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## **ITU**Events

# 2<sup>nd</sup> ITU Inter-regional Workshop on WRC-23 Preparation

29 November - 1 December 2022 Geneva, Switzerland

www.itu.int/go/ITU-R/wrc-23-irwsp-22 #ITUWRC Session 4 – Aeronautical and maritime issues

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## WRC-23 Als 1.9, 1.10 & 1.11

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Rapporteur – Chapter 2



## **AERONAUTICAL ISSUES**

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)** 

1.10

1.9

1.11

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)** 

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)** 





# 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)

#### **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 the ITU Radiocommunication Sector

1 to identify any necessary modifications to Appendix **27** for the AM(R)S 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 with *recognizing e*);



#### resolves to invite the ITU Radiocommunication Sector (continued)

4 to define the relevant technical characteristics and to conduct any necessary sharing and compatibility studies, taking into 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 the studies in time for WRC-23,

#### invites the 2023 World Radiocommunication Conference

to consider necessary changes to Appendix 27, on the basis of the studies conducted under resolves to invite the ITU Radiocommunication Sector above,

#### instructs the Secretary-General

to bring this Resolution to the attention of the ICAO,

#### 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 Radiocommunication Sector studies.



## SUMMARY OF STUDIES

 Since the approach followed for the analyses was to keep the provisions of this RR Appendix 27 for the individual channels unchanged, for wideband communication using aggregation of channels no technical studies were required.



## Method A:

No change to the Radio Regulations

#### **Reason:**

It may be considered that the current version of RR Appendix **27** does not preclude the digital HF communication for the relevant type of classes. This method could support some applications.

## Method B:

Inclusion of the relevant part of the Rules of Procedure relating to RR Appendix **27** into the Radio Regulations and the introduction into RR Appendix **27** of other provisions related to wideband digital communications.

## **Reasons:**

This agenda item could be the opportunity to include in RR Appendix **27** the relevant part of current text of the Rules of Procedures and make other changes to this Appendix on the use of wideband digital emissions.

In Both methods, the suppression of Resolution 429 (WRC-19) is also proposed.



# 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)**.

## 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 the ITU Radiocommunication Sector

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

- 1 studies on spectrum needs for new non-safety aeronautical mobile applications for air-air, ground-air and air-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 frequency bands considered and, as appropriate, in adjacent frequency bands;
- 3 sharing and compatibility studies on possible new primary allocations to the aeronautical mobile service (AMS) for non-safety aeronautical applications in the frequency band 15.4-15.7 GHz, while ensuring the protection of primary services in the frequency bands considered and, as appropriate, in adjacent frequency bands;
- 4 definition of appropriate protection for the passive services and the RAS allocated in adjacent frequency bands from unwanted emissions of the AMS,

#### invites the 2023 World Radiocommunication Conference

to review the results of the ITU Radiocommunication Sector (ITU-R) studies and take appropriate actions,

#### invites administrations

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



# SUMMARY OF STUDIES

- Frequency band 15.4-15.7 GHz:
  - Radio astronomy operating in the frequency band 15.35-15.4 GHz
  - Radiolocation operating in the frequency band 15.4-15.7 GHz
  - Aeronautical radionavigation operating in the frequency band 15.4-15.7 GHz
  - Fixed satellite operating in the frequency band 15.43-15.63 GHz



# SUMMARY OF STUDIES

- Frequency band 22-22.21 GHz:
  - Broadcasting satellite operating in the frequency band 21.4-22 GHz
  - Fixed service operating in the frequency band 22-22.21 GHz
  - Mobile service operating in the frequency band 22-22.21 GHz
    - No characteristics were available regarding the mobile service. Hence, no study was performed.
  - Radio astronomy operating in the frequency band 22.21-22.5 GHz
  - Earth exploration-satellite service (passive) operating in the frequency band 22.21 22.5 GHz
  - Space research service operating in the frequency band 22.21-22.5 GHz
    - No characteristics were available regarding the space research service. Hence, no study was performed.



Method A: No change to the Radio Regulations.

Method B: New primary aeronautical mobile (off-route) service allocation in the frequency band 15.4-15.7 GHz

This method proposes to add an AMS allocation in the frequency band 15.4-15.7 GHz with an associated footnote.

Method C: Remove the exception of aeronautical mobile (off-route) service in the frequency band 22 22.21 GHz

This method proposes to remove the exception of aeronautical mobile service of the mobile service allocation in the frequency band 22-22.21 GHz, and to add associated footnotes.

Method D: Combination of Methods B and C

This method proposes to add an AM(OR)S allocation in the frequency band 15.4-15.7 GHz with an associated footnote, and to remove the exception to aeronautical mobile (off-route) service of the MOBILE allocation in the frequency band 22-22.21 GHz, and to add associated footnotes.





# 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)

## Resolution 361 (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



WRC-23, 2<sup>nd</sup> ITU Inter-regional Workshop on WRC-23 Preparation, 29 November – 1 December 2022, ITU, Geneva, Switzerland

#### resolves to invite the 2023 World Radiocommunication Conference

- 1 to consider possible regulatory actions, based on 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 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 the ITU Radiocommunication Sector* below, to support the introduction of additional satellite systems into the GMDSS,

#### invites the ITU Radiocommunication Sector

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 enavigation, 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.



## Issue A: global maritime distress and safety system modernization:

## Method A proposes:

- The deletion of NBDP for distress and safety communications from GMDSS in RR Appendices 15 and 17 for MF and HF in all bands. This is due to the fact that NBDP for such purpose has been deleted by the IMO from SOLAS Chapter IV. As NBDP is not in practical use on ships for distress alerting the deletion simplifies the operational use and reduces the burden on the administrations to maintain a system which is no longer in use.
- The implementation of an ACS for MF and HF in selected bands using DSC technology as indicated by IMO in the related performance standards, taking into account studies performed within ITU-R, especially in Recommendation ITU-R M.493 and Recommendation ITU-R M.541 and working document towards a preliminary draft new Report ITU-R M.[ACS]. It is proposed to implement this on the frequencies which had previously been used by NBDP for GMDSS in MF and all HF bands in RR Article 5 and Appendix 17 by a footnote.
- The introduction of the NAVDAT frequencies in MF and HF in RR Appendix **15** and modification of the relevant provisions in RR Articles **5**, **32**, **33** and **52**.
- To implement AIS SART as locating equipment for which frequencies are protected by reference in RR Appendix 15. Taking into account studies performed within ITU-R, especially in Recommendation ITU-R M.1371, it is proposed to amend RR No. 31.7 that survival craft stations may carry this equipment as an alternative to the RADAR-SART to be in line with SOLAS Chapter IV.



## Issue B: E-Navigation:

## Method B proposes:

- Previous WRCs have identified the frequency bands to be utilized for VDES and NAVDAT. These two systems can both support e-navigation.
- Satellite networks which would support the e-navigation have already their allocation identified in the Radio Regulations.
- E-navigation is not part of the GMDSS.
- These elements bring to the conclusion that no additional frequency allocation is necessary in RR Article **5** for e-navigation. Therefore, it is proposed a no change to RR Article **5**.



Issue C: Introduction of additional satellite systems into the global maritime distress and safety system:

Method C1: No Change (NOC)

Method C2:

- the addition of the frequency bands [1 610.00-1 610.5 / 1 610.18-1 618.34] MHz and [2 483.59-2 499.91 / 2 499.5 2 500] 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, in order to support the requirement of safety of life aspects by the GMDSS and implement applicable provisions of RR;
- two alternatives to apply or not RR No. **4.10** to the MMSS for GMDSS:
  - Alternative approach 1 proposes to modify RR Nos. 5.364 and 5.368 to apply RR No. 4.10 in the frequency band [1 610.00-1 610.5 / 1 610.18-1 618.34] MHz to GMDSS stations operating in the MMSS (Earth-to-space) and to modify RR No. 5.368 to keep the status between GMDSS stations operating in the MMSS and AMS(R)S in the frequency band [1 610.00-1 610.5 / 1 610.18-1 618.34] MHz.
  - Alternative approach 2 proposes NOC to RR Nos. 5.364 and 5.368 in order not to expand the application of RR No. 4.10 on MMSS in the frequency band [1 610.00-1 610.5 / 1 610.1 8-1 618.34] MHz to uphold the existing priority of the ARNS and AMS(R)S systems.



### Issue C: Introduction of additional satellite systems into the global maritime distress and safety system:

#### Method C3:

The introduction of additional satellite systems for the GMDSS operations is subject to the completion of relevant and applicable provisions of the Radio Regulations in force including RR Articles **9** and **11** together with the objectives of their associated Rules of Procedure (RoP), before such addition is made with a view to comply with the protection of existing services to which the frequency band is allocated, taking into account the conditions under which these existing services are currently operating and implemented.

This method also includes:

- the addition of the frequency bands 1 610.18-1 621.35 MHz 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, in order to support the requirement of safety of life aspects by the GMDSS and implement applicable provisions of RR;
- to modify the RR Nos. 5.364 and 5.368 to apply RR No. 4.10 in the frequency band 1 610.18-1 621.35 MHz to GMDSS stations operating in the MMSS (Earth-to-space) and to modify the RR No. 5.368 to keep the status between GMDSS stations operating in the MMSS and AMS(R)S in the frequency band 1 610.18-1 621.35 MHz.
- an associated Resolution with a view to addressing the coordination needs and the mitigation and elimination of possible harmful interference.

