

PUBLIC UTILITIES REGULATORY AUTHORITY

QUALITY OF SERVICE
GUIDELINES

FOR

MOBILE SERVICE PROVIDERS



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1 INTRODUCTION

This Quality-of-Service Guideline 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 provide adequate information such as Quality of Service Reports.

Licensees are also obligated by virtue of Section 84(1) (a) – (b) of the 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.

2 SHORT TITLE, EXTENT AND COMMENCEMENT

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

3 OBJECTIVES

The objective of these Guidelines is to protect and enhance the rights of consumers in obtaining quality services. The Guidelines will set service standards to ensure that consumers are given satisfactory level of services that meet acceptable standards. These Guidelines have the following objectives:

- a) Ensure the protection and promotion of the interest of consumers against unfair practices including but not limited to matters relating to tariffs, charges, availability, quality of communications services, equipment, and facilities.
- b) Improve 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.
- d) Measure the Quality of Service provided by the service providers and compare them with the required standards to assess the level of performance.
- e) Ensure information availability to help consumers make informed choice of services.
- f) Improve the operation and performance of interconnected networks.
- g) Assist the development of related telecommunications markets.

- h) Encourage the implementation and sustainability of a Quality of Service Framework through which the Quality of Service provided by operators in the market will be measured, reported and published based on definitions and measurement methodology uniformly applied across the industry.

4 SCOPE

These Guidelines:

- a) Stipulate the minimum quality and standards of service-associated measurement, reporting and record keeping.
- a) Establish a common framework for the measurement, improvement and, where applicable, guaranteed levels of service that can apply to affected services.
- b) Define the set of parameters, measurement of parameters across service categories, reporting and publishing of parameters and enforcement measures for non-compliance.
- c) Focuses solely on QoS parameters related to mobile networks as well as the corresponding measurement methods.
- d) Apply to all licensed mobile operators and serve as a reference to end users of mobile communications in The Gambia.

5 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 always running.
- 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 the same terms and conditions at the same quality regardless of destination of the consumer.

6 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 sufficient and credible 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 and credible information services to assist consumers with queries relating to the services provided.
- f) They provide to the consumers equal access to the same Quality of Service.
- g) They avail information to ensure subscribers make informed choice of services.
- h) They improve the operation and performance of interconnected networks.

7 MEASUREMENT, REPORTING AND RECORD KEEPING

7.1 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 are 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 to 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

7.2 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. Data availability Shall not be less than 95%.

The raw data records must be transferred in .csv using a format specified by the supplier of the Authority's QoS monitoring system.

A storage space has been created on PURA QoS server for each individual Licensee to store data using **user log in** and **passwords**.

Licensees Shall provide the up-to-date updated 2G,3G and 4G cells mapping by the 5th of each month in excel format. The parameters to report are outlined in **Schedule 4**.

7.3 Confidentiality

Any information relating to the business or other affairs provided by any of the licensees for the purposes of these Guidelines shall be deemed as confidential from the public if 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.

7.4 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 in both urban and rural areas where Licensees have installed equipment to provide service to customers.

7.5 Reporting Areas

- a) The Reporting Areas, which are the geographic areas for which measurements are taken and archived, 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 after such installation and prior to commissioning. The Authority shall use this information to update the network configuration and monitoring of the operator.
- c) The Licensee shall make efforts to ensure that the areas covered are in tandem with the operators' License roll out plan and obligations.

7.6 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 operator's 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.

8 QUALITY OF SERVICE PARAMETERS

8.1 Technical Quality of Service Parameters

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

9 PUBLICATION

9.1 Timing of Publication

The QoS Monitoring Tool of PURA processes 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 KPIs every three (3) months with or without additional notes or comments.

9.2 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) The Enforceable KPIs as appended in **schedule 1** shall be Published
- c) An identification of the Reporting Area or Network Segments for which the measurements were taken.
- d) The measurements collected from or submitted by the Licensee.
- e) An indication of any target for the parameter and the service that has not been achieved by the Licensee.
- f) 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.

10 INVESTIGATION

In accordance with section 83 (b) of the IC Act 2009, the Authority may audit some or all 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 or inspect the records relating to the reporting of compliance to the QoS parameters, using its own equipment and software or an independent agency.

The Authority, if it deems fit, may request the QoS reports audited at the expense of the licensee through an independent and qualified agency.

11 CONTRAVENTION AND ENFORCEMENT

11.1 Contravention

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

- a) Failure by a Licensee to upload QoS raw data constantly and automatically to the Authority's QoS monitoring network servers located in each operator's premises, as specified in **Section 7.2**.
- 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 data or information outlined in these Guidelines.
- 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 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 and Fault Reporting Guidelines.
- g) Failure to inform the Authority and/or the public of the non-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 and/or cell site.
- k) Failure of a Licensee to provide adequate security to our QoS servers installed in their premises.

11.2 Enforcement Procedure

Where a Licensee contravenes any of the parameters set out in these Guidelines, 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 timeframe determined by the Authority. Any information submitted may be cross-checked against the performance data collected and processed by the Authority's QoS Monitoring Tool.

- b) Issue directives including but not limited to directing Licensees to compensate subscribers/consumers for poor quality of service caused as a result of faults under the control of the Licensee.
- c) Impose a fine on Licensees as in **Schedule 2 and 3**.

12 INTERPRETATION

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

13 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 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
- a) 15. These Guidelines shall come into force with effect from 1st **July 2022**.

Done in Banjul, on ----- Day of ----- 2022



**Director General
PURA**

14 APPENDIX 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 calls 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 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 with 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.

15 APPENDIX 2: 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
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
Data Availability	The percentage of 2G counter data automatically uploaded to PURA QoS servers located at operator's premises	≥ 95%
Cell Availability	Percentage of time that the cell is considered available during the period observation	≥ 96 %
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.	≥ 96 %
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.	≤ 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.	≥ 96%
Call Success Rate	This refers to the number of calls terminated over the total number of mobile call attempts.	≥ 96%
SDCCH Availability Rate	The ratio of the number of available SDCCHs to the number of configured SDCCHs in a measurement period	≥ 96%
TCH Availability Rate	The ratio of the number of available TCHs to the number of configured TCHs in a measurement period	≥ 96%
SDCCH congestion rate	Determines the percentage of failed SDCCH seizures due to the channel being pre-occupied.	≤ 2%
TCH Congestion Rate	The ratio of the number of failed TCH seizures due to busy TCHs to the number of TCH seizure requests	≤ 2%
TCH Drop Rate	The ratio of the number of calls drops to the number of successful TCH seizures after the BSC successfully assigns TCHs to MSs.	≤ 2%

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

Parameter	Definition	Target value
Number of new data enabled NodeB's outside GBA as a universal service obligation	Province is defined as anywhere in the country excluding Greater Banjul Area and Brikama,	≥ 1
Data Availability	The percentage of 3G counter data automatically uploaded to PURA QoS servers located at operator's premises	$\geq 95\%$
Cell Availability	Percentage of time that the cell is considered available during the period observation	$\geq 96\%$
CS RRC Call setup success Rate	The ratio of all successful Circuit Switch RRC establishments to RRC establishment attempts for UTRAN network	$\geq 96\%$
CS Radio access bearer call Setup success Rate	The ratio of all successful Circuit Switch RAB establishments to RAB establishment attempts for UTRAN network	$\geq 96\%$
CS voice call setup success rate	The percentage of Circuit switch voice successfully calls set-up to a valid number	$\geq 96\%$
CS voice call drop rate	Determines the percentage of the number of Circuit switch drop voice calls which due to technical reasons.	$\leq 2\%$
CS HO 3G-2G	The percentage of Circuit switch successful Handover 3G to 2G	$\geq 96\%$
PS RRC Call setup success Rate	The ratio of all successful Packet Switch RRC establishments to RRC establishment attempts for UTRAN network	$\geq 96\%$
PS Radio access bearer call Setup success Rate	The ratio of all successful Packet Switch RAB establishments to RAB establishment attempts for UTRAN network	$\geq 96\%$
PS call setup success rate	The percentage of Packet switch sessions successfully set-up to a valid number	$\geq 96\%$
PS call drop rate	Determines the percentage of the number of Packet switch drop sessions which due to technical reasons.	$\leq 2\%$
Soft Ho Success Rate	The percentage of successful Handover 3G system	$\geq 96\%$

Table 1C: Threshold, Targets and Key performance indicators on 4G networks at busy hour

Parameter	Definition	Target value
Number of new data enabled ENodeB's outside GBA as a universal service obligation	Province is defined as anywhere in the country excluding Greater Banjul Area and Brikama.	≥ 1
Data Availability	The percentage of 4G counter data automatically uploaded to PURA QoS servers located at operator's premises.	$\geq 95\%$
Cell Availability	Percentage of time that the cell is considered available during the period observation	$\geq 96\%$
RRC Call setup success Rate	The ratio of all successful RRC establishments to RRC establishment attempts for EUTRAN network.	$\geq 96\%$
EPS Radio access bearer call Setup success Rate	The ratio of all successful ERAB establishments to ERAB establishment attempts for EUTRAN network.	$\geq 96\%$
EPS Radio access bearer Drop Rate	The ratio of all dropped ERAB to ERAB establishment for EUTRAN network	$\leq 2\%$
Call setup success rate	The KPI is calculated based on multiplying the KPI of RRC Setup Success Rate and the KPI of ERAB Setup Success Rate.	$\geq 96\%$
CS Fall Back Success Rate	Determines the percentage of the number of Circuit switch drop voice calls which due to technical reasons.	$\geq 96\%$
Ho Success Rate (4G)	This KPI can be used to evaluate the handover success rate in a cell or a cluster. The HO includes both inter-eNodeB and intra-eNodeB scenarios.	$\geq 96\%$
Inter Rat Ho Success Rate	This KPI measures the performance of the inter-RAT handover from LTE to GSM, from LTE to WCDMA.	$\geq 96\%$
Cell DL Throughput	Average Downlink throughput of all the users in the network.	$\geq 10\text{Mbps}$
Cell UL Throughput	Average Uplink throughput of all the users in the network.	$\geq 1\text{Mbps}$

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. However, when trunk utilization hit 75%, the operators must initiate the process to add required E1s.	$\geq 85\%$
Blocking probability during bust hour.	The blocking probability allowed on a trunk group during busy hour traffic	$\leq 1\%$

16 APPENDIX 3: SCHEDULE 2 ENFORCEABLE QoS KEY PERFORMANCE INDICATORS AND FINES CALCULATION

Table 1: 2G Enforceable parameters

	PARAMETERS	Target Value
2G	Cell Availability	$\geq 96\%$
	Call Setup Success Rate	$\geq 96\%$
	Call Drop Rate	$\leq 2\%$

16.1 Enforcement on 2G QoS parameters

Failure to meet the minimum standard of each of the KPIs as specified by the Authority, a fine will be imposed per month as stipulated below.

How to Calculate Fine for 2G KPIs

U = unit fine per KPI = D200,000.00

N= Number of failed KPIs in each Region

$$\text{Fine} = U * N$$

Table 2: 3G Enforceable parameters

	PARAMETERS	Target Value
3G	Cell Availability	≥ 96
	CS voice call setup success rate	≥ 96
	CS voice call drop rate	≤ 2
	PS call setup success rate	≥ 96
	PS call drop rate	≤ 2

16.2 Enforcement for 3G QoS Parameters

Failure to meet the minimum standard of each of the KPIs as specified by the Authority, a fine will be imposed per month as stipulated below.

How to Calculate Fine for 3G KPIs

U = Unit fine per KPI in GBA = D150,000

N= Number of failed KPIs in each Region

$$\text{Fine} = U * N$$

Table 3: 4G Enforceable parameters

4G	PARAMETERS	Target Value
	Cell Availability	≥ 96
	EPS Radio access bearer Drop Rate	≤ 2
	Call setup success rate	≥ 96
	CS Fall Back Success Rate	≥ 96
	Cell DL Throughput	10Mbps
	Cell UL Throughput	1Mbps

16.3 Enforcement for 4G QoS Parameters

Failure to meet the minimum standard of each of the KPIs as specified by the Authority, a fine will be imposed per month as stipulated below.

How to Calculate Fine for 4G KPIs

U = Unit fine per KPI in each Region = D100,000

N= Number of failed KPIs in each Region

Fine= U * N

17 APPENDIX 4: SCHEDULE 3 DATA AVAILABILITY

Data Availability	The percentage of 2G counter data automatically uploaded to PURA QoS servers located at operator's premises	$\geq 95\%$
Data Availability	The percentage of 3G counter data automatically uploaded to PURA QoS servers located at operator's premises	$\geq 95\%$
Data Availability	The percentage of 4G counter data automatically uploaded to PURA QoS servers located at operator's premises	$\geq 95\%$

17.1 Enforcement

Failure to meet the minimum standard of Data availability as specified by the Authority, a fine of **D500, 000.00** will be imposed per month.

18 APPENDIX 5: SCHEDULE 4 CELL SITE MAPPING

The following table outlines the reporting parameters

Cell-Name	Cell-ID	Site/BTS-Name	Longitude	Latitude	Azimuth	District
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