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| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
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| PLENARY MEETING | **Addendum 2 to Document 16(Add.9)-E** |
|  | **4 October 2019** |
|  | **Original: English** |
|  | |
| European Common Proposals | |
| Proposals for the work of the conference | |
|  | |
| Agenda item 1.9.2 | |

1.9 to consider, based on the results of ITU-R studies:

1.9.2 modifications of the Radio Regulations, including new spectrum allocations to the maritime mobile-satellite service (Earth-to-space and space-to-Earth), preferably within the frequency bands 156.0125-157.4375 MHz and 160.6125-162.0375 MHz of Appendix **18**, to enable a new VHF data exchange system (VDES) satellite component, while ensuring that this component will not degrade the current terrestrial VDES components, applications specific messages (ASM) and AIS operations and not impose any additional constraints on existing services in these and adjacent frequency bands as stated in *recognizing d)* and *e)* of Resolution **360** (**Rev.WRC-15**);

Introduction

Taking into account the studies performed during this study period, CEPT proposes the following changes to the Radio Regulations (RR) in order to introduce the VHF data exchange system (VDES) satellite component (VDE-SAT) to support the digital evolution of maritime communications.

It is proposed to create a new primary allocation to the maritime mobile-satellite service (MMSS) (Earth-to-space) in the frequency bands 157.1875-157.3375 MHz and 161.7875‑161.9375 MHz. These two frequency bands correspond to channels 24, 84, 25, 85, 26 and 86 of RR Appendix **18**. Within the context of VDES, channels 26 and 86 are identified for ship-to-satellite (VDE-SAT uplink) communications. The channels 24, 84, 25 and 85 are identified for the VDES terrestrial component (VDE-TER), but ship-to-satellite (VDE-SAT uplink) communications are possible without imposing constraints on VDE-TER.

Furthermore, it is proposed to create a new primary allocation to the maritime mobile-satellite service (space-to-Earth) in the frequency band 160.9625‑161.4875 MHz, which is identified for satellite-to-ship (VDE-SAT downlink) communications.

Coordination of space stations with assignments to the MMSS (space-to-Earth) in the frequency band 160.9625‑161.4875 MHz with respect to terrestrial services is captured under RR No **9.14**, which is introduced by the new footnote No. **5.A192**.

Also, it is proposed to modify RR Nos. **5.208A** and **5.208B** and Annex 1 to Resolution **739 (Rev.WRC-15)** in order to ensure protection of the radio astronomy service (RAS) in the frequency bands 150.05-153 MHz and 322-328.6 MHz.

This proposal is supported by the studies provided in Report ITU-R M.2435-0, and corresponds to Method B with option 1 in the CPM Report.

Proposals

ARTICLE 5

Frequency allocations

Section IV – Table of Frequency Allocations  
(See No. 2.1)

MOD EUR/16A9A2/1#50295

148-161.9375 MHz

|  |  |  |
| --- | --- | --- |
| Allocation to services | | |
| Region 1 | Region 2 | Region 3 |
| 156.8375-157.1875  FIXED  MOBILE except aeronautical mobile | 156.8375-157.1875  FIXED  MOBILE | |
| 5.226 | 5.226 | |
| 157.1875-157.3375  FIXED  MOBILE except aeronautical mobile  MARITIME MOBILE-SATELLITE (Earth-to-space) MOD 5.228AA | 157.1875-157.3375  FIXED  MOBILE  MARITIME MOBILE-SATELLITE (Earth-to-space) MOD 5.228AA | |
| 5.226 | 5.226 | |
| 157.3375-160.9625  FIXED  MOBILE except aeronautical mobile | 157.3375-160.9625  FIXED  MOBILE | |
| 5.226 | 5.226 | |
| **160.9625**- **161.4875**  FIXED  MOBILE except aeronautical mobile  MARITIME MOBILE-SATELLITE (space-to-Earth) MOD 5.208A MOD 5.208B ADD 5.A192 | 160.9625-161.4875  FIXED  MOBILE  MARITIME MOBILE-SATELLITE (space-to-Earth) MOD 5.208A MOD 5.208B  ADD 5.A192 | |
| 5.226 | 5.226 | |
| 161.4875-161.7875  FIXED  MOBILE except aeronautical mobile | 161.4875-161.7875  FIXED  MOBILE | |
| 5.226 | 5.226 | |
| 161.7875-161.9375  FIXED  MOBILE except aeronautical mobile  MARITIME MOBILE-SATELLITE (Earth-to-space) MOD 5.228AA | 161.7875-161.9375  FIXED  MOBILE  MARITIME MOBILE-SATELLITE (Earth-to-space) MOD 5.228AA | |
| 5.226 | 5.226 | |

**Reasons:** The above modification adds primary allocations to the maritime mobile-satellite service (Earth-to-space) in the frequency bands 157.1875-157.3375 MHz and 161.7875‑161.9375 MHz, and a primary allocation to the maritime mobile-satellite service (space-to-Earth) in the frequency band 160.9625-161.4875 MHz.

MOD EUR/16A9A2/2#50298

5.208A In making assignments to space stations in the mobile-satellite service in the bands 137-138 MHz, 387‑390 MHz and 400.15-401 MHz, and in the maritime-mobile satellite service (space-to-Earth) in the band 160.9625-161.4875 MHz, administrations shall take all practicable steps to protect the radio astronomy service in the bands 150.05-153 MHz, 322-328.6 MHz, 406.1-410 MHz and 608-614 MHz from harmful interference from unwanted emissions, as shown in the most recent version of Recommendation ITU‑R RA.769.     (WRC-19)

**Reasons:** The above modification is proposed to ensure the protection of the radio astronomy service (RAS).

MOD EUR/16A9A2/3#50299

5.208B[[1]](#footnote-1)\* In the frequency bands:

137-138 MHz,  
 160.9625-161.4875 MHz,  
 387-390 MHz,  
 400.15-401 MHz,  
 1 452-1 492 MHz,  
 1 525-1 610 MHz,  
 1 613.8-1 626.5 MHz,  
 2 655-2 690 MHz,  
 21.4-22 GHz,

Resolution **739** **(Rev.WRC‑19)** applies.     (WRC‑19)

**Reasons:** The above modification is proposed to ensure the protection of the radio astronomy service (RAS).

MOD EUR/16A9A2/4#50296

5.228AA The use of the frequency bands 157.1875-157.3375 MHz, 161.7875-161.9375 MHz, 161.9375-161.9625 MHz and 161.9875-162.0125 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to the systems which operate in accordance with Appendix **18**.     (WRC‑19)

**Reasons:** The above modification specify that the MMSS allocation (Earth-to-space) for VDE‑SAT as described in Report ITU-R M.2435-0 should operate in accordance with RR Appendix **18**.

ADD EUR/16A9A2/5#50297

5.A192 The use of the frequency band 160.9625-161.4875 MHz by the maritime mobile-satellite (space-to-Earth) service is limited to non-GSO systems operating in accordance with the most recent version of Recommendation ITU-R M.2092. Such use is subject to the application of the provisions of No **9.14**, and the receiving ship earth stations shall not claim protection from transmitting stations in the land mobile service.     (WRC‑19)

**Reasons:** The above modification specify that the MMSS allocation (space-to-Earth) for VDE-SAT as described in Report ITU-R M.2435-0 should operate in accordance with the most recent version of Recommendation ITU-R M.2092. This new footnote also clarifies that the coordination between MMSS (space-to-Earth) and terrestrial services is subject to the application of the provision of RR No **9.14**. VDES ship stations within the range of land based infrastructure are expected to use the terrestrial component of VDES, and shall not claim protection from transmissions by stations in the land mobile service using this frequency band.

MOD EUR/16A9A2/6#50303

APPENDIX 5 (REV.WRC‑19)

Identification of administrations with which coordination is to be effected or  
agreement sought under the provisions of Article 9

MOD EUR/16A9A2/7#50304

TABLE 5-1     (Rev.WRC‑19)

Technical conditions for coordination

(see Article 9)

…

TABLE 5-1 (*continued*)     (Rev.WRC‑19)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Reference of Article 9 | Case | Frequency bands  (and Region) of the service  for which coordination  is sought | Threshold/condition | Calculation  method | Remarks |
| No. **9.14** Non-GSO/ terrestrial, GSO/ terrestrial | A space station in a satellite network in the frequency bands for which a footnote refers to No. **9.11A** or to No. **9.14**, in respect of stations of terrestrial services where threshold(s) is (are) exceeded | 1) Frequency bands for which a footnote refers to No. **9.11A**; or  2) 11.7-12.2 GHz (Region 2 GSO FSS)  3) 5 030-5 091 MHz  4) 160.9625‑161.4875 MHz (non-GSO maritime mobile-satellite service) | 1) See § 1 of Annex 1 to this Appendix; In the bands specified in No. **5.414A**, the detailed conditions for the application of No. **9.14** are provided in No. **5.414A** for MSS networks or  2) In the band 11.7-12.2 GHz (Region 2 GSO FSS): −124 dB(W/(m2 · MHz)) for 0° ≤ θ ≤ 5° −124 + 0.5 (θ – 5) dB(W/(m2 · MHz)) for 5° < θ ≤ 25° −114 dB(W/(m2 · MHz)) for θ > 25° where θ is the angle of arrival of the incident wave above the horizontal plane (degrees)  3) Bandwidth overlap  4) In the band 160.9625‑161.4875 MHz (non-GSO maritime mobile-satellite service):  −149 + 0.16·θ° dB(W/(m2· 4 kHz)) for 0° ≤ θ < 45° −142 + 0.53·(θ° − 45°) dB(W/(m2 · 4 kHz)) for 45° ≤ θ < 60° −134 + 0.1·(θ° − 60°) dB(W/(m2 · 4 kHz)) for 60° ≤ θ ≤ 90 where θ is the angle of arrival of the incident wave above the horizontal plane (degrees) | 1) See § 1 of Annex 1 to this Appendix |  |

**Reasons:** The above modification defines a coordination threshold in Table 5-1 for references of RR No. **9.14** for the VDE-SAT downlink to ensure compatibility with terrestrial services. The coordination threshold mask is defined in Recommendation ITU-R M.2092-0 and in line with studies provided in Report ITU-R M.2435-0.

MOD EUR/16A9A2/8#50300

APPENDIX 18 (REV.WRC‑19)

Table of transmitting frequencies in the  
VHF maritime mobile band

(See Article 52)

…

| **Channel designator** | **Notes** | **Transmitting frequencies  (MHz)** | | **Inter-ship** | **Port operations  and ship movement** | | **Public corres-pondence** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **From ship stations** | **From coast stations** | **Single frequency** | **Two frequency** |
| … | *…* | … | … | … | … | … | … |
| 80 | *y), wa)* | 157.025 | 161.625 |  | x | x | x |
| 21 | *y), wa)* | 157.050 | 161.650 |  | x | x | x |
| 81 | *y), wa)* | 157.075 | 161.675 |  | x | x | x |
| 22 | *y), wa)* | 157.100 | 161.700 |  | x | x | x |
| 82 | *x), y), wa)* | 157.125 | 161.725 |  | x | x | x |
| 23 | *x), y), wa)* | 157.150 | 161.750 |  | x | x | x |
| 83 | *x), y), wa)* | 157.175 | 161.775 |  | x | x | x |
| 24 | *w), ww), x), xx)* | 157.200 | 161.800 |  | x | x | x |
| 1024 | *w), ww), x), xx)* | 157.200 |  |  |  |  |  |
| 2024 | *w), ww), x), xx)* | 161.800 | 161.800 | x  (digital only) |  |  |  |
| 84 | *w), ww), x), xx)* | 157.225 | 161.825 |  | x | x | x |
| 1084 | *w), ww), x), xx)* | 157.225 |  |  |  |  |  |
| 2084 | *w), ww), x), xx)* | 161.825 | 161.825 | x  (digital only) |  |  |  |
| 25 | *w), ww), x), xx)* | 157.250 | 161.850 |  | x | x | x |
| 1025 | *w), ww), x), xx)* | 157.250 |  |  |  |  |  |
| 2025 | *w), ww), x), xx)* | 161.850 | 161.850 | x  (digital only) |  |  |  |
| 85 | *w), ww), x), xx)* | 157.275 | 161.875 |  | x | x | x |
| 1085 | *w), ww), x), xx)* | 157.275 |  |  |  |  |  |
| 2085 | *w), ww), x), xx)* | 161.875 | 161.875 | x  (digital only) |  |  |  |
| 26 | *w), ww), x)* | 157.300 | 161.900 |  | x | x | x |
| 1026 | *w), ww), x)* | 157.300 |  |  |  |  |  |
| 2026 | *w), ww), x)* |  | 161.900 |  |  |  |  |
| 86 | *w), ww), x)* | 157.325 | 161.925 |  | x | x | x |
| 1086 | *w), ww), x)* | 157.325 |  |  |  |  |  |
| 2086 | *w), ww), x)* |  | 161.925 |  |  |  |  |
| 27 | *z), zx)* | 157.350 | 161.950 |  |  | x | x |
| 1027 | *zz)* | 157.350 | 157.350 |  | x |  |  |
| 2027*\** | *z)* | 161.950 | 161.950 |  |  |  |  |
| 87 | *zz)* | 157.375 | 157.375 |  | x |  |  |
| 28 | *z), zx)* | 157.400 | 162.000 |  |  | x | x |
| 1028 | *zz)* | 157.400 | 157.400 |  | x |  |  |
| 2028*\** | *z)* | 162.000 | 162.000 |  |  |  |  |
| 88 | *zz)* | 157.425 | 157.425 |  | x |  |  |
| AIS 1 | *f), l), p)* | 161.975 | 161.975 |  |  |  |  |
| AIS 2 | *f), l), p)* | 162.025 | 162.025 |  |  |  |  |
| \*   From 1 January 2019, channel 2027 will be designated ASM 1 and channel 2028 will be designated ASM 2. | | | | | | | |

**Notes referring to the Table**

*General notes*

*…*

*Specific notes*

*…*

*w)* In Regions 1 and 3:

The frequency bands 157.1875‑157.3375 MHz and 161.7875-161.9375 MHz (corresponding to channels: 24, 84, 25, 85, 26 and 86) are identified for the VHF Data Exchange System (VDES), including the satellite component of VDES (VDE-SAT) in the maritime mobile-satellite service (Earth-to-space) by non-GSO satellite systems, as described in the most recent version of Recommendation ITU‑R M.2092.

Until 1 January 2024, these frequency bands may also be used for analogue modulation described in the most recent version of Recommendation ITU‑R M.1084 by an administration that wishes to do so, subject to not causing harmful interference to, or claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations.     (WRC‑19)

*wa)*  In Regions 1 and 3:

The frequency bands 157.0125‑157.1125 MHz and 161.6125-161.7125 MHz (corresponding to channels: 80, 21, 81 and 22) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842 using multiple 25 kHz contiguous channels.

The frequency bands 157.1375‑157.1875 MHz and 161.7375-161.7875 MHz (corresponding to channels: 23 and 83) are identified for utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842 using two 25 kHz contiguous channels.

The frequencies 157.125 MHz and 161.725 MHz (corresponding to channel: 82) are identified for the utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842.

The frequency bands 157.0125‑157.1875 MHz and 161.6125-161.7875 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) can also be used for analogue modulation described in the most recent version of Recommendation ITU‑R M.1084 by an administration that wishes to do so, subject to not claiming protection from other stations in the maritime mobile service using digitally modulated emissions and subject to coordination with affected administrations.     (WRC‑19)

...

*xx)* The channels 24, 84, 25 and 85 may be merged in order to form channels with bandwidths of 50 kHz or 100 kHz for the VHF Data Exchange System (VDES), as described in the most recent version of Recommendation ITU‑R M.2092.     (WRC‑19)

...

*)* The channels 27 and 28 are each split into two simplex channels. The channels ASM 1 and ASM 2 are used for application specific messages (ASM) as described in the most recent version of Recommendation ITU-R M.2092.     (WRC‑19)

...

*zz)* The channels 1027, 1028, 87 and 88 are used as single-frequency analogue channels for port operation and ship movement.     (WRC‑19)

**Reasons:** Notes *a)* to *mm)*, *n)* to *v)* and *y)*: no change as the notes are not relevant to this agenda item.  
Notes *wa)*, *xx)*, *z)* and *zz)*: changes are to update the Radio Regulations.  
Notes *ww)*, *x)* and *zx)*: no change as the notes are not applicable to any of the CEPT countries.  
Note *w)*: changes are to update the RR and introduce VDE-SAT into Appendix **18** on both lower leg and upper leg of channels 24, 84, 25, 85, 26 and 86 for ship-to-satellite (VDE-SAT uplink) communications according to the most recent version of the Recommendation ITU-R M.2092.

SUP EUR/16A9A2/9#50294

Resolution 360 (Rev.WRC‑15)

Consideration of regulatory provisions and spectrum allocations to the maritime mobile-satellite service to enable the satellite component of the VHF Data Exchange System and enhanced maritime radiocommunication

**Reasons:** Resolution **360 (Rev. WRC-15)** is proposed to be suppressed as it will not be needed when the regulatory provisions and spectrum allocations to the maritime mobile-satellite service required to enable the VDES satellite component (VDE-SAT) have been approved by WRC‑19.

MOD EUR/16A9A2/10#50301

RESOLUTION 739 (Rev.WRC-19)

Compatibility between the radio astronomy service and the active   
space services in certain adjacent and nearby frequency bands

The World Radiocommunication Conference (Sharm el-Sheikh, 2019),

MOD EUR/16A9A2/11#50301

ANNEX 1 TO RESOLUTION 739 (Rev.WRC-19)

Unwanted emission threshold levels

…

TABLE 1-2

epfd thresholds(1) for unwanted emissions from all space stations of a non-GSO satellite system   
at a radio astronomy station

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Space service | Space service band | Radio astronomy band | Single dish, continuum observations | | Single dish, spectral line observations | | VLBI | | Condition of application: the API is received by the Bureau following the entry into force of the Final Acts of: |
| epfd(2) | Reference bandwidth | epfd(2) | Reference bandwidth | epfd(2) | Reference bandwidth |
| **(MHz)** | **(MHz)** | **(dB(W/m2))** | **(MHz)** | **(dB(W/m2))** | **(kHz)** | **(dB(W/m2))** | **(kHz)** |
| MSS (space-to-Earth) | 137-138 | 150.05-153 | −238 | 2.95 | NA | NA | NA | NA | WRC-07 |
| MMSS (space-to-Earth) | 160.9625-161.4875 | 150.05-153 | −238 | 2.95 | NA | NA | NA | NA | WRC-19 |
| MMSS (space-to-Earth) | 160.9625-161.4875 | 322-328.6 | −240 | 6.6 | −255 | 10 | −228 | 10 | WRC-19 |
| MSS (space-to-Earth) | 387-390 | 322-328.6 | −240 | 6.6 | −255 | 10 | −228 | 10 | WRC-07 |
| MSS (space-to-Earth) | 400.15-401 | 406.1-410 | −242 | 3.9 | NA | NA | NA | NA | WRC-07 |
| MSS (space-to-Earth) | 1 525-1 559 | 1 400-1 427 | −243 | 27 | −259 | 20 | −229 | 20 | WRC-07 |
| RNSS (space-to-Earth)(3) | 1 559-1 610 | 1 610.6-1 613.8 | NA | NA | −258 | 20 | −230 | 20 | WRC‑07 |
| MSS (space-to-Earth) | 1 525-1 559 | 1 610.6-1 613.8 | NA | NA | −258 | 20 | −230 | 20 | WRC-07 |
| MSS (space-to-Earth) | 1 613.8-1 626.5 | 1 610.6-1 613.8 | NA | NA | −258 | 20 | −230 | 20 | WRC-03 |

**Reasons:** The above modification is proposed to ensure the protection of the radio astronomy service (RAS).

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

1. \* This provision was previously numbered as No. **5.347A**. It was renumbered to preserve the sequential order. [↑](#footnote-ref-1)