

RESOLUTION 35 (REV.WRC-23)

**A milestone-based approach for the implementation of frequency assignments
to space stations in a non-geostationary-satellite system
in specific frequency bands and services**

The World Radiocommunication Conference (Dubai, 2023),

considering

- a)* that filings for frequency assignments to non-geostationary-satellite (non-GSO) systems composed of hundreds to thousands of non-GSO satellites have been received by ITU since 2011, in particular in frequency bands allocated to the fixed-satellite service (FSS) or the mobile-satellite service (MSS);
- b)* that design considerations, availability of launch vehicles to support multiple satellite launches and other factors mean that notifying administrations may require longer than the regulatory period stipulated in No. **11.44** to complete implementation of the non-GSO systems referred to in *considering a)*;
- c)* that any discrepancies between the deployed number of orbital planes/satellites per orbital plane of a non-GSO system and the Master International Frequency Register (Master Register) have, to date, not significantly impinged upon the efficient use of the orbit/spectrum resource in any frequency band used by non-GSO systems;
- d)* that the bringing into use and recording in the Master Register of frequency assignments to space stations in non-GSO systems by the end of the seven-year regulatory period referred to in No. **11.44** do not require confirmation by the notifying administration of the deployment of all the satellites associated with these frequency assignments;
- e)* that ITU Radiocommunication Sector studies on the issue have shown that the adoption of a milestone-based approach will provide a regulatory mechanism to help ensure that the Master Register reasonably reflects the actual deployment of such non-GSO systems in certain frequency bands and services, and improve the efficient use of the orbit/spectrum resource in those frequency bands and services;
- f)* that, in defining the timeline and objective criteria for the milestone-based approach, there is a need to seek a balance between the prevention of spectrum warehousing, the proper functioning of coordination mechanisms and the operational requirements related to the deployment of a non-GSO system;
- g)* that adherence to fixed milestone periods is desirable, as this creates certainty with respect to the deployment of non-GSO systems,

recognizing

- a) that the bringing into use of frequency assignments to non-GSO systems is addressed in Article 11;
- b) that any regulatory mechanism for management of frequency assignments to non-GSO systems in the Master Register should not impose an unnecessary burden;
- c) that the number of orbital planes in a non-GSO system (item A.4.b.1) and the number of satellites in each orbital plane (item A.4.b.4.b) are among the notified required characteristics as specified in Appendix 4;
- d) that No. 13.6 is applicable to non-GSO systems with frequency assignments that were confirmed to have been brought into use prior to 1 January 2021 in the frequency bands and services to which this Resolution applies;
- e) that, for frequency assignments to non-GSO systems brought into use and having reached the end of the period referred to in No. 11.44 prior to 1 January 2021 in the frequency bands and services to which this Resolution applies, affected notifying administrations should be given either the opportunity to confirm completion of the deployment of satellites in accordance with the Appendix 4 characteristics of their recorded frequency assignments or sufficient time to complete deployment in accordance with this Resolution;
- f) that No. 11.49 addresses the suspension of recorded frequency assignments to a space station of a satellite network or to space stations of a non-GSO system,

recognizing further

that this Resolution relates to those aspects of non-GSO systems to which *resolves* 1 applies with regard to the notified required characteristics as specified in Appendix 4, and the conformity of the notified required characteristics of the non-GSO systems, other than those referred to in *recognizing c)* above, is outside the scope of this Resolution,

noting

that for the purpose of this Resolution:

- the term “frequency assignments” is understood to refer to frequency assignments to a space station of a non-GSO system;
- the term “notified orbital plane” means an orbital plane of the non-GSO system, as provided to the Radiocommunication Bureau (BR) in the most recent notification information for the system’s frequency assignments, that possesses the general characteristics of items:
 - A.4.b.4.a, the inclination of the orbital plane of the space station;
 - A.4.b.4.d, the altitude of the apogee of the space station;
 - A.4.b.4.e, the altitude of the perigee of the space station; and
 - A.4.b.4.i, the argument of the perigee of the orbit of the space station (only for orbits whose altitudes of the apogee and perigee are different)

in Table A of Annex 2 to Appendix 4;

- the term “total number of satellites” is understood to mean the sum of the various values of Appendix 4 data item A.4.b.4.b associated with the notified orbital planes in the most recent notification information submitted to BR,

resolves

- 1 that this Resolution applies to frequency assignments to non-GSO systems brought into use in accordance with Nos. **11.44** and **11.44C**, in the frequency bands and for the services listed in the Table below:

TABLE
Frequency bands and services for application of the milestone-based approach

Frequency bands (GHz)	Space radiocommunication services		
	Region 1	Region 2	Region 3
10.70-11.70	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (space-to-Earth)	
11.70-12.50	FIXED-SATELLITE (space-to-Earth)		
12.50-12.70	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (space-to-Earth)	BROADCASTING-SATELLITE FIXED-SATELLITE (space-to-Earth)
12.70-12.75	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (Earth-to-space)	BROADCASTING-SATELLITE FIXED-SATELLITE (space-to-Earth)
12.75-13.25	FIXED-SATELLITE (Earth-to-space)		
13.75-14.50	FIXED-SATELLITE (Earth-to-space)		
17.30-17.70	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)	None	FIXED-SATELLITE (Earth-to-space)
17.70-17.80	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)	FIXED-SATELLITE (space-to-Earth)	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)
17.80-18.10	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)		
18.10-19.30	FIXED-SATELLITE (space-to-Earth)		
19.30-19.60	FIXED-SATELLITE (space-to-Earth) FIXED-SATELLITE (Earth-to-space)		
19.60-19.70	FIXED-SATELLITE (space-to-Earth) (Earth-to-space)		

Frequency bands (GHz)	Space radiocommunication services		
	Region 1	Region 2	Region 3
19.70-20.10	FIXED-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth)	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)	FIXED-SATELLITE (space-to-Earth) Mobile-satellite (space-to-Earth)
20.10-20.20	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)		
27.00-27.50		FIXED-SATELLITE (Earth-to-space)	
27.50-29.50	FIXED-SATELLITE (Earth-to-space)		
29.50-29.90	FIXED-SATELLITE (Earth-to-space) Mobile-satellite (Earth-to-space)	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space)	FIXED-SATELLITE (Earth-to-space) Mobile-satellite (Earth-to-space)
29.90-30.00	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space)		
37.50-38.00	FIXED-SATELLITE (space-to-Earth)		
38.00-39.50	FIXED-SATELLITE (space-to-Earth)		
39.50-40.50	FIXED-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth)		
40.50-42.50	FIXED-SATELLITE (space-to-Earth) BROADCASTING-SATELLITE		
47.20-50.20	FIXED-SATELLITE (Earth-to-space)		
50.40-51.40	FIXED-SATELLITE (Earth-to-space)		

2 that, for frequency assignments to which *resolves* 1 applies, and for which the end of the seven-year regulatory period specified in No. **11.44** is on or after 1 January 2021, the notifying administration shall communicate to BR the required deployment information in accordance with Annex 1 to this Resolution no later than 30 days after the end of the regulatory period specified in No. **11.44** or 30 days after the end of the bringing-into-use period in No. **11.44C**, whichever comes later;

3 that, for frequency assignments to which *resolves* 1 applies, and for which the end of the seven-year regulatory period specified in No. **11.44** has expired prior to 1 January 2021, the notifying administration shall communicate to BR the required deployment information in accordance with Annex 1 to this Resolution no later than 1 February 2021;

4 that, for the purposes of this Resolution, all references to 100% of the total number of satellites indicated in the latest notification information shall mean either 100% of the filed satellites (counting the number of satellites in each notified orbital plane), or 100% of the filed satellites minus one satellite;

5 that, upon receipt of the required deployment information submitted in accordance with *resolves* 2 or 3 above, BR shall:

a) promptly make this information available “as received” on the ITU website;

- b) add a remark to the Master Register entry, if available, or to the latest notification information, as appropriate, stating that the assignments are subject to the application of *resolves* 7 to 18 of this Resolution if the number of satellites communicated to BR under *resolves* 2 or 3 above is less than 100% of the total number of satellites indicated in the latest notification information published in its International Frequency Information Circular (BR IFIC) (Part I-S) or in the latest notification information received by BR, as appropriate, for the frequency assignments; and
- c) publish the results of action taken pursuant to *resolves* 5b) above in the BR IFIC and on the ITU website;

6 that, if the number of satellites communicated to BR under *resolves* 2 or 3 above is 100% of the total number of satellites indicated in the Master Register in Part II-S of the BR IFIC, if available, or in the latest notification information published in the BR IFIC (Part I-S) for the frequency assignments, *resolves* 7 to 18 of this Resolution are not applicable;

7 that, for the frequency assignments to which *resolves* 2 applies, the notifying administration shall communicate to BR the required deployment information in accordance with Annex 1 to this Resolution as of the expiry of the milestone periods mentioned in subsections a) through c) below (see also *resolves* 9):

- a) no later than 30 days after the expiry of the two-year period after the end of the seven-year regulatory period referred to in No. **11.44**;
- b) no later than 30 days after the expiry of the five-year period after the end of the seven-year regulatory period referred to in No. **11.44**;
- c) no later than 30 days after the expiry of the seven-year period after the end of the seven-year regulatory period referred to in No. **11.44**;

8 that, for frequency assignments to which *resolves* 3 applies, the notifying administration shall communicate to BR the complete deployment information in accordance with Annex 1 to this Resolution as of 1 January of the years mentioned in subsections a) through c) below (see also *resolves* 9):

- a) no later than 1 February 2023 (corresponding to 30 days after the expiry of the two-year period after 1 January 2021);
- b) no later than 1 February 2026 (corresponding to 30 days after the expiry of the five-year period after 1 January 2021);
- c) no later than 1 February 2028 (corresponding to 30 days after the expiry of the seven-year period after 1 January 2021);

9 that, for purposes of *resolves* 7 and 8:

- a) BR shall process the deployment information required to be submitted under *resolves* 7a)/8a) or 7b)/8b), as appropriate, at any point during the relevant period, if the notifying administration reports that the total number of satellites required to be deployed as of the end of that milestone period has been achieved;

- b) BR shall process, at any time, a report from the notifying administration stating that the total number of satellites deployed as a part of the system is 100% of the total number of satellites indicated in the Master Register in Part II-S of the BR IFIC, if available, or in the latest notification information published in the BR IFIC (Part I-S) for the frequency assignments;
 - c) if the total number of satellites deployed as part of the system during any relevant milestone period is greater than the number of satellites that remain deployed as part of the system as of the expiry of the relevant milestone period, BR shall take into account the total number of satellites deployed during the period that has been reported by the notifying administration if:
 - i) the notifying administration includes a detailed explanation of the circumstances which led to having the reduced number of satellites deployed as of the expiry of that milestone period with the complete deployment information in accordance with Annex 1 to this Resolution; and
 - ii) the notifying administration provides an indication of whether any of the satellites no longer counted as of the expiry of the relevant milestone period have been or will be used to satisfy milestone obligations associated with frequency assignment(s) of any other non-GSO system(s) subject to this Resolution and, if so, how many satellites and the identity of the non-GSO system(s) in question;
 - d) the notifying administration shall provide with its reporting under *resolves 7* or *8*, as appropriate, an indication of whether any of the satellites counted as of the expiry of the relevant milestone period have been used to satisfy milestone obligations associated with frequency assignment(s) of any other non-GSO system(s) subject to this Resolution and, if so, how many satellites and the identity of the non-GSO system(s) in question;
- 10 that, upon receipt of the required deployment information submitted in accordance with *resolves 7* or *8*, BR shall:
- a) promptly make this information available “as received” on the ITU website;
 - b) conduct an examination of the information provided for compliance with the minimum number of satellites to be deployed as prescribed for each period in *resolves 11a)*, *11b)* or *11c)*, as appropriate;
 - c) modify the Master Register entry, if available, or the latest notification information, as appropriate, for the frequency assignments to the system to remove the remark added in accordance with *resolves 5b)*, stating that the assignments are subject to the application of this Resolution if the number communicated to BR under *resolves 7* or *8* is 100% of the total number of satellites indicated in the Master Register entry for the non-GSO system;
 - d) publish this information and its findings in the BR IFIC and make that information available on the ITU website as soon as possible;

11 that the notifying administration shall also submit to BR, no later than 90 days after the expiry of each of the milestone periods referred to in *resolves* 7 or 8, as appropriate, the modifications to the characteristics of the notified or recorded frequency assignments if the number of space stations declared as deployed:

- a) under *resolves* 7a) or 8a), as appropriate, is less than 10% of the total number of satellites (rounded down to the lower integer) indicated in the latest notification information published in Part I-S of the BR IFIC for the frequency assignments; in this case, the modified total number of satellites shall not be greater than 10 times the number of space stations declared as deployed under *resolves* 7a) or 8a);
- b) under *resolves* 7b) or 8b), as appropriate, is less than 50% of the total number of satellites (rounded down to the lower integer) indicated in the latest notification information published in Part I-S of the BR IFIC for the frequency assignments; in this case, the modified total number of satellites shall not be greater than two times the number of space stations declared as deployed under *resolves* 7b) or 8b);
- c) under *resolves* 7c) or 8c), as appropriate, is less than 100% of the total number of satellites indicated in the latest notification information published in Part I-S of the BR IFIC for the frequency assignments; in this case, the modified total number of satellites shall not be greater than the number of space stations declared as deployed under *resolves* 7c) or 8c);

12 that *resolves* 11a) shall not apply for frequency assignments for which the end of the seven-year regulatory period in No. **11.44** is before 28 November 2022, provided that the notifying administration submits the complete information listed in Annex 2 to this Resolution to BR by 1 March 2023, and a favourable determination is made by the Radio Regulations Board (RRB) or WRC-23;

13 that BR shall, no later than 45 days before any deadline for submission by a notifying administration under *resolves* 2, 3, 7a), 7b), 7c), 8a), 8b), 8c), 19, 20 or 21 send a reminder to the notifying administration to provide the information required;

14 that, upon receipt of the modifications to the characteristics of the notified or recorded frequency assignments as referred to in *resolves* 11 or 21:

- a) BR shall promptly make this information available “as received” on the ITU website;
- b) BR shall conduct an examination for compliance with the maximum number of satellites as per *resolves* 11a), 11b) or 11c) and Nos. **11.43A/11.43B**, as appropriate;
- c) BR, for the purpose of No. **11.43B**, shall retain the original dates of entry of the frequency assignments in the Master Register if:
 - i) BR reaches a favourable finding under No. **11.31**; and

- ii) the modifications are limited to reduction of the number of orbital planes (Appendix 4 data item A.4.b.2) and modifications to the longitude of the ascending node (Appendix 4 data item A.4.b.4.j) associated with the remaining orbital planes, or reduction of the number of space stations per plane (Appendix 4 data item A.4.b.4.b) and modifications of the initial phase angle of the space stations (Appendix 4 data item A.4.b.4.h) within planes; and
 - iii) the notifying administration provides a commitment stating that the characteristics as modified will not cause more interference or require more protection than the characteristics provided in the latest notification information published in Part I-S of the BR IFIC for the frequency assignments (see Appendix 4 data item A.23.a);
- d) for modifications submitted under *resolves* 11, BR shall ensure the remark stating that the assignments are subject to the application of this Resolution as defined in *resolves* 7 or 8 is retained until the milestone process in *resolves* 7 to 18 of this Resolution is complete;
- e) BR shall publish the information provided and its findings in the BR IFIC;
- 15 that, if a notifying administration fails to communicate the information required under *resolves* 2, 3, 7a), 7b), 7c), 8a), 8b), 8c), 11a), 11b), 11c), 19, 20 or 21, as appropriate, BR shall promptly send to the notifying administration a reminder asking the administration to provide the required information within 30 days from the date of this reminder from BR;
- 16 that, if a notifying administration fails to provide information after the reminder sent under *resolves* 15, BR shall send to the notifying administration a second reminder asking it to provide the required information within 15 days from the date of the second reminder;
- 17 that, if a notifying administration fails to provide the required information:
- a) under *resolves* 2 or 3, as appropriate, following the reminders under *resolves* 15 and 16, BR shall continue to take the entry in the Master Register into account when conducting its examinations until the decision is made by RRB to cancel the entry;
 - b) under *resolves* 7a), 7b), 7c), 8a), 8b), 8c), 11a), 11b), 11c), 19, 20 or 21, as appropriate, following the reminders under *resolves* 15 and 16, BR shall:
 - i) modify the entry by suppressing the notified orbital parameters of all satellites not listed in the last complete deployment information submitted under *resolves* 2, 3, 7, 8, 19 or 20, as appropriate; and
 - ii) no longer consider the frequency assignments under subsequent examinations under Nos. **9.36**, **11.32** or **11.32A**, and inform administrations having frequency assignments subject to subsection IA of Article 9 that those assignments shall not cause harmful interference to, or claim protection from, other frequency assignments recorded in the Master Register with a favourable finding under No. **11.31**;

18 that the suspension of the use of frequency assignments in accordance with No. **11.49** at any point prior to the end of a milestone period as specified in *resolves* 7a), 7b), 7c), 8a), 8b) or 8c) of this Resolution, as applicable, shall not alter or reduce the requirements associated with any of the remaining milestones as derived from *resolves* 7a), 7b), 7c), 8a), 8b) or 8c), as appropriate;

19 that the notifying administration for a non-GSO system that has completed the milestone process described in this Resolution, including application of *resolves* 10c) by BR, and for systems to which *resolves* 6 applies, shall communicate to BR the required deployment information in accordance with Annex 1 to this Resolution no later than 30 days after the expiry of the 11-year period after the end of the seven-year regulatory period referred to in No. **11.44** (for frequency assignments to which *resolves* 2 applies) or no later than 1 February 2032 (corresponding to 30 days after the expiry of the 11-year period after 1 January 2021) (for frequency assignments to which *resolves* 3 applies);

20 that the notifying administration for a non-GSO system that has provided deployment information under *resolves* 19 shall, no later than 30 days after the expiry of a four-year period from the due date of the submission under *resolves* 19, and every four years thereafter, communicate to BR the required deployment information in accordance with Annex 1 to this Resolution;

21 that, if the number of satellites reported pursuant to *resolves* 19 or 20 is less than:

$$X = N \cdot 50\% \quad \text{for} \quad N \leq 340$$

$$X = N - 67 \cdot \log(N) \quad \text{for} \quad 340 < N \leq 4\,950$$

$$X = N \cdot 95\% \quad \text{for} \quad N > 4\,950$$

where N is the total number of satellites in the non-GSO system indicated in the Master Register in Part II-S of the BR IFIC, if available, or in the latest notification information published in the BR IFIC (Part I-S) for the frequency assignments, and if the number of satellites deployed remains less than X in the formula above on the due date of the subsequent report under *resolves* 20, the notifying administration shall submit modifications to the characteristics of the notified or recorded frequency assignments to align with the number of space stations declared as deployed no later than 90 days after the due date of the subsequent report;

22 that, for a non-GSO system that has completed the milestone process described in this Resolution, including application of *resolves* 10c) by BR, and for systems to which *resolves* 6 applies, if the number of satellites considered as part of the system falls below the total number of satellites indicated in the Master Register in Part II-S of the BR IFIC, if available, or in the latest notification information published in the BR IFIC (Part I-S) for the frequency assignments, the notifying administration shall, for information purposes only:

- a) provide a report to BR, on an annual basis as of the completion of the milestone process, within 30 days of the anniversary, containing the date when this event, or events, began, and a general explanation of the event(s) for each affected satellite;

b) provide to BR, either as part of the annual report under *resolves 22a*), or with the next report under *resolves 19* or *20*, whichever comes first, the date or dates on which each affected satellite was restored to operational status or replaced;

23 that BR shall:

a) make any information reported under *resolves 22a*) and *22b*) available on its website; and

b) include a report of its activities and data gathered under *resolves 22* to the relevant ITU-R study group and a future competent conference(s),

further resolves

to apply *resolves 19* to *23* above on a provisional basis as of 1 January 2025 pending review by a future competent conference,

instructs the Radiocommunication Bureau

1 to take the necessary actions to implement this Resolution;

2 to report any difficulties it encounters in the implementation of this Resolution to future competent world radiocommunication conferences;

3 to continue to identify and report on specific frequency bands in specific services for which there may be a problem similar to that which resulted in the creation of this Resolution, as early as possible, but not later than the penultimate meeting of the responsible group prior to the second session of the conference preparatory meeting,

invites the ITU Radiocommunication Sector

to continue studies with a view to confirming the suitability and regulatory implementation of the post-milestone procedure set out in *resolves 19* to *21* above, and to recommend appropriate action under Resolution **86 (Rev.WRC-07)**.

ANNEX 1 TO RESOLUTION 35 (REV.WRC-23)

Information to be submitted about the deployed space stations

A Satellite system information

1) Name of the satellite system

2) Name of the notifying administration

3) Country symbol

4) Reference to the advance publication information or the request for coordination, or the notification information, if available

- 5) Total number of space stations deployed into each notified orbital plane of the satellite system with the capability of transmitting or receiving the frequency assignments
- 6) Orbital plane number indicated in the latest notification information published in Part I-S of the BR IFIC for the frequency assignments into which each space station is deployed.

B Launch information to be provided for each deployed space station

- 1) Name of the launch vehicle provider
- 2) Name of the launch vehicle
- 3) Name and location of the launch facility
- 4) Launch date.

C Space station characteristics for each space station deployed

- 1) Frequency bands from the notification information in which the space station can transmit or receive
- 2) Orbital characteristics of the space station (altitude of the apogee and perigee, inclination, and argument of the perigee)
- 3) Name of the space station.

ANNEX 2 TO RESOLUTION 35 (REV.WRC-23)

Information to be provided by the notifying administration pursuant to *resolves 12*

- 1) Reference to notification information already submitted
- 2) Current deployment and operational information
- 3) Report indicating efforts made and detailing status of coordination with systems or networks
- 4) Clear evidence of a binding agreement for the manufacture or procurement of a sufficient number of satellites to meet the milestone obligation in *resolves 7b)* or *8b)*, as appropriate
- 5) Clear evidence of a binding agreement to launch a sufficient number of satellites to meet the milestone obligation in *resolves 7b)* or *8b)*, as appropriate.

NOTE – The manufacturing or procurement agreement should identify the contract milestones leading to the completion of manufacture or procurement of satellites required, and the launch agreement should identify the launch window, launch site and launch service provider.

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The information required under this Annex shall be submitted in the form of a written commitment by the responsible administration, including manufacturer or launch provider letters or declarations, and evidence of guaranteed funding arrangements for the implementation of the project, where possible.

The notifying administration is responsible for authenticating the evidence of agreement.