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| A close up of a sign  Description automatically generated | **World Radiocommunication Conference (WRC-23) Dubai, 20 November - 15 December 2023** | |  |
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| PLENARY MEETING | | **Addendum 16 to Document 148-E** | |
|  | | **25 October 2023** | |
|  | | **Original: English** | |
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| Iran (Islamic Republic of) | | | |
| PROPOSALS FOR THE WORK OF THE CONFERENCE | | | |
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| Agenda item 1.16 | | | |

1.16 to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by non-geostationary fixed-satellite service earth stations in motion, while ensuring due protection of existing services in those frequency bands, in accordance with Resolution **173 (WRC‑19)**;

Introduction

In *resolves*1.16of Resolution **811 (WRC‑19)**, the 2019 World Radiocommunication Conference (WRC‑19) resolved “to study and develop technical, operational and regulatory measures, as appropriate, to facilitate the use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7‑20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by non‑geostationary fixed-satellite service earth stations in motion, while ensuring due protection of existing services in those frequency bands, in accordance with Resolution **173 (WRC‑19)**” as part of the agenda for WRC‑23.

The CPM text includes methods below to satisfy this agenda item:

– Method A: No changes to the Radio Regulations and suppression of Resolution **173 (WRC‑19)**.

– Method B: Add a new footnote in RR Article 5 that refers to a new WRC Resolution with technical, operational, and regulatory conditions for the operation of non-GSO maritime and aeronautical ESIMs while ensuring protection of allocated services and consequential suppression of Resolution **173 (WRC‑19)**.

The draft CPM text and draft new Resolution were reviewed in detail only partially due to the lack of time at the meeting of WP 4A in September 2022. Notes in the text indicate the relevant parts subject to detailed consideration.

Discussion

This Administration supports Method A of the CPM Report.

However, it may consider Method B under this agenda item provided that all the issues raised below are duly resolved and agreed upon. These include but not limited to issues raised below:

– In order to make it possible to use the aeronautical and maritime earth stations communicating with non-GSO FSS systems in the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz (space-to-Earth), and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space), it is required to continue studies to develop technical/regulatory solution(s) for all concerns that are currently raised. Completion of studies and decisions shall be made to ensure the protection of the existing services.

– ESIMs operating with non-GSO FSS systems shall not cause unacceptable interference to the terrestrial services in those frequency bands and in adjacent frequency bands and not adversely affect these terrestrial services, and ESIMs shall not claim protection from existing radiocommunication services (including terrestrial services) in those frequency bands and adjacent frequency bands.

– To this effect, the notifying administration of A-ESIM and M-ESIM when submitting RR Appendix **4** data elements to the Bureau:

• also send a firm actionable evidence, objective, measurable and enforceable commitment undertaking that in case of any interference to assignments of terrestrial services it shall immediately cease emission or reduce it to the minimum level acceptable to the interfered assignments of administration(s);

• in case of no action taken in regard with obligation referred to above, the Bureau shall send a reminder and request that administration to comply with the requirements referred to in commitment;

• should the interference persist 30 days after the dispatch date of the above- mentioned reminder, the Bureau shall submit the case to the subsequent meeting of the RRB for review and eventual suppression from the date base of the Bureau and inform the notifying administration accordingly.

– With respect to other space services, it shall operate within the envelope of technical characteristics and envelope of coordination agreement. However, the procedure by which such verification is to be made needs to be clearly specified and agreed upon.

– The only administration that could notify ESIM is the administration notifying the non‑GSO system to which the ESIM communicates. Thus, notification of any frequency assignment for ESIMs shall only be made by one single administration, which will be responsible for ESIM operation.

– An administration the territory of which is situated inside the service area of a satellite and has provided explicit authorization to receive the service/ to be served /provided by any type of ESIM has no obligation nor any mandate, whatsoever, to be involved directly or indirectly in detection, identification, reporting, resolution of any interference caused by the operation of the ESIM that is authorized to operate.

– Interference management mechanism and its functioning shall be clearly defined by completing relevant studies for inclusion in the draft new Resolution associated with this agenda item.

– The current version of interference management system as described in the CPM text has not been adequately and properly analyzed and fully discussed and agreed upon since it was submitted by some administrations to one of the almost last meetings of ITU‑R study groups. Moreover, it is incomplete as there are no timing elements for each function to be performed.

– The use of PFD mask in order to protect terrestrial services, that shall be prepared based on studies including different operating conditions (comprising the range of aircraft altitude change), the outcome of the PFD limit would only be considered as guidance.

– Compliance to the limit once performed by the Bureau does not release the notifying administration of A-ESIM and M-ESIM from their responsibility and commitment not to cause unacceptable interference nor claiming protection from the terrestrial services.

– There are several other inconsistencies, shortcomings, ambiguities which were already included in CPM text and its attached draft new Resolution which shall be addressed, resolved and agreed upon.

– That for the protection of other space services, non-GSO ESIM characteristics shall remain within the envelope characteristics as well as within the envelope of coordination agreement of typical earth stations associated with the non-GSO satellite system with which these ESIM communicate. These are including but not limited to the issues raised below, However, the procedure and approach by which such verification to be made shall be clearly defined and agreed upon.

– That for the protection of GSO FSS networks operating in the frequency bands 17.8-18.6 GHz, 19.7-20.2 GHz, 27.5-28.6 GHz and 29.5-30.0 GHz the relevant EPFD limits in RR Nos. **22.5C**, **22.5D** and **22.5F** shall apply.

– That the methodology included in the Recommendation ITU‑R S.1503-3 for determination of compliance with EPFD limits in RR Article **22** is applicable to ESIMs communicating with non-GSO FSS systems.

– That currently pfd limit to protect EESS (passive) operating in the frequency band 18.6-18.8 GHz from non-GSO satellite systems needs more accurate consideration. Therefore, it is necessary to set up appropriate pfd limits for unwanted emissions from non-GSO satellite transmitters with which ESIM communicate.

– That receiving non-GSO ESIMs in the frequency bands 17.7-18.6 GHz and 18.8-19.3 GHz and 19.7-20.2 GHz (see RR No. **5.524**) shall not claim protection from terrestrial services to which the frequency bands are allocated and operating in accordance with the Radio Regulations.

– That transmission by non-GSO ESIMs in the frequency band 27.5-29.1 GHz shall not cause unacceptable interference to terrestrial services to which the frequency band is allocated and that operate in accordance with the Radio Regulations, and Annex 1 to the new Resolution under this agenda item shall apply the items enumerated below:

– That the provisions in the attached Resolution under this agenda item, including Annex 1, set the conditions for the purpose of protecting terrestrial services from unacceptable interference which could likely be caused by non-GSO ESIMs in neighbouring countries in accordance with the provisions included in the Resolution in the frequency band 27.5-29.1 GHz and in the frequency band 29.5-30.0 GHz as guidance for administrations. However, the requirement not to cause unacceptable interference to, or claim protection from, terrestrial services to which the frequency bands are allocated and operating in accordance with the Radio Regulations, will not release the notifying administration of non-GSO ESIM from its obligation mentioned above.

– That regulatory provision, and technical and operational measures with appropriate examination methodology by the Bureau for non-GSO ESIM should be established before the implementation of the associated Resolution for this agenda item in order to ensure the protection of services to which the frequency bands are allocated and operated in accordance with the Radio Regulations. In the absence of such methodology necessary transitional measures should be developed and agreed by WRC‑23.

– That there are still several issues on the operation of ESIMs to be clarified and specified in the draft new Resolution, such as interference management mechanism and its due functionality. As well as the proper functioning of switching facility to respond to authorization provided for the operation of ESIM from the countries that did not agree with operation.

– That the procedure and use of “qualified finding” shall not be applied for the implementation of this Resolution due to the fact that such type of finding arising from lack of methodology for the Bureau to formulate its finding may last several years during which the non-compliance with the provisions of this Resolution could result in occurrence of unacceptable interference to the incumbent services.

– Moreover, there are several areas on which there is no consensus either on the text or how to proceed with the implementation of the draft new Resolution **[A116] (WRC‑23)** contained in Section 4/1.16/5.2 of the CPM Report to WRC‑23.

Consequently, the text of the draft new Resolution **[A116] (WRC‑23)** is not consistent with *resolves*5 of Resolution **173 (WRC‑19)**. Below, several amendments to the draft new Resolution **[A116] (WRC‑23)** contained in Section 4/1.16/5.2 of the CPM Report to WRC‑23, are proposed that could help develop Method B.

Proposals

This Administration supports Method A of the CPM Report.

NOC IRN/148A16/1#1877

ARTICLES

**Reasons:** Based on the explanation mentioned above in Section 2. Proposals.

NOC IRN/148A16/2#1878

APPENDICES

**Reasons:** Based on the explanation mentioned above in Section 2. Proposals.

SUP IRN/148A16/3#1879

RESOLUTION 173 (WRC‑19)

Use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by   
earth stations in motion communicating with non-geostationary space stations   
in the fixed-satellite service

Alternative Proposal:

This Administration may consider Method B under this agenda item provided that all the issues raised in the discussion part are duly resolved and agreed upon.

Below, several amendments to the draft new Resolution **[A116] (WRC‑23)** contained in Section 4/1.16/5.2 of the CPM Report to WRC‑23, are proposed that could help develop Method B.

ADD IRN/148A16/4#1885

draft new RESOLUTION [A116] (WRC‑23)

There are several areas in which there is no consensus either on the text or how to proceed with the implementation of this Resolution. Consequently, the text below is not consistent with *resolves*5 of Resolution **173 (WRC‑19)**.

*Resolves the ITU Radiocommunication Sector to ensure that the results of ITU‑R studies are agreed by Member States by consensus*

Use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) by   
aeronautical and maritime earth stations in motion communicating   
with non-geostationary space stations in the fixed-satellite service

The World Radiocommunication Conference (Dubai, 2023),

considering

*a)* that there is some interest for global broadband mobile satellite communications, and that some of this need could be met by allowing earth stations in motion (ESIMs) to communicate with space stations of the non-geostationary-satellite orbit (non-GSO) fixed-satellite service (FSS) operating in the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth), and 27.5-29.1 GHz and 29.5-30.0 GHz (Earth-to-space);

*b)* that the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) are allocated to space services, and the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz, and 27.5-29.1 GHz are allocated to terrestrial services on a primary basis worldwide; in the countries identified in No. **5.524** of the Radio Regulations, the frequency band 19.7-20.2 GHz is allocated to the fixed and mobile services on a primary basis; and, in the countries identified in No. **5.542** of the Radio Regulations, the frequency band 29.5-30 GHz is allocated to the fixed and mobile services on a secondary basis, and used by a variety of different systems and these existing services and their future development need to be acknowledged in such a way that their current and/or future operation would be continued/functioned, without any additional constraints, from the operation of non-GSO ESIMs;

NOTE: There should be a necessary assurance that these secondary status assignments could continue to render services which were designed for before any allocation be made to ESIM under agenda item 1.16 without being adversely affected. This assurance does not exist to date.

*c)* that the frequency band 18.6-18.8 GHz is allocated to the Earth exploration-satellite service (EESS) (passive) and space research service (SRS) (passive) and that these services need to be protected from operation of non-GSO FSS in the space-to-Earth direction;

*d)* that there is no specific regulatory procedure in the Radio Regulations for the coordination of non-GSO ESIMs relative to terrestrial stations for these services since the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space) are not allocated for the operation of non-GSO ESIMs;

*e)* that regulatory procedures and interference-management mechanisms, including necessary mitigation measures, are required for the operation of non-GSO ESIMs to protect other space and terrestrial services allocated in the frequency bands mentioned in *considering a)*,

considering further

*a)* that aeronautical and maritime ESIMs operating within the service area of the non-GSO FSS systems with which they communicate may provide service within the territories under the jurisdiction of multiple administrations;

*b)* that this Resolution does not establish any technical or regulatory provisions for the operation and use of land ESIMs communicating with non-GSO FSS space stations, and any authorization of land ESIMs remains strictly a national matter, taking also into account the need to avoid cross-border interference,

recognizing

*a)* that the administration authorizing non-GSO ESIMs on the territory under its jurisdiction has the right to require that non-GSO ESIMs referred to above only use those assignments associated with non-GSO FSS systems which have been successfully coordinated, notified, brought into use and recorded in the Master International Frequency Register (MIFR) with a favourable finding under Articles **9** and **11**, including Nos. **11.31**, **11.32** or **11.32A**, where applicable with the exception of No. **11.41** of the Radio Regulation;

*b)* that the provisions of No. **22.2** apply to non-GSO FSS satellite systems with which ESIMs operate in the frequency band 17.7-17.8 GHz (space-to-Earth) with respect to GSO FSS and GSO BSS networks;

*c)* that, under the provisions of No. **22.2**, non-GSO ESIMs in the frequency bands 17.8-18.6 GHz and 19.7-20.2 GHz shall not claim protection from GSO FSS and GSO BSS networks operating in accordance with these Regulations, and non-GSO ESIMs in the frequency bands 27.5-28.6 GHz and 29.5-30 GHz shall not cause unacceptable interference to GSO FSS and GSO BSS networks operating in accordance with the Radio Regulations, and No. **5.43A** does not apply in this case;

*d)* that there is no obligation for any administration to authorize/license any non-GSO ESIMs to operate within the territory under its jurisdiction;

*e)* that, for the implementation of the relevant parts of *resolves* 1.1.2 below that a non-GSO FSS system operating in the frequency bands 17.8-18.6 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5-28.6 GHz and 29.5-30 GHz (Earth-to-space) in compliance with the epfd limits referred to in Nos. **22.5C**, **22.5D** and **22.5F** is considered as having fulfilled its obligations under No. **22.2** with respect to any geostationary-satellite network;

*f)* that, with respect to GSO FSS networks, in the frequency bands 18.8-19.3 GHz (space-to-Earth) and 28.6-29.1 GHz (Earth-to-space) Nos. **9.12A** and **9.13** apply, and No. **22.2** does not apply;

*g)* that, for the use of the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5‑29.1 GHz and 29.5-30 GHz (Earth-to-space) by non-GSO FSS systems, No. **9.12** applies,

recognizing further

*a)* that frequency assignments to non-GSO ESIMs need to be notified to the Radiocommunication Bureau (BR);

*b)* that the notification by different administrations of frequency assignments to be used by the same non-GSO satellite system could/would create difficulties to identify the responsible administration in case of unacceptable interference;

*c)* that, an administration authorizing the operation of ESIMs within the territory under its jurisdiction may modify or withdraw that authorization at any time;

*d)* that that there are still several issues on the operation of ESIMs to be clarified and specified in the draft new Resolution, such as the interference management mechanism and its due functionality, as well as the proper functioning of the switching facility to respond to authorization provided for the operation of ESIM from the countries that did not agree with operation,

resolves

1 that, for any aeronautical or maritime ESIM communicating with non-GSO FSS space stations in the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz and 19.7-20.2 GHz (space-to-Earth) and 27.5‑29.1 GHz and 29.5-30 GHz (Earth-to-space), or parts thereof, the following conditions shall apply:

1.1 with respect to space services in the frequency bands 17.7-18.6 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz (space-to-Earth), and 27.5-29.1 GHz and 29.5-30 GHz (Earth-to-space), and in their adjacent bands in the frequency band 18.6-18.8 GHz, non-GSO ESIMs shall comply with the following conditions:

1.1*bis* an administration the territory of which is situated inside the service area of a non-GSO FSS satellite system and has provided explicit authorization to receive the service/to be served by any type of ESIM has no obligation nor any mandate, whatsoever, to be involved directly or indirectly in detection, identification, reporting, resolution of any interference caused by the operation of the ESIM the operation of which was authorized:

1.1.1 to prevent potential interference with respect to satellite networks or systems of other administrations non-GSO ESIMs characteristics shall remain within the envelope characteristics and envelope of coordination of typical earth stations associated with the non-GSO FSS system with which these ESIMs communicate, however the procedure and approach by which such verifications are made need to be clearly defined and agreed upon;

1.1.1.1 for the implementation of *resolves* 1.1.1 above, the notifying administration for the non-GSO FSS system with which the non-GSO ESIMs communicate shall, in accordance with this Resolution, send to the BR Appendix **4** notification information related to the characteristics of the non-GSO ESIMs intended to communicate with that non-GSO FSS system, together with the commitment that the operation shall be in conformity with the Radio Regulations, including this Resolution;

1.1.1.2 upon receipt of the notification information referred to in *resolves* 1.1.1.1 above, the Bureau shall examine it with respect to the provisions referred to in *resolves* 1.1.1 above, including the commitment referred to in *resolves* 1.1.1.1 above, and publish the result of such examination in the International Frequency Information Circular (BR IFIC);

1.1.2 the notifying administration of the non-GSO FSS system with which the ESIMs communicate shall ensure that the operation of ESIMs complies with the coordination agreements for the frequency assignments of the typical earth station of this non-GSO FSS system obtained under the provisions of Article **9** of the Radio Regulations, taking into account *recognizing b)* above;

1.1.3 notifying administration of the non-GSO FSS system with which the ESIMs communicate shall ensure that non-GSO ESIMs comply with the epfd limits referred to in Nos. **22.5C**, **22.5D** and **22.5F** for the protection of GSO FSS networks operating in the frequency bands 17.8-18.6 GHz, 19.7-20.2 GHz (space-to-Earth), 27.5-28.6 GHz and 29.5-30 GHz (Earth-to-space) (see *recognizing g)*);

1.1.4 non-GSO ESIMs shall not claim protection from BSS feeder-link earth stations operating in accordance with the Radio Regulations in the frequency band 17.7‑18.4 GHz;

1.1.5 with respect to protection of EESS (passive) operating in the frequency band 18.6-18.8 GHz, any non-GSO FSS systems with an orbital apogee of less than 20 000 km operating in the frequency bands 18.3-18.6 GHz and 18.8-19.1 GHz with which aeronautical and/or maritime ESIMs communicate and for which the complete notification information has been received by the BR after 1 January 2025 shall comply with the provisions indicated in Annex 3 to this Resolution;

1.1.5.1 for the implementation of *resolves*1.1.6 above, the notifying administration for the non-GSO FSS system with which the non-GSO ESIMs communicate shall send to the BR the relevant Appendix **4** notification information including the commitment that the operation shall be in conformity with *resolves*1.1.5 and *further resolves* below;

1.2 with respect to terrestrial services in the frequency bands 17.7‑18.6 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, 27.5-29.1 GHz and 29.5-30 GHz, non-GSO ESIMs shall comply with the following conditions:

1.2.1 receiving non-GSO ESIMs in the frequency bands 17.7-18.6 GHz and 18.8-19.3 GHz and 19.7-20.2 GHz (see No. **5.524**) shall not claim protection from assignments in the terrestrial services to which those frequency bands are allocated and that operate in accordance with the Radio Regulations;

1.2.2 transmitting non-GSO ESIMs in the frequency band 27.5-29.1 GHz shall not cause unacceptable interference to terrestrial services to which the frequency band is allocated and that operate in accordance with the Radio Regulations, and Annex 1 to this Resolution shall apply;

1.2.3 transmitting non-GSO ESIMs in the frequency band 29.5-30.0 GHz shall not adversely affect the operations of terrestrial services to which this frequency band is allocated on secondary basis and that operate in accordance with the Radio Regulations, and limits in Annex 1 to this Resolution shall apply with respect to administrations mentioned in No. **5.542**;

Option 1:

1.2.4 the provisions in this Resolution, including Annex 1, set the conditions for the purpose of protecting terrestrial services from unacceptable interference from non-GSO ESIMs in neighbouring countries in accordance with the provisions included in *resolves* 1.2.2 and 1.2.3 above in the frequency band 27.5-29.1 GHz and in the frequency band 29.5-30.0 GHz; however, the requirement not to cause unacceptable interference to, or claim protection from, terrestrial services to which the frequency bands are allocated and operating in accordance with the Radio Regulations remains valid (see *resolves* 6);

Option 2:

1.2.4 the provisions in this Resolution, including Annex 1, set the conditions for the purpose of protecting terrestrial services from unacceptable interference from non-GSO ESIMs in neighbouring countries in accordance with the provisions included in *resolves* 1.2.2 and 1.2.3 above in the frequency band 27.5-29.1 GHz and in the frequency band 29.5-30.0 GHz as guidance for administrations; however, the requirement not to cause unacceptable interference to, or claim protection from, terrestrial services to which the frequency bands are allocated and operating in accordance with the Radio Regulations remains valid (see *resolves* 6);

Option 3:

1.2.4 the provisions in this Resolution, including Annex 1, set the conditions for the purpose of protecting terrestrial services from unacceptable interference from non-GSO ESIMs in neighbouring countries in accordance with the provisions included in *resolves* 1.2.2 and 1.2.3 above in the frequency band 27.5-29.1 GHz and in the frequency band 29.5-30.0 GHz with respect to administrations mentioned in No.**5.542**; however, the requirement not to cause unacceptable interference to, or claim protection from, terrestrial services to which the frequency bands are allocated and operating in accordance with the Radio Regulations remains valid (see *resolves* 6);

There is a need to further analyze the text of the above-mentioned options at WRC‑23.

NOTE: START of a section that was not discussed in detail at CPM23-2

***below 1 (Applies if the relevant methodology is included in Annex 2)***

1.2.5 the Bureau shall examine, in accordance with the provisions included in *resolves* 1.2.2 and 1.2.3 above and with the methodology in Annex 2, the characteristics of aeronautical non‑GSO ESIMs with respect to the conformity with the power flux-density (pfd) limits on the Earth’s surface specified in Part 2 of Annex 1 to this Resolution and publish the results of such examination in the BR IFIC;

1.2.5.1 however, the compliance with the technical conditions in Annex 1, does not release the notifying administration of the A-ESIM and M-ESIM with respect to discharging its responsibility that such earth station shall not cause unacceptable interference and any interrelated receiving part shall not claim protection from the terrestrial stations;

1.2.6 the Bureau shall examine, in accordance with the provisions included in *resolves* 1.2.2 and 1.2.3 above, the characteristics of aeronautical non-GSO ESIMs with respect to the conformity with the power flux-density (pfd) limits on the Earth’s surface specified in Part 2 of Annex 1, and publish the results of such examination in the BR IFIC;

1.2.7should the results of examination of the Bureau with respect to this resolution, including *resolves*1.2.5 above, be satisfactory, the assignments in question would be published in appropriate Bureau’s Special Section and recorded in the MIFR with favourable finding, otherwise the assignments in question shall be returned to the notifying administration with the reasons thereto;

NOTE: END of a section that was not discussed in detail at CPM23-2

1.3 that, in the case unacceptable interference caused by A‑ESIM and/or M‑ESIM is reported:

1.3.1 only the notifying administration of the non-GSO FSS system with which ESIMs communicate is responsible for resolving the case of unacceptable interference;

1.3.2 the notifying administration of the non-GSO FSS system with which the ESIMs communicate shall immediately take the required action to eliminate or reduce interference to an acceptable level;

1.3.3 the affected administration(s) may assist resolving or provide information that would facilitate resolving the case of unacceptable interference;

1.3.4 the administration authorizing the operation of A‑ESIM and M‑ESIM on territory under its jurisdiction, subject to its explicit agreement, may provide assistance, including information for the resolution of unacceptable interference;

1.3.5 the administration responsible for the aircraft or vessel on which the ESIM operates shall provide a point of contact to assist identifying the notifying administration of the satellite with which the ESIM communicates;

1.4 that the notifying administration of non-GSO FSS satellite system with which ESIMs communicate shall ensure that:

1.4.1 for the operation of A‑ESIM and M‑ESIM, techniques are employed to maintain adequate antenna pointing accuracy with the associated non-GSO FSS satellite;

1.4.2 all necessary measures shall be taken so that earth stations on aircraft and vessels are subject to permanent monitoring and control by a Network Control and Monitoring Centre (NCMC) in order to comply with the provisions in this Resolution, and are capable of receiving and immediately acting upon inter alia “enable transmission” and “disable transmission” commands from the NCMC (see Annex 4);

1.4.3 measures are taken so that the A‑ESIM and/or M‑ESIM do not transmit on the territory under the jurisdiction of an administration, including its territorial waters and its national airspace, that has not authorized its use;

1.4.4 the notifying administration of the non-GSO FSS system with which ESIMs communicate shall provide a permanent point of contact in the Appendix **4** submission and this shall be published in the relative special section of the BR IFIC for the purpose of tracing any suspected cases of unacceptable interference from A‑ESIMs or M‑ESIMs and for the purpose of immediately responding to the relevant requests;

NOTE: START of a section that was not discussed in detail at CPM23-2

2 that non-GSO ESIMs shall not be used or relied upon for safety-of-life applications;

3 that the operation of non-GSO ESIMs within the territory, including territorial waters and airspace, under the jurisdiction of any administration shall be carried out only if an authorization or a licence according to No.**18.1** of that administration is obtained;

4 that the notifying administrations of those non-GSO FSS systems with which non-GSO ESIMs in the frequency bands in *considering a)* above are intended to operate shall submit a commitment to the Bureau to immediately act to eliminate or reduce the interference to an acceptable level upon receiving a report of unacceptable interference (see *resolves*5);

**NOTE: END of a section that was not discussed in detail at CPM23-2**

5 in case there is more than one administration involved in the notification of frequency assignments of the same non-GSO satellite system with which ESIMs communicate, those administrations shall nominate one administration as the notifying administration responsible to act on their behalf to be responsible to eliminate any unacceptable interference cases and inform the Bureau accordingly;

**NOTE: START of a section that was not discussed in detail at CPM23-2**

6 that the application of this Resolution does not provide regulatory status to non-GSO ESIMs different from that derived from the non-GSO FSS satellite system with which they communicate, taking into account the provisions referred to in this Resolution (see *recognizing b)*,

7 that any course of action taken under this Resolution has no impact on the original date of receipt of the frequency assignments of the non-GSO FSS satellite system with which non-GSO ESIMs communicate or on the coordination requirements of that satellite system;

**NOTE: END of a section that was not discussed in detail at CPM23-2**

8 the implementation of this Resolution is conditioned on providing a description to the administrations whose authorization is sought and convince them how the interference management system(s), monitoring facilities (NCMC), dealing with the cessation of transmission over territories which have not authorized (*see resolves*3) the functioning and operation of any ESIM over their territories are performed in order to provide a satisfactory resolution of the problem as referred to in *recognizing further d)* above;

9 the compliance to this Resolution does in no way, whatsoever, release the notifying administration(s) from its obligation to not cause unacceptable interference nor claim protection from the incumbent services as indicated in the Resolution,

resolves further

1 that ESIMs shall not cause unacceptable interference to nor claim protection from other services as referred to *recognizing c)* andin relevant *resolve*s mentioned above and *resolves*1.1.1, 1.1.4, 1.1.5, 1.2.1, 1.2.2 and 1.2.4;;

2 that the following obligation and statement shall be submitted to the Bureau:

*a)* the notifying administration of non-GSO ESIMs when submitting Appendix **4** information/data elements shall also send a firm objective, measurable, enforceable and actionable evidence commitment that in case of reported unacceptable interference undatable to immediately cease the interference or reduce it to an acceptable level. Such commitment shall be objective, measurable and enforceable;

*b)* in the commitment the notifying administration of non-GSO ESIMs shall state that in case of no action taken with regard to the obligation referred to in *a)* above, the Bureau shall send a reminder and request that administration to comply with the requirements referred to in commitment;

*c)* should the interference persist 30 days after the dispatch date of the above-mentioned reminder, the Bureau shall submit the case to the subsequent meeting of the RRB for review and eventual suppression from the database of the Bureau and inform the notifying administration accordingly;

3 that, in case of continued unacceptable interference despite of the commitment referred to in *resolves further*2, the assignment causing interference shall be submitted to the Radio Regulation Board for review;

4 that compliance with the provisions contained in Annex 1 does not release the notifying administration of the non-GSO satellite system with which ESIMs communicate of its obligations mentioned in *resolves further*1 above.

NOTE: START of a section that was not discussed in detail at CPM23-2

5 that frequency assignments to ESIMs shall be notified by the notifying administration of the non-GSO satellite system in the FSS with which ESIMs communicate;

6 that the notifying administration of the satellite system shall ensure that non-GSO ESIMs operate only in the territory under the jurisdiction of administrations from which an authorization has been obtained, taking into account *recognizing further* *c)*;

Option 2

7 that ESIMs shall be designed and operate so as to cease transmission over the territory of any administration/country from which authorization has not been obtained;

8 that, for the implementation of *resolves further* 2 above, the system shall employ the minimum software and hardware capabilities listed in Annex 4;

9 that, for the implementation of *resolves further* 1, the notifying administration responsible for the operation of aeronautical and maritime non-GSO ESIMs shall also be responsible for observing and complying with all relevant regulatory and administrative provisions applicable to the operation of the ESIMs as included in this Resolution and those contained in the Radio Regulations;

10 that the authorization to non-GSO ESIM to operate in the territory under the jurisdiction of an administration shall in no way release the notifying administration of the non‑GSO satellite system with which the non-GSO ESIM communicates from the obligation to comply with the provisions included in this Resolution and those contained in the Radio Regulations;

11 that, should an administration authorizing aeronautical non-GSO ESIMs agree to pfd levels higher than the limits contained in Part 2 of Annex 1 to this Resolution within the territory under its jurisdiction, such agreement shall not affect other countries that are not party to that agreement,

instructs the Director of the Radiocommunication Bureau

1 to take all necessary actions to facilitate the implementation of this Resolution, together with providing any assistance for the resolution of interference, when required;

2 to report to future world radiocommunication conferences any difficulties or inconsistencies encountered in the implementation of this Resolution, including whether or not the responsibilities relating to the operation of aeronautical and maritime non-GSO ESIMs have been properly addressed;

3 not to examine, under No. **11.31**, the conformity of non-GSO FSS systems with the provisions of *resolves*1.1.5 of this Resolution,

4 to report to future world radiocommunication conferences any difficulties or inconsistencies encountered in the implementation of Recommendation ITU‑R S.1503 for verifying that the non-GSO FSS systems under this Resolution comply with the epfd limits specified in Article **22**;

5 to publish the list of non-GSO satellite systems with which ESIM communicate brought into use with information about its service area and countries authorize such use if any; this information shall be updated regularly,

invites administrations

to take into consideration the relevant recommendations to employ Annex 4 procedures when licensing/authorizing the operation of earth stations in motion in their territories,

instructs the Secretary-General

to bring this Resolution to the attention of the Secretary-General of the International Maritime Organization and of the Secretary General of the International Civil Aviation Organization.

**NOTE: END of a section that was not discussed in detail at CPM23-2**

Annex 1 to draft new Resolution [A116] (WRC‑23)

NOTE: Annex 1 was not discussed in detail at CPM23-2

**WRC‑23 NEEDS TO DISCUSS THIS**

Provisions for maritime and aeronautical non-GSO ESIMs to protect terrestrial services operating in the frequency band 27.5-29.1 GHz and for the frequency band 29.5-30.0 GHz with respect to/on the territories of/in relation to administrations mentioned in No. 5.542 /as a guidance for administrations when considering to authorize the A‑ESIM and M‑ESIM in their territories



Annex 2 to draft new Resolution [A116] (WRC‑23)

Methodology with respect to the examination referred to in Scenario 1 *resolves*1.2.5

Annex 3 to draft new Resolution [A116] (WRC‑23)

Provisions for non-GSO FSS systems[[1]](#footnote-1)1 transmitting to aeronautical and/or maritime ESIMs operating in or over an ocean in the frequency bands   
18.3-18.6 GHz and 18.8-19.1 GHz with respect to EESS (passive)   
operating in the frequency band 18.6-18.8 GHz   
(in accordance with *resolves*1.1.6)

Option 1:

Non-GSO fixed-satellite space stations operating with an orbit apogee less than 20 000 km in the frequency bands 18.3-18.6 GHz and 18.8-19.1 GHz with an aeronautical or maritime ESIM shall not exceed a pfd produced at the surface of the oceans across the 200 MHz of the frequency band 18.6-18.8 GHz, of −123 dB(W/(m² ∙ 200 MHz)). This value can be exceeded provided that the non-GSO fixed-satellite system does not exceed a pfd across the 200 MHz of the frequency band 18.6-18.8 GHz of −137 dB(W/(m² ∙ 200 MHz)) averaged over an area of 10 000 000 km² at the surface of the oceans.

Option 2:

Non-GSO fixed-satellite space stations operating with an orbit apogee less than 20 000 km in the frequency bands 18.3-18.6 GHz and 18.8-19.1 GHz over oceans with aeronautical or maritime ESIM shall not exceed the following pfd values produced at the surface of the oceans across the 200 MHz of the 18.6-18.8 GHz band:

−123 dB(W/(m² · 200 MHz)) for non-GSO FSS space stations operating at orbital altitudes greater than 2 000 km;

−117 dB(W/(m² · 200 MHz)) for non-GSO FSS space stations operating at orbital altitudes between 1 000 km and 2 000 km;

−104 dB(W/(m² · 200 MHz)) for non-GSO FSS space stations operating at orbital altitudes below 1 000 km.

Option 3:

Any non-GSO fixed satellite space station operating in the frequency bands 18.3-18.6 GHz and 18.8-19.1 GHz with (i) an orbit apogee less than 20 000 km (ii) communicating with an aeronautical or maritime ESIM over the ocean, and (iii) for which complete notification information has been received by the Radiocommunication Bureau after 1 January 2025, shall not exceed an unwanted emission power flux-density produced at the surface of the ocean in the 18.6-18.8 GHz band, based on the following piecewise equation:

|  |  |  |
| --- | --- | --- |
| *for N ≥ 10:* | *pfd* = *min*(−77 − 10 \* log(*S*) −110) | dB(W/(m² · 200 MHz)) |
| *for N < 10:* | *pfd* = *min*(−67 − 10 \* log(*S*) − 10 \* log(*N*), −110) | dB(W/(m² · 200 MHz)) |

where *S* is the non-GSO fixed satellite space station 3 dB beam footprint area on the ground expressed in km² and *N* is the maximum number of co-frequency beams generated by the non-GSO fixed satellite system within a 10 000 000 km2 square on the Earth.

NOTE: Annex 4 was not discussed in detail at CPM23-2

WRC‑23 NEEDS TO DISCUSS THIS ANNEX



Table a4-1

Minimum ESIM capabilities and justification

| Capability | Justification |
| --- | --- |
| GNSS (or other geolocation capabilities) | Required to assess the ESIM’s geographic location so the ESIM is aware when entering an administration’s territory that has not given authorization and feedback to software to cease transmissions accordingly. |
| Monitor and control of the transmission frequency | Required to anticipate an error in transmission frequency, which could potentially lead to interference out of assigned transmission band. |
| Internal power off/on/reset | Required for the ESIM to have the ability to self-power down after experiencing a fault condition, then restart or power back on when fault is resolved. |
| Disable/enable transmission and level adjustment | Required to cease, adjust and re-enable transmissions as necessary to mitigate interference or unauthorized transmissions. |
| Receive and execute commands from NCMC | Required to receive commands to enable/disable transmission from NCMC or other commands as necessary to mitigate interference or unauthorized transmissions. |



\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. 1 These provisions do not apply to non-GSO systems using orbits with an apogee less than 2 000 km that employ a frequency reuse factor of at least three. [↑](#footnote-ref-1)