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| **Telecommunication Standardization Bureau** |  |
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Geneva, 21 November 2011

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| Subject: | **Approval of revised Question 9/12** |

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| - To Administrations of Member States  of the Union  **Copy:**  - To ITU-T Sector Members;  - To ITU-T Associates;  - To ITU-T Academia;  To the Chairman and Vice-Chairmen  of Study Group 12;  - To the Director of the Telecommunication Development Bureau;  - To the Director of the Radiocommunication Bureau |

Dear Sir/Madam,

1 At the request of the Chairman of Study Group 12 *Performance, QoS and QoE*, I have the honour to inform you that, in accordance with the procedure described in Resolution 1, Section 7, § 7.2.2, of WTSA (Johannesburg, 2008), Member States and Sector Members present at the last meeting of this Study Group which was held in Geneva from 31 October to 9 November 2011, agreed by reaching consensus to approve the following revised Question:

Question 9/12 – Perceptual-based objective methods for voice, audio and visual quality measurements in telecommunication services (see Annex 1).

2 **Question 9/12 is therefore approved.**

3 The resulting Recommendations are assumed to fall under the Alternative approval process (AAP).

Yours faithfully,

Malcolm Johnson  
Director of the Telecommunication  
Standardization Bureau

**Annex: 1**

ANNEX 1  
(to TSB Circular 240)

Text of revised Question 9/12

# Question 9/12 – “Perceptual-based objective methods for voice, audio and visual quality measurements in telecommunication services”

**Motivation**

The work of this Question will focus on objective methods for evaluating quality parameters in telecommunication scenarios. Primarily, the methods under study should concentrate on user-perceived quality characteristics. Consequently, these methods and algorithms include perceptual approaches. They model results and procedures, which are applicable in subjective tests. So that subjective procedures will get an objective counterpart by using same scaling and basic procedures.

An example for that is the successful standardization of Recommendations P.862, P.862.1, P.862.2 and P.862.3, a perceptual based method, which models objectively Listening Only Tests with Absolute Category Rating for the evaluating of the Listening Speech Quality according to Recommendation P.800. A no-reference counterpart of P.862 was approved as P.563.

This Question will extend the objective evaluation of Listening Quality – the main issue up to now – to other quality aspects of voice telephony like talking quality and wideband speech. Under consideration of new generation telecommunication services, also other media than speech like music and video should be taken into account.

Furthermore, the evaluation of transmitted noise – especially after processing by noise suppression systems – should be covered by the work of this Question.

This Question will also continue and finalize the ongoing work on P.OLQA and P.ONRA.

The following Recommendations, in force at the time of approval of this Question, fall under its responsibility:

P.862, P.862.1, P.862.2, P.862.3, P.563

**Question**

Study items to be considered include, but are not limited to:

* Because the measurements at the acoustical interface of terminals are still an open issue, the continuation of this work is one of the main topics of this Question and mainly covered by P.OLQA.
* It has to be underlined that the objective assessment of wideband speech is an important point of further investigation. P.OLQA covers already the voice band up to 14 kHz.
* An already defined work item in the previous Q.9/12 is the objective assessment of talking quality. Therefore at first a reliable subjective test method has to be established. In a second step, an objective model can be developed.
* In addition to the existing objective models like P.862 or P.563 that are producing single numbers describing the overall quality; a need for additional information about possible quality degradations is requested by the market. These so-called ‘cause-analysis’ approaches are forming a part of P.OLQA but has also be studied in no-reference single ended approaches such as P.563.
* Furthermore, the objective assessment of audio signals such as music transmitted over telecommunication links like GSM or VoIP should be investigated.
* The objective rating of the annoyance of noise and residual noise – especially by processing by VQE’s – in voice communications has to be investigated. Here a close relationship to the recently approved subjective method P.835 is given. A study item P.ONRA is already launched in this Question.
* The determination of the quality of synthesised speech in an instrumental way, e.g. using the objective perceptual methods, is an interesting topic in this Question.
* In addition to the voice related topics a request for evaluating of objective video assessment models was registered. This topic should be restricted to typical video applications in telecommunication services. That requires a restriction to low bit rate video coding as well as limited image sizes like used in mobile phones and PDA’s. Here a close partnership to VQEG is established.
* This Question analyses and recommends methods, metrics and procedures for statistical evaluation, qualification and comparison of objective quality prediction models. These statistics can be applied to objective prediction models which can be translated to an estimated subjective judgment of a dedicated subjective test procedure. This Question discusses frameworks, metrics and example procedures for those statistical analyses.”
* Considerations on how to help measure and mitigate climate change.

**Tasks**

Tasks include, but are not limited to:

* Maintenance and enhancement of P-series Recommendations with regards to objective quality testing methods and perceptual models.
* It is anticipated that new Recommendations on objective evaluation of
  + Super-wideband speech quality under consideration of acoustical interfaces (P.OLQA)
  + Objective evaluation of Noise Reduction Systems (P.ONRA)
  + Talking Quality
  + Annoyance models for noise in voice communications
  + Non-Speech signals in voice-band telecommunication scenarios (e.g. music)
  + ‘Cause-Analysis’ approaches for quality degradations in no-reference scenarios can be produced in the 2009-2012 Study Period.

An up-to-date status of work under this Question is contained in the SG 12 Work Programme <http://www.itu.int/ITU-T/workprog/wp_search.aspx?isn_sp=545&isn_sg=551>

**Relationships**

Recommendations: P-series, G.700 Series

Questions: 2/12, 3/12, 4/12, 6/12, 7/12, 9/12, 10/12, 14/12

Study Groups: ITU-T SG 9, SG 16

Standardization bodies: VQEG, ETSI TC STQ, ETSI 3GPP

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