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| **UNITED STATES OF AMERICA** |
| PROPOSALS FOR THE WORK OF THE CONFERENCE |
|  |
| Agenda item 10 |

10to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, in accordance with Article 7 of the Convention,

**Background Information:**

Historically, aeronautical HF (High Frequency) Radio communications has been recognized as the primary long-range communication system for safe, efficient air travel in remote or oceanic areas beyond the range of ground-based VHF radios. Current HF analog single sideband systems are susceptible to static crashes from lightning and man-made noise, as well as selective fading as the atmosphere continually changes. Future HF voice systems can move to more advanced digital voice as many CODECS (Coder/Decoders) are now available commercially. Modem technology has evolved significantly over the last 27 years and techniques such as Automatic Link Establishment allow HF radios to find and link on the best available frequency at a given time. The use of spectrally efficient modulation techniques and bonding consecutive HF channels (for Wide-Band HF (WBHF)) will enable technology improvements that will support high rate data transmissions.

Development of the next generation of HF data communications will enable achieving Required Communications Performance (RCP)-240[[1]](#footnote-1) compliance for the delivery of ATC traffic, provide for a digital voice capability that will address the frequent complaints about the noisy nature of analog HF voice communications and enable reduction in flight crew workload by automatically assigning frequencies to aircraft radios by leveraging modern protocols. This effort will allow Terrestrial HF and space-based systems (Satcom) to work well together in a complementary and synergistic fashion to offer better performance, reliability and availability than either system alone. Having both space-based and modernized terrestrial HF long range communication mitigates single point of failure concerns associated with vulnerabilities which differ for each system (e.g., solar events, rain fade, jamming, hardware failures, etc.). It is in the interest of administrations and industry to review and revise the ITU Radio Regulation Appendices 26 and 27 to provide the relevant regulatory framework to realize the above stated capabilities for aviation use (including aviation safety of life) and enable the coexistence of current HF systems alongside modernized HF systems that deliver the above mentioned capabilities. ICAO has considered modernization of the way HF spectrum is utilized and endorses[[2]](#footnote-2) a revision of Appendix 27 for a WRC-23 Agenda Item.

**Proposals**

**SUP USA/10(XXX)/1**

RESOLUTION 810 (WRC15)

**Preliminary agenda for the 2023 World Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2015),

**Reasons:** This Resolution must be suppressed, as WRC-19 will create a new Resolution that will include the agenda for WRC-23.

**ADD USA/10(XXX)/2**

DRAFT NEW RESOLUTION [USA-2023]

**Agenda for the 2023 World Radiocommunication Conference**

The World Radiocommunication Conference (Geneva, 2015),

*considering*

*a)* that, in accordance with No. 118 of the ITU Convention, the general scope of the agenda for a world radiocommunication conference should be established four to six years in advance and that a final agenda shall be established by the Council two years before the conference;

*b)* Article 13 of the ITU Constitution relating to the competence and scheduling of world radiocommunication conferences and Article 7 of the Convention relating to their agendas;

*c)* the relevant resolutions and recommendations of previous world administrative radio conferences (WARCs) and world radiocommunication conferences (WRCs),

*resolves*

to recommend to the Council that a world radiocommunication conference be held in 2023 for a maximum period of four weeks, with the following agenda:

1 on the basis of proposals from administrations, taking account of the results of WRC15 and the Report of the Conference Preparatory Meeting, and with due regard to the requirements of existing and future services in the bands under consideration, to consider and take appropriate action in respect of the following items:

1.[XXX] to consider, on the basis of ITU-R studies in accordance with Resolution **[USA/10/WIDEBAND HF] (WRC-19)**, appropriate regulatory actions, updates to revise ITU - R Appendices 26 and 27 in support of Wideband HF;

*resolves further*

to activate the Conference Preparatory Meeting,

*invites the Council*

to finalize the agenda and arrange for the convening of WRC23, and to initiate as soon as possible the necessary consultations with Member States,

*instructs the Director of the Radiocommunication Bureau*

to make the necessary arrangements to convene meetings of the Conference Preparatory Meeting and to prepare a report to WRC23,

*instructs the Secretary-General*

to communicate this Resolution to international and regional organizations concerned.

**Reasons:** The aeronautical use of the various HF frequency bands in the range 2 850 – 22 000 kHz is essential to long distance aeronautical communications in remote and oceanic areas. Since the last substantive review of Appendices 26 and 27 of the ITU Radio Regulations, use of HF by aviation has continued to change and grow, especially for HF Datalink (HFDL) services used by many aircraft. Aviation is evaluating future developments within the HF band, using new technology to significantly improve capacity, connectivity, and quality of service for aviation data and voice, including increased channel bandwidths for greater data throughput. Such developments within existing aviation HF allocations would provide aviation with additional capabilities, improving safety, global coverage and link diversity to L-band SATCOM systems thus allowing updated HF systems to work well together in a complementary and synergistic fashion with Satcom systems to better maintain communications at all times. In light of the evolving HF technologies, Appendices 26 and 27 need to be reviewed to ensure they meet the current and future aeronautical requirements by allowing for bonding contiguous HF channels and allow digital modulations that support higher data rates while ensuring that interference outside of the assigned multi-channel bands is no greater than the interference of individually utilized channels.

**ADD USA/10(XXX)/3**

DRAFT NEW RESOLUTION [USA/10/XX] (WRC-19)

**UPDATE ITU RADIO REGULATION APPENDICES 26 AND 27 IN SUPPORT OF WIDEBAND HF**

The World Radiocommunication Conference (Sharm el-Sheik Egypt, 2019),

*considering*

1. That with the availability of advanced technologies and demonstrated capabilities of aeronautical wideband HF through channel bonding, faster data rates and better voice communications are possible;
2. That aeronautical wideband HF must co-exist with current aeronautical HF systems and will not interfere with maritime HF uses;
3. that desirable properties of HF propagation from the perspective of providing global coverage,
4. that aeronautical analog voice and narrow band digital HF systems are the primary means for international and domestic aviation to communicate with aircraft in remote and oceanic areas;
5. the operational need for the modernization of data link services in the HF band for messages related to the safety and regularity of flight for use by international civil aviation;
6. that current aeronautical HF systems are limited by the available technology, and are insufficient to meet modern aviation information requirements without being augmented by aeronautical safety satellite communications;
7. that the use of the frequencies in the frequency bands allocated to the aeronautical mobile (R) service (AM(R)S) in the bands between 2.8-22 MHz is governed by the provisions of RR Appendix 27,

*noting*

1. the special arrangements clause in Appendix 27 for classes of emissions other than J3E or H2B;
2. the existing frequency allotments for aeronautical HF and the arrangements in the HF band for maritime mobile service,
3. that Appendix 27 provides international and regional allotments for HF channels within the AM(R)S
4. the current HF narrow band digital communications are detailed in ITU-R Recommendation M.1458.

*recognizing*

1. the need for improving HF performance in support of internationally recognized aviation performance standards as defined by ICAO;
2. necessary improvements in HF voice communications;
3. the ability to provide better communication capabilities including higher data rates;
4. The link diversity that will be provided by WBHF to current Satcom solutions,
5. The modernization of aeronautical HF communications will not require Article V allocation changes,

*resolves to invite ITU-R*

1. to conduct studies

- to identify any necessary modifications to Appendices 26 and 27 towards incorporating

relevant updates that allow for advanced modulation schemes and bonding of contiguous channels in support of Wideband HF taking into account the need to ensure spectral compatibility with legacy and existing uses of HF.

*further resolves to invite WRC-23*

to consider, on the basis of the studies conducted under the *resolves to invite ITU-R*above,appropriate regulatory revisions to Appendices 26 and 27

**ATTACHMENT**

**PROPOSAL FOR FUTURE AGENDA ITEM TO UPDATE ITU RADIO REGULATION APPENDICES 26 AND 27 IN SUPPORT OF WIDEBAND HF**

**Subject:** Proposed Future WRC Agenda Item for WRC-2023 to support updates to ITU Radio Regulations in support of Wideband HF

**Origin**: United States of America

*Proposal:* To review and update the relevant sections of ITU RR Appendices 26 and 27 in support of Wideband HF for aviation applications while ensuring compatibility with legacy HF uses.

***Background/reason:***

The aeronautical use of the various HF frequency bands in the range 2 850 – 22 000 kHz is essential to long distance aeronautical communications in remote and oceanic areas. Since the last substantive review of Appendices 26 and 27 of the ITU Radio Regulations, use of HF by aviation has continued to change and grow, especially for HF Datalink (HFDL) services used by many aircraft. Aviation is evaluating future developments within the HF band, using new technology to significantly improve capacity, connectivity, and quality of service for aviation data and voice, including increased channel bandwidths for greater data throughput. Such developments within existing aviation HF allocations would provide aviation with additional capabilities, improving safety, global coverage and link diversity to L-band SATCOM systems thus allowing updated HF systems to work well together in a complementary and synergistic fashion with Satcom systems to better maintain communications at all times. In light of the evolving HF technologies, Appendices 26 and 27 need to be reviewed to ensure they meet the current and future aeronautical requirements by allowing for bonding contiguous HF channels and allow digital modulations that support higher data rates while ensuring that interference outside of the assigned multi-channel bands is no greater than the interference of individually utilized channels.

***Radiocommunication services concerned:***

Terrestrial HF Radio communication

***Indication of possible difficulties:*** none foreseen

***Previous/ongoing studies on the issue***: N/A

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| ***Studies to be carried out by:*** ITU-R WP5B | *with the participation of:* |

***ITU-R Study Groups concerned:*** SG 5

***ITU resource implications, including financial implications (refer to CV126):*** minimal

***Common regional proposal:*** Yes/No ***Multicountry proposal:*** Yes/No

*Number of countries:*

***Remarks***

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1. Manual on Required Communication Performance, ICAO Doc 9869 AN/462, 2006 [↑](#footnote-ref-1)
2. FSMP-WG08-Flimsy07 WRC-23 Agenda Item for HF Rev1 - Final.docx [↑](#footnote-ref-2)