

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

13 - 15 December 2021

www.itu.int/go/ITU-R/wrc-23-irwsp-21

#ITUWRC

**Session 3 Aeronautical & Maritime
Issues**

WRC-23 agenda item 1.6

John Mettrop
Chairman WP 5B



Agenda Item 1.6

to consider, in accordance with Resolution **772 (WRC-19)**,
regulatory provisions to facilitate radiocommunications for sub-
orbital vehicles

Responsible Group **WP-5B** **Chair: J Mettrop (UK),** **WG Chair: Jerome André**

Contributing Groups **WP-3M, WP-4A, WP-4C, WP-7B & WP 7D**

Resolution 777 (WRC-19)

Consideration of regulatory provisions to facilitate the introduction of sub-orbital vehicles

resolves to invite ITU-R

1 to study spectrum needs for communications between stations on board sub-orbital vehicles and terrestrial/space stations providing functions such as, *inter alia*, voice/data communications, navigation, surveillance and TT&C;

resolves to invite ITU-R (continued)

2 to study appropriate modification, if any, to the Radio Regulations, excluding any new allocations or changes to the existing allocations in Article 5, to accommodate stations on board sub-orbital vehicles, whilst avoiding any impact on conventional space launch systems with the following objectives:

- to determine the status of stations on sub-orbital vehicles, and study corresponding regulatory provisions to determine which existing radiocommunication services can be used by stations on sub-orbital vehicles, if necessary;
- to determine the technical and regulatory conditions to allow some stations on board sub-orbital vehicles to operate under the aeronautical regulation and to be considered as earth stations or terrestrial stations even if a part of the flight occurs in space;
- to facilitate radiocommunications that support aviation to safely integrate sub-orbital vehicles into the airspace and be interoperable with international civil aviation;
- to define the relevant technical characteristics and protection criteria relevant for the studies to be undertaken in accordance with the bullet point below;
- to conduct sharing and compatibility studies with incumbent services that are allocated on a primary basis in the same and adjacent frequency bands in order to avoid harmful interference to other radiocommunication services and to existing applications of the same service in which stations on board sub-orbital vehicles operate, having regard to the sub-orbital flight application scenarios;

resolves to invite ITU-R (continued)

3 to identify, as a result of the studies above, whether there is a need for access to additional spectrum that should be addressed after WRC-23 by a future competent conference,

Invites ICAO

to participate in the studies and provide to ITU the relevant technical characteristics required for the studies called for in *resolves to invite ITU-R*,

invites the 2023 World Radiocommunication Conference

to consider the results of the studies above and take the appropriate action,

instructs the Director of the Radiocommunication Bureau

to bring this Resolution to the attention of the relevant ITU-R study groups,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R,



Methods Proposed to Solve the Agenda Item

Method A

No change to the Radio Regulations

Method B

A WRC Resolution, not incorporated by reference in the Radio Regulations, on the assignment and use of frequencies for sub-orbital vehicles

Method C

Modification of Radio Regulations Article 4 to clarify the use of *fixed*, *mobile* and *mobile-satellite*, radionavigation-satellite, and *radiodetermination* service allocations for radiocommunications with and used by suborbital vehicles

Note: These methods are included in the working document towards Draft CPM Text for WRC-23 AI 1.6 but have not been agreed as option by the Working Party

Relevant Documents

- 5B/481 [Annex 1](#) Working document towards draft CPM text for WRC-23 agenda item 1.6
- 5B/481 [Annex 2](#) Work plan for WRC-23 agenda item 1.6
- 5B/481 [Annex 30](#) Working document towards preliminary draft new Report on WRC-23 agenda item 1.6 [suborbital vehicles studies] - Regulatory, operational, and technical studies of radiocommunications for suborbital vehicles

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

13 - 15 December 2021

www.itu.int/go/ITU-R/wrc-23-irwsp-21

#ITUWRC

**Session 3 Aeronautical & Maritime
Issues**

WRC-23 agenda item 1.7

John Mettrop
Chairman WP 5B



Agenda Item 1.7

to consider a new aeronautical mobile-satellite (R) service (AMS(R)S) allocation in accordance with Resolution **428 (WRC-19)** for both the Earth-to-space and space-to-Earth directions of aeronautical VHF communications in all or part of the frequency band 117.975-137 MHz, while preventing any undue constraints on existing VHF systems operating in the AM(R)S, the ARNS, and in adjacent frequency bands

Responsible Group **WP-5B** Chair: J Mettrop (UK), **WG Chair: Jerome André**

Contributing Groups **WP-3M, WP-4C & WP-7B**

Resolution 428 (WRC-19)

Studies on a possible new allocation to the aeronautical mobile satellite (R) service within the frequency band 117.975-137 MHz in order to support aeronautical VHF communications in the Earth-to-space and space-to-Earth directions

resolves to invite ITU-R

- 1 to define the relevant technical characteristics and to study, taking into account *considering c)* and taking into account No. **5.200**, compatibility between potential new AMS(R)S systems that operate within the frequency band 117.975-137 MHz in the Earth-to-space and space-to-Earth directions and existing primary services in band and in adjacent frequency bands, while ensuring protection of systems using existing primary services in those frequency bands and not constraining planned usage of those systems;
- 2 to take into account the results of the studies, to provide technical and regulatory recommendations relative to a possible new allocation to AMS(R)S within the frequency band 117.975-137 MHz, taking into consideration the responsibility of ICAO in *noting b)*,



invites the 2023 World Radiocommunication Conference

to consider the results of the studies and take appropriate actions, including possible primary allocation to AMS(R)S within the frequency band 117.975-137 MHz,

invites Member States and Sector Members

to participate actively in the studies and to submit characteristics of any current and planned systems to be studied, as appropriate,

invites the International Civil Aviation Organization

to participate in the studies by providing aeronautical operational requirements and relevant available technical characteristics to be taken into account in ITU-R studies and to take into account the sharing and compatibility conclusions at ITU-R in the SARPs to be developed for AMS(R)S,

instructs the Secretary-General

to bring this Resolution to the attention of ICAO.



Methods Proposed to Solve the Agenda Item

Method A

No change to the Radio Regulations

Method B

Add a new primary allocation to the aeronautical mobile-satellite (R) service (AMS(R)S) in the band 117.975-136 MHz, limited to internationally standardized aeronautical systems.

Method C

Add a new primary allocation for the AMS(R)S service in the band 117.975-[136/137] MHz limiting to systems that operate in accordance with international Standards and Recommended Practices and procedures established in accordance with the Convention on International Civil Aviation

Method D

Create a new co-primary allocation for the AMS(R)S service in the band 117.975-137 MHz on the condition that maximum power flux density radiated over the Earth above 137 MHz is limited to [197.7 dB(W/(m² · Hz))] and limited to internationally standardized aeronautical systems

Note: These methods are included in the working document towards Draft CPM Text for WRC-23 AI 1.7 but have not been agreed as option by the Working Party

Relevant Documents

5B/481 [Annex 3](#)

Working Document towards draft CPM text for WRC-23 agenda item 1.7

5B/481 [Annex 33](#)

Working document towards a preliminary draft new Report ITU-R M.[Space-VHF] - Working document related to WRC-23 agenda item 1.7 - Space-based aeronautical VHF communications in 117.975-137 MHz frequency band

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

13 - 15 December 2021

www.itu.int/go/ITU-R/wrc-23-irwsp-21

#ITUWRC

**Session 3 Aeronautical & Maritime
Issues**

WRC-23 agenda item 1.8

John Mettrop
Chairman WP 5B



Agenda Item 1.8

to consider, on the basis of ITU-R studies in accordance with Resolution **171 (WRC-19)**, appropriate regulatory actions, with a view to reviewing and, if necessary, revising Resolution **155 (Rev.WRC-19)** and No. **5.484B** to accommodate the use of fixed-satellite service (FSS) networks by control and non-payload communications of unmanned aircraft systems

Responsible Group **WP-5B** Chair: J Mettrop (UK), **WG Chair: Per Hovstad**

Contributing Groups **WP-4A & WP-4B**

Resolution 171 (WRC-19)

Review and possible revision of Resolution **155 (Rev.WRC-19)** and No. **5.484B** in the frequency bands to which they apply

resolves to invite ITU-R

- 1 to continue and complete in time for WRC 23 relevant studies of the technical, operational and regulatory aspects, based on the frequency bands mentioned in resolves 1 of Resolution **155 (Rev.WRC 19)**, in relation to the implementation of Resolution **155 (Rev.WRC 19)**, taking into account the progress obtained by ICAO in the completion of SARPs on the use of FSS for the UAS CNPC links;
- 2 to review No. **5.484B** and Resolution **155 (Rev.WRC 19)** taking into account the results of the above studies,

resolves to invite WRC 23

to revise, if necessary, No. **5.484B** and Resolution **155 (Rev.WRC 19)** and take other necessary actions, as appropriate, on the basis of the studies conducted under Resolution **155 (Rev.WRC 19)** and resolves to invite ITU R above,

instructs the Secretary-General

to bring this Resolution to the attention of the Secretary-General of ICAO.

Methods Proposed to Solve the Agenda Item

No methods have yet been included in the working Document towards Draft CPM Text although two different approaches have been proposed in contributions received by Working Party 5B but neither has been agreed too.

Approach 1

Develop a new Resolution based on existing WRC Resolutions **155** (UAV) & **169** (ESIMS)

Approach 2

Revise WRC Resolution **155**

Note: Work on methods is awaiting to see whether agreement can be reached on the principles document

Relevant Documents

5B/481 Annex 4	Working document towards draft CPM text for WRC-23 agenda item 1.8
5B/481 Annex 5	Work plan for WRC-23 agenda item 1.8
5B/481 Annex 35	Information by the Director, Radiocommunication Bureau, on characteristics of earth stations communicating with space stations in the fixed satellite service which are in compliance with Resolution 155 (Rev.WRC-19)
5B/355 Annex 31	Characteristics of unmanned aircraft system control and non-payload Earth stations for use with space stations operating in the Fixed Satellite Service
???	Principles document

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

13 - 15 December 2021

www.itu.int/go/ITU-R/wrc-23-irwsp-21

#ITUWRC

Session 3 Aeronautical & Maritime Issues

WRC-23 agenda item 1.9

John Mettrop
Chairman WP 5B



Agenda Item 1.9

to review Appendix **27** of the Radio Regulations and consider appropriate regulatory actions and updates based on ITU-R studies, in order to accommodate digital technologies for commercial aviation safety-of-life applications in existing HF bands allocated to the aeronautical mobile (route) service and ensure coexistence of current HF systems alongside modernized HF systems, in accordance with Resolution **429 (WRC-19)**

Responsible Group **WP-5B** **Chair: J Mettrop (UK),** **WG Chair: Jerome André**

Contributing Groups **WP-3L, WP-3M & WP-6A**

Resolution 429 (WRC-19)

Consideration of regulatory provisions for updating Appendix 27 of the Radio Regulations in support of aeronautical HF modernization

resolves to invite ITU-R

- 1 to identify any necessary modifications to Appendix **27** for the aeronautical mobile (route) service between 2 850 and 22 000 kHz noting *recognizing c*);
- 2 to identify any necessary transition arrangements for the introduction of new digital aeronautical wideband HF systems and any consequential changes to Appendix **27**;
- 3 to recommend how new digital aeronautical wideband HF systems can be introduced while ensuring compliance with safety requirements and *recognizing e*);

resolves to invite ITU-R (continued)

4 to define the relevant technical characteristics and to conduct any necessary sharing and compatibility studies, taking account *noting e)*, with incumbent services that are allocated on a primary basis in the same or adjacent frequency bands to avoid harmful interference in accordance with *recognizing e)*;

5 to complete studies in time for WRC-23,

resolves to invite WRC-23

to consider necessary changes to Appendix **27**, on the basis of the studies conducted under *resolves to invite ITU-R* above,

instructs the Secretary-General

to bring this Resolution to the attention of the International Civil Aviation Organization,

invites the International Civil Aviation Organization

to participate actively by providing aeronautical operational requirements and relevant available technical characteristics to be taken into account in ITU-R studies



Methods Proposed to Solve the Agenda Item

No methods have yet been proposed or developed for this agenda item due to priority changes as a result of Covid

Relevant Documents

- 5B/355 [Annex 04](#) Working document towards draft CPM text for WRC-23 agenda item 1.9
- 5B/355 [Annex 03](#) Work plan for WRC-23 agenda item 1.9
- 5B/355 [Annex 32](#) Working document towards preliminary draft new Report ITU-R M.[Aero-WidebandHF] – Aeronautical Wideband HF

Note: No contributions aimed at advancing this agenda item were received at the last meeting of WP-5B

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

13 - 15 December 2021

www.itu.int/go/ITU-R/wrc-23-irwsp-21

#ITUWRC

Session 3 Aeronautical & Maritime Issues

WRC-23 agenda item 1.10

John Mettrop
Chairman WP 5B



Agenda Item 1.10

to conduct studies on spectrum needs, coexistence with radiocommunication services and regulatory measures for possible new allocations for the aeronautical mobile service for the use of non-safety aeronautical mobile applications, in accordance with Resolution **430 (WRC-19)**

Responsible Group **WP-5B** **Chair: J Mettrop (UK),** **WG Chair: Jerome André**

Contributing Groups **WP-3K, WP-3M, WP-4A, WP-5A, WP-5C, WP-7C & WP-7D**

Resolution 430 (WRC-19)

Studies on frequency-related matters, including possible additional allocations, for the possible introduction of new non-safety aeronautical mobile applications

resolves to invite ITU-R

to conduct, and complete in time for WRC-23:

- 1 studies on spectrum needs for new non-safety aeronautical mobile applications for air-to-air, ground-to-air and air-to-ground communications of aircraft systems;
- 2 sharing and compatibility studies in the frequency band 22-22.21 GHz, already allocated on a primary basis to the mobile, except aeronautical mobile, service, in order to evaluate the possible revision or deletion of the “except aeronautical mobile” restriction while ensuring the protection of primary services in the considered frequency bands and, as appropriate, in adjacent frequency bands;

resolves to invite ITU-R (continued)

3 sharing and compatibility studies on possible new primary allocations to the aeronautical mobile service for non-safety aeronautical applications in the frequency band 15.4-15.7 GHz, while ensuring the protection of primary services in the considered frequency bands and, as appropriate, adjacent frequency bands;

4 definition of appropriate protection for passive services and radio astronomy allocated in adjacent bands from unwanted emission of AMS,

invites the 2023 World Radiocommunication Conference

to review the results of the ITU-R studies and take appropriate actions,

invites administrations

to participate actively in the studies by submitting contributions to ITU-R

Methods Proposed to Solve the Agenda Item

No methods have yet been proposed or developed for this agenda item

Relevant Documents

- 5B/225 [Annex 6](#) Working document towards draft CPM text for WRC-23 agenda item 1.10
- 5B/225 [Annex 7](#) Work plan for WRC-23 agenda item 1.10
- 5B/481 [Annex 31](#) Working document towards a preliminary draft new Report ITU-R [NON-SAFETY AMS CHARACTERISTICS AND SHARING STUDIES] related to WRC-23 agenda item 1.10 - Technical characteristics, operational scenarios, spectrum needs, coexistence, and sharing studies of non-safety aeronautical mobile systems in the frequency bands 15.4-15.7 GHz and 22-22.21 GHz

ITUEvents

1st ITU Inter-regional Workshop on WRC-23 preparation

13 - 15 December 2021

www.itu.int/go/ITU-R/wrc-23-irwsp-21

#ITUWRC

Session 3 Aeronautical & Maritime Issues

WRC-23 agenda item 1.11 Resolves 1 & 2

John Mettrop
Chairman WP 5B



Agenda Item 1.11

to consider possible regulatory actions to support the modernization of the Global Maritime Distress and Safety System and the implementation of e-navigation, in accordance with Resolution **361 (Rev.WRC-19)**

Responsible Groups

Resolves 1 & 2

WP-5B Chair: J Mettrop (UK),

WG Chair: Fer

Resolves 3

WP-4C

Contributing Groups

WP-4C & WP-7B

Resolution 361 (Rev. WRC-19)

Consideration of possible regulatory actions to support the modernization of the Global Maritime Distress and Safety System and the implementation of e-navigation

resolves to invite the 2023 World Radiocommunication Conference

- 1 to consider possible regulatory actions, based on the ITU Radiocommunication Sector (ITU-R) studies, taking into consideration the activities of IMO, as well as information and requirements provided by IMO, to support GMDSS modernization;
- 2 to consider possible regulatory actions, including spectrum allocations based on the ITU Radiocommunication Sector (ITU-R) studies, for the maritime mobile service, supporting e-navigation;
- 3 to consider regulatory provisions, if any, based on the results of ITU-R studies, referred to in *invites ITU-R* below, to support the introduction of additional satellite systems into the GMDSS,



invites ITU-R

to conduct studies taking into consideration the activities of IMO and other relevant international organizations, in order to determine spectrum needs and regulatory actions to support GMDSS modernization and the implementation of e-navigation, including the introduction of additional satellite systems into the GMDSS,

instructs the Secretary-General

to bring this Resolution to the attention of IMO and other international and regional organizations concerned.

Methods Proposed to Solve the Agenda Item

Issue A

Method A1

Removal of narrow band direct printing (NBDP) from the global maritime distress and safety system (GMDSS) and introduction of an automatic connection system (ACS) for MF and selected HF bands; Introduction of the NAVDAT in the Radio Regulations

Method A2

Automatic identification system search and rescue transmitter to be used as homing Equipment for Survival craft station

Method A3

Allow the use of the frequency band 1 645.5 - 1 646.5 MHz, currently reserved for emergency position indicating radio beacons (EPIRBs), to be used by GMDSS and general maritime radiocommunication

Methods Proposed to Solve the Agenda Item

Issue B

Method B1

No Change as the provisions with the current Radio Regulations are sufficient to address the issue

Methods Proposed to Solve the Agenda Item

Issue C

Method C1

Addition of the frequency band 1 610.18-1 622.42 MHz (Carrier 1 and Carrier 2), and 2 483.59-2 499.91 MHz to Table 15-2 of RR Appendix **15**, as well as provisions RR No. **33.50** and RR No. **33.53** of RR Article **33**.

Modification of RR No. **5.368** to add the frequency band 1 610.18-1 622.42 MHz to list of frequency bands for the maritime mobile satellite service and by doing so making RR No. **4.10** applicable

Method C2

Should the International Maritime Organisation not approve the new GMDSS satellite provider then no changes to the Radio Regulations would be required

Relevant Documents

5B/481 [Annex 7](#)

Working document towards draft CPM text for WRC-23 agenda item 1.11

5B/481 [Annex 8](#)

Work plan for WRC-23 agenda item 1.11

4C/283 [Annex 5](#)

Working document towards a preliminary draft new Report ITU-R M.[ADD_GSO_GMDSS] or Working draft document related to WRC-23 agenda item 1.11 - Introduction of additional GSO MSS systems into the GMDSS (WRC-23 agenda item 1.11, resolves 3)