



*Radiocommunication Bureau*

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**Administrative Circular  
CACE/476**

31 March 2009

**To Administrations of Member States of the ITU, Radiocommunication Sector Members,  
ITU-R Associates participating in the work of the Radiocommunication Study Group 6  
and the Special Committee on Regulatory/Procedural Matters**

**Subject: Radiocommunication Study Group 6**

- **Approval of 2 new ITU-R Questions and 5 revised ITU-R Questions**
- **Suppression of 14 ITU-R Questions**

By Administrative Circular CAR/268 of 18 December 2008, 2 draft new and 5 draft revised ITU-R Questions were submitted for approval by correspondence in accordance with Resolution ITU-R 1-5 (§ 3.4). In addition, the Study Group proposed the suppression of 14 ITU-R Questions.

The conditions governing these procedures were met on 18 March 2009.

The texts of the approved Questions are attached for your reference (Annexes 1 to 7) and will be published in Addendum 2 to [Document 6/1](#) which contains the ITU-R Questions approved by the 2007 Radiocommunication Assembly and assigned to Radiocommunication Study Group 6. The suppressed ITU-R Questions are indicated in Annex 8.

Valery Timofeev  
Director, Radiocommunication Bureau

**Annexes: 8**

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 129/6

#### **Impact of audio signal processing and compression techniques on terrestrial FM sound broadcasting emissions at VHF**

(2009)

The ITU Radiocommunication Assembly,

*considering*

- a) that Recommendation ITU-R BS.412 specifies planning standards for terrestrial FM sound broadcasting at VHF, including the conditions for average multiplex signal levels and peak deviation;
- b) that audio signal processing techniques have rapidly developed in the last few years, based on advances of digital signal compression techniques, and are widely used in sound broadcasting to increase the subjective sound level/programme loudness;
- c) that listeners desire audio programmes to be uniform in subjective sound level/programme loudness;
- d) that careful guidance on system alignment is required, as the average power of the complete multiplex signal of FM sound broadcasting stations may exceed the limit specified in Recommendation ITU-R BS.412;
- e) that the application of such audio signal processing and compression techniques which result in an increase of the average power of the complete multiplex signal may lead to an increase in interference to sound broadcasting stations which do not use such techniques,

*decides* that the following Questions should be studied

- 1** What is the impact of audio signal processing and compression techniques on the average power of the complete multiplex signal and the maximum deviation of the emission?
- 2** What techniques are available to ensure that the emission complies with the planning parameters given in Recommendation ITU-R BS.412 when audio signal processing and compression techniques are used?

*further decides*

- 1** that the results of the above studies should be included in either a new Report(s) and/or Recommendation(s) or incorporated in Recommendation ITU-R BS.412;
- 2** that the above studies should be completed by 2011.

Category: S2

## **Annex 2**

### **QUESTION ITU-R 130/6**

#### **Digital interfaces for production and post-production applications in broadcasting systems**

(2009)

The ITU Radiocommunication Assembly,

*considering*

- a) that the practical implementation of television and sound production requires definition of the details of various studio interfaces and the data streams traversing them;
- b) that ITU-R has established Recommendations on digital interfaces for SDTV and HDTV, in parallel and serial forms, for electrical and optical cables;
- c) that ITU-R has also established Recommendations on digital audio interfaces;
- d) that ITU-R has been studying video formats with higher definition than HDTV and multichannel sound systems, which require higher data rate interfaces;
- e) that programme content and related data can be transferred either as a continuous stream or in the form of packets;
- f) that increased performance of IP networks has made it possible for broadcasters to introduce networked broadcasting systems for production and post-production inside and between broadcasting stations;
- g) that networked production and post-production systems should be constructed from interoperable pieces of equipment having standardized common interfaces and control protocols;
- h) that the transport mechanism should operate independently of the type of payload;
- j) that specifications should cover the possibility of conveying sound or any other ancillary signals through the interface, taking into account the original source timing;
- k) that for operational and economic reasons it is desirable to investigate whether the specification should also cover the possibility to use the same interface to transport the various image formats given in ITU-R Recommendations;
- l) that digital television and sound signals produced by these interfaces may be a potential source of interference to other services and due notice must be taken of No. 4.22 of the Radio Regulations,

*decides* that the following Questions should be studied

- 1** What parameters are necessary to define specified digital interfaces for the signal sets covered by ITU-R Recommendations?
- 2** What parameters are necessary to define compatible optical fibre digital interfaces?
- 3** What transport and control protocols are necessary to define interfaces for networked production and post-production systems?
- 4** What ancillary signals are required to be carried across the interfaces with the video signals, and what are the parameters necessary to define specifications for these signals?
- 5** What provisions are required for the associated digital sound channels?
- 6** What are the parameters that should be specified to use the same interface to also transport the various payloads given in ITU-R Recommendations?

NOTE 1 – See Recommendations ITU-R BT.709, ITU-R BT.601, ITU-R BT.656, ITU-R BT.799, ITU-R BT.1120 and Report ITU-R BT.2003,

*further decides*

- 1** that the results of the above studies should be included in (a) Report(s) and/or Recommendation(s);
- 2** that the above studies should be completed by 2011.

Category: S2

## **Annex 3**

### **QUESTION ITU-R 19-1/6**

#### **Bit-rate reduction coding of audio signals for broadcasting applications**

(1993-1995-2002-2009)

The ITU Radiocommunication Assembly,

*considering*

- a) that a number of different bit-rate reduction coding systems have been developed for digital audio applications;
- b) that requirements on bit-rate reduction coding systems for broadcasting are specified in Recommendations ITU-R BS.1548;
- c) that recent progress in digital audio coding techniques allows for a very considerable degree of bit-rate reduction to be achieved while maintaining high quality;
- d) that applications exist for audio bit-rate reduction coding systems for digital audio broadcasting, television sound and for storage of signals;
- e) that the requirements for the various broadcasting applications mentioned in § c) might be very different and should be carefully defined in view of the planned services;
- f) that the performance of the whole broadcasting chain should be considered, and multiple transcoding between bit-rate reduction coding standards used for production, transmission links and broadcasting should be avoided as far as possible,

*decides* that the following Questions should be studied

- 1** What are the sound quality and other requirements needed for production including recording, for transmission links and for various broadcasting applications from terrestrial transmitters and for satellite, including multichannel audio formats?
- 2** What are the bit-rate reduction techniques that would satisfy the quality level and other requirements for each of the applications listed in § 1 while making efficient use of storage or transmission media?
- 3** What are the techniques which would maximize interoperability between the various parts of the broadcasting chain?
- 4** What is the nature of signal impairments due to bit-rate reduction coding techniques, in particular after a number of cascaded codecs?
- 5** What are the lossless bit-rate reduction techniques which could be applied to audio coding, especially for studio and storage application?
- 6** What methods could be used to minimize the incompatibilities between the various bit-rate reduction coding techniques and what interface for compressed bit-rate audio can be recommended to avoid transcoding digital signals in linear format?

**7** What methods of transcoding between low bit-rate coding techniques adopted by ITU-R can be recommended, if unavoidable?

**8** What audio coding schemes are appropriate for application where remote interaction is important?

*further decides*

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

**2** that the above studies should be completed by 2011.

Category: S2

## Annex 4

### QUESTION ITU-R 45-2/6\*

#### Broadcasting of multimedia and data applications

(2003-2005-2009)

The ITU Radiocommunication Assembly,

*considering*

- a) that digital television and sound broadcasting systems have been implemented in many countries;
- b) that multimedia and data broadcasting services have been introduced in many countries;
- c) that mobile radiocommunication systems with advanced information technologies have been implemented in many countries;
- d) that reception of digital broadcasting services is possible both inside and outside the home with fixed receivers such as TV sets in the living room, as well as handheld/portable/vehicular receivers;
- e) that the characteristics of mobile reception and stationary reception are quite different;
- f) that the display sizes and receiver capabilities may be different between handheld / portable / vehicular receivers and fixed receivers;
- g) that the format of the transmitted information should be such that the content can be displayed intelligibly on as many types of terminals as possible;
- h) the need for interoperability between the telecommunication services and interactive digital broadcasting services;
- j) the need to harmonize technical methods used to implement content protection and conditional access;
- k) that audiovisual informational systems for presentation of various kinds of multimedia information applicable to programmes such as dramas, plays, sporting events, concerts, cultural events, etc. are widespread, and those systems are being installed for collected viewing,

*decides* that the following Questions should be studied

- 1** What are the user requirements for broadcasting of multimedia and data applications:
  - for mobile reception;
  - for stationary reception;

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\* This Question should be brought to the attention of ITU-R Study Group 5 and ITU-T Study Group 16.

- for digital multimedia video informational systems on the basis of high definition television (HDTV), large screen digital imagery (LSDI) and extremely high resolution imagery (EHRI);

and

What is necessary to implement these requirements?

**2** What system characteristics are required for broadcasting of multimedia and data applications for mobile reception and for stationary reception?

**3** What data transport protocol(s) is (are) most suited to deliver broadcast multimedia and data contents to handheld, portable and vehicular receivers and to fixed receivers?

**4** What solutions can be adopted to ensure the interoperability between the telecommunication services and interactive digital broadcasting services?

*further decides*

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

**2** that the above studies should be completed by 2011.

Category: S2



## Annex 5

### QUESTION ITU-R 12-2/6\*

#### **Generic bit-rate reduction coding of digital video signals for production, for contribution, for primary and secondary distribution, for emission and for related applications**

(1993-1997-2001-2002-2009)

The ITU Radiocommunication Assembly,

*considering*

- a) that rapid progress has been made in bit-rate reduction coding techniques;
- b) that bit-rate reduction coding of digital video signals (e.g. LDTV, SDTV, EDTV, HDTV LSDI and UHDTV\*\*) finds wide applications for production, for emission by terrestrial means and by satellite, for contribution, for both primary and secondary distribution by telecommunication and by CATV networks;
- c) that the large channel capacity required for the digital transmission and recording of UHDTV video signals may introduce problems that are both technical and economic, and it is desirable to reduce the bit-rate required by these signals to a minimum consistent with the necessary performance objectives;
- d) that the encoding methods adopted for digital video should have as many common characteristics as possible so as to simplify conversion between standards and also permit operating economies;
- e) that lossless<sup>1</sup> or perceptually lossless<sup>2</sup> bit-rate reduction coding may be desired particularly for studio applications;

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\* This Question should be brought to the attention of the ISO, the IEC and the relevant ITU-T Study Groups (9 and 16).

\*\* LDTV: Low definition television  
SDTV: Standard definition television  
EDTV: Enhanced definition television  
HDTV: High definition television  
LSDI: Large screen digital imagery  
UHDTV: Ultra-high definition television

<sup>1</sup> The ITU terminology database defines “lossless bit-rate reduction” as “a bit-rate reduction process that fully preserves the information content of the original bit stream, which can be reconstructed with bit-to-bit accuracy (e.g. exploiting the bit-stream statistics)”.

<sup>2</sup> Perceptually lossless as used in the context of this Question means a lossy compression scheme with compression artefacts that are not subjectively visible during the production process.

- f) that there are advantages in having a generic bit-rate reduction coding in the various applications;
- g) that a number of compression families have been used for various television applications,

*decides* that the following Question should be studied

What are the appropriate bit-rate reduction methods for use in production, in contribution, in emission, both terrestrial and by satellite, for distribution, both primary and secondary by telecommunication networks, for the recording media and for related applications such as ENG/SNG?

*further decides*

- 1** that the results of the above studies should be included in (a) Report(s) and/or Recommendation(s);
- 2** that the above studies should be completed by 2011.

Category: S2

## Annex 6

### QUESTION ITU-R 16-2/6

#### Digital interactive broadcasting

(2002-2003-2009)

The ITU Radiocommunication Assembly,

*considering*

- a) the progress in information processing and communication technologies;
- b) the rapid progress towards digital broadcast delivery systems;
- c) the potential for such systems to support interactivity for a variety of purposes;
- d) the development of radiocommunication methods over various delivery media suitable for use in receiving, from users, return communication related to the programme material (vision, sound, multimedia and data);
- e) that broadcast receivers and multimedia systems which incorporate interactive services are available for consumer use;
- f) that a number of ITU Recommendations already exist which are related to provision for a return channel, for instance Recommendations ITU-R BT.1667 and ITU-R BT.1832;
- g) that return information from viewers can be also provided in a deferred way (users have to store and then take care of the delivery of the information);
- h) the availability of mass storage media in receivers permitting local interaction without the need of a return channel;
- j) the existence of Recommendation ITU-R BT.1369 “Basic principles for a worldwide common family of systems for the provision of interactive television services”, many of which apply equally to sound, multimedia and data broadcasting;
- k) the necessity of the development of interactive broadcasting in order to accelerate bridging the digital divide;
- l) the possible role of interactive broadcasting in the broadcasting audience monitoring (e.g. mediamestry) and Internet audience monitoring,

*decides* that the following Questions should be studied

- 1** What are the opportunities for commonality among systems specified for return data from the receiver to the broadcaster, and to other users of such data, for different reception media (e.g. terrestrial, satellite, common antenna, cable, the Internet etc.)?
- 2** What interactive services (including deferred and local interactive services<sup>\*</sup>) are likely to be needed and what are their performance requirements for the return channel?

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\* The level of interaction provided by broadcasting a range of alternative content to a local mass storage device for access and selection by the user.

- 3** Which protocols, preferably selected among those already standardized for such purposes, should be recommended as being suitable for the various transmission media used to carry the return channel?
- 4** What are the appropriate protocols, APIs and storage media suitable to collect “various versions of forward broadcast data requiring user activity” or “interactive data resulting from the user activity”?
- 5** What possibilities exist for the harmonious use of multimedia systems, in storing in an appropriate way, the “various versions of forward broadcast data” or the “interactive data created by the user”?
- 6** How can anonymous reception of broadcast without explicit signalling for privacy opt-out, be maintained in the framework of interactive broadcasts?

*further decides*

- 1** that the results of the above studies should be included in (a) Report(s) and/or Recommendation(s);
- 2** that this work should be coordinated with the relevant Study Groups in the Radiocommunication and Telecommunication Standardization Sectors;
- 3** that the above studies should be completed by 2011.

Category: S2

## **Annex 7**

### **QUESTION ITU-R 34-2/6\***

#### **File formats and transport for the exchange of audio, video, data and metadata materials in the professional television and large screen digital imagery (LSDI) environments**

(2002-2007-2009)

The ITU Radiocommunication Assembly,

*considering*

- a) that storage systems based on information technology, including data disks and data tapes have already started to penetrate all areas of the professional television environment; production, non-linear editing, play-out, post-production, distributed production, archiving, contribution and distribution;
- b) that future TV production environments will increasingly incorporate systems from the Information Technology (IT) world such as networks, and server systems;
- c) that applications for professional TV and LSDI are being increasingly based on software which generally handle content in file form;
- d) that file exchange does not introduce additional picture and sound quality degradation if, for example, the compressed audio and video accommodated in the file body is transferred in its original, compressed form;
- e) that file exchange can be adapted easily to the available channel bandwidth so that user can trade-off transfer-bandwidth versus transfer-time;
- f) that metadata, audio, video, data essence and ancillary data can be transferred in a common file;
- g) that metadata, audio, video, data essence and ancillary data can be stored and transferred as independent files with provision for later synchronization;
- h) that the technology of file formats and file exchange offers significant advantages in terms of operating flexibility, production flow, station automation, economy;
- j) that the interoperability within and between content management systems is an essential user requirement and demands interoperable file formats and transport mechanisms for the exchange of Content and Assets;
- k) that the application of metadata exchange (i.e. in TV production) requires support of existing specifications on metadata;

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\* This Question should be brought to the attention of ITU-T Study Group 9 and the ISO/IEC JTC1 SC29 Working Group 11.

- l) that compatibility with both binary and XML metadata transport protocols needs to be considered;
- m) that the adoption of a small number of interoperable file formats for signal exchange would greatly simplify the design and operation of equipment and remote studios;
- n) that interoperability and conformance testing are simplified when a single coding construct is specified for each compression standard;
- o) that many world broadcasters have already deployed systems based on file formats;
- p) that Recommendation ITU-R BT.1775 “File format with editing capability, for the exchange of metadata, audio, video, data essence and ancillary data for use in broadcasting” defines the editable file format and the generic container;
- q) that many applications from multiple manufacturers rely on file exchange which are in an interoperable format;
- r) that some file formats may not meet all future user requirements and for that reason new development may be required to meet specific users needs,

*decides* that the following Questions should be studied

- 1** What are the user requirements and potential category of requirements for carrying programme and programme genres for the exchange of audio, video, data and metadata encapsulated in a file format in the professional television and LSDI environments?
- 2** What structure of file formats will best serve the future needs of users, while desirably maintaining interoperability with existing deployments?
- 3** What degree of extensibility can be achieved while maintaining backward compatibility?
- 4** What will be the design of the encoders and decoders which would be utilized for interchange of metadata, audio, video, data essence and ancillary data?
- 5** What digital interfaces should be specified for transport of the file format(s) for interchange of metadata, audio, video, data essence and ancillary data?
- 6** What independent video/audio search capability will be required to assist asset management during and following interchange of the file?
- 7** What operational considerations will be required by broadcasting organizations for the interchange of audio, video, data essence and ancillary data?

*further decides*

- 1** that ITU-R Study Group 6 should continue to monitor the standardization work of other organizations with regard to file formats and transport mechanisms, and that appropriate existing and future file formats should be proposed for adoption by the ITU-R;

- 2** that the study should also include a consideration of integration and migration strategies for legacy, established and future file formats;
- 3** that the results of the above studies should be included in Report(s) and/or Recommendation(s);
- 4** that the above studies should be completed by 2011.

Category: S2

## Annex 8

### Suppressed ITU-R Questions

| Question<br>ITU-R | Title   |
|-------------------|---|
| 5-1/6             | Serial data transport mechanism for packetized data within a television production studio based on, and compatible with, Recommendations ITU-R BT.656 and ITU-R BT.1120 |
| 6-1/6             | Standards for digital high-definition television coding   |
| 7/6               | Interface to webcasting and its supporting data services  |
| 17/6              | Data broadcasting in the digital broadcasting environment   |
| 20/6              | Digital HDTV studio interfaces  |
| 33/6              | Standards for digital audio coding and interfaces   |
| 41/6              | Auxiliary signals for digital television codecs to assist editing and cascading   |
| 42/6              | Interfaces for digital video signals  |
| 43/6              | Digital coding for multi-programme television in contribution and distribution circuits   |
| 66/6              | Audio coding schemes for sound broadcast programme inserts  |
| 87/6              | Acquisition and recovery times in digital television encoding   |
| 101/6             | Broadcasting of copy protection signalling for television   |
| 103/6             | Reference signals for the component digital studio  |
| 119/6             | Use of lossless/perceptually lossless bit-rate reduction to transport HDTV signals over HD-SDI  |

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