

RECOMMENDATION ITU-R BT.1790

Requirements for monitoring of broadcasting chains during operation

(Questions ITU-R 44/6, ITU-R 48/6 and ITU-R 109/6)

(2007)

Scope

This Recommendation describes broadcasters' requirements for operational monitoring in digital broadcasting chains. Monitoring issues are first categorized into status monitoring and quality monitoring, and the requirements are itemized in each category.

The ITU Radiocommunication Assembly,

considering

- a) that broadcasting chains are composed of contribution and distribution networks, production and post-production, and satellite and terrestrial emissions to the end-user;
- b) that the whole delivery chain is composed of a multiplicity of cascaded processing devices such as converters, encoders, switches, multiplexers, modulators, receivers, etc.;
- c) that digital audiovisual and audio services have rapidly developed based on advances in digital signal compression and communication technologies;
- d) that digital compression coding technologies have enabled the widespread growth of high-quality multichannel audiovisual services;
- e) that audiovisual signals after digital coding processing have different characteristics from those of conventional analogue signals;
- f) that the digitizing of broadcasting systems have made them more advanced and complex;
- g) that it has become difficult to manage the quality by conventional methods for monitoring or subjective evaluation, and has become necessary to develop new monitoring methods;
- h) that monitoring today is conducted mainly by human operators, but the increased functionality and complexity of digital broadcasting systems increase the need for automatic monitoring;
- j) that a unified approach for monitoring for every step in a broadcasting chain would facilitate the development of reliable, efficient and cost-effective monitoring systems for broadcasting chains;
- k) that broadcasters are seeking to provide guidance to equipment manufacturers on the operational monitoring requirements in broadcasting chains,

recommends

- 1** that the broadcaster's requirements for operational monitoring described in Annex 1 should be taken into account for the development of monitoring systems in broadcasting chains.

Annex 1

1 Introduction

Digital compression coding technologies have enabled the widespread growth of high-quality multichannel audiovisual services. Audiovisual signals after digital coding processing have characteristics different from those of conventional analogue signals, e.g. the perceptual quality depends on the content and the characteristics of the original signal, and degradation due to digital compression coding and transmission errors often occurs locally. In addition, digitalization has made systems more advanced and complex, and new services, such as data broadcasting, have emerged.

Therefore, it has become difficult to manage the quality of digital broadcasting systems by conventional methods for monitoring analogue systems or subjective evaluation, and a new monitoring method is needed. This Recommendation describes user requirements for operational monitoring for digital broadcasting chains based on the quality monitoring/assessment technologies to be introduced in broadcasting stations and communication carriers.

2 References

2.1 Informative references

Recommendation ITU-R BS.1387 – Method for objective measurements of perceived audio quality.

Recommendation ITU-R BT.1204 – Measuring methods for digital video equipment with analogue input/output.

Recommendation ITU-R BT.1683 – Objective perceptual video quality measurement techniques for standard definition digital broadcast television in the presence of a full reference.

Recommendation ITU-R BT.1720 – Quality of service ranking and measurement methods for digital video broadcasting services delivered over broadband Internet protocol networks.

ITU-T Recommendation J.143 (2000) – User requirements for objective perceptual video quality measurements in digital cable television.

ITU-T Recommendation J.148 (2003) – Requirements for an objective perceptual multimedia quality model.

3 Types of monitoring

Operational monitoring means to monitor whether the object is in the desired operational status or conforms to the standard or specification. In this Recommendation, operational monitoring especially means in-service objective monitoring operation by equipment, not by human operators. It is categorized into status monitoring of physical signal levels and perceptual quality monitoring of audiovisual contents.

Signals to be monitored are categorized into the following three:

- Baseband signal (SDI, analogue video and audio signals, etc.).
- Coded bit-stream (MPEG-2-TS signals, etc.).
- Modulated signal (RF signals, etc.).