

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 from April to December 2011.

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) 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

b) 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;

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

c) 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. Call Setup Time of Cellular Mobile Voice Service, 2011

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso
Apr-11	Cape Coast	9.3	7.59	8.69	10.62	10.5
Apr-11	Elmina	9.05	8.4	9.81	10.36	9.78
Apr-11	Winneba	8.77	7.59	8.94	13.71	9.93
May-11	Sekondi Takoradi	9.75	8.64	9.72	10.27	8.53
May-11	Tarkwa & Prestea	7.23	6.81	9.27	8.25	
Jun-11	Wa & Jirapa	10.89	10.6	8.98	18.06	12.58
Jun-11	Bolgatanga & Navrongo	9.71	9.19	9.09	11.81	10.44
Jun-11	Tamale	11.18	10.86	8.86	10.42	10.12
Aug-11	Sunyani	9.36	12.09	8.1	9.58	11.33
Aug-11	Berekum	10.1	15	8.86	9.38	8.38
Aug-11	Dormaa Ahenkro	10.39	9.31	8.97	9.39	9.7
Aug-11	Techiman	9.2	9.53	7.98	9.83	7.83
Sep-11	Accra	10.84	11.47	10.27	16.61	14.6
Oct-11	Kumasi	15.34	11.93	11.6	12.47	14.13
Oct-11	Obuasi	11.05	10.12	9.93	13.22	12.57
Oct-11	Mampong	9.88	10.94	9.88	11.1	18.16
Oct-11	Konongo	10.95	10.94	9.01	12.1	12.53
Nov-11	Tema	12.34	10.92	9.81	10.47	15.3
Dec-11	Aflao	9.57	8.49	7.8	11.6	7.97
Dec-11	Ho	9.25	7.89	8.4	9.43	10.66
Dec-11	Keta	8.21	7.59	7.5	9.8	12.28
Dec-11	Kpando	17.75	7.66	7.6	8.98	10.27
Dec-11	Hohoe	8.71	7.86	7.5	10.4	9.86
Dec-11	Jasikan	8.13	7.37	7.6	8.98	
Dec-11	Koforidua	10.13	8.43	7.3	12.7	10.34
Dec-11	Akosombo	8.24	7.66	7.95	9.7	14.14

Table 2 Call Congestion Rate Cellular Mobile Voice Service, 2011

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso
Apr-11	Cape Coast	1%	4%	1%	3%	8%
Apr-11	Elmina	0%	2%	0%	0%	0%
Apr-11	Winneba	0%	0%	0%	18%	3%
May-11	Sekondi Takoradi	2.18%	0.37%	1.82%	2.54%	5.24%
May-11	Tarkwa & Prestea	8.82%	0%	0%	13%	78.57%
Jun-11	Wa & Jirapa	1.32%	0.68%	3.95%	31.81%	15.63%
Jun-11	Bolgatanga & Navrongo	1.47%	0%	1%	8.53%	21.29%
Jun-11	Tamale	1.41%	1.72%	1%	23.10%	5.64%
Aug-11	Sunyani	2.76%	10.32%	0.69%	3.01%	1.73%
Aug-11	Berekum	3.57%	4.87%	0%	1.50%	0.75%
Aug-11	Dormaa Ahenkro	0%	1.61%	1.61%	0%	0%
Aug-11	Techiman	1.03%	3.05%	0.35%	6.22%	1.70%
Sep-11	Accra	7.90%	5.67%	3.08%	14.74%	4.40%
Oct-11	Kumasi	2.60%	1.18%	3.50%	1.07%	0.62%
Oct-11	Obuasi	1.40%	0%	0%	2.80%	2.60%
Oct-11	Mampong	0%	0%	0%	0%	5.10%
Oct-11	Konongo	0%	0%	1.40%	4.16%	0%
Nov-11	Tema	1.20%	3.80%	0.90%	12.90%	0.40%
Dec-11	Aflao	1.03%	0%	0%	6.40%	10.80%
Dec-11	Ho	0%	0%	0%	0%	6.90%
Dec-11	Keta	0%	0%	0%	0%	0%
Dec-11	Kpando	1.52%	0%	0%	1.40%	0%
Dec-11	Hohoe	0%	0%	0%	1.80%	0%
Dec-11	Jasikan	0%	0%	0%	0%	
Dec-11	Koforidua	0.51%	0%	0%	0%	0%
Dec-11	Akosombo	19.30%	0%	0%	10.50%	0%

Table 3 Call Drop Rate Cellular Mobile Voice Service, 2011

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso
Apr-11	Cape Coast	0%	0%	0%	1%	1%
Apr-11	Elmina	0%	0%	0%	0%	0%
Apr-11	Winneba	0%	0%	0%	0%	0%
May-11	Sekondi Takoradi	0.20%	1.85%	1.09%	0.54%	1.05%
May-11	Tarkwa & Prestea	0%	0%	0%	0%	0%
Jun-11	Wa & Jirapa	0%	0%	0%	1.95%	0%
Jun-11	Bolgatanga & Navrongo	0%	0%	0%	0.95%	0.41%
Jun-11	Tamale	1.41%	0.57%	0.28%	1.23%	0%
Aug-11	Sunyani	1.72%	0.29%	0%	1.33%	0.34%
Aug-11	Berekum	1.42%	0%	0%	0%	0%
Aug-11	Dormaa Ahenkro	0%	0%	0%	0%	1.64%
Aug-11	Techiman	0.70%	0%	0%	1.96%	0%
Sep-11	Accra	1.28%	0.78%	0.77%	1.62%	0.71%
Oct-11	Kumasi	1.15%	0.47%	1.87%	1.27%	0.21%
Oct-11	Obuasi	0%	0%	2.90%	3.85%	0%
Oct-11	Mampong	1.75%	0%	0%	0%	3.45%
Oct-11	Konongo	0%	1.45%	0%	2.78%	0%
Nov-11	Tema	0.80%	0.51%	0.24%	0.35%	0.86%
Dec-11	Aflao	0%	0%	0%	2.70%	3.60%
Dec-11	Ho	0.40%	0%	0.80%	0.97%	2.90%
Dec-11	Keta	0%	3.23%	0%	0%	1.20%
Dec-11	Kpando	0%	0%	0%	0%	0%
Dec-11	Hohoe	0%	0%	1.02%	2.10%	0%
Dec-11	Jasikan	0%	0%	0%	0%	
Dec-11	Koforidua	0%	0.95%	0%	0%	0%
Dec-11	Akosombo	0%	0%	0%	0%	0%