

Appendix II – Decisions on Recommendations Matrix for First Consultation Round

The following summarises the comments and recommendations received from stakeholders on the *Consultative Document on Broadcasting Technical Quality of Service Standards: Subscription and Free-to-Air Television Services in Trinidad and Tobago (First Round)* and the decisions made by the Authority to be incorporated into the revised consultative document.

Item	Section	Stakeholder	Comments	Recommendations	TATT's Decision
1	General Comments/ Recommendations	Digicel	<p>Digicel has concerns that the proposal to adopt standards which deal with different aspects of end user experience dependent on the underlying technical deliver mechanism is not consistent with good regulatory practice.</p> <p>Specifically, providers of the same service but which use different underlying technologies will be regulated on different aspects of the service depending on their technology choice. For example, it would appear that the proposals outlined for IPTV would regulate the performance of channel</p>		<p>The Telecommunications Authority of Trinidad and Tobago (the Authority) appreciates Digicel's review of the subject document and its comments and recommendations to same.</p> <p>The Authority agrees that the subject document seeks to define the QoS standards based on the specific technology employed. The Authority does not agree, however, that in doing so, it is being 'unfair and discriminatory'.</p> <p>The imposition of quality of service (QOS) standards, based on the</p>

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			<p>selection, Electronic Program Guide ("EPG") scrolling, Video on Demand ("VoD"), etc. Digital hybrid fiber-coax ("HFC") based providers also provide EPG and VoD facilities. However, the standards outlined in Appendix 1 to apply to digital HFC systems do not cover these aspects. It is clearly unfair and discriminatory for regulation to impose different obligations on different concessionaires providing the same service to end users. From a consumer protection point of view, if the matter is so material that it is justified for one provider then it should apply to all. Conversely, if it is sufficiently immaterial to not apply to one provider then it should apply to none.</p>		<p>underlying technology utilised (and not the service provided) is consistent with international best practice, for subscription-based broadcasting service. For example, in the USA, the FCC adopted different QoS standards for an IPTV network and a QAM-based network.</p> <p>Additionally, most digital HFC networks in Trinidad and Tobago are essentially one-way broadcast systems. These networks offer a non-interactive EPG service that does not affect the delivery of the cable video signals. However, on an IPTV network, VOD and interactive program guide (IPG), often referred to as EPG, are highly interactive services and directly relate to the customer's quality of service (QoS) and by extension quality of experience (QoE).</p> <p>The Authority wishes to reassure that standards for digital HFC networks and IPTV are in keeping with</p>

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			<p>Digicel notes that VDSL and ADSL2+ are often used to provide broadband services and that TV provided over these technologies can be considered to be IPTV services over copper rather than fibre.</p>		<p>international best practices and the requirements of the Telecommunications Act, Chap.47:31 (the Act).</p> <p>The Authority notes that non-QAM technologies, such as VDSL and ADSL2+, can be used to provide video service over legacy copper lines; however, quality standards for these technologies are not currently available for broadcasting services. As the industry develops and standards for non-QAM systems such as VDSL, ADSL2+ and other technologies become available, the Authority shall review/update its quality standards accordingly.</p> <p>As stated above, the Authority seeks to define broadcasting QoS standards based on the specific technology employed. As such, the same QoS standards cannot be used to monitor</p>

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				<p>Digicel recommends that the Authority review the various standards proposed for adoption, identify common elements and only adopt those elements which have equivalents across all of the proposed standards.</p> <p>In section 2.2.1 of this policy document, the Authority sets out that ITU standard G.1080 which deals with Quality of Experience "is agnostic to network deployment architectures and transport protocols". It would appear that it may be more appropriate to consider the applicability of this</p>	<p>the same service across all networks. For example, an IPTV network and an HFC network both offer a digital television service; however, the QoS standards used to monitor these networks are different, since there is a contrast in the delivery method of the video signal across these networks.</p> <p>The Authority does not agree that the G.1080 standard is appropriate to use across all digital distribution mechanisms.</p> <p>The ITU-T G.1080 recommendation defines user requirements for QoE for IPTV services. As correctly stated, these QoE requirements are agnostic to network deployment architectures and transport protocols for an IP video signal; however, they are not applicable for RF video signals delivered over an HFC network.</p> <p>The Authority wishes to assure that the adopted standards for each technology</p>

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				standard across all digital distribution mechanisms.	are in keeping with international best practices for subscription and free-to-air television broadcasting services.
2	The entire policy document	Digicel	Digicel notes that there has been no cost benefit analysis of the imposition of the proposed standards. There is no assessment of the incremental cost to concessionaires of any network investment that might be required to meet the proposed standards.	Digicel recommends that a cost benefit analysis be carried out.	<p>The Authority notes these concerns and wishes to assure that the Authority has analysed the current QoS provided by our concessionaires and the intended standards prescribed in the document should not impose excessive burdens on our concessionaires that would reduce their competitiveness.</p> <p>In fulfilling its mandate, as stipulated by the Act, the Authority has monitored the QoS currently delivered to consumers and does not envision that the implementation of the specified standards in this consultative document would require a large financial outlay</p>

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				<p>Digicel suggests that, except for those standards required to prevent unwanted RF interference, rather than specify parameters as mandatory they should at this time be specified as desirable targets. The Authority should monitor the extent to which networks come in to conformance with the standards over time and only in the event of non-compliance over an extended period should they be made mandatory.</p>	<p>by concessionaires. In this regard, the Authority does not see the need for a cost-benefit analysis at this time. Further to this, a cost-benefit analysis on a legislative and concession obligation, such as QoS, would not negate the need for such standards.</p> <p>The Authority does not agree with this recommendation that only standards related to RF interference should be “<i>mandatory ... at this time</i>” and <i>all others should be specified as desirable targets</i>”. The Authority is not only concerned with the protection of concessionaires from unwanted RF interference but is also concerned with consumer protection and the ultimate quality of service provided to consumers. To make this latter aspect discretionary would dilute the protection of consumers, as required by</p>

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					<p>the Act.</p> <p>Section 45(2) of the Act allows for the imposition of preferred standards specific to what the Authority considers appropriate in our country. With respect to standards that may have now become outmoded, ineffective, insufficient, or excessively burdensome, the Authority is at liberty to determine whether or not such standards should be modified, streamlined, expanded or repealed.</p> <p>The Authority has added section 1.4, which references the salient sections of the Act that inform this consultative document.</p> <p>Additionally, the Authority does not agree that the implementation of these standards should be deferred to a time after the Authority has monitored concessionaires for non-conformance. As stated, the Authority is required under the Act to protect consumers.</p>

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					<p>However, where, in the Authority's view, the implementation of the requisite standards would be wholly burdensome on concessionaires at the present time, or where the imposition of same would require significant outlay, the Authority will prescribe a suitable period to allow the affected concessionaire to conform to the new standards.</p>
3	1. Introduction	CCTL	<p>CCTL welcomes the opportunity to provide input in this consultation process.</p> <p>The views expressed herein are not exhaustive. Failure to address any issue in our response, does not in any way indicate acceptance, agreement or</p>		<p>The Authority appreciates CCTL's review of the subject document and its comments and recommendations to same.</p>

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			relinquishing of CCTL's rights.		
4	1.1 Rationale	CCTL	<p>This document makes reference to the Consumer Rights and Obligation Policy (CROP) 2014, and states that this consultation is to establish standards not currently captured in the CROP document.</p> <p>The final version of the CROP document was published in July 2014. In addressing consumer rights and obligation policy, the CROP document focusses on making recommendations on policy objectives around safeguarding the interest of consumers. As such, the focus is more general quality of service related standards. Such standards include both customer services and service related network</p>	<p>CCTL is requesting that TATT clarifies its position as to the process for recommending quality of service regulations for the Minister to approve, and that related to establishing technical standards. CCTL believes these are distinct and separate processes.</p>	<p>The Authority agrees with CCTL that recommending quality of service regulations to the Minister for negative resolution of Parliament and the establishing of technical standards are distinct and separate processes.</p> <p>The Authority agrees that the CROP document focuses on making recommendations on policies which safeguards the interest of the consumer through customer service standards and network quality of service standards, focussed towards public telecommunication networks.</p>

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			<p>standards.</p> <p>Section (78) (1) of the Act, includes quality of service regulations among the list of areas where TATT has the power to make recommendations to the Minister. Regulations are approved by the Minister, based on negative resolution by Parliament.</p> <p>The Act in Part V, Section (45) specifically deals with technical standards. Sub Section (1) provides that;</p> <p><i>“Subject to the other provisions of this Act, concessionaires and licensees may implement such technical standards as they deem appropriate and which are in conformity with accepted international standards.”</i></p> <p>and (2) states,</p>		<p>The Authority concurs with CCTL as it relates to the approval process of Regulations.</p> <p>The Authority concurs with CCTL as it relates to the process of establishing Standards.</p>

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			<p><i>“Notwithstanding subsection (1), the Authority may identify, adopt or establish preferred technical standards.”</i></p> <p>Additionally, Section (18)(1) of the Act list among the powers and or functions of the Office;</p> <p>(d) <i>“establish national telecommunications industry standards and technical standards,”</i></p> <p>(f) <i>“...advise the Minister on technical standards.”</i></p> <p>It seems that procedurally, the process of making regulations about quality of service standards (as is the case with the CROP document), is a separate process from that of establishing technical industry standards.</p> <p>In this regard, TATT's statement that</p>		<p>Notwithstanding the title of this document, the Authority intends to propose regulations pursuant to this document, similar to the manner in which regulations were proposed pursuant to the CROP.</p> <p>Consequently, regulations proposed</p>

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			<p>this consultation is to establish standards not currently captured in the CROP document, seems inconsistent with the intentions of the Act. CCTL is requesting that TATT clarifies its position as to the process for recommending regulations for the Minister to approve, and that related to establishing technical standards.</p> <p>Further, as far as CCTL is aware, the Authority's recommendations in the CROP document which deals with consumer rights and obligation, have not been approved. Over three years have passed since this document was published. Given the pace of change in the sector, we believe that the recommendations in the CROP document should be revisited before they are approved.</p>	<p>Given that over three years have passed since the CROP document was published, and in light of the speed of industry and market transformation, we recommend that the recommendations set out in the July 2014 CROP document are revisited before they are finalized.</p>	<p>pursuant to <i>Broadcasting Technical Quality of Service Standards: Subscription and Free-to-Air Television Services in Trinidad and Tobago</i> shall be consulted upon in accordance with the Authority's consultation procedures and then submitted to the Minister to consider for negative resolution of Parliament.</p> <p>The regulations proposed pursuant to the CROP are currently before the Authority's line Ministry for tabling in Parliament. The regulations are still relevant to today's market.</p> <p>Notwithstanding this, the CROP can be revised, in accordance with the review cycle, which can be triggered by the Industry or the Authority. Any revision to the CROP may imply a consequential revision to the attendant regulations.</p>

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					Hence, the CROP document can be revisited, if required, subsequent to the enactment of the proposed regulations.
5	1.2 Purpose	CCTL	CCTL reiterates the points made above with respect to the distinction between the process to recommend and approve regulations, including general quality of service regulations, as opposed to the process for establishing technical industry standards.	CCTL is requesting that TATT clarifies its position as to the process for recommending quality of service regulations for the Minister to approve, and that related to establishing technical standards. CCTL believes these are distinct and separate processes.	<p>The Authority agrees that the CROP document focuses on making recommendations on policies which safeguards the interest of the consumer through customer service standards and network quality of service standards, focussed towards public telecommunication networks.</p> <p>Notwithstanding the title of this document, the Authority intends to propose regulations pursuant to this document, similar to the manner in which regulation were proposed pursuant to the CROP.</p> <p>Consequently, regulations proposed pursuant to <i>Broadcasting Technical Quality of Service Standards:</i></p>

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					<i>Subscription and Free-to-Air Television Services in Trinidad and Tobago shall be consulted upon in accordance with the Authority's consultation procedures and then submitted to the Minister to consider for negative resolution of Parliament.</i>
6	2. Quality Requirements for Subscription Service 2.1 QAM Based Digital Cable Systems technical Standards	CCTL	Notwithstanding the issued raised above, CCTL offers the following comments on the technical standards. As it relates to the establishment and implementation of technical standards for these systems, these seem generally consistent with standards accepted internationally for these systems.	CCTL has no issues with the technical standards proposed.	The Authority appreciates CCTL's review of the subject standard and its non-objection to same.
7	2.2.1IPTV Systems Technical Standards Table 1	Digicel	Digicel notes that providers may not able to measure from the home today or the optical line terminal ("OLT").		Test instruments are available that allow for the measurement of end-user service quality. (See measurement methods in section 2.2.1 of the consultative document.)

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			<p>If these are to be managed on an ongoing basis then an analysis will be required to fully understand the service touch points that require monitoring and then the cost implications of putting these measures in place.</p> <p>The cost to bring current equipment into standards may be prohibitive.</p>	<p>Digicel recommends that a full cost benefit analysis be carried out on the cost of meeting these standards.</p>	<p>Monitoring the key areas of a network's performance is an ongoing exercise for any cable TV operator, to ensure conformance with its own QoS standards. The Authority does not anticipate any additional cost outside of the regular maintenance and QoS verification costs to ensure compliance with these proposed standards.</p> <p>Good QoS and verification of same are essential characteristics in the design and operation of a cable TV network.</p> <p>The Authority has monitored the QoS currently delivered to consumers and does not envision that the implementation of the specified standards in this consultative document would require a large financial outlay by concessionaires. In this regard, the Authority does not see the need for a cost-benefit analysis at this time. Further to this, a cost-benefit analysis</p>

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				<p>In addition, should they be introduced as mandatory requirements rather than a desirable objective then lead in time for compliance must be defined.</p> <p>Some provision must be made for the embedded base if existing set top boxes.</p>	<p>on a legislative and concession obligation, such as QoS, would not negate the need for such standards.</p> <p>The Authority is required under the Act to protect consumers; however, where in the Authority's view the implementation of the requisite standards would be wholly burdensome on a concessionaire at the present time or where the imposition of same would require significant outlay; the Authority will prescribe a suitable lead time to allow the concessionaires to become compliant with the new standards.</p>
8	2.2.1IPTV Systems Technical Standards Tables 2 -5	Digicel	Digicel notes that bitrates cannot be set to define content resolution (SD/HD) due to different source and encoding techniques that might be implemented. We note also that a technical standard relating to the transport layer does not directly translate to		The transport layer performance guidelines provided in Tables 2-5 are with respect to the viewer experience and are measured after any application layer protection mechanisms have been employed to overcome network

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			<p>picture quality.</p> <p>Operators may not currently be able to monitor these parameters and so may not be able to manage their compliance risk without substantial investment.</p>	<p>As the goal is to ensure a minimum end-user experience, the Authority should clearly map the transport layer targets to desired end-user outcomes.</p> <p>A full cost benefit analysis should be carried out on the cost of meeting these standards.</p>	<p>impairments.</p> <p>Additionally, test instruments (such as the Agilent – IPTV test instrument) are available that allow for the measurement of end-user service quality.</p> <p>Video streams are highly sensitive to information loss and the QoE impact is in turn correlated. Therefore, losses in the transport layer (IP packet loss, jitter, etc.) are mapped to achieve a satisfactory service quality target.</p> <p>The Authority has monitored the QoS delivered to consumers and does not see a significant difference in the specified standards in this consultative document that would require a large financial investment. Therefore, the Authority does not support the</p>

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				<p>In addition, should they be introduced as mandatory requirements rather than a desirable objective then lead in time for compliance must be defined.</p>	<p>recommendation for a cost-benefit analysis at this time. Further to this, a cost-benefit analysis on a legislative and concession obligation, such as QoS, would not negate the need for such standards.</p> <p>Lead-in time shall be provided to allow concessionaires to become compliant with the new standards.</p>
9	2.3 Analog Cable Systems Standards	CCTL	<p>The proposed standards are generally consistent with international technical standards. However to move in line with best practices we would recommend the following adjustments:</p> <p>Table 6, page 18:</p>	CCTL recommends the following adjustments:	

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			<p>The technical standard for line amplifier voltage is set at 60 Vac max, we recommend increasing this to 89 Vac max.</p> <p>On page 20, the standard for the terminal isolation provided to each subscriber terminal is set at no less than 18 dB. We recommend that should be no less than 20 dB</p> <p>The technical standard for permissible variation of visual carrier level (page 18, item c is stated as “Between any 2 channels - 12dB.” For clarity, we recommend that this should read - variation of low and high visual carrier – 12dB.</p>	<p>Line amplifier voltage should be established at 89 Vac max.</p> <p>Terminal isolation provided to each subscriber terminal should be no less than 20dB.</p> <p>The technical standard for permissible variation of visual carrier level should read - variation of low and high visual carrier – 12dB.</p>	<p>The Authority accepts this increase in voltage as we understand that it can result in reduction in line loss, as the current will be reduced for the same power transfer.</p> <p>The Authority acknowledges CCTL comment and recommendation to change the terminal isolation to no less than 20 db. However, the FCC value, which this standard is based on, recommends that the terminal isolation is set at no less than 18dB. Hence, the Authority elects to maintain the value of 18 dB.</p> <p>The Authority acknowledges CCTL's recommendation and agrees with CCTL. Item c) on page 18 in the QoS document would be changed to. “between low and high visual carrier 12dB max”.</p>

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10	3. Free-To-Air Television Technical Standards	Digicel	The obligations for both digital and analog Free-to-Air ("FTA") services are expressed as "...shall not exceed..." in the text before the respective tables. As some of the specified parameters are minimum levels then these should be exceeded.	We recommend that the Authority review the wording of any final order to ensure that it adequately reflects that some parameters will be minima and some will be maxima.	The Authority thanks Digicel for this recommendation and agrees. The document has been revised to reflect both minima and maxima parameters. For clarity, the wording in sections 3.1 and 3.2 has been modified, as their purpose was to identify the tables of the technical standards for digital and analogue FTA television broadcasting services.
11	Concluding Comments	CCTL	CCTL looks forward to providing further input in subsequent phases of this process.		The Authority looks forward to CCTL's input to the revised consultative document.