STATUTORY INSTRUMENT

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THE COMMUNICATIONS QUALITY-OF-SERVICE REGULATIONS, 2025

ARRANGEMENT OF REGULATIONS

SSTATUTORY INSTRUMENT NO. 10 of 2025

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THE NATIONAL COMMUNICATIONS AUTHORITY ACT, 2022
(ACT NO.16 OF 2022)

THE COMMUNICATIONS QUALITY-OF-SERVICE REGULATIONS, 2025

Short title

In exercise of the powers conferred on the Authority by Section 194 of the National Communications Authority Act 2022, the Authority hereby makes the following Regulations: -

PART I–PRELIMINARY

Definitions.

1. In these Regulations, unless the context otherwise requires-

"Authority" means the National Communications Authority established under the Act;

"Act" means the National Communications Authority Act, Act No.16 of 2022;

"access network utilisation" means the total data traffic moving between the access node and the aggregation node;

"access network utilisation" means the measure of the network's capacity to handle traffic;

"bandwidth" means the maximum rate of data transfer across a network or internet connection, typically measured in bits per second (bps);

"benchmark" means a baseline that helps measure performance quality or progress;

"billing" means the process of recording and processing the usage of telecommunications services by customers and generating invoices;

"billing complaint rate" means the percentage of customer billing related complaints per the reporting period;

"billing accuracy" means the percentage of billing records that are correct and free from errors;

"BSC" means Base Station Controller;

"BTS" means Base Transceiver Station;

"call connection success rate" means the number of successfully connected calls to the number of call attempts;

"cell" means a geographical area in a mobile communication system that is served by a Base Transceiver Station;

"cell availability" means the percentage of time a cell is able to accept and process calls or data requests relative to the total time period under consideration;

"complaint resolution time" means the time taken for a service provider to resolve a complaint;

"voice access service delay" means the time duration between an initial bid by the user for a voice service and the instant the user has access to the voice service;

"call connection failure" means the percentage of unsuccessful calls;

"call setup time" means the duration from when a user initiates a call (or a service request) until the call is successfully established and the user is connected;

"call setup success rate" means the ratio of total number of successful calls to the total number of all call attempts made on the network during a specified period;

"call centre operator response" means the measurement of the time taken by a call center operator to respond to a customer's call. This measurement is typically referred to as the "waiting time" or "response time." It includes the duration from when the customer initiates the call to when the operator answers it. The goal is to minimize this waiting time to ensure efficient and satisfactory customer service.

"critical event" means an occurrence that significantly impacts the operations, performance or reliability of a telecommunications system, requiring immediate attention and corrective action to mitigate its effects on service availability and quality;

"critical event" means incidents or occurrences that havesignificant impact on security, safety, operations, often requiring immediate attention or response to prevent or to mitigateserious consequences;

"critical outage" means a significant failure in a telecommunications system that results in extensive loss of service or a severe degradation of service quality;

"critical service outage" means any event that disrupts the normal operation of a service, including planned and unplanned outages, degradation and interruptions. This definition encompasses various scenarios where the service is either completely unavailable or its performance is significantly reduced, affecting the end-users' experience;

"electronic communications services" means transmission and reception of information by wire, radio waves, optical media or other electromagnetic systems, between or among points of the user's choice;

"eNodeB" means a radio base station used in 4th Generation (4G) Long Term Evolution (LTE) networks;

"call drop rate" means the probability that a call will terminate unexpectedly without the user's action;

"circuit switching" also means circuit switched, which is a method of communication where a dedicated communication path or circuit is established and maintained for the entire transmission between two or more end points or nodes;

"customer or consumer" means a person or legal entity subscribing to services provided by a service provider;

"downtime" means the period during which a system, service or component is unavailable or not operational.

"downtime" means the total time during a reporting period when the fault exists for the service;

"FTP" means File Transfer Protocol;

"fault" means a state where a network does not meet the service specifications and repair action is required;

"force majeure "means an event beyond the control of the licensed service provider and not involving the licensed service provider's fault or negligence and which is unforeseeable including, acts of wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

"handover success rate" means the percentage of successful handovers compared to the total handover attempts;

"interconnection" means the physical and logical linking of telecommunications networks used by the same or a different service provider in order to allow the users of one service provider to communicate with the users of the same or another service;

"ITU" means the International Telecommunication Union;

"jitter" means the delay variation among the different packets sent from the source host to the destination (measured over a given period of time);

"KPI" means Key Performance Indicator;

"latency" means the time delay experienced in a network during the transmission of data from the source to the destination;

"licensee" means Licensed Service provider

"licensed service provider" means an entity licensed by the Authority to engage in the provision of electronic communications services;

"major events" means any occurrence that significantly affect the operations of a telecommunication system or service

"major service outage" means a significant interruption or degradation of service that impacts a large number of users or critical business functions;

"mean opinion score (MOS)" means the average score given by users or testing methods to evaluate the rate of quality of voice, data and video services on a predefined scale, typically from 1 (bad) to 5 (excellent);

"mobile telephone service" means a telecommunication service that provides voice, data and multimedia communication capabilities to users via mobile devices over a wireless network;

"MSC" means Mobile Switching Center;

"network effectiveness ratio" means the relationship between the number of seizures and the sum of the number of seizures resulting in either an answer message, or a user busy, or a ring no answer, or in the case of Integrated Services Digital Network (ISDN) a terminal rejection/unavailability;

"network performance" means the ability of a network to provide the functions related to communication services with a certain level of quality including various performance indicators such as latency, throughput, packet loss and jitter, which are used to measure and ensure the efficiency and reliability of network operations;

"NMS" means network management system;

"NOC" means network operation center;

"NodeB" means a radio base station used in 3rd Generation (3G) Universal Mobile Telecommunications System (UMTS) networks;

"Non-Bank-Led Mobile Money Service" means a mobile money service originating from a cellular device and terminating on a cellular device;

"Non-Bank-Led Mobile Money Service" means a type of mobile financial service that is provided by corporate entity other than a traditional bank (built in brick and stones);

"Operator" means licensed service provider;

OTT (over-the-top) means an application accessed and delivered over the public internet that may be a direct technical and functional substitute for traditional international telecommunications services;

"public emergency and national security" means Sierra Leone Police, Military, fire force, public health

"packet loss" means the percentage of data packets transmitted from the source but fail to arrive at their destinations;

"packet switching" means also packet switched, which is a method of data transmission where data is broken down into packets before being sent over a network;

"planned outage" means a scheduled interruption of service for maintenance, upgrades, or other necessary work on the network infrastructure;

"peak hour" means the period during which the highest traffic load occurs on a network, typically measured in terms of the average number of simultaneous calls or data sessions and is crucial for network planning and dimensioning, as it helps ensure that the network can handle the maximum expected load without degradation in service quality;

"peak hour" mean the busiest hour of a day for a specific cell, during which the highest volume of traffic is observed and this measurement is crucial for network planning and optimization, as it helps identify periods of maximum demand and ensures that the network can handle the load without degradation in service quality;

"provision of service" means act of delivering telecommunications services to end users;

"quality of service" means a collective effect of service performance that determines the degree of satisfaction of a user when using tele-communications service;

"quality of experience" means the degree of delight or annoyance of the user of an application or service;

"RAN" means Radio Access Network;

"RNC" means Radio Network Controller;

"RSCP" means Received Signal Code Power

"RSRP" means Reference Signal Received Power

"RSSI" means Received Signal Strength Indicator

"rural area" means a geographical area located outside towns and cities, characterized by low population density and limited access to certain services and infrastructure including telecommunications and these include other parts of country other than urban and sub-urban areas;

"service availability" means the percentage of time that the network is operational and accessible to the users;

"sanction" means a fine, levy or compensation imposed on the licensed service provider for defaulting in its QoS obligations;

"SMS delivery success rate" means percentage of sent messages that are delivered to the intended recipients;

"Service Level Agreement" means a formal contract between a service provider and a customer that outlines the expected level of service, performance metrics, and responsibilities of both parties and a Service Level Agreement typically includes details such as Service Description, Performance Metrics, Responsibilities, Penalties and Remedies, and Monitoring and Reporting;

"service" means a provision of a function or set of functions offered to users by a network or a system;

"service provider" means an entity engaged in the provision of electronic communications services;

"subscriber" means an individual or entity that has an agreement with a service provider for the provision of telecommunications services;

"sub-urban area" mean areas that typically have a mix of residential and commercial developments and are characterized by lower population density compared to urban areas, and these include Kabala, Pujehun, Magburaka, Kambia, Kailahun, Moyamba, Lungi, Kamakwie, Lunsar and Mattru Jong;

"throughput" means a measure of the rate at which data is successfully transmitted from one point to another within a specific period;

"unplanned outage" means unaccepted interruptions in the operations of communication services or systems which can result in the loss of service availability and functionality;

"unsolicited messages or services" means communications or messages that are sent without prior consent or request from the recipients, often for commercial purposes;

"urban area" means a geographical area characterized by high population density, significant infrastructure development and a concentration of economic, social and cultural activities, and these include Freetown, Bo, Kenema, Makeni, Port Loko, Waterloo and Koidu cities;

"website" means the National Communications Authority website

Application.

2. These Regulations shall apply to licensed communications service providers in Sierra Leone, including-

(a) mobile telephony network operators;

(b) broadband internet service providers including satellite services;

(c) cable network service providers;

(d) infrastructure service providers;

(e) non-bank-led digital financial service providers; and

(f) OTT licensed service providers.

SERVICE PROVIDERS

Duties and obligations of service provider.

3. A licensed communications service provider shall-

(a) establish and maintain information or data to assist customers with queries relating to the services offered, installation and access requirements, processes, and customer support facilities;

(b) provide customers with equal access to services within the licensed area at the same quality of service and at the same tariff;

(c) notify all its customers of the terms and conditions of the Service Level Agreement of its licensed services and thereafter provide services based on the agreement;

(d) submit to the Authority copies of its Service Level Agreement containing the minimum quality of service standards which customers are entitled to, and the remedies and compensation available when the quality of service is below such standards;

(e) notify the customer of any modification to an existing Service Level Agreement; and

(f) submit to the Authority relevant information on quality of service as and when requested.

Obligations of licensee.

4. Subject to the Act, a licensee shall-

(a) deliver services at a performance level that meets or exceeds levels of performance as set out in these Regulations;

(b) provide information on such performance levels to the Authority to ensure that customers are allowed to make informed decisions on the choices of services.

(c) establish performance measurement systems consistent with these Regulations.

(d) provide services to a person who applies and is capable of paying the appropriate charges for the licensed services;

(e) provide uninterrupted services to customers and ensure that the operation of its services in the normal course of business is not intentionally interrupted or hindered;

(f) notify the Authority and its customers of any planned and unplanned service interruptions either through Short Message Service email, phone calls, mobile app, updates on its official website, social media announcements, or postal mail.

PART III -MEASUREMENT, REPORTING AND RECORD-KEEPING

Use of parameters.

5. (1) The quality-of-service standards of a service provider shall be in accordance with-

(a) measurements required for the features of services that are significant to the operations of service providers;

(b) measurement methods and reporting format to enable the Authority compare the parameters of the quality-of-service reports of the licensee fairly; and

(c) applicable targets or key performance indicators and other characteristics of the identified quality of service standards, appropriate to Sierra Leone.

(2) A parameter shall be used to report measurement of services as specified in the Schedules.

Reporting period.

6. (1) The reporting period, which is the period of time within which measurements are taken and recorded, shall be one month starting from the first day of every applicable calendar month to the last day of the month or such other period as the Authority may determine.

(2) The Authority shall use any of the following methods to carry out measurements, data collection and acquisition-

(a) drive tests;

(b) mobile station probe tests;

(c) fixed probes installed at premises of service providers;

(d) consumer perception survey;

(e) data collection from operators, the Authority's network management system or the Authority's network operation center; and

(f) any other method as may be determined by the Authority.

(3) The Authority shall rely on near real-time data acquired from feeds provided by the operators' network operation centers or network management system.

(4) Key performance indicator measurements shall be carried out at all network nodes including: BTS, Cell, BSC, MSC, eNodeB, nodeB, and RNC levels, and interconnection points.

Measurements, reporting and record-keeping tasks.

7. (1) For each reportable parameter, reporting area, and reporting period, a licenseeshall perform the following measurements and tasks- record-keeping;

(a) take the measurements according to the defined measurement methods;

(b) submit the measurements to the Authority within 7 working days after the end of the reporting period and ensure availability of near real-time performance data from the performance measurement or management systems of the licensee as may be specified by the Authority;

(c) submit information to the Authority on any additional sites, and or network elements to facilitate the processing and analysis of performance management files and other raw data;

(d) submit any additional information requested by the Authority including details of the times, places, network nodes, and other particulars of the measurements, within one month after the end of the reporting period or asmay be directed by the Authority;

(e) retain quality of service data and its measurement figures or targets for a minimum period of 12 months for raw data and a minimum period of 18 months for processed data after the end of the reporting period or as may be directed by the Authority.

(2) The Authority shall publish quarterly reports of quality-of-service measurements for all licensed service providers across all districts on the Authority's website.

PART IV - QUALITY OF SERVICE

Quality of service network compliance

8. (1) The network licensee shall install, repair, and maintain electroniccommunications facilities to deliver quality of service at performance levels that meet the required parameters.

(2) A licensed service provider shall operate an electronic communications network and deliver services as specified in these Regulations.

(3) The Licensed Service Provider shall submit a monthly report to the Authority, detailing measurements of all applicable key performance indicators.

Review of quality-of-service parameters.

9. The Authority may review the quality-of-service parameters asspecified in the Schedules from time to time and shall notify a licensed service provider of the proposed review within 30 days prior to the review.

Quality of service to override.

10. The key performance indicators in these Regulations shall supersede the parameters that may be provided as terms and conditions in the licences and Service Level Agreement of service providers.

Parameters for mobile telephone services.

11. (1) A mobile telephone service provider shall meet the quality-of-service benchmarks for cellular mobile service as specified in the First Schedule, for each specified parameter measured by test methods.

(2) A service provider shall submit a monthly report to the Authority based on 24 hours network peak hour conditions per district, as specified in the Schedules.

Parameters for mobile telephone services.

12. (1) A licensed service provider shall meet the quality-of-service benchmarks for interconnected services as specified in the Second Schedule for each specified parameter measured for services traversing any interconnected route.

(2) A service provider shall submit a monthly report to the Authority, detailing the daily peak hour conditions of its services.

Parameters for interconnection service.

13. (1) A licensed internet service provider shall meet the quality-of-service benchmarks for broadband services delivered via wireless or wired connections, as specified in the Third Schedule, for each specified parameter measured by test in any locality.

(2) A licensed internet service provider shall submit a monthly report to the Authority, detailing the network peak hour conditions for its services.

Parameters for broadband services including stalelite services.

14. (1) A licensed service provider shall meet the quality-of-service benchmarks for providing Over-The-Top services through an electronic communications network, as specified in the Fourth Schedule, for each specified parameter measured by tests.

(2) A licensed Over-The-Top service provider shall submit a monthly report to the Authority, detailing the network peak hour conditions for its services.

Parameters for Over-the-top service.

15. (1) A licensed infrastructure service provider shall meet the quality-of- service benchmarks for services provided at interconnection facilities through network nodes, points of presence, and add-drop multiplexer sites, as specified in the Fifth Schedule, for each specified parameter measured in any locality.

(2) The Authorityshall install equipment at interconnection points of licensed infrastructure service providers to inspect various traffic patterns.

(3) A licensed infrastructure service provider shall submit a monthly report to the Authority detailing its infrastructure performance.

Parameters for infrastructure service providers.

16. (1) A licensed non-bank-led mobile money operator shall meet the quality-of-service benchmarks for delivering financial services to customers, as specified in the Sixth Schedule, for each specified parameter measured.

(2) A licensed digital financial service provider shall submit a monthly report to the Authority detailing the its service accessibility, money transfer success rate, money success transfer time, money transfer failed transaction time, etc.

Parameters for non-bank-led digital financial service providers.

17. (1) A licensed service provider shall meet the quality-of-service benchmarks for billing different services provided by its network to customers, as specified in the Seventh Schedule, for each specified parameter measured.

(2) A licensed service provider shall submit a monthly report to the Authority detailing compliance with billing metrics and customer complaints.

Parameters for billing services and customers satisfaction.

18. (1) A licensed service provider shall provide performance management in formats consistent with International Telecommunication Union file transfer data standards, including but not limited to ASN.1, CSV, TXT, or XML (3GPP TS 32.410).

(2) A licensed service provider shall provide access to quality-of-service performance data daily, with performance data for the preceding 24 hours (day minus one) or on near real-time basis as directed by the Authority.

Parameters management data submission.

19. (1) The Authority may, in the event of national emergency, request licensees to support in providing services such as toll-free -lines, short code, mobile alert, data sharing, mobile money transfers, telemedicine services and support to the Government.

(2) The Authority in collaboration with a licensee may prepare a plan for the operating procedures of the emergency, which they shall follow to enhance its effectiveness.

(3) In the event of a national security emergency or crisis, the licensee shall coordinate with the relevant authorities indicated by the Authority and implement the emergency plan as far as reasonably practicable, in accordance with the instructions given by the Authority.

Public emergency and national infrastructure security.

20. In the event of a major or critical service outage at the district level or across a wider coverage area, a licensed service provider shall notify the Authority in writing at least 24 hours before a planned service outage, including its duration, or within one hour after an unplanned service outage and failure to notify the Authority within the time frames specified may attract fines that will be determined by the Authority.

Notification of service outage

21. (1) In cases of quality-of-service failures, the Authority shall send a formal notice to the licensed service provider, requiring a resolution plan within a maximum period of 24 hours, with the exception of quality issues linked to third parties or force majeure.

(2) If the period provided in the resolution plan is not met, the Licensed Service Provider shall inform the Authority within 48 hours about the failure to achieve the target date, providing valid justifications.

(3) The Authority may assess such failures and determine whether the terms and conditions of the proposed fault resolution plan constitute a breach.

(4) If the quality-of-service failures persist beyond the period approved in the resolution plan or repetitive cases as per the terms and conditions of the resolution plan, an applicable sanction as set out in the Schedules shall apply or any sanction prescribed by the Authority

Procedures for rectifying quality of service failure.

22. (1) The Authority may periodically conduct drive tests using an appropriate drive test tool to measure the quality of service for various technologies delivered by licensed communications service providers.

(2) The report of the drive test conducted may be shared with operators initially and subsequently to address anomalies in the key performance indicators of quality-of-service failures.

(3) The Authority may employ a consultant to conduct annual drive tests using an appropriate drive test tool to independently confirm the drive test results periodically conducted by the Authority and a licensed service provider shall be notified of the findings of the consultant and any infractions of the related key performance indicator targets.

(4) Where the infractions of the drive test conducted by the Authority are identified by consultant following an annual drive test campaign, such failures shall attract fines as set out in the Schedules.

PART V - INVESTIGATIONS

Drive test measurements.

23. (1) The Authority may audit the quality-of-service data acquired from a icensee under sub-regulation (2) of Regulation 6 or the data retained by the licensee.

(2) The Authority may, in carrying out its obligations under sub-regulation (1) of Regulations 23, vary the frequency of audits, data collection, licensees' services, parameters, reporting areas, network nodes, and reporting periods that require audits.

(3) The Authority may also utilise data acquired under sub-regulation (2) of Regulation 6.

Auditing of quality-of-service.

24. (1) The Authority may investigate the quality-of-service measurement, reporting, and record-keeping procedures of a licensee pursuant to section paragraph (1) of subsection (2) of 11 of the Act and paragraph (d) of sub-regulation (10 of Regulation 7.

(2) The Authority may from time-to-time conduct consumer perception surveys to determine consumer's quality of experience and satisfaction.

(3) The analysis and conclusions of such consumer perception surveys may be sent to the service provider for remedial actions.

(4) Where the Authority is not satisfied with any remedial actions taken by the service provider within a specific timeframe, the Authority may request a meeting to discuss the report or give directives for resolution of performance failures within a specific period.

(5) Where a service provider fails to remedy such concerns, the Authority may invoke the appropriate regulatory sanctions as specified in the Eighth Schedule.

PART VI - CONTRAVENTIONS AND ENFORCEMENTS

Investigation of and record keeping procedures.

25. (1) A licensee providing service is deemed to have contravened the Regulations relating to predefined parameters of service reporting area, prescribed network nodes and reporting period where the licensee-

(a) fails to perform the measurement, reporting and record-keeping tasks set out in Regulation 7;

(b) fails to achieve the set targets for parameters and services as set out in the Schedules, after the-

(i) commencement date of these Regulations; or

(ii) date when the target was most recently specified.

(c) fails to submit information requested within a timeframe specified by the Authority under Regulations 6;

(d) submits or publishes false or misleading information about its quality of service; or

(e) obstructs or prevents an investigation or near real-time collection of performance data by the Authority in respect of quality-of-service measurement, reporting and record-keeping procedures.

Contraventions.

26. (1) The Authority may, where a licensee contravenes any of the parameters specified in these Regulations, take one or more of the following enforcement measures-

(a) require the licensee to submit additional information about the quality of the relevant service,vvincluding implementation of a remedial plan within a timeframe approved by the Authority and cross-check the submitted information against the performance data collected by the Authority under sub-regulation (2) of Regulations 6 and paragraph (b) of sub-regulation (1) of Regulations 7;

(b) apply section 177 of the Act, including directing licensees to compensate subscribers or consumers for poor quality of service, except in the cases of force majeure or failures attributable to third parties;

(c) apply the terms and conditions of the Service Level Agreement in existence between the service providers;

(d) impose a fine on the contravening licensee as prescribed under the Eighth Schedule of these Regulations or any other sanction deemed fit by the Authority.

(2) If the operator fails to achieve the set targets of key performance indicators, the Authority shall inform the operator in writing to improve the target figures.

(3) Where the operator fails to meet the key performance indicator target for 2 consecutive reporting months, a sanction for defaulting on the set target shall be triggered when the operator fails to remedy the quality-of-service target.

(4) The sanctions specified in the Eighth Schedule shall apply for non-compliance with the quality-of-service provisions as set out in these Regulations.

(5) If the infraction persists, ten percent (10%) of the initial fine shall be levied daily until the licensee remedies the contravention.

(6) The Authority may, where a sanction is not prescribed for a key performance indicator in any of the Schedules, at its discretion monitor and prescribe a sanction for any KPI which has not been prescribed in the eighth schedule, by giving thirty (30) days prior notice to operators of such fine.

PART VII - MISCELLANEOUS PROVISIONS

Enforcement measures.

27. (1) A licensee shall resolve a customer complaint within the resolution timeframe stated in these Regulations or as directed by the Authority from time to time.

(2) Where a licensee fails to resolve a customer complaint within the resolution timeframe, the licensee shall compensate the customer in addition to paying any fine that may be imposed by the Authority.

(3) A licensee may be sanctioned by the Authority if the rate of occurrence exceeds the maximum number of two consecutive reporting months pursuant to these Regulations, except linked to third party fault or force majeure.

Unsolicited services or messages.

28. (1) A licensed service provider shall not provide any subscriber with an unsolicited service or message except for promotions, advertisements, emergencies,pandemics, epidemics, and other natural disasters.

(2) Where a licensed service provider disseminates unsolicited services or messages to subscribers for promotional purposes, the duration of the promotion shall be finite and specified, and such promotions shall have a prior approval from the Authority.

(3) The service provider shall provide an option for the subscriber to opt out of receiving unsolicited services or messages by providing clear instructions on how to opt out at no cost to the subscriber.

(4) A licensed service provider shall make reasonable efforts to identify and block or filter bulk, unsolicited messages from unlicensed sources.

(5) A licensed service provider who contravenes sub-regulation (1) of Regulation 28 is liable to a fine as specified in the Eighth Schedule of these Regulations.

Revocation.

29. The Telecommunications Quality-of-Service Regulations, 2020 (SI No.72 2020) is hereby revoked. 2020 (SI No.72 2020) is hereby revoked.

MADE this 28th day July , 2025

JOSEPH C. Blell,
Chairman, Board of Directors
National Communications Authority

FREETOWN,
SIERRA LEONE.

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SCHEDULES

First Schedule
(Reg 11 (1))

Quality of Service Key Performance Indicators (KPIs) for Mobile Telephony Services
Every licensed Service Provider is required to meet the following Quality of Service benchmarks for Mobile
Telephony Services in respect of each specified parameter measured by real traffic on any cellular network.

Quality of Service KPIs for Mobile Telephony Services

(i) Technical Performance Measurements

No.	Key Performance Indicators (KPIs)	Definition	Measurement Formula	Measurement Tool	Targets
	2G Network KPIs				

1	Traffic Channel (TCH) Congestion (measured at Cell levels)	The failure to allocate a Traffic Channel (TCH) when a user initiates a call or a data session due to the unavailability of free TCH resources in the Cell	100 * (Failed TCH Allocations/Total TCH Allocation Attempts)	Drive Test, Performance Monitoring too Test Stations	=2.0% (95% of Cells Should record measure ment values of real traffic)
2	Standalone Dedicated Control Channel (SDCCH) Congestion (measured at Cell levels)	The percentage of SDCCH requests that fail due to the unavailability of an SDCCH at the Cell level	100 * (Failed SDCCH Allocations/Total SDCCH Allocation Attempts)	Drive Test, Performance Monitoring tools, Test Stations	=1.5%for Urban areas =1.5% for Sub-Urban areas =3% for Rural areas.
3	Call Setup Success Rate (measured at Cell levels)	Measures the percentage of call attempts that are successfully connected to a target party within a given time frame	100*(Successful call setups/ Total Call Setup Attempts)	Drive Test, Performance Monitoring tools, Test stations	=95% (95% of cells should record measurement values)

3	Call Setup Success Rate Cell levels)	Measures the percentage of call attempts that are successfully connected to a target party within a given time frame	100*(Successful call setups/ Total Call Setup Attempts)	Drive Test, Performance Monitoring tools, Test stations	≥95% (95% of Cells Should record measure ment values)
4	Drop Call Rate (measured at Cell level)	The percentage of calls that are terminated unexpected ly during a call session due to various reasons related to network performance	100* (Number of dropped calls/Total call Attempts)	Drive Test Tool, Performance Monitoring Tools, Test Stations	<2% (95% of Cells Should record measure ment values for real traffic)
5	Handover Success Rate	The percentage of successful handovers compared to the total handover attempts	100* (successful handover events/Total handover Attempts)	Drive Test Tool, Performance Monitoring Tools, Test Stations	≥95% for Urban Areas ≥94% for Sub-Urban Areas ≥93% for Rural areas

6	Mean Opinion Score (MOS)	Measurement used to assess the perceived quality of voice and multimedia communications by end-users	Mean Opinion Score (MOS) Refer to ITU-T P.863.2 (PESQ)	Drive Test [Perceptual Objective Listening Quality Analysis (POLQA)], Test Stations	≥3.5 for 2G (95% of samples should record measuremen values for real traffic)
7	Call Setup time	The duration from when a user initiates a call (or a service request) until the call is successfully established and the user is connected	Time of Call Answer- Time of Call Initiation	Drive Test Tools, Performance Monitoring Tools, Test Stations	Mobile Networks: <6 seconds for voice calls

8	Cell Availability	The percentage of time a Cell is able to accept and process calls or data requests relative to the total time period under consideration.	100* (Total Time– Down Time)/Total Time	Performance Monitoring Tools, Test Stations	>95%
9	SMS Delivery Success Rate	Percentage of sent messages that are delivered to the intended recipients	100*(Number of SMS received by the intended recipient/Number of SMS sent)	Test Station, Drive Tests, Performance Monitoring Systems	>98%
10	SMS/MMS Delivery time	Duration between the SMS/MMS sent time and SMS/MMS receiving by the intended recipient	Time SMS/MMS Received– Time SMS/MMS Sent	Test Station, Drive Tests, Performance Monitoring Systems	<5 seconds in 90%of the time
11	Coverage Signal Strength (Rx Level/Rx Quality)	Refers to the quality and strength of the signal received by a mobile device from a cell tower.	Field Strength Measurements	Drive Test Tools, Network Analysers	Outdoor RxLev>-70dBm Indoor RxLev >-85 dBm (RSSI Levels)

12	Voice Access Service Delay	Time duration between an initial bid by the user for a voice service and the instant the user has access to the voice service	Delay = Call Connected Time– Call Request Time	Test Station or Drive Test System	≤ 12 seconds (per ITU-T E.807 & G.1028.2)
	3G Network KPIs				
1	Call Setup\ Success Rate [Packet Switched (PS)]	Measures the percentage of successfully established call setups compared to the total number of attempts made	100*(Successful call setups/Total Call Setup Attempts)	Drive Test Tools, Performance Monitoring Tools, Test Stations	≥95% (95% of cells should record measure ment values for real traffic)
2	Call Setup Success Rate [Circuit Switched (CS)]	Measures the percentage of call attempts successfully completed compared to the total number of call attempts made in a circuit-switched network	100*(Successful call setups/Total Call Setup Attempts)	Drive Test Tools, Performance Monitoring Tools, Test Stations	≥95% (95% of cells should record measurem ent values for real traffic)

3	Radio Resource Call (RRC) Connection Establish ment success rate (PS)	Measures the percentage of successfully established RRC connections compared to the total attempts to establish RRC connections	100*(Successful RRC Connections/Total RRC Connection Attempts)	Drive Test Tools, Performance Monitoring Tools, Test Stations	=95% (95% of RRC cells should record measure ment values for real traffic)
4	Radio Resource Call (RRC) connection establish ment success rate (CS)	Measures the percentage of successful RRC connections established to a mobile network compared to the total number of RRC connection attempts	100*(Successful RRC Connections/Total RRC Connection Attempts)	Drive Test Tools, Performance Monitoring Tools, Test stations	=95% (95% of RRC cells should record measure ment values for real traffic)
5	Radio Access Bearer RAB) Establish ment Success Rate	Measures the percentage of successful attempts to establish a radio access bearer (RAB) compared to the total number of attempts made to establish an RAB	100*(Successful RAB establishments/Total RAB establishment attempts)	Drive Test Tools, Performance Monitoring Tools, Test stations	=95% (95% of RAB cells Should record measure ment values for real traffic)

6	High-Speed Up Link Packet Access (HSUPA) Setup Success Ratio	Measures the success rate of establishing connections for different types of services (Streaming, Interactive, and Background) using High-Speed Uplink Packet Access (HSUPA) technology	100*(Successful HSUPA setup Attempts/Total HSUPA Setup Attempts)	Drive Test Tools, Performance Monitoring Tools, Test Stations	≥90%
7	High-Speed Down-link Packet Access (HSDPA) Setup Success Ratio	Measures the effectiveness of establishing successful HSDPA connections for different types of services (Streaming (S), Interactive (I), and Background (B)) using High-Speed Downlink Packet Access (HSDPA) technology	100*(Successful HSDPA setup Attempts/Total HSDPA Setup Attempts)	Drive Test Tools, Performance Monitoring Tools, Test stations	≥90%
8	Iub Congestion	Refers to the congestion occurring on the Iub interface between the Radio Network Controller (RNC) and the Node B (Base Station) in 3G mobile Networks	100*(failed Iub Allocations/Total Iub Allocation Attempts)	Drive Test Tools, Performance Monitoring Tools, Test stations	<2% (95% of Iub interface should record measure ment values for real traffic)
9	RRC Congestion	Refers to the situation where a network's RRC layer (part of t Access Network, RAN) cannot sufficient resources to initiate signalling connection due to hig insufficient resources	100*(Number of RRC connection fail RRC connection attempts)	Drive Test Tools, Performance Monitor Test stations	≤2% (95% of RRC cells sh measuremen real traffic)

10	Circuit Switched RAB Congestion	Refers to the failure to establish a Circuit Switched Radio Access Bearer (CS RAB) in a 3G or 4G mobile network, due to the unavailability of network resources, typically when the system is unable to allocate the required channels or bearers for circuit-switched voice or video services	100*(Failed CS RAB Connection Setup Attempts/Total CS RAB Connection Setup Attempts)	Drive Test Tools, Performance Monitoring Tools, Test stations	<2% (95% of CS RAB cell should record measure ment values for real traffic)
11	CS RAB Abnormal Release Rate	Refers to the percentage of circuit-switched (CS) connections that are abnormally terminated before the user or network intentionally ends the session	100*(Number of Abnormally Released CS RABs/Total Established CS RABs)	Drive Test, Performance Monitoring Tools, Test stations	=2% (95% of Cells should record measure ment values for real traffic)
12	PS RAB Abnormal Release Rate	Measures the percentage of abnormal terminations of packet-switched sessions, such as data sessions	100* (Number of Abnormal RAB Releases/Total number of established PS RABs)	Drive Test, Performance Monitoring Tools, Test stations	=2% (95% of cells should record measure ment values for real traffic)

13	Soft Handover Success Rate	Defined as the percentage of successful handovers during a soft handover process, where a mobile device is simultaneously connected to multiple Base Stations, allowing seamless transition from one Cell to another without dropping the call	100*(Number Successful Soft Handovers Releases/Total number of Soft Handover Attempts)	Drive Test, Performance Monitoring Tools, Test stations	≥95% for \Urban Areas ≥94% for\ Sub-Urban Areas ≥93% for Rural Areas
14	Inter Radio Access Technology (RAT) Handover Success Rate for CS Domain	Refers to the percentage of successful handovers between different Radio Access Technologies (RATs) in the Circuit-Switched (CS) domain	100*(Successful Inter RAT Handover/Total Inter RAT Handover Attempts)	Drive Test, Performance Monitoring Tools, Test stations	≥95% (95% of cells should record measure ment values stated above for real traffic)
15	Cell Availability	The percentage of time that a specific cell (or group of Cells) is operational and capable of providing service to users	100*(Total Time cell is available/Total Measurement period)	Drive Test, Performance Monitoring Tool Test stations	>95%
16	Average Downlink Through put per Use	Measures the average data rate experienced by users in the downlink direction (from the network to the user device)	(Total Downlink Data Volume/Total Number of Active Users)	Drive Test, FTP service	≥1.50 Mbps

17	CS Call setup time (CST) for on-net calls	Refers to the time taken to establish a Circuit Switched (CS) voice call from the moment a user initiates the call until the call is successfully connected	Call Setup Time (CST)=T−T0 Where: T is the time when the called party answers the call (the call is connected) T0 is the time when the calling party initiates the call	Performance Monitoring Tools, Drive Test, Test Stations	≤6 seconds
18	CS Call setup time (CST) for off-net calls	Refers to the duration from when the caller initiates a call until the call is successfully established and the receiver answers.	CST=Time when Call is Answered −Time when Call is Initiated	Performance Monitoring Tool Drive Test, Test stations	≤6 seconds
19	Mean Opinion Score (MOS)	Measurement used to assess the perceived quality of voice and multimedia communications by end-users	Mean Opinion Score (MOS) Refer to ITU-T P.863.2 (PESQ)	Drive Test [Perceptual Objective Listening Quality Analysis (POLQA)] Network Monitoring Tools	≥3.5 for 3G (90% of Samples should record measure ment values for real traffic)
20	SMS Delivery Success Rate	Percentage of sent messages that are delivered to the intended recipients	100*(Number of SMS received by the intended recipient/Number of SMS sent)	Test Station, Drive Tests, Performance Monitoring Systems	>98%

21	SMS/MMS Delivery time	Duration between the SMS/MMS sent time and SMS/MMS receiving by the intended recipient	Time SMS/MMS Received – Time SMS/MMS Sent	Test Station, Drive Tests, Performance Monitoring Systems	<5 seconds in 90% of the time
22	Latency	Refers to the time delay experienced in the transmission of data between the source and destination, specifically during the process of sending and receiving data packets	Time to send packet + Time to receive acknowledgment	Network Performance Monitoring Tools, Drive Test Tools. Active Probes	<105ms National < 300ms international
23	Data Access Success Rate	Refers to the rate at which data can be accessed or transmitted over the network.	100 * (Number of data service connections made/ Total number of data service connections requested)	Speed Test Tools Performance Measuring Tools	≥ 95% urban areas > 94% Sub-urban Areas ≥93% rural areas

24	Data Service Access Time	Refers to the time it takes for a device to establish a connection and start transmitting data over the network	Data Access Time=Connection Setup Time+Initial Data Transfer Time	Performance Management Tools, Drive Test Tools	<5 seconds in 90% of the time
25	CS call drop rate	Refers to call that are disconnected unintentionally while the caller is still engaged in conversation	100* (Number of call drops/total number of call attempts)	Performance Management Tools, Drive Test Tools	<2% (95% of Cells Should record measure ment values for real traffic)
26	PS call drop rate	Refers to the percentage of packet switch sessions that are terminated unexpectedly	100*(Number of drop sessions/Total number of sessions attempts)	Performance Management Tools, Drive Test Tools	<2% (95% of Cells Should record measure ment values for real traffic)

26	Coverage Signal Strength	Refers to the quality and strength of the signal received by a mobile device from a cell tower.	Field Strength Measurements	, Drive Test Tools, Network Analysers	Outdoor ≥ −70 dBm (Good coverage for voice and basic data) Indoor ≥ − 95 dBm (Accept able for indoor voice/data) (RSCP Levels)
27	Voice Access Service Delay	Time duration between an initial bid by the user for a voice service and the instant the user has access to the voice service	Delay = Call Connected Time− Call Request Time	Test Station or Drive Test System	≤ 10 Seconds (per ITU-T G.1028.2)
	4G Network KPIs				
1	Cell Availability	The proportion of time that a cell is operational and capable of handling calls and data sessions	100*(Total Time Cell is Available/Tc	Network Monitoring Tools, Drive Test, Performance Monitoring Tools,	≥95%

2	Circuit Switch Fall Back (CSFB) Call Set-up Time (CST)	A technique used in 4G LTE networks to handle voice calls by temporarily falling back to the circuit-switched domain, such as 2G or 3G, when a voice call is initiated	CST=Time from Call Initiation to Call Established	Drive Test Tools, Network Probes	≤6 seconds
3	CSFB Preparation Success Rate	Refers to the percentage of successful preparations for circuit-switched (CS) calls that are initiated when a user is in a 4G LTE network, but the call needs to fall back to a 2G/3G network for connection	100*(Successful CSFB Preparations/Total CSFB Preparation)	Performance Monitoring Tools, Drive Test Tools	≥98% (95% of cells should record measure ment values for real traffic)
4	Extended Radio Access Bearer (ERAB) Set up Success Rate	Measures the success of establishing a Radio Access Bearer in 4G LTE networks	100*(Number of successful ERAB setup/Total Number of ERAB setup Attempts)	Drive Test Tools, Network Probes	≥98% (95% of cells record measure ment values for real traffic)

5	Radio Resource Call (RRC) Set up Success Rate	Refers to the percentage of successful Radio Resource Control connections established between a user's device (UE) and the network's base station (eNodeB) out of the total RRC connection attempts	100*(Successful RRC Setup Attempts/Total RRC Setup Attempts)	Performance Monitoring Tools, Drive Test, Test stations	≥98% (95% of cells should record measure ment values for real traffic)
6	ERAB Drop Rate	The ratio of the number of ERABs that are dropped to the total number of ERABs established over a specific period.	100*(Dropped ERABs/Total Established ERABs)	Performance Monitoring Tools, Drive Test, Test stations	≤2% (95% of cells should record measure ment values for real traffic)
7	Evolved-UMTS Terrestrial Radio Access Network (E – UTRAN) Downlink Throughput (Mbps) per user	Refers to the data transmission rate achieved by a user device when receiving data from the network, measured in megabits per second (Mbps)	100*(Total Data Successfully Received/Total Time)	Drive Test, FTP service	≥10 Mbps

8	E – UTRAN Uplink Throughput (Mbps) per user	Refers to the data transmission rate that a user can achieve while sending data from their device (user equipment) to the network	100*(Total Uplink Data Volume/Total Uplink Time)	Drive Test Tools, Performance Monitoring Tools, Network Monitoring Tools	≥1 Mbps
9	Latency	Refers to the time delay experienced in the transmission of data between the source and destination, specifically during the process of sending and receiving data packets	Time to send packet + Time to receive acknowledgment	Network Performance Monitoring Tools, Drive Test Tools, Active Probes	<100ms National < 300ms Internatio nal
10	Mean Opinion Score (MOS)	Measurement used to assess the perceived quality of voice and multimedia communications by end-users	Mean Opinion Score (MOS) Refer to ITU-T P.863.2 (PESQ)	Drive Test [Perceptual Objective Listening Quality Analysis (POLQA)] Network Monitoring Tools	≥3.5 for 4G (90% of Samples should record measure ment values for real traffic)

11	Single Radio Voice Call continuity (SRVCC)	A feature in 4G (LTE) networks that ensures seamless voice call continuity when a user transitions from a 4G LTE networkto a 2G/3G Network	100*(Successful SRVCCs/Total S RVCC Attempts)	Drive Test, Performance Management Tools.	≥98% (95% of Cells SRVCC success should record measure ment values for real traffic)
12	Data Success Access Rate	Refers to the rate at which data can be accessed or transmitted over the network.	100 * (Number of data service connections made/ Total number of data service connections requested)	Performance Measuring Tools, Drive test tools	≥ 95% for Urban Areas >94% for Sub-Urban ≥93% for Rural Areas
13	Data Success Access Time	Refers to the time it takes for a device to establish a connection and start transmitting data over the network	Data Access Time=Connection Setup Time+Initial Data Transfer Time	Performance monitoring tool, Drive test Tools	<5seconds 90% of the time

14	Coverage Signal Strength	Refers to the quality and strength of the signal received by a mobile device from a cell tower.	Field Strength Measurements	Drive Test Tools, Network Analysers
	5G Network KPIs			
1	Latency	The time it takes for a data packet to travel from the source to the destination and back again	Time to send packet + Time to receiv acknowledgment	Network Monitoring Tools, Drive Test Tools, Network Emulators
2	Download throughput	The rate at which data is successfully transmitted from the network to the user's device over a specified period	100*(Total Data Received (in bits)/Total time (in seconds))	Network Performance Monitoring Tools, Drive Test, Test Stations
3	Upload Throughput	The rate at which data is successfully transmitted from a user equipment (UE) to the network in a 5G system	100*Total Uplink Data Transmitted (in bits)/Total duration (in seconds) *10^6)	Monitoring Drive Test Tools Network Probes
4	Cell Availability	The proportion of time that a cell is operational and capable of handling calls and data sessions	100*(Total Time Cell is Available/Total Time)	Network Monitoring Tools, Drive Test, Performance Monitoring Tools,

Second Schedule **(Reg. 12 (1))**

Quality of Service Parameters for Interconnection Services

Every licensed Service Provider is required to meet the following Quality of Service benchmarks for Interconnection Services for each specified parameter measured by real traffic on any interconnection route.

Quality of Service KPIs for Interconnection Services

(ii) Technical Performance Measurements

No.	KPIs	Definition	Measurement Formula	Measurement Tool	Targets
1	Downtime for Interconnection route	Refers to the period during which the interconnection route is not operational or fails to meet the required performance standards	100*(MTTR/MTBF+MTTR)	Test Station, Performance Monitoring Systems	≤2hrs

2	Interconnection Route Utilization	The percentage of Provisioned Interconnection route that is actively carrying traffic	100*(capacity in use/Total capacity)	Test Station, Performance Monitoring Systems	≤80%
3	Interconnection Route Availability	The percentage of time that an interconnection route is operational and capable of carrying traffic	100* (Total Operational/ Total Time)	Test Station, Performance Monitoring Systems	≥99.99%
4	Network Effectiveness Ratio (NER)	The ability of a network to deliver a call to the called terminal (Ref ITU-T E.425)	100* (Answers Call+ Ring no answer + user busy + terminal rejected/seizures)	Test Station, Performance Monitoring Systems	≥95%

5	Time to Repair Interconnection Route	The duration from when the fault is reported until the service is fully restored	Time at which service is restored – Time at which fault is reported	Test Station, Performance Monitoring Systems	≤2hrs for Urban Area ≤4hrs for Sub-Urban Areas >6hrs for Rural Areas
6	Answer Seizure Ratio (ASR) (bi-directional)	Measures the percentage of successful answered incoming calls out of the total number of incoming call attempts	100* (Number of answered incoming calls/Total number of incoming call Attempts)	Test Station, Performance Monitoring Systems	≥35% for MNOs ≥40% for fixed line networks

Third Schedule (Reg. 13 (1))

Quality of Service Parameters for Broadband Services

Every licensed Internet Service Providers shall meet the following Quality of Service benchmarks for broadband services delivered via wireless network services and satellites, for each specified parameter measured by tests in any locality.

(iii) Technical Performance Measurements

No.	KPIs	Definition	Measurement Formula	Measurement Tool	Targets
1	Metro Latency	The total round-trip time for a data packet to be transmitted and return to the source	Average round trip time	Test Station or Drive Test System / ping test	≤10ms
2	National Terrestrial Latency	The total round-trip time for a data packet to be transmitted and return to the source	Average round trip time	Test Station or Drive Test System / ping test	≤70ms
3	International Latency	The total round-trip time for a data packet to be transmitted and return to the source	Average round trip time	Test Station or Drive Test System / ping test	≤85ms

4	Service Availability	The percentage of time that the network is operational and accessible to the users	100*{(Agreed service time – downtime)/ (Agreed Service time)}	Test Station or Drive Test System / ping test	≥99%
5	Packet Loss	The ratio between the number of packets lost in the network and the total number of transmitted packets	100* (Number of lost data packets/Total number of sent data packets)	Test Station or Drive Test System / ping test	≤1%
6	Jitter				±10% of later
	Jitter for Metro Latency	The variation in the time delay in the transmission of packets over a network	Jitter Refer to ITU-T G.810/ITU-R BT.1363	Test Station or Drive Test System / ping test	±4ms

	Jitter Long Distance Jitter Latency	The variation in the time delay in the transmission of packets over a network	Jitter Refer to ITU-T G.810/ITU-R BT.1363	Test Station or Drive Test System / ping test	±10ms
	Jitter International Latency	The variation in the time delay in the transmission of packets over a network	Jitter Refer to ITU-T G.810/ITU-R BT.1363	Test Station or Drive Test System / ping test	≤ 30ms
5	Traffic Utilizatior	The measurement of hov the available network re such as bandwidth or ca being used to transmit d	100*(Actual Traffic/Tot	Test Station or D System / ping tes	≤95%
6	Download Throughput	The average volume of data (in bits) downloaded per second in a network	Total amount of data (in bits)/Time taken to download data (Secs)	Test Station or Drive Test System / ping test	±5% Deviation from purchased or assigned capacity

7	**Upload Throughput**	**The average volume of data (in bits) Uploaded per second in a network**	**Total amount of data (in bits)/Time taken to Upload data (Secs)**	**Test Station or Drive Test System / ping test**	**±5% deviation from purchased or assigned capacity**
8	**Downtime for radio Access and Core equipment**	**The unavailability of radio Access and Core equipment (Controller, Switches, Routers, etc..) within 24 hrs**	**Time reported time restoration – System time of site outage**	**Network uptime Performance monitoring syste**	**<1hr (Core Controllers) within 24hrs <2hrs (Other equipment) for Urban areas within 24hrs <4hrs (Other equipment) for sub-urban areas within 24hrs <6hrs (Other equipment) for Rural areas within 24hrs**

9	Mean Time to repair (MTTR)	The duration from reported fault to service restoration	Time reported time restoration – System time of site outage	Network uptime performance monitoring system	<1hr (Core Controllers) Within 24hrs <2hrs (Other equipment) for Urban areas within 24hrs <4hrs (Other equipment) for sub-urban areas

					within 24hrs <6hrs (Other equipment) for rural areas within 24hrs

Fourth Schedule (Reg. 14 (1))

Quality of Service (QoS) Requirements for Over-The-Top Services

Every licensed Over-The-Top (OTT) service provider shall meet the following Quality of Service benchmarks for OTT services delivered via a network,
for each specified parameter measured by tests in any locality.

(iv) Technical Performance Measurements

No	Parameter	Definition	Formula	Measurement Tool	Target
1	Call Success Rate	The percentage of successfully established calls compared to the total number of call attempts	100* (Number of Calls connected to intended recipients/Number of calls attempted)	Test Stations or Drive Test System Performance Management Tools	≥98%
2	Call Setup Time	The period from the initiation of a call (when the user sends the call request) to the moment the call is successfully established and the called party is alerted	Time Call Alerting- Time Dial	Test Stations or Drive Test System	≤10 seconds
3	Call Drop Rate	The percentage of calls that are unexpectedly terminated by the network or service before either party ends the call intentionally	(Number of Calls disconnected without intervention by any user/ Number of calls connected to intended recipients) *100%	Test Stations or Dri System	<2%

4	Call Clarity	The audio during a call, ensuring that the speech is clear and understandable without significant distortion or noise	Mean Opinion Score Refer to ITU-T P.863.2 (PESQ)	Test Stations or Drive Test System	≥3.5

Fifth Schedule (Reg. 15 (1))

Quality of Service Parameters for Infrastructure Communication Services

Every licensed Infrastructure Communication Service Providers shall meet the following Quality of Service benchmarks for infrastructure communication services delivered via a cable network, for each specified parameter measured by tests in any locality.

(v) Technical Performance Measurements

No.	Parameter Name	Definition	Measurement Formula	Measurement Tool	Target
1	Infrastructure Service Availability	A measure of the Percentage of Time that a telecommunication service is operational and accessible to users over a specific period	100* {(Total Time-Downtime)/ (Total time)}	Performance Monitoring Tools, Complaints	>99.99%
2	Downtime for Infrastructure service	A period during which a telecommunication service is unavailable or not functioning properly due to system failures, maintenance or external factors	Total Time – Uptime	Performance Monitoring Tools, Complaints	Urban <2 hrs/day Sub-urban areas <3 hrs/day Rural <4 hrs/day

3	**Latency**	**The time it takes for a data packet to travel from the source to the destination and back again**	**Average round Trip time**	**Test System / ping test**	**≤105ms national ≤160ms international**
4	**Mean Time to Restore**	**The duration from reported fault to service restoration**	**Time reported time restoration – System time of site outage.**	**Network uptime performance monitoring system**	**<2 hrs/day for Urban areas <3 hrs/day for Sub-urban areas <4 hrs/day for Rural areas-**

Sixth Schedule (Reg. 16 (1))

Quality of Service (QoS) Requirements for Digital for Non-Bank-Led Financial Service Providers
A service provider offering digital financial services (such as mobile money) must adhere to the following Quality of Service benchmarks for each specified parameter, through the measurement of test traffic.

(vi) Technical Performance Measurements

No	**Parameter**	**Definition**	**Formula**	**Measurement Tool**	**Target**
1	Service Accessibility Rate (P2P & merchant)	The percentage of successful attempts to access the service compared to the total number of attempts.	(Number of service request response received / Total service request attempts) *100	Test Stations System or Performance Reports	≥99%
2	Money Transfer Success Rate	The percentage of successful money transfer transactions compared to the total number of attempted transactions	(Number of Money Transfers received by intended recipients/ Number of Money Transfers sent) *100%	Test Stations System or Performance Reports	100%

3	Money Transfer Success Time	The duration it takes for a money transfer transaction to be successfully completed from the initiation of the transfer to the confirmation of receipt by the recipient.	Time Mobile Money Notice received- Time Mobile Money Sent	Test Stations System or Performance Reports	≤10 seconds
4	Money Transfer Failed Transaction Resolution Time	The duration it takes to resolve a failed money transfer transaction from the moment the failure is detected to the moment the issue is resolved and the user is notified.	Time Mobile Money Credited - Time Mobile Money Failed transaction reported	Trouble Ticket System	≤24 hours

Seventh Schedule **(Reg. 17 (1))**

Quality of Service (QoS) Requirements for Billing Services and Customer Satisfaction

A Licensed service provider shall adhere to the following benchmarks for billing services and customer satisfaction for each specified parameter.

(i) Technical Performance Measurements

No	Parameter	Definition	Formula	Measurement Tool	Target
1	Billing Accuracy- Voice Calls	The precision with which a service provider charges users for their voice call usage	Per pulse Charging	Billing Assurance Systems	Accurate Charging

No	Parameter	Definition	Formula	Measurement Tool	Target
1	Billing Accuracy-Voice Calls	The precision with which a service provider charges users for their voice call usage	Per pulse Charging	Billing Assurance Systems	Accurate Charging
2	Billing Accuracy-Messaging	The precision with which a service provider charges users for their messaging services	Message length of 160 characters	Billing Assurance Systems	Accurate Charging
3	Billing Accuracy-Data usage (Internet Service)	The precision with which a service provider charges users for their data usage	Volume (per kb/Mb/Gb) charging	Billing Assurance Systems	Accurate Charging

4	Billing Accuracy-Internet service	The precision with which a service provider charges users for their internet usage	Speed (per kbps/ Mbps/Gbps) charging	Billing Assurance Systems	Accurate Charging
6	Interactive Voice 0Response (IVR)	Duration of announcement of the first IVR option before a customer can make a choice	Time IVR option to operator to speak to an agent -Time IVR Started	Test Stations	<15 seconds
7	Call Centre Operator Response	Duration of waiting after the option to a Customer Care Assistant has been chosen	Time Operator Assistant Pick up-Time making operator Request	Test Stations	<60 seconds
8	Customer satisfaction on overall Quality of Service	A measure of how well the telecommunication services meet the expectations and needs of the users	100*(Number of answers as good Quality)/ (Number of customers Interviewed)	Trouble ticket system or Survey	>95%

Eighth Schedule (Reg. 24(5), 26(1) (d), 26 (4), 26 (6) 28 (5))

Sanctions on Default on Quality-of-Service Compliance

No.	Parameter Name	Sanction	Amount (Le)	Category 1- Urban Areas	Category 2- Sub-Urban Areas	Category 3- Rural Areas
Mobile Telecommunications Services						
2G Network KPIs				**Percentage of penalty Amount to pay per Category**		
1	Traffic Channel (TCH) Congestion (measured at Cell levels)	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
2	Standalone Dedicated Control Channel (SDCCH) Congestion (measured at Cell levels)	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
3	Call Setup Success Rate (measured at Cell levels)	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
4	Drop Call Rate (measured at Cell level)	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
5	Handover Success Rate	Fine to be paid by the defaulting operator to the Authority	Le 6,000/cell/month	100%	85%	70%

6	Mean Opinion Score (MOS)	Fine to be paid by the defaulting operator to the Authority	Le2,000/cell/measurement	100%	85%	70%
7	Cell Availability	Fine to be paid by the defaulting operator to the Authority	Le5,000/cell/month	100%	85%	75%
8	Coverage Signal Strength (RSSI)	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
9	Voice Access Service Delay	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
10	Call Setup time	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3- Rural Areas**
Mobile Telecommunications Services						
3G Network KPIs				**Percentage of penalty Amount to pay per Category**		
1	Call Setup Success Rate [Packet Switched (PS)]	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
2	Call Setup Success Rate [Circuit Switched (CS)]	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%

3	Radio Resource Call (RRC) connection establishment success rate (PS)	Fine to be paid by the defaulting operator to the Authority	Le 10,000/cell/month	100%	85%	70%
4	Radio Resource Call (RRC) Connection establishment success rate (CS)	Fine to be paid by the defaulting operator to the Authority	Le 10,000/cell/month	100%	85%	70%
5	Circuit Switched ca	Fine to be paid by the defaulting operator to the Authority	Le 10,000/cell/month	100%	85%	70%
6	High-Speed Up Lin (HSUPA) Setup Su	Fine to be paid by the defaulting operator to the Authority	Le 4,200/cell/month	100%	85%	70%
7	High-Speed Down- Access (HSDPA) S Ratio	Fine to be paid by the defaulting operator to the Authority	Le 4,200/cell/month	100%	85%	70%
8	Packet Switched cal	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
9	Radio Resource Cal	Fine to be paid by the defaulting operator to the Authority	Le10,000/cell/month	100%	85%	70%
10	Inter Radio Access (RAT) Handover Su CS Domain	Fine to be paid by the defaulting operator to the Authority	Le 6,000/cell/month	100%	85%	70%
11	Cell Availability	Fine to be paid by the defaulting operator to the Authority	Le5,000/cell/month	100%	85%	75%

12	Mean Opinion Score (MOS)	Fine to be paid by the defaulting operator to the Authority	Le2,000/cell/measurement	100%	85%	70%
13	Latency	Fine to be paid by the defaulting operator to the Authority	Le 4,000/Cell/measurement	100%	85%	70%
14	Data Access Success Rate	Fine to be paid by the defaulting operator to the Authority	10,000/cell/hour	100%	85%	70%
15	Coverage Signal Strength (RSCP)	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
16	Voice Access Service Delay	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
17	Circuit Switch Fall Back (CSFB) Call Set-up Time (CST)	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
18	Average Downlink Throughput per User	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3- Rural Areas**
Mobile Telecommunications Services						
4G Network KPIs				**Percentage of penalty Amount to pay per Category**		
1	Cell Availability	Fine to be paid by the defaulting operator to the Authority	Le5,000/Cell/month	100%	85%	75%

2	CSFB Preparation Success Rate	Fine to be paid by the defaulting operator to the Authority	Le 10,000/Cell/month	100%	85%	70%
3	Extended Radio Access Bearer (ERAB) Set up Success Rate	Fine to be paid by the defaulting operator to the Authority	Le 10,000/Cell/month	100%	85%	70%
4	Radio Resource Call (RRC) Set up Success Rate	Fine to be paid by the defaulting operator to the Authority	Le10,000/Cell/month	100%	85%	70%
5	ERAB Drop Rate	Fine to be paid by the defaulting operator to the Authority	Le10,000/Cell/month	100%	85%	70%
6	Evolved-UMTS Terrestrial Radio Access Network (E – UTRAN) Downlink Throughput (Mbps) per user	Fine to be paid by the defaulting operator to the Authority	Le 4,200/Cell/measurement	100%	85%	70%
7	E – UTRAN Uplink Throughput (Mbps) per user	Fine to be paid by the defaulting operator to the Authority	Le 4,200/cell/measurement	100%	85%	70%
8	Latency	Fine to be paid by the defaulting operator to the Authority	Le 4,000/cell/measurement	100%	85%	70%
9	LTE HOSR (Inter Cell/ Inter Frequency)	Fine to be paid by the defaulting operator to the Authority	Le 6,000/cell/month	100%	85%	70%
10	Mean Opinion Score (MOS)	Fine to be paid by the defaulting operator to the Authority	Le 4,000/cell/measurement	100%	85%	70%

11	Data Access Success Rate	Fine to be paid by the defaulting operator to the Authority	Le 10,000/cell/hour	100%	85%	70%
12	Coverage Signal Strength (RSRP)	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
13	Data Success Access Time	Fine to be paid by the defaulting operator to the Authority	Le.4,000.00/cell/measurement	100%	85%	70%
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3- Rural Areas**
Mobile Telecommunications Services						
5G Network KPIs				**Percentage of penalty Amount to pay per Category**		
1	Latency	Fine to be paid by the defaulting operator to the Authority	Le4,000/cell/measurement	100%	85%	70%
2	Download Throughput	Fine to be paid by the defaulting operator to the Authority	Le4,200/cell/measurement	100%	85%	70%
3	Upload Throughput	Fine to be paid by the defaulting operator to the Authority	Le4,200/cell/measurement	100%	85%	70%

4	Cell Availability	Fine to be paid by the defaulting operator to the Authority	Le5,000/cell/month	100%	85%	75%
	Parameter Name	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2-Sub-urban Areas**	**Category 3-Rural Areas**
Interconnection Services						
				Percentage of penalty Amount to pay per Category		
1	Interconnection Route Utilization	Fine to be paid by defaulting operator to the Authority	Le 100,000/route/day	100%	85%	70%
2	Interconnection Route Availability	Fine to be paid by defaulting operator to the Authority	Le 12,000/route/day	N/A	N/A	N/A
3	Network Effectiveness Ratio (NER)	Fine to be paid by defaulting operator to the Authority	Le20,000/cell/month	N/A	N/A	N/A
4	Time to Repair Interconnection Route	Fine to be paid by defaulting operator to the Authority	Le 25,000/route/hour	100%	85%	70%
5	Answer Seizure Ratio (ASR) bi-directional	Fine to be paid by defaulting operator to the Authority	Le10,000/Cell/month	N/A	N/A	N/A
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1-Urban Areas**	**Category 2-Sub-Urban Areas**	**Category 3-Rural Areas**
Broadband Services						

				Percentage of penalty Amount to pay per Category		
1	Metro Latency	Fine to be paid by defaulting operator to the Authority	Le 4,000/measurement	100%	85%	70%
2	National Terrestrial Latency	Fine to be paid by defaulting operator to the Authority	Le 4,000/measurement	100%	85%	70%
3	International Latency	Fine to be paid by defaulting operator to the Authority	Le 4,000/measurement	100%	85%	70%
4	Service Availability	Fine to be paid by defaulting operator to the Authority	Le10,000/hour	100%	85%	70%
5	Packet Loss	Fine to be paid by defaulting operator to the Authority	Le 4,000/measurement	100%	85%	70%
6	Jitter					
	Jitter for Metro Latency	Fine to be paid by defaulting operator to the Authority	Le4,000/measurement	100%	85%	70%
	Jitter Long Distance Jitter Latency	Fine to be paid by defaulting operator to the Authority	Le3,000/measurement	100%	85%	70%
	Jitter International Latency	Fine to be paid by defaulting operator to the Authority	Le2,500/measurement	100%	85%	70%
5	Traffic Utilization	Fine to be paid by defaulting operator to the Authority	Le 250,000/route/day	100%	85%	70%

6	Download Throughput	Fine to be paid by defaulting operator to the Authority	Le 4,200/measurement	100%	85%	70%
7	Upload Throughput	Fine to be paid by defaulting operator to the Authority	Le 4,200/measurement	100%	85%	70%
8	Downtime for radio access and core equipment	Fine to be paid by defaulting operator to the Authority	Le 40,000/route/hour	100%	85%	70%
9	Mean Time to repair (MTTR)	Fine to be paid by defaulting operator to the Authority	Le 2,500/hour	100%	85%	70%
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1-Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3-Rural Areas**
Over-The-Top Services				**Percentage of penalty Amount to pay per Category**		
1	Call Set up Success Rate	Fine to be paid by defaulting operator to the Authority	Le10,000/month	100%	85%	70%
2	Call Drop Rate	Fine to be paid by defaulting operator to the Authority	Le10,000/month	100%	85%	70%
3	Call Clarity	Fine to be paid by defaulting operator to the Authority	Le5,000/measurement	100%	85%	70%
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1-Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3-Rural Areas**

Infrastructure Communication Services						
				Percentage of penalty Amount to pay per Category		
1	Infrastructure Availability	Fine to be paid by defaulting operator to the Authority	Le50,000/hour	100%	85%	70%
2	Downtime for Infrastructure	Compensation to customer and fine t the defaulting operator to the Authority	Le 100,000/hour	100%	85%	70%
3	Latency	Fine to be paid by defaulting operator to the Authority	Le 4,000/measurement	100%	85%	70%
4	Mean Time to Restore	Fine to be paid by defaulting operator to the Authority	Le 2,500/hour	100%	85%	70%
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2- Sub-Urban Areas**	**Category 3-Rural Areas**
Non-Bank-Led Financial Service Providers						
				Percentage of penalty Amount to pay per Category		
1	Service Accessibility Rate	Fine to be paid by defaulting operator to the Authority	Le10,000/hour	N/A	N/A	N/A
2	Money Transfer Success Rate	Fine to be paid by defaulting operator to the Authority	Le 10,000/hour	N/A	N/A	N/A

3	Money Transfer Success Time	Fine to be paid by defaulting operator to the Authority	Le10,000/hour	N/A	N/A	N/A
4	Money Transfer Failed Transaction Resolution Time	Fine to be paid by defaulting operator to the Authority	Le10,000/day	N/A	N/A	N/A
No.	**Parameter Name**	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3- Rural Areas**
				Percentage of penalty Amount to pay per Category		
1	Billing Accuracy – Voice Calls	Fine to be paid by defaulting operator to the Authority and customer compensation to be determined by the Authority	Le 10,000/hour	N/A	N/A	N/A
2	Billing Accuracy- Messaging	Fine to be paid by defaulting operator to the Authority and Customer Compensation to be determined by the Authority	Le 10,000/hour	N/A	N/A	N/A
3	Billing Accuracy- Data usage (Internet Service)	Fine to be paid by defaulting operator to the Authority and customer compensation to be determined by the Authority	Le 10,000/hour	N/A	N/A	N/A

4	Billing Accuracy- Internet service	Fine to be paid by defaulting operator to the Authority and customer compensation to be determined by the Authority	Le 10,000/hour	N/A	N/A	N/A
5	Provision And installation of Internet equipment (modem and Related accessories) on premise after payment.	Fine to be paid by defaulting operator to the Authority	Le 5,000/Activity	N/A	N/A	N/A
6	Interactive Voice Response (IVR)	Fine to be paid by defaulting operator to the Authority	Le 5,000/call	N/A	N/A	N/A
7	Call Centre Operator Response	Fine to be paid by defaulting operator to the Authority	Le 5,000/call	N/A	N/A	N/A
8	Customer satisfaction on overall Quality of Service	Fine to be paid by defaulting operator to the Authority and customer	Le 500,000/Overall QoS (not less than 95%)	N/A	N/A	N/A
	Parameter Name	**Sanction**	**Amount (Le)**	**Category 1- Urban Areas**	**Category 2- Sub-urban Areas**	**Category 3- Rural Areas**
Other Contraventions						
				Percentage of penalty Amount to pay per Category		
1	Failure to submit information within 72hrs as specified by the Authority	Fine to be paid by defaulting operator to the Authority	Le. 100,000	N/A	N/A	N/A

2	Submission or publication misleading information about QoS by a Licensee		Le. 500,000	N/A	N/A	N/A
3	Obstructing or preventing the Authority from carrying out an investi gation in respect of quality of service measure ments, repor ting, data collection and record keeping procedures by a licensee, its officers, agents, etc	Fine to be paid by defaulting operator to the Authority	Le. 500,000	N/A	N/A	N/A
4	Failure to Deactivate Unsolicited services by a Licensee	Fine to be paid by defaulting operator to the Authority	Le 10,000/within 24hrs	N/A	N/A	N/A
5	Failure to submit data in the approved format within 72 hours	Fine to be paid by defaulting operator to the Authority	Le 100,000	N/A	N/A	N/A

MADE this day of , 2025.

AMB. JOE C. BLELL
CHAIRMAN, BOARD OF DIRECTORS
NATIONAL COMMUNICATIONS AUTHORITY

Freetown,
Sierra Leone.

EXPLANATORY NOTE

This is not part of the Regulations but it is intended to indicate their general purport.

The objectives of these Regulations are to-

a) implement a transparent quality of service framework whereby the quality of service of electronic communications shall be objectively measured, reported and published based on definitions and measurement methodologies;

b) create conditions for improvement in the quality of experience of customer by making known the quality of services which the service provider is required to provide, and the user should expect;

c) objectively assess the quality of service provided by the service providers from time to time, by measuring and comparing them with established benchmarks and norms;

d) protect the interests of consumers of electronic communications services;

e) make information readily and publicly available to help with informed customer choice of services and comparative performance of licensees; and

f) improve the operation and performance of interconnected networks.