

DSNG Commercial Users' Requirements

Introduction

Digital compressed television is attractive to satellite news gathering (SNG) operators for two main reasons: compared to analogue transmission, the size and quantity of equipment required for the uplink terminal is reduced, and the required transponder bandwidth is reduced. Both of these factors can have a marked influence on operating costs.

Use of digital compression for SNG is increasing, and it is appropriate for the DVB to define standards for DSNG as soon as possible. The main benefit of doing this is to maximise interoperability, an important requirement for most satellite network and SNG operators.

This document describes user requirements for DSNG.

Definition

Recommendation ITU-R SNG.770-1 proposes the following definition of SNG:

Temporary and occasional transmission with short notice of television or sound for broadcasting purposes, using highly portable or transportable uplink earth stations operating in the framework of the fixed-satellite service.

The definition of the equipment is that it should be capable of uplinking the video programme with its associated sound or sound programme signals, and capable of providing two-way co-ordination (communication) circuits. The equipment may provide for data transmission and should be capable of being set up and operated by a crew of no more than two (2) people within a reasonably short time (for example, one hour).

Transportable earth stations are also applicable for meeting the SNG requirements when logistics dictate use of such systems and the systems meet the basic functional characteristics of the SNG systems.

Distinction between fly-away and transportable terminals will be made when necessary.

Functional description

The main features of SNG systems are essentially defined by the uplink characteristics. Operations with the SNG uplink terminal assumes that the receiving side is appropriately dimensioned. To ensure system compatibility and efficient operation, it is necessary to standardize equipment characteristics and operating procedures. Interoperability is clearly most important to both satellite and SNG

operators. Evidence of this exists in the amount of effort put into interoperability trials by ISOG/INTELSAT in 1996 and continuing in 1997. (There has been discussion, particularly in a recent meeting of ITU WP4SNG, of mandatory tables that do not seem appropriate to DSNG. An example is tuning parameters in the NIT. On the basis that a compliant receiver may expect to see valid (if irrelevant data in mandatory tables, the Technical Module should be requested to consider whether guidelines to or definitions of their content are appropriate).

The functions of the SNG system are to:

- transmit with a minimum of impairments, a vision and associated sound or sound programme signal;
- provide limited receiving capability to assist in pointing the antenna and to monitor the transmitted signals, where possible;
- provide two-way communication channels for operation.

Quality of audio and video

SNG links are by nature contribution links. The quality objectives are those of contribution quality as defined in Rec. ITU-R BT. 1121. There is no need to define a lower quality objectives, if it is understood that due to circumstances, possible relaxation are to be accepted by the user.

For DSNG links, the typical bit-rate used by fly-away and small transportable terminals are about 8 Mbit/s, using MPEG-2 MP@ML.

However for transportable stations use of MPEG-2 422P@ML (professional profile) should be supported. ITU-T Study Group 9 is presently preparing a draft recommendation on that matter. In this case, bit rates should be higher than 8 Mbit/s and lower than 34 Mbit/s.

Multiplexing

Advantage should be taken of the flexibility of the MPEG-DVB multiplex to consider

- the addition of a multiplex of sound channels for commentary purposes
- the multiplexing of many TV programmes originating from the same point (multifeed, 3-D applications, etc...).

Co-ordination channels

Co-ordination channels should optionally be provided in line with Recommendation ITU-R SNG-771 which proposes:

1. that SNG earth stations should be equipped to provide two-way satellite communication circuits which must be available prior to, during, and after, the transmission of the vision and associated sound or sound programme signal. These circuits will provide communication between the SNG operator, the satellite operator and the broadcaster;

2. that two or more duplex circuits should be provided, whenever possible within the same transponder as the programme vision and associated sound or sound programme signal;
3. that these communication circuits should be in compliance with Recommendation ITU-T G.703, i.e. 64 kbit/s.

Cost of equipment

It should be noted that SNG service is inherently different from a normal broadcasting service where complexity and costs are affected by the transmitter side and every effort is made to lower the cost of the receiver.

SNG is professional equipment and must be robust and small. The receiving installation is usually located at the broadcaster premises and is also highly professional equipment. Therefore, the total cost of the system and its operation should be considered, and not just the receiver cost.

A non-negligible part of the overall cost of an SNG transmission lies in the requirements for satellite capacity. Modulation techniques, additional to QPSK, such as 8-PSK and 16-QAM, should be investigated to optimise the efficient use of satellite capacity, whilst still maximising, as much as possible, interworking between different suppliers products.

Regulatory constraint

SNG is a versatile and flexible uplink. Attention must be paid to respect the existing regulations. These are not only international regulations (as published in the Radio Regulation of ITU) but also regional regulations. In Europe, SNG equipment should comply with ETSI ETS 300 327.

Furthermore, the satellite operator has also set up his own regulations. As an example, SNG stations to be used on Eutelsat transponders should also be registered with Eutelsat and should comply with Eutelsat Standard L.