CONSULTATION DOCUMENT

Recommendation of the
Eastern Caribbean Telecommunications Authority (ECTEL)
To the National Telecommunications Regulatory Commissions to consult on the Revised and Updated Electronic Communications (Quality of Service) Regulations

January 2023
No.1/2023

1. The National Telecommunications Regulatory Commission is in receipt of a submission from the Eastern Caribbean Telecommunications Authority ('ECTEL') to consult on the Revised and Updated Draft Electronic Communications (Quality of Service) Regulations.

2. A copy of the Revised and Updated Draft Electronic Communications (Quality of Service) Regulations is attached.

3. The comments period will run from Wednesday **11th January, 2023 –** Friday **24th February, 2023.**

4. The Comment on Comments period will run from Wednesday **1st March, 2023 –** Friday **17th March, 2023.**

5. Following the Reply Comments period, ECTEL's Directorate will revise and submit the Revised and Updated Draft Electronic Communications (Quality of Service) Regulations to the Board of Directors and Council of Ministers for its recommendation, for adoption in the ECTEL Member State.

All responses to this Consultative Document should be sent via e-mail to: -

Acting Managing Director
ECTEL
P. O. Box BW395,
Gros Islet, LC01 601
Saint Lucia
Email: consultation@ectel.int

Disclaimer

This consultative document does not constitute legal, commercial, or technical advice. The consultation is without prejudice to the legal position of ECTEL's duties to provide advice and recommendations to the Ministers with responsibility for electronic communications and the National Telecommunications Regulatory Commissions.

SUGGESTED GUIDELINES FOR RESPONSES TO CONSULTATION

In order to reduce administrative lags in ECTEL's public consultation processes and to enable a reasonable degree of transparency by sharing of views submitted, ECTEL hereby recommends that parties desirous of making contributions to the attached consultation follow the procedures outlined below:

1) Responses to consultations should be clearly labeled as a response to the particular ECTEL consultation and correctly referenced by title.

2) Documents should contain: the name of Party/Licensee/NTRC commenting, address, telephone, and email contacts of commentary author or corporate officer(s) responsible for the document. This information will enable ECTEL to clarify any comments where necessary, or to facilitate follow-up dialog by ECTEL where required.

3) The Consultation Document sets out questions on specific regulations/parts of the regulations. Commenting parties may indicate a response (concur or disagree) on the recommendation and provide explanations/reasons for each response.

4) Where parties have no view or interest in expressing a view on a specific recommendation, parties should indicate "no comment" and number appropriately.

5) Responses/comments to specific recommendations should be double spaced and numbered in sequence with the recommendation. Where comments are extensive, paragraphs should be numbered. Pages should be numbered.

6) Commenting parties should avoid making comments in the form of tracked changes to consultation documents.

7) Where possible, comment documents should be submitted in PDF format.

8) Where possible, parties should make explicit reference to academic articles, legislative provisions in other jurisdictions, or other sources relied on, and should provide copies of these together with comments. Accurate citations of resources relied on will suffice if copies cannot be provided.

9) If relevant, parties commenting on specific provisions of legal language should propose alternative language where possible. Such language should be appropriately highlighted and double spaced. Parties should

avoid proposing alternative language in tracked changes to the consultation document.

10) Comments should be submitted via e-mail; only comments submitted via e-mail will be acknowledged.

11) Commenting parties should expressly indicate or highlight which parts of comment documents contain commercially sensitive or confidential information that should not be published.

ECTEL reserves the right to publish all the responses received to the consultation and provides no undertakings to refuse to publish such comments where requested, on its website or otherwise.

ECTEL is grateful to those parties adopting the recommended guidelines for submitting comments to this consultation.

INTRODUCTION

The Eastern Caribbean Telecommunications Authority ('ECTEL') undertook a public consultation for the Electronic Communications (Quality of service) Regulations ('2016 Draft Regulations') in June 2015. The aim of the public consultation was to revise and update the current version of the Telecommunications (Quality of Service) Regulations ('QoS Regulations') to address the concerns expressed by retail consumers of the electronic communications services in the ECTEL Member States ('MS').

During that public consultation, significant feedback was received which was considered in the review of the 2016 Draft Regulations. The Board of Directors ('Board') and the Council of Ministers ('Council') of ECTEL approved the 2016 Draft Regulations. However, there was a delay in submission of the approved Quality of Service Regulations to the ECTEL MS. Eventually, it was decided by ECTEL that a more detailed review of the Quality of Service Regulations was warranted to address the myriad of complaints from retail consumers and to strengthen the monitoring and enforcement functions of the National Telecommunications Regulatory Commission ('Commission') in all the ECTEL MS.

The Organisation of Eastern Caribbean States ('OECS') and the Governments of the Eastern Caribbean States of the Commonwealth of Dominica, Grenada, Saint Lucia, and St. Vincent and the Grenadines are implementing a digital transformation project, financed through the World Bank Group. The Caribbean Digital Transformation Program ('CARDTP') was approved by the World Bank on 22nd June, 2020 and will support the development of the digital economy as a driver of economic growth, job creation and improved service delivery in the four (4) participating ECTEL MS and by extension, the OECS Member States.

One key component of the project focuses on the Legal and Regulatory Environment, Institutions and Capacity for Telecommunications. This component, under the technical leadership of ECTEL, supports initiatives aimed at achieving greater competition in the electronic communications sector, to improve service affordability and quality across the region, as well as to enhance resilience and emergency response capabilities for critical communications infrastructure. In addition, it supports the modernisation of the legal, regulatory and institutional frameworks governing the electronic communications sector at the regional level, and the capacity of the Commissions to implement them at the national level.

In this context, ECTEL has undertaken the task of revising and updating the current Telecommunications (Quality of Service) Regulations (Regulations of 2008) and the draft Electronic Communications (Quality of Service) Regulations (Draft Regulations of 2016), including the quality of service parameters for electronic communications services. Under the new Electronic Communications Bill/Act and revised Quality of Service Regulations, the function and capacity of the Commissions to monitor and enforce the Quality of Service Regulations will be strengthened.

AXON

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Organisation of Eastern Caribbean States

Consulting Services to Develop a Methodology for Quality-of-Service (QoS) and Quality of Customer Experience (QoE) Monitoring and Enforcement; and Capacity Building for the Implementation of QoS and QoE Framework

Draft Public Consultation Document on the Revised and Updated Electronic Communications (Quality of Service) Regulations

Axon Partners Group

01 January 2023

Table of contents

1. Introduction

1.1 The Organisation of Eastern Caribbean States ("OECS") and the Governments of the Eastern Caribbean States namely, Grenada, the Commonwealth of Dominica, Saint Lucia, and St. Vincent and the Grenadines ("OECS Member States") are implementing a digital transformation project, financed by the World Bank Group, aiming at addressing key bottlenecks and harness opportunities to develop the Eastern Caribbean Digital Economy as a driver of growth, job creation and improved service delivery.

1.2 One component of this project focuses on the Legal and Regulatory Environment, Institutions and Capacity for electronic communications. This component, under the technical leadership of the Eastern Caribbean Telecommunications Authority ("ECTEL"), supports initiatives aimed at achieving greater competition in the electronic communications sector, to improve service affordability and quality across the region, as well as enhance resilience and emergency response capabilities for critical communications infrastructure. In addition, it supports the modernisation of the legal, regulatory, and institutional frameworks governing the electronic communications sector at the regional level, and the capacity of National Telecommunications Regulatory Commissions ("NTRCs") to implement them at the national level.

1.3 In this context, ECTEL has undertaken the task of reviewing the current Telecommunications (Quality of Service) Regulations in all ECTEL Member States[1] ("Regulations of 2008") and revising and updating the draft Electronic Communications (Quality of Service) Regulations[2] ("draft Regulations of 2016"), including the quality of service ("QoS") parameters for electronic communications services. Under the new Electronic Communications Bill/Act and revised Quality of Service Regulations, the function and capacity of the NTRCs to monitor and enforce the QoS Regulations will be strengthened.

[1] Source: ECTEL & NTRC "Telecommunications (Quality of Service) Regulations"; Available at: https://www.ectel.int/

[2] Source: ECTEL, "Electronic Communications (Quality of Service) Regulations"; Available at: https://www.ectel.int/wp-content/uploads/2015/06/QoS-regs.pdf

1.4 Draft Regulations of 2016

1.4.1 ECTEL undertook a public consultation for the draft Telecommunications (Quality of Service) Regulations of 2016 in June 2015. The aim of this current public consultation was to revise and update the current version of the Telecommunications (Quality of Service) Regulations to address the concerns expressed by retail consumers of the electronic communications services in the ECTEL Member States.

1.4.2 During that 2015 public consultation, significant feedback was received and this feedback was considered in the review of the draft regulations of 2016. The Board of Directors ('Board') and the Council of Ministers ('Council') of ECTEL approved the draft regulations of 2016.

1.4.3 However, upon further review of the draft regulations of 2016, ECTEL recognised that a more detailed review of the QoS Regulations was warranted, to address the myriad of complaints from customers and to strengthen the monitoring and enforcement functions of the NTRCs in all the ECTEL Member States. To this end, a revised and updated draft Electronic Communications (Quality of Service)Regulations was prepared.

2. Background

2.1 ECTEL was established by the ECTEL Treaty, signed on 4th May, 2000 in St. George's Grenada (and amended by Protocol Amendment in force as of 5th December, 2019) by five (5) Member States; namely the Commonwealth of Dominica, Grenada, the Federation of St. Kitts and Nevis, Saint Lucia, and St. Vincent and the Grenadines. ECTEL provides support to the five (5) Member States for the management and regulation of the electronic communications sector through the NTRCs established in each Member State.

2.2 The ECTEL Member States share a harmonised regulatory framework for the management of the electronic communications/telecommunications sector and are currently in the process of transitioning from the Telecommunications Acts and regulations to a new Electronic Communications legislative framework. The harmonised regulatory framework in the ECTEL Member States provides a suite of regulations that govern aspects of the electronic communications/telecommunications sector, from providing access to telecommunications facilities, to the management of the universal service fund. The harmonised regulatory framework establishes technical regulations, setting technical standards for the electronic communications sector, and ensuring compatibility with international best practices and standards.

2.3 Under Article 4 of the ECTEL Treaty, ECTEL is mandated to promote the introduction of advanced electronic communications/telecommunications technologies and an increased range of services in its Member States. As such, one of the priorities of ECTEL is to improve access to electronic communications/telecommunications services, particularly reliable broadband services in the five (5) ECTEL Member States.

2.4 In recent years, ECTEL has observed that the QoS standards stipulated in the current QoS Regulations – the Regulations of 2008 – under the Telecommunications Act, have become obsolete and ineffective in responding to the growth of the sector and the current challenges facing the ECTEL Member States. Therefore, the regulations need to be updated to reflect the current dynamics of the market and international best practices and standards.

2.5 The proposed draft Regulations of 2016 have been revised and updated in accordance with widely accepted international standards and aim to ensure that they:

- follow a future-proof and forward-looking approach,
- are agnostic in respect of specific access technologies or services,
- avoid unnecessary burdens on licensees, such as asking for closely related parameters that measure similar aspects of the operation, and
- enable the NTRCs to monitor QoS standards.

2.6 In essence, the revised and updated draft QoS Regulations will strive to ensure that the users of public electronic communications networks obtain reliable QoS standards from the public electronic communications network operators in ECTEL's Member States.

3. Purpose of the consultation

3.1 This public consultation provides an overview of the proposed revised and updated QoS Regulations developed by ECTEL, to be eventually applied by all its Member States, and invites stakeholders' comments on the proposed revised and updated regulations. The public consultation examines in detail the approaches followed in ten (10) jurisdictions, including other Caribbean jurisdictions, and countries in regions with a more advanced electronic communications /telecommunications sector.

3.2 The consultation document is structured as follows:

- **Section 4** provides a summary of the internationally accepted standards and best practices under review.
- **Section 5** provides a summary of the revised and updated Regulations containing new and amended provisions reflective of new considerations; as well as a summary of the revised technical QoS parameters in Parts A-F. Therefore, Section 5 is the core of the document and should be given special attention.
- **Section 6** refers to **Annex A** which presents the Draft Revised and Updated Electronic Communications (Quality of Service) Regulations, and **Annex B** which presents the 2016 Draft Electronic Communications (Quality of Service) Regulations.
- **Section 7** provides a summary of questions to stakeholders relating to the revised and updated regulations.

4. Review of international QoS practices and standards

4.1. Introduction

4.1 This section provides an overview of the benchmark study carried out by ECTEL, to ensure that the proposed QoS Regulations are aligned with international best practices and standards. Accordingly, the next subsections provide information on:

- The scope of the study, in terms of topics and jurisdictions compared (section 4.2).
- Similar QoS regulations in other jurisdictions (section 4.3).
- A summary of the key takeaways from this analysis (section 0).

4.2 Scope

4.2.1 As a first step, we have analysed how similar regulations from other jurisdictions deal with the following key areas:

- **General Provisions:** These address general aspects, such as the target audience, the geographical scope of QoS measures, whether they include monitoring parameters (i.e., those that may not be reported by licensees but instead be duly controlled by the corresponding national regulatory authority ("NRA").
- **Procedure to submit QoS reports:** This subsection describes the information that must be reported to the NRA, as well as when and by what means QoS reports must be submitted.
- **Verification of QoS Reports:** This subsection describes the processes that NRAs carry out and the mechanisms they use to validate QoS reports submitted by licensees.
- **Publication of QoS results:** This describes who must and/or may publish the QoS results to the general public, as well as the time for publication and the means by which the results are to be published.
- **Parameters:** This presents the categories under which different parameters are grouped for the purpose of comparing these and their associated targets

between countries. A detailed assessment of these parameters is presented in subsection 5.4

- **Services covered:** This subsection presents the main type of services covered in similar regulations related to QoS.
- **Enforcement actions and sanctions:** This describes enforcement measures and sanctions applicable to licensees that fail to meet their QoS obligations.
- **Key Takeaways:** This section summarises the conclusions of this study about the international QoS practices and standards.

4.2.2 We note that QoS is dependent on the peculiarities of the telecommunications networks in each country of the international benchmark study. Therefore, the benchmark must be populated with references that are comparable or otherwise relevant to ECTEL's Member States to avoid including extremely challenging targets that licensees may not be able to meet. We also considered that the revised and updated draft Regulations of 2016 must have a robust framework for an evolving electronic communications sector. Thus, countries with more advanced networks and markets, must be included in the benchmarking exercise. In this regard, we have thoroughly analysed related regulations and frameworks issued by the respective NRAs from the following ten (10) reference countries:

Country	ISO3	Flag	Consulted document
Jamaica	JAM		Quality of service (Consumer) Standards (2014) (Link)
Bahamas	BHS		Quality of service regulations (2016) (Link) Consumer protection regulations (2013) (Link)
Trinidad and Tobago	TTO		Telecommunications (Consumer) (QoS) Regulations (2014) (Link)
Dominican Republic	DOM		Quality of services regulations (2015) (Link)
Ghana	GHA		Quality of service regulations (2019) (Link)
India	IND		Regulations (and their corresponding amendments): Voice (Link), Broadband (Link), Data services (Link), Billing and metering (Link)
Singapore	SGP		Telecommunications Quality of Service Standards (Link)
United Kingdom	GBR		Quality of service parameters (2004) (Link) Universal services conditions (2020) (Link)
European Union	EU		BEREC guidelines for QoS Parameters (2020) (Link)
Qatar	QAT		Quality of retail communication services (2020) (Link)

Exhibit 1: References and consulted documents used [Source: Axon]

4.3 General Provisions

4.3.1 This subsection provides insights on the key topics examined in the jurisdictions covered by our international benchmark study and compares them to the previous QoS Regulations (namely those of 2008 and 2016 - see section 1 for further details on these documents).

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Applicability	All licen.	All licen.	All licen.	All licen.	All licen.	All licen.	All licen.	All licen.	All licen.	USP[3]	All licen.	All licen.
Measurement and reporting requirements	✓	✓	✓	✓	✓	✓	✗	✗	✓	✗	✗	✓
Commencement of regulations	Not defined	6mth. after	6mth. after	24h after	ASAP[4]-18 mth.	6mth. after	N/A	N/A	Not defined	N/A	N/A	ASAP[4]-18 mth.
Glidepath on targets	✓	✗	✗	✗	✓	✗	N/A	N/A	✓	N/A	N/A	✓
Reportable vs monitoring parameters	Report.	Report.	Report.	Report.	Report.	Report.	Report.	Both	Both	Both	Both	Both
Is a geographical scope defined?	✗	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nationwide	N/A	N/A	✓	✗	✓	✓	✗	✓	✓	Note[5]	✓	✓
Areawide	N/A	N/A	✗	✓	✓	✓	✓	✓	✗	Note[5]	✗	✓
Period to keep the measurement records	1.5 years	1.5 years	Not defined	1 year	Not defined	1 year	Not defined	Not defined	Not defined	6 years	N/A	5 years
Contact person	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗
Validation of reports	✗	✗	✓	✓	✗	✓	✗	✓	✗	✓	✗	✓
Provisions of advance notice of planned interruptions	✓	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗	✓
Minimum time in advance	48h	36h	N/A	N/A	N/A	Not defined	N/A	N/A	N/A	N/A	N/A	48h
Provisions related to exemptions in Force Majeure events	✓	✓	✓	✓	✗	✗	✓	✗	✗	✗	✗	✓

Exhibit 2: International benchmark study regarding general provisions [Source: Axon]

4.3.2 All benchmark references define QoS requirements for all applicable licensees in the market, except for the United Kingdom, where this applies to Universal Service Providers (USP) only.

[3] Universal Service Providers
[4] As soon as possible
[5] Locations where universal access is provided.

4.3.3 Some mechanisms are often established to give a margin for licensees to adapt their systems and procedures to the revised and updated regulations, prior to reporting measurements and results.

4.3.4 We have identified two (2) main approaches:

- Typically, international regulations, including ECTEL's draft Regulations of 2016, acknowledge a period between the entry into force of the regulations and the time the licensees are required to report their performance.
- In a few cases, including ECTEL's Regulations of 2008, QoS targets are more relaxed in the first years and gradually become more stringent until the final applicable target has been reached.

4.3.5 Although compliance with QoS standards and targets is mandatory for licensees, not every QoS parameter defined in the framework must be reported to the NRA. In particular, some jurisdictions define **monitoring parameters** as those where results are not required to be reported by licensees, but are meant to be monitored by the NRA, which is responsible for verifying the licensees' compliance with the corresponding standards and regulations.

4.3.6 Most non-Caribbean countries in our study (namely, India, Singapore, the United Kingdom, the European Union and Qatar) define both reporting and monitoring indicators in their regulations. By contrast, Caribbean countries define reportable indicators only.

4.3.7 In terms of geographical scope, all countries explicitly define areas where licensees must take measures and report the QoS results to the NRA. Usually, such measures must be provided at a national level; however, six (6) countries (Bahamas, Trinidad and Tobago, Dominican Republic, Ghana, India, and Qatar) have defined smaller areas (for instance, by municipality, by island, etc.). With the exception of Qatar which defines specific reporting areas for a single parameter, the other five (5) countries comprise either different islands with a reasonable size (Bahamas, and Trinidad and Tobago), or are much larger than ECTEL's Member States (Ghana and India). Of the six (6) countries, Trinidad and Tobago, the Dominican Republic, India, and Qatar require licensees to report average QoS parameters at a national level as well.

4.3.8 It is also usual to define a record keeping period during which licensees are mandated to keep the measurements (i.e., data points) and results of each reporting period. Other than in the current ECTEL's Regulations of 2008 and the

draft Regulations of 2016, this same approach is found in some other Caribbean countries, such as Bahamas, and Trinidad and Tobago, as well as in the United Kingdom and Qatar. In the case of the Caribbean countries, such records must be kept for a period of 1-1.5 years, while in other countries they must be kept for a period of 5-6 years.

4.3.9 However, it appears that in Jamaica, a contact person for the licensee validates the reports' accuracy of content and measurements (see regulation 12).

4.3.10 Most countries in our benchmark study (Jamaica, Bahamas, Dominican Republic, India, United Kingdom, and Qatar) require a validation process for QoS reports submitted by licensees.

4.3.11 ECTEL's QoS Regulations of 2008 and draft Regulations of 2016 provide some indication on the minimum advance notice licensees must give to their users to notify them of planned interruptions, such as those due to regular operation and maintenance activities. Only two (2) other countries in our study (the Dominican Republic and Qatar) have similar indications in their regulations. Of those two, only Qatar defines a specific timeframe for licensees to comply. Other countries have provisions with such a period of advance notice, either in a separate policy text or in the service contracts.

4.3.12 Finally, only four (4) other countries in the study include explicit provisions in their QoS Regulations, which exempt licensees from complying with QoS obligations, in a similar manner to ECTEL's Regulations of 2008 and draft Regulations of 2016. In the case of Bahamas, force majeure is only considered when determining the penalty to apply after a non-compliance.

4.4 Procedure to submit QoS reports

4.4.1 The length of the reporting period and the time to submit QoS reports once this period ends are clearly defined in regulations of other countries.

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Length of the reporting period	Quarter	Quarter	Quarter	Quarter	Quarter Annual	Quarter	Month	Quarter	Month Quarter	Quarter Annual	Annual	Quarter
Time to submit the report after period ends	1 mth. later	1 mth. later	1 mth. later	1 mth. later	Not defined	1 mth. later	Not defined	1 mth. later	1-3 mth. later	1-3 mth. later	Not defined	1 mth. later
Mean to submit reports	Not defined	Not defined	Electr. format	E-mail	Not defined	Not defined	Not defined	Not defined	Not defined	Not defined	Not defined	E-mail

Exhibit 3: International benchmark study regarding the submission of reports [Source: Axon]

4.4.2 Regulations in most of the countries, including ECTEL Member States, require licensees to submit reports quarterly. The EU requires QoS reports on a yearly basis, and Ghana on a monthly basis.

4.4.3 Similarly, most benchmark countries require licensees to submit the reports to the NRA within one (1) month of the expiry of the reporting period.

4.4.4 The minimum contents of QoS reports are not defined by most countries, and their approach vary as regards the definition of key terms, as shown in the exhibit below.

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Minimum contents defined beyond results?	✓	✓	Deter. by NRA	✓	✗	✗	✗	Deter. by NRA	✗	✗	✗	✓
Reporting area	✗	✗	-	✓	N/A	N/A	N/A	-	N/A	N/A	N/A	✗
Reporting period	✗	✗	-	✓	N/A	N/A	N/A	-	N/A	N/A	N/A	✗
Measurements (i.e., data points)	✗	✗	✓	✗	N/A	N/A	N/A	-	N/A	N/A	N/A	✗
Measurement mechanisms and/or tools	✗	✗	-	✗	N/A	N/A	N/A	-	N/A	N/A	N/A	✓
Comments regarding contraventions	✓	✓	-	✗	N/A	N/A	N/A	-	N/A	N/A	N/A	✓
Corrective actions	✗	✗	-	✗	N/A	N/A	N/A	-	N/A	N/A	N/A	✓
# user & amount of compensation	✗	✗	-	✗	N/A	N/A	N/A	-	N/A	N/A	N/A	✓

Exhibit 4: International benchmark study regarding the list of contents to be included in the reports [Source: Axon]

4.4.5 Those countries that do define a minimum list of contents require licensees to submit, along with the results of the calculation of QoS parameters in the reporting period, the measurements themselves (i.e., the specific data points), explanations of the mechanisms or procedures used to obtain the measurements, and a summary of the corrective actions taken in case any targets have not been met, including the number of users affected and the amount paid to them as a compensation for failing to meet QoS standards, if any.

4.5 Verification of QoS Reports

4.5.1 After the report's submission by the licensees, most NRAs require a validation process to verify the quality of the results. There is no common practice among NRAs in this regard, but a wide variety of validation mechanisms exist. While these primarily seek to verify the QoS parameter measurements, the verifications may also extend to the reporting methodology and the calculations made.

4.5.2 In the Bahamas, once the Commission has verified the reporting format, licensees are required to make any necessary amendments or corrections and to re-submit a properly adjusted report or the relevant part thereof.

4.5.3 With regards to the verification of QoS parameter results included in the report, a common approach followed among the reference countries is to conduct an audit process for an exhaustive review of the parameter measurements and calculations. Qatar defines two types of controls in this audit: validity controls, to review the accuracy of results and the internal (administrative and technical) procedures followed, and performance controls, conducted to compare real and reported measurements.

4.5.4 Two (2) reference countries (Jamaica and the Bahamas), define a set of activities to be conducted in the audit process. These include the inspection of equipment, analysis of information, conducting tests, providing additional information, etc.

4.5.5 The Dominican Republic defines tools for validation other than an audit, such as site and equipment inspections and monitoring, field studies and measurements, user surveys, and a comparison between data from network administration centres and data supplied by the licensee. The other reference countries do not define any specific activities for the audit process.

4.5.6 In four (4) reference countries (Jamaica, Dominican Republic, Ghana, and Qatar) the NRA conducts the audits. Two (2) countries (Bahamas and United Kingdom) commission the audit process through an independent auditor. In the case of India, the audit process can be conducted by either the NRA or an independent auditor.

4.5.7 The regulations reviewed generally do not specify a time frame for the occurrence of such audits, except for Ghana, which defines a maximum of one (1) audit process per year per licensee.

4.6 Publication of QoS results

4.6.1 Comparable regulations in other countries show that NRAs are usually responsible for publishing the QoS performance of licensees, mainly through their website.

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Includes provisions regarding publication	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Defines entity publishing results	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NRA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	At NRA discret.
Licensees	✓	✓	✗	✗	✗	✓	✗	✓	✓	✓	✓	✓
Time to publish results after submission	3-12 mth.	1 year	Not defined	At least 6mth.	At most 1 year	Not defined	1mth.	Not defined	No defined	1mth.	1 year	10d
Mean to publish results	✓	✓	✗	✓	✓	✗	✗	✓	✓	✓	✓	✓
Website	✓	✓	N/A	✓	✓	N/A	N/A	✓	✓	✓	✓	✓
Press	✓	-	N/A	✗	✗	N/A	N/A	✓	✗	✗	✗	✓
Annual reports	✗	-	N/A	✓	✗	N/A	N/A	✗	✗	✗	✗	✗

Exhibit 5: International benchmark study regarding the publication of results [Source: Axon]

4.6.2 With the exception of the United Kingdom and Qatar, NRAs are empowered to periodically publish QoS performance reports. Moreover, in the Dominican Republic, India, Singapore, the United Kingdom, the EU, Qatar, and ECTEL's Member States, licensees must inform the general public of their QoS performance.

4.6.3 There is no convergence on the time for publication of the results, either by the NRA or by the licensees concerned, following the submission of the QoS report. The time for publication varies from ten (10) days to one (1) year depending on the country. In other cases, including Jamaica, Dominican Republic, India, and Singapore, it is left undefined.

4.6.4 However, international practice is well-aligned on the means of publication of the reports, with a clear preference for the corresponding NRA's website as the appropriate medium for publication.

4.7 Parameters

4.7.1 In addition to analysing the provisions included in other regulations, ECTEL has conducted a thorough assessment of the QoS parameters in each regulation, as well as their associated target(s).

4.7.2 When comparing parameters between countries, a main challenge comes from the fact that each country uses its own naming conventions, which makes direct comparisons complicated. To address this challenge, ECTEL has harmonised the names of parameters based on its definition, measurement and calculation procedures, and target units. Parameters were grouped in the following nine (9) categories, based on the lifecycle of a service or a client: 1) coverage, 2) service provisioning, 3) availability, 4) network performance, 5) service quality, 6) fault management, 7) billing, 8) customer care, and 9) customer experience.

4.7.3 These "level 1" categories are then broken down into subcategories ("level 2") which are then disaggregated into further subcategories ("level 3"). As a next step, we have harmonised and aggregated the parameters. The aim of such aggregation in different hierarchies is two-fold: i) ensuring that all level 1 categories are present in the draft revised and updated QoS Regulations and ii) avoiding overlapping requests for similar parameters.

4.7.4 Subsection 5.19.3 contains detailed explanations of the QoS parameters included in the draft revised and updated QoS Regulations as well as those already present in the Regulations of 2008 or the draft Regulations of 2016. Further, this subsection includes the QoS parameters that were removed from the draft revised and updated QoS Regulations.

4.8 Services covered

4.8.1 Voice and broadband are the main services covered by QoS and QoE regulatory frameworks. The following exhibit summarises the services covered in each jurisdiction:

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Voice	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Broadband	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Mobile messaging	✓	✓	✓	✓	✓	✓	✓	✗	✓	✗	✓	✓
Leased line	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Satellite	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓
Subscription TV	✗	✓	✗	✓	✓	✗	✗	✗	✗	✗	✗	✗

Exhibit 6: International benchmark study regarding the services covered [Source: Axon]

4.8.2 Despite the low adoption of parameters related to leased lines and satellite services, the increasing importance of these services in the telecom landscape justifies their inclusion in the new QoS Regulations.

4.9 Enforcement actions and sanctions

4.9.1 In general, most countries have mechanisms to enforce QoS targets, however these are vaguely defined. The following exhibit presents a summary of the different enforcement actions an NRA may use, depending on the regulatory framework:

Provision	2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
Enforcement actions defined?	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓
Issue of order and /or determinations	✗	✗	✓	✓	✓	✓	✓	✗	✗	✗	N/A	✗
Suspension of the licence	✓	✓	✗	✓	✓	✓	✗	✗	✗	✗	N/A	✗
Termination of the licence	✓	✓	✗	✗	✓	✗	✗	✗	✗	✗	N/A	✗
Direction on remedial actions	✗	✗	✓	✗	✗	✗	✓	✗	✗	✗	N/A	✓
Consumer compensation	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	N/A	✓
Financial penalty	✗	✗	✓	✓	✓	✓	✓	✓	✓	✗	N/A	✓
Specific figures provided?	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	N/A	✗
Name & shame	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	N/A	✓

Exhibit 7: International benchmark study regarding the enforcement actions [Source: Axon]

4.9.2 Only the European Union has not defined any enforcement action, as its activity in this area is limited to recommendations, leaving the adoption of definitive rules to EU Member States.

4.9.3 Of the remaining jurisdictions, five (5) (Jamaica, Bahamas, Trinidad and Tobago, the Dominican Republic, and Ghana) start the enforcement process by issuing a notice to licensees, prior to undertaking more drastic actions.

4.9.4 All of countries examined, with the exception of the United Kingdom, consider financial penalties as the best means to enforce targets. Interestingly, only three of them (Ghana, India, and Singapore) outline specific figures or ranges of such penalties in their regulations.

4.9.5 A few countries impose more drastic measures, including the revocation and termination of a licence, in the event of a licensee's repeated failure to comply with the QoS standards and regulations.

Key takeaways

4.10 Our key takeaways from the international comparison are summarised below:

- Benchmark countries differentiate between "reportable" and "monitoring" parameters. Only reportable parameters are to be included in QoS reports submitted by the licensees.
- Most frameworks define a geographic area for licensees to report their QoS performance. Such areas may be sub-national (e.g., regions, islands, or municipalities) and apply only to specific parameters.
- Regulations require operators in benchmark countries to maintain records of the results and the measurements collected for a certain period.
- Regulations may include specific requirements to notify users in advance of any planned interruption of services or networks. However, such requirements may also be found in policies related to consumer protection or directly in the terms and conditions of operators' contracts with end customers.
- All benchmark countries define the length of the reporting period and a deadline for the submission of the reports after each reporting period. A few of them also define a channel for the submitting these reports to the NRA.
- Regulations may include a list of minimum contents licensees must include in the report.
- Defining a single point of contact for the purposes of communication with the NRA on QoS-related matters is not a common practice among the benchmark countries. In Jamaica, this specified person also bears

responsibility for ensuring the quality and trustworthiness of information on QoS reports the licensee submits to the relevant NRA.

- Most jurisdictions include a process for the NRA to verify the information included in QoS reports submitted by licensees. Verification is made through an audit process, carried out by the NRA or a third party acting on its behalf. Some countries also define a set of activities for validations or audits, such as gathering additional information on equipment, taking QoS measures, reviewing processes, etc.
- The performance of licensees in each reporting period is published by either the NRA or the licensees themselves. The time for publication of the results and the media for such publication are usually specified in the regulations.
- Most countries include enforcement actions and sanctions in their regulations.

5. Electronic Communications (Quality of Service) Regulations

5.1 Revised and updated QoS Regulations

This section provides additional information on the proposed revised and updated QoS Regulations of 2016, taking into consideration international standards and best practices identified in the international benchmark study. In general, there was no major departure from the draft regulations of 2016, save that the revised and updated regulations is now more current and addresses new QoS elements for the electronic communications sector in the ECTEL Member States. It is notable that in the revised and updated QOS Regulations of 2016 some existing regulations were amended and, in some cases, revised and updated regulations were included.

The following are key regulations which form part of the revised and updated QOS regulations of 2016:

- **Regulation 3 – Interpretation:** (minor amendments made)
- **Regulation 4 – Application:** (minor amendments made)
- **Regulation 5 – Quality of Service Criteria and Parameters**: (amended)
- **Regulation 6 – Geographical Scope:** (new regulation included)
- **Regulation 7 – Monitoring Quality of Service:** (new regulation included)
- **Regulation 8 – Publication of Quality of Service Information:** (new regulation included)
- **Regulation 9 – Service Level Agreement:** (amended - previously regulation 8)
- **Regulation 10 – Record keeping:** (no amendments made)
- **Regulation 11 – Submission of Reports to the Commission:** (amended)
- **Regulation 12 – Accountable Officer:** (new regulation included)
- **Regulation 13 – Verification of reports:** (new regulation included)
- **Regulation 14 – Force Majeure:** (amended - previously regulation 12)
- **Regulation 15 – Advance Notice of Interruption:** (amended - previously regulation 14)
- **Regulation 16 – Commission to issue Guidelines:** (new regulation included)

- **Regulation 17 – Compliance and enforcement**: (amended - previously regulation 15)
- **FIRST SCHEDULE:** (included with proposed prescribed forms under regulation 14)
- **SECOND SCHEDULE:** (amended - previously only schedule in QOS regulations)
- **Parts A – D:** (amended and now reflect Parts A – F)

5.2 New and amended provisions

The revised and updated draft regulations of 2016 contains new and amended provisions which reflect new considerations for QoS, as the sector has evolved since the draft QoS Regulations of 2016 were drafted.

5.3 Regulation 3 – Interpretation

Amendments made include the deletion of a few definitions. A definition of force majeure (regulation 14) was amended.

5.4 Regulation 4 – Application

Minor amendments were made to this provision.

5.5 Regulation 5 - Quality of Service Criteria and Parameters

5.5.1 During the review process we identified a number of issues to be addressed in the revised and updated QOS Regulations of 2016. These are as follows:

- The process of reporting performance to the NTRC
- The monitoring process of QoS parameters
- The degree of engagement of licensees in the measurement of QoS
- The verification of QoS results reported by the licensees
- The QoS parameters included in, or excluded from, the draft new
- Regulations
- The publication of QoS performance results
- The minimum period for which licensees must maintain QoS measurements and results
- The minimum period within which licensees must inform end-users before executing a planned interruption
- The definition and process for licensees to notify force majeure events which affects their obligations relating to QoS
- Amendments and inclusion of new Parts/Tables with the relevant QoS parameters

- The discretionary power of the Minister with responsibility for electronic communications to amend the Schedules upon receipt of a recommendation from the Commission, after consultation with ECTEL

5.6 Regulation 6 – Geographical Scope

Regulation 6 – is a new provision included in the revised and updated Regulations.

5.6.1 ECTEL recommended the inclusion of this regulation, to accommodate the variations in the geographical scope of its Member States. Under this provision, the NTRC in each Member State, shall on a recommendation of ECTEL, determine the geographical scope for the application of the regulations. ECTEL shall undertake a public consultation, before submitting its advice and recommendation to the NTRC.

5.6.2 Geographical scope is an area in which the applicable licensees (regulation 6) must take measurements and report the results. According to the benchmark study, we confirmed reference jurisdictions which includes 'geographical scope' for reporting purposes:

- Three (3) reference jurisdictions (Jamaica, Singapore, and the European Union) define the reporting area at national level.
- Two (2) countries (Bahamas and Ghana) define reporting areas at regional level (e.g., municipalities, islands).
- Four (4) countries (Trinidad and Tobago, the Dominican Republic, India, and Qatar) define reporting areas at both regional and national level. Qatar is defining a reporting area at regional level only for one specific parameter.
- Only one (1) jurisdiction (the United Kingdom) does not clearly specify the reporting areas. This is because regulations apply only to operators with universal service obligations and hence only to those specific areas in which such universal service is provided.

5.6.3 Most of the countries specifying reporting areas at regional level, either comprise different islands of a reasonable size in terms of area and population (Bahamas, and Trinidad and Tobago) or are much larger in size than any of the Member States (the Dominican Republic, Ghana, and India).

5.6.4 Therefore, acknowledging the geographical characteristics of the ECTEL Member States in terms of land area (km^2) and population, and to facilitate the collection process by the applicable licensees (regulation 4), we suggest determining the

reporting area in each Member State, as that which is confirmed in ECTEL's recommendation following the public consultation.

5.6.5 Notwithstanding the above, an NTRC may require a licensee to take and report measurements in one or more specific areas, if this is deemed necessary by the NTRC.

Question 1: Do you consider it reasonable to define a national level reporting area, comprising the entirety of each individual state, in the draft revised and updated regulations? Should the reports also cover any sub-national areas?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.7 Regulation 7 – Monitoring Quality of Service

Regulation 7 – This is a new provision included in the revised and updated Regulations.

5.7.1 The revised and updated regulations outline a duty for the NTRCs to conduct their own measurements of QoS service parameters defined in the Regulations, according to the methodology specified in the Guidelines to be issued by the NTRC is accordance with regulation 16.

5.7.2 Such measurements should be made by the NTRCs or a third party commissioned for that purpose in areas and at the frequency decided by the corresponding Commission and should be used as first-hand information to be compared to the information provided by the licensees.

5.7.3 The ITU Quality of Service Regulation Manual states that QoS Monitoring is an essential aspect of QoS regulation. The benchmark study has confirmed that monitoring is widely used as a tool to identify any gaps in the licensees' network performance and compliance with the relevant regulations. For example, Singapore monitors and reports QoS quarterly for licensees, providing visibility on their performance. The Dominican Republic does not monitor the network on a regular basis but uses this process to verify the results reported by the licensees. Other countries (Trinidad and Tobago, Ghana and Qatar) monitor licensees' compliance with QoS regulations through procedures for the continuous review of

QoS results, guided by the applicable terms and conditions for the provision of telecommunication services.

Question 2: Do you find it useful that NTRCs monitor the licensees' QoS parameters? Do you agree with the provisions set out in the Regulations regarding QoS monitoring by the NTRCs? Would you propose any modifications to those provisions? Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.7.4 Even when licensees are required to comply with a target for each parameter set out in the regulations, international practice shows that licensees are not necessarily required to report the measurements and results for all of them, as the NTRCs may conduct their own measurement campaigns and verify compliance with the QoS standards.

5.7.5 In the benchmark study, we confirmed that:

- Caribbean countries and Ghana define only reportable parameters; and
- Five (5) other jurisdictions (India, Singapore, the United Kingdom, the European Union, and Qatar) define both monitoring and reportable parameters.

5.7.6 ECTEL is of the opinion that monitoring parameters (i.e., parameters monitored by the NTRCs, for which licensees are not required to submit measurements) are useful in reducing the burden on licensees. Moreover, the NTRCs' monitoring of compliance with QoS standards is one of the key objectives of the revised and updated draft Regulations. Therefore, it defines both monitoring and reportable parameters.

5.7.7 The definition of a parameter in the "monitoring" category, does not exempt licensees from the obligation to comply with the targets set out in the draft revised and updated regulations. An NTRC conducting its own measurements and detecting a QoS performance below the targets set, will ask the service provider concerned for more information to validate its observations and to clarify the reasons for any non-compliance. Hence licensees are strongly advised to monitor such parameters themselves as well, and optionally provide them in their QoS reports although they are not obliged to do so.

Question 3: Do you find the definition of monitoring parameters reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.8 Regulation 8 – Publication of Quality of Service Information

Regulation 8 – This is a new provision included in the updated and revised Regulations.

5.8.1 The publication of QoS and QoE reports brings transparency and visibility to the whole process and allows customers to make informed decisions. ITU recommends that NRAs publish information about QoS in the country to foster competition[6], and international practice shows that results are either published by the NRA or by licensees.

5.8.2 Most references in the benchmark study (with the exception of the United Kingdom and Qatar) define in their regulations the NRA as the entity publishing the results.

- NRAs of six (6) jurisdictions (Dominican Republic, India, Qatar, Singapore, United Kingdom and the European Union) mandate operators to publish their QoS reports and parameters.
- The NRA of Qatar reserves the right to publish QoS information at its discretion.
- The United Kingdom requires only licensees to publish their results.

5.8.3 In the ECTEL's Member States, the Regulations of 2008 and the draft Regulations of 2016 define the NTRC as the entity publishing the results, and require licensees to inform the general public of their QoS performance.

5.8.4 Accordingly, the revised and updated QoS Regulations has given the NTRC the mandate to publish (totally or partially), the QoS and QoE results submitted by licensees.

5.8.5 Moreover, the NTRC will also have the mandate to publish the QoS performance, relying on its own measurements following a monitoring campaign. This approach

[6] Source: ITU, Section 3.4.5 "Quality of service regulation manual", 2017; Available at: http://handle.itu.int/11.1002/pub/8108e11f-en

is aligned with the practice observed in the benchmark study, but is also consistent with ITU's recommendations on the publication of QoS performance of national telecommunication licensees.

5.8.6 In addition, the benchmark study shows that NRAs usually have a timeframe to publish the results from licensees. However, such timeframe and the periodicity of publications differ between countries:

- In Qatar, the publication of results normally occurs ten (10) days after the submission of the reports.
- In Ghana and the United Kingdom, results are published within a month, while in the Bahamas this period extends to six (6) months after the submission of the reports.
- In Trinidad and Tobago, and the European Union, results are published at least once a year.

5.8.7 In the previous Regulations of ECTEL, it was observed that different timeframes were adopted, spanning from three (3) to twelve (12) months. Recognising that there was not a common approach, ECTEL believes that the period for the publication of the results must not exceed six (6) months, which leaves enough time for licensees to provide any comment to the NTRC, while the general public is adequately informed.

Question 4: Do you find the publication process of results to be reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.9 Regulation 9 – Service Level Agreement

Regulation 9 – This regulation was amended.

5.9.1 The revised and updated regulation includes a public consultative process to ensure feedback is received from licensees and other related stakeholders, before ECTEL submits its advice and recommendations to the NTRCs.

Question 5: Do you find the process outlined in this regulation reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.10 Regulation 10 – Record keeping

Regulation 10 – This regulation remained unchanged

5.10.1 We confirmed that this provision did not necessitate amendments, as in some cases, licensees are required to store the measurements (i.e., data points) and results, so that this may help in a possible audit that may be conducted by the NTRC. In the benchmark, we have taken note of different approaches:

- Six (6) references (Jamaica, Trinidad and Tobago, Ghana, India, Singapore, and the European Union) do not define a record keeping period.
- Two (2) countries (Bahamas and Dominican Republic) define a record keeping period of no less than 12 months.
- Two (2) countries (the United Kingdom and Qatar) define a period of five (5)years, or longer for the record keeping period.

5.10.2 In the previous QoS Regulations 2008, licensees were mandated to keep the records for an eighteen (18)-months period, which ECTEL deems appropriate to maintain in the draft revised and updated regulations.

Question 6: Do you find the proposed record keeping period reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.11 Regulation 11 – Submission of Reports to the Commission

Regulation 11 – This regulation was amended.

5.11.1 During our review of this provision, we observed that licensees in benchmark countries are required to report their QoS performance to the NRA. The draft revised and updated regulations must therefore clearly cover the procedure for the submission of such reports by the licensees.

5.11.2 Licensees in benchmark countries are required to report their QoS performance to the NRA. The revised and updated draft Regulations must therefore clearly cover the procedure for the submission of such reports by the licensees.

5.11.3 Regarding the timeframe for the collection of measurements by the licensees (i.e., the "reporting period"), previous Regulations proposed by ECTEL considered a three-month reporting period, which is aligned with international best practice. In particular, out of the 10 reference jurisdictions whose regulations we studied:

- Five (5) countries (Jamaica, Bahamas, the Dominican Republic, India, and Qatar) define the reporting period as three months (i.e., once every quarter).
- One (1) reference (the European Union) recommends a reporting period of one year.
- One (1) country (Ghana) has a reporting period of one month only.
- Trinidad and Tobago requests licensees to submit their QoS information quarterly, with an annual summary.
- Singapore and United Kingdom request monthly or quarterly report submission, depending on the parameter.

5.11.4 Therefore, with the exception of Ghana and the European Union, there is a clear preference among NRAs to set a quarterly reporting period (i.e., every three (3) months). As a result, we have decided to maintain the reporting period of three (3) months in the draft revised and updated regulations.

Question 7: Do you find a period of three (3) months reasonable for reporting QoS parameters?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.11.5 Once the reporting period ends, licensees must submit the corresponding QoS report with the results of the calculation of the requested parameters. The maximum time to submit such a report after the reporting period ends is usually specified in the regulations. As in ECTEL's previous Regulations, the benchmark countries define a so-called "submission period" of one (1) month after the end of each reporting period.

5.11.6 The revised and updated draft Regulations maintain a submission period of one (1) month.

Question 8: Do you find it reasonable to require that the report on QoS performance should be submitted within a month from the end of the reporting period?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.11.7 Lastly, beyond the QoS results, licensees are also required to submit additional information to contextualise the results. In two (2) countries (Jamaica and India), such information is determined mainly by the NRA. Further in two (2) countries (Bahamas and Qatar) there is a clearly defined minimum list of contents. In particular:

- Some countries request additional information about the measurements performed such as, the methodology used for the calculation, in addition to the results or data points of the calculation. Jamaica requires the provision of all data points while Qatar asks for the measurement mechanisms or procedures utilised to obtain the results.
- In Bahamas, licensees must provide the reporting area and the reporting period under assessment.
- Qatar goes a step further and requires licensees to include explanations whenever a target is not met.

5.11.8 ECTEL believes that providing enough background information will greatly facilitate the interpretation and validation of the QoS reports. Accordingly, the revised and updated QoS Regulations request licensees to provide:

i. name and type of service;
ii. results;
iii. calculation methodology, including all data points used and procedures to obtain the data, comments on any failure to comply with the target; and
iv. (if target is not met) any corrective actions taken to comply with the target in the future.

Question 9: Do you find the information required in the QoS reports reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.12 Regulation 12 – Accountable Officer

Regulation 12 – This is a new regulation being recommended to the updated and revised Regulations.

5.12.1 The applicable licensees (regulation 4) are now obligated to assign a senior accountable officer as a single point of contact in communication with the NTRCs

in relation to QoS matters, and to fulfil the licensees' obligations under these regulations.

Question 10: Do you consider the obligation imposed on licensees to assign a senior accountable officer as a contact person reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.13 Regulation 13 – Verification of Reports

Regulation 13 is a new provision being recommended to the updated and revised Regulations.

5.13.1 This regulation discusses the procedure set out which requires the NTRCs and ECTEL to verify the information provided by licensees in their periodic reports on QoS, which they should be submitting to the NTRCs, as outlined in these Regulations.

5.13.2 This verification process comprises two (2) steps:

1. First, the NTRCs will determine whether the information received from the licensees is in compliance with the requirements, compare that information to the NTRCs' own measurements, and evaluate any non-compliance reported by the licensees. The NTRCs, may, in consultation with ECTEL:
   (a) Require the submitting licensee to make any necessary amendments or corrections to the measurements and reporting format, or
   (b) Request additional information from the licensee on the methodology and the measures taken.
2. Second, in the event of inconsistencies between the measurements reported by a licensee and those measured by the NTRC, or of sustained non-compliance with QoS targets by a licensee, or if so recommended by ECTEL, the NTRCs may send a written request to open an investigation in order to clarify the procedure and the measures taken by the licensee that led to such inconsistencies.

5.13.3 After [7] days from the reception of such a written request, the affected licensee must be ready to demonstrate the methodology followed, to calculate the parameters, the measurements taken and the sources of information used, and

hence transparently demonstrate that the measurements and reporting requirements have been complied with.

5.13.4 If an NTRC is dissatisfied with the outcome of the investigation, the NTRC must consult with ECTEL, which in turn, may consult with an independent body and will submit its recommendations to the NTRC (subregulations 13(7) and (8)).

5.13.5 The ITU Quality of Service Regulation Manual recommends auditing QoS information provided by licensees. This recommendation is also followed by the practices observed in benchmark countries: most of them conduct audits as a verification tool for QoS results reported by the licensees. This auditing process is conducted by the NRAs concerned or by an independent auditor.

Question 11: Do you find the process to verify the qos report useful and complete? Would you propose any modifications to the process or the associated provisions?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.14 Regulation 14 – Force Majeure

Regulation 14 – This regulation was amended.

5.14.1 This provision was amended in the revised and updated regulations of 2016 to provide a more robust and streamlined procedure for dealing with force majeure events. It substantially expands the force majeure provisions contained in the draft regulations of 2008 and provides a step-by-step procedure with prescribed times lines, following the notification of a force majeure event by a licensee, for the NTRC to investigate the force majeure event, complete its investigation and inform the licensee of its findings. This is now aligned with the amended definition of force majeure in regulation 3.

5.14.2 Under this revised and updated regulation, the NTRC must submit a report to ECTEL with information on the force majeure notification and the relevant investigation's conclusions. ECTEL must review this report and submit its recommendations to the NTRC. Based on the recommendations made, the NTRC will issue a Force Majeure Certificate (prescribed), where it is accepted that a force majeure event has occurred or issue a Force Majeure Non-Certificate (prescribed)where it is determined that no force majeure event has occurred.

5.14.3 In cases where a non-certificate is issued, the NTRC must provide the licensee with reasons for its decision in writing. In keeping with principles of fairness, the amended regulation 14 provides an appeal process, where adverse decisions are taken against a licensee.

5.14.4 A Force Majeure Certificate may exempt a licensee (totally or partially) from its obligation to comply with QoS standards under the revised and updated draft QoS Regulations. It also specifies the actual or estimated duration of the Force Majeure period, with the possibility of extension. The expansion of this regulation, which sets out a more formal and detailed process, was necessary to ensure transparency and fairness, so that licensees are clear as to the extent of their exemption from regulatory obligations during a force majeure event. Further, ECTEL deemed it necessary to include timelines to ensure efficiency when dealing with such events.

5.14.5 We observed that 4 out of the 10 benchmark countries include provisions related to force majeure in their QoS Regulations. More generally, the issuance of force majeure certificates is not an unusual process. ECTEL has proposed the introduction of prescribed Force Majeure Certificates which will be included in the First Schedule.

Question 12: Do you find the definition of Force Majeure in regulation 3 reasonable? Do you agree with the proposed provisions and the procedure required for licensees to obtain a Force Majeure exemption as stipulated in regulation 14?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.15 Regulation 15 – Advance Notice of Interruption

Regulation 15- This regulation was amended.

5.15.1 This regulation contains minor amendments to the time frame in which notice is to be given and includes an additional platform by which customers are to be notified.

5.15.2 Advanced notice of planned interruptions refers to the minimum period given to licensees to communicate such events in advance to the general public.

5.15.3 Only two (2) benchmark references (Dominican Republic and Qatar) include provisions regarding advance notices of interruptions. Both include separate sections for this topic within their regulations rather than defining it in QoS parameters. Only Qatar is clearly specifying a required timeframe of 48 hours.

5.15.4 In the QoS Regulations of 2008, this period was outlined as 48 hours, while in the draft QoS Regulations of 2016, it was outlined as 36 hours. Licensees were required to inform the average notice period achieved in their QoS Reports, which ECTEL does not consider necessary.

5.15.5 In the revised and updated draft QoS Regulations, ECTEL proposes an advance notice of 48 hours for any network interruption considered "planned".

Question 13: Do you find the advance notice of planned interruptions reasonable? Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.16 Regulation 16 – Commission to issue Guidelines

Regulation 16 – This is a new regulation being recommended to the updated and revised Regulations.

5.16.1 This is similar to the powers granted to the NTRCs to issue guidelines or directives to the applicable licensees (regulation 4) on any aspect of these regulations under these regulations, after consultation with ECTEL, and publish these guidelines on its website.

Question 14: Do you consider the proposed regulation reasonable?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

5.17 Regulation 17 – Compliance and enforcement

Regulation 17 – This regulation was amended.

5.17.1 Minor amendments were made to this regulation to include a penalty for a continuing offence and non-compliance with the regulations.

FIRST SCHEDULE:

This has been added with the proposed prescribed forms under regulation 14

5.18.1. Two (2) prescribed forms have been included in the First Schedule, which are aligned to the new and amended regulation 14 (see section 5.13 of this document).

Question 15: Do have any suggestions on the Force Majeure Certificate and Force Majeure Non-Certificate prescribed forms?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

SECOND SCHEDULE:

5.19.1 Previously this appeared as the only Schedule. Amendments were made to this Schedule, which now includes revised and updated tables.

PARTS A-F

5.19.2 Parts A – D These were amended and now reflect Parts A - F

QoS parameters and targets

5.19.3 This section discusses the list of QoS parameters included in the revised and updated draft QoS Regulations. We compared the parameters contained in the QoS Regulations of 2008 and the draft QoS Regulations of 2016. In particular, we explain the reasons for the inclusion or exclusion of some parameters in the revised and updated draft QoS Regulations. Accordingly, this section outlines the following:

- Parameters included in the draft revised and updated regulations: this explains the reasons behind the selection of the parameters and the targets defined for each parameter.
- Parameters excluded from the draft revised and updated regulations: this explains why some parameters mentioned in the current QoS Regulations of 2008 and draft QoS Regulations of 2016 have been removed from the new text.

5.19.4 In selecting QoS parameters, ECTEL has relied on three (3) factors, in line with the principles set out in section 2 of this document, namely:

- **Alignment with international practice**
- **Degree of reliance on licensees** to calculate the parameter, i.e., assessing whether this parameter can be easily measured by the NTRC through QoS monitoring campaigns or whether the NTRC must rely on the information provided by licensees to calculate it.
- **Dependence on technology**, i.e., assessing whether the parameter is technology-agnostic, as is preferable, to ensure more future-proof draft revised and updated QoS Regulations.

5.19.5 In addition, the ECTEL has based its targets on both the international benchmark and those of the previous QoS Regulations. For that purpose, targets from the 10 countries in the benchmark study were grouped in three tiers (**low**, **moderate**, and **high**) depending on the stringency of the targets they impose on licensees.

5.19.6 The Minister with responsibility for electronic communications may adjust targets for QoS parameters (following consultation with ECTEL and the NTRC) as stipulated in regulation 5(3).

5.19.7 Overall, the Regulations include twenty-seven (27) parameters compared to the forty-nine (49) included in those of 2016. Six (6) new parameters have been added to ensure full coverage of the service lifecycle and twenty-eight (28) have been removed from the draft QoS Regulations of 2016 or aggregated into other parameters to reduce the burden imposed on operators. Five (5) parameters have been classified as "monitoring" meaning that operators are not required, but welcome, to include them in their periodic reports, and that they will be monitored separately by the corresponding NTRC.

Parameters included in the draft revised and updated regulations – Second Schedule

Signal strength

5.20.1 This parameter is defined as: "*The transmitter power output received by a reference antenna at a distance from the transmitting antenna within the coverage areas as reported by a licensee*". It is applicable to licensees of mobile public EC and/or wireless internet services.

5.20.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗

Exhibit 8: International benchmark for signal strength [Source: Axon]

5.20.3 Signal strength is covered in the regulations from three benchmark references and can be defined regardless of the technology currently in use. In line with the draft Regulations of 2016, ECTEL believes that understanding coverage across the country will allow the NTRC to identify areas with poor mobile or wireless service quality and contribute to improving the overall performance of the service. This parameter is declared as "monitoring", meaning that licensees are not required to report this parameter to the NTRC and that it will be the NTRC that will take its own measurements and verify whether the target is met in areas supposedly covered by the licensees.

5.20.4 More detailed explanations on how the signal strength must be measured by licensees can be found 2016 Draft Electronic Communications (Quality of Service) Regulations below. Licensees must carry out measurements according to the following international standards: 2G and 3G: ETSI TS 125 225; 4G: ETSI 136 214; and 5G: ETSI 138 215).

5.20.5 The following exhibit compares the targets in the Regulations of 2008, the draft Regulations of 2016 and the ones found in international practice to the values proposed in the draft revised and updated regulations.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
Fixed public EC and internet services					
-	**ECS** *Indoor:* 90% of measures ≥ -75 dBm *Outdoor:* 90% of measures ≥ -95 dBm *In-vehicle:* 90% of measures ≥ -85 dBm	**SGP** For 3G *Indoor:* 85% of measures ≥ -100 dBm *Outdoor:* 99% of measures ≥ -100 dBm *In-vehicle:* 99% of measures ≥ -100 dBm For 4G *Indoor:* 85% of measures ≥ -109 dBm *Outdoor:* 99% of measures ≥ -109 dBm *In-vehicle:* 99% of measures ≥ -109 dBm	-	**GHA** *Indoor:* 100% of measures ≥ -75 dBm *In-vehicle:* 100% of measures ≥ -85 dBm *Outdoor:* 100% of measures ≥ -95 dBm **IND** *Indoor:* 100% of measures ≥ -75 dBm *In-vehicle:* 100% of measures ≥ -85 dBm	**ECS** *Indoor:* 85% of measures ≥ -75 dBm *Outdoor:* 85% of measures ≥ -95 dBm *In-vehicle:* 85% of measures ≥ -85 dBm

Exhibit 9: International benchmark about signal strength targets [Source: Axon]

5.20.6 Looking at the international benchmark and acknowledging the readiness of networks in Member States, ECTEL proposes to soften the targets for signal strength as defined in the draft Regulations of 2016 for all types of measurements: indoor, outdoor and in-vehicle.

Supply time for connection

5.21.1 This parameter is defined as: "*The time elapsed from receipt of a valid service order being placed by a customer to the instant a working service is made available for use, excluding orders cancelled by the user during the provisioning process*." It is applicable to licensees of fixed public EC, mobile public EC, internet services, and subscriber television services.

5.21.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓

Exhibit 10: International benchmark for supply time for connection [Source: Axon]

5.21.3 The supply time for connection is defined in the regulations of all other countries in the benchmark for public fixed telephony and internet services, except for the Dominican Republic. It is not so common to find it for public mobile and subscriber

television services in countries outside the Caribbean. In the case of leased line services, this parameter is found only in Qatar.

5.21.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the values proposed by the draft revised and updated regulations for the different services.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed public EC and Internet services					
ECS 90% in 7 w.[7] days	**ECS** *Fixed telephony:* 90% in 5 w. days *Fixed internet*: 90% in 5 w. days *Wireless internet:* 95% in 3 w. days	**GBR** 80% in 12 months 95% in 18 months 95% in 24 months **JAM** 80% in 5 w. days 95% in 10 w. days	**TTO** 75% in 3 days 95% in 5 days 100% in 7 days **IND** *Fixed telephony*: 100% in 7 days *Fixed broadband*: 100% in 15 days	**BHS** 100% in 5 days (A1) 100% in 6 days (A2) 100% in 7 days (A3) **GHA** 100% in 5 days **QAT** 99% in 3 days if c.w.[8] not required 95% in 10 days if c.w. required **SGP** 98% in 3 w. days 100% in 7 w. days	**ECS** 75% in 3 w. days 95% in 5 w. days 100% in 7 w. days
Mobile public EC services					
ECS 85.0% in 2 w. days	**ECS** *Pre-paid*: On-demand *Post-paid*: 100.0% in 3 hours	**GHA** 100% in 5 days	**TTO** 95% in 1 hour 99% in 5 hours 100% in 24 hours **IND** 95% in 4 hours	**BHS** 100% in 1 w. hour	**ECS** *Pre-paid*: On-demand *Post-paid*: 95% in 1 hour 99% in 5 hours 100% in 24 hours
Leased line services					
-	**ECS** 90% on agreed day	**-**	**QAT** 100% in 20 days if civil works not required 100% in 2 months if civil works required	**-**	**ECS** 90% on agreed day

[7] "w" stands for "working".
[8] "c.w." stands for "civil works".

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Subscription TV services					
-	**ECS** 100% in 5 w. days	**BHS** 100% in 5 days (A1) 100% in 6 days (A2) 100% in 7 days (A3)	-	**TTO** 75% in 1 days 95% in 2 days 100% in 3 days	**ECS** 100% in 5 w. days

Exhibit 11: International benchmark about supply time for connection targets [Source: Axon]

5.21.5 In the case of fixed public EC, mobile public EC, and internet services, we have updated the main targets following the best international approach, using moderate targets. For leased line services and subscriber TV services, ECTEL has maintained the targets defined in the draft QoS Regulations of 2016, due to the lack of references.

Time for reconnection of service

5.22.1 This parameter is defined as: *"The duration from the instant of a cause of suspension of a service is removed by the affected licensee to the instant a working service is reactivated for use."* It is applicable to licensees of fixed public EC, internet, mobile public EC and/or subscriber television services.

5.22.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✓	✓	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓

Exhibit 12: International benchmark for time of reconnection of service [Source: Axon]

5.22.3 Although this parameter is not widely adopted in the international practice, ECTEL has emphasised its importance in previous QoS Regulations. Accordingly, we believe it should be maintained in the draft revised and updated regulations.

5.22.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the values proposed by the draft revised and updated QoS Regulations for the different services.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed public EC and internet services					
ECS 85% within 3 w. hours *Fixed internet:* 79% within 3 w. hours	**ECS** 85% within 3 w. hours	**TTO** 90% in 24 hours 95% in 48 hours	**BHS** 100% in 8 w. hours	**QAT** 95% in 2 w. hours	**ECS** 85% within 3 w. hours
Mobile public EC services					
ECS 90% within 3 w. hours	**ECS** 95% within 3 w. hours	**BHS** 100% in 8 w. hours	**QAT** 95% in 2 w. hours	**TTO** 95% in 1 hour	**ECS** 95% within 3 w. hours
Subscription TV services					
-	-	**-**	**TTO** 90% in 12 hours 95% in 24 hours	**-**	**ECS** 90% within 3 w. hours

Exhibit 13: International benchmark about time of reconnection of service targets [Source: Axon]

5.22.5 In the case of fixed, mobile public EC and internet services, the targets included in the draft QoS Regulations of 2016 are aligned with the moderate targets. Accordingly, ECTEL proposes to maintain the same target. In the case of subscriber television services, a separate target has not been defined and, hence, we propose to use the same target as in the rest of services.

Network availability

5.23.1 This parameter is defined as: "*The percentage of time the network is operational and not in a state of failure or interruption at any point of time within the reporting period (i.e., network elements working properly), excluding all planned interruptions*". It is applicable to licensees of fixed and mobile public EC, and internet services.

5.23.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✗	✓	✓	✓	✗	✗	✓	✓	✗	✗	✓

Exhibit 14: International benchmark for network availability [Source: Axon]

5.23.3 This parameter has been adopted only in four (4) countries of the benchmark study. However, it reflects the readiness of telecommunications networks, and so

ECTEL deems it appropriate to include it in the draft revised and updated QoS Regulations.

5.23.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the values proposed by the draft revised and updated QoS Regulations for the different services.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed public EC and Internet services					
-	-	**-**	**TTO, SGP** 99.90%	**-**	**ECS** 99.90%
Mobile public EC					
-	**-**	**SGP** Monitored (no target) **IND** 98.00%	**JAM** 99.00%	**BHS, TTO** 99.90% **QAT** 99.95%	**ECS** 99.00%

Exhibit 15: International benchmark for network availability targets [Source: Axon]

5.23.5 No targets were defined in any of the previous regulations. Accordingly, we propose to use the moderate targets of the available references as starting point.

Broadband service availability

5.24.1 This parameter is defined as: "*The ratio of successful log-in to broadband test servers, excluding unsuccessful log-in due to planned interruptions of the service*". It is applicable to licensees of internet services.

5.24.2 The following exhibit shows which countries of the international benchmark study require this specific parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✓	✗	✗	✗	✓	✗	✗	✗	✗

Exhibit 16: International benchmark about broadband service availability [Source: Axon]

5.24.3 Even though this parameter is not widely adopted by other countries, it can be monitored by the NTRCs. Thus, ECTEL's proposes to maintain it in the draft revised and updated QoS Regulations.

5.24.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
Fixed Internet services					
-	**ECS** 99.00%	**IND** 98.00%	**BHS** 99.90%	**JAM** 99.95%	**ECS** 99.90%
Wireless Internet services					
	ECS 99.00%	**IND** 98.00%	**BHS** 99.90%	**JAM** 99.95%	**ECS** 99%

Exhibit 17: International benchmark about broadband service availability targets [Source: Axon]

5.24.5 ECTEL's current target is within the international benchmark's moderate targets. We therefore propose to align this target to the one applying to network availability.

Broadband session drop ratio

5.25.1 This parameter is defined as: "*The percentage of abnormal disconnections with respect to all broadband session disconnects (both normal and abnormal) and measures the ability of the access network to maintain a connection*". It is applicable to licensees of wireless internet services.

5.25.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✗	✗	✗	✗	✗	✓	✓	✗	✗	✗

Exhibit 18: International benchmark about broadband session drop ratio [Source: Axon]

5.25.3 Even if the broadband session drop ratio is not usually adopted among benchmark countries, ECTEL considers that this parameter can be measured by both licensees and the ECTEL and would provide transparency to the QoS performance of wireless internet service quality. Moreover, this parameter is meant to replace other network-related parameters required in previous versions of this Regulations, such as the handover success ratio.

5.25.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
Wireless internet services					
-	**ECS** 1%	**SGP** Monitored (no target)	**IND** 5%	-	**ECS** 1%

Exhibit 19: International benchmark about broadband session drop ratio targets [Source: Axon]

5.25.5 The target of the previous Regulations is maintained.

Packet loss ratio

5.26.1 This parameter is defined as: *"The ratio between the number of the packets lost in the network and the total number of transmitted packets".* It is applicable to licensees who provide internet services.

5.26.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✗	✗	✓	✓	✗	✓	✗

Exhibit 20: International benchmark about packet loss ratio [Source: Axon]

5.26.3 This parameter is present in four (4) of the international benchmark jurisdictions and in the draft QoS Regulations of 2016. The former includes advanced economies such as Singapore and the European Union. Accordingly, the ECTEL finds it appropriate to maintain it in the draft revised and updated regulations.

5.26.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
Internet services					
-	**ECS** *Fixed:* 3% *Wireless:* 5%	**SGP** Monitored (no target)	-	**JAM, IND** 1%	**ECS** 3%

Exhibit 21: International benchmark about packet loss ratio targets [Source: Axon]

5.26.5 Even though the current targets are more relaxed that the average international standards, ECTEL prefers to keep the target as defined in previous QoS Regulations for fixed internet services.

Latency

5.27.1 This parameter is defined as: "*The time required for a packet to travel from a source to a destination and back*". It is applicable to licensees of internet services.

5.27.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✓	✗	✗	✓	✓	✓	✗	✓	✓

Exhibit 22: International benchmark about latency [Source: Axon]

5.27.3 This parameter has been adopted in most benchmark countries with the exception of the following jurisdictions: Trinidad and Tobago, the Dominican Republic, and the United Kingdom. In addition, it was also considered in ECTEL's draft QoS Regulations of 2016, and it is a key QoS parameter determining the experience of users with broadband and OTT services. We therefore propose to maintain it.

5.27.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed internet services					
-	**ECS** *Audio: 150 ms* *Data: 250 ms* *Interactive: 75 ms*	**SGP** Monitored (no target) **BHS** 233 ms **IND** 250 ms	**JAM** *Ntn'l:* 95% in 100 ms *Intn'l:* 95% in 300 ms **GHA** 100 ms	**QAT** 90% in 40 ms	**ECS** *Ntn'l:* 95% in 80 ms *Intn'l:* 95% in 200 ms
Wireless internet services					
-	**ECS** *Audio: 150 ms* *Data: 250 ms* *Interactive: 75 ms*	**IND** *Int'l:* 120 ms *Terrestrial:* 350 ms *Satellite:* 800 ms	**JAM** *Ntn'l:* 95% in 85 ms *Intn'l:* 95% in 300 ms	**GHA** 80 ms **QAT** *Ntn'l*: 60 ms *Satellite*: 800 ms **SGP** *Ntn'l:* 30-50 ms *Intn'l:* 300 ms	**ECS** *Ntn'l:* 95% in 80 ms *Intn'l:* 95% in 200 ms *Satellite:* 95% in 800 ms

Exhibit 23: International benchmark about latency targets [Source: Axon]

5.27.5 ECTEL has broken down latency targets for fixed and wireless internet services acknowledging that they cannot provide the same level when measured against national and international test servers 2016 Draft Electronic Communications (Quality of Service) Regulations Annex Baccording to the recommendations of the ITU. However, it was not considered a further breakdown by service as in the former version of the Regulations, due to the variety and variability of audio, video and interactive licensees on the Internet.

Jitter

5.28.1 This parameter is defined as: "*The variation between the maximum delay and minimum delay within a specific time window*". It is applicable to licensees of internet services.

5.28.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✗	✗	✗	✗	✗	✓	✗

Exhibit 24: International benchmark about jitter [Source: Axon]

5.28.3 Jitter is also defined as the packet delay variation and can be calculated by means of the latency 2016 Draft Electronic Communications (Quality of Service) Regulations Annex B. Accordingly, despite its being barely adopted among benchmark countries, ECTEL believes that this parameter can be easily calculated by licensees, taking advantage of an already defined and widely adopted parameter, and monitored by NTRCs, as well. For these reasons, ECTEL proposes to maintain it.

5.28.4 The following exhibit compares the targets in the QoS Regulations of 2008 and the draft QoS Regulations of 2016 and the ones in the international practice to the value proposed by the draft revised and updated regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Internet services					
-	**ECS** 30 ms	-	**JAM** 50 ms	-	**ECS** 30 ms

Exhibit 25: International benchmark about jitter targets [Source: Axon]

5.28.5 We are maintaining the target outlined in the draft QoS Regulations of 2016.

Call set-up success ratio

5.29.1 This parameter is defined as: "*The percentage of successful calls, including those completed, lost or abandoned, to the total number of call attempts in a specified time period – i.e., the proportion of call attempts that result in a connection to the dialled number*". It is applicable to licensees of fixed and /or mobile public EC services.

5.29.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Exhibit 26: International benchmark about call set-up success ratio [Source: Axon]

5.29.3 This parameter is defined in the regulations of all the jurisdictions included in the benchmark study.

5.29.4 The following exhibit compares the targets outlined in the QoS Regulations of 2008, in the draft QoS Regulations of 2016, and in international practice to the ones proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed public EC services					
ECS *Ntn'l:* 90% *Intn'l:* 85%	**ECS** 98%	**JAM** *On-net:* 98% *Off-net*: 95%	**DOM** 98%	**TTO, GHA** 99%	**ECS** 98%
Mobile public EC services					
ECS *Ntn'l:* 98% *Intn'l:* 90%	**ECS** 95%	**IND, GHA** 95% **DOM** 97%	**JAM** *On-net:* 98% *Off-net*: 95% **TTO** 98%	**BHS, SGP, QAT** 99%	**ECS** 98%

Exhibit 27: International benchmark about call set-up success ratio targets [Source: Axon]

5.29.5 In accordance with international practice, we have considered a target of 98% of successful calls. While this maintains the target for fixed public EC services, the target for mobile public EC services will be more stringent when compared to the former version of the Regulations.

Call set-up time

5.30.1 This parameter is defined as: "*The period starting when the address information required for setting up a call is received by the network and finishing when the called party busy tone or ringing tone or answer signal is received by the calling party*". It is applicable to licensees of fixed public EC and mobile public EC services.

5.30.2 The following exhibit shows which countries of the international benchmark study specify this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✓	✓	✗	✓	✓	✓	✓

Exhibit 28: International benchmark about call set-up time ratio [Source: Axon]

5.30.3 This parameter is widely adopted in international practice. It is required not only in comparable Caribbean countries, but also in other, more advanced, reference jurisdictions in the benchmark study such as Singapore, the United Kingdom, and the European Union, and also in those with recent QoS regulations, such as Qatar. Moreover, it can be monitored by NTRCs. Accordingly, we propose to include this parameter in the draft revised and updated QoS Regulations .

5.30.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed public EC services					
-	**ECS** *Ntn'l:* 3 s *Intn'l:* 8 s	**QAT** 95% in 10 seconds 99% in 15 seconds	**DOM** 98% in 6 s	**JAM** *On-net:* 98% in 5 s *Off-net:* 95% in 10 s	**ECS** *Ntn'l:* 95% in 5 s *Intn'l:* 95% in 10 s
Mobile public EC services					
-	**ECS** *Ntn'l:* 5 s *Intn'l:* 10 s	**SGP** Monitored (no target) **QAT** 95% in 10 s 99% in 15 s	**GHA** 95% in 10 s **DOM** 95% in 8 s	**JAM** *On-net:* 98% in 5 s *Off-net:* 95% in 10 s	**ECS** *Ntn'l:* 95% in 5 s *Intn'l:* 95% in 10 s

Exhibit 29: International benchmark about call set-up time ratio targets [Source: Axon]

5.30.5 Unlike the targets of ECTEL's draft QoS Regulations of 2016, most benchmark countries define the same targets for national and international, and off-net and

on-net calls. However, ECTEL considers that such a separation, with different targets by category, is reasonable. Since the current targets are aligned with international practice, no update is required.

Dropped call ratio

5.31.1 This parameter is defined as: "*The proportion of incoming and outgoing calls which, once they have been correctly established and therefore have an assigned traffic channel, are dropped, or interrupted prior to their normal completion by the user, the cause of the early termination being within the operator's network*". It is applicable to licensees of mobile public EC services.

5.31.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✓	✓	✓	✓	✓	✓	✗	✓	✓

Exhibit 30: International benchmark about dropped call ratio [Source: Axon]

5.31.3 This parameter is defined in the regulations of all benchmark countries except for the United Kingdom. It helps avoid having to measure other QoS parameters that may trigger a call drop (e.g., handover failure, TCH congestion).

5.31.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Mobile public EC services					
-	**ECS** 2.0%	**JAM, TTO, DOM, IND, SGP** 2.0%	**QAT** 1.5%	**BHS, GHA** 1.0%	**ECS** 2.0%

Exhibit 31: International benchmark about dropped call ratio targets [Source: Axon]

5.31.5 The target for this parameter is aligned with most benchmark countries, and thus ECTEL proposes to maintain it in the draft revised and updated QoS Regulations.

Effective vs subscription throughput ratio

5.32.1 This parameter is defined as: "*The percentage of the throughput compared to the subscribed speed*". It is applicable to licensees of fixed internet services.

5.32.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✓	✓	✓	✗	✓	✗	✗	✗	✗

Exhibit 32: International benchmark about effective vs subscription throughput ratio [Source: Axon]

5.32.3 This parameter aims at comparing the speed offered by licensees in their broadband subscriptions against the actual speed measured at the end-user's terminal. It requires measuring throughput as recommended by the ITU 2016 Draft Electronic Communications (Quality of Service) Regulations Annex B.

5.32.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed internet services					
-	**ECS** 90% during 100% of the time	**TTO** 50% during 99% of the time 75% during 75% of the time 100% during 50% of the time	**BHS, IND** 80% during 100% of the time	**JAM** 95% during 95% of the time **DOM** 98% during 100% of the time	**ECS** 90% during 95% of the time

Exhibit 33: International benchmark about effective vs subscription throughput ratio targets [Source: Axon]

5.32.5 ECTEL proposes to slightly relax the existing target for this parameter by assuming that there could be temporary situations where, due to congestion, the throughput may fall below the target.

SMS completion ratio

5.33.1 This parameter is defined as: "*The percentage of SMS between two terminal equipment correctly sent and received within two minutes after being sent, excluding duplicated, received, and corrupted messages*". It is applicable to licensees of SMS services.

5.33.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✓	✓	✗	✗	✗	✗	✓

Exhibit 34: International benchmark about SMS completion ratio [Source: Axon]

5.33.3 This QoS parameter is adopted in only four of the jurisdictions included in the benchmark, namely Jamaica, the Dominican Republic, Ghana, and Qatar. Acknowledging the relevance of messaging services in Member States, we propose to maintain this parameter.

5.33.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Mobile public EC services					
-	**ECS** 95.00%	**DOM** 95.00%	**GHA** 98.00% **JAM** 99.00%	**QAT** 99.99%	**ECS** 98%

Exhibit 35: International benchmark about SMS completion ratio targets [Source: Axon]

5.33.5 The current target for SMS completion ratio is aligned with that of the Dominican Republic, but lower than those of Ghana and Jamaica. ECTEL proposes to establish a new target of 98%, aligned with the average of international practice.

SMS end-to-end delivery time

5.34.1 This parameter is defined as: "*The period starting when sending a SMS from a terminal equipment to a Short Message Center and finishing when receiving the very same SMS on another terminal equipment*". It is applicable to licensees of SMS services.

5.34.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✗	✗	✓	✓	✓	✗	✗	✗	✗	✓

Exhibit 36: International benchmark about SMS end-to-end delivery time [Source: Axon]

5.34.3 This QoS parameter is adopted in only three benchmark countries, namely Trinidad and Tobago, the Dominican Republic, and Ghana. Acknowledging the relevance of messaging services in Member States, we propose to maintain this parameter.

5.34.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Mobile public EC services					
-	**ECS** 99% in 5 s	**TTO** 75% in 1 min 95% in 5 min 99% in 60 min	**QAT** 95% in 10 s 99% in 20 s	**DOM** 98% in 4 s **GHA** 100% in 5 s	**ECS** 99% in 5 s

Exhibit 37: International benchmark about SMS end-to-end delivery time targets [Source: Axon]

5.34.5 The international benchmark shows disparate targets for SMS delivery time. Countries with theoretically more advanced networks (Qatar) have more relaxed values than countries with less advanced networks (the Dominican Republic and Ghana). Considering the decreasing trend in the use of SMS services, we propose to maintain the target of the former QoS Regulations.

Fault report rate

5.35.1 This parameter is defined as: "*The number of fault reports per fixed access line*". It is applicable to licensees of fixed public EC, fixed internet and/or subscriber television services.

5.35.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✓	✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✓

Exhibit 38: International benchmark about fault report rate [Source: Axon]

5.35.3 This parameter is adopted in all benchmark countries except for Ghana and the Dominican Republic.

5.35.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Fixed public EC and fixed internet services					
ECS 3.00% per month	**ECS** 3.00% per month	**IND** 7.00% per month	**JAM, BHS** 5.00% per quarter **TTO** 4.50% per quarter	**QAT** 0.25% per quarter **SGP** 0.50% per quarter	**ECS** 5.00% per quarter
Subscription TV services					
-	**ECS** 3.00% per month	**-**	**TTO** 4.50% per quarter	**-**	**ECS** 5.00% per quarter

Exhibit 39: International benchmark about fault report rate targets [Source: Axon]

5.35.5 In the light of international practice, the new proposed target (up to 5% fixed access lines reporting a fault during a quarter) relaxes that of the former QoS Regulations.

Fault repair time

5.36.1 This parameter is defined as: "*The duration from the instant a fault report has been made to the instant when the service element or service has been restored to normal working order*". It is applicable to licensees of public fixed EC, internet and/or subscriber television services.

5.36.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓

Exhibit 40: International benchmark about fault repair time [Source: Axon]

5.36.3 This parameter is adopted in all benchmark countries, with the single exception of the Dominican Republic. In general, the jurisdictions specify the parameter for fixed public EC and internet services, but it is not so common for mobile, leased lines and subscriber television services. However, ECTEL considers fault repair time a critical parameter for all fixed services.

5.36.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations for the different fixed services.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
Fixed public EC and fixed internet services					
ECS 90% in 24 hours 95% in 72 hours 98% in 168 hours	**ECS** 80% in 24 hours 95% in 48 hours 100% in 72 hours	**BHS**[9] 100% in 72 hours (A1) 100% in 96 hours (A2) 100% in 120 hours (A3)	**TTO** 75% in 24 hours 90% in 48 hours **JAM** 80% in 24 hours 95% in 48 hours **GHA** 100% in 48 hours	**SGP** 90% in 1 hour 99.9% in 72 hours **IND** *Mean-time:* 10 hours **QAT** 90% in 8 w. hours 99% in 16 w. hours	**ECS** 90% in 24 hours 95% in 48 hours 100% in 72 hours
Leased lines services					
-	**ECS** *Ntn'l:* 95% in 24 hours *Int'l:* 90% on agreed time	-	**QAT** 95% in 6 hours 99% in 24 hours	-	**ECS** *Ntn'l:* 95% in 24 hours *Int'l:* 90% on agreed time
Subscription TV services					
-	**ECS** 90% in 24 hours 95% in 48 hours 99% in 72 hours 100% in more than 72 hours	**BHS** 100% in 72 hours (A1) 100% in 96 hours (A2) 100% in 120 hours (A3)	-	**TTO** 75% in 24 hours 90% in 48 hours	**ECS** 90% in 24 hours 95% in 48 hours 100% in 72 hours

Exhibit 41: International benchmark about fault repair time targets [Source: Axon]

5.36.5 We propose to maintain the targets of the former QoS Regulations for subscriber television and leased line services, in line with the few international references available. In the case of fixed public EC and fixed internet services, the target has been tightened by increasing the percentage of faults to be solved in the first 24 hours.

Billing accuracy

5.37.1 This parameter is defined as: "*The measure of the number of incorrect bills per 1000 bills issued, has been determined by the licensee or the Commission to have been issued with an error*". It is applicable to all licensees.

5.37.2 The following exhibit shows which countries of the international benchmark study require this parameter:

[9] Targets in Bahamas depend on the three defined reporting areas.

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✓	✓	✓	✗	✓	✗	✗	✓	✗	✗	✗	✗

Exhibit 42: International benchmark about billing accuracy [Source: Axon]

5.37.3 Although it is not being widely adopted by benchmark countries (only by Jamaica, Trinidad and Tobago, and India), ECTEL considers that measuring billing accuracy is important to test the effectiveness of the billing process, as a critical aspect contributing to the satisfaction of retail customers.

5.37.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
All licensees					
ECS 0.5%	**ECS** 0.1%	**JAM, TTO** 1.0%	-	**IND** 0.1%	**ECS** 0.5% per billing cycle

Exhibit 43: International benchmark about billing accuracy targets [Source: Axon]

5.37.5 The target set in the draft QoS Regulations of 2016 is aligned with the most stringent targets of the international benchmark, whereas other Caribbean countries are setting more relaxed targets (10 times lower). Accordingly, we propose to reset the target to the one of the QoS Regulations of 2018, which is an average of the ones we find in international practice.

Complaint submission ratio

5.38.1 This parameter is defined as: "*The number of complaints logged per customer in a data collection period*". It is applicable to all licensees.

5.38.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✗	✗	✗	✓	✗	✗	✓

Exhibit 44: International benchmark about complaint submission ratio [Source: Axon]

5.38.3 The complaint submission ratio provides a deeper understanding on the number of complaints received by a service provider. Generally, such complaints are triggered by deficiencies in the quality of service delivered to customers (e.g., incorrect billing, network faults, unreasonable supply time, etc.).

5.38.4 While former QoS Regulations defined billing complaints, we believe the billing QoS can be captured by the previous parameter "billing accuracy", and thus we propose to remove it from the customer complaint submission ratio. Therefore, three categories of complaints are defined in the draft revised and updated QoS Regulations:

- Complaints with the provision of services;
- Complaints with help services; and
- Complaints with network performance, reliability, and availability.

5.38.5 Even though only three benchmark countries have adopted this parameter, ECTEL considers that measuring the number of complaints submitted for each category is key to understanding customer satisfaction. Therefore, we propose to maintain the parameter in the draft revised and updated QoS Regulations.

5.38.6 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
All licensees					
-	**ECS** *Billing complaints:* 1.00% *Other complaints:* 5.00%	**SGP** Monitored (no target)	**JAM** *Each category*: 1.00% *Total*: 5.00%	**QAT** 0.15%	**ECS** 5.00% per quarter for each category

Exhibit 45: International benchmark about complaint submission ratio targets [Source: Axon]

5.38.7 We propose to maintain the target from the draft QoS Regulations of 2016.

Answered customer service call ratio

5.39.1 This parameter is defined as: "*The percentage of completed call attempts to the licensee's customer support services*". It is applicable to all licensees.

5.39.2 The following exhibit shows which countries of the international benchmark study ask for this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✓	✗	✗	✓	✓	✗	✗	✗

Exhibit 46: International benchmark about answered customer service call ratio [Source: Axon]

5.39.3 Even though this parameter is adopted only in four countries out of those included in the benchmark, it is key to measuring the performance of customer care processes of licensees. Therefore, we propose to maintain the parameter in the draft revised and updated QoS Regulations.

5.39.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
All licensees					
-	**ECS** 100%	**SGP** Monitored (no target)	-	**JAM, TTO, IND** 95%	**ECS** 95%

Exhibit 47: International benchmark about answered customer service call ratio targets [Source: Axon]

5.39.5 The target has been relaxed, in line with international practice.

Response time for enquiries

5.40.1 This parameter is defined as: "*The time elapsed between the end of dialling to the customer service and reaching an IVR or a human operator*". This parameter is applicable to all licensees.

5.40.2 The following exhibit shows which jurisdictions of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✗	✗	✓	✗	✓	✓	✓	✗	✓	✓

Exhibit 48: International benchmark about response time for enquiries [Source: Axon]

5.40.3 This parameter is widely adopted by jurisdictions included in the benchmarking study, with the exception of Jamaica, Bahamas, the Dominican Republic, and United Kingdom. ECTEL considers that measuring the performance of customer care is paramount in helping consumers achieve a satisfactory experience. Therefore, we propose to maintain this parameter in the draft revised and updated QoS Regulations.

5.40.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
All licensees					
-	**ECS** 80% in 10 s 95% in 20 s	**SGP** Monitored (no target) **GHA** 100% in 15 min	**IND** 95% in 90 s	**TTO** *IVR:* 80% in 10 s 95% in 20 s *Operator:* 80% in 20 s 95% in 40 s **QAT** 75% in 15 s 95% in 20 s	**ECS** 80% in 5 s 95% in 10 s

Exhibit 49: International benchmark about response time for enquiries targets [Source: Axon]

5.40.5 The proposed target value is more stringent than the one under the former QoS Regulations, as ECTEL considers that the response time of the customer care service must be improved, as part of a more general improvement of the quality of customer care.

Complaints resolution time

5.41.1 This parameter is defined as: "*The duration from the instant a complaint is notified to the published point of contact of a service provider and is not found to be invalid to the instant the cause for the complaint has been resolved*". It is applicable to all licensees.

5.41.2 The following exhibit shows which jurisdictions of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✗	✓	✓	✓	✗	✓	✗	✗	✗	✓	✓

Exhibit 50: International benchmark about complaint resolution time [Source: Axon]

5.41.3 This parameter is widely adopted in the Caribbean countries with the exception of the Dominican Republic. Furthermore, complaint resolution time strongly affects the perception of customers about the quality of customer care processes of the service provider. Therefore, ECTEL finds it beneficial to include this parameter in the draft revised and updated QoS Regulations.

5.41.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016 and in international practice to the values proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
All licensees					
-	-	**BHS** 100% in 30 days **JAM** 80% in 15 w. days 95% in 30 w. days	**TTO** 75% in 7 days 90% in 10 days 95% in 20 days	**QAT** 90% in 5 w. days 99% in 15 w. days **GHA** 100% in 5 days	**ECS** 75% in 7 days 90% in 10 days 95% in 20 days

Exhibit 51: International benchmark about complaint resolution time targets [Source: Axon]

5.41.5 The proposed target values have been set examining the targets of Trinidad and Tobago, which are an average of the targets set by other jurisdictions in the benchmark study.

Voice quality

5.42.1 This parameter is defined as: "*The overall speech quality as perceived and scored by human subjects*". It is applicable to licensees of fixed public and mobile public EC services.

5.42.2 The following exhibit shows which countries of the international benchmark study require this parameter:

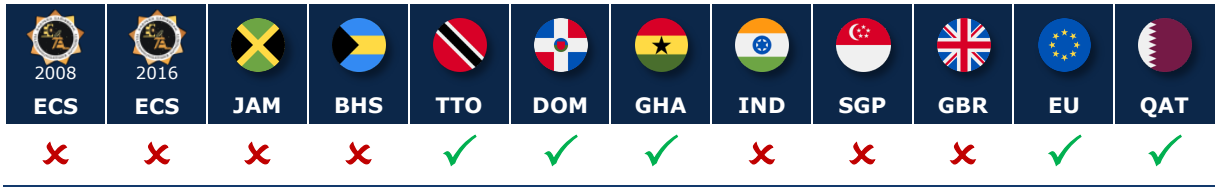

Exhibit 52: International benchmark about voice quality [Source: Axon]

5.42.3 Voice quality is the most common parameter to measure QoE of voice services because it measures the quality experienced by end-users in a voice call. It is also monitorable by the NTRCs, in accordance with well-known international standards such as ITU-T P.863. Further, this parameter is used widely in QoS regulations worldwide, including those of the Caribbean States. Since voice services are very important in Member States, ECTEL considers that this parameter must be included in the draft revised and updated QoS Regulations. This parameter is defined as "monitoring", meaning that licensees are not required, but welcome, to periodically report it to the NTRCs; in parallel, the NTRCs will take its own measurements and verify that the target is met.

5.42.4 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	**ECS '16**	**Low**	**Moderate**	**High**	
Fixed public EC and mobile public EC services					
-	-	**QAT** *Fixed*: 90% in MOS 3.5 *Mobile*: 90% in 3.5 & MOS 4.0 for VoLTE	**GHA** 95% in MOS 3.5 **DOM** *Fixed*: 98% in R80 *Mobile*: 95% in R80	**TTO** 95% in MOS 3.8	**ECS** 95% in MOS 3.5

Exhibit 53: International benchmark about voice quality targets [Source: Axon]

5.42.5 The target proposed by ECTEL is in line with the average value required by other countries in the benchmark study.

Customer satisfaction with the service provider

5.43.1 Customer satisfaction parameters measure the degree of satisfaction that customers have with licensees as a whole or with specific processes of licensees, such as billing, customer care, or service provisioning.

5.43.2 The following exhibit shows which jurisdictions of the international benchmark study require these types of parameters:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✓	✓	✓	✓	✓	✓	✓

Exhibit 54: International benchmark about customer satisfaction parameters [Source: Axon]

5.43.3 Customer satisfaction parameters are generally adopted in international practice. Even if they are not part of the respective QoS Regulations, most countries (e.g., Belgium, Spain, Mexico, etc.) carry out surveys of consumers to measure their degree of satisfaction with electronic communication services.

5.43.4 Although, some parameters are included in ECTEL's draft QoS Regulations of 2016, we are defining customer satisfaction parameters related to:

- Overall satisfaction
- Enquiry services
- Billing performance

5.43.5 These parameters are declared as "monitoring", meaning that licensees are not mandated, but welcome, to report this parameter to the NTRCs. However, it will fall on the NTRC that will carry out consumer surveys to measure and verify that the target is adequately met.

5.43.6 The following exhibit compares the targets in the QoS Regulations of 2008, the draft QoS Regulations of 2016, and in international practice to the value proposed by the draft revised and updated QoS Regulations.

Previous		International benchmark			Proposed target
ECS '08	ECS '16	Low	Moderate	High	
Overall customer satisfaction					
-	**ECS** 95%	**IND** 90%	-	**GHA** 95%	**ECS** 95%
Customer satisfaction with specific dimensions					
-	**ECS** 90%	**IND** 85%-90%	**-**	**GHA** 90%	**ECS** 90%

Exhibit 55: International benchmark about customer satisfaction [Source: Axon]

The proposed target value is set according to the references available.

Parameters excluded from the draft revised and updated regulations

Grade of service

5.44.1 This parameter is defined as: "*The probability of call failure over the junctions between switches due to non-availability of junctions*". It was applicable to licensees of fixed public EC services.

5.44.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✗	✗	✗	✗	✗	✓	✗	✗	✗	✗

Exhibit 56: International benchmark about grade of service [Source: Axon]

5.44.3 This parameter is considered only in the former QoS Regulations of 2016 and in similar regulations in India. From ECTEL's perspective, this parameter aims at reflecting the availability of different network elements, and relies on a tedious exercise of information and details for each of these elements. The so-called "network availability" proved to be the preferred option among countries in the benchmark study, because it reflects the percentage of time the whole network is up and working properly (i.e., no network outage is reported).

5.44.4 In ECTEL's opinion, the network availability parameter is easier to collect data and report and provides equivalent information. Accordingly, we propose to exclude the grade of service parameter from the draft revised and updated QoS Regulations.

Advance notice of planned interruptions

5.45.1 This parameter is defined as: "*The scheduled or planned downtime of the electronic communications service by the licensee*". It was applicable to all licensees.

5.45.2 The following exhibit shows which countries of the international benchmark study require this parameter:

Exhibit 57: International benchmark about advance notice of planned disruption [Source: Axon]

5.45.3 While understanding the importance of providing advanced notice of a planned interruption to ensure that customers are well informed, ECTEL does not see a need to include this aspect as a QoS parameter in the draft revised and updated regulations. Instead, licensees should have a minimum time to inform both NTRCs and consumers about future planned interruptions.

5.45.4 Accordingly, we propose to exclude this parameter from the draft revised and updated QoS Regulations.

Traffic channel (TCH) congestion

5.46.1 The definition of this parameter was not included in the former regulations. According to ITU E.807, such parameter is defined as: "*The probability of failure of accessing traffic channel(s) during call connections*". It was applicable to licensees of mobile public EC services.

5.46.2 The following exhibit shows which countries of the international benchmark study require this parameter:

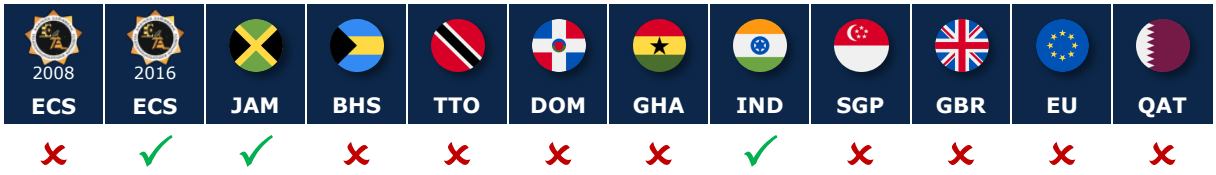

Exhibit 58: International benchmark about Traffic channel (TCH) congestion [Source: Axon]

5.46.3 This parameter is only considered in the Jamaican and Indian regulations among the countries included in the benchmark study. In addition, it is directly related to the 2G technology, which goes against the principle of technological neutrality sought by the draft revised and updated QoS Regulations. In fact, in the case of India, their regulations had to be amended twice to include equivalent parameters for 3G (RAB congestion) and 4G (e-RAB congestion). Finally, we consider that measuring this parameter would be difficult for NTRCs on their own, as the methodology relies on network measurement indicators available to network operators only.

5.46.4 Since TCH congestion can also be detected through other parameters, already included in the draft revised and updated QoS Regulations, such as "Call set-up success ratio", we propose to remove the TCH congestion parameter.

Standalone dedicated control channel (SDCCH) congestion rate

5.47.1 The definition of this parameter was not included in the former regulations. According to ITU E.807, such parameter is defined as: "*The probability of failure of accessing a stand-alone dedicated control or radio resource control channel during call set-up*". It was applicable to licensees of mobile public EC services.

5.47.2 The following exhibit shows which countries of the international benchmark study require this parameter:

2008 ECS	2016 ECS	JAM	BHS	TTO	DOM	GHA	IND	SGP	GBR	EU	QAT
✗	✓	✓	✗	✗	✗	✗	✓	✗	✗	✗	✗

Exhibit 59: International benchmark about Standalone dedicated control channel (SDCCH) congestion rate [Source: Axon]

5.47.3 This parameter is considered only Jamaica and India among the countries included in the benchmark study. Moreover, it is directly related to the 2G technology, which goes against the principle of technological neutrality sought by the draft revised and updated regulations. In fact, in the case of India, their regulations had to be amended to include equivalent a parameter for 3G (RRC congestion). Finally, measuring this parameter would be difficult for NTRCs on their own, as the methodology relies on network measurement indicators available to network operators only.

5.47.4 Since SDCCH congestion can also be detected through other parameters, already included in the Regulations, such as "Call set-up success ratio", we propose to remove the SDCCH congestion parameter.

Handover success rate

5.48.1 This parameter is defined as:" The *ratio of the number of successfully completed handovers to the total number of initiated handovers expressed as a percentage".* It was applicable to licensees of mobile public EC services.

5.48.2 The following exhibit shows which countries of the international benchmark study require this parameter:

Exhibit 60: International benchmark about handover success rate [Source: Axon]

5.48.3 Beyond the current Qos regualtions in the ECTEL Member States and Jamaica's QoS regulations, this parameter is not considered anywhere else. Measuring this parameter would be difficult for the ECTEL on its own, since it would depend on network measurement indicators, which depend on the licensees' systems alone.

5.48.4 In addition, a failed handover usually triggers a "Broadband session drop ratio" or "Dropped call ratio", which will be detected by parameters already included in the draft revised and updated QoS Regulations. Accordingly, we propose to remove this parameter.

Response time for operator service

5.49.1 This parameter is defined as: "*The duration from the instant when the address information required for setting up a call is received by an electronic communications network to the instant the human operator answers the calling user to provide the electronic communications service requested*". It was applicable to licensees of mobile public EC services.

5.49.2 The following exhibit shows which countries of the international benchmark study require this parameter:

Exhibit 61: International benchmark about response time for operator service [Source: Axon]

5.49.3 This parameter has not been found in any regulation outside the draft QoS Regulations of 2016. We propose to remove it as it is no longer in use.

Non-QoS parameters

5.50.1 We have identified several parameters in former regulations that are not necessarily-QoS parameters, namely:

- **Notice to consumers of preventive maintenance of not more than 24 hours**, with similar implications as the one above.
- **Advanced notice of rate change**, which referred to the instructions operators must follow in case they decide to change rates of mobile public EC services. In particular, the target level was: "[n]*otice to be publicized in two weekly newspapers, over a two-week period using a quarter page Ad.*"
- **Advanced notice of rate change**, which referred to the conditions set to licensees for sending promotional SMS. In particular, the target level was: "*ALL persons receiving SMS promotional text must have expressly given authorization that they are interested in receiving promotions. Customers can decide at a later date to opt in to promotions.*"

5.50.2 These parameters are not aimed at measuring the QoS performance of the electronic communications service but rather refer to the terms and conditions of consumer contracts. They must therefore be considered in the consumer protection regulations or directly, in specific provisions in the contracts with end customers. Thus, we propose to exclude them from the draft revised and updated QoS Regulations.

Question 16: Do you agree with the exclusion of the above-mentioned parameters from the QoS Regulations?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

Question 17: Should any other parameter be excluded from the QoS Regulations?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

6. Draft Electronic Communications (Quality of Service) Regulations

6.1 Please refer to Annex A for the proposed draft Electronic Communications (Quality of Service) Regulations, which has been revised and updated, taking into consideration previous feedback on the draft QoS Regulations of 2016 public consultation, current review and international best practices and standards.

6.2 Annex B - the draft Regulations of 2016 is appended to indicate the changes made to the revised and updated regulations (Annex A).

Question 18: Do you have any other comments on the proposed revised and updated draft Electronic Communications (Quality of Service) Regulations, which have not been discussed previously?

Please support your answer and any suggestions with relevant information and internal or best-practice references.

7. Summary of questions

This section provides the summary of the questions included along the document.

- **Question 1:** Do you consider it reasonable to define a national level reporting area, comprising the entirety of each individual state, in the draft revised and updated regulations? Should the reports also cover any sub-national areas?
- **Question 2:** Do you agree with the provisions set out in the Regulations regarding QoS monitoring by the NTRCs? Would you propose any modifications to those provisions?
- **Question 3:** Do you find the definition of monitoring parameters reasonable?
- **Question 4:** Do you find the publication process of results to be reasonable?
- **Question 5:** Do you find the process outlined in this regulation reasonable?Q
- **Question 6:** Do you find the proposed record keeping period reasonable?
- **Question 7:** Do you find a period of three (3) months reasonable for reporting QoS parameters?
- **Question 8:** Do you find it reasonable to require that the report on QoS performance should be submitted within a month from the end of the reporting period?
- **Question 9:** Do you find the information required in the QoS reports reasonable?
- **Question 10:** Do you consider the obligation imposed on licensees to assign a senior accountable officer as a contact person reasonable?
- **Question 11:** Do you find the process to verify the QoS report useful and complete? Would you propose any modifications to the process or the associated provisions?
- **Question 12:** Do you find the definition of Force Majeure in regulation 3 reasonable? Do you agree with the proposed provisions and the procedure required for licensees to obtain a Force Majeure exemption as stipulated in regulation 14?
- **Question 13:** Do you find the advance notice of planned interruptions reasonable?
- **Question 14:** Do you consider the proposed regulation reasonable?
- **Question 15:**Do you have any suggestions on the Force Majeure Certificate and Force Majeure Non-Certificate prescribed forms?
- **Question 16:** Do you agree with the exclusion of the above-mentioned parameters from the QoS Regulations?
- **Question 17:** Should any other parameter be excluded from the QoS Regulations?

- **Question 18:** Do you have any other comments on the proposed revised and updated draft Electronic Communications (Quality of Service) Regulations, which have not been discussed previously?

Annex A. Draft Revised and Updated Electronic Communications (Quality of Service) Regulations

Annex B. 2016 Draft Electronic Communications (Quality of Service) Regulations

Annex A

Revised and Updated Electronic Communications (Quality of Service) Regulations

ELECTRONIC COMMUNICATIONS (QUALITY OF SERVICE) REGULATIONS

[NAME OF CONTRACTING STATE]

Explanatory Notes

Within the scope of a regional digital transformation project, the Eastern Caribbean Telecommunications Authority ("ECTEL") is leading a component focused on the modernization of the legal, regulatory and institutional frameworks governing the telecoms sector and the capacity to implement them at regional and national level.

ECTEL, established by the ECTEL Treaty, advises the National Telecommunications Regulatory Commissions ("NTRCs") on the legal and regulatory framework, to effectively manage the electronic communications sector in the ECTEL Contracting States. Under the current legislative framework, the NTRCs are responsible for technical regulation and the setting of technical standards of electronic communications/telecommunications and for ensuring compatibility with international standards. The Quality of Service ("QoS") standards stipulated in the current QoS Regulations under the Telecommunications Act are deficient, obsolete and ineffective in responding to the growth of the sector and the challenges currently facing the ECTEL Contracting States.

Further, the new Electronic Communications ("EC") Bill envisages a new legislative framework, placing new or updated obligations on the licensees. It will also strengthen the capacity of NTRCs to monitor and enforce QoS and Quality of Experience ("QoE") standards. The envisaged Electronic Communications (Quality of Service) Regulations will strive to ensure that the users of public electronic communications networks obtain reliable QoS and QoE standards from the public electronic communications network operators in the ECTEL Contracting States.

Therefore, as part of the project, the ECTEL has undertaken the task of revising and updating the current 2016 draft Electronic Communications (Quality of Service) Regulations, to address some issues identified in an internal analysis of this regulations. The analysis included a benchmark study for a comparison with similar regulations of other

countries. As a result, the revised and updated version of the QoS Regulations, attached to this document, aims to cover the following issues:

- adapting the QoS Regulation to the new EC Bill;
- transitioning to a framework where NTRCs play an active role by monitoring compliance with QoS parameters, and strengthening the legal basis and capacity for NTRCs to validate QoS reports submitted by the licensees;
- restructuring the QoS standards to cover all the service lifecycle and avoiding technology-specific parameters;
- reducing the burden on licensees by removing entirely unnecessary parameters where possible, and reorganising some others, which will instead be monitored by the NTRCs, from the regular QoS Reports;
- improving the definition of QoS parameters and clarifying their geographical scope;
- clearly specifying their measurement and calculation methodology, where possible by reference to international standards, in a separate QoS Regulation Guidelines document;
- extending the provisions describing the contents and format of the reports to be submitted to the NTRCs and/or the consumers; and
- establishing requirements on the contact persons in charge of submitting the reports, and those responsible for their contents and any other QoS matters;

ELECTRONIC COMMUNICATIONS (QUALITY OF SERVICE) REGULATIONS

[NAME OF CONTRACTING STATE]

ARRANGEMENT OF REGULATIONS

Electronic Communications (Quality of Service) Regulations

[NAME OF CONTRACTING STATE]

[STATUTORY RULES AND ORDERS/STATUORY INSTRUMENT], No. [-] of 202[-]

(Gazette [Date])

Made by the Minister under section [-] of the Electronic Communications Act, 202[-] No. [-] of 202[-]).

1. Citation

(1) These Regulations may be cited as the Electronic Communications (Quality of Service) Regulations, 202[-]**.**

2. Commencement

(1) These Regulations shall come into force on the date of its publication in the [Gazette]

3. Interpretation

(1) In these Regulations –

"Act" means the Electronic Communications Act No. [-] of 202[-]

"Commission" means the National Telecommunications Regulatory Commission

"ECTEL" means the Eastern Caribbean Telecommunications Authority established by Article 2 of the Eastern Caribbean Telecommunications Authority Treaty signed at St. Georges, Grenada on 4th May, 2000 and amended by Protocol Amendment of 5th December, 2019;

"**force majeure"** means any unforeseeable event or effect outside a licensee's control, which renders the performance of one or more of that licensee's obligations under these Regulations impossible including, but not limited to, acts of nature such as an earthquake, flood, lightning, storm, hurricane, heat wave, volcanic eruption, epidemic or pandemic, and acts of people such as an act, law, decision or requirement of any governmental authority, riot, strike, lockouts or other industrial disturbances, civil disorder, declared state of emergency, terrorist actions, and war or any similar act;

"quality of service" means the measurement of the performance for an electronic communications service and the degree to which the electronic communications service conforms to the stipulated parameters;

"quarter" means a period of three months ending 31st March, 30th June, 30th September or 31st December in a calendar year;

"reseller of service" means a licensee engaged in the subsequent sale or lease on a commercial basis with or without adding value, of an electronic communications service provided by another licensee on a wholesale basis;

"Service Level Agreement" means a formally negotiated agreement between a wholesale licensee and a reseller of service with the main purpose of agreeing on the level of electronic communications service the wholesale licensee provides to the reseller of service**;**

"service level objectives" means the level of electronic communications service the wholesale licensee and the reseller of service agree on and usually include a set of service level indicators such as availability, performance and reliability;

"standard installation" means an installation where the necessary equipment to carry out the installation is readily available and no significant additional resources are required;

"**working day**" means any day that is not a public holiday in [ECTEL Contracting State], between 8:00 a.m. and 5:00 p.m.;

(2) A word or expression that is used in these Regulations and is also used in the Act shall have in these Regulations the same meaning as it has in the Act, unless the contrary appears.

4. Application

(1) These Regulations apply to a licensee that offers any of the following electronic communications services:

(a) a public fixed electronic communications service;

(b) a public mobile electronic communications service;

(c) internet services; or

(d) a subscriber television service.

5. Quality of service criteria and parameters

(1) The quality of service criteria and parameters –

(a) in the case of public fixed electronic communications services are set out in Part B of the Schedule;

(b) in the case of public mobile electronic communications services are set out in Part C of the Schedule;

(c) in the case of Internet services are set out in Part D of the Schedule; and

(d) in the case of subscriber television services are set out in Part E of the Schedule.

(2) Nothing in these Regulations exempts a licensee that is required to provide universal service from complying with the established quality of service criteria and parameters.

(3) Subject to sub-regulation 5(4), the Commission shall, after consultation with ECTEL, and having regard to market needs or the regulatory objectives of the Commission make a recommendation to the Minister to amend the service criteria and parameters set out in the Schedule.

(4) The Minister shall amend the Schedule within [3] months of receipt of a recommendation by the Commission.

(5) An amendment by the Minister under sub-regulation 5(4) shall be published in the [Official *Gazette*].

6. Geographical scope

(1) A licensee shall report the quality of service measurements to the Commission at a national level, unless otherwise stated in the Schedule.

(2) The Commission may require a licensee to make and report measurements in one or more specific geographic areas.

(3) The Commission shall on a recommendation of ECTEL, determine the geographical scope in sub-regulation 6(2) for [ECTEL Contacting State].

(4) ECTEL shall undertake a public consultation before submitting its advice and recommendation to the Commission outlined in sub-regulation 6(3).

7. Monitoring quality of service

(1) The Commission may measure any quality of service parameters in relation to a licensee as defined in regulation 5, and according to a methodology described in guidelines issued by the Commission under regulation 16.

(2) The Commission may conduct measurements of the quality of service parameters within such areas and at such frequency as the Commission may determine.

8. Publication of quality of service information

(1) The Commission may, after consultation with ECTEL, determine the content, form and manner of publication of information on the quality of service to be provided by a licensee to its customers.

(2) The Commission shall publish online, including on its website, the information provided by a licensee on approval by the Commission or resulting from measurements conducted by the Commission on the overall level of an electronic communications service being offered to customers; and

(3) The Commission shall issue the notification of the notice outlined in sub-regulation 8(2) in at least one newspaper of wide circulation in [Name of Contracting State] no later than three [3] months after the submission of information by that licensee.

(4) The Commission shall submit to ECTEL, on a quarterly basis, a report on information on quality of service in [ECTEL Contracting State].

9. Service Level Agreement

(1) A licensee who intends to make a retail service available as a wholesale service to a reseller of service, shall enter into a Service Level Agreement with this reseller to ensure that the electronic communications service to be delivered to the customer meets the quality of service criteria and parameters for service to be provided.

(2) A Service Level Agreement under sub-regulation 9(1) must include provisions in relation to –

(a) the definition of the electronic communications services being provided;

(b) the measurement of performance;

(c) service level objectives;

(d) duties of the wholesale service licensee;

(e) duties of the reseller of service;

(f) problem management;

(g) warranties;

(h) disaster recovery;

(i) complaints and dispute resolution; and

(j) penalties.

(3) The Commission shall, on the recommendation of ECTEL, include additional provisions to Service Level Agreements.

(4) ECTEL shall undertake a public consultation before submitting its advice and recommendation to the Commission outlined in sub-regulation 9(3).

10. Record keeping

A licensee shall retain quality of service data**,** all measurements and related records for a minimum period of eighteen (18) months after the end of the reporting period or until such time as the Commission may direct.

11. Submission of Reports to the Commission

(1) A licensee shall submit to the Commission, on a quarterly basis, a report as outlined in the Second Schedule on the last working day of the month following the end of the quarter.

(2) A licensee shall submit the report to the Commission outlined in sub-regulation (1) using the template set out in Part F of the Second Schedule, with the following information:

(a) name and type of service;

(b) geographical scope;

(c) reporting results (e.g., values of the parameters in the reporting period); and

(d) details on the methodology, such as the source of network measurements, details on the calculation of the parameters, time span and spatial distribution of the observations made to come up with such results.

(3) If a licensee has not attained the quality of service criteria and parameters referred to in regulation 5, the licensee shall submit to the Commission the following –

(a) statement outlining the reasons;

(b) the corrective actions undertaken or planned;

(c) the time period within which it will attain the required quality of service criteria and parameters; and

(d) any preventive actions taken to avoid similar issues in the future.

(4) The Commission may, on completion of a review of a quality of service report under sub-regulation 11(1), require the submitting licensee to make amendments or corrections to the measurements and reporting format as may be necessary, to meet the requirements and objectives of these Regulations.

(5) The submitting licensee shall resubmit an amended or corrected version of the report to the Commission within [5] days of the request, under sub-regulation 11(4).

12. Accountable Officer

A licensee shall appoint a senior officer who shall be responsible for –

(a) fulfilling any quality of service obligation under these Regulations; and

(b) acting as a single point of contact in any communication with the Commission related to quality of service matters under these regulations.

13. Verification of reports

(1) The Commission, after consultation with ECTEL, may take the necessary steps and utilise the necessary methods to verify the accuracy of a report submitted by a licensee under sub-regulation 11(1).

(2) The Commission may, at any time, in order to verify the information submitted in a report under sub-regulation 11(1), request the submission of additional information and documents from the submitting licensee.

(3) Upon receipt of a written request from the Commission, the licensee shall submit the additional information to the Commission and in accordance with the directions provided by the Commission, within [14] days of the request.

(4) For the purpose of verifying the information submitted in a report under sub-regulation 11(1) or any additional information received under sub-regulation 13(3), the Commission may conduct an investigation to verify the information submitted by a licensee under these Regulations.

(5) Investigations on quality of service related matters, as outlined in sub-regulation 13(4) may be triggered by –

(a) inconsistencies between the measurements reported by a licensee and those measured by the Commission;

(b) sustained non-compliance of quality of service targets by a licensee; or

(c) a recommendation by ECTEL;

(6) Within [7] days of receipt of written notification of an investigation by the Commission under sub-regulation 13(5), a licensee shall be prepared to demonstrate that –

(a) the measurements and reporting requirements have been complied with;

(b) the quality of service parameters are calculated according to the methodology stated in the quality of service report;

(c) the methodology used is compliant with the Guidelines issued by the Commission under regulation 16;

(d) its support systems involved in making, processing and reporting the measurements do so accurately; and

(e) the operations the licensee has performed in making, processing and reporting the measurements can be traced back for individual measurements.

(7) If the Commission is dissatisfied with the outcome of the investigation under sub-regulation 13(4), the Commission shall refer the matter to ECTEL.

(a) The Commission shall, in referring the matter to ECTEL under sub-regulation 13(7), provide ECTEL with all required information and ECTEL shall investigate the matter.

(8) In conducting an investigation under sub-regulation 13(7)(a), ECTEL may consult with an independent body.

(a) ECTEL shall submit its recommendations to the Commission, following the investigation conducted under sub-regulation 13(7)(a).

(9) On completion of the verification process, the Commission shall approve and publish its report in accordance with regulation 8(2).

14. Force Majeure

(1) A licensee shall notify the Commission with a reasonably practicable notice, that a Force Majeure event has occurred, which affects a licensee's obligations relating to quality of service under these Regulations.

(2) The licensee shall notify the Commission of the extent of the Force Majeure event and provide the details of the Force Majeure in writing within [3] days, which must include particulars –

(a) of the Force Majeure event, which may include the date, time and circumstances; and
(b) of the effect of such Force Majeure event, as it relates to the licensee's obligations under these Regulations.

(3) The Commission shall –

(a) within [3] working days of receipt of the licensee's notification under sub-regulation 14(2), investigate and inform the licensee in writing of such investigation; and

(b) during its investigation under sub-regulation 14(3)(a), take into account any factors that may reasonably affect the ability of an affected licensee to achieve the quality of service criteria and parameters.

(4) During the Commission's investigation under sub-regulation 14(3), a licensee shall be prepared to demonstrate –

(a) a material change in the licensee's environmental or operating conditions that could not have been reasonably foreseen by the licensee;
(b) an electronic communications service deficiency, which arose partly or wholly from unforeseeable acts, omissions or operations of another licensee or other party; or
(c) any other information reasonably requested by the Commission to verify the licensee's claims

which may affect the ability of a licensee to achieve the quality of service criteria and parameters under regulation 5.

(5) The Commission shall complete its investigation under sub-regulation 14(3) within [14] days and submit a report to ECTEL, which shall include the following –

(a) particulars of the Force Majeure event and its effect;
(b) any related submissions made by the affected licensee;
(c) the estimated or actual period of time required to end the Force Majeure period; and
(d) recommendations from the Commission;

(6) ECTEL shall review a report submitted under sub-regulation 14(5) and within [14] days submit its recommendations to the Commission.

(7) Subject to sub-regulation 14(6), the Commission shall –

(1) Where it has been determined that a Force Majeure event has occurred, notify and issue to the licensee a Force Majeure Certificate as prescribed, which shall include the following:

(a) the actual or estimated duration of the Force Majeure period; and
(b) whether the licensee is exempt, in whole or in part, from the obligation to submit a quality of service report during the quarter in which the Force Majeure event occurred or during which the relevant Force Majeure event continued;
(c) any other recommendation; or

(2) Where it has been determined that a Force Majeure event has not occurred, notify and issue to the licensee a Force Majeure Non-Certificate as prescribed.

(a) Where the Commission has issued a Force Majeure Non-Certificate under sub-regulation 14(7)(2), the Commission shall provide reasons for its decision in writing;

(b) A licensee may appeal the Commission's decision under sub-regulation 14(7)(2) under the [Electronic Communications (Tribunal) Regulations].

(8) The licensee may request an extension of the Force Majeure period issued by the Commission under sub-regulation 14(7)(1) and shall submit to the Commission –

(a) the particulars of the request; and
(b) the particulars of any efforts made by the licensee to restore the normal fulfilment of its obligations under the Regulations.

(9) The Commission shall submit the request under sub-regulation 14(8) to ECTEL within [2] working days, for its review and recommendations.

(10) The Commission in determining its decision under sub-regulation 14(8) shall consider –

(a) submissions made by the affected licensee;
(b) national concerns; and
(c) recommendations by ECTEL.

(11) Subject to sub-regulation 14(10), the Commission shall, within [5] days –

(a) grant the extension of the Force Majeure period and inform the licensee in writing; or
(b) refuse the extension and inform the licensee of its reasons in writing.

(12) A licensee may appeal the Commission's decision under sub-regulation 14(11)(b), under the [Electronic Communications (Tribunal) Regulations].

15. Advance Notice of Interruption

A licensee shall give its customers notice at least [2] days in advance of any planned interruption of service, by publishing a notice by text message, email, other online application or print media.

16. Commission to issue Guidelines

The Commission may from time to time, and after consultation with ECTEL, publish guidelines on any aspect of these regulations online, including on its website, and such guidelines may be of general application under these Regulations.

17. Compliance and enforcement

(1) A licensee, to whom these Regulations apply, shall comply with the obligations provided for in these Regulations within [6] months of the coming into effect of these Regulations.

(2) A licensee commits an offence if –

(a) it fails to comply with sub-regulation 17(1);

(b) it fails to submit during a time period specified in these Regulations or by the Commission, information requested by these Regulations;

(c) it submits or publishes false or misleading information relating to quality of service; or

(d) it obstructs or prevents an investigation by the Commission on the quality of service measurement, reporting or record keeping procedures.

(3) If a licensee fails to comply with sub-regulation 17(1), the Commission may direct the licensee to remedy its breach of these Regulations.

(4) Without prejudice to sub-regulations (2) and (3), the Commission may take one or more of the following enforcement measures –

(a) direct the licensee to implement a remedial plan to improve the quality of service of the relevant services over a period to be determined by the Commission;

(b) direct the licensee to publish additional information about the quality of the service and, if so determined by the Commission, its implementation of the remedial plan.

(5) A licensee who fails to comply with these Regulations commits an offence and is liable on summary conviction to a fine not exceeding $50,000, or if the offence is a continuing offence, the licensee is liable to a further fine not exceeding $5,000 for every day that the offence continues after conviction, or suspension of its licence, as provided for in section 45 of the Act.

FIRST SCHEDULE

(Regulation 14)

FORCE MAJEURE CERTIFICATE

Force Majeure Certificate No. …….. **Name of Licensee**
(to be completed by the Commission)

…….

Force Majeure Event

1. Particulars of the Force Majeure event

……

……

2. Actual or estimated duration of the Force Majeure period

……..

……

3. Whether the licensee is exempt, in whole or in part, from the obligation to submit a quality of service report during the quarter in which the Force Majeure event occurred or during which the relevant Force Majeure event continued

……..

……

4. Other submissions by the Licensee

……

……

5, Any other recommendation by the Commission

……

……

5. Date……

……..
Chairperson
NTRC

FORCE MAJEURE NON-CERTIFICATE

Force Majeure Non-Certificate No. …….. **Name of Licensee**
(to be completed by the Commission)

……

Non- Certificate of Force Majeure Event

1. Particulars of the Non- Force Majeure event

……

……

2. Reasons for refusal

……

……

3, Any other recommendation by the Commission

……

……

4. Date……

……..
Chairperson
NTRC

SECOND SCHEDULE

(Regulation 5)

1. Definitions

(1) In this Schedule −

"active subscribers" are persons who have subscribed for a service offered by a licensee and have been engaged in the revenue-generating actions in the last ninety (90) days.

"answered" means the duration from the instant when the address information required for setting up a call is received by an electronic communications network to the instant a human operator answers the calling party to provide the electronic communications service requested where the electronic communications service provided is not wholly automatic or does not employ the use of a voice response system;

"**answered customer serv. call ratio**" means the percentage of completed call attempts to the licensee's customer support services;

"**billing accuracy**" means the measure of the number of incorrect bills per 1000 bills issued, has been determined by the licensee or the Commission to have been issued with an error;

"**broadband service availability**" means the ratio of successful log-in to broadband test servers, excluding unsuccessful log-in due to planned interruptions of the service.

"broadband session drop ratio" means the percentage of abnormal disconnections with respect to all broadband session disconnects (both normal and abnormal) and measures the ability of the access network to maintain a connection.

"call attempt" in a telecommunications network is a demand by a user of the network for a connection to another user. For clarity, this includes all completed, overflowed, abandoned or lost calls.

"**call completion rate**" means the ratio of successfully completed calls to the total number of attempted calls, that is, the ratio of the number of completed call attempts to the total number of call attempts, at a given point of an electronic communications network;

"**call completion success rate**" means the percentage of originated calls successfully completed where a successfully completed call is established by a successful connection to the called number although the called party may not answer;

"**call setup success ratio**" means the percentage of successful calls, including those completed, lost or abandoned, to the total number of call attempts in a specified time period - i.e., the proportion of call attempts that result in a connection to the dialled number

"**call set-up time**" means the period starting when the address information required for setting up a call is received by the network and finishing when the called party busy tone or ringing tone or answer signal is received by the calling party.

"**complaint category**" refers to 1) complaints with the provision of service, 2) complaints with help services, or 3) complaints with network performance, reliability, and availability;

"**complaint resolution time**" means the duration from the instant a complaint is notified to the published point of contact of a licensee and is not found to be invalid to the instant the cause for the complaint has been resolved.

"**complaint submission ratio**" means the number of complaints logged per customer in a data collection period;

"**connection**" means the interval between approval of a request for an electronic communications service and the provision of the electronic communications service by the licensee;

"customer service call" is a call to a telephone number of a licensee that is intended for complaints, service orders, fault reports or service enquiries;

"customer service centre" means an office or other location where customers can, among other things, apply for telecommunications services and lodge complaints;

"domestic leased lines" means leased lines connecting two end points within the country;

"**delay**" means the time required for a packet to travel from a source to a destination;

"drive test" means a method of measuring and assessing the coverage, capacity and quality of service of a mobile radio network while driving;

"disconnection" is a deliberate blocking by a licensee of calls, messages and/or data uploads or downloads. It does not necessarily entail removal of physical network access points, even for fixed telephony;

"dropped call ratio" means the proportion of incoming and outgoing calls which, once they have been correctly established and therefore have an assigned traffic

channel, are dropped or interrupted prior to their normal completion by the user, the cause of the early termination being within the operator's network;

"**effective vs subscription speed ratio**" means the percentage of the throughput compared to the subscribed speed measured at the terminating point;

"fault repair" means the time taken to restore an existing customer's electronic communications service to operational level from the time that a problem is reported or a fault report is received but faults due to the customer premises equipment which is owned by a customer, such as computer hardware and software are excluded from the measurement of performance against this benchmark**;**

"fault report" means a report of disrupted or degraded electronic communications service that is made by a customer and is attributable to an electronic communications network of the licensee or any interconnected public electronic communications network, and that is not found to be invalid;

"**fault repair time**" means the duration from the instant a fault report has been made to the instant when the service element or service has been restored to normal working order;

"fault report rate" means the number of fault reports per fixed access line;

"fixed access technology" refers to (a) xDSL, (b) FTTx, (c) hybrid fibre coaxial (HFC), (d) fixed wireless access, or any other fixed access technology offered by the licensee during the reporting period, if so requested or defined by the Commission;

"interruption" means any degradation in the ability of an end user to establish and/or maintain a channel of communication as a result of the failure of, or degradation in the performance of, a licensee's network or service;

"**internet exchange point**" or "**IXP**" means a single physical network infrastructure operated by a single entity with the purpose to facilitate the exchange of Internet traffic, acting as a centralised hub enabling local traffic to be routed locally and save international bandwidth which has the effect to reduce the overall costs of international Internet connectivity;

"IVR" means Interactive Voice Response systems;

"jitter" means the variation between the maximum delay and minimum delay within a specific time window;

"**latency**" means the time required for a packet to travel from a source to a destination and back;

“maintainability” means the probability of performing a successful repair action within a given time;

“mobile access technology” refers to any mobile access technology commercially available and offered by the licensee during the reporting period (e.g., 2G, 3G, 4G, 5G, and so on), or any other mobile access technology defined by, or requested by the Commission;

“monitoring parameter" means that the targets must be monitored and ensured by all licensees, but which do not need to be periodically reported to the Commission**;**

“network availability” means the percentage of time the network is operational and not in a state of failure or interruption at any point of time within the reporting period (i.e., network elements working properly), excluding all planned interruptions;

“**overall satisfaction**” means the degree of satisfaction that a customer has with the service offering;

“packet loss” means the failure of a packet to traverse the network to its destination;

“packet loss ratio” refers to the ratio between the number of the packets lost in the network and the total number of transmitted packets;

“**planned interruption**” means any interruption that is part of regular operation and maintenance activities and has been communicated to the end users according to regulation 15;

“**Point of interconnection**” or “**POI**” means the demarcated point or the facility for exchange of traffic between networks to facilitate inter-network communication of/for respective subscribers, who are end users of such networks;

“**POI congestion**” refers to the ratio of calls failed over the POI (between two network operators) due to unavailability of free circuits to the total call requests for seizure of POI circuit;

“reconnection of service” means the restoration of an electronic communications service by the licensee after the licensee receives overdue payment from the customer;

“reportable parameter” means that the targets that must be periodically reported to the Commission by licensees, in accordance with the terms and conditions stated in the Rules;

“response time” means the duration from the instant when the address information required for setting up a call is received by an electronic

communications network to the instant the human operator answers the calling user to provide the electronic communications service requested. **The electronic communication services covered are the electronic communication services for operator controlled and assisted calls that are accessed with special access codes. Access to emergency services is excluded;**

"**response time for enquiries**" means the time elapsed between the end of dialling to the customer service and reaching an IVR or a human operator;

"**satisfaction with billing performance**" means the degree of satisfaction that a customer has with the correctness of bills and billing clearance;

"**satisfaction with enquiry services**" means the degree of satisfaction that a customer has with the customer support (i.e., help/enquiry services, technical support);

"service orders" are requests by a customer to be supplied with a telecommunications service, that is conveyed or submitted to a licensee via a Customer Service Call, at a Customer Service Centre or in writing by or on behalf of a customer;

"service availability" means the measure of the degree to which the electronic communications service is operable and not in a state of failure or outage at any point of time for all users;

"strength" means the transmitter power output received by a reference antenna at a distance from the transmitting antenna within the coverage areas as reported by a licensee;

"**SMS completion ratio**" means the percentage of SMS between two terminal equipment correctly sent and received within two minutes after being sent, excluding duplicated, received, and corrupted messages;

"**SMS end-to-end delivery time**" means the period starting when sending a SMS from a terminal equipment to a Short Message Center and finishing when receiving the very same SMS on another terminal equipment;

"s**uccessful call attempt**" means a call from a calling party who is successfully switched through to the called party, or receives busy tone when the called party is engaged speaking;

"supply time for connection" means the time elapsed from the receipt of a valid service order being placed by a customer to the instant a working service is made available for use, excluding orders cancelled by the user during the provisioning process;

"**throughput**" means the data transmission rate that is achieved separately for downloading and uploading specified test files between a remote website and a user's terminal;

"**time for reconnection of service**" means the duration from the instant of a cause of suspension of a service is removed by the affected licensee to the instant a working service is reactivated for use.

"**VAT**" means value added tax;

"**voice quality**" means the overall speech quality as perceived and scored by human subjects;

"wireless access technology" refers to any wireless access technology commercially available and offered by the licensee during the reporting period (e.g, WiMax, Satellite, 2G, 3G, 4G, 5G, and so on), or any other wireless mobile access technology defined by, or requested by the Commission;

"working day" or **"w. day"** means any day that is not a public holiday in [ECTEL Contracting State], between 8:00 a.m. and 5:00 p.m.;

"working hour" or **"w. hour"** means any hour between 8:00 a.m. and 5:00 p.m. in a working day;

2. Application of this Schedule

(1) This Schedule does not apply to a request for connection or maintenance of an electronic communications service that does not involve a standard installation.

(2) A licensee shall inform the Commission of a request for connection or maintenance of an electronic communications service that does not involve a standard installation within [14] days on receipt of a request because the licensee –

(a) does not supply the particular electronic communications service in the requested geographical area;

(b) cannot technically install the electronic communications service within the time frame provided for in this Schedule; or

(c) cannot install the electronic communications service because it is not technically feasible.

(2) A licensee shall have the burden of proving that the electronic communications service cannot technically be installed within the time frame set out in this Schedule or that it is not technically feasible to install the electronic communications service lies with the licensee.

(3) Notwithstanding sub-paragraph (1), the Commission and a licensee shall agree within [21/28] days of the licensee's notification under sub-regulation 2 that a request for connection or maintenance from a customer would be completed within an agreed time frame, the delivery time shall be taken into consideration for measurement purposes.

(4) A licensee may make a request to the Commission for additional time under sub-regulation (2).

(5) In determining whether it is reasonable to grant a further time period under sub-regulation (4), the Commission may take into account —

(a) the history of the application;

(b) the geographical area;

(c) technical feasibility; and

(d) any other matter referred to in the application.

3. Parameters

(1) A licensee shall comply with the targets for all applicable quality of service parameters as outlined in Parts B, C, D, and E of the Schedule.

(2) A licensee shall provide measurements for every possible combination of the parameters, including any combination in the applicable categories outlined in the Schedule.

(3) The Commission, on the recommendation of ECTEL, may recommend additional information from a licensee, on all applicable quality of service parameters as outlined in sub-regulations (1) and (2).

PART A
Quality of Service Parameters

The following table summarises the quality of service parameters under the scope of these Regulations, and the Part A in this Schedule outlines the targets for each of the electronic communications services to which the parameter is applicable.

A. Quality of Parameter		Applicable to	Targets
Coverage			
P1	**Signal strength**	Public Mobile Electronic Communications services	Part C
		Wireless Internet services	Part D.2
Service provisioning			
P2	**Supply time for connection**	Public Fixed Electronic Communications services	Part B
		Mobile Telephony services	Part C.1
		Internet services	Part D
		Subscriber Television services	Part E
P3	**Time for reconnection of service**	Fixed Telephony services	Part B.1
		Mobile Telephony services	Part C.1
		Internet services	Part D
		Subscriber Television services	Part E
Availability			
P4	**Network availability**	Fixed Telephony services	Part B.1
		Mobile Telephony services	Part C.1
		Internet services	Part D
P5	**Broadband service availability**	Internet services	Part D
Network performance			
P6	**Broadband session drop ratio**	Internet services	Part D
P7	**Packet loss ratio**	Internet services	Part D
P8	**Latency**	Internet services	Part D
P9	**Jitter**	Internet services	Part D

A. Quality of Parameter		Applicable to	Targets
Service quality			
P10	**Call set-up success ratio**	Fixed Telephony services	Part B.1
		Mobile Telephony services	Part C.1
P11	**Call set-up time**	Fixed Telephony services	Part B.1
		Mobile Telephony services	Part C.1
P12	**Dropped call ratio**	Fixed Telephony services	Part B.1
		Mobile Telephony services	Part C.1
P13	**Effective vs subscription throughput ratio**	Internet services	Part D
P14	**SMS completion ratio**	SMS services	Part C.2
P15	**SMS end-to-end delivery time**	SMS services	Part C.2
Fault management			
P16	**Fault report rate**	Fixed Telephony services	Part B.1
		Fixed Internet services	Part D
		Subscriber Television services	Part E
P17	**Fault repair time**	Public Fixed Electronic Communications services	Part B
		Fixed Internet services	Part D
		Subscriber Television services	Part E
Billing			
P18	**Billing accuracy**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E

A. Quality of Parameter		Applicable to	Targets
Customer care			
P19	**Complaint submission ratio**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E
P20	**Answered customer serv. call ratio**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E
P21	**Response time for enquiries**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E
P22	**Complaints resolution time**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E

A. Quality of Parameter		Applicable to	Targets
Customer experience			
P23	**Voice quality**	Fixed Telephony services	Part B.1
		Mobile Telephony services	Part C.1
P24	**Overall satisfaction**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E
P25	**Satisfaction with enquiry services**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E
P26	**Satisfaction with billing performance**	Public Fixed Electronic Communications services	Part B
		Public Mobile Electronic Communications services	Part C
		Internet services	Part D
		Subscriber Television services	Part E

PART B

Public Fixed Electronic Communications Services

B.1 – Fixed Telephony services

B.1 Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P2	**Supply time for connection**	Fixed access technology	75% in 3 w. days 95% in 5 w. days 100% in 7 w. days	Reportable
P3	**Time for reconnection of service**	Fixed access technology	85% within 3 w. hours	Reportable
P4	**Network availability**	Fixed access technology	99.9%	Reportable
P10	**Call set-up success ratio**	National calls, and international calls	98%	Reportable
P11	**Call set-up time**	National calls, and international calls	National calls: 95% in 5 seconds International calls 95% in 10 seconds	Reportable
P16	**Fault report rate**	Fixed access technology	5%	Reportable
P17	**Fault repair time**	Fixed access technology	90% in 24 hours 95% in 48 hours 100% in 72 hours	Reportable
P18	**Billing accuracy**	Not applicable	0.5% per billing cycle	Reportable
P19	**Complaint submission ratio**	Each complaint category	5%	Reportable
P20	**Answered customer serv. call ratio**	Not applicable	95%	Reportable
P21	**Response time for enquiries**	Not applicable	80% in 5 seconds 95% in 10 seconds	Reportable
P22	**Complaints resolution time**	Not applicable	90% in 5 w. days 99% in 15 w. days	Reportable
P23	**Voice quality**	Not applicable	95% in MOS 3.5	Monitoring
P24	**Overall satisfaction**	Not applicable	95%	Monitoring
P25	**Satisfaction with enquiry services**	Not applicable	90%	Monitoring
P26	**Satisfaction with billing performance**	Not applicable	90%	Monitoring

B.2 – Leased lines services

B.2 Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P2	**Supply time for connection**	Domestic and international leased lines	90% on agreed day	Reportable
P17	**Fault repair time**	Domestic leased line	95% in 24 hours	Reportable
		International leased line	90% on agreed time	Reportable
P18	**Billing accuracy**	Not applicable	0.5% per billing cycle	Reportable
P19	**Complaint submission ratio**	Complaint category	5%	Reportable
P20	**Answered customer serv. call ratio**	Not applicable	95%	Reportable
P21	**Response time for enquiries**	Not applicable	80% in 5 seconds 95% in 10 seconds	Reportable
P22	**Complaints resolution time**	Not applicable	90% in 5 w. days 99% in 15 w. days	Reportable
P23	**Voice quality**	Not applicable	95%	Monitoring
P24	**Overall satisfaction**	Not applicable	90%	Monitoring
P25	**Satisfaction with enquiry services**	Not applicable	90%	Monitoring
P26	**Satisfaction with billing performance**	Not applicable	90%	Monitoring

PART C

Public Mobile Electronic Communications Services

C.1 – Mobile Telephony services

C.1 Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P1	**Signal strength**	Mobile access technology	*Indoor:* 85% of measures ≥ -75 dBm *Outdoor:* 85% of measures ≥ -95 dBm *In-vehicle:* 85% of measures ≥ -85 dBm	Monitoring
P2	**Supply time for connection**	Post-paid plans	95% in 1 hour 99% in 5 hours 100% in 24 hours	Reportable
		Pre-paid plans	On-demand	Reportable
P3	**Time for reconnection of service**	Post-paid and pre-paid plans	95% within 3 w. hours	Reportable
P4	**Network availability**	Mobile access technology	99%	Reportable
P10	**Call set-up success ratio**	National calls, and international calls	98%	Reportable
P11	**Call set-up time**	National calls, and international calls	National calls: 95% in 5 seconds International calls 95% in 10 seconds	Reportable
P12	**Dropped call ratio**	Not applicable	2%	Reportable
P18	**Billing accuracy**	Not applicable	0.5% per billing cycle	Reportable
P19	**Complaint submission ratio**	Complaint category	5%	Reportable
P20	**Answered customer serv. call ratio**	Not applicable	95%	Reportable
P21	**Response time for enquiries**	Not applicable	80% in 5 seconds 95% in 10 seconds	Reportable
P22	**Complaints resolution time**	Not applicable	90% in 5 w. days 99% in 15 w. days	Reportable
P23	**Voice quality**	Not applicable	95% in MOS 3.5	Monitoring

P24	**Overall satisfaction**	Not applicable	95%	Monitoring
P25	**Satisfaction with enquiry services**	Not applicable	90%	Monitoring
P26	**Satisfaction with billing performance**	Not applicable	90%	Monitoring

C.2 – SMS services

C.2 Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P14	**SMS completion ratio**	Not applicable	98%	Reportable
P15	**SMS end-to-end delivery time**	Not applicable	99% in 5 seconds	Reportable

PART D

Internet Services

D.1 – Fixed Internet Services

D.2 – Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P2	**Supply time for connection**	Fixed access technology	75% in 3 w. days 95% in 5 w. days 100% in 7 w. days	Reportable
P3	**Time for reconnection of service**	Fixed access technology	85% within 3 w. hours	Reportable
P4	**Network availability**	Fixed access technology	99.9%	Reportable
P5	**Broadband service availability**	Fixed access technology	99.9%	Reportable
P7	**Packet loss ratio**	Fixed access technology Local and international test server	3%	Reportable
P8	**Latency**	Fixed access technology Local and international test server	National: 95% in 80 ms International: 95% in 200 ms	Reportable
P9	**Jitter**	Fixed access technology Local and international test server	30 ms	Reportable
P10	**Effective vs subscription throughput ratio**	Local and international test server	90% during 95% of the time	Reportable
P16	**Fault report rate**	Fixed access technology	5%	Reportable
P17	**Fault repair time**	Fixed access technology	90% in 24 hours 95% in 48 hours 100% in 72 hours	Reportable
P18	**Billing accuracy**	Not applicable	0.5% per billing cycle	Reportable
P19	**Complaint submission ratio**	Complaint category	5%	Reportable
P20	**Answered customer serv. call ratio**	Not applicable	95%	Reportable
P21	**Response time for enquiries**	Not applicable	80% in 5 seconds 95% in 10 seconds	Reportable
P22	**Complaints resolution time**	Not applicable	90% in 5 w. days 99% in 15 w. days	Reportable

P24	**Overall satisfaction**	Not applicable	95%	Monitoring
P25	**Satisfaction with enquiry services**	Not applicable	90%	Monitoring
P26	**Satisfaction with billing performance**	Not applicable	90%	Monitoring

D.2 – Wireless Internet Services

D.2 – Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P1	**Signal strength**	Mobile access technology	*Indoor:* 85% of measures ≥ -75 dBm *Outdoor:* 85% of measures ≥ -95 dBm *In-vehicle:* 85% of measures ≥ -85 dBm	Monitoring
P2	**Supply time for connection**	Not applicable	95% in 1 hour 99% in 5 hours 100% in 24 hours	Reportable
P3	**Time for reconnection of service**	Not applicable	85% within 3 w. hours	Reportable
P4	**Network availability**	Wireless access technology	99%	Reportable
P5	**Broadband service availability**	Wireless access technology	99%	Reportable
P6	**Broadband session drop ratio**	Wireless access technology	1%	Reportable
P7	**Packet loss ratio**	Wireless access technology	3%	Reportable
P8	**Latency**	Wireless access technology Local and international test server	National: 95% in 80 ms International: 95% in 200 ms Satellite: 95% in 800 ms	Reportable
P9	**Jitter**	Wireless access technology Local and international test server	30 ms	Reportable
P13	**Effective vs subscription throughput ratio**	Local and international test server	90% during 95% of the time	Reportable
P18	**Billing accuracy**	Not applicable	0.5% per billing cycle	Reportable

P19	**Complaint submission ratio**	Complaint category	5%	Reportable
P20	**Answered customer serv. call ratio**	Not applicable	95%	Reportable
P21	**Response time for enquiries**	Not applicable	80% in 5 seconds 95% in 10 seconds	Reportable
P22	**Complaints resolution time**	Not applicable	90% in 5 w. days 99% in 15 w. days	Reportable
P24	**Overall satisfaction**	Not applicable	95%	Monitoring
P25	**Satisfaction with enquiry services**	Not applicable	90%	Monitoring
P26	**Satisfaction with billing performance**	Not applicable	90%	Monitoring

PART E

Subscriber Television Services

E – Subscriber Television Services

E – Quality of Service Parameter		Break down results by	Target level	Reportable / Monitoring
P2	**Supply time for connection**	Not applicable	100% in 5 w. days	Reportable
P3	**Time for reconnection of service**	Not applicable	90% within 3 w. hours	Reportable
P16	**Fault report rate**	Not applicable	5%	Reportable
P17	**Fault repair time**	Not applicable	90% in 24 hours 95% in 48 hours 100% in 72 hours	Reportable
P18	**Billing accuracy**	Not applicable	0.5% per billing cycle	Reportable
P19	**Complaint submission ratio**	Not applicable	5%	Reportable
P20	**Answered customer serv. call ratio**	Not applicable	95%	Reportable
P21	**Response time for enquiries**	Not applicable	80% in 5 seconds 95% in 10 seconds	Reportable
P22	**Complaints resolution time**	Not applicable	90% in 5 w. days 99% in 15 w. days	Reportable
P24	**Overall satisfaction**	Not applicable	95%	Monitoring
P25	**Satisfaction with enquiry services**	Not applicable	90%	Monitoring
P26	**Satisfaction with billing performance**	Not applicable	90%	Monitoring

PART F

Quality of Service Report Template

F – Quality of Service Report Template

F – QUALITY OF SERVICE REPORT	
Licensee:	
Service:	[One report per each service provided]
Geographical Area:	[Specify geographical scope. One report per geographical area]
Reporting period:	
General observations:	

QoS parameter summary [one row for every applicable parameter]				
Id	*Parameter*	*Value*	*Target*	*Accomplished*
P[X]	[Parameter X Name]	[Value in the period]	[Parameter Target]	YES/NO
P[Y]				
…				

QoS parameter calculation details [one table for every applicable parameter]

Parameter Id:	P[X]
Parameter Name:	[Parameter X Name]
Parameter QoS Measures	
Source:	[The licensee to include details about the systems and the indicators or parameters of those systems that were used to calculate the QoS parameter]
Time Span and frequency:	[The licensee to include information about the dates, time span, geographical scope, and the frequency of the measures]
Geographical scope:	[The licensee to include information about the geographical scope of the measures and/or the network nodes for which information was taken]
Parameter calculation methodology	
Calculation methodology:	[The licensee to provide clear thorough explanations about the operations that were made to calculate Parameter X from the measures described above.]
Target accomplished:.	YES/NO [If the answer is no, the licensee must fill the form below]

Observations:	
Justification of non-compliance, corrective and preventive measures undertaken [To be included only if QoS standards were not met for Parameter X]	
Reasons for non-compliance:	[The licensee to provide reasons to justify why QoS standards were not met]
Corrective actions:	[The licensee to provide information about corrective actions taken to correct QoS shortfall]
Due date:	[If corrective actions are not immediate, planned date for the measures to become effective and for the target for Parameter X to be met]
Preventive actions:	[The licensee to provide information about preventive actions taken to avoid similar QoS shortfalls in the future]

Made this [ ] day of [ ] 202[ ].

[Name of Minister]
Minister responsible for Electronic Communications.

Annex B

2016 Electronic Communications (Quality of Service) Regulations.

ELECTRONIC COMMUNICATIONS (QUALITY OF SERVICE) REGULATIONS

[NAME OF CONTRACTING STATE]

ARRANGEMENT OF REGULATIONS

Electronic Communications (Quality of Service) Regulations

[NAME OF CONTRACTING STATE]

[STATUTORY RULES AND ORDERS/STATUORY INSTRUMENT], No. [-] of 200[-]

(Gazette [Date])

Made by the Minister under section [-] of the Electronic Communications Act, 200[-] No. [-] of 20[-]).

Citation

1. These Regulations may be cited as the Electronic Communications (Quality of Service) Regulations, 20[-]**.**

[Commencement

2. These Regulations shall come into force on the date of its publication in the Gazette.]

Interpretation

3. In these Regulations –

"Act" means the Electronic Communications Act No. [-] of 200[-];

"Compliance Manual" means a document that includes details of work processes and information systems concerning criteria and parameter treatment, and details of algorithmic treatment of parameter calculations;

"***force majeure***" means any event or effect that cannot be anticipated or controlled and includes both acts of nature such as earthquake, flood, lightning and hurricane, and acts of people such as riot, strike, civil disorder, declared state of emergency and war or any similar act which the Commission determines to be *force majeure*;

"quality of service" means the measurement of the performance for an electronic communications service and the degree to which the electronic communications service conforms to the stipulated parameters;

"quarter" means a period of three months ending 31st March, 30th June, 30th September or 31st December in a calendar year;

"reseller of service" means a licensee engaged in the subsequent sale or lease on a commercial basis with or without adding value, of an electronic communications service provided by a licensee on a wholesale basis;

"Service Level Agreement" means a formally negotiated agreement between a wholesale licensee and a reseller of service with the main purpose of agreeing on the level of electronic communications service the wholesale licensee provides to the reseller of service**;**

"service level objectives" means the level of electronic communications service the wholesale licensee and the reseller of service agree on and usually include a set of service level indicators such as availability, performance and reliability;

"standard installation" means an installation where the necessary equipment to carry out the installation is readily available and no significant additional resources are required.

Application

4. These Regulations apply to a licensee of any of the following electronic communications services -

(a) a public fixed electronic communications service;
(b) a public mobile electronic communications service;
(c) a fixed and wireless broadband service;
(d) a subscriber television service.

Quality of service criteria and parameters

5. (1) The quality of service criteria and parameters -

(a) in the case of a public fixed electronic communications service are set out in Part A of the Schedule;

(b) in the case of a public mobile electronic communications service are set out in Part B of the Schedule;

(c) in the case of a fixed and wireless broadband service are set out in Part C of the Schedule; and

(d) in the case of subscriber television are set out in Part D of the Schedule.

(2) Nothing in these Regulations exempts a licensee that is required to provide universal service from complying with the established quality of service criteria and parameters.

(3) Subject to subsection (4), the Commission shall, after consultation with ECTEL, and having regard to market needs or the regulatory objectives of the Commission make a recommendation to the Minister to amend the service criteria and parameters set out in the Schedule.

(4) The Minister may, upon receipt of a recommendation from the Commission, amend the Schedule.

(5) An amendment by the Minister under subsection (4) shall be published in the [Official Gazette].

Adoption of additional service criteria or parameters

6. (1) A licensee may in addition to the criteria set out herein adopt additional service criteria or parameters to determine its level of quality of service.

(2) Where a licensee adopts additional criteria in accordance with sub-regulation (1) and introduces procedures and information systems intended for the treatment of quality of service criteria and parameters, it shall –

(a) notify the Commission at least 30 days prior to the intended introduction; and

(b) subject to regulation 7, notify the public of its quality of service information.

(3) A notification under sub-regulation (2) (a) must contain details of all relevant matters including the methods and systems used for the measurement of quality of service criteria and parameters.

Publication of quality of service information

7. (1) The Commission may, after consultation with ECTEL, determine the content, form and manner of publication of information on the quality of service to be provided by a licensee to its customers.

(2) The Commission shall publish the information provided by a licensee on the overall level of an electronic communications service being offered to customers on the Commission's website on an annual basis.

Service Level Agreement

8. (1) A licensee who intends to make his retail services available as wholesale services to a reseller of service shall enter into a Service Level Agreement with reseller to ensure that the electronic communications service being delivered to the customer meets the desired expectation of the customer with regard to the quality of service being provided.

(2) A Service Level Agreement under sub-regulation (1) must include the following provisions related to -

(a) the definition of the electronic communications service being provided;
(b) the measurement of performance;
(c) service level objectives;
(d) duties of the wholesale service licensee;
(e) duties of the reseller of service;
(f) problem management;
(g) warranties;
(h) disaster recovery;
(i) complaints and dispute resolution; and
(j) penalties.

(3) The Commission may, on the recommendation of ECTEL, include additional provisions to Service Level Agreements.

Compliance Manual

9. (1) A licensee shall keep a Compliance Manual in respect of each electronic communications service that it is licensed to provide, within 3 months after the introduction of the criteria and parameters under regulation 5.

(2) A licensee shall not delete any part of the Compliance Manual without the prior written consent of the Commission.

(3) A licensee shall keep and provide the Compliance Manual in any format directed by the Commission.

(4) Where pursuant to regulation 5 (4) the Schedule is amended, the affected licensee shall include the amendments with any necessary adaptations in the Compliance Manual within 30 days of the coming into effect of the amendments.

Record keeping

10. A licensee shall retain quality of service data**,** all measurements and related records for a minimum period of eighteen months after the end of the reporting period or until such time as the Commission may direct.

Information to Commission

11. (1) A licensee shall submit to the Commission on a quarterly basis a report on its achievements for each of the electronic communications service criteria and parameters under regulation 5 for the last reporting quarter.

(2) A licensee shall submit the report referred to in sub-regulation (1) on the last working day of the month following the end of the quarter.

(3) Where a licensee has not attained the service criteria and parameters under regulation 5, the licensee shall state the reasons and the time period within which it shall attain the required service criteria and parameters.

Unpredictable situations and *force majeure*

12. (1) In the event of an unpredictable situation or *force majeure* affecting quality of service, a licensee shall within the reporting period in which the unpredictable situation or *force majeure* occurred -

(a) provide the Commission with satisfactory information with regard to compliance with quality of service requirements during the reporting period; and

(b) make available to the Commission and the public details of the achieved level of compliance during the reporting period.

(2) The Commission may take into account factors relating to -

(a) a change in environmental or operating conditions that could not have been reasonably foreseen by the licensee; or

(b) an electronic communication**s** service deficiency that arise partly or wholly from the operations of another licensee;

which may affect the ability of a licensee to achieve the quality of service criteria and parameters under regulation 5.

(3) Where a licensee is unable to submit a report during the relevant quarter as a result of an unpredictable situation or *force majeure*, he may apply to the Commission in writing for an extension of time.

(4) In the event of an unpredictable situation or *force majeure*, the Commission may exempt a licensee from the obligation to submit a report during the quarter in which the unpredictable situation or *force majeure* occurred until the subsequent quarter.

Making information available to customer

13. (1) A licensee shall, before it concludes a contract with a customer, make available to that customer clear and up-to-date information on its quality of service for each electronic communications service that it is licensed to provide.

(2) Notwithstanding sub-regulation (1), before the last working day of January in each year, a licensee shall publish on its website and in one newspaper of wide circulation in [Name of Contracting State] -

(a) clear and up-to-date information on the average performance levels achieved during the previous year compared with each criterion and parameter under regulation 5;

(b) clear and up- to- date information on the minimum and average quality of service levels it proposes to provide to consumers in the course of the year.

Advance notice

14**.** A licensee shall give consumers advance notice of planned interruption of service, in accordance with the timeframe provided in the Schedule, by publishing the notice in the electronic media and or the print media.

Compliance and enforcement

15. (1) Notwithstanding regulation 13, a licensee to whom these Regulations apply shall comply with the obligations provided for in these Regulations within 6 months of the coming into effect of these Regulations.

(2) A licensee who -

(a) fails to comply with these Regulations after six months have elapsed from the coming into effect of these Regulations;

(b) fails to submit during a time period specified in these Regulations or by the Commission, information requested by these Regulations;

(c) submits or publishes false or misleading information relating to quality of service; or obstructs or prevents an investigation by the Commission of the quality of service measurement, reporting or record keeping procedures;

commits an offence and is liable to the enforcement measures outlined in the Act including suspension of its licence as provided for in section 43 of the Act.

(3) Without prejudice to sub-regulation (2), the Commission may take one or more of the following enforcement measures -

(a) direct the licensee to implement a remedial plan to improve the quality of service of the relevant services over a period to be determined by the Commission; and

(b) direct the licensee to publish additional information about the quality of the service and, if so determined by the Commission, its implementation of the remedial plan.

SCHEDULE

(Regulation 5)

Definitions

1. In this Schedule –

"answered" means the duration from the instant when the address information required for setting up a call is received by an electronic communications network to the instant a human operator answers the calling party to provide the electronic communications service requested where the electronic communications service provided is not wholly automatic or does not employ the use of a voice response system;

"billing accuracy" means the measure of the number of incorrect bills per 1000 bills issued where an incorrect bill is one which has been determined by the licensee or Commission to have been issued with an error;

"call completion rate" means the ratio of successfully completed calls to the total number of attempted calls, that is, the ratio of the number of completed call attempts to the total number of call attempts, at a given point of an electronic communications network**;**

"call completion success rate" means the percentage of originated calls successfully completed where a successfully completed call is established by a successful connection to the called number although the called party may not answer;

"connection" means the interval between approval of a request for an electronic communications service and the provision of the electronic communications service by the licensee;

"customer care accessibility" means 100% of calls to the center must be answered by a customer care personnel or a machine within 30 seconds**;**

"drop call rate" means the number of calls that are prematurely terminated before being released normally by the caller or called party divided by the total number of call attempts Or (1 - Call Completion Ratio) x 100%**;**

"fault rate per access line" means a measure of the faults per distribution circuits from the exchange to the distribution point, including the fiber, copper, access multiplexers and any other access equipment where applicable**;**

"fault repair" means the time taken to restore an existing customer's electronic communications service to operational level from the time that a problem is reported or a fault report is received but faults due to the customer premises equipment which is owned by a customer, such as computer hardware and software are excluded from the measurement of performance against this benchmark**;**

"fault report" means a report of disrupted or degraded electronic communications service that is made by a customer and is attributable to an electronic communications network of the licensee or any interconnected public electronic communications network, and that is not found to be invalid;

"grade of service" means the probability of call failure over the junctions between switches due to non-availability of junctions**;**

"handover success rate" means the ratio of the number of successfully completed handovers to the total number of initiated handovers expressed as a percentage**;**

"jitter" means packets from the source will reach the destination with different delays which can seriously affect the quality of streaming audio or video**;**

"latency" means the measure of duration of a round trip for a data packet between specific source and destination Router Port or Customer Premises Equipment**;**

"maintainability" means the probability of performing a successful repair action within a given time;

"packet loss" means the percentage of packets lost to the total packets transmitted between two designated Customer Premises Equipment or Router Ports;

"peak period" means a continuous twelve-hour period of the day that the licensee designates as the period of high level of electronic communications traffic on its electronic communications network;

"POI congestion" means **t**he ratio of calls failed over the P**O**I between two licensees due to unavailability of free circuits to the total call requests for seizure of P**O**I circuit**;**

"post dialing delay", in relation to a GSM electronic communications network, means the average time between pressing send button after pressing correct digits and getting a ring back tone**;**

"planned disruption" means the scheduled or planned downtime of the electronic communications service by the licensee;

"reconnection of service" means the restoration of an electronic communications service by the licensee after the licensee receives overdue payment from the customer;

"response time" means the duration from the instant when the address information required for setting up a call is received by an electronic communications network to the instant the human operator answers the calling user to provide the electronic communications service requested. **The electronic communication services covered are the electronic communication services for operator controlled and assisted calls that are accessed with special access codes. Access to emergency services is excluded;**

"service availability" means the measure of the degree to which the electronic communications service is operable and not in a state of failure or outage at any point of time for all users**;**

"s**uccessful call attempt"** means a call from a calling party who is successfully switched through to the called party, or receives busy tone when the called party is engaged speaking;

"**time consistent busy hour**" means the one hour period starting at the same time each day for which the average traffic of resource group is greatest over the days under consideration.

Application of this Schedule

2. (1) This Schedule does not apply to a request for connection of an electronic communications service that does not involve a standard installation because the licensee -

(a) does not supply the particular electronic communications service in the requested geographical area;

(b) cannot technically install the electronic communications service within the time frame provided for in this Schedule; or

(c) cannot install the electronic communications service because it is not technically feasible.

(2) The burden of proving that the electronic communications service cannot technically be installed within the time frame set out in this Schedule or that it is not technically feasible to install the electronic communications service lies with the licensee.

(3) Notwithstanding sub-paragraph (1), where a licensee and a customer agree that a request for connection would be completed within an agreed time frame, the delivery time shall be taken into consideration for measurement purposes.

PART A

Public Fixed Electronic Communications

PUBLIC FIXED ELECTRONIC COMMUNICATIONS	
PROPOSED QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Service Availability	>99.00%
Supply Time for Connection	90% within 5 working days
Fault Repair Time	80% in 24 hours 95% in 48 hours 100% in 72 hours
Call completion success rate	>98%
Fault Rate per Access Line	≤ 3% per 100 lines per month
Reconnection of service after payment of overdue amounts within period (Business Hours)	85% within 3 hours
Advance Notice of planned disruption	Notification of 95% of planned disruptions should be issued within a 36-hour timeframe before the event.
Call Set Up Time (Post dialing delay to ring tone)	National calls @ busy hour 3 seconds; International calls @ busy hour 8 seconds
Customer Care Accessibility	100%
POI Congestion	< 1%
Grade of Service	< 1%
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a month	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks
Response time to the customer for assistance	% of calls answered by operator (voice to voice): Within 10 seconds 80% Within 15 seconds 95%
Line Shifting or relocation	< 5 working days
Service disconnection	>99%
Period of all refund / payments due to customers from the date of resolution of complaints as in the above	< 4 weeks
Complaints with the provision of the service	<5%
Complaints with the billing performance	<1%
Complaints with help services	<5%
Complaints with network performance, reliability and availability	<5%
Satisfied with maintainability	<95%
Overall customer satisfaction	>95%
Customer satisfaction with offered supplementary services	>95%

Domestic Leased Line Services

DOMESTIC LEASED LINE SERVICES	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Supply Time for Connection	≥90% completed on agreed day (as per the terms and conditions of the service)
Fault Repair Time	95% within 24 hours
Service Availability	≥99.70%
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a quarter	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks

International Leased Line Services

INTERNATIONAL LEASED LINE SERVICES	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Supply Time for Connection	90% completed on agreed day (as per the terms and conditions of the service)
Fault Repair Time	90% within agreed repair time.
Service Availability	≥96.00%
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a quarter	>99%

General Complaints

The number of general service related (not billing) complaints per 1000 subscribers over period specified.

Fault and Repair Parameters	**Benchmarks**	**Average over a period**
No of fault incidences per month per 100 subscribers	<3	1 month
Fault incidences repaired in; 24 hours 48 hours 72 hours More than 72 hours	 90% 95% 99% 100%	 1 day 2 days 3 days More than 3 days

PART B

Public Mobile Electronic Communications

PUBLIC MOBILE ELECTRONIC COMMUNICATIONS	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Supply Time for Connection	On demand for pre-paid. Within 3 hours for postpaid
Call Completion Success Rate	>95%
Service Availability	>99.00%
Response Time for Operator Service	80% within 10 seconds 90% within 15 seconds
Reconnection of service after payment of overdue amounts within period	95% within 3 hours
Advance Notice of planned disruption	Notification of 95% of planned disruptions should be issued within a 36-hour timeframe before the event.
Drop Call Rate (during peak periods)	< 2%
Blocked call rate (during peak periods)	SDCCH congestion <1% TCH congestion <2%
Service Coverage (> 90% populated coverage)	In door ≥-75 dBm In-Vehicle ≥-85 dBm Outdoor – in city≥ -95 dBm
POI Congestion	< 0.5%
Prepaid Credits Complaints	<0.5% complaint over 1000 pre- paid credit top-ups
Call Set Up Time (Post dialing delay to ring tone)	National calls @ busy hour 5 seconds; International calls @ busy hour 10 seconds
Handover Success Rate (%)	>95%
Traffic Channel Congestion Ratio (for Busy Hour)	≤ 2%
Customer Care Accessibility	100%
Advanced Notice of Rate change	Notice to be publicized in two weekly newspapers, over a two week period using a quarter page Ad
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a quarter	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks

PUBLIC MOBILE ELECTRONIC COMMUNICATIONS	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Response time to the customer for assistance	% of calls answered by operator (voice to voice): Within 10 seconds 80% Within 15 seconds 95%
Line Shifting or relocation	< 5 working days
Service disconnection	>99%
Period of all refund / payments due to customers from the date of resolution of complaints as in the above	< 4 weeks
Complaints with the provision of the service	<5%
Complaints with the billing performance	<1%
Complaints with help services	<5%
Complaints with network performance, reliability and availability	<5%
Satisfied with maintainability	<95%
Overall customer satisfaction	>95%
Customer satisfaction with offered supplementary services	>95%

Note: It is to be noted that all the measurements of performance parameters should be carried out during the time consistent busy hour.

SMS Service

SMS SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
SMS Service availability	>99%
SMS end-to-end delivery time	<5 sec, for 99% conditions: The receiving mobile equipment should be ON, have coverage and have adequate storage.
SMS Completion Ratio	>95%
SMS Promotion	ALL persons receiving SMS promotional text must have expressly given authorization that they are interested in receiving promotions. Customers can decide at a later date to opt in to promotions.
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle

SMS SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Percentage of billing related errors cleared within a quarter	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks

General Complaints

The number of general service related (not billing) complaints per 1000 subscribers over period specified.

Fault and Repair Parameters	**Benchmarks**	**Average over a period**
No of fault incidences per month per 100 subscribers	<3	1 month
Fault incidences repaired in; 24 hours 48 hours 72 hours More than 72 hours	 90% 95% 99% 100%	 1 day 2 days 3 days More than 3 days

PART C

Fixed and Wireless Broadband Service

Fixed Broadband Service:

FIXED BROADBAND SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Service Availability	>99.00%
Supply Time for Connection	90% within 5 working days
Fault Repair Time	95% within 24 hours 100% within 72 hours
Fault Rate per Access Line	≤ 3% per 100 lines per month
Ratio of Packet Loss (Upload and Download)	≤ 3% Packet loss
Average Throughput for Packet data	>90% of the subscribed speed
Latency	< 150ms for Audio; <250 ms for Data < 75 ms for Data (interactive)
Drop Rate	<1%

FIXED BROADBAND SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Jitter	< 30 ms
Reconnection of service after payment of overdue amounts within period (Business Hours)	85% within 3 hours
Advance Notice of planned disruption	Notification of 95% of planned disruptions should be issued within a 36-hour timeframe before the event.
Customer Care Accessibility	100%
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a quarter	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks
Response time to the customer for assistance	% of calls answered by operator (voice to voice): Within 10 seconds 80% Within 15 seconds 95%
Line Shifting or relocation	< 5 working days
Service disconnection	>99%
Period of all refund / payments due to customers from the date of resolution of complaints as in the above	< 4 weeks
Complaints with the provision of the service	<5%
Complaints with the billing performance	<1%
Complaints with help services	<5%
Complaints with network performance, reliability and availability	<5%
Satisfied with maintainability	<95%
Overall customer satisfaction	>95%
Customer satisfaction with offered supplementary services	>95%

General Complaints

The number of general service related (not billing) complaints per 1000 subscribers over period specified.

Fault and Repair Parameters	**Benchmarks**	**Average over a period**
No of fault incidences per month per 100 subscribers	<3	1 month
Fault incidences repaired in;		

Fault and Repair Parameters	Benchmarks	Average over a period
24 hours 48 hours 72 hours More than 72 hours	90% 95% 99% 100%	 1 day 2 days 3 days More than 3 days

Wireless Broadband Service:

WIRELESS BROADBAND SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Service Availability	>99.00%
Supply Time for Connection	95% within 3 working days
Fault Repair Time	95% within 24 hours
Ratio of Packet Loss (Upload and Download)	≤ 5% Packet loss
Average Throughput for Packet data	>90% of the subscribed speed
Latency	< 150ms for Audio; <250 ms for Data < 75 ms for Data (interactive)
Drop Rate	<1%
Jitter	< 30 ms
Signal Strength	≥-75 dBm
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a month	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks
Response time to the customer for assistance	% of calls answered by operator (voice to voice): Within 10 seconds 80% Within 15 seconds 95%
Line Shifting or relocation	< 5 working days
Service disconnection	>99%
Period of all refund / payments due to customers from the date of resolution of complaints as in the above	< 4 weeks
Response time to the customer for	% of calls answered by operator (voice to

WIRELESS BROADBAND SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
assistance	voice): Within 10 seconds 80% Within 20 seconds 95%
Complaints with the provision of the service	<5%
Complaints with the billing performance	<1%
Complaints with help services	<5%
Complaints with network performance, reliability and availability	<5%
Satisfied with maintainability	<95%
Overall customer satisfaction	>95%
Customer satisfaction with offered supplementary services	>95%

General Complaints

The number of general service related (not billing) complaints per 1000 subscribers over period specified.

Fault and Repair Parameters	**Benchmarks**	**Average over a period**
No of fault incidences per month per 100 subscribers	<3	1 month
Fault incidences repaired in; 24 hours 48 hours 72 hours More than 72 hours	 90% 95% 99% 100%	 1 day 2 days 3 days More than 3 days

PART D

Subscriber Television Service

SUBSCRIBER TELEVISION SERVICE	
Proposed QoS KPI	**Proposed Target Level – Over period of 1 quarter**
Installation time of service after application	< 5 working day
All installation and service related complaints (except those related to billing)	90 % in 48 hours 100% in 72 hours
Notice to consumers of preventive maintenance of not more than 24 hours	A minimum of 36 hour notice to consumers
Billing Accuracy (valid accuracy-related complaints)	≤ 1 complaint per 1000 bills over billing cycle
Percentage of billing related errors cleared within a quarter	>99%
Period of all refund/payments due to customers from the date of resolution of complaints as in the above	<4 weeks
Response time to the customer for assistance	% of calls answered by operator (voice to voice): Within 10 seconds 80% Within 15 seconds 95%
Line Shifting or relocation	< 5 working days
Service disconnection	>99%
Period of all refund / payments due to customers from the date of resolution of complaints as in the above	< 4 weeks
Response time to the customer for assistance	% of calls answered by operator (voice to voice): Within 10 seconds 80% Within 20 seconds 95%
Complaints with the provision of the service	<5%
Complaints with the billing performance	<1%
Complaints with help services	<5%
Complaints with network performance, reliability and availability	<5%
Satisfied with maintainability	<95%
Overall customer satisfaction	>95%
Customer satisfaction with offered supplementary services	>95%

Adherence to all relevant standards as outlined by the International Telecommunications Union for television broadcasting is required for all analogue and digital transmission systems, including but not limited to, National Television System Committee, Phase Alternating Line, and Séquentiel couleur avec mémoire, Advanced Television Systems Committee, Digital Video Broadcasting, Integrated Services Digital Broadcasting and Digital Terrestrial Multimedia Broadcast.

General Complaints

The number of general service related (not billing) complaints per 1000 subscribers over period specified.

Fault and Repair Parameters	**Benchmarks**	**Average over a period**
No of fault incidences per month per 100 subscribers	<3	1 month
Fault incidences repaired in; 24 hours 48 hours 72 hours More than 72 hours	 90% 95% 99% 100%	 1 day 2 days 3 days More than 3 days

Made this [ ] day of [ ] 20[ ].

[Name of Minister]

Minister responsible for Electronic Communications.