

EACO 4th WRC-23 Online Preparatory Meeting

28th February 2022

Chapter 4A - South Sudan

Agenda Item 1.15 (In-Flight/Onboard Connectivity - IFC)

Part A: Description

to harmonize the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels communicating with geostationary space stations in the fixed-satellite service globally, in accordance with Resolution 172 (WRC-19);

Part B: Key Elements - the notables

Resolution 172 (WRC-19) invites the ITU-R to study the sharing and compatibility issues between earth stations on aircraft and vessels communicating with GSO space stations in the FSS and current and planned stations of existing services allocated in the band, as well as services in adjacent frequency bands, to ensure protection of, and not impose undue constraints on those services and their future development, taking into account the provisions of RR Appendix 30B.

1. Resolution 172 invites the ITU Radiocommunication Sector:

- i. to study the technical and operational characteristics and user requirements of earth stations on aircraft and vessels that communicate or plan to communicate with GSO space stations in the FSS in the frequency band 12.75-13.25 GHz (Earth-to-space) under the envelope of Appendix 30B Article 6 recorded in the List or MIFR with favourable finding only and examination of related existing regulatory provisions;
- ii. to study the sharing and compatibility issues between earth stations on aircraft and vessels communicating with GSO space stations in the FSS and current and planned stations of existing services as well as services in bands adjacent to those, to ensure protection of, and not impose undue constraints on, those services and their future development, taking into account the provisions of Appendix 30B;
- iii. to study the responsibility of the entities involved in the operation of the earth stations on aircraft and vessels in this Resolution;

- iv. to develop the criteria to ensure that earth stations on aircraft and vessels as a new application of FSS in this frequency band shall not claim more protection or cause more interference than filed earth stations in Appendix 30B;
 - v. to develop the technical conditions and regulatory provisions for the harmonized operation of earth stations on aircraft and vessels communicating with GSO space stations in the FSS operating in the frequency band 12.75-13.25 GHz (Earth-to-space), considering the results of the studies outlined in resolves to invite ITU-R 1 and 2, and in particular without affecting the Appendix 30B Plan;
 - vi. to ensure that the operation of earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz under Appendix 30B shall not adversely affect the criteria set out in Annex 4 of said appendix, including the cumulative effect of multiple earth stations on aircraft and vessels;
 - vii. to ensure that the use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels shall not limit the access of other administrations to their national resources in Appendix 30B as well as implementation of Resolution 170(WRC-19);
 - viii. to ensure that the use of earth stations on aircraft and vessels in this Resolution would not result in any additional status than the GSO network with which these stations communicate;
 - ix. to ensure that the results of ITU-R studies are agreed by Member States by consensus.
2. Aeronautical and maritime routes are often out of reach of terrestrial networks and must rely on satellite connectivity. In addition, ships and airplane need automated digital data processing for their operation. The satellite user terminal can provide the connectivity to the Internet to meet that demand while in motion around the globe.
3. The frequency band 12.75-13.25 GHz is used by the geostationary-satellite (GSO) FSS in accordance with the provisions of Appendix 30B;
4. There is no methodology on how to protect neighboring space stations of Appendix 30B from earth stations on aircraft and vessels communicating with a GSO FSS space station;
5. Unlike the unplanned frequency bands, under the Appendix 30B (AP30B) Plan the explicit agreement of an administration is required under the Appendix 30B (AP30B) Plan in order to include it territory in the service area of a given AP30B FSS network (No. 6.6 of AP30B);
6. A review by the BR of the service area of existing AP30B assignments in the MIFR

showed that generally the service areas of AP30B networks are non-contiguous and the number of countries in these service areas ranges from one to fifty countries;

7. Additionally, No. 6.16 of AP30B provides that an administration can exclude its territory from the service area of an AP30B network at any time. Therefore, aeronautical or maritime earth stations in the 12.75-13.25 GHz band need to have the capability to restrict operations to territories of those administrations where agreement under No. 6.6 has been obtained and authorization for such operations has been granted;
8. In addition, Procedure to be followed by the Bureau for the protection of fixed-satellite service in Appendix 30B from earth stations on aircraft and vessels operating in the frequency band 12.75-13.25 GHz is currently being discussed as separate procedure beyond normal Appendix 30B procedure will be developed for operation of earth station in board aircraft or maritime.
9. *WP4A as the SWG dealing with WRC-23 AI 1.15 met four times and considered eleven input contributions in addition to information provided by the BR during the meeting. The contributions covered both regulatory matters and technical studies on sharing with other services.*
10. *The SWG produced six output documents that include: LSs to WP 5A and WP 7C; the Work Plan for WRC-23 AI 1.15; updated ToR for Correspondence Group 1 (CG#1); the WD on AI 1.15 (see [Annex 15](#)) to address the various areas that need to be dealt with under this AI, and a document that includes draft CPM text and an associated WRC-23 Resolution [A115]. This is a very complex agenda item given that the FSS spectrum is subject to the RR Appendix 30B world-wide Plan.*
11. *Great progress was made in agreeing to Annex 1 of the WRC-23 draft Resolution [A115] (see [Annex 25](#)) addressing procedures for administrations and the BR for submitting/notifying earth stations on board aircraft and vessels in the 12.75-13.25 GHz band and protection of allotments in the Plan, assignments in the RR Appendix 30B List and those submitted under Articles 6 and 7 of RR Appendix 30B as well as under Resolution 170 (WRC-19). This annex also includes a procedure for the BR examination and protection between ESIM.*

Part C: Status of the Bands under consideration

Part A RR article 5 :

Region 1	Region 2	Region 3
12.5-12.75 FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B	12.7-12.75 FIXED FIXED-SATELLITE (Earth-to-space)	12.5-12.75 FIXED FIXED-SATELLITE (space-to-Earth) 5.484A

(Earth-to-space) 5.494 5.495 5.496	MOBILE except aeronautical mobile	5.484B MOBILE except aeronautical mobile BROADCASTING- SATELLITE 5.493
12.75-13.25	FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)	
13.25-13.4	EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499	

Part B Draft AfriSAP:

ITU Region 1 allocations and footnotes	Africa Common Allocation(s) and footnotes	Typical Applications	Additional information
12.5-12.75 GHz FIXED-SATELLITE (space-to-Earth) 5.484A 5.484B (Earth-to-space) 5.494 5.495 5.496	12.5-12.75 GHz FIXED-SATELLITE (space- to-Earth) 5.484A 5.484B (Earth-to-space) 5.494[AddA22] 5.495[AddA2]	FSS uplinks (VSAT/SNG) (12.5- 12.75 GHz) Aeronautical Earth Stations/ ESV/ESIM Applications NGSO FSS Fixed links	Article 9.12 applies Res. 155 (WRC - 15) applies

12.75-13.25 GHz FIXED FIXED-SATELLITE (Earth-to-space) 5.441 MOBILE Space research (deep space) (space-to- Earth)	12.75-13.25 GHz FIXED FIXED-SATELLITE (Earth- to-space) 5.441 MOBILE Space research (deep space) (space-to-Earth)	Fixed links - 13 GHz (12.75-13.25 GHz)	Channelling plan for 13 GHz band in accordance with ITU-R Rec. F.497 The band 12.75- 13.25 GHz is part of the APP30B Plan (FSS Earth- to-space); refer to Annex C. Article 9.12 applies Res. 172 (WRC-19) applies
13.25-13.4 GHz EARTH EXPLORATION- SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A 5.499	13.25-13.4 GHz EARTH EXPLORATION- SATELLITE (active) AERONAUTICAL RADIONAVIGATION 5.497 SPACE RESEARCH (active) 5.498A	Airborne Doppler Radar	

Part D: Conclusions of the Results of Studies if any

1. The studies are still ongoing within the ITU-R Working Party 4A.
2. There is a working document on WRC-23 agenda item 1.15 which is compilation of the inputs received at the WP 4A meeting.
3. The sharing studies are focusing on following scenarios:
 - i. Sharing and compatibly between earth stations on aircraft/vessels and terrestrial services (fixed and mobile);
 - ii. Sharing and compatibly between earth stations on aircraft/vessels and aeronautical radio navigation in band 13.25-13.40 GHz;
 - iii. Sharing and compatibly between earth station on aircraft/vessels and FSS (including AP30B assignments);
 - iv. Sharing and compatibly between earth station on aircraft/vessels and EESS (active) and Space Research in band 13.25-13.40 GHz.
4. The second document contains a draft CPM text and draft new Resolution [A115] (WRC-

23) based on inputs received at WP 4A meetings. The document was not fully discussed and agreed to.

5. *At the last meeting, four studies on compatibility with other systems and services were discussed. LSs were sent to WP 5A and WP 7C on studies regarding the mobile service and Earth exploration-satellite service, respectively, with a request for comment.*
6. *However, there remain critical areas that need further work including addressing the responsibilities of different administrations involved in the operation of ESIM in this band;*
 - i. *Completing studies on pfd mask(s) for the protection of terrestrial services from aeronautical earth stations;*
 - ii. *Developing a methodology for BR examination of these pfd masks;*
 - iii. *Finalizing the language of WRC-23 Resolution [A115] including the preamble and operative parts;*
 - iv. *Updating the draft CPM text including the inclusion of appropriate elements from the WD.*
7. *CG#1 has been working between the end of the last WP 4A meeting and the next WP 4A meeting in May 2022 in an effort to progress the work in accordance with the agreed ToR. Outputs from the CG will be submitted to WP 4A for consideration.*

Part E: Options and Associated Implications

Method A: No changes to the Radio Regulations and suppression of Resolution 172 (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 earth stations on aircraft and vessels communicating with GSO space stations in the fixed-satellite service in the frequency band 12.75-13.25 GHz (Earth-to-space) while ensuring protection of allocated services and consequential suppression of Resolution 172 (WRC-19).

Part F: Proposed EACO Preliminary View and or Position

EACO is invited to Support studies on the regulatory and technical aspects for ESIMs on aircraft and vessels communicating with GSO space stations in the FSS operating in the frequency band 12.75-13.25 GHz (Earth-to-space) in the following interests;

- i. Protection to the existing services and those in the adjacent bands within the frequency band 13.25–13.75 GHz), taking into account the provisions of Appendix 30B.
- ii. Consider and mitigate the effect of aggregated interference from GSO ESIMs to ensure long term protection of Fixed and Mobile Service stations.
- iii. Consider the impact of operation of such stations on the usability of the allotments in the Plan and assignments in the List under Appendix 30B of the Radio Regulations and not limit the access of other administrations to their national resources in Appendix 30B as

well as implementation of Resolution 170 (WRC 19).

- iv. Development of a methodology for the BR to examine the conformity of earth stations on aircraft and vessels in case of usage of a pfd to protect terrestrial services from ESIM with such methodology needs to be established and agreed upon.
- v. That aeronautical or maritime earth stations in the 12.75 13.25 GHz band have the capability to restrict operations in territories of those administrations where agreement under No. 6.6 has been obtained and authorization for such operations has been granted.
- vi. Subject to the result of studies, there may be need to establish regulatory, technical and recording procedures for the usage of these type of Earth Stations (ESIMs) that may differ than the current FSS Appendix 30B Plan and list recording procedures. Although it may require to review and consider the Cost recovery fees and networks filings to be used for these purposes.
- vii. Seek to ensure that the use of ESIMs with satellite networks that have a global coverage in Appendix 30B do not create an obstacle for deployment of national or sub-regional satellite networks of other countries in RR APP 30B in accordance with topic F under AI 7 which are initiated from Multi African administration proposal.
- viii. Support that the administrations responsible for notice to use an Appendix 30B assignment in the List in support of the operation of earth stations on aircraft and vessels in the frequency band 12.75-13.25 GHz, to seek the explicit agreement of all the affected administrations from such use.

Part G: Recommendations and way forward

1. Follow up the studies between earth stations on aircraft and vessels communicating with GSO space stations in the FSS and current and planned stations of existing as well as services in adjacent frequency bands, to ensure protection of, and not impose undue constraints on, those services and their future development, considering the provisions of Appendix 30B in accordance with Resolution 172 (WRC-19).
2. Follow up the regulatory and technical aspects of operations of earth stations on aircraft and vessels communicating with GSO space stations in international waters and airspace.
3. Encourage administration to conduct an audit of spectrum utilization in the frequency band 12.75 – 13.25 GHz within their countries
4. Contribute to the ITU-R WP4A work, in order to have EACO views addressed in the Agenda item.

Part G: Other Regional Groups and International Organisations Preliminary Views or Positions

APT:

- Operation of such earth stations on aircraft and vessels should not impact the usability of the allotments in the Plan and assignments in the List under Appendix 30B of the Radio Regulations.
- Use of the frequency band 12.75-13.25 GHz (Earth-to-space) by earth stations on aircraft and vessels shall not limit the access of other administrations to their national resources in Appendix **30B** as well as implementation of Resolution **170 (WRC-19)**.

ASMG: To be established in the next meeting

CEPT:

- Supports establishing a regulatory framework and technical requirements for operation of earth stations on aircraft in the frequency band 12.75-13.25 GHz (Earth-to-space) with conditions that protect the services currently allocated in this frequency band and bands adjacent to it, taking into account ECC Decision (19)04.
- Supports establishing a regulatory framework and technical requirements for operation of earth stations on vessels in the frequency band 12.75-13.25 GHz (Earth-to-space) pending on the results of the studies conducted on protection of services currently allocated in this frequency band and bands adjacent to it.
- Considers that earth stations on aircraft and vessels in the frequency range 12.75-13.25 GHz shall operate consistent with the Appendix **30B** procedures, protect the Appendix **30B** allotments in the Plan and assignments in the List and respect Resolution **170 (WRC-19)**.
- Supports the operation of these earth stations in and over the territories of administrations that have given agreement under No. 6.6 of Article 6 of Appendix **30B** and within the envelope of notified earth station characteristics.
- Supports to study regulatory and technical aspects of operations of earth stations on aircraft and vessels in international waters and airspace.

RCC

- The RCC Administrations are in favour of the study-based development of technical requirements and regulatory provisions for ESIMs on aircraft and vessels for the harmonized operation of such earth stations communicating with GSO space stations in the FSS operating in the frequency band 12.75-13.25 GHz (Earth-to-space), while ensuring protection to the existing services and those in the adjacent bands (i.e. EESS (active) within the frequency band 13.25–13.75 GHz), taking into account the provisions of Appendix **30B**.
- The RCC Administrations consider that ESIMs on aircraft and vessels shall operate in the frequency band 12.75-13.25 GHz (Earth-to-space) within the envelope of the earth station's characteristics notified under the satellite network and also within the agreements reached by administrations under §§ 6.5, 6.6 and 6.16 of Article 6, Appendix **30B**.
- The RCC Administrations consider that the use of ESIM on aircraft and vessels in the frequency band 12.75-13.25 GHz (Earth-to-space) shall be allowed within the frequency assignments to satellite networks notified and recorded in accordance with provisions of Articles 6 and 8 of RR Appendix **30B**.