RECOMMENDATION ITU-R SNG.770-1*

Uniform operational procedures for satellite news gathering (SNG)

(1992-1994)

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 would be 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 are 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,

recommends

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

2 that to facilitate the temporary authorization of SNG 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 SNG communications facilities, etc.);

---

* Radiocommunication Study Groups 4 and 9 made editorial amendments to this Recommendation in 2001 in accordance with Resolution ITU-R 44 (RA-2000).

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 (examples are found in Annex 2);

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

5 that host countries are encouraged to develop SNG 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 SNG earth stations;

7 that SNG 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 SNG 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 SNG

1 Operating characteristics

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

1.1 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 coordination (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, 1 h).

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. SNG sound may also be operated in the mobile-satellite service.

1.2 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.

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.

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 SNG operations, the particular established satellite configurations in the orbital arc appropriate for the required circuit need to be taken into account.

Details of current satellites are available from the Radiocommunication Bureau.

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.

2.1.2 Frequency bands appropriate for SNG

All frequency bands allocated to uplinks for the FSS may be used by SNG systems. However, since an SNG terminal requires a small antenna to provide high portability, the operating frequency band is extremely important. Presently, the 14 GHz band is the most used. 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 SNG 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.

For normal operation, it is desirable to take account of satellite G/T values of 0 dB(K^{-1}). To be as flexible as possible, the SNG 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 SNG applications.

As it is not always possible to change satellite gain settings for short-term use, SNG 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 SNG 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 Future design possibilities

Steerable antenna

Advantages of steerable satellite beams have been demonstrated by INTELSAT. This allows a narrow beam antenna to be directed to the SNG 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 SNG 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, however, two-way communication channels can sometimes be affected.

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

3 Uniform operating procedures required for temporary authorization for SNG

3.1 Introduction

SNG differs from most other forms of satellite transmissions in a number of ways. For example, the requirement for SNG 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 SNG 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 an SNG operation takes place has a dual effect on its operational effectiveness. In order to carry out its intended function, the SNG 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 SNG capability.

Given that SNG 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 SNG technology requires uniform agreement on standard technical approaches (see Recommendation ITU-R SNG.722) and recognized operating procedures. The frequency and number of programme sound channels as well as the number of auxiliary, data and coordination simplex and duplex 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 SNG terminal with the space segment. To meet this requirement, administrations are required to consider procedures to permit the SNG terminal to be brought into service as quickly as possible. Administrations are urged to investigate the possibility that an SNG 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 SNG 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,

– transmit off beam spectral density for the worst 4 kHz,

– 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 SNG 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 an SNG terminal in this respect, the responsible body may require the same information detailed in § 3.2, plus details of the geographical location of the SNG terminal and the anticipated transmission times.

The SNG operator requires timely radio regulatory authorization by the host administration for operation of the SNG terminal. Coordination between the proposed SNG terminal and existing terrestrial radio services is a necessary prerequisite to manage radio interference and allow authorization of the SNG terminal. Frequency coordination for SNG terminals is more difficult in the 6 GHz band, since this band is 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 the 14 GHz band is not shared with the fixed service using radio-relay systems and this makes SNG coordination much easier. In some countries, however, the 14 GHz band is used for fixed and other terrestrial purposes and coordination is, therefore, necessary. The frequency band 29.5-30.0 GHz is allocated worldwide to the FSS (Earth-to-space) on a primary basis; this band is 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). With future improvements in technology, this band may become suitable for SNG applications. Where coordination is required between the SNG station and the terrestrial links of the host country, it may be difficult because of the temporary nature of SNG.

3.4 Space segment booking

The SNG 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 SNG 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 SNG terminal, support communication facilities may be required. These facilities may include point-to-point microwave, telephone communication systems, two-way simplex/duplex radio, 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 the required number of telephone circuits. These are critical to the proper functioning of the SNG. The SNG operator will require cost-effective (including a clear definition of tariffs and services) and reliable access to such telephone lines, 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.

SNG 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 SNG terminals shall be identified, checked and clearly marked.

3.8 Importation and customs

The SNG 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 SNG, 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 SNG 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.

Examples of implementation of designated points of contact are shown in Annex 2.

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. SNG 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

ANNEX 2

Examples of implementation of a designated point of contact (DPC)

1 Sweden

1.1 Regulatory authority

The Swedish Government has delegated the radio-frequency regulatory authority to the National Post & Telecom Agency.

A licence is required to hold and to operate earth stations intended for transmission, according to the Radio Communications Act. Applications for a licence shall be submitted to the National Post & Telecom Agency.

A licence will relate to a specific type of use and can be subject to conditions.

The Agency can provide further information concerning the Act and other provisions on technical requirements.

A fee will be charged for a licence, covering the cost of handling the application and other costs of the activity pursued by the Agency.

Any transmission of radio signals must comply with the provisions of the ITU Radio Regulations (RR).

The RR contain procedures concerning frequency coordination, which in certain cases are valid also for receive-only earth stations. Such coordination is aimed at avoiding harmful interference, although complete absence of such interference cannot be guaranteed. If the customer desires this type of coordination, he would submit relevant information about his plans to the National Post & Telecom Agency, Sweden.

The earth station must also meet the specifications established by the relevant international satellite organization providing the space segment. According to relevant international agreements Telia AB, as the Swedish regulatory body to the international satellite organizations, is responsible for the compliance of the earth station with these specifications. Furthermore, Telia AB is required to ensure the proper operation of an earth station on Swedish territory *vis-à-vis* INTELSAT, INMARSAT and EUTELSAT.

Consequently, in the case of temporary transmissions from a customer-owned earth station Telia AB will nominate a person, who will have the formal operational responsibility for the transmissions *vis-à-vis* these three organizations mentioned above.

The customer shall, at least, give the following information to the National Post & Telecom Agency, Sweden and if applicable to Telia AB, when applying for the use of a transmitting earth station on a temporary basis:

– intended service,

– time and duration of the service,

– intended space segment,

– earth station identification (e.g. satellite operator approval of the earth station),

– transmission parameters.

1.2 Lease of space segment

Point of contact/postal address:	Telia International AB Network Development Box 4646, S-116 91 STOCKHOLM Sweden
Tel:	+46 8 743 75 00
Tlx:	17060 (STI S)
Fax:	+46 8 743 77 12 +46 8 743 77 13
Working hours:	Monday to Friday: 0800-1500 h GMT

1.3 Regulatory matters

Point of contact/postal address:	National Post & Telecom Agency Box 5398, S-102 49 STOCKHOLM, Sweden
Tel:	+46 8 678 55 00
Fax:	+46 8 678 55 05
Working hours:	Monday to Friday: 0800-1500 h GMT
Language spoken:	English

2 United States of America

2.1 United States method for establishing SNG authorization

The United States approach to managing a single designated point of contact is based on the distribution of responsibilities for authorizing and utilizing radio frequencies in the United States of America. While the authorization for use of the frequencies required by an SNG operation resides with the Federal Communications Commission (FCC), the Communications Act of l962 has also established that the Communications Satellite Corporation (COMSAT) has responsibilities for management of and access to the Intelsat Space Segment, and that the FCC has authorized certain separate satellite systems to also provide space segment. In addition, several operators of earth stations which provide an international service may also be able to facilitate SNG services.

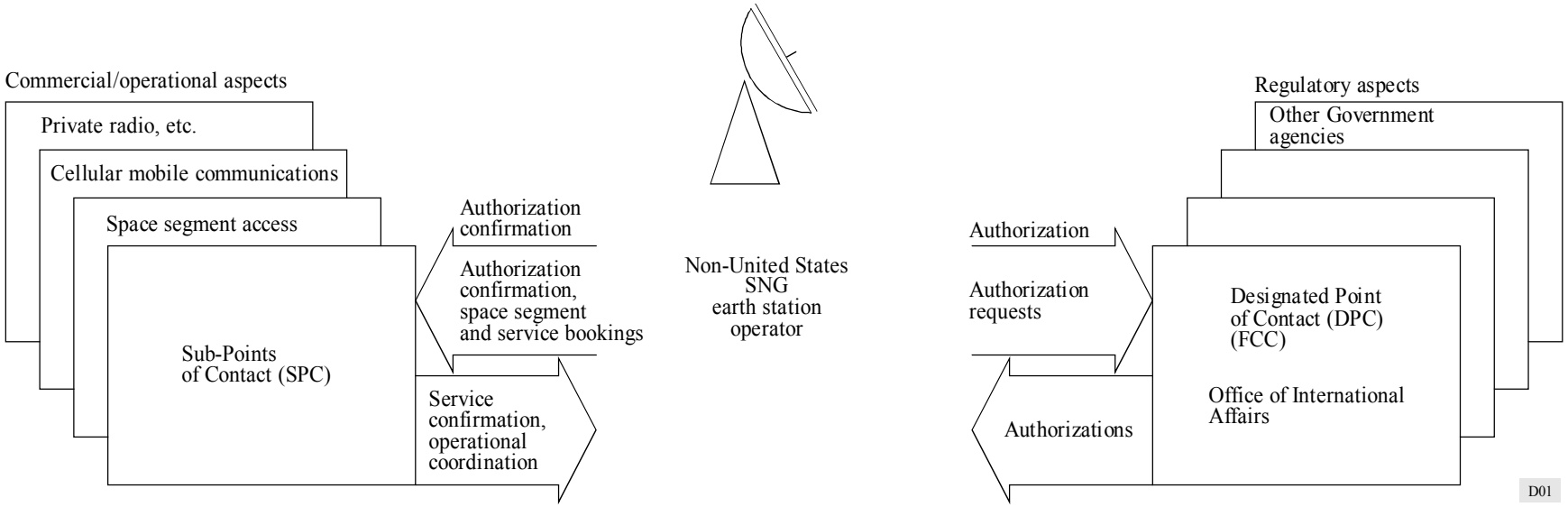
The United States Federal Communications Commission, in accordance with the Communications Act of 1934 (as amended) is responsible for the authorization of the use of all radio frequencies in the United States of America which are transmitted on frequencies not owned and/or operated by United States Government Departments and Agencies. The latter are authorized by the National Telecommunications and Information Administration (NTIA). The United States Department of State, through its Bureau of Coordination of International Communications Policy provides an interface with other administrations.

Figure 1 is an example of the organizational structure that would be involved in the United States DPC process. Arrangements for additional DPC roles (see § 4 of Annex 1) could be depicted to show the interface to other entities in a similar manner. Temporary authorization to transmit from within the territory of the United States of America on frequencies used by commercial organizations is granted by the Federal Communications Commission. However, those entities which provide such transmission services are generally in the commercial private sector.

Therefore, because temporary transmit authorizations are involved, the DPC must reside within the responsible governmental organization for granting such authorizations to non-United States operators. The DPC will grant such authorization to the non-United States entity applying in a form which will be standardized for recognition by commercial United States service providers.

FIGURE 1

Methodology for establishing non-United States SNG operations in the United States of America



2.2 The designated point of contact (DPC)

In the United States of America, the DPC is the Office of the Assistant Bureau Chief (International), Common Carrier Bureau in the FCC. The FCC is in the unique position to provide the necessary information to a non-United States organization for an SNG operation. However, as Fig. l implies, there are other entities which will play a role. The DPC is in position to identify these sub-points of contact (SPC) which include:

– United States International Space Segment – COMSAT, PanamSat, Orion, etc.,

– United States Domestic Space Segment,

– cellular mobile communications,

– private radio organizations (ancillary communications links, e.g. microwave feeder, hand-held radio devices, etc.),

– site selection.

A list will be maintained by the DPC regarding persons to contact along with appropriate telephone numbers. In addition, the DPC in consultation with the various SPCs involved will have available information necessary for granting temporary authorization and expediting importation of the earth station. The responsibility for organizing and processing this information will reside in the office of the DPC.