



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

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PREFACE

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

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

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

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1. BACKGROUND



1. BACKGROUND

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

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

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

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

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

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

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

2. OBJECTIVES AND METHODOLOGY



2. OBJECTIVES AND METHODOLOGY

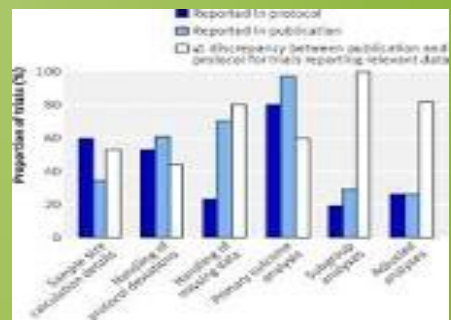
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for Punjab, Rajasthan and Gujarat circles during the quarter April 2015 – June 2015.**

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

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

3. SAMPLE SIZE



3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

- 100% of the Gateway MSC's (GMSC's) and Mobile Switching Centers (MSC's) of all the Cellular Mobile Service Providers or Unified Access Service Providers (UASP) were covered for audit in specified circles/service areas. Following were the various operators covered in Haryana circle

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
		April-15	May-15	June-15	
GSM Operators					
1	AIRCEL	13, 14 & 16 Apr-15	14, 15 & 18 May-15	5, 8 & 9 Jun-15	Green Buleward Building, NSN office, Sector-62, Noida (UP)
2	AIRTEL	16, 17 & 20 Apr-15	11 to 13 May-15	9 to 11 Jun-15	Bharti Airtel Ltd, Plot No. 21, Rajiv Gandhi Chandigarh Technology Park, Chandigarh.
3	BSNL	16 to 18 Apr-15	15, 16 & 18 May-15	15 to 17 Jun-15	AGM (PG) Cum Nodal Officer (TRAI) O/o CGMT Haryana, Ambala (HR)
4	VIDEOCON	20 to 22 Apr-15	13 to 15 May-15	3 to 5 Jun-15	Videocon Telecommunication Ltd, Golden Palace, Near Vita Milk Plant, Jasmeet Nagar, Ambala City-134007
5	TATA GSM	20 to 22 Apr-15	21, 22 & 25 May-15	9 to 11 Jun-15	Tata Teleservices Limited, 5 - Jasmeet Nagar, Near Vita Milk Plant Gt Road, Ambala, Ambala-134001, India
6	IDEA	14 to 16 Apr-15	12 to 14 May-15	5, 8 & 9 Jun-15	Idea Cellular Limited, E-5, Sector-63, Noida (UP)
7	RCOM GSM	10, 13 & 14 Apr-15	7, 8 & 11 May-15	10 to 12 Jun-15	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
8	VODAFONE	16, 17 & 20 Apr-15	11 to 13 May-15	5, 8 & 9 Jun-15	Vodafone Digilink Limited, 173 HSIDC Industrial Area, Sector-3, Karnal (Har.)
CDMA Operators					
9	RCOM CDMA	10, 13 & 14 Apr-15	7, 8 & 11 May-15	10 to 12 Jun-15	Reliance Communication Limited, NH-1, VPO-Mohari, Kuruskhetra, Near Hasari Pouthry Farm, Milestone 188.
10	TATA CDMA	20 to 22 Apr-15	21, 22 & 25 May-15	9 to 11 Jun-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 June 2015.

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

3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles 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 June - 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 June - 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 **4.30%, 4.62% and 6.27%** respectively. Further, **Aircel and Tata (CDMA)** also failed to meet the benchmark of the parameters **Call Drop Rate (CDR) and Worst affected BTS due to down time** respectively with their achieved levels as **5.89% and 5.46%**.

(ii) From three days assessment, the performance of all operators was found satisfactory as they were largely meeting the benchmarks except the parameter **‘Worst affected cells> 3 % TCH drops’**, which could not be complied with by **Aircel, Tata (GSM), Tata (CDMA)** in all the three months of the quarter. The average performance of **Aircel, Tata (GSM) and Tata (CDMA)** for parameter **‘Worst affected cells> 3 % TCH drops’** was **3.17%, 4.43% and 5.47%** respectively. **Aircel** also failed to meet the benchmark of **Call Drop rate (9.39%)**.

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 and RCOM GSM** have not met the benchmark of parameter **calls answered by Operators (voice to voice) within 90 seconds with their performance as 54.53% and 94.82%** respectively against the benchmark of $\geq 95\%$. The performance of BSNL was way below the benchmark

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 **40.92%**, 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 in Hissar and Voice Quality & CSSR in Narnaul SSAs**. Whereas, **RCOM (GSM)** needs to improve its indoor performance for parameter CDR in Hissar SSA.

5. PMR AUDIT REPORT



5. PMR AUDIT REPORTS:

5.1 MONTHLY PMR:

5.1.1 BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	AIRCEL	June -15	20:00 - 21:00
2	AIRTEL	June -15	19:00 - 20:00
3	BSNL	June -15	20:00 - 21:00
4	VIDEOCON	June -15	20:00 - 21:00
5	TATA GSM	June -15	20:00 - 21:00
6	IDEA	June -15	20:00 - 21:00
7	RCOM GSM	June -15	20:00 - 21:00
8	VODAFONE	June -15	20:00 - 21:00
CDMA Operators			
9	RCOM CDMA	June -15	20:00 - 21:00
10	TATA CDMA	June -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
GSM Operators						
1	AIRCEL	NA*	1	28	NSN	NSN
2	AIRTEL	4	25	2832	Ericsson	Ericsson
3	BSNL	9	29	2053	Ericsson & ZTE	Ericsson, NSN & ZTE
4	IDEA	6	30	3191	NSN	NSN
5	RCOM GSM	1	8	901	Huawei	Huawei
6	TATA GSM	2	12	1602	NSN	NSN
7	VIDEOCON	1	8	1414	Huawei	Huawei
8	VODAFONE	7	46	3046	NSN	NSN
CDMA Operators						
9	RCOM CDMA	3	NA	551	Lucent & ZTE	Lucent
10	TATA CDMA	4	6	397	Ericsson & Huawei	ZTE & Motorola

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

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – APRIL 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - APRIL 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
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Apr-15	0.01%	0.05%	1.19%	0.14%	0.04%	0.01%	0.47%	0.03%	0.47%	0.05%
	b) Worst affected BTSs due to downtime	<=2%	Apr-15	0.00%	0.04%	1.27%	0.21%	0.00%	0.00%	1.89%	0.00%	0.54%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-15	99.06%	99.33%	97.62%	98.84%	97.25%	99.98%	99.72%	99.74%	98.44%	97.85%
	b) SDCCH/PAGING Channel congestion	<=1%	Apr-15	0.57%	0.12%	0.19%	0.10%	0.13%	0.37%	0.01%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	0.00%	0.12%	0.86%	0.05%	1.65%	0.43%	0.02%	0.26%	0.13%	0.53%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Apr-15	5.25%	0.22%	1.40%	0.50%	0.81%	0.52%	0.17%	0.66%	0.06%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Apr-15	4.48%	0.56%	2.25%	0.76%	4.52%	1.37%	0.06%	1.67%	0.20%	6.31%
	c) Connections with good voice quality	>=95%	Apr-15	99.24%	99.05%	NP	97.26%	97.04%	98.13%	99.23%	97.61%	99.74%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Apr-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 – MAY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - MAY 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	
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	May-15	0.25%	0.06%	1.95%	0.31%	0.10%	0.00%	0.44%	0.03%	0.47%	0.35%
	b) Worst affected BTSs due to downtime	<=2%	May-15	0.00%	0.00%	1.85%	0.14%	0.00%	0.00%	0.44%	0.00%	0.36%	0.25%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	May-15	99.45%	99.33%	97.78%	98.84%	97.79%	99.96%	99.66%	99.73%	97.58%	97.30%
	b) SDCCH/PAGING Channel congestion	<=1%	May-15	0.33%	0.16%	0.33%	0.11%	0.17%	0.45%	0.02%	0.18%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	0.00%	0.13%	0.87%	0.05%	1.18%	0.53%	0.03%	0.27%	0.31%	0.81%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	May-15	3.14%	0.19%	1.31%	0.41%	0.87%	0.49%	0.17%	0.60%	0.06%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	May-15	4.38%	0.52%	2.15%	0.65%	4.57%	1.49%	0.08%	1.38%	0.22%	6.31%
	c) Connections with good voice quality	>=95%	May-15	99.38%	99.16%	NP	97.38%	97.12%	98.26%	99.31%	97.78%	99.76%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	May-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.

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – JUNE 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - JUNE 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			
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Jun-15	0.22%	0.09%	1.46%	0.30%	0.51%	0.04%	0.60%	0.05%	0.64%	0.98%
	b) Worst affected BTSs due to downtime	<=2%	Jun-15	0.00%	0.07%	1.41%	0.71%	2.81%	0.09%	2.00%	0.16%	1.63%	16.12%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	99.47%	99.12%	97.92%	98.80%	97.59%	99.97%	99.69%	99.59%	98.61%	97.07%
	b) SDCCH/PAGING Channel congestion	<=1%	Jun-15	0.04%	0.14%	0.33%	0.10%	0.32%	0.45%	0.09%	0.13%	0.00%	0.00%
	c) TCH congestion	<=2%	Jun-15	0.00%	0.19%	0.91%	0.07%	1.19%	0.40%	0.04%	0.41%	0.08%	0.94%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Jun-15	9.28%	0.22%	1.33%	0.46%	0.75%	0.54%	0.17%	0.61%	0.06%	0.52%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jun-15	4.05%	0.65%	1.88%	0.66%	4.76%	1.83%	0.08%	1.51%	0.15%	6.20%
	c) Connections with good voice quality	>=95%	Jun-15	99.29%	98.83%	NP	97.20%	97.02%	98.09%	99.35%	97.69%	99.75%	NP
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Jun-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- JUNE 15 (APRIL- MAY- JUNE 2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE - JUNE 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		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.16%	0.07%	1.53%	0.25%	0.22%	0.02%	0.50%	0.04%	0.53%	0.46%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.04%	1.51%	0.35%	0.94%	0.03%	1.44%	0.05%	0.84%	5.46%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.33%	99.26%	97.77%	98.83%	97.54%	99.97%	99.69%	99.69%	98.21%	97.41%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.31%	0.14%	0.28%	0.10%	0.21%	0.42%	0.04%	0.14%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.00%	0.15%	0.88%	0.06%	1.34%	0.45%	0.03%	0.31%	0.17%	0.76%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	5.89%	0.21%	1.35%	0.46%	0.81%	0.52%	0.17%	0.62%	0.06%	0.49%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	4.30%	0.58%	2.09%	0.69%	4.62%	1.56%	0.07%	1.52%	0.19%	6.27%
	c) Connections with good voice quality	>=95%	Quarterly	99.30%	99.01%	NP	97.28%	97.06%	98.16%	99.30%	97.69%	99.75%	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 parameter 'BTS accumulated downtime'**. However benchmark on the parameter '**worst affected BTSs due to down time**' could not be met by **Tata (CDMA)** with its average performance as **5.46%**.

- **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 **5.89%**.

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 **4.30%, 4.62%** and **6.27%** 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) – APRIL 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - HARYANA CIRCLE - APRIL 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		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.02%	1.67%	0.07%	0.07%	0.01%	0.57%	0.04%	0.51%	0.02%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.25%	99.41%	98.12%	98.87%	97.96%	99.98%	99.78%	99.80%	98.91%	97.22%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.03%	0.09%	0.15%	0.05%	0.08%	0.29%	0.01%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.08%	0.67%	0.03%	1.10%	0.44%	0.03%	0.20%	0.04%	1.23%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	6.70%	0.22%	1.46%	0.42%	0.83%	0.52%	0.15%	0.65%	0.05%	0.48%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.78%	0.54%	2.36%	0.48%	4.15%	1.36%	0.01%	1.66%	0.24%	6.18%
	c) Connections with good voice quality	>=95%	Live data	99.85%	99.04%	NP	97.28%	97.07%	98.14%	99.22%	97.65%	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 data for this parameter.

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

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE - MAY 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		
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.02%	1.82%	0.17%	0.10%	0.00%	0.46%	0.03%	0.72%	0.18%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100%	99.39%	98.63%	98.86%	97.86%	99.98%	99.17%	99.77%	96.66%	97.48%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.00%	0.16%	0.41%	0.09%	0.09%	0.36%	0.02%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.08%	0.82%	0.03%	1.12%	0.34%	0.03%	0.23%	0.52%	0.48%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.87%	0.20%	1.24%	0.44%	0.71%	0.46%	0.17%	0.55%	0.08%	0.45%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.57%	0.47%	1.95%	0.61%	4.34%	1.38%	0.01%	1.22%	0.44%	5.05%
	c) Connections with good voice quality	>=95%	Live data	99.63%	99.17%	NP	97.51%	97.00%	98.33%	99.30%	97.87%	99.75%	NP
4	No. of POI having >=0.5% congestion	<0.5%	Live data	0	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES HARYANA CIRCLE- JUNE 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	
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Live data	0.34%	0.07%	1.84%	0.40%	1.88%	0.24%	0.12%	0.17%	0.37%	0.53%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.24%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.97%	99.19%	98.00%	98.88%	97.50%	99.96%	99.44%	99.76%	98.61%	96.75%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.23%	0.20%	0.58%	0.07%	0.39%	0.45%	0.02%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.14%	0.82%	0.03%	1.27%	0.54%	0.03%	0.24%	0.10%	1.79%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Live data	19.59%	0.18%	1.32%	0.39%	0.65%	0.46%	0.15%	0.51%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.17%	0.50%	1.41%	0.70%	4.80%	1.31%	0.02%	1.05%	0.28%	5.19%
	c) Connections with good voice quality	>=95%	Live data	98.82%	98.92%	NP	97.51%	97.28%	98.31%	99.46%	97.94%	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 APRIL – MAY – JUNE 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	
Network Service Quality Parameter													
Network Availability													
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.11%	0.04%	1.78%	0.21%	0.68%	0.08%	0.38%	0.08%	0.53%	0.24%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.21%	0.00%	0.00%	0.03%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.07%	99.33%	98.25%	98.87%	97.77%	99.97%	99.46%	99.78%	98.06%	97.15%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.09%	0.15%	0.38%	0.07%	0.19%	0.37%	0.02%	0.08%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.00%	0.10%	0.77%	0.03%	1.16%	0.44%	0.03%	0.22%	0.22%	1.17%
Connection maintenance (Retainability)													
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	9.39%	0.20%	1.34%	0.42%	0.73%	0.48%	0.16%	0.57%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	3.17%	0.50%	1.91%	0.60%	4.43%	1.35%	0.01%	1.31%	0.32%	5.47%
	c) Connections with good voice quality	>=95%	Quarterly	99.43%	99.04%	NP	97.43%	97.12%	98.26%	99.33%	97.82%	99.74%	NP
4	No. of POI having >=0.5% congestion	<0.5%	Quarterly	0	0	0	0	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days assessment, the performance of all operators was found satisfactory as they were largely meeting the benchmarks except the parameter ‘Worst affected cells> 3 % TCH drops”, which could not be complied with by **Aircel, Tata (GSM), Tata (CDMA)** in all the three months of the quarter. The average performance of **Aircel, Tata (GSM)** and **Tata (CDMA)** for parameter ‘Worst affected cells> 3 % TCH drops” was **3.17%, 4.43%** and **5.47%** respectively. **Aircel** also failed to meet the benchmark of **Call Drop rate (9.39%)**.

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 - April 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
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		Apr-15	28	2829	2041	1406	1550	3191	901	3015	551	400
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Apr-15	2.36	994.01	17442.46	1381.53	428.44	178.38	3022.17	630.20	1871.18	134.19
	c) BTS Accumulated Downtime	<=2%	Apr-15	0.01%	0.05%	1.19%	0.14%	0.04%	0.01%	0.47%	0.03%	0.47%	0.05%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Apr-15	0	1	26	3	0	0	17	0	3	0
	e) Worst affected BTSs due to downtime	<=2%	Apr-15	0.00%	0.04%	1.27%	0.21%	0.00%	0.00%	1.89%	0.00%	0.54%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Apr-15	99.06%	99.33%	97.62%	98.84%	97.25%	99.98%	99.72%	99.74%	98.44%	97.85%
	b) SDCCH/PAGING Congestion	<=1%	Apr-15	0.57%	0.12%	0.19%	0.10%	0.13%	0.37%	0.01%	0.10%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	0.00%	0.12%	0.86%	0.05%	1.65%	0.43%	0.02%	0.26%	0.13%	0.53%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Apr-15	5.25%	0.22%	1.40%	0.50%	0.81%	0.52%	0.17%	0.66%	0.06%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	Apr-15	4.48%	0.56%	2.25%	0.76%	4.52%	1.37%	0.06%	1.67%	0.20%	6.31%
	c) % of connections with good voice quality	>=95%	Apr-15	99.24%	99.05%	NP	97.26%	97.04%	98.13%	99.23%	97.61%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Apr-15	4	47	135	33	206	133	2	153	3	76
	e) Total no. of cells (Sector) in the licensed service area		Apr-15	84	8472	6028	4306	4563	9693	2697	9132	1655	1198
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Apr-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Apr-15	0	0	0	0	0	0	0	0	0	0
Network Data													
5	a) Equipped Capacity of Network in Erlang		Apr-15	212	77479	240000	63092	99073	105384	50000	141397	56000	54292
	b) Total traffic in TCBH in erlang (Avg.)		Apr-15	2	66248	83879	28199	44873	112827	39827	130244	11483	12062
	c) Total no. of customers served (as per VLR) on last day of the month		Apr-15	197	2524482	1536886	1009239	1667048	4593479	1577160	4994665	334002	205439

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- April 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	
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Live data	28	2826	2040	1405	1537	3191	901	2996	551	400
	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	32.19	2449.82	71.42	74.61	18.02	368.67	87.88	204.12	6.17
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.02%	1.67%	0.07%	0.07%	0.01%	0.57%	0.04%	0.51%	0.02%
	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%	0.25%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.25%	99.41%	98.12%	98.87%	97.96%	99.98%	99.78%	99.80%	98.91%	97.22%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.03%	0.09%	0.15%	0.05%	0.08%	0.29%	0.01%	0.07%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.00%	0.08%	0.67%	0.03%	1.10%	0.44%	0.03%	0.20%	0.04%	1.23%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	6.70%	0.22%	1.46%	0.42%	0.83%	0.52%	0.15%	0.65%	0.05%	0.48%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.78%	0.54%	2.36%	0.48%	4.15%	1.36%	0.01%	1.66%	0.24%	6.18%
	c) % of connections with good voice quality	>=95%	Live data	99.85%	99.04%	NP	97.28%	97.07%	98.14%	99.22%	97.65%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	2	46	140	21	193	132	0	15	4	74
e) Total no. of cells (Sector) in the licensed service area		Live data	84	8507	5941	4308	4651	9691	2697	9075	1653	1198	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle- May 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	
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		May-15	28	2838	1348	1408	1572	3191	901	3032	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		May-15	52.72	1174.62	19507.89	3198.41	1117.73	103.09	2957.12	747.57	1930.38	1029.30
	c) BTS Accumulated Downtime	<=2%	May-15	0.25%	0.06%	1.95%	0.31%	0.10%	0.00%	0.44%	0.03%	0.47%	0.35%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		May-15	0	0	25	2	0	0	4	0	2	1
	e) Worst affected BTSs due to downtime	<=2%	May-15	0.00%	0.00%	1.85%	0.14%	0.00%	0.00%	0.44%	0.00%	0.36%	0.25%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	May-15	99.45%	99.33%	97.78%	98.84%	97.79%	99.96%	99.66%	99.73%	97.58%	97.30%
	b) SDCCH/PAGING Congestion	<=1%	May-15	0.33%	0.16%	0.33%	0.11%	0.17%	0.45%	0.02%	0.18%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	0.00%	0.13%	0.87%	0.05%	1.18%	0.53%	0.03%	0.27%	0.31%	0.81%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	May-15	3.14%	0.19%	1.31%	0.41%	0.87%	0.49%	0.17%	0.60%	0.06%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	May-15	4.38%	0.52%	2.15%	0.65%	4.57%	1.49%	0.08%	1.38%	0.22%	6.31%
	c) % of connections with good voice quality	>=95%	May-15	99.38%	99.16%	NP	97.38%	97.12%	98.26%	99.31%	97.78%	99.76%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		May-15	4	45	129	28	217	144	2	127	4	58
	e) Total no. of cells (Sector) in the licensed service area		May-15	84	8525	5998	4314	4745	9696	2697	9188	1655	926
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		May-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		May-15	0	0	0	0	0	0	0	0	0	0
Network Data													
5	a) Equipped Capacity of Network in Erlang		May-15	212	78270	240000	64289	97356	105200	50000	142676	56000	56707
	b) Total traffic in TCBH in erlang (Avg.)		May-15	2	66598	86189	26987	44021	110265	37886	128275	10620	9822
	c) Total no. of customers served (as per VLR) on last day of the month		May-15	181	2547904	1494774	978530	1625339	4552627	1565662	4966763	328466	157298

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- May 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	
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Live data	28	2836	2048	1407	1572	3191	901	3023	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	40.69	2684.72	175.32	112.11	7.09	295.50	57.89	285.00	51.45
	c) BTS Accumulated Downtime	<=2%	Live data	0.00%	0.02%	1.82%	0.17%	0.10%	0.00%	0.46%	0.03%	0.72%	0.18%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	3	0	0	0	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.15%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Live data	100%	99.39%	98.63%	98.86%	97.86%	99.98%	99.17%	99.77%	96.66%	97.48%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.00%	0.16%	0.41%	0.09%	0.09%	0.36%	0.02%	0.10%	0.00%	0.00%
c) TCH congestion	<=2%	Live data	0.00%	0.08%	0.82%	0.03%	1.12%	0.34%	0.03%	0.23%	0.52%	0.48%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	1.87%	0.20%	1.24%	0.44%	0.71%	0.46%	0.17%	0.55%	0.08%	0.45%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.57%	0.47%	1.95%	0.61%	4.34%	1.38%	0.01%	1.22%	0.44%	5.05%
	c) % of connections with good voice quality	>=95%	Live data	99.63%	99.17%	NP	97.51%	97.00%	98.33%	99.30%	97.87%	99.75%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	3	40	119	26	206	134	0	111	7	25
e) Total no. of cells (Sector) in the licensed service area		Live data	84	8534	6127	4314	4759	9703	2697	9155	1653	495	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Haryana Circle - June 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	
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Jun-15	28	2832	2053	1414	1602	3191	901	3046	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		Jun-15	45.27	1749.89	21512.87	3082.64	5881.60	960.22	3913.45	1179.85	2545.73	2811.67
	c) BTS Accumulated Downtime	<=2%	Jun-15	0.22%	0.09%	1.46%	0.30%	0.51%	0.04%	0.60%	0.05%	0.64%	0.98%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jun-15	0	2	29	10	45	3	18	5	9	64
e) Worst affected BTSs due to downtime	<=2%	Jun-15	0.00%	0.07%	1.41%	0.71%	2.81%	0.09%	2.00%	0.16%	1.63%	16.12%	
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	99.47%	99.12%	97.92%	98.80%	97.59%	99.97%	99.69%	99.59%	98.61%	97.07%
	b) SDCCH/PAGING Congestion	<=1%	Jun-15	0.04%	0.14%	0.33%	0.10%	0.32%	0.45%	0.09%	0.13%	0.00%	0.00%
c) TCH congestion	<=2%	Jun-15	0.00%	0.19%	0.91%	0.07%	1.19%	0.40%	0.04%	0.41%	0.08%	0.94%	
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Jun-15	9.28%	0.22%	1.33%	0.46%	0.75%	0.54%	0.17%	0.61%	0.06%	0.52%
	b) Worst affected cells>3% TCH drop	<=3%	Jun-15	4.05%	0.65%	1.88%	0.66%	4.76%	1.83%	0.08%	1.51%	0.15%	6.20%
	c) % of connections with good voice quality	>=95%	Jun-15	99.29%	98.83%	NP	97.20%	97.02%	98.09%	99.35%	97.69%	99.75%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jun-15	3	56	115	29	229	177	2	140	2	31
e) Total no. of cells (Sector) in the licensed service area		Jun-15	84	8591	6124	4323	4816	9693	2697	9230	1653	498	
4	No. of POI's having >=0.5% POI congestion												
	No. of POI's having >=0.5% POI congestion		Jun-15	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jun-15	0	0	0	0	0	0	0	0	0	0
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Jun-15	212	78153	240000	64316	100655	104635	50000	142708	56000	21635
	b) Total traffic in TCBH in erlang (Avg.)		Jun-15	2	64846	83050	25584	43262	112778	36476	124995	9463	5488
c) Total no. of customers served (as per VLR) on last day of the month		Jun-15	185	2588418	1560466	1037838	1664644	4609375	1526002	4972512	311404	136806	

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurements-Haryana Circle- Jun 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	
Network Service Quality Parameter													
Network Availability													
1	a) Total no. of BTSs in the licensed service area		Live data	28	2850	2053	1409	1572	3191	901	3034	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	6.83	152.21	2712.96	408.46	2127.65	560.25	80.70	371.82	146.52	151.50
	c) BTS Accumulated Downtime	<=2%	Live data	0.34%	0.07%	1.84%	0.40%	1.88%	0.24%	0.12%	0.17%	0.37%	0.53%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	5	0	0	3	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.24%	0.00%	0.00%	0.09%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)													
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	98.97%	99.19%	98.00%	98.88%	97.50%	99.96%	99.44%	99.76%	98.61%	96.75%
	b) SDCCCH/PAGING Congestion	<=1%	Live data	0.23%	0.20%	0.58%	0.07%	0.39%	0.45%	0.02%	0.07%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.00%	0.14%	0.82%	0.03%	1.27%	0.54%	0.03%	0.24%	0.10%	1.79%
Connection Maintenance (Retainability)													
3	a) Call Drop Rate (CDR)	<=2%	Live data	19.59%	0.18%	1.32%	0.39%	0.65%	0.46%	0.15%	0.51%	0.07%	0.46%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.17%	0.50%	1.41%	0.70%	4.80%	1.31%	0.02%	1.05%	0.28%	5.19%
	c) % of connections with good voice quality	>=95%	Live data	98.82%	98.92%	NP	97.51%	97.28%	98.31%	99.46%	97.94%	99.74%	NP
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	3	42	86	30	231	127	1	96	5	26
	e) Total no. of cells (Sector) in the licensed service area		Live data	84	8602	6089	4318	4805	9693	2697	9194	1653	495
No. of POI's having >=0.5% POI congestion													
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



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

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

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE JUNE 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
Customer Service Quality Parameters													
Metering & Billing Credibility -Post Paid													
1	A) No. of bills issued during the quarter		Haryana	53	292410	55480	785647	44622	166593	NA	535715	92093	64834
	B) No. of bills disputed including billing complaints during the quarter		Haryana	0	64	52	468	44	3	NA	284	71	1
	C) % of billing complaints during the quarter	<= 0.1%	Haryana	0.00%	0.02%	0.09%	0.06%	0.10%	0.002%	NA	0.05%	0.08%	0.002%
Metering & Billing Credibility -Pre Paid													
2	A) Total No. of Pre-paid customers at the end of the quarter		Haryana	3046	2552333	2684699	4418450	1625021	2875769	1986409	5105664	348587	350540
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		Haryana	0	54	443	3189	1461	0	17	3801	271	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	Haryana	0.00%	0.002%	0.02%	0.07%	0.09%	0.00%	0.001%	0.07%	0.08%	0.00%
Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints													
3	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		Haryana	0	118	495	12659	1505	3	17	4085	342	1
	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	118	495	12659	1505	3	17	4085	342	1
	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	118	495	12659	1505	3	17	4085	342	1
	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 JUNE 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%
Response time to customers for assistance													
	A) Total no of calls attempted to customer care/Call center		Haryana	2422	805081	236111	11543968	1791519	616158	417026	13658666	242509	45639
	B) Total no. of calls successfully established to customer care/Call center.		Haryana	2341	775779	236111	11473499	1781018	611154	417026	13658641	240723	44120
4	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	Haryana	96.66%	96.36%	100.00%	99.39%	99.41%	99.19%	100.00%	100.00%	99.26%	96.67%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		Haryana	1066	1461782	1436652	3278197	184510	1165588	1268998	3643046	49119	56284
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Haryana	1065	1401068	783453	3257717	174957	1153678	1211612	3601835	47709	55825
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	Haryana	99.91%	95.85%	54.53%	99.38%	94.82%	98.98%	95.48%	98.87%	97.13%	99.18%
Termination/closure of service													
5	A) Total No. of requests for Termination / Closure of service received during the quarter		Haryana	0	1161	254	8096	270	1739	NA	1642	864	750
	B) No. of requests for Termination /Closure of service complied within 7 days during the quarter		Haryana	0	1161	254	8096	270	1739	NA	1642	864	750
	C) % of Termination/ Closure of service within 7 days	<=7days	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%
Time taken for refunds of deposits after closures.													
6	A) No. of Payments/ Refunds due during the quarter		Haryana	0	182	335	2558	420	700	NA	12707	303	623
	B) No. of Payments/ Refunds Cleared during the quarter		Haryana	0	182	335	2558	420	700	NA	12707	303	623
	C)Time taken for refunds of deposits after closures.	100% within 60 days	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%

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

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

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES – QE - JUNE 15													
3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators									CDMA Operators
Response time to customers for assistance													
1	A) Total no of calls attempted to customer care/Call center		Haryana	43	21745	8566	434357	NP	21778	15404	487834	NP	1339
	B) Total no. of calls successfully established to customer care/Call center.		Haryana	42	21745	8566	432024	NP	21591	15404	487834	NP	1317
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	Haryana	97.67%	100.00%	100.00%	99.46%	NP	99.14%	100.00%	100.00%	NP	98.36%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		Haryana	17	50128	54622	117997	5799	41475	48863	130515	1463	1816
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Haryana	17	48902	22354	117626	5651	40783	46966	129534	1433	1786
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	Haryana	100.00%	97.55%	40.92%	99.69%	97.45%	98.33%	96.12%	99.25%	97.95%	98.35%

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

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

The performance of the service providers with respect to the parameter metering and billing credibility for both post-paid and pre-paid is well within the prescribed bench mark of $\leq 0.1\%$.

2. Resolution of Billing complaints and applying credits -

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

All operators have 100% resolved the billing complaints within stipulated period of 4 weeks and 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 and RCOM GSM** have not met the benchmark of parameter **calls answered by Operators (voice to voice) within 90 seconds with their performance as 54.53% and 94.82%** against the benchmark of $\geq 95\%$. The performance of BSNL was way below the benchmark.

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

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

Live Measurements

The results for three days live measurements 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 **40.92%** respectively, 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%	100%	100%	100%	100%	100%	100%	100%
BSNL	Haryana	100%	---	100%	100%	100%	100%	100%	100%	100%
IDEA	Haryana	100%	100%	---	100%	100%	100%	100%	100%	100%
RCOM GSM	Haryana	100%	100%	100%	---	100%	100%	100%	100%	100%
RCOM CDMA	Haryana	100%	100%	100%	100%	---	100%	100%	100%	100%
TATA GSM	Haryana	100%	100%	100%	100%	100%	---	100%	100%	100%
TATA CDMA	Haryana	100%	100%	100%	100%	100%	100%	---	100%	100%
VIDEOCON	Haryana	100%	100%	100%	100%	100%	100%	100%	---	100%
VODAFONE	Haryana	100%	100%	100%	100%	100%	100%	100%	100%	---

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

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	Haryana	100	100	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	Haryana	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	Haryana	100	100	100	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total calls successfully established * 100 / Total call attempts)	Haryana	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	Haryana	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	Haryana	100	100	96	100	98	100	96	98	98	100
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total calls attempts)	Haryana	100.00%	100.00%	96.00%	100.00%	98.00%	100.00%	96.00%	98.00%	98.00%	100.00%

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, Videocon, Vodafone and RCOM CDMA could connect 96%, 98%, 96%, 98% and 98% of calls to the operator.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	Haryana	0	118	150	230	200	3	17	200	200	1
Total No. of calls Answered	Haryana	0	100	80	200	140	1	15	135	150	1
Cases resolved within 4 weeks	Haryana	0	100	80	200	140	1	15	135	150	1
%age of cases resolved	Haryana	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

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

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING															
Month	Circle Name	SSA Name	SDCA Name	Emergency No.	No. of calls made	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	RCOM (CDMA)	TATA (CDMA)	
April'15	Haryana	Sonipat	Sonipat	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Gohana	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
May'15	Haryana	Hisar	Sirsa	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Fateabad	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Hisar	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Kalanwali	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Adampur mandi	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Hansi	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Ratia	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Dabwali	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			Tohana	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
			ellenabad	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	√
June'15	Haryana	Narnaul	Narnaul	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Mahendergarh	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Rewari	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Bawal	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Jatusana	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	
			Kosli	100,102,1056,101,1073,1098,1091,1098	8	√	√	√	√	√	√	√	√	√	

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

7. DRIVE TEST



7. OPERATOR ASSESTID DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three SSA's namely **Sonipat, Hissar and Narnaul** in the months of April, May and June 2015 respectively. The total route Kms covered during the drive tests in respective SSAs was **572 Kms, 590 Kms and 450 Kms**. The performance of the operators has been highlighted below in the tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour.

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

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

DRIVE TEST TABLE – 1
OPERATOR ASSISTED DRIVE TEST AT SONIPAT SSA IN APRIL 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	176	26	193	26	150	25	188	25	102	21	150	25	150	25	113
		Highways	NC	NC	114	25	115	25	99	25	123	25	92	29	101	25	150	25	88	25	93	29
		Within City	NC	NC	175	25	177	33	156	25	181	27	197	26	163	25	190	25	178	25	198	25
		Overall SSA	NC	NC	465	76	485	84	405	75	492	77	391	76	414	75	490	75	379	75	395	75
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	1.04%	0.00%	0.67%	0.00%	0.00%	0.00%	0.00%	0.00%	0.67%	0.00%	0.67%	0.00%	1.77%	0.00%	0.00%	0.00%
		Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%	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%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.05%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	NC	NC	0.00%	0.00%	0.41%	0.00%	0.49%	0.00%	0.20%	0.00%	0.00%	0.00%	0.24%	0.00%	0.61%	0.00%	0.53%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	0.52%	0.00%	1.34%	0.00%	0.00%	0.00%	0.98%	0.00%	0.00%	0.00%	0.00%	0.00%	1.77%	0.00%	0.00%	0.00%
		Highways	NC	NC	0.00%	0.00%	0.00%	0.00%	1.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.14%	0.00%	2.15%	0.00%
		Within City	NC	NC	0.00%	0.00%	0.56%	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%	0.51%	0.00%
		Overall SSA	NC	NC	0.00%	0.00%	0.41%	0.00%	0.74%	0.00%	0.00%	0.00%	0.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.79%	0.00%	0.76%	0.00%
Percentage connections with good voice quality (=>95%)																						
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Roads	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	96.01%	98.66%	99.86%	100%
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	94.54%	99.60%	99.91%	100%
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.49%	98.87%	99.99%	100%
		Overall SSA	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.44%	99.05%	99.94%	100%
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	NC	NC	96.04%	98.72%	94.73%	100%	96.03%	97.07%	95.31%	99.76%	97.59%	99.95%	95.31%	99.71%	96.75%	96.19%	NA	NA	NA	NA
		Highways	NC	NC	96.73%	97.52%	95.17%	95.43%	96.00%	95.40%	96.20%	98.04%	98.19%	99.25%	95.31%	95.47%	96.11%	95.78%	NA	NA	NA	NA
		Within City	NC	NC	96.52%	98.22%	97.32%	98.31%	95.75%	98.18%	96.56%	97.07%	98.34%	98.93%	95.73%	99.56%	96.32%	96.06%	NA	NA	NA	NA
		Overall SSA	NC	NC	96.39%	98.12%	95.79%	97.28%	95.92%	96.93%	95.99%	98.18%	98.12%	99.29%	95.46%	97.59%	96.41%	96.01%	NA	NA	NA	NA

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

DRIVE TEST TABLE – 1
OPERATOR ASSISTED DRIVE TEST AT SONIPAT SSA IN APRIL 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
Service Coverage																						
5	In door (≥ -75 dBm)	Major Roads	NC	NC	83.02%	27.12%	86.25%	98.80%	29.21%	21.35%	76.65%	100%	56.74%	100%	59.32%	99.24%	95.87%	99.89%	17.71%	24.42%	96.17%	98.59%
		Highways	NC	NC	87.13%	99.80%	88.38%	100%	41.71%	59.47%	85.20%	100%	55.48%	100%	49.22%	98.56%	98.23%	100%	34.56%	99.97%	97.24%	100%
		Within City	NC	NC	95.20%	82.64%	98.73%	88.61%	53.36%	99.69%	95.23%	85.26%	70.67%	93.62%	84.97%	99.42%	99.53%	98.64%	80.34%	59.49%	98.19%	99.31%
		Overall SSA	NC	NC	88.74%	72.58%	91.37%	95.12%	40.60%	58.87%	85.64%	94.51%	63.67%	97.67%	65.42%	98.95%	97.85%	99.53%	41.62%	60.83%	97.49%	99.36%
	In-vehicle (≥ -85 dBm)	Major Roads	NC	NC	97.53%	99.68%	98.85%	100%	66.71%	94.86%	96.01%	100%	85.52%	100%	89.50%	100%	98.33%	100%	54.61%	43.49%	97.58%	99.87%
		Highways	NC	NC	99.21%	100%	99.77%	100%	75.02%	87.90%	96.67%	100%	82.35%	100%	70.34%	99.99%	99.36%	100%	76.65%	100%	98.90%	100%
		Within City	NC	NC	99.96%	91.65%	100%	97.07%	83.39%	100%	99.93%	90.88%	93.25%	100%	98.11%	99.88%	99.58%	99.57%	94.61%	100%	99.85%	100%
		Overall SSA	NC	NC	98.87%	96.82%	99.49%	98.84%	74.47%	92.11%	97.62%	96.60%	88.79%	100%	87.12%	99.96%	99.06%	99.86%	72.53%	80.76%	99.09%	99.97%
	Outdoor-in city (≥ -95 dBm)	Major Roads	NC	NC	99.86%	99.96%	99.98%	100%	95.94%	99.90%	99.61%	100%	98.79%	100%	97.91%	100%	99.87%	100%	97.12%	100%	100%	100%
		Highways	NC	NC	100%	100%	100%	100%	97.78%	95.13%	98.98%	100%	99.02%	100%	78.14%	100%	99.93%	100%	97.34%	100%	99.97%	100%
		Within City	NC	NC	100%	99.75%	100%	100%	96.81%	100%	99.95%	99.27%	99.74%	100%	99.64%	100%	99.97%	100%	98.81%	100%	100%	100%
		Overall SSA	NC	NC	99.95%	99.90%	99.99%	100%	96.82%	97.30%	99.57%	99.73%	99.34%	100%	92.97%	100%	99.92%	100%	97.71%	100%	99.99%	100%
6	Call Setup Success Rate ($\geq 95\%$)	Major Roads	NC	NC	100%	100%	98.96%	100%	99.33%	100%	100%	100%	100%	100%	99.33%	100%	99.33%	100%	100%	100%	100%	100%
		Highways	NC	NC	100%	100%	100%	100%	100%	100%	99.19%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	NC	NC	100%	100%	100%	100%	99.36%	100%	100%	100%	100%	100%	100%	100%	98.95%	100%	100%	100%	100%	100%
		Overall SSA	NC	NC	100%	100%	99.59%	100%	99.51%	100%	99.80%	100%	100%	100%	99.76%	100%	99.39%	100%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.81%	100%	98.91%	100%	98.73%	100%	100%	100%	100%	100%	66.67%	100%	100%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.35%	100%	99.62%	100%	100%	100%	99.68%	100%	100%	100%	100%	100%	99.22%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.82%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.15%	100%	100%	100%	100%	100%
		Overall SSA	NC	NC	99.71%	100%	99.58%	100%	99.70%	100%	99.91%	100%	100%	100%	90.23%	100%	99.39%	100%	100%	100%	100%	100%

- NC-No Coverage
- NA-Not Applicable

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

**DRIVE TEST TABLE – 2
OPERATOR ASSISTED DRIVE TEST AT HISSAR SSA IN MAY 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	201	25	174	25	120	25	204	25	125	25	75	25	167	25	137	25
Highways	NC	NC			92	25	92	29	102	25	90	25	80	23	94	25	148	25	90	25	81	22	
Within City	NC	NC			199	26	154	27	189	25	208	25	202	25	168	25	202	25	163	25	205	25	
Overall SSA	NC	NC			492	76	420	81	411	75	502	75	407	73	337	75	517	75	390	75	412	73	
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	0.00%	0.00%	0.83%	0.00%	0.49%	0.00%	0.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.73%	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%	1.06%	0.00%	0.68%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	NC	NC	0.00%	0.00%	1.95%	0.00%	1.06%	0.00%	0.48%	0.00%	0.50%	0.00%	1.19%	0.00%	0.00%	0.00%	0.61%	0.00%	0.00%	0.00%	
		Overall SSA	NC	NC	0.00%	0.00%	0.71%	0.00%	0.73%	0.00%	0.40%	0.00%	0.49%	0.00%	0.89%	0.00%	0.19%	0.00%	0.51%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	1.72%	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%	0.79%	0.00%	
		Highways	NC	NC	0.00%	0.00%	2.17%	0.00%	0.00%	0.00%	0.00%	0.00%	1.25%	8.70%	0.00%	0.00%	0.00%	0.00%	1.11%	0.00%	3.70%	0.00%	
		Within City	NC	NC	0.50%	0.00%	1.30%	0.00%	0.53%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.98%	0.00%	
		Overall SSA	NC	NC	0.20%	0.00%	1.67%	0.00%	0.25%	0.00%	0.00%	0.00%	0.49%	2.74%	0.00%	0.00%	0.00%	0.00%	0.77%	0.00%	1.46%	0.00%	
Percentage connections with good voice quality (=>95%)																							
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Roads	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.30%	99.44%	99.95%	100%	
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.60%	98.81%	99.85%	99.99%	
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.49%	96.75%	99.99%	100%	
		Overall SSA	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.48%	98.36%	99.95%	100%	
	(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	NC	NC	97.11%	99.56%	92.51%	100%	95.28%	95.20%	94.59%	98.96%	98.27%	92.04%	97.16%	95.24%	96.76%	97.23%	NA	NA	NA	NA	
Highways		NC	NC	96.54%	98.90%	96.45%	97.92%	95.18%	99.62%	94.27%	99.28%	96.22%	96.28%	95.86%	95.69%	97.34%	97.04%	NA	NA	NA	NA		
Within City		NC	NC	96.81%	97.77%	92.20%	95.90%	95.15%	95.52%	96.16%	98.12%	98.06%	99.93%	95.45%	97.94%	97.43%	96.05%	NA	NA	NA	NA		
Overall SSA		NC	NC	96.87%	98.74%	93.27%	97.38%	95.18%	96.56%	95.28%	98.79%	97.79%	96.93%	95.81%	96.11%	97.13%	96.79%	NA	NA	NA	NA		
5	Service Coverage																						
	In door	Major Roads	NC	NC	70.37%	90.77%	32.19%	89.12%	42.27%	24.95%	73.03%	9.94%	36.11%	0.11%	47.23%	20.02%	90.47%	99.38%	22.62%	99.58%	94.56%	93.86%	

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

**DRIVE TEST TABLE – 2
OPERATOR ASSISTED DRIVE TEST AT HISSAR SSA IN MAY 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
	(>= - 75dBm)	Highways	NC	NC	65.00%	37.81%	38.27%	9.48%	59.81%	100%	78.48%	18.82%	38.69%	41.50%	56.45%	91.01%	96.11%	99.56%	42.70%	99.79%	95.80%	100%
		Within City	NC	NC	82.54%	8.55%	39.53%	15.19%	86.68%	91.37%	97.95%	88.43%	83.81%	100%	77.55%	80.56%	98.93%	96.44%	59.44%	0.18%	99.23%	100%
		Overall SSA	NC	NC	74.09%	47.01%	36.09%	42.47%	69.55%	72.22%	85.20%	38.94%	62.78%	60.05%	65.96%	61.23%	94.79%	98.35%	47.14%	64.14%	97.55%	98.02%
In-vehicle (>= - 85dBm)	Major Roads	NC	NC	94.88%	99.83%	53.72%	99.22%	80.59%	95.41%	95.40%	88.40%	67.32%	0.74%	85.98%	59.94%	98.17%	100%	57.62%	100%	98.22%	98.85%	
	Highways	NC	NC	95.52%	78.97%	66.10%	75.44%	83.51%	100%	97.77%	88.12%	69.75%	58.50%	85.49%	99.98%	99.20%	100%	76.59%	100%	97.96%	100%	
	Within City	NC	NC	99.01%	89.15%	52.74%	59.36%	98.12%	99.82%	99.68%	99.94%	98.26%	100%	97.27%	99.89%	99.93%	99.64%	86.01%	34.72%	99.88%	100%	
	Overall SSA	NC	NC	96.64%	89.43%	55.52%	81.08%	90.31%	98.41%	97.74%	92.14%	84.75%	62.95%	91.84%	84.89%	99.05%	99.87%	77.47%	76.68%	99.16%	99.63%	
Outdoor-in city (>= - 95dBm)	Major Roads	NC	NC	99.82%	100%	59.27%	100%	98.22%	98.55%	99.28%	99.86%	95.86%	91.24%	98.14%	98.99%	99.88%	100%	95.84%	100%	99.85%	100%	
	Highways	NC	NC	99.87%	99.86%	74.90%	99.92%	98.54%	100%	99.66%	99.85%	97.43%	74.50%	96.97%	99.07%	99.89%	100%	96.25%	100%	99.98%	100%	
	Within City	NC	NC	99.68%	100%	56.03%	99.17%	99.74%	100%	99.88%	100%	100%	100%	99.61%	100%	100%	100%	96.68%	99.84%	100%	100%	
	Overall SSA	NC	NC	99.77%	99.95%	60.78%	99.77%	99.08%	99.51%	99.61%	99.90%	98.41%	93.26%	98.59%	99.31%	99.93%	100%	96.39%	99.94%	99.96%	100%	
6	Call Setup Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	100%	100%	99.17%	100%	99.51%	100%	99.20%	100%	100%	100%	100%	100%	99.27%	100%	100%	100%
		Highways	NC	NC	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	98.94%	100%	99.32%	100%	100%	100%	100%	100%
		Within City	NC	NC	100%	100%	98.05%	100%	98.94%	100%	99.52%	100%	99.50%	100%	98.81%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	NC	NC	100%	100%	99.29%	100%	99.27%	100%	99.60%	100%	99.51%	100%	99.11%	100%	99.81%	100%	99.74%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.81%	100%	97.59%	100%	99.05%	100%	96.68%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.68%	100%	97.95%	100%	100%	100%	100%	100%	100%	100%	100%	93.33%	100%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.62%	100%	99.58%	100%	99.75%	100%	100%	100%	99.01%	100%	99.45%	100%	99.59%	100%	100%	100%	100%	100%
		Overall SSA	NC	NC	99.69%	100%	98.60%	100%	99.69%	100%	98.87%	100%	99.35%	100%	99.63%	98.77%	99.82%	100%	100%	100%	100%	100%

NC-No Coverage; NA-Not Applicable

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

DRIVE TEST TABLE – 3
OPERATOR ASSISTED DRIVE TEST AT NARNAUL SSA IN JUNE 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	146	25	145	25	64	25	132	25	28	20	56	25	151	25	93	25
Highways	NC	NC			178	25	214	28	86	25	177	25	75	25	99	25	140	25	80	25	75	25	
Within City	NC	NC			111	25	125	26	117	25	132	25	154	26	116	25	177	25	116	25	153	26	
Overall SSA	NC	NC			435	75	484	79	267	75	441	75	257	71	271	75	468	75	289	75	256	71	
2	Blocked Call Rate	Major Roads	NC	NC	0.00%	0.00%	2.07%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.66%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	NC	NC	0.00%	0.00%	2.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.02%	0.00%	1.43%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	NC	NC	0.00%	0.00%	3.20%	0.00%	0.85%	0.00%	0.00%	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Overall SSA	NC	NC	0.00%	0.00%	2.48%	0.00%	0.37%	0.00%	0.00%	1.33%	0.39%	0.00%	0.74%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Major Roads	NC	NC	0.00%	0.00%	2.26%	0.00%	0.00%	0.00%	0.76%	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%	0.49%	4.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	0.00%	
		Within City	NC	NC	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.65%	0.00%	
		Overall SSA	NC	NC	0.00%	0.00%	0.88%	1.33%	0.00%	0.00%	0.23%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.38%	0.00%	0.39%	0.00%
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	94.98%	98.66%	99.41%	98.76%
		Highways	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.50%	99.60%	99.93%	100%
		Within City	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.74%	98.87%	99.98%	100%
		Overall SSA	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	95.44%	99.05%	99.91%	99.96%
(b) 0-5 (with frequency)	Major Roads	NC	NC	97.53%	99.79%	92.22%	97.68%	95.36%	95.92%	94.33%	99.61%	97.82%	97.22%	97.06%	98.80%	97.59%	97.39%	NA	NA	NA	NA		
Highways	NC	NC	97.60%	99.34%	91.35%	99.34%	95.28%	98.91%	95.36%	99.78%	97.74%	99.84%	96.86%	98.93%	97.73%	97.00%	NA	NA	NA	NA			

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

DRIVE TEST TABLE – 3
OPERATOR ASSISTED DRIVE TEST AT NARNAUL SSA IN JUNE 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
			NC	NC	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
	hopping for GSM Operators)	Within City	NC	NC	97.34%	99.56%	93.23%	99.56%	95.58%	99.66%	95.39%	97.58%	98.14%	100%	96.77%	99.07%	97.91%	96.70%	NA	NA	NA	NA
		Overall SSA	NC	NC	97.51%	99.55%	92.10%	98.84%	95.42%	97.85%	95.05%	98.99%	98.01%	99.80%	96.86%	98.96%	97.73%	97.03%	NA	NA	NA	NA
Service Coverage																						
5	In door (>= - 75dBm)	Major Roads	NC	NC	73.95%	94.89%	68.42%	49.31%	53.63%	99.70%	50.23%	0.03%	65.56%	100%	55.16%	6.75%	95.61%	99.09%	17.71%	24.42%	96.19%	82.34%
		Highways	NC	NC	77.72%	73.48%	68.59%	73.48%	57.79%	95.44%	56.49%	71.14%	62.19%	0.00%	49.22%	90.66%	95.82%	99.63%	34.56%	99.97%	95.97%	100%
		Within City	NC	NC	85.65%	100%	77.23%	99.61%	78.96%	100%	76.51%	99.92%	60.74%	100%	78.78%	98.95%	98.08%	98.93%	80.34%	59.49%	98.33%	100%
		Overall SSA	NC	NC	78.60%	88.68%	70.83%	74.12%	64.36%	98.37%	60.49%	57.53%	61.60%	52.23%	63.43%	69.77%	96.28%	99.21%	41.62%	60.83%	97.55%	99.64%
	In-vehicle (>= - 85dBm)	Major Roads	NC	NC	92.78%	100%	92.60%	95.87%	95.27%	99.96%	93.90%	71.30%	79.33%	100%	89.38%	92.88%	98.12%	100%	54.61%	43.49%	96.81%	82.34%
		Highways	NC	NC	95.79%	99.52%	93.79%	99.52%	90.39%	100%	92.98%	99.79%	74.53%	66.63%	81.87%	99.99%	98.50%	100%	76.65%	100%	99.27%	100%
		Within City	NC	NC	98.14%	100%	88.22%	99.85%	97.24%	100%	98.26%	100%	80.75%	100%	97.95%	100%	99.20%	99.33%	94.61%	100%	99.28%	100%
		Overall SSA	NC	NC	95.47%	99.82%	91.97%	98.25%	94.50%	99.98%	94.83%	90.55%	79.08%	84.06%	90.51%	97.97%	98.52%	99.76%	72.53%	80.76%	99.02%	99.64%
	Outdoor-in city (>= - 95dBm)	Major Roads	NC	NC	99.18%	100%	97.73%	100%	98.89%	100%	99.89%	98.97%	94.22%	100%	98.32%	99.90%	99.68%	100%	97.12%	100%	99.60%	96.70%
		Highways	NC	NC	99.92%	100%	99.72%	100%	99.30%	100%	99.78%	100%	89.49%	99.57%	98.19%	100%	99.69%	100%	97.34%	100%	100%	100%
		Within City	NC	NC	99.86%	100%	90.62%	99.85%	99.31%	100%	99.99%	100%	95.97%	100%	99.92%	100%	99.96%	100%	98.81%	100%	99.94%	100%
		Overall SSA	NC	NC	99.68%	100%	96.73%	99.94%	99.17%	100%	99.88%	99.66%	94.20%	99.80%	98.98%	99.97%	99.75%	100%	97.71%	100%	99.92%	99.93%
6	Call Setup Success Rate (>=95%)	Major Roads	NC	NC	100%	100%	91.72%	100%	100%	100%	100%	96.00%	100%	100%	100%	99.34%	100%	100%	100%	100%	100%	
		Highways	NC	NC	100%	100%	95.79%	89.29%	100%	100%	100%	100%	100%	100%	97.98%	100%	98.57%	100%	100%	100%	100%	
		Within City	NC	NC	100%	100%	94.40%	96.15%	99.15%	100%	100%	100%	99.35%	100%	100%	100%	100%	100%	100%	100%	100%	
		Overall SSA	NC	NC	100%	100%	94.21%	94.94%	99.63%	100%	100%	98.67%	99.61%	100%	99.26%	100%	99.36%	100%	100%	100%	100%	100%

AUDIT & ASSESSMENT OF QOS FOR QE- JUNE-2015 - HARYANA CIRCLE

DRIVE TEST TABLE – 3																							
OPERATOR ASSISTED DRIVE TEST AT NARNAUL SSA IN JUNE 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	
7	Hand Over Success Rate (HOSR)	Major Roads	NC	NC	99.33%	100%	96.66%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	NC	NC	99.50%	100%	94.61%	98.85%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	NC	NC	99.07%	100%	96.63%	100%	97.40%	100%	99.30%	100%	99.14%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	NC	NC	99.31%	100%	95.65%	99.01%	98.84%	100%	99.79%	100%	98.78%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

NC-No Coverage; NA-Not Applicable

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

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
Sonipat	April-15	Sonipat /182km	Sec-15 market, sec-12, Fazilpur, kumaspur, Dipalpur, Bhalgarh, Khewra,Jhundpur, Jakholi, Rai, Kundli, Murthal, Barhi, Gannaur, Datouli, Begha,Ghasoli, Umedangarh, Malikpur, Ram nagar, Bhighan. Indoor: DCR University	Gohana, Sonipat /210km	Police line, Barwasni, Mohana, Pinana, Lath, Bhainswal, Anwari,Rewara, Rukhi, Mahra, Gohana city, Baroda,Banwasa, Bhutana, Bichpuri, Mehmoodpur. Indoor: Civil hospital Gohana	Sonipat, Kharkhoda /180km	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.
Hissar	May-15	Sirsa, Ellanabad, Dabwali, Kallanwali /220Km	Bsnl Exchange Sirsa, Jagdev Singh Cowk, Kashpur Rana Chungi, Bhambhori,Madho Singh Hana, Mallekan, Elnabad, Jiwan Nagar, Dhudian Wali, Sada Wala, Goriwala,Mauj Garh, Alika, Dabwali, Anaj Mandi, Sawant Khera, Mithdi,Naurang, Kalanwali, Lakadwali, Bada Gudha,Sirsa. Indoor: Civil Hospital Sirsa	Fatehbad, Tohana, Barwala /200Km	Fathebad, Model Town, Bhatu road, Partap Market, Hisar Road,Ayalki, Ahrawan, Hazampur,Ratia, Nathwan,Chimun, Nanheri Khurd, Zabtewala,Jamalpur, Shekihan , Tohana, Kanheri, Samain, Bithmara, Gabipur,Barwala , Sarsod, Talwandi rana, Hisar. Indoor: Civil hospital Hisar	Ananadpur mandi, Hansi, Hisar /170Km	Hisar, Bus Stand Agroha, Adampur,Sec-14, Hisar Auto market, Sabji Mandi, Camp Chowk,Sec-13, Sec-16 &17, Urban Estate, Sector 27,28,1,4,Industrial Area,Hisar Cantt, Hansi Bus Stand, Railway Station,Model Town
Narnaul	June-15	Narnaul /160Km	Rewari,Khori, Ateli Kund, Narnaul, Nangal Chaudhary, NangalDagru, Nizam Pur, Hudiana, Dongra,Ahir Bewal, Bhojwas,Nangal,Jamaipur Indoor: Civil Hospital Narnaul	Mahendergarh /150	Sec-3 Rewari, Chanduwas, Budhpur, Bonda, Beri Kalan, Jatusana, Gundian, Kosli, Nahar, Kanina, Buchawas, Mahendergarh, Daina, Nangal Mundi, Roliawas, Saharanwas Indoor: Civil Hospital Mahendergarh	Narnaul, Rewari /140 Km	Rewari Circular Road, Ambedkar Chowk,Brass Market,Uttam Nagar, Meerpur University, Johnawas, Kaliawas, Daruhera, Dungarwas,Nikhri,Boini,Bawal Ind Area, Karanwas, Bithwana,Rewari

7.2 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF SONIPAT SSA (APRIL-15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Sonipat	Poor Rx Quality Near Sec-15 Market.	Gohana	Poor Rx Level and Rx Quality Near Anwali - Rewara Road.	Sonipat	Poor Rx Quality Near Bus Stand.
2	BSNL		Poor Rx Quality Near Malikpur Village.		Poor Rx Level and Rx Quality Between Bhutana & Bichpuri.		Poor Rx Level and Rx Quality Near Rohat to Banvapur Village.
3	TATA GSM		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
4	TATA CDMA		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
5	IDEA		Poor Rx Level and Rx Quality Near Gannaur & GT Road		Poor Rx Level and Rx Quality Near Mohana.		Poor Rx Level and Rx Quality Near Barotha
6	RCOM GSM		Poor Rx Level and Rx Quality Near NH1 and Near Rasoi Village Due to Newly Constructed High Multistory Buildings in Ansal Sushant City is the Obstruction Near to NH1, Near Srinagar Site Due to Higher Inter site Distance.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Rx Level and Rx Quality Near Mandauri - Kharkhoda Road.
7	RCOM CDMA		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
8	VIDEOCON		Poor Rx Level and Rx Quality Near Bari, Jundpur, Khasmpur.		Poor Rx Level and Rx Quality Near Badshahpur Machhri, Khanpur Khurd, Nuran Khera.		Poor Rx Level and Rx Quality Near Levan, Jatula, Pipli, Jaroart.
9	VODAFONE		Poor Rx Level and Rx Quality Near Kanakghar to Teha, Kshornabnra to Ghasoli, Seolison to Riswa Mills, Adarsg Nagar to SHO Colony		Poor Rx Level and Rx Quality Near Bichpuri to Mahmadpur, near Gohana to Raswan		Poor Rx Level and Rx Quality Near Adarsh Nagar, Malhmazra to Halalpur, Nearr Kharkhoda
10	AIRCEL		No Coverage		No Coverage		No Coverage

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF HISSAR SSA (MAY 15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Sirsa, Ellanabad, Goriwala, Dabwali	Poor Rx Level and Rx Quality Near Kalawali.	Sirsa, Fatehbad, Ratia, Tohana, Hissar	Poor Rx Level and Rx Quality Near Ratiya.	Hisar, Adampur Mandi, Hansi	Overall Good Coverage in Covered SDCA.
2	BSNL		Poor Rx Level and Rx Quality Near Mngla, Goriwala.		Poor Rx Level and Rx Quality Near Ayalki, Uglan.		Overall Good Coverage in Covered SDCA.
3	TATA GSM		Poor Rx Level and Rx Quality Near Mangla, Ellanabad to Jeevan Nagar(8Km), Dhudhain, Aliaka.		Poor Rx Level and Rx Quality Near Ayalki, Hamzapur, Nathawan, Akkanwali, Kanheri, Samian		Poor Rx Level and Rx Quality Near Nayolo Kalan.
4	TATA CDMA		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Rx Level and Rx Quality Near jamalpur village(Tohana)		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
5	IDEA		Poor Rx Level and Rx Quality Near Ellanabad Highway and Goriwala.		Poor Rx Level and Rx Quality Near Ayalki, Hamzapur, Nathawan, Akkanwali, Kanheri, Samian		Poor Rx Level and Rx Quality Near Nayolo Kalan.
6	RCOM GSM		Poor Rx Level and Rx Quality at Sirsa-Ellanabad Road Near Madhosinghana.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
7	RCOM CDMA		Poor Rx Level and Rx Quality at Sirsa-Ellanabad Road Near Madhosinghana.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
8	VIDEOCON		Poor Rx Level and Rx Quality Near Bhurat wala, Sirs Rd Ellenabad, Dabwali Rd near Panniwala Mota, Mirpur, Ramnagar, Dabwali Rd near Sanwant Khera.		Poor Rx Level and Rx Quality Near Khonora to Fatehwad, Nathwan, Kallar Bainsi, Sasrod to Badaopatti Road.		Poor Rx Level and Rx Quality Near Dhurjanpur, Kohli, Meengni khera, Hisar Hansi Road.
9	VODAFONE		Poor Rx Level and Rx Quality Near Jeevan Nagar to Amritsarkalan, Prem Nagar to Anajmandi Sirsa,		Poor Rx Level and Rx Quality Near Behbalpur to Uglan.		Poor Rx Level and Rx Quality Near Hisar to Neoli kalan, landharish to chiknawas.
10	AIRCEL		No Coverage		No Coverage		No Coverage

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF NARNAUL SSA (JUNE 15)

S. No	Name of SP	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Narnaul, Jatusana	Poor Rx Level and Rx Quality on KUND-BHOHAWAS Road.	Kosli, Mahendergarh	Overall Good Coverage and Quality in Covered SDCA on Day 2.	Rewari, Bawal	Poor Rx Level Patch Observed on NH-8.
2	BSNL		Poor Rx Level and Rx Quality Near Shemma nd kund Road, Hazipur,Nangal Choudhary.		Poor Rx Level and Rx Quality Near Mahendergarh Highway, Dhaina Village, Bhuroli, Near Kosli Road.		Poor Rx Level and Rx Quality Near Bawal & Dharuhera, Ramgarh.
3	TATA GSM		Poor Rx Level and Rx Quality Near Nangal Choudhary, Nangal Jamalpur,Dhongra Ahir.		Poor Rx Level and Rx Quality Near Bhuchawas & Daina.		Poor Rx Level and Rx Quality Near Meerpur.
4	TATA CDMA		Poor Rx Level and Rx Quality Near Nangal Choudhary, Nangal Jamalpur, Dhongra Ahir.		Poor Rx Level and Rx Quality Near Bhuchawas & Daina.		Poor Rx Level and Rx Quality Near Meerpur.
5	IDEA		Overall Good Coverage and Quality in Covered SDCA on Day 1.		Overall Good Coverage and Quality in Covered SDCA on Day 2.		Poor Rx Quality Observed in Rewari City.
6	RCOM GSM		Poor Rx Level and Rx Quality Near Ateli , on outer road, Qutubpur.		Poor Rx Level and Rx Quality Near Kosli.		Poor Rx Level and Rx Quality Near Raliawas, Near Asshi India and Bawal IS .
7	RCOM CDMA		Poor Rx Level and Rx Quality Near Bhojawas.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
8	VIDEOCON		Poor Rx Level and Rx Quality Near Gobindpur, Sujapur, BahdurNagar,Faizabad.		Poor Rx Level and Rx Quality Near Kosli Road, karira, Parkhotampur, Rewari -Kanina-mahendragrah Rd, Kaira.		Poor Rx Level and Rx Quality Near Masani, Raliawas, Asalwas, Singpur Khera.
9	VODAFONE		Overall Good Coverage and Quality in Covered SDCA on Day 1.		Overall Good Coverage and Quality in Covered SDCA on Day 2.		Poor Rx Level and Rx Quality Near Jhajjar Road to Circular Road.
10	AIRCEL		No Coverage		No Coverage		No Coverage

DRIVE TEST TABLE: 8
NO NETWORK COVERAGE STATUS OF DRIVE TEST – APRIL TO JUNE 15

Operator Name	SSA Name	SDCA Name	No Coverage Area	ICR Status
Reliance GSM	Sonipat	Sonipat	Bahalgarh	Khewara ICR With Tata
			Bahalgarh-Jhundpur Road, Parts Of NH-1 Sonipat	No
		Gohana	Sonipat-Mohana Road, Gohana To Farmanah Road	No
			Sonipat-Kharkhoda Road, Kharkhoda-Saidpur Road	Saidpur ICR With Tata
Reliance CDMA		Sonipat	Bahalgarh	No
			Bahalgarh-Jhundpur Road, Parts Of NH-1 Sonipat	No
		Gohana	Sonipat-Mohana Road, Gohana To Farmanah Road	No
			Sonipat-Kharkhoda Road, Kharkhoda-Saidpur Road	No
Tata GSM		Sonipat	Daipur, Puri,Khewra	No
			Jakhol,Rai	No
		Gohana	Papera, Ram Nagar, Lath, Bhainiwal	No
			Banwara,Mehmoodpur,Ratdhana,Nahra, Riwara, Moi,Farmana	No
Tata CDMA	Sonipat	Daipur, Puri,Khewra	No	
		Jakhol,Rai	No	
	Gohana	Papera,Ram Nagar,Lath,Bhainiwal	No	
		Banwara,Mehmoodpur,Ratdhana,Nahra, Riwara, Moi,Farmana	No	
Videocon	Sonipat	Dipalpur To Joshi Chohan	Fazilpur With Tata	
		Badkhalsa,Bhanwasa	Fazilpur With Tata	
		Umeadgarh To Dhatori	Lath With Tata	
	Gohana	Bhainswal,Aanwali,Bahadurpur To Nahara,Chattera	Pipli, Jharurat With Tata	
Riwara, Moi		No		
Airtel	Sonipat, Gohana	Sonipat, Gohana	No Coverage Issue	No
Vodafone		Sonipat, Gohana	No Coverage Issue	No
BSNL		Sonipat, Gohana	No Coverage Issue	No
IDEA		Sonipat, Gohana	No Coverage Issue	No
Videocon		Hisar	Sirsa	Sirsa Rania Road To Bambhor,Bambhor To Mangla,Mangla To Madho Singha
	Ellnabad		Ellnabad To Jeevan Nagar,Mallekhah To	No

Operator Name	SSA Name	SDCA Name	No Coverage Area	ICR Status		
			Mamera			
		Dabwali	Goriwala To Dabwali Rural	No		
		Fatehbad	Ding Village To Fatehbad,	No		
		Barwala	Natwan To Chinmon,Bawalpur To Talbandi Rana	No		
		Ratia	Dhani To Ahrawn	No		
		Hisar	No Coverage Issue	No		
		Hansi	Barwala Road To Hansi,Kalirawan To Kohli	No		
		Adampur Mandi	Adampur To Siswal,Teja Market To Prawal Chownk	No		
		Tohana	Hauder Wala To Jamalpur Sheikhan And Jamalpur To Tohana	No		
		Tata GSM		Sirsa	Sirsa Rania Road To Bambhor,Bambhor To Mangla,Mangla To Madho Singha	ICR With Videocon
				Ellnabad	Ellnabad To Jeevan Nagar,Mallehkah To Mamera	ICR With Videocon
				Dabwali	Goriwala To Dabwali Rural	ICR With Videocon
				Fatehbad	Ding Village To Fatehbad,	ICR With Videocon
Barwala	Natwan To Chinmon,Bawalpur To Talbandi Rana			ICR With Videocon		
Ratia	Dhani To Ahrawn			ICR With Videocon		
Hisar	No Coverage Issue			No		
Hansi	Barwala Road To Hansi,Kalirawan To Kohli			No		
Adampur Mandi	Adampur To Siswal,Teja Market To Prawal Chownk			No		
Tohana	Hauder Wala To Jamalpur Sheikhan And Jamalpur To Tohana			ICR With Videocon		
Tata CDMA		Sirsa	Sirsa Rania Road To Bambhor,Bambhor To Mangla,Mangla To Madho Singha	No		
		Ellnabad	Ellnabad To Jeevan Nagar,Mallehkah To Mamera	No		
		Dabwali	Goriwala To Dabwali Rural	No		
		Fatehbad	Ding Village To Fatehbad,	No		
		Barwala	Natwan To Chinmon,Bawalpur To Talbandi Rana	No		
		Ratia	Dhani To Ahrawn	No		
		Hisar	No Coverage Issue	No		
		Hansi	Barwala Road To Hansi,Kalirawan To Kohli	No		
		Adampur Mandi	Adampur To Siswal,Teja Market To Prawal Chownk	No		
		Tohana	Hauder Wala To Jamalpur Sheikhan And	No		

Operator Name	SSA Name	SDCA Name	No Coverage Area	ICR Status
			Jamalpur To Tohana	
Relinace GSM		Sirsa	Sirsa & Dabwali Road,Sirsa Hisar Road,Bambhor To Mangla,Mangla To Madho Singha	No
		Ellnabad	Odhan To Paniwala	No
		Dabwali	Dabwali & Ellnabad Road	No
		Fatehbad	Ding Village To Fatehbad,	No
		Barwala	Natwan To Chinmon,Bawalpur To Talbandi Rana	No
		Ratia	Ratia & Tohana Road,Ratia To Jamalapur Sehkan	No
		Hisar	No Coverage Issue	No
		Hansi	Kalirawan To Kohli	No
		Adampur Mandi	Adampur To Nelo Kalan,Adampur To Siswal	No
		Tohana	Ratia & Tohana Road,Jamalpur To Tohana	No
		Relinace CDMA		Sirsa
Ellnabad	Odhan To Paniwala			No
Dabwali	Dabwali & Ellnabad Road			No
Fatehbad	Ding Village To Fatehbad,			No
Barwala	Natwan To Chinmon,Bawalpur To Talbandi Rana			No
Ratia	Ratia & Tohana Road,Ratia To Jamalapur Sehkan			No
Hisar	No Coverage Issue			No
Hansi	Kalirawan To Kohli			No
Adampur Mandi	Adampur To Nelo Kalan,Adampur To Siswal			No
Tohana	Ratia & Tohana Road,Jamalpur To Tohana			No
BSNL				Sirsa,Tohana,Anadpur Mandi,Hansi,Fatehbad,Ratia,Barwal, Ellnabad
Airtel		Sirsa,Tohana,Anadpur Mandi,Hansi,Fatehbad,Ratia,Barwal, Ellnabad	No Coverage Issue	No
Idea		Sirsa,Tohana,Anadpur Mandi,Hansi,Fatehbad,Ratia,Barwal, Ellnabad	No Coverage Issue	No
Vodafone		Sirsa,Tohana,Anadpur Mandi,Hansi,Fatehbad,Ratia,Barwal, Ellnabad	No Coverage Issue	No
Tata GSM	Narnaul	Rewari	-	No
		Bawal	Lehroda To Akbarpur Ramu,Kairana,Bawal To	No

Operator Name	SSA Name	SDCA Name	No Coverage Area	ICR Status
			Rewari	
		Jhatusana	Dhani Sundrod To Kund,	No
		Narnaul	Meerpur To Daruhera,Bhudana To Jhodawas,Narnaul To Nangal Chodhary,Nizampur To Nangal Choudhary	No
		Kosli	Chanduwas To Berali Kalan,Buchawas & Diana	No
		Mahendergarh	Nahar To Kanina, Kanina To Mahendergarh,Kanina To Rewari	No
		Rewari	No Coverage Issue	No
		Bawal	Lehroda To Akbarpur Ramu,Kairana,Bawal To Reawari	No
Tata CDMA		Jhatusana	Dhani Sundrod To Kund,	No
		Narnaul	Meerpur To Daruhera,Bhudana To Jhodawas,Narnaul To Nangal Chodhary,Nizampur To Nangal Choudhary	No
		Kosli	Chanduwas To Berali Kalan,Buchawas & Diana	No
		Mahendergarh	Nahar To Kanina,Kanina To Mahendergarh,Kanina To Rewari	No
		Rewari	No Coverage Issue	ICR With TATA GSM
		Bawal	Lehroda To Akbarpur Ramu,Kairana,Bawal To Reawari	ICR With TATA GSM
Videocon		Jhatusana	Dhani Sundrod To Kund,	ICR With TATA GSM
		Narnaul	Meerpur To Daruhera,Bhudana To Jhodawas,Narnaul To Nangal Chodhary,Nizampur To Nangal Choudhary	ICR With TATA GSM
		Kosli	Chanduwas To Berali Kalan,Buchawas & Diana	Icr With Tata Gsm
		Mahendergarh	Nahar To Kanina,Kanina To Mahendergarh,Kanina To Rewari	ICR With TATA GSM
		Rewari	No Coverage Issue	No
		Bawal	Dhani Sundrod To Kund,	No
Relinace CDMA		Jhatusana	Berali, Jatusana, Jatusana To Kosli,	No
		Narnaul	Ateali & Narnaul, Nizampur,Narnaul To Nangal Chodhary,Nizampur To Nangal Choudhary	No
		Kosli	Gundian, Kosli, Nahar, Kanina, Buchawas,	No
		Mahendergarh	Mahendergarh,Daina,Nangal Mundi,Roliawas,Bhuddani,IG University	No
		Rewari	No Coverage Issue	No
		Bawal	Dhani Sundrod To Kund,	No
Relinace GSM		Jhatusana	Berali, Jatusana, Jatusana To Kosli,	No
		Narnaul	Ateali & Narnaul, Nizampur,Narnaul To Nangal Chodhary,Nizampur To Nangal Choudhary	No
		Kosli	Gundian,Kosli,Nahar,Kanina,Buchawas,	No

Operator Name	SSA Name	SDCA Name	No Coverage Area	ICR Status
		Mahendergarh	Mahendergarh,Daina,Nangal Mundi,Roliawas,Bhuddani,IG University	No
BSNL		Rewari, Bawal, Mahendergarh, Jhatusana, Narnaul, Kosli	No Coverage Issue	No
Airtel		Rewari, Bawal, Mahendergarh, Jhatusana, Narnaul, Kosli	No Coverage Issue	No
Idea		Rewari, Bawal, Mahendergarh, Jhatusana, Narnaul, Kosli	No Coverage Issue	No
Vodafone		Rewari, Bawal, Mahendergarh, Jhatusana, Narnaul, Kosli	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 April -15** drive tests were conducted across **Sonipat SSA** covering Sonipat, Kharkhoda and Gohana SDCAs during three consecutive days. The overall performance of the service providers was satisfactory as they were largely meeting the benchmarks.
- (ii) **In the Month of May -15**, drive tests were conducted across **Hissar SSA** covering Sirsa, Ellanabad, Dabwali, Kallanwali Fatehabad, Tohana, Barwala Ananadpur mandi, Hansi, Hisar SDCAs during three consecutive days. In this SSA also, the overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. Only **BSNL and RCOM (GSM)** remained non-complied for parameters **Voice Quality** and **Call Drop Rate** with their performance **93.27% and 2.74%** (indoor) respectively.
- (iii) **In the month of June -15**, drive tests were conducted across **Narnaul SSA** covering Narnaul, Jatusana, Kosli, Mahendergarh Rewari, Bawal SDCAs. In **Narnaul SSA** also, **BSNL** failed to meet the benchmarks for parameters **Voice Quality (92.10%) and CSSR (94.21%-out door) / (94.94%-indoor)** respectively. 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.

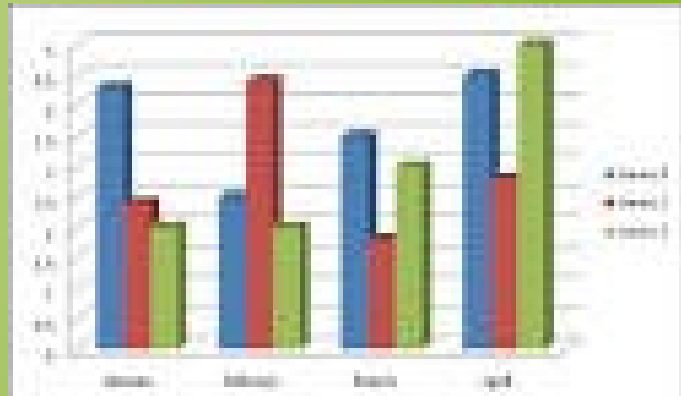
*Thus overall performance of the service providers was satisfactory as they were largely meeting the benchmarks. However, **BSNL** remained non-compliant with respect to the parameters **Voice Quality and CSSR in Hissar and Narnaul SSAs**. Whereas, **RCOM (GSM)** needs to improve its indoor performance for parameter **CDR** in Hissar SSA.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

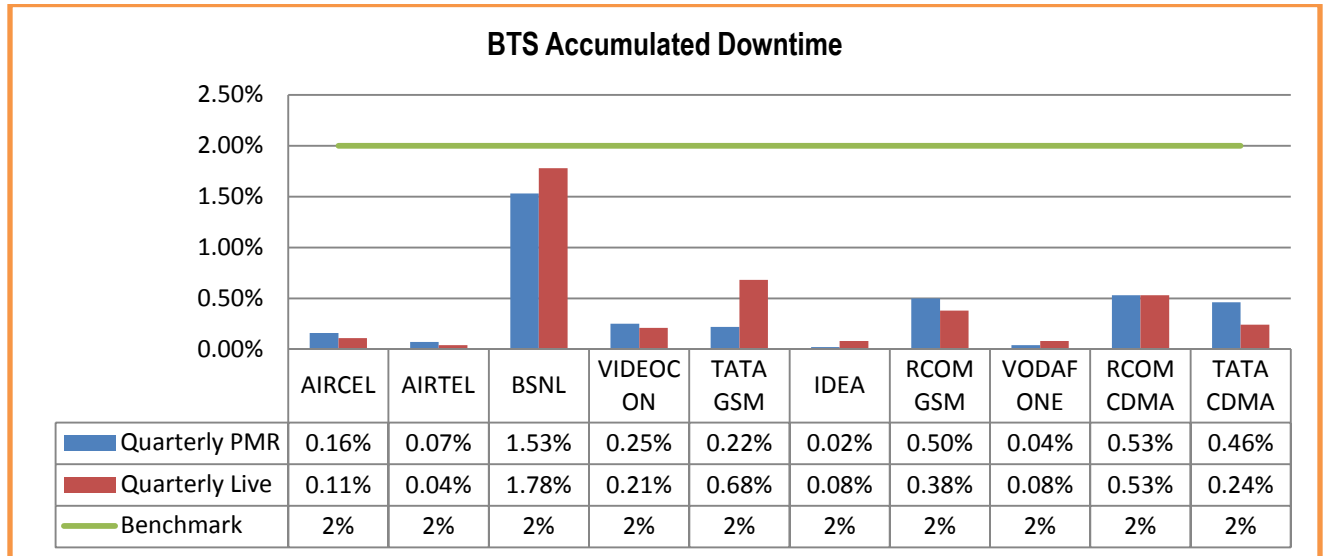
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION (CMTS):

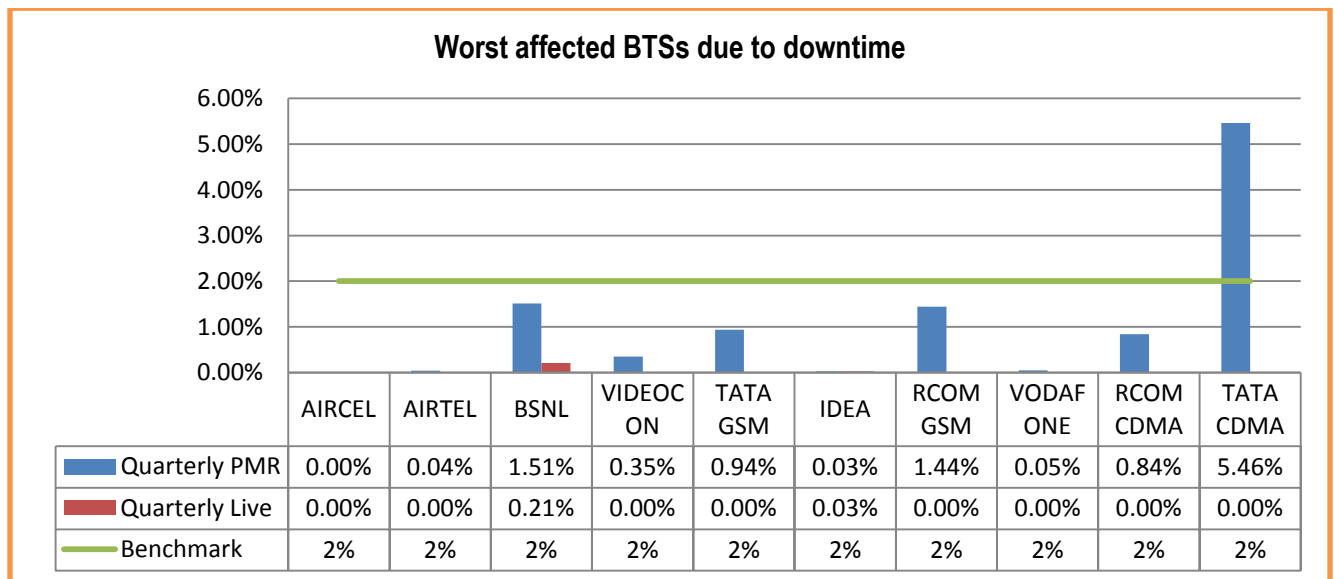
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME:



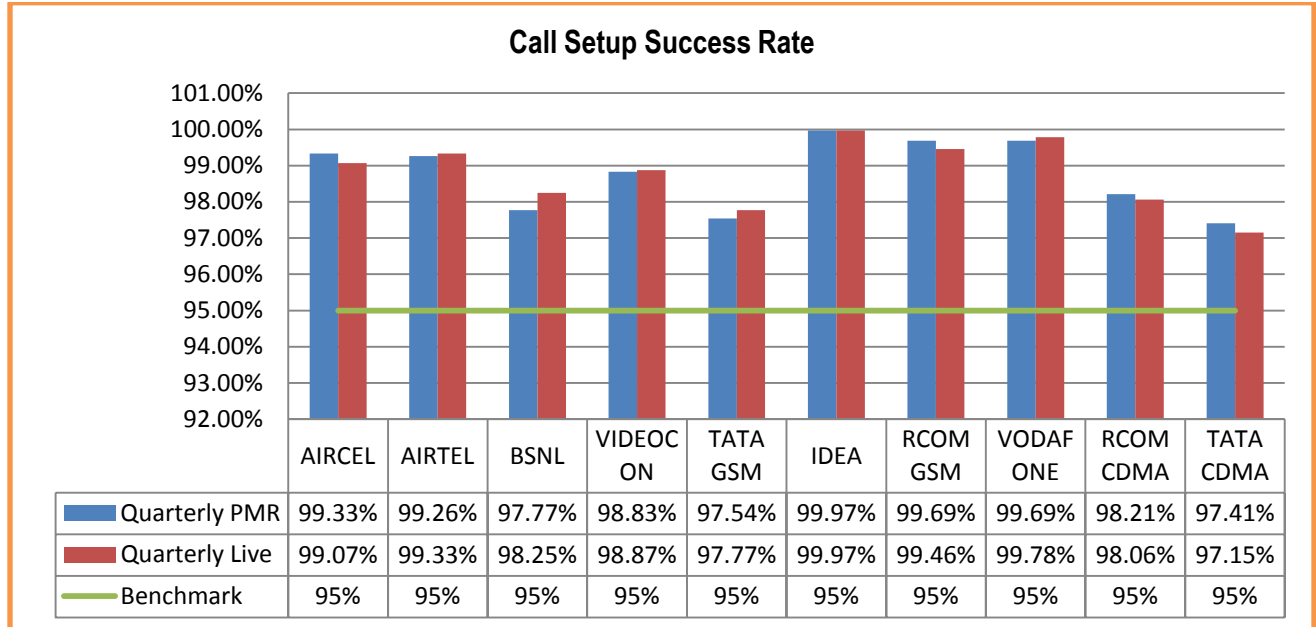
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSS DUE TO DOWNTIME:



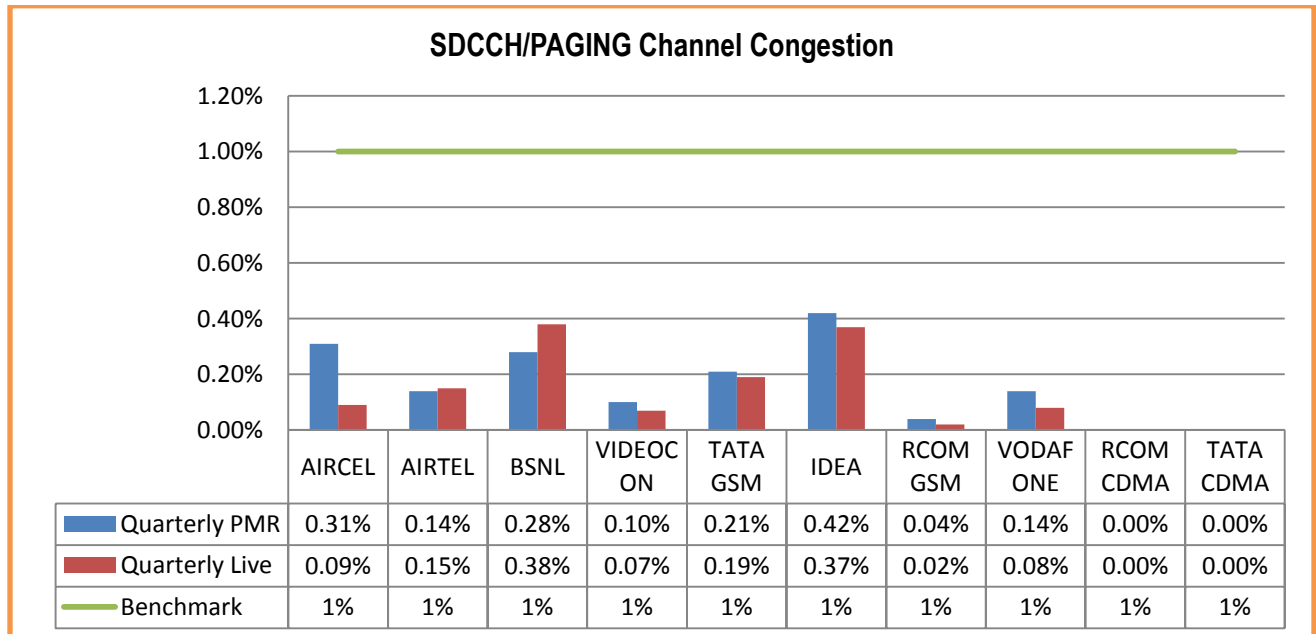
All operators are meeting the benchmarks except Tata CDMA during monthly audit.

3) CALL SETUP SUCCESS RATE:



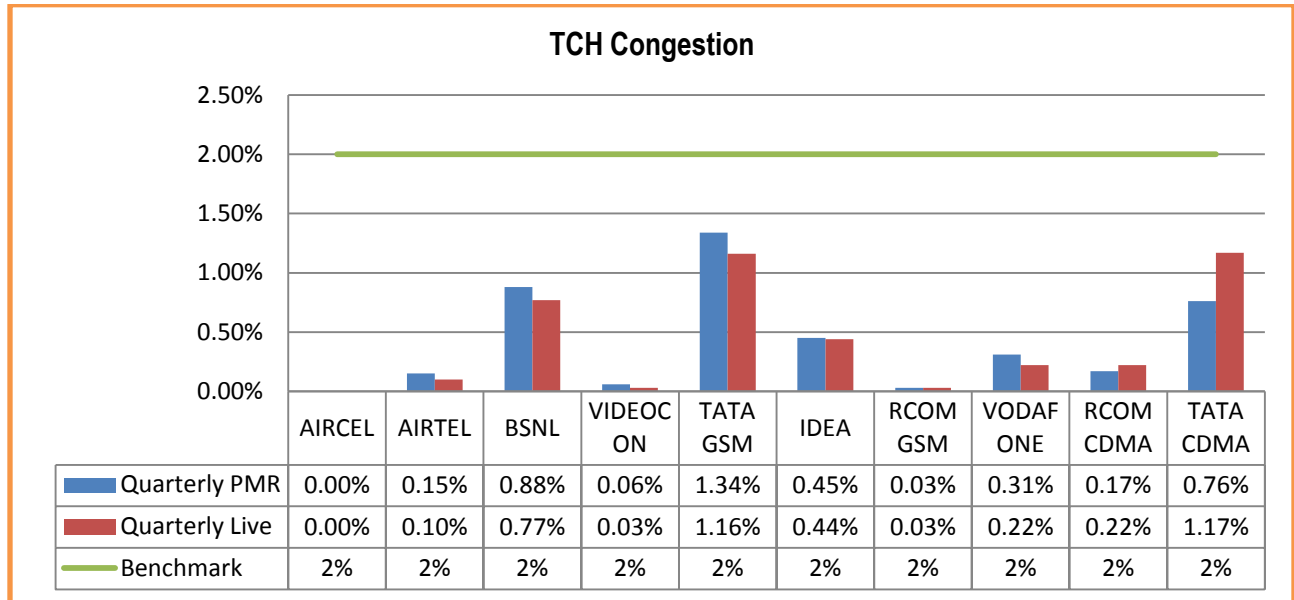
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:



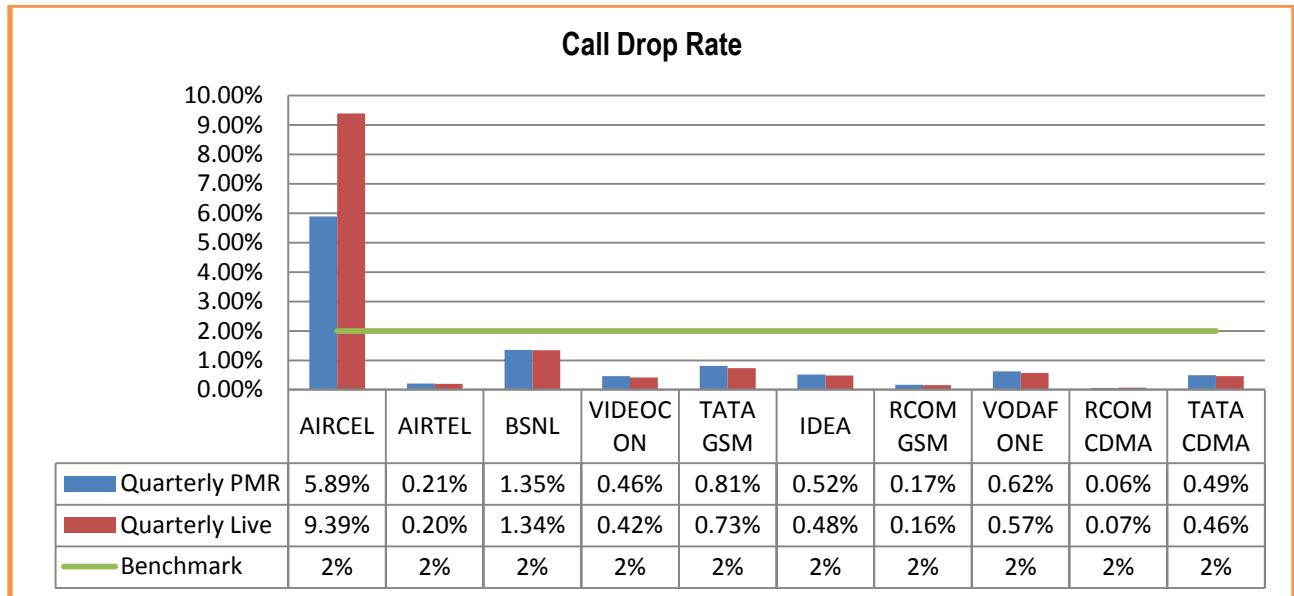
All operators are meeting the benchmarks.

5) TCH CONGESTION:



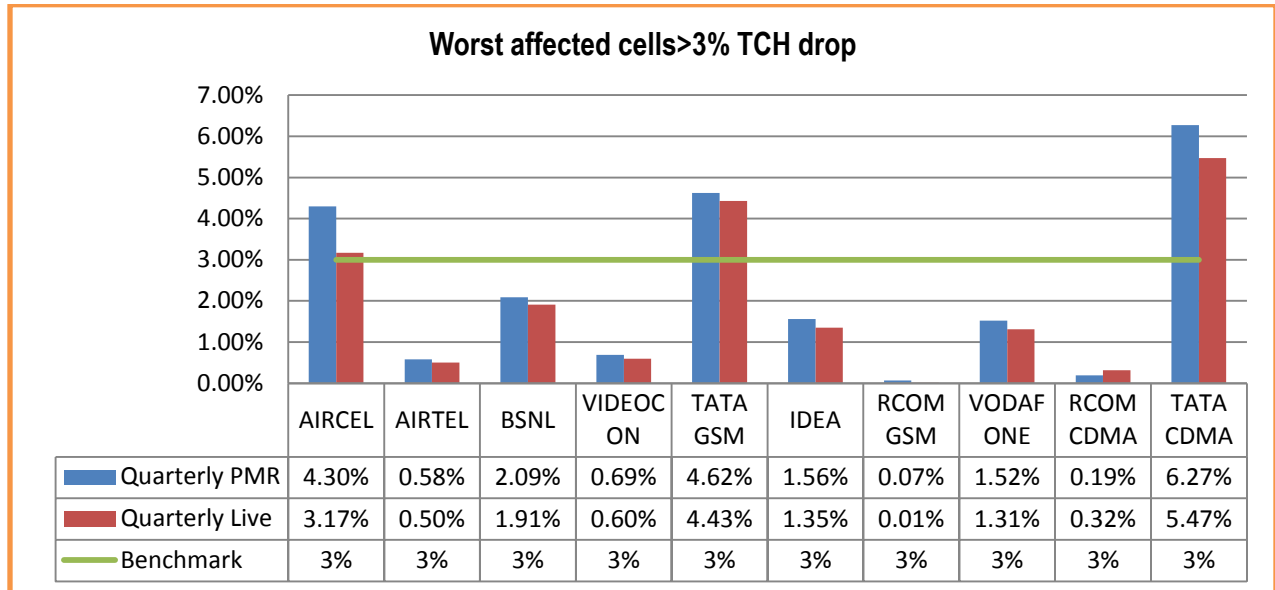
All operators are meeting the benchmarks.

6) CALL DROP RATE:



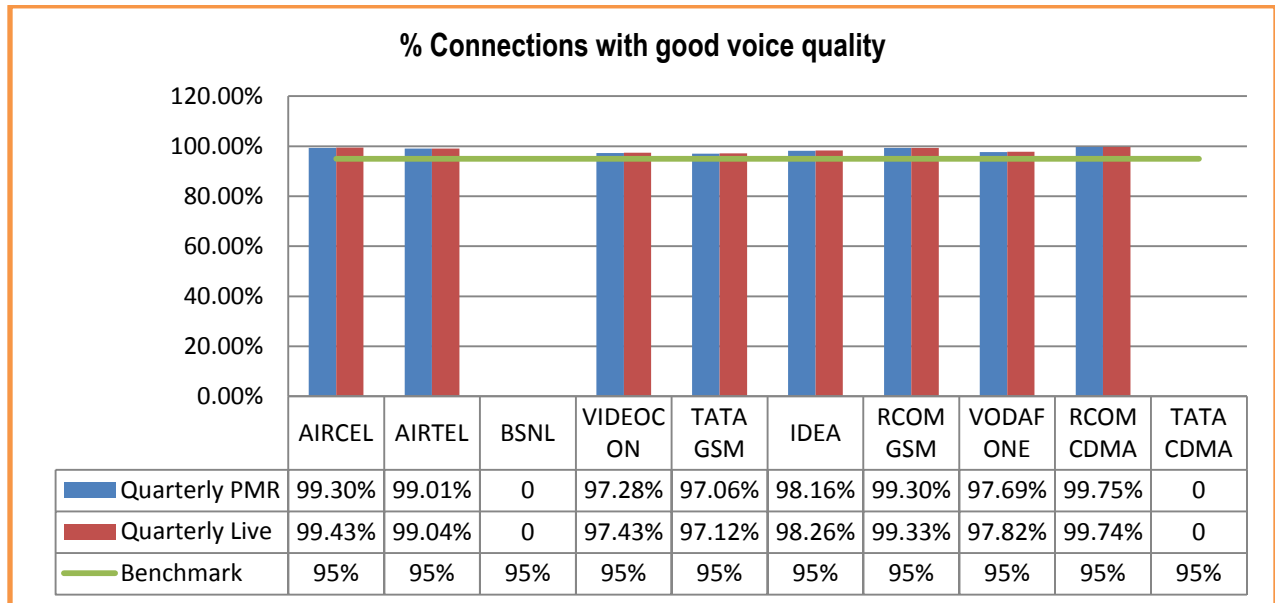
All operators are meeting the benchmarks except Aircel.

7) WORST AFFECTED CELLS>3% TCH DROP:



All operators are meeting the benchmarks except Aircel, 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.