



**Audit & Assessment of Quality of Service
Of
Cellular Mobile Telephone Service
Basic Telephone (Wire line) Service
&
Broadband Service
For
Telecom Regulatory Authority Of India
North Zone – Rajasthan 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 **Rajasthan circle** against the QoS bench marks laid down by TRAI in the respective regulations.

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1. BACKGROUND



1. BACKGROUND

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

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

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

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

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

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

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

2. OBJECTIVES AND METHODOLOGY



2. OBJECTIVES AND METHODOLOGY

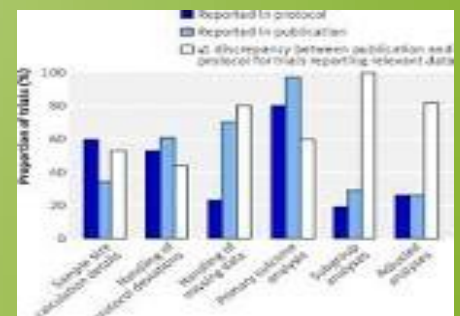
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service was carried out by **TUV SUD South Asia across all the Circles/Service areas of North and West Zones for Cellular Mobile Service. Apart from this, QoS audit for Basic (Wire line) and Broadband Services was also undertaken for 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 operators were covered for QoS audit in Rajasthan circle.

Sl. No.	Service Provider	Dates of live measurement Audit			Audit Location
GSM Operators		April-15	May-15	June-15	
1	AIRCEL	1 to 3 Apr-15	12, 14 & 15 May-15	3 to 5 Jun-15	Aircel limited, 1st & 2nd Floor, Navajyoti, Amrapali Circle,C-Block,Vaishali Nagar, Jaipur-302021
2	AIRTEL	6 to 8 Apr-15	6 to 8 May-15	3 to 5 Jun-15	Bharti Hexacom Limited, K-21, Malviya Marg, c-scheme , Jaipur-302001
3	BSNL	8 to 10 Apr-15	11 to 13 May-15	8 to 10 Jun-15	Bharat Sanchar Nigam Ltd. (BSNL) Room no. 116, Bajaj Nagar MSC, First Floor, BSNL Bajaj Nagar, JLN Marg, Jaipur- 302015
4	IDEA	8 to 10 Apr-15	11 to 13 May-15	3 to 5 Jun-15	Idea Cellular Ltd. Plot-C, Sahkar Marg, Jaipur- 302001
5	RCOM GSM	6 to 8 Apr-15	6 to 8 May-15	2 to 4 Jun-15	Reliance Communications Ltd. F-161, E-170, Road No-12, VKIA, Jaipur-302013
6	TATA GSM	1 to 3 Apr-15	11 to 13 May-15	3 to 5 Jun-15	Tata Teleservices Limited, The Guman-1, Amrapali circle, Vaishali nagar, jaipur-302021
7	VODAFONE	8 to 10 Apr-15	11 to 13 May-15	3 to 5 Jun-15	Vodafone Ltd. 5th Floor,Gaurav Tower,Malviya Nagar jaipur,-302017
CDMA Operators					
8	MTS	1 to 3 Apr-15	11 to 13 May-15	3 to 5 Jun-15	Sistema Shyam Teleservices Ltd. 3, MTS Tower, Amrapali Circle Vaishali Nagar, Jaipur.
9	RCOM CDMA	6 to 8 Apr-15	6 to 8 May-15	2 to 4 Jun-15	Reliance Communications Ltd. F-161, E-170, Road No-12, VKIA, Jaipur-302013
10	TATA CDMA	1 to 3 Apr-15	11 to 13 May-15	3 to 5 Jun-15	Tata Teleservices Limited, The Guman-1, Amrapali circle, Vaishali nagar, jaipur-302021

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 **once in a year**. As per the current list of the exchanges provided by BSNL, there are total 2183 exchanges in Rajasthan Circle. Out of 2183, **audit was done for sampled 16 (Urban) and 91 (Rural) exchanges** of BSNL (List of BSNL exchanges undertaken for QoS audit attached as **Annex-1**), 1 exchange each of Bharti-Airtel, RCL, Sistema Shyam and Vodafone and 2 exchange of TTL.

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. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

Discussion with the private broadband service providers revealed that there is no concept of their PoPs on SDCA basis; they are maintaining their entire data on centralized basis so audit has been done for the centralized data

4. EXECUTIVE SUMMARY



4. EXECUTIVE SUMMARY

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

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

1) Cellular Mobile Service:

(i) From the **monthly audit**, it was revealed that the performance of the service providers in Rajasthan Service area was satisfactory for network related parameters except for one parameter namely ‘Worst affected cells having > 3% TCH drop. The benchmark for this parameter could not be complied with by **Aircel, Tata (GSM)** and **Tata (CDMA)** with their average achievement as **3.24%, 5.03% and 8.00%** respectively.

(ii) From three days live measurement assessment, it was found that the performance of all operators was satisfactory as they have largely met the benchmarks except the parameter ‘**Worst affected cells> 3 % TCH drops**’, which could not be complied with by **Aircel, Tata (GSM)** and **Tata (CDMA)**. The average performance of **Aircel, Tata (GSM)** and **Tata (CDMA)** on this parameter was **3.21%, 5.46% and 7.88%** respectively. **The similar non-compliance of Aircel, Tata (GSM) and Tata (CDMA) was also observed during monthly PMR audit of the quarter.**

(iii) With regard to the **Customer Service Quality Parameters**, it is revealed that most of the operators are in well compliance of the parameters on Metering and Billing Credibility, Response Time to Customers, Termination of Service and Time taken for refunds except few cases of non-compliance for some of the parameters. **Vodafone** could not meet the benchmark of the parameter billing credibility with its performance as **0.16%** (for post paid) and **0.29%** (for pre-paid), while

BSNL failed to meet the benchmark for pre-paid with its performance as **0.49%**. **BSNL** also failed to meet the benchmark of resolution of billing complaints by resolving (**99.89%**) of billing complaints within 6 weeks.

Regarding the parameters related to Response time to customers, all service providers are in compliance with respect to the parameter accessibility of call center. In case of **Calls answered by operator (Voice to Voice)**, **Airtel** and **BSNL** have not met the benchmark of >95% with their performed level as **92.32%** and **74.52%** respectively.

Regarding parameter Termination / Closure of Service within 7 days, all operators have met the benchmark. Whereas, in case of parameter Time taken for refund of deposits, **Vodafone** lagged behind the benchmark of 100% refunds with its performance as **94.90%**.

The results of **three days live measurements** reveal that all **operators (except Airtel)** have met the benchmarks for the parameter Accessibility of Call Center. **Airtel** could achieve its performance as **87.23%**. Regarding calls answered by operator (Voice to voice) within 90 seconds, **Airtel** and **Vodafone** remained **non-complied** with their performance as **88.99%** and **85.18%** respectively.

(iv) The performance of the service providers with regard to the **Drive Test** revealed that all the service providers performed well within the QoS norms. **BSNL** has not provided the report of drive test conducted across Chittorgarh and Tonk SSAs despite best efforts. So their performance for these SSAs could not be assessed

2) Basic (wireline) Service:

With regard to the audit of Basic (wire line), it was concluded that the performance of **BSNL** was not satisfactory in respect of the parameters **Fault incidences, Fault Repairs/Restoration Time, MTTR, Response time to customer for assistance and Termination/ Closure**. Hence, **BSNL** need to improve their services in respect of these parameters. Apart from this **TTL** failed to meet the benchmark of **Fault repair by next working day (urban area)** and **MTTR**, whereas **Bharti Airtel** remained under performed for parameter **Call answered by operator (Voice to voice)**.

3) Broadband Service:

The QoS audit of the Broadband service reveals that the majority of the operators are largely meeting the benchmarks. However, some of the service providers have not met the benchmark as detailed below:

BSNL: Could not meet the benchmark of **%age connections provided within 15 days** and **“% age Faults repaired within three days** ; with its achievement level as **97.99%** and **98.57%** respectively.

TCL: failed to meet the benchmark of **‘fault Repair by next working day’** and **%age of calls answered by Operator (voice to voice) within 90 seconds’** with its achievement level as **87.14%** and **65.48 %** respectively.

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	20:00 - 21:00
3	BSNL	June-15	19:00 - 20:00
4	IDEA	June-15	20:00 - 21:00
5	RCOM GSM	June-15	20:00 - 21:00
6	TATA GSM	June-15	20:00 - 21:00
7	VODAFONE	June-15	20:00 - 21:00
CDMA Operators			
8	MTS	June-15	20:00 - 21:00
9	RCOM CDMA	June-15	19:00 - 20:00
10	TATA CDMA	June-15	20:00 - 21:00

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the Rajasthan 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	3	14	2170	NSN	NSN
2	AIRTEL	44	80	8245	Ericsson	Ericsson
3	BSNL	17	56	4085	Ericsson	NSN & Ericsson
4	IDEA	13	49	6249	Ericsson	Ericsson
5	RCOM GSM	4	15	2067	Huawei	Huawei
6	TATA GSM	2	12	1390	Huawei	Huawei
7	VODAFONE	12	93	7267	NSN	NSN
CDMA Operators						
8	MTS	2	6	1656	ZTE	ZTE
9	RCOM CDMA	6	6	934	Huawei, Lucent, Ericsson & ZTE	Huawei & Lucent
10	TATA CDMA	5	6	690	Ericsson & Huawei	Huawei & Motorola

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – APRIL-15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - RAJASTHAN CIRCLE - APRIL 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	April-15	0.16%	0.09%	1.59%	0.06%	0.18%	0.14%	0.05%	0.16%	0.09%	0.10%
	b) Worst affected BTSs due to downtime	<=2%	April-15	0.48%	0.12%	1.75%	0.03%	0.10%	0.07%	0.17%	0.00%	0.00%	0.29%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	April-15	97.00%	98.62%	98.60%	99.29%	99.65%	98.51%	99.72%	98.30%	99.11%	97.91%
	b) SDCCH/PAGING Channel congestion	<=1%	April-15	0.23%	0.22%	0.49%	0.26%	0.02%	0.06%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	April-15	0.50%	0.48%	1.58%	0.41%	0.05%	0.06%	0.28%	0.03%	0.21%	1.21%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	April-15	0.80%	0.72%	1.32%	0.84%	0.31%	0.74%	0.68%	0.14%	0.30%	0.53%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	April-15	3.42%	0.87%	1.88%	1.73%	0.08%	4.76%	2.13%	0.65%	0.39%	8.32%
	c) Connections with good voice quality	>=95%	April-15	96.59%	99.05%	98.47%	96.39%	98.66%	98.81%	97.06%	99.72%	99.18%	98.78%
4	No. of POI's having >=0.5% POI congestion		April-15	0	0	0	0	0	0	0	0	0	0

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – MAY- 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - RAJASTHAN CIRCLE – MAY 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
Network Service Quality Parameter													
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	May-15	0.16%	0.11%	1.55%	0.09%	0.15%	0.26%	0.05%	0.17%	0.06%	0.06%
	b) Worst affected BTSs due to downtime	<=2%	May-15	0.38%	0.15%	1.74%	0.11%	0.00%	0.36%	0.13%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	May-15	97.48%	98.82%	98.64%	99.31%	99.67%	98.40%	99.78%	98.77%	99.21%	98.45%
	b) SDCCH/PAGING Channel congestion	<=1%	May-15	0.27%	0.19%	0.55%	0.28%	0.02%	0.07%	0.18%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	0.51%	0.40%	1.38%	0.42%	0.05%	0.08%	0.22%	0.01%	0.13%	0.65%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	May-15	0.69%	0.69%	1.30%	0.78%	0.27%	0.72%	0.67%	0.12%	0.28%	0.49%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	May-15	2.97%	0.87%	2.13%	1.58%	0.10%	5.05%	2.24%	0.62%	0.45%	7.91%
	c) Connections with good voice quality	>=95%	May-15	97.21%	99.14%	98.61%	96.48%	98.83%	98.83%	97.23%	99.72%	99.18%	98.81%
4	No. of POI's having >=0.5% POI congestion		May-15	0	0	0	0	0	0	0	0	0	0

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – JUNE- 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES - RAJASTHAN CIRCLE – JUNE 15 MONTH													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators							CDMA Operators		
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Jun-15	0.20%	0.14%	1.55%	0.12%	0.23%	0.30%	0.09%	0.21%	0.12%	0.21%
	b) Worst affected BTSs due to downtime	<=2%	Jun-15	0.78%	0.16%	1.83%	0.14%	0.15%	0.72%	0.26%	0.11%	0.12%	0.43%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	97.44%	97.89%	98.68%	99.32%	99.65%	98.22%	99.74%	98.99%	99.15%	98.56%
	b) SDCCH/PAGING Channel congestion	<=1%	Jun-15	0.59%	0.38%	0.49%	0.26%	0.02%	0.12%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jun-15	0.67%	1.07%	1.23%	0.41%	0.05%	0.14%	0.26%	0.01%	0.11%	0.48%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	Jun-15	0.73%	1.15%	1.35%	0.83%	0.27%	0.75%	0.74%	0.13%	0.31%	0.51%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jun-15	3.32%	2.83%	1.94%	1.83%	0.02%	5.29%	2.48%	0.70%	0.51%	7.76%
	c) Connections with good voice quality	>=95%	Jun-15	97.18%	99.08%	98.60%	96.32%	98.91%	98.74%	97.12%	99.71%	99.17%	98.84%
4	No. of POI's having >=0.5% POI congestion		Jun-15	0	0	0	0	0	0	0	0	0	0

5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- JUNE- 15 (APRIL-15 TO JUNE- 2015 MONTHS AUDITED DATA)

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE- JUNE 15) - RAJASTHAN CIRCLE

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE- JUNE 15) - RAJASTHAN CIRCLE													
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Quarterly	0.17%	0.11%	1.56%	0.09%	0.19%	0.23%	0.06%	0.18%	0.09%	0.12%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.55%	0.14%	1.77%	0.09%	0.08%	0.38%	0.19%	0.04%	0.04%	0.24%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	97.31%	98.44%	98.64%	99.31%	99.66%	98.38%	99.75%	98.69%	99.16%	98.31%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.36%	0.26%	0.51%	0.27%	0.02%	0.08%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.56%	0.65%	1.40%	0.41%	0.05%	0.09%	0.25%	0.02%	0.15%	0.78%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.74%	0.85%	1.32%	0.82%	0.28%	0.74%	0.70%	0.13%	0.30%	0.51%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	3.24%	1.52%	1.98%	1.71%	0.07%	5.03%	2.28%	0.66%	0.45%	8.00%
	c) Connections with good voice quality	>=95%	Quarterly	96.99%	99.09%	98.56%	96.40%	98.80%	98.79%	97.14%	99.72%	99.18%	98.81%
4	No. of POI's having >=0.5% POI congestion		Quarterly	0	0	0	0	0	0	0	0	0	0

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit of network related parameters for cellular mobile service providers was conducted at their respective MSCs in the 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 Rajasthan circle, **all the operators were found meeting benchmark on the above parameters i.e.** 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter.

- **Connection Establishment (Accessibility)**

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

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

PMR audit revealed that all operators met the benchmark, prescribed for 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 also satisfactory as **all operators met the TRAI specified benchmarks on the congestion parameters.**

POI Congestion: With respect to this parameter, all operators were found having congestion within the prescribed benchmark of < 0.5%.

- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

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

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, **all the service providers were found to be meeting the TRAI specified benchmark**. The lowest call drop rate (average 0.13%) was for RCOM (CDMA) during the quarter.

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

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

The audit with respect to this parameter revealed that all the operators met the benchmark for this parameter except **Aircel, Tata (GSM) and Tata (CDMA)** which could not meet the benchmark of this parameter with their average achievement as **3.24%, 5.03% and 8.00%** respectively.

- iii. Connections with good voice quality:

Some of the Operators are measuring this parameter through the system generated data at their switches whereas some are measuring through their periodic drive tests. The audit results for this parameter reveal that **all operators have met the bench mark during the quarter**.

**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 RAJASTHAN CIRCLE - APRIL 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Live data	0.28%	0.08%	1.73%	0.06%	0.25%	0.23%	0.04%	0.17%	0.37%	0.24%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.05%	0.00%	0.17%	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	96.86%	98.50%	97.67%	99.34%	99.64%	98.47%	99.68%	98.71%	99.15%	98.43%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.32%	0.21%	0.67%	0.32%	0.02%	0.06%	0.20%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.56%	0.57%	1.66%	0.35%	0.05%	0.05%	0.32%	0.02%	0.12%	0.77%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	Live data	0.87%	0.78%	1.36%	0.84%	0.31%	0.79%	0.71%	0.11%	0.31%	0.45%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	3.70%	0.91%	1.72%	1.81%	0.01%	5.02%	2.37%	0.34%	0.21%	7.43%
	c) Connections with good voice quality	>=95%	Live data	96.54%	99.00%	98.33%	96.39%	98.61%	98.82%	96.96%	99.73%	99.18%	98.85%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES RAJASTHAN CIRCLE- MAY 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Live data	0.15%	0.07%	1.59%	0.09%	0.14%	0.33%	0.07%	0.12%	0.08%	0.13%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.17%	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	97.50%	98.98%	98.91%	99.51%	99.68%	98.51%	99.80%	98.36%	99.18%	97.76%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.23%	0.12%	0.83%	0.15%	0.02%	0.06%	0.13%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.53%	0.35%	1.38%	0.23%	0.05%	0.03%	0.20%	0.02%	0.20%	1.07%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	Live data	0.69%	0.66%	1.36%	0.78%	0.28%	0.74%	0.69%	0.11%	0.30%	0.52%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.95%	0.78%	2.12%	1.52%	0.03%	5.38%	2.60%	0.70%	0.51%	8.50%
	c) Connections with good voice quality	>=95%	Live data	97.33%	99.16%	98.67%	96.48%	98.73%	98.80%	97.27%	99.73%	99.18%	98.79%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0

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

CELLULAR MOBILE TELEPHONE SERVICES RAJASTHAN CIRCLE- JUNE 15 MONTH													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Live data	0.24%	0.18%	1.52%	0.14%	0.31%	0.46%	0.11%	0.28%	0.07%	0.34%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.10%	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	97.33%	98.86%	98.59%	99.42%	99.67%	98.41%	99.74%	98.99%	99.15%	98.88%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.37%	0.20%	0.28%	0.20%	0.02%	0.08%	0.25%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.64%	0.38%	1.29%	0.32%	0.05%	0.09%	0.26%	0.01%	0.17%	0.28%
3	Connection maintenance (Retainability)												
	a) CDR (Call Drop Rate)	<=2%	Live data	0.67%	0.71%	1.28%	0.77%	0.26%	0.78%	0.68%	0.10%	0.30%	0.44%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	2.99%	0.88%	1.72%	1.77%	0.01%	5.98%	2.46%	0.54%	0.45%	7.70%
	c) Connections with good voice quality	>=95%	Live data	97.25%	99.14%	98.33%	96.42%	98.92%	98.84%	97.12%	99.72%	99.17%	98.86%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0

5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF APRIL-2015 TO JUNE- 2015)

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE - JUNE 15) – RAJASTHAN CIRCLE													
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators			
	Network Service Quality Parameter												
1	Network Availability												
	a) BTS Accumulated Downtime	<=2%	Quarterly	0.22%	0.11%	1.61%	0.10%	0.23%	0.34%	0.07%	0.19%	0.17%	0.24%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.02%	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%	Quarterly	97.23%	98.78%	98.39%	99.42%	99.66%	98.46%	99.74%	98.69%	99.16%	98.36%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.31%	0.18%	0.59%	0.22%	0.02%	0.07%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.58%	0.43%	1.44%	0.30%	0.05%	0.06%	0.26%	0.02%	0.16%	0.71%
	Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.74%	0.72%	1.33%	0.80%	0.28%	0.77%	0.69%	0.11%	0.30%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	3.21%	0.86%	1.85%	1.70%	0.02%	5.46%	2.48%	0.53%	0.39%	7.88%
	c) Connections with good voice quality	>=95%	Quarterly	97.04%	99.10%	98.44%	96.43%	98.75%	98.82%	97.12%	99.73%	99.18%	98.83%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0	0	0	0	0

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days live measurement assessment, it was found that the performance of all operators was satisfactory as they have largely met the benchmarks except the parameter ‘Worst affected cells> 3 % TCH drops”, which could not be complied with by **Aircel, Tata (GSM) and Tata (CDMA)**. The average performance of **Aircel, Tata (GSM) and Tata (CDMA)** on this parameter was **3.21%, 5.46% and 7.88%** respectively. **The similar non-compliance of Aircel, Tata (GSM) and Tata (CDMA) was also observed during monthly PMR 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- Rajasthan Circle- April-15 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		Apr-15	2100	8185	4051	6229	2065	1390	7117	946	1657	690
	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	2456.21	5394.42	46476.02	2823.08	2618.33	1379.93	2400.22	1085.72	1037.08	517.62
	c) BTS Accumulated Downtime	<=2%	Apr-15	0.16%	0.09%	1.59%	0.06%	0.18%	0.14%	0.05%	0.16%	0.09%	0.10%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Apr-15	10	10	71	2	2	1	12	0	0	2
	e) Worst affected BTSs due to downtime	<=2%	Apr-15	0.48%	0.12%	1.75%	0.03%	0.10%	0.07%	0.17%	0.00%	0.00%	0.29%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Apr-15	97.00%	98.62%	98.60%	99.29%	99.65%	98.51%	99.72%	98.30%	99.11%	97.91%
	b) SDCCH/PAGING Congestion	<=1%	Apr-15	0.23%	0.22%	0.49%	0.26%	0.02%	0.06%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Apr-15	0.50%	0.48%	1.58%	0.41%	0.05%	0.06%	0.28%	0.03%	0.21%	1.21%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Apr-15	0.80%	0.72%	1.32%	0.84%	0.31%	0.74%	0.68%	0.14%	0.30%	0.53%
	b) Worst affected cells>3% TCH drop	<=3%	Apr-15	3.42%	0.87%	1.88%	1.73%	0.08%	4.76%	2.13%	0.65%	0.39%	8.32%
	c) % of connections with good voice quality	>=95%	Apr-15	96.59%	99.05%	98.47%	96.39%	98.66%	98.81%	97.06%	99.72%	99.18%	98.78%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Apr-15	214	212	189	331	5	199	464	18	22	184
	e) Total no. of cells (Sector) in the licensed service area		Apr-15	6264	24438	10089	19109	6188	4180	21736	2833	5644	2213
4	No. of POI's having >=0.5% POI congestion												
	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
5	Network Data												
	a) Equipped Capacity of Network in Erlang		Apr-15	108061	445949	265400	272773	NP	66059	299605	NP	122000	170839
	b) Total traffic in TCBH in erlang (Avg.)		Apr-15	104566	438477	102075	194625	NP	31344	273189	NP	58541	26781
	c) Total no. of customers served (as per VLR) on last day of the month		Apr-15	3617697	17324775	2525989	7319184	NP	567553	10511260	NP	1325818	319493

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- April-15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	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	2090	8148	4022	6186	2065	1389	7091	945	1635	687
	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	425.19	465.45	5007.55	254.07	375.75	228.32	210.35	116.85	434.40	118.70
	c) BTS Accumulated Downtime	<=2%	Live data	0.28%	0.08%	1.73%	0.06%	0.25%	0.23%	0.04%	0.17%	0.37%	0.24%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	0	7	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.05%	0.00%	0.17%	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	96.86%	98.50%	97.67%	99.34%	99.64%	98.47%	99.68%	98.71%	99.15%	98.43%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.32%	0.21%	0.67%	0.32%	0.02%	0.06%	0.20%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.56%	0.57%	1.66%	0.35%	0.05%	0.05%	0.32%	0.02%	0.12%	0.77%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.87%	0.78%	1.36%	0.84%	0.31%	0.79%	0.71%	0.11%	0.31%	0.45%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	3.70%	0.91%	1.72%	1.81%	0.01%	5.02%	2.37%	0.34%	0.21%	7.43%
	c) % of connections with good voice quality	>=95%	Live data	96.54%	99.00%	98.33%	96.39%	98.61%	98.82%	96.96%	99.73%	99.18%	98.85%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	231	222	174	346	1	210	514	10	12	164
	e) Total no. of cells (Sector) in the licensed service area		Live data	6241	24403	10089	19091	6187	4178	21699	2831	5587	2207
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- Rajasthan Circle- May 15 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	TATA CDMA
				GSM Operators						CDMA Operators			
Network Service Quality Parameter													
1	Network Availability												
	a) Total no. of BTSs in the licensed service area		May-15	2123	8225	4075	6231	2066	1390	7182	947	1657	690
	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	2455.34	6714.53	46907.95	4082.65	2303.15	2663.97	2582.31	1191.27	684.29	314.44
	c) BTS Accumulated Downtime	<=2%	May-15	0.16%	0.11%	1.55%	0.09%	0.15%	0.26%	0.05%	0.17%	0.06%	0.06%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		May-15	8	12	71	7	0	5	9	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	May-15	0.38%	0.15%	1.74%	0.11%	0.00%	0.36%	0.13%	0.00%	0.00%	0.00%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	May-15	97.48%	98.82%	98.64%	99.31%	99.67%	98.40%	99.78%	98.77%	99.21%	98.45%
	b) SDCCCH/PAGING Congestion	<=1%	May-15	0.27%	0.19%	0.55%	0.28%	0.02%	0.07%	0.18%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	May-15	0.51%	0.40%	1.38%	0.42%	0.05%	0.08%	0.22%	0.01%	0.13%	0.65%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	May-15	0.69%	0.69%	1.30%	0.78%	0.27%	0.72%	0.67%	0.12%	0.28%	0.49%
	b) Worst affected cells>3% TCH drop	<=3%	May-15	2.97%	0.87%	2.13%	1.58%	0.10%	5.05%	2.24%	0.62%	0.45%	7.91%
	c) % of connections with good voice quality	>=95%	May-15	97.21%	99.14%	98.61%	96.48%	98.83%	98.83%	97.23%	99.72%	99.18%	98.81%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		May-15	188	213	214	303	6	211	490	18	26	175
	e) Total no. of cells (Sector) in the licensed service area		May-15	6311	24586	10012	19212	6190	4181	21850	2837	5659	2216
4	No. of POI's having >=0.5% POI congestion												
	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
5	Network Data												
	a) Equipped Capacity of Network in Erlang		May-15	109386	445877	265400	277263	NP	66059	299974	NP	132000	170839
	b) Total traffic in TCBH in erlang (Avg.)		May-15	106284	425882	101067	196339	NP	30848	267783	NP	60994	24504
	c) Total no. of customers served (as per VLR) on last day of the month		May-15	3620521	17013749	2508416	7253625	NP	535056	10313769	NP	1313645	307411

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- May 15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	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	2106	8197	4051	6229	2065	1390	7118	947	1657	690
	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	226.39	413.32	4641.15	392.65	207.75	325.70	363.22	84.05	97.67	66.19
	c) BTS Accumulated Downtime	<=2%	Live data	0.15%	0.07%	1.59%	0.09%	0.14%	0.33%	0.07%	0.12%	0.08%	0.13%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	7	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.17%	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	97.50%	98.98%	98.91%	99.51%	99.68%	98.51%	99.80%	98.36%	99.18%	97.76%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.23%	0.12%	0.83%	0.15%	0.02%	0.06%	0.13%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.53%	0.35%	1.38%	0.23%	0.05%	0.03%	0.20%	0.02%	0.20%	1.07%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.69%	0.66%	1.36%	0.78%	0.28%	0.74%	0.69%	0.11%	0.30%	0.52%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.95%	0.78%	2.12%	1.52%	0.03%	5.38%	2.60%	0.70%	0.51%	8.50%
	c) % of connections with good voice quality	>=95%	Live data	97.33%	99.16%	98.67%	96.48%	98.73%	98.80%	97.27%	99.73%	99.18%	98.79%
	d) d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	186	192	212	292	2	225	568	20	29	188
	e) Total no. of cells (Sector) in the licensed service area		Live data	6295	24551	10012	19212	6189	4181	21796	2837	5659	2216
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- Rajasthan Circle- June 15 month													
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	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	2170	8245	4085	6232	2067	1390	7267	934	1656	690
	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	3113	8339	45593	5418	3444	2973	4581	1392	1396	1044
	c) BTS Accumulated Downtime	<=2%	Jun-15	0.20%	0.14%	1.55%	0.12%	0.23%	0.30%	0.09%	0.21%	0.12%	0.21%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jun-15	17	13	71	9	3	10	19	1	2	3
	e) Worst affected BTSs due to downtime	<=2%	Jun-15	0.78%	0.16%	1.83%	0.14%	0.15%	0.72%	0.26%	0.11%	0.12%	0.43%
2	Connection Establishment (Accessibility)												
	a) CSSR (Call Setup Success Rate)	>=95%	Jun-15	97.44%	97.89%	98.68%	99.32%	99.65%	98.22%	99.74%	98.99%	99.15%	98.56%
	b) SDCCH/PAGING Congestion	<=1%	Jun-15	0.59%	0.38%	0.49%	0.26%	0.02%	0.12%	0.19%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jun-15	0.67%	1.07%	1.23%	0.41%	0.05%	0.14%	0.26%	0.01%	0.11%	0.48%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Jun-15	0.73%	1.15%	1.35%	0.83%	0.27%	0.75%	0.74%	0.13%	0.31%	0.51%
	b) Worst affected cells>3% TCH drop	<=3%	Jun-15	3.32%	2.83%	1.94%	1.83%	0.02%	5.29%	2.48%	0.70%	0.51%	7.76%
	c) % of connections with good voice quality	>=95%	Jun-15	97.18%	99.08%	98.60%	96.32%	98.91%	98.74%	97.12%	99.71%	99.17%	98.84%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jun-15	213	699	194	351	1	221	550	20	29	172
	e) Total no. of cells (Sector) in the licensed service area		Jun-15	6416	24676	10009	19217	6192	4181	22151	2815	5673	2216
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	109949	447869	265400	276900	102000	66059	301484	116000	132000	170839
	b) Total traffic in TCBH in erlang (Avg.)		Jun-15	105955	402769	100051	194653	67076	30521	256681	32566	57508	23009
	c) Total no. of customers served (as per VLR) on last day of the month		Jun-15	3704009	17064307	2514975	7340146	5179296	548435	10267561	968818	1302806	303302

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Rajasthan Circle- Jun-15 month													
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	TATA GSM	VODAFONE	RCOM CDMA	MTS	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	2137	8227	4075	6228	2065	1390	7209	947	1655	690
	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	373.80	1067.17	4464.48	631.73	456.72	459.77	573.30	188.67	84.20	171.27
	c) BTS Accumulated Downtime	<=2%	Live data	0.24%	0.18%	1.52%	0.14%	0.31%	0.46%	0.11%	0.28%	0.07%	0.34%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	4	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.10%	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	97.33%	98.86%	98.59%	99.42%	99.67%	98.41%	99.74%	98.99%	99.15%	98.88%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.37%	0.20%	0.28%	0.20%	0.02%	0.08%	0.25%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.64%	0.38%	1.29%	0.32%	0.05%	0.09%	0.26%	0.01%	0.17%	0.28%
3	Connection Maintenance (Retainability)												
	a) Call Drop Rate (CDR)	<=2%	Live data	0.67%	0.71%	1.28%	0.77%	0.26%	0.78%	0.68%	0.10%	0.30%	0.44%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	2.99%	0.88%	1.72%	1.77%	0.01%	5.98%	2.46%	0.54%	0.45%	7.70%
	c) % of connections with good voice quality	>=95%	Live data	97.25%	99.14%	98.33%	96.42%	98.92%	98.84%	97.12%	99.72%	99.17%	98.86%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	191	217	172	340	0	250	543	15	26	171
	e) Total no. of cells (Sector) in the licensed service area		Live data	6389	24648	10009	19207	6190	4181	22073	2837	5655	2216
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

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 AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audited Data for Cellular Mobile Telephone Services													
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S / N	Name of Parameter			GSM Operators						CDMA Operators			
1	Metering & Billing Credibility -Post Paid												
	A) No. of bills issued during the quarter		RAJ	164251	1165183	395377	353003	116406	NA	1641748	274191	163046	111426
	B) No. of bills disputed including billing complaints during the quarter		RAJ	4	166	188	187	107	NA	2699	213	147	0
	C)% of billing complaints during the quarter	<= 0.1%	RAJ	0.002%	0.01%	0.05%	0.05%	0.09%	NA	0.16%	0.08%	0.09%	0.00%
2	Metering & Billing Credibility -Pre Paid												
	A) Total No. of Pre-paid customers at the end of the quarter		RAJ	5859884	17346307	3086921	7115645	5353720	778798	10772186	2129379	918513	588572
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		RAJ	11	45	15072	5824	4866	0	31711	947	742	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	RAJ	0.00%	0.00%	0.49%	0.08%	0.09%	0.00%	0.29%	0.04%	0.08%	0.00%
3	Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints												
	A) No. of Billing/Charging/Credit/Valid ity Complaints received during the quarter		RAJ	15	211	15072	10681	4973	0	34410	1160	889	0
	B) No. of billing complaints for Post paid customers/Charging/Credit/ Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		RAJ	15	211	15055	10681	4973	0	34410	1160	889	0

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S / N	Name of Parameter			GSM Operators						CDMA Operators			
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		RAJ	15	211	15055	10681	4973	0	34410	1160	889	0
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	RAJ	100.00%	100.00%	99.89%	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	RAJ	100.00%	100.00%	99.89%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	RAJ	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		RAJ	19777814	4749385	318331	22178928	6553389	104765	23756875	5989943	903413	68893
	B) Total no. of calls successfully established to customer care/Call center.		RAJ	19408924	4749274	310846	21954088	6486960	103198	23756875	5832308	884789	67553
4	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	RAJ	98.13%	100.00%	97.65%	98.99%	98.99%	98.50%	100.00%	97.37%	97.94%	98.05%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		RAJ	4279791	8883231	178604	7179534	1134940	113343	7546362	2276869	189763	98970
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		RAJ	4156134	8200571	133087	7102241	1132970	111958	7370982	2220211	188990	97325

QUARTERLY CSD AUDITED DATA FOR CELLULAR MOBILE TELEPHONE SERVICES

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S / N	Name of Parameter			GSM Operators						CDMA Operators			
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	RAJ	97.11%	92.32%	74.52%	98.92%	99.83%	98.78%	97.68%	97.51%	99.59%	98.34%
Termination/closure of service													
5	A) Total No. of requests for Termination / Closure of service received during the quarter		RAJ	1315	2884	4238	2852	784	NA	8972	4987	834	1392
	B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		RAJ	1315	2884	4238	2852	784	NA	8972	4987	834	1392
	C) % of Termination/ Closure of service within 7 days	<=7days	RAJ	100.00%	100.00%	100.00%	100.00%	100.00%	NA	100.00%	100.00%	100.00%	100.00%
Time taken for refunds of deposits after closures.													
6	A) No. of Payments/ Refunds due during the quarter		RAJ	718	1091	733	1791	783	NA	24683	94	910	1064
	B) No. of Payments/ Refunds Cleared during the quarter		RAJ	718	1091	733	1791	783	NA	23425	94	910	1064
	C) Time taken for refunds of deposits after closures.	100% within 60 days	RAJ	100.00%	100.00%	100.00%	100.00%	100.00%	NA	94.90%	100.00%	100.00%	100.00%

NA: Not applicable as Tata (GSM) has any post-paid connections.

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. 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)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators						CDMA Operators			
RESPONSE TIME TO CUSTOMERS FOR ASSISTANCE													
1	Total no of calls attempted to customer care/Call center		Rajasthan	769841	142661	9790	712882	NP	3708	761401	232595	NP	2924
	Total no. of calls successfully established to customer care/Call center		Rajasthan	671497	142661	9474	707463	NP	3688	761401	222825	NP	2918
	% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempt)	>=95%	Rajasthan	87.23%	100.00%	96.77%	99.24%	NP	99.46%	100.00%	95.80%	NP	99.79%
	Total Calls reached to Operator for Voice to Voice (Total call attempts)		Rajasthan	132209	273058	5381	245048	45339	3635	250997	81568	7626	2904
	Total number of calls answered by the operator (Voice to voice) within 90 seconds		Rajasthan	117657	263401	5342	244495	44122	3599	213800	78251	7420	2892
	% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempts)	>=95%	Rajasthan	88.99%	96.46%	99.28%	99.77%	97.32%	99.01%	85.18%	95.93%	97.30%	99.59%

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

KEY FINDINGS: CUSTOMER SERVICE DELIVERY 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 $\leq 0.1\%$ for most of the operators. However, **Vodafone** could not meet the benchmark with its performance as **0.16%** (for post paid) and **0.29%** (for pre-paid), while **BSNL** failed to meet the benchmark for pre-paid with its performance as **0.49%**.

2. Resolution of Billing complaints and applying credits -

- i. Resolution of billing /charging complaints ($\geq 98\%$ within 4 weeks and 100% within 6 weeks)
- 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 except **BSNL** failed to meet the benchmark by resolving (99.89%) of billing complaints within 6 weeks.

In all cases where customers were due for credit / adjustment, all the service providers have met the benchmark of 100 % refund in one week.

3. Response Time to the Customer for assistance

- i. Accessibility of call centre/customer care ($>95\%$)
- ii. Percentage of calls answered by Operators (Voice to Voice) ($>95\%$)

All service providers are in compliance with respect to the parameter accessibility of call center.

Regarding Calls answered by operator (Voice to Voice), **Airtel** and **BSNL** have not met the benchmark of $>95\%$ with their performed level as **92.32%** and **74.52%** respectively.

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

All operators (**except Vodafone**) were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure. The performance of **Vodafone** remained **94.90%**.

Live Measurements:

The results of three days live measurements reveal that all operators (**except Airtel**) have met the benchmarks for the parameter Accessibility of Call Center. **Airtel** could achieve its performance as **87.23%**.

Regarding calls answered by operator (Voice to voice) within 90 seconds, **Airtel** and **Vodafone** remained **non-complied** with their performance as **88.99%** and **85.18%** respectively.

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 Rajasthan service area during the time 1100 to 1400 Hrs and 1600 to 1900 was carried out by TUV auditors. The test calls were made from one operator to another within the same licensed area to judge the ease of connectivity amongst the operators. While doing this exercise, the radio part, the switch part and POI in between the two operators are involved. Congestion in any of these network elements could result in congestion in the network.

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT											
Calling Operators	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
AIRCEL	Rajasthan	--	100%	100%	100%	100%	100%	100%	100%	100%	100%
AIRTEL	Rajasthan	100%	--	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	Rajasthan	100%	100%	--	100%	100%	100%	100%	100%	100%	100%
IDEA	Rajasthan	100%	100%	100%	--	100%	100%	100%	100%	100%	100%
RCOM (GSM)	Rajasthan	100%	100%	100%	100%	--	100%	100%	100%	100%	100%
TATA (GSM)	Rajasthan	100%	100%	100%	100%	100%	--	100%	100%	100%	100%
VODAFONE	Rajasthan	100%	100%	100%	100%	100%	100%	--	100%	100%	100%
MTS	Rajasthan	100%	100%	100%	100%	100%	100%	100%	--	100%	100%
RCOM (CDMA)	Rajasthan	100%	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA (CDMA)	Rajasthan	100%	100%	100%	100%	100%	100%	100%	100%	100%	--

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

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	Rajasthan	100	100	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	Rajasthan	100	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	Rajasthan	100	100	100	98	98	99	100	96	99	99
% Accessibility of Call centre /customer Care (Total call successfully established *100 / Total call attempt)	Rajasthan	100.00%	100.00%	100.00%	98.00%	98.00%	99.00%	100.00%	96.00%	99.00%	99.00%
Total Calls reached to agent desk for Voice to Voice (Total call attempt)	Rajasthan	100	100	100	98	98	99	100	96	99	99
Total number of calls answered by the operator (Voice to voice) within 90 seconds	Rajasthan	100	100	97	96	96	98	100	96	97	98
% age of calls answered by operator(voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempt)	Rajasthan	100.00%	100.00%	97.00%	97.96%	97.96%	98.99%	100.00%	100.00%	97.98%	98.99%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, 100% calls were connected to the Operator within 90 seconds except for BSNL, Idea, RCOM GSM, Tata GSM, RCOM CDMA and Tata (CDMA), the calls answered by operators were 97%, 97.96%, 97.96%, 98.99%, 97.98% and 98.99% respectively.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLAINTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS											
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	Rajasthan	15	130	140	120	125	0	130	120	115	0
Total No. of calls Answered	Rajasthan	15	100	100	100	100	0	100	100	100	0
Cases resolved within 4 weeks	Rajasthan	15	100	100	100	100	0	100	100	100	0
%age of cases resolved	Rajasthan	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. However, most of the customers reported their satisfaction on resolution of the billing complaints

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING														
Month	SSA Name	Name of SDCA	Emergency No.	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	MTS	VODAFONE
April'15	Chittorgarh	Rashmi, Kapasan	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
		Nimbahera, Pratapgarh, Arnod, Badi Sadri, Dungla	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
		Chittorgarh, Begun	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
May'15	Tonk	Todaraisingh, Malpura	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
		Deoli, Uniara	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
		Tonk, Newai	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
June'15	Jhunjhunu	Udaipurwati	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
		Bissau, Jhunjunu	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√
		Chirawa, Khetri	100	5	√	√	√	√	√	√	√	√	√	√
			101	5	√	√	√	√	√	√	√	√	√	√
			102, 108	5	√	√	√	√	√	√	√	√	√	√

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various mobile service providers in the SDCAs of the three SSAs where drive tests were conducted, the calls were made from mobile phones provided by the service providers during the drive test. In these SSA of Rajasthan service areas, the emergency services as mentioned in the above table were found functional in the networks of all the service providers.

7. DRIVE TEST



7. OPERATOR 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 **Chittorgarh, Tonk and Jhunjhunu** in the months of April, May and June 2015 respectively. The total route Kms covered during the drive tests in the respective SSAs was **456Kms, 378Kms and 338Kms**. 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 FERs 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.

DRIVE TEST TABLE – 1

OPERATOR ASSISTED DRIVE TEST AT CHITTORGARH SSA IN APRIL 15 MONTH- RAJASTHAN CIRCLE

S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Roads	-	30	-	30	NP	NP	-	31	-	31	-	30	-	30	-	31	-	30	-	30
		Highways	163	30	264	30	NP	NP	238	31	164	33	113	30	234	30	80	30	154	30	114	31
		Within City	200	30	228	30	NP	NP	197	31	188	30	214	30	200	30	237	30	183	30	193	30
		Overall SSA	363	90	492	90	NP	NP	435	93	352	94	327	90	434	90	317	91	337	90	307	91
2	Blocked Call Rate	Major Roads	-	0.00%	-	0.00%	NP	NP	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
		Highways	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	NP	NP	1.02%	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%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	NP	NP	0.46%	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%
3	Dropped Call Rate (<=2%)	Major Roads	-	0.00%	-	0.00%	NP	NP	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
		Highways	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency hopping for CDMA	Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	99.97%	-	100%	-	99.97%
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.61%	99.86%	99.49%	99.98%	99.58%	99.44%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.76%	99.86%	99.90%	99.99%	98.56%	99.97%

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



S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.73%	99.89%	99.74%	99.99%	98.93%
Operators)	Major Roads	-	99.99%	-	99.19%	NP	NP	-	98.61%	-	98.05%	-	100%	-	98.32%	NA	NA	NA	NA	NA	NA	
	Highways	97.30%	99.90%	97.53%	99.49%	NP	NP	98.16%	98.52%	97.51%	99.12%	97.32%	100%	96.89%	99.64%	NA	NA	NA	NA	NA	NA	
	Within City	97.42%	99.93%	98.44%	98.78%	NP	NP	97.58%	96.15%	96.62%	99.98%	97.55%	100%	96.75%	98.28%	NA	NA	NA	NA	NA	NA	
	Overall SSA	97.36%	99.94%	97.95%	99.16%	NP	NP	97.90%	97.87%	97.03%	99.04%	97.47%	100%	96.83%	98.75%	NA	NA	NA	NA	NA	NA	
	Service Coverage																					
5	In door (>= - 75dBm)	Major Roads	-	99.94%	-	98.65%	NP	NP	-	92.42%	-	6.74%	-	83.68%	-	99.95%	-	99.99%	-	46.91%	-	100%
		Highways	48.83%	99.95%	96.24%	99.04%	NP	NP	41.12%	92.31%	52.67%	47.01%	72.62%	35.82%	71.50%	94.26%	60.45%	100%	61.37%	54.80%	45.82%	99.27%
		Within City	64.28%	25.19%	97.50%	98.76%	NP	NP	59.46%	0.68%	64.05%	81.05%	67.56%	35.13%	81.39%	64.67%	94.56%	99.49%	65.39%	55.44%	83.29%	2.20%
		Overall SSA	57.32%	74.86%	96.83%	98.82%	NP	NP	49.14%	61.50%	58.93%	41.82%	69.25%	51.57%	76.07%	86.31%	86.38%	99.82%	63.79%	52.42%	69.54%	67.41%
	In-vehicle (>= - 85dBm)	Major Roads	-	100%	-	100%	NP	NP	-	100%	-	83.85%	-	99.98%	-	100%	-	100%	-	94.19%	-	100%
		Highways	78.74%	100%	99.47%	100%	NP	NP	76.30%	100%	87.84%	89.19%	89.45%	99.58%	95.06%	99.95%	99.07%	100%	76.28%	100%	86.42%	100%
		Within City	86.17%	93.79%	99.85%	100%	NP	NP	90.45%	34.86%	93.66%	99.69%	89.94%	97.59%	98.83%	96.36%	99.66%	100%	84.00%	71.41%	99.01%	87.31%
		Overall SSA	82.82%	97.91%	99.65%	100%	NP	NP	82.49%	78.07%	91.04%	90.16%	89.78%	99.05%	96.80%	98.77%	99.52%	100%	80.94%	86.72%	94.39%	95.80%
	Outdoor-in city (>= - 95dBm)	Major Roads	-	100%	-	100%	NP	NP	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	96.46%	100%	100%	100%	NP	NP	97.27%	100%	99.07%	99.97%	97.85%	100%	99.79%	99.99%	100%	100%	93.93%	100%	99.24%	100%
		Within City	99.24%	99.95%	100%	100%	NP	NP	99.41%	97.69%	99.90%	100%	99.40%	100%	99.98%	99.99%	100%	100%	98.43%	99.99%	99.93%	99.92%
		Overall SSA	97.99%	99.98%	100%	100%	NP	NP	98.20%	99.22%	99.52%	99.99%	98.88%	100%	99.88%	99.99%	100%	100%	96.64%	100%	99.68%	99.97%
6	Call Setup Success	Major Roads	-	100%	-	100%	NP	NP	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%

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



S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
	Rate (>=95%)	Highways	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	NP	NP	98.98%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	NP	NP	99.54%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	-	100%	-	100%	NP	NP	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	99.34%	100%	99.09%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	99.58%	100%	99.61%	100%	100%	100%	100%	100%	100%	100%

- i) NA: Not Applicable, NP: Not Provided: BSNL has not provided the drive test report despite best efforts.
- ii) The drive test on major roads has been covered in the drive test conducted within city.
- iii) The service providers having block call rate more than 3% have been shaded in yellow colour.

DRIVE TEST TABLE – 2

OPERATOR ASSISTED DRIVE TEST AT TONK SSA IN MAY 15 MONTH- RAJASTHAN CIRCLE

S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Roads	-	30	-	30	NP	NP	-	30	-	30	-	30	-	30	-	30	-	30	-	30
		Highways	109	30	168	30	NP	NP	72	30	140	29	127	30	127	30	151	30	89	30	137	31
		Within City	178	30	214	30	NP	NP	179	31	207	30	221	30	212	30	259	30	227	30	196	30
		Overall SSA	287	90	382	90	NP	NP	251	91	347	89	348	90	339	90	410	90	316	90	333	91
2	Blocked Call Rate	Major Roads	-	0.00%	-	0.00%	NP	NP	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
		Highways	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Roads	-	0.00%	-	0.00%	NP	NP	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
		Highways	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	NP	NP	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency hopping for CDMA	Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	99.95%	-	100%	-	99.67%
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.37%	100%	98.14%	99.71%	95.67%	99.92%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.04%	99.96%	99.57%	100%	98.76%	99.81%

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



S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.16%	99.97%	99.18%	99.89%	97.49%	99.80%
5	Operators)	Major Roads	-	99.40%	-	98.89%	NP	NP	-	96.90%	-	96.39%	-	100%	-	97.18%	NA	NA	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Highways	96.53%	98.36%	97.40%	97.74%	NP	NP	98.32%	98.48%	95.71%	99.74%	97.51%	98.22%	96.66%	99.06%	NA	NA	NA	NA	NA	NA
		Within City	95.92%	99.47%	97.70%	98.17%	NP	NP	97.14%	99.54%	95.24%	99.24%	96.53%	99.22%	96.95%	99.27%	NA	NA	NA	NA	NA	NA
		Overall SSA	96.15%	99.07%	97.57%	98.27%	NP	NP	97.54%	98.12%	95.43%	98.44%	96.87%	99.15%	96.84%	98.50%	NA	NA	NA	NA	NA	NA
		Service Coverage																				
5	In door (>= - 75dBm)	Major Roads	-	99.68%	-	100%	NP	NP	-	56.56%	-	76.87%	-	99.95%	-	99.44%	-	100%	-	100%	-	99.33%
		Highways	32.23%	93.21%	96.12%	100%	NP	NP	73.62%	100%	39.98%	32.00%	45.40%	99.66%	69.82%	99.24%	66.40%	100%	57.09%	66.27%	45.08%	33.78%
		Within City	66.10%	98.65%	97.13%	100%	NP	NP	63.23%	99.37%	53.23%	69.65%	61.19%	0.03%	73.18%	70.87%	95.75%	100%	72.92%	99.86%	82.97%	88.90%
		Overall SSA	53.40%	97.18%	96.68%	100%	NP	NP	66.78%	85.55%	47.89%	59.83%	55.72%	66.59%	71.91%	89.86%	84.77%	100%	68.52%	86.85%	67.49%	74.21%
	In-vehicle (>= - 85dBm)	Major Roads	-	100%	-	100%	NP	NP	-	99.35%	-	99.91%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	70.85%	99.99%	99.55%	100%	NP	NP	97.89%	100%	85.97%	99.66%	74.48%	100%	96.63%	100%	97.21%	100%	76.46%	99.86%	85.70%	98.43%
		Within City	96.09%	99.95%	99.60%	100%	NP	NP	96.79%	100%	92.99%	99.98%	90.74%	51.71%	98.99%	98.57%	99.99%	100%	91.68%	100%	95.29%	100%
		Overall SSA	86.62%	99.98%	99.58%	100%	NP	NP	97.16%	99.79%	90.16%	99.85%	85.11%	83.93%	98.10%	99.52%	98.95%	100%	87.46%	99.95%	91.37%	99.48%
	Outdoor-in city (>= - 95dBm)	Major Roads	-	100%	-	100%	NP	NP	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	97.03%	100%	100%	100%	NP	NP	99.95%	100%	99.42%	100%	96.25%	100%	99.98%	100%	100%	100%	93.85%	100%	99.64%	100%
		Within City	99.96%	99.98%	100%	100%	NP	NP	99.91%	100%	99.80%	100%	97.79%	99.77%	99.98%	100%	100%	100%	99.64%	100%	99.74%	99.92%
		Overall SSA	98.86%	99.99%	100%	100%	NP	NP	99.92%	100%	99.65%	100%	97.26%	99.92%	99.98%	100%	100%	100%	98.04%	100%	99.70%	99.97%
6	Call Setup Success	Major Roads	-	100%	-	100%	NP	NP	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%

S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Rate (>=95%)																			
7	Hand Over Success Rate (HOSR)	Highways	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Major Roads	-	100%	-	100%	NP	NP	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	100%	100%	100%	100%	NP	NP	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	NP	NP	99.12%	100%	100%	100%	100%	100%	98.83%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	NP	NP	99.44%	100%	100%	100%	100%	100%	99.31%	100%	100%	100%	100%	100%	100%	100%

- i) NA: Not Applicable, NP: Not Provided: BSNL has not provided the drive test report despite best efforts.
- ii) The drive test on major roads has been covered in the drive test conducted within city.
- iii) The service providers having block call rate more than 3% have been shaded in yellow colour.

DRIVE TEST TABLE - 3

OPERATOR ASSISTED DRIVE TEST AT JHUNJHUNU SSA IN JUNE 15 MONTH- RAJASTHAN CIRCLE

S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
1	Call Attempts	Major Roads	-	30	-	30	-	45	-	31	-	31	-	30	-	30	-	30	-	30	-	30
		Highways	177	30	220	30	92	45	133	30	127	32	173	30	213	30	177	30	224	30	165	30
		Within City	139	30	171	30	264	45	146	30	157	31	167	30	138	30	160	30	177	30	136	30
		Overall SSA	316	90	391	90	356	135	279	91	284	94	340	90	351	90	337	90	401	90	301	90
2	Blocked Call Rate	Major Roads	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
		Highways	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Major Roads	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%	-	0.00%
		Highways	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Within City	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Overall SSA	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Percentage connections with good voice quality (=>95%)																					
	(a) 0-4 (w/o frequency hopping for CDMA	Major Roads	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	99.92%	-	99.97%	-	99.94%
		Highways	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	97.76%	99.90%	97.63%	100%	99.49%	99.97%
		Within City	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.17%	97.61%	99.29%	99.88%	99.85%	99.97%

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

S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			Overall SSA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	98.46%	99.09%	98.36%	99.95%
	Operators)	Major Roads	-	99.25%	-	98.63%	-	99.91%	-	99.71%	-	99.82%	-	99.33%	-	99.35%	NA	NA	NA	NA	NA	NA
	(b) 0-5 (with frequency hopping for GSM Operators)	Highways	97.78%	99.95%	97.67%	99.49%	97.95%	95.56%	96.98%	99.92%	97.18%	98.91%	96.36%	97.88%	95.18%	99.66%	NA	NA	NA	NA	NA	NA
		Within City	98.16%	99.88%	97.26%	98.78%	97.14%	97.19%	96.60%	99.62%	97.97%	99.88%	98.09%	95.86%	97.16%	99.69%	NA	NA	NA	NA	NA	NA
		Overall SSA	97.95%	99.70%	97.52%	98.92%	97.34%	97.46%	96.80%	99.84%	97.62%	99.53%	97.24%	97.69%	95.96%	99.57%	NA	NA	NA	NA	NA	NA
		Service Coverage																				
5	In door (>= - 75dBm)	Major Roads	-	98.95%	-	100%	-	99.99%	-	99.96%	-	87.57%	-	98.61%	-	99.87%	-	76.78%	-	99.82%	-	91.21%
		Highways	57.63%	99.89%	97.24%	100%	61.71%	100%	76.20%	100%	57.29%	65.24%	41.55%	98.73%	63.66%	100%	75.69%	98.38%	76.02%	100%	57.05%	100%
		Within City	69.88%	99.87%	97.20%	100%	95.41%	99.49%	78.04%	99.94%	71.90%	94.56%	74.23%	97.49%	77.41%	100%	79.73%	100%	89.87%	92.94%	83.67%	79.96%
		Overall SSA	63.09%	99.58%	97.22%	100%	86.88%	99.83%	77.09%	99.97%	65.34%	81.99%	58.23%	98.28%	69.08%	99.96%	77.66%	91.97%	82.10%	97.45%	69.09%	90.31%
	In-vehicle (>= - 85dBm)	Major Roads	-	99.99%	-	100%	-	100%	-	100%	-	99.98%	-	99.90%	-	100%	-	98.35%	-	100%	-	99.85%
		Highways	85.00%	100%	99.18%	100%	97.74%	100%	98.55%	100%	90.36%	96.75%	69.60%	100%	94.40%	100%	97.63%	100%	87.55%	100%	91.05%	100%
		Within City	95.45%	100%	98.97%	100%	99.67%	100%	98.28%	100%	96.11%	99.88%	89.53%	99.82%	97.61%	100%	98.15%	100%	95.12%	99.82%	99.18%	100%
		Overall SSA	89.65%	100%	99.10%	100%	99.18%	100%	98.42%	100%	93.53%	98.83%	79.78%	99.91%	95.67%	100%	97.88%	99.47%	90.87%	99.94%	94.72%	99.95%
	Outdoor-in city (>= - 95dBm)	Major Roads	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	97.88%	100%	100%	100%	100%	100%	99.99%	100%	99.50%	99.72%	90.52%	100%	99.90%	100%	100%	100%	98.22%	100%	99.31%	100%
		Within City	99.50%	100%	100%	100%	100%	100%	100%	100%	99.94%	100%	97.43%	100%	99.96%	100%	100%	100%	99.68%	100%	99.98%	100%
		Overall SSA	98.60%	100%	100%	100%	100%	100%	99.99%	100%	99.74%	99.90%	94.05%	100%	99.93%	100%	100%	100%	98.86%	100%	99.61%	100%

S/N	Parameter	Classification of route covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		MTS CDMA		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
6	Call Setup Success Rate (>=95%)	Major Roads	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%	-	100%
		Highways	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.44%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.60%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	99.53%	100%	100%	100%	100%	100%	100%	100%	100%	100%

- i) NA: Not Applicable, NP: Not Provided:
 ii) The drive test on major roads has been covered in the drive test conducted within city.
 iii) The service providers having block call rate more than 3% have been shaded in yellow color.

7.1 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

Name of SSA	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
Chittorgarh	Kapasun ,Rashmi ,Dungla / 129 Kms	Highway To Rashmi- Chandoriya, Borda, Rood, Maroli, Rashmi. Rashmi Within City– Sen. Sec. School, Sbbj Bank, Ambrish Mkt, Bus Stand, Royal Public School. Highway To Kapasun – Dhindoli , Rooka Khera , Keshar Kheri Kapasun Within City –Chittor Rd Main Mkt ,Govt. School Old Kapasun, Ramdwara ,Subji Mandi ,Rly Stn. ,Post Office ,Kapasun College , Rnt College . Highway To Chittorgarh- Rajpura , Singpur ,Narela, Pandoli, Chittorgarh. Indoor: Vinayak Hotel	Arnod ,Pratapgarh ,Nimbahera ,Badi Sadri ,Dungla / 205 Kms	Highway To Nimbahera – Senthil ,Ochri ,Shambhupura Bypass Satkhanda ,Mangrol . Within City –Vasant Vihar ,Jk Road , Mall Godam ,Chandan Chowk , Adarsh Col. ,Ahinsa Circle , Udaipur Rd. ,Geetanjali Colony ,Bala Ji Ngr. Highway To Pratapgarh – Narsingarh ,Narsakhedi ,Choti Sadri ,Dholapani , Dhamotra . Within City – Ambedkar Circle , Tagore Park ,Bus Stand Gopalganj Circle , M.G Road ,Bada Bagh Colony ,Natonal P.G College . Highway To Arnod –Banediya , Aamlikheda, Kherot . Within City – Police Stn. ,Post Office ,Gautmeshwar Rd. ,Aganwari Kendra , Sabji Mandi , Zero Mile Circle . Highway To Badi Sadri – Semarthali ,Baaliya Kheda, Doodhtalai ,Chandpuria ,Aklingpura Within City – Sdo Office ,Ayurvedic Hospital , Ghanta Ghar, Nagar Palika Jhalamanna Circle , Girls Senior Sec School ,Karnod Darwaja ,Vivekanand Sen Sec School ,Ahinsa Ngar .Highway To Dungli – Chandra Khedi ,Nikumb ,Aalakhera ,Somaliya . Within City – Court ,Primary School ,Sadra Bazar , Bus Stand ,Prem Nagar , Police Thana . Indoor: Shri Ji Hotel	Chittorgarh, Bagun /122 Kms	Chittorgarh Within City – Vaikas Ngr ,Rajeev Gandhi Park ,Udaipur Road ,Bapu Ngr Panchwati Colony ,Kumbha Ngr , Shastri Ngr , Kabeer Colony ,Sadar Bazar , Keshav Madhav Auditorium ,Gandhi Nagar, Mewar Girls College ,Ochri Gate , Collectrate Circle ,Zinc Nagar, Chanderia Ind. Area , Madhav Nagar ,Vinayak Hotel Gopal Nagar . Highway To Begun - Hukumpura ,Bassi Toll Plza ,Rajgarh ,Kherpura , Khatunda . Begun Within City – Kishorepura Mod , Court ,Tehsil Circle ,Mistri Market ,Roadways Bus Stand ,Chuth Mata Colony ,Ganpati Nagar ,Jai Nagar, Bsnl Exchange . Indoor: Ratan Bagh Restaurant.

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Name of SSA	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
Tonk	Malpura, Toda Raisingh/100 Kms	Highway To Todaraisingh – Nagarfort , Toll Plaza , Karempura Mod , Ganeta , Basera , To Daraisingh Within City Purana Bus Stand , Post Office , New Murti Market , Pareek Singh College , New Bus Stand , Krishi Upaj Mandi Highway To Malpura – Kukod , Mor , Tordi , Rac . Malpura Within City Dadawadi , Kakri Rd, Ramdwara , Truck Stand , Maharaj Ki Baghichi , Moksh Dham , Phed , Vyas Circle , Sr. Sec. School , Indira Colony , Main Pump House , Abu Nagar . Indoor: BSNL Exchange	Deoli , Uniara /189 Kms	Highway To Deoli Mehanwas , Chhan , Devdawas , Saroli Mod , Senthali , Sirohi , Panwar , Ambapura , Deoli Within City Deoli Tonk Rd , Kota Rd , Kekri Rd , Cantt. Area , Govt. School , Govt. Hospital , Dak Bangla , Pawan Hospital , Deoli Gaon , Tonk Rd . Highway To Uniara Uniara Mod , Ghans , Kakod , Guman Pura , Kheleniya , Within City Uniara Police Check Ost , Govt. School , Court , Govt. Girls School , Nagar Palika , Nainwa Rd , Maitry Mahila Dairy , Bus Stand , Bsnl Exchange. Indoor: Main Bus Stand	Tonk Newai /89 Kms	Within City Tonk Barmor Rd , Housing Board Colony , Vet. Hsptl. . Dhanna Talai Chauraha , Bada Kuan , Hemu Circle , Bus Depot , Isuzu Textile , Kota Bypass , Sawaimadhapur Chauraha , Cantt. Area , Indira Chowk , Police Line , Adarh Subhash School , Pandey Ji Ka Bagh , Ghanta Ghar , Civil Lines , Shekhawati Defence Academy , Gurjar Hostel , Mayur School , Takhta , Amirganj Bazar , Kotwali , Subhash Bazar , Govt. Hospital , Govt. College , Ganesh Colony , Modi Ki Choki , Dak Bangla , Krishi Mandi Road . Highway To Newai Chironj , Sohela Mod , Baroni , Newai Within City Newai Niwai Bypass , Bus Stand , Jilai Mod , Railway Stn. , Banasthali Mod , Bsnl Exchange. Indoor: Housing Board
Jhunjunu	Udaipurwati /127 Kms	Highway To Udaipurwati - Udaipurwati Rd, Toll Gate , Narsinghpura , Badagaon Shithal , Balaji , Gudagorji , Raghunathpura , Inderpura , Udaipurwati . Within City Udaipurwati – Jaipur Rd , Govt. School , Nai Sabzi Mandi , Cbi , Ghoomchakkar , Police Stn. , Court , Jail , Main Mkt , Vetrinity Hospital , Post Office , Panch Batti , Zangid Colony , Regional Girls School , Shahkumbhari Rd , Sbi , Bus Stand , Sdm Office , Seekar Rd. Highway To Jhunjunu- Chirana , Basava , Nawalgarh. Indoor: Bsnl Exchange	Bissau , Jhunjunu / 126 Kms	Highway To Bissau - .Pipli Chowk , Bhorasar Ka Bans , Dhandori , Alसार Mahal , Malsisar , Gangiyasar Within City Bissau – Police Chowki , Govt. School , Saran Hospital , Main Mkt , Nagar Palika , Gandhi Chowk , Govt . Hospital , Bazar Rd , R.P Girls School , New Mkt , Bus Stand , Churu Rd. Highway To Jhunjunu – Birmi , Chudela , Nard , Rijani . With In City Jhunjunu – Churu Bypass , Housing Board , Ganpati Ngr , Abusarr , Mahavir Ngr , Ram Ngr , Basant Vihar , Gandhi Ngr , Peepli Chowk , Motilal Coolege , Rani Sati Mandir , Baggar Rd , Sara Hotel , Jamuna Resort , Phed Office , Mahesh Talkies , Old Bus Stand , Kotwali , Main Bazar , Station Rd. ,	Chirawa , Khetri / 85 Kms	Within City Chirawa - Chinkara Center , Post Office , Nagar Palika , Lohiya School , Bsnl Exchange , Stn. Rd , Pansari Mkt , Dalmiya School , Narayani Niketan Girls School , Panchayat Samiti , Govt. Hospital , Neelkanth Complex , Mandrella Rd. , Shayam Mandir , Main Mkt. , Gandhi Chowk , Rly . Station , Khetri Bypas . Highway To Khetri – Lakhu , Toll Both , Bisanpura , Moi , Devi Pura , Singhana . Within City Singhana –Khetri Ngr , Hcl , Bsnl Exchange , Kendriya Vidyalaya , Subhash Mkt , Jaat Dharamshala , Azad Ngr , Police Thana , Gothara , Khetri Town , Nizampur Circle , Iti Khetri , Vivekanand Bal Niketan , Bus Stand ,

Name of SSA	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
				Post Office , Roadways , Govt. Hospital , Main Bus Stand , Nagar Palika , Collectrate , Ambedkar Park , Maan Ngr , Ss Modi School , Road No 1 , Road No 2 , Road No 3 , Rly. Station. Indoor: Om Complex		Sbbj , Lic , Govt. P.G College , Police Stn. , Khetri Jai , Govt . Hospital. Indoor: Railway Station

7.2 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF CHITTORGARH 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	Rashmi, Kapasan, Chittorgarh, Dindoli.	Poor Rx Quality Observed Near Singhpur and Borda.	Nimbahera, Pratapgarh, Choti Sadri.	Poor Rx Quality Near Nandoli, Ambawali, Madhura Talab.	Bassichittor, Bichor, Parsoli, Katunda, Begun	Poor Rx Quality Near Parsoli.
2	BSNL		NP		NP		NP
3	TATA GSM		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Rx Quality Near Nawankheri.		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		They have coverage Only In SDCA's & Major Towns. Poor Rx Level and Rx Quality Near RIICO industrial Area Chittorgarh, Kati.		Poor Rx Level and Rx Quality Near Avb Birla Cement and Wonder Cement Plant, Bari.		Poor Rx Level and Rx Quality Near Gujar Mohalla, Ward No-3, Itawa, Gopalpura,.
6	RCOM 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.
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	MTS		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.
9	VODAFONE		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.
10	AIRCEL		Poor Rx Level and Rx Quality Near Rashmi, Dindoli, Kaoti.		Poor Rx Level and Rx Quality Near Badi Sadri, Ambawali, Jalodajaggir.		Poor Rx Level and Rx Quality in Bassichittor, Parsoli.

NP: Drive test reports were not provided by the BSNL.

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF TONK 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	Todaraisingh, Malpura.	Poor Rx Quality Patch Observed Near Dordahindi.	Deoli, Uniara	They have Overall Good Rx Level and Rx Quality in Covered SDCA's.	Newai, Tonk, Motuka	Poor Rx Quality Patches Observed in Newai SDCA.
2	BSNL		NP		NP		NP
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.		Poor Rx Quality Near Tonk SDCA.
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 Dhakiya and Saroli Mode.		Poor Rx Level and Rx Quality Near Rajwas.
5	IDEA		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.
6	RCOM 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.		Poor Rx Level and Rx Quality Near Newai SDCA.
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	MTS		Poor Rx Level and FER Near Tordi, Todarai singh.		They have Overall Good Rx Level and FER in Covered SDCA's.		Poor Rx Level and FER Near Motuka.
9	VODAFONE		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.		They have Overall Good Rx Level and Rx Quality in Covered SDCA's.
10	AIRCEL		Poor Rx Level and Rx Quality in Tordi, Todaraisingh.		Poor Rx Level and Rx Quality Near Kakod and Uniara.		Poor Rx Quality in Motuka SDCA Observed.

NP: Drive test reports were not provided by the BSNL.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF JHUNJHUNU 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	Udaipurwati	They have Overall Good Rx Level and Rx Quality in Covered SDCA's.	Bissau, Jhunjhunu	They have Overall Good Rx Level and Rx Quality in Covered SDCA's.	Chirawa, Khetri	They have Overall Good Rx Level and Rx Quality in Covered SDCA's.
2	BSNL		Poor Rx Level and Rx Quality Near Raghunathpura, Indrapura.		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.
3	TATA GSM		Poor Rx Level and Rx Quality Observed Near Dhinga, Jhajhar.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Rx Level and Rx Quality in Chirawa and Baggar.
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		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.
6	RCOM GSM		Poor Rx Level and Rx Quality Near Mandansi, Hasalsar, Udawas, Jhajad and Shekawati Shiksha Sansthan.		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. Poor Rx Level and Rx Quality at Railway Station Chidawa, Bagar Govt. School.
7	RCOM CDMA		Poor Rx Level and Rx Quality Near Dhamora, Khinwasar.		Poor Rx Level and FER Near Government School Birmi, Gangiyasar.		Poor Rx Level and FER Near Gadakheda, Bhaiswata.
8	MTS		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.
9	VODAFONE		Poor Rx Quality Observed in Jhunjhunu, Dhingal, Nawalgarh.		Poor Rx Quality Observed Between Bus Stand and Abusar.		Poor Rx Quality Patches Observed In Baggar.
10	AIRCEL		Poor Rx Level and Rx Quality Observed Near Raghunathpura and Todpura.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Rx Level and Rx Quality Near Bhakhtawarpura and Bantriya.

DRIVE TEST TABLE: 8

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

S. No	Month of Drive Test	Name of Operators	SSA Covered	SDCAs Covered	Status of no network coverage area	ICR Status
1	Apr-15	AIRCEL	Chittorgarh	Rashmi ,Kapasana, Dungla, Arnod, Pratapgarh, Nimbahera, Badisadri, Dunglachittorgarh, Bagun	Baliyakhera, Rajgarh, Kherpura	No
		AIRTEL			No coverage issue	No
		BSNL			NP	No
		IDEA			Ordi To Mangrol, Mangrol To Rasoolpura, Rasoolpura To Ranikhera, Ranikhera To Bari, Bari To Karunda, Bassi Ti Takhatpura, Takhatpura To Parsoli, Parsoli To Katunda, Katunda To Begun, Kapasan To Nimbahera (Kapasana), Nimbahera (Kapasana) To Singpur, Singpur To Narela, Rood To Muroli, Muroli To Rashmi, Rashmi To Dindoli, Dindoli To Kapasana, Narela To Pandoli, Pandoli To Chittaurgarh, Chittaurgarh To Ordi, Chittaurgarh To Borda, Borda To Kati, Kati To Rood, Chittaurgarh To Samelpura, Semalpura To Anwalhera, Anwalhera To Bassi	No
		RCOM (GSM)			Rashmi, Barisadri	Yes
		TATA (GSM)			No coverage issue	No
		MTS			Badi Sadri -No Coverage Between Chotti Sadri To Nimbahera (Highway) ,No Coverage Between Pratapgarh To Arnod (Highway), Nimbahera - No Coverage Between Kapasana To Dungla (Highway) And No Coverage Between Nimbahera To Chotti Sadri (Highway) , Kapasana- No Coverage Between Singhpur To Kapasana(Highway), Rashmi -No Coverage Between Rashmi To Kapasana Highway And Chanderiya To Kapasana	No
		VODAFONE			No coverage issue	No
		RCOM (CDMA)			Rashmi, Dungla, Barisadri	No
		TATA (CDMA)			No coverage issue	No
2	May-15	AIRCEL	Tonk	Malpura, Todaraisingh, Deoli, Uniaratonk, Newai	Basera, Ganeta, Mor, Khelniya, Gumanpura, Ghas	No
		AIRTEL			No coverage issue	No
		BSNL			NP	NP

S. No	Month of Drive Test	Name of Operators	SSA Covered	SDCAs Covered	Status of no network coverage area	ICR Status
		IDEA			Ban Ka Khera, Kheramalooka Nagar, Mehrod, Rameshwarapura, Golipura, Dhanota, Borkhandi Khurd, Motooka, Vijaipura, Barthal, Pahari, Barh Bishanpura, Bishanpura, Bara Abdullapura, Ghas, Rasoolpura, Nayagaon, Sardarpura, Kakod, Shyorajpura, Beshki, Hukampura, Dhikoliya, Khelniya, Dhandholi, Kalanara, Polyara, Madhosinghpura, Ganeti, Ratwai, Ghareda, Kookar, Bas Jagroop, Khedoolya Kalan, Khedoolya Khurd, Nayabas, Gangolaw, Kerli, Usmanpura Veeran, Usmanpura Abad, Ahmadpura Chauki, Mor Bhatiyar, Deorawas, Gafoorpura, Bichpuri, Chandlai, Latifganj	No
		RCOM (GSM)			All Sdca Covered & Week Coverage On Inter Connecting Highway	Yes
		TATA (GSM)			No coverage issue	No
		MTS			Tonk- No Coverage Between Tonk(Highway) To Newai(Highway), Deoli- No Coverage Between Mendwas To Deodawas, Deoli -No Coverage Between Mendwas(Highway) To Malpura (Highway), Malpura (Toda Raisingh Nagar) -No Coverage Between Toda Rai Singh And Malpura (Highway)	No
		VODAFONE			No coverage issue	No
		RCOM (CDMA)			Tonk(N)(Piploo)	No
		TATA (CDMA)			No coverage issue	No
3	Jun-15	AIRCEL	Jhunjunu	Udaipurwati, Bissau, Jhunjunu, Chirawa, Khetri	Badagaon, Raghunathpura, Birmi, Chudela, Nand, Baktawarpura, Gothara	No
		AIRTEL			No coverage issue	No
		BSNL			No coverage issue	No
		IDEA			No Coverage On Hwy Between Chirawa Mod Jhunjunu To Baggar Chauraha, No Coverage Between Baggar To Bakhtawarpura On Hwy, No Coverage Between Bakhtawarpura To Chirawa Town On Hwy, No Coverage Between Chirawa Town To Gadakheda & Gadakheda To Devipura Singhana On Hwy, No Coverage In Between Singhana To Nanuwali Baori Khetri On Hwy. , New Site Require In Between Jhunjunu To Bhorasar Ka Bans At Peepli Chowk, No Coverage Between Bhorasar Ka Bans To Dhanuri & Dhanuri To Rampura On Hwy, No Coverage Between Rampura To Alsisar & Alsisar To Malsisar On Hwy, No Coverage Between Malsisar To	No

S. No	Month of Drive Test	Name of Operators	SSA Covered	SDCAs Covered	Status of no network coverage area	ICR Status
					Niradhanu & Niradhanu To Gangiyasar On Hwy, No Coverage Between Gangiyasar To Bissau Town & Bissau Town To Birmi On Hwy, No Coverage Between Birmi To Chudela & Chudela To Nard On Hwy Toward Jhunjhunu.,No Coverage Between Udawas To Badagaon, No Coverage On Hwy Bajawa, No Coverage Between Balaji Stand To Teetanwad On Hwy, No Coverage Between Teetanwad To Gudhagorji On Hwy, No Coverage Between Gudhagorji To Raghunathpura On Hwy, No Coverage Between Raghunathpura To Udaipurwati & Udaipurwati To Chirana On Hwy, No Coverage Between Chirana To Basava & Basava To Jhajhar On Hwy, No Coverage Between Jhajhar To Nawalgarh By-Pass & Nawalgarh By-Pass To Mukundgarh On Hwy. No Coverage Between Mukundgarh By-Pass To Jhunjhunu Toll Gate.	
		RCOM (GSM)			No coverage issue	Yes
		TATA (GSM)			No coverage issue	No
		MTS			Khetri -No Coverage Between Singhana To Khetri (Highway) , No Coverage Between Gadakhada To Singhana (Highway), Chirawa -No Coverage Between Jhunjhnu To Baggar (Highway) , No Coverage Between Baggar To Chirawa(Highway), Udaipurwati To Mukundgarh -No Coverage Between Gudagorji To Udaipurwati(Highway) & Udaipurwati To Mukundgarh (Highway),Udaipurwati -No Coverage Between Jhunjhnu To Baragaon And Baragaon To Guda Gorji (Highway),	No
		VODAFONE			No coverage issue	No
		RCOM (CDMA)			No coverage issue	No
		TATA (CDMA)			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 –

- (i) **In the Month of April -15**, drive tests were conducted across **Chittorgarh SSA** covering Kapasan, Rashmi, Dungla, Arnod, Pratapgarh, Nimbahera, Badi Sadri, Dungla, Chittorgarh and Bagun SDCAs for three consecutive days. The performance of the service providers in general was satisfactory as all operators met the benchmarks on SSA level. **BSNL** has not provided the drive test report despite best efforts.
- (ii) **In the Month of May -15**, drive tests were conducted across **Tonk SSA** covering Malpura, Toda Raisingh, Deoli, Uniara, Tonk and Newai SDCAs. The drive test results for this SSA also revealed that in general, all operators were doing well within the QoS norms on overall SSA basis. **BSNL** has not provided the drive test report despite best efforts.
- (iii) **In the month of June -15**, drive tests were conducted across **Jhunjhunu SSA** covering Udaipurwati, Bissau, Jhunjhunu, Chirawa and Khetri SDCAs. In Jhunjhunu SSA also, it was revealed that in general, all operators were doing well within the QoS norms on overall SSA basis.
- (iv) Though the Operators have shown good performance in general, but the deficiencies with respect to adequate coverage and voice quality, observed during the drive tests, at the various locations on the drive test plots are detailed in the above **table -5, table 6 and table 7** for the respective **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.

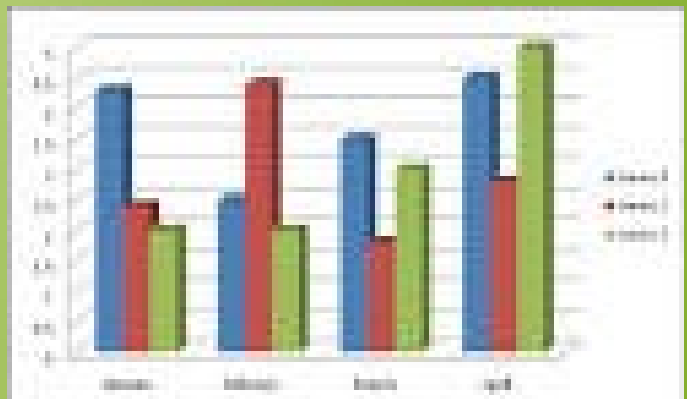
*The performance of the service providers with regard to the Drive Test revealed that all the service providers performed well within the QoS norms. **BSNL** has not provided the report of drive test conducted across Chittorgarh and Tonk SSAs despite best efforts. So their performance could not be assessed.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

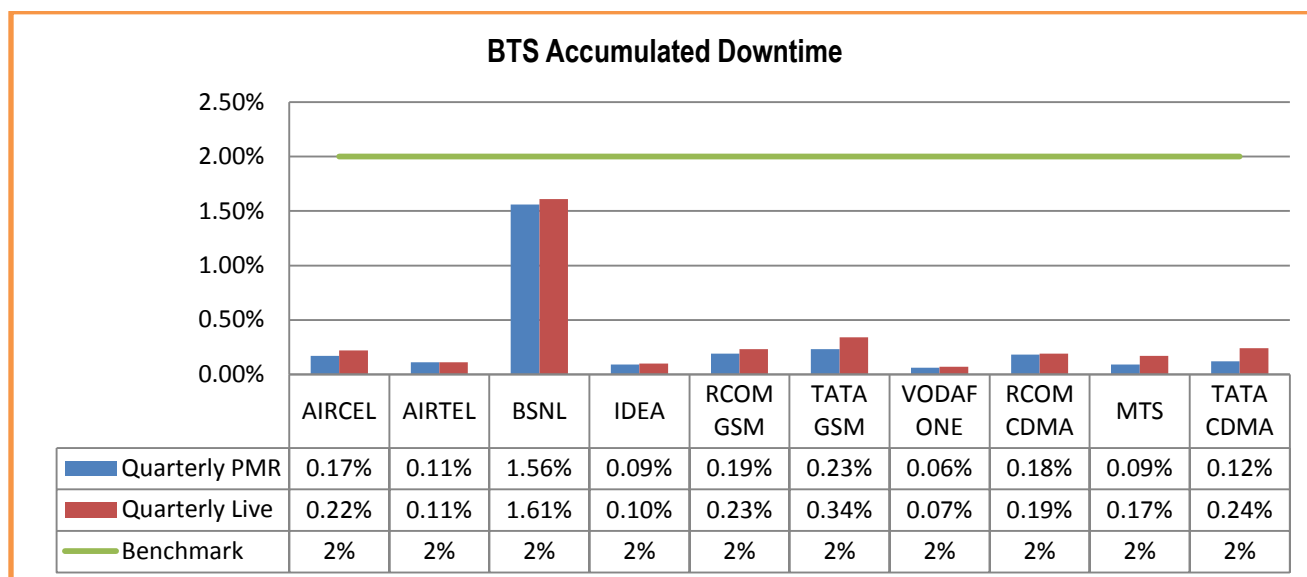
AVERAGED QUARTERLY 3-DAYs LIVE MEASUREMENT



8. GRAPHICAL REPRESENTATION (CMTS):

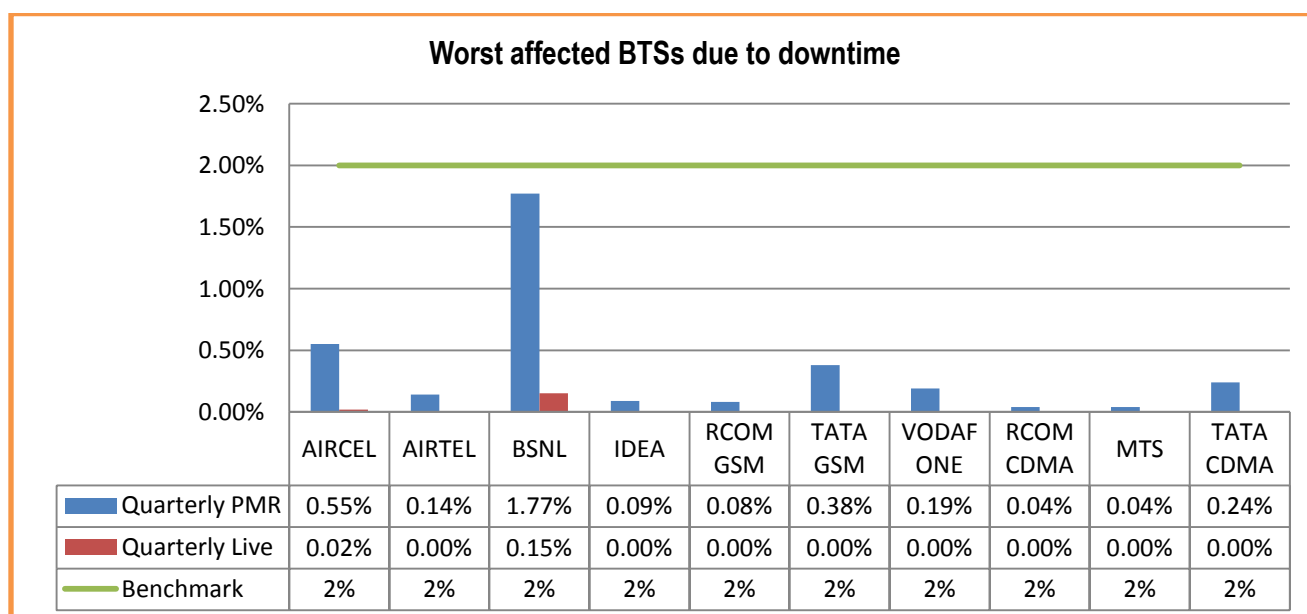
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME



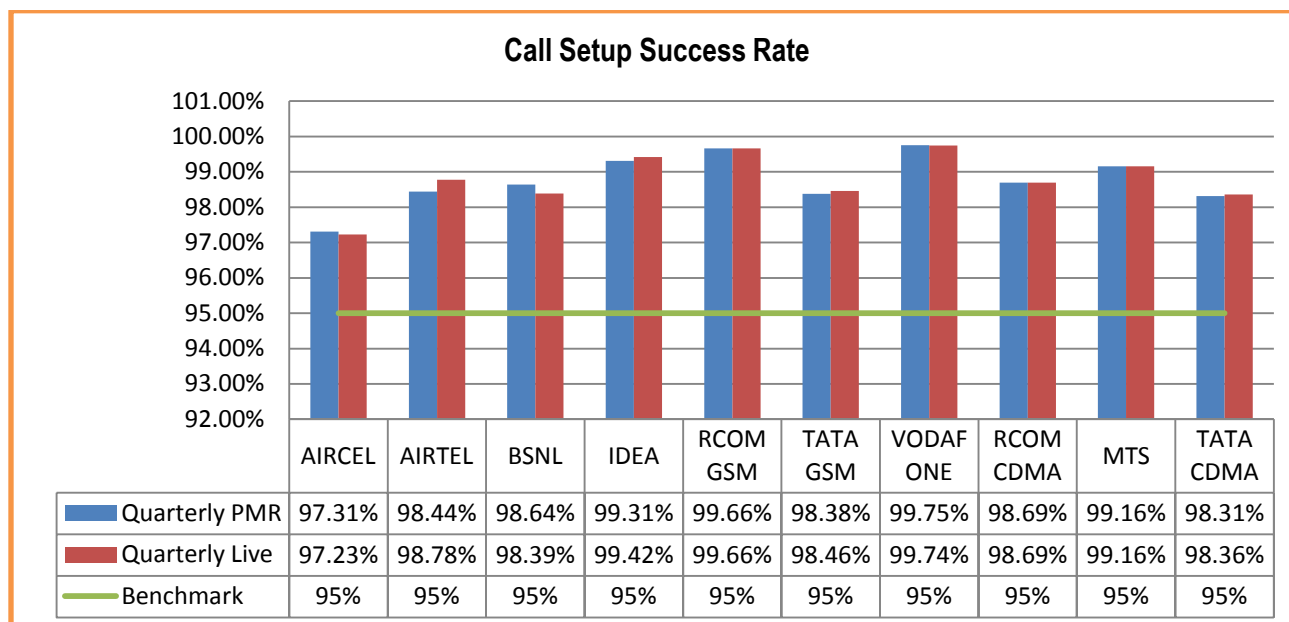
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSS DUE TO DOWNTIME:



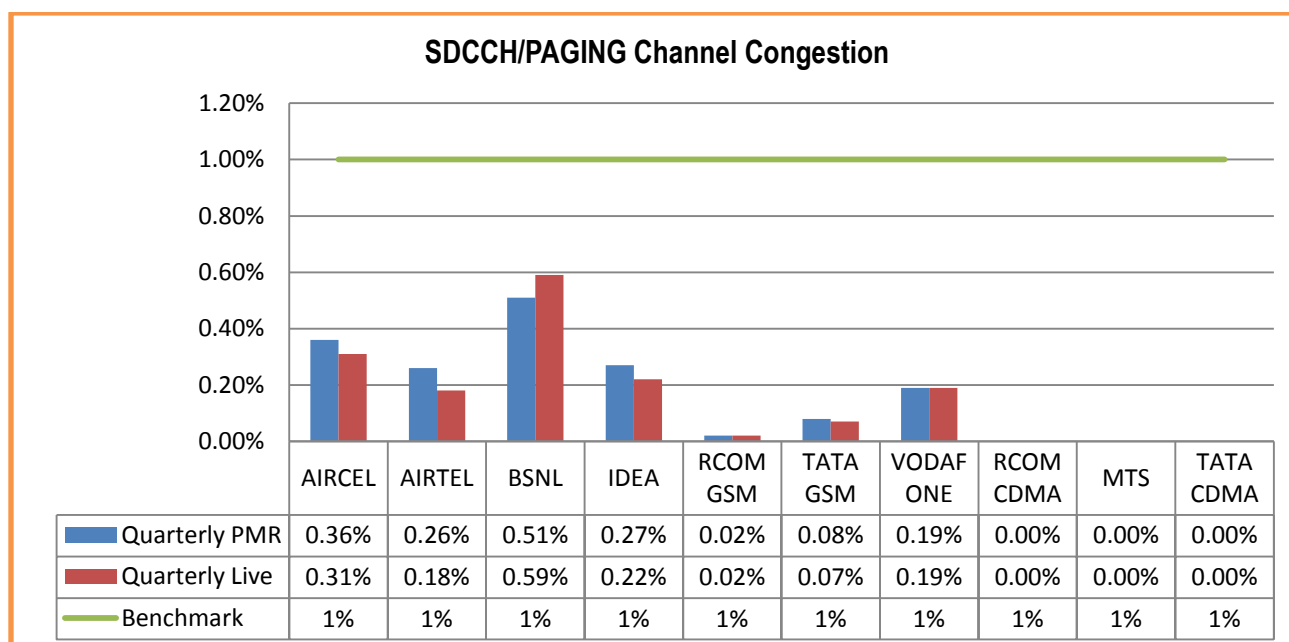
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE:



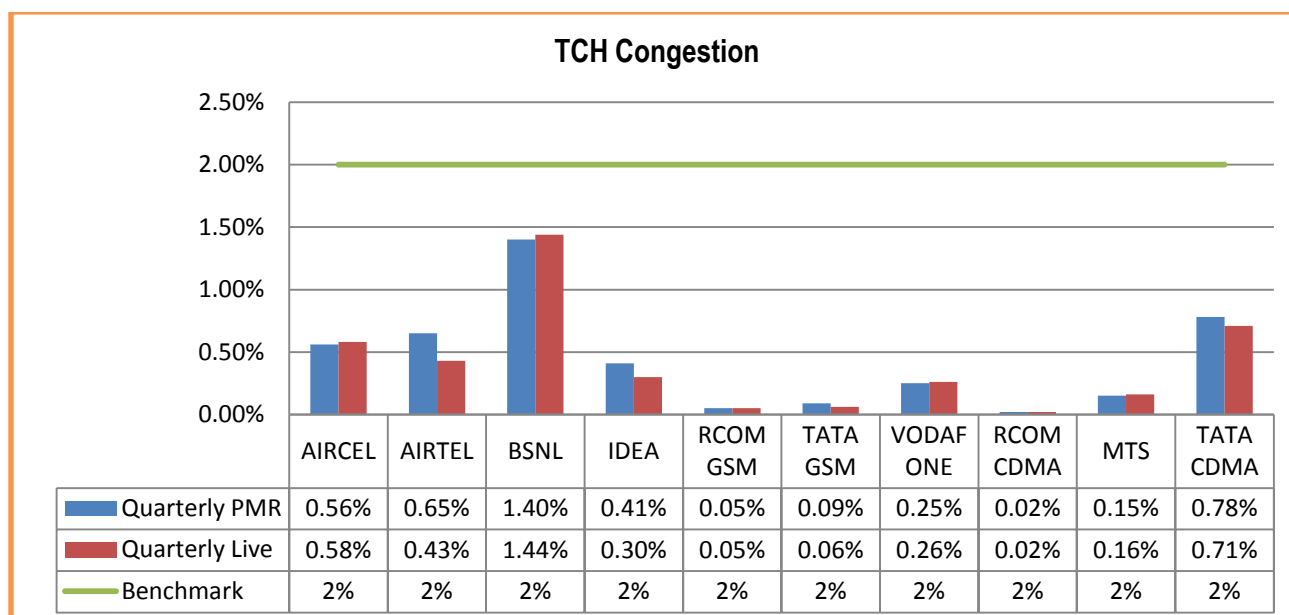
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION:



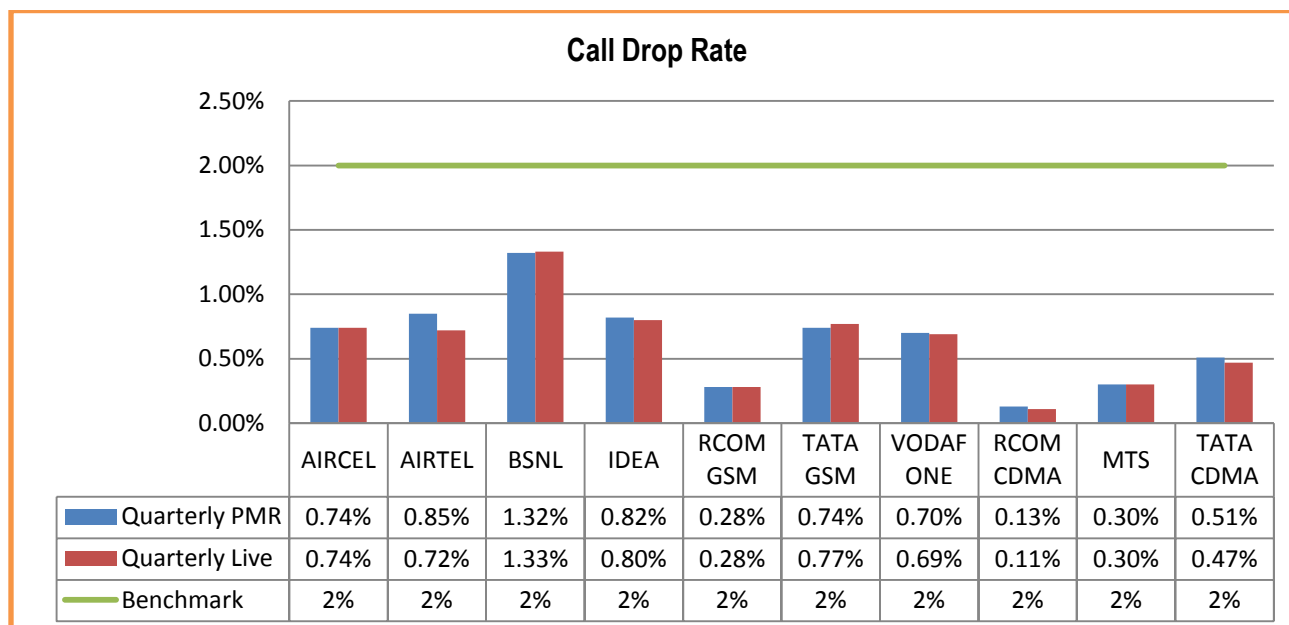
All operators are meeting the benchmarks.

5) TCH CONGESTION:



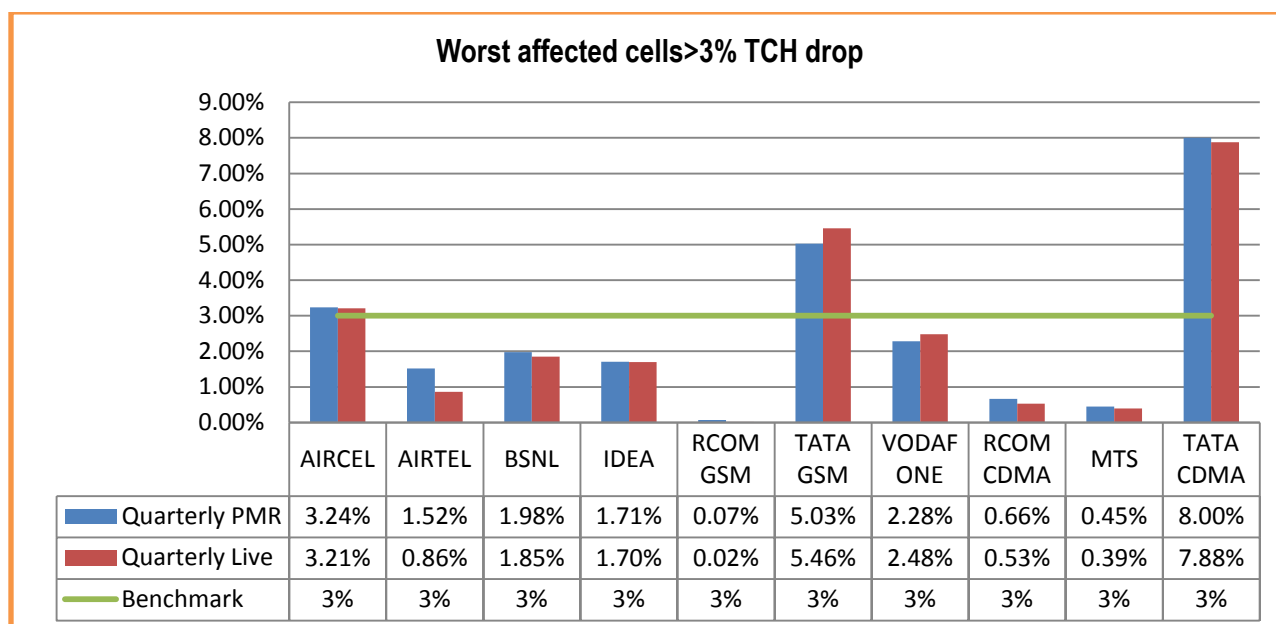
All operators are meeting the benchmarks.

6) CALL DROP RATE:



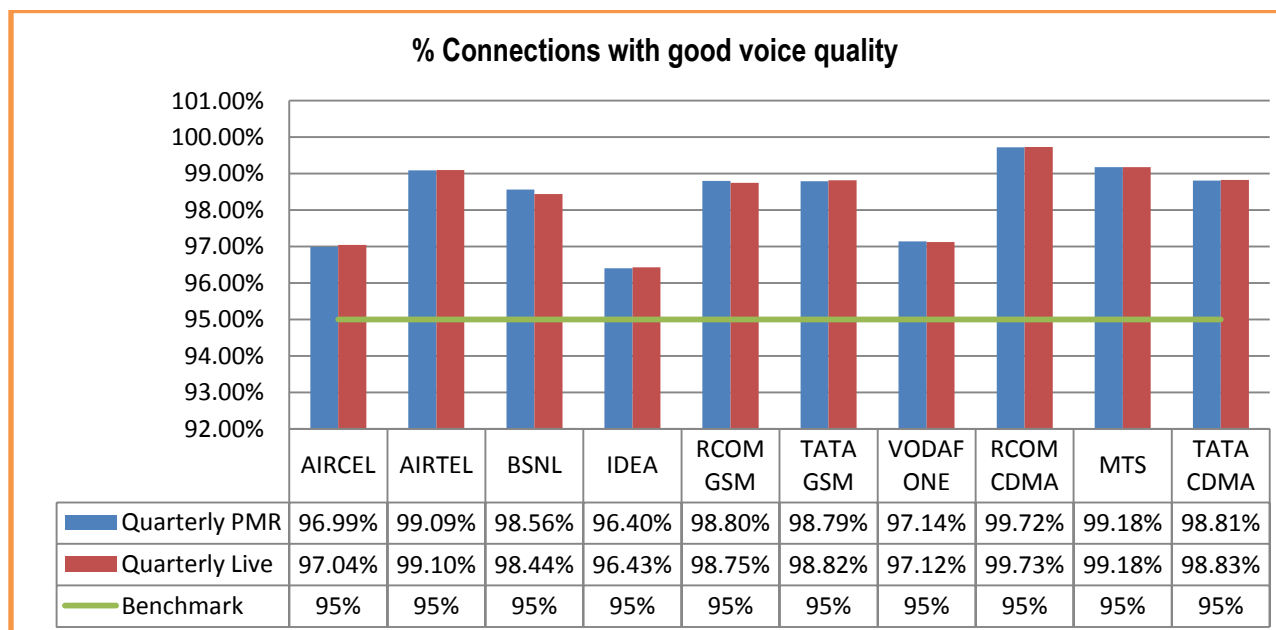
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP:



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

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks.

9. QOS AUDIT OF BASIC (WIRELINE) SERVICE PROVIDERS



9. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINE)

The QoS audit for basic (wire line) service was undertaken for assessment of quarterly performance of the service providers for quarter ended June-2015. As per the current list of the exchanges provided by BSNL, there are total 2183 exchanges in Rajasthan Circle. Out of 2183, **audit was done for sampled 16 (Urban) and 91 (Rural) exchanges** of BSNL (List of BSNL exchanges undertaken for QoS audit attached as **Annex-1**), 1 exchange each of Bharti-Airtel, RCL, Sistema Shyam and Vodafone and 2 exchange of TTL. Rajasthan Circle is having 258 SDCAs, so 107 BSNL exchanges spread over 26 SDCAs (10% of total 258 SDCAs) have been taken for audit. The performance of the Service providers against each parameter has been evaluated by taking average of performance value of each parameter for all the exchanges of the respective service providers. The averaged value of each parameter has been tabulated as follows:

Sr. No	Service Provider	Circle	Urban Exchange in Rajasthan	Rural Exchange in Rajasthan	Total Exchange in Rajasthan	No. of Urban Exchanges Covered for Audit	No. of Rural Exchanges Covered for Audit
1	BSNL	Rajasthan	393	1790	2183	16	91
2	Bharti-Airtel	Rajasthan	1	0	1	1	0
3	RCL	Rajasthan	1	0	1	1	0
4	Sistema Shayam	Rajasthan	3	0	3	1	0
5	TTL	Rajasthan	8	0	8	2	0
6	Vodafone	Rajasthan	1	0	1	1	0
Total Exchanges			407	1790	2197	22	91

9.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON QUARTERLY MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:

AVERAGED AUDITED DATA FOR WIRELINE (BASIC) SERVICES – RAJASTHAN CIRCLE									
Sl. No.	Parameters	Benchmark	Period	BHARTI AIRTEL	BSNL	SISTEMA SHAYAM	RCL	TTL	VODAFONE
1	Fault incidences								
	(No. of faults/100 subscribers /month)	< 7%	Quarterly	3.28%	10.39%	1.52%	0.00%	0.14%	0.42%
2	Faults Repair/Restoration Time								
	Fault repair by next working day(Urban Area)	>85%	Quarterly	98.12%	64.49%	93.68%	100.00%	66.67%	100.00%
	% of fault repair within 5 days (Urban Area)	100%	Quarterly	100.00%	92.01%	100.00%	100.00%	100.00%	100.00%
	Fault repair by next working day(Rural & hilly Area)	>75%	Quarterly	NA	70.06%	NA	NA	NA	NA
	% of fault repair within 7 days(Rural & hilly Area)	100%	Quarterly	NA	96.59%	NA	NA	NA	NA
	Mean time to Repair(MTTR)	≤10 Hrs	Quarterly	7.69	12.64	9.12	4.70	11.33	1.54
3	Rent Rebate								
	Fault pending > 3 days & <7 days	Rebate for 7 days	Quarterly	NP	1	0	0	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Quarterly	NP	2	0	0	0	0
	Fault pending > 15 days	Rebate for 1 month	Quarterly	NP	3	0	0	0	0
4	Metering & Billing Performance								
	% of disputed Bills over bills issued (Post Paid)	< 0.1%	Quarterly	0.01%	0.00%	0.05%	0.00%	0.00%	0.00%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA	NA	NA	NA	NA
	% of billing complaints resolved within 4 weeks	98% within 4 weeks	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	% of billing complaints resolved within 6 weeks	100% within 6 weeks	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
5	POI Congestion								
	No. of POI's having congestion >0.5%		Quarterly	0	0	0	0	0	0
6	Response Time to customer for assistance								
	Accessibility of Call centre/customer Care	≥95%	Quarterly	98.29%	96.71%	98.69%	96.40%	100.00%	99.60%
	% age of calls answered by operator(voice to voice) within 90 seconds	≥95%	Quarterly	94.76%	84.91%	96.86%	98.37%	97.96%	100.00%
7	Customer care(promptness in attending to customers request)								
	Termination / Closures	100%	Quarterly	100.00%	98.86%	100.00%	100.00%	100.00%	100.00%
	Time taken for refunds of deposit after closures	100%	Quarterly	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

- NA-Not Applicable

9.2 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS LIVE MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELIN) PROVIDERS:

3 DAYS LIVE MEASUREMENT DATA FOR WIRELINE (BASIC) SERVICES - RAJASTHAN CIRCLE									
SI No.	Parameters	Benchmark	Period	AIRTEL-BHARTI	BSNL	SISTEMA SHYAM	RCL	TTL	VODAFONE
1	POI Congestion								
	No. of POI's having congestion >0.5%	≤0.5%	Quarterly	1	0	0	0	0	0
2	Response Time to customer for assistance								
	Accessibility of Call centre/customer Care	≥95%	Quarterly	100.00%	96.86%	99.10%	99.11%	100.00%	NP
	% age of calls answered by operator(voice to voice) within 90 seconds	≥95%	Quarterly	91.59%	82.23%	97.77%	99.83%	100.00%	NP

- NP- Vodafone has not provided 3 days live data for the parameter "Response Time to customer for assistance" despite our best efforts.

9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINER)

Fault Incidences: The audit of the service providers revealed that the performance of all service providers was well within the benchmark except **BSNL**. The performance of **BSNL** was **1.39%** for the parameter 'No. of faults/100 subscribers /month'.

Fault Repair/Restoration Time: For this parameter, **Only BSNL and TTL** failed to meet the benchmark of **fault repair by next working day (Urban Area)** with their performance as **64.49% and 66.67%** respectively. Apart from this, **BSNL** also remained under performed for parameters **Fault repair within 5 days (urban area), within next working day (rural and hilly areas) and within 7 days (rural & hilly areas)** with its performance as **92.01%, 70.06% and 96.59%** respectively.

Mean Time to Repair: Only **BSNL and TTL** could not achieve the benchmark with their achieved level as **12.64% and 11.33%** respectively.

Metering and Billing performance: For this parameter, all operators were meeting the benchmark.

POI Congestion: All operators were found meeting the benchmark for this parameter.

Response Time to Customer for assistance: For percentage of calls getting connected to call center and answered, all operators were found meeting the benchmark for the parameter "Accessibility of Call centre/customer Care" and with respect to the parameter of calls answered by operator (voice to voice within 90 sec), **BSNL and Bharti-Airtel** could not meet the benchmark with their performance as **84.91% and 94.76%** respectively against the benchmark of **>= 95%**.

BSNL and Bharti Airtel also failed to meet the benchmark for the same parameter during 3 days live measurement with their performance as **82.23% and 91.59%** respectively.

Termination/Closures: All operators were found meeting the benchmark for this parameter except **BSNL**. **BSNL** could not meet the benchmark for the parameter with its performance as **98.86%** against the benchmark of **100%**.

*Thus, from the above findings that, it was concluded that the performance of **BSNL** was not satisfactory in respect of the parameters **Fault incidences, Fault Repairs/Restoration Time, MTTR, Response time to customer for assistance and Termination/ Closure**. Hence, **BSNL** need to improve their services in respect of these parameters. Apart from this **TTL** failed to meet the benchmark of **Fault repair by next working day (urban area) and MTTR**, whereas **Bharti Airtel** remained under performed for parameter **Call answered by operator (Voice to voice)**.*

9.4 INTER OPERATOR CALL ASSESSMENT (WIRELINE SERVICES)

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in HP Circle service area during the time 1000 to 1300 Hrs and 1500 to 1700 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

INTER OPERATOR CALL ASSESSMENT BASED ON LIVE MEASUREMENT								
Calling Operators	Circle Name	Total No. of calls Made	AIRTEL-BHARTI	BSNL	SISTEMA SHYAN	RCL	TTL	VODAFONE
AIRTEL-BHARTI	Rajasthan	100	--	100%	100%	100%	100%	100%
BSNL	Rajasthan	100	100%	--	100%	100%	100%	100%
SISTEMA SHYAM	Rajasthan	100	100%	100%	--	100%	100%	100%
RCL	Rajasthan	100	100%	100%	100%	--	100%	100%
TTL	Rajasthan	100	100%	100%	100%	100%	--	100%
VODAFONE	Rajasthan	100	100%	100%	100%	100%	100%	--

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

9.5 LEVEL-1 LIVE CALLING (WIRELINE SERVICES)

LEVEL 1 LIVE CALLING								
Emergency no.	Circle Name	No. of calls made	AIRTEL-BHARTI	BSNL	SISTEMA SHYAN	RCL	TTL	VODAFONE
100	Rajasthan	10	√	√	√	√	√	√
101	Rajasthan	10	√	√	√	√	√	√
108	Rajasthan	10	√	√	√	√	√	√
1090	Rajasthan	10	√	√	√	√	√	√
1073	Rajasthan	10	√	√	√	√	√	√
1091	Rajasthan	10	√	√	√	√	√	√
1070	Rajasthan	10	√	√	√	√	√	√
1098	Rajasthan	10	√	√	√	√	√	√

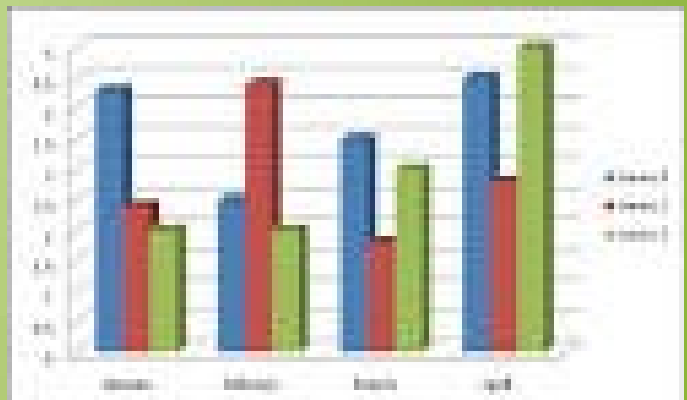
To assess the availability and efficiency of level 1 service such as police, fire, ambulance (emergency services) offered by BSNL, Bharti Airtel, Systema Shyam, Reliance, TTL and Vodafone, the calls were made from telephone provided by service providers, these services were found functional in the networks of all the service providers.

9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)

LIVE CALLING TO CALL CENTRE								
	Benchmark	Circle	AIRTEL-BHARTI	BSNL	SISTEMA SHYAN	RCL	TTL	VODAFONE
<i>Total No. of calls Attempted</i>		Rajasthan	100	100	100	100	100	100
A) Total no of calls attempted to customer care/Call center		Rajasthan	100	100	100	100	100	100
B) Total no. of calls successfully established to customer care/Call center		Rajasthan	100	100	98	100	100	100
C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	>=95%	Rajasthan	100.00%	100.00%	98.00%	100.00%	100.00%	100.00%
D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)		Rajasthan	100	100	98	100	100	100
E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		Rajasthan	100	100	98	100	100	100
F) % age of calls answered by the operators (voice to voice) within 90 seconds (E *100/ D)	>=95%	Rajasthan	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

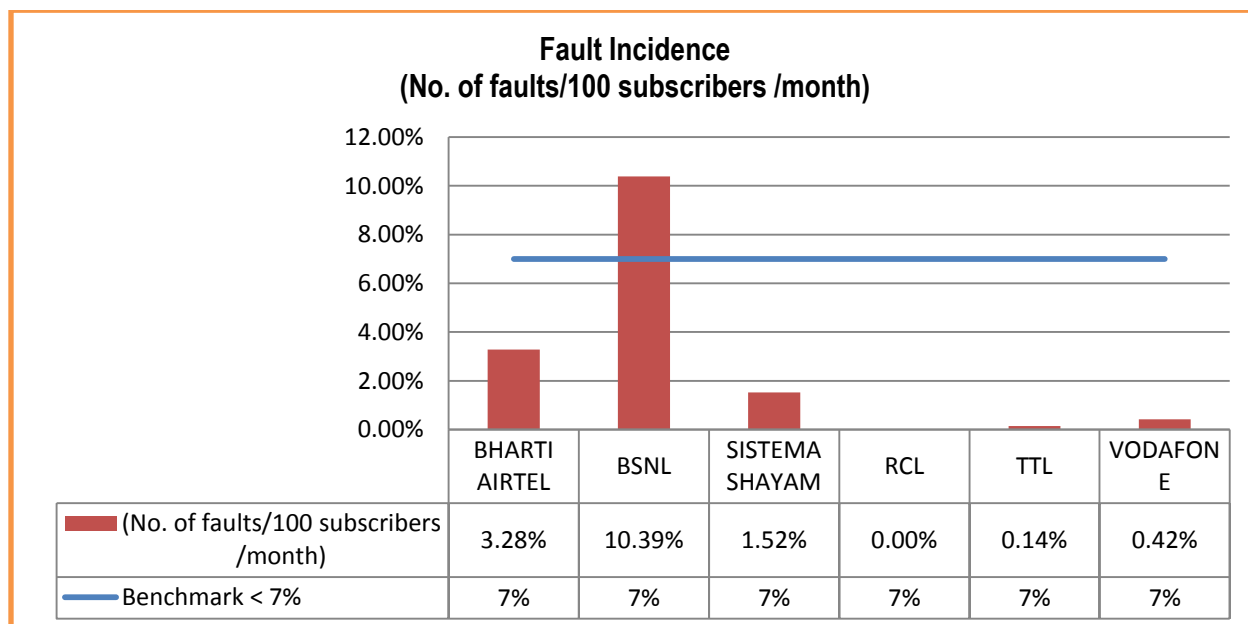
In case of calls answered by operators (voice to voice), when test calls were made to the call centers, all service providers, 100% calls were connected to the call center within 90 seconds.

GRAPHICAL REPRESENTATION OF BASIC (WIRELINE) SERVICES



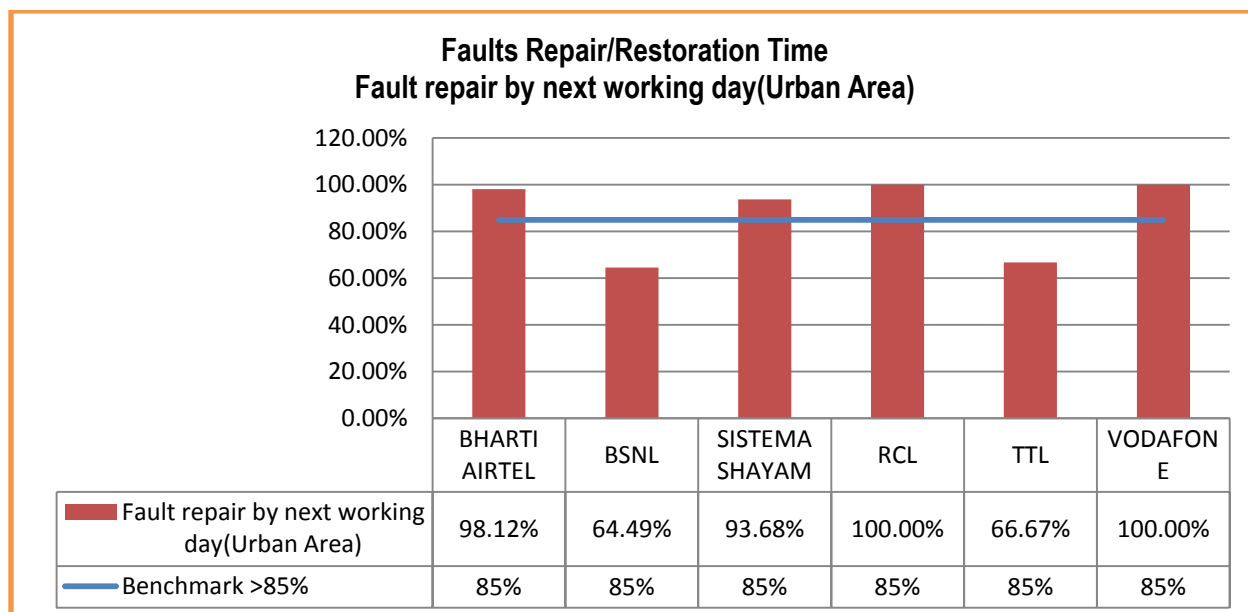
9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:

1) FAULT INCIDENCE:



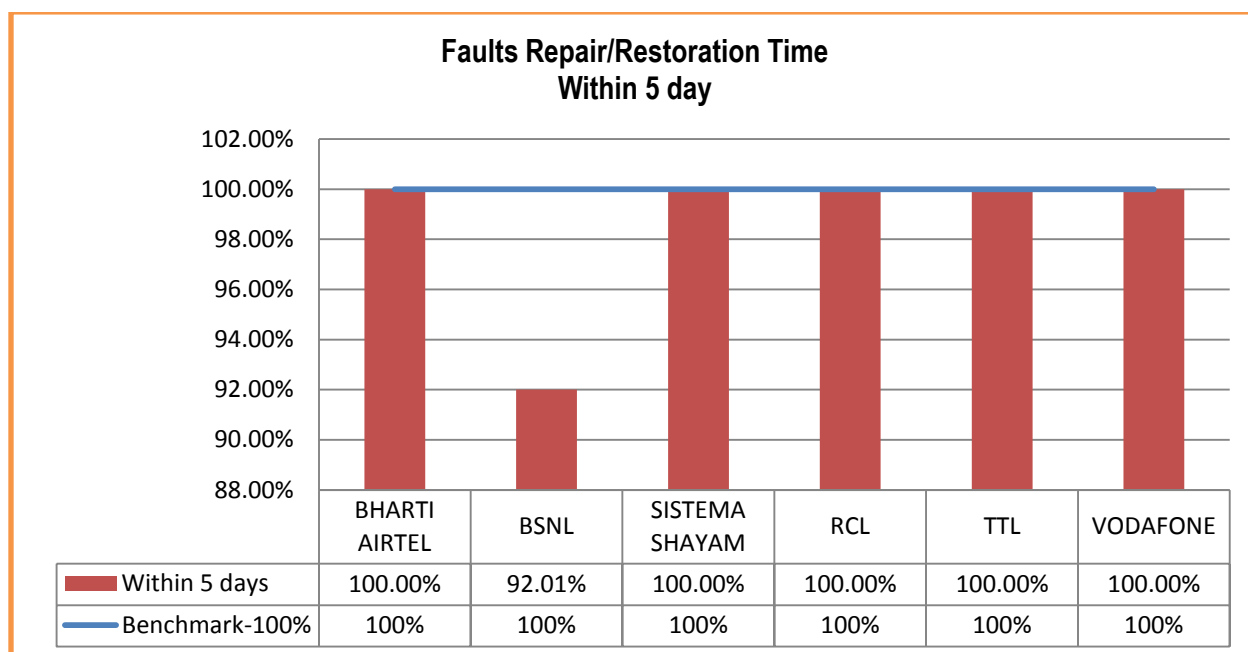
BSNL is not meeting the benchmark.

2) FAULTS REPAIR/RESTORATION TIME:



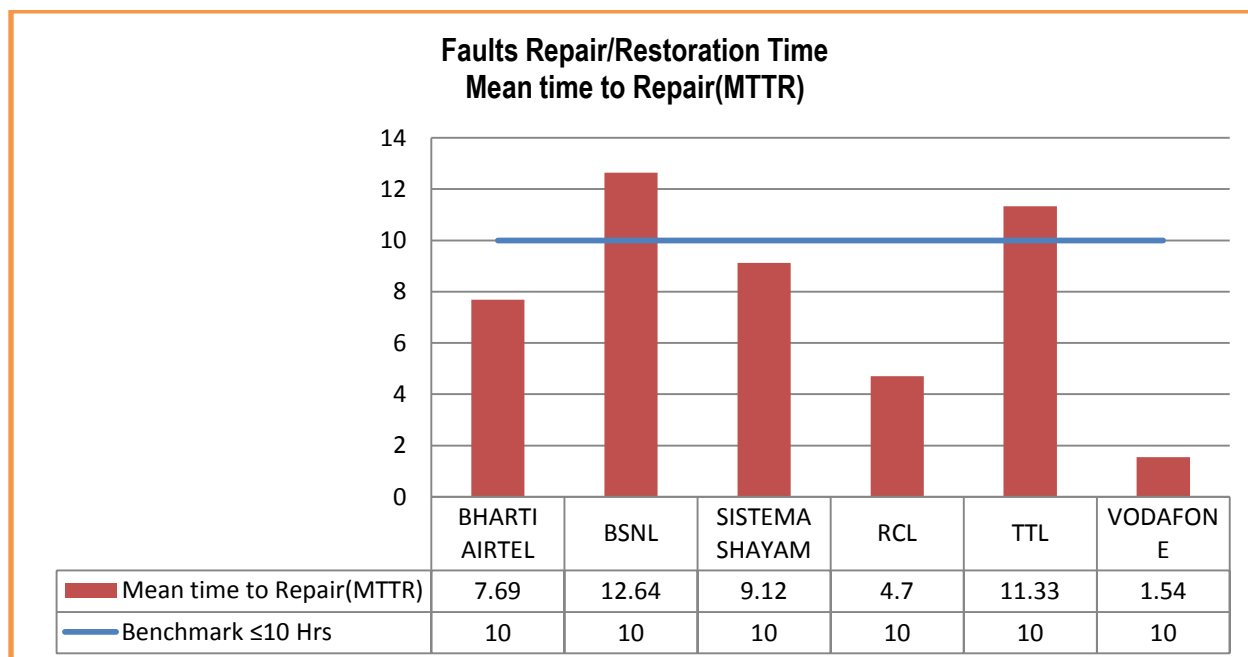
BSNL and TTL are not meeting the benchmark.

3) FAULTS REPAIR/RESTORATION TIME WITHIN 5 DAYS:



BSNL is not meeting the benchmark.

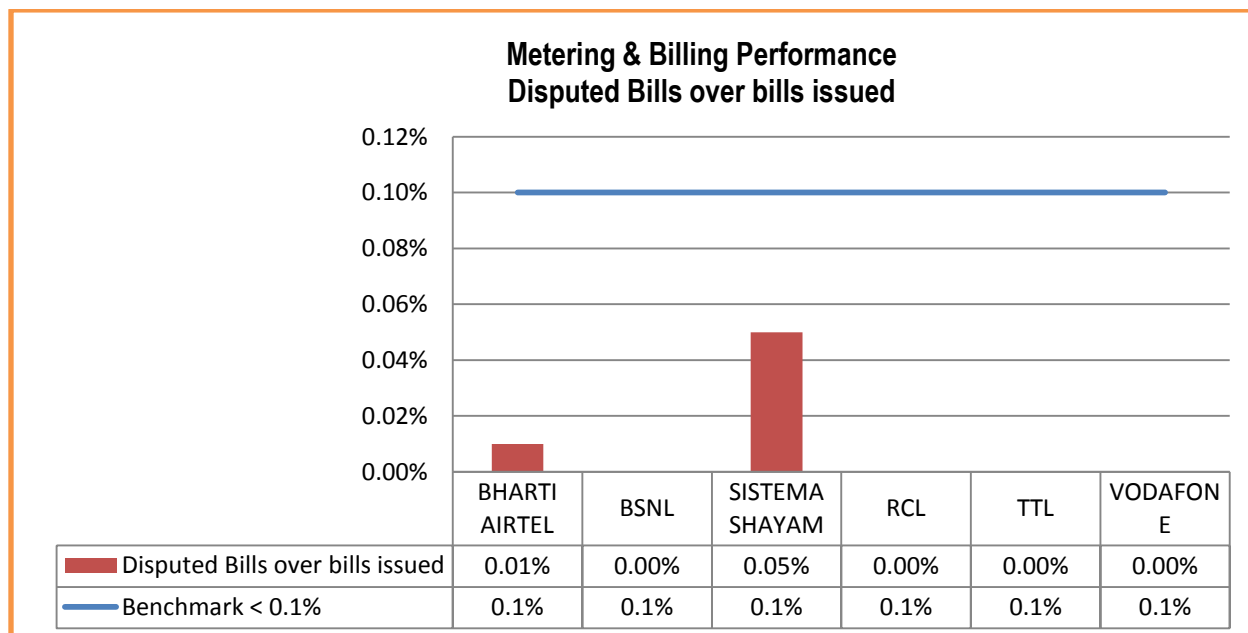
4) MEAN TIME TO REPAIR (MTTR):



BSNL and TTL are not meeting the benchmark.

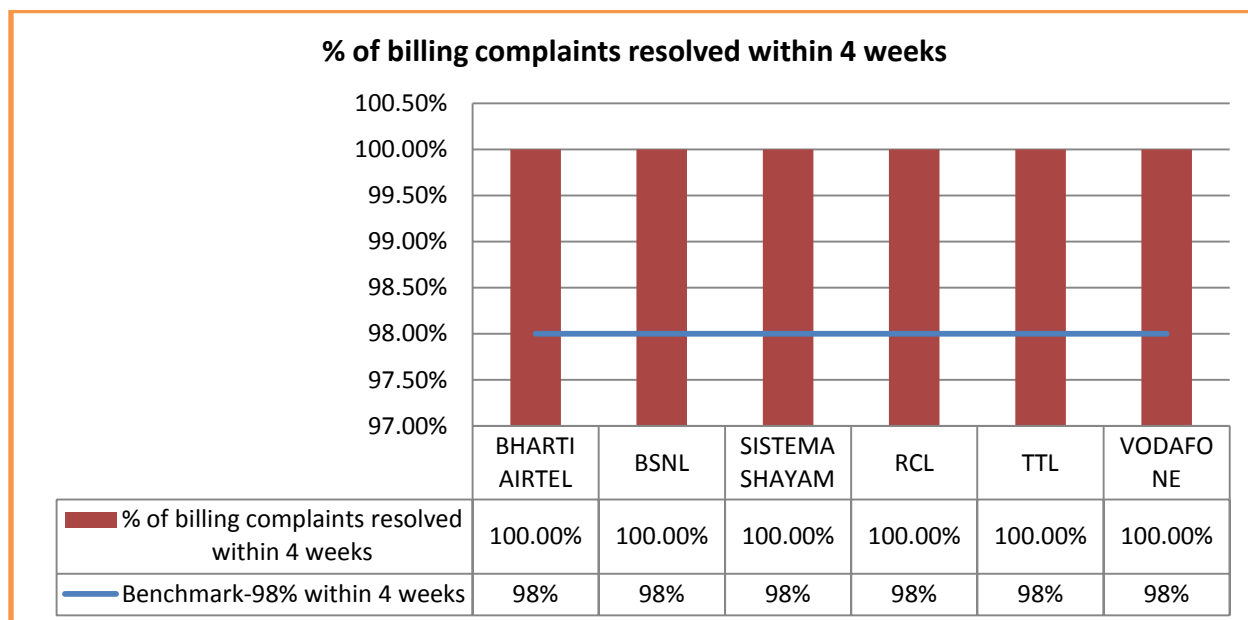
5) METERING & BILLING PERFORMANCE:

a) DISPUTED BILLS OVER BILL ISSUED :



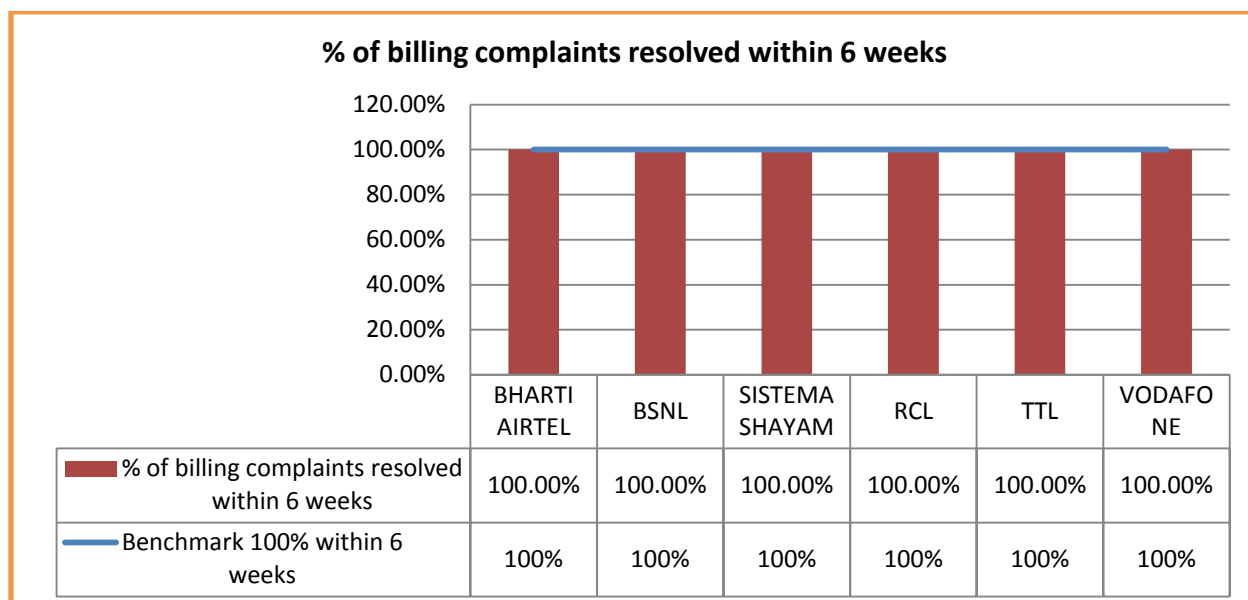
All operators are meeting the benchmark.

b) BILLING COMPLAINT RESOLUTION WITHIN 4 WEEKS:



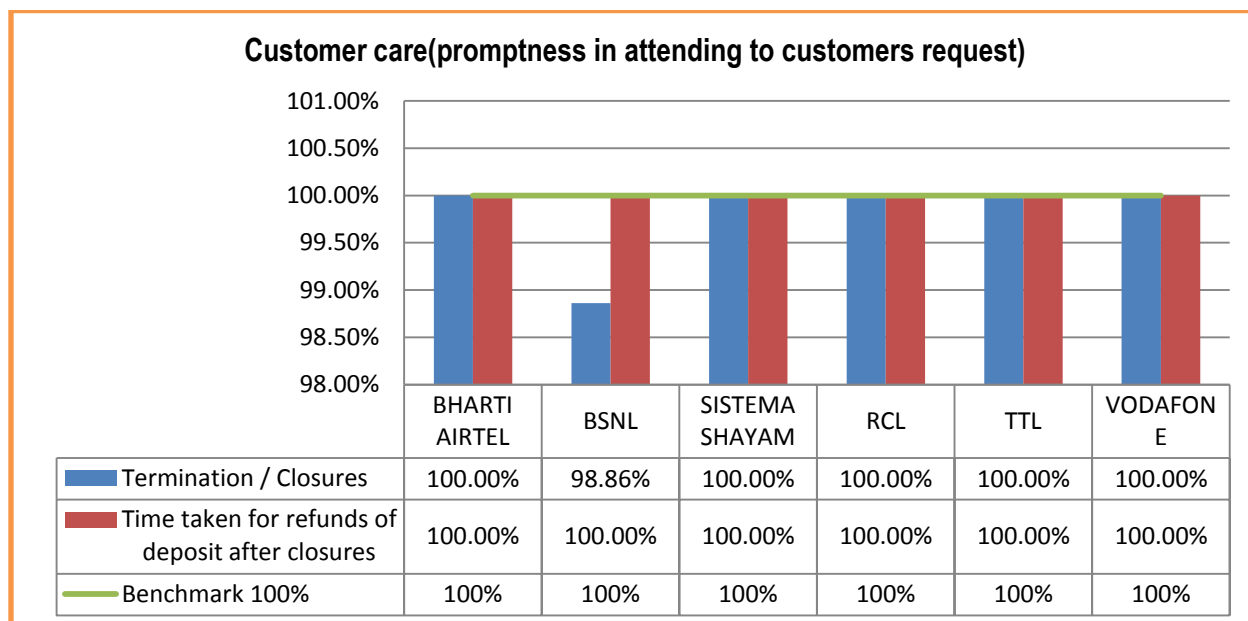
All operators are meeting the benchmark.

c) BILLING COMPLAINT RESOLUTION WITHIN 6 WEEKS:



All operators are meeting the benchmark.

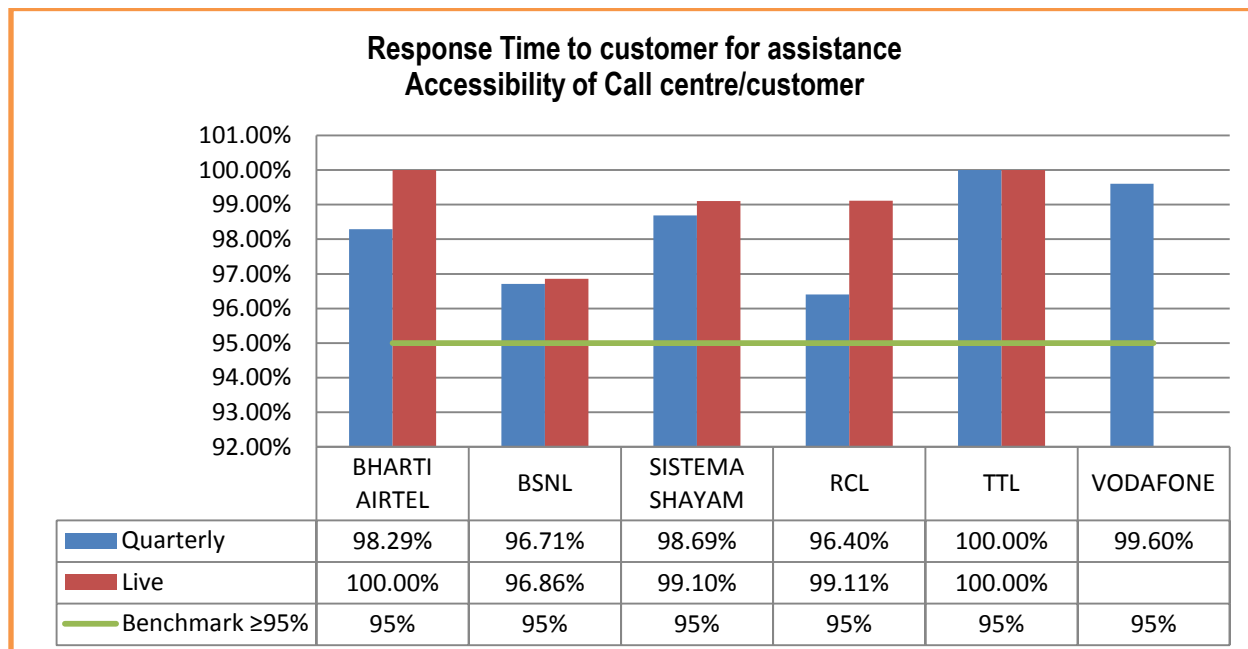
6) TERMINATION & CLOSURES:



BSNL is not meeting the benchmark for the parameter Termination/Closure.

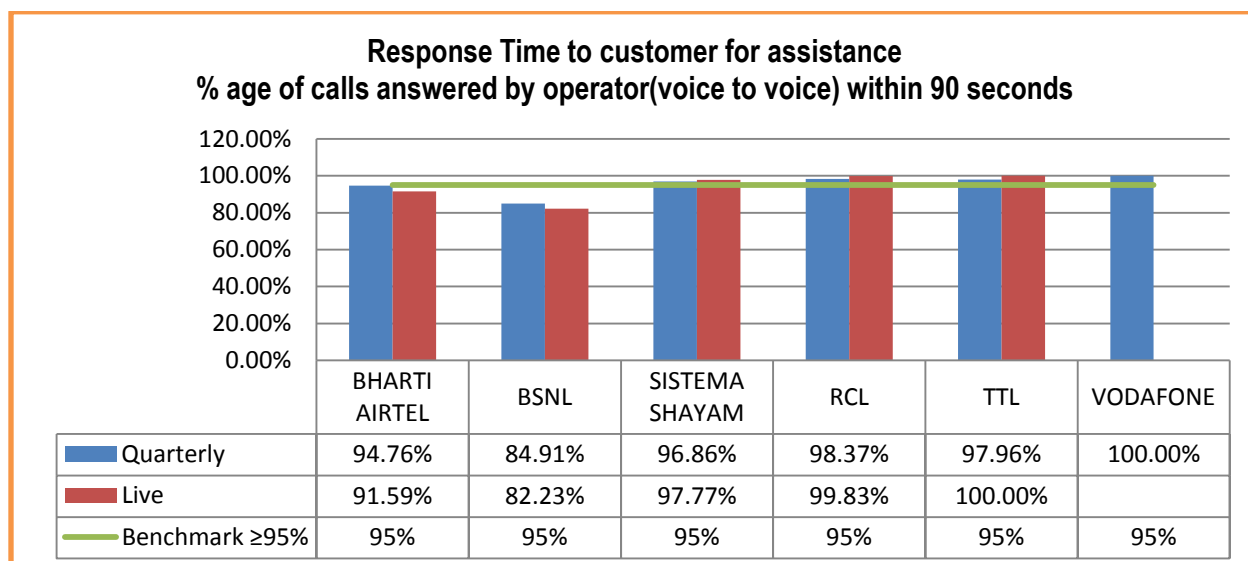
9.8 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE ACCESSIBILITY OF CALL CENTRE/CUSTOMER CARE:



All operators are meeting the benchmark.

2) RESPONSE TIME TO CUSTOMER FOR ASSISTANCE CALL ANSWERED BY OPERATORS :



Bharti-Airtel and BSNL are not meeting the benchmark.

10. QOS AUDIT OF BROADBAND SERVICE PROVIDERS



10. QUALITY OF SERVICE AUDIT OF 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. Location of PoPs, covered for QoS audit is attached as **Annex-2**.

Discussion with the private broadband service providers reveals that there is no concept of their PoPs on SDCA basis; they are maintaining their entire data on centralized basis so audit has been done for the centralized data.

Audit was done for the following Broadband service Providers in Rajasthan circle.

Sl. No.	Name of Broadband Service Providers	Location of Audit
1	BHARTI AIRTEL LIMITED	BHARTI AIRTEL LIMITED, JAIPUR
2	BSNL	BSNL OFFICE - BHILWARA, CHITTORGARH, UDAIPUR
3	D-VOIS BROADBAND	D-VOIS BROADBAND, JAIPUR
4	FIVE-NETWORKS	FIVE NETWORK PVT LTD, SADULSAHAR, RAJASTHAN
5	NSTPL	NSTPL OFFICE DAUSA, RAJASTHAN
6	BROADBAND PACENET INDIA PVT. LTD	BROADBAND PACENET INDIA PRIVATE LIMITED, JAIPUR
7	RELIANCE COMMUNICATION LIMITED (RCL)	RELIANCE COMMUNICATION LIMITED, DAKC, MUMBAI
8	MTS (SISTEMA SHYAM)	SISTEMA SHYAM TELESERVICES LIMITED, JAIPUR
9	TATA TELE SERVICES LIMITED (TTSL)	TATA TELESERVICES LTD, JAIPUR
10	TIKONA	TIKONA DIGITAL NETWORKS PVT LTD, JAIPUR

10.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON QUARTERLY MEASUREMENT DATA VERIFICATION FOR BROADBAND SERVICE PROVIDERS:

AVERAGED QUARTERLY (APR TO JUN-15) AUDIT DATA FOR BROADBAND SERVICES

Broadband Audit Data		Benchmark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/N	Name of Parameter													
1	Service Provisioning/Activation Time													
	A) No of connections registered during the period		Raj	2038	748	0	10	572	18	98	735	0	249	71
	B) Total number of connections provided within 15 days of registration on demand during the period		Raj	2038	733	0	10	572	18	98	735	0	249	71
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	<15 days	Raj	100%	97.99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	D) Total number of connections provided after 15 days of registration on demand		Raj	0	15	0	0	0	0	0	0	0	0	0
	E) %age of connections provided after 15 days of registration on demand		Raj	0.00%	2.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2	F) In all cases where payment towards installation charge & SD is taken and the Broadband connection is not provided within 15 working days	credit @ Rs.10/ per day.	Raj	0	0	0	0	0	0	0	0	0	0	0
	Fault Repair/Restoration Time													
	A) Total number of faults registered during the period		Raj	2311	6970	6952	40	2838	213	298	772	70	685	65
	B) Total number of faults repaired by next working day		Raj	2283	6437	6952	40	2685	213	287	772	61	625	62
	C) % age of faults repaired by next working day	>90%	Raj	98.79%	92.35%	100%	100%	94.61%	100%	96.31%	100%	87.14%	91.24%	95.38%
	D) Total number of faults repaired within three working days		Raj	2306	6870	6952	40	2838	213	298	772	70	680	65
	E) % age of faults repaired within three working days	≥99%	Raj	99.78%	98.57%	100%	100%	100%	100%	100%	100%	100%	99.27%	100%

AVERAGED QUARTERLY (APR TO JUN-15) AUDIT DATA FOR BROADBAND SERVICES

Broadband Audit Data		Benchmark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/N	Name of Parameter													
3	Rent Rebate													
	A) Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		Raj	0	0	0	0	0	0	0	0	0	11	0
	B) Faults Pending for > 7 working days and < 15 working days: (Rebate equivalent to 15 days of minimum monthly charge or equivalent usage allowance)		Raj	0	0	0	0	0	0	0	0	0	2	0
	C) Faults Pending for > 15 working days: (Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		Raj	0	0	0	0	0	0	0	0	0	3	0
4	Billing Performance													
	A) Total bills generated during period		Raj	61781	44034	1	NA	12766	NA	3360	19222	87	3005	565
	B) Total complaints received from customers/ Bills disputed		Raj	5	1	0	NA	14	NA	49	49	0	22	0
	C) Billing complaints per 100 bills issued	<2%	Raj	0.01%	0.00%	0.00%	NA	0.11%	NA	1.46%	0.25%	0.00%	0.73%	0.00%
	D) Total number of complaints resolved in 4 weeks from date of receipt		Raj	5	1	0	NA	11	NA	49	49	0	22	0
	E) %age billing complaints resolved in 4 weeks	100%	Raj	100%	100%	100%	NA	100%	NA	100%	100%	100%	100%	100%
	F) Total number of cases requiring refund of deposits after closure		Raj	0	658	0	NA	0	NA	0	1	0	0	0
	G) Total number of cases where refund was made in <60 days		Raj	0	658	0	NA	0	NA	0	1	0	0	0
	H) Percentage cases in which refund received within 60 days	100%	Raj	100%	100%	100%	NA	100%	NA	100%	100%	100%	100%	100%

AVERAGED QUARTERLY (APR TO JUN-15) AUDIT DATA FOR BROADBAND SERVICES

Broadband Audit Data		Benchmark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/N	Name of Parameter													
Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)														
5	A) Total number of calls received by the operator		Raj	24215	123636	6952	22	33222	*NA	68	101370	155290	7086	77
	B) Total number of calls answered by the operator within 60 seconds		Raj	20535	102955	6605	22	32178	*NA	59	95238	96546	4488	75
	C) % age calls answered by the operator in 60 seconds	>60%	Raj	84.80%	83.27%	95.01%	100%	96.86%	*NA	86.76%	93.95%	62.17%	63.34%	97.40%
	D) Total number of calls answered by the operator within 90 seconds		Raj	21669	111560	6952	22	32178	*NA	68	96125	101534	5858	76
	E) % age calls answered by the operator within 90 seconds	>80%	Raj	89.49%	90.23%	100%	100%	96.86%	*NA	100%	94.83%	65.48%	82.67%	98.70%
6	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).													
6.1	POP to ISP Gateway Node [Intra-network] Link(s)													
	A) Total Bandwidth Available at the link for the period days		Raj	7230	NP	355	20	1098	97.66	511	6000	40960	232	2048
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		Raj	4741.9	NP	191.67	12.38	353.28	77.56	399.67	1661	8167.67	179.83	1413.12
	C) % age Bandwidth utilized during the period	<80%	Raj	65.59%	NP	53.99%	61.90%	32.17%	79.42%	78.21%	27.68%	19.94%	77.62%	69.00%
6.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity													
	A) Total number of upstream links for International connectivity		Raj	NA	NA	2	NA	2	NA	NA	11	10	2	1
	B) Number of Links having Bandwidth utilization > 90% during TCBH		Raj	NA	NA	0	NA	0	NA	NA	0	0	0	0
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		Raj	NA	NA	355	NA	1322	NA	NA	318000	2048	183.33	18391.04
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		Raj	NA	NA	19167	NA	800.6	NA	NA	164132	1433.60	141.83	14028.80
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	Raj	NA	NA	53.99%	NA	60.56%	NA	NA	51.60%	70.00%	77.36%	76.28%

AVERAGED QUARTERLY (APR TO JUN-15) AUDIT DATA FOR BROADBAND SERVICES

Broadband Audit Data		Benchmark	Circle Name	AIRTEL- BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/ N	Name of Parameter													
6.3	Broadband Connection Speed (download) - from ISP Node to User													
	A) Total committed download speed to the sample subscribers (In mpbs)		Raj	2	NP	1	4	2	1	2	0.26	1.5	NP	8.67
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		Raj	2	NP	0.96	3.63	1.71	0.98	1.9	0.25	1.38	NP	8.05
	C) % age subscribed speed available to the subscriber during TCBH	>80%	Raj	100%	NP	96.00%	90.75%	85.50%	98.00%	95.00%	97.27%	92.00%	NP	92.88%
7	Service Availability/Uptime													
	A) Total operational Hours		Raj	14918048	2184	2184	2184	2184	2184	2184	2184	34560	2184	14568
	B) Total downtime (In hours)		Raj	2017.55	0	0	0	0	0	0	8.76	131.98	1.11	39
	C) Total time when the service was available (In Hrs)		Raj	14916030.45	2184	2184	2184	2184	2184	2184	2175.24	34428.02	2182.89	14529
	D) % age of Service availability uptime	>98%	Raj	99.99%	100%	100%	100%	100%	100%	100%	99.60%	99.62%	99.95%	99.73%
8	Packet Loss													
	A) Total number of ping packets transmitted		Raj	3000	NP	3000	91000	91000	3000	3000	91000	91000	3000	3000
	B) Total number of ping packets lost		Raj	0	NP	0	0	59	0	1	400	0	0	0
	C) % age packet loss	<1%	Raj	0.00%	NP	0.00%	0.00%	0.06%	0.00%	0.03%	0.44%	0.00%	0.00%	0.00%
9	Network latency (for wired broadband access)													
9.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway													
	A) Total number of ping packets transmitted		Raj	3000	NP	3000	91000	91000	3000	NA	3000	91000	NA	3000
	B) Total round trip time for all the ping packets transmitted during the period		Raj	3000	NP	3000	91000	91000	30	NA	21	23	NA	3000
	C) Average round trip tip time for all the ping transmitted	<120 ms	Raj	40	NP	86	58	23.34	0.03	NA	7	0.08	NA	54
9.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)													
	A) Total number of ping packets transmitted		Raj	3000	NP	3000	91000	NP	NA	3000	3000	91000	NA	3400
	B) Total round trip time for all the ping packets transmitted during the period		Raj	3000	NP	3000	91000	NP	NA	1161	25	277.67	NA	208520

AVERAGED QUARTERLY (APR TO JUN-15) AUDIT DATA FOR BROADBAND SERVICES														
Broadband Audit Data		Benchmark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/N	Name of Parameter													
	C) Average round trip time for all the ping transmitted	<350 ms	Raj	79.5	NP	200	101.83	NP	NA	294	8.33	9	NA	61.26
9.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)													
	A) Total number of ping packets transmitted		Raj	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		Raj	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip time for all the ping transmitted	<800 ms	Raj	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

- NA- Not Applicable
- *NA- In case of NSTPL, There is no Customer Care Number. Customers reported to them via Mobile Numbers.
- NP-Not Provided- Monthly Data Not Monitored by ISPs

10.2 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS MEASUREMENT DATA VERIFICATION FOR BROADBAND SERVICE PROVIDERS:

3 DAYS LIVE DATA FOR BROADBAND SERVICES														
3 days live Broadband Audit Data		Bench- mark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/ N	Name of Parameter													
1	Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)													
	A) Total number of calls received by the operator		Raj	1064	3050	NP	2	1437	*NA	11	4205	10	293	10
	B) Total number of calls answered by the operator within 60 seconds		Raj	791	2208	NP	2	1405	*NA	11	4150	10	195	10
	C) % age calls answered by the operator in 60 seconds	>60%	Raj	74.34%	72.39%	NP	100%	97.77%	*NA	100%	98.69%	100%	66.55%	100%
	D) Total number of calls answered by the operator within 90 seconds		Raj	880	2592	NP	2	1405	*NA	11	4158	10	240	10
	E) % age calls answered by the operator within 90 seconds	>80%	Raj	82.71%	84.98%	NP	100%	97.77%	*NA	100%	98.88%	100%	81.91%	100%
2	Bandwidth Utilization/ Throughput: (If on any link(s) / route bandwidth utilization exceeds 90%, then network is considered to have congestion. For this additional provisioning of Bandwidth on immediate basis, but not later than one month, is mandated.) < 80% link(s) / route bandwidth utilization during peak hours (TCBH).													
2.1	POP to ISP Gateway Node [Intra-network] Link(s)													
	A) Total Bandwidth Available at the link for the period days		Raj	20	13840	355	20	1098	97	511	2000	40960	275	2048
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		Raj	9.97	1476.78	31.33	13.45	420.6	78.23	400.67	368	1071.33	217.87	1385.78
	C) % age Bandwidth utilized during the period	<80%	Raj	49.85%	10.67%	8.83%	67.25%	38.31%	80.65%	78.41%	18.40%	2.62%	79.23%	67.76%
2.2	A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity													
	A) Total number of upstream links for International connectivity		Raj	NA	NA	2	NA	2	NA	NA	11	10	2	1
	B) Number of Links having Bandwidth utilization > 90% during TCBH		Raj	NA	NA	0	NA	0	NA	NA	0	0	0	0
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		Raj	NA	NA	355	NA	1322	NA	NA	106000	2048	230	18391.04
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		Raj	NA	NA	31.33	NA	925.77	NA	NA	78151	1030	181.2	14745.6

3 DAYS LIVE DATA FOR BROADBAND SERVICES														
3 days live Broadband Audit Data		Bench- mark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/ N	Name of Parameter													
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	Raj	NA	NA	8.83%	NA	70.03%	NA	NA	73.73%	50.29%	78.78%	80.18%
2.3	Broadband Connection Speed (download) - from ISP Node to User													
	A) Total committed download speed to the sample subscribers (In mpbs)		Raj	8	5.36	1	4	2	1	1.67	2	1.5	4	7.67
	B) Total average download speed observed for the sample subscribers during TCBH (In Mpbs)		Raj	8.41	4.57	1	3.93	1.79	0.98	1.52	1.45	1.45	3.97	7
	C) % age subscribed speed available to the subscriber during TCBH	>80%	Raj	105.13%	85.22%	100%	98.25%	89.50%	98.00%	91.02%	72.50%	96.67%	99.25%	91.26%
3	Packet Loss													
	A) Total number of ping packets transmitted		Raj	3000	2714.29	3000	3000	3000	3000	3000	1000	3000	3000	3000
	B) Total number of ping packets lost		Raj	0	10.57	5	0	3	0	0	0	0	0	0
	C) % age packet loss	<1%	Raj	0.00%	0.39%	0.17%	0.00%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
4	Network latency (for wired broadband access)													
4.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway													
	A) Total number of ping packets transmitted		Raj	3000	3000	3000	3000	3000	3000	NA	1000	3000	NA	3000
	B) Total round trip time for all the ping packets transmitted during the period		Raj	3000	217.43	2995	2997	2997	3000	NA	4	3000	NA	3000
	C) Average round trip tip time for all the ping transmitted	<120 ms	Raj	24	72.48	81	65.66	26	10	NA	1.48	26	NA	54
4.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)													
	A) Total number of ping packets transmitted		Raj	3000	9000	9000	9000	9000	NA	9000	1000	6000	NA	3600
	B) Total round trip time for all the ping packets transmitted during the period		Raj	3000	1491.43	8982	8990	8995	NA	8961	8	6000	NA	3600
	C) Average round trip tip time for all the ping transmitted	<350 ms	Raj	74.9	165.71	186	109.87	182.23	NA	203.55	2.50	297	NA	61.6

3 DAYS LIVE DATA FOR BROADBAND SERVICES

3 days live Broadband Audit Data		Bench- mark	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
S/ N	Name of Parameter													
4.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)													
	A) Total number of ping packets transmitted		Raj	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		Raj	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	C) Average round trip time for all the ping transmitted	<800 ms	Raj	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	Service Availability/Uptime													
	A) Total operational Hours		Raj	2471520	72	72	72	72	72	72	72	1152	72	432
	B) Total downtime (In hours)		Raj	84	0	0	0	0	0	0	0	1.4	0	3
	C) Total time when the service was available (In Hrs)		Raj	2471436	72	72	72	72	72	72	72	1150.6	72	429
	D) % age of Service availability uptime	>98%	Raj	100%	100%	100%	100%	100%	100%	100%	100%	99.88%	100%	99.31%

NA: Not Applicable

*NA- In case of NSTPL, There is no Customer Care Number. Customers reported to them via Mobile Numbers.

NP: Data not provided

10.3 KEY FINDINGS: BROADBAND SERVICES

Service Provisioning / Activation Time: The audit of the service providers revealed that all Broadband service providers were well within the benchmark except **BSNL** could not achieve the benchmark of **Connections provided within 15 days** with its achieved level as **97.99%** against the benchmark of 100%.

Fault Repair/Restoration Time: With regards to this parameter the performance of the service providers was within TRAI norms except **TCL**, its achievement level was **87.14%** for parameter **Fault Repair by next working day**. Further, **BSNL** remained under performed for parameter **Faults repaired within three working days** with its performance as **98.57%**.

Billing Performance: For this parameter also the performance of the service providers was found well within the compliance benchmarks.

Response Time to Customer for assistance by operator (Voice to Voice): For percentage of calls getting connected to call center and answered, all service providers were found meeting the benchmark for this parameter. However, for parameter “% age calls answered by the operator within 90 seconds”; **TCL** failed to meet the benchmark with its achieved level as **65.48%**.

Bandwidth Utilization/ Throughput: All the service providers were found using Multiple Router Traffic Grapher (MRTG) and also it was observed that all service providers were reporting combined bandwidth utilization for corporate customers and household customers.

The performance of service providers with respect of these parameters was found satisfactory i.e. within benchmark.

Live measurement: The performance of **NSTPL** and **TTL** for the parameter **%age Bandwidth utilized during the period and %age International Bandwidth utilization during peak hour was 80.65% and 80.18%** respectively against the benchmark of <80%.

Service Availability/Uptime: All service providers were found meeting the benchmark for this parameter.

Packet Loss and Network Latency: It was observed that almost all operators were measuring packet loss and latency by conducting ping test on random basis for their internal assessment.

However, the ping test conducted during live measurement revealed that all service providers were meeting the benchmark prescribed by TRAI.

10.4 CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE FOR BROADBAND SERVICES												
Parameter	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
Total No. of calls Attempted	Raj	100	100	100	100	100	100	100	100	100	100	100
Total number of calls answered by the operator within 60 seconds	Raj	100	100	95	100	98	100	100	100	100	100	100
% age calls answered by the operator in 60 seconds	Raj	100%	100%	95.00%	100%	98.00%	100%	100%	100%	100%	100%	100%
Total number of calls answered by the operator within 90 seconds	Raj	100	100	100	100	98	100	100	100	100	100	100
% age calls answered by the operator within 90 seconds	Raj	100%	100%	100%	100%	98.00%	100%	100%	100%	100%	100%	100%

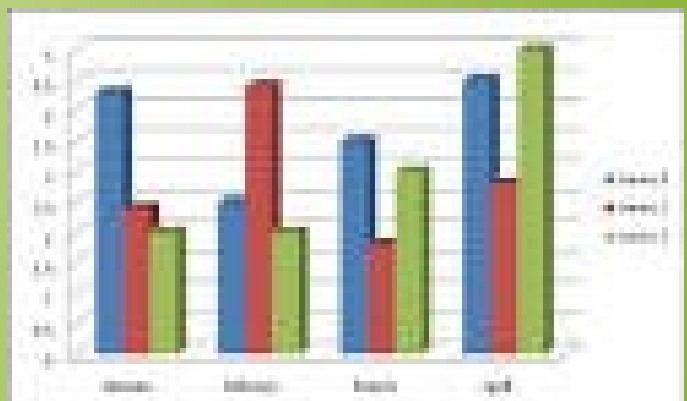
In case of calls answered by operators (voice to voice) within 60 seconds and 90 seconds, when test calls were made to the call centers, all broadband service providers were found meeting the TRAI prescribed benchmark. **Dvois and MTS** could connect 95% and 98% calls respectively within 60 seconds whereas and only **MTS** could connect 98% calls within 90 seconds.

10.5 LIVE CALLING FOR BILLING COMPLAINTS

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS												
Parameter	Circle Name	AIRTEL-BHARTI	BSNL	D-VOIS	FIVE NETWORK	MTS	NSTPL	PACENET	RCL	TCL	TIKONA	TTL
Total No. of calls Attempted	Raj	5	2	0	NA	14	NA	49	49	0	22	0
Total No. of calls Answered	Raj	4	2	0	NA	14	NA	30	33	0	17	0
Cases resolved within 4 weeks	Raj	4	2	0	NA	14	NA	30	33	0	17	0
%age of cases resolved	Raj	100%	100%	100%	NA	100%	NA	100%	100%	100%	100%	100%

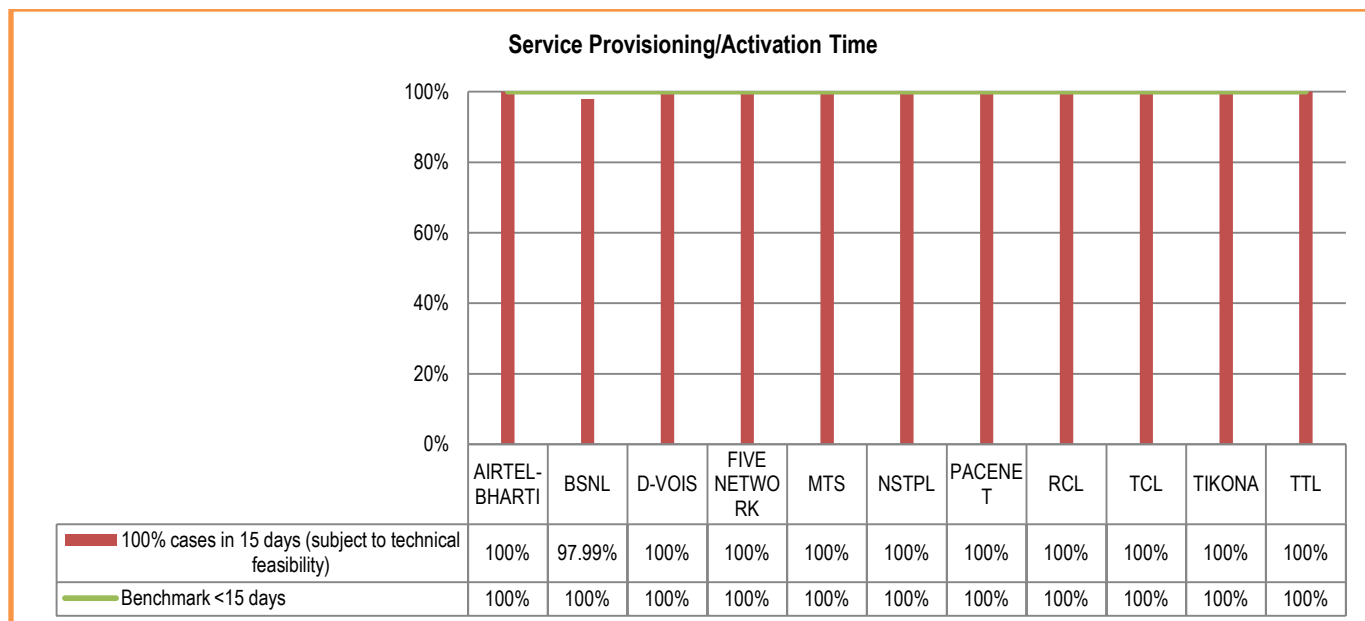
To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling for about random 100 nos. of customers. However, in some cases, the number of customers contacted for verification was very less due to less number of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

GRAPHICAL REPRESENTATION OF BROADBAND SERVICES



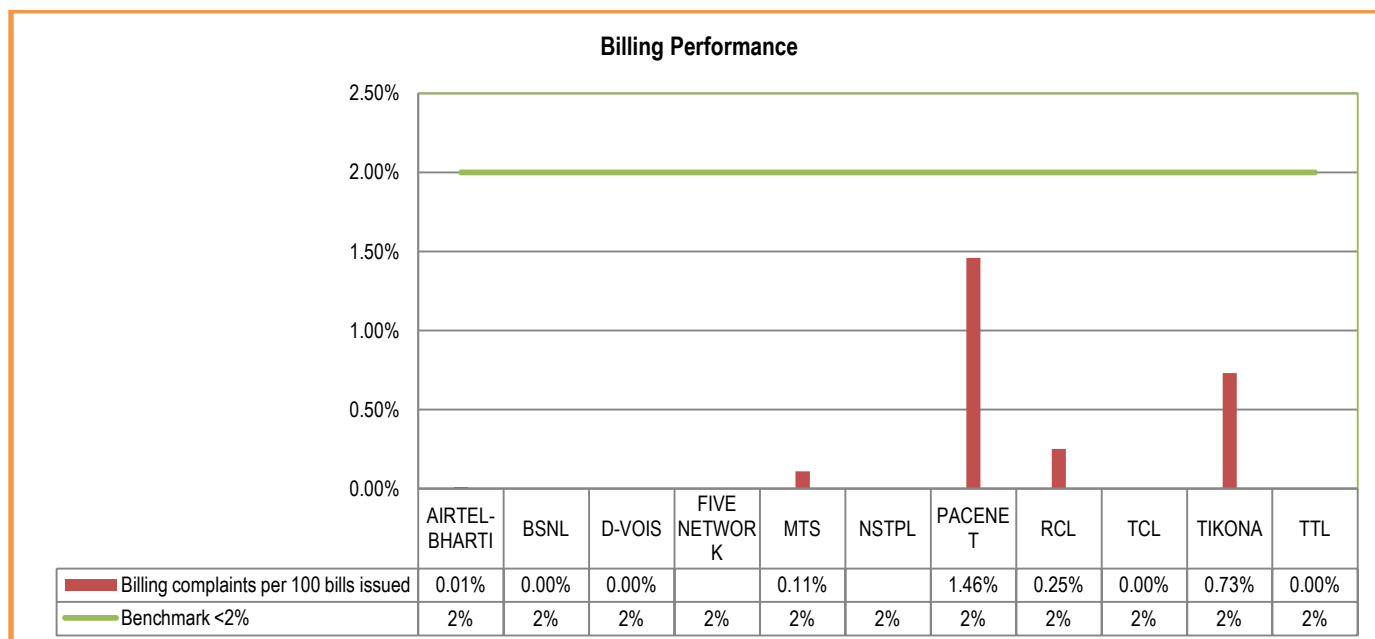
10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:

1. SERVICE PROVISIONING/ACTIVATION TIME:



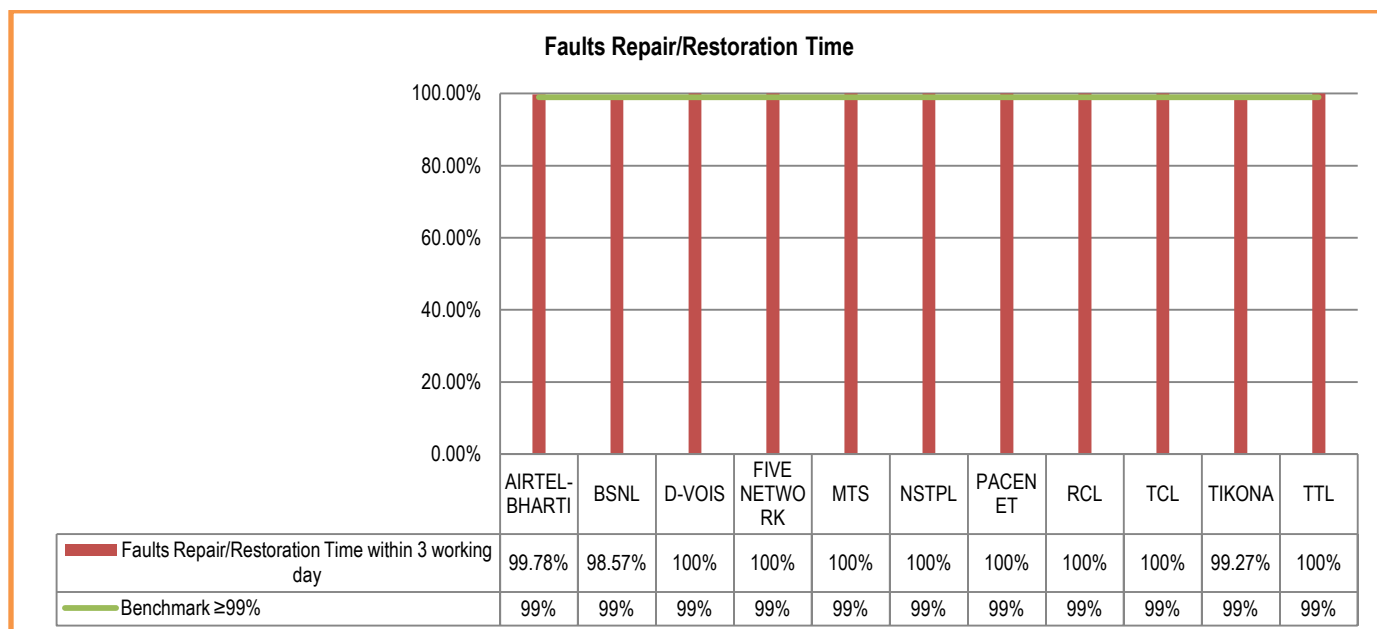
All Operators are meeting the benchmarks except BSNL.

2. BILLING PERFORMANCE:



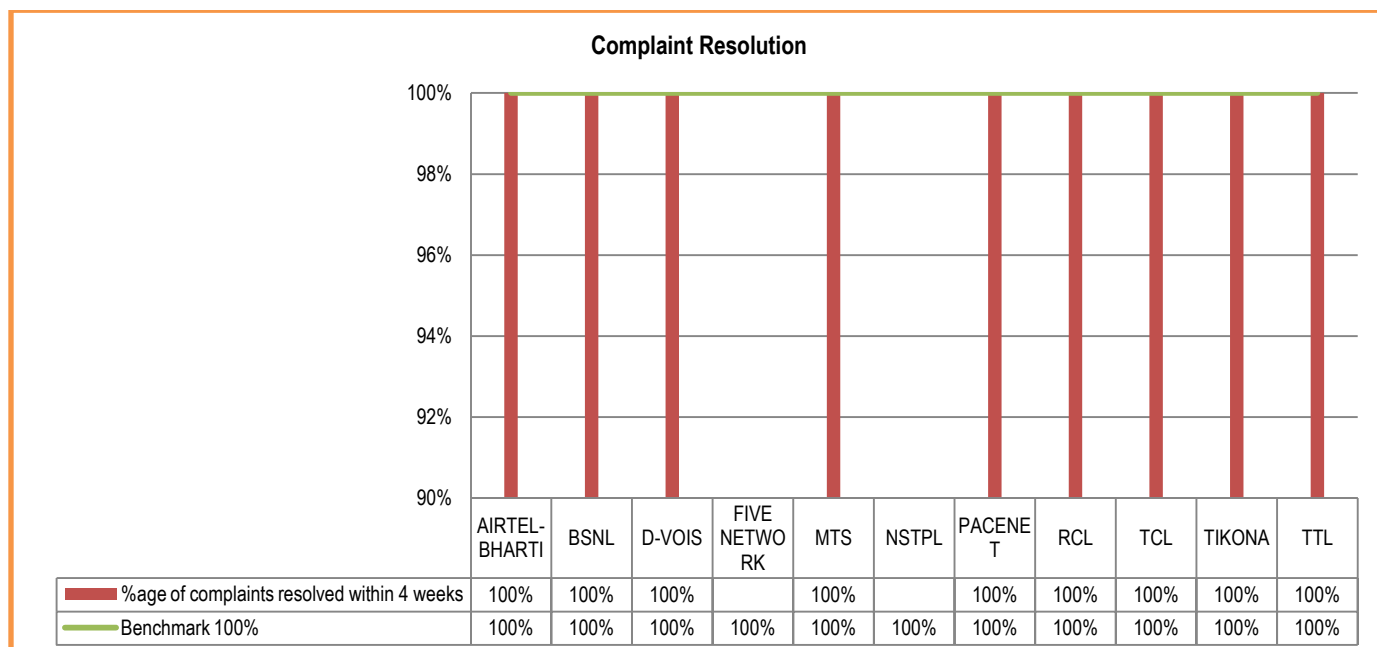
All Operators are meeting the benchmarks.

3. FAULTS REPAIR/RESTORATION TIME:



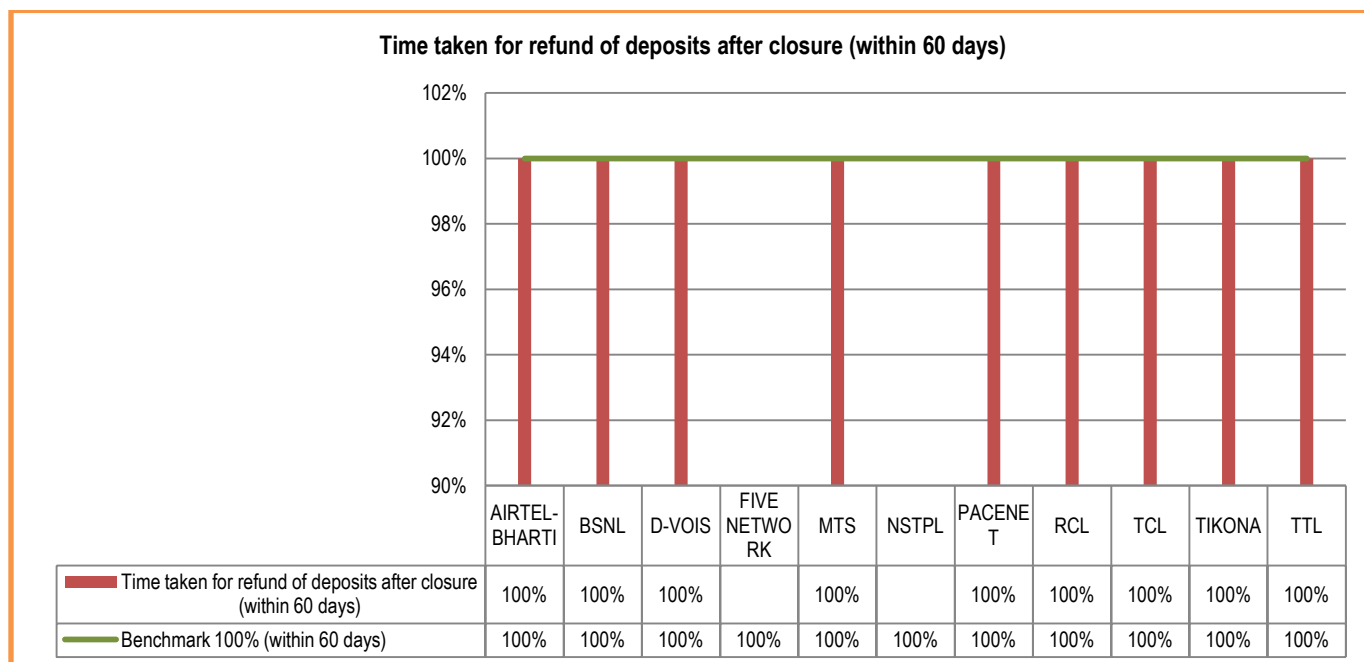
All Operators are meeting the benchmarks except BSNL.

4. COMPLAINT RESOLUTION:



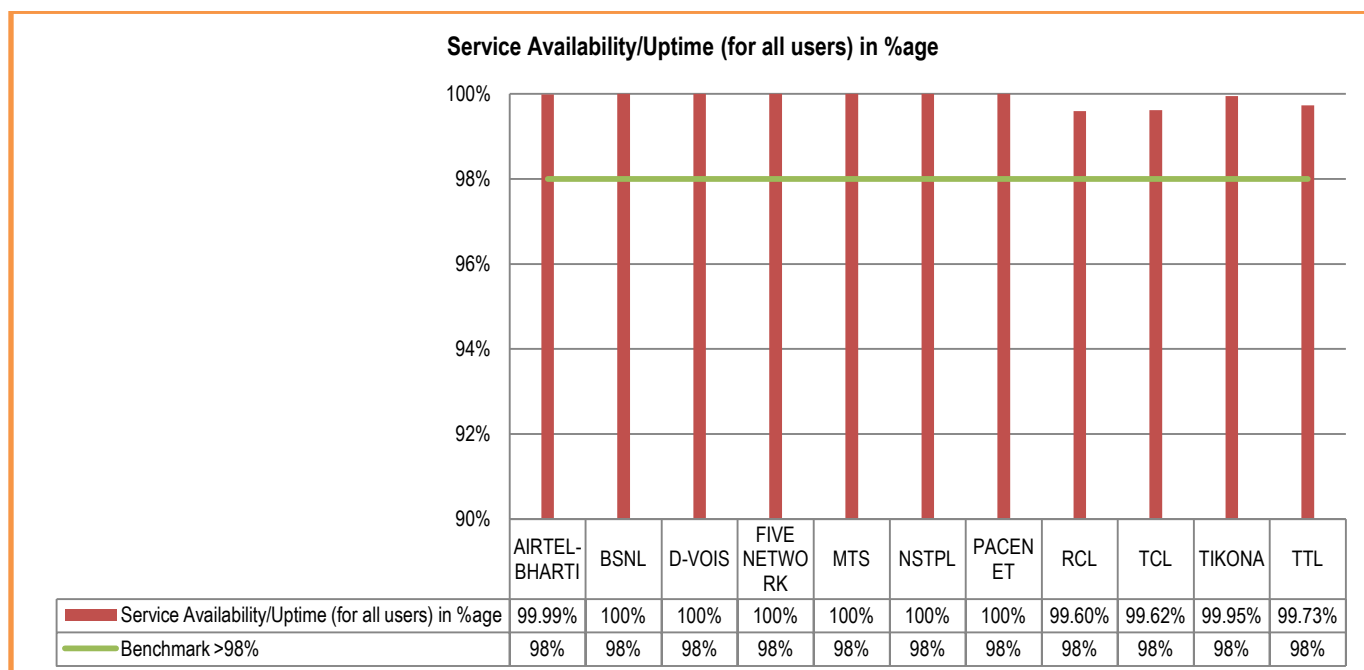
All Operators are meeting the benchmarks. In case of Five Network and NSTPL, they do not have postpaid services.

5. REFUND:



All Operators are meeting the benchmarks. In case of Five Network and NSTPL, they do not have postpaid services.

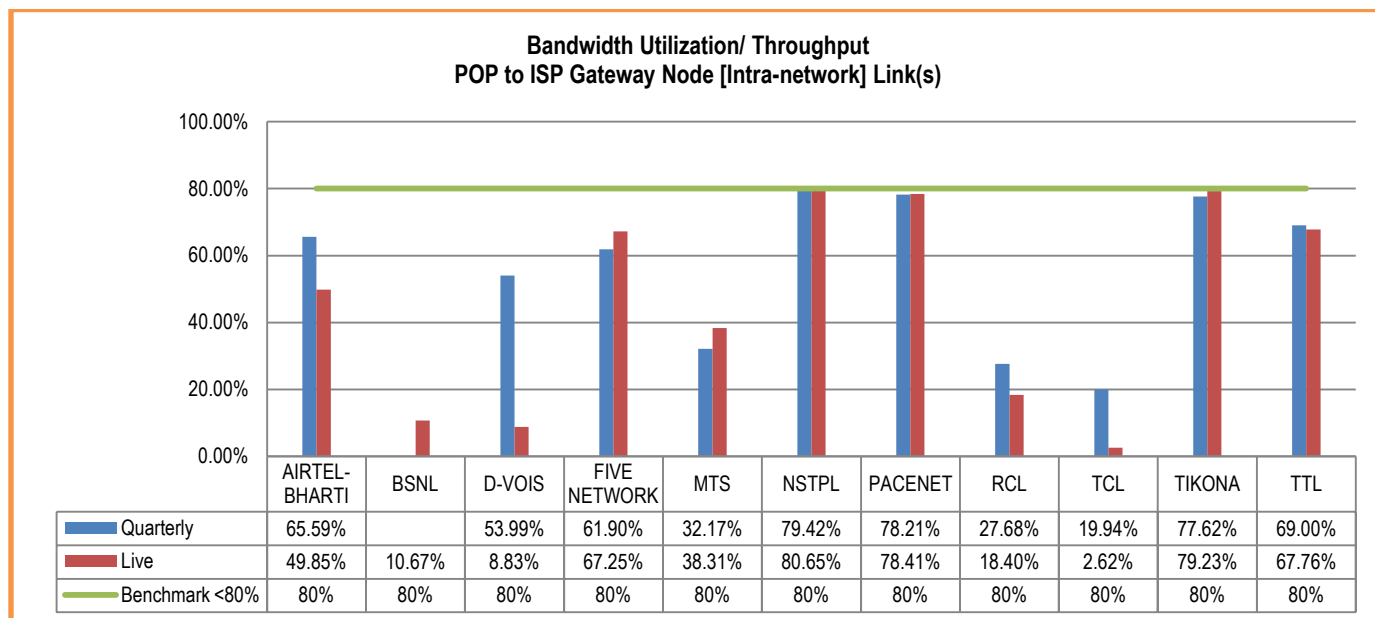
6. SERVICE AVAILABILITY/UPTIME:



All Operators are meeting the benchmarks.

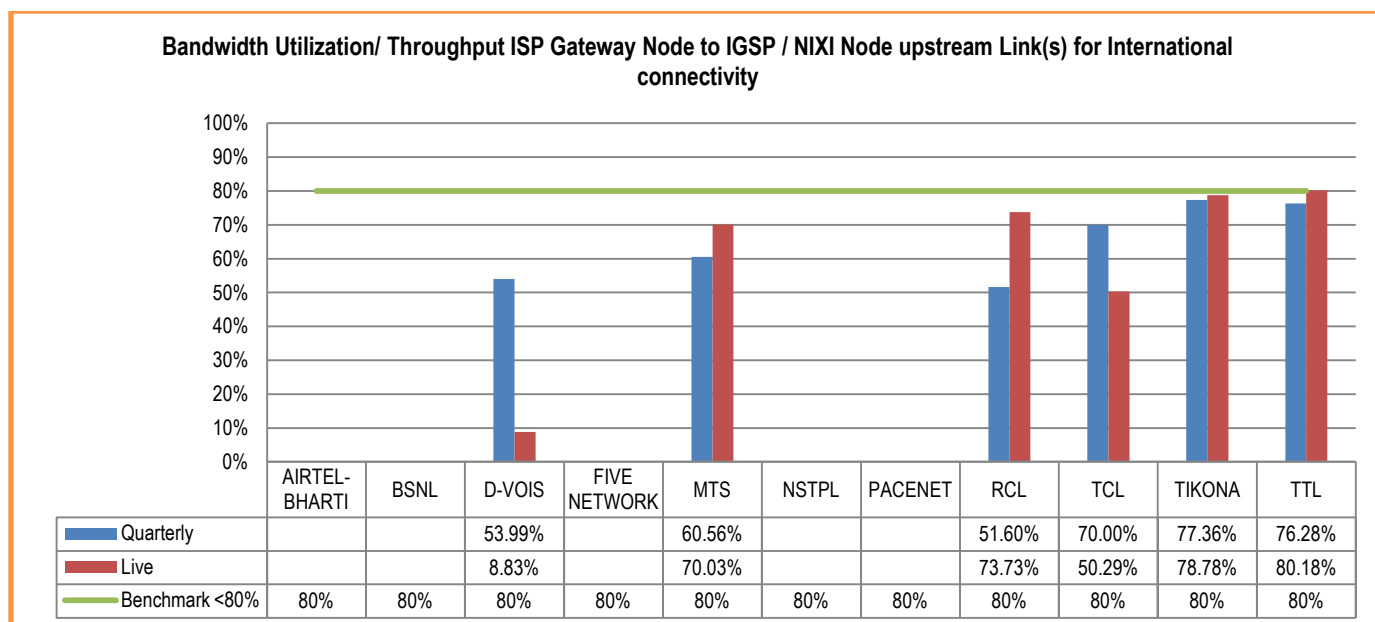
10.7 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BROADBAND SERVICE PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

1. BROADBAND UTILIZATION/THROUGHPUT POP TO ISP GATEWAY NODE:



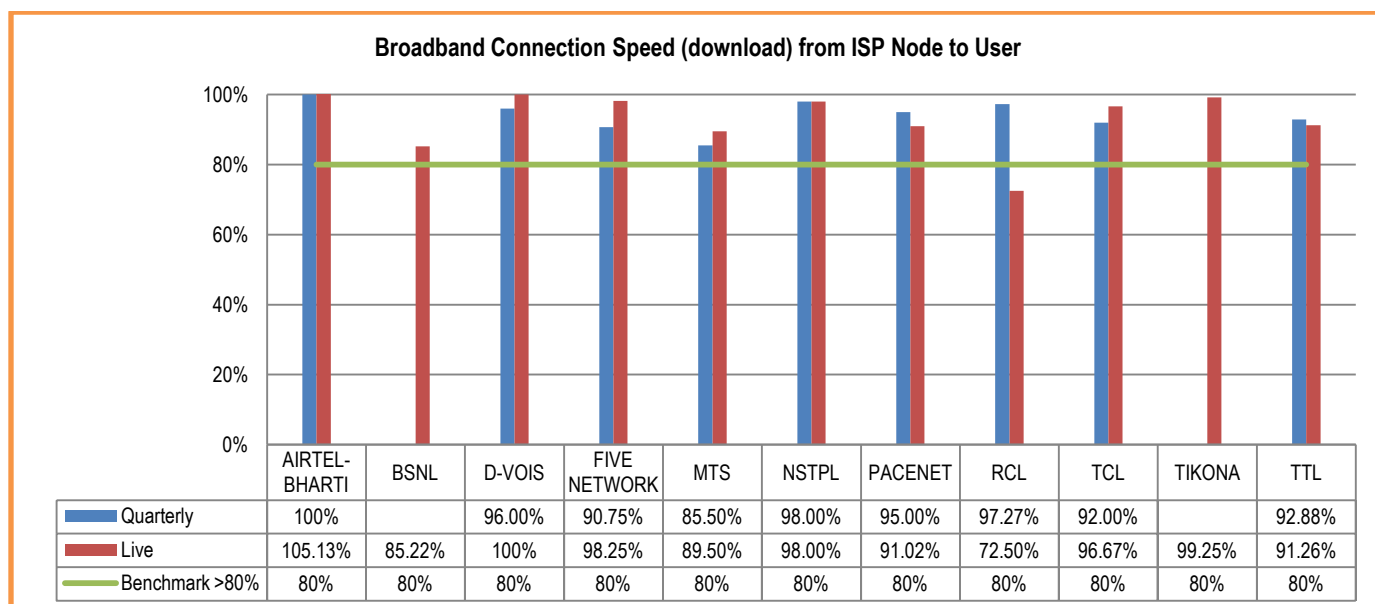
All Operators are meeting the benchmarks except NSTPL during the 3 day live measurement.

2. BROADBAND UTILIZATION/THROUGHPUT ISP GATEWAY NODE TO IGSP/NIXI NODE:



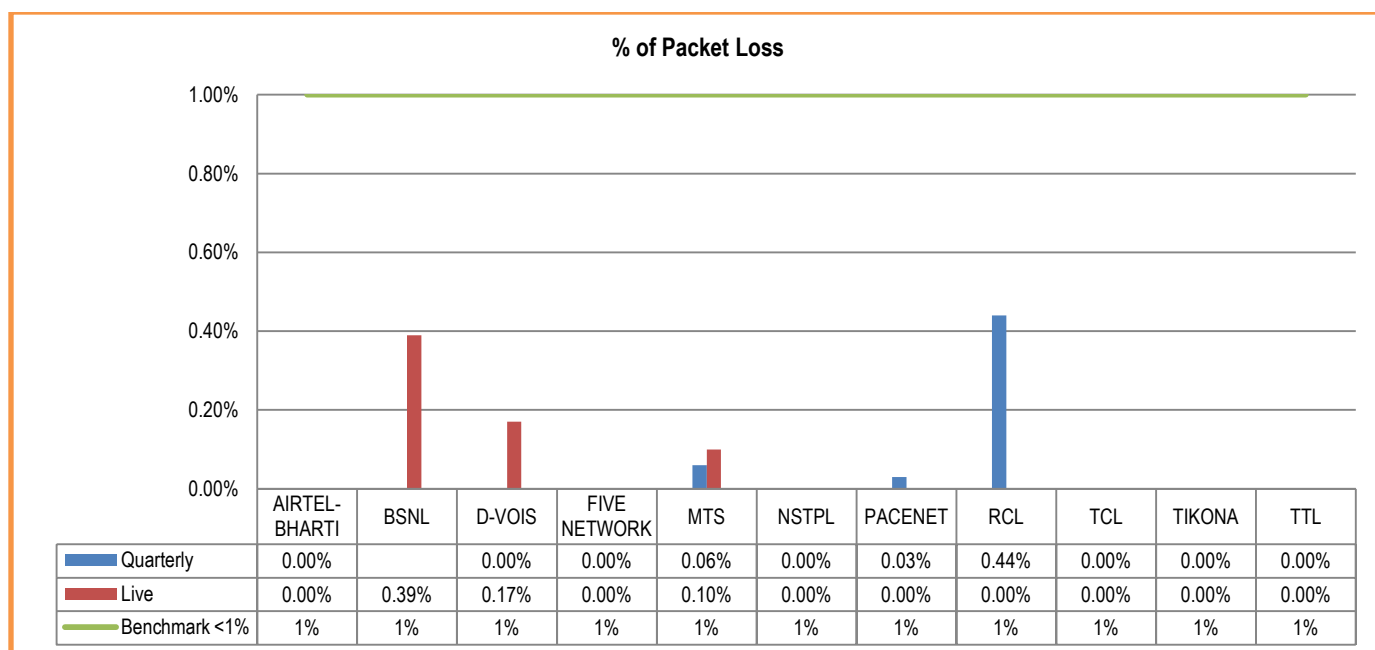
All Operators are meeting the benchmarks.

3. BROADBAND CONNECTION SPEED (DOWNLOAD) FROM ISP NODE TO USER:



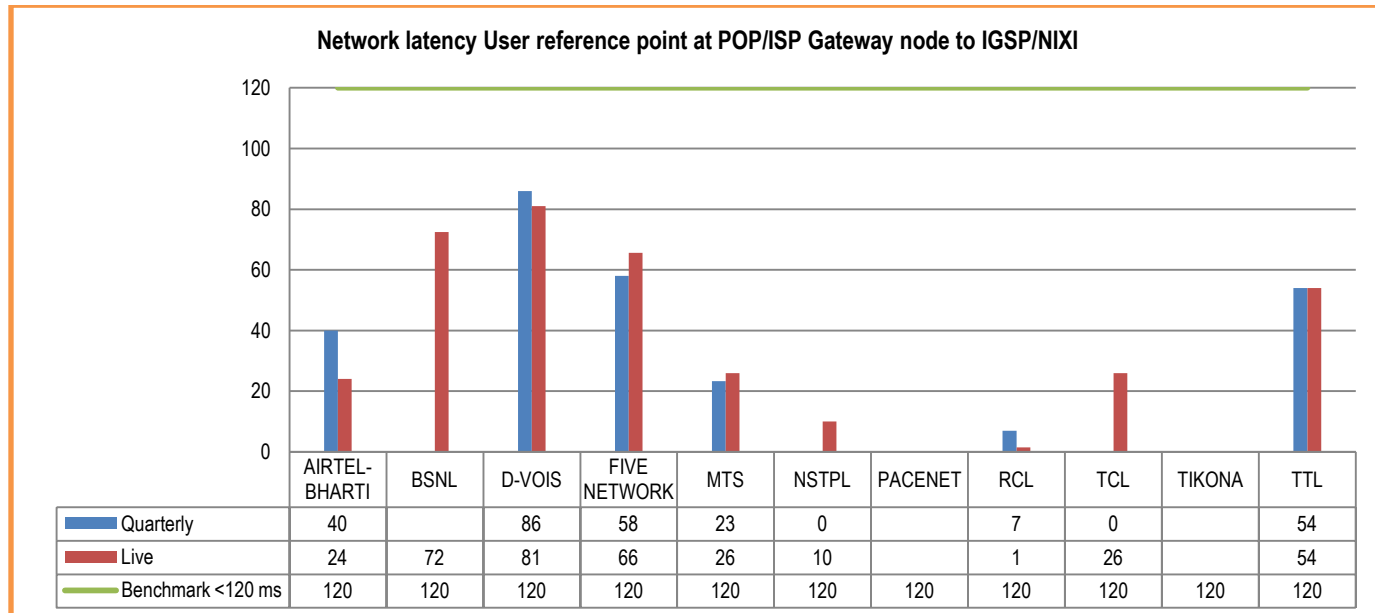
All Operators are meeting the benchmarks except RCL during 3 day live measurement.

4. PACKET LOSS:



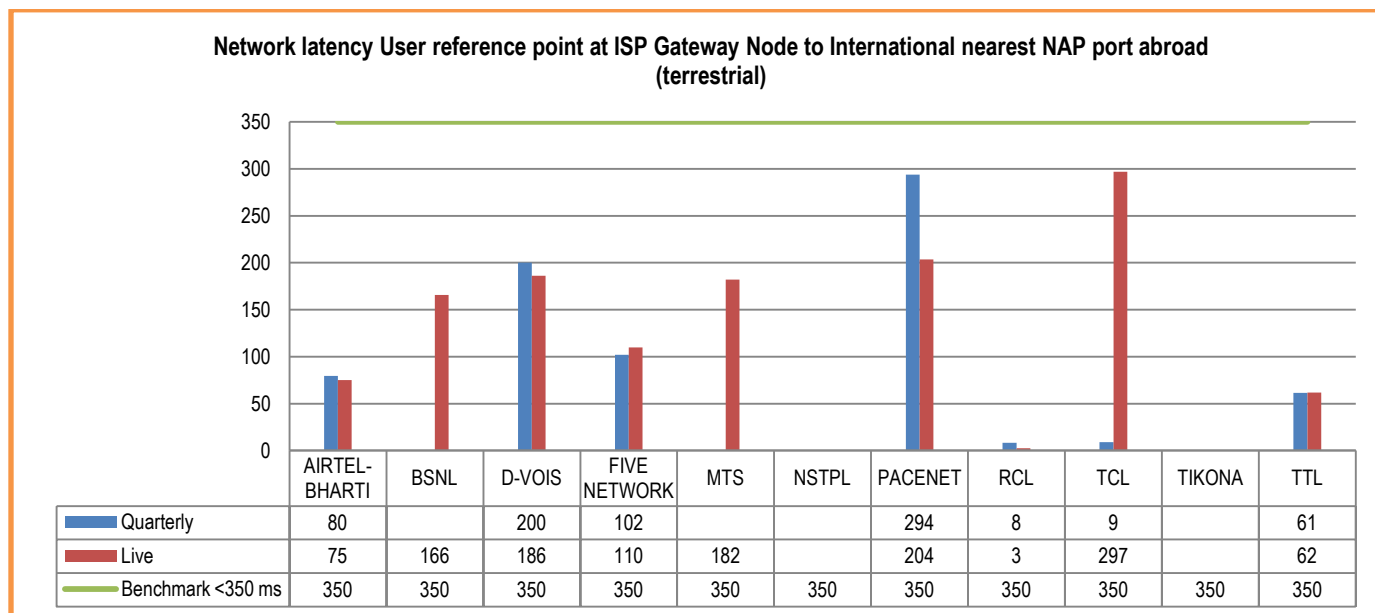
All Operators are meeting the benchmarks.

5. NETWORK LATENCY USER REFERENCE POINT AT POP/ISP GATEWAY NODE TO IGSP/NIXI:



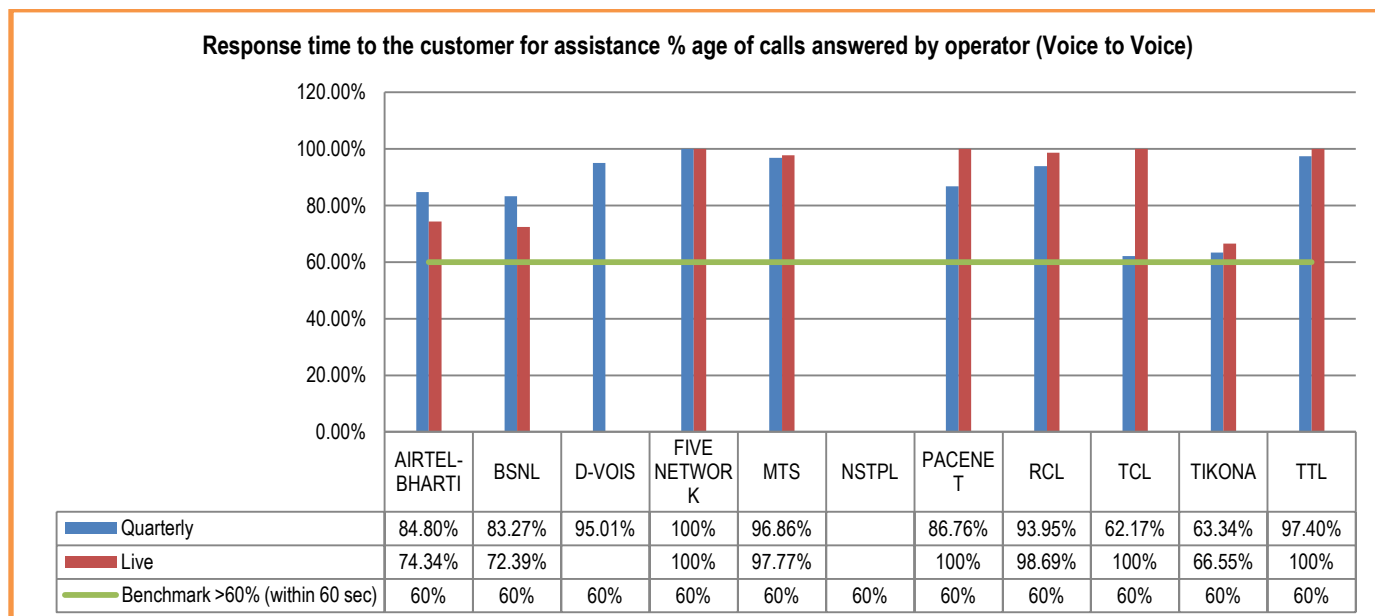
All Operators are meeting the benchmarks.

6. NETWORK LATENCY USER REFERENCE POINT AT ISP GATEWAY NODE TO INTERNATIONAL NEAREST NAP PORT ABROAD (TERRESTRIAL):



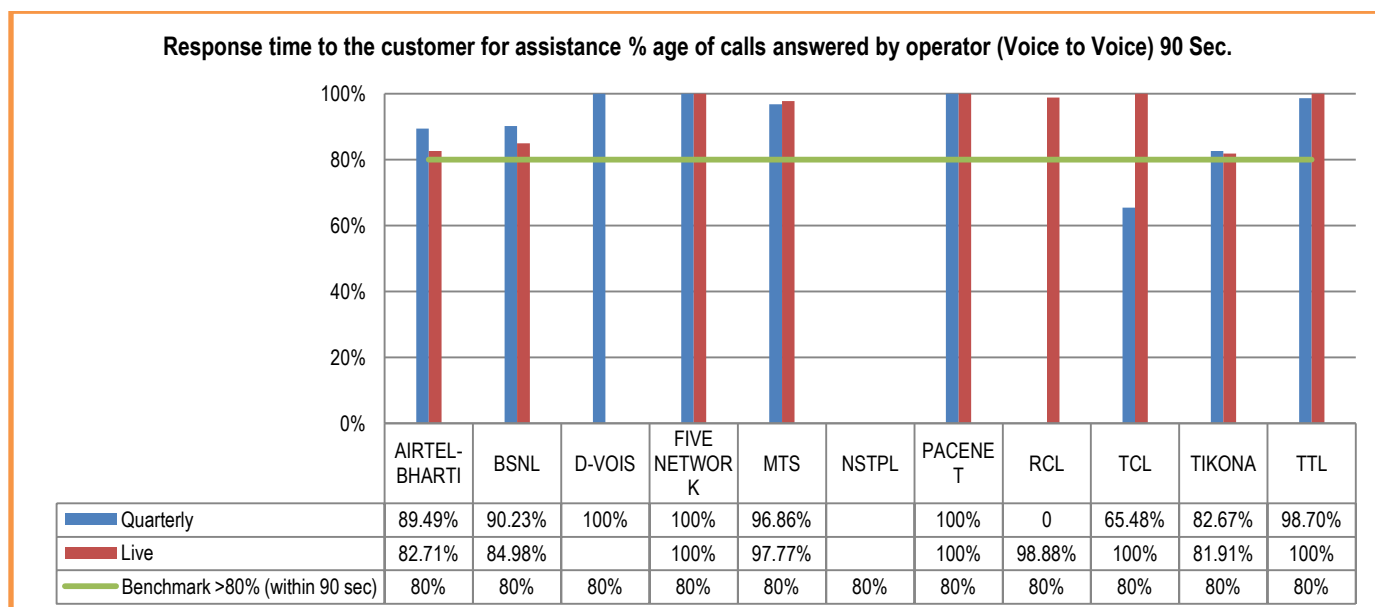
All Operators are meeting the benchmarks.

7. RESPONSE TIME TO THE CUSTOMER FOR ASSISTANCE ACCESSIBILITY BY OPERATOR WITHIN 60 SECONDS:



All Operators are meeting the benchmarks. In case of NSTPL, There is no Customer Care Number. Customers reported to them via Mobile Nos.

8. RESPONSE TIME TO THE CUSTOMER FOR ASSISTANCE ACCESSIBILITY BY OPERATOR WITHIN 90 SECONDS:



All Operators are meeting the benchmarks. In case of NSTPL, There is no Customer Care Number. Customers reported to them via Mobile Nos.

Exchanges covered for QoS audit in Rajasthan Circle -

Annex-1

S.NO	Service provider	SSA Name	SDCA	EXCHANGE NAME	Exchange Type	Exchange Code	Exchange Level
1	BSNL	Bhilwara	Bhilwara	Bhilwara Main Ewsd	URBAN	BWABWE	01482-230 to 239
2	BSNL	Bhilwara	Mandal	Mandal	URBAN	BWAMD	01486-266
3	BSNL	Bhilwara	Banera	Banera	RURAL	BWABRA	01487-272
4	BSNL	Bhilwara	Shahpura	Shahpura	URBAN	BWASPU	01484-222
5	BSNL	Bhilwara	Mandalgarh	Mandalgarh	URBAN	BWAMGH	01489-230
6	BSNL	Chittorgarh	Chittorgarh	Chittorgarh	URBAN	CTTCTT	01472-24X & 250
7	BSNL	Chittorgarh	Kapasan	Kapasan	URBAN	CTTKPS	01476-230 & 231
8	BSNL	Chittorgarh	Badi Sadri	ChhotiSadri	URBAN	CTTCSR	01473-262,263
9	BSNL	Chittorgarh	Nimbahera	Nimbahera	URBAN	CTTNMB	01477-220 to 224
10	BSNL	Chittorgarh	Pratapgarh	Pratapgarh	URBAN	CTTPGH	01478-220 to 223
11	BSNL	Udaipur	Udaipur	UP Main C01	URBAN	UPRMAN	0294-241,242,252,256
12	BSNL	Udaipur	Udaipur	UP KUM RSU-1	URBAN	UPRKUM	0294-248, 258
13	BSNL	Udaipur	Mavli	Fatehnagar SDCC	URBAN	UPRFNR	02955-220 to 221
14	BSNL	Udaipur	Nathdwara	Nathdwara SDCC	URBAN	UPRNAW	02953-230 to 235
15	BSNL	Udaipur	Rajsamand	KKR Main SDCC	URBAN	UPRKKR	02952-220 to 226
16	BSNL	Udaipur	Vallabhnagar	Bhinder	URBAN	UPRBNR	02955-220
17	BSNL	Bhilwara	Asind	Badnore	RURAL	BWABDN	01480-2255
18	BSNL	Bhilwara	Asind	Daulatgarh	RURAL	BWADLG	01480-227
19	BSNL	Bhilwara	Asind	Shamboogarh	RURAL	BWASMG	01480-2332
20	BSNL	Bhilwara	Bhilwara	Hamirgarh	RURAL	BWAHMG	01482-286
21	BSNL	Bhilwara	Bhilwara	Mangrop	RURAL	BWAMGR	01482-280
22	BSNL	Bhilwara	Bhilwara	Bhilwara C S Azadnagar	URBAN	BWACSA	01482-267
23	BSNL	Bhilwara	Mandal	Bagore	RURAL	BWABGR	01486-265
24	BSNL	Bhilwara	Mandal	Bhagwanpura	RURAL	BWABGP	01486-264
25	BSNL	Bhilwara	Mandal	Rajajikrera	RURAL	BWARKK	01486-262
26	BSNL	Bhilwara	Banera	Upreda	RURAL	BWAUPR	01487-277
27	BSNL	Bhilwara	Banera	Raila Road	RURAL	BWARLA	01487-273
28	BSNL	Bhilwara	Banera	Dabla	RURAL	BWADBL	01487-276
29	BSNL	Bhilwara	Shahpura	Phulia Kalan	RURAL	BWAPLY	01484-225
30	BSNL	Bhilwara	Shahpura	Dhikola	RURAL	BWADHL	01483-228
31	BSNL	Bhilwara	Shahpura	Sangaria	RURAL	BWASNG	01484-226
32	BSNL	Bhilwara	Mandalgarh	Bigod	RURAL	BWABGD	01489-232
33	BSNL	Bhilwara	Mandalgarh	Kachhola	RURAL	BWAKCL	01489-239
34	BSNL	Bhilwara	Mandalgarh	Singoli	RURAL	BWASLC	01489-235
35	BSNL	Bhilwara	Kotri	Nandrai	RURAL	BWANND	01482-2342
36	BSNL	Bhilwara	Kotri	Badliyas	RURAL	BWABRL	01488-234

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

S.NO	Service provider	SSA Name	SDCA	EXCHANGE NAME	Exchange Type	Exchange Code	Exchange Level
37	BSNL	Bhilwara	Kotri	Paroli	RURAL	BWAPRL	01488-233
38	BSNL	Bhilwara	Jahazpur	Pander	RURAL	BWAPND	01485-235
39	BSNL	Bhilwara	Jahazpur	Shakargarh	RURAL	BWASKR	01485-235
40	BSNL	Bhilwara	Jahazpur	Piplund	RURAL	BWAPPL	01485-234
41	BSNL	Chittorgarh	Chittorgarh	Shambhupura	RURAL	CTTSBP	01472-276
42	BSNL	Chittorgarh	Chittorgarh	Bijaypur	RURAL	CTTBZP	01472-276
43	BSNL	Chittorgarh	Chittorgarh	Ghosunda	RURAL	CTTGSD	01472-276
44	BSNL	Chittorgarh	Kapasan	Bhoopalsagar	RURAL	CTTBUP	01476-224
45	BSNL	Chittorgarh	Kapasan	Singhpur	RURAL	CTTSGP	01476-229
46	BSNL	Chittorgarh	Kapasan	Danta	RURAL	CTTDNT	01476-287
47	BSNL	Chittorgarh	Badi Sadri	Bansibohera	RURAL	CTTBNS	01473-245
48	BSNL	Chittorgarh	Badi Sadri	Kesunda	RURAL	CTTKSD	01473-252
49	BSNL	Chittorgarh	Badi Sadri	Nikumbh	RURAL	CTTNKB	01473-242
50	BSNL	Chittorgarh	Nimbahera	Kanera	RURAL	CTTKNR	01477-241
51	BSNL	Chittorgarh	Nimbahera	Wonder Cement	RURAL	CTTWON	01477-226
52	BSNL	Chittorgarh	Nimbahera	Bari	RURAL	CTTBRI	01477-244
53	BSNL	Chittorgarh	Begun	Chenchi	RURAL	CTTCHC	01474-231
54	BSNL	Chittorgarh	Begun	Nandwai	RURAL	CTTNDW	01474-252
55	BSNL	Chittorgarh	Begun	Parasoli	RURAL	CTTPRS	01474-233
56	BSNL	Chittorgarh	Rashmi	Dindoli	RURAL	CTTDDL	01471-239
57	BSNL	Chittorgarh	Rashmi	Pahuna	RURAL	CTTPHN	01471-222
58	BSNL	Chittorgarh	Rashmi	Roodh	RURAL	CTTRUD	01471-234
59	BSNL	Chittorgarh	Dungla	Bhadsora	RURAL	CTTBSR	01470-245
60	BSNL	Chittorgarh	Dungla	Bhadesar	RURAL	CTTBAS	01470-243
61	BSNL	Chittorgarh	Dungla	Mangalwar	RURAL	CTTMGD	01470-246
62	BSNL	Chittorgarh	Pratapgarh	Baravarda	RURAL	CTTBRV	01478-251
63	BSNL	Chittorgarh	Pratapgarh	Dhamotar	RURAL	CTTDMT	01478-255
64	BSNL	Chittorgarh	Pratapgarh	Suhagpura	RURAL	CTTSUG	01478-265
65	BSNL	Udaipur	Udaipur	Bambora	RURAL	UPRBBR	0294-23982,23984
66	BSNL	Udaipur	Udaipur	Chirwa	RURAL	UPRCRW	0294-2352
67	BSNL	Udaipur	Udaipur	Kurabar	RURAL	UPRKRB	0294-23928-23927
68	BSNL	Udaipur	Udaipur	Lakarwas	RURAL	UPRKNP	0294-2342
69	BSNL	Udaipur	Udaipur	Nai	RURAL	UPRNAI	0294-2762
70	BSNL	Udaipur	Udaipur	UPR Kaladwas	RURAL	UPRKWS	0294-265
71	BSNL	Udaipur	Udaipur	HZL Debari	RURAL	UPRHZL	0294-2655
72	BSNL	Udaipur	Udaipur	Madar	RURAL	UPRMDA	0294-2732,2734
73	BSNL	Udaipur	Mavli	Chandesara	RURAL	UPRCDS	02955-
74	BSNL	Udaipur	Mavli	Ghasa	RURAL	UPRGHS	02955-273
75	BSNL	Udaipur	Mavli	Thamla	RURAL	UPRTML	02955-236

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

S.NO	Service provider	SSA Name	SDCA	EXCHANGE NAME	Exchange Type	Exchange Code	Exchange Level
76	BSNL	Udaipur	Mavli	Sakroda	RURAL	UPRSKD	02955-260
77	BSNL	Udaipur	Vallabhnagar	Bhatewar	RURAL	UPRBTR	02957-226
78	BSNL	Udaipur	Vallabhnagar	Rundera	RURAL	UPRRND	02955-244
79	BSNL	Udaipur	Vallabhnagar	Wana	RURAL	UPRVNA	02957-227
80	BSNL	Udaipur	Vallabhnagar	BathardaKalan	RURAL	UPRBDT	02957-2376
81	BSNL	Udaipur	Kotra	Kotra SDCC	RURAL	UPRKTR	02958-227, 229
82	BSNL	Udaipur	Kotra	Was	RURAL	UPRWAS	02958-223
83	BSNL	Udaipur	Nathdwara	Delwara	RURAL	UPRDLW	02953-289
84	BSNL	Udaipur	Nathdwara	Khamnore	RURAL	UPRKMR	02953-285
85	BSNL	Udaipur	Nathdwara	Namana	RURAL	UPRNMA	02953-282
86	BSNL	Udaipur	Nathdwara	Gaongurha	RURAL	UPRGDA	02953-286
87	BSNL	Udaipur	Rajsamand	Gilund	RURAL	UPRGLD	02952-266
88	BSNL	Udaipur	Rajsamand	Kuraj	RURAL	UPRKRJ	02952-262
89	BSNL	Udaipur	Rajsamand	Mohi	RURAL	UPRMHI	02952-275
90	BSNL	Udaipur	Rajsamand	Binol	RURAL	UPRBNL	02952-273
91	BSNL	Udaipur	Rajsamand	KKR J.K.GRAM	RURAL	UPRJKG	02952-232
92	BSNL	Udaipur	Gogunda	Nandeshma	RURAL	UPRNSM	02956-288,289
93	BSNL	Udaipur	Gogunda	Semad	RURAL	UPRSMD	02956-285
94	BSNL	Udaipur	Gogunda	Bhanpura	RURAL	UPRBNP	02956-
95	BSNL	Udaipur	Gogunda	Gogunda SDCC	RURAL	UPRGGD	02956-282
96	BSNL	Udaipur	Salumber	Bhabrana	RURAL	UPRBRN	02906-237
97	BSNL	Udaipur	Salumber	Intali Khera	RURAL	UPRITK	02906-2216
98	BSNL	Udaipur	Salumber	Gingla	RURAL	UPRGGL	02906-221
99	BSNL	Udaipur	Salumber	Salumber SDCC	RURAL	UPRSLB	02906-232, 233
100	BSNL	Udaipur	Sarada	Semari	RURAL	UPRSMR	02905-263
101	BSNL	Udaipur	Sarada	Prasad	RURAL	UPRPRD	02905-2684
102	BSNL	Udaipur	Sarada	Jhadol (S)	RURAL	UPRJDL	02905-2675, 2678
103	BSNL	Udaipur	Sarada	Jawad	RURAL	UPRJWD	02905-2672, 2673
104	BSNL	Udaipur	Kherwara	Nayagaon	RURAL	UPRNYG	02907-240
105	BSNL	Udaipur	Kherwara	Bawalwara	RURAL	UPRBLW	02907-251
106	BSNL	Udaipur	Kherwara	Kalyanpur	RURAL	UPRKLP	02907-235
107	BSNL	Udaipur	Kherwara	Rikhabdeo	RURAL	UPRRKD	02907-230, 231
108	Bharti-Airtel	---	---	Jaipur	URBAN	---	---
109	RCL	---	---	DAKC, Mumbai	URBAN	---	---
110	Sistema Shayam	---	---	Jaipur	URBAN	---	---
111	TTL	---	---	Jaipur	URBAN	---	---
112	Vodafone	---	---	Jaipur	URBAN	---	---

PoPs covered for Broadband QoS audit in Rajasthan Circle -

Annex-2

S.NO	Service provider	SSA Name	SDCA	PoPs Location	Activity
1	BSNL	Bhilwara	Bhilwara	Bhilwara Main Ewsd	BB Audit
2	BSNL	Bhilwara	Mandal	Mandal	BB Audit
3	BSNL	Bhilwara	Banera	Banera	BB Audit
4	BSNL	Bhilwara	Shahpura	Shahpura	BB Audit
5	BSNL	Bhilwara	Mandalgarh	Mandalgarh	BB Audit
6	BSNL	Chittorgarh	Chittorgarh	Chittorgarh	BB Audit
7	BSNL	Chittorgarh	Kapasan	Kapasan	BB Audit
8	BSNL	Chittorgarh	Badi Sadri	ChhotiSadri	BB Audit
9	BSNL	Chittorgarh	Nimbahera	Nimbahera	BB Audit
10	BSNL	Chittorgarh	Pratapgarh	Pratapgarh	BB Audit
11	BSNL	Udaipur	Udaipur	UP Main C01	BB Audit
12	BSNL	Udaipur	Udaipur	UP KUM RSU-1	BB Audit
13	BSNL	Udaipur	Mavli	Fatehnagar SDCC	BB Audit
14	BSNL	Udaipur	Nathdwara	Nathdwara SDCC	BB Audit
15	BSNL	Udaipur	Rajsamand	KKR Main SDCC	BB Audit
16	BSNL	Udaipur	Vallabh Nagar	Bhinder	BB Audit
17	BSNL	Bhilwara	Asind	Badnore	BB Audit
18	BSNL	Bhilwara	Asind	Daulatgarh	BB Audit
19	BSNL	Bhilwara	Asind	Shamboogarh	BB Audit
20	BSNL	Bhilwara	Bhilwara	Hamirgarh	BB Audit
21	BSNL	Bhilwara	Bhilwara	Mangrop	BB Audit
22	BSNL	Bhilwara	Bhilwara	Bhilwara C S Azadnagar	BB Audit
23	BSNL	Bhilwara	Mandal	Bagore	BB Audit
24	BSNL	Bhilwara	Mandal	Bhagwanpura	BB Audit
25	BSNL	Bhilwara	Mandal	Rajajikakrera	BB Audit
26	BSNL	Bhilwara	Banera	Banera	BB Audit
27	BSNL	Bhilwara	Banera	Raila Road	BB Audit
28	BSNL	Bhilwara	Banera	Dabla	BB Audit
29	BSNL	Bhilwara	Shahpura	Phulia Kalan	BB Audit
30	BSNL	Bhilwara	Shahpura	Dhikola	BB Audit
31	BSNL	Bhilwara	Shahpura	Sangaria	BB Audit
32	BSNL	Bhilwara	Mandalgarh	Bigod	BB Audit
33	BSNL	Bhilwara	Mandalgarh	Kachhola	BB Audit
34	BSNL	Bhilwara	Mandalgarh	Singoli	BB Audit
35	BSNL	Bhilwara	Kotri	Nandrai	BB Audit
36	BSNL	Bhilwara	Kotri	Badliyas	BB Audit
37	BSNL	Bhilwara	Kotri	Paroli	BB Audit
38	BSNL	Bhilwara	Jahazpur	Pander	BB Audit

S.NO	Service provider	SSA Name	SDCA	PoPs Location	Activity
39	BSNL	Bhilwara	Jahazpur	Shakargarh	BB Audit
40	BSNL	Bhilwara	Jahazpur	Piplund	BB Audit
41	BSNL	Chittorgarh	Chittorgarh	Shambhupura	BB Audit
42	BSNL	Chittorgarh	Chittorgarh	Bijaypur	BB Audit
43	BSNL	Chittorgarh	Chittorgarh	Ghosunda	BB Audit
44	BSNL	Chittorgarh	Kapasan	Bhoopalsagar	BB Audit
45	BSNL	Chittorgarh	Kapasan	Singhpur	BB Audit
46	BSNL	Chittorgarh	Kapasan	Danta	BB Audit
47	BSNL	Chittorgarh	Badi Sadri	Bansibohera	BB Audit
48	BSNL	Chittorgarh	Badi Sadri	Kesunda	BB Audit
49	BSNL	Chittorgarh	Badi Sadri	Nikumbh	BB Audit
50	BSNL	Chittorgarh	Nimbahera	Kanera	BB Audit
51	BSNL	Chittorgarh	Nimbahera	Wonder Cement	BB Audit
52	BSNL	Chittorgarh	Nimbahera	Bari	BB Audit
53	BSNL	Chittorgarh	Begun	Chenchi	BB Audit
54	BSNL	Chittorgarh	Begun	Nandwai	BB Audit
55	BSNL	Chittorgarh	Begun	Parasoli	BB Audit
56	BSNL	Chittorgarh	Rashmi	Dindoli	BB Audit
57	BSNL	Chittorgarh	Rashmi	Pahuna	BB Audit
58	BSNL	Chittorgarh	Rashmi	Roodh	BB Audit
59	BSNL	Chittorgarh	Dungla	Bhadsora	BB Audit
60	BSNL	Chittorgarh	Dungla	Bhadesar	BB Audit
61	BSNL	Chittorgarh	Dungla	Mangalwar	BB Audit
62	BSNL	Chittorgarh	Pratapgarh	Baravarda	BB Audit
63	BSNL	Chittorgarh	Pratapgarh	Dhamotar	BB Audit
64	BSNL	Chittorgarh	Pratapgarh	Suhagpura	BB Audit
65	BSNL	Udaipur	Udaipur	Bambora	BB Audit
66	BSNL	Udaipur	Udaipur	Chirwa	BB Audit
67	BSNL	Udaipur	Udaipur	Kurabar	BB Audit
68	BSNL	Udaipur	Udaipur	Lakarwas	BB Audit
69	BSNL	Udaipur	Udaipur	Nai	BB Audit
70	BSNL	Udaipur	Udaipur	UPR Kaladwas	BB Audit
71	BSNL	Udaipur	Udaipur	HZL Debari	BB Audit
72	BSNL	Udaipur	Udaipur	Madar	BB Audit
73	BSNL	Udaipur	Mavli	Chandesara	BB Audit
74	BSNL	Udaipur	Mavli	Ghasa	BB Audit
75	BSNL	Udaipur	Mavli	Thamla	BB Audit
76	BSNL	Udaipur	Mavli	Sakroda	BB Audit
77	BSNL	Udaipur	Vallabhnagar	Bhatewar	BB Audit
78	BSNL	Udaipur	Vallabhnagar	Rundera	BB Audit
79	BSNL	Udaipur	Vallabhnagar	Wana	BB Audit

S.NO	Service provider	SSA Name	SDCA	PoPs Location	Activity
80	BSNL	Udaipur	Vallabh Nagar	BathardaKalan	BB Audit
81	BSNL	Udaipur	Kotra	Kotra SDCC	BB Audit
82	BSNL	Udaipur	Kotra	Was	BB Audit
83	BSNL	Udaipur	Nathdwara	Delwara	BB Audit
84	BSNL	Udaipur	Nathdwara	Khamnore	BB Audit
85	BSNL	Udaipur	Nathdwara	Namana	BB Audit
86	BSNL	Udaipur	Nathdwara	Gaongurha	BB Audit
87	BSNL	Udaipur	Rajsamand	Gilund	BB Audit
88	BSNL	Udaipur	Rajsamand	Kuraj	BB Audit
89	BSNL	Udaipur	Rajsamand	Mohi	BB Audit
90	BSNL	Udaipur	Rajsamand	Binol	BB Audit
91	BSNL	Udaipur	Rajsamand	KKR J.K.GRAM	BB Audit
92	BSNL	Udaipur	Gogunda	Nandeshma	BB Audit
93	BSNL	Udaipur	Gogunda	Semad	BB Audit
94	BSNL	Udaipur	Gogunda	Bhanpura	BB Audit
95	BSNL	Udaipur	Gogunda	Gogunda SDCC	BB Audit
96	BSNL	Udaipur	Salumber	Bhabrana	BB Audit
97	BSNL	Udaipur	Salumber	Intali Khera	BB Audit
98	BSNL	Udaipur	Salumber	Gingla	BB Audit
99	BSNL	Udaipur	Salumber	Salumber SDCC	BB Audit
100	BSNL	Udaipur	Sarada	Semari	BB Audit
101	BSNL	Udaipur	Sarada	Prasad	BB Audit
102	BSNL	Udaipur	Sarada	Jhadol (S)	BB Audit
103	BSNL	Udaipur	Sarada	Jawad	BB Audit
104	BSNL	Udaipur	Kherwara	Nayagaon	BB Audit
105	BSNL	Udaipur	Kherwara	Bawalwara	BB Audit
106	BSNL	Udaipur	Kherwara	Kalyanpur	BB Audit
107	BSNL	Udaipur	Kherwara	Rikhabdeo	BB Audit
108	BHARTI AIRTEL LIMITED	---	---	Jaipur	BB Audit
109	D-VOIS BROADBAND	---	---	Jaipur	BB Audit
110	FIVE-NETWORKS	---	---	Sadul Sahar	BB Audit
111	NSTPL	---	---	Dausa	BB Audit
112	BROADBAND PACENET INDIA PVT. LTD	---	---	Jaipur	BB Audit
113	RELIANCE COMMUNICATION LIMITED (RCL)	---	---	DAKC, Mumbai	BB Audit
114	MTS	---	---	Jaipur	BB Audit
115	TATA TELE SERVICES LIMITED (TTSL)	---	---	Jaipur	BB Audit
116	TATA COMMUNICATION LIMITED (TCL)	---	---	Jaipur	BB Audit
117	TIKONA	---	---	Jaipur	BB Audit