan ,Gannaur To Datauli , Gorar To Muzamnagar , Mahipr To Mahlana , Barwasi To Mohana , Certain Area Jhundpur To Bahalgarh	ICR With Tata Is Available Between Jhundpur & Bahalgarh , Bahalgarh & Murthal , Ahmedpur , Bighan; Kheri Gujjar , Sisana , Bhatgaon Dogran , Khizarpur Jat ,Tihar , Rukhi , Bhainswankhurd
		Reliance CDMA			No Coverage Between Muthal To Bighan , Khazirpur Ahir , Gannaur To Datauli , Gorar To Muzamnagar , Mahipr To Mahlana , Barwasi To Mohana ,Tihat Ot Latth , Katwal To Kalhani , Gohana To Garhi Ujale Khan ,Gannaur To Datauli , Gorar To Muzamnagar , Mahipr To Mahlana , Barwasi To Mohana , Certain Area Jhundpur To Bahalgarh	No
		Videocon			Kheri Gujjar ,Umedhgarh To Bhigaan ,Badkhalsa ,Khewra To Jakholi ,Kathura To Dhanana ,Katwal To Rukhi ,Chhtera To Nahara ,Rampur To Pai ,Polangi To Muzzam Nagar ,Mahipur To Salimsar Majra ,Hasyanpur Tihara Kalan ,Mehlana To Snp Road	ICR With Tata Is Available Between Begh ,Rajlu ,Larsauli ,Msit Engg Collage ,Nilothi ,Bhatgaon ,Khizarpur Jat ,Lath ,Ahulana ,Kathura
Idea	No Coverage Issue	No				

### 7.3 KEY FINDINGS ON DRIVE TEST:

The key observations, derived from the results of the drive tests are as under –

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 -15** drive tests were conducted across **Rohtak SSA** covering Rohtak, Bhiwani, Tosam, Bhiwani Khera and Jhajjar SDCAs during three consecutive days (476 Kms.). The overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. Only **BSNL** failed to meet the benchmark of **Voice Quality** with its performance as **88.33%**
- (ii) **In the Month of August -15**, drive tests were conducted across **Ambala SSA** covering Ambala, Barara, Yamunanagar, Jagadhari, Kalka and Narayangarh SDCAs during three consecutive days (460 Kms.). In this SSA also, the overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. Only **BSNL remained** non-complied for parameters **Call Drop Rate** with its performance **2.21%**.
- (iii) **In the month of September -15**, drive tests were conducted across **Sonipat SSA** covering Sonipat and Gohana SDCAs during three consecutive days (489 Kms.). In **Sonipat** SSA also, **BSNL** failed to meet the benchmarks for parameters **Voice Quality (97.78)**. The overall performance on SSA level for other service providers was well within the compliance range of the benchmarks.

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.

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

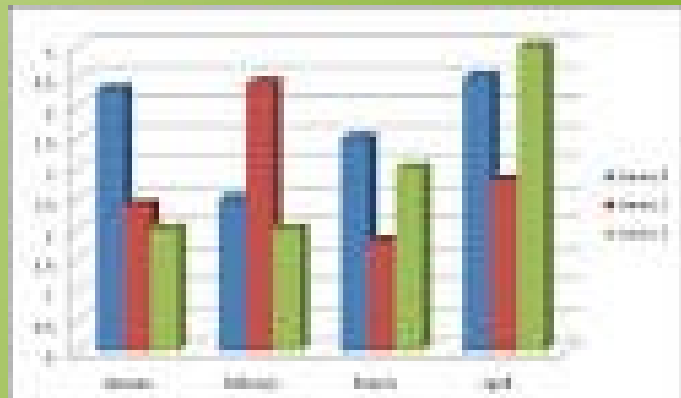
*Thus overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. However, **BSNL** remained non-compliant with respect to the parameters **Voice Quality and CDR** in the respective SSAs.*

## 8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

**AVERAGED QUARTERLY PMR**

**V/S**

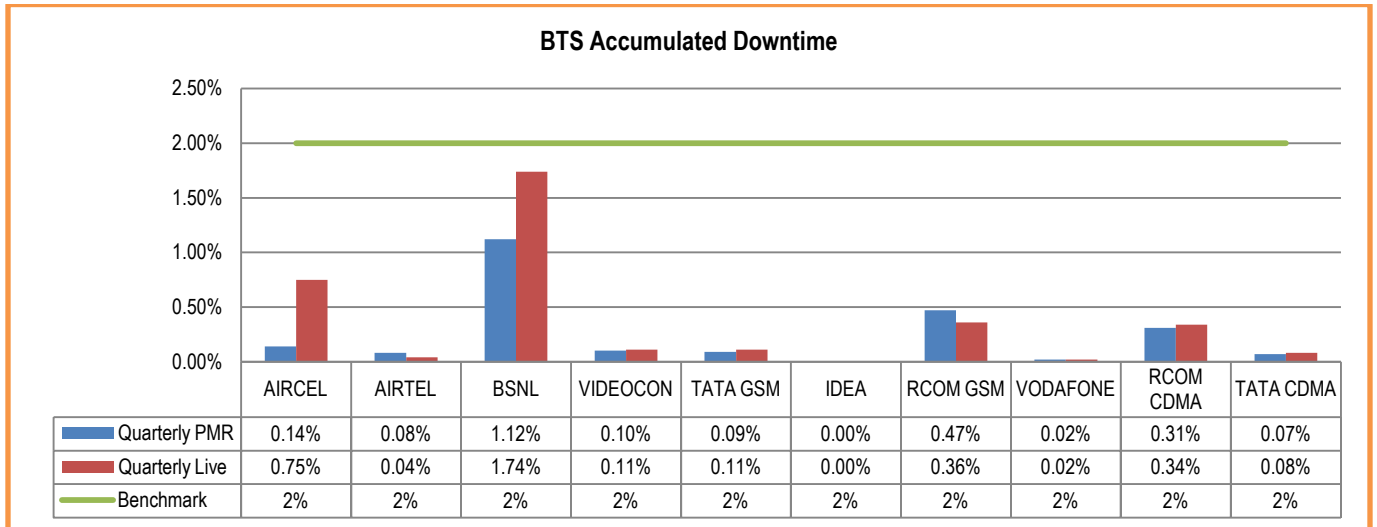
**AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT**



## 8. GRAPHICAL REPRESENTATION (CMTS):

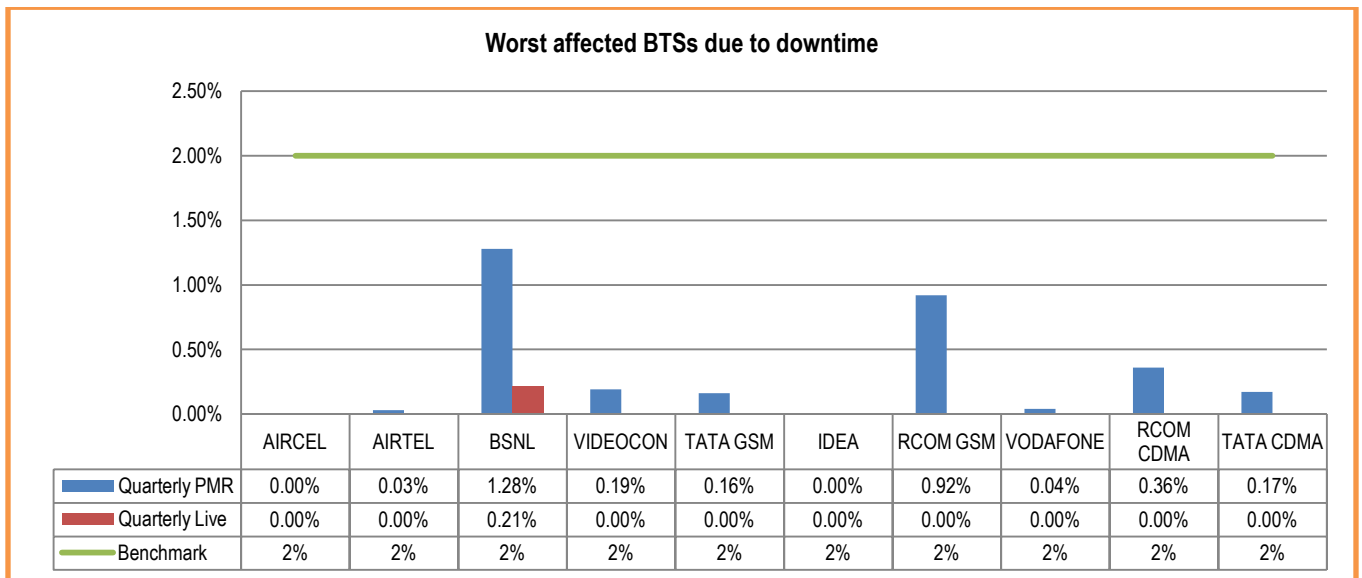
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

### 1) BTS ACCUMULATED DOWNTIME:



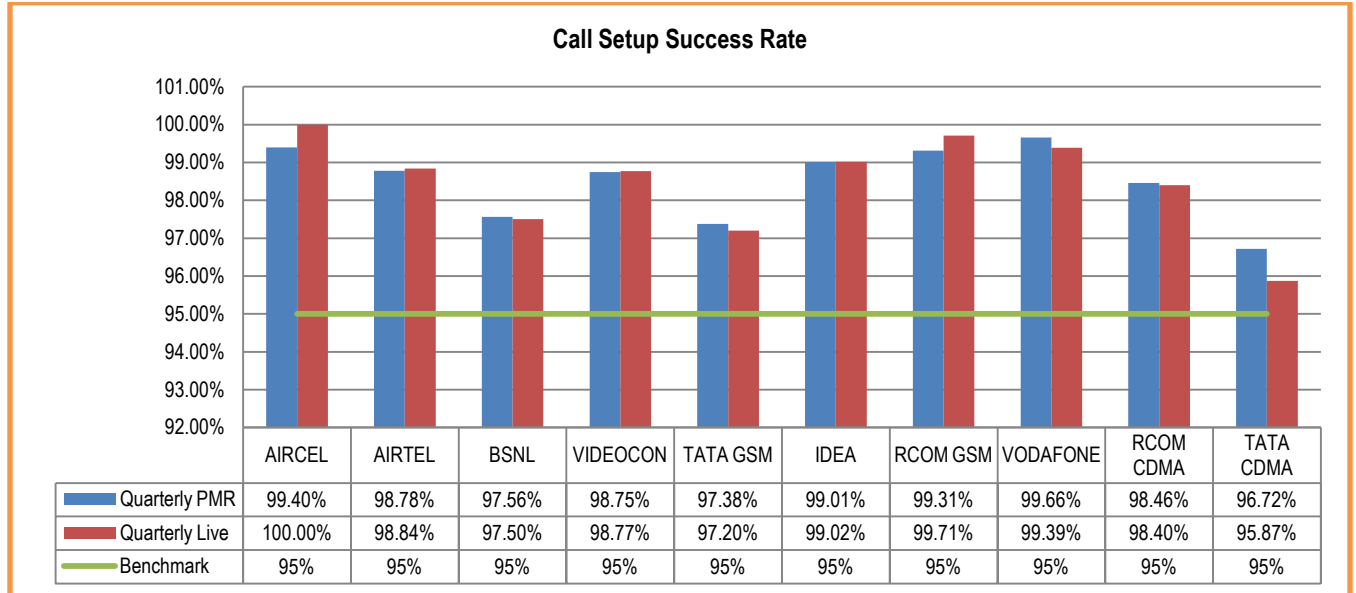
All operators are meeting the benchmarks.

### 2) WORST AFFECTED BTSS DUE TO DOWNTIME:



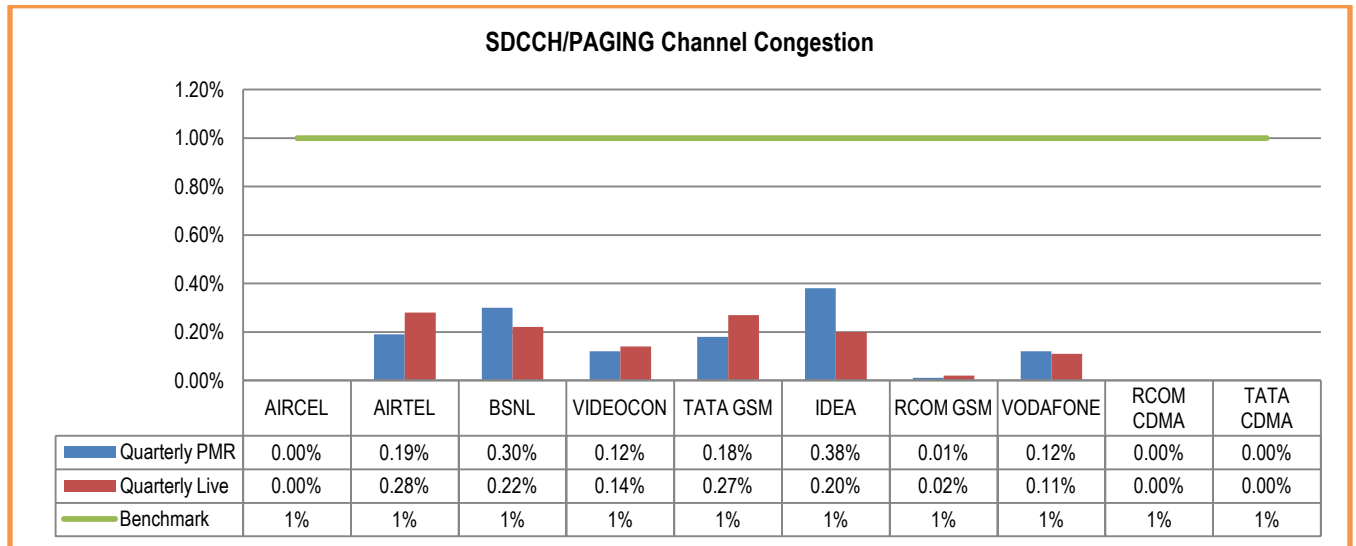
All operators are meeting the benchmarks except Tata CDMA during monthly audit.

3) CALL SETUP SUCCESS RATE:



All operators are meeting the benchmarks.

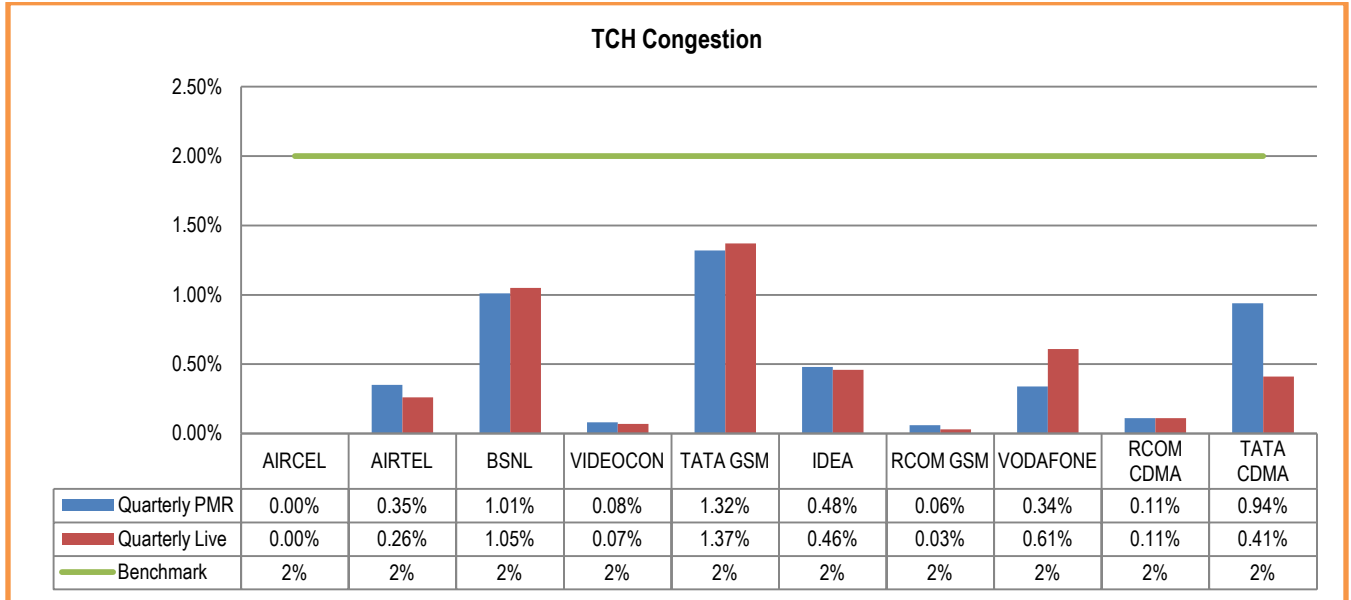
4) SDCCH/PAGING CHANNEL CONGESTION:



All operators are meeting the benchmarks.

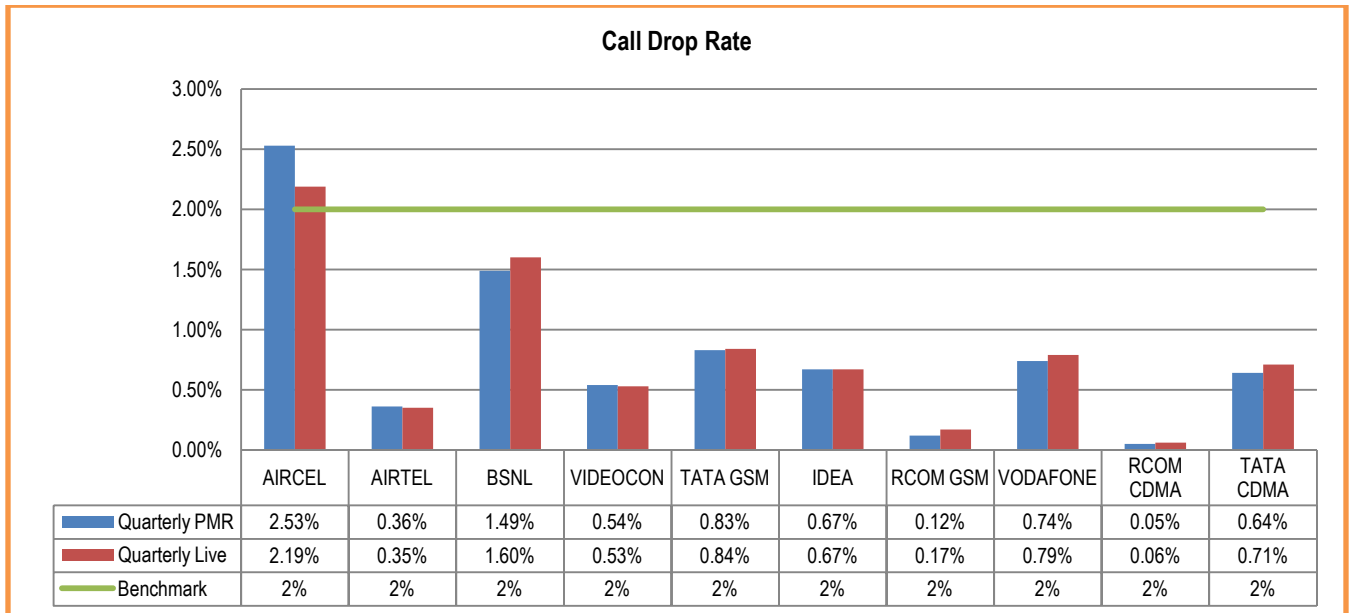


5) TCH CONGESTION:



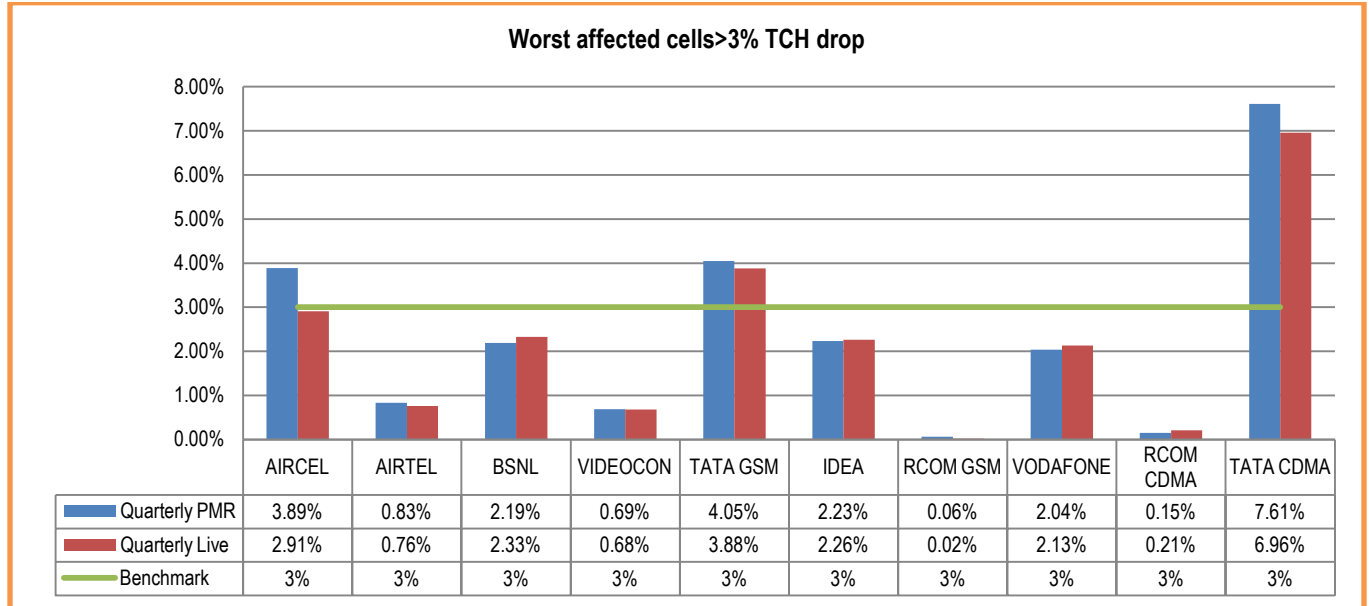
All operators are meeting the benchmarks.

6) CALL DROP RATE:



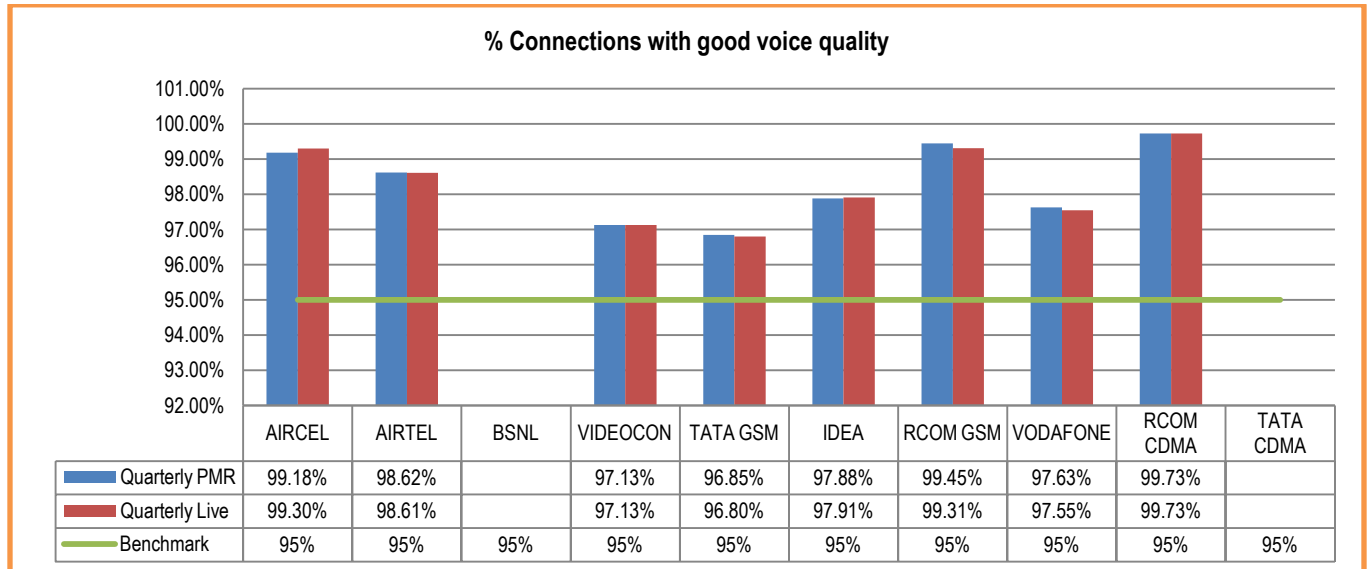
All operators are meeting the benchmarks except Aircel.

7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Aircel (Quarterly PMR), 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. PMR VERIFICATION TABLE:

### (i) NETWORK RELATED PARAMETERS:

Name of Service Provider	Parameter	BTS Accumulated Downtime	Worst affected BTSs due to downtime	CSSR (Call Setup Success Rate)	SDCCH / PAGING Channel congestion	TCH congestion	CDR (Call Drop Rate)	Worst affected cells>3% TCH drop (Call drop) rate	Connections with good voice quality	No. of POI's having >=0.5% POI congestion
Benchmark		≤ 2%	≤ 2%	≥ 95%	≤ 1%	≤ 2%	≤ 2%	≤ 3%	≥ 95%	≤ 0.5%
AIRCEL	Reported	0.15	0.00	99.40	0.00	0.00	2.53	3.89	99.18	0
	Verified	0.14%	0.00%	99.40%	0.00%	0.00%	2.53%	3.89%	99.18%	0
AIRTEL	Reported	0.09	0.05	98.75	0.18	0.34	0.39	0.84	98.55	0
	Verified	0.08%	0.03%	98.78%	0.19%	0.35%	0.36%	0.83%	98.62%	0
BSNL	Reported	1.12	1.28	97.56	0.29	1.01	1.50	2.19	97.20	0
	Verified	1.12%	1.28%	97.56%	0.30%	1.01%	1.49%	2.19%	NP	0
VIDEOCON	Reported	0.10	0.21	98.75	0.12	0.08	0.54	0.69	97.13	0
	Verified	0.10%	0.19%	98.75%	0.12%	0.08%	0.54%	0.69%	97.13%	0
TATA GSM	Reported	0.09	0.16	97.38	0.18	1.32	0.83	4.04	96.85	0
	Verified	0.09%	0.16%	97.38%	0.18%	1.32%	0.83%	4.05%	96.85%	0
IDEA	Reported	0.00	0.00	99.00	0.38	0.48	0.67	2.23	97.88	0
	Verified	0.00%	0.00%	99.01%	0.38%	0.48%	0.67%	2.23%	97.88%	0
RCOM GSM	Reported	0.41	0.81	99.72	0.03	0.04	0.16	0.01	99.31	0
	Verified	0.47%	0.92%	99.31%	0.01%	0.06%	0.12%	0.06%	99.45%	0
VODAFONE	Reported	0.02	0.04	99.66	0.12	0.34	0.74	2.04	97.63	0
	Verified	0.02%	0.04%	99.66%	0.12%	0.34%	0.74%	2.04%	97.63%	0
RCOM CDMA	Reported	0.31	0.36	98.46	0.00	0.11	0.05	0.16	99.73	0
	Verified	0.31%	0.36%	98.46%	0.00%	0.11%	0.05%	0.15%	99.73%	0
TATA CDMA	Reported	0.07	0.00	96.72	0.00	0.01	0.64	7.22	97.90	0
	Verified	0.07%	0.17%	96.72%	0.00%	0.94%	0.64%	7.61%	NP	0

- The above data is averaged for three months of the quarter ending September-2015.
- The PMR data provided by the service providers is largely matching with verified (audited) data. However the variation in data has been indicated by yellow colour.
- Aircel, Tata GSM and Tata CDMA have not met the benchmark for the parameter “Worst affected cells>3% TCH drop”.
- Aircel has not met the benchmark for the parameter “Call drop rate”.
- BSNL and Tata CDMA are not having the system generated data for Voice Quality, so not provided the data.

(ii) CUSTOMER SERVICE DELIVERY (CSD) RELATED PARAMETER:

Name of Service Provider	Parameter	Metering and billing credibility - post paid	Metering and billing credibility - pre paid	Resolution of billing /charging complaints	Resolution of billing /charging complaints	Period of applying credit/ waiver/ adjustment to customer's account from the date of resolution of complaints	Accessibility of call centre/ customer care	Percentage of calls answered by the operators (voice to voice) within 90 seconds	%age requests for Termination / Closure of service	Time taken for refund of deposits after closures
Benchmark		<= 0.1%	<= 0.1%	98% within 4 weeks	100% within 6 weeks	within 1 week of resolution of complaint	>=95%	≥ 95%	100% within <=7days	100% within 60 days
AIRCEL	Reported	0.00	0.00	100.00	100.00	100.00	96.81	99.89	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	96.81%	99.89%	100.00%	100.00%
AIRTEL	Reported	0.02	0.00	100.00	100.00	100.00	100.00	95.22	100.00	100.00
	Verified	0.02%	0.00%	100.00%	100.00%	100.00%	99.99%	95.22%	100.00%	100.00%
BSNL	Reported	0.14	0.01	100.00	100.00	100.00	100.00	93.43	100.00	100.00
	Verified	0.14%	0.01%	100.00%	100.00%	100.00%	100.00%	79.17%	100.00%	100.00%
IDEA	Reported	0.05	0.09	100.00	100.00	100.00	99.36	99.51	97.19	98.46
	Verified	0.05%	0.09%	100.00%	100.00%	100.00%	99.36%	99.51%	97.19%	98.46%
RCOM (GSM)	Reported	0.08	0.09	100.00	100.00	100.00	99.08	82.57	100.00	100.00
	Verified	0.08%	0.09%	100.00%	100.00%	100.00%	99.09%	82.57%	100.00%	100.00%
TATA (GSM)	Reported	0.00	0.00	100.00	100.00	100.00	99.11	94.98	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	99.11%	94.98%	100.00%	100.00%
VIDEOCON	Reported	NA	0.13	100.00	100.00	100.00	100.00	95.61	NA	100.00
	Verified	NA	0.00%	100.00%	100.00%	100.00%	100.00%	95.61%	NA	100.00%
VODAFONE	Reported	0.00	0.00	100.00	100.00	100.00	100.00	99.17	100.00	100.00
	Verified	0.09%	0.10%	100.00%	100.00%	100.00%	100.00%	99.17%	100.00%	100.00%
RCOM (CDMA)	Reported	0.09	0.09	100.00	100.00	100.00	98.70	98.18	100.00	100.00
	Verified	0.09%	0.09%	100.00%	100.00%	100.00%	NP	98.18%	100.00%	100.00%
TATA (CDMA)	Reported	0.00	0.00	100.00	100.00	100.00	97.04	98.99	100.00	100.00
	Verified	0.00%	0.00%	100.00%	100.00%	100.00%	97.04%	98.99%	100.00%	100.00%

- The above data is average for three months of the quarter ending September-2015.
- The PMR data provided by the service providers is largely matching with verified (audited) data. However the variation in data has been indicated by yellow colour.
- BSNL, RCOM GSM and Tata GSM have not met the benchmark for the parameter “% call answered by operators (voice to voice) within 90 sec”.
- Idea has not met the benchmark for the parameters “%age requests for Termination / Closure of service and “Time taken for refund of deposits after closures”.
- BSNL has not met the benchmark for the parameter “Metering and billing credibility - Post Paid”.