



Public Utilities
Regulatory Authority
Equity in development

QUALITY OF SERVICE GUIDELINES

FOR

MOBILE SERVICE PROVIDERS

SEPTEMBER 2016

94, Kairaba Avenue, P. O. Box 4230 Bakau, The Gambia
Tel. (220) 4399601 / 4399606 Fax: (220) 4399905
Email: pura@pura.gm Website: www.pura.gm

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In exercise of the powers conferred upon the Authority under Section 14 (1) (g) of the PURA Act 2001, the Authority hereby makes the following Quality of Service Guidelines for Mobile Service Providers:

1 DEFINITIONS

“**Access Service**” means a service that is provided for communications to or from Network Termination Points that serves End Users without making the communications pass through more than one public network;

“**Act**” means The Gambia Public Utilities Regulatory Authority Act, 2001 and the IC ACT 2009

“**ADR**” means Alternative Dispute Resolution

“**Authority**” means The Gambia Public Utilities Regulatory Authority as established by the Gambia Public Utilities Regulatory Authority Act 2001 (PURA Act 2001).

“**Average**” or “**Mean**” means the result of dividing the sum of the numerical values in a set by the number of values in the set;

“**Call Attempt**” means an attempt to achieve a connection to one or more devices attached to a telecommunication network;

“**Call Drop Rate**” means the unintended disconnection of mobile calls by the network;

“**Call Set Up Time**” means the amount of time taken between pressing the call button to the time the called party receives the signal;

“**Call Success Rate**” means the number of calls established over the total number of mobile call attempts;

“**Commercial Launch Date**” means the date when a Licensee commences commercial provision of a service in a Reporting Area;

“**Communication Service**” means a telecommunication service;

“**Complainant**” means a person or public utility who files a complaint with the Authority;

“**Confidential Information**” means any information classified as such and includes information that a reasonable person would regard as confidential, having regard to the nature of the information, such as material or documents relating directly to specific customers; employee-sensitive information; market analyses or other market specific information relating to services offered in competition with others. Reports, work papers or other documentation related to work produced by internal or external auditors or consultants; strategies employed, or to be employed, under consideration in contract negotiations;

“**Consumer**” means a person who purchases, receives or makes use of a regulated public service provided by a public utility being a person who does not resell or deliver the service to another person;

“**Contravention**” means any failure to comply with the requirements identified in the Guidelines;

“**Coverage Area**” is based on Signal Strength and refers to the network’s ability in achieving an acceptable level of voice quality. Cellular operators will be required to provide defined technical details for each GSM site;

“**End User**” means a Customer that is not an Interconnecting Licensee or a provider of an international route to or from The Gambia;

“**Enforcement Regulations**” means the PURA Enforcement Regulations 2010.

“**Fault**” means a state where a network does not meet the service specifications and some repair action is required;

“**Force Majeure**” means an unforeseen event that is a result of the elements of nature, as opposed to one caused by human beings for example: natural disasters, heavy storms and flooding.

“Hand Over” means the nature of GSM communications to provide customers the convenience of communicating whilst on the move. Whilst on the networks, the operator should hand them over to the visiting cell site successfully;

“Inspector” means a person for the time being holding the office of Inspector by virtue of an appointment made under section 40(1) of the PURA Act 2001;

“Interconnecting Licensee” means a Licensee that has an Interconnection with another Licensee at a Network Termination Point;

“Key Performance Indicator” means set standards that help a business or organization determine how they are doing when it comes to meeting goals or expectations;

“Licence” means a license issued pursuant to the PURA Act 2001 and any other applicable legislation and **“Licensee”** shall be construed accordingly;

“Licensing” includes the regulatory process in respect of the procedure for receiving applications for evaluating and granting licenses;

“Maintainability Performance”: means the ability of an item under stated conditions of use to be retained in or restored to a state in which it can perform a required function, when maintenance is performed under given conditions and using stated procedures and resources;

“Measurement” means a numerical value that is obtained by using a Measurement Method;

“Measurement Method” means a method of measuring a parameter;

“Mobile Telephony Service” means a telephony service that requires the use of radio frequencies assigned under individual Licences to achieve communications at the Network Termination Points of the End Users and that permits the End Users to move between different geographic locations without appearing to lose communications;

“Network Availability” means the time the network will be operational;

“Network Termination Point” means a point at which a Customer has physical access through customer equipment to a network of a Licensee;

“Parameter” means a measurable characterization of the quality of an aspect of a service;

“Person” means any individual, partnership, corporation, association, governmental body, public or private organisation;

“Proprietary Information” means trade secrets and private technical, financial and business information;

“Public Utility” means a specified organisation or licensee providing a prescribed utility service pursuant to the relevant legislation, for the purposes of providing goods or services in relation to the provision of telecommunications, energy, water and sewerage services and transport;

“Published Measurement” means a Measurement that is intended for publication with content and format that is identified in the QoS Guidelines;

“Quality of Service” (QoS) means “is the level of performance (or quality) that a service provider provides to its subscribers. ;

“Regulated Entity” means a public utility which, though providing regulated public services need not be regulated by a licensing arrangement; but should nevertheless be subject to regulation by the Authority acting in accordance with the PURA Act 2001 and the IC Act 2009;

“Regulated Utility Service” means a utility service specified in the PURA Act 2001;

“Reporting Area” means a geographic area for which Measurements are taken and recorded, determined in accordance with the QoS Guidelines;

“Reporting Period” means the period of time over which measurements are taken and recorded when a Licensee performs quality of service measurements, reporting and record keeping tasks once for each Reporting Area, Parameter and Service, determined in accordance to these Guidelines or as determined by the Authority from time to time;

“Responsible Minister” means the Minister responsible for the administration of the relevant legislation;

“Restoration Time” means the time it takes an operator to restore the service after a failure;

“**Service**” means application, content, network or facilities service, or any combination of these services, that is provided substantially for communications between Network Termination Points;

“**Service Activation Time**” means the time it takes the operator to activate new customers, those who have been disconnected and roaming customers;

“**Service Provider**” means an entity engaged in the provision of Electronic communication services on a Mobile Network

“**Service Support Performance**” means the ability of an organization to provide a Service and assist in its utilization.

“**Service Operability Performance**” means the ability of a Service to be successfully and easily operated by a User.

“**Service Accessibility Performance**” means the ability of a service to be obtained, within specified tolerances and other given conditions, when requested by the User;

“**Stand-alone Dedicated Control Channel (SDCCH)**” is used in the GSM system to provide a reliable signal connection for signalling and Short Message Service (SMS)

“**Target**” means a value that is reached by a given Parameter where the relevant Service identified in these Guidelines is satisfactory;

“**Traffic channel (TCH)**” means the traffic channels which carry speech or data information;

“**Voice Quality**” means the network’s ability in achieving an acceptable level of voice quality.

2 INTRODUCTION

This Quality of Service Guidelines set forth the principles and procedures that the Gambia Public Utilities Regulatory Authority (hereinafter referred to as PURA) shall refer in measuring and enforcing Quality of Service pursuant to the PURA Act 2001 and IC Act 2009 and other relevant laws.

PURA is mandated by section 83 of the Information and Communication (IC) Act 2009 to measure quality of service indicators for which the targets should be set by the Authority and sanctions applied where the Licensee fails to meet targets or to provide adequate information such as Quality of Service Reports.

Licensees are also obligated by virtue of section 84(1) (a) – (b) IC Act 2009 respectively to:

- a) Establish and administer measurement systems consistent with the Quality of Service Framework;
- b) Establish the measures needed to comply with measurement systems;

3 SHORT TITLE, EXTENT AND COMMENCEMENT

- a) These Guidelines shall be referred to as *Quality of Service Guidelines for Mobile Service Providers 2016*.
- b) These Guidelines shall be applicable to all the Mobile Service Providers and other entities related to the subject.

4 OBJECTIVES

The objective of these guidelines is to protect and enhance the rights of consumers in obtaining quality services due to the clear and specific criteria through which the quality of services received or used can be measured. The Guidelines will set service standards so as to ensure that consumers are given satisfactory level of services that meet acceptable standards. These Guidelines have the following objectives:

- a) Ensuring the protection and promotion of the interests of consumers against unfair practices including but not limited to matters relating to tariffs and charges and the availability and quality of communications services, equipment and facilities;
- b) Improving service quality by identifying service deficiencies and by encouraging, enforcing, or requiring appropriate changes;
- c) Create conditions for customer satisfaction by making known the quality of service which the service provider is required to provide and the user has a right to expect;
- d) Measure the quality of service provided by the service providers and compare them with the norms in order to assess the level of performance
- e) Making information available to help with informed customer choice of services and Licensees;
- f) Improving the operation and performance of interconnected networks;
- g) Assisting the development of related telecommunications markets;
- h) Encourage the implementation and sustainability of a Quality of Service Framework whereby the quality of service of operators in the market will be measured, reported and published based on definitions and measurement methodology uniformly applied across the industry.

5 SCOPE

These Guidelines

- a) stipulate the minimum quality and standards of service-associated measurement, reporting and record keeping .
- b) establish a common framework for the measurement, improvement and, where applicable, guaranteed levels of service that can apply to affected services.
- c) define the set of parameters, measurement of parameters across service categories, reporting and publishing of parameters and enforcement measures for non-compliance.
- d) apply to all licensed mobile operator and serve as a reference to end users of mobile communications in The Gambia.

6 KEY PRINCIPLES

This Section highlights applicable key principles paramount to Quality of Service;

- a) **Accuracy:** Information published or availed to consumers must be accurate.
- b) **Reliability:** The information provided must be reliable and the source of such information must be acknowledged.
- c) **Flexibility:** The Service Provider must ensure that the network accommodates churn without undue restriction.
- d) **Availability:** The Service Provider must ensure that the network is up and running at all times.
- e) **Accessibility:** The Service Provider must ensure access to information and services regardless of barriers such as distance and cost.
- f) **Performance:** The network or network portion must be able to provide the functions related to communications between users.
- g) **Transparency:** There must be openness, communication, and accountability. Operations must be such that it is easy to see what actions are performed.
- h) **Non-discrimination:** Service Providers are expected to supply the same product/service to all consumers on similar terms and conditions and at the same service quality regardless of destination of the customer.

7 OBLIGATIONS OF A LICENSEE TO PROVIDE QUALITY OF SERVICE.

In executing their services the Service Providers shall ensure that;

- a) The performance of their services meets or exceeds levels of performance as set forth in these guidelines;
- b) Consumers are provided with information to enable them to make informed decisions;
- c) Consumers are informed of any significant outages that affect service provision.
- d) The Authority is informed of any significant outages that affect service provision
- e) They establish and maintain efficient information services to assist a consumer with queries relating to the services;
- f) They provide to consumers equal access to the same quality of service
- g) They avail information to ensure informed subscriber choice of services and Licensees;
- h) They improve the operation and performance of interconnected networks.

8 MEASUREMENT, REPORTING AND RECORD KEEPING

8.1 Principles to Guide the Measurement, Reporting and Record Keeping of the QoS Parameters

The quality of service standards defined by these Guidelines has been developed in accordance with the following principles:

- (a) Measurements should be required for features of services that are significant, with an emphasis on services that are subject to competition;
- (b) The Measurement Methods, and related reporting of information, shall enable the Authority compare the service quality of Licensees fairly, but should not unnecessarily restrict the measurement or other quality of service monitoring practices of Licensees;
- (c) Any applicable targets/ Key Performance Indicators (KPIs), and other characteristics of the identified quality of service standards, shall be in accordance with internationally accepted standards

8.2 Measurement and Data Acquisition

Unless otherwise stated in these Guidelines, the measurement period is on an hourly (24/7) basis and the raw data consisting of counter records from the switches of Licensees must be automatically uploaded directly to PURA QoS servers located in each Operators premises.

The raw data records must be transferred in .csv using a format specified by the SFM Technologies engineers

A storage space has been created on PURA QoS server for each individual Licensee to store data using **user log in** and **passwords**. Licensees are at liberty to change their own log in and password details whenever they want.

8.3 Confidentiality

Any information relating to the business or other affairs provided by any of the parties for the purposes of these Guidelines shall be deemed as confidential from the public where a request for confidentiality based on justifiable reasons has been submitted to and accepted by the Authority. This confidentiality clause is precluded where at the time of disclosure the information has already been made available to the public from other sources.

8.4 Reports

- a. The Authority's QoS Monitoring Tool shall extract and process the raw data archived by Licensees to generate QoS KPI reports on an hourly, daily, weekly, monthly and yearly basis.
- b. The reports shall show QoS KPI data of all network segments including at Base Station Transceiver (BTS), Cells, Base Station Controller (BSC) in both urban and rural areas where Licensees have installed equipment to provide service to customers.

8.5 Reporting Areas

- a. The Reporting Areas, which are the geographic areas for which measurements are taken and recorded, shall be in all installed BTS's throughout the country.
- b. The Licensee shall inform and provide details of new BTS installation such as location, latitude and longitude, to the Authority within 30 days prior to its commissioning. The Authority shall use this information to update the network configuration and monitoring of the operator.
- c. The Licensee shall ensure that the areas covered are in tandem with the operators' License roll out plan and obligations.

8.6 Measurement Reporting and Record Keeping Tasks

For each parameter that is reportable for a Service, for each Reporting Area and for each Reporting Period, a Licensee shall perform the following measurement, reporting and record keeping tasks:

- a) Take their own QoS measurements which shall include but not be limited to the technical KPIs appended in **Schedule 1**;
- b) Submit counter records from their switches through file transfer protocol to the Authority's QoS Server located in each operators premises on an hourly basis and ensure availability of real time performance data.
- c) Submit any additional information requested by the Authority, including details of the times, places, network segments, and other particulars of the measurements
- d) Retain quality of service data, including all measurements and related records, for a minimum of six (6) months or as may be otherwise directed by the Authority.

9 QUALITY OF SERVICE PARAMETERS

9.1 Technical Quality of Service Parameters

The service providers shall meet the Technical Quality of Service Parameters for mobile services as appended in **Schedule 1**

10 PUBLICATION

10.1 Timing of Publication

The QoS Monitoring Tool of PURA shall process and generates individual and comparison reports for all mobile service providers on an hourly, daily, weekly, monthly and annual basis. The Authority shall publish the generated comparison reports of some or all KPI every three (3) months with or without additional notes or comments.

10.2 Content and Format of Publication

For each parameter that is reportable for a service, for each Reporting Area, for each identified Network Segment, and for each Reporting Period, measurements as published by the Authority under these Guidelines shall be set out in tables that contain the following data for each Licensee:

- a) The name of the service provided by the Licensee;
- b) An identification of the Reporting Area or Network Segments for which the measurements were taken;
- c) The measurements collected from or submitted by the Licensee;
- d) An indication of any target for the parameter and the service that has not been achieved by the Licensee;
- e) Any explanatory remarks by the Licensee, accepted by the Authority, including but not limited to remarks about changes in environmental or operating conditions that could not have been reasonably foreseen by the Licensee;
- f) All causes as prescribed under the 'Force Majeure' provision in the operators' License conditions; and
- g) Any other information or comparison of service quality that the Authority determines to be appropriate, including but not limited to information to help the Authority and or Customers to assess the performance of competing Licensees.

In considering whether to approve explanatory remarks by a Licensee, the Authority may take into account factors including but not limited to:

- a) Any service deficiencies that arise partly or wholly from the services of another Licensee;
- b) Any changes in environmental or operating conditions that could not have been reasonably foreseen by the Licensee; and
- c) Any expectation about quality of service that is appropriate to the tariffs and other commercial terms for the services of the Licensee.

11 INVESTIGATION

In accordance with section 83 (b) of the IC Act 2009, the Authority may audit some or all of the quality of service data acquired from the Licensee, or data retained by Licensees. In doing so the Authority may vary the regularity and frequency of the audits, as well as, Data Collection, the Licensees Services, Parameters, Reporting Areas, Network Segments, and Reporting Periods that require audits.

The Authority may investigate the quality of service measurement, reporting and record keeping procedures of a Licensee pursuant to Sections 83 and 84 of the IC Act 2009. In doing so, the Authority may exercise its powers of information gathering pursuant to section 14 (1) (a) of the PURA Act 2001

The Authority may audit / inspect, either directly using its own equipment's and software or through an independent agency, the records relating to the reporting of compliance to the QoS parameters. The Authority, if it deems fit, may require the service providers to get the QoS Reports submitted to the Authority, audited, at its own cost, through independent and qualified agencies.

12 CONTRAVENTION AND ENFORCEMENT

12.1 Contravention

Fines will be calculated on the basis of the provisions prescribed within the **Enforcement Regulations 2010** hereof for each Parameter Key Performance Indicator for a service. A Licensee shall have committed a contravention, but not limited to the following:

- a) Failure by a Licensee to constantly and automatically upload QoS raw data to the Authority's QoS monitoring networks server located in each operators premises, as specified in **Section 8.2**.
- b) Failure by a Licensee to meet and maintain a minimum target for the KPI and the Service;
- c) Failure by a Licensee to submit, during a time period specified in these Guidelines, information requested by the Authority pursuant to Section 84 (2) of the IC Act 2009;
- d) Submission or publication of false or misleading information about quality of service by Licensees;
- e) Obstructing or preventing an investigation by the Authority in respect of the quality of service measurement, reporting, data collection, and record keeping procedures by a Licensee,
- f) Failure to inform the Authority and the general public of a major network outage whether planned for maintenance purpose or otherwise in accordance with Section 121 (4) (d) of the IC Act 2009;
- g) Failure to inform the Authority and/or the general public of the access or availability of a value added service to customers;
- h) Failure of a Licensee to inform the Authority of a software upgrade on their equipment which may alter the configuration or ability of the Authority's QoS monitoring tool to process and generate the KPIs specified in **Schedule 1**
- i) Failure of a Licensee to inform the Authority of a new Mobile Switching Center/ Base Station Controller installation.
- j) Failure of a Licensee to inform the Authority of a newly commissioned Base Station Transceiver & cell
- k) Failure of a Licensee to provide adequate security to our QoS servers installed in their premises

12.2 Enforcement Procedure

Where a Licensee contravenes any of the parameters set out in these Regulations, the Authority may take one or more of the enforcement measures enshrined in the Authority's Enforcement Regulations 2010.

Notwithstanding, the Authority may:

- a) Require the Licensee to submit and or publish additional information about the quality of the relevant services including but not limited to its implementation of a remedial plan within a time-frame determined by the Authority. Any information submitted may be cross-checked against the performance data collected and processed by the Authority's QoS Monitoring network
- b) Issue directives including but not limited to directing Licensees to compensate subscribers/consumers for poor quality of service;
- c) Impose a fine on Licensees as determined under the Enforcement Regulation 2010

13 INTERPRETATION

In case of any doubt regarding interpretation of any of the provisions of these Guidelines, the decision of the Authority shall be final and binding.

14 AMENDMENT OF GUIDELINES

- a) These Guidelines may be amended by the Authority from time to time taking into consideration the key principles as set out in these guidelines and any other consideration that may be relevant as provided for by the Act, Regulations or the Service Providers Licence.
- b) Any amendment to the Guidelines shall be done in consultation with the stakeholders.
- c) Any amendments shall be communicated to the Licensees 14 days before they take effect.
- d) Implementation of the amended Guidelines shall only be done after Ninety (90) days' notice of such amendment to all Service Providers

15 EFFECTIVENESS

These guidelines shall become effective from the date of signature.

Issued By

Public Utilities Regulatory Authority

Dated thisDay of.....

Director General

16 APPENDIX 1: SCHEDULE 1 TECHNICAL QoS KEY PERFORMANCE INDICATORS

Table 1A: Threshold, Targets and Key performance indicators on 2G networks at busy hour

Parameter	Definition	Target value
2G networks		
Number of new BTS's installed in the provinces as a universal service obligation	Province is defined as anywhere in the country excluding Greater Banjul Area, Basse, Brikama, Soma, Bansang, Jangjangbureh and Farafenni.	≥ 1
Call Success Rate	This refers to the number of calls established over the total number of mobile call attempts.	$\geq 95\%$
Call Setup Success Rate	The percentage of calls successfully set-up to a valid number, properly dialled and during which the 'party busy' tone, 'ringing' tone or 'answer' signal is recognised at the network termination point.	$\geq 95\%$
TCH Congestion Rate	Traffic congestion rate is the probability of failure accessing a traffic channel during call setup	$\leq 2\%$
Call Drop Rate	Determines the percentage of the number of calls which due to technical reasons were cut off before the speaking parties had finished their conversation and before either of them hung up.	$\leq 2\%$
Handover Success Rate	A handover is a process in which a mobile customer engage in a telephone conversation is seamlessly transferred from one base station to another base station without the call being interrupted. The handover rate is the percentage of successful 'handover' out of the total 'handover' requests made.	$\geq 95\%$
SDCCH congestion rate	Determines the percentage of failed SDCCH seizures due to the channel being pre-occupied.	$\leq 2\%$
TCH success rate	Determines the percentage of successful channel allocations at call set up.	$\geq 95\%$

Table 1B: Threshold, Targets and Key performance indicators on 3G networks at busy hour

Parameter	Definition	Target value
3G networks		
Number of new data enabled BTS's outside GBA as a universal service obligation	Province is defined as anywhere in the country excluding Greater Banjul Area and Brikama,	≥ 1
Circuit switched	RRC Call setup success Rate	$\geq 95\%$
	Circuit Radio access bearer call Setup success Rate	$\geq 95\%$
	Circuit Switched voice call setup success rate	$\geq 95\%$
	Circuit switched voice call drop rate	$\leq 2\%$
	Circuit Switched data call setup success rate	$\geq 95\%$

	Circuit switched data call drop rate	$\leq 2\%$
	Circuit switched call drop rate.	$\geq 95\%$
Packet switched	Packet switched call setup success rate	$\geq 95\%$
	Packet switched radio access bearer call setup success rate	$\geq 95\%$
	Packet switched call drop rate	$\leq 2\%$

Table 2: Trunk utilisation between operators

Parameter	Definition	Target value
Trunk utilisation	The average utilisation for any trunk group during busy hour above which the number of E1's must be increased to accommodate traffic	$\geq 95\%$
Blocking probability during bust hour	The blocking probability allowed on a trunk group during busy hour traffic	$\leq 1\%$