|  |  |
| --- | --- |
| **World Radiocommunication Conference (WRC-19) Sharm el-Sheikh, Egypt, 28 October – 22 November 2019** |  |
|  |  |
|  | CPG(18)073 ANNEX V0-9B |
| PLENARY MEETING | **Addendum 2 to Document XXX(Add.9)-E** |
|  | **DATE** |
|  | **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, this ECP proposes the following changes to the Radio Regulations in order to introduce the VDES satellite component (VDE-SAT) for the maritime community.

It is proposed to create a new primary allocation to the maritime mobile-satellite service (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 Appendix **18**. Within the context of VDES, channels 26 and 86 are exclusively reserved for ship-to-satellite (VDE-SAT uplink) services. The channels 24, 84, 25 and 85 are reserved for the VDES terrestrial component (VDE-TER), specifically ship-to-shore, shore-to-ship and ship-to-ship services, but ship-to-satellite (VDE-SAT uplink) services 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. Within the context of VDES, this frequency band is exclusively reserved for satellite-to-ship (VDE-SAT downlink) services.

Coordination of space stations with assignments to the MMSS (space-to-Earth) in the frequency band 160.9625‑161.4875 MHz with regards to terrestrial services is captured through a modification of Appendix **5**, taking into account the pfd mask defined in Recommendation ITU-R M.2092. The coordination mechanism under No. **9.14** is introduced in the new footnote No 5.A192.

It is proposed to modify provisions Nos **5.208A** and **5.208B** in order to ensure protection of the radio astronomy service (RAS). Furthermore, Annex 1 to Resolution **739 (Rev.WRC-15)** is revised to include the MMSS (space-to-Earth) allocation in the frequency band 160.9625-161.4875 MHz.

This proposal is supported by the studies provided in the PDN Report ITU-R M.[VDES-SAT], and corresponds to Method B of the CPM report.

Proposals

ARTICLE 5

Frequency allocations

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

MOD EUR/XXXA9A2/1

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. The threshold levels of interference detrimental to the radio astronomy service are shown in the relevant ITU‑R Recommendation.     (WRC-19)

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

MOD EUR/XXXA9A2/2

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/XXXA9A2/3

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) ADD 5.B192 | 157.1875-157.3375  FIXED  MOBILE  MARITIME MOBILE-SATELLITE (Earth-to-space) ADD 5.B192 | |
| 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 | 160.9625-161.4875  FIXED  MOBILE  MARITIME MOBILE-SATELLITE (space-to-Earth) MOD 5.208A MOD 5.208B | |
| 5.226 ADD 5.A192 | 5.226 ADD 5.A192 | |
| 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) ADD 5.B192 | 161.7875-161.9375  FIXED  MOBILE  MARITIME MOBILE-SATELLITE (Earth-to-space) ADD 5.B192 | |
| 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.

ADD EUR/XXXA9A2/4

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 which operate 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**.     (WRC‑19)

**Reasons:** The above modification specify that the MMSS allocation (space-to-Earth) for the VDES satellite component (VDE-SAT) as described in PDNR ITU-R M.[VDES-SAT] should operate in accordance with the most recent version of Recommendation ITU-R M.2092. This footnote also clarifies that the coordination between MMSS (space-to-Earth) and terrestrial services is subject to the application of the provision of No **9.14**.

ADD EUR/XXXA9A2/5

5.B192 The use of the frequency bands 157.1875-157.3375 MHz and 161.7875-161.9375 MHz by the maritime mobile-satellite (Earth-to-space) service is limited to non-GSO systems which operate in accordance with Appendix **18**.     (WRC‑19)

**Reasons:** The above modification specify that the MMSS allocation (Earth-to-space) for the VDES satellite component (VDE-SAT) as described in the PDNR ITU-R M.[VDES-SAT] should operate in accordance with Appendix **18**.

MOD EUR/XXXA9A2/6

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/XXXA9A2/7

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 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 PDNR ITU-R M.[VDES-SAT].

MOD EUR/XXXA9A2/8

APPENDIX 18 (REV.WRC‑19)

Table of transmitting frequencies in the  
VHF maritime mobile band

(See Article 52)

NOTE A – For assistance in understanding the Table, see Notes *a)* to *zz)* below.     (WRC‑15)

NOTE B – The Table below defines the channel numbering for maritime VHF communications based on 25 kHz channel spacing and use of several duplex channels. The channel numbering and the conversion of two-frequency channels for single-frequency operation shall be in accordance with Recommendation ITU‑R M.1084‑5 Annex 4, Tables 1 and 3. The Table below also describes the harmonized channels where the digital technologies defined in the most recent version of Recommendation ITU‑R M.1842 could be deployed.     (WRC‑15)

| 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 | |
| 60 | | *m)* | | 156.025 | | 160.625 | |  | | x | | x | | x | |
| 01 | | *m)* | | 156.050 | | 160.650 | |  | | x | | x | | x | |
| 61 | | *m)* | | 156.075 | | 160.675 | |  | | x | | x | | x | |
| 02 | | *m)* | | 156.100 | | 160.700 | |  | | x | | x | | x | |
| 62 | | *m)* | | 156.125 | | 160.725 | |  | | x | | x | | x | |
| 03 | | *m)* | | 156.150 | | 160.750 | |  | | x | | x | | x | |
| 63 | | *m)* | | 156.175 | | 160.775 | |  | | x | | x | | x | |
| 04 | | *m)* | | 156.200 | | 160.800 | |  | | x | | x | | x | |
| 64 | | *m)* | | 156.225 | | 160.825 | |  | | x | | x | | x | |
| …/… | | …/… | | …/… | | …/… | | …/… | | …/… | | …/… | | …/… | |
| 1024 | | *w), ww), x), xx)*  *AAA)* | | 157.200 | |  | |  | |  | |  | |  | |
| 2024 | | *w), ww), x), xx)*  *AAA)* | | 161.800 | | 161.800 | | x  (digital only) | |  | |  | |  | |
| 84 | | *w), ww), x), xx)* | | 157.225 | | 161.825 | |  | | x | | x | | x | |
| 1084 | | *w), ww), x), xx)*  *AAA)* | | 157.225 | |  | |  | |  | |  | |  | |
| 2084 | | *w), ww), x), xx)*  *AAA)* | | 161.825 | | 161.825 | | x  (digital only) | |  | |  | |  | |
| 25 | | *w), ww), x), xx)* | | 157.250 | | 161.850 | |  | | x | | x | | x | |
| 1025 | | *w), ww), x), xx)*  *AAA)* | | 157.250 | |  | |  | |  | |  | |  | |
| 2025 | | *w), ww), x), xx)*  *AAA)* | | 161.850 | | 161.850 | | x  (digital only) | |  | |  | |  | |
| 85 | | *w), ww), x), xx)* | | 157.275 | | 161.875 | |  | | x | | x | | x | |
| 1085 | | *w), ww), x), xx)*  *AAA)* | | 157.275 | |  | |  | |  | |  | |  | |
| 2085 | | *w), ww), x), xx)*  *AAA)* | | 161.875 | | 161.875 | | x  (digital only) | |  | |  | |  | |
| 26 | | *w), ww), x)* | | 157.300 | | 161.900 | |  | | x | | x | | x | |
| 1026 | | *w), ww), x)*  *AAA)* | | 157.300 | |  | |  | |  | |  | |  | |
| 2026 | | *w), ww), x)*  *AAA)* | |  | | 161.900 | |  | |  | |  | |  | |
| 86 | | *w), ww), x)* | | 157.325 | | 161.925 | |  | | x | | x | | x | |
| 1086 | | *w), ww), x)*  *AAA)* | | 157.325 | |  | |  | |  | |  | |  | |
| 2086 | | *w), ww), x)*  *AAA)* | |  | | 161.925 | |  | |  | |  | |  | |
| 27 | | *z), zx)* | | 157.350 | | 161.950 | |  | |  | | x | | x | |
| 1027 | | *zz)* | | 157.350 | | 157.350 | |  | | x | |  | |  | |
| *ASM1* | | *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 | |  | |  | |
| *ASM2* | | *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 | |  | |  | |  | |  | |
|  | | | | | | | | | | | | | | | |

**Notes referring to the Table**

*General notes*

...

*Specific notes*

...

*m)* These channels may be operated as single frequency channels, subject to coordination with affected administrations. The following conditions apply for single frequency usage:

– The lower frequency portion of these channels may be operated as single frequency channels by ship and coast stations.

– Transmission using the upper frequency portion of these channels is limited to coast stations.

– If permitted by administrations and specified by national regulations, the upper frequency portion of these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, ASM1 and ASM2.     (WRC‑19)

*mm)* Transmission on these channels is limited to coast stations. If permitted by administrations and specified by national regulations, these channels may be used by ship stations for transmission. All precautions should be taken to avoid harmful interference to channels AIS 1, AIS 2, ASM1 andASM2.     (WRC‑19)

...

*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 utilization of the VHF Data Exchange System (VDES) described in the most recent version of Recommendation ITU‑R M.2092. 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 a unique duplex channel with a bandwidth of 100 kHz in order to operate the VDES terrestrial component described in the most recent version of Recommendation ITU‑R M.2092.     (WRC‑19)

...

*z)* 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)

*AAA)* These channels may be used for the maritime mobile-satellite service (Earth-to-space) by the VDES satellite component as described in the most recent version of the Recommendation ITU-R M.2092 in the following way:

– The channels 1024, 1084, 1025 and 1085 are reserved for ship-to-shore services, but ship-to-satellite (VDE-SAT uplink) services are possible without imposing constraints on ship-to-shore services.

– The channels 2024, 2084, 2025 and 2085 are reserved for shore-to-ship and ship-to-ship services, but ship-to-satellite (VDE-SAT uplink) services are possible without imposing constraints on shore-to-ship and ship-to-ship services.

– The channels 1026, 1086, 2026 and 2086 are exclusively reserved for ship-to-satellite (VDE-SAT uplink) services. (WRC-19)

**Reasons:** Notes *a)* to *l)*, *n)* to *v)* and *y)*: No change as the notes are not relevant to this agenda item

Notes *m)*, *mm)*, *w)*, *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 CEPT countries

Note *AAA)*: Introduces the satellite component of VDES (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) according to the most recent version of the Recommendation ITU-R M.2092

SUP EUR/XXXA9A2/9

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 (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/XXXA9A2/10

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),

…

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 frequency band | Radio astronomy frequency 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 |
| NA: Not applicable, measurements of this type are not made in this frequency band.  (1) These epfd thresholds should not be exceeded for more than 2% of time.  (2) Integrated over the reference bandwidth with an integration time of 2 000 s.  (3) This Resolution does not apply to current and future assignments of the radionavigation-satellite system GLONASS/GLONASS-M in the frequency band 1 559-1 610 MHz, irrespective of the date of reception of the related coordination or notification information, as appropriate. The protection of the radio astronomy service in the frequency band 1 610.6‑1 613.8 MHz is ensured and will continue to be in accordance with the bilateral agreement between the Russian Federation, the notifying administration of the GLONASS/GLONASS-M system, and IUCAF, and subsequent bilateral agreements with other administrations. | | | | | | | | | |

**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)