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Regulatory procedures for satellite networks not subject to coordination

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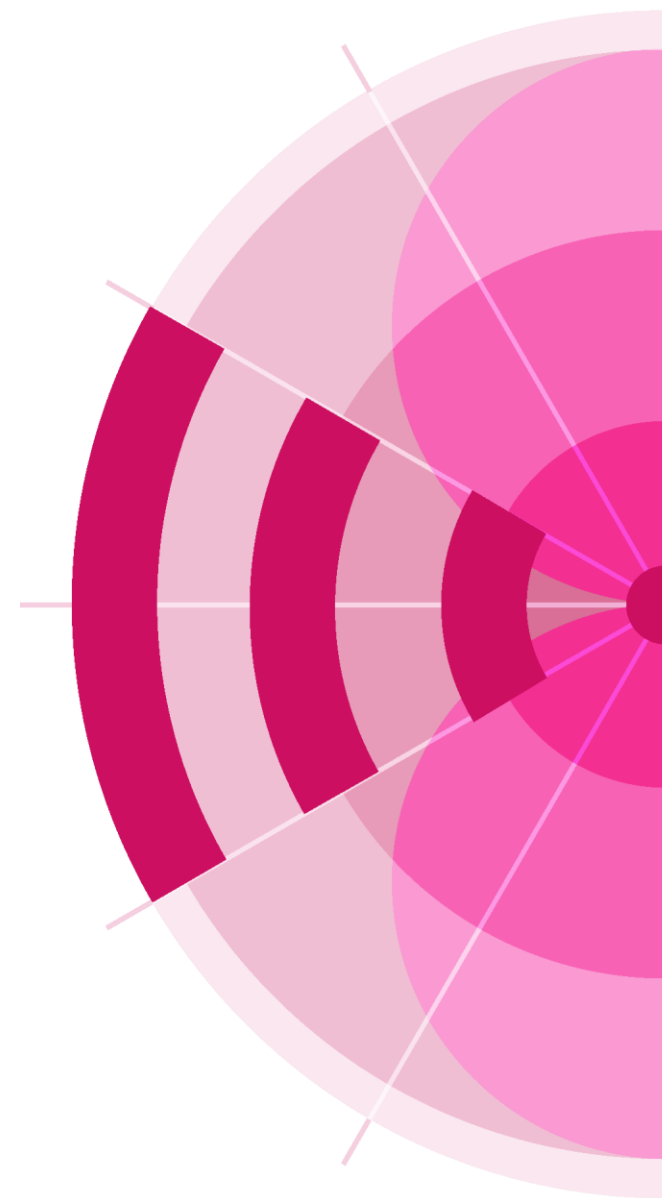


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Background regulations

Radio Regulations

- **Intergovernmental Treaty** governing the use of spectrum/orbit resources by administrations
- Define the **rights** and **obligations** of Member States in respect of the use of these resources
- **Recording of a frequency assignment in the Master Register (MIFR)** provides **international recognition and protection**
- **Updated every 4 years by a WRC**
 - The most recent was held in Sharm El Sheikh in 2019

Some relevant Articles

- Article **1** Definitions
- Article **5** Table of Frequency Allocations
- Article **9** and **11** Procedures for the advance publication (API), coordination (CR/C) and notification
- Article **21/22** Power limits
- Article **25** Amateur and Amateur-satellite service
- Article **29A** Radio services related to Earth observation
- Appendix **1** Classification of emissions
- Appendix **4** Data required for satellite filings



- **Free download**
- <http://www.itu.int/pub/R-REG-RR/>

Background regulations

- Frequency Allocations

- Frequency block allocations in Article 5 along with regulatory/technical conditions in footnotes

- Right to international recognition

- Any frequency assignment recorded in the Master Register with a favourable finding under No. 11.31 shall have 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. (No. 8.3)

- Assigning Frequencies

- Member States undertake that in assigning frequencies to stations which are capable of causing harmful interference to the services rendered by the stations of another country, such assignments are to be made in accordance with the Table of Frequency Allocations and other provisions of these Regulations. (No. 4.2)

Non-conforming Assignments

- Non-conforming assignment (No.8.4)– a frequency assignment that is not in accordance with the Table of Frequency Allocations or the other provisions of the Radio Regulations, and is recorded for information purposes only when the notifying administration states that it will be operated in accordance with No. 4.4

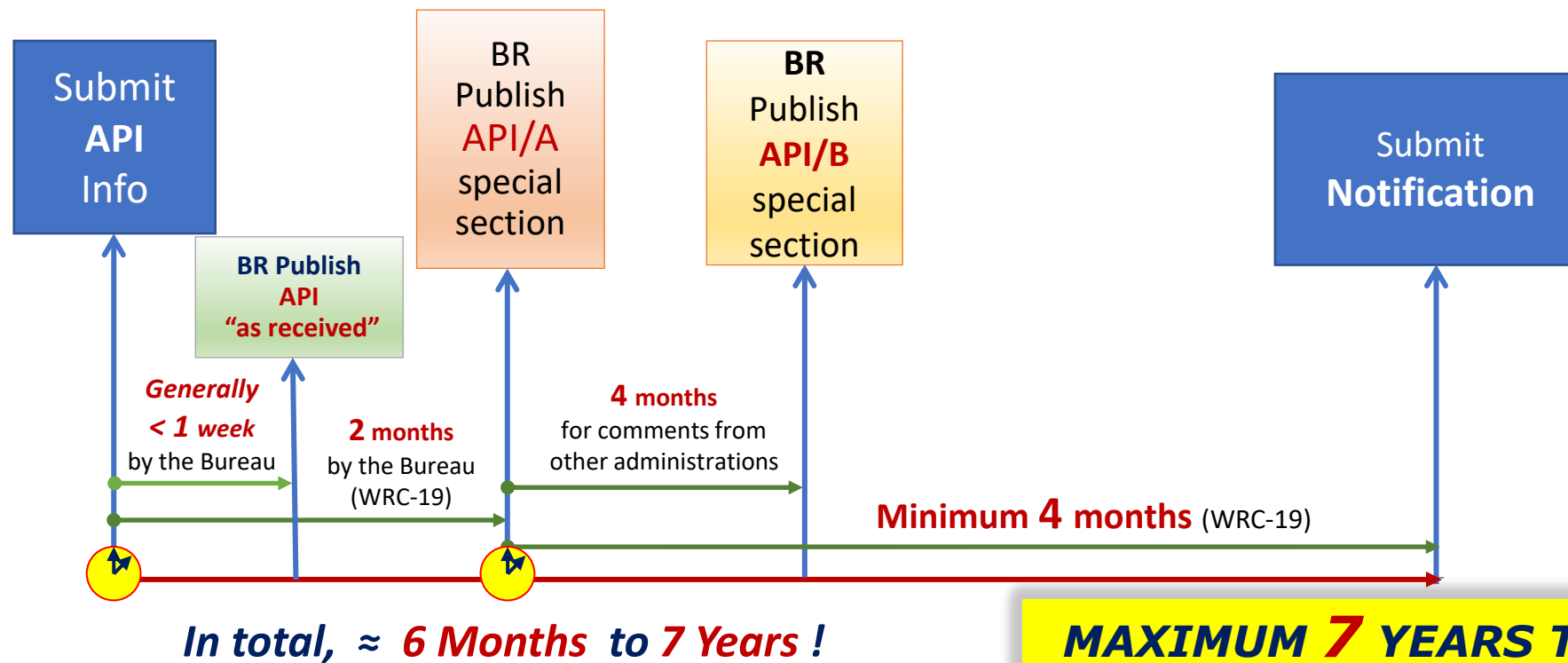
4.4 Administrations of the Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations in this Chapter or the other provisions of these Regulations, except on the express condition that such a station, when using such a frequency assignment, **shall not cause harmful interference to, and shall not claim protection from** harmful interference caused by, a station operating in accordance with the provisions of the Constitution, the Convention and these Regulations.

- On advice that it is causing harmful interference, the station using the non-conforming assignment must immediately eliminate this harmful interference. (No.8.5)
- Rules of Procedure relating to No.4.4
 - Frequency assignments under No. 4.4 are still obligated to be notified to the Bureau (para 1.3)
 - In the notification, the Administration shall provide a **confirmation** that it has determined that these frequency assignments under No.4.4 will not cause harmful interference into the stations of other administrations operating in conformity with the Radio Regulations and that it has identified measures to avoid harmful interference and to immediately eliminate such in case of a complaint.

Subject to coordination?

- To know whether a frequency band is subject to coordination, check the footnotes in **the Table of Frequency Allocations in Article 5**
 - For NGSO satellite networks, pay particular attention to No.9.21, No.9.11A and the sub provisions Nos.9.12 and 9.12A
 - For coordination under No.9.11A (and Nos.9.12 and 9.12A) please note §2.3 of Rules of Procedure related to No.9.11A: the procedure is applicable to all other space and terrestrial services with respect to those satellite services having allocations with equal rights and mentioned in the specific footnotes to which this provision applies (check TABLE 9.11A-1).

Regulatory process for satellite networks not subject to coordination



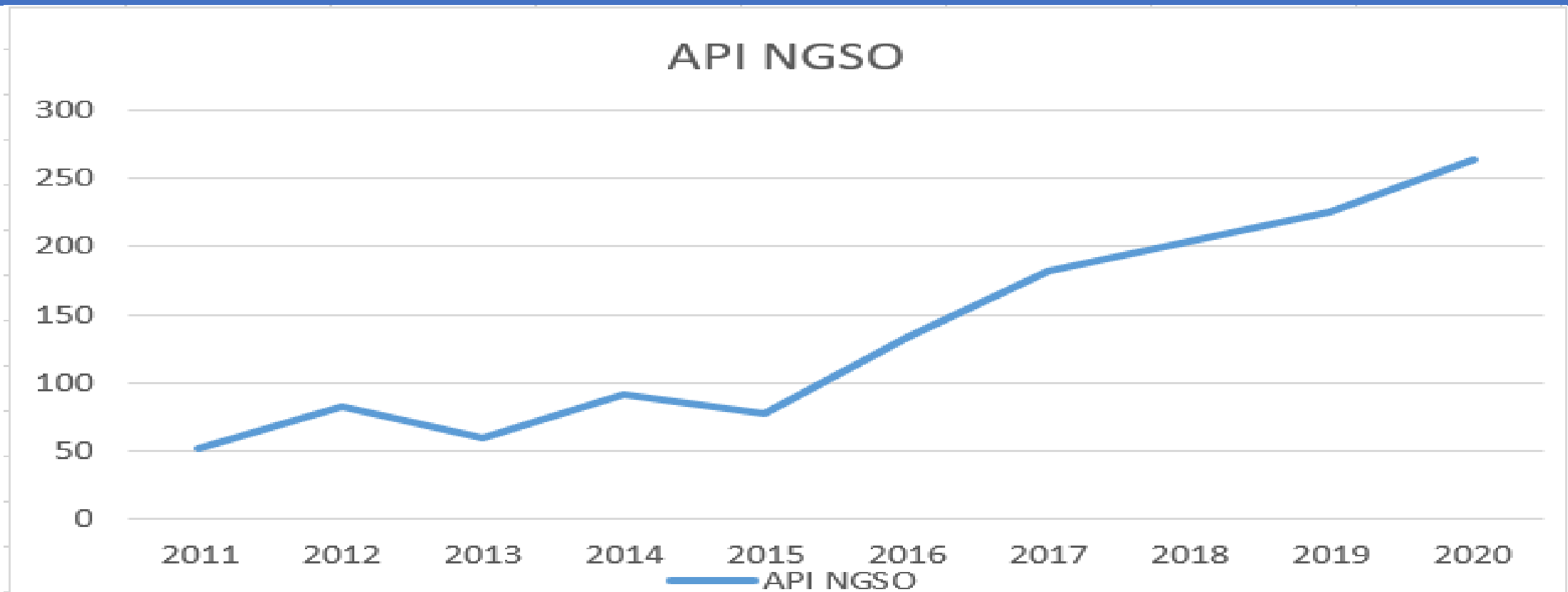
**MAXIMUM 7 YEARS TO
SUBMIT NOTIFICATION
AND BRING INTO USE!**

Advance Publication Information (API)

Advance Publication Information (**API**)

- The submission of advance publication information under No. **9.1** is a mandatory procedure for all satellite network not subject to coordination
 - For non-geostationary satellite networks where the frequency bands are not subject to coordination
 - the use of inter-satellite links of a geostationary space station communicating with a non-geostationary space station which are not subject to coordination
- Procedure for commenting and resolutions of difficulties specified in subsection IA of Article 9
- Cost recovery fee: 570 CHF (not applicable for filings in the amateur-satellite service)
 - Note that if payment is not received by the payment due date, the filing will be cancelled, but the invoice continues to be payable!

API for NGSO satellite networks not subject to coordination received in the last 10 year



Information required

Information required

- Specified in Annex 2 to Appendix 4 of the Radio Regulations, including:
 - Satellite name, responsible administration and op_agcy
 - Orbital characteristics
 - Antenna beam characteristics
 - Frequency band
 - Service Areas
 - Power levels/designation of emissions etc.
 - Associated earth or space stations
 -

Information required – orbital characteristics

- Revised Appendix 4 enter into force 23.11.2019
- Orbital parameters for non-geostationary satellite networks:
 - Number of orbital planes
 - Constellation
 - Single or multiple configurations, details of the configuration if multiple
 - Reference body
- If reference body is Earth
 - Angle of inclination
 - Number of satellites in the orbital plane
 - Orbital period
 - Altitude of apogee and perigee
 - Min altitude
 - Initial phase angle
 - Argument of perigee
 - Longitude of ascending node
 - Date/time at which satellite is at the location defined by the longitude of the ascending node
 - Sun-synchronous orbit? If yes, local time of ascending/descending node
 - Additional requirements for those subject to 22.5C, 22.5D, 22.5F, 22.5L

Information required - sensors

- Sensors specific information
 - **Active Sensors**
 - Transmit beam
 - Mean peak power and mean power density
 - Pulse length and pulse repetition frequency
 - Receive beam
 - Receiver noise bandwidth
 - Noise temperature at output of signal processor
 - If an active sensor is submitted that do not have both transmit and receive beams in the same notice, it is considered as incomplete
 - **Passive sensors**
 - Observed bandwidth
 - Sensitivity
- To capture sensor information in SpaceCap, go to [Beam tab](#), check the box “**Beam has Sensors**”
- Class of stations – **E1, E2, E3, E4**

Symbol	Space Station Class of Station
E1	Space research (active sensor) space station
E2	Space research (passive sensor) space station
E3	Space station in the Earth exploration-satellite service (active sensor)
E4	Space station in the Earth exploration-satellite (passive sensor)

Commenting and resolution of difficulties

Procedure for commenting and resolution of difficulties

- No. 9.3 Commenting procedures
 - Comments to an API/A should be submitted to the notifying Administration and the SpaceCom comment file submitted to the Bureau within **4 months** from the date of publication of the API/A special section
 - BR now makes the comments available “as received” on the web
 - The Bureau publishes the list of administrations which have sent comments within the 4 month period in an **API/B** special section in a BR IFIC
- No. 9.4 Cooperation and Resolution of Difficulties
 - 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 for the **assistance** of the Radiocommunication Bureau (**No.9.3**)
 - **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 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 networks
- 11.28.1
 - Further commenting following the publication of the Part I-S for modifications of characteristics

Submission of Modifications

Modification of characteristics for satellite networks not subject to coordination

- According to No.9.2, amendments to the information for NGSO filing that requires a new API are:
 - Additional frequency band
 - Modification of the direction of transmission
 - Modification of reference body
- However, it is a good practice to submit a modification to the API any change in characteristics including orbital characteristics, service area (adding earth stations) etc.
- This will allow other administrations/operators the chance to submit comments before the modifications are notified for recording in the Master Register.
- If during the notification, there are changes in characteristics from the information published in API/A, other administrations can submit comments following the Part I-S (No.11.28.1).

Notification for recording in the Master Register

Notification for recording in the Master Register

- Notification for recording is mandatory for frequency assignments of satellite networks, as they are capable of causing harmful interference to a service of another administration (No.11.2)
- Even nonconforming assignments recorded under No. 8.4 (i.e. operating under No 4.4) shall also be notified
- Frequency assignments for satellite networks in the amateur-satellite service shall also be notified. However, frequency assignments to earth stations in the amateur-satellite service shall not be notified.
- If notification is submitted at the same time as the API, the notification date of receipt will be 4 months after the date of publication of the API (effective from 1.1.2021)
- All frequency assignments in the notification must be covered fully within the frequency bands published in the API

Receivability for notifications of satellite networks not subject to coordination

- Notification for recording for **Space Stations**

- Prior procedures must be completed

- For bands not subject to coordination, prior **API/A** must have been published for that band

- Checking of the date of bringing into use

- Date of receipt of the notification should **not be earlier than 3 years** before the date of bringing into use indicated in the notice (No.11.25)
 - Notified date of bringing into use shall **not be later than the 7-year regulatory limit** (No.11.44)

- Notification must be received by the Bureau by the end of the **7-year regulatory limit** (No.11.44.1)

- **Complete** AP4 information must be submitted

- Check that all new AP4 items for NGSO orbits are provided!
 - If GIMs diagrams are the same as in CR/C, just request BR to use the same diagrams
 - Any additional notes must be provided separately in the notification submission
 - If requested for operation under No.4.4, the commitment under 1.6 to ROP related to 4.4 must be provided

Cost recovery fee: 7030 CHF for a notification of a satellite network not subject to coordination

Additional data to be submitted for notifications of satellite networks not subject to coordination

- Assigned frequency, assigned bandwidth
- Date of bringing into use
- Reference to API/A special section
- Other specific data items, for example:
 - Commitment under A.24.a for those notices indicated as NGSO-SDM
 - Commitment under 1.6 to ROP related to 4.4 for those notices where there is at least one group with request for No.4.4

Notice returned to administration under No.11.36

- A notice that received unfavourable findings under No.11.31 (for example due to non-conformity with Table of frequency allocation or PFD exceedance) will be returned to the administration under No.11.36
- BR will send a communication to the administration explaining the reason for the unfavourable finding with an indication of the appropriate action
- Note that a notice returned under No.11.36 cannot be resubmitted under No.11.46 to benefit from retaining the original date of receipt
- The notice can be submitted again if the 7-year deadline is not expired, but it will be treated as a modification with a new date of receipt and new cost recovery fee, regardless of whether there are modified parameters, or with exactly the same parameters with an additional request for No.4.4

Bringing into use

Bringing into use of frequency assignments for NGSO satellite networks not subject to coordination

- Reference body: Earth
 - FSS, BSS, MSS Service
 - One satellite deployed in one notified orbital plane with capability of transmitting or receiving that frequency assignment (No.11.44C)
 - Maintained for a continuous period of operation of 90 days (11.44C)
 - Adm shall identify the orbital plane number (11.44C.4)
 - Other services
 - One satellite deployed in one notified orbital plane with capability of transmitting or receiving that frequency assignment (No.11.44D)
 - Adm shall identify the orbital plane number (11.44C.4)
- Reference body: not Earth
 - One satellite deployed with capability of transmitting or receiving that frequency assignment (No.11.44E)

Specifics for Amateur-Satellite Service

- Class of station - EA
- API must be submitted to ITU
- Notification under No.11.2 is required for the satellite network
 - Notification for Earth stations in the amateur-satellite service are not required
- Note that frequency assignments in the notification must be covered by frequency bands in API, therefore avoid submitting a very narrow frequency band at the API, in case there is a change needed during the comments/consultation process
- Additional specific requirements for Amateur-satellite service spelt out in Article 25
- Administrations authorizing space stations in the amateur-satellite service shall ensure that sufficient earth command stations are established before launch to ensure that any harmful interference caused by emissions from a station in the amateur-satellite service can be terminated immediately (see No. 25.11)
- Amateur-satellite service is exempted from cost recovery fee for both the API and the notification (please refer to DEC 482)



Non-geostationary satellite networks or systems identified as short-duration mission not subject to the application of Section II of Article 9 (NGSO-SDM)

Resolution 32 (WRC-19) Regulatory procedures for frequency assignments to non-geostationary satellite networks or systems identified as short-duration mission not subject to the application of Section II of Article 9 (NGSO-SDM)

- New procedure for satellite networks indicated as NGSO-SDM
- NGSO-SDM must meet the following criteria
 - Using bands not subject to coordination
 - total number of satellites ≤ 10
 - Period of validity ≤ 3 years, no possibility of extension, after which the recorded assignments shall be cancelled
 - Shall comply with the conditions for use of the frequency band that is allocated to the service within which they operate;
 - Those using spectrum allocated to the amateur-satellite service shall operate in accordance with the definition of the amateur-satellite service as contained in Article 25;
 - Shall have the capability to cease transmitting immediately in order to eliminate harmful interference

Regulatory procedure for NGSO-SDM – API

- Notifying administration must identify in the submission whether the non-GSO networks or systems is operating as short-duration mission (NGSO-SDM) (Appendix 4 data item A.1.g)
- Advance Publication Information
 - For API, submit the orbital characteristics (Appendix 4 data item A.4.b.4) planned at the early development stage of the satellite project
- Commenting
 - Comments to API/A will be made promptly available “as-received”, on the ITU website (No. 9.3.1)

Regulatory procedure for NGSO-SDM – Notification

- Notification information cannot be communicated to the Bureau at the same time as API, and can only be submitted after the launch of the first satellite, but not more than 2 months after date of bringing into use
- Additional commitment required for Notification (item A.24.a of Appendix 4) that, in the case that unacceptable interference caused by NGSO-SDM is not resolved, the administration shall undertake steps to eliminate the interference or reduce it to an acceptable level
- Findings and characteristics under No.11.31 to be published in the BR IFIC and on BR website within no more than 4 months from the date of receipt of complete information of the Notification
- Date of bringing into use
 - In the application of No. 11.44, the date of BIU of a NGSO-SDM shall be defined as the launch date of the first satellite
- Provisions concerning modifications to recorded assignment (Nos. 11.43A, 11.43B) and suspension of frequency assignments (11.49) cannot be applied for NGSO-SDM

NGSO-SDM – special bands for the space operation service

For the following bands used for **space operation service** which are normally subject to coordination under Section II of Article 9, they are **exempt from coordination procedures** if **submitted as NGSO-SDM under Resolution 32 (WRC-19)** and meet all additional conditions:

- 137.175-137.825 MHz (space-to-Earth)
 - exempt from No.9.21 (No.5.209A)

Note that the use of the entire band 137.025-138 MHz for space operation service (space-to-Earth) is limited to NGSO-SDM under Resolutions 32 and 660 (WRC-19)


- 148-149.9 MHz (Earth-to-space),
 - exempt from No.9.11A (No.5.219)
 - exempt from No.9.21 (No. 5.218A), must meet PFD limit to qualify for exemption

As-received

As-received – Resolution 55 (Rev. WRC-19)

All notices are published “as received”, **within 30 days of receipt and made freely available on ITU website**: <https://www.itu.int/ITU-R/space/asreceived/Publication/AsReceived>

Free access
No password required



e-Submission of Satellite Network Filings

□ Home Submissions **As-Received** Users Log Email template

Published Comments

Information "As Received"

Contains text ☐ Select administration... ▾ Advance publication info... ✕ ▾ Orbit type filter... ▾

Export

□ □ **1** **2** **3** □ □

NTC ID	Adm.	Network Org.	Station/Satellite Name	Long. Nom.	▼ BR Registry Date	Type of submission	Reg	Act. Code
120545268	TUR		GRIZU-263A		11.11.2020	Advance publication information		A
120545267	NOR		TYVAK-182A		10.11.2020	Advance publication information		M
120545266	POL		SWIATOWID 2		10.11.2020	Advance publication information		M
120545265	J		HSU-SAT1		10.11.2020	Advance		A



As-received – comments to API/A for publication in API/B

Home	Submissions	As-Received	Users	Log	Email template	Help
Published		Comments				

Information "As Received"

[Export](#)

Reference	Adm.	Network Org.	▼ BR Registry Date	Comment type	BR IFIC	IFIC Date
D2020-34610	D		12.11.2020	API/B	2933	10.11.2020
MRC2020-34583	MRC		10.11.2020	API/B	2930	29.09.2020
MRC2020-34580	MRC		10.11.2020	API/B	2929	15.09.2020
THA2020-34562	THA		07.11.2020	API/B	2927	18.08.2020
ARS2020-34532	ARS		05.11.2020	API/B	2929	15.09.2020
ARS2020-34523	ARS		05.11.2020	API/B	2931	13.10.2020
ARS2020-34522	ARS		05.11.2020	API/B	2930	29.09.2020
ARS2020-34520	ARS		05.11.2020	API/B	2928	01.09.2020

Publications

Publication: API/A special section



UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS BUREAU DES RADIOCOMMUNICATIONS		INTERNATIONAL TELECOMMUNICATION UNION RADIOCOMMUNICATION BUREAU		UNIÓN INTERNACIONAL DE TELECOMUNICACIONES OFICINA DE RADIOCOMUNICACIONES		© I.T.U.
RÉSEAU À SATELLITE SATELLITE NETWORK RED DE SATELITE		ZACUBE-2		SECTION SPÉCIALE N° SPECIAL SECTION No. SECCIÓN ESPECIAL N.º		API/A/12068
				BR IFIC / DATE BR IFIC / DATE BR IFIC / FECHA		2864 / 20.02.2018
ADM. RESPONSABLE RESPONSIBLE ADM. ADM. RESPONSABLE	AFS	LONGITUDE NOMINALE NOMINAL LONGITUDE LONGITUD NOMINAL	NGSO	NUMÉRO D'IDENTIFICATION IDENTIFICATION NUMBER NÚMERO DE IDENTIFICACIÓN		117545401
RENSEIGNEMENTS REÇUS PAR LE BUREAU LE / INFORMATION RECEIVED BY THE BUREAU ON / INFORMACIÓN RECIBIDA POR LA OFICINA EL						15.12.2017

Ces renseignements reçus par le Bureau des radiocommunications, en application du numéro 9.1/9.2 du Règlement des radiocommunications, sont publiés conformément au numéro 9.2B.

This information, received by the Radiocommunication Bureau pursuant to No.9.1/9.2 of the Radio Regulations, is published in accordance with No. 9.2B.

Esta información, recibida por la Oficina de Radiocomunicaciones con arreglo al número 9.1/9.2 del Reglamento de Radiocomunicaciones, se publica de acuerdo con lo dispuesto en el número 9.2B.

Une administration qui estime que des brouillages inacceptables risquent d'être causés à ses réseaux ou à ses systèmes à satellites existants ou en projet communique à l'administration qui a demandé la publication des renseignements ses observations, avec copie au Bureau des radiocommunications, dans le délai indiqué ci-après.

Any administration which believes that unacceptable interference may be caused to its existing or planned satellite networks or systems shall communicate its comments to the publishing administration, with a copy to the Radiocommunication Bureau, by the deadline indicated below.

Cualquier administración que estime que se podría causar interferencia perjudicial a sus redes o sistemas de satélites existentes o planificados deberá comunicar sus comentarios a la administración que publica, con copia a la Oficina de Radiocomunicaciones, en el plazo que se indica más abajo.

**DATE LIMITE POUR LA RÉCEPTION DES COMMENTAIRES
EXPIRY DATE FOR THE RECEIPT OF COMMENTS
FECHA LÍMITE PARA LA RECEPCIÓN DE LOS COMENTARIOS**

20.06.2018

Contains advance publication information on
a planned satellite network.



Publication: API/B special section



UNION INTERNATIONALE DES TÉLÉCOMMUNICATIONS
BUREAU DES RADIOCOMMUNICATIONS

INTERNATIONAL TELECOMMUNICATION UNION
RADIOCOMMUNICATION BUREAU

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RÉSEAU À SATELLITE SATELLITE NETWORK RED DE SATELITE		PRISMA-I1	SECTION SPÉCIALE N° SPECIAL SECTION No. SECCIÓN ESPECIAL N.º	API/B/827
			BR IFIC / DATE BR IFIC / DATE BR IFIC / FECHA	2864 / 20.02.2018
ADM. RESPONSABLE RESPONSABLE ADM. ADM. RESPONSABLE	I	LONGITUDE NOMINALE NOMINAL LONGITUDE LONGITUD NOMINAL	NGSO	NUMÉRO D'IDENTIFICATION IDENTIFICATION NUMBER NÚMERO DE IDENTIFICACIÓN
				117545350 / 117545350

RÉFÉRENCE DE LA SECTION SPÉCIALE (BR IFIC / DATE) SPECIAL SECTION REFERENCE (BR IFIC / DATE) REFERENCIA DE LA SECCIÓN ESPECIAL (BR IFIC / FECHA)	API/A/12034 (BR IFIC 2854 / 19.09.2017)
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<p>1. La présente Section spéciale est publiée conformément au numéro 9.5 du Règlement des radiocommunications, et concerne la demande de coordination publiée dans la section spéciale API/A indiquée ci-dessus.</p> <p>2. Les administrations qui ont soumis des observations au titre du numéro 9.3 dans le délai de quatre mois suivant la date de publication de la Section spéciale API/A précitée, sont indiquées ci-dessous et le tableau contient un résumé de ces observations.</p>	<p>1. This Special Section is published in accordance with No. 9.5 of the Radio Regulations, in respect of the request for coordination published in the API/A Special Section referenced above.</p> <p>2. Administrations that have submitted comments under No. 9.3 within four months of the date of publication of the mentioned API/A Special Section are listed below and the table contains a summary of the comments.</p>	<p>1. Esta Sección Especial se publica de conformidad con lo dispuesto en el número 9.5 del Reglamento de Radiocomunicaciones, en lo que respecta a la solicitud de coordinación publicada en la Sección Especial API/A antes citada.</p> <p>2. Las administraciones que han presentado comentario al número 9.3 dentro de un plazo de cuatro meses conforme al número 9.3 dentro de un plazo de cuatro meses a partir de la fecha de publicación de la Sección Especial API/A mencionada, se indican a continuación y en el cuadro se presenta un resumen de los comentarios.</p>
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ALG, AUS, BHR, BLR, CAN, CHN, CYP, D, E, EGY, F, HOL, J, KAZ, KOR, MLA, MRC, PAK, QAT, RUS, USA

Contains a list of administrations which have sent comments within 4 months.



Publications: Notifications

PART I-S Complete Information received by the Bureau.
Constitutes the receipt acknowledgement.
Published within 2 months from date of receipt.(Provision 11.28)

PART II-S Frequency Assignments which obtained
FAVORABLE FINDING after the examination by the Bureau.
They are recorded in the MIFR !

PART III-S Frequency Assignments which obtained
UNFAVORABLE FINDING after the examination by the Bureau.
They are returned to the Administration.



Thank you!

