



**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 – Himachal Pradesh Service Area
(January 2015 – March 2015)**

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

PREFACE

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

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

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

Table of Contents

1.	BACKGROUND.....	6
2.	OBJECTIVES AND METHODOLOGY.....	9
3.	SAMPLE SIZE.....	11
	3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS	11
	3.2 SAMPLING FOR BASIC (WIRELIN) SERVICES.....	12
	3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS	12
4.	EXECUTIVE SUMMARY	14
5.	PMR AUDIT REPORTS:	17
	5.1 MONTHLY PMR:.....	17
	5.1.1 BUSY HOUR OF VARIOUS SERVICE PROVIDERS:	17
	5.1.2 SWITCHES/BSC/BTS DETAILS OF SERVICE PROVIDERS:	17
	5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JANUARY 15 MONTH:.....	18
	5.1.4 QOS PERFORMANCE OF MONTHLY PMR – FEBRUARY 15 MONTH:	19
	5.1.5 QOS PERFORMANCE OF MONTHLY PMR – MARCH 15 MONTH:.....	20
	5.1.6 QOS PERFORMANCE OF QUARTERLY PMR –AVERAGE OF QE- MARCH 15 (JANUARY TO MARCH 2015 MONTHS AUDITED DATA)	21
	5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:.....	22
	5.2 LIVE MEASUREMENT DATA (3-DAYS) FOR CELLULAR MOBILE SERVICE PROVIDERS (NETWORK SERVICE QUALITY PARAMETER):.....	25
	5.2.1 LIVE MEASUREMENT DATA (3-DAYS) – JANUARY 15 MONTH:.....	25
	5.2.2 LIVE MEASUREMENT DATA (3-DAYS) – FEBRUARY 15 MONTH:	26
	5.2.3 LIVE MEASUREMENT DATA (3-DAYS) – MARCH 15 MONTH:.....	27
	5.2.4 QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT AUDITED DATA (AVERAGE OF JANUARY TO MARCH 2015)	28
	5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:.....	28
	5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:.....	29
	5.3 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT FOR CMTS-QE MAR- 15:.....	36
	5.3.1 QUARTERLY CUSTOMER SERVICE DELIVERY (CSD) AUDITED DATA FOR CELLULAR MOBILE SERVICES (JANUARY TO MARCH 2015 MONTHS AUDITED DATA):	36
	5.3.2 3 DAYS LIVE CSD AUDITED DATA FOR CELLULAR MOBILE SERVICES (QE – MARCH 2015):.....	38
	5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS	39
6.	LIVE CALLING ASSESSMENT:.....	41
	6.1 INTER OPERATOR CALLS ASSESSMENT:	41

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:	42
6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:	42
6.4 LEVEL -1 CALLING ASSESSMENT:	43
7. OPERATOR ASSISTED DRIVE TEST	45
7.1 OPERATOR ASSISTED DRIVE TEST: KANGRA (DHARAMSALA) SSA (JANUARY-15)...	46
7.2 OPERATOR ASSISTED DRIVE TEST: SHIMLA SSA (FEBRUARY-15).....	49
7.3 OPERATOR ASSISTED DRIVE TEST: MANDI SSA (MARCH-15)	52
7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:	55
7.5 SSA WISE DRIVE TEST OBSERVATION:	57
7.6 KEY FINDINGS ON DRIVE TEST:.....	62
8. GRAPHICAL REPRESENTATION (CMTS):.....	64
9. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINE)	69
9.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON QUARTERLY MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:	70
9.2. SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS LIVE MEASUREMENT DATA VERIFICATION FOR BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:	71
9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRELINE).....	72
9.4 INTER OPERATOR CALL ASSESSMENT (WIRELINE).....	73
9.5 LEVEL-1 LIVE CALLING (WIRELINE).....	73
9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRELINE SERVICES)	74
9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:	76
9.8 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:.....	80
10. QUALITY OF SERVICE AUDIT OF BROADBAND SERVICE PROVIDERS.....	82
10.1 QUARTERLY MEASURMENT DATA FOR BROADBAND SERVICE PROVIDERS	83
10.2 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3 DAYS MEASUREMENT DATA VERIFICATION FOR BROADBAND SERVICE PROVIDERS:	86
10.3 KEY FINDINGS: BROADBAND SERVICES	88
10.4 CUSTOMER CARE / HELPLINE ASSESSMENT	89
10.5 LIVE CALLING FOR BILLING COMPLIANTS	89
10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:	91
10.7 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BROADBAND SERVICE PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:	94



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

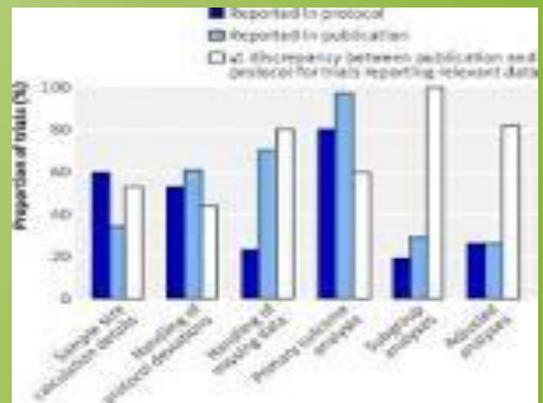
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

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 Himanchal Pradesh, J&K and Maharashtra & Goa circles during the quarter January 2015 – March 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 are the various operators covered in Himachal Pradesh circle

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location/Address
		January-15	February-15	March-15	
GSM Operators					
1	AIRCEL	7 to 9 Jan-15	11 to 13 Feb-15	9 to 11 Mar-15	3rd Floor Keothal Complex Khalini Shimla.
2	AIRTEL	13 to 15 Jan-15	9 to 11 Feb-15	16 to 18 Mar-15	Bharti Airtel Campus, Plot No 21, Rajiv Gandhi Information and Technology Park, Chandigarh, 160101
3	BSNL	15 to 17 Jan-15	5 to 7 Feb-15	12 to 14 Mar-15	BSNL Shimla
4	IDEA	15, 16 & 19 Jan-15	5, 6 & 9 Feb-15	16 to 18 Mar-15	Idea Cellular Limited, Phase -7 Industrial Area, Mohali
5	RCOM GSM	8, 9 & 12 Jan-15	5, 6 & 9 Feb-15	18 to 20 Mar-15	Reliance Communications Ltd., Phase-8, Industrial Area, Mohali
6	TATA GSM	9, 12 & 13 Jan-15	9 to 11 Feb-15	16 to 18 Mar-15	Tata Teleservices Ltd Charu sood Building Chota Shimla, Kasumpti
7	VODAFONE	5 to 7 Jan-15	2 to 4 Feb-15	2 to 4 Mar-15	130 durga cottage SDA complex Kasumpti Shimla
CDMA Operators					
8	RCOM CDMA	8, 9 & 12 Jan-15	5, 6 & 9 Feb-15	18 to 20 Mar-15	Reliance Communications Ltd., Phase-8, Industrial Area, Mohali
9	TATA CDMA	9, 12 & 13 Jan-15	9 to 11 Feb-15	16 to 18 Mar-15	Tata Teleservices Ltd Charu sood Building Chota Shimla, Kasumpti

For all the above operators, audit was conducted in all the three months of the Quarter ended March 2015.

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

3.2 SAMPLING FOR BASIC (WIRELIN) SERVICES

- The QoS audit for basic (wireline) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. **The following Basic Service providers in HP circle were audited in quarter ended March 2015.**

Sl. No.	Name of Basic (Wireline)Service Provider
1	BSNL
2	RCL

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV–SUD South Asia had to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who were having broadband subscriber base of more than 10,000 subscribers in their licensed service area. The following Service providers in **HP Circle**, providing broadband service were audited for their quality of service assessment.

Sl. No.	Name of Broadband Service Provider
1	BSNL
2	NSTPL
3	BROADBAND PACENET INDIA PVT. LTD
4	RELIANCE COMMUNICATION LIMITED (RCL)

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

(i) From monthly PMR audit it was concluded that on an average, performance of the operators in the Himachal Pradesh service area was satisfactory for Network related Parameters. However, the audit with respect to the parameter **‘Worst affected cell> 3% TCH Drop’** revealed that quarterly average performance of **Aircel, Tata (GSM)** and **Tata (CDMA)** was **11.04%** , **15.96%** and **3.35%**, which was way beyond the benchmark. In fact, Tata (GSM) was having only five sites with 15 cells resulting in poor performance, remaining network was on ICR with other service provider (RCOM-GSM).

(ii) The three days live assessment, revealed that the performance of all operators (except **BSNL, Aircel** and **Tata GSM**) was within the benchmarks for all the three months of the quarter. **BSNL** failed to meet the benchmarks of the parameter **‘TCH congestion’**, whereas **Aircel** and **Tata (GSM)** could not meet the benchmark of the parameter **‘Worst affected cells> 3 % TCH drops’**. The quarterly average performance of **BSNL** for parameters **TCH congestion** was **2.39%**. Further, in respect of parameter **‘Worst affected cells> 3 % TCH drops’**, average performance of **Aircel** and **Tata (GSM)** was **10.67%** and **18.52%**, way beyond the benchmark of <3%.

Similar non-compliance of **Aircel** and **Tata (GSM)** was also observed during monthly audit.

(iii) With regard to the **Customer Service Quality Parameters**, all service providers were in compliance with most of the parameters. However, **BSNL and RCOM (GSM)** have not met the benchmark of '**calls answered by Operators (voice to voice) within 90 seconds**' with their achieved performance as **65.45% and 92.43%** respectively. The performance of BSNL was way below the benchmark of >95%.

In case of live measurements also, **BSNL and RCOM (GSM)** have not met the benchmark of '**calls answered by Operators (voice to voice) within 90 seconds**' with their performance as **22.71% and 82.95%** against the benchmark of >=95%.

(iv) The performance of the service providers with respect to drive test revealed that **BSNL and Tata (GSM)** remained under performed in respect of parameters **Voice Quality** and **Call drop rate**. The defaulting Service providers need to take corrective actions to improve their network quality

(2) Basic (Wireline) service:

From the audit of Basic Service providers, it was concluded that the performance of **BSNL** was not satisfactory in respect of the parameters **Fault Repairs/Restoration Time, MTTR, Response time to customer for assistance and Termination / Closures**. Hence, BSNL need to improve their services in respect of these parameters.

(3) Broadband service:

The performance of all Broadband service providers was found well within the benchmarks except **BSNL** could not meet the benchmark of **Fault repaired by next working day** with its achieved level as **84.59%** against the benchmark of >90%.

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	March-15	20:00 - 21:00
2	AIRTEL	March-15	19:00 - 20:00
3	BSNL	March-15	19:00 - 20:00
4	IDEA	March-15	20:00 - 21:00
5	VODAFONE	March-15	20:00 - 21:00
6	RCOM GSM	March-15	20:00 - 21:00
7	TATA GSM	March-15	19:00 - 20:00
CDMA Operators			
8	RCOM CDMA	March-15	20:00 - 21:00
9	TATA CDMA	March-15	12:00 - 13:00

The TCBH reported by all the service providers matched the network busy hour calculated by TUV auditors for the Himachal Pradesh 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	1	8	662	Ericsson	Ericsson
2	AIRTEL	6	17	1465	Ericsson	Ericsson
3	BSNL	5	18	1189	Ericsson	Ericsson, NSN & ZTE
4	VODAFONE	1	9	810	NSN	NSN
5	IDEA	2	7	952	Ericsson	Ericsson
6	RCOM GSM	2	12	751	Huawei & Ericsson	ZTE
7	TATA GSM	1	1	5	NSN	NSN
CDMA Operators						
8	RCOM CDMA	1	NA	282	Lucent	Lucent
9	TATA CDMA	1	1	130	Ericsson	ZTE

5.1.3 QOS PERFORMANCE OF MONTHLY PMR – JANUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HIMACHAL PRADESH CIRCLE - JANUARY 15 MONTH												
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Jan-15	0.27%	0.05%	1.60%	0.03%	0.04%	0.13%	0.00%	0.06%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Jan-15	1.51%	0.14%	1.96%	0.00%	0.00%	0.27%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	99.27%	99.13%	98.33%	97.64%	98.83%	98.63%	98.67%	99.08%	98.20%
	b) SDCCH/PAGING Channel congestion	<=1%	Jan-15	0.06%	0.14%	0.61%	0.01%	0.09%	0.03%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.50%	0.13%	1.67%	0.08%	0.47%	0.02%	0.07%	0.00%	0.17%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Jan-15	1.27%	0.50%	1.46%	0.58%	1.36%	0.68%	1.29%	0.05%	0.17%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jan-15	10.64%	1.40%	2.71%	2.35%	2.49%	0.04%	15.86%	0.19%	1.59%
	c) Connections with good voice quality	>=95%	Jan-15	95.38%	98.79%	NP	98.00%	96.05%	98.09%	97.60%	99.78%	98.10%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Jan-15	0	0	0	0	0	0	0	0	0

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

5.1.4 QOS PERFORMANCE OF MONTHLY PMR – FEBRUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HIMACHAL PRADESH CIRCLE – FEBRUARY 15 MONTH												
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Feb-15	0.32%	0.05%	1.70%	0.19%	0.07%	0.23%	0.00%	0.22%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Feb-15	1.51%	0.07%	1.44%	1.24%	0.00%	0.53%	0.00%	0.35%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	98.97%	99.11%	98.15%	97.53%	98.82%	98.54%	98.47%	99.11%	98.44%
	b) SDCCH/PAGING Channel congestion	<=1%	Feb-15	0.07%	0.09%	0.71%	0.01%	0.16%	0.04%	0.02%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-15	0.82%	0.15%	1.65%	0.16%	0.48%	0.03%	0.00%	0.00%	0.05%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Feb-15	1.22%	0.50%	1.60%	0.58%	1.30%	0.68%	1.43%	0.06%	0.15%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Feb-15	11.14%	1.39%	2.88%	2.24%	2.49%	0.08%	17.62%	0.21%	1.20%
	c) Connections with good voice quality	>=95%	Feb-15	95.40%	98.85%	NP	97.99%	96.02%	98.08%	97.88%	99.78%	98.17%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Feb-15	0	0	0	0	0	0	0	0	0

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

5.1.5 QOS PERFORMANCE OF MONTHLY PMR – MARCH 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HIMACHAL PRADESH CIRCLE – MARCH 15 MONTH												
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators							CDMA Operators	
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Mar-15	0.44%	0.05%	1.57%	0.33%	0.11%	0.24%	0.00%	0.34%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Mar-15	1.36%	0.07%	1.93%	2.10%	0.00%	0.53%	0.00%	0.71%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	99.06%	99.10%	98.41%	97.60%	98.17%	98.58%	98.43%	99.15%	97.54%
	b) SDCCH/PAGING Channel congestion	<=1%	Mar-15	0.60%	0.09%	0.48%	0.05%	0.38%	0.04%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-15	0.75%	0.19%	1.59%	0.26%	0.90%	0.05%	0.00%	0.00%	0.46%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Mar-15	1.20%	0.45%	1.50%	0.64%	1.41%	0.67%	1.12%	0.07%	0.52%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Mar-15	11.35%	1.19%	2.93%	2.23%	2.44%	0.07%	14.41%	0.19%	7.25%
	c) Connections with good voice quality	>=95%	Mar-15	95.44%	98.88%	NP	97.94%	96.03%	98.12%	97.40%	99.78%	98.18%
4	No. of POI's having >=0.5% POI congestion	<=0.5%	Mar-15	0	0	0	0	0	0	0	0	0

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

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

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-MARCH-15) OF HIMACHAL PRADESH CIRCLE												
PMR Generation Data		Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
	Network Service Quality Parameter											
1	Network Availability											
	a) BTS Accumulated Downtime	<=2%	Quarterly	0.34%	0.05%	1.62%	0.18%	0.07%	0.20%	0.00%	0.21%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	1.46%	0.09%	1.78%	1.11%	0.00%	0.44%	0.00%	0.35%	0.00%
2	Connection Establishment (Accessibility)											
	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.10%	99.11%	98.30%	97.59%	98.61%	98.58%	98.52%	99.11%	98.06%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.24%	0.11%	0.60%	0.02%	0.21%	0.04%	0.01%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.69%	0.16%	1.64%	0.17%	0.62%	0.03%	0.02%	0.00%	0.23%
3	Connection maintenance (Retainability)											
	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.23%	0.48%	1.52%	0.60%	1.36%	0.68%	1.28%	0.06%	0.28%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	11.04%	1.33%	2.84%	2.27%	2.47%	0.06%	15.96%	0.20%	3.35%
	c) Connections with good voice quality	>=95%	Quarterly	95.41%	98.84%	NP	97.98%	96.03%	98.10%	97.63%	99.78%	98.15%
4	No. of POI's having >=0.5% POI congestion											
		<=0.5%	Quarterly	0	0	0	0	0	0	0	0	0

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

5.1.7 KEY FINDINGS ON MONTHLY PMR AUDIT REPORTS:

The audit 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 Himachal Pradesh circle, **all the operators were found meeting benchmarks** of the above parameters 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter. Only **Vodafone (2.10%)** failed to meet the benchmark of the parameter 'Worst affected BTSs due to down time' in the month of March- 2015. However, its average performance for the quarter was within the benchmark.

- **Connection Establishment (Accessibility)**

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

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

All the operators were found meeting the benchmark on this parameter.

- **Parameters related to Network Congestion:**

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

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

With respect to this parameter, the performance of the operators is quite satisfactory as **all operators met the TRAI specified benchmarks on the congestion parameters.** There was no congestion on individual POI links between a service provider vis-à-vis other service providers.

- **Connection Maintenance (Retainability)**

- i. Call Drop Rate:

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

The audit of this parameter revealed that all the service providers were measuring this parameter as per the TRAI guidelines. Also, **all the service providers were found to be meeting the TRAI specified benchmark**. The lowest call drop rate (average 0.06 %) 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 (except **Aircel, Tata GSM and Tata CDMA**) met the benchmark for this parameter in all the three months of the quarter. The performance of **Aircel, Tata (GSM) and Tata (CDMA)** on an average for three months was **11.04, 15.96% and 3.35%** respectively, which was way beyond the benchmark. In fact, Tata (GSM) is having only five sites with 15 cells which are resulting in poor performance, remaining network are on ICR with other service provider (RCOM-GSM).

- (iii) Connections with good voice quality:

The audit results for this parameter indicates that **all operators have met the benchmark during the quarter**. BSNL has not provided the data for this parameter as they are not able to fetch the system generated data.

**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) – JANUARY 15 MONTH:

CELLULAR MOBILE TELEPHONE SERVICES HIMACHAL PRADESH CIRCLE - JANUARY 15 MONTH												
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Live data	0.34%	0.02%	1.47%	0.01%	0.05%	0.11%	0.00%	0.02%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.16%	98.98%	97.70%	97.75%	98.68%	98.58%	98.30%	99.11%	98.76%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.02%	0.26%	0.67%	0.00%	0.07%	0.02%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.65%	0.16%	2.30%	0.04%	0.65%	0.02%	0.00%	0.00%	0.02%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.17%	0.49%	1.15%	0.60%	1.32%	0.66%	2.08%	0.07%	0.22%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	10.59%	1.24%	2.89%	2.33%	2.66%	0.06%	17.78%	0.12%	1.33%
	c) Connections with good voice quality	>=95%	Live data	95.40%	98.78%	NP	98.02%	95.88%	98.08%	96.90%	99.78%	98.16%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES HIMACHAL PRADESH CIRCLE- FEBRUARY 15 MONTH												
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Live data	0.39%	0.02%	1.70%	0.06%	0.03%	0.17%	0.00%	0.12%	0.00%
	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%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.51%	99.19%	97.47%	97.34%	98.72%	98.65%	99.54%	99.22%	98.75%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.06%	0.07%	0.65%	0.02%	0.17%	0.02%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.29%	0.13%	2.53%	0.24%	0.61%	0.02%	0.00%	0.00%	0.04%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.23%	0.47%	1.99%	0.55%	1.33%	0.64%	0.80%	0.05%	0.13%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	10.93%	1.24%	2.84%	2.25%	2.35%	0.00%	22.22%	0.36%	0.95%
	c) Connections with good voice quality	>=95%	Live data	95.50%	98.85%	NP	98.03%	95.97%	98.07%	98.22%	99.78%	98.18%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0

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

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

CELLULAR MOBILE TELEPHONE SERVICES HIMACHAL PRADESH CIRCLE- MARCH 15 MONTH												
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Live data	0.24%	0.05%	1.76%	0.78%	0.26%	0.11%	0.00%	0.35%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.34%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.36%	99.31%	97.67%	97.05%	98.26%	98.58%	98.17%	99.18%	98.43%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.03%	0.02%	0.47%	0.05%	0.33%	0.03%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.45%	0.11%	2.33%	0.78%	0.88%	0.05%	0.00%	0.01%	0.27%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Live data	1.15%	0.41%	2.62%	0.63%	1.51%	0.65%	1.57%	0.06%	0.47%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	10.50%	1.08%	2.94%	2.45%	2.55%	0.00%	15.56%	0.12%	NP
	c) Connections with good voice quality	>=95%	Live data	95.49%	98.89%	NP	97.87%	95.91%	98.08%	97.29%	99.78%	98.21%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0

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

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

QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE – MAR 15) – HP CIRCLE												
Live measurement Data		Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
S/N	Name of Parameter			GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.32%	0.03%	1.64%	0.28%	0.11%	0.13%	0.00%	0.16%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.00%	0.00%	0.26%	0.25%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.34%	99.16%	97.61%	97.38%	98.55%	98.60%	98.67%	99.17%	98.65%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.04%	0.12%	0.60%	0.02%	0.19%	0.02%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.46%	0.13%	2.39%	0.35%	0.71%	0.03%	0.00%	0.00%	0.11%
Connection maintenance (Retainability)												
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	1.18%	0.46%	1.92%	0.59%	1.39%	0.65%	1.48%	0.06%	0.27%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	10.67%	1.19%	2.89%	2.34%	2.52%	0.02%	18.52%	0.20%	1.14%
	c) Connections with good voice quality	>=95%	Quarterly	95.46%	98.84%	NP	97.97%	95.92%	98.08%	97.47%	99.78%	98.18%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	0	0	0	0	0	0

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

5.2.5 KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

The three days live assessment, revealed that the performance of all operators (except **BSNL, Aircel** and **Tata GSM**) was within the benchmarks for all the three months of the quarter. **BSNL** failed to meet the benchmarks of the parameter 'TCH congestion', whereas **Aircel** and **Tata (GSM)** could not meet the benchmark of the parameter **Worst affected cells> 3 % TCH drops**. The average performance of **BSNL** for three months of quarter for parameters **TCH congestion** was **2.39%**. Further, in respect of parameter '**Worst affected cells> 3 % TCH drops**', average performance of **Aircel** and **Tata (GSM)** was **10.67%** and **18.52%**, way beyond the benchmark of <3%. **Tata (GSM)** and **BSNL** also failed to meet the benchmark of **CDR** in the month of January and March -15 with their performance as **2.08%** and **2.68%** respectively, however their quarterly average performance on this parameter was within the limit. .

Similar non-compliance of **Aircel** and **Tata (GSM)** was also observed during monthly audit.

5.2.6 DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Himachal Pradesh Circle- January 15 month												
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) Total no. of BTSs in the licensed service area		Jan-15	662	1456	1174	798	944	752	5	282	131
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Jan-15	1345.65	498.99	14006.08	172.22	274.93	754.05	0	120.97	4.69
	c) BTS Accumulated Downtime	<=2%	Jan-15	0.27%	0.05%	1.60%	0.03%	0.04%	0.13%	0.00%	0.06%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jan-15	10	2	23	0	0	2	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Jan-15	1.51%	0.14%	1.96%	0.00%	0.00%	0.27%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-15	99.27%	99.13%	98.33%	97.64%	98.83%	98.63%	98.67%	99.08%	98.20%
	b) SDCCH/PAGING Congestion	<=1%	Jan-15	0.06%	0.14%	0.61%	0.01%	0.09%	0.03%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-15	0.50%	0.13%	1.67%	0.08%	0.47%	0.02%	0.07%	0.00%	0.17%
Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Jan-15	1.27%	0.50%	1.46%	0.58%	1.36%	0.68%	1.29%	0.05%	0.17%
	b) Worst affected cells>3% TCH drop	<=3%	Jan-15	10.64%	1.40%	2.71%	2.35%	2.49%	0.04%	15.86%	0.19%	1.59%
	c) % of connections with good voice quality	>=95%	Jan-15	95.38%	98.79%	NP	98.00%	96.05%	98.09%	97.60%	99.78%	98.10%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jan-15	210	59	91	57	70	1	2	2	7
	e) Total no. of cells (Sector) in the licensed service area		Jan-15	1974	4235	3371	2404	2816	2253	15	845	426
No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Jan-15	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jan-15	0	0	0	0	0	0	0	0	0
Network Data												
5	a) Equipped Capacity of Network in Erlang		Jan-15	32774	63458	74000	17725	36095	40000	165	28000	17466
	b) Total traffic in TCBH in erlang (Avg.)		Jan-15	12724	51237	30194	12104	15567	26589	6	2427	1892
	c) Total no. of customers served (as per VLR) on last day of the month		Jan-15	526152	2521047	1109140	523357	689597	1295118	581	94907	24760

TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurement - HP Circle- Jan 15 month												
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) Total no. of BTSs in the licensed service area		Live data	662	1456	1159	790	942	752	5	282	131
	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	160.10	24.76	1227.50	2.88	31.17	59.45	0.00	4.05	0.00
	c) BTS Accumulated Downtime	<=2%	Live data	0.34%	0.02%	1.47%	0.01%	0.05%	0.11%	0.00%	0.02%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	3	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.26%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.16%	98.98%	97.70%	97.75%	98.68%	98.58%	98.30%	99.11%	98.76%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.26%	0.67%	0.00%	0.07%	0.02%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.65%	0.16%	2.30%	0.04%	0.65%	0.02%	0.00%	0.00%	0.02%
Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.17%	0.49%	1.15%	0.60%	1.32%	0.66%	2.08%	0.07%	0.22%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	10.59%	1.24%	2.89%	2.33%	2.66%	0.06%	17.78%	0.12%	1.33%
	c) % of connections with good voice quality	>=95%	Live data	95.40%	98.78%	NP	98.02%	95.88%	98.08%	96.90%	99.78%	98.16%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	209	53	97	56	75	1	3	1	6
	e) Total no. of cells (Sector) in the licensed service area		Live data	1974	4262	3357	2402	2817	2253	15	845	426
No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0

TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Himachal Pradesh Circle - Feb 15 month												
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) Total no. of BTSs in the licensed service area		Feb-15	662	1462	1179	805	944	751	5	282	130
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Feb-15	1411.02	468.06	13475.13	1015.39	429.47	1147.83	0	418.03	5.26
	c) BTS Accumulated Downtime	<=2%	Feb-15	0.32%	0.05%	1.70%	0.19%	0.07%	0.23%	0.00%	0.22%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Feb-15	10	1	17	10	0	4	0	1	0
	e) Worst affected BTSs due to downtime	<=2%	Feb-15	1.51%	0.07%	1.44%	1.24%	0.00%	0.53%	0.00%	0.35%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-15	98.97%	99.11%	98.15%	97.53%	98.82%	98.54%	98.47%	99.11%	98.44%
	b) SDCCH/PAGING Congestion	<=1%	Feb-15	0.07%	0.09%	0.71%	0.01%	0.16%	0.04%	0.02%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-15	0.82%	0.15%	1.65%	0.16%	0.48%	0.03%	0.00%	0.00%	0.05%
Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Feb-15	1.22%	0.50%	1.60%	0.58%	1.30%	0.68%	1.43%	0.06%	0.15%
	b) Worst affected cells>3% TCH drop	<=3%	Feb-15	11.14%	1.39%	2.88%	2.24%	2.49%	0.08%	17.62%	0.21%	1.20%
	c) % of connections with good voice quality	>=95%	Feb-15	95.40%	98.85%	NP	97.99%	96.02%	98.08%	97.88%	99.78%	98.17%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Feb-15	220	59	98	55	70	2	3	2	5
	e) Total no. of cells (Sector) in the licensed service area		Feb-15	1974	4264	3389	2434	2825	2251	15	845	422
No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Feb-15	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Feb-15	0	0	0	0	0	0	0	0	0
Network Data												
5	a) Equipped Capacity of Network in Erlang		Feb-15	31303	62299	74000	17814	37502	40000	165	28000	17302
	b) Total traffic in TCBH in erlang (Avg.)		Feb-15	13699	55096	31064	13072	15789	27973	5	2684	2019
	c) Total no. of customers served (as per VLR) on last day of the month		Feb-15	544171	2318654	1080290	546064	722351	1275776	508	95031	25418

TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurement - HP Circle- Feb 15 month												
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) Total no. of BTSs in the licensed service area		Live data	662	1457	1174	798	944	752	5	282	390
	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	185.43	15.86	1439.22	36.76	20.75	94.47	0	24.75	0.47
	c) BTS Accumulated Downtime	<=2%	Live data	0.39%	0.02%	1.70%	0.06%	0.03%	0.17%	0.00%	0.12%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	2	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%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.51%	99.19%	97.47%	97.34%	98.72%	98.65%	99.54%	99.22%	98.75%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.06%	0.07%	0.65%	0.02%	0.17%	0.02%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.29%	0.13%	2.53%	0.24%	0.61%	0.02%	0.00%	0.00%	0.04%
Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.23%	0.47%	1.99%	0.55%	1.33%	0.64%	0.80%	0.05%	0.13%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	10.93%	1.24%	2.84%	2.25%	2.35%	0.00%	22.22%	0.36%	0.95%
	c) % of connections with good voice quality	>=95%	Live data	95.50%	98.85%	NP	98.03%	95.97%	98.07%	98.22%	99.78%	98.18%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	216	53	96	55	66	0	3	3	4
	e) Total no. of cells (Sector) in the licensed service area		Live data	1974	4271	3381	2429	2825	2253	15	845	422
No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0

TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Himachal Pradesh Circle- Mar 15 month												
S/N	Name of Parameter	Bench- mark	Audit Period	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) Total no. of BTSs in the licensed service area		Mar-15	662	1465	1189	810	952	751	5	282	130
	b) Sum of downtime of BTSs in a month in hours i.e. total outage time of all BTSs in hours during a month		Mar-15	2190.70	525.18	13897.27	1983.16	793.70	1344.08	0	708.05	9.35
	c) BTS Accumulated Downtime	<=2%	Mar-15	0.44%	0.05%	1.57%	0.33%	0.11%	0.24%	0.00%	0.34%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Mar-15	9	1	23	17	0	4	0	2	0
	e) Worst affected BTSs due to downtime	<=2%	Mar-15	1.36%	0.07%	1.93%	2.10%	0.00%	0.53%	0.00%	0.71%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-15	99.06%	99.10%	98.41%	97.60%	98.17%	98.58%	98.43%	99.15%	97.54%
	b) SDCCH/PAGING Congestion	<=1%	Mar-15	0.60%	0.09%	0.48%	0.05%	0.38%	0.04%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-15	0.75%	0.19%	1.59%	0.26%	0.90%	0.05%	0.00%	0.00%	0.46%
Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Mar-15	1.20%	0.45%	1.50%	0.64%	1.41%	0.67%	1.12%	0.07%	0.52%
	b) Worst affected cells>3% TCH drop	<=3%	Mar-15	11.35%	1.19%	2.93%	2.23%	2.44%	0.07%	14.41%	0.19%	7.25%
	c) % of connections with good voice quality	>=95%	Mar-15	95.44%	98.88%	NP	97.94%	96.03%	98.12%	97.40%	99.78%	98.18%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Mar-15	224	51	99	55	69	2	2	2	31
	e) Total no. of cells (Sector) in the licensed service area		Mar-15	1974	4280	3386	2451	2829	2250	15	845	422
No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Mar-15	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Mar-15	0	0	0	0	0	0	0	0	0
Network Data												
5	a) Equipped Capacity of Network in Erlang		Mar-15	28584	63636	74000	17627	37536	40000	165	28000	17302
	b) Total traffic in TCBH in erlang (Avg.)		Mar-15	14435	55891	31722	13760	15521	28470	5	2775	2030
	c) Total no. of customers served (as per VLR) on last day of the month		Mar-15	554766	2354972	1106022	565144	745894	1314691	13749	94372	25307

TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live measurement - HP Circle- Mar 15 month												
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRCEL	AIRTEL	BSNL	VODAFONE	IDEA	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
				GSM Operators						CDMA Operators		
Network Service Quality Parameter												
Network Availability												
1	a) Total no. of BTSs in the licensed service area		Live data	662	1459	1183	805	945	751	5	282	130
	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	114.90	48.60	1498.95	454.53	174.01	57.20	0.00	71.97	1.08
	c) BTS Accumulated Downtime	<=2%	Live data	0.24%	0.05%	1.76%	0.78%	0.26%	0.11%	0.00%	0.35%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	0	0	4	6	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.00%	0.00%	0.34%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)												
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.36%	99.31%	97.67%	97.05%	98.26%	98.58%	98.17%	99.18%	98.43%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.03%	0.02%	0.47%	0.05%	0.33%	0.03%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.45%	0.11%	2.33%	0.78%	0.88%	0.05%	0.00%	0.01%	0.27%
Connection Maintenance (Retainability)												
3	a) Call Drop Rate (CDR)	<=2%	Live data	1.15%	0.41%	2.62%	0.63%	1.51%	0.65%	1.57%	0.06%	0.47%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	10.50%	1.08%	2.94%	2.45%	2.55%	0.00%	15.56%	0.12%	NP
	c) % of connections with good voice quality	>=95%	Live data	95.49%	98.89%	NP	97.87%	95.91%	98.08%	97.29%	99.78%	98.21%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	207	46	100	60	72	0	2	1	NP
	e) Total no. of cells (Sector) in the licensed service area		Live data	1974	4274	3408	2450	2828	2250	15	845	422
No. of POI's having >=0.5% POI congestion												
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0

CUSTOMER SERVICE QUALITY (CSD) PARAMETERS



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

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

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE MARCH 15												
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators						CDMA Operators		
Customer Service Quality Parameters												
Metering & Billing Credibility -Post Paid												
1	A) No. of bills issued during the quarter		HP	4420	106418	145638	9457	21850	11777	33448	13096	13670
	B) No. of bills disputed including billing complaints during the quarter		HP	0	28	33	1	13	0	2	9	0
	C) % of billing complaints during the quarter	<= 0.1%	HP	0.00%	0.03%	0.02%	0.01%	0.06%	0.00%	0.01%	0.07%	0.00%
Metering & Billing Credibility -Pre Paid												
2	A) Total No. of Pre-paid customers at the end of the quarter		HP	971434	2334844	1343905	692610	1403985	58158	604062	168789	34399
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		HP	0	14	243	106	1248	0	213	93	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	HP	0.00%	0.001%	0.02%	0.02%	0.09%	0.000%	0.04%	0.06%	0.00%
Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints												
3	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		HP	0	42	276	445	1261	38	215	102	30
	B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		HP	0	42	276	445	1261	38	215	102	30
	C) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 6 weeks during the quarter		HP	0	42	276	445	1261	38	215	102	30
	D) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	>=98% within 4 weeks	HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	E) % of billing complaints (for post paid customer) / Charging /Credit/Validity (for Pre paid customer) resolved within 6 weeks	100% within 6 weeks	HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

QUARTERLY CSD DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE MARCH 15

Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators						CDMA Operators		
	F) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	HP	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		HP	2020763	597925	97518	1117747	3236186	14075	1213182	276179	852
	B) Total no. of calls successfully established to customer care/Call center.		HP	1988382	597925	97518	1107549	3202638	13956	1213182	272331	824
4	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	HP	98.40%	100.00%	100.00%	99.09%	98.96%	99.15%	100.00%	98.61%	96.71%
	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		HP	369389	1090612	500984	493411	770262	11112	347517	101873	6488
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		HP	358915	1053292	327903	487780	711917	10911	346970	98344	6438
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 Sec.*100 / Total call attempts)	>=95%	HP	97.16%	96.58%	65.45%	98.86%	92.43%	98.19%	99.84%	96.54%	99.23%
Termination/closure of service												
5	A) Total No. of requests for Termination / Closure of service received during the quarter		HP	29	207	943	176	13	160	94	18	198
	B) No. of requests for Termination /Closure of service complied within 7 days during the quarter		HP	29	207	943	176	13	160	94	18	198
	C) % of Termination/ Closure of service within 7 days	<=7days	HP	100.00%	100.00%	100.00%	100.00%	100.00%	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		HP	38	50	943	42	90	40	9	26	62
	B) No. of Payments/ Refunds Cleared during the quarter		HP	38	50	943	42	90	40	9	26	62
	C)Time taken for refunds of deposits after closures.	100% within 60 days	HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

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

CSD 3 DAYS LIVE DATA FOR CELLULAR MOBILE TELEPHONE SERVICES - QE-MARCH 15

3 days live CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
S/ N	Name of Parameter			GSM Operators						CDMA Operators		
Response time to customers for assistance												
1	A) Total no of calls attempted to customer care/Call center		HP	66568	20687	5192	37954	96146	489	42121	8783	489
	B) Total no. of calls successfully established to customer care/Call center.		HP	65954	20687	5192	37667	95147	486	42121	8685	486
	C) % Accessibility of Call centre /customer Care (Total calls successfully established *100/ Total call attempts)	>=95%	HP	99.08%	100.00%	100.00%	99.24%	98.96%	99.39%	100.00%	98.88%	99.39%
2	D) Total Calls reached to operator for Voice to Voice (Total call attempts)		HP	11468	34444	32763	14676	22013	375	12096	4055	208
	E) Total number of calls answered by the operator (Voice to voice) within 90 seconds		HP	11292	33923	7442	14620	18260	374	12032	3944	207
	F) % age of calls answered by operator (voice to voice) (Total calls successfully established within 90 sec.*100 / Total call attempts)	>=95%	HP	98.47%	98.49%	22.71%	99.62%	82.95%	99.73%	99.47%	97.26%	99.52%

5.3.3 KEY FINDINGS ON CUSTOMER SERVICE DELIVERY (CSD) PARAMETERS

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

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

2. Resolution of Billing complaints and applying credits

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

All operators were found to have 100 % resolved the billing complaints within stipulated period of 4 weeks and within 6 weeks.

3. Response Time to the Customer for assistance

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

All service providers are in compliance with respect to the parameter accessibility of call center. However, **BSNL and RCOM (GSM)** have not met the benchmark of 'calls answered by Operators (voice to voice) within 90 seconds' with their achieved performance as **65.45% and 92.43%** respectively. The performance of BSNL was way below the benchmark of $>95\%$.

4. Termination/Closure of Service

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

5. Time Taken for Refund of deposits after closures

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

Live Measurement

The results for three days live measurements reveal that all operators have met the benchmark for the parameter 'Call connection to operators (Voice to voice) within 90 seconds' except **BSNL and RCOM (GSM)** not met the benchmark with their performance as **22.71% and 82.95%** against the benchmark of $\geq 95\%$. The performance of BSNL is way below the benchmark in live testing also.

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 Himachal Pradesh 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	VODAFONE	RCOM GSM	TATA GSM	RCOM CDMA	TATA CDMA
AIRCEL	HP	--	100%	100%	100%	100%	100%	100%	100%	100%
AIRTEL	HP	100%	--	100%	100%	100%	100%	100%	100%	100%
BSNL	HP	100%	100%	--	100%	100%	100%	100%	100%	100%
IDEA	HP	100%	100%	100%	--	100%	100%	100%	100%	100%
VODAFONE	HP	100%	100%	100%	100%	--	100%	100%	100%	100%
RCOM GSM	HP	100%	100%	100%	100%	100%	--	100%	100%	100%
TATA GSM	HP	100%	100%	100%	100%	100%	100%	--	100%	100%
RCOM CDMA	HP	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA CDMA	HP	100%	100%	100%	100%	100%	100%	100%	100%	--

The result of the testing revealed that the inter connection performance among the operators were comfortably meeting the benchmark.

6.2 CUSTOMER CARE / HELPLINE ASSESSMENT:

LIVE CALLING TO CALL CENTRE										
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	HP	100	100	100	100	100	100	100	100	100
Total no of calls attempted to customer care/Call center	HP	100	100	100	100	100	100	100	100	100
Total no. of calls successfully established to customer care/Call center	HP	100	96	100	100	100	100	100	100	100
% Accessibility of Call centre /customer Care (Total call successfully established * 100 /Total call attempts)	HP	100.00%	96.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Calls reached to agent desk for Voice to Voice (Total calls attempt)	HP	100	96	100	100	100	100	100	100	100
Total number of calls answered by the operator (Voice to voice) within 90 seconds	HP	98	88	39	100	96	100	100	98	100
% age of calls answered by operator (voice to voice) (Total call successfully established within 90 Sec.*100 / Total call attempts)	HP	98.00%	91.67%	39.00%	100.00%	96.00%	100.00%	100.00%	98.00%	100.00%

In case of calls answered by operators (voice to voice) within 90 seconds when test calls were made to the call centers, the calls answered by operators in case of Aircel, Airtel, BSNL, RCOM (GSM) and RCOM (CDMA), were 98%, 91.67%, 39% , 96% and 98% respectively.

6.3 LIVE CALLING ASSESSMENT FOR BILLING COMPLIANTS:

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS										
Parameter	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	RCOM (GSM)	TATA (GSM)	VODAFONE	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	HP	0	42	158	123	133	38	115	102	30
Total No. of calls Answered	HP	0	36	100	100	100	4	100	84	19
Cases resolved within 4 weeks	HP	0	36	100	100	100	4	100	84	19
%age of cases resolved	HP	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback by calling the number of complainants. However, in some cases, the number of customers contacted for verification was very less due to less number of billing complaints. During live calling, most of the subscribers reported that there complaints have been resolved satisfactorily.

6.4 LEVEL -1 CALLING ASSESSMENT:

LEVEL 1 LIVE CALLING														
Emergency no.	Circle Name	SSA Name	Name of SDCA	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	RCOM CDMA	TATA GSM	TATA CDMA	VODAFONE	
100, 101, 108, 1073, 1091, 1098	HP	Dharmshala	Dehra	12	√	√	√	√	√	√	√	NC	√	
			Kangra	12	√	√	√	√	√	√	√	NC	√	
			Palampur	12	√	√	√	√	√	√	√	√	NC	√
			Dharmshala	12	√	√	√	√	√	√	√	√	NC	√
			Nurpur	12	√	√	√	√	√	√	√	√	NC	√
			Chamba	12	√	√	√	√	√	√	√	√	NC	√
100, 101, 108, 1073, 1091, 1098	HP	Shimla	Shimla	12	√	√	√	√	√	√	√	√	√	
			Rampur	12	√	√	√	√	√	√	√	√	√	
			Theog	12	√	√	√	√	√	√	√	√	√	
100, 101, 108, 1073, 1091, 1098	HP	Mandi	Sundernagar	12	√	√	√	√	√	√	√	√	√	
			Jogindemagar	12	√	√	√	√	√	√	√	√	√	
			Mandi	12	√	√	√	√	√	√	√	√	√	

NC: No Coverage

To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various mobile service providers, the calls were made from mobile phones provided by the service providers during drive test. In these SDCAs of Himachal Pradesh service area, these services were found functional in the networks of all the service providers except at the places where they didn't have their coverage.

7. DRIVE TEST



7. OPERATOR ASSISTED DRIVE TEST

In terms of TRAI's letter dated 21st January, 2014, the drive tests were conducted for three consecutive days in one select SSA each month in each service area. Thus, the drive tests were carried out in three SSA's namely **Kangra (Dharamsala), Shimla and Mandi** in the months of January, February and March 2015 respectively. The total route Kms covered during the drive tests in the respective SSAs was **480 Kms, 420 Kms and 470 Kms** respectively. 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.

7.1 OPERATOR ASSISTED DRIVE TEST: KANGRA (DHARAMSALA) SSA (JANUARY-15)

DRIVE TEST TABLE: 1

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR															
1	Call Attempts	Major Roads	141	25	139	25	143	25	129	25	140	25	164	25	158	25	133	25	44	27	
		Highways	149	25	125	25	179	25	135	25	132	25	171	25	136	25	151	25	57	10	
		Within City	156	25	158	25	141	25	162	25	154	25	172	25	155	25	171	25	88	NC	
		Overall SSA	446	75	422	75	463	75	426	75	426	75	507	75	449	75	455	75	189	37	
2	Blocked Call Rate	Major Roads	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	0.00%	0.00%	0.80%	0.00%	2.79%	0.00%	1.48%	0.00%	0.00%	0.00%	0.00%	0.00%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	0.00%	0.00%	0.63%	0.00%	2.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	
		Overall SSA	0.00%	0.00%	0.47%	0.00%	3.02%	0.00%	0.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Major Roads	0.00%	0.00%	0.72%	0.00%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	0.00%	0.00%	0.00%	0.00%	2.86%	0.00%	0.00%	0.00%	0.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	0.00%	0.00%	0.00%	0.00%	1.44%	0.00%	0.00%	0.00%	0.65%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	
		Overall SSA	0.00%	0.00%	0.24%	0.00%	2.43%	0.00%	0.00%	0.00%	0.00%	0.47%	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 Operators)	Major Roads	NA	97.99%	99.90%	97.31%	98.08%														
		Highways	NA	98.60%	99.97%	98.31%	99.95%														
		Within City	NA	99.34%	100%	98.00%	NC														
		Overall SSA	NA	98.73%	99.95%	97.94%	98.56%														

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH - 2015 -HIMACHAL PRADESH CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR
			(b) 0-5 (with frequency hopping for GSM Operators)	Major Roads	96.52%	98.27%	96.63%	98.18%	90.09%	95.31%	95.42%	97.23%	94.15%	96.96%	97.48%	98.94%	97.15%	99.37%	NA	NA
Highways	97.07%	99.13%		97.18%	97.92%	91.25%	99.48%	96.50%	95.40%	92.50%	99.67%	96.95%	99.87%	96.32%	99.37%	NA	NA	NA	NA	
Within City	96.62%	99.31%		95.86%	99.53%	94.35%	98.79%	95.75%	98.13%	97.64%	99.83%	97.05%	98.93%	96.57%	99.02%	NA	NA	NA	NA	
Overall SSA	96.76%	98.92%		96.51%	98.54%	91.95%	97.68%	95.89%	96.76%	94.63%	98.65%	97.16%	99.24%	96.71%	99.26%	NA	NA	NA	NA	
Service Coverage																				
5	In door (>= -75dBm)	Major Roads	40.75%	35.10%	77.72%	79.53%	42.46%	92.71%	46.82%	96.30%	50.43%	91.94%	37.17%	72.74%	44.33%	99.65%	39.76%	99.02%	37.17%	100%
		Highways	40.91%	11.10%	72.58%	56.34%	44.09%	88.80%	49.00%	36.70%	34.36%	81.18%	39.03%	68.84%	38.10%	63.59%	47.40%	96.27%	36.17%	0.00%
		Within City	42.12%	40.30%	83.72%	99.85%	59.96%	88.83%	74.64%	6.50%	69.00%	9.26%	67.21%	57.60%	69.87%	7.89%	68.38%	95.20%	59.20%	NC
		Overall SSA	41.26%	28.70%	78.46%	78.31%	48.85%	90.27%	58.05%	45.01%	50.43%	57.85%	47.81%	66.33%	51.53%	57.00%	53.59%	96.83%	47.49%	74.25%
	In-vehicle (>= -85dBm)	Major Roads	66.77%	85.80%	92.49%	94.17%	82.28%	100%	83.66%	100%	94.04%	98.60%	83.79%	99.57%	80.26%	100%	67.92%	100%	82.67%	100%
		Highways	65.10%	55.50%	92.00%	88.44%	83.65%	100%	87.03%	89.80%	89.93%	98.66%	85.71%	98.61%	74.06%	96.10%	83.44%	99.97%	80.67%	94.83%
		Within City	73.94%	82.60%	96.50%	100%	90.87%	100%	96.74%	51.20%	95.13%	98.39%	95.97%	92.36%	93.28%	99.77%	89.80%	99.93%	89.87%	NC
		Overall SSA	68.56%	74.39%	93.85%	94.13%	85.63%	100%	89.66%	81.18%	92.91%	98.53%	88.48%	96.82%	83.05%	98.63%	81.73%	99.97%	85.54%	98.67%
	Outdoor- in city (>= -95dBm)	Major Roads	91.18%	99.90%	98.98%	100%	93.43%	100%	97.89%	100%	97.74%	98.71%	98.54%	100%	96.30%	100%	98.84%	100%	99.27%	100%
		Highways	91.69%	99.00%	99.52%	100%	94.54%	100%	99.18%	100%	98.26%	99.28%	99.51%	99.97%	95.42%	98.67%	99.97%	100%	98.45%	100%
		Within City	96.56%	99.90%	99.75%	100%	97.77%	100%	99.85%	97.80%	98.50%	99.28%	99.96%	99.97%	98.73%	98.67%	99.88%	100%	99.35%	NC
		Overall SSA	93.17%	99.59%	99.43%	100%	95.29%	100%	99.03%	99.34%	98.16%	99.06%	99.33%	99.93%	96.90%	99.56%	99.62%	100%	99.06%	100%
6	Call Setup Success Rate (>=95%)	Major Roads	100%	100%	100%	100%	95.80%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	100%	100%	99.20%	100%	97.21%	100%	98.52%	100%	100%	100%	100%	100%	99.26%	100%	100%	100%	100%	100%
		Within City	100%	100%	99.37%	100%	97.87%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
			Overall SSA	100%	100%	99.53%	100%	96.98%	100%	99.53%	100%	100%	100%	100%	100%	100%	99.78%	100%	100%	100%	100%
7	Hand Over Success Rate (HOSR)	Major Roads	100%	100%	100%	100%	98.60%	100%	95.15%	100%	96.67%	100%	100%	100%	97.37%	100%	100%	100%	100%	100%	100%
		Highways	100%	100%	98.31%	100%	97.78%	100%	98.59%	100%	96.75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	98.95%	100%	100%	100%	97.97%	100%	99.18%	100%	95.70%	100%	100%	100%	99.23%	100%	100%	100%	100%	100%	NC
		Overall SSA	99.53%	100%	99.46%	100%	98.09%	100%	98.16%	100%	96.46%	100%	100%	100%	98.71%	100%	100%	100%	100%	100%	100%

NA: Not Applicable

NC: No Coverage

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

7.2 OPERATOR ASSISTED DRIVE TEST: SHIMLA SSA (FEBRUARY-15)

DRIVE TEST TABLE: 2

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR															
1	Call Attempts	Major Roads	96	25	122	25	82	25	64	25	79	25	129	25	66	25	97	26	37	25	
		Highways	135	25	155	25	131	25	149	25	83	25	211	25	113	25	174	25	105	25	
		Within City	112	25	140	25	101	25	133	25	80	25	141	25	137	25	121	25	109	0	
		Overall SSA	343	75	417	75	314	75	346	75	242	75	481	75	316	75	392	76	251	50	
2	Blocked Call Rate	Major Roads	0.00%	0.00%	0.82%	0.00%	1.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	0.00%	0.00%	0.65%	0.00%	2.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	0.00%	0.00%	0.00%	0.00%	1.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	
		Overall SSA	0.00%	0.00%	0.48%	0.00%	1.91%	0.00%	0.00%	0.00%	0.00%										
3	Dropped Call Rate (<=2%)	Major Roads	0.00%	0.00%	1.65%	0.00%	1.23%	0.00%	0.00%	0.00%	2.53%	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%	1.56%	0.00%	0.00%	0.00%	1.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	
		Within City	0.00%	0.00%	0.00%	0.00%	2.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NC	
		Overall SSA	0.00%	0.00%	0.48%	0.00%	1.62%	0.00%	0.00%	0.00%	0.00%	1.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.00%
4	Percentage connections with good voice quality (=>95%)																				
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Major Roads	NA	95.55%	100%	99.53%	98.23%														
		Highways	NA	96.83%	100%	99.21%	99.99%														
		Within City	NA	99.11%	100%	99.74%	NC														
		Overall SSA	NA	97.27%	100%	99.54%	99.16%														
(b) 0-5 (with	Major Roads	95.81%	97.68%	97.10%	98.43%	92.00%	98.33%	97.05%	97.36%	95.75%	98.14%	97.55%	97.95%	97.66%	98.85%	NA	NA	NA	NA		

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH - 2015 -HIMACHAL PRADESH CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR																
	frequency hopping for GSM Operators)	Highways	96.03%	99.51%	95.82%	95.65%	90.58%	99.51%	95.72%	99.69%	84.55%	99.79%	97.08%	98.68%	97.16%	99.37%	NA	NA	NA	NA
		Within City	98.87%	99.84%	97.17%	99.74%	91.22%	97.88%	95.34%	99.78%	97.70%	99.37%	96.92%	99.57%	95.96%	99.48%	NA	NA	NA	NA
		Overall SSA	96.88%	99.00%	96.70%	97.97%	91.13%	98.59%	95.88%	98.95%	93.33%	99.04%	97.15%	98.73%	96.75%	99.24%	NA	NA	NA	NA
5	Service Coverage																			
	In door (>= -75dBm)	Major Roads	26.61%	97.90%	83.36%	100%	40.30%	91.90%	42.29%	99.80%	42.29%	95.11%	33.98%	87.00%	24.22%	73.93%	46.32%	100%	35.23%	100%
		Highways	30.68%	95.90%	79.57%	99.29%	42.18%	99.70%	31.40%	36.70%	32.92%	81.18%	38.62%	90.30%	23.70%	85.50%	39.47%	100%	36.26%	99.57%
		Within City	65.12%	96.70%	95.63%	99.20%	55.09%	64.20%	56.44%	92.30%	48.48%	9.26%	45.53%	79.48%	55.38%	79.82%	69.93%	99.74%	61.92%	NC
		Overall SSA	39.21%	96.84%	86.71%	99.51%	45.40%	85.64%	42.84%	74.04%	41.72%	71.24%	39.55%	85.64%	37.38%	79.75%	51.03%	99.91%	49.42%	99.77%
	In-vehicle (>= -85dBm)	Major Roads	64.82%	100%	88.67%	100%	77.41%	100%	64.50%	100%	93.37%	99.26%	76.20%	99.70%	60.35%	98.78%	75.21%	100%	64.01%	100%
		Highways	68.85%	100%	96.09%	100%	83.25%	99.90%	66.01%	100%	42.28%	98.66%	79.82%	99.49%	66.50%	99.70%	69.81%	100%	77.19%	100%
		Within City	84.95%	100%	98.07%	100%	88.33%	96.90%	84.19%	98.30%	94.13%	98.39%	87.34%	98.85%	86.40%	99.86%	90.83%	100%	87.97%	NC
		Overall SSA	72.20%	100%	94.78%	100%	83.20%	98.97%	72.16%	99.38%	79.60%	98.84%	81.20%	99.35%	73.77%	99.45%	77.95%	100%	80.69%	100%
	Outdoor- in city (>= -95dBm)	Major Roads	95.27%	100%	98.23%	100%	96.43%	100%	91.20%	100%	98.15%	99.26%	95.60%	100%	87.37%	99.94%	96.45%	100%	93.29%	100%
		Highways	94.13%	100%	99.31%	100%	97.76%	100%	93.02%	100%	72.23%	99.28%	97.68%	99.97%	91.75%	100%	97.71%	100%	98.22%	100%
		Within City	98.00%	100%	99.82%	100%	98.44%	100%	96.74%	100%	98.15%	99.29%	97.50%	100%	96.75%	99.94%	99.72%	100%	98.62%	NC
		Overall SSA	95.56%	100%	99.21%	100%	97.61%	100%	93.93%	100%	91.04%	99.27%	97.10%	99.99%	93.00%	99.96%	98.06%	100%	97.64%	100%
6	Call Setup Success Rate (>=95%)	Major Roads	100%	100%	99.18%	100%	98.78%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	100%	100%	99.35%	100%	97.71%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	100%	100%	100%	100%	98.02%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	NC
		Overall SSA	100%	100%	99.52%	100%	98.09%	100%												

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH - 2015 -HIMACHAL PRADESH CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
7	Hand Over Success Rate (HOSR)	Major Roads	100%	100%	100%	100%	97.60%	100%	100%	100%	96.84%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	98.71%	100%	100%	100%	97.20%	100%	99.21%	100%	96.94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	98.73%	100%	100%	100%	98.06%	100%	97.87%	100%	94.62%	100%	100%	100%	100%	100%	100%	100%	100%	99.90%	NC
		Overall SSA	98.89%	100%	100%	100%	97.67%	100%	98.67%	100%	96.15%	100%	100%	100%	100%	100%	100%	100%	100%	99.94%	100%

NA: Not Applicable

NC: No Coverage

7.3 OPERATOR ASSISTED DRIVE TEST: MANDI SSA (MARCH-15)

DRIVE TEST TABLE: 3

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR															
1	Call Attempts	Major Roads	137	25	123	25	163	25	122	25	142	25	171	25	102	25	122	27	90	25	
		Highways	128	25	111	25	147	25	104	25	125	25	184	25	144	25	111	25	130	25	
		Within City	151	25	171	25	113	25	136	25	191	25	188	25	174	25	149	31	146	25	
		Overall SSA	416	75	405	75	423	75	362	75	458	75	543	75	420	75	382	83	366	75	
2	Blocked Call Rate	Major Roads	0.00%	0.00%	0.81%	0.00%	1.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Highways	0.00%	0.00%	0.90%	0.00%	0.68%	0.00%	1.92%	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%	2.65%	0.00%	0.74%	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%	0.49%	0.00%	1.65%	0.00%	0.83%	0.00%	0.00%	0.00%									
3	Dropped Call Rate (<=2%)	Major Roads	0.00%	0.00%	0.00%	0.00%	2.48%	0.00%	0.00%	0.00%	0.70%	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%	2.74%	0.00%	0.00%	0.00%	1.60%	0.00%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Within City	0.00%	0.00%	0.00%	0.00%	0.91%	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%	2.16%	0.00%	0.00%	0.00%	0.00%	0.66%	0.00%	0.18%	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 Operators)	Major Roads	NA	98.74%	100%	99.88%	99.97%														
		Highways	NA	98.50%	100%	99.87%	100%														
		Within City	NA	99.47%	99.92%	99.93%	100%														
		Overall SSA	NA	98.99%	99.97%	99.90%	99.99%														
(b) 0-5 (with	Major Roads	96.90%	95.09%	95.50%	97.63%	90.54%	99.93%	95.77%	98.01%	88.92%	99.68%	98.16%	99.84%	97.70%	99.56%	NA	NA	NA	NA		

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH - 2015 -HIMACHAL PRADESH CIRCLE



S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA	
			OUTDOOR	INDOOR																
	frequency hopping for GSM Operators)	Highways	96.86%	99.06%	96.05%	98.44%	91.30%	97.86%	95.57%	95.91%	96.13%	96.51%	98.17%	99.36%	96.57%	99.39%	NA	NA	NA	NA
		Within City	96.40%	99.35%	95.46%	98.04%	93.78%	97.74%	95.73%	93.18%	98.25%	99.74%	98.79%	99.42%	97.11%	98.10%	NA	NA	NA	NA
		Overall SSA	96.70%	97.82%	95.65%	98.04%	91.87%	98.51%	95.70%	95.71%	95.71%	99.38%	98.41%	99.54%	97.07%	99.02%	NA	NA	NA	NA
5	Service Coverage																			
	In door (>= -75dBm)	Major Roads	42.10%	0.20%	70.97%	98.81%	25.99%	100%	30.72%	90.30%	26.44%	95.06%	27.72%	81.59%	22.61%	99.74%	54.73%	99.28%	39.59%	77.91%
		Highways	50.07%	98.80%	60.02%	99.15%	36.19%	53.30%	38.49%	96.40%	38.53%	98.92%	41.24%	99.80%	43.95%	97.07%	60.45%	100%	21.54%	96.07%
		Within City	65.82%	98.40%	71.89%	99.63%	51.41%	13.60%	47.01%	98.90%	54.57%	99.03%	49.90%	87.61%	49.49%	75.68%	80.26%	98.47%	62.11%	90.59%
		Overall SSA	53.32%	65.70%	67.98%	99.19%	37.78%	55.15%	39.17%	95.18%	43.43%	97.27%	40.52%	89.56%	41.16%	90.82%	67.59%	99.19%	45.90%	88.02%
	In-vehicle (>= -85dBm)	Major Roads	82.13%	94.10%	94.20%	100%	73.57%	100%	64.89%	100%	63.62%	99.32%	72.34%	98.86%	56.93%	100%	84.79%	100%	65.91%	89.09%
		Highways	87.01%	100%	97.48%	100%	82.40%	100%	72.78%	100%	63.88%	98.09%	82.49%	100%	78.83%	99.97%	82.34%	100%	61.86%	99.84%
		Within City	91.99%	100%	99.28%	100%	93.21%	99.20%	79.30%	100%	97.72%	99.08%	89.26%	99.35%	82.54%	99.28%	96.47%	99.95%	84.58%	100%
		Overall SSA	87.28%	98.03%	97.43%	100%	82.99%	99.73%	72.66%	100%	79.08%	99.08%	82.05%	99.40%	75.12%	99.75%	89.17%	99.98%	74.13%	96.18%
	Outdoor- in city (>= -95dBm)	Major Roads	97.84%	100%	99.76%	100%	94.14%	100%	92.37%	100%	95.74%	99.32%	96.59%	100%	86.55%	100%	99.88%	100%	94.16%	100%
		Highways	98.66%	100%	99.75%	100%	95.73%	100%	94.52%	100%	85.02%	99.09%	97.58%	100%	94.90%	100%	97.22%	100%	78.28%	100%
		Within City	99.49%	100%	100%	100%	99.64%	100%	96.90%	100%	99.11%	99.08%	99.14%	100%	96.45%	99.92%	100%	100%	95.40%	100%
		Overall SSA	98.70%	100%	99.86%	100%	96.48%	100%	94.71%	100%	93.43%	99.19%	97.88%	100%	93.55%	99.97%	99.14%	100%	90.42%	100%
6	Call Setup Success Rate (>=95%)	Major Roads	100%	100%	99.19%	100%	98.16%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Highways	100%	100%	99.10%	100%	99.32%	100%	98.08%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Within City	100%	100%	100%	100%	97.35%	100%	99.26%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
		Overall SSA	100%	100%	99.51%	100%	98.35%	100%	99.17%	100%										

S/N	Parameter	Classification of routes covered	AIRCEL		AIRTEL		BSNL		IDEA		TATA GSM		RCOM GSM		VODAFONE		RCOM CDMA		TATA CDMA		
			OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	OUTDOOR	INDOOR	
7	Hand Over Success Rate (HOSR)	Major Roads	98.86%	100%	99.54%	100%	98.02%	100%	100%	100%	96.84%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Highways	98.58%	100%	98.65%	100%	97.79%	100%	97.65%	100%	96.94%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Within City	98.99%	100%	99.73%	100%	98.96%	100%	98.99%	100%	94.62%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
		Overall SSA	98.85%	100%	99.46%	100%	98.25%	100%	98.93%	100%	96.15%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

NA: Not Applicable

7.4 DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 4

DRIVE TEST ROUTE OF JANUARY TO MARCH 2015 – HIMACHAL PRADESH CIRCLE							
Name of SSA	Drive test Period	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
KANGRA	Jan-15	Dehra, Kangra, Palampur /160 KM	<p>1. DEHRA- WITHIN CITY: dehra chownk, dehra market, sanot market, jawalmukhi market, jwalamukhi city, dehra city. MAJOR ROAD: Dehra bus stand road, siota, kathog badoli, sakwal, choran, HIGHWAY: Dehra to jawalamukhi, dehra to kangara.</p> <p>2. KANGRA - MAJOR ROAD: Kohal, sakwal, sapri, gumer, gumbargharun katiyal, bane di hati. WITHIN CITY: Kangra city, tanda chownk, power house road, daultpur city, old kangra, kangra fort road. HIGHWAY: Nagrota bangwan, kangra, bagwan, daultpur, ranital,</p> <p>3. PALAMPUR - MAJOR ROAD: Tanda, Parour, parour bus stand, palampur, palmpur bus stand, chamunda bus stand, chamunda ji market, gopalpur,dari HIGWAY: Palampur (Dharmshala Highway), palampur to chamunda ji. WITH IN CITY: Palmpur city, parour city, tanda city, chamunda city</p> <p>INDOOR: Technical Board Dharmshala.</p>	Dharmshal a,Nurpur/ 170 KM	<p>1 Dharmshala: WITHIN CITY: kotwali bazar, dharamshala market, meclodganj market, gagal market. jawahar nagar,gagal city, yol,chandaran, MAJOR ROAD: Dharmshal bus stand , hpca road housing board colony, meclodganj road, HIGHWAY: Dharmshala to Gagal(Pathankot Highway)</p> <p>2 NURPUR: WITHIN CITY jawahar nagar, shahpur, nurpur, jassurcity, sutrahar, raja ka talab, MAJOR ROAD: nurpur, bus stand Road, balah,jonta village, Draman, badwal , jassur bus stand, shahpur bus stand, Kakira. HIGHWAY--gagal to shahpur, shahpur to jonta, jonta tonurpur, nurpur to jassur(Pathankot Highway),nurpur to kakira, Kakira To Banikhet(Nurpur Chamba Highway</p> <p>INDOOR: Goldy Guest House Banikhet</p>	Chamba/ 150 KM	<p>CHAMBA: WITH IN CITY-- Chamba, city, Chamba Chogan, Banikhet City, Dalhousi, Bathri Market MAJOR ROAD-- chamba bus stand road,Bhalai Temple Road, Bathri Village (Bhalai To Bathri), Koti village, Pukhri HIGHWAY-- Banikhet To Dalhousi, Banikhet To Bathri, Bathri To Chamba</p> <p>INDOOR: Bhalai Rest house (Near Bhalai Temple Chamba)</p>

<p>SHIMLA</p>	<p>Feb-15</p>	<p>Shimla /140 KM</p>	<p>SHIMLA : MAJOR ROAD-- Naaldehra to Dhama, mashobra, summer hill university , ghannati, ghannati B Ed college, Chakkar, HP university, Bells Institute, Junga WITH IN CITY-- Naal Dehara shimla new bus stand, Khalini Chowkn,mehli market, kasumpti, kasumpti chownk ,khalini market, Toland, BCS, Vikas nagar, New Shimla,chota Shimla, Summerhill. HIGHWAY--Sumer hill to Old Bus Stand Shimla,(solan -shimla highway), sanjauli to naaldehra, Baluganj, tootu, mashobra, dadha, sanjouli, INDOOR: DAV New Shimla</p>	<p>Theoge, Rampur/ 150 KM</p>	<p>1.THEOGE--HIGHWAY :-- Kufri To Theoge, Theoge to Shilaru, Shilaru To narkanda, Narkanda To Oddi, Oddi To Kumar sen, Kumarsen To Kingal WITHIN CITY--theoge market, cheoge, narkanda market, narkanda, bus stand, oddi. MAJOR ROAD--Theoge bus Stop, kumarsen ,shilaru village. 2. RAMPUR: MAJOR ROAD-- Hydro Project,, DC office, Jakhri Road, Rampur. WITH IN CITY-- Rampur Market, Kingal Market. HIGHWAY-- Rampur to Jakhri, Kingal to Rampur INDOOR: Rampur Degree College</p>	<p>Rampur /130 Km</p>	<p>RAMPUR--WITH IN CITY: -- Shilai market, bada Gaon, Basantpur Market, Kingal . MAJOR ROAD:--Kingal to Bada Gaon,Bada Gaon Tto Hatiya, hatiya to Banuna. HIGHWAY: -- Rampur To Jakhri, Rampur To Shilai, Banuna To Basantpur. INDOOR: Hotel Basantpur</p>
<p>MANDI</p>	<p>Mar-15</p>	<p>Sundernagar, Mandi /150 KM</p>	<p>1. SUNDERNAGAR - WITH IN CITY--sunder nagar city, MLSM college, Baggi,bus stand sundernagar, chail chownk, gohar. MAJOR ROAD--Kaned to chail chownk, gohar, Shiva badhar to Pandoh. HIGHWAY-- Sundernagar to kaned , Ner chownk to kaned, (Sundernagar-Mandi Highway) 2 MANDI - WITH IN CITY -- Pandoh city,Mandi City. MAJOR ROAD--Masawari, mandi bus satand, pandoh dam. HIGHWAY--Pandoh to Mandi(MANDI-KULLU) Mandi to Ner chowk INDOOR: BBMB Rest House Sundernagar</p>	<p>Mandi, Jogindernagar/180 KM</p>	<p>1MANDI - WITH IN CITY--Indra Market, IITMandi, Mandi market, Khaliar, tarna devi, kotli, saiglu. MAJOR ROAD--Mandi to kotli, Tarna to Bassi,bassi to saiglu. HIGHWAY-- Katendi, Pakhri, Mehar, Bhanwar, Sadhala, Chipu, Khaliar, Mandi. 2 JOGINDERNAGARA--WITH IN CITY: Ogindernagar city, jogindernagar market,batdhar, bus stand market, Palli Market,Padhar Market. MAJOR ROAD: Saiglu to batdhar, batdhar to jogindernagar,,palli, kunnu HIGHWAY Joginder nagar to padhar, padhar to saned, saned to kunnu, kunnu to shingari, shingari to Pali (jogindernagar -Mandi Highway) INDOOR: Delhi Darbar restaurant Mandi</p>	<p>Sundernagar/140 KM</p>	<p>SUNDER NAGAR- WITH IN CITY--NER chownk city, Rewalsar, Gahar, dhamrol city, sarkaghat, awah devi,jahu city. MAJOR ROAD--Kalkhar to rewalsar, ratti,cholthra, Sarkaghat bus stand,gari badarpur , sulgwan, chamboh.gahar. HIGHWAY: Ner chownk to Kalkhar, kalkhar to gahar, gahar to jahu, jahu to sarkaghat. INDOOR: Comfort hotel, Ner Chownk</p>

7.5 SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 5

DRIVE TEST OBSERVATION OF KANGRA SSA – JANUARY 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	AIRCEL	Dehra, Kangra & Palampur	Poor Coverage and Quality Near Chimbhar, Gupt Ganga Road, Ranital, Bankhandi.	Dharmshala & Nurpur	Poor Coverage and Quality Near Kakirabakloh, Karikothi, Mamoon, Machiyal.	Chamba	Poor Coverage and Quality Near Kiani, Darda.
2	AIRTEL		Poor Coverage and Quality Near Pargpur. Poor Quality Near lawalaji, Nagrota, Chamunda, Chimbhar.		Poor Coverage and Quality Near Banikhet, Kakirabakloh, Karikothi, Nagani.		Poor Coverage and Quality Near Kiani, Darda.
3	BSNL		Poor Coverage and Quality Near Pargpur, Darkata, Dehra. Poor Quality Near Gupt Ganga Road, Daulatpur, Bankhandi.		Poor Coverage and quality Near Baili, Karikothi, Trilokpur. Poor Quality Near Bakloh.		Poor Coverage and Quality Near Kiani, Bathri, Banikhet. Poor Quality Near Darda.
4	TATA GSM		Poor Coverage and Quality Near Chimbhar, Dedra. Poor Quality Near Pargpur. Poor Quality Near Bankhandi.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Coverage and Quality Near Sundla, Darda, Kiani.
5	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.
6	IDEA		Poor Quality Near Pargpur, Narwana, Bankhandi, Dehra.		Poor Coverage and Quality Near Karikothi, Kakirabakloh.		Poor Coverage and Quality Near Kiani.
7	RCOM GSM		Poor Quality Near Darkata.		Poor Coverage and Quality Near Kakirabakloh. Poor Quality Near Dagli.		Poor Coverage and Quality Near Kiani, Pukhari.
8	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.		Poor Coverage and quality Near Koti, Bhalei Mata, Chambas.
9	VODAFONE		Poor Coverage and Quality Near Ranital, Darkata, Nalipul, Arla. Poor Quality Near Nagrota.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Coverage and Quality Near Kiani, Bathri, Banikhet, Darda.

DRIVE TEST TABLE: 6

DRIVE TEST OBSERVATION OF SHIMLA SSA – FEBRUARY 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	AIRCEL	Shimla	Poor Rx Level and Rx Quality Near Sunni, Naldera, Dhama and Tutu. Poor Rx Quality Near Mashobra.	Theoge & Rampur	Poor Rx Level and Rx Quality Near Nirmand, Narkanda.	Rampur	They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
2	AIRTEL		Poor Rx Level and Rx Quality Near Dhama and Tutu. Poor Rx Quality Near New Shimla.		Poor Rx Level and Rx Quality Near Kingal. Poor Rx Quality Near Shimla, Kufri, Theog, Kumarsen.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
3	BSNL		Poor Rx Level and Rx Quality Near Dhama, Naldera, Sunni. Poor Rx Quality Near Ghandal, Ghanahatti, Baluganj, Mashobrate.		Poor Rx Level and Rx Quality Near Braglijadaun, Kufri, Narkanda. Poor Rx Quality Near Kumarsain, Nayanirsoo, Theog, Jadon.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
4	TATA GSM		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
5	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.
6	IDEA		Poor Rx Level Near Sunni, Dhama, Dhanda, Tutu, Naldera.		Poor Rx Level and Rx Quality Near Nirmand, Kumarsen.		Poor Rx Level and Rx Quality Near Badagaon, Basantpur.
7	RCOM GSM		Poor Rx Level and Rx Quality Near Halog Road, Mashobra, Ghanati.		Poor Rx Level and Rx Quality Near Rampur, Narkanda, Shilaru, Kufari.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
8	RCOM CDMA		Poor Rx Level and Rx Quality Near Dhama, Sunni, Baldeha, Mashobra.		Poor Rx Level and Rx Quality Near Nogli, Narkanda, Kufri, Shilaru.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.
9	VODAFONE		Poor Rx Level and Rx Quality Near Sunni, Tutu. Poor Rx Quality Near Shimla.		Poor Rx Level and Rx Quality Near Narkanda, Theog. Poor Rx Quality Near Kufri, Rampur.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.

DRIVE TEST TABLE: 7

DRIVE TEST OBSERVATION OF MANDI SSA – MARCH 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	AIRCEL	Sunder Nagar & Mandi	Poor Rx Level and Rx Quality Near Pandoh, Gohar. Poor Rx Quality Near Sunder Nagar.	Mandi & Joginder Nagar	Poor Rx Level and Rx Quality Near Shakrog, Batdhar. Poor Rx Quality Near Saiglu, Katendi.	Sunder Nagar	Poor Rx Level and Rx Quality Near Sarkaghat, Gohar. Poor Rx Quality Near Salgwan, Gari Bahadurpur.
2	AIRTEL		Poor Rx Quality Near Ner Chowk, Kanaid, Sunder Nagar, Gohar.		Poor Rx Quality Near Ghatasni, Mandi, Batdhar.		Poor Rx Quality Near Cholthra, Jahu.
3	BSNL		Poor Rx Level and Rx Quality Near Gharan, Pandoh, Gohar. Poor Rx Quality Near Chail Chowk.		Poor Rx Level and Rx Quality Near Ghatashani. Poor Rx Quality Near Bhararu, Padhar, Bhargoan.		Poor Rx Level and Rx Quality Near Awahdevi, Bhareri, Sadhiyani, Hadsar.
4	TATA GSM		Poor Rx Level and Rx Quality Near Pandoh. Poor Rx Quality Near Mandi.		Poor Rx Level and Rx Quality Near Batdhar. Poor Rx Quality Near Shingari.		Poor Rx Level and Rx Quality Near Gari Bahadurpur, Gohar.
5	TATA CDMA		Poor Rx Level and Rx Quality Near Chail Chowk. Poor Rx Quality Near Mandi.		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	IDEA		Poor Rx Level and Rx Quality Near Pandoh. Poor Rx Quality Near Ner Chowk, ChailChowk.		Poor Rx Level and Rx Quality Near Harabag, Kotali, Jamnabad.		Poor Rx Level and Rx Quality Near Chamboh, Gari Bahadurpur. Rakhoh.
7	RCOM GSM		Poor Rx Level and Rx Quality Near Sainj, Baggi to Chail Chowk Road.		Poor Rx Level and Rx Quality Near Batdhar, Koon, Devdhar.		Poor Rx Level and Rx Quality Near Dhalwan, Sadhiyani.
8	RCOM CDMA		Poor Rx Level and Rx Quality Near Gharan.		They have coverage Only In SDCA's & Major Towns with Poor Level and Quality at Outers.		Poor Rx Level and Rx Quality Near Chamboh, Gari Bahadurpur.
9	VODAFONE		Poor Rx Level and Rx Quality Near Gohar, Chail Chowk, Sundar Nagar.		Poor Rx Level and Rx Quality Near Joginder Nagar, Batdhar, Shakrog.		Poor Rx Level and Rx Quality Near Sarkaghat, Gari Bahadurpur, Ner Chowk.

DRIVE TEST TABLE: 8

NO NETWORK COVERAGE STATUS OF DRIVE TEST – JANUARY TO MARCH 15

S No	Month of Drive Test	Circle	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
1	Jan'15		AIRCEL	Dharmshala	Dehra, Palampur, Kangra, Dharmshala, Nurpur, Chamba	1)Kangra SDCA:- Near Daultpur, Near ranital 2) Nurpur SDCA:-Near Shahpur, Sadwan, Near Lahru	NO
			AIRTEL			1)Nurpur SDCA:- Near Sadwan. 2) Chamba SDCA:- Near Pukhari	NO
			BSNL			1)Kangra SDCA;,-Yol kent, Ranital. 2)Chamb SDCA;,-pukhari. 3)NurpurSDCA:-kakira	NO
			IDEA			1)Nurpur SDCA:-In Between Sadwan and Lahru. 2) Kangra SDCA:-Ranitaal	NO
			RCOM (GSM)			1)Kangra SDCA;-Yol kent, Ranital. 2)Chamb SDCA;-pukhari. 3)NurpurSDCA:-kakira	NO
			VODAFONE			1)Chamba SDCA;-Kakira. 2)Nurpur SDCA;-Near Lahru,Near Shahpur. 3)Kangra SDCA;-Near Nagrota,	NO
			TATA GSM			1)Kangra SDCA;,-Yol kent, Ranital. 2)Chamb SDCA;-pukhari, 3)NurpurSDCA:-kakira	Reliance GSM
			RCOM (CDMA)			1) Kangra SDCA:-Daultpur,Ranitaal. 2) Palampur SDCA;-Parour, Nurpur SDCA;-No coverage Baret To Lahru. 3) Chamba SDCA:-Sehwan,Bhalai,Koti	NO
			TATA (CDMA)			1)Dharmshala SDCA;-Between Gggal and Shahpur., 2) Nurpur SDCA;-Between Shapur and Nurpur. 3) Kangra SDCA;-Ranital,Nagrota, (After Nurpur TATA CDMA Network not available)	NO
2	Feb'15		AIRCEL	Shimla	Shimla, Theog, Rampur	1)Theog SDCA;-No Coverage Towards Kingle to Basantpur. 2) Shimla SDCA:- Near Dhami, Sunni	NO
			AIRTEL			Shimla SDCA:- Near Dhami	NO
			BSNL			1)Shimla SDCA;-near Dhami. 2) Theog SDCA:-Near Banuna	NO
			IDEA			1)Shimla SDCA;-Near Dhami,Near Naldehra, Sunni. 2) Theog SDCA:- Near Badagaon, Near Shilaru	NO
			RCOM (GSM)			1)Shimla SDCA:Near Mashobra-Near Kanchi to Halog road, Near Ghannati. 2)Theog SDCA:- Near Narkanda,Jalog. 3)Rampur SDCA:-Jakhri,	NO
			VODAFONE			1)Shimla SDCA:-Naldehra To Sunni, Near Dhami, 2)Theog SDC:-bada Gaon To Basantpur,Near Narkanda, Near kumarsen	NO
			TATA GSM			1)Shimla SDCA:-Near Mashobra,Near Kanchi to Halog road, Near Ghannati. 2)Theog SDCA:- Near Narkanda,Jalog. 3)Rampur SDCA:-Jakhri,	Reliance GSM

S No	Month of Drive Test	Circle	Name of Operators	SSA	SDCA Covered	Status of no network coverage area	ICR Status
			RCOM (CDMA)			1) SHIMLA SDCA;-Dhami,Baldeha,Near Kufri,Near Mashobra,Near Shilaru. 2)Theog SDCA;- Jalog	NO
			TATA (CDMA)			Theog SDCA:-Basantpur,Jalog,Badagaon ,Shilaru,	NO
3	Mar'15		AIRCEL	Mandi	Sundernagar, Mandi, Jogindernagar	SunderNagar SDCA:- Baggi to Chailchowkn ,Gohar to Pandoh	NO
			AIRTEL			Coverage available in covered root	NO
			BSNL			1)Jogindernagar SDCA:- Near Ghatasni. 2) Sundernagar SDCA:- Near Hadsar	NO
			IDEA			1) Mandi SDCA:-Near Pandoh Near Kotli. 2) Jogindernagar SDCA:- Jamnabad 3) Sundernagar:- Ramkoh Near Sarkaghar	NO
			RCOM (GSM)			1)Sundernagar SDCA:-Baggi To Chailchowk, Sainj,Sadhyani,Dhalwan. 2)Jogindernagar SDCA:- Batdhar,devdhar	NO
			VODAFONE			1)SundernagarSDCA:-Gohar,Near Chail Chowkn, kalkhar, near Dhamrol, near chamboh 2)Jogindrnagar SDCA:- Near Batdhar, Near Kotli	Reliance/ SDCA sundernagar(chail chowkn to Pandoh) between Ner Chowk To Kalkhar), SDCAJogindernagar(Kotli to jogindernagar)
			TATA GSM			1)Sundernagar SDCA:-Baggi To Chailchowk, Sainj,Sadhyani,Dhalwan 2)Jogindernagar SDCA:- Batdhar,devdhar	Reliance GSM
			RCOM (CDMA)			1)Mandi SDCA:- Batdhar,Padhar. 2)Jogindernagar:-Devidhar. 3) Sundernagar SDCA:-Goahr,Near Chail Chowkn	NO
			TATA (CDMA)			1)Sundernagar SDCA:- Chail Chowkn , Pandoh, Gohar. 2) Jogindernagar SDCA:- Ghatasni,Kotli, Padhar	NO

7.6 KEY FINDINGS ON DRIVE TEST:

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

- (i) Tata (GSM), is operating its services with its own 05 no. of BTSs only, however is on ICR with Reliance (GSM) in most of the HP licensed service area.
- (ii) **Drive test in January-15:** Drive tests were conducted across the **Kangra SSA** covering Dehra, Kangra, Palampur, Dharamshala, Nurpur and Chamba SDCAs. The drive test results revealed that performance of the service providers was satisfactory as most of the service providers were largely meeting the benchmarks. However, **BSNL** failed to meet the benchmark of **Call Drop Rate (2.43%)** and **Voice Quality (91.95%)**, whereas **Tata (GSM)** could not meet the benchmark of **Voice Quality** with its performance as **94.63%**.
- (iii) **Drive Test in February -15:** Drive tests were conducted across **Shimla SSA** covering Shimla, Theoge and Rampur SDCAs. In this SSA, only **BSNL** and **Tata (GSM)** lagged behind the benchmarks for parameter **Voice Quality** with their performance as **91.13%** and **93.33%** respectively.
- (iv) **Drive Test in March-15:** Drive tests were conducted in **Mandi SSA** covering Mandi, Sunder nagar and Joginder nagar SDCAs. In this SSA also, **BSNL** could not meet the benchmark of the parameters **Call drop rate (2.16%)** and **Voice Quality (91.87%)**. The performance of other service providers was well within the norms.

The deficiencies with respect to inadequate coverage and voice quality, encountered by different Service providers at various places as shown in the drive tests plots, are detailed in the above drive test table.-5, 6 & 7.

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

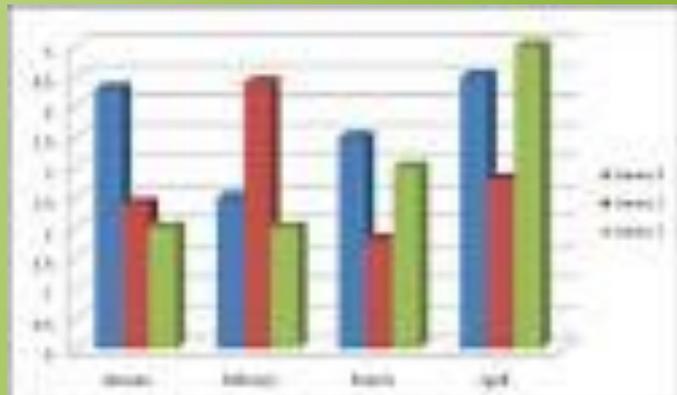
*Thus from the above, it was concluded that **BSNL and Tata (GSM)** remained under performed with respect to the parameters **Voice Quality** and **Call drop rate** . The defaulting Service providers need to take corrective actions to improve their network quality.*

8. GRAPHICAL REPRESENTATION (CELLULAR MOBILE SERVICE PROVIDERS)

AVERAGED QUARTERLY PMR

V/S

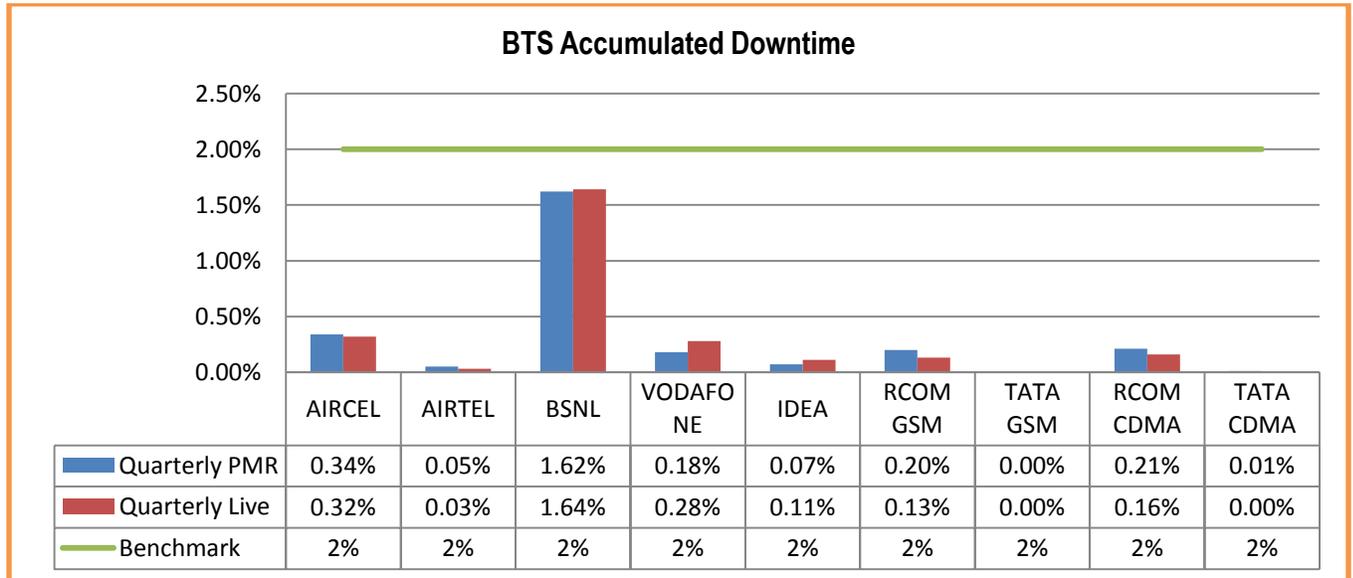
AVERAGED QUARTERLY 3-DAYs LIVE MEASURMENT



8. GRAPHICAL REPRESENTATION (CMTS):

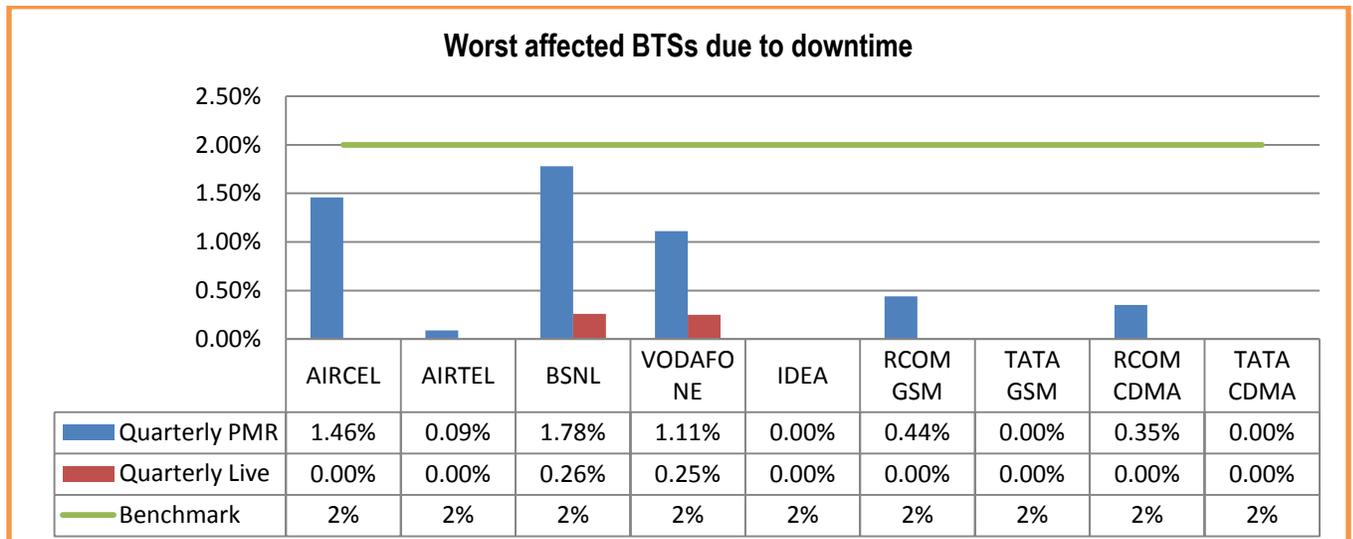
Graphical Representation of Performance of the Cellular Mobile Service Providers (PMR) V/S 3-Days Live Measurement (Quarterly Average Data):

1) BTS ACCUMULATED DOWNTIME :



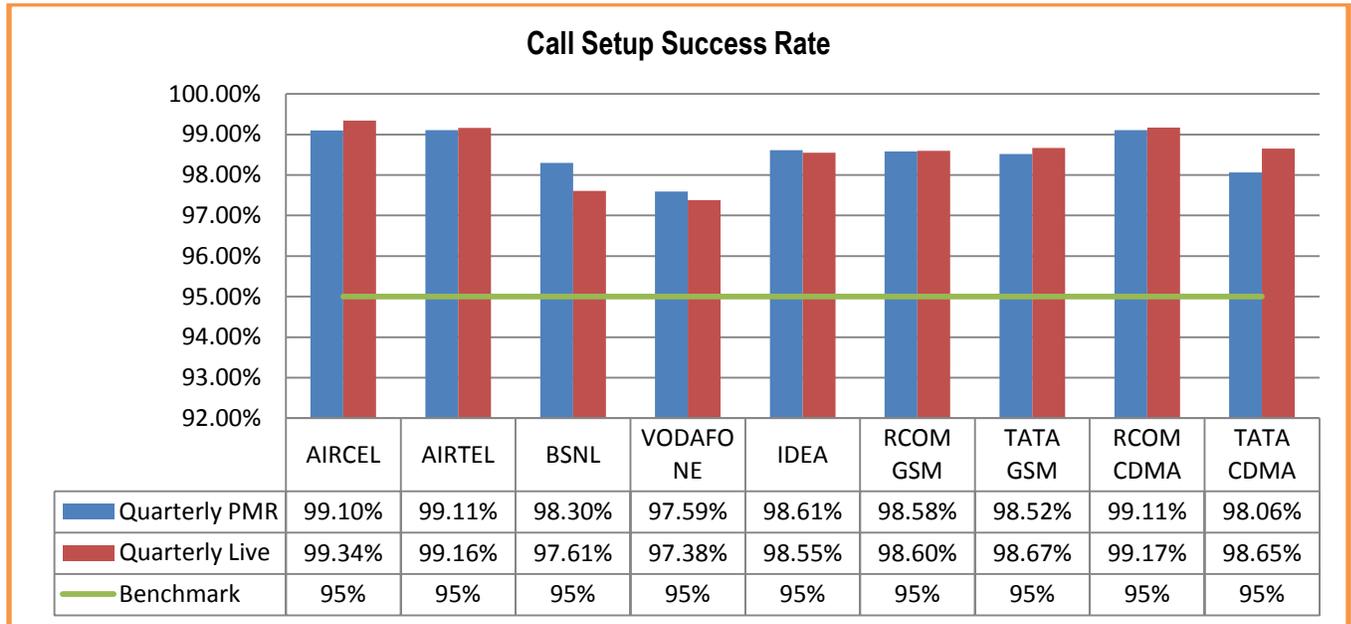
All operators are meeting the benchmarks.

2) WORST AFFECTED BTSS DUE TO DOWNTIME :



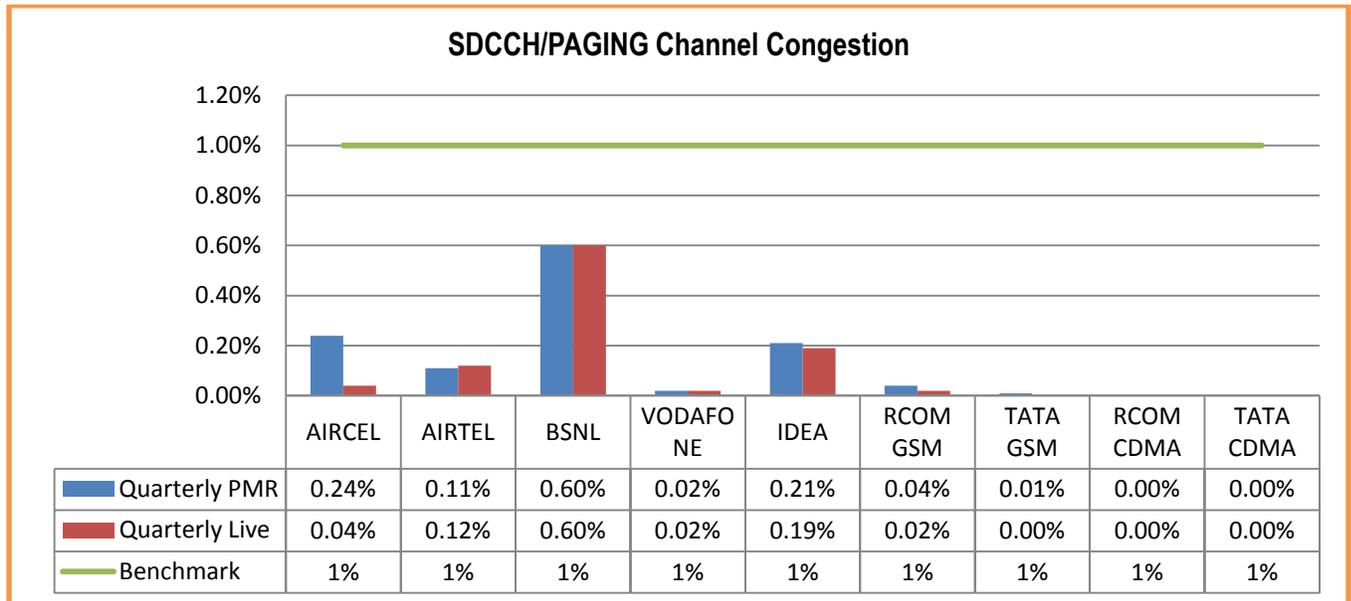
All operators are meeting the benchmarks.

3) CALL SETUP SUCCESS RATE :



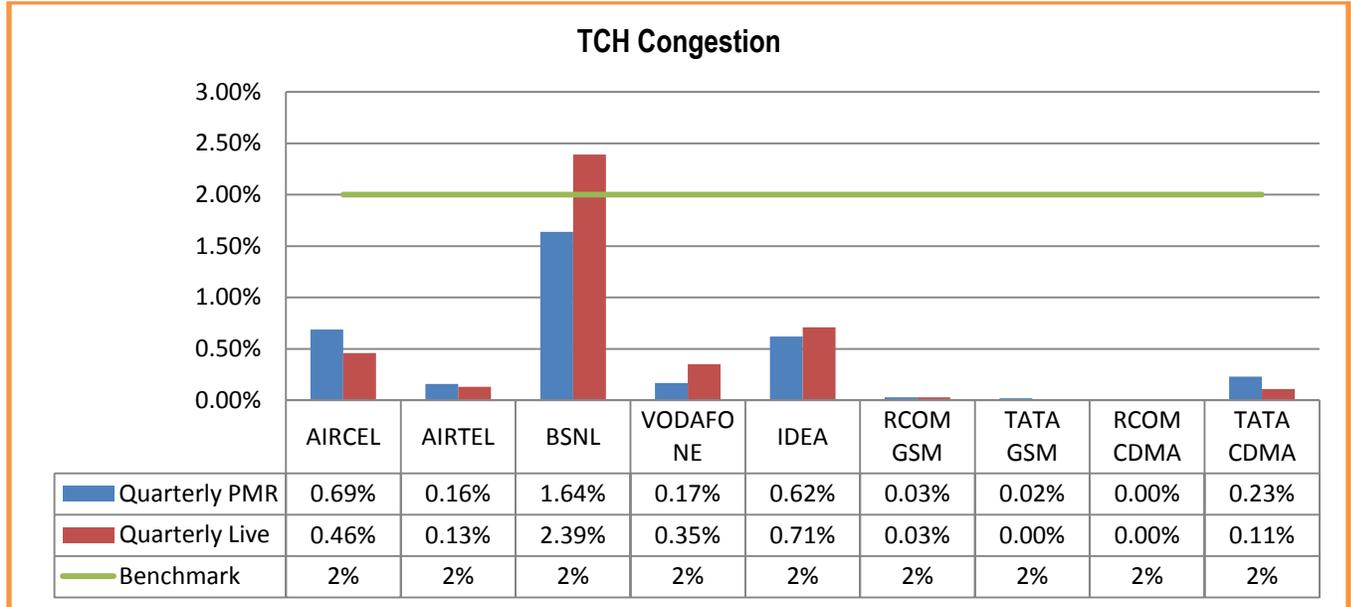
All operators are meeting the benchmarks.

4) SDCCH/PAGING CHANNEL CONGESTION :



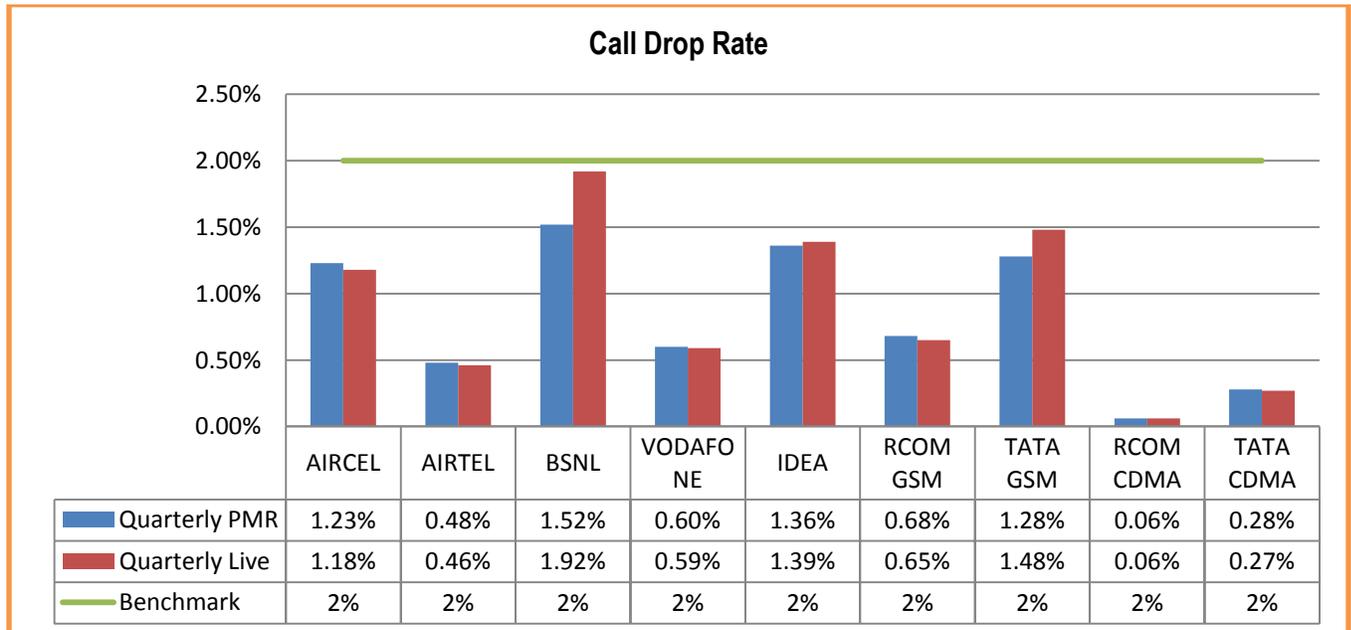
All operators are meeting the benchmarks.

5) TCH CONGESTION :



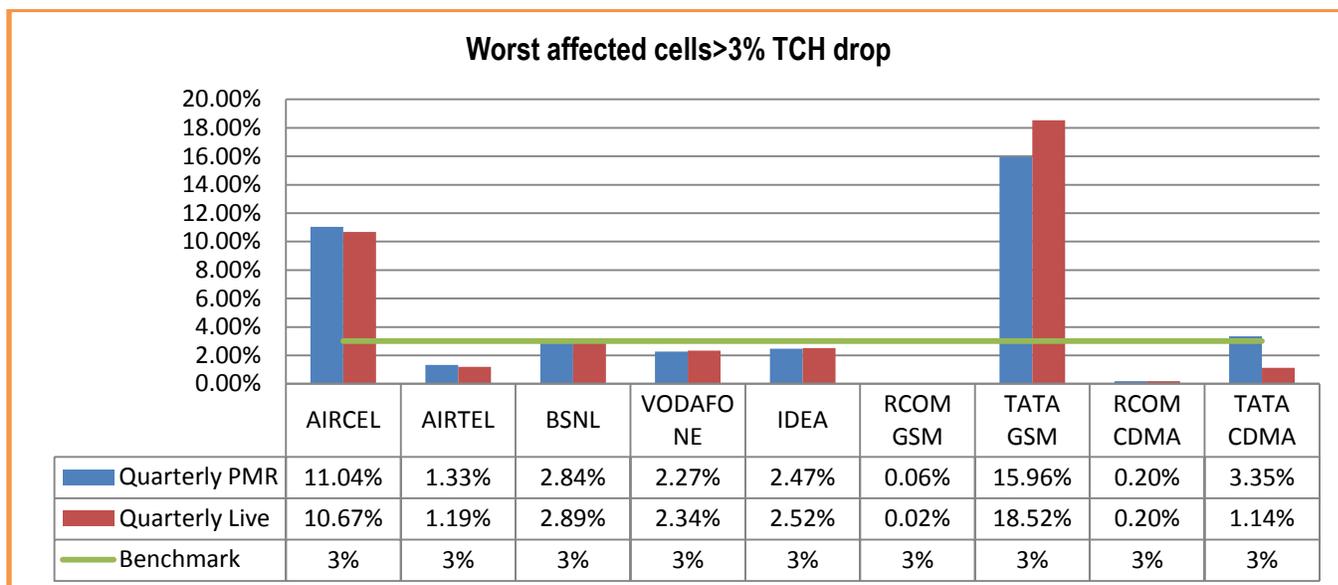
All operators are meeting the benchmarks except BSNL (during 3 day live measurement).

6) CALL DROP RATE :



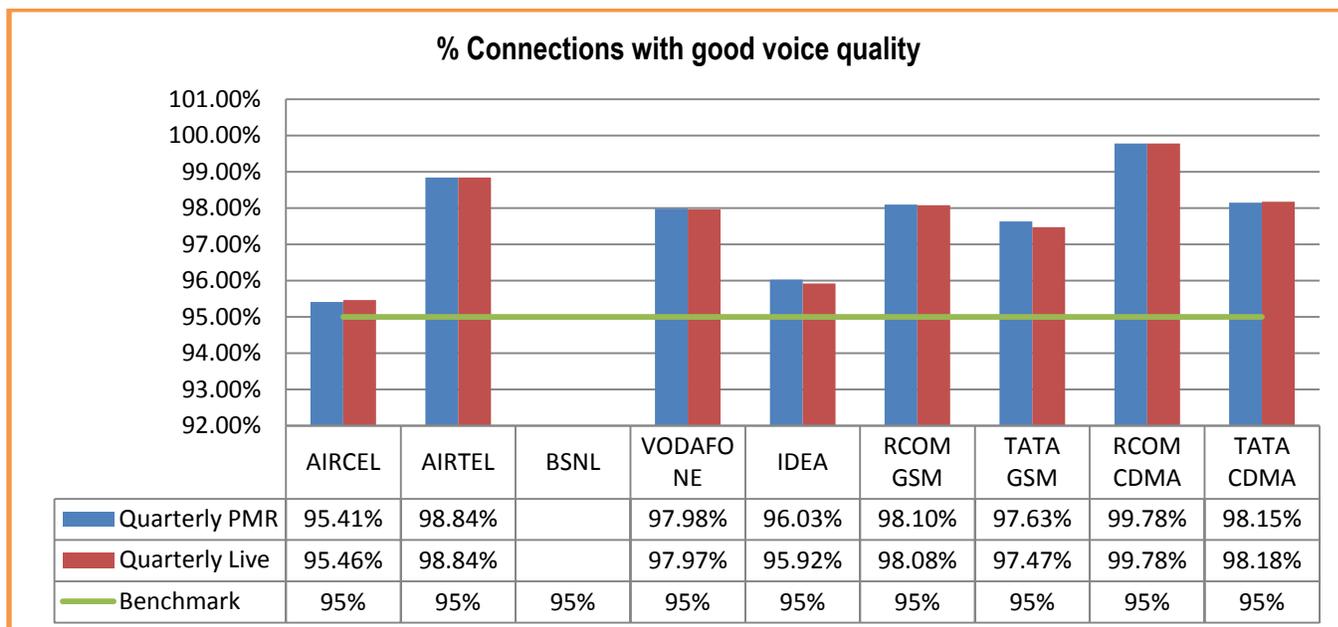
All operators are meeting the benchmarks.

7) WORST AFFECTED CELLS>3% TCH DROP :



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

8) PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY :



All operators are meeting the benchmarks. BSNL has not provided the data as they are not able to fetch the system generated data.

9. QOS AUDIT OF BASIC (WIRELINE) SERVICE PROVIDERS



9. QOS AUDIT OF BASIC TELEPHONE SERVICE (WIRELINER)

The QoS audit for basic (wire line) service was undertaken for assessment of quarterly performance of the service providers for quarter ended March-2015. As per the current list of the exchanges provided by BSNL, there are total 755 exchanges in HP Circle. Out of 755, **audit was done for sampled 6 (Urban) and 52 (Rural) exchanges** of BSNL (List of BSNL exchanges undertaken for QoS audit attached as annex-1 in the end of the report) and 1 exchange of RCL. 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	Rural Exchange	Total Exchange	No. of Urban Exchanges Covered for audit	No. of Rural Exchanges Covered for audit
1	BSNL	HP	73	682	755	6	52
2	RCL	HP	1	0	1	1	0
Total Exchanges at present			74	682	756	7	52

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 – HP CIRCLE					
Sl. No.	Parameters	Benchmark	Audit Period	BSNL	RCL
1	Fault incidences				
	(No. of faults/100 subscribers /month)	< 7%	Quarterly	3.18%	NIL
2	Faults Repair/Restoration Time				
	Fault repair by next working day(Urban Area)	>85%	Quarterly	64.14%	100.00%
	% of fault repair within 5 days (Urban Area)	100%	Quarterly	98.44%	100.00%
	Fault repair by next working day(Rural & hilly Area)	>75%	Quarterly	41.47%	NA
	% of fault repair within 7 days(Rural & hilly Area)	100%	Quarterly	97.67%	NA
	Mean time to Repair(MTTR)	≤10 Hrs	Quarterly	27.85 Hrs	0 Hrs
3	Rent Rebate				
	Fault pending > 3 days & <7 days	Rebate for 7 days	Quarterly	0	0
	Fault Pending > 7 days & < 15 days	Rebate for 15 days	Quarterly	4	0
	Fault pending > 15 days	Rebate for 1 month	Quarterly	5	0
4	Metering & Billing Performance				
	% of disputed Bills over bills issued (Post Paid)	< 0.1%	Quarterly	0.00%	0.00%
	% of Pre-paid Charging Complaints	< 0.1%	Quarterly	NA	NA
	% of billing complaints resolved within 4 weeks	98% within 4 weeks	Quarterly	100.00%	100.00%
	% of billing complaints resolved within 6 weeks	100% within 6 weeks	Quarterly	100.00%	100.00%
	Period of all refunds/payments from the date of resolution of complaints within 1weeks	≤1 week	Quarterly	Within 1 Week	Within 1 Week
5	POI Congestion				
	No. of POI's having congestion >0.5%		Quarterly	0	0
6	Response Time to customer for assistance				
	Accessibility of Call centre/customer Care	≥95%	Quarterly	100.00%	97.36%
	% age of calls answered by operator(voice to voice) within 90 seconds	≥95%	Quarterly	93.69%	95.98%
7	Customer care(promptness in attending to customers request)				
	Termination / Closures	100%	Quarterly	98.40%	100.00%
	Time taken for refunds of deposit after closures	100%	Quarterly	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 (WIRELINE) PROVIDERS:

3 DAYS LIVE MEASUREMENT DATA FOR WIRELINE (BASIC) SERVICES - HP CIRCLE					
SI No.	Parameters	Benchmark	Period	BSNL	RCL
1	POI Congestion				
	No. of POI's having congestion >0.5%	≤0.5%	Live	0	0
2	Response Time to customer for assistance				
	Accessibility of Call centre/customer Care	≥95%	Live	100.00%	95.26%
	% age of calls answered by operator(voice to voice) within 90 seconds	≥95%	Live	100.00%	95.52%

9.3 KEY FINDINGS: BASIC TELEPHONE SERVICES (WIRES)

Fault Incidences: The audit of the service providers revealed that the performance of the service providers was well within the benchmark. RCL is having only 33 telephone connections in HP circle and no fault has been reported.

Fault Repair/Restoration Time: For this parameter, **Only BSNL failed to meet the benchmark of fault repair by next working day and restoration time both in urban & rural areas.** The performance of BSNL was **64.14%** for 'Fault repaired by next working day' and **98.44%** for fault repaired within 5 days in urban areas whereas their performance for the same parameters was **41.47% (by next working day) & 97.67% (Within 7 days)** in rural & hilly areas.

Mean Time to Repair: BSNL was also failed to meet the benchmark for MTTR with their performance as **27.85 hrs** against the benchmark of ≤ 10 Hrs.

Metering and Billing performance: For this parameter, the performance of the service providers was found well within the compliance benchmarks.

Period of refund/adjustment from date of resolution of complaints: The performance of the service providers was within the benchmark of ≤ 1 week.

Response Time to Customer for assistance: For percentage of calls getting connected to call center, both operators met the benchmark, whereas, in case of Call answered by operator, **BSNL** could not meet the benchmark with its performance as **93.69%** against the benchmark of $\geq 95\%$.

Termination/Closures: BSNL lagged behind the benchmark with its achieved level as **98.40%**.

*Thus, from the above findings that, it was concluded that the performance of BSNL was not satisfactory in respect of the parameters **Fault Repairs/Restoration Time, MTTR, Response time to customer for assistance and Termination / Closures.** Hence, BSNL need to improve their services in respect of these parameters.*

9.4 INTER OPERATOR CALL ASSESSMENT (WIREFLINE)

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	Total No. of calls Made	Circle	BSNL	RCL
BSNL	100	HP	--	100.00%
RCL	100	HP	100.00%	--

The result of the testing revealed that the inter connection performance among the operators was quite satisfactory as there was hardly any problem in interconnection from one operator to other operators.

9.5 LEVEL-1 LIVE CALLING (WIREFLINE)

LEVEL 1 LIVE CALLING				
EMERGENCY NO.	CIRCLE	NO. OF CALLS MADE	BSNL	RCL
100	HP	10	√	√
101	HP	10	√	√
108	HP	10	√	√
1091	HP	10	√	√
1098	HP	10	√	√

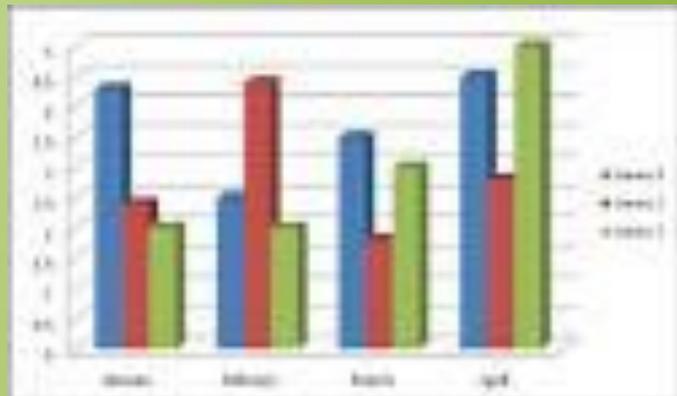
To assess the availability and efficiency of level 1 services such as police, fire, ambulance (emergency services) offered by various service providers, the calls were made from telephone provided by the service providers. In HP circle, these services were found functional in the networks of both the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

9.6 CUSTOMER CARE / HELPLINE ASSESSMENT (WIRESERVICE SERVICES)

LIVE CALLING TO CALL CENTRE			
Parameter	Circle	BSNL	RCL
A) Total no of calls attempted to customer care/Call center	HP	100	100
B) Total no. of calls successfully established to customer care/Call center	HP	100	100
C) % Accessibility of Call centre /customer Care (Total call attempt*100/ Total call successfully established)	HP	100.00%	100.00%
D) Total Calls reached to agent desk for Voice to Voice (Total call attempt)	HP	100	100
E) Total number of calls answered by the operator (Voice to voice) within 90 seconds	HP	100	100
F) % age of calls answered by the operators (voice to voice) within 90 seconds	HP	100.00%	100.00%

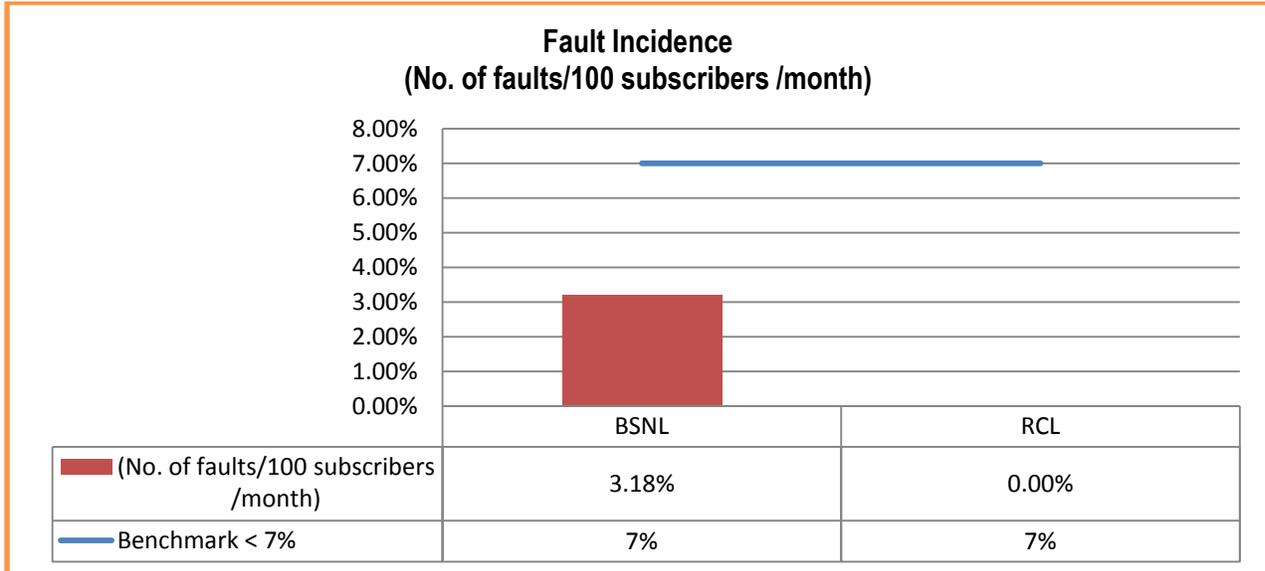
In case of calls answered by operators (voice to voice), when test calls were made to the call centers of different service providers, 100% of calls were answered by the call center operators of BSNL and RCL

GRAPHICAL REPRESENTATION OF BASIC (WIRELINE) SERVICES



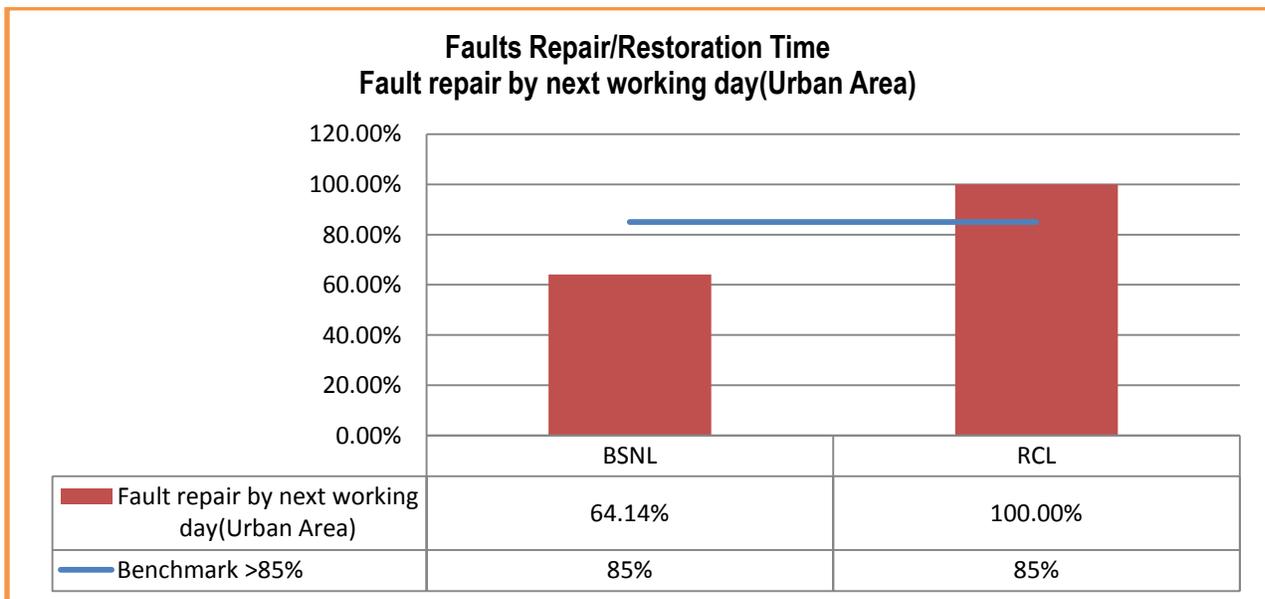
9.7 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS:

1) FAULT INCIDENCE:



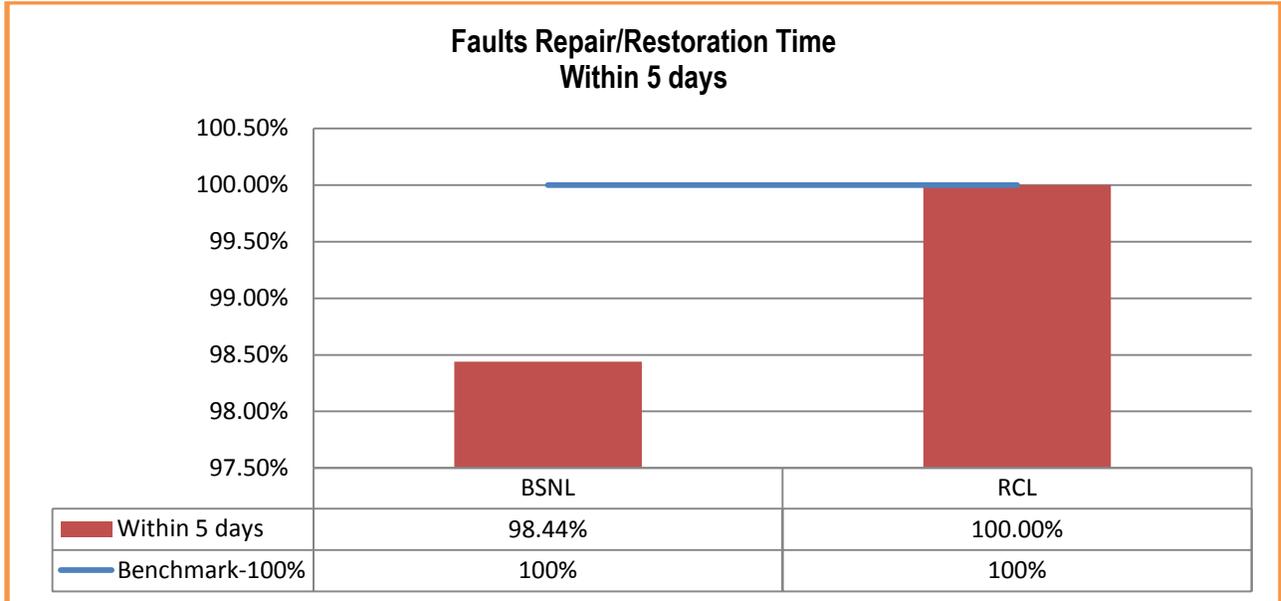
Both operators are meeting the benchmarks.

2) FAULTS REPAIR/RESTORATION TIME:



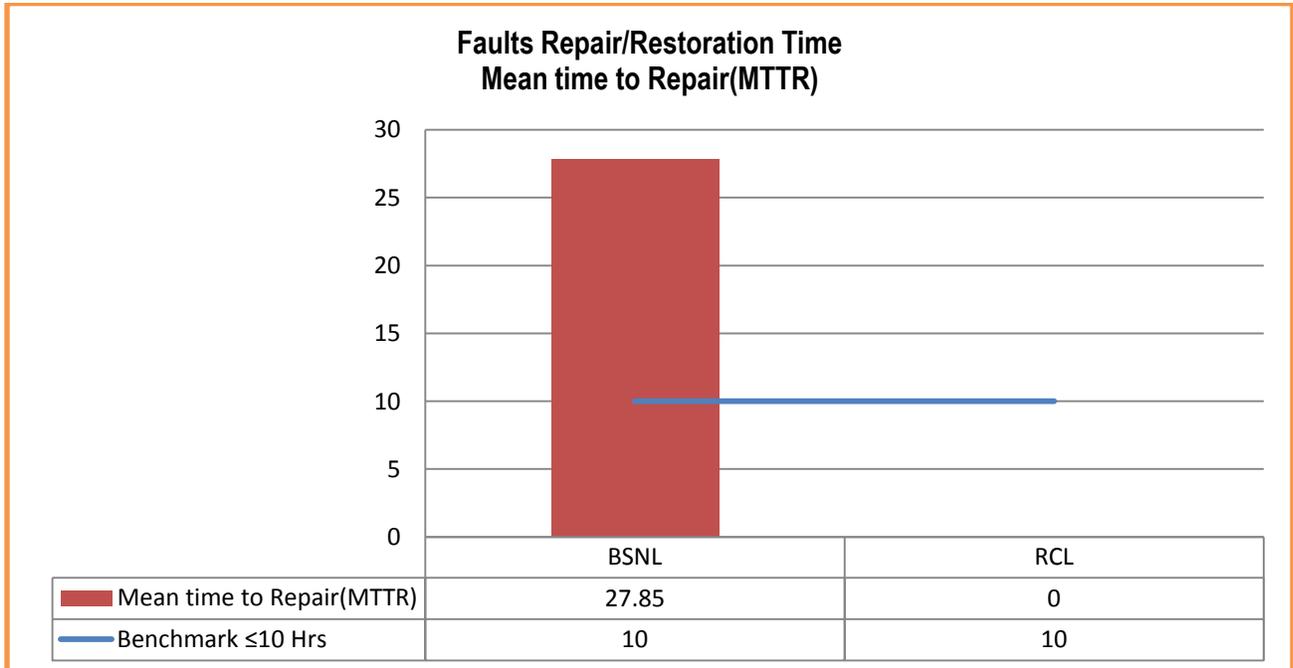
BSNL is not meeting the benchmark.

3) FAULTS REPAIR/RESTORATION TIME WITHIN 5 DAYS:



BSNL is not meeting the benchmark.

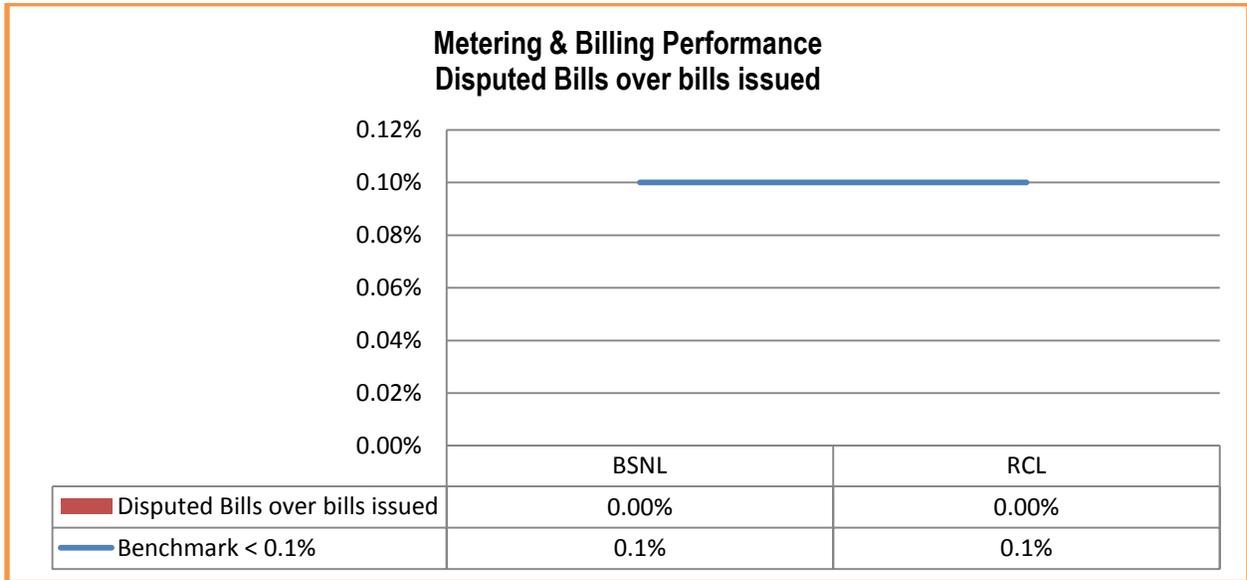
4) MEAN TIME TO REPAIR (MTTR):



BSNL is not meeting the benchmark and RCL did not have any fault during this quarter.

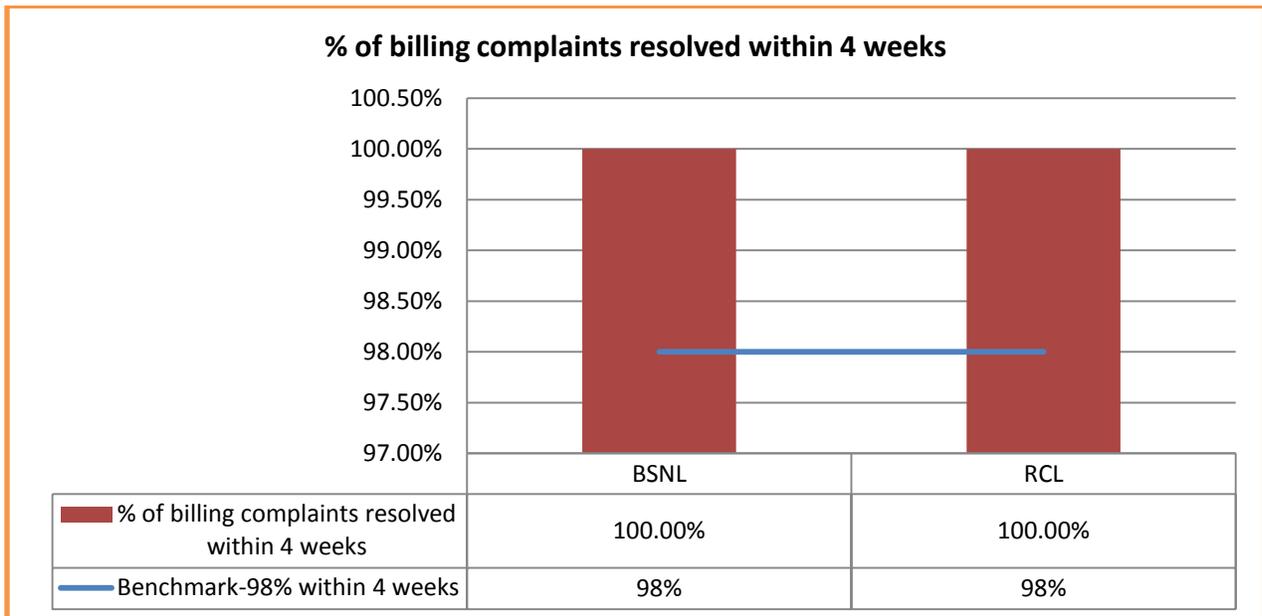
5) METERING & BILLING PERFORMANCE:

a) DISPUTED BILLS OVER BILL ISSUED :



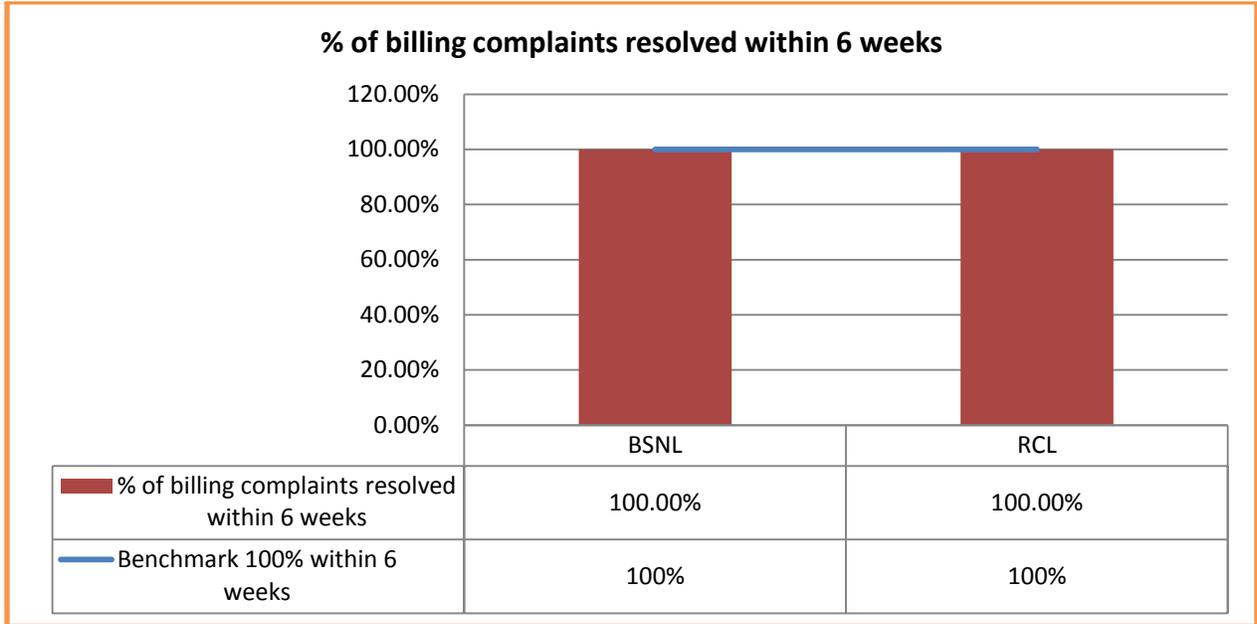
Both operators are meeting the benchmarks.

b) BILLING COMPLAINT RESOLUTION WITHIN 4 WEEKS:



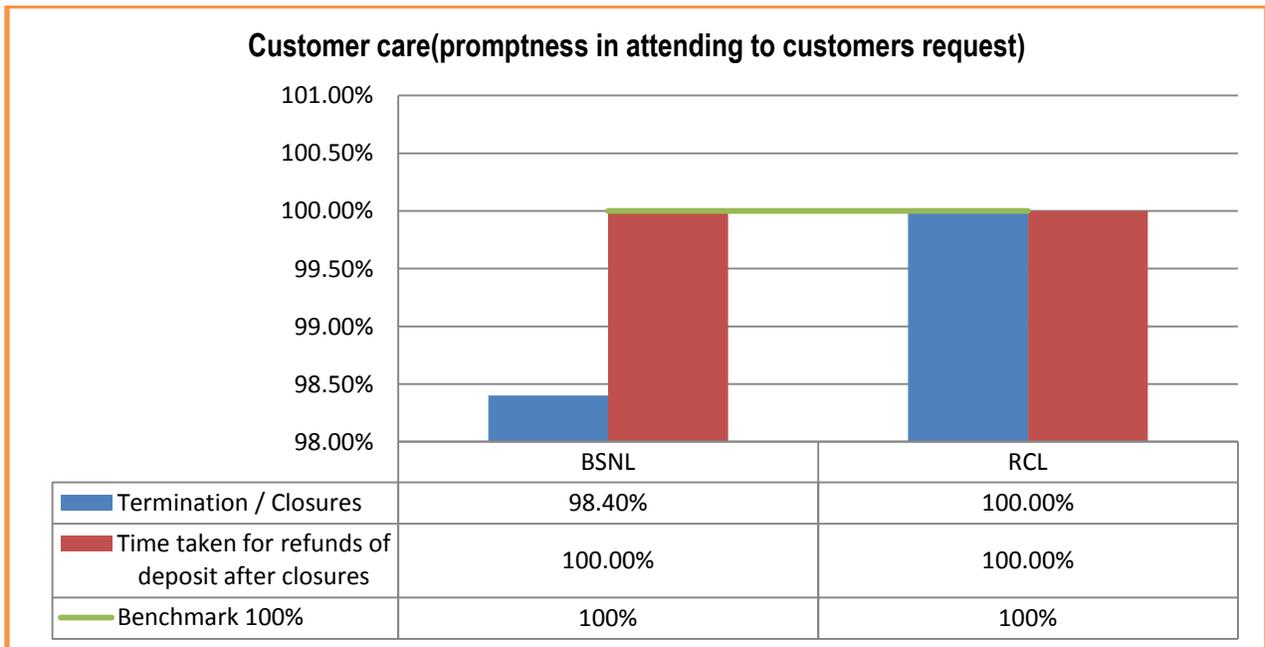
Both operators are meeting the benchmarks.

c) BILLING COMPLAINT RESOLUTION WITHIN 6 WEEKS:



Both operators are meeting the benchmarks.

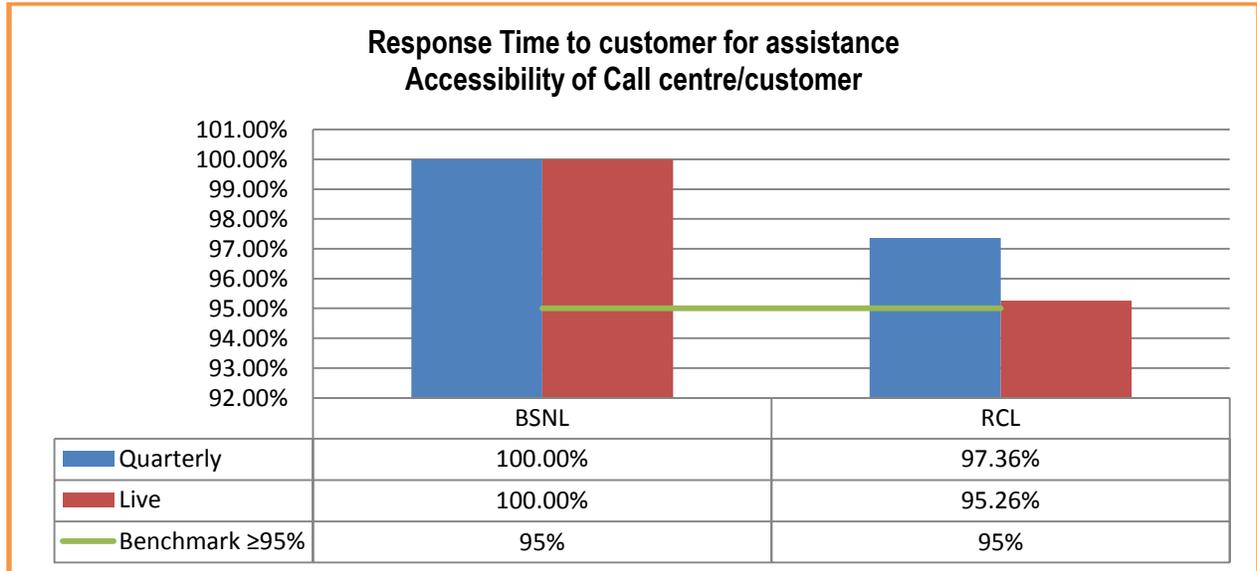
6) TERMINATION & CLOSURES:



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

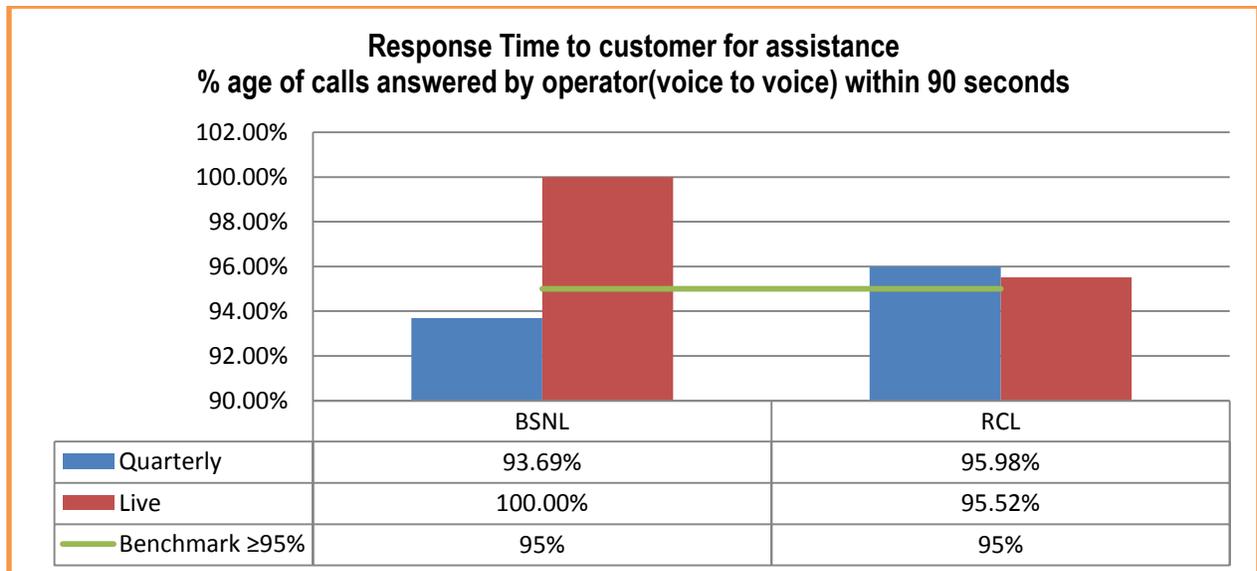
9.8 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BASIC TELEPHONE SERVICE (WIRELINE) PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

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



Both Operators are meeting the benchmarks.

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



BSNL is 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**.

Audit was done for BSNL, Broadband Pacenet India, RCL and NSTPL broadband service providers providing their service in HP circle. TCL is having only two subscribers, so their audit is not done.

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.

Audit was done for the following Broadband four service Providers.

S. NO.	NAME OF BROADBAND SERVICE PROVIDER	LOCATION OF AUDIT
1	BSNL	BSNL OFFICE SHIMLA, SOLAN
2	BROADBAND PACENET INDIA PVT. LTD	BROADBAND PACNET INDIA PVT LTD, SUBHASH NAGAR, NEW DELHI
3	RELIANCE COMMUNICATION LIMITED (RCL)	DAKC, MUMBAI
4	NSTPL	NSTPL OFFICE, BADDI, HP

10.1 QUARTERLY MEASUREMENT DATA FOR BROADBAND SERVICE PROVIDERS

AVERAGED QUARTERLY (JAN to MAR 15) AUDIT DATA FOR BROADBAND SERVICES – HIMACHAL PRADESH CIRCLE							
Broadband Audit Data		Bench- mark	Circle Name	BSNL	RCL	NSTPL	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS			
Service Provisioning/Activation Time							
1	A) No of connections registered during the period		HP	175	0	16	0
	B) Total number of connections provided within 15 days of registration on demand during the period		HP	175	0	16	0
	C) % age of connections provided within 15 days of registration on demand (subject to technical feasibility)	<15 days	HP	100.00%	100.00%	100.00%	100.00%
	D) Total number of connections provided after 15 days of registration on demand		HP	0	0	0	0
	E) %age of connections provided after 15 days of registration on demand		HP	0.00%	0.00%	0.00%	0.00%
	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.	HP	0	0	0	0
Fault Repair/Restoration Time							
2	A) Total number of faults registered during the period		HP	688	0	61	32
	B) Total number of faults repaired by next working day		HP	582	0	58	31
	C) % age of faults repaired by next working day	>90%	HP	84.59%	100.00%	95.08%	96.87%
	D) Total number of faults repaired within three working days		HP	685	0	61	32
	E)% age of faults repaired within three working days	≥99%	HP	99.56%	100.00%	100.00%	100.00%
Rent Rebate							
3	A) Faults Pending for > 3 working days and < 7 working days: (Rebate equivalent to 7 days of minimum monthly charge or equivalent usage allowance)		HP	0	0	0	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)		HP	0	0	0	0
	C) Faults Pending for > 15 working days:(Rebate equivalent to one month of minimum monthly charge or equivalent usage allowance)		HP	0	0	0	0
Billing Performance							
4	A) Total bills generated during period		HP	12726	78	38	185
	B) Total complaints received from customers/ Bills disputed		HP	2	0	0	0
	C) Billing complaints per 100 bills issued	<2%	HP	0.02%	0.00%	0.00%	0.00%

AVERAGED QUARTERLY (JAN to MAR 15) AUDIT DATA FOR BROADBAND SERVICES – HIMACHAL PRADESH CIRCLE							
Broadband Audit Data		Bench- mark	Circle Name	BSNL	RCL	NSTPL	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS			
	D) Total number of complaints resolved in 4 weeks from date of receipt		HP	2	0	0	0
	E) %age billing complaints resolved in 4 weeks	100%	HP	100.00%	100.00%	100.00%	100.00%
	F) Total number of cases requiring refund of deposits after closure		HP	4	0	0	0
	G) Total number of cases where refund was made in <60 days		HP	4	0	0	0
	H) Percentage cases in which refund received within 60 days	100%	HP	100.00%	100.00%	100.00%	100.00%
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		HP	27820	90304	NO CUSTOMER CARE	32
	B) Total number of calls answered by the operator within 60 seconds		HP	23802	81386		32
	C) % age calls answered by the operator in 60 seconds	>60%	HP	85.56%	90.00%		100.00%
	D) Total number of calls answered by the operator within 90 seconds		HP	25518	82412		32
	E) % age calls answered by the operator within 90 seconds	>80%	HP	91.73%	91.00%		100.00%
6	Bandwidth Utilization/ Throughput:						
POP to ISP Gateway Node [Intra-network] Link(s)							
6.1	A) Total Bandwidth Available at the link for the period days		HP	3072	27000	135	444
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		HP	1877	4153	58	245
	C) % age Bandwidth utilized during the period	<80%	HP	61.10%	15.38%	42.96%	55.18%
A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity							
6.2	A) Total number of upstream links for International connectivity		HP	12	11	NA	NA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		HP	0	0	NA	NA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP (Mbps)		HP	12288	314000	NA	NA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		HP	6471.95	176041	NA	NA
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	HP	52.67%	56.06%	NA	NA
Broadband Connection Speed (download) - from ISP Node to User							
6.3	A) Total committed download speed to the sample subscribers (In mpbs)		HP	21.63	15	NP	NP

AVERAGED QUARTERLY (JAN to MAR 15) AUDIT DATA FOR BROADBAND SERVICES – HIMACHAL PRADESH CIRCLE							
Broadband Audit Data		Bench- mark	Circle Name	BSNL	RCL	NSTPL	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS			
	B) Total average download speed observed for the sample subscribers during TCBH (In Mbps)		HP	18.38	17.58	NP	NP
	C) % age subscribed speed available to the subscriber during TCBH	>80%	HP	84.99%	117.23%	NP	NP
Service Availability/Uptime							
7	A) Total operational Hours		HP	2031	2160	NP	2160
	B) Total downtime (In hours)		HP	4	0	NP	25.45
	C) Total time when the service was available (In Hrs)		HP	2027	2160	NP	2134.55
	D) % age of Service availability uptime	>98%	HP	99.78%	100.00%	NP	98.82%
Packet Loss							
8	A) Total number of ping packets transmitted		HP	11000	90000	NP	NP
	B) Total number of ping packets lost		HP	56.67	465	NP	NP
	C) % age packet loss	<1%	HP	0.52%	0.52%	NP	NP
9 Network latency (for wired broadband access)							
9.1	Network Latency from User reference point at POP/ISP Node to IGSP/NIXI gateway		HP				
	A) Total number of ping packets transmitted		HP	11000	3000	NP	NP
	B) Total round trip time for all the ping packets transmitted during the period		HP	822	31	NP	NP
	C) Average round trip tip time for all the ping transmitted	<120 ms	HP	25.33	31	NP	NP
9.2 Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)							
9.2	A) Total number of ping packets transmitted		HP	11000	3000	NP	NP
	B) Total round trip time for all the ping packets transmitted during the period		HP	2356	37	NP	NP
	C) Average round trip tip time for all the ping transmitted	<350 ms	HP	92.67	37	NP	NP
9.3 Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)							
9.3	A) Total number of ping packets transmitted		HP	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		HP	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	HP	NA	NA	NA	NA

- In case of NSTPL, There is no Customer Care Number. Customers contact them via Mobile No 9218690010 so Data is not available for Customer Care
- NA- Not Applicable
- NP-Not Provided- Monthly Data Not Monitored by ISPs as

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

3 DAYS LIVE DATA FOR BROADBAND SERVICES – HIMACHAL PRADESH CIRCLE							
3 days live Broadband Audit Data			BSNL	RCL	NSTPL	PACENET	
S/ N	Name of Parameter	Bench- mark	Circle Name	BROADBAND SERVICE PROVIDERS			
Response time to the customer for assistance % age of calls answered by operator (Voice to Voice)							
1	A) Total number of calls received by the operator		HP	1448	1216	NO CUSTOMER CARE	3
	B) Total number of calls answered by the operator within 60 seconds		HP	1374	1153		3
	C) % age calls answered by the operator in 60 seconds	>60%	HP	94.89%	95.00%		100.00%
	D) Total number of calls answered by the operator within 90 seconds		HP	1401	1159		3
	E) % age calls answered by the operator within 90 seconds	>80%	HP	96.75%	95.29%		100.00%
2	Bandwidth Utilization/ Throughput:						
POP to ISP Gateway Node [Intra-network] Link(s)							
2.1	A) Total Bandwidth Available at the link for the period days		HP	2158	9000	135	148
	B) Total Bandwidth utilized during the period during TCBH (In Mbps)		HP	159.92	1601	79.14	80
	C) % age Bandwidth utilized during the period	<80%	HP	7.41%	18.00%	59.00%	54.05%
A) ISP Gateway Node to IGSP / NIXI Node upstream Link(s) for International connectivity							
2.2	A) Total number of upstream links for International connectivity		HP	12	10	NA	NA
	B) Number of Links having Bandwidth utilization > 90% during TCBH		HP	0	0	NA	NA
	C) Total international bandwidth available from ISP Node to IGSP/NIXI/NAP		HP	12288	96000	NA	NA
	D) Total international bandwidth utilization during peak hours (TCBH) in Mbps		HP	7177	67153	NA	NA
	E) %age International Bandwidth utilization during peak hours (TCBH)	<80%	HP	58.41%	70.00%	NA	NA
Broadband Connection Speed (download) - from ISP Node to User							
2.3	A) Total committed download speed to the sample subscribers (In mpbs)		HP	7.79	1	2	1.66
	B) Total average download speed observed for the sample subscribers during TCBH (In Mbps)		HP	6.88	0.92	2	1.64

3 DAYS LIVE DATA FOR BROADBAND SERVICES – HIMACHAL PRADESH CIRCLE							
3 days live Broadband Audit Data		Bench- mark	Circle Name	BSNL	RCL	NSTPL	PACENET
S/ N	Name of Parameter			BROADBAND SERVICE PROVIDERS			
	C) % age subscribed speed available to the subscriber during TCBH	>80%	HP	88.24%	92.00%	100.00%	99.00%
3	Packet Loss						
	A) Total number of ping packets transmitted		HP	3265	1000	3000	3000
	B) Total number of ping packets lost		HP	8	0	13	3
	C) % age packet loss	<1%	HP	0.25%	0.00%	0.43%	0.10%
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		HP	2941	1000	1000	3000
	B) Total round trip time for all the ping packets transmitted during the period		HP	96621	5.42	336	136
	C) Average round trip tip time for all the ping transmitted	<120 ms	HP	43.17	1.80	112	45.33
4.2	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Terrestrial)						
	A) Total number of ping packets transmitted		HP	8824	1000	3000	3000
	B) Total round trip time for all the ping packets transmitted during the period		HP	578560	2.26	837	567
	C) Average round trip tip time for all the ping transmitted	<350 ms	HP	181.93	0.75	279	189
4.3	Network Latency from User reference point at ISP Node to nearest NAP Port abroad (Satellite)						
	A) Total number of ping packets transmitted		HP	NA	NA	NA	NA
	B) Total round trip time for all the ping packets transmitted during the period		HP	NA	NA	NA	NA
	C) Average round trip tip time for all the ping transmitted	<800 ms	HP	NA	NA	NA	NA
5	Service Availability/Uptime						
	A) Total operational Hours		HP	72	72	72	72
	B) Total downtime (In hours)		HP	0.09	0	0	0
	C) Total time when the service was available (In Hrs)		HP	71.91	72	72	72
	D) % age of Service availability uptime	>98%	HP	99.88%	100.00%	100.00%	100.00%

NA: Not Applicable

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 for this parameter.

Fault Repair/Restoration Time: With regards to this parameter the performance of the service providers was within TRAI norms except BSNL, its achievement level was **84.59%** for fault Repair by next working day.

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. In case of NSTPL, there is no Customer Care Number. Customers contact them via Mobile No 9218690010 so Data is not available for Customer Care

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 during quarterly audit as well as 3 days live measurement.

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

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

10.4 CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE FOR BROADBAND SERVICES					
PARAMETER	CIRCLE	BSNL	RCL	NSTPL	PACENET
Total No. of calls Attempted	HP	100	100	No Customer Care	100
Total number of calls answered by the operator within 60 seconds	HP	87	100		100
% age calls answered by the operator in 60 seconds (> 60%)	HP	87.00%	100.00%		100.00%
Total number of calls answered by the operator within 90 seconds	HP	97	100		100
% age calls answered by the operator within 90 seconds (>80%)	HP	97.00%	100.00%		100.00%

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. In case of NSTPL, There is no Customer Care Number. Customers contact them via Mobile No 9218690010 so Data is not available for Customer Care

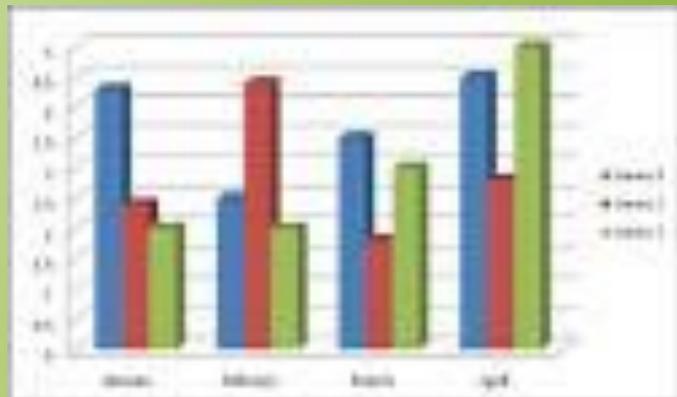
10.5 LIVE CALLING FOR BILLING COMPLIANTS

TELEPHONIC INTERVIEW FOR BILLING COMPLAINTS					
PARAMETER	CIRCLE	BSNL	RCL	NSTPL	PACENET
Total No. of Billing complaints received/ Call verified	HP	2	0	0	0
Total No. of calls Answered	HP	2	0	0	0
Cases resolved within 4 weeks	HP	2	0	0	0
%age of cases resolved	HP	100%	NA	NA	NA

NA: Not Applicable

To test the Service Providers performance on billing related complaints and their resolutions, TUV-SUD auditors conducted a customer feedback calling the effected customers. However, in one case, the number of customers contacted for verification was very less due to less number of billing complaints and in other cases the billing complaints were Zero. In case of the operators having billing complaints, the customers reported their satisfaction on resolution of the billing complaints.

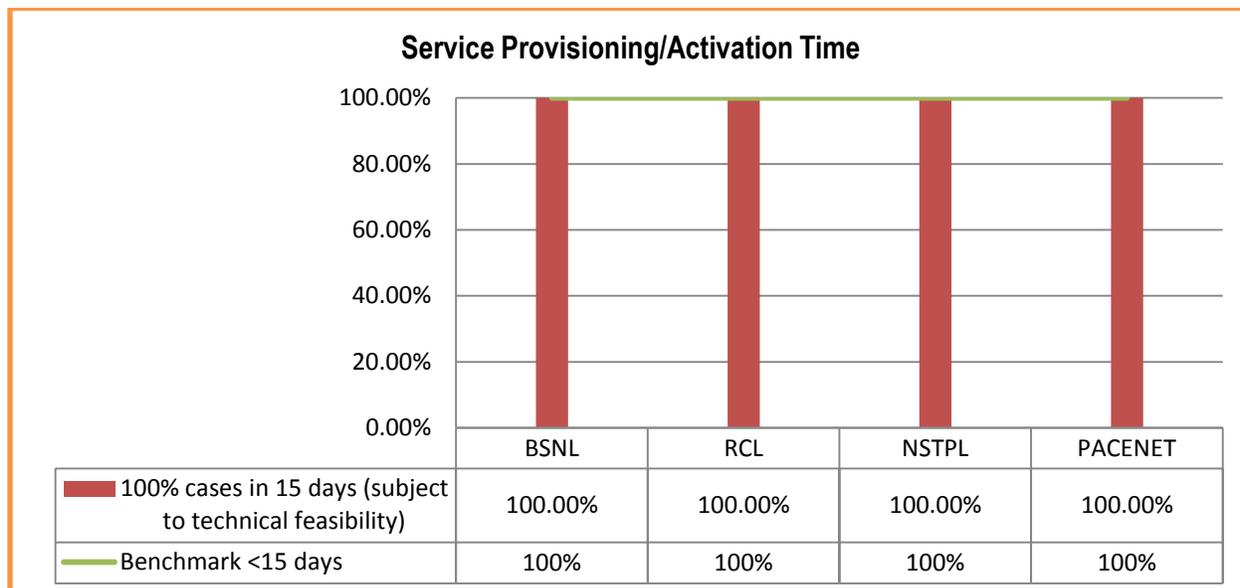
GRAPHICAL REPRESENTATION OF BROADBAND SERVICES



.

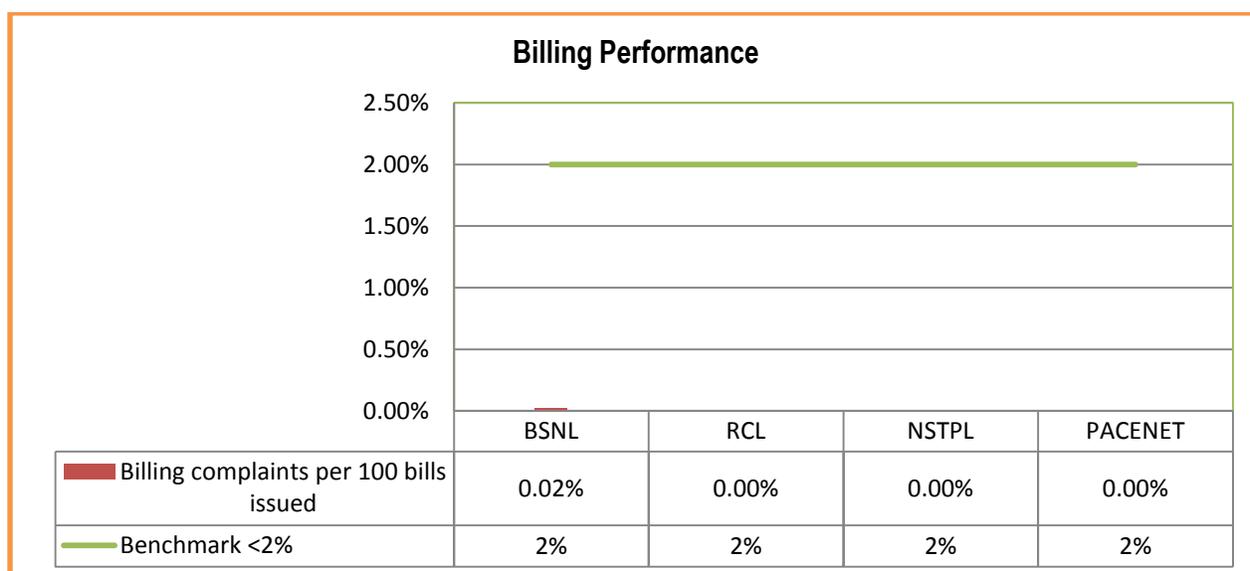
10.6 GRAPHICAL REPRESENTATION OF QUARTERLY PERFORMANCE OF BROADBAND SERVICE PROVIDERS:

1. SERVICE PROVISIONING/ACTIVATION TIME:



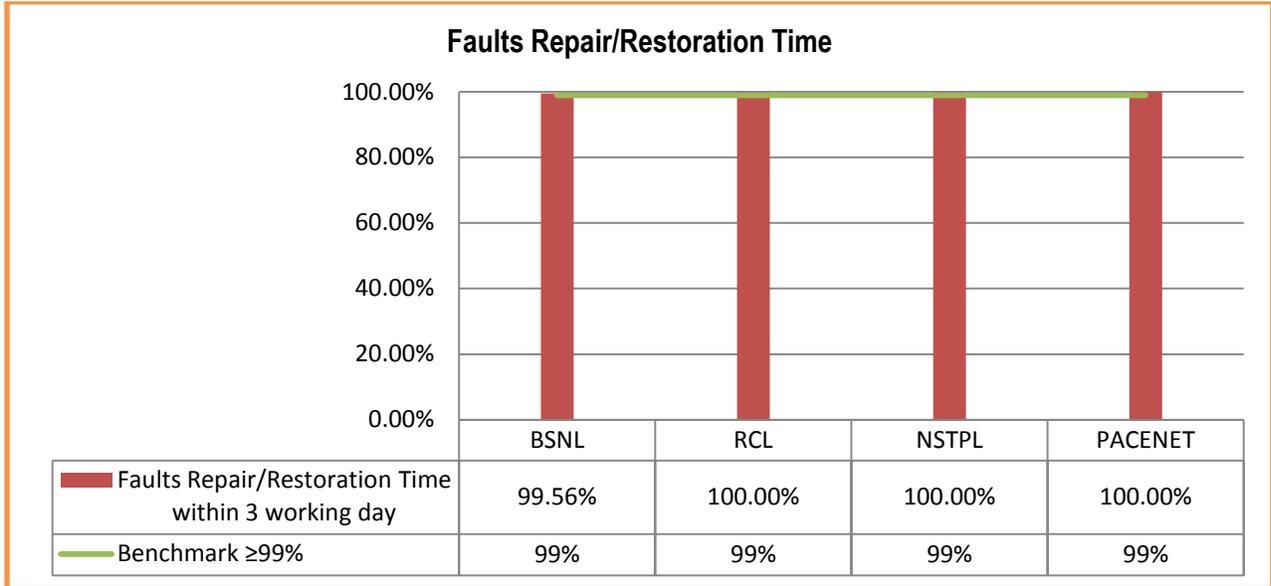
All Operators are meeting the benchmarks. In case of RCL and PACENET, no new connections and Installations were registered during this quarter.

2. BILLING PERFORMANCE:



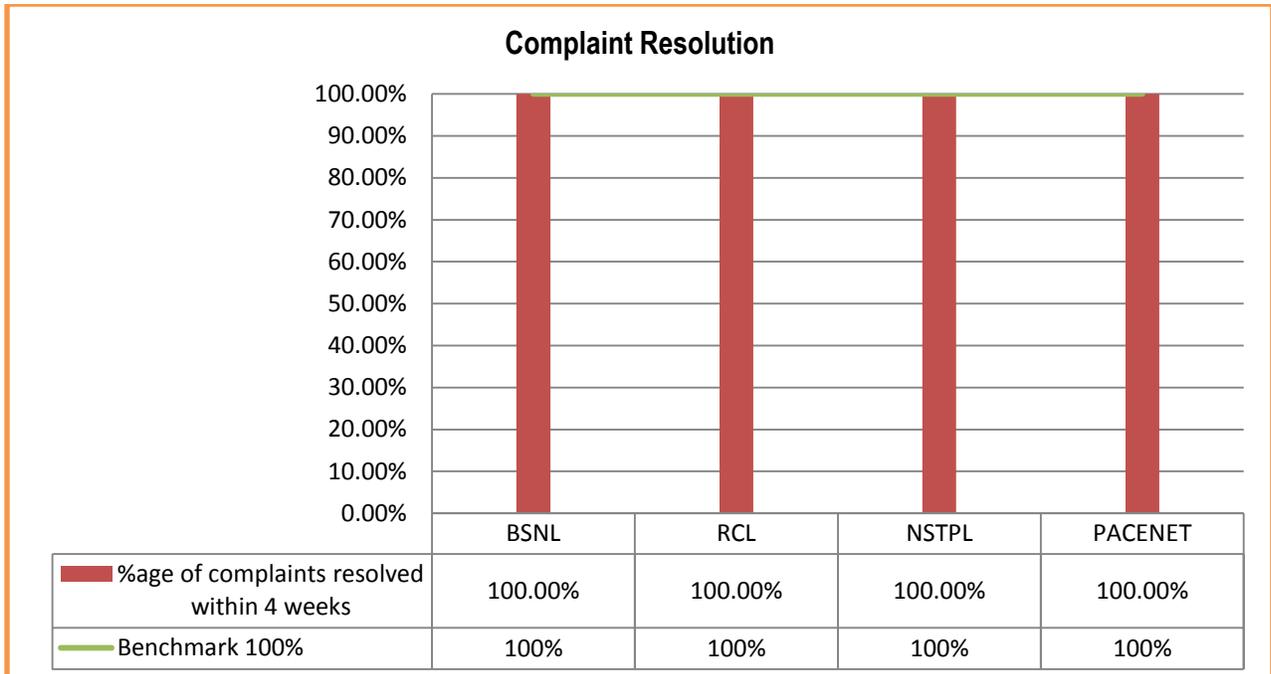
All Operators are meeting the benchmarks.

3. FAULTS REPAIR/RESTORATION TIME:



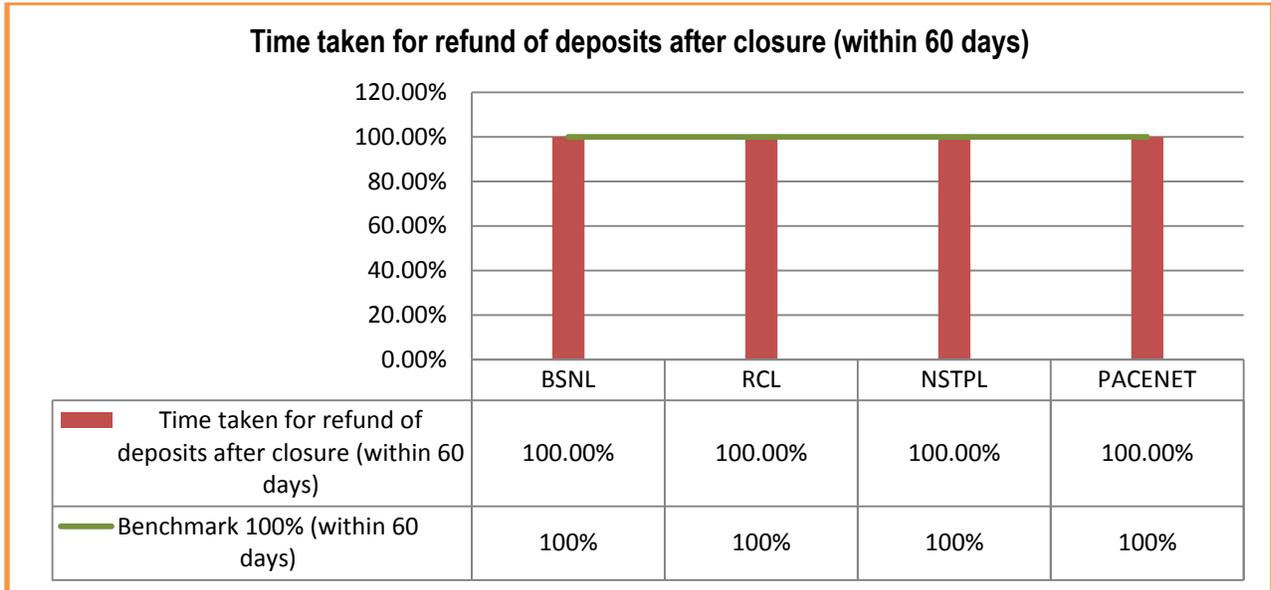
All Operators are meeting the benchmarks.

4. COMPLAINT RESOLUTION:



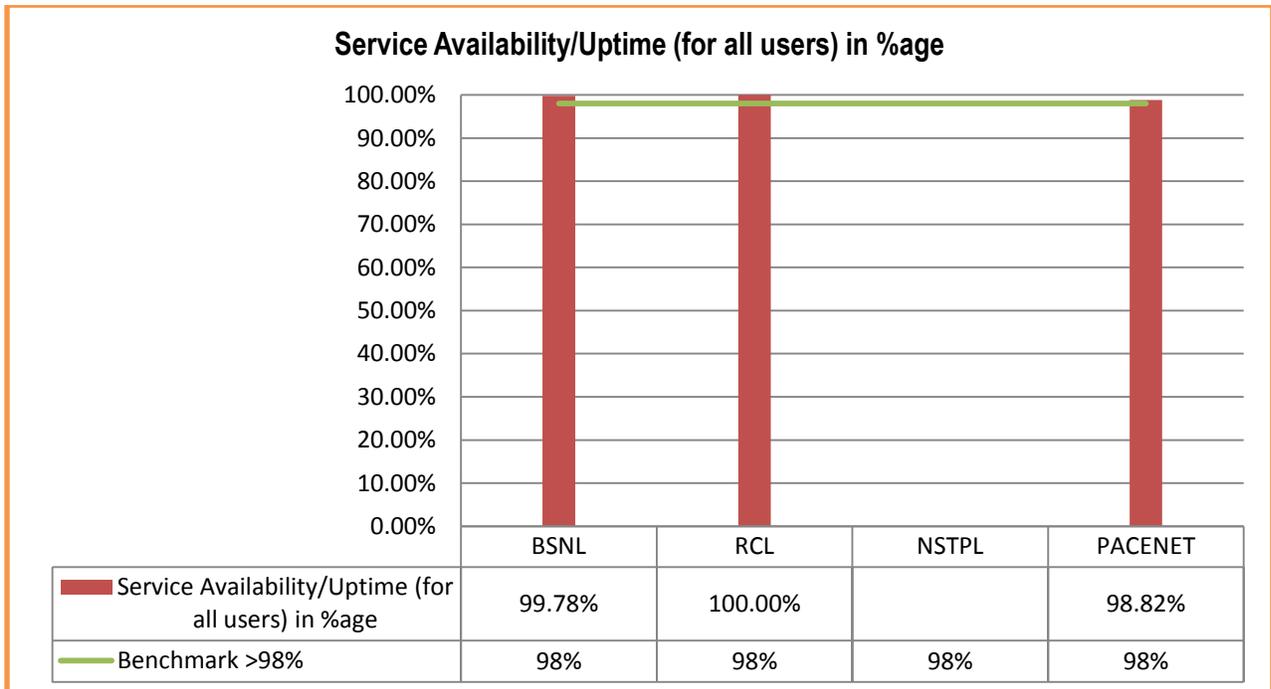
All Operators are meeting the benchmarks.

5. REFUND:



All Operators are meeting the benchmarks.

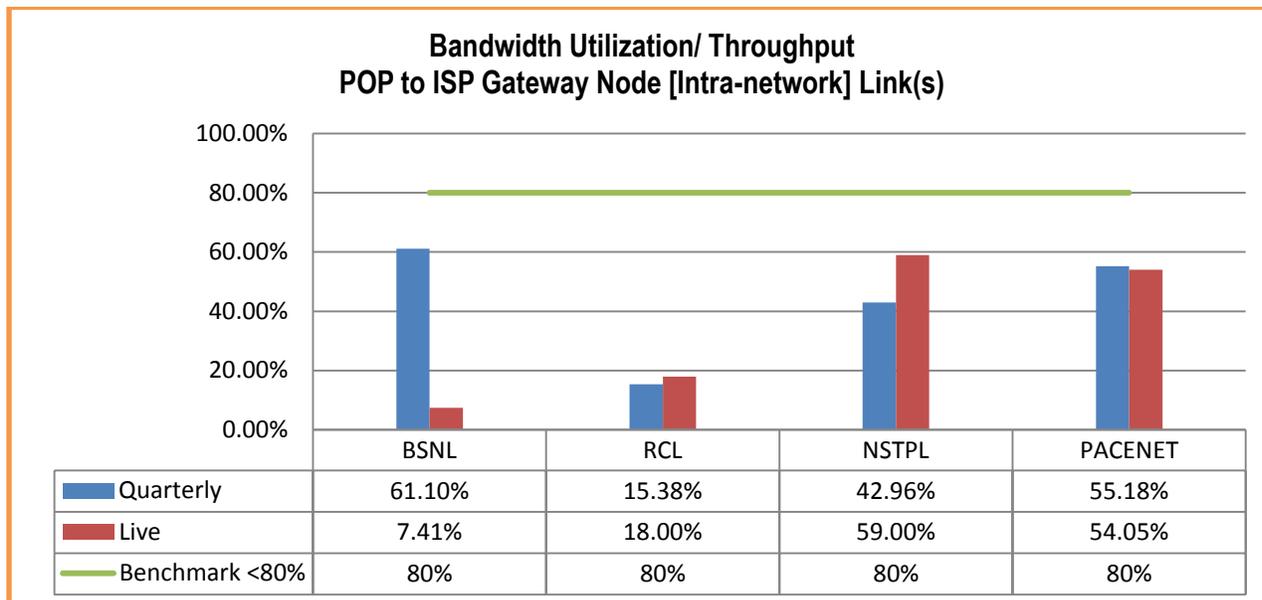
6. SERVICE AVAILABILITY/UPTIME:



All Operators are meeting the benchmarks.

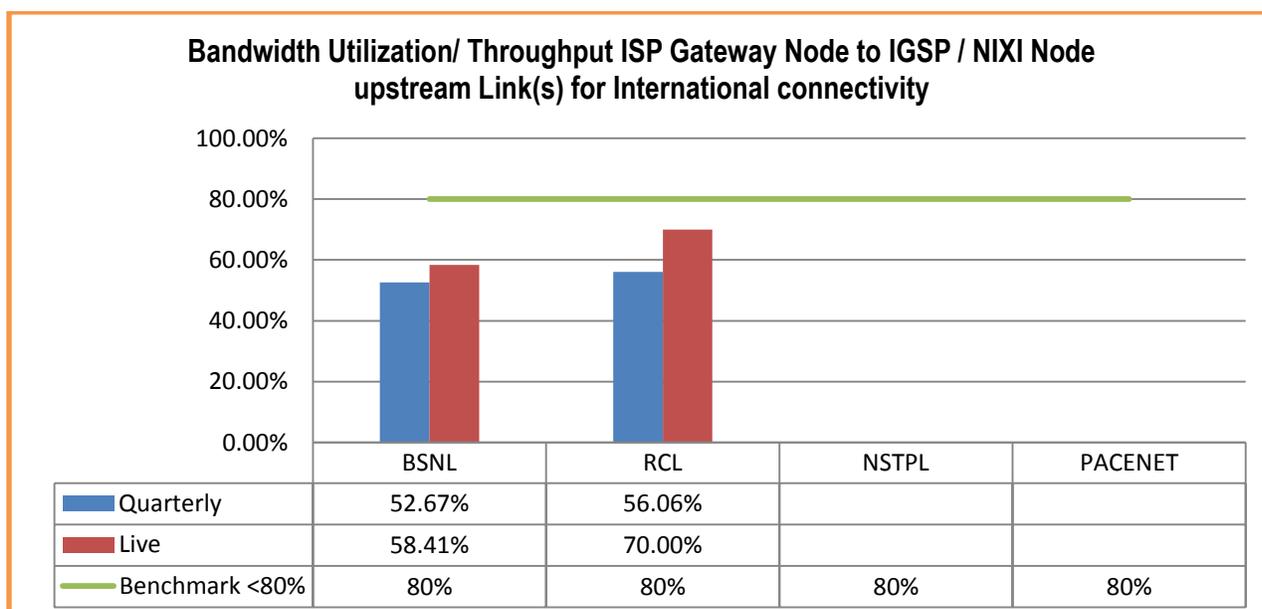
10.7 GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE BROADBAND SERVICE PROVIDERS V/S 3-DAYS LIVE MEASUREMENT:

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



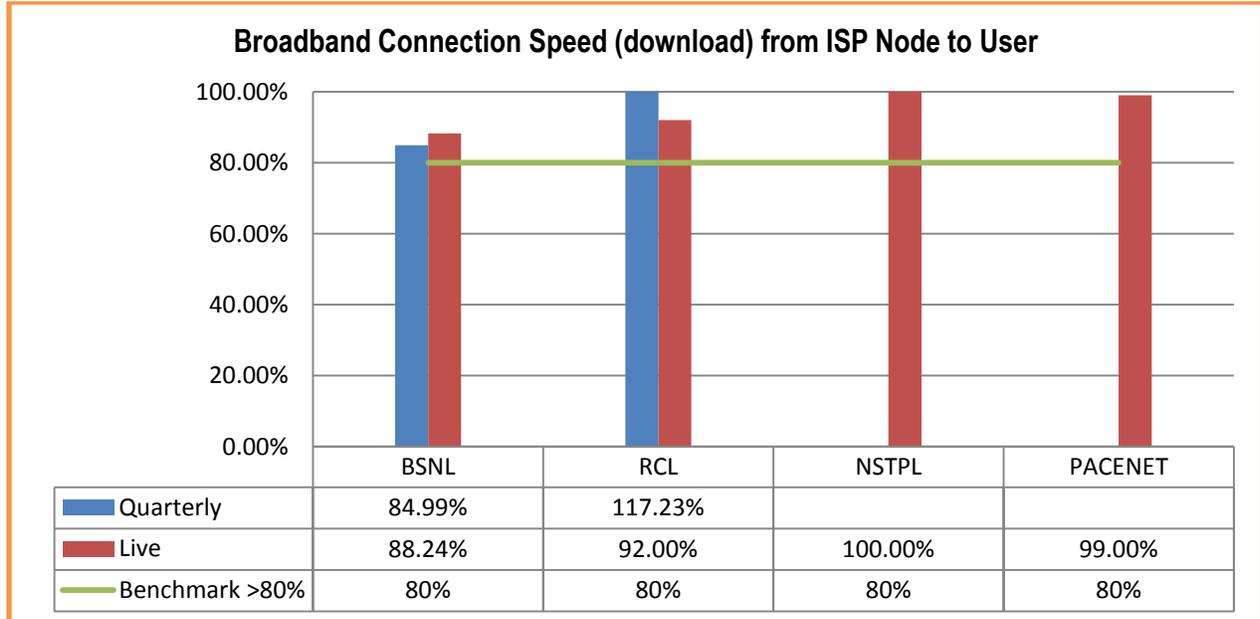
All Operators are meeting the benchmarks.

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



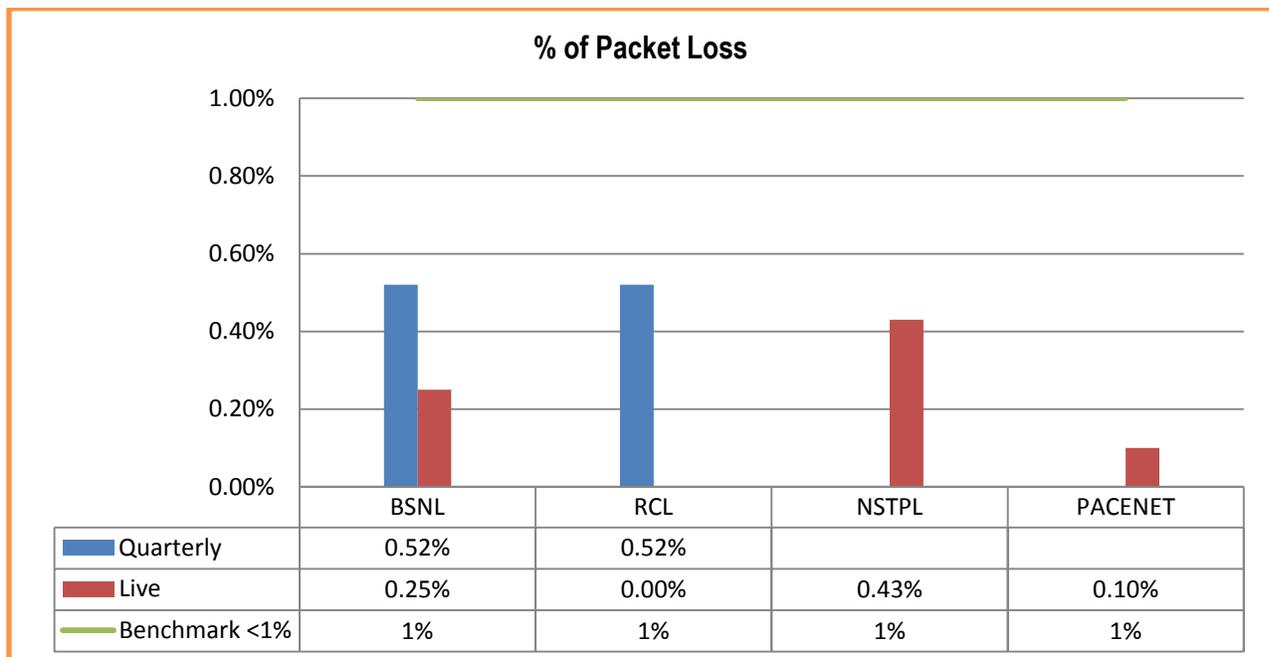
All Operators are meeting the benchmarks.

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



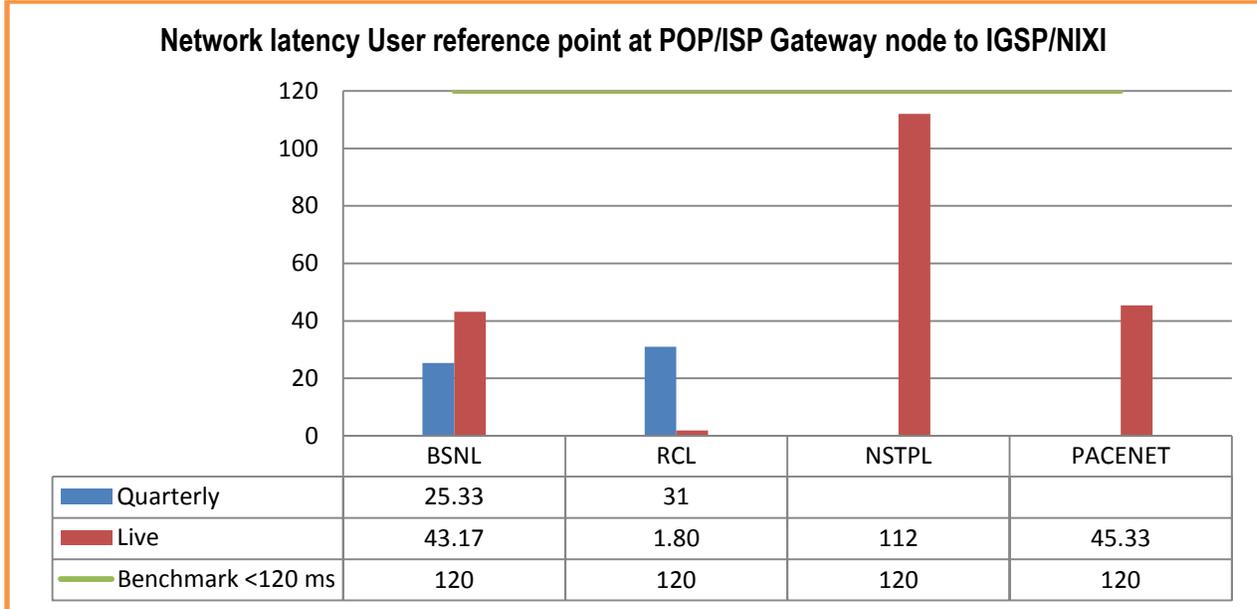
All Operators are meeting the benchmarks.

4. PACKET LOSS:



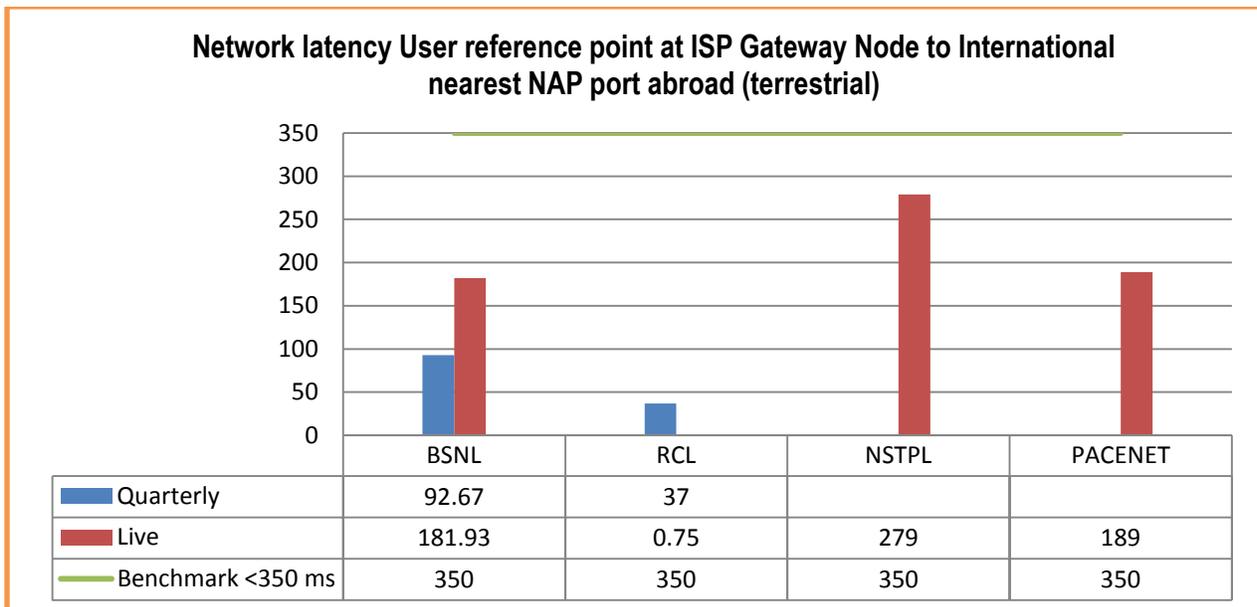
All Operators are meeting the benchmarks.

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



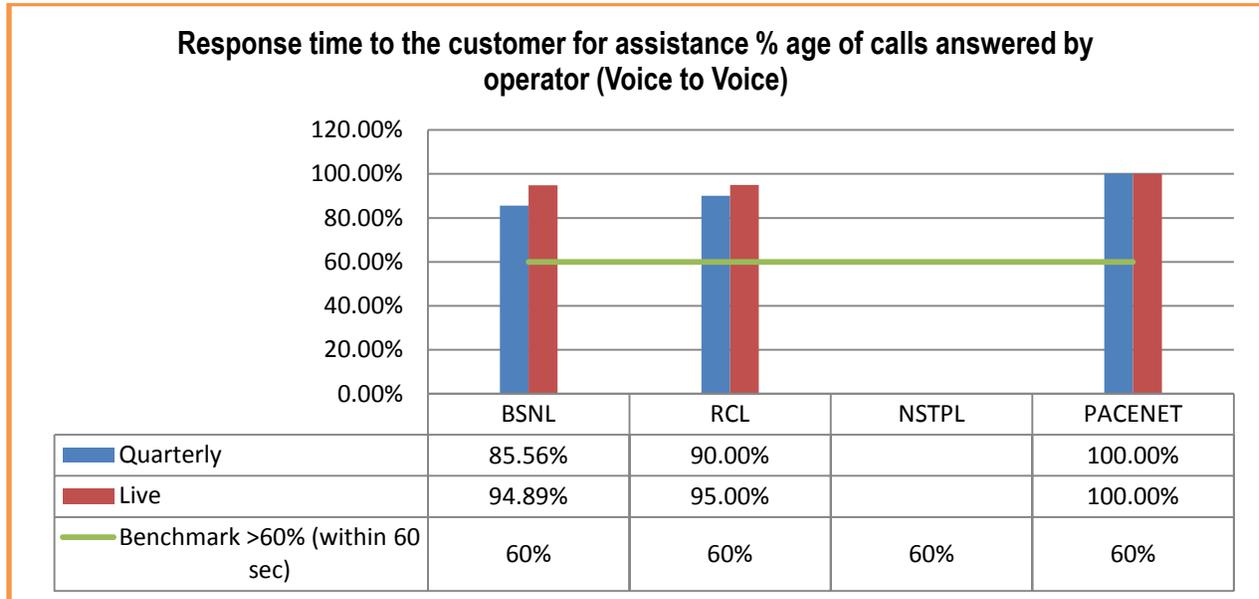
All Operators are meeting the benchmarks.

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



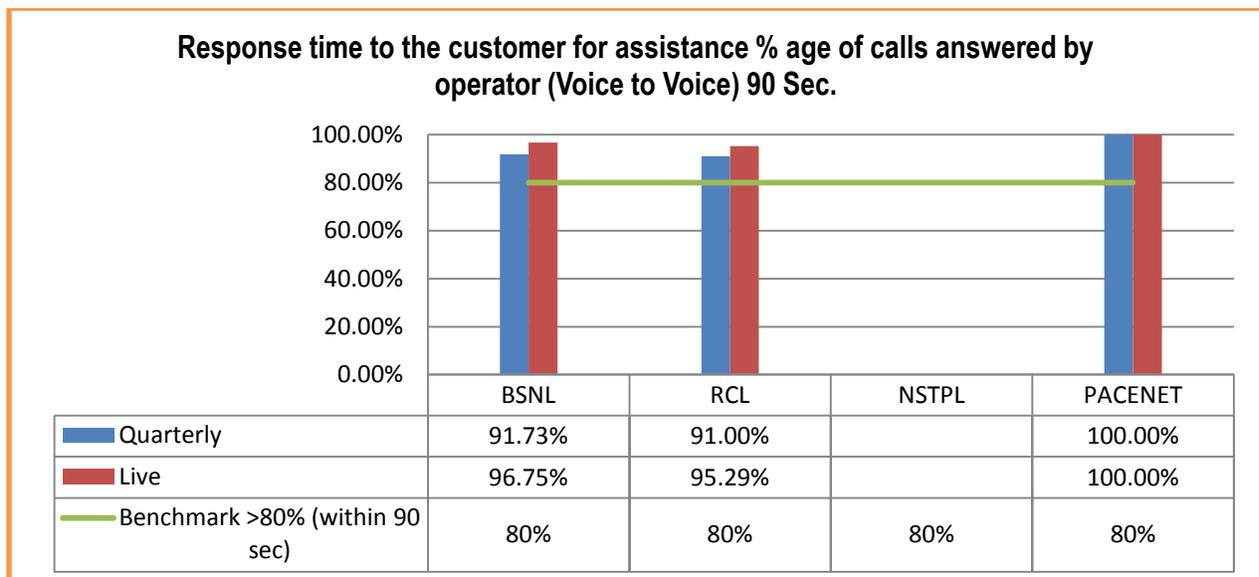
All Operators are meeting the benchmarks.

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 No 9218690010 so Data is not available for Customer Care.

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 No 9218690010 so data is not available for Customer Care.

Annex-1

S NO	CIRCLE	SERVICE PROVIDER	SSA	SDCA	EXCHANGE TYPE	NAME OF EXCHANGE	EXCHANGE LEVEL
1	HP	BSNL	SHIMLA	SHIMLA	URBAN	NEW SHIMLA RSU	267XXXX
2	HP	BSNL	SHIMLA	SHIMLA	URBAN	SHIMLA -B.ESTATE ,OCB MSU	262XXXX
3	HP	BSNL	SHIMLA	SHIMLA	RURAL	DHAMI	2790XXX
4	HP	BSNL	SHIMLA	SHIMLA	RURAL	BASANTPUR	27842XX
5	HP	BSNL	SHIMLA	SHIMLA	RURAL	BEOLIA	27512XX
6	HP	BSNL	SHIMLA	SHIMLA	RURAL	CHHARABRA	2648XXX
7	HP	BSNL	SHIMLA	SHIMLA	RURAL	GADHERI	2767XXX
8	HP	BSNL	SHIMLA	SHIMLA	RURAL	GHAINI	27484XX
9	HP	BSNL	SHIMLA	SHIMLA	RURAL	GHANDEL	27796XX
10	HP	BSNL	SHIMLA	SHIMLA	RURAL	GUMMA (GHANNATTI)	2781XXX
11	HP	BSNL	SHIMLA	SHIMLA	RURAL	JUBAR HATTI	2736XXX
12	HP	BSNL	SHIMLA	SHIMLA	RURAL	KADARGHAT	27808XX
13	HP	BSNL	SHIMLA	SHIMLA	RURAL	KARYALI	27644XX
14	HP	BSNL	SHIMLA	SHIMLA	RURAL	GHANNATI	2774XXX
15	HP	BSNL	SHIMLA	SHIMLA	RURAL	KOTI	27331XX
16	HP	BSNL	SHIMLA	SHIMLA	RURAL	LAMBA JUBBER	27358XX
17	HP	BSNL	SHIMLA	SHIMLA	RURAL	MANDHORGHAT	27851XX
18	HP	BSNL	SHIMLA	THEOG	URBAN	KOTKHAI	255XXX
19	HP	BSNL	SHIMLA	THEOG	URBAN	THEOG	234XXX
20	HP	BSNL	SHIMLA	THEOG	RURAL	BAGHI	242XXX
21	HP	BSNL	SHIMLA	THEOG	RURAL	BAKHOL	256XXX
22	HP	BSNL	SHIMLA	THEOG	RURAL	CHAMAIN	24XXXX
23	HP	BSNL	SHIMLA	THEOG	RURAL	CHHAILA	2362XX
24	HP	BSNL	SHIMLA	THEOG	RURAL	DEHA	231XXX
25	HP	BSNL	SHIMLA	THEOG	RURAL	DEORIKHANETI	2462XX
26	HP	BSNL	SHIMLA	THEOG	RURAL	DURGAPUR	27474XX
27	HP	BSNL	SHIMLA	THEOG	RURAL	SANDHU	221XXX
28	HP	BSNL	SHIMLA	THEOG	RURAL	GUMMA(KHOTKHAI)	2532XX
29	HP	BSNL	SHIMLA	THEOG	RURAL	JHIKNIPUL	2665XX
30	HP	BSNL	SHIMLA	THEOG	RURAL	KIARA	228XXX
31	HP	BSNL	SHIMLA	THEOG	RURAL	KIARI	2582XX
32	HP	BSNL	SHIMLA	THEOG	RURAL	KUPVI	2701XX
33	HP	BSNL	SHIMLA	THEOG	RURAL	KUTHAR	2262XX
34	HP	BSNL	SHIMLA	THEOG	RURAL	MARHOG	2611XX
35	HP	BSNL	SHIMLA	THEOG	RURAL	MOHRI	2272XX
36	HP	BSNL	SHIMLA	THEOG	RURAL	NERWA	264XXX

S NO	CIRCLE	SERVICE PROVIDER	SSA	SDCA	EXCHANGE TYPE	NAME OF EXCHANGE	EXCHANGE LEVEL
37	HP	BSNL	SHIMLA	THEOG	RURAL	RAWLAKIAR	2442XX
38	HP	BSNL	SHIMLA	THEOG	RURAL	SAINJ	2352XX
39	HP	BSNL	SOLAN	BADDI	URBAN	BADDI	243000-247999
40	HP	BSNL	SOLAN	BADDI	RURAL	BHATOLI KALAN	275000-275499
41	HP	BSNL	SOLAN	BADDI	RURAL	JHARMAJRI	271000-271999
42	HP	BSNL	SOLAN	BADDI	RURAL	MALKU MAJRA	276000-276499
43	HP	BSNL	SOLAN	BADDI	RURAL	MANPURA	236000-236999
44	HP	BSNL	SOLAN	BADDI	RURAL	THANA	274001-274499
45	HP	BSNL	SOLAN	SOLAN	URBAN	CHAMBAGHAT	230000-231999
46	HP	BSNL	SOLAN	SOLAN	RURAL	AIR FORCE	270500-270799
47	HP	BSNL	SOLAN	SOLAN	RURAL	BADHALAG	259001-259199
48	HP	BSNL	SOLAN	SOLAN	RURAL	BANI DOMEHAR	245100-245499
49	HP	BSNL	SOLAN	SOLAN	RURAL	BAROG	238500-238999
50	HP	BSNL	SOLAN	SOLAN	RURAL	BAROTIWALA	253000-255999
51	HP	BSNL	SOLAN	SOLAN	RURAL	BHARTI	271000-271199
52	HP	BSNL	SOLAN	SOLAN	RURAL	BHOJ NAGAR	269101-269499
53	HP	BSNL	SOLAN	SOLAN	RURAL	CHAIL	248000-248999
54	HP	BSNL	SOLAN	SOLAN	RURAL	CHANDI	278000-278999
55	HP	BSNL	SOLAN	SOLAN	RURAL	CHAUSSA	245500-245999
56	HP	BSNL	SOLAN	SOLAN	RURAL	DEOTHI	243000-243999
57	HP	BSNL	SOLAN	SOLAN	RURAL	DHARMPUR	264000-265500
58	HP	BSNL	SOLAN	SOLAN	RURAL	DHIARIGHAT	247400-247799
59	HP	RCL	---	---	URBAN	SHIMLA	2650XXX

Annex-2

S NO	CIRCLE	SERVICE PROVIDER	POPS LOCATION	ACTIVITY
1	HP	BSNL	NEW SHIMLA RSU	BB AUDIT
2	HP	BSNL	SHIMLA -B.Estate ,OCB MSU	BB AUDIT
3	HP	BSNL	DURGAPUR	BB AUDIT
4	HP	BSNL	BASANTPUR	BB AUDIT
5	HP	BSNL	BEOLIA	BB AUDIT
6	HP	BSNL	GADHERI	BB AUDIT
7	HP	BSNL	GHAINI	BB AUDIT
8	HP	BSNL	GUMMA (Ghannatti)	BB AUDIT
9	HP	BSNL	JUBAR HATTI	BB AUDIT
10	HP	BSNL	KADARGHAT	BB AUDIT
11	HP	BSNL	KARYALI	BB AUDIT
12	HP	BSNL	KOHBAG	BB AUDIT
13	HP	BSNL	KOTI	BB AUDIT
14	HP	BSNL	MANDHORGHAT	BB AUDIT
15	HP	BSNL	THEOG	BB AUDIT
16	HP	BSNL	CHHAILA	BB AUDIT
17	HP	BSNL	DEHA	BB AUDIT
18	HP	BSNL	KIARA	BB AUDIT
19	HP	BSNL	MOHRI	BB AUDIT
20	HP	BSNL	SAINJ	BB AUDIT
21	HP	BSNL	BADDI	BB AUDIT
22	HP	BSNL	BHATOLI KALAN	BB AUDIT
23	HP	BSNL	JHARMAJRI	BB AUDIT
24	HP	BSNL	MALKU MAJRA	BB AUDIT
25	HP	BSNL	MANPURA	BB AUDIT
26	HP	BSNL	THANA	BB AUDIT
27	HP	BSNL	CHAMBAGHAT	BB AUDIT
28	HP	BSNL	BANI DOMEHAR	BB AUDIT
29	HP	BSNL	BAROG	BB AUDIT
30	HP	BSNL	BHARTI	BB AUDIT
31	HP	BSNL	BHOJ NAGAR	BB AUDIT
32	HP	BSNL	CHAUSSA	BB AUDIT
33	HP	BSNL	DEOTHI	BB AUDIT
34	HP	BSNL	DHIARIGHAT	BB AUDIT
35	HP	NSTPL	BADDI	BB AUDIT
36	HP	RCL	SHIMLA	BB AUDIT
37	HP	PACENET	SHIMLA	BB AUDIT