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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 toDocument 28(Add.9)-E** |
|  | **27 September 2019** |
|  | **Original: Chinese** |
|  |
| China (People's Republic of) |
| 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**);

# 1 Discussion

This agenda item invites WRC-19 to consider possible regulatory actions for VHF data exchange system (VDES) satellite component (VDE-SAT), taken into account technical and sharing studies in ITU-R, while ensuring that no harmful interference is caused to, nor additional constraints are imposed on incumbent services on primary basis in the same and adjunct bands, and that the operation and development of maritime radiocommunication systems, especially terrestrial VDES components, applications specific messages (ASM) and AIS operations, is protected and not degraded.

Report ITU-R M.2435-0 “Technical studies on the satellite component of the VHF data exchange system” was developed in this study cycle providing technical study materials to support this agenda item. However, consensus was not reached on some aspects of this Report:

– Frequency Plans: on the basis of the frequency plan for VDE-TER which was agreed during WRC-15, three alternative frequency plans for VDE-SAT have been developed describing frequency channel allocation and sharing between VDE-TER and VDE-SAT. These frequency plans were evaluated with same criteria and compared to each other. Advantages and disadvantages for each frequency plan were summarized in the Report. Some administrations prefer frequency plan 2 as it improves system capacity and link robustness for both the terrestrial and the satellite components of the VDES compared with the other two frequency plans. The proponents of frequency plan 3 support this method because no frequency channels outside Appendix **18** of the Radio Regulations (RR) are required.

– The pfd limit to VDE-SAT downlink signal: four different pfd masks for VDE-SAT downlink have been developed based on studies from administrations who had a different interpretation of protection criteria for the land mobile service contained in Recommendation ITU-R M.1808-0.

The CPM Report contains six methods:

Table 1

Methods of the CPM Report

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Method in the CPM Report | Options | Frequency plan | Satelliteallocation | Measure to protect incumbent services |
| A | - | No change | None | - |
| B | 1 | Alternative 2 | Primary | pfd mask 1 |
| 2 | Alternative 2 | Primary | pfd mask 2 |
| C | - | Alternative 2 | Secondary | - |
| D | 1 | Alternative 2 | Secondary | pfd mask 3 |
| 2 | Alternative 2 | Secondary | pfd mask 4 |
| E | - | Alternative 2 | Secondary | RR No. **9.21** |
| F | - | Alternative 3 rev | Primary | pfd mask 1 |

NOTE - Pfd mask 1 is described in Recommendation ITU-R M.2092-0 which was developed in last study cycle and pfd masks 2-4 are described in Report ITU-R M.2435-0.

At its 5th and last meeting, APT Conference Preparatory Group for WRC-19 (APG-19) developed APT views and Preliminary APT Common Proposals (PACP) for this agenda item by consensus. APT administrations support the proposal that VDE-SAT should use frequency channels within RR Appendix **18** and an additional secondary allocation to the maritime mobile-satellite service (MMSS) (Earth-to-space and space-to-Earth) be made.

# 2 Views and proposals

Since no consensus was reached on the pfd mask for satellite downlink, the Administration of China is in favour of the consideration of a secondary allocation to MMSS (space-to-Earth) while ensuring that no interference will be caused to, nor any constraints will be placed on the development and future use of terrestrial services. This Administration is of the view that pfd masks 1 and 2 have been developed with the intention to trigger coordination between MMSS (space-to-Earth) and terrestrial services in the same frequency band and that they can’t provide full protection to the land more service. It is preferred that the frequency channels in RR Appendix **18** beused byVDE-SAT.

A secondary allocation to MMSS (Earth-to-space) is proposed so that no constraints will be imposed on the use and development of terrestrial service. It has been recognized that some studies in Report ITU-R M.2435-0 indicate that the aggregate interference from terrestrial stations could cause interference to VDE-SAT space station.

This Administration supports no degradation to the operation of the VDE terrestrial component and therefore the footnote *xx)* of RR Appendix **18** is proposed to be revised.

ARTICLE 5

Frequency allocations

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

MOD CHN/28A9A2/1#50326

5.208A In making assignments to space stations in the mobile-satellite service in the bands 137‑138 MHz, 387‑390 MHz, 400.15-401 MHz and in the maritime mobile-satellite service (space-to-Earth) in the band 161.7875-161.9375 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 relevant ITU‑R Recommendation.     (WRC‑19)

**Reasons:** To incorporate the frequency band allocated to MMSS(space-to-Earth) in the footnote to protect the Radio astronomy service (RAS) in the adjacent bands.

MOD CHN/28A9A2/2#50299

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

 137-138 MHz,
 161.7875-161.9375 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:** To incorporate the frequency band allocated to MMSS (space-to-Earth) in the footnote to protect the RAS in the adjacent bands.

MOD CHN/28A9A2/3#50295

148-161.9375 MHz

|  |
| --- |
| Allocation to services |
| Region 1 | Region 2 | Region 3 |
| 156.8375-157.1875FIXEDMOBILE except aeronauticalmobile | 156.8375-157.1875 FIXED MOBILE |
| 5.226 |  5.226 |
| 157.1875-157.3375FIXEDMOBILE except aeronauticalmobileMaritime mobile-satellite (Earth-to-space)ADD 5.A192 | 157.1875-157.3375 FIXED MOBILE Maritime mobile-satellite (Earth-to-space)ADD 5.A192 |
| 5.226  |  5.226  |
| 157.3375-161.7875FIXEDMOBILE except aeronauticalmobile | 157.3375-161.7875 FIXED MOBILE |
| 5.226 |  5.226 |
| 161.7875-161.9375FIXEDMOBILE except aeronauticalmobileMaritime mobile-satellite (space-to-Earth) MOD 5.208A MOD 5.208BADD 5.B192 | 161.7875-161.9375 FIXED MOBILE Maritime mobile-satellite (space-to-Earth)MOD 5.208A MOD 5.208BADD 5.B192 |
| 5.226  |  5.226  |

**Reasons:** The above modifications to the table of allocation adds a MMSS allocation to the uplink and downlink for the satellite component of VHF Data Exchange System (VDE-SAT) on the secondary basis.

MOD CHN/28A9A2/4#50333

APPENDIX 18 (REV.WRC‑19)

Table of transmitting frequencies in the
VHF maritime mobile band

(See Article 52)

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| Channeldesignator | Notes | Transmittingfrequencies (MHz) | Inter-ship | Port operations and ship movement | Publiccorrespondence |
| --- | --- | --- | --- | --- | --- |
| From ship stations | From coast stations | Single frequency | Two frequency |
| ... | *...* | ... | ... | ... | ... | ... | ... |
| 24 | *w), ww), x), xx)* | 157.200 | 161.800 |  | x | x | x |
| 1024 | *w), ww), x), xx), AAA)* | 157.200 | 157.200 | x (digital only) |  |  |  |
| 2024 | *w), ww), x), BBB)* | 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 | 157.225 | x (digital only) |  |  |  |
| 2084 | *w), ww), x), BBB)* | 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 | 157.250 | x (digital only) |  |  |  |
| 2025 | *w), ww), x), BBB)* | 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 | 157.275 | x (digital only) |  |  |  |
| 2085 | *w), ww), x), BBB)* | 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), BBB)* |  | 161.900 |  |  |  |  |
| 86 | *w), ww), x)*  | 157.325 | 161.925 |  | x | x | x |
| 1086 | *w), ww), x), AAA)* | 157.325 |  |  |  |  |  |
| 2086 | *w), ww), x), BBB)* |  | 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**

*...*

*Specific notes*

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*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)

*ww)* In Region 2, 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 designated for digitally modulated emissions in accordance with the most recent version of Recommendation ITU‑R M.1842.

In Canada and Barbados, the frequency bands 157.1875-157.2825 MHz and 161.7875-161.8875 MHz (corresponding to channels: 24, 84, 25 and 85) may be used for digitally modulated emissions, such as those described in the most recent version of Recommendation ITU‑R M.2092, subject to coordination with affected administrations.     (WRC‑19)

*x)* In Angola, Botswana, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Democratic Republic of the Congo, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe, the frequency bands 157.1125-157.3375 MHz and 161.7125-161.9375 MHz (corresponding to channels: 82, 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions.

 In China, the frequency bands 157.1375-157.3375 MHz and 161.7375-161.9375 MHz (corresponding to channels: 23, 83, 24, 84, 25, 85, 26 and 86) are designated for digitally modulated emissions.     (WRC‑19)

**Reasons:** Correction on the frequency bands.

*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.

 The channels 1024, 1084, 1025 and 1085 may be merged in order to form a unique channel with a bandwidth of 100 kHz in order to operate the VDES terrestrial component for ship-to-ship, ship-to-shore and shore-to-ship communications as described in the most recent version of Recommendation ITU‑R M.2092.     (WRC‑19)

 The channels 2024, 2084, 2025 and 2085 may be merged in order to form a unique channel with a bandwidth of 100 kHz in order to operate the VDES terrestrial component for ship-to-ship, ship-to-shore and shore-to-ship communications as described in the most recent version of Recommendation ITU‑R M.2092.     (WRC‑19)

**Reasons**: The above modifications of the RR Appendix **18** identify both the simplex and duplex operation of the terrestrial component of VDES.

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*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)

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

*AAA)* From 1 January 2024, the combination of the channels 1024, 1084, 1025, 1085, 1026 and 1086, which are also allocated to the maritime mobile-satellite service (Earth-to-space), shall be used for the reception of VDES messages from ships as described in the most recent version of Recommendation ITU‑R M.2092.     (WRC‑19)

*BBB)* From 1 January 2024, the combination of the channels 2024, 2084, 2025, 2085, 2026 and 2086, which are also allocated to the maritime mobile-satellite service (space-to-Earth), shall be used for the reception of VDES messages from satellites as described in the most recent version of Recommendation ITU‑R M.2092.      (WRC‑19)

**Reasons:** The above modifications of RR Appendix **18** identify a MMSS allocation uplink and downlink for the VDES which is described in the most recent version of Recommendation ITU-R M.2092.

SUP CHN/28A9A2/5#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:** It is proposed to suppress the Resolution **360 (Rev. WRC-15)** since it will become superfluous after the studies are completed.

MOD CHN/28A9A2/6#50334

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 servicefrequency band | Radio astronomyfrequency 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) | 161.7875-161.9375 | 150.05-153 | −238 | 2.95 | NA | NA | NA | NA | WRC-19 |
| MMSS (space-to-Earth) | 161.7875-161.9375 | 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 frequency band 161.7875-161.9375 MHz is a new allocation to the maritime mobile-satellite service (space-to-Earth). To protect the RAS, this frequency band has to be added to Annex 1 to Resolution **739 (Rev.WRC-15)**.

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