



REPORT
ON
AUDIT & ASSESSMENT OF QUALITY OF SERVICE
OF
CELLULAR MOBILE TELEPHONE SERVICE
FOR
TELECOM REGULATORY AUTHORITY OF INDIA
WEST ZONE – GUJARAT SERVICE AREA
(JANUARY 2014 – MARCH 2014)

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PREFACE

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

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

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



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1. BACKGROUND





1. BACKGROUND

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

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

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

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

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

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



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

2. OBJECTIVES AND METHODOLOGY





2. OBJECTIVES AND METHODOLOGY

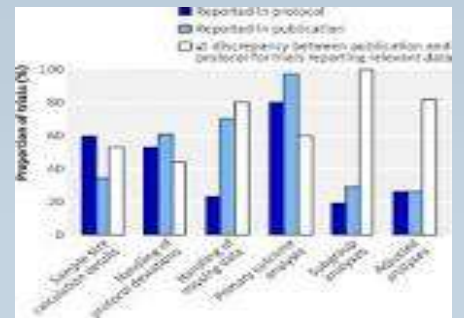
The primary objective is to audit and assess the Quality of Service being rendered by Basic, Cellular Mobile & Broadband service providers against the parameters notified by TRAI.

The audit and assessment of Quality of Service is 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) is undertaken for J&K , Himachal Pradesh & Mumbai circles and for Broadband service, the audit is done for J&K , Himachal Pradesh, Haryana, Delhi & Mumbai Circles during the quarter January – March 2014.**

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

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

3. SAMPLE SIZE





3. SAMPLE SIZE

3.1 SAMPLING FOR CELLULAR MOBILE (WIRELESS) SERVICE PROVIDERS

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

Sl. No.	Name of Service Provider	Dates of live measurement Audit			Audit Location
		January-14	February-14	March-14	
GSM Operators					
1	AIRCEL	20 to 22 Jan'14	17 to 19th Feb'14	10 to 12th Mar'14	Aircel limited, 204 , 2nd floor, c block, Ganesh meridian, opp. Amiraj farm, near new gujarat high court, s.g highway, Ahmedabad-380 060
2	AIRTEL	20 to 22 Jan'14	18 to 20th Feb'14	4 to 6th Mar'14	Bharti Airtel Limited, 2nd Floor, Zodiac Square, Opposite Gurudwara, S.G Highway, Ahmedabad-380054
3	BSNL	6 to 8 jan'14	11 to 13th Feb'14	5 to 7th Mar'14	BSNL, Vastrapur Telephone Exchange, Bima Nagar, Vastrapur, Ahmedabad.
4	VIDEOCON	14 to 16th Jan'14	18 to 20th Feb'14	4 to 6th Mar'14	Videocon Telecommunications Ltd, 4th floor, Campus Corner 2, Opp AUDA Garden, Prahladnagar Ahmedabad- 380 015, Gujarat
5	TATA GSM	21 to 23th Jan'14	24 to 26th Feb'14	10 to 12th Mar'14	Tata Teleservices Ltd, 2nd Floor- Citygold Building, Near Shyamal Cross Road, 132 Feet Ring Road, Ahmedabad
6	IDEA	7 to 9 Jan'14	10 to 12th Feb'14	4 to 6th Mar'14	Idea Cellular Ltd, Venus Atlantis, 2nd Floor, 100ft road, Prahlad Nagar, Ahmedabad-380015
7	RCOM GSM	20 to 22 Jan'14	19 to 21st Feb'14	8 to 10th Mar'14	Reliance Communications Limited, 103/106, Gate No: 6, Near Muthiyagaam Bus Stand, Naroda GIDC, Naroda, Ahmedabad- 382330
8	VODAFONE	15 to 17th Jan'14	10 to 12th Feb'14	5 to 7th Mar'14	House A, Vodafone West Limited, Vodafone House Corporate Road, Prahladnagar , Off S. G. Highway, Ahmedabad -380051 Gujarat, India
CDMA Operators					
9	RCOM CDMA	20 to 22 Jan'14	19 to 21st Feb'14	8 to 10th Mar'14	Reliance Communications Limited, 103/106, Gate No: 6, Near Muthiyagaam Bus Stand, Naroda GIDC, Naroda, Ahmedabad- 382330
10	TATA CDMA	21 to 23th Jan'14	24 to 26th Feb'14	10 to 12th Mar'14	Tata Teleservices Ltd, 2nd Floor- Citygold Building, Near Shyamal Cross Road, 132 Feet Ring Road, Ahmedabad

- For all the above operators, audit was conducted in all the three months of the Quarter ended March 2014.
- The data generated by monthly PMR and 3-days live measurements audit for the period January 2014 to March 2014 has been successfully uploaded to the server located at TRAI premises.**



3.2 SAMPLING FOR BASIC (WIRE LINE) SERVICES

- The QoS audit for basic (wire line) service is to be done for the number of exchanges spread over in about 10% of SDCAs with each service providers in specified circles. **However, QoS audit for basic (wire line) service was not required to be done for Gujarat Circle in the quarter ended March-2014.**

3.3 SAMPLING FOR BROADBAND SERVICE PROVIDERS

- TUV-SUD South Asia has to conduct the audit and assessment of Quality of Service of Broadband Service only in respect of the service providers who are having broadband subscriber base of more than 10,000 subscribers in their licensed service area, for 5% of Point of Presence (PoPs) spread over in 10% SDCAs in specified Telecom Circle. **However, the QoS audit for Broadband service was not required to be done for Gujarat Circle in the quarter ended March-2014.**

4. EXECUTIVE SUMMARY





4. EXECUTIVE SUMMARY

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

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

**4.1 MONTHLY DATA VERIFICATION FOR CELLULAR
MOBILE SERVICE PROVIDERS
(NETWORK SERVICE QUALITY PARAMETER)**





4.1 SERVICE PROVIDER PERFORMANCE REPORT BASED ON MONTHLY DATA VERIFICATION: NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES.

BUSY HOUR OF VARIOUS SERVICE PROVIDERS:

Sl. No.	Name of Service Provider	Month of Audit	Network TCBH Hour
GSM Operators			
1	AIRTEL	March-14	20:00 - 21:00
2	AIRCEL	March-14	20:00 - 21:00
3	TATA GSM	March-14	20:00 - 21:00
4	BSNL	March-14	21:00 - 22:00
5	IDEA	March-14	20:00 - 21:00
6	UNINOR	March-14	21:00 - 22:00
7	RCOM GSM	March-14	20:00 - 21:00
8	VIDEOCON	March-14	20:00 - 21:00
9	VODAFONE	March-14	19:00 - 20:00
CDMA Operators			
10	RCOM CDMA	March-14	19:00 - 20:00
11	MTS	March-14	18:00 - 19:00
12	TATA CDMA	March-14	11:00 - 12:00

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

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



SWITCHES/BSC/BTS DETAILS OF OPERATORS:

Sl. No.	Name of Service Provider	No. of MSC + GMSC	No. of BSC	No. of BTS	NSS make	BSS make
GSM Operators						
1	AIRTEL	17	108	7355	NSN	NSN
2	AIRCEL	1	6	827	ZTE	ZTE
3	TATA GSM	3	15	2162	Huawei	Huawei
4	BSNL	9	92	4592	Alcatel-Lucent	Alcatel-Lucent
5	IDEA	21	44	6222	Ericsson	Ericsson
6	UNINOR	7	16	3346	NSN	NSN+Huawei
7	RCOM GSM	5	18	2937	Huawei	Huawei
8	VIDEOCON	2	11	1861	Huawei	Huawei
9	VODAFONE	20	147	7525	NSN	NSN
CDMA Operators						
10	RCOM CDMA	7	4	1681	Lucent,ZTE,Ericsson,Huawei	Lucent,Huawei
11	MTS	1	3	564	ZTE	ZTE
12	TATA CDMA	7	6	578	Ericsson	Motorola,Huawei

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



TABLES OF MONTHLY QOS PERFORMANCE:

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE- JAN-14 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators	
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Jan-14	0.08%	0.04%	0.01%	1.26%	0.04%	0.08%	0.17%	0.06%	0.02%	0.15%	0.06%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Jan-14	0.19%	0.00%	0.00%	1.92%	0.00%	0.19%	0.00%	0.16%	0.01%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-14	99.67%	99.51%	98.15%	97.56%	99.37%	97.76%	99.61%	98.70%	99.80%	99.26%	99.75%	98.02%
	b) SDCCH/PAGING Channel congestion	<=1%	Jan-14	0.06%	0.02%	0.04%	0.05%	0.17%	0.10%	0.01%	0.13%	0.08%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-14	0.27%	0.09%	0.03%	0.48%	0.29%	0.65%	0.06%	0.36%	0.20%	0.00%	0.02%	0.97%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Jan-14	0.64%	0.51%	0.84%	1.02%	1.04%	0.44%	0.17%	0.54%	0.70%	0.03%	0.11%	0.55%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Jan-14	1.08%	1.49%	6.03%	2.81%	0.88%	2.20%	0.01%	0.92%	1.55%	0.08%	1.50%	5.09%
	c) Connections with good voice quality	>=95%	Jan-14	97.10%	98.43%	98.31%	NP	96.44%	98.26%	98.80%	98.10%	97.57%	99.86%	99.20%	99.34%
4	No. of POI's having >=0.5% POI congestion		Jan-14	0	0	0	2	0	0	0	0	0	0	0	0

NP: Data not provided, BSNL has not provided data for the parameter "Connections with good voice quality" because its OMC (ALCATEL LUCENT Technology being used by BSNL) does not support parameter.

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE- FEB-14 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators	
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Feb-14	0.05%	0.01%	0.00%	1.26%	0.02%	0.07%	0.12%	0.04%	0.00%	0.12%	0.06%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Feb-14	0.11%	0.00%	0.00%	1.96%	0.00%	0.31%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Feb-14	99.70%	99.49%	98.16%	97.89%	99.24%	97.24%	99.59%	98.25%	99.74%	99.33%	99.76%	98.16%
	b) SDCCH/PAGING Channel congestion	<=1%	Feb-14	0.04%	0.12%	0.04%	0.05%	0.22%	0.14%	0.01%	0.09%	0.09%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Feb-14	0.19%	0.27%	0.03%	0.46%	0.38%	0.88%	0.07%	0.53%	0.26%	0.00%	0.02%	0.80%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Feb-14	0.62%	0.49%	0.81%	0.92%	0.98%	0.44%	0.23%	0.52%	0.76%	0.02%	0.11%	0.57%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Feb-14	1.02%	1.89%	6.05%	2.68%	0.74%	2.18%	0.02%	0.93%	1.54%	0.04%	1.56%	5.26%
	c) Connections with good voice quality	>=95%	Feb-14	97.13%	98.37%	98.27%	NP	96.41%	98.08%	98.83%	97.92%	97.49%	99.87%	99.20%	99.34%
4	No. of POI's having >=0.5% POI congestion		Feb-14	0	0	0	1	0	0	0	0	0	0	0	0

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE- MAR-14 MONTH															
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators	
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Mar-14	0.05%	0.01%	0.00%	1.12%	0.03%	0.09%	0.11%	0.05%	0.01%	0.11%	0.01%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Mar-14	0.15%	0.00%	0.00%	1.96%	0.02%	0.60%	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Mar-14	99.70%	99.49%	98.05%	97.35%	99.14%	97.20%	99.59%	97.87%	99.64%	99.33%	99.76%	97.93%
	b) SDCCH/PAGING Channel congestion	<=1%	Mar-14	0.03%	0.01%	0.04%	0.06%	0.23%	0.35%	0.03%	0.16%	0.09%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Mar-14	0.16%	0.14%	0.09%	0.56%	0.47%	1.47%	0.08%	0.55%	0.36%	0.00%	0.02%	1.02%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Mar-14	0.57%	0.48%	0.81%	0.95%	0.98%	0.48%	0.19%	0.55%	0.74%	0.03%	0.14%	0.62%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Mar-14	0.93%	1.81%	6.02%	2.70%	0.69%	2.56%	0.02%	1.00%	1.65%	0.04%	2.03%	6.30%
	c) Connections with good voice quality	>=95%	Mar-14	97.23%	98.36%	98.22%	NP	96.40%	97.91%	98.85%	97.68%	97.49%	99.87%	99.20%	99.32%
4	No. of POI's having >=0.5% POI congestion		Mar-14	0	0	0	1	0	0	0	0	0	0	0	0

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



TABLE OF QUARTERLY QOS PERFORMANCE:

TABLE: 4

QUARTERLY QOS PERFORMANCE (AVERAGE OF QE-MARCH-14) OF GUJARAT CIRCLE															
PMR Generation Data		Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators	
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.06%	0.02%	0.00%	1.21%	0.03%	0.08%	0.13%	0.05%	0.01%	0.13%	0.04%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.15%	0.00%	0.00%	1.95%	0.01%	0.37%	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.69%	99.50%	98.12%	97.60%	99.25%	97.40%	99.60%	98.27%	99.73%	99.31%	99.76%	98.04%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.04%	0.05%	0.04%	0.05%	0.21%	0.20%	0.02%	0.13%	0.09%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.21%	0.17%	0.05%	0.50%	0.38%	1.00%	0.07%	0.48%	0.27%	0.00%	0.02%	0.93%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.61%	0.49%	0.82%	0.96%	1.00%	0.45%	0.20%	0.54%	0.73%	0.03%	0.12%	0.58%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	1.01%	1.73%	6.03%	2.73%	0.77%	2.31%	0.02%	0.95%	1.58%	0.05%	1.70%	5.55%
	c) Connections with good voice quality	>=95%	Quarterly	97.15%	98.39%	98.27%	NP	96.42%	98.08%	98.83%	97.90%	97.52%	99.87%	99.20%	99.33%
4	No. of POI's having >=0.5% POI congestion		Quarterly	0	0	0	1	0	0	0	0	0	0	0	0



KEY FINDINGS: CELLULAR MOBILE SERVICES

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 Gujarat circle, all the operators were found meeting benchmark of the above parameters 'BTS accumulated downtime' and 'worst affected BTSs due to down time' in all the three months of the quarter.

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

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

All the operators were comfortably meeting the benchmark of 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 except **BSNL was found having congestion on only two POIs and one POI in the month of Jan and Feb & March-14 respectively.**



▪ **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 0.03 %) 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 only **Tata (GSM)/ Tata (CDMA)** were non-compliant in the three months of the quarter with their average performance of **6.03% and 5.55%** respectively.

Aircel has provided the data on monthly basis but not on daily basis as required for audit.

iii. Connections with good voice quality:

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

4.2 CUSTOMER SERVICE QUALITY (CSD) PARAMETERS





4.2 CUSTOMER SERVICE QUALITY PARAMETERS MEASUREMENT-QE MARCH-14:

CSD Data for Cellular Mobile Telephone Services-QE March-14															
Quarterly CSD Audit Data		Bench- mark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM GSM	TATA GSM	VIDEOCON	VODA FONE	MTS	RCOM CDMA	TATA CDMA
S/ N	Name of Parameter			GSM Operators										CDMA Operators	
Customer Service Quality Parameters															
1	Metering & Billing Credibility -Post Paid														
	A) No. of bills issued during the quarter		GUJ	NA	501723	61854	404119	NA	60282	45651	NA	1507362	13593	196723	66571
	B) No. of bills disputed including billing complaints during the quarter		GUJ	NA	39	14	225	NA	54	0	NA	1656	5	191	0
	C) % of billing complaints during the quarter	<= 0.1%	GUJ	NA	0.01%	0.03%	0.06%	NA	0.09%	0.00%	NA	0.11%	0.04%	0.10%	0.00%
2	Metering & Billing Credibility -Pre Paid														
	A) Total No. of Pre-paid customers at the end of the quarter		GUJ	40390	6858133	4086677	8683024	5286205	4986111	2321504	1526262	15772882	169140	1262082	344331
	B) Total No. of complaints relating to charging, Credit and Validity during the quarter		GUJ	0	235	4226	1936	422	4981	0	69	902	4	954	0
	C) % of Pre-paid Charging Complaints	<= 0.1%	GUJ	0.00%	0.00%	0.10%	0.03%	0.01%	0.10%	0.00%	0.01%	0.01%	0.00%	0.08%	0.00%
3	Resolution of Billing/Charging Complaints and Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints														
	A) No. of Billing/Charging/Credit/Validity Complaints received during the quarter		GUJ	0	275	4226	4263	422	5035	280	69	2558	9	1145	54

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B) No. of billing complaints for Post paid customers/Charging/Credit/Validity complaints for pre-paid customers resolved within 4 weeks during the quarter		GUJ	0	275	4226	4263	422	5035	280	69	2558	9	1145	54
C) % of billing complaints (for post paid customer) / Charging/Credit/Validity (for Pre paid customer) resolved within 4 weeks	100 % within 4 week	GUJ	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
D) % of Period of applying credit/Waiver/Adjustment to customers account from the date of resolution of complaints	<=1 week	GUJ	NA	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
4 Response time to customers for assistance														
A) Accessibility of call centre/Customer Care	>=95%	GUJ	98.16%	99.99%	95.34%	99.70%	95.32%	98.77%	99.18%	100%	100%	98.41%	98.27%	98.41%
B) % call answered by operators(voice to voice) within 60 sec.	>=90%	GUJ	98.21%	91.30%	96.49%	99.50%	91.02%	76.63%	88.57%	93.75%	93.46%	95.84%	83.87%	92.21%
5 Termination/closure of service														
A) Total No. of requests for Termination / Closure of service received during the quarter		GUJ	NA	1201	3360	2113	NA	236	386	NA	6826	507	953	199
B) No. of requests for Termination / Closure of service complied within 7 days during the quarter		GUJ	NA	1201	3360	1920	NA	236	386	NA	6826	507	953	199
C) % of Termination/ Closure of service within 7 days	<=7days	GUJ	NA	100%	100%	98.50	NA	100%	100%	NA	100%	100%	100%	100%
6 Time taken for refunds of deposits after closures.														
A) No. of Payments/ Refunds due during the quarter		GUJ	NA	750	389	1996	NA	441	118	NA	1416	NA	607	75

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B) No. of Payments/ Refunds Cleared during the quarter		GUJ	NA	750	389	1880	NA	441	118	NA	1399	NA	607	75
C) Time taken for refunds of deposits after closures.	100% within 60 days	GUJ	NA	100%	100%	94.19	NA	100%	100%	NA	98.80%	NA	100%	100%

*NA.: Aircel, Uninor and Videocon have no post-paid customers, so data for parameters related to post-paid bills not applicable for them.



KEY FINDINGS:

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 was well within the prescribed bench mark of $\leq 0.1\%$. However only **Vodafone** could not meet the benchmark for the parameter “% of billing complaints ” with its performance as **0.11%**.

2. Resolution of Billing complaints and applying credits -

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

All operators have 100 % resolved the billing complaints within stipulated period of 4 weeks. Similarly, in all cases where customers were due for credit / adjustment, all the service providers have complied with the benchmark of 100 % refund in one week.

3. Response Time to the Customer for assistance

- i. Accessibility of call centre/customer care*
- ii. Percentage of calls answered by Operators (Voice to Voice) within 60 seconds*

All service providers are in compliance with respect to the parameter Accessibility of call center. However, **RCOM (GSM), Tata (GSM) and RCOM (CDMA)** have not met the benchmark of ‘calls answered by Operators (voice to voice) within 60 seconds. They have achieved their performance as **76.63%%, 88.57% and 83.87%** respectively.

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 except **Idea** which was non-compliant with its performance **98.50%**.

5. Time Taken for Refund of deposits after closures

All operators, except **Idea and Vodafone** were found to have complied with the benchmark of 100% refund of deposits within 60 days of closure. **Idea and Vodafone** failed to comply with the TRAI norms as their achievement was **94.19%** and **98.80%** respectively.

**4.3 3-DAYS LIVE MEASUREMENT DATA VERIFICATION FOR
CELLULAR MOBILE SERVICE PROVIDERS
(NETWORK SERVICE QUALITY PARAMETER)**



:



4.3 SERVICE PROVIDER PERFORMANCE REPORT BASED ON 3-DAYS LIVE MEASUREMENT DATA VERIFICATION CONDUCTED IN EACH MONTH OF THE QUARTER:

A) NETWORK SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

TABLE: 1

CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE- JAN-14 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	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	0.20%	0.21%	0.09%	1.15%	0.02%	0.29%	0.29%	0.12%	0.06%	0.30%	0.02%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.00%	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.74%	99.47%	98.19%	97.86%	99.43%	97.67%	99.60%	98.46%	99.83%	99.14%	99.77%	96.08%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.02%	0.04%	0.03%	0.05%	0.10%	0.07%	0.01%	0.26%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.10%	0.05%	0.03%	0.47%	0.23%	0.80%	0.06%	0.53%	0.17%	0.00%	0.00%	2.93%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.64%	0.56%	0.89%	0.91%	1.06%	0.47%	0.11%	0.55%	0.79%	0.04%	0.12%	0.53%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	1.09%	1.49%	3.95%	2.79%	0.89%	2.33%	0.00%	0.89%	1.17%	0.06%	1.45%	3.64%
	c) Connections with good voice quality	>=95%	Live data	97.10%	98.40%	98.28%	NP	96.41%	98.21%	98.77%	98.01%	97.57%	99.86%	99.23%	99.33%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

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TABLE: 2

CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE- FEB-14 MONTH															
Live measurement Data		Bench-mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	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	0.06%	0.02%	0.01%	1.71%	0.02%	0.06%	0.11%	0.02%	0.02%	0.09%	0.09%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.07%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.73%	99.49%	98.20%	97.69%	99.33%	97.46%	99.58%	98.45%	99.79%	99.19%	99.77%	97.56%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.02%	0.02%	0.03%	0.04%	0.33%	0.14%	0.01%	0.05%	0.11%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.07%	0.07%	0.01%	0.49%	0.34%	1.08%	0.06%	0.42%	0.21%	0.00%	0.02%	1.41%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.62%	0.50%	0.80%	0.56%	0.89%	0.47%	0.28%	0.52%	0.71%	0.02%	0.09%	0.59%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	0.94%	2.41%	3.72%	2.82%	0.67%	2.29%	0.01%	0.97%	1.23%	0.02%	1.45%	3.70%
	c) Connections with good voice quality	>=95%	Live data	97.09%	98.40%	98.29%	NP	96.67%	97.98%	98.83%	97.91%	97.65%	99.87%	99.19%	99.34%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0

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TABLE: 3

CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE- MAR-14 MONTH															
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	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	0.08%	0.01%	0.00%	0.98%	0.04%	0.10%	0.11%	0.11%	0.01%	0.11%	0.00%	0.00%
	b) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	0.02%	0.00%	0.06%	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	99.64%	99.45%	98.14%	97.50%	99.12%	97.30%	99.59%	98.12%	99.76%	99.32%	99.79%	97.55%
	b) SDCCH/PAGING Channel congestion	<=1%	Live data	0.07%	0.01%	0.02%	0.03%	0.11%	0.19%	0.01%	0.16%	0.04%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.23%	0.09%	0.04%	0.60%	0.50%	1.36%	0.08%	0.45%	0.24%	0.00%	0.01%	1.34%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Live data	0.60%	0.52%	0.83%	0.65%	1.02%	0.48%	0.11%	0.55%	0.76%	0.02%	0.16%	0.64%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Live data	0.94%	2.02%	4.27%	2.40%	0.79%	2.64%	0.01%	1.09%	1.65%	0.10%	2.20%	5.01%
	c) Connections with good voice quality	>=95%	Live data	97.39%	98.26%	98.24%	NP	96.29%	97.94%	98.81%	97.67%	97.45%	99.87%	99.21%	99.30%
4	No. of POI having >=0.5% congestion		Live data	0	0	0	1	0	0	0	0	0	0	0	0

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TABLE OF QUARTERLY QOS PERFORMANCE OF 3-DAYS LIVE MEASUREMENT DATA:

TABLE: 4

QUARTERLY QOS PERFORMANCE BASED ON 3-DAYS LIVE MEASUREMENT (AVERAGE OF QE-MARCH-14) – GUJARAT CIRCLE															
Live measurement Data		Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	TATA CDMA
S/N	Name of Parameter			GSM Operators										CDMA Operators	
Network Service Quality Parameter															
Network Availability															
1	a) BTS Accumulated Downtime	<=2%	Quarterly	0.11%	0.08%	0.03%	1.28%	0.03%	0.15%	0.17%	0.08%	0.03%	0.17%	0.04%	0.01%
	b) Worst affected BTSs due to downtime	<=2%	Quarterly	0.04%	0.00%	0.00%	0.06%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Quarterly	99.70%	99.47%	98.18%	97.68%	99.29%	97.48%	99.59%	98.34%	99.79%	99.22%	99.78%	97.06%
	b) SDCCH/PAGING Channel congestion	<=1%	Quarterly	0.04%	0.02%	0.03%	0.04%	0.18%	0.13%	0.01%	0.16%	0.07%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Quarterly	0.13%	0.07%	0.03%	0.52%	0.36%	1.08%	0.07%	0.47%	0.21%	0.00%	0.01%	1.89%
Connection maintenance (Retainability)															
3	a) CDR (Call Drop Rate)	<=2%	Quarterly	0.62%	0.53%	0.84%	0.71%	0.99%	0.47%	0.17%	0.54%	0.75%	0.03%	0.12%	0.59%
	b) Worst affected cells>3% TCH drop (Call drop) rate	<=3%	Quarterly	0.99%	1.97%	3.98%	2.67%	0.78%	2.42%	0.01%	0.98%	1.35%	0.06%	1.70%	4.12%
	c) Connections with good voice quality	>=95%	Quarterly	97.19%	98.35%	98.27%	NP	96.46%	98.04%	98.80%	97.86%	97.56%	99.87%	99.21%	99.32%
4	No. of POI having >=0.5% congestion		Quarterly	0	0	0	1	0	0	0	0	0	0	0	0



KEY FINDING ON 3 DAYS LIVE MEASUREMENTS:

From three days live measurement assessment, it is found that the performance of all operators is satisfactory as they have largely met the benchmarks except the parameter ‘Worst affected cells> 3 % TCH drops”, which could not be complied with by Tata (GSM) and Tata (CDMA) in all the three months of the quarter. The performance of Tata (GSM) and Tata (CDMA) for this parameter, on an average of three months was 3.98% and 4.12 % respectively. Tata (CDMA) was also found non-compliant of the parameter TCH Congestion with its performance of 2.93% in the month of Jan-14.

BSNL was found having congestion on only one POI with Idea-CMTS in the month of March-14.

B) CUSTOMER SERVICE QUALITY PARAMETER- CELLULAR MOBILE SERVICES

CSD 3 days live data for Cellular Mobile Telephone Services-QE-March-14															
3 days live CSD Audit Data		Benchmark	Circle Name	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
S/N	Name of Parameter			GSM Operators									CDMA Operators		
Response time to customers for assistance															
1	Total no of calls attempted to customer care/Call center		GUJ	26	19486	4530	27654	16702	92660	12092	380	34635	13	11933	877
	Total no. of calls successfully established to customer care/Call center		GUJ	25	19486	4337	27558	15969	91294	11998	380	34635	13	11707	852
	% Accessibility of Call centre /customer Care (Total call successfully established*100 / Total call attempts)	>=95%	GUJ	96.15%	100%	95.74%	99.65%	95.61%	98.53%	99.22%	100%	100%	100%	98.11%	97.15%
	Total Calls reached to agent desk for Voice to Voice (Total call attempt)		GUJ	44	56817	26059	104959	40850	20564	16647	259	108199	690	2591	1268
	Total number of calls answered by the operator (Voice to voice) within 60 seconds		GUJ	44	53330	25223	104586	39160	15765	15594	258	105817	669	2419	1213

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% age of calls answered by operator(voice to voice) (Total call successfully established within 60 Sec.*100 / Total call attempts)	>=90%	GUJ	100%	93.86%	96.79%	99.64%	95.86%	76.66%	96.50%	99.61%	97.80%	96.96%	93.36%	95.66%

CUSTOMER CARE / HELPLINE ASSESSMENT

LIVE CALLING TO CALL CENTRE													
	CIRCLE NAME	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
Total No. of calls Attempted	GUJ	100	100	100	100	100	100	100	100	100	100	100	100
Total No. of calls connected to IVR	GUJ	100	100	100	100	100	100	100	100	100	100	100	100
Calls got connected to agent within 60 Sec	GUJ	100	100	97	100	100	100	100	100	100	100	100	100
%age of calls got answered	GUJ	100%	100%	97%	100%	100%	100%	100%	100%	100%	100%	100%	100%

KEY FINDINGS: The results for three days live measurements reveal that all operators have met the benchmarks for the parameters 'Accessibility to call center. However **RCOM (GSM)** failed to meet the benchmark of 'Call connection to operators (Voice to voice) within 60 seconds with its performance of **76.66%**.

In case of calls answered by operators (voice to voice) within 60 seconds when test calls were made to the call centers, BSNL could connect 97% of calls to the operator within 60 Seconds.

INTER OPERATOR CALLS ASSESSMENT





INTER OPERATOR CALLS ASSESSMENT

Inter operator call assessment with a sample of 2x50 test calls for each Service provider operating in Gujarat 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	UNINOR	RCOM GSM	TATA GSM	VIDEOCON	VODAFONE	MTS	RCOM CDMA	TATA CDMA
AIRCEL	GUJ	--	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AIRTEL	GUJ	100%	--	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
BSNL	GUJ	100%	100%	--	100%	100%	100%	100%	100%	100%	100%	100%	100%
IDEA	GUJ	100%	100%	100%	--	100%	100%	100%	100%	100%	100%	100%	100%
UNINOR	GUJ	100%	100%	100%	100%	--	100%	100%	100%	100%	100%	100%	100%
RCOM GSM	GUJ	100%	100%	100%	100%	100%	--	100%	100%	100%	100%	100%	100%
TATA GSM	GUJ	100%	100%	100%	100%	100%	100%	--	100%	100%	100%	100%	100%
VIDEOCON	GUJ	100%	100%	100%	100%	100%	100%	100%	--	100%	100%	100%	100%
VODAFONE	GUJ	100%	100%	100%	100%	100%	100%	100%	100%	--	100%	100%	100%
MTS	GUJ	100%	100%	100%	100%	100%	100%	100%	100%	100%	--	100%	100%
RCOM CDMA	GUJ	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	--	100%
TATA CDMA	GUJ	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	--

The result of the testing revealed that the inter connection performance among the operators is quite satisfactory as there was hardly any problem in interconnection from one operator to other operators because of no congestion on individual POIs of the respective service providers.

LEVEL-1 LIVE CALLING



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LEVEL-1 LIVE CALLING

LEVEL 1 LIVE CALLING															
Emergency no.	Circle Name	SDCA Name	No. of calls made	AIRCEL	AIRTEL	BSNL	IDEA	UNINOR	RCOM (GSM)	TATA (GSM)	VIDEOCON	VODAFONE	MTS	RCOM (CDMA)	TATA (CDMA)
100,101,108,1091,1098	GUJ	Valsad	10	NS	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Navsari	5	NS	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Vapi	10	NS	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Surat	10	NS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Bardoli	5	NS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Mandvi	5	NS	✓	✓	✓	NS	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Mangrol	10	NS	✓	✓	✓	NS	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Sayan	5	NS	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Valod	10	NS	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	✓
100,101,108,1091,1098	GUJ	Vyara	5	NS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Songadh	5	✓	✓	✓	✓	NS	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Vadodara	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Padra	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Sankheda	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	NS
100,101,108,1091,1098	GUJ	Pavijetpur	5	NS	✓	✓	✓	✓	✓	NS	NS	✓	NS	✓	NS
100,101,108,1091,1098	GUJ	Chota Udaipur	10	NS	✓	✓	✓	✓	✓	NS	NS	✓	NS	✓	NS
100,101,108,1091,1098	GUJ	Naswadi	5	NS	✓	✓	✓	✓	✓	NS	NS	✓	NS	✓	NS
100,101,108,1091,1098	GUJ	Dabhoi	10	✓	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	NS
100,101,108,1091,1098	GUJ	Karjan	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Waghodiya	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
100,101,108,1091,1098	GUJ	Savli	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	NS	✓	NS

NS: No service

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 different SDCA in Valsad, Surat and Vadodara SSA. In Gujarat service area, these services were found functional in the networks of all the service providers.

5. DRIVE TEST





5. 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 **Valsad, Surat** and **Vadodara** in the months of January, February and March 2014 respectively, covering minimum 300 Km distance in each SSA. The performance of the operators has been highlighted below in the tables. The drive test was conducted simultaneously for all the operators following the same route of drive tests. The holding period for all test calls was 120 seconds. The drive test vehicle across all routes plied at a speed of about 30-50 km per hour

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

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DRIVE TEST TABLE: 1

OPERATOR-ASSISTED DRIVE TEST AT VALSAD SSA IN JAN-14 MONTH- GUJARAT CIRCLE

S / N	Parameter	SSA Name: Valsad	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	MTS CDMA	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators			
1	Call Attempts	Day-1	Jan-14	NS	64	75	83	98	79	63	111	82	59	100	87
		Day-2	Jan-14	NS	123	164	197	201	171	132	188	144	135	153	189
		Day-3	Jan-14	NS	154	193	228	247	212	175	185	149	159	247	197
		Over all SSA Result	Total	NS	341	432	508	546	462	370	484	375	353	500	473
2	Blocked Call Rate	Day-1	Jan-14	NS	0.00%	1.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-2	Jan-14	NS	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-3	Jan-14	NS	0.00%	1.55%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA Result	Total	NS	0.00%	1.16%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Day-1	Jan-14	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-2	Jan-14	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-3	Jan-14	NS	0.00%	0.51%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA Result	Total	NS	0.00%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
PERCENTAGE CONNECTIONS WITH GOOD VOICE QUALITY (=>95%)															
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Jan-14	NS	NA	NA	NA	NA	NA	NA	NA	NA	100.00%	98.21%	99.93%
		Day-2	Jan-14	NS	NA	NA	NA	NA	NA	NA	NA	NA	99.96%	97.26%	99.83%
		Day-3	Jan-14	NS	NA	NA	NA	NA	NA	NA	NA	NA	98.76%	99.59%	99.80%
		Over all SSA Result	Total	NS	NA	NA	NA	NA	NA	NA	NA	NA	99.42%	98.49%	99.84%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Jan-14	NS	96.92%	95.01%	98.48%	98.86%	96.13%	97.59%	95.77%	96.01%	N/A	N/A	N/A
		Day-2	Jan-14	NS	95.93%	96.20%	96.40%	95.96%	95.75%	98.73%	96.60%	95.59%	N/A	N/A	N/A
		Day-3	Jan-14	NS	96.20%	96.60%	97.67%	97.37%	96.70%	98.74%	96.60%	95.28%	N/A	N/A	N/A
		Over all SSA Result	Total	NS	96.22%	95.98%	97.31%	97.10%	96.19%	98.51%	96.26%	95.54%	NA	NA	NA
SERVICE COVERAGE															
5	In door (>= -75dBm)	Day-1	Jan-14	NS	98.54%	73.61%	99.65%	88.55%	87.27%	82.04%	93.51%	95.89%	95.93%	82.37%	62.48%
		Day-2	Jan-14	NS	94.98%	76.04%	98.86%	92.35%	90.70%	86.51%	86.38%	92.33%	99.13%	94.67%	76.68%
		Day-3	Jan-14	NS	94.27%	69.67%	98.54%	88.07%	80.78%	85.20%	76.93%	74.22%	96.71%	95.03%	62.82%
		Over all SSA Result	Total	NS	95.23%	73.78%	98.85%	89.73%	86.17%	85.03%	85.78%	85.08%	97.49%	92.73%	68.17%

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	In-vehicle (>= -85dBm)	Day-1	Jan-14	NS	99.89%	97.53%	100.00%	98.22%	99.42%	97.30%	99.20%	99.40%	99.98%	98.54%	91.73%
		Day-2	Jan-14	NS	99.29%	98.95%	99.99%	99.30%	99.07%	99.35%	98.11%	99.49%	99.99%	99.70%	98.75%
		Day-3	Jan-14	NS	99.49%	98.95%	99.99%	98.89%	97.88%	97.23%	97.26%	95.80%	100.00%	99.98%	93.96%
		Over all SSA Result	Total	NS	99.48%	98.71%	99.99%	98.92%	98.67%	97.99%	98.20%	97.85%	99.99%	99.63%	95.44%
	Outdoor-in city (>= -95dBm)	Day-1	Jan-14	NS	99.96%	100.00%	100.00%	99.93%	100.00%	99.75%	99.99%	99.82%	100.00%	100.00%	99.98%
		Day-2	Jan-14	NS	99.93%	99.99%	100.00%	100.00%	100.00%	99.95%	99.71%	99.95%	100.00%	100.00%	99.99%
		Day-3	Jan-14	NS	99.97%	99.98%	100.00%	100.00%	100.00%	99.59%	99.98%	99.78%	100.00%	100.00%	99.85%
		Over all SSA Result	Total	NS	99.95%	99.99%	100.00%	99.98%	100.00%	99.75%	99.88%	99.85%	100.00%	100.00%	99.85%
6	Call Setup Success Rate (>=95%)	Day-1	Jan-14	NS	100.00%	97.33%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Jan-14	NS	100.00%	99.35%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-3	Jan-14	NS	100.00%	98.96%	96.92%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	NS	100.00%	98.61%	98.62%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Hand Over Success Rate (HOSR)	Day-1	Jan-14	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Jan-14	NS	100.00%	99.01%	99.31%	99.71%	100.00%	100.00%	100.00%	99.50%	100.00%	100.00%	100.00%
		Day-3	Jan-14	NS	100.00%	100.00%	99.73%	99.66%	100.00%	100.00%	100.00%	99.69%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	NS	100.00%	99.53%	99.58%	99.74%	100.00%	100.00%	99.87%	99.83%	100.00%	100.00%	100.00%

*NS: No Service, *NA: Not applicable

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DRIVE TEST TABLE: 2

OPERATOR-ASSISTED DRIVE TEST AT VALSAD SSA IN JAN-14 MONTH- GUJARAT CIRCLE - INDOOR																
S/N	Parameter	Valsad SSA	Indoor Location	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	MTS CDMA	RCOM CDMA	TATA CDMA	
				GSM Operators								CDMA Operators				
1	Call Attempts	Day-1	Sai City Mall (Valsad)	NS	12	10	11	11	10	10	10	18	12	11	10	
		Day-2	Shoppers Gate (Vapi)	NS	12	10	11	11	10	10	10	12	10	11	10	
		Day-3	Fountain Plaza (Navsari)	NS	12	10	11	11	10	10	10	10	10	11	10	
		Over all SSA		NS	36	30	33	33	30	30	30	40	32	33	30	
2	Blocked Call Rate	Day-1	Sai City Mall (Valsad)	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Day-2	Shoppers Gate (Vapi)	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Day-3	Fountain Plaza (Navsari)	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Over all SSA		NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
3	Dropped Call Rate (<=2%)	Day-1	Sai City Mall (Valsad)	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Day-2	Shoppers Gate (Vapi)	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Day-3	Fountain Plaza (Navsari)	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
		Over all SSA		NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
4	Percentage connections with good voice quality (=>95%)															
	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Sai City Mall (Valsad)	NS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.00%	100.00%	100.00%
		Day-2	Shoppers Gate (Vapi)	NS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.00%	100.00%	100.00%
		Day-3	Fountain Plaza (Navsari)	NS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.00%	100.00%	99.57%
		Over all SSA		NS	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100.00%	100.00%	99.85%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Sai City Mall (Valsad)	NS	99.23%	99.35%	99.26%	100.00%	98.13%	100.00%	99.09%	97.61%	N/A	N/A	N/A	
		Day-2	Shoppers Gate (Vapi)	NS	99.12%	99.30%	96.80%	98.32%	99.34%	99.84%	97.09%	98.45%	N/A	N/A	N/A	
		Day-3	Fountain Plaza (Navsari)	NS	98.05%	96.79%	99.05%	94.97%	98.09%	99.52%	94.86%	97.96%	N/A	N/A	N/A	
Over all SSA			NS	98.78%	98.49%	98.42%	97.20%	98.52%	99.79%	96.99%	98.06%	N/A	N/A	N/A		
5	Service Coverage															
	In door (>= -	Day-1	Sai City Mall (Valsad)	NS	100.00%	71.73%	99.25%	100.00%	88.06%	97.19%	100.00%	100.00%	100.00%	92.16%	99.17%	

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	75dBm)	Day-2	Shoppers Gate (Vapi)	NS	100.00%	85.14%	95.86%	100.00%	100.00%	91.70%	95.47%	100.00%	100.00%	100.00%	100.00%
		Day-3	Fountain Plaza (Navsari)	NS	99.78%	57.94%	87.52%	37.57%	98.75%	86.58%	91.48%	99.08%	98.82%	100.00%	65.35%
		Over all SSA		NS	99.93%	71.60%	94.21%	79.19%	95.60%	91.82%	95.65%	99.69%	99.61%	97.39%	88.17%
	In-vehicle (>= -85dBm)	Day-1	Sai City Mall (Valsad)	NS	100.00%	99.75%	99.97%	100.00%	99.58%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Shoppers Gate (Vapi)	NS	100.00%	100.00%	99.96%	100.00%	100.00%	100.00%	99.85%	100.00%	100.00%	100.00%	100.00%
		Day-3	Fountain Plaza (Navsari)	NS	100.00%	99.93%	99.96%	100.00%	100.00%	100.00%	98.08%	100.00%	100.00%	100.00%	100.00%
		Over all SSA		NS	100.00%	99.89%	99.96%	100.00%	99.86%	100.00%	99.31%	100.00%	100.00%	100.00%	100.00%
	Outdoor-in city (>= -95dBm)	Day-1	Sai City Mall (Valsad)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Shoppers Gate (Vapi)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-3	Fountain Plaza (Navsari)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Over all SSA		NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	6	Call Setup Success Rate (>=95%)	Day-1	Sai City Mall (Valsad)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Day-2			Shoppers Gate (Vapi)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
Day-3			Fountain Plaza (Navsari)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
Over all SSA				NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
7	Hand Over Success Rate (HOSR)	Day-1	Sai City Mall (Valsad)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Day-2	Shoppers Gate (Vapi)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Day-3	Fountain Plaza (Navsari)	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	
		Over all SSA		NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	

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DRIVE TEST TABLE: 3

OPERATOR-ASSISTED DRIVE TEST AT SURAT SSA IN FEB-14 MONTH- GUJARAT CIRCLE

S/N	Parameter	SSA Name: SURAT	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators		
1	Call Attempts	Day-1	Feb-14	NS	175	169	185	236	194	182	191	78	144	243	123
		Day-2	Feb-14	NS	90	153	155	195	78	119	102	71	58	208	40
		Day-3	Feb-14	26	69	101	100	158	70	96	87	58	40	158	37
		Over all SSA Result	Total	26	334	423	440	589	342	397	380	207	242	609	200
2	Blocked Call Rate	Day-1	Feb-14	NS	0.00%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-2	Feb-14	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-3	Feb-14	0.00%	0.00%	0.99%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA Result	Total	0.00%	0.00%	0.47%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Day-1	Feb-14	NS	0.00%	0.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.81%
		Day-2	Feb-14	NS	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-3	Feb-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA Result	Total	0.00%	0.00%	0.24%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%
PERCENTAGE CONNECTIONS WITH GOOD VOICE QUALITY (=>95%)															
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Feb-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.92%	98.89%	99.54%
		Day-2	Feb-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.96%	99.89%	99.95%
		Day-3	Feb-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	100.00%	99.84%	99.99%
		Over all SSA Result	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.94%	99.45%	99.70%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Feb-14	NS	95.30%	95.92%	95.40%	96.50%	95.90%	97.44%	95.27%	96.58%	NA	NA	NA
		Day-2	Feb-14	NS	97.84%	96.80%	98.75%	99.48%	98.54%	99.52%	97.87%	97.15%	NA	NA	NA
		Day-3	Feb-14	99.22%	98.06%	96.93%	98.98%	98.84%	98.23%	99.89%	98.51%	95.39%	NA	NA	NA
		Over all SSA Result	Total	99.22%	96.55%	96.47%	97.38%	98.03%	96.79%	98.67%	96.50%	96.47%	NA	NA	NA
SERVICE COVERAGE															
5	In door (>= -75dBm)	Day-1	Feb-14	NS	97.52%	75.08%	99.96%	89.89%	95.83%	90.78%	94.00%	98.63%	99.94%	88.10%	93.37%
		Day-2	Feb-14	NS	97.21%	75.35%	96.19%	90.16%	79.99%	87.88%	83.29%	88.00%	96.19%	82.41%	74.23%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



		Day-3	Feb-14	81.72%	90.53%	69.35%	98.47%	84.44%	66.56%	83.16%	84.95%	88.22%	97.50%	80.74%	48.35%
		Over all SSA Result	Total	81.72%	96.16%	73.87%	98.31%	98.61%	87.89%	88.02%	90.19%	93.08%	98.64%	84.43%	81.49%
	In-vehicle (>= -85dBm)	Day-1	Feb-14	NS	99.72%	96.85%	100.00%	98.68%	99.53%	99.66%	99.65%	99.75%	100.00%	99.27%	99.71%
		Day-2	Feb-14	NS	99.81%	97.14%	99.90%	98.29%	98.38%	98.65%	95.46%	98.93%	100.00%	98.10%	95.90%
		Day-3	Feb-14	97.81%	99.02%	96.37%	99.98%	97.47%	97.31%	95.26%	95.42%	98.90%	99.95%	96.43%	87.86%
		Over all SSA Result	Total	97.81%	99.61%	96.84%	99.96%	98.25%	98.94%	98.26%	98.03%	99.31%	99.99%	98.19%	96.89%
	Outdoor-in city (>= -95dBm)	Day-1	Feb-14	NS	99.94%	99.73%	100.00%	99.97%	100.00%	100.00%	99.94%	99.92%	100.00%	100.00%	100.00%
		Day-2	Feb-14	NS	99.96%	99.96%	100.00%	99.96%	100.00%	99.95%	99.67%	99.80%	100.00%	100.00%	99.94%
		Day-3	Feb-14	100.00%	99.99%	99.95%	100.00%	99.83%	100.00%	99.97%	99.94%	99.93%	100.00%	100.00%	99.75%
		Over all SSA Result	Total	100.00%	99.96%	99.86%	100.00%	99.93%	100.00%	99.97%	99.88%	99.88%	100.00%	100.00%	99.94%
6	Call Setup Success Rate (>=95%)	Day-1	Feb-14	NS	100.00%	99.40%	98.92%	98.93%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Feb-14	NS	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-3	Feb-14	100.00%	100.00%	99.01%	99.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	100.00%	100.00%	99.53%	99.32%	99.49%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Hand Over Success Rate (HOSR)	Day-1	Feb-14	NS	100.00%	98.92%	99.49%	99.65%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Feb-14	NS	100.00%	99.02%	99.35%	100.00%	100.00%	100.00%	100.00%	99.67%	100.00%	100.00%	100.00%
		Day-3	Feb-14	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.21%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	100.00%	100.00%	99.13%	99.57%	99.77%	100.00%	100.00%	100.00%	99.70%	100.00%	100.00%	100.00%

*NS: No Service, *NA: Not applicable

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



DRIVE TEST TABLE: 4

OPERATOR-ASSISTED DRIVE TEST AT SURAT SSA IN FEB-14 MONTH- GUJARAT CIRCLE - INDOOR																
S/N	Parameter	SURAT SSA	Indoor Location	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	MTS CDMA	RCOM CDMA	TATA CDMA	
				GSM Operators								CDMA Operators				
1	Call Attempts	Day-1	Iscon Mall at Surat	NS	11	17	10	13	10	10	10	10	12	13	10	
		Day-2	Millenium Mall at Bardoli	NS	10	12	11	12	10	10	10	10	10	12	12	10
		Day-3	Surbhi Tower at Vyara	10	10	10	11	12	10	10	10	10	10	10	12	10
		Over all SSA		10	31	39	32	37	30	30	30	30	30	34	37	30
2	Blocked Call Rate	Day-1	Iscon Mall at Surat	NS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
		Day-2	Millenium Mall at Bardoli	NS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Day-3	Surbhi Tower at Vyara	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Over all SSA		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3	Dropped Call Rate (<=2%)	Day-1	Iscon Mall at Surat	NS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	
		Day-2	Millenium Mall at Bardoli	NS	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Day-3	Surbhi Tower at Vyara	0.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
		Over all SSA		0.0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Iscon Mall at Surat	NA	NA	NA	NA	NA	NA	NA	NA	NA	100%	100%	100%	
		Day-2	Millenium Mall at Bardoli	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100%	100%	100%
		Day-3	Surbhi Tower at Vyara	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100%	100%	100%
		Over all SSA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	100%	100%	100%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Iscon Mall at Surat	NS	99.7%	99.8%	99.1%	99.6%	99.5%	99.8%	99.8%	99.0%	NA	NA	NA	
		Day-2	Millenium Mall at Bardoli	NS	97.2%	98.6%	99.0%	99.4%	100.0%	99.7%	99.9%	98.6%	NA	NA	NA	
		Day-3	Surbhi Tower at Vyara	99.8%	97.7%	96.3%	99.1%	100.0%	100.0%	100.0%	99.7%	97.0%	NA	NA	NA	
		Over all SSA		99.8%	98.2%	98.7%	99.1%	99.6%	99.7%	99.8%	99.8%	98.2%	NA	NA	NA	

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



	Service Coverage															
5	In door (>= -75dBm)	Day-1	Iscon Mall at Surat	NS	100.0%	96.8%	99.9%	100.0%	98.5%	38.5%	83.7%	100.0%	100.0%	100.0%	98.7%	
		Day-2	Millenium Mall at Bardoli	NS	100.0%	99.2%	100.0%	100.0%	99.9%	95.4%	100.0%	100.0%	100.0%	100.0%	100.0%	99.4%
		Day-3	Surbhi Tower at Vyara	98.1%	98.6%	95.1%	99.2%	100.0%	17.0%	90.6%	93.8%	99.9%	99.9%	100.0%	100.0%	15.6%
		Over all SSA		98.1%	99.5%	97.1%	99.7%	100.0%	71.8%	74.8%	92.5%	100.0%	100.0%	100.0%	100.0%	71.5%
	In-vehicle (>= -85dBm)	Day-1	Iscon Mall at Surat	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.2%	98.2%	100.0%	100.0%	100.0%	100.0%
		Day-2	Millenium Mall at Bardoli	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		Day-3	Surbhi Tower at Vyara	100.0%	99.8%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		Over all SSA		100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	99.7%	99.4%	100.0%	100.0%	100.0%	100.0%
	Outdoor-in city (>= -95dBm)	Day-1	Iscon Mall at Surat	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		Day-2	Millenium Mall at Bardoli	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		Day-3	Surbhi Tower at Vyara	100.0%	100.0%	99.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		Over all SSA		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
6	Call Setup Success Rate (>=95%)	Day-1	Iscon Mall at Surat	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
		Day-2	Millenium Mall at Bardoli	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
		Day-3	Surbhi Tower at Vyara	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
		Over all SSA		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
7	Hand Over Success Rate (HOSR)	Day-1	Iscon Mall at Surat	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
		Day-2	Millenium Mall at Bardoli	NS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
		Day-3	Surbhi Tower at Vyara	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
		Over all SSA		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



DRIVE TEST TABLE: 5

OPERATOR-ASSISTED DRIVE TEST AT VADODARA SSA IN MAR-14 MONTH- GUJARAT CIRCLE

S/N	Parameter	SSA Name: Vadodara	Drive Test Period	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	MTS	RCOM CDMA	TATA CDMA
				GSM Operators									CDMA Operators		
1	Call Attempts	Day-1	Mar-14	149	232	179	175	207	362	215	167	162	142	207	167
		Day-2	Mar-14	41	87	88	91	70	84	19	22	80	149	70	NS
		Day-3	Mar-14	36	59	46	49	89	88	84	103	38	52	89	50
		Over all SSA Result	Total	226	378	313	315	366	534	318	292	280	343	366	217
2	Blocked Call Rate	Day-1	Mar-14	0.00%	0.00%	0.56%	0.00%	0.00%	0.00%	0.00%	1.19%	0.00%	0.00%	0.00%	0.60%
		Day-2	Mar-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NS
		Day-3	Mar-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA Result	Total	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.00%	0.46%
3	Dropped Call Rate (<=2%)	Day-1	Mar-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.64%
		Day-2	Mar-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NS
		Day-3	Mar-14	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA Result	Total	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.46%
PERCENTAGE CONNECTIONS WITH GOOD VOICE QUALITY (=>95%)															
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	Mar-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.95%	99.72%	99.48%
		Day-2	Mar-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.84%	100.00%	NS
		Day-3	Mar-14	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.98%	99.97%	99.95%
		Over all SSA Result	Total	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.91%	99.82%	99.59%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	Mar-14	96.47%	95.77%	97.30%	97.64%	96.97%	95.21%	99.05%	96.27%	93.62%	NA	NA	NA
		Day-2	Mar-14	98.57%	98.68%	98.20%	99.07%	99.81%	96.89%	100.00%	99.34%	97.54%	NA	NA	NA
		Day-3	Mar-14	98.60%	98.31%	97.58%	99.06%	99.31%	96.61%	99.75%	96.99%	98.07%	NA	NA	NA
		Over all SSA Result	Total	97.09%	96.88%	97.56%	98.26%	97.94%	95.67%	99.30%	96.74%	95.21%	NA	NA	NA
SERVICE COVERAGE															
5	In door (>= -75dBm)	Day-1	Mar-14	91.65%	99.09%	92.99%	99.30%	91.79%	98.20%	89.01%	90.59%	98.06%	93.81%	96.13%	88.79%
		Day-2	Mar-14	86.19%	94.05%	88.47%	97.16%	84.93%	93.76%	42.94%	75.15%	84.14%	96.14%	84.29%	NS
		Day-3	Mar-14	91.83%	97.64%	94.05%	99.36%	88.59%	90.95%	75.40%	82.35%	90.88%	78.56%	94.30%	70.95%
		Over all SSA Result	Total	90.91%	97.81%	92.04%	98.72%	89.94%	96.50%	86.85%	87.01%	91.87%	92.53%	94.09%	84.65%
	In-vehicle	Day-1	Mar-14	99.78%	99.84%	99.77%	100.00%	99.63%	99.48%	99.40%	99.05%	99.66%	99.97%	99.78%	98.98%

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



	(>= - 85dBm)	Day-2	Mar-14	99.33%	99.68%	99.23%	99.95%	98.99%	99.43%	95.05%	97.86%	98.19%	99.97%	97.55%	NS
		Day-3	Mar-14	99.91%	99.88%	99.93%	99.99%	99.03%	99.76%	99.32%	96.56%	99.77%	98.90%	99.92%	98.40%
		Over all SSA Result	Total	99.74%	99.81%	99.66%	99.98%	99.40%	99.52%	99.11%	98.16%	99.09%	99.81%	99.47%	98.72%
	Outdoor-in city (>= - 95dBm)	Day-1	Mar-14	100.00%	99.95%	100.00%	100.00%	100.00%	99.99%	100.00%	99.73%	99.87%	100.00%	100.00%	100.00%
Day-2		Mar-14	99.99%	100.00%	100.00%	100.00%	99.95%	99.76%	100.00%	100.00%	100.00%	100.00%	99.89%	NS	
Day-3		Mar-14	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	99.77%	100.00%	100.00%	100.00%	100.00%	
Over all SSA Result		Total	100.00%	99.97%	100.00%	100.00%	99.99%	99.83%	100.00%	99.76%	99.93%	100.00%	99.98%	100.00%	
6	Call Setup Success Rate (>=95%)	Day-1	Mar-14	100.00%	100.00%	99.44%	98.86%	100.00%	100.00%	100.00%	97.00%	100.00%	100.00%	100.00%	99.40%
		Day-2	Mar-14	100.00%	100.00%	100.00%	95.60%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Mar-14	100.00%	100.00%	100.00%	95.92%	100.00%	100.00%	100.00%	99.02%	100.00%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	100.00%	100.00%	99.68%	97.46%	100.00%	100.00%	100.00%	97.95%	100.00%	100.00%	100.00%	99.54%
7	Hand Over Success Rate (HOSR)	Day-1	Mar-14	100.00%	100.00%	99.49%	100.00%	100.00%	100.00%	99.57%	97.32%	100.00%	100.00%	100.00%	100.00%
		Day-2	Mar-14	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Mar-14	100.00%	99.25%	96.49%	100.00%	100.00%	100.00%	100.00%	97.88%	100.00%	100.00%	100.00%	100.00%
		Over all SSA Result	Total	100.00%	99.20%	99.26%	100.00%	100.00%	100.00%	100.00%	99.67%	97.59%	100.00%	100.00%	100.00%

*NS: No Service, *NA: Not applicable

AUDIT & ASSESSMENT OF QOS FOR QE-MARCH-2014-GUJARAT CIRCLE



DRIVE TEST TABLE: 6

OPERATOR-ASSISTED DRIVE TEST AT VADODARA SSA IN MAR-14 MONTH- GUJARAT CIRCLE - INDOOR															
S/N	Parameter	Vadodara SSA	Indoor Location	AIRCEL	AIRTEL	BSNL	IDEA	RCOM GSM	UNINOR	TATA GSM	VIDEOCON	VODAFONE	MTS CDMA	RCOM CDMA	TATA CDMA
				GSM Operators								CDMA Operators			
1	Call Attempts	Day-1	7 sease Mall , Vadodara	10	12	10	13	10	10	10	10	12	10	10	10
		Day-2	Seva Sadan, Sankheda	10	12	10	11	10	10	10	10	12	11	10	NS
		Day-3	Shopping Complex, Savli	10	13	11	11	10	10	10	10	12	10	10	10
		Over all SSA		30	37	31	35	30	30	30	30	36	31	30	20
2	Blocked Call Rate (<=3%)	Day-1	7 sease Mall , Vadodara	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-2	Seva Sadan, Sankheda	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NS
		Day-3	Shopping Complex, Savli	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
3	Dropped Call Rate (<=2%)	Day-1	7 sease Mall , Vadodara	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Day-2	Seva Sadan, Sankheda	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	NS
		Day-3	Shopping Complex, Savli	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
		Over all SSA		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percentage connections with good voice quality (=>95%)															
4	(a) 0-4 (w/o frequency hopping for CDMA Operators)	Day-1	7 sease Mall , Vadodara	NA	NA	NA	NA	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%
		Day-2	Seva Sadan, Sankheda	NA	NA	NA	NA	NA	NA	NA	NA	NA	99.92%	100.00%	NS
		Day-3	Shopping Complex, Savli	NA	NA	NA	NA	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%
		Over all SSA		NA	NA	NA	NA	NA	NA	NA	NA	NA	99.97%	100.00%	100.00%
	(b) 0-5 (with frequency hopping for GSM Operators)	Day-1	7 sease Mall , Vadodara	99.45%	97.30%	99.89%	99.16%	93.96%	97.61%	99.33%	100.00%	98.46%	NA	NA	NA
		Day-2	Seva Sadan, Sankheda	99.73%	99.84%	100.00%	99.44%	100.00%	100.00%	100.00%	99.81%	99.48%	NA	NA	NA

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		Day-3	Shopping Complexi	99.73%	99.74%	99.53%	99.19%	100.00%	100.00%	100.00%	99.13%	98.50%	NA	NA	NA
		Over all SSA		99.64%	98.97%	99.79%	99.26%	95.98%	98.20%	99.78%	99.65%	98.81%	NA	NA	NA
Service Coverage															
5	In door (>= - 75dBm)	Day-1	7 sease Mall , Vadodara	86.17%	100.00%	100.00%	92.18%	2.24%	98.54%	64.35%	100.00%	80.00%	92.40%	99.13%	75.23%
		Day-2	Seva Sadan, Sankheda	100.00%	100.00%	100.00%	99.93%	100.00%	93.18%	43.13%	87.53%	99.90%	99.78%	100.00%	NS
		Day-3	Shopping Complex, Savli	92.45%	87.35%	99.96%	98.59%	100.00%	8.35%	20.98%	0.00%	97.50%	99.96%	100.00%	95.12%
		Over all SSA		92.87%	95.78%	99.99%	96.90%	67.41%	66.69%	42.82%	62.51%	92.47%	97.38%	99.71%	85.18%
	In-vehicle (>= - 85dBm)	Day-1	7 sease Mall , Vadodara	99.65%	100.00%	100.00%	99.97%	91.86%	97.29%	100.00%	100.00%	98.70%	100.00%	100.00%	100.00%
		Day-2	Seva Sadan, Sankheda	100.00%	100.00%	100.00%	99.96%	100.00%	100.00%	98.65%	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Shopping Complex, Savli	99.83%	98.93%	100.00%	100.00%	100.00%	96.76%	98.80%	77.09%	100.00%	100.00%	100.00%	100.00%
		Over all SSA		99.83%	99.64%	100.00%	99.98%	97.29%	98.02%	99.15%	92.36%	99.57%	100.00%	100.00%	100.00%
	Outdoor-in city (>= -95dBm)	Day-1	7 sease Mall , Vadodara	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Seva Sadan, Sankheda	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Shopping Complex, Savli	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Over all SSA		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
6	Call Setup Success Rate (>=95%)	Day-1	7 sease Mall , Vadodara	100.00%	100.00%	100.00%	92.31%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Seva Sadan, Sankheda	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Shopping Complex, Savli	100.00%	100.00%	100.00%	90.91%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Over all SSA		100.00%	100.00%	100.00%	94.29%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
7	Hand Over Success Rate (HOSR)	Day-1	7 sease Mall , Vadodara	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Day-2	Seva Sadan, Sankheda	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	NS
		Day-3	Shopping Complex, Savli	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
		Over all SSA		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%



DETAIL OF THE ROUTES COVERED DURING THE DRIVE TESTS:

DRIVE TEST TABLE: 7

DRIVE TEST ROUTE OF JAN TO MAR - 14 – GUJARAT CIRCLE							
Name of SSA	Drive test Period	Day 1		Day 2		Day 3	
		Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered	Name of SDCA Covered	Route Covered
VALSAD	Jan-14	Valsad (110 KM)	Sation Road, Old City, Chhipwad, Tithal Road, Mograwadi, Abrama, Dharampur Cross Road.	Vapi (103 KM)	Vapi Gunjan Cross Road, Chharwada Road, Vapi GIDC Phase 1 & 2, Station Road, Zanda Chawk, Kachigam Road, Chala, Daman Road	Navsari (103 KM)	Mota Bazar, Golwad, Fuvara, Jublee Baug, Station Road, Jalalpor, Vijalpore, Eru Cross Road, Chhapra, Jamalpor, Kabilpor, Navsari Grid - NH, Navsari GIDC
SURAT	Feb-14	Surat (105 KM)	Surat City ((Surat Railway Station-Ring Road-Varacch-Adajan-Udhna)/Inbuilding (Iscon Mall , Piplod-Dumas Road ,Surat)	Bardoli/ Mandvi /Mangrol/ Sayan (107 KM)	Bardoli-Mandvi-Mangrol-Sayan All Road And Streets Coverd/Inbuilding Millenium Mall , Station Road , Bardoli	Songadh / Vyara/ Valod (109 KM)	Valod-Vyara-Songarh All Road And Streets Coverd/Inbuilding Surbhi Tower , Cinema Road , Vyara
VADODARA	Mar-14	Vadodara City, PADRA (123 KM)	Vadodara City(Kalagodha-Mandvi-Sursagar-Alkapuri- OP Road- Makarpura-Wagodia Ring Road-Fathegunj- Channi-Ranoli- Seven Sease Mall) , Padara, Karjan (Indoor 7 Seas Mall, Fatehganj)	Chhotaudaipur, Pavijetpur, Naswadi, Sankheda (125 KM)	Gayatri Nager,Padmavti Nager,Najampuramain Road,Aanjan Society,Sama Road, Savali Road,Shubhanpura, Alembic Road, Gonwa Road, Diwalipura, Bhayli Road, Haripura, RC Dutt Road, Fatehpura, Warsia, Choksi Bazar, 132 Foot Ring Road./Indoor (Taluka Bhavan, Sankheda) Indoor Pandurang Plaza (Shahuwadi)	Savli, Dabhoi, Miyagam, Waghodia (109 KM)	Karjan & Waghodiatown:- Karjan Miyagam Road,Santoshnagar, Ranjitnagar,Navabazar, Bodana,Gokuldhm.Waghodia Town, Waghodia GIDC./Indoor (Saraswati Complex,Savali),Indoor Jadisidhaswar Mat



SSA WISE DRIVE TEST OBSERVATION:

DRIVE TEST TABLE: 8

DRIVE TEST OBSERVATION OF VALSAD SSA (JAN-14)

S NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Jan-14	Valsad	Valsad	---	Vapi	Voce quality bad patches observed over a short area nearby Site id 24057	Navsari	Voce quality bad patches observed over a short area nearby Site id 34031 overshooting
2	BSNL				Bad Quality patches over a Kilometer on highway/Observed Poor Rx Level all over SSA		Poor Rx Level & Quality all Vapi SDCA		Poor Rx Level & Quality all Navsarii SDCA
3	TATA GSM				Voce quality bad patches observed over a short area nearby Site id W_Valsd_015 , W_Valsd_019, GJ642, GJ641, GJ645		Voce quality bad patches observed over a short area nearby Site id GJ710		Poor Level near GJ735,And Quality W_GJ_NAVSR006 & 001
4	TATA CDMA				Poor Rx Quality near Site id 2643		---		Poor Rx Level & Quality nearby Site id 2733
5	IDEA				---		---		---
6	RCOM GSM				Poor Voce quality and level observed over a area nearby Site id GJ2VLSAD-001-B23		Poor Rx Quality observed all over Vapi SDCA		Poor Rx Quality observed nearby Site id GJ6NVSRO09G_22 & GJ6NVSRO04B_37
7	RCOM CDMA				Poor Voce quality and level observed over a area nearby Site id GJVALSD_003_23 & GJVALSD_002_23		Poor Voce quality and level observed over a area nearby Site id GJ 6 VAPI00264_13		---
8	VIDEOCON				Poor Voce quality observed over a area nearby Site id GJ645,W-GJ VALSAD015		Poor Voce quality observed over a area nearby Site id GUJVSD3012		Poor Voce quality observed over a area nearby Site id GUJNAV0008, GUJNAV0026
9	UNINOR				Poor Voce quality observed over a area nearby Site id 1478		Poor Voce quality observed over a area nearby Site id 0629,2737 & 1426		Poor Voce quality and level observed over a area nearby Site id 0389,1294 & 1028
10	MTS				---		---		Poor voice quality near Kasbapar
11	VODAFONE				Poor Voce quality observed over a area nearby Site id VALMOGARBC		Poor Voce quality observed over a area nearby Site id Vpigidcide,Vpichalas		---
12	AIRCEL				No Coverage		No Coverage		No Coverage

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DRIVE TEST TABLE: 9

DRIVE TEST OBSERVATION OF SURAT SSA (FEB-14)

S NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Feb-14	Surat	Surat	Poor Voice quality observed at a spot due to Site-id 36806 far from spot	Bardoli / Mandvi / Mangrol / Sayan	Voice quality worst observed at a spot due to Site-id 21656 far from spot	Songadh / Vyara / Valod	Observed poor Rx Level in Valod town
2	BSNL				Poor C/I overall city		Poor C/I overall city		---
3	TATA GSM				---		Mangrol :- Poor RxLevel W_GJ_MNGRO_001 Sayan:- Poor voice quality nearby Site W_GJ_sayan_003		Songadh:- Rx Level poor all over SDCA
4	TATA CDMA				Poor voice quality near Site id 2435		They have coverage only in Bardoli SDCA. Bardoli:- Poor Rx Power near GIDC ,Station road		They have coverage only in Vyara SDCA. Vyara: - Poor Rx Power near Raj nagar , Railway station ,SBI
5	IDEA				Observed Poor Quality at Adajan-Gam		Bardoli:- Observed Poor Quality near NH6 GIDC		---
6	RCOM GSM				Poor Level & Quality near Site id GJ08SURAT039_10, GJ08SURAT062_10		---		Valod:- Poor level and quality nearby Site GJ4VAL0D001B_36,GJ5VAL0D003B_37
7	RCOM CDMA				---		---		---
8	VIDEOCON				Observed bad voice quality all over SSA		Sayan:- Observed bad voice quality over road nearby Site-id w_GJ_Sayan002. In Bardoli:- Observed bad voice quality nearby Site id W GJ BRDLI004 In Mangrol :- Level poor at W GJ MNGRO 001		In Songadh:- Poor Rx Level nearby Site id: SUSRT001 & SNGDHC001. In Valod:- Poor quality and level nearby Site Valodc001 and Valodg002
9	UNINOR				---		They have coverage only in Bardoli & Sayan SDCA. Sayan:- Poor Rx Quality nearby Site id 4560		They have coverage only in Valod & Vyara SDCA. Valod:- Poor Rx Quality nearby Site id 2507
10	MTS				---		They have coverage only in Bardoli SDCA		They have coverage only in Vyara SDCA on TATA ICR
11	VODAFONE				---		Bardoli:- Observed Poor Quality near GIDC to Railway station road		Songadh: - Observed Poor Quality nearby Site-id XSTSONGDID. Vyara :- Observed Poor Quality nearby Site-id XSTVyapash
12	AIRCEL				No Coverage		No Coverage		They have coverage only in Songadh SDCA



DRIVE TEST TABLE: 10

DRIVE TEST OBSERVATION OF VADODARA SSA (MARCH-14)

S NO	Name of SP	Month	SSA Covered	SDCA Covered in Day 1	Day 1 Observation	SDCA Covered in Day 2	Day 2 Observation	SDCA Covered in Day 3	Day 3 Observation
1	AIRTEL	Mar-14	Vadodara	Vadodara City, PADRA	Vadodara:- Bad patches of Voice Quality was observed at Lions hall road,Hotel express tower & Swami vivekanand Vidyalaya	CHHOTAUDAIPUR, PAVIJETPUR, NASWADI, SANKHEDA	---	SAVLI, DABHOI, MIYAGAM, WAGHODIA	Miyagam- Bad patches of Voice Quality was observed at Indraprasth Sociaty / Parda, Sardar Patel marg.
2	BSNL				---		Pavijetpur:- Poor Rx level & RxQul Quality patches over a Kilometer on highway nearby Site id :VAD065 due to hardware malfunction		---
3	TATA GSM				Vadodara:- Observed Poor voice quality nearby Site id GUVAD664,GUVAD1001.GUVAD684		They have coverage in Sankheda SDCA only		Dhaboi:- Observed Poor voice quality nearby Site id GUVAD968,GUVAD652
4	TATA CDMA				Vadodara :Observed Poor voice quality nearby Site id 3071		No Coverage		They have coverage in Miyagam,Waghodia SDCA only
5	IDEA				Vadodara : Observed Poor voice qul nearby Site id COWI01 & BRD076		Chhotaudaipur : Observed Poor voice quality nearby Site id CH004		Dhabhoi:Observed Poor voice quality nearby Site id DBO002
6	RCOM GSM				Vadodara : Observed Poor voice quality nearby Site id 10573		Observed Poor Rx level nearby Site id Chhotaudaipur : 31251 & 31252 and Naswadi : 31353		Savali:- Observed Poor Rx level nearby Site id 20311 Dhaboi:- Poor Rx Quality nearby Site id 31201,31262
7	RCOM CDMA				---		Sankheda : Observed Poor Rx Level nearby Site id PN-18		
8	VIDEOCON				Vadodara :Observed Poor voice qul nearby Site id GUJVAD0074 & GUJVAD0011		No Coverage		Observed Poor voice quality nearby Site id Karjan GUJVAD3004 & Dhabhoi GUJVAD0011
9	UNINOR				Vadodara : Observed Poor voice quality all over Vadodara & Padra		Observed poor voice quality in chhotaudaipur near Site id 4675 and Dabhoi Site id 0679		Observed bad voice quality over road Miyagam Karjan: nearby Site-id 0640 and Savli:Site-id 1076
10	MTS				---		No Coverage		They have coverage in MIYAGAM,WAGHODIA SDCA only
11	VODAFONE				Vadodara :Voice Quality not good all over the city and Critcal nearby Site-id Brdakshars,Brddhairya & Brdgadapra		Poor Quality patches near Site id: XBR SANKHED		---
12	AIRCEL				No Coverage		Coverage in Sankheda SDCA Only		No Coverage



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

1. Jan-14 : Valsad SSA

Valsad, Vapi and Navasari SDCAs were covered.

2. Feb-14 (Surat SSA):

Day-1: Coverd Only Surat SDCA with one office/Inbuilding Complex

Day-2: Coverd Bardoli/ Mandvi/ Mangrol/ Sayan SDCAs with one Office/ Inbuilding Complex

Day-3: Coverd Songadh/ Vyara/ Valod SDCAs with one Office/ Inbuilding Complex

No Service:

- i. Aircel on Day-3 : Have no coverage in given SSA except in Songadh SDCA
- ii. TATA CDMA Day-2 :There was no network of TATA CDMA in Mandvi, Mangrol & Sayan (report belongs to only Bardoli SDCA)
- iii. TATA CDMA Day-3 :There was no network of TATA CDMA in Valod & Songadh (report belongs to only Vyara SDCA)
- iv. Uninor Day-2 : There was no network of Uninor in Mandavi & Mangrol SDCA (report belongs to only Vardoli & Sayan SDCA)
- v. Uninor Day-3 : There was no network of Uninor in Songadh SDCA (report belongs to only Valod & Vyaara SDCA)
- vi. MTS Day-2: There was no network of MTS in Mandvi/ Mangrol/ Sayan SDCAs (reports belongs to only Bardoli SDCA)
- vii. MTS Day-3: There was no network in Songadh/Valod SDCAs (reports belongs to only Vyara SDCA and ICR with TATA)

ICR Networks: Videocon (VTL): On ICR with TATA in Day-2 & Day-3 covering cities.

3. Mar-14 (Vadodara SSA):

No Service:

- i. TATA CDMA : Chhota udaipur, Sankheda, Naswadi, Pavijetpur during day-2 Drive test
- ii. TATA CDMA: Dabhoi, Savli during day3 drive test
- iii. TATA GSM: Chhotaudaipur, Naswadi, Pavijetpur.
- iv. Videocon (VTL): No service as well as ICR Network in Pavijetpur,Naswadi,Chotaudaipur. So drive test not conducted in these towns during day-2 Drive
- v. Aircel: Pavijetpur,Naswadi,Chhotaudaipur during day-2 drive
- vi. MTS:Chhotaudaipur, Pavijetpur, Naswadi, Sanheda, Dabhoi, Savali during day-2 & 3 drive
- vii. UNINOR: - Naswadi.

The results of the drive test, carried out during three months of the quarter ended March-14 for all service providers revealed that they were in compliance of benchmarks for all the parameters. Vodafone not met the benchmark for parameter 'Good Voice Quality' on Day-1 drive test with its performance as 93.62%.

Though the drive test results suggest satisfactory working of the network of the service providers, yet the deficiencies with respect to inadequate coverage and voice quality, encountered by different Service providers at the various places as shown in the drive tests plots, are detailed in the above table.-8, table-9 and table-10 for Valsad, Surat and Vadodra SSAs respectively.

6. ESSENCE OF COMPLIANCE REPORT OF SERVICE PROVIDERS WITH RESPECT TO THE QOS





6. ESSENCE OF COMPLIANCE REPORT OF SERVICE PROVIDERS WITH RESPECT TO THE QOS

From analysis of monthly audit and 3 days live measurements results, it can be concluded that performance of the operators in the Gujarat service area is fairly satisfactory for **Network parameters** as all operators (except Tata-GSM/ Tata (CDMA)) were found to have met the benchmarks of all parameters. Tata (GSM)/ Tata (CDMA) were non-compliant in all the three months of the quarter with their average performance of 6.03% and 5.55% respectively.

In case of 3 days live measurement also Tata (GSM) and Tata (CDMA) remained non-compliant of parameter 'Worst affected cells > 3 % TCH drops' in all the three months of the quarter. The performance of Tata (GSM) and Tata (CDMA) for this parameter, on an average of three months was 3.98% and 4.12 % respectively.

With regard to the **Customer Service Quality Parameters**, the performance of operators remained satisfactory as most of the service providers were found in compliance of most of the benchmarks. **Vodafone** could not meet the benchmark for the parameter "% of billing complaints" with its performance as **0.11%**. The compliance with respect to the parameter 'Calls answered by Operators (voice to voice) within 60 seconds' was not met by **RCOM (GSM), Tata (GSM) and RCOM (CDMA)** with their performance of **76.63%, 88.57% and 83.87%** respectively.

In case of this parameters closure/termination within the benchmark of 7 days, only **Idea** was non-compliant with its performance **98.50%**. With regard to the parameter 'Refund of deposits within 60 days of closure' only **Idea and Vodafone** failed to comply with the benchmark, as their achievement was **94.19% and 98.80%** respectively.

With regard to the **Drive Tests**, all service providers were found meeting the benchmarks for all the parameters.

Thus, taking cognizance on overall performance of the service providers, it was concluded that service providers were doing fairly well in Gujarat Circle for most of the parameters. However, the performance with respect to the parameters Worst affected cell having > 3 % TCH drop, Calls answered by operator (voice to voice) and Refund of deposits after closure needs further improvement for those operators who could not meet the benchmarks of these parameters.

**7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR
MOBILE TELEPHONE SERVICES**





7. DETAILED NETWORK DATA ASSESSMENT OF CELLULAR MOBILE TELEPHONE SERVICES GUJARAT CIRCLE:

TABLE: 1

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Gujarat Circle- Jan-14 month															
S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	Tata CDMA
				GSM Operators									CDMA Operators		
Network Service Quality Parameter															
Network Availability															
1	a) Total no. of BTSs in the licensed service area		Jan-14	7313	829	2147	4592	6197	3195	2935	1842	7488	1676	565	572
	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-14	4483	251	118	43078	1653	1897	3660	818	892	1924	247	15
	c) BTS Accumulated Downtime	<=2%	Jan-14	0.08%	0.04%	0.01%	1.26%	0.04%	0.08%	0.17%	0.06%	0.02%	0.15%	0.06%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Jan-14	14	0	0	88	0	6	0	3	1	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Jan-14	0.19%	0.00%	0.00%	1.92%	0.00%	0.19%	0.00%	0.16%	0.01%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Jan-14	99.67%	99.51%	98.15%	97.56%	99.37%	97.76%	99.61%	98.70%	99.80%	99.26%	99.75%	98.02%
	b) SDCCH/PAGING Congestion	<=1%	Jan-14	0.06%	0.02%	0.04%	0.05%	0.17%	0.10%	0.01%	0.13%	0.08%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Jan-14	0.27%	0.09%	0.03%	0.48%	0.29%	0.65%	0.06%	0.36%	0.20%	0.00%	0.02%	0.97%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Jan-14	0.64%	0.51%	0.84%	1.02%	1.04%	0.44%	0.17%	0.54%	0.70%	0.03%	0.11%	0.55%
	b) Worst affected cells>3% TCH drop	<=3%	Jan-14	1.08%	1.49%	6.03%	2.81%	0.88%	2.20%	0.01%	0.92%	1.55%	0.08%	1.50%	5.09%

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	c) % of connections with good voice quality	>=95%	Jan-14	97.10%	98.43%	98.31%	NP	96.44%	98.26%	98.80%	98.10%	97.57%	99.86%	99.20%	99.34%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Jan-14	241	37	389	356	162	216	1	51	350	4	801	88
	e) Total no. of cells (Sector) in the licensed service area		Jan-14	22229	2487	6448	12668	18505	9826	8660	5522	22653	4975	53537	1729
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		Jan-14	0	0	0	2	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Jan-14	0	0	0	IDEA CMTS & SSTL	0	0	0	0	0	0	0	0
Network Data															
5	a) Equipped Capacity of Network in Erlang		Jan-14	253209	32213	114783	317000	261285	113348	144000	80410	416753	144000	21000	94997
	b) Total traffic in TCBH in erlang (Avg.)		Jan-14	174334	7135	31083	90080	199878	130920	128811	17500	374392	47297	2758	17879
	c) Total no. of customers served (as per VLR) on last day of the month		Jan-14	7111820	13131	1329416	2670378	9257158	3368748	4980023	769969	16285146	1370108	136936	305848

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TABLE: 2

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Gujarat Circle- Jan-14 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	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	7280	829	2139	4591	6158	3135	2934	1832	7473	1675	565	572
	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	1035.98	123.31	131	3793.55	87.63	649	618.6	162.77	308	363	6.47	4.2
	c) BTS Accumulated Downtime	<=2%	Live data	0.20%	0.21%	0.09%	1.15%	0.02%	0.29%	0.29%	0.12%	0.06%	0.30%	0.02%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	2	0	0	6	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.03%	0.00%	0.00%	0.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.74%	99.47%	98.19%	97.86%	99.43%	97.67%	99.60%	98.46%	99.83%	99.14%	99.77%	96.08%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.04%	0.03%	0.05%	0.10%	0.07%	0.01%	0.26%	0.05%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.10%	0.05%	0.03%	0.47%	0.23%	0.80%	0.06%	0.53%	0.17%	0.00%	0.00%	2.93%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.64%	0.56%	0.89%	0.91%	1.06%	0.47%	0.11%	0.55%	0.79%	0.04%	0.12%	0.53%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	1.09%	1.49%	3.95%	2.79%	0.89%	2.33%	0.00%	0.89%	1.17%	0.06%	1.45%	3.64%
	c) % of connections with good voice quality	>=95%	Live data	97.10%	98.40%	98.28%	NP	96.41%	98.21%	98.77%	98.01%	97.57%	99.86%	99.23%	99.33%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	242	37	254	359	165	230	0	49	265	3	25	63

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	e) Total no. of cells (Sector) in the licensed service area	Live data	22128	2487	6424	12852	18487	9856	8660	5521	22599	4852	1727	1729	
4	No. of POI's having $\geq 0.5\%$ POI congestion														
	No. of POI's having $\geq 0.5\%$ POI congestion	Live data	0	0	0	0	0	0	0	0	0	0	0	0	
	Name of POI not meeting the benchmark	Live data	0	0	0	0	0	0	0	0	0	0	0	0	

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TABLE: 3

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Gujarat Circle- Feb-14 month															
S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	Tata CDMA
				GSM Operators									CDMA Operators		
Network Service Quality Parameter															
1	Network Availability														
	a) Total no. of BTSs in the licensed service area		Feb-14	7328	829	2162	4592	6208	3190	2936	1856	7513	1681	565	572
	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-14	2378.56	78	58	38861	968	1530	2366	513	46.58	1377	219	25
	c) BTS Accumulated Downtime	<=2%	Feb-14	0.05%	0.01%	0.00%	1.26%	0.02%	0.07%	0.12%	0.04%	0.00%	0.12%	0.06%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Feb-14	8	0	0	90	0	10	0	1	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Feb-14	0.11%	0.00%	0.00%	1.96%	0.00%	0.31%	0.00%	0.05%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Feb-14	99.70%	99.49%	98.16%	97.89%	99.24%	97.24%	99.59%	98.25%	99.74%	99.33%	99.76%	98.16%
	b) SDCCH/PAGING Congestion	<=1%	Feb-14	0.04%	0.12%	0.04%	0.05%	0.22%	0.14%	0.01%	0.09%	0.09%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Feb-14	0.19%	0.27%	0.03%	0.46%	0.38%	0.88%	0.07%	0.53%	0.26%	0.00%	0.02%	0.80%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Feb-14	0.62%	0.49%	0.81%	0.92%	0.98%	0.44%	0.23%	0.52%	0.76%	0.02%	0.11%	0.57%
	b) Worst affected cells>3% TCH drop	<=3%	Feb-14	1.02%	1.89%	6.05%	2.68%	0.74%	2.18%	0.02%	0.93%	1.54%	0.04%	1.56%	5.26%
	c) % of connections with good voice quality	>=95%	Feb-14	97.13%	98.37%	98.27%	NP	96.41%	98.08%	98.83%	97.92%	97.49%	99.87%	99.20%	99.34%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Feb-14	227	47	393	334	137	219	2	52	351	2	27	91
e) Total no. of cells (Sector) in the licensed service area		Feb-14	22338	2487	6493	12480	18606	10035	8665	5577	22732	5045	1727	1729	

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No. of POI's having >=0.5% POI congestion														
4	No. of POI's having >=0.5% POI congestion	Feb-14	0	0	0	1	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark	Feb-14	0	0	0	IDEA CMTS	0	0	0	0	0	0	0	0
Network Data														
5	a) Equipped Capacity of Network in Erlang	Feb-14	247409	32213	115593	317000	263312	117991	144000	81775	425823	144000	21000	94997
	b) Total traffic in TCBH in erlang (Avg.)	Feb-14	167003	7636	31561	87304	214645	143228	124425	21533	392063	47862	2729	18517
	c) Total no. of customers served (as per VLR) on last day of the month	Feb-14	7151719	12018	1347947	2674676	9379121	3816571	4885912	841980	16148631	1344220	136756	306022

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TABLE: 4

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Gujarat Circle- Feb-14 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	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	7316	829	2160	4592	6199	3214	2936	1852	7488	1682	565	572
	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	313	10	19	5642	92	130	228	28	81	104	38	5
	c) BTS Accumulated Downtime	<=2%	Live data	0.06%	0.02%	0.01%	1.71%	0.02%	0.06%	0.11%	0.02%	0.02%	0.09%	0.09%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	5	0	0	1	0	0	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.07%	0.00%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Connection Establishment (Accessibility)															
2	a) CSSR (Call Setup Success Rate)	>=95%	Live data	99.73%	99.49%	98.20%	97.69%	99.33%	97.46%	99.58%	98.45%	99.79%	99.19%	99.77%	97.56%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.02%	0.02%	0.03%	0.04%	0.33%	0.14%	0.01%	0.05%	0.11%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.07%	0.07%	0.01%	0.49%	0.34%	1.08%	0.06%	0.42%	0.21%	0.00%	0.02%	1.41%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.62%	0.50%	0.80%	0.56%	0.89%	0.47%	0.28%	0.52%	0.71%	0.02%	0.09%	0.59%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	0.94%	2.41%	3.72%	2.82%	0.67%	2.29%	0.01%	0.97%	1.23%	0.02%	1.45%	3.70%
	c) % of connections with good voice qul.	>=95%	Live data	97.09%	98.40%	98.29%	NP	96.67%	97.98%	98.83%	97.91%	97.65%	99.87%	99.19%	99.34%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	209	60	255	342	125	232	1	54	278	1	25	64
	e) Total no. of cells (Sector) in the licensed service area		Live data	22215	2487	6847	12124	18619	10124	8666	5586	22653	5087	1727	1729
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	0	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	0	0	0	0	0	0	0	0	0

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TABLE: 5

Detailed Network Data Assessment of Cellular Mobile Telephone Services- Gujarat Circle- Mar-14 month															
S/N	Name of Parameter	Bench- mark	Audit Period	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	Tata CDMA
				GSM Operators									CDMA Operators		
Network Service Quality Parameter															
1	Network Availability														
	a) Total no. of BTSs in the licensed service area		Mar-14	7355	827	2162	4592	6222	3346	2937	1861	7525	1657	564	578
	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-14	2794.54	92.28	80.152	38289	1314	2286	2469	747	564.28	1376	46	41.5
	c) BTS Accumulated Downtime	<=2%	Mar-14	0.05%	0.01%	0.00%	1.12%	0.03%	0.09%	0.11%	0.05%	0.01%	0.11%	0.01%	0.01%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Mar-14	11	0	0	90	1	20	0	2	0	0	0	0
e) Worst affected BTSs due to downtime	<=2%	Mar-14	0.15%	0.00%	0.00%	1.96%	0.02%	0.60%	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%	
2	Connection Establishment (Accessibility)														
	a) CSSR (Call Setup Success Rate)	>=95%	Mar-14	99.70%	99.49%	98.05%	97.35%	99.14%	97.20%	99.59%	97.87%	99.64%	99.33%	99.76%	97.93%
	b) SDCCH/PAGING Congestion	<=1%	Mar-14	0.03%	0.01%	0.04%	0.06%	0.23%	0.35%	0.03%	0.16%	0.09%	0.00%	0.00%	0.00%
c) TCH congestion	<=2%	Mar-14	0.16%	0.14%	0.09%	0.56%	0.47%	1.47%	0.08%	0.55%	0.36%	0.00%	0.02%	1.02%	
3	Connection Maintenance (Retainability)														
	a) Call Drop Rate (CDR)	<=2%	Mar-14	0.57%	0.48%	0.81%	0.95%	0.98%	0.48%	0.19%	0.55%	0.74%	0.03%	0.14%	0.62%
	b) Worst affected cells>3% TCH drop	<=3%	Mar-14	0.93%	1.81%	6.02%	2.70%	0.69%	2.56%	0.02%	1.00%	1.65%	0.04%	2.03%	6.30%
	c) % of connections with good voice quality	>=95%	Mar-14	97.23%	98.36%	98.22%	NP	96.40%	97.91%	98.85%	97.68%	97.49%	99.87%	99.20%	99.32%
d) Total No. of cells exceeding 3% TCH drop (call drop)		Mar-14	207	45	391	343	128	266	2	56	375	2	35	110	

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	e) Total no. of cells (Sector) in the licensed service area	Mar-14	22365	2481	6493	12686	18562	10393	8669	5612	22778	4972	1724	1747	
4	No. of POI's having >=0.5% POI congestion														
	No. of POI's having >=0.5% POI congestion	Mar-14	0	0	0	1	0	0	0	0	0	0	0	0	
	Name of POI not meeting the benchmark	Mar-14	0	0	0	IDEA CMTS	0	0	0	0	0	0	0	0	
5	Network Data														
	a) Equipped Capacity of Network in Erlang	Mar-14	246406	32127	116199	317000	263837	121918	144000	83751	425324	144000	21000	95735	
	b) Total traffic in TCBH in erlang (Avg.)	Mar-14	161233	7636	33796	91444	218575	154320	126349	23629	394326	46969	2666	18690	
	c) Total no. of customers served (as per VLR) on last day of the month	Mar-14	7019469	10612	1359188	2672008	9445778	3916856	4820387	936041	16107836	1319374	137915	301242	

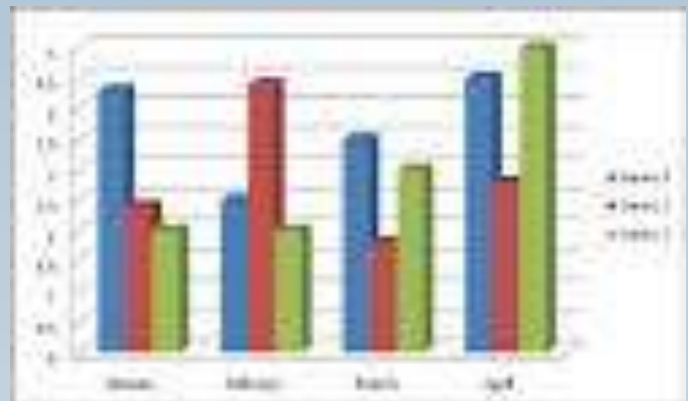
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TABLE: 6

Detailed Network Data Assessment of Cellular Mobile Telephone Services-3 days live- Gujarat Circle- Mar-14 month															
S/N	Name of Parameter	Bench- mark	Average of 3 Days	AIRTEL	AIRCEL	TATA GSM	BSNL	IDEA	UNINOR	RCOM GSM	VIDEOCON	VODAFONE	RCOM CDMA	MTS	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	7332	827	2162	4592	6209	3312	2937	1858	7513	1682	565	575
	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	433.78	3.99	5.12	3236.33	190.93	235	233	143.13	49.27	129	1.09	1.46
	c) BTS Accumulated Downtime	<=2%	Live data	0.08%	0.01%	0.00%	0.98%	0.04%	0.10%	0.11%	0.11%	0.01%	0.11%	0.00%	0.00%
	d) No. of BTSs having accumulated downtime of >24 hours in a month		Live data	1	0	0	1	0	2	0	0	0	0	0	0
	e) Worst affected BTSs due to downtime	<=2%	Live data	0.01%	0.00%	0.00%	0.02%	0.00%	0.06%	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	99.64%	99.45%	98.14%	97.50%	99.12%	97.30%	99.59%	98.12%	99.76%	99.32%	99.79%	97.55%
	b) SDCCH/PAGING Congestion	<=1%	Live data	0.07%	0.01%	0.02%	0.03%	0.11%	0.19%	0.01%	0.16%	0.04%	0.00%	0.00%	0.00%
	c) TCH congestion	<=2%	Live data	0.23%	0.09%	0.04%	0.60%	0.50%	1.36%	0.08%	0.45%	0.24%	0.00%	0.01%	1.34%
Connection Maintenance (Retainability)															
3	a) Call Drop Rate (CDR)	<=2%	Live data	0.60%	0.52%	0.83%	0.65%	1.02%	0.48%	0.11%	0.55%	0.76%	0.02%	0.16%	0.64%
	b) Worst affected cells>3% TCH drop	<=3%	Live data	0.94%	2.02%	4.27%	2.40%	0.79%	2.64%	0.01%	1.09%	1.65%	0.10%	2.20%	5.01%
	c) % of connections with good voice quality	>=95%	Live data	97.39%	98.26%	98.24%	NP	96.29%	97.94%	98.81%	97.67%	97.45%	99.87%	99.21%	99.30%
	d) Total No. of cells exceeding 3% TCH drop (call drop)		Live data	209	50	277	302	147	275	1	61	374	5	38	87
	e) Total no. of cells (Sector) in the licensed service area		Live data	22343	2481	6493	12598	18523	10425	8668	5607	22732	5047	1727	1738
No. of POI's having >=0.5% POI congestion															
4	No. of POI's having >=0.5% POI congestion		Live data	0	0	0	1	0	0	0	0	0	0	0	0
	Name of POI not meeting the benchmark		Live data	0	0	0	IDEA_CMTS	0	0	0	0	0	0	0	0

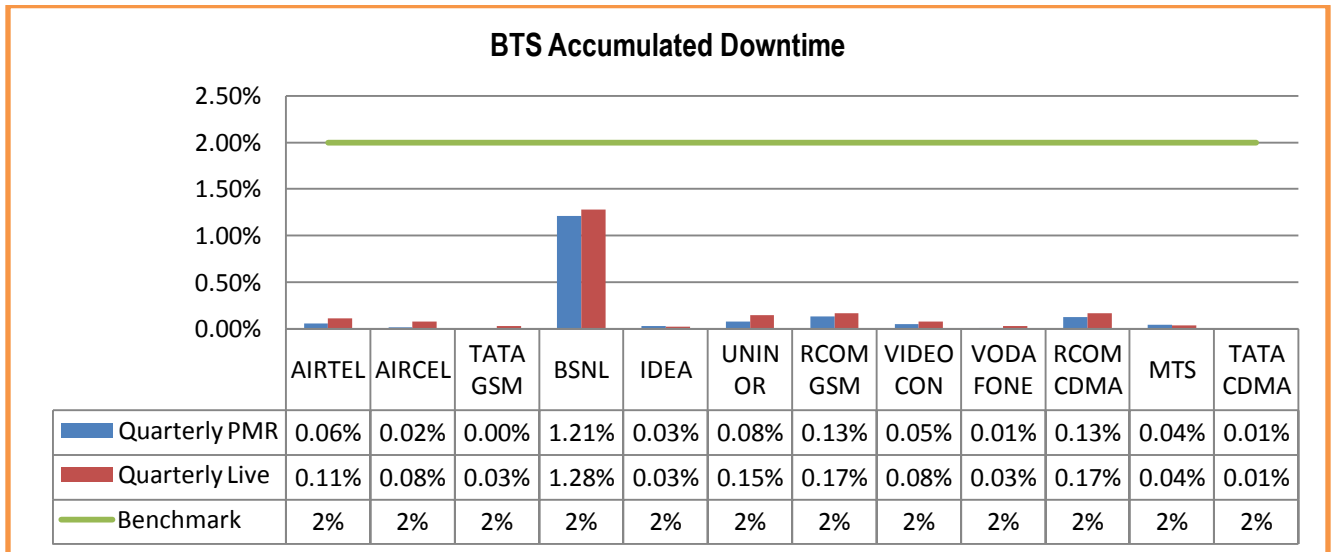
8. GRAPHICAL REPRESENTATION





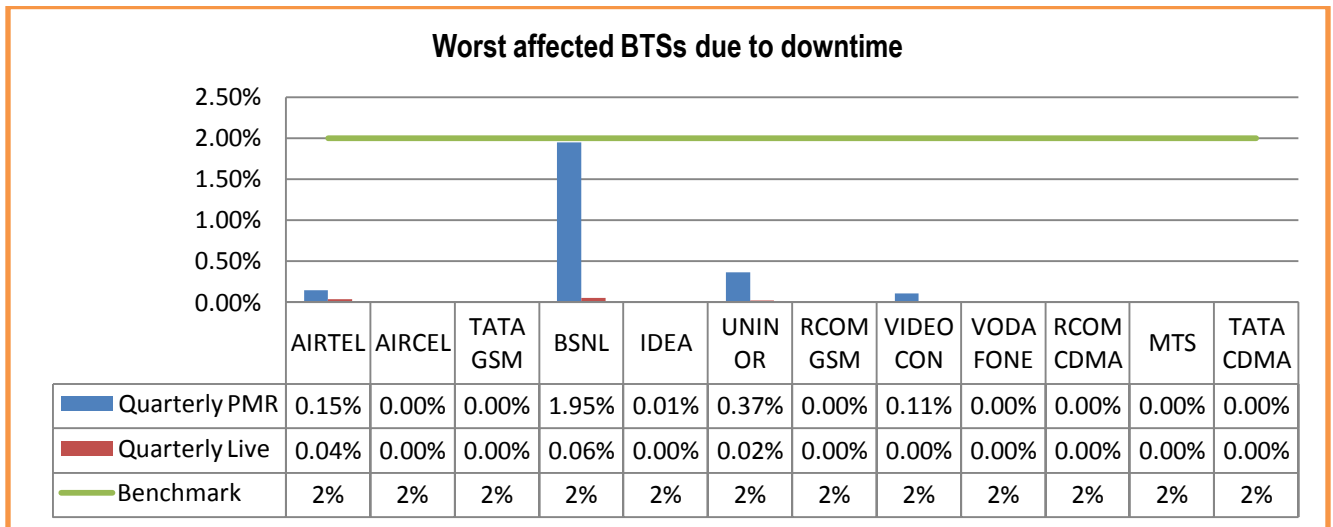
8. GRAPHICAL REPRESENTATION OF PERFORMANCE OF THE CELLULAR MOBILE SERVICE PROVIDERS-MONTHLY V/S 3-DAYS LIVE MEASUREMENT:

1. BTS ACCUMULATED DOWNTIME



All operators are meeting the benchmarks.

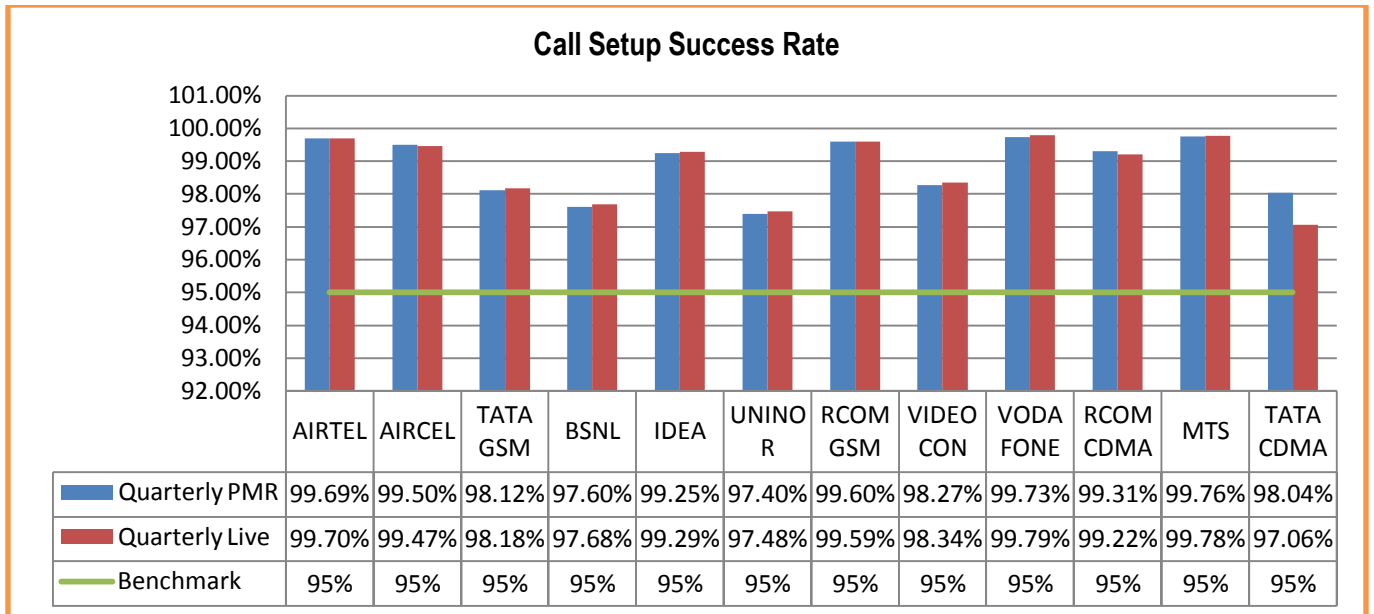
2. WORST AFFECTED BTSs DUE TO DOWNTIME:



All operators are meeting the benchmarks.

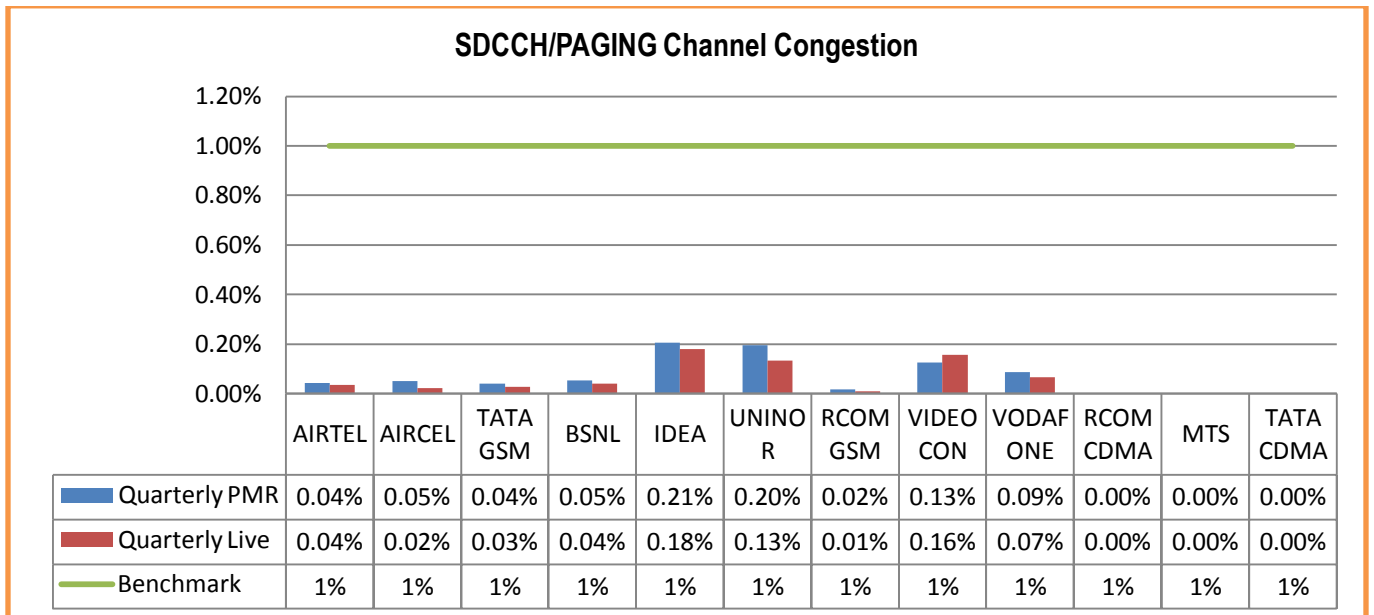


3. CALL SETUP SUCCESS RATE



All operators are meeting the benchmarks.

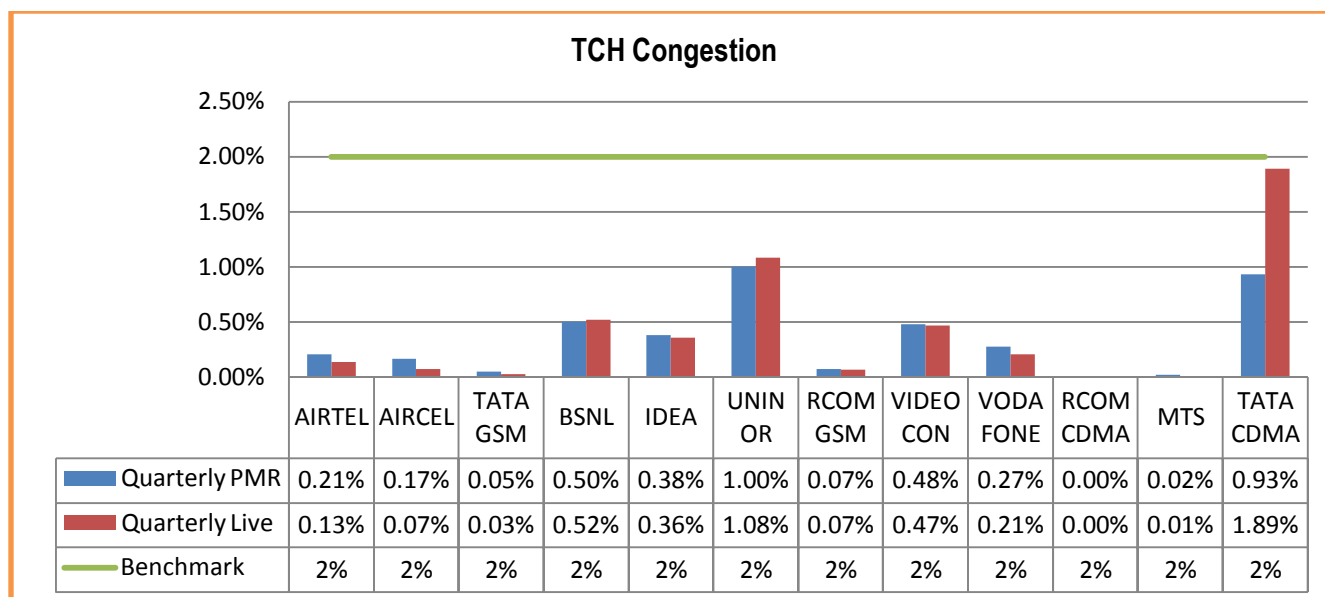
4. SDCCH/PAGING CHANNEL CONGESTION:



All operators are meeting the benchmarks.

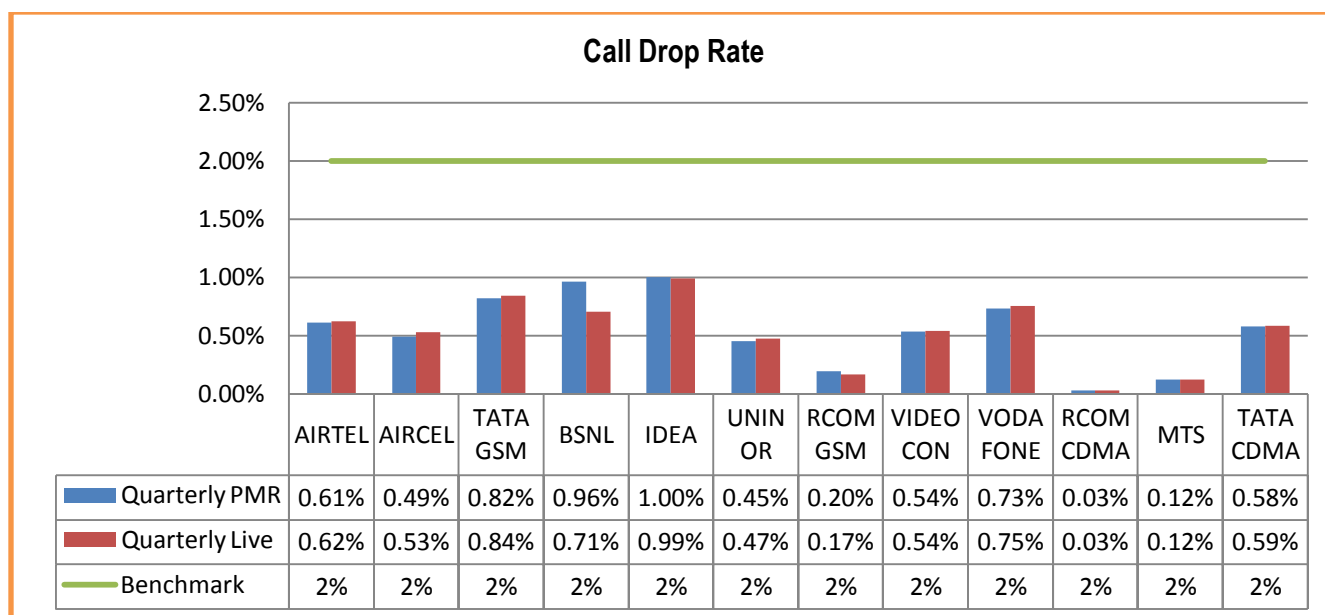


5. TCH CONGESTION:



All operators are meeting the benchmarks.

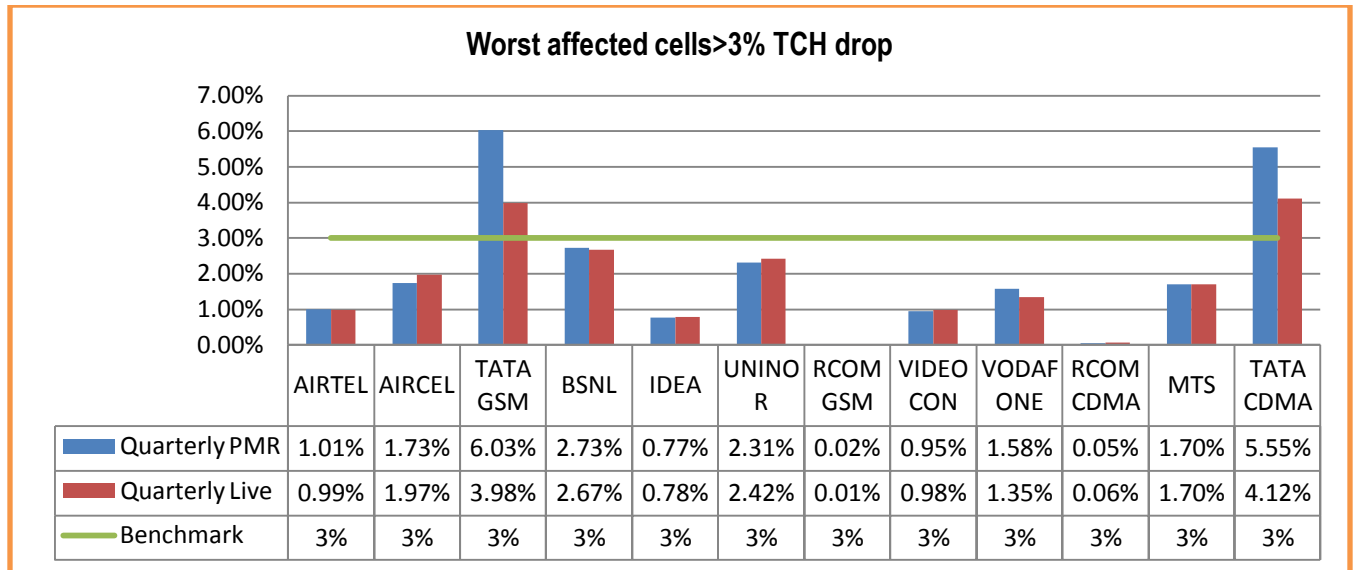
6. CALL DROP RATE:



All operators are meeting the benchmarks.

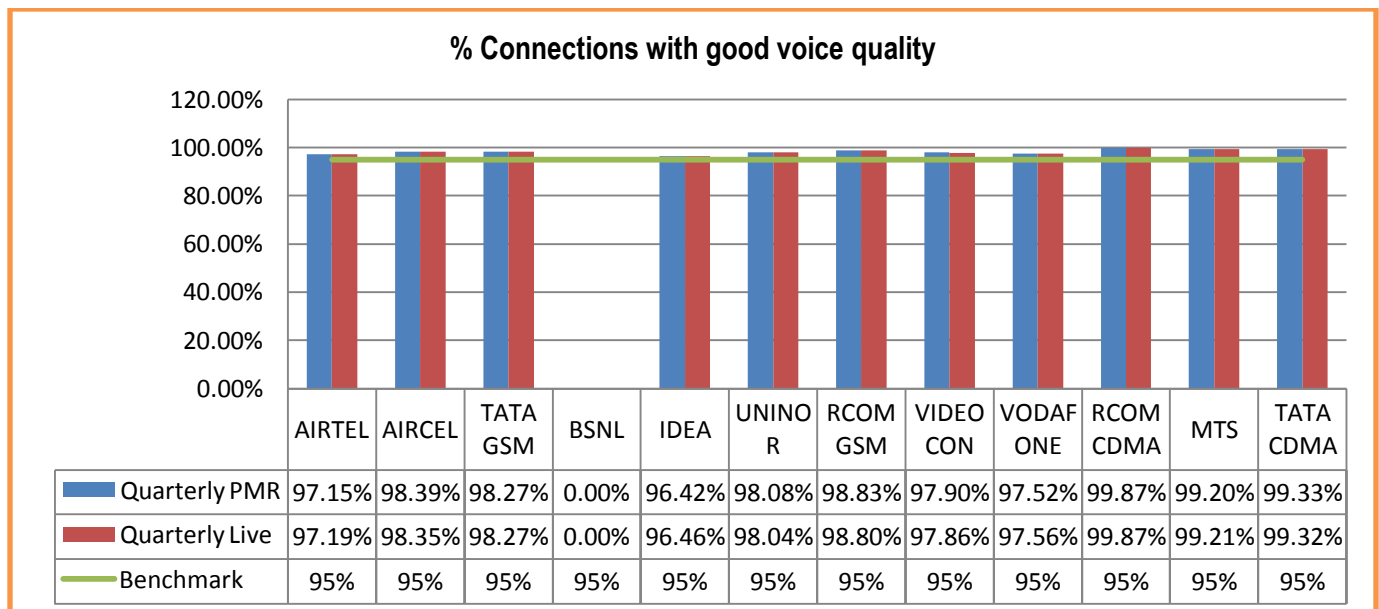


7. WORST AFFECTED CELLS>3% TCH DROP:



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

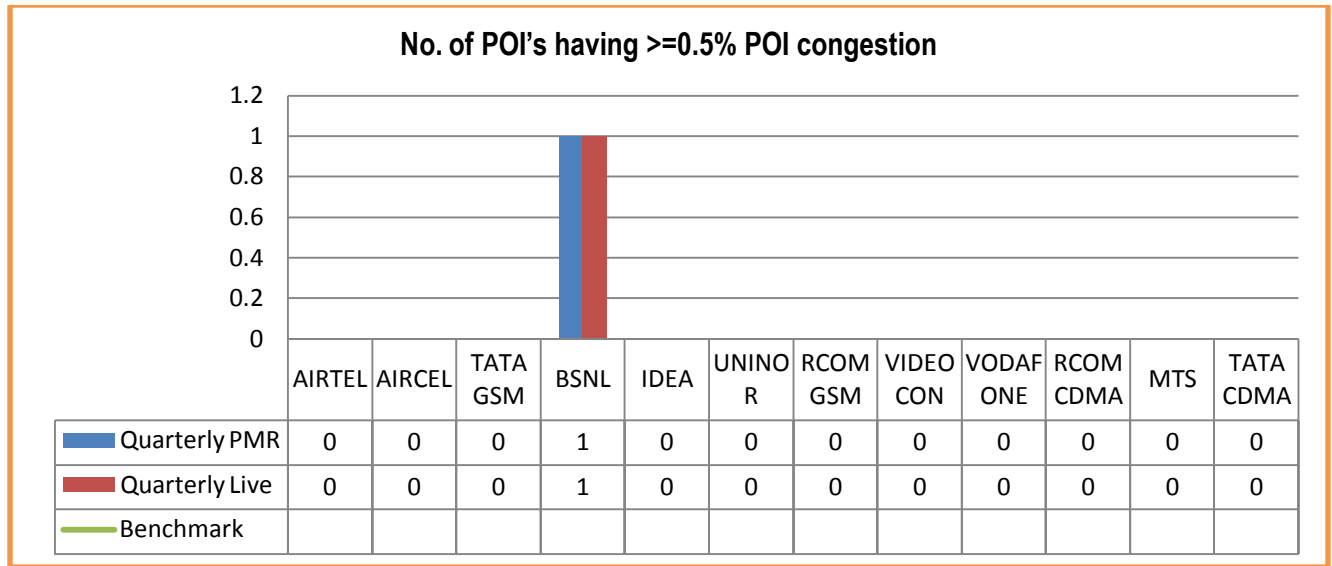
8. PERCENTAGE OF CONNECTIONS WITH GOOD VOICE QUALITY:



All operators are meeting the benchmarks. BSNL has not provided the data for Voice Quality.



9. NO. OF POI'S HAVING $\geq 0.5\%$ POI CONGESTION:



BSNL was having congestion on one POI.