|  |  |
| --- | --- |
| **World Radiocommunication Conference (WRC-15)Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
|  |  |
| PLENARY MEETING | **Addendum 16 toDocument 32-E** |
|  | **29 September 2015** |
|  | **Original: English** |
|  |
| Asia-Pacific Telecommunity Common Proposals |
| Proposals for the work of the conference |
|  |
| Agenda item 1.16 |

1.16 to consider regulatory provisions and spectrum allocations to enable possible new Automatic Identification System (AIS) technology applications and possible new applications to improve maritime radiocommunication in accordance with Resolution **360** **(WRC‑12)**;

Introduction

Taking into account the studies performed during this study period, these APT Common Proposalswere developed based on Methods A1, B1, C1-A and D of the CPM Report to introduce the VHF data exchange system (VDES) for the maritime community:

– RR Appendix 18 channels 27 and 28 will be split into four simplex channels, channels 1027, 1028, 2027 and 2028. Channels 2027 and 2028 will be assigned for the ASM application. This will be achieved through an effective date of implementation. 1 January 2019 for the date of implementation was proposed.

– To prevent blocking of the reception of the channels AIS 1, AIS 2, 2027 and 2028, the transmission from ship on channels 2078, 2019, 2079 and 2020 will not be permitted.

– To identify the duplex channels 24, 84, 25 and 85 of RR Appendix 18 for the usage of VDE terrestrial component. It is further proposed that the merging of these channels will permit a better data rate for the VDE terrestrial component.

– It is proposed to create a new secondary allocation for the maritime mobile-satellite service (Earth-to-space) for frequency band 161.9375-161.9625 MHz (channel 2027) and frequency band 161.9875-162.0125 MHz (channel 2028) for improved ASM communications capacity and coverage.

– It is proposed to identify a new secondary allocation for the maritime mobile-satellite service (Earth-to-space) in the frequency band 157.1875-157.3375 MHz and a new secondary allocation for the maritime mobile-satellite service (space-to-Earth) in the frequency band 161.7875-161.9375 MHz.

– To ensure protection of mobile, fixed services and radio astronomy service, it is proposed that a pfd mask be introduced in RR No. 5.B116.

– It is proposed to modify provision RR No. 5.208A, No. 5.208B and Annex 1 to Resolution 739 (Rev. WRC-07) in order to ensure the protection of the RAS in the nearest frequency band.

– It is proposed to introduce VDES regional solution. Channels 80, 21, 81 and 22 can be used using multiple 25 kHz contiguous channels for both ship and coast station transmission for regional use. Channel 82 can be used for both ship and coast station transmission for regional use. Channels 23 and 83 can be used as multiple 25 kHz contiguous channels for both ship and coast station transmission for regional use.

Proposals

MOD ASP/32A16/1

APPENDIX 18 (REV.WRC‑15)

Table of transmitting frequencies in the
VHF maritime mobile band

(See Article 52)

| Channeldesignator | Notes | Transmittingfrequencies (MHz) | Inter-ship | Port operations and ship movement | Publiccorres-pondence |
| --- | --- | --- | --- | --- | --- |
| From ship stations | From coast stations | Single frequency | Two frequency |
| .../... | .../... | .../... | .../... | .../... | .../... | .../... | .../... |
| 2078 | *t), u), v)* | 161.525 | 161.525 |  | x |  |  |
| 19 | *t), u), v)* | 156.950 | 161.550 |  | x | x | x |
| 1019 |  | 156.950 | 156.950 |  | x |  |  |
| 2019 | *t), u), v)* | 161.550 | 161.550 |  | x |  |  |
| 79 | *t), u), v)* | 156.975 | 161.575 |  | x | x | x |
| 1079 |  | 156.975 | 156.975 |  | x |  |  |
| 2079 | *t), u), v)* | 161.575 | 161.575 |  | x |  |  |
| 20 | *t), u), v)* | 157.000 | 161.600 |  | x | x | x |
| 1020 |  | 157.000 | 157.000 |  | x |  |  |
| 2020 | *t), u), v)* | 161.600 | 161.600 |  | x |  |  |
| .../... | .../... | .../... | .../... | .../... | .../... | .../... | .../... |
| 27 | *z)* | 157.350 | 161.950 |  |  | x | x |
| 1027 | *z)* | 157.350 |  |  |  |  |  |
| 2027 | *z)* | 161.950 | 161.950 |  |  |  |  |
| 87 |  | 157.375 | 157.375 |  | x |  |  |
| 28 | *z)* | 157.400 | 162.000 |  |  | x | x |
| 1028 | *z)* | 157.400 |  |  |  |  |  |
| 2028 | *z)* | 162.000 | 162.000 |  |  |  |  |
| 88 |  | 157.425 | 157.425 |  | x |  |  |
| AIS 1 | *f), l), p)* | 161.975 | 161.975 |  |  |  |  |
| AIS 2 | *f), l), p)* | 162.025 | 162.025 |  |  |  |  |

**Reasons:** Introduction of the ASM in the RR Appendix 18 as follows:

ASM 1 (161.950) and ASM 2 (162.000) are non-navigation ASM.

SAT Up1 (161.950) and SAT Up2 (162.000) are used for receiving ASM by satellite.

**Notes referring to the Table**

*General notes*

*...*

*Specific notes*

*...*

MOD ASP/32A16/2

*t)* These channels may be operated as single-frequency channels, subject to coordination with affected administrations. Channels 2078, 2019, 2079 and 2020 are not available for transmitting from ships.     (WRC‑15)

**Reasons:** To prevent blocking of the reception of AIS and ASM transmissions from other stations the transmission from ships on 2078, 2019, 2079 and 2020 are prohibited. Due to the rising number of voluntarily fitted AIS installations aboard ships and ships not fitted with AIS, the use of these frequencies with lower power has been discarded because this requires reprogramming of the communication equipment on board the vessel and a high administrative burden to ensure this.

MOD ASP/32A16/3

*u)* In Region 2, these channels may be operated as single-frequency channels, subject to coordination with affected administrations. Channels 2078, 2019, 2079 and 2020 are not available for transmitting from ships.     (WRC‑15)

*v)* After 1 January 2017, in the Netherlands, these channels may continue to be operated as duplex frequency channels, subject to coordination with affected administrations. Channels 2078, 2019, 2079 and 2020 are not available for transmitting from ships.     (WRC‑15)

**Reasons:** The split of the channels 78, 19, 79, 20 and the use of the upper legs of these channels could block the AIS equipment. Therefore it is proposed that channels 2078, 2019, 2079 and 2020 will not be available for transmitting from ships.

MOD ASP/32A16/4

*z)* Until 1 January 2019,these channels may be used for possible testing of future AIS applications without causing harmful interference to, or claiming protection from, existing applications and stations operating in the fixed and mobile services.

 From 1 January 2019, these channels are split into two simplex channels. The upper legs, 2027 and 2028, respectively designated as ASM 1 and ASM 2, are used for non-navigation ASM (application specific messages) as described in the most recent version of Recommendation ITU‑R M.[VDES].

 The channels 2027 and 2028 are also allocated to the maritime mobile-satellite service (Earth-to-space) for the reception of ASM messages from ships, as described in the most recent version of Recommendation ITU‑R M.[VDES], in which they are denominated respectively as SAT Up1 and SAT Up2. (WRC-15)

**Reasons:** Identification of two channels dedicated to the ASM applications non necessary for the security of the navigation in order to secure the VDL of the channels AIS1 and AIS2.

MOD ASP/32A16/5

APPENDIX 18 (REV.WRC‑15)

Table of transmitting frequencies in the
VHF maritime mobile band

(See Article 52)

| Channeldesignator | Notes | Transmittingfrequencies (MHz) | Inter-ship | Port operations and ship movement | Publiccorres-pondence |
| --- | --- | --- | --- | --- | --- |
| From ship stations | From coast stations | Single frequency | Two frequency |
| 24 | *w), ww), x),AAA)* | 157.200 | 161.800 |  | x | x | x |
| 1024 | *BBB)* | 157.200 |  |  |  |  |  |
| 2024 | *CCC)* | 161.800 | 161.800 | x |  |  |  |
| 84 | *w), ww), x),AAA)* | 157.225 | 161.825 |  | x | x | x |
| 1084 | *BBB)* | 157.225 |  |  |  |  |  |
| 2084 | *CCC)* | 161.825 | 161.825 | x |  |  |  |
| 25 | *w), ww), x), AAA)* | 157.250 | 161.850 |  | x | x | x |
| 1025 | *BBB)* | 157.250 |  |  |  |  |  |
| 2025 | *CCC)* | 161.850 | 161.850 | x |  |  |  |
| 85 | *w), ww), x), AAA)* | 157.275 | 161.875 |  | x | x | x |
| 1085 | *BBB)* | 157.275 |  |  |  |  |  |
| 2085 | *CCC)* | 161.875 | 161.875 | x |  |  |  |
| 26 | *w), ww), x)* | 157.300 | 161.900 |  | x | x | x |
| 1026 | *BBB)* | 157.300 |  |  |  |  |  |
| 2026 | *CCC)* | 161.900 | 161.900 | x |  |  |  |
| 86 | *w), ww), x)* | 157.325 | 161.925 |  | x | x | x |
| 1086 | *BBB)* | 157.325 |  |  |  |  |  |
| 2086 | *CCC)* | 161.925 | 161.925 | x |  |  |  |

**Reasons:** Introduction of the VDES in the RR Appendix 18 as follows:

VDE 1 lower legs (channels 1024, 1084, 1025 and 1085) are ship-shore VDE.

VDE 1 upper legs (channels 2024, 2084, 2025 and 2085) are shore-ship and ship-ship VDE.

SAT Up3 (channels 1024, 1084, 1025, 1085, 1026 and 1086) is a ship-satellite VDE uplink.

SAT Downlink (channels 2024, 2084, 2025, 2085, 2026 and 2086) is the satellite-ship VDE downlink.

**Notes referring to the Table**

*General notes*

*...*

*Specific notes*

*...*

MOD ASP/32A16/6

*w)* In Regions 1 and 3:

 Until 1 January 2017, the frequency bands 157.025-157.325 MHz and 161.625-161.925 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23, 83, 24, 84, 25, 85, 26 and 86) may be used for new technologies, subject to coordination with affected administrations. Stations using these channels or frequency bands for new technologies shall not cause harmful interference to, or claim protection from, other stations operating in accordance with Article **5**.

 From 1 January 2017, the frequency bands 157.025‑157.175 MHz and 161.625-161.775 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23 and 83) are identified for the utilization of the digital systems described in the most recent version of Recommendation ITU‑R M.1842. These frequency bands could 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.

 From 1 January 2017, the frequency bands 157.200‑157.325 MHz and 161.800-161.925 MHz (corresponding to channels: 24, 84, 25, 85, 26, 86) are identified for the utilization of the VHF Data Exchange System (VDES) described in the most recent version of Recommendation ITU‑R M.[VDES]. (WRC‑15)

**Reasons:** The date of 1 January 2017 has been defined by WRC-12.

ADD ASP/32A16/7

*AAA)* From 1 January 2019 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 described in the most recent version of Recommendation ITU‑R M.[VDES].     (WRC‑15)

**Reasons:** The merge of these channels will permitted a better data rate for the VDE terrestrial.

ADD ASP/32A16/8

*BBB)* From 1 January 2019 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.[VDES].     (WRC‑15)

**Reasons:** The channels are identified for the satellite uplink of the VDES.

ADD ASP/32A16/9

*CCC)* From 1 January 2019 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.[VDES], in which this combination is denominated as SAT downlink.     (WRC‑15)

**Reasons:** The channels are identified for the satellite downlink of the VDES.

ARTICLE 5

Frequency allocations

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

MOD ASP/32A16/10

148-223 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) | 157.1875-157.3375 FIXED MOBILE Maritime mobile-satellite (Earth-to-space) |
| 5.226 ADD 5.A116 |  5.226 ADD 5.A116 |
| 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 5.208B | 161.7875-161.9375 FIXED MOBILE Maritime mobile-satellite (space-to-Earth) MOD 5.208A MOD 5.208B |
| 5.226 ADD 5.B116 |  5.226 ADD 5.B116 |
| 161.9375-161.9625FIXEDMOBILE except aeronauticalmobileMaritime mobile-satellite (Earth-to-space) | 161.9375-161.9625 FIXED MOBILE Maritime mobile-satellite (Earth-to-space) |
| 5.226 ADD 5.A116 |  5.226 ADD 5.A116 |
| 161.9625-161.9875FIXEDMOBILE except aeronauticalmobileMobile-satellite (Earth-to-space) 5.228F | 161.9625-161.9875AERONAUTICAL MOBILE (OR)MARITIME MOBILEMOBILE-SATELITE (Earth-to-space) | 161.9625-161.9875MARITIME MOBILEAeronautical mobile (OR) 5.228EMobile-satellite (Earth-to-space) 5.228F |
| 5.226 5.228A 5.228B | 5.228C 5.228D | 5.226 |
| 161.9875-162.0125FIXEDMOBILE except aeronauticalmobileMaritime mobile-satellite (Earth-to-space) | 161.9875-162.0125 FIXED MOBILE Maritime mobile-satellite (Earth-to-space) |
| 5.226 ADD 5.A116 5.229 |  5.226 ADD 5.A116 |

**Reasons:** Introduction of the VDES in the RR Appendix 18 as follows:

SAT Up3 (channels 1024, 1084, 1025, 1085, 1026 and 1086) is a ship-satellite VDE uplink.

SAT Downlink (channels 2024, 2084, 2025, 2085, 2026 and 2086) is the satellite-ship VDE downlink.

ADD ASP/32A16/11

5.A116 The use of the frequency bands 157.1875-157.3375 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-15)

**Reasons:** The above modifications of RR Article 5 identify a MMSS allocation uplink for the VHF Data Exchange System which is described in the preliminary draft new Recommendation ITU‑R M.[VDES].

ADD ASP/32A16/12

5.B116 The use of the frequency band 161.7875-161.9375 MHz by the maritime mobile-satellite (space-to-Earth) service is limited to the systems which operate in accordance with Appendix **18**.

The power flux-density at the Earth’s surface produced by emissions from a maritime mobile-satellite service space station operating in the frequency band 161.7875-161.9375 MHz shall not exceed the following mask in dB(W/(m2 · 4 kHz)):

 −149 + 0.16 \* θ° 0° ≤ θ < 45°

 −142 + 0.53 \* (θ° − 45°) 45° ≤ θ < 60°

 −134 + 0.1 \* (θ° − 60°) 60° ≤ θ ≤ 90°

where θis the angle of arrival of the incident wave above the horizontal plane, in degrees.     (WRC‑15)

**Reasons:** The above modifications of RR Article 5 identify a MMSS allocation downlink for the VHF Data Exchange System which is described in the preliminary draft new Recommendation ITU‑R M.[VDES].

MOD ASP/32A16/13

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 for 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. The threshold levels of interference detrimental to the radio astronomy service are shown in the relevant ITU‑R Recommendation.     (WRC-15)

**Reasons:** The frequency range 161.7875-161.9375 MHz is a new allocation to the maritime mobile-satellite service (space-to-Earth). To ensure protection of the RAS this frequency range has to be added to RR No. 5.208A.

MOD ASP/32A16/14

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

 137-138 MHz,
 387-390 MHz,
 161.7875-161.9375 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-15)** applies.     (WRC-15)

**Reasons:** The frequency range 161.7875-161.9375 MHz is a new allocation to the maritime mobile-satellite service (space-to-Earth). To ensure protection of the RAS this frequency range has to be added to RR No. 5.208B.

RESOLUTION 739 (Rev.WRC-07)

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

MOD ASP/32A16/15

ANNEX 1 TO RESOLUTION 739 (Rev.WRC-15)

Unwanted emission threshold levels

.../...

TABLE 1-1

pfd thresholds for unwanted emissions from any geostationary space station
at a radio astronomy station

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Space service | Space serviceband | Radio astronomyband | 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: |
| pfd(1) | Reference bandwidth | pfd(1) | Reference bandwidth | pfd(1) | Reference bandwidth |
| **(MHz)** | **(MHz)** | **(dB(W/m2))** | **(MHz)** | **(dB(W/m2))** | **(kHz)** | **(dB(W/m2))** | **(kHz)** |
| MSS (space-to-Earth) | 387-390 | 322-328.6 | −189 | 6.6 | −204 | 10 | −177 | 10 | WRC-07 |
| MMSS (space-to-Earth) | 161.7875-161.9375 | 150.05-153 | −238 | 2.95 | NA | NA | NA | NA | WRC-15 |
| BSSMSS (space-to-Earth) | 1 452-1 4921 525-1 559 | 1 400-1 427 | −180 | 27 | −196 | 20 | −166 | 20 | WRC-03 |
| MSS (space-to-Earth)MSS (space-to-Earth) | 1 525-1 5591 613.8-1 626.5 | 1 610.6-1 613.8 | NA | NA | −194 | 20 | −166 | 20 | WRC-03 |
| RNSS (space-to-Earth) | 1 559-1 610 | 1 610.6-1 613.8 | NA | NA | −194 | 20 | −166 | 20 | WRC-07 |
| BSSFSS (space-to-Earth) | 2 655-2 670 | 2 690-2 700 | −177 | 10 | NA | NA | −161 | 20 | WRC-03 |
| FSS (space-to-Earth) | 2 670-2 690 | 2 690-2 700(in Regions 1 and 3) | −177 | 10 | NA | NA | −161 | 20 | WRC-03 |
|  | **(GHz)** | **(GHz)** | − | − | − | − | − | − |  |
| BSS | 21.4-22.0 | 22.21-22.5 | −146 | 290 | −162 | 250 | −128 | 250 | WRC-03 for VLBI, and WRC-07 for other types of observation |
| NA: Not applicable, measurements of this type are not made in this band. |
| (1) Integrated over the reference bandwidth with an integration time of 2 000 s. |

**Reasons:** In order to protect the RAS, Annex 1 to Resolution **739** (**Rev.WRC-07**) is revised to include new space service in the frequency band 161.7875-161.9375 MHz.

NOC ASP/32A16/16

APPENDIX 5 (REV.WRC‑12)

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

**Reasons:** A new secondary allocation for the MMSS (space-to-Earth) on the VDES channels was identified to ensure protection of mobile and fixed services. No coordination mechanism is required between a secondary MMSS allocation and primary terrestrial services.

MOD ASP/32A16/17

APPENDIX 18 (REV.WRC‑15)

Table of transmitting frequencies in the
VHF maritime mobile band

(See Article 52)

| Channeldesignator | Notes | Transmittingfrequencies (MHz) | Inter-ship | Port operations and ship movement | Publiccorres-pondence |
| --- | --- | --- | --- | --- | --- |
| From ship stations | From coast stations | Single frequency | Two frequency |
| 80 | *w), y), xx)* | 157.025 | 161.625 |  | x | x | x |
| 1080 | *w), y), xx)* | 157.025 | 157.025 | x | x |  |  |
| 2080 | *w), y), xx)* | 161.625 | 161.625 | x | x |  |  |
| 21 | *w), y), xx)* | 157.050 | 161.650 |  | x | x | x |
| 1021 | *w), y), xx)* | 157.050 | 157.050 | x | x |  |  |
| 2021 | *w), y), xx)* | 161.660 | 161.660 | x | x |  |  |
| 81 | *w), y), xx)* | 157.075 | 161.675 |  | x | x | x |
| 1081 | *w), y), xx)* | 157.075 | 157.075 | x | x |  |  |
| 2081 | *w), y), xx)* | 161.675 | 161.675 | x | x |  |  |
| 22 | *w), y), xx)* | 157.100 | 161.700 |  | x | x | x |
| 1022 | *w), y), xx)* | 157.100 | 157.100 | x | x |  |  |
| 2022 | *w), y), xx)* | 161.700 | 161.700 | x | x |  |  |
| 82 | *w), x), y)* | 157.125 | 161.725 |  | x | x | x |
| 1082 | *w), x, y)* | 157.125 | 157.125 | x | x |  |  |
| 2082 | *w), x), y)*  | 161.725 | 161.725 | x | x |  |  |
| 23 | *w), x), y), xxx)* | 157.150 | 161.750 |  | x | x | x |
| 1023 | *w), x), y), xxx)* | 157.150 | 157.150 | x | x |  |  |
| 2023 | *w), x), y), xx)* | 161.750 | 161.750 | x | x |  |  |
| 83 | *w), x), y), xxx)* | 157.175 | 161.775 |  | x | x | x |
| 1083 | *w), x), y), xxx)* | 157.175 | 157.175 | x | x |  |  |
| 2083 | *w), x), y), xxx)* | 161.775 | 161.775 | x | x |  |  |

**Notes referring to the Table**

*General notes*

*...*

*Specific notes*

*...*

ADD ASP/32A16/18

*xx)* Assignable for wideband digital system operation using multiple 25 kHz contiguous channels.     (WRC‑15)

ADD ASP/32A16/19

*xxx)* Assignable for 50 kHz bandwidth digital system operation using two 25 kHz contiguous channels.     (WRC‑15)

**Reasons:** The channels are identified for regional use of the VDES.

SUP ASP/32A16/20

RESOLUTION 360 (WRC‑12)

Consideration of regulatory provisions and spectrum allocations for
enhanced Automatic Identification System technology applications
and for enhanced maritime radiocommunication

**Reasons:** It is proposed to suppress Resolution 360 (WRC-12) since it will become superfluous after the studies are completed and the identification of frequencies in order to enhance maritime radiocommunication has been made by WRC-15 Conference.

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

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