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| **World Radiocommunication Conference (WRC-15)Geneva, 2–27 November 2015** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| PLENARY MEETING | **Addendum 16 toDocument 130-E** |
|  | **16 October 2015** |
|  | **Original: English** |
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| Angola (Republic of)/Botswana (Republic of)/Lesotho (Kingdom of)/Madagascar (Republic of)/Malawi/Mauritius (Republic of)/Mozambique (Republic of)/Namibia (Republic of)/Democratic Republic of the Congo/Seychelles (Republic of)/South Africa (Republic of)/Swaziland (Kingdom of)/Tanzania (United Republic of)/Zambia (Republic of)/Zimbabwe (Republic of) |
| 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

The Automatic Identification System(AIS) is a proven maritime data system. The carriage of the shipborne AIS is mandatory for safety of navigation under Chapter V of the International Convention of Safety of Life at Sea (SOLAS). AIS enables the identification of stations using these systems, provides information about a ship and its cargo and provides a means for ships to exchange ship date i.e. Identification, position, course and speed with other nearby ships and coast stations.

a) resolve 1:

To consider based on the results of ITU-R studies, modifications to the Radio Regulations including possible spectrum allocations to enable new AIS terrestrial and satellite applications while ensuring that these applications will not degrade the current AIS operations and other existing services;

When the AIS VDL(VHF data link) is used for data communications it performs poorly with higher loads resulting in a higher loss of AIS messages, a higher number of retransmission and finally a breakdown of data communications;

With the increasing demand for maritime VHF data communications, AIS will become more heavily used which will lead to an overloading of the existing AIS1 and AIS2 channels’

The decision of WRC-12 to assign new channels of the RR Appendix 18 to digital communications makes the implementation and use of new digital communications means possible;

The use of the 6 VHF data channels plus 2 further channels (which have been identified for “possible testing of future AIS applications”) as proposed to be use for an international scheme to be known as VHF data exchange scheme)VDES).

b) resolve 2:

To consider based on the results of ITU-R studies, additional or new applications for maritime radio communication within existing maritime mobile and mobile-satellite service allocations, and if necessary to take appropriate regulatory measures;

Traditional communications e.g. voice has been inadequate for transfer of traditional communications e.g. voice has been inadequate for transfer of information required to improve safety of navigation particularly in adverse conditions. Information is required in real-time to improve operational decisions on land and on ship. The channels identified at WRC-12 would be used to respond to increased data transfer and improve maritime safety and efficiency;

Increasing use of satellite networks has resulted in the development of new applications that can support and enhance safety and navigation

WRC-15 agenda item 1.16 addresses the following issues:

• Issue A: Application specific message designation;

• Issue B: New applications for maritime radiocommunication – terrestrial component

• Issue C: New application for maritime radiocommunication – satellite component

• Issue D: VDES regional solution.

Proposal – Issue A: Application specific message designation

The SADC member states support Method A2 of the CPM report, which proposes the following:

RR Appendix 18 simplex channels 87 and 88 will be assigned for ASM application with an effective date to be decided at WRC-15.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/1

APPENDIX 18 (REV.WRC‑12)

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 |
| 15 | *g)* | 156.750 | 156.750 | x | x |  |  |
| 75 | *n), s)* | 156.775 | 156.775 |  | x |  |  |
| 16 | *f)* | 156.800 | 156.800 | DISTRESS, SAFETY AND CALLING |
| 76 | *n), s)* | 156.825 | 156.825 |  | x |  |  |
| 17 | *g)* | 156.850 | 156.850 | x | x |  |  |
| 77 |  | 156.875 |  | x |  |  |  |
| 18 | *m)* | 156.900 | 161.500 |  | x | x | x |
| 78 | *t), u), v)* | 156.925 | 161.525 |  | x | x | x |
| 1078 |  | 156.925 | 156.925 |  | x |  |  |
| 2078 | *ZZZZ)* | 161.525 | 161.525 |  | x |  |  |
| 19 | *t), u), v)* | 156.950 | 161.550 |  | x | x | x |
| 1019 |  | 156.950 | 156.950 |  | x |  |  |
| 2019 | *ZZZZ)* | 161.550 | 161.550 |  | x |  |  |
| 79 | *t), u), v)* | 156.975 | 161.575 |  | x | x | x |
| 1079 |  | 156.975 | 156.975 |  | x |  |  |
| 2079 | *ZZZZ)* | 161.575 | 161.575 |  | x |  |  |
| 20 | *t), u), v)* | 157.000 | 161.600 |  | x | x | x |
| 1020 |  | 157.000 | 157.000 |  | x |  |  |
| 2020 | *ZZZZ)* | 161.600 | 161.600 |  | x |  |  |
| … | *…* | … | … | … | … | … | … |
| 27 | *z)* | 157.350 | 161.950 |  |  | x | x |
| 87 | *z), ZZZ)* | 157.375 | 157.375 |  | x |  |  |
| 28 | *z)* | 157.400 | 162.000 |  |  | x | x |
| 88 | *z), ZZZ)* | 157.425 | 157.425 |  | x |  |  |
| AIS 1 | *f), l), p)* | 161.975 | 161.975 |  |  |  |  |
| AIS 2 | *f), l), p)* | 162.025 | 162.025 |  |  |  |  |

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 ZMB/ZWE/130A16/2

zzz) From 1 January 2019, these channels may be used for ASM application. These channels could be continuously used for simplex voice applications subject to coordinating with ASM application, and not claiming protection.    (WRC-15)

**Reasons:** The existing duplex channel 27 and 28 will be kept as a duplex for MMS. The existing simplex channels will be identified for ASM.

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/3

zzzz) While using these channels (2078, 2079, 2019 and 2020) all precautions should be taken to avoid harmful interference to channels AIS1 and AIS2, by limiting the output power to 1 W.    (WRC‑15)

**Reasons:** The following channels (2078, 2079, 2019 and 2020) will be kept for voice transmission in MMS. This approach is in similar to measures to protect 16 channel (footnote *n)* Appendix **18**).

Proposal – Issue B: New applications for maritime radiocommunication – terrestrial component

The SADC member states support Method B2 of the CPM report, which proposes the following:

• Channels 24, 84, 25, 85, 26 and 86 in RR Appendix 18 could be used for global harmonized VDE testing and experiments for the terrestrial and satellite component of VDES.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/4

APPENDIX 18 (REV.WRC‑12)

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)* | 157.025 | 161.625 |  | x | x | x |
| 21 | *w), y)* | 157.050 | 161.650 |  | x | x | x |
| 81 | *w), y)* | 157.075 | 161.675 |  | x | x | x |
| 22 | *w), y)* | 157.100 | 161.700 |  | x | x | x |
| 82 | *w), x), y)* | 157.125 | 161.725 |  | x | x | x |
| 23 | *w), x), y)* | 157.150 | 161.750 |  | x | x | x |
| 83 | *w), x), y)* | 157.175 | 161.775 |  | x | x | x |
| 24 | *w), ww), x), y), dddd)* | 157.200 | 161.800 |  | x | x | x |
| 84 | *w), ww), x), y), dddd)* | 157.225 | 161.825 |  | x | x | x |
| 25 | *w), ww), x), y), dddd)* | 157.250 | 161.850 |  | x | x | x |
| 85 | *w), ww), x), y), dddd)* | 157.275 | 161.875 |  | x | x | x |
| 26 | *w), ww), x), y), dddd)* | 157.300 | 161.900 |  | x | x | x |
| 86 | *w), ww), x), y), dddd)* | 157.325 | 161.925 |  | x | x | x |
| 27 | *z,), dd)* | 157.350 | 161.950 |  |  | x | x |
| 1027 |  | 157.350 | 157.350 |  | x |  |  |
| 2027 | *ddd)* | 161.950 | 161.950 |  | x |  |  |
| 87 | *z)* | 157.375 | 157.375 |  | x |  |  |
| 28 | *dd), z)* | 157.400 | 162.000 |  |  | x | x |
| 1028 |  | 157.400 | 157.400 |  | x |  |  |
| 2028 | *ddd)* | 162.00 | 162.000 |  | x |  |  |
| 88 | *z)* | 157.425 | 157.425 |  | x |  |  |
| AIS 1 | *f), l), p)* | 161.975 | 161.975 |  |  |  |  |
| AIS 2 | *f), l), p)* | 162.025 | 162.025 |  |  |  |  |

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/5

w) In Regions 1 and 3 except China:

 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, 86) may be used for new technologies, or VDE terrestrial component testing and experiment, 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 157.025‑157.325 MHz and 161.625-161.925 MHz (corresponding to channels: 80, 21, 81, 22, 82, 23, 83, 24, 84, 25, 85, 26, 86) 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.    (WRC‑15)

NOC AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/ZWE/130A16/6

Notes *ww)*, *x)*, *y)* and *z)*

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/7

*dddd)* From 1 January 2019, the frequency bands 157.200-157.325 and 161.800-161.925 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.

Proposal – Issue C: New application for maritime radiocommunication – satellite component

The SADC member states support Method C2 of the CPM report, which proposes the following:

• To use the frequency band 148-150 MHz (Earth-to-space) for the purpose of VDES satellite uplink(improvement of VDE communications capacity and coverage, ASM communications capacity and coverage) as the band is already allocated for MSS.

• To use the frequency band 137-138 MHz (space-to-Earth) for the purpose of the VDES satellite downlink as the band is already allocated for MSS.

• Will require no additional allocations and RR changes.

NOC AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/8

ARTICLE 5

Frequency allocations

Proposal – Issue D: VDES regional solution

The SADC member states support Method D of the CPM report, which proposes the following:

• Channels 80, 21, 81, 22, 82, 23 and 83 are available in some Regions as follows-

• Channels 80, 21, 81 and 22 can be used using multiple 25 kHz contiguous channels for both ship and coast station transmission on a regional basis

• Channel 82 can be used for both ship and coast station transmission on a regional basis.

• Channel 23 and 83 can be used using multiple 25 kHz contiguous channels for both ship and coast station transmission on a regional basis.

**Reasons:**

a) Study of VHF data link loading

 The various studies have concluded that the loading levels in some high traffic areas have already exceeded the critical level of 50% and more are expected to exceed the level in the near future. It is proposed to designate channels for ASM in RR Appendix 18.

b) AIS Blocking

 Studies indicated that AIS1 and AIS2 are in close proximity to channels 2078, 2019, 2079 and 2020. The use of these 4 channels for maritime radio communications may block the ship’s AIS receiver resulting in a negative impact on the ship’s AIS safety and navigation. It is proposed to modify the provisions of channels 2078, 2019, 2079 and 2020 in RR Appendix 18 to indicate those channels are not available for transmitting from ships.

c) Study of review of channels for terrestrial component of VDES

 Adjacent VHF channels can be merged as 50 kHz channel(s) or 100 kHz channel comprising a contiguous frequency and are thus amendable to protection by a single selective filter in the receiver.

 Studies have indicated that the coordination levels already in use are sufficient to permit the sharing of spectrum between maritime terrestrial and non-maritime terrestrial services.

 Channels 24, 84, 24, 85 ,26 and 86 in RR Appendix 18 could be allocated for global harmonised VDE applications in accordance with the outcomes of WRC-12.

 Channels 80, 21, 81, 22, 82, 23 and 83 in RR Appendix 18 could be allocated for regional or national VDE applications.

 Studies on channel plan A, B and C is documented in the Report ITU-R M.[VDES-SELECT] and based on its performance channel plan A was selected.

d) Study of possible frequencies for satellite component of VDES

 Frequencies already allocated for MSS (137-138 MHz) will not require additional studies or regulatory actions to introduce the VDES satellite component

 Sharing frequencies in the frequency band 156-162 MHz for the VDES satellite component between satellite downlink and terrestrial services shows that compatibility could be feasible if PFD levels will be established in order to protect primary services

 In addition epfd thresholds -238 dB(w/m2)/2.95 MHz should be guaranteed to protect radio astronomy(RA) stations from unwanted emissions of MSS space stations operating in all or parts of the frequency band 150.05-153 MHz in Region 1.

The SADC member states further notes that the four (4) issues identified are complementary to each other.

MOD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/9

APPENDIX 18 (REV.WRC‑12)

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)* | 161.650 | 161.650 | 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),*  *xxx)* | 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 |  |  |
| … | … | … | … | … | … | … | … |

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/ZMB/ZWE/130A16/10

xx) Assignable for wideband digital system operation using multiple 25 kHz contiguous channels.

ADD AGL/BOT/LSO/MDG/MWI/MAU/MOZ/NMB/COD/SEY/AFS/SWZ/TZA/
 ZMB/ZWE/130A16/11

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

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

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