



*Radiocommunication Bureau*

*(Direct Fax N°. +41 22 730 57 85)*

Administrative Circular  
CACE/311

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**To Administrations of Member States of the ITU and  
Radiocommunication Sector Members participating in the  
work of the Radiocommunication Study Groups and the Special  
Committee on Regulatory/Procedural Matters**

**Subject:** Approval of 1 new and 5 revised ITU-R Questions and 1 change of completion date of a Question and their assignment to Radiocommunication Study Group 6

With reference to Administrative Circular CAR/160 of 17 November 2003, I wish to inform you that 1 new and 5 revised ITU-R Questions have been approved by correspondence in accordance with Resolution ITU-R 1-4 (§ 3.4) and therefore constitute official texts for study by the Radiocommunication Study Groups. Furthermore, 1 modification in the date of completion of an ITU-R Question was approved. The texts of these Questions are attached for your reference and are contained in Addendum 1 to Document 6/1 which contains the ITU-R Questions approved by the 2003 Radiocommunication Assembly and assigned to Radiocommunication Study Group 6.

Valery Timofeev  
Director, Radiocommunication Bureau

**Annexes:**

- 6 new and revised ITU-R Questions
- Modification in the date of completion

Distribution:

- Administrations of Member States and Radiocommunication Sector Members
- ITU-R Associates in the work of Radiocommunication Study Group 6
- Chairmen and Vice-Chairmen of Radiocommunication Study Groups and Special Committee on Regulatory/Procedural Matters
- Chairman and Vice-Chairmen of the Conference Preparatory Meeting
- Members of the Radio Regulations Board
- Secretary-General of the ITU, Director of the Telecommunication Standardization Bureau, Director of the Telecommunication Development Bureau

## ANNEX 1

### QUESTION ITU-R 112/6

#### **Guidelines on functionalities of facilities based on the use of digital servers<sup>1</sup> in broadcast programme recording, archiving and playout**

(2004)

The ITU Radiocommunication Assembly

*considering*

- a) that in the past, television broadcasting has used specialized recording equipment, such as broadcast-quality video tape recorders or digital video disc recorders for programme recording, editing, archiving and playout;
- b) that general-purpose digital servers originally designed for Information Technology (IT) applications are now also being used in broadcasting facilities for programme recording, editing, archiving and playout applications;
- c) that important operating benefits are expected from the use of facilities based on digital servers for broadcast programme production and transmission including recording, post production, archiving and playout, such as faster programme creation, exchange and repurposing, exchange of multi-version content, ability to immediately search, browse and retrieve essence data, simultaneous access to essence on the part of multiple users, etc.;
- d) that the functionalities of digital servers to be used in television programme production and broadcasting transmission facilities are often different and sometimes more demanding than those required for their general-purpose IT use;
- e) that various television production and broadcasting organizations have undertaken studies on the functionalities required in facilities based on the use of digital servers in order that they may be used to best advantage in facilities for broadcast applications;
- f) that broadcasters would benefit from guidelines on the functionalities that general-purpose digital servers should desirably provide in broadcast facilities for recording, editing, archiving, and playout of television programmes, and if possible in their harmonization,

*decides* that the following Question should be studied

- 1** what guidelines should be provided to television broadcasters on the preferred technical requirements of digital television facilities based on the use of digital servers, e.g. in terms of:

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<sup>1</sup> In this Question the term “server” is defined as in ITU-T Recommendation T.190, “A communicating entity which provides services for other communicating entities. A server may possess and administer a document store”, when this server is functional within a broadcasting environment.

- file types and formats;
- picture and sound quality levels (e.g. full quality, browse quality, etc.);
- metadata;
- data capacity (e.g. for short-term archiving, medium-term archiving, etc.);
- multichannel access and throughput;
- latency (e.g. in terms of the time needed to read out programme segments after their recording);
- interoperability and scalability;
- reliability, availability and maintainability?

**2** What guidelines should be provided to broadcasters on the basic operating requirements of such digital television facilities, e.g. in terms of:

- key operating functions (e.g. ingesting, indexing, archiving, retrieving, browsing, etc.);
- automatic data management;
- data transfer (e.g. streaming through SDI/SDTI or file transfer, etc);
- interfaces;
- flexibility (e.g. capability to simultaneously feed several users and several video format platforms)?

*further decides*

**1** that studies on guidelines for digital television facilities based on the use of digital servers should be performed in close cooperation among the Working Parties concerned within Study Group 6;

**2** that those studies should, as far as possible, take account of existing operating models and formats for the storage and transfer for audio, video and data files;

**3** that the results of the studies should be reflected in a Report and/or one or more ITU-R Recommendations;

**4** that the studies should be completed by the year 2005.

Category: S1/AP

## ANNEX 2

### QUESTION ITU-R 4-2/6

#### **Planning parameters for digital television broadcasting using terrestrial channels**

(1993-1994-1997-2001-2004)

The ITU Radiocommunication Assembly,

*considering*

- a) the progress being made in bit rate reduction techniques;
- b) that the quality achievable with digital emission systems is improving;
- c) that different countries can use different digital and analogue television systems;
- d) that certain digital television broadcasting systems have proven the capability to be used for mobile reception;
- e) that reception of digital television with small hand held TV receivers is feasible,

*decides* that the following Question should be studied

**1** What are the frequency planning parameters for such services, including but not limited to:

- minimum field strengths;
- implications of modulation and emission methods;
- receiving and transmitting antenna characteristics;
- location correction values;
- single frequency networks;
- speed ranges;
- building penetration loss;
- indoor location variations?

**2** What protection ratios are required when two or more digital transmitters of the same system, digital transmitters of different systems, or analogue and digital television transmitters are operating:

- in the same channel;
- in adjacent channels;
- with overlapping channels;
- in other potential interference relationships (e.g. image channel);
- with digital signals multiplexed in the television signal?

- 3** What receiver characteristics should be used for frequency planning with respect to more efficient use of the frequency spectrum (e.g. selectivity, noise figure, etc.)?
- 4** What are the protection ratios needed to protect broadcasting services from other services sharing the bands or operating in adjacent bands?
- 5** What techniques (e.g. frequency offset, synchronous operation) can be used to reduce the necessary protection ratios from interference?
- 6** What are the technical bases required for planning which lead to efficient utilization of bands 8 (VHF), 9 (UHF) and 10/11 (SHF) for terrestrial television services?
- 7** What type of modulation should be recommended for terrestrial television broadcasting in band 10 and band 11?
- 8** What are the radio parameters, including the system characteristics, propagation factors and protection ratios, that are necessary for planning and sharing purposes in bands 10/11 (SHF)?
- 9** What are the characteristic multipath conditions that need to be taken into account in the planning of such services?
- 10** What technical or planning criteria can be optimized to facilitate the implementation of terrestrial digital broadcasting, taking into account existing services?
- 11** What are the characteristics of the mobile multipath channel that are needed to be taken into account in the use of mobile reception, at different speeds?
- 12** What are the characteristics of the multipath channel that are needed to be taken into account in the use of hand-held reception, at different speeds?

*further decides*

- 1** that the results of the above studies should be included in (a) Recommendation(s);
- 2** that the above studies should be completed by 2006.

Category: S1

## ANNEX 3

### QUESTION ITU-R 81-1/6

#### **Subjective assessments of the quality of television pictures including alphanumeric and graphic pictures**

(1993-1995-2004)

The ITU Radiocommunication Assembly,

*considering*

- a) that it would be highly desirable to have standard methods of measuring television picture quality, in a subjective way, permitting an appropriate comparison of the results obtained in different places;
- b) that subjective assessment methods should be used in testing all forms of television, whether analogue or digital, and including standard definition, enhanced and high definition, as well as specific applications such as multiprogramming and scalable coding;
- c) that subjective assessment methods should be used in testing the quality of systems designed to handle graphic and alphanumeric pictures;
- d) that, while methods for the subjective assessments of the quality of pictures have been agreed (see Recommendation ITU-R BT.500), new systems and technologies may require extensions to these methods;
- e) that a significant effort is being made in the characterization of perceptual models, the statistical analysis of the probability of occurrence of the TV pictures in relation to their criticality, and the definition of several quality levels and new quality assessment methods to take account of the perception of the TV quality in different applications, including home viewing;
- f) that it is necessary to consider the effects of all the possible sources of impairment, from the picture source up to the receiver, as well as the way in which the subjective effects of impairments combine;
- g) that due account must be taken of the special issues arising in the development and use of new and future systems (e.g., digital, stereoscopic, etc.) which may require different methods and test conditions;
- h) that many objective test methods might benefit from being based on known relationships to picture quality;
- j) that the results of subjective tests can be analysed, presented and interpreted in many ways, and therefore it is highly desirable to increase the degree of standardization in the methods of analysis, presentation, and interpretation of the results of subjective tests so that comparisons may be made between results obtained by different workers,

*decides* that the following Question should be studied

- 1 What modifications or additions to the specifications of the testing methods in Recommendation ITU-R BT.500 may be necessary to improve the degree of standardization and effectiveness of subjective assessments of the quality of television pictures, including those from standard definition, enhanced and high-definition systems, whether analogue or digital, and those from systems designed to handle graphic and alphanumeric pictures?
- 2 What are the subjective performance parameters for new systems and what new methods or rating scales would be more suitable for assessing pictures provided by these new systems, yet simply relate to earlier methods and rating scales?
- 3 What are the relationships between the objective parameters of television signals and the subjective assessments of displayed picture quality?
- 4 How should the perceptual attributes that are contributing to subjective quality and their related system properties be identified and defined?
- 5 What are the ways in which subjective effects combine when several causes of picture impairment are present simultaneously?
- 6 What are the subjective evaluation methods to be used in the case of assessing the picture quality when the picture suffers relatively major transmission errors that happen occasionally?
- 7 What are the necessary test materials required in each case for subjective assessment?
- 8 What minimum performance specifications, and alignment procedures, should be recommended for picture displays used during subjective tests?
- 9 What methods should be employed for the analysis and presentation of results?

*further decides*

- 1 that the results of the above studies, as appropriate, should be included in (a) Recommendation(s);
- 2 that the above studies should be completed by 2006.

Category: S3/AP

## ANNEX 4

### QUESTION ITU-R 89-1/6

#### **User requirements for electronic news gathering**

(1995-2004)

The ITU Radiocommunication Assembly,

*considering*

- a) that electronic news gathering (ENG) crews must be able to operate in all parts of the world, and in all venues where a news event breaks;
- b) that news coverage produced by ENG crews must be delivered to the appropriate television facility, which is often remote from the area where the crews operate;
- c) that delivery of news coverage may be effected, depending on circumstances:
  - by physical delivery of recorded ENG videocassettes;
  - by transmission of the signal over portable microwave links;
  - by injection of the signal in a switched telecommunication network;
  - by satellite transmission;
- d) that the user requirements specific to ENG operation in terms of:
  - received picture quality;
  - received sound quality;
  - number of sound channels;
  - transmission channel bandwidth and reliability;
  - equipment size and weight;
  - talkback facilities, etc.;

are often different from those that apply to normal television contribution transmission, and they are peculiar to the operating environment of ENG;

- e) that such user requirements are generally independent from the delivery method used,

*decides* that the following Question should be studied

- 1** What are the user requirements peculiar to ENG operation, in terms of:
  - received picture quality;
  - received sound quality;
  - latency;
  - number of sound channels;
  - transmission channel bandwidth,
  - transmission equipment size, weight, power consumption, reliability, etc.;
  - talkback facilities, etc.?



**2** Which are the technical means to be recommended in order to meet the user requirements peculiar to ENG operation?

**3** How do those user requirements translate in terms of expected performance in the delivery of ENG news coverage:

- by physical delivery of recorded ENG video cassettes;
- by transmission of the signal over portable microwave links;
- by injection of the signal in a telecommunication network;
- by satellite transmission (SNG)?

NOTE 1 – Close cooperation with Radiocommunication Study Groups 4 and 9 and Telecommunication Standardization Study Group 9 will be required in the study of this Question, which should be brought to their attention,

*further decides*

**1** that the results of the above studies should be included in (a) Recommendation(s);

**2** that the above studies should be completed by 2007.

Category: S2

## ANNEX 5

### QUESTION ITU-R 97-1/6

#### **Optimization of quality colour reproduction in television**

(1997-2004)

The ITU Radiocommunication Assembly,

*considering*

- a) that in television the quality of colour reproduction is an important part of the overall quality of TV images and of the TV service itself;
- b) that it seems that in future broadcasters will continue to be interested in further enhancement of colorimetric quality of TV images;
- c) that modern level of colorimetric knowledge may be a basis for further development of the methods of optimization of colour reproduction quality in television;
- d) that throughout the world, digital TV systems development is based on the transmission of the transport stream containing video, audio and data, where additional data contain service information which may be used for the enhancement of video, audio and data transmission in the light-to-light TV chain. It becomes possible to optimize the quality of colour reproduction by means of processing of the TV image at the near and far ends. Account can be taken of the signal processing in components of the TV chain, colorimetric characteristics of TV cameras and displays and viewing conditions at both ends (and therefore light and colour adaptation of viewer) for any sequences, scenes, plots;
- e) that use of colour image statistics, human colour perception properties and appropriate colour appearance model will give an opportunity for further improvement of image compression that may lead to further bit stream rate reduction, and a decision should be made on basis of the trade off between the quality of colour reproduction and the degree of reduction of bit rate;
- f) that use of new methods of colour image processing and compression may lead to new possibilities of colour reproduction in television;
- g) that some receivers of the future may contain intelligence that will define the procedure for reaching optimal colour reproduction from the point of view of the observer, that will correspond to better contribution to subjective colour image quality;
- h) that the optimum solution for colour optimization may be achieved with use of suitable colour appearance model;
- j) that the problem of overall image quality evaluation includes the objective and subjective evaluation of colorimetric quality of TV images as important components;

k) that the optimum solution of the problem of objective evaluation of colorimetric quality of TV images depends upon the choice of a suitable colour appearance model and the colour reproduction accuracy evaluation criterion and algorithm used,

*decides* that the following Question should be studied

- 1 What processing algorithms should be used for optimization of colorimetric quality of colour images and what will be the complexity of such algorithms and expedience of their use for different TV broadcasting applications?
- 2 What information is needed for colour reproduction optimization in light-to-light TV chain to be transmitted on transport bit stream?
- 3 What data rate must be used for additional data for the optimization of colorimetric quality of TV images at the receiving end?
- 4 What provision can be made in the programme and transport stream for this additional data?
- 5 What will be the influence of the optimization of light-to-light colorimetric characteristics of TV chain upon the mechanisms of image compression?
- 6 What will be the influence of the use of optimization of light-to-light colorimetric characteristics of TV chain upon the optimum degree of image compression?
- 7 What should be the choice of a colour appearance model used in algorithms for the evaluation and optimization of colour image quality?
- 8 What should be the choice of criterion of colour image quality and a way of considering colour statistics of TV images and human colour perception properties?
- 9 In what a manner may the idea of optimization of light-to-light colorimetric characteristics of the TV chain optimization be used for other audio-visual services?

*further decides*

- 1 that the results of the above studies, as appropriate, should be included in a Report and (a) Recommendation(s);
- 2 that the above studies should be completed by 2006.

Category: S3/AP

## ANNEX 6

### QUESTION ITU-R 98-1/6

#### **Adaptive image quality control in future TV systems**

(1997-2004)

The ITU Radiocommunication Assembly,

*considering*

- a) that digital TV systems are developed as a compromise between image quality and compression ratio with consideration of image statistics, human viewing system properties, methods of image processing, characteristics of transmission and receiving equipment, and capturing and display systems;
- b) that use of digital representation brings an opportunity to transmit additional information inside the digital TV signal, the use of which provides the possibility of control of video signal processing characteristics at the transmitting and receiving ends;
- c) that new methods of image processing and transmission, such as fractal analysis, wavelet transformation, object-oriented coding, transmission of content and corresponding tools, are now developed and may be in future used in TV applications, and that parameters and characteristics of these methods may be controlled during video processing transmission and presentation;
- d) that the objective is to obtain optimum subjective quality of the reproduced image for any sequences, scenes, plots, the methods and parameters of image compression, source and reproducing devices' characteristics, the conditions of image viewing at both ends of the light-to-light TV path, with provision for their possible change;
- e) that the receiver of the future may contain intelligent element that can calculate necessary processing parameters for optimum image quality;
- f) that some suggestions for the processing of the image at the transmitting and receiving ends may be generated at the transmitting end and transmitted for receiving equipment characteristics automatical use;
- g) that an important part of adaptive image quality optimization is colour reproduction quality optimization and that this specific matter is a subject for study for answer Question ITU-R 97/6,

*decides* that the following Question should be studied

- 1** What responses of the end-to-end TV chain may be adaptively controlled using information from the transmitting end?
- 2** What will be the methods of image quality control in TV systems using new methods of image processing, transmission and presentation?

- 3 What parameters and other information are needed for adaptive control of light-to-light characteristics of the TV chain?
- 4 What must be the data rate of additional data used for the adaptive control?
- 5 What location in the programme stream may be used for additional data used for the adaptive control parameters and recommendations transmission?
- 6 What are the influences of the adaptive control of light-to-light characteristics of the TV chain upon the mechanisms of image compression?
- 7 What will be the influence of the use of adaptive control of the light-to-light TV chain upon the optimum degree of image compression?
- 8 What are the possibilities of adaptive control of light-to-light characteristics of the TV chain in interactive TV services?
- 9 In what a manner can the idea of adaptive control of light-to-light characteristics of the TV chain be used for other audio-visual services?

*further decides*

- 1 that the results of the above studies, as appropriate, should be included in a Report and (a) Recommendation(s);
- 2 that above studies should be completed by 2006.

Category: S3/AP

ANNEX 7

**Modification in the date of completion**

<b>Question ITU-R</b>	<b>Title</b>	<b>Category</b>	<b>Date of completion</b>	<b>Page number Doc. 6/1</b>
93/6	Frequency requirements for electronic news gathering	S2	2007	153

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