

## Space Services Department

# REGULATORY REQUIREMENTS AND PROCEDURES FOR SATELLITE NETWORKS OR SYSTEMS THAT ARE NOT SUBJECT TO THE COORDINATION PROCEDURE UNDER SECTION II OF ARTICLE 9

## 1 Introduction

This document describes the regulatory requirements and procedures for satellite networks or systems that are not subject to the coordination procedure under Section II of Article 9. These procedures generally apply to space stations using a non-geostationary-satellite orbit (NGSO), depending on the frequency bands and services as defined in Article 5.

Some services commonly used in NGSO satellite networks not subject to coordination are Earth exploration-satellite service, meteorological satellite service, space research service, space operation service, etc.

The following chart summarizes the regulatory procedure for these networks.



In addition to NGSO satellite networks using frequency bands not subject to coordination, the above procedure is also applicable for the inter-satellite links of a geostationary space station communicating with an NGSO space station which is not subject to coordination. This is the only case where a geostationary satellite network is not subject to coordination.

## 2 Determination of the applicability of coordination procedures

The formal coordination procedures are spelt out under Section II of Article 9. To determine whether a frequency band/service used by an NGSO satellite network is subject to these procedures, one should check the Radio Regulations, in particular Article 5 of the Radio Regulations.

The requirement for coordination stems from a footnote in Article 5.

One example is No. 5.364: *“The use of the band 1 610-1 626.5 MHz by the mobile-satellite service (Earth-to-space) and by the radiodetermination-satellite service (Earth-to-space) is subject to coordination under No. 9.11A.”*

Another example is No. 5.286: *“The band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space research service (Earth-to-space), subject to agreement obtained under No. 9.21.”*

It should be noted that coordination under No. 9.11A is required not only for the service specified in the footnote, it is also required for other services having allocations with equal rights (see Rules of Procedure related to No. 9.11A). As a quick reference, Table 9.11A-1 of the Rules of Procedure provides a list of all frequency bands/direction and services that are subject to No. 9.11A.

Only those frequency bands where there are no specific requirement for the services to be coordinated under Section II of Article 9 are subject to the procedures described in this paper.

Small satellites, including nanosatellites and picosatellites, are frequently designed to use frequency bands that are not subject to coordination.

## 3 Advance Publication Information

For such systems not subject to coordination, the provisions of Article 9, Sub-Section IA (Advance publication of information on satellite networks or satellite systems that are not subject to coordination procedure under Section II) are applicable, and the submission of the advance publication information (API) to the Bureau is a mandatory procedure spelt out in No. 9.1.

Information to be provided for the API is specified in Appendix 4 of the Radio Regulations, and has to be submitted in an electronic format to the Bureau (see Resolution 55 (Rev.WRC-15)). To assist Administrations in capturing the required information for an API and validate the completeness of the data, the Bureau has made available the two following software tools: SpaceCap and SpaveVal (see section 9 of this document).

The Administration should remember to run SpaceVal on the electronic notice file to ensure that all mandatory information specified in Appendix 4 have been captured. If there are fatal errors, they should be corrected prior to submission to the Bureau. If fatal errors identified by SpaceVal could not be corrected, the Administration may request for assistance from the Bureau in the cover letter accompanying the submission, and the Bureau will provide assistance to address the errors.

It should be ensured that all required antenna radiation patterns are provided (both for the space station beams and the associated earth stations), by either of the following methods:

- specifying a pattern id from the Antenna Pattern Library at URL  
<https://www.itu.int/en/ITU-R/software/Pages/ant-pattern.aspx>; or

- providing a table showing antenna gain for all off-axis angles between 0° and 180°; or
- in terms of a set of equations for all off-axis angles between 0° and 180°; or
- diagrams showing the measured radiation pattern (note that they should clearly show the antenna gain for all off-axis angles between 0° and 180°).

In all cases, the maximum gain captured in the electronic notice should be consistent with what is provided in the antenna radiation pattern.

In accordance with the Rules of Procedure on receivability, the final electronic notice file (in mdb file), together with any additional attachments, shall be submitted through the Bureau's new online submission system "e-submission of satellite network filings" (<https://www.itu.int/itu-r/go/space-submission>) (see BR circular letter CR/434 dated 1 August 2018 for more details).

Notices submitted using "e-Submission of satellite network filings" for space services do not require any separate confirmation by telefax or mail. However, it is a good idea to attach a cover letter for the submission together with the upload of the electronic filing, so as to highlight some pertinent points concerning the filing, e.g. the information concerning the operating agency, the address where the invoice should be issued to.

The API that has been successfully submitted to the Bureau will be published in "as-received" on the ITU website.

The following are some additional points concerning the checks concerning the receivability of the notice:

- Frequency bands/services included in the API should be not subject to coordination, otherwise the Bureau will inform the administration to submit them separately as a request for coordination.
- If a notice does not contain all of the mandatory information as defined in Appendix 4 of the Radio Regulations, further processing of the notice will remain in abeyance and a date of receipt will not be established until the missing information is received.
- If all mandatory data have been submitted and further clarification is required concerning the correctness of the mandatory data, the Bureau shall request the notifying administration to provide the required clarification within 30 days.
- If the information is received within this 30-day period, the original date of receipt is retained, otherwise, a new date of receipt will be established when the information is received.

When the Bureau has determined that the information is complete and correct, it will publish the corresponding API/A special section in a BR IFIC.

#### **4 Commenting Procedures**

Although these satellite networks are not subject to coordination procedure under Section II of Article 9, there is still a commenting procedure and resolutions of difficulties specified under No. 9.3.

After the publication of the API/A special section, any administration who believes that interference which may be unacceptable may be caused to its existing or planned satellite networks or systems, may submit a comment to the notifying Administration, with a copy to the Bureau, within 4 months from the date of publication of the special section. The copy of comments to the Bureau shall be captured using SpaceCom software. The Bureau consolidates the comments received at the end of

the 4-month period, and publishes the list of administrations which have sent comments in an API/B special section of a BR IFIC.

## 5 Cooperation and Resolutions of Difficulties

The procedure for cooperation and resolution of difficulties is spelt out in Nos. **9.3** and **9.4**, as follows:

- Both administrations shall endeavor to cooperate in joint efforts to resolve any difficulties and shall exchange any additional relevant information that may be available.
- Either party can request the assistance of the Radiocommunication Bureau.
- In case of difficulties, the administration responsible for the planned satellite network shall explore all possible means to resolve the difficulties without considering the possibility of adjustment to satellite networks of other administrations.
- If no such means can be found, it may request the other administrations to explore all possible means to meet its requirements.
- The administrations concerned shall make every possible effort to resolve the difficulties by means of mutually acceptable adjustments to their satellite networks.

It should be noted that, although No. **9.4** states that reports on the progress made in resolving any difficulties should be submitted to the Bureau, since the Bureau does not require this information in the examination of the notification for recording, it is not necessary to provide this information except if the notifying administration wishes to keep the Bureau informed about the progress of its project.

For satellite networks operating in the amateur-satellite service, the operator or notifying administration should contact the International Amateur Radio Union for assistance in the frequency coordination process (<http://www.iau.org/satellite.html> and <http://www.amsat.org.uk/iaru/>).

Finally, the attention of administrations is brought to the BR [Circular Letter CR/420](#) concerning the application of No. **9.3** in the bands 2 025-2 110 MHz (Earth-to-space) and 2 200-2 290 MHz (space-to-Earth).

## 6 Modifications

Any amendments to the information published in an API/A special section should be sent to the Bureau as soon as they become available. In particular, amendments to the following information for NGSO filing will require a new API:

- Additional frequency band;
- Modification of the direction of transmission;
- Modification of reference body.

If, in the notification submission, there are other changes in the characteristics as compared to the information published in API/A, other administrations can submit comments following the publication of the Part I-S (No. **11.28.1**).

It is a good practice to submit a modification to the API including any change in characteristics like orbital characteristics, service areas, addition of associated earth stations, etc. because this will allow other administrations and operators to submit comments before the modifications are notified for recording in the Master Register.

## 7 Notification for recording in the Master Register

The benefit of having a frequency assignment to a satellite network notified and recorded in the Master Register is that it has the right to international recognition. For such an assignment, this right means that other administrations shall take it into account when making their own assignments, in order to avoid harmful interference (see No. **8.3**).

The frequency assignments that should be notified include those of transmitting and receiving earth and space stations that are:

- *Capable of causing harmful interference; or*
- *Used for international radiocommunication; or*
- *Seeking to obtain international recognition; or*
- *Non-conforming assignment seeking to be recorded for information purposes only.....*
- *Etc.*

(See Nos. **11.2** to **11.11**)

On the other hand, frequency assignments to earth stations in the amateur-satellite service are **not** required to be notified for recording in the Master Register.

Information required for the submission of a notification for recording is spelt out in Appendix 4 of the Radio Regulations. The capture, validation and submission procedure described for the API in section 3 of this document also applies to the notification submission.

In particular, for notification submission, the earliest date that it can be considered receivable is 6 months after the date of publication of the corresponding API/A special section. If it is received by the Bureau earlier, it will be given an official date of receipt that is equal to this earliest date. Due to the need to open to comments and to go through the process of cooperation and resolution of difficulties described in sections 4 and 5 of this document, administrations are advised not to submit notification for recording before this earliest date.

Information received for a notification submission will first be published in a Part I-S of a BR IFIC, as an acknowledgement for the receipt of the complete information. The notification will then be examined in details and a finding will be established, which will be published in a Part II-S if the finding is favourable, and in a Part III-S if the finding is unfavourable. Since these networks are not subject to coordination, the examination of these networks will be conducted only with respect to its conformity with the Table of Frequency Allocations and other provisions listed in the Rules of Procedure related to No. **11.31**. There will be no examination against coordination requirements (No. **11.32**) or probability of harmful interference (No. **11.32A**).

It should be noted that if the frequency assignments are published with unfavourable findings, any subsequent request to change the notified characteristics towards attaining a favourable finding will be considered as a modification to the notification, treated with a new date of receipt, and a new cost recovery invoice will be issued.

More details concerning the overall notification procedure and bringing into use of frequency assignments are provided in separate documents.

## 8 Operation under No. 4.4 (non-conformity with the Table of Frequency Allocations)

In accordance with the Rules of Procedure related to No. **4.4**, Administrations, prior to bringing into use any frequency assignment to a transmitting station operating under No. **4.4**, shall determine:

- a) that the intended use of the frequency assignment to the station under No. **4.4** will not cause harmful interference into the stations of other administrations operating in conformity with the Radio Regulations;
- b) what measures it would need to take in order to comply with the requirement to immediately eliminate harmful interference pursuant to No. **8.5**.

When notifying the use of frequency assignments to be operated under No. **4.4**, the notifying Administration *shall provide a confirmation* that it has determined that these frequency assignments meet the conditions referred to above in item a) and that it has identified measures to avoid harmful interference and to immediately eliminate such in case of a complaint.

## 9 Software

The latest version of BR software for capture, validation of space notices and submission of comments are available on the BR IFIC DVD as well as from the ITU website (<http://www.itu.int/ITU-R/go/space-software/en>). It should be noted that Administrator privilege is required to install these software.

## 10 Cost recovery fees

Satellite network filings concerning advance publication and notification for recording of frequency assignments in the Master International Frequency Register are subject to cost-recovery charges, as defined in [Council Decision 482 \(C2018\)](#). For satellite networks not subject to coordination, the fees are as follows: a flat fee of 570 CHF for each API and a flat fee of 7 030 CHF for each notification.

Filings in the amateur-satellite service are exempt from cost recovery fee.

Member states can benefit from one free filing per year, based on the year of receipt of the filing.

## 11 Useful References

The Bureau provides a webpage on small satellites which is updated regularly at the following URL: <https://www.itu.int/en/ITU-R/space/Pages/supportsmallsat.aspx>

In addition, the following are some useful handbooks and ITU-R reports:

Title	URL
Handbook for amateur and amateur-satellite services	<a href="https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-52-2014&amp;media=electronic">https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-52-2014&amp;media=electronic</a>
Handbook for earth exploration satellite service	<a href="https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-56-2011&amp;media=electronic">https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-56-2011&amp;media=electronic</a>
Handbook for meteorological-satellite service	<a href="https://www.itu.int/en/publications/ITU-R/Pages/publications.aspx?lang=en&amp;media=electronic&amp;parent=R-HDB-45-2017">https://www.itu.int/en/publications/ITU-R/Pages/publications.aspx?lang=en&amp;media=electronic&amp;parent=R-HDB-45-2017</a>

Handbook for space research service	<a href="https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-43-2013&amp;media=electronic">https://www.itu.int/en/publications/ITU-R/pages/publications.aspx?parent=R-HDB-43-2013&amp;media=electronic</a>
ITU-R Report ITU-R SA.2312 - Characteristics, definitions and spectrum requirements of nanosatellites and picosatellites, as well as systems composed of such satellites	<a href="https://www.itu.int/pub/R-REP-SA.2312">https://www.itu.int/pub/R-REP-SA.2312</a>
ITU-R Report ITU-R SA.2348 - Current practice and procedures for notifying space networks currently applicable to nanosatellites and picosatellites	<a href="https://www.itu.int/pub/R-REP-SA.2348">https://www.itu.int/pub/R-REP-SA.2348</a>

---