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# **QUALITY OF SERVICE (QOS) STANDARD FOR TELEVISION BROADCASTING SERVICES IN UGANDA**

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## **1 INTRODUCTION**

Under Section 5 of the Uganda Communications Act of 2013, Uganda Communications Commission (UCC) has a responsibility to:

- (i) “Set national communication standards and ensure compliance with national and international standards”; and
- (k) “Safeguard the interests of consumers and operators as regards the quality of communications services and equipment”.

Citizens globally recognise broadcasting services as the most prevalent means of accessing news and information. Service quality though, is one of the key factors that impact the appreciation of the services by the viewers.

Following the advancement of digital TV broadcasting services primarily driven by the analogue to digital migration process, there is significant opportunity to improve and guarantee the service quality to viewers.

This standard is put forth to facilitate the evaluation of the quality of services provided towards ensuring the performance of the services offered meet and exceed the expectations of customers/viewers.

In developing this standard, UCC has taken into cognisance the evolving TV broadcasting landscape, the market in Uganda, the acceptable user experience and responsibility of various stakeholders.

## **2 DURATION OF THE STANDARD**

This standard shall be valid for a period of two years effective the date of adoption by the Commission. UCC shall periodically review the standard to ensure its continued relevance and effectiveness. UCC may therefore amend this standard during this period.

## **3 OBJECTIVES OF THE STANDARD**

This standard seeks to:-

- (i) Define the QoS parameters and associated threshold.
- (ii) Specify the methodologies for measuring, reporting and recording the performance against various performance aspects.
- (iii) Empower consumers to drive the provision of quality services by making informed choices.

## **4 INTERPRETATIONS**

In this document, unless the context otherwise requires, the following terms shall have the meanings ascribed to them under this section. In the event of conflict or ambiguity between the terms defined herein and the terms defined

in a license or in the Communication Act, the following order of precedence shall apply:

- a) Communication Act
- b) Regulations
- c) Technical Guidelines
- d) License Terms and Conditions

**Billing:** Administrative function of preparing bills and submitting the bills to customers

**Complaint:** A statement by a customer expressing dissatisfaction due to a difference between the expected and the delivered benefits from the use of the service. The complaint may be made in various forms such as writing, electronic means, or in person.

**Customer:** A user of a service who is responsible for payment for the services.

**Customer Premise Equipment (CPE):** Equipment that is placed at the customer's premises and that enables the customer to access the service providers' services. Set top boxes, satellite dishes and decoders are examples of CPEs.

**Force majeure:** An inevitable, unpredictable act of nature, not dependent on an act of man.

**Preventive maintenance:** This is maintenance that is regularly performed on equipment to lower the likelihood of the equipment failing.

**Quality of Service (QoS):** Totality of characteristics of a communications service that bear on its ability to satisfy stated and implied needs of the user of the service.

**Service provider:** A legal entity licensed by UCC for the provision of broadcasting services in Uganda.

## 5 APPLICABLE LEGISLATION AND REGULATIONS

This standard shall be read and applied together with the provisions of the Uganda Communications Act 2013 or its amendments, the associated regulations on broadcasting and licenses.

This standard shall supersede any previous directives and/or requirements that may have been prescribed by the Commission with respect to Quality of Service for TV broadcasting services.

## 6 SCOPE OF THE STANDARD

The standard covers both network related parameters and customer service parameters. However, it does not include programming and the content broadcast.

## **7 APPLICABILITY**

This standard shall apply to the following Television (TV) Broadcasting service categories:-

- (1) Public Infrastructure Provision (PIP)-Broadcasting Infrastructure that includes terrestrial, satellite and cable platforms.
- (2) Public Service Provision (PSP)-Content Service Provision (CSP) on the terrestrial, satellite and cable platforms. The content classifications include subscription and free to air content.

## **8 QoS REGULATORY REQUIREMENTS**

### **8.1 QoS Measurements by Licensees**

Measurement methods, formulas and calculation shall be in accordance with those specified for the associated QoS parameters by UCC. All supported data used to produce the respective reports shall be kept by the licensee for a minimum of Twelve (12) months and shall be availed to representatives of the UCC on request.

For each quality of service parameter, that the licensee is required to report against, the licensee shall prepare periodic reports at intervals as provided in the license or as requested by UCC.

### **8.2 QoS Measurements & Auditing By UCC**

UCC shall conduct inspections, surveys or performance audits of the quality of service of the licensees from time to time to establish the performance of the licensees and adherence to the UCC quality of service standards.

Measurements for this shall be done using modes of collection of data that may include but are not limited to:

- i. Impromptu and routine drive tests,
- ii. Consumer survey, and
- iii. Statistical data and documents received from service operators

UCC reserves the right to use its own personnel, employ the services of specialist personnel and/or an independent third party to conduct any QoS audits deemed necessary.

UCC shall always give the service operators at least 48-hour notice prior to conducting any QoS audits. In cases of impromptu onsite audits/visits, the licensee shall arrange for UCC personnel/representatives to be w granted access to their network installations/records as and when this access is required.

The licensee shall fully co-operate with and provide all assistance to such inspectors. The licensee shall comply with all UCC requests for information and all UCC verification and audit activities.

### **8.3 QoS Parameters**

The parameters and key performance indicators included under **Annex 1** shall apply in assessment of performance of licensees with respect to quality of service.

The QoS parameters defined comprise of the following:-

- (1) Network related QoS parameters that apply to PIP Licensees; and
- (2) Service related QoS parameters that apply to all or some of PIP and PSP licensees

The measurement method(s) as well as the associated formulae and calculations to be used to evaluate the QoS performance against each parameter shall be as specified by UCC in **Annex 1**.

## **9 RESPONSIBILITIES OF UCC & LICENSEES UNDER THIS STANDARD**

### **9.1 Responsibilities of UCC**

- (1) Set the QoS standard, specifying the QoS parameters against which performance shall be evaluated and the associated target levels. UCC may amend these parameters or the targets from time to time to accommodate developments in the sector.
- (2) To specify the methodology to measure performance against each QoS parameter.
- (3) To apply appropriate sanctions in cases of non-compliance by the licensee.
- (4) To carry out audit of the QoS reports submitted by Licensees.
- (5) To carry out measurements against any QoS parameters as necessary.
- (6) To carry out comparative publishing of QoS performance of the licensees.

### **9.2 Responsibilities of Licensees**

The licensed service provider shall take full responsibility for the quality of service offered and achieved via their broadcasting service and/or distribution platforms as measured at both the network side and the end user interface side. In this vain, the licensee shall have the following responsibility:-

- (1) To have their technical operation in line with the standards set by UCC.

- (2) To cooperate in providing access to facilities and information to UCC and UCC authorised persons for inspections, audits and investigations.
- (3) Carry out measurements as specified by UCC and submit periodic reporting on the respective QoS indicators and critical outage reports as outlined by UCC.
- (4) Provision of explanations in cases where the QoS performance is below the standard as well as associated remedial plans;
- (5) Comply with the reporting requirements set by UCC on the QoS performance of the licensee.

## 10 REPORTING BY LICENSEES

The licensee shall, every quarter, provide UCC with reports on the results of measurements done against some of the QoS parameters.

This reporting shall be done using only the standard reporting templates provided by UCC for this purpose. These shall, in all cases, be accompanied with a declaration letter signed by a duly authorized officer of the licensee, stating that the report is true and accurate in all respects.

The reports submitted shall contain results for the respective quarter aggregated on a monthly basis starting on 1<sup>st</sup> January of the respective calendar year. Such report shall be submitted to UCC by the 25th day of the first month of the following quarter.

### 10.1 Network Outage Reports

The Licensee shall inform UCC about all outages affecting its transmission<sup>1</sup> and distribution network<sup>2</sup>.

This shall be done using the standard template provided in **Annex 2** and shall be sent either electronically to the email address **registry@ucc.co.ug (Attention: ECI)** or via hard copies submitted to the UCC at any of its branch offices.

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<sup>1</sup> Transmission network is the infrastructure between the multiplex and the distribution network.

<sup>2</sup> Distribution network is the infrastructures that the end users are connected to the distribution networks include terrestrial, cable and satellite networks.

Such reporting shall be done at least 48 hours before outage<sup>3</sup> for scheduled maintenance<sup>4</sup>, 12 hours before outage for unscheduled maintenance and within 24 hours of the occurrence of the unplanned<sup>5</sup> outages.

## **11 PUBLICATION OF QoS RESULTS**

UCC shall publish the evaluation results of the QoS performance of licensees for consumption by the general public in any form or manner as may be deemed appropriate by UCC.

The evaluation results of QoS performance of licensees will be published after discussions with the service providers.

## **12 COMPLAINTS HANDLING**

Consumers who are dissatisfied with services rendered to them by any of the service providers have a right to redress the situation through lodging of complaints to the Uganda Communications Commission (UCC).

The complaints include and are not limited to arbitrary disconnection, poor services delivery, supply of sub-standard equipment, and delayed restoration of service, poor picture quality etc.

A complaint to UCC can be in writing, by phone, email, fax, or by personal visit.

Details of the complaints handling procedure is provided in this link <http://www.ucc.co.ug/data/smenu/64/Complaint-Handling-Procedure.html>

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<sup>3</sup> An outage is unavailability of service due to unexpected behavior of that particular service, or an incident impacting consumers that results in a service not being delivered at a level they reasonably expected.

<sup>4</sup> Scheduled maintenance will constitute planned network changes, carried out to optimize network resources, install new services/infrastructure or expand network coverage and are included on a company annual business plan as a scheduled activity for the financial period.

Unscheduled maintenance will constitute planned network changes or enhancements carried out to remedy a fault, optimize network services or any other activity associated with the daily operations of the network. These activities are not scheduled activities on annual business plan.

<sup>5</sup> Unplanned outages defined as network service degradation or interruptions caused by unforeseen or unpredictable events on the network.



## **13 ENFORCEMENT AND REMEDIAL MEASURES**

### **13.1 Contravention**

A licensee shall have committed a contravention:

- a) It fails to perform the measurement, reporting and record keeping tasks set out in this Standard document;
- b) It fails to achieve a target for a UCC QoS parameter for a reporting period at a given reporting region;
- c) It does not comply with a directive issued by the Commission to remedy a contravention
- d) It publishes false or misleading information about its quality of service;
- e) It obstructs or prevents UCC conducting a QoS investigation, inspection, audit or measurement.

The consequence of committing a contravention is a fine or penalty or other appropriate sanctions by UCC.

### **13.2 Exemption from compliance**

A service operator shall be exempted from compliance with the QoS standard or provisions of this document to the extent it is unable to comply due to Force Majeure on condition that the event is reported in time (*as detailed in section 10.1*).

Low Voltage grid power, lack of grid power, load shedding or any other such event(s) shall not be considered as grounds for exemption.

## ANNEX 1 QoS PARAMETERS FOR TV BROADCASTING SERVICES

### 1. Network Related QoS Parameters

Parameter	Definition	Purpose	Computation	Target	Test method	Report	Applicability								
Service Availability	This is the ability of a service provider to perform its required function at a stated instant or over a stated period.	It measures the proportion of time for which each broadcasting service is available on the signal distribution platform.	$\frac{\text{Service Uptime}}{24 \text{ hours}} \times 100$	>99% availability	Use of the Network monitoring system	Quarterly reports on daily systems measurements of service availability submitted by the licensee.	PIP licensees on satellite, cable and terrestrial platforms								
Picture Quality	It is a term used by a TV viewer to rate the inherent quality of the picture.	It assesses the television picture quality of the output of the signal distribution platform received by the viewers.	ITU-R BT.500 <sup>6</sup> discrete quality and impairment scale <table border="1"> <thead> <tr> <th>Quality Five-grade scale</th> <th>Impairment</th> </tr> </thead> <tbody> <tr> <td>5 = Excellent</td> <td>5 = Imperceptible</td> </tr> <tr> <td>4 = Good</td> <td>4 = Perceptible, but not annoying</td> </tr> <tr> <td>3 = Fair</td> <td>3 = Slightly annoying</td> </tr> </tbody> </table>	Quality Five-grade scale	Impairment	5 = Excellent	5 = Imperceptible	4 = Good	4 = Perceptible, but not annoying	3 = Fair	3 = Slightly annoying	≥4	This will be agreed by UCC & signal distributors	Quarterly reports on monthly measurements of picture quality for each UCC-approved TV channels.	PIP licensees on satellite, cable and terrestrial platforms
Quality Five-grade scale	Impairment														
5 = Excellent	5 = Imperceptible														
4 = Good	4 = Perceptible, but not annoying														
3 = Fair	3 = Slightly annoying														

<sup>6</sup> ITU-R BT.500-13 (01/2012) is the ITU-R Recommendation that describes the methodology for the subjective assessment of the quality of television pictures

			2 = Poor 1 = Bad	2 = Annoying 1 = Very annoying				
Bitrate per program stream	It is a measurement of the number of bits that are transmitted over a set length of time.	It is used to know the speed at which the digital audio and video files are encoded or compressed.	Average bit rate over 24 hours	Average bitrate $\geq$ 1.5Mbit/s	Transport stream analyser	Quarterly reports on daily systems measurement of average bitrate per program stream submitted by the licensee.	PIP licensees on terrestrial platform	
Modulation Error Ratio (MER)	It a measure of the signal-to-noise ratio (SNR) in a digitally modulated signal.	It quantifies the performance of a digital broadcast transmitter using digital modulation.	$10 \log$ (average symbol power/ average error power)	MER > 32dB at the transmitter output	Quarterly routine drive tests by UCC	<ul style="list-style-type: none"> <li>Field measurements from the drive tests</li> <li>The drive tests are to be done in areas that are within the service area of each broadcast transmitter</li> </ul>	PIP licensees on terrestrial platform	
Bit Error Rate before RS (Outer) decoder	The ratio of the number of bits with errors to the total number of bits transmitted.	It quantifies the quality of a digital transmission from broadcast transmitter.	$\frac{\text{No. of bits with errors}}{\text{No. of bits transmitted}}$	BER < 10 e-9	Quarterly routine drive tests by UCC.	<ul style="list-style-type: none"> <li>Field measurements from the drive tests. The measurements are carried out at test points away</li> </ul>	PIP licensees on terrestrial platform	

						from the transmitter.  • Areas that are within the service area of each broadcast transmitter	
Carrier Power to Noise Ratio <sup>7</sup>	The ratio of the received signal strength relative to the strength of the received noise.	It evaluates the quality of the received signal from a broadcast transmitter.	$\frac{\text{Carrier Power}}{\text{Noise}}$	$C/N \geq 10\text{dB}$	Quarterly routine drive tests by UCC	<ul style="list-style-type: none"> <li>Field measurements from the drive tests.</li> <li>The drive tests are done within the service area of each broadcast transmitter</li> </ul>	PIP licensees on terrestrial platform
Signal strength <sup>8</sup>	It is the magnitude of an electric field at a reference point, which is located at a	It measures the transmitter power output as received by a TV receiver antenna at a distance from the	Signal strength	Signal strength > 32dbm/μV	Quarterly routine drive tests by UCC	Field measurements from the drive tests.	PIP licensees on terrestrial platform

<sup>7</sup> It will be the responsibility of the service provider to make the necessary changes to the relevant variables to attain the target C/N

<sup>8</sup> It will be up to the service provider to make the necessary changes to the relevant variables to attain the target signal strength.

	significant distance from the transmitting antenna.	broadcast transmitter evaluates the transmitting antenna.				<ul style="list-style-type: none"> <li>• The measurements are done within the service area of each broadcast transmitter.</li> </ul>	
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## 2. Customer Service Related QoS parameters

Parameter	Purpose	Computation	Target	Report	Applicability
First time service activation	It assesses the proportion of time taken to provide a pay TV service to the customer from the instant the licensee acknowledges receipt of the payment from the customer	$\frac{\text{No. of first time service activation done within 48 or 72 hours}}{\text{No. of first time service activation done within a month}} \times 100$ <p>Public holidays and Sundays are not included in the computation.</p>	<p>≥95% within 48hrs</p> <p>100% within 72hrs</p>	Quarterly reports on first time service activation report submitted by the licensee Customer care Service	PSP-pay TV licensees on all platforms
Subsequent service reactivation after payment	The proportion of requests for reactivation that are concluded within the agreed timeframe after acknowledgement of the customer's payment by the licensee	$\frac{\text{No. of service reactivations done within 24 or 36 hours}}{\text{No. of service reactivations done within a month}} \times 100$ <p>Public holidays and Sundays are not included in the computation.</p>	<p>≥98% within 24 hrs</p> <p>100% within 36 hrs</p>	Quarterly reports on service reactivation report submitted by the Licensee	PSP-pay TV licensees on all platforms
Customer support performance in complaints handling	It assesses the quality of support services offered to customers by the licensee through service centres.	$\frac{\text{No. of complaints on nonreception of FTA services or pay TV services resolved within 24 or 36 hours}}{\text{Total No. of complaints on nonreception of FTA services or pay TV services received in a month}} \times 100$	<p>≥99% of the complaints are resolved within 24hrs</p> <p>100% within 36 hrs</p>	Customer care Service Quarterly reports on customer support performance submitted by the licensee	<ul style="list-style-type: none"> <li>• PSP-pay TV licensees on all platforms</li> <li>• PIP licensees on terrestrial platform</li> </ul>

		$\frac{\text{No. of other complaints resolved with 3 or 5 working days}}{\text{Total No. of other complaints received in a month}} \times 100$	<p>≥95% of the Other complaints are resolved within 3 working days</p> <p>≥99% within 5 working days</p>	Customer care Service Quarterly reports on customer support performance submitted by the licensee	<ul style="list-style-type: none"> <li>• PSP-pay TV licensees on all platforms</li> <li>• PIP licensees on terrestrial platform</li> </ul>
		<i>Date of addressing complaint redress - Date of receiving the complaints redress</i>	Complaints redress should be done within 30 days		PSP-pay TV licensees on all platforms
Notification time on service maintenance	It measures the time given to the customers (Content service providers /and public) to receive notification about preventive maintenance work on the signal distributor's network	<i>Time of providing notice to the public – Time of the preventive maintenance work on the licensee's network ( pay TV service operators &amp; public signal distributor)</i>	Notice should be at least 3 days in advance	A copy of the formal communication send to UCC	<ul style="list-style-type: none"> <li>• PSP-pay TV licensees on all platforms</li> <li>• PIP licensees on terrestrial platform</li> </ul>
Billing performance	It assesses the accuracy of the bill and billing options (Prepaid and Post-paid) and billing currency.	$\frac{\text{No. of billing complaints resolved within 24 hours}}{\text{Total No. of billing complaints handled within 24 hours}} \times 100$	≥99%are accurate	Customer care Service Quarterly reports on billing performance submitted by the licensee	PSP-pay TV licensees on all platforms



**TRANSMISSION & DISTRIBUTION NETWORK OUTAGE REPORT TEMPLATE**

<b>CONTACT INFORMATION</b>		
Name of the Licensee :		
Name of the Technical Contact Person	Email:	
	Mobile No:	
<b>OUTAGE INFORMATION</b>		
Type of critical outage		
<input type="checkbox"/> Unplanned	<input type="checkbox"/> Scheduled	<input type="checkbox"/> Unscheduled
Date of Incident (dd/mm/yyyy): .....		
Local Time Outage Began (24-hr hh:mm): .....		
Outage Duration: .....hrs                      ..... Mins		
Outage status when filling this report:.....		
.....		
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.....		
Local Time Outage was resolved: .....		



Cause of the outage:

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**EFFECTS OF THE OUTAGE**

Network Element(s) affected:

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Affected Areas:

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Description of Outage:

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Explanation of Outage Duration:

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Actions taken and to be taken:

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**DECLARATION**

I..... in the capacity of .....  
declare and state that the information contained herein is true, correct, and accurate to the  
best of my knowledge and belief.

Name: .....

Date:.....Time:.....