

## QUALITY OF SERVICE (QoS) MONITORING OF CELLULAR MOBILE VOICE SERVICES

In pursuance of Annexures D1 and D2 of the Cellular Mobile Licence of Telecommunication Operators, the user perspective of the quality of voice services are tested to ensure the compliance of Operators to the obligations on service quality to the user.

The report is based on findings on quality of service in all regions for February and March 2012.

As per the Cellular Mobile licence obligations, the QoS indicators and their respective threshold for compliance under assessment considering the user's perspective are;

### a) Stand-alone Dedicated Control Channel (SDCCH) Congestion Rate

SDCCH Congestion Rate should be equal or less than one per cent (1%).

SDCCH Congestion is defined as the probability of failure of accessing a stand-alone dedicated control channel during call set up.

For analysis and calculations,

$$\text{SDCCH Congestion [\%]} = \frac{\text{Number of connect fails due to Immediate Assignment Failures}}{\text{MOC call attempts}} \times 100\%$$

### b) Call Setup Time (CST)

CST should be less than ten seconds (<10secs) in 95% of cases.

Call Setup Time is the period of time elapsing from the sending of a complete destination address (target telephone number) to the setting up of a call to the receiving terminal;

$$\text{Call set - up time [s]} = t_{\text{alerting-signal}} - t_{\text{address-sending}}$$

$t_{\text{alerting signal}}$  – Moment when an alerting signal is sent to the called terminal

$t_{\text{address sending}}$  – Moment user presses the SEND button on the calling terminal

### c) Call Congestion Rate

Traffic Channel Congestion should be equal or less than one per cent (1%).

Call Congestion Rate is the probability of failure of accessing a traffic channel during call setup;

$$\text{Call Congestion [\%]} = \frac{\text{Number of Connect failed calls}}{\text{Total number of call attempts}} \times 100\%$$

**d) Call Drop Rate ( CDR)**

Call drop rate should be equal or less than three per cent (3%).

Voice Call Drop Rate is the probability of a call terminating without any of the users' will;

$$\text{Drop Rate [\%]} = \frac{\text{Number of calls terminated unwillingly}}{\text{Total number of call attempts}} \times 100\%$$

The results for the cities and towns tested this year are as below:

Table 1 Signalling Congestion Rate Cellular Mobile Voice Service, 2012

Month	City/Town	MTN	Vodafone	Tigo	Airtel
February	Kumasi	1.09%	0%	0%	0.71%
February	Obuasi	0%	0%	0%	0%
February	Mampong	0%	0%	0%	0%
February	Konongo	0%	2.20%	0%	1.02%
February	Tarkwa	0%	2.5	0%	0%
February	Sekondi-Takoradi	0%	0.97%	0%	1.70%
February	Asamankese	0%	0%	0%	0%
February	Akim-Oda	0%	0%	0%	0%
February	Koforidua	0%	1.82%	0%	1.70%
February	Akosombo	1.16%	0%	0%	0%
March	Cape Coast	0%	0%	0%	4.72%
March	Elmina	0%	0%	0%	0%
March	Kasoa	0.93%	0%	0%	1.04%
March	Swedru	0%	0%	0%	0%
March	Winneba	0%	0%	0%	0%

**REMARK:**

- ❖ Tigo is the only network that was within the licence threshold in all localities.

Table 2. Call Setup Time of Cellular Mobile Voice Service, 2012

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso
February	Kumasi	11.78	9.94	8.48	9.8	13.1
February	Obuasi	11.17	9.46	7.99	9.69	12.78
February	Mampong	9.82	10.58	7.61	9.3	15.12
February	Konongo	10.48	9.6	8.04	12.67	9.8
February	Tarkwa	8.86	15.45	8.14	9.07	13.52
February	Sekondi-Takoradi	10.45	10.78	7.44	9.32	12.43
February	Asamankese	8.77	7.54	7.69	9.12	12.47
February	Akim-Oda	8.74	9.43	7.86	9.01	10.2
February	Koforidua	9.5	9.82	8.34	10.54	10.19
February	Akosombo	8.45	8.96	7.78	10.3	12.56
March	Cape Coast	15.2	9.16	7.21	9.9	14.53
March	Elmina	11.45	9.41	8.29	10.12	10.68
March	Kasoa	9.88	10.45	9.19	12.42	16.6
March	Swedru	8.57	10.76	8.36	9.11	13.67
March	Winneba	9.23	9.43	8	9.03	10.79

**REMARK:**

- ❖ Tigo is the only network that was within the licence threshold in all localities.

Table 3 Call Congestion Rate Cellular Mobile Voice Service, 2012

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso
February	Kumasi	0.72%	0%	0%	1.46%	0%
February	Obuasi	2.91%	0%	0%	1.81%	0%
February	Mampong	0%	0%	0%	0%	0%
February	Konongo	0%	0%	0%	0%	0%
February	Tarkwa	0%	0%	0%	0%	4.90%
February	Sekondi-Takoradi	0.98%	0%	0%	1.90%	5.20%
February	Asamankese	2.17%	0%	0%	0%	0%
February	Akim-Oda	0%	0%	0%	0%	2.12%
February	Koforidua	29.87%	0%	10.10%	0%	0%
February	Akosombo	16.28%	0%	0%	0%	0%
March	Cape Coast	9.68%	0%	0%	11.52%	1.96%
March	Elmina	0%	0%	0%	4.20%	0%
March	Kasoa	24.63%	0%	0%	0%	0%
March	Swedru	0%	0%	0%	0%	8.10%
March	Winneba	0%	0%	0%	17%	0%

**REMARK:**

- ❖ Vodafone is the only network that was within the licence threshold in all localities.

Table 4 Call Drop Rate Cellular Mobile Voice Service, 2012

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso
February	Kumasi	1.12%	0.95%	0.74%	0%	0%
February	Obuasi	0%	0%	0%	0.60%	0%
February	Mampong	0%	0%	1.72%	0%	0%
February	Konongo	0%	0%	1.18%	3.06%	0%
February	Tarkwa	0%	0%	0%	0%	2.10%
February	Sekondi-Takoradi	1.03%	0%	0%	1.02%	2%
February	Asamankese	1.09%	0%	0%	0%	0%
February	Akim-Oda	0%	0%	0%	0%	0.9
February	Koforidua	0%	0%	0%	3.13%	0%
February	Akosombo	0%	0%	0%	0%	0%
March	Cape Coast	1.85%	0%	0%	6.88%	0%
March	Elmina	0%	0%	0%	0%	0%
March	Kasoa	0%	0%	0%	0%	0%
March	Swedru	0%	0%	0%	1.05%	0%
March	Winneba	0%	0%	0%	0%	0%

**REMARK:**

- ❖ All Operators except Airtel were within the licence threshold in all localities.