

QUESTION ITU-R 285/4*

Digital broadcasting of multiple services and programmes in the broadcasting-satellite service

(2009)

The ITU Radiocommunication Assembly,

considering

- a) that means for improving the flexibility and efficiency of use of the radio-frequency spectrum are continuously investigated;
- b) that there have been significant developments in efficient modulation and channel coding techniques, including but not limited to formats using QPSK and 8PSK modulation techniques;
- c) that advances in video and audio compression techniques have shown the practicality of transmitting more than one television and/or audio and/or data service per satellite transponder;
- d) that the very nature of digital transmissions, and the recent significant advancements in multiplexing techniques, enables the flexible and simultaneous transmission of a wide variety of services, digitally coded and systematically integrated, within any single satellite transponder using such multi-service satellite broadcasting techniques;
- e) that video, audio, still-pictures, teletext, facsimile, and a variety of useful data services, including software distribution or interactive multimedia services, can be included in these type of broadcasts;
- f) that the availability requirements of these different services can vary according to their application;
- g) that broadcasting multimedia services will be widely introduced in the future,
- h) that the multiplexing of these services can be referred to as, *inter alia*, Integrated Services Digital Broadcasting, or ISDB;
- j) that broadcasting-satellite channels provide an effective means for transmitting integrated digital broadcasting services;
- k) that the transmission of multiple video, audio or data services per transponder reduces programme costs per channel, facilitates the increase in number of services, and provides a more attractive overall service;

* Former Question ITU-R 3/6.

- l) that technological developments of large-scale integrated circuits, digital information processing techniques, and bit-rate reduction techniques, especially for video and sound signals, facilitate the economical implementation of multi-service satellite broadcasting systems to provide improved broadcast services to the public;
- m) that multi-service satellite broadcasting systems are also used to serve professional cable and SMATV installations for further terrestrial distribution, and that a high degree of harmonization between digitally-coded signals used for satellite broadcasting and for radiocommunication services may offer further advantages,

decides that the following Questions should be studied

- 1 What are suitable and/or optimal modulation and channel coding techniques for multi-service satellite broadcasting, what are practical channel transmission rates (capacity), and what performance is achievable (e.g. BER as a function of C/N and C/I)?
- 2 What are appropriate availability performance requirements and bit error rate requirements for the transmission of these multi-service satellite broadcasting systems?
- 3 What are appropriate error-correction coding and/or error-concealment processes that optimize quality, bandwidth and cost considerations?
- 4 What protection ratios are required between two digital signals and between a digital signal and other types of signals likely to be transmitted in the band allocated to the broadcasting-satellite service?
- 5 What type of multiplexing structure is optimal for the flexible transport of multiple services in the satellite transponder? What type of multiplexing structure is optimal for the flexible transmission of different types of services?
- 6 What are the optimum satellite system parameters, such as digital transmission bit rate (and associated channel coding, error-correction rate), to match the current performance of cable networks and SMATV installations?

NOTE 1 – See Report ITU-R BO.2008 and Recommendations ITU-R BO.1408 and ITU-R BO.1516,

further decides

- 1 that the results of the above studies should be included in appropriate Reports and/or Recommendations.
- 2 that the above studies should be completed by 2011.

Category: S1