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| **The 2nd Meeting of the APT Conference Preparatory Group for WRC-15 (APG15-2)** | **Document:****APG15-2/INP-54** |
| 01 – 05 July 2013, Bangkok, Thailand | **01 July 2013** |

**Socialist Republic of Viet Nam**

**PRELIMINARY VIEWS ON WRC-15 AGENDA ITEMS 1.5, 1.1.5, 1.16, 1.17 and 1.18**

## Agenda item 1.5

*to consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices* ***30****,* ***30A*** *and* ***30B*** *for the control and non-payload communications of unmanned aircraft systems (UAS) in non-segregated airspaces, in accordance with Resolution* ***153 (WRC-12)***

**Background**

Resolution **153 (WRC‑12)**: *To consider the use of frequency bands allocated to the fixed-satellite service not subject to Appendices 30, 30A and 30B for the control and non-payload communications of unmanned aircraft systems in non-segregated airspaces.*

The ITU-R Working Party 5B should conduct the necessary studies leading to technical and regulatory recommendations to the WRC-15, enabling that Conference to decide on the usage of FSS links (in frequency bands allocated to the FSS not subject to Appendix **30**, **30A**, and **30B**) for the CNPC links (for Earth stations on-board UAs and UACS on fixed point on the ground communication with) for the operation of UAS.

The International Civil Aviation Organization (ICAO) is responsible for developing the technical Standards and Recommended Practices (SARPs) for CNPC to ensure safe operation of UAS in non-segregates airspace. UAS CPNC operations in non-segregated airspace need to satisfy ICAO SARPS requirements.

### Preliminary View

When considering the spectrum for the UAS using FSS allocations, the followings should be carefully consider:

- Operation of other aeronautical safety services must be ensured;

- No constrain is introduced to existing services;

- Clearly identified of UAS spectrum requirement.

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## Agenda item 1.15

*to consider spectrum demands for on-board communication stations in the maritime mobile service in accordance with Resolution* ***358 [COM6/3] (WRC-12)***

**Background**

Resolution **358 (WRC‑12)**: *Consideration of improvement and expansion of on-board communication stations in the maritime mobile service in the UHF bands*.

The use of UHF frequencies for on-board communications is considered very important, without these, critical functions of the ship in restricted waters could not effectively take place. These functions include anchoring, berthing, control of fire-fighting/damage control parties, security patrols, terrorism threats etc. Whilst these are of significant concern to those operating the ship the consequences of failure affect not only the seafarer but have significant implication for the immediate environment the ship is operating in.

Only six frequencies, in the bands between 450 and 470 MHz, are currently identified in
RR No. **5.287** for on-board communication stations using 25 kHz channels spacing. These frequencies are 457.525 MHz, 457.550 MHz, 457.575 MHz, 467.525 MHz, 467.550 MHz and 467.575 MHz. Where needed, equipment designed for 12.5 kHz channel spacing using also the additional frequencies 457.5375 MHz, 457.5625 MHz, 467.5375 MHz and 467.5625 MHz may be introduced for on-board communications.

The use of these frequencies in territorial waters may be subject to the national regulations of the administration concerned. The characteristics of the equipment used shall conform to those specified in Recommendation ITU-R M.1174-2. (WRC-07)

A worldwide survey indicates that in several geographical areas, communications by UHF of a ship were either prevented on some channels by traffic from other vessels or shore operations or were severely interfered.

It should also be noted that several Administrations actively use these frequencies for land mobile communications. In accordance with RR No. **5.286AA** the bands 450-470 MHz is identified for use by Administrations wishing to implement International Mobile Telecommunication (IMT).

According to a rough survey currently, the congested situation rarely occurs in few big harbors.

### Preliminary View

This Administration supports ITU-R studies to introduce new digital technology and higher efficiency channel system (e.g. 12.5 kHz and/or 6.25 kHz) to the existing on-board UHF frequencies.

The use of Continuous Tone Coded Squelch Systems (CTCSS) and/or Digital Coded Squelch (DCS) should be recommended as a way to mitigate the congestion.

Studies on sharing and compatibility between on-board UHF communication stations and IMT systems should be take into consideration.

## Agenda item 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)***

**Background**

Resolution **360 (WRC‑12)**: *Consideration of regulatory provisions and spectrum allocations for enhanced Automatic Identification System technology applications and for enhanced maritime radiocommunication*

In regards to *resolves* 1 of Resolution **360 (WRC-12):**

The ship-borne automatic identification system (AIS) mandated under Chapter V of the international convention for the safety of life at sea (SOLAS) has become well accepted by the maritime community and is also being used by thousands of ships not subject to the SOLAS Convention. This safety of navigation system operates in the VHF band and is used for vessel collision avoidance as well as the delivery of information about specific details of a vessel.

AIS is supported by a large shore based VHF infrastructure as well as being able to be detected by satellite. AIS is routinely used by ships for navigation and crew familiarity is a positive factor. AIS messages can be sent with a priority #1 (highest) through #4 (lowest).

The AIS VHF Data Link (VDL) is designed mainly for navigation, with top priority on vessel collision avoidance. The ships positions are continuously transmitted on the VDL and the closer ships have the highest probability of reception. This ensures that, even during high VDL loading, ships will receive all position reports from the closest ships but fewer position reports from the more distant ships.

When the AIS VDL is used for data communications, it cannot in the same way tolerate loss of AIS messages. Higher load on the VDL results in higher loss of AIS messages, which results in higher number of retransmissions. This will eventually result in the breakdown of data communications on the AIS VDL.

With increasing demand for maritime VHF data communications, AIS has become heavily used. The result is overloading of the existing AIS1 and AIS2 channels.

In regards to *resolves* 2 of Resolution **360 (WRC-12):**

Traditional communication methods (i.e. voice) could not adapted to the transfer of the information required to improve the safety of navigation in these conditions. More information (such as weather, ice charts, aids to navigation status and water levels) are required in real-time to improve operational decisions on land and on ship that will lead to safer and more efficient voyages.

Shore authorities have also demonstrated interest in increasing the quantity of information retrieved from ships in real-time (such as voyage information, passenger manifest and pre-arrival reports).

As a result of these additional requirements on maritime communications, the channels identified by WRC-12 in Appendix 18 would be used by maritime authorities across the world to respond to increased data transfer and improve maritime safety and efficiency in the growing maritime environment.

A number of Administrations have implemented shore infrastructure for AIS. In addition, AIS signals can be detected by satellite.

WRC-12 defined some channels in Appendix 18 for digital communications and others for new AIS applications as summarized in below figure.



### Preliminary View

- New AIS:

The two channels 2027 and 2028 could be considered for introduction of new AIS applications, the usage of remaining channels 1027 and 1028 should be taken into account.

- VHF data communication:

WRC-12 specified 13 channels for VHF digital communications but only 6 channels are globally harmonized. It should be considered the channels number 24, 84, 25, 85, 26, 86 for Global purpose; and channels # 80, 21, 81,22, 82, 23, 83 for Regional and National purpose.

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## Agenda item 1.17

*to consider possible spectrum requirements and regulatory actions, including appropriate*

*aeronautical allocations, to support wireless avionics intra-communications (WAIC), in accordance with Resolution* ***423 (WRC-12)***

**Background**

Resolution **423 (WRC‑12)**: *Consideration of regulatory actions, including allocations, to support Wireless Avionics Intra-Communications*

Wireless avionics intra-communications (WAIC) systems make use of radio communications between two or more stations on a single aircraft, consisting of on-board networks supporting the operation of the aircraft and its systems. WAIC system transmissions may be included the interior and/or exterior of the aircraft structure. For example, sensors mounted on the wings or engines could communicate with systems located within the airplane. WAIC technology will allow for better monitoring of the health or maintenance of the aircraft, and it could also lead to improved aircraft manufacturing techniques. The combined effects of these changes may provide the opportunity for lower costs of operations and environmental benefits. WAIC systems will be used for safety-related aircraft applications, providing communications within a single aircraft (i.e. WAIC systems do not provide communications between an aircraft and the ground, another aircraft or a satellite).

### Preliminary View

The ability to use WAIC communication systems is important to the civil aviation industry, but presents a significant challenge given the global nature of air travel.

The technical, regulatory and operational actions should not put other aeronautical safety services at risk.

Compatibility and sharing studies need to be taken carefully to ensure no constrain is introduced to related terrestrial services.

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## Agenda item 1.18

*to consider a primary allocation to the radiolocation service for automotive applications in*

*the 77.5-78.0 GHz frequency band in accordance with Resolution* ***654 (WRC-12)***

**Background**

Resolution **654 (WRC-12)**: Allocation of the band 77.5-78 GHz to the radiolocation service to support automotive short-range high-resolution radar operations

Portions of the 76-81 GHz frequency band are allocated to the radio astronomy service, amateur and amateur-satellite and radiolocation services on a primary or secondary basis and to the space research (space-to-Earth) service on a secondary basis. At frequencies above 30 GHz, radio propagation decreases more rapidly with distance than at lower frequencies and antennas that can narrowly focus transmitted energy are practical and of modest size. While the limited range of such transmissions might appear to be a major disadvantage for many applications, it does allow the reuse of frequencies over very short distances and, thereby enables a higher concentration of transmitters to be located in a geographical area than is possible at lower frequencies.

The attenuation of the transmissions, however, varies depending on the water vapor content of the atmosphere and other atmospheric factors.

There has been significant growth in the use of automobile radar systems, and these systems are expected to become relatively commonplace within a few years because of consumer demand for increased vehicle safety. Studies have shown that the use of collision avoidance technology can prevent or lessen the severity of a significant number of traffic accidents. In certain parts of the world, automotive radars have successfully operated in this portion of the spectrum, particularly the 76-77 GHz band, for many years without mitigation methods or deactivation methods and without increased reports of interference to licensed services.

### Preliminary View

Intelligent transport systems (ITS) could provide mechanisms for human and vehicle safety.

The Administration supports ITU-R studies on automotive radar in the 77.5-78 GHz band to improve global road safety. This new RLS allocation should not limit other allocated radio communication services.

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