

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 April to September 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	Glo
April	Accra	0.18%	0.13%	0.18%	0.24%	
April	Tema	0.30%	0%	0%	0.57%	
April	Wa	0.35%	0%	0%	0%	
April	Nandom	0%	0%	0%	0%	
April	Jirapa	0%	0%	0%	0%	
April	Bawku	0%	0%	0%	0%	
April	Navrongo	0%	0%	0%	0%	
April	Bolgatanga	0%	0%	0%	0%	
April	Tamale	0%	0.40%	0.17%	0.17%	
May	Anloga	0%	0%	0%	0%	
May	Keta	0%	0%	0%	0%	
May	Aflao	0%	0%	0%	0%	
May	Ho	1.20%	0%	0%	0%	
May	Kpando	5.97%	5.63%	0%	0%	
May	Jasikan	0%	0%	0%	0%	
May	Hohoe	0%	0%	0%	0%	
May	Obuasi	0.90%	0%	0%	0%	
May	Kumasi	0%	0%	2.60%	1.85%	
May	Mampong	1.15%	1.35%	0%	0%	
May	Konongo	0%	0%	0%	0%	
May	Tarkwa	0%	0%	0%	0%	
May	Sekondi-Takoradi	0%	1.07%	0%	0%	
June	Asamankese	2.50%	0%	0%	0%	
June	Akim-Oda	0%	0%	0%	0%	
June	Koforidua	0%	0%	0%	0%	

June	Akosombo	0%	0%	0%	0%	
June	Cape Coast	0.13%	0%	0%	0%	
June	Elmina	0%	0%		0%	
June	Kasoa	0%	0.45%	0%	0%	
June	Swedru	0%	0%	0%	0%	
June	Winneba	0%	0%	0%	0%	
July	Wa	0%	0%	0.63%	0.27%	
July	Nandom	0%	0%	0%	0%	
July	Jirapa	0%	1.16%	0%	0%	
July	Bawku	0%	0.98%	0%	0%	
July	Navrongo	0%	0%	9.84%	0%	
July	Bolgatanga	0%	0%	0%	0%	
July	Yendi	0.84%	0%	0%	0%	
July	Tamale	0%	0.29%	0%	0%	
August	Accra	0.08%	0.21%	0.13%	0.21%	0.32%
August	Tema	0.34%	0%	0.17%	0%	0.55%
September	Kumasi	0.06%	0.06%	0.07%	0.06%	0.53%
September	Obuasi	0%	0%	0%	1.40%	0.60%
September	Mampong	0.58%	0%	1.02%	0%	0%
September	Agogo	0%	0%	0%	0%	0%
September	Konongo	0%	0%	0%	0%	1.78%

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

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso	Glo
April	Accra	11.79	7.71	13.87	8.97	15.63	
April	Tema	12.27	9.6	8.56	11.41	14.52	
April	Wa	10.92	8.01	6.63	8.8	12.16	
April	Nandom	7.76	7.11	6.31	7.44		
April	Jirapa	7.68	7.32	6.13	10.04		
April	Bawku	8.31	7.28	6.2	8.02	11.26	
April	Navrongo	8.46	7.87	6.28	7.33	11.04	
April	Bolgatanga	4.24	7.49	6.29	8.06	11.46	
April	Tamale	7.28	8.4	6.43	8.59	13.65	
May	Anloga	18.07	10.73	8.24	9.77	N/A	
May	Keta	10.67	9.23	7.81	8.53	N/A	
May	Aflao	10	11.27	7.97	7.35	N/A	
May	Ho	10.12	9.28	8.27	9.53	N/A	
May	Kpando	19.42	11.78	7.75	8.89	N/A	
May	Jasikan	9.96	8.94	8.16	9.28	N/A	
May	Hohoe	12.76	9.05	7.81	8.99	N/A	

May	Obuasi	9.59	8.3	N/A	N/A	12.24	
May	Kumasi	10.89	6.93	7.47	8.52	13.28	
May	Mampong	11.9	7.2	6.62	7.75	N/A	
May	Konongo	8.1	6.89	6.34	7.65	11.14	
May	Tarkwa	6.57	4.3	6.81	6.72	14.18	
May	Sekondi-Takoradi	7.29	7.53	8.77	8.35	13.24	
June	Asamankese	11.06	7.98	12.53	7.54	N/A	
June	Akim-Oda	7.86	6.55	6.09	7.86	11.21	
June	Koforidua	8.3	8.35	6.99	7.48	11.44	
June	Akosombo	6.73	6.89	5.98	7.67	15.94	
June	Cape Coast	7.56	6.64	11.36	7.52	13.98	
June	Elmina	6.53	13.45		7.84	12.59	
June	Kasoa	10.05	7.27	11.5	9.03	13.76	
June	Swedru	7.74	7.05	6.46	6.87	11.41	
June	Winneba	7.64	5.44	7.31	7.27	12.39	
July	Wa	13.08	8.67	8.11	10.3	10.08	
July	Nandom	11.22	9.14	8.29	8.9	N/A	
July	Jirapa	11.36	9.59	8.36	12.06	N/A	
July	Bawku	11.66	11.49	8.16	11.51	N/A	
July	Navrongo	11.54	8.46	14.85	11.88	9.62	
July	Bolgatanga	8.49	7.53	8.22	10.52	9.65	
July	Yendi	11.29	9.62	8.05	8.79	9.84	
July	Tamale	10.74	9.36	8.05	9.07	11.5	
August	Accra	11.61	7.98	9.47	8.45	15.58	7.35
August	Tema	13.41	7.89	7.81	8.95	15.48	9.4
September	Kumasi	11.4	6.92	11.12	7.80	14.73	11.37
September	Obuasi	8.18	6.1	6.18	9.03	11.35	7.64
September	Mampong	11.32	7.22	6.77	7.54	17.18	9.73
September	Agogo	7.66	5.34	6.25	7.28	11.14	7.86
September	Konongo	8.46	5.51	7.25	7.2		8.56

Table 3 Call Congestion Rate Cellular Mobile Voice Service, 2012

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso	Glo
April	Accra	0.72%	0%	0.40%	0.54%	0.51%	
April	Tema	10.52%	0%	0.57%	0.19%	2.79%	
April	Wa	0%	0.38%	1.38%	0%	0.74%	
April	Nandom	0%	0%	0%	0%		
April	Jirapa	0%	0%	0%	0%		
April	Bawku	0%	0%	0%	0%	3.77%	
April	Navrongo	0%	0%	0%	0%	0%	
April	Bolgatanga	0%	0%	0%	0%	0.70%	
April	Tamale	1.61%	0%	0%	0.17%	1.50%	
May	Anloga	6.10%	0%	0%	0%	N/A	
May	Keta	4.10%	0%	0%	0%	N/A	
May	Aflao	0%	0%	0%	0%	N/A	
May	Ho	11.61%	0%	0%	0%	N/A	
May	Kpando	4.50%	0%	0%	0%	N/A	
May	Jasikan	2.78%	0%	0%	0%	N/A	
May	Hohoe	2.50%	0%	1.30%	0%	N/A	
May	Obuasi	1.80%	0%	0%	0%	0%	
May	Kumasi	8.03%	0%	0%	1%	0%	
May	Mampong	4.60%	0%	0%	0%	6.67%	
May	Konongo	0%	0%	0%	0%	1.75%	
May	Tarkwa	0.90%	0%	0%	0%	0%	
May	Sekondi-Takoradi	5.40%	0%	1.20%	2.45%	3.09%	
June	Asamankese	2.50%	0%	0%	0%	0%	
June	Akim-Oda	4.30%	0%	0%	0%	0%	
June	Koforidua	8.53%	0%	0%	0%	0%	
June	Akosombo	1.39%	0%	0%	0%	0%	
June	Cape Coast	0.13%	0%	0%	0%	0%	
June	Elmina	5.66%	0%		0%	1%	
June	Kasoa	0.45%	0%	0%	0.13%	0.42%	
June	Swedru	0%	0%	0%	0%	0%	
June	Winneba	0%	0%	0%	0%	2%	
July	Wa	0.57%	0%	0.85%	0.27%	0.67%	
July	Nandom	0%	0%	0%	0%	N/A	
July	Jirapa	0%	0%	0%	0%	N/A	
July	Bawku	0%	0%	0%	0%	N/A	
July	Navrongo	0%	0%	0%	1.37%	0%	
July	Bolgatanga	0%	0%	0.97%	0.30%	0%	
July	Yendi	0%	0%	0%	0%	0%	
July	Tamale	0.15%	0%	2.20%	0.29%	0%	

August	Accra	0.30%	0%	0%	0.04%	0.51%	0%
August	Tema	0.86%	0%	0%	0.87%	2.99%	0%
September	Kumasi	0.27%	0%	0.07%	0%	0.49%	0%
September	Obuasi	0%	0%	0%	0%	1.94%	0%
September	Mampong	20.90%	0%	1.02%	0%	1.61%	0%
September	Agogo	4.87%	0%	0%	0%	0%	0%
September	Konongo	0%	0%	2.59%	0%		0%

Table 4 Call Drop Rate Cellular Mobile Voice Service, 2012

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso	Glo
April	Accra	0.31%	0.18%	0.13%	0.29%	0.00%	
April	Tema	0.76%	0.38%	0.38%	0%	4.90%	
April	Wa	0%	0%	1.38%	0.78%	0.37%	
April	Nandom	0%	0%	0%	0%		
April	Jirapa	0%	0%	0%	1.16%		
April	Bawku	0%	1.31%	0%	0%	1.88%	
April	Navrongo	1.30%	0%	0%	0%	0%	
April	Bolgatanga	0%	0%	0%	0%	0%	
April	Tamale	0%	0%	0%	0.17%	0%	
May	Anloga	0%	0%	2.50%	3.64%	N/A	
May	Keta	0%	0%	0%	0%	N/A	
May	Aflao	0%	0%	0%	0%	N/A	
May	Ho	1.41%	0%	1.61%	1.30%	N/A	
May	Kpando	0%	0%	0%	0%	N/A	
May	Jasikan	0%	0%	0%	0%	N/A	
May	Hohoe	0%	0%	0%	0%	N/A	
May	Obuasi	0%	2.44%	0%	0%	0%	
May	Kumasi	6.67%	5.34%	0%	1.14%	1.52%	
May	Mampong	1.15%	0%	0%	0%	0%	
May	Konongo	0%	6.25%	1.67%	2%	0%	
May	Tarkwa	0%	0%	0%	0%	0%	
May	Sekondi-Takoradi	3.02%	0%	0%	2.49%	0%	
June	Asamankese	0%	0%	1.27%	0%	0%	
June	Akim-Oda	0%	1.10%	0%	0%	0%	
June	Koforidua	0%	0.97%	2.20%	0%	0%	
June	Akosombo	0%	0%	0%	1.64%	8.06%	
June	Cape Coast	0%	0%	0%	0%	0%	
June	Elmina	0%	1.11%		1%	0%	
June	Kasoa	0%	0%	1%	1%	0.42%	
June	Swedru	2%	0%	0%	0%	0%	

June	Winneba	2%	0%	0%	0%	0%	
July	Wa	0%	0%	0.20%	0%	0%	
July	Nandom	0%	0%	0%	0%	N/A	
July	Jirapa	0%	0%	0%	0%	N/A	
July	Bawku	0%	0%	0%	0%	N/A	
July	Navrongo	0%	0%	3.28%	9.59%	0%	
July	Bolgatanga	0%	0%	0.65%	0%	0%	
July	Yendi	0%	0%	0%	0%	1.04%	
July	Tamale	0.15%	0%	0.29%	0%	0.16%	
August	Accra	0.55%	0.12%	0.13%	0.21%	0%	0.12%
August	Tema	0.17%	0.34%	0.17%	0.17%	0%	0.40%
September	Kumasi	0.34%	0.21%	0.15%	0.20%	0.78%	0%
September	Obuasi	1.87%	1.87%	0%	0%	1.29%	0.60%
September	Mampong	0%	5.12%	1.02%	0%	0%	1.19%
September	Agogo	0%	0%	0%	0%	0%	0%
September	Konongo	0%	0%	0%	0%		8.92%