International Telecommunication Union

ITU-R

Radiocommunication Sector of ITU

Recommendation ITU-R SNG.770-2

(01/2012)

Uniform operational procedures for digital satellite news gathering (DSNG)

SNG Series

Satellite news gathering

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S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	**Satellite news gathering**
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: *This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.*

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RECOMMENDATION ITU-R SNG.770-2

Uniform operational procedures for digital satellite news gathering (DSNG)

(1992-1994-2012)

Scope

This Recommendation specifies characteristics and operating procedures for satellite news gathering transmissions using digital encoding and modulation techniques. Annex 1 provides operating characteristics and procedures with a view toward the prevention of interference among satellite transmissions.

The ITU Radiocommunication Assembly,

considering

a) that satellite news gathering (SNG) using portable transmitting earth stations is essential for broadcast operations and provides a valuable method of transmission for the rapid acquisition and broadcasting of news events;

b) that to facilitate the international coverage of news and to optimize the design of equipment, it has been desirable to adopt uniform operational procedures for SNG taking into account the possibility for interference to other satellites and systems;

c) that SNG is temporary and occasional and its activation often cannot be determined long in advance;

d) that the ITU Convention states in its Preamble “fully recognizing the sovereign right of each state to regulate its telecommunications”;

e) that for the successful operation of SNG, it is essential that there be expeditious authorization for the activation of SNG earth stations, for transmissions to a telecommunication satellite, in conformance with the administrative procedure of the host country; and operational criteria for these systems;

f) that SNG would be facilitated through the availability of an SNG user’s guide from satellite operators (space segment providers) and host countries;

g) that additional communication facilities, such as point-to-point microwave, telephone communications systems, two-way simplex/duplex radio wireless microphones and mobile satellite terminals for voice and data may be required in support of SNG operators;

h) that some regional or national organizations have already worked out standards which should be satisfied by the SNG transmitting earth stations;

j) that SNG systems, applications and international interchange now employ digital encoding and modulation techniques,

noting

a) that ITU-R has established Recommendation ITU-R BO.1516 D*igital multiprogramme television systems for use by satellites operating in the 11/12 GHz frequency range*;

b) that ITU-R has established Recommendation ITU-R BO.1784 *Digital satellite broadcasting system with flexible configuration (television, sound and data)* which is also referred to as DVB-S2,

recognizing

that digital satellite news gathering (DSNG) is a point-to-point service that is, generally, provided through the fixed-satellite service and that the definition of broadcasting-satellite service in the Radio Regulations is a radiocommunication service in which signals transmitted or retransmitted by space stations are intended for direct reception by the general public,

recommends

1 that the operation of digital SNG (DSNG) should comply with the uniform operating procedures as described in Annex 1;

2 that to facilitate the temporary authorization of DSNG operations, administrations and relevant organizations are encouraged to consider harmonization of the standards which could exist in this field and harmonization of expeditious and simplified procedures (e.g. earth station approval, satellite reservation, frequency coordination, and timely authorization of radio related services in support of additional DSNG communications facilities, etc.);

3 that each administration should establish a full-time point of contact for exchange of information and guidance on frequency coordination and administrative procedures of the host country (for example via an Internet webpage);

4 that in order to simplify operations and minimize delays, satellite space segment providers should develop user guides for DSNG operational procedures of their individual systems and take steps to harmonize those procedures between these systems;

5 that host countries are encouraged to develop DSNG user guides or other documents which may be in the form of national regulations to facilitate operations;

6 that satellite organizations should, on request, provide an easily identifiable carrier to facilitate the operation of DSNG earth stations;

7 that DSNG transmissions include an appropriate identification signal, notified to the host country to assist in interference abatement;

8 that two-way communication circuits should be available prior to and at all times during the DSNG transmission;

9 that for satellite transponders having regional coverage of a number of countries, the authorization of only the appropriate uplinking country is required.

Annex 1

Uniform operating procedures for DSNG

1 Operating characteristics

The nature of DSNG operations is described below, with respect to frequency use and requirements.

1.1 Definition of DSNG

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 news programme material with its associated sound or sound programme signals. 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, 1 h).

Transportable earth stations are also applicable for meeting the DSNG requirements when logistics dictate use of such systems and the systems meet the basic functional characteristics of the DSNG systems. DSNG sound may also be operated in the mobile-satellite service.

1.2 Functional description

The main features of DSNG systems are essentially defined by the uplink characteristics. Operations with the DSNG 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.

The functions of the DSNG 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.

2 Satellite characteristics for performance and interconnection

2.1 Uplinks

2.1.1 Orbit spacing

Satellite systems may use orbit spacings as low as 2°. For actual DSNG operations, the particular established satellite configurations in the orbital arc appropriate for the required circuit need to be taken into account.

Some administrations require that transmitting satellite earth stations have an antenna radiation pattern designed to ensure that side-lobe peaks do not exceed $G = 29 - 25 \log \theta$ (dBi), at least in the direction of the geostationary orbit. In any case the antenna performance will concur with the specifications of the satellite operator.

2.1.2 Frequency bands appropriate for DSNG

All frequency bands allocated to uplinks for the FSS may be used by DSNG systems. However, since a DSNG terminal requires a small antenna to provide high portability, the operating frequency band is extremely important. Some bands may require appropriate coordination with other services. There is a preference for use of the 14 GHz band for which the technology is sufficiently mature.

2.1.3 Uplink service area

Uplink service areas fall into two general categories:

– national

– international.

Nations spanning large areas sometimes use large satellite antenna beamwidths which would be more appropriately categorized as “continental”.

2.1.4 Satellite *G*/*T*

The predominant factor governing *G*/*T* performance is the size of the uplink service area. National beams generally have higher gain antennas, more suitable to the low e.i.r.p.'s from DSNG terminals.

The more common configuration is for large uplink service areas – national and international – resulting in *G*/*T* values of zero, or in some cases negative values, at the edge of the beam.

In some cases, it is desirable to take account of satellite *G*/*T* values of 0 dB(K^{-1}). To be as flexible as possible, the DSNG terminals should be capable of working to satellite *G*/*T* values as low as –6 dB(K^{-1}), even if this involves lower performance. In the event of operation in the 6/4 GHz band, global beam values of *G*/*T* as low as –12 dB(K^{-1}) can be encountered.

2.1.5 Satellite gain

Satellites are often equipped with variable gain settings to achieve a higher e.i.r.p. Lower gain values have been shown to provide improved overall performance when the satellite is used for DSNG applications.

As it is not always possible to change satellite gain settings for short-term use, DSNG terminals should be capable of operating with nominal satellite gain settings and the downlink receiver should be appropriately dimensioned.

2.1.6 Bandwidth

It may be possible to carry DSNG on a shared basis with other television signals, and communication channels, depending on the transponder bandwidth available and its intermodulation characteristics.

2.1.7 Channel plans for satellites

Satellites often make use of overlapping channels with orthogonal polarization discrimination. Account needs to be taken of interference in relation to each specific satellite, in particular the polarization discrimination requirements.

2.1.8 Steerable satellite antenna

Steerable satellite beams have been deployed and allow a narrow beam antenna to be directed to the DSNG earth station location to provide improved performance.

2.2 Downlink

2.2.1 Downlink service area

It is necessary that the downlink service area encompasses the intended receiving site. For ease of establishment, for communications and for monitoring, it is also highly desirable that the DSNG terminal site be capable of reception of signals from the satellite.

2.3 Connectivity

Satellites generally have some levels of connectivity (on-board switching) flexibility such as switching to spare components, variable interconnection of input amplifiers, output amplifiers and antenna beams. Use of variable connectivity depends on the satellite operator and may be related to the level of reliability and the interrelationship of the satellite hardware affected by any change.

Where available, reconfiguration of connectivity may be useful in establishing the desired circuit. In some satellites it may be possible to connect 14 GHz band uplink capacity to, for example, 4 GHz band downlink circuits.

Improved flexibility in future satellites may be of benefit to DSNG operations.

3 Uniform operating procedures required for temporary authorization for DSNG

3.1 Introduction

DSNG differs from most other forms of satellite transmissions in a number of ways. For example, the requirement for DSNG typically is identified only days, possibly hours, before transmission. It lasts typically for no more than a few days, or at the most, weeks. Nevertheless, the DSNG operator has to comply with the regulations of the host country and with a number of procedures which are designed to ensure the proper management and protection of the space segment and frequency spectrum.

The regulatory framework in which a DSNG operation takes place has a dual effect on its operational effectiveness. In order to carry out its intended function, the DSNG operator must have access to temporary agreements and/or authorizations in a timely and cost-effective manner. The operator's needs range from frequency authorization, to coordination with the space segment entity, to tariffs and administrative costs, to the necessary supporting lines of communication. This section describes the nature of the operational information that is required to assist the DSNG capability.

Given that DSNG requirements are occasional and/or temporary and that coverage for an unplanned fast-breaking news event is a valuable worldwide service, expeditious approval for activation of portable earth stations is essential.

The successful application of DSNG technology requires uniform agreement on standard technical approaches and recognized operating procedures. The frequency and number of programme sound channels as well as the number of auxiliary, data and coordination channels should be uniformly adopted.

3.2 Earth station approval

Earth station approval is necessary to allow the responsible body to ensure compatibility of the DSNG terminal with the space segment. To meet this requirement, administrations are required to consider procedures to permit the DSNG terminal to be brought into service as quickly as possible. Administrations are urged to investigate the possibility that a DSNG terminal whose technical performance is approved by the space segment providers be accepted on a uniform basis and they are encouraged to complete administrative procedures in close cooperation with DSNG operators as expeditiously as possible. A technical report demonstrating the measured performance characteristics should be prepared and be available to the administration. The following technical characteristics should be documented as a minimum:

– transmit gain as a function of frequency;
– transmit off-axis gain;
– transmit main beam e.i.r.p.;
– transmit beamwidth and polarization;
– transmit main beam spectral density for the worst 4 kHz, or 1 MHz, as appropriate (see Recommendation ITU-R SF.675);
– transmit off beam spectral density for the worst 4 kHz, or 1 MHz, as appropriate (see Recommendation ITU-R SF.675);

– maximum energy dispersal (where required);
– receive G/T as a function of frequency;
– cross-polarization isolation;
– pointing accuracy performance;
– receive and transmit frequency agility within the operating bands;
– spurious emissions (in-band and out-of-band);
– manufacturers' model numbers, modulation characteristics and frequency stability;
– other technical characteristics which are part of an DSNG standard used in the concerned country.

3.3 Frequency assignment and coordination

Frequency coordination procedures are derived from international and national regulations. In order to assess the acceptability of a DSNG terminal in this respect, the responsible body may require the same information detailed in § 3.2, plus details of the geographical location of the DSNG terminal and the anticipated transmission times.

The DSNG operator requires timely radio regulatory authorization by the host administration for operation of the DSNG terminal. Coordination between the proposed DSNG terminal and existing terrestrial radio services is a necessary prerequisite to manage radio interference and allow authorization of the DSNG terminal. Frequency coordination for DSNG terminals is more difficult in the 6 GHz band, since some bands may be shared between fixed-satellite and fixed-terrestrial services and many fixed-terrestrial links exist. For reasons of portability and ease of coordination, use of higher frequency bands (e.g. 14 and 30 GHz) is beneficial. A portion of some bands, e.g. 14 GHz band are not shared with the fixed service using radio-relay systems and this makes DSNG coordination much easier. In some countries, however, other bands such as the 14 GHz band are used for fixed and other terrestrial purposes and coordination is, therefore, necessary. Some frequency bands are allocated worldwide to the FSS (Earth-to-space) on a primary basis; these bands are also allocated to the MSS (Earth-to-space) on a co-primary basis in Region 2 (entire band) and Regions 1 and 3 (upper 100 MHz). Where coordination is required between the DSNG station and the terrestrial links of the host country, it may be difficult because of the temporary nature of DSNG.

3.4 Space segment booking

The DSNG operator needs to have a quick and clear understanding of what space segment will be available in a timely manner (e.g. within less than 24 h) for this purpose. This information needs to include:

– transponder characteristics (satellite identifier);
– amount of bandwidth and power;
– earliest available time of access.

The DSNG operator may require direct contact with the space segment provider on a continuous basis.

3.5 Auxiliary coordination circuits

Auxiliary coordination circuits are required between both the satellite operator's communication control centre and the broadcaster's premises. These circuits are described in Annex 1 of Recommendation ITU-R SNG.722.

3.6 Additional support communication/transmission facilities

To facilitate the effective operations of the DSNG terminal, support communication facilities may be required. These facilities may include point-to-point microwave, telephone communication systems, wireless microphones and mobile satellite terminals for voice and data.

For radio-related services, temporary authorization may be needed to use frequencies at the desired location. This authorization needs to be obtained in a timely fashion, and to the extent possible, in advance of actual equipment deployment. Also, it is necessary to have information with respect to the technical acceptability of particular equipment which might be used.

In addition, it may be necessary to have fixed and/or mobile telephony access. These are critical to the proper functioning of the DSNG. The DSNG operator will require cost-effective (including a clear definition of tariffs and services) and reliable access to such telephone access, and will need to have knowledge of the actual circuit availability involved.

3.7 Radiation hazards

It is essential to protect the public and personnel from hazardous radiation. Many administrations have established standards for safe exposure to radio (non-ionizing) radiation which are a function of frequency, power level and duration of exposure.

DSNG operators should comply with permitted radiation standards (health and safety) established by the host country. Where the host has not established its own standards, the World Health Organization (WHO) standards should be used (WHO develops health criteria in conjunction with the International Non-Ionizing Radiation Committee of the International Radiation Protection Association).

Operators must carefully consider the siting and configuration of specific installations, and the access of both occupational personnel and the general public, when applying applicable maximum exposure criteria.

A danger area around the DSNG terminals shall be identified, checked and clearly marked.

3.8 Importation and customs

The DSNG operator should have a sufficient understanding of the importation and customs system of the host country. This is particularly important when there is frequent news gathering and where facilities in that country cannot be used.

4 Contact point for information, guidance and approval

Each administration or relevant organization should, if possible, establish a designated point of contact (DPC) for DSNG, which should be available for 24 h per day, seven days per week.

This contact point should be available for assistance to facilitate temporary authorization of DSNG earth stations owned by foreign operators through intermediating exchange of information necessary for authorization procedures and frequency coordination, and providing guidance for the administrative procedures of the host country.

It is considered necessary to exchange the information shown in Table 1.

TABLE 1

Information to be given to the administration	Information to be received from the administration
1. Service characteristics (e.g. TV standard, number and type of audio channels)	1. Enquiry reference
2. Time and duration of service	2. Ordering entity
3. Uplink and downlink location	3. Other authorizing sections to be routed to
4. Intended space segment	4. Custom contact points
5. DSNG earth terminal characteristics (e.g. existing applications, identification code, frequency band, maximum e.i.r.p., antenna transmit pattern, modulation methods)	5. Tariff information
6. Additional support transmission facilities (e.g. microwave, number of telephone support circuits)	6. Safety standards