



NATIONAL COMMUNICATIONS AUTHORITY

Quality of Service (QoS) Monitoring of Cellular Mobile Voice Services

[March 2014]

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Background

In pursuance of Annexure 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 the three Northern, Western, Central, Ashanti, Eastern and Volta regions in 2014. The Espresso network was not available in Western, Northern, Upper East and Upper West Regions at the time of testing.

What we measure

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

- **Stand-alone Dedicated Control Channel (SDCCH) Congestion Rate**
- **Call Setup Time (CST)**
- **Call Congestion Rate**
- **Call Drop Rate (CDR)**

Findings

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

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,

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

Table 1 Signalling Congestion Rate Cellular Mobile Voice Service, March 2014

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Glo
March	Kumasi	0	0	0	0	0
March	Obuasi	0	0	0	0	0
March	Mampong	0	0	0	0	0
March	Konongo	0	0	0	0	0
March	Kasoa	0	0	0	0	0
March	Swedru	0	0	0	0	0
March	Winneba	0	0	0	0	0
March	Elmina	0	0	0	0	0
March	Cape Coast	0	0	0	0	0
March	Tarkwa	0	0	0	0	0
March	Takoradi	0	0	0	0	0

REMARK:

- ❖ All Operators were in compliance in tested cities and towns in Ashanti, Western and Central regions in March with the signalling congestion threshold of less than one percent (1%).

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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

Table 2. Call Setup Time of Cellular Mobile Voice Service, March 2014

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso	Glo
March	Kumasi	6.25	13.62	8.48	6.06	14.75	7.05
March	Obuasi	6.05	5.32	14.27	6.79	N/A	5.62
March	Mampong	4.98	13.78	6.73	7.39	17.70	7.31
March	Konongo	5.51	7.62	10.69	9.81	N/A	19.62
March	Kasoa	10.36	15.43	12.12	7.098	N/A	14.481
March	Swedru	5.63	15.1	8.618	6.294	N/A	13.042
March	Winneba	11.06	9.55	10.92	6.837	N/A	13.825
March	Cape Coast	5.99	6.83	11.76	7.45	N/A	4.913
March	Elmina	4.98	8.62	6.81	5.06	N/A	9.567
March	Tarkwa	4.93	6.38	8.55	5.77	N/A	9.96
March	Takoradi	5.91	7.24	8.56	7.65	N/A	9.17

REMARK:

- ❖ All Operators except Airtel failed to meet the parameter threshold in certain locations.

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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;

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

Table 3 Call Congestion Rate Cellular Mobile Voice Service March 2014

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso	Glo
March	Kumasi	0	0	0	0	6.71	2.10
March	Obuasi	0	0	16.33	0	N/A	0
March	Mampong	0	0	0	0	7.24	N/A
March	Konongo	0	0	0	0	N/A	N/A
March	Kasoa	0	0.68	0	0	N/A	0
March	Swedru	0	0	0	0	N/A	0
March	Winneba	0	0	0	0	N/A	0
March	Cape Coast	0	0	0	0	N/A	0
March	Elmina	0	0	0	0	N/A	0
March	Tarkwa	0	0	0	0	N/A	0
March	Takoradi	0	0	0	0	N/A	0

REMARK:

MTN, Vodafone and Airtel were compliant with the licence threshold of less than one percent (1%) in all the tested locations.

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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;

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

Table 4 Call Drop Rate Cellular Mobile Voice Service, March 2014

Month	City/Town	MTN	Vodafone	Tigo	Airtel	Expresso	Glo
March	Kumasi	0	0	0	0	0	0
March	Obuasi	0	0	0	0	N/A	0
March	Mampong	0	0	0	0	0	0
March	Konongo	0	0	0	0	N/A	0
March	Kasoa	0	0	0	0	N/A	0
March	Swedru	0	0	0	0	N/A	0
March	Winneba	0	0	0	0	N/A	0
March	Cape Coast	0	0	0	0	N/A	0
March	Elmina	0	0	0	0	N/A	0
March	Tarkwa	0	0	0	0	N/A	0
March	Takoradi	0	0	0	0	N/A	0

REMARK:

- ❖ All operators were in compliance with the Call Drop Rate licence threshold of less than three percent (3%) in all localities tested.

REMEDIES

- ❖ The NCA has notified Operators of publication of these findings and deferred sanctions for Operators to improve their performance by the third quarter to be verified in the next monitoring.
- ❖ Espresso has been barred from new subscriber acquisitions, sales and marketing campaigns until July 31st, 2014 to resolve their network challenges.