



PLENARY MEETING

**Addendum 1 to
Document 6222(Add.22)-
E
9 October 2023
Original: English**

African Common Proposals

PROPOSALS FOR THE WORK OF THE CONFERENCE

Agenda item 7(A)

7 to consider possible changes, in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference, on advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks, in accordance with Resolution **86 (Rev.WRC-07)**, in order to facilitate the rational, efficient and economical use of radio frequencies and any associated orbits, including the geostationary-satellite orbit;

7(A) Topic A - Tolerances for certain orbital characteristics of non-GSO space stations in the FSS, BSS or MSS

ARTICLE 11

Notification and recording of frequency assignments^{1, 2, 3, 4, 5, 6, 7} (WRC-19)

Section II – Examination of notices and recording of frequency assignments in the Master Register

MOD AFCP/6222A22A1/1

11.44C A frequency assignment to a space station in a non-geostationary-satellite orbit network or system in the fixed-satellite service, the mobile-satellite service or the broadcasting-satellite service shall be considered as having been brought into use when a space station with the capability of transmitting or receiving that frequency assignment has been deployed and maintained on one of the notified orbital plane(s)^{MOD 27} of the non-geostationary satellite network or system for a continuous period of 90 days, irrespective of the notified number of orbital planes and satellites per orbital plane in the network or system. The notifying administration shall so inform the Bureau within 30 days from the end of the 90-day period^{25, 28, 29}. On receipt of the information sent under this provision, the Bureau shall make that information available on the ITU website as soon as possible and shall publish it in the BR IFIC subsequently. (WRC-19²³)

MOD AFCP/6222A22A1/2

²⁷ **11.44C.1** and **11.44D.1** For the purposes of No. **11.44C** or No. **11.44D**, the term “notified orbital plane” means an orbital plane of the non-geostationary-satellite system, as provided to the Bureau in the most recent notification information for the system’s frequency assignments, that corresponds to Items A.4.b.4.a, A.4.b.4.d, A.4.b.4.e and A.4.b.5.c (only for orbits whose altitudes of the apogee and perigee are different) in Table A of Annex 2 to Appendix 4. For the purposes of No. 11.44C, Resolution [A7(A)-NGSO-FSS-BSS-MSS-Tolerance] (WRC-23) also applies for space stations of a non-GSO FSS, BSS or MSS system. (WRC-19²³)

MOD AFCP/6222A22A1/3

11.49 Wherever the use of a recorded frequency assignment to a space station of a satellite network or to all space stations of a non-geostationary-satellite system is suspended for a period exceeding six months, the notifying administration shall inform the Bureau of the date on which such use was suspended. When the recorded assignment is brought back into use, the notifying administration shall, subject to the provisions of Nos. **11.49.1**, **11.49.2**, **11.49.3** or **11.49.4**, as applicable, so inform the Bureau, as soon as possible. On receipt of the information sent under this provision, the Bureau shall make that information available as soon as possible on the ITU website and shall publish it in the BR IFIC. The date on which the recorded assignment is brought back into use^{32, 33, 34, 35}, ^{MOD 36} shall be not later than three years from the date on which the use of the frequency assignment was suspended, provided that the notifying administration informs the Bureau of the suspension within six months from the date on which the use was suspended. If the notifying administration informs the Bureau of the suspension more than six months after the date on which the use of the frequency assignment was suspended, this three-year time period shall be reduced. In this case, the amount by which the three-year period shall be reduced shall be equal to the amount of time that has elapsed between the end of the six-month period and the date that the Bureau is informed of the suspension. If the notifying administration informs the Bureau of the

suspension more than 21 months after the date on which the use of the frequency assignment was suspended, the frequency assignment shall be cancelled. Ninety days before the end of the period of suspension, the Bureau shall send a reminder to the notifying administration. If the Bureau does not receive the declaration of the commencement of the bringing back into use period within thirty days following the limit date of the period of suspension established in accordance with this provision, it shall cancel the entry in the Master Register. The Bureau shall, however, inform the administration concerned before taking such action. (WRC-1923)

MOD AFCP/6222A22A1/4

³⁶ **11.49.5** For the purposes of Nos. **11.49.2** and **11.49.3**, the term “notified orbital plane” means an orbital plane of the non-geostationary-satellite system, as provided to the Bureau in the most recent notification information for the system’s frequency assignments, that corresponds to Items A.4.b.4.a, A.4.b.4.d, A.4.b.4.e and A.4.b.5.c (only for orbits whose altitudes of the apogee and perigee are different) in Table A of Annex 2 to Appendix 4. For the purposes of No. **11.49.2**, Resolution [A7(A)-NGSO-FSS-BSS-MSS-Tolerance] (WRC-23) also applies for space stations of a non-GSO FSS, BSS or MSS system. (WRC-1923)

Section III – Maintenance of the recording of frequency assignments to non-geostationary-satellite systems in the Master Register (WRC-19)

MOD AFCP/6222A22A1/5

11.51 For frequency assignments to some non-geostationary-satellite systems in specific frequency bands and services, Resolution **35 (WRC-19)** and Resolution [A7(A)-NGSO-FSS-BSS-MSS-Tolerance] (WRC-23) for space stations of a non-GSO FSS, BSS or MSS system shall apply. (WRC-1923)

ADD AFCP/6222A22A1/6

DRAFT NEW RESOLUTION [A7(A)-NGSO-FSS-BSS-MSS-TOLERANCE-OPTION A] (WRC-23)

Tolerances for certain orbital characteristics of space stations deployed as part of non-GSO FSS, BSS or MSS systems

The World Radiocommunication Conference (Dubai, 2023),

considering

that WRC-19 invited ITU-R to study, as a matter of urgency, tolerances for certain orbital characteristics of the non-geostationary-satellite orbit (non-GSO) space stations of the fixed-satellite service (FSS), the broadcasting-satellite service (BSS) and the mobile-satellite service (MSS) to account for the potential differences between the notified and deployed orbital characteristics for

the inclination of the orbital plane, the altitude of the apogee of the space station, the altitude of the perigee of the space station and the argument of the perigee of the orbital plane,

noting

that, for the purposes of this Resolution, tolerances refer to the maximum variations allowed between the value notified and/or recorded for the orbital characteristics referred to in the *considering* above and those associated with the actual deployment of satellites of the non-GSO FSS, BSS or MSS under consideration,

recognizing

- a) that the use of frequency assignments to non-GSO FSS, BSS and MSS are subject to the regulatory and operational limits stipulated in the Radio Regulations;
- b) that Nos. **11.44C**, **11.49.2** and **11.51** require the deployment of satellites on notified orbital planes;
- c) that orbital tolerances for a non-GSO system should take into account design considerations including the atmospheric drag characteristics of the altitude chosen and solar cycle predictions, which could have an impact on the lifetime of the satellites;
- d) that there are legitimate reasons for a satellite operating at a variance from its notified orbital characteristics, such as maintaining separation between satellites in the same system or with satellites in another satellite system, in order to minimize the risk of collision;
- e) that satellites on highly elliptical orbits and high inclined orbits have significant orbital precession rates and, consequently, restrictive orbital-keeping requirements and correction of orbit parameters may lead to a reduction of such satellites lifetime and to a frequent replacement;
- f) that this Resolution defines the maximum acceptable variation of certain orbital characteristics of a non-GSO system to be considered as operating within its notified orbital plane and does not preclude other coordination requests or notification filings under Articles **9** and **11** of the Radio Regulations for other non-GSO systems at the same altitude and tolerance;
- g) that administrations and their operators may establish separate operational arrangements regarding coexistence of the physical orbits of satellite systems and networks, including satellites in geostationary-satellite orbits and non-GSO, and that such arrangements are not addressed by the ITU Radio Regulations which deal with avoidance of harmful interference due to radio frequency usage,

resolves

1 **Option A2A1:** that, as of [16 December 2023 or the entry into force of the Final Acts of WRC-23] for space stations notified as part of a non-GSO FSS, BSS or MSS system with an apogee altitude less than 15 000 km:

Option A2A2: that, as of [16 December 2023 or the entry into force of the Final Acts of WRC-23] for space stations with an orbital eccentricity¹ less than 0.5/TBD notified as part of a non-GSO FSS, BSS or MSS system with an apogee altitude less than 15 000 km:

¹ The eccentricity “*e*” is equal to: $e = (R_a - R_p) / (R_a + R_p)$,

where:

R_a: distance between the centre of the Earth and the space station at apogee

Option A2A3: that, as of [16 December 2023 or the entry into force of the Final Acts of WRC-23] for space stations notified as part of a non-GSO FSS, BSS or MSS system subject to Resolution 35 (WRC-19) with an apogee altitude less than 15 000 km:

Option A2A4: that, as of [16 December 2023 or the entry into force of the Final Acts of WRC-23] for space stations with an orbital eccentricity¹ less than 0.5/TBD notified as part of a non-GSO FSS, BSS or MSS system subject to Resolution 35 (WRC-19) with an apogee altitude less than 15 000 km:

- a) the observed variation for the altitude ($\Delta alt_{Observed}$) of both perigee and apogee, shall not exceed allowed variation for the altitude ($\Delta alt_{Allowed}$) (see the Annex);
- b) the observed variation for the inclination ($\Delta i_{Observed}$) shall not exceed allowed variation ($\Delta i_{Allowed}$) for the inclination (see the Annex);

2 that, as of [16 December 2023 or the entry into force of the Final Acts of WRC-23] and except for the application of Nos. 11.44C or 11.49.2, the BR shall allow a possible exceedance of the tolerances referred to in *resolves* 1 for a maximum of (90/180) consecutive days, when conducting its investigations under No. 13.6;

3 that any space station deployed as part of a non-GSO FSS, BSS or MSS system at an altitude and with an inclination other than the notified altitude or the notified inclination, shall not cause more interference nor require more protection than if the space station was deployed at the notified altitude and the notified inclination,

instructs the Radiocommunication Bureau

1 to take the necessary actions to implement this Resolution, including providing assistance to administrations when requested, to address the difficulties they may encounter in the implementation of this Resolution without any regulatory impact on the administrations; and

2 to report to future world radiocommunication conferences any difficulties or inconsistencies encountered in the implementation of this Resolution.

ANNEX TO DRAFT NEW RESOLUTION [A7(A)-NGSO-FSS-BSS-MSS-TOLERANCE-OPTION A] (WRC-23)

Variation for the altitude and the inclination

1 The observed variation for the altitude ($\Delta alt_{Observed}$) of a non-GSO satellite is equal to:

$$\Delta alt_{Observed} = |alt_d - alt_n| \quad \text{in kilometres}$$

where:

alt_d: is the observed altitude in kilometres of the deployed satellite at the perigee or apogee

alt_n: is the altitude of the perigee or apogee in kilometres of the associated notified orbital plane of the non-GSO system.

2 The allowed variation for the altitude ($\Delta alt_{Allowed}$) of a non-GSO satellite is equal to:

Option 1

R_p: distance between the centre of the Earth and the space station at perigee.

$$\Delta alt_{Allowed} = X \quad \text{in kilometres}$$

Where X is a fixed value equal to TBD

End of Option 1

Option 2

$$\Delta alt_{Allowed} = Y \times alt_n \quad \text{in kilometres}$$

Where Y is a fixed percentage value equal to TBD

End of Option 2

3 The observed variation for the inclination ($\Delta i_{Observed}$) of a non-GSO satellite is equal to:

$$\Delta i_{Observed} = |i_d - i_n| \quad \text{in degrees}$$

where:

i_d is the observed inclination in degrees of the deployed satellite

i_n is the inclination in degree of the associated notified orbital plane of the non-GSO system.

4 The allowed variation for the inclination ($\Delta i_{Allowed}$) of a non-GSO satellite is equal to:

Option 1

$$\Delta i_{Allowed} = Z \quad \text{in degrees}$$

Where Z is a fixed value equal to TBD

End of Option 1

Option 2

$$\Delta i_{Allowed} = \arcsin \left(\frac{\Delta alt_{Allowed}}{\sqrt{R_{Alt}^2 + \Delta alt_{Allowed}^2}} \right) \quad \text{in degrees} \quad (1)$$

with:

$$R_{Alt} = R_e + alt_n$$

where:

R_e : is the radius of the Earth (i.e. 6 378 km).

End of Option 2