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| **Radiocommunication Study Groups** |  |
| **INTERNATIONAL TELECOMMUNICATION UNION** |  |
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| Received: xx mm 2016  Subject: Agenda item 1.9.2 (WRC-19) | **Document 5B/ -E** |
| **XX MM 2016** |
| **English only** |
| **International Association of Marine Aids to Navigation and Lighthouse Authorities** | |
| Liaison Note to ITU-R WORKING pARTY 5B | |
| Regarding the AGENDA ITEM 1.9.2 (WRC-19) | |

**1 Background**

IALA has noted with great interest the new AI 1.9.2 supported by Resolution 360 (Rev. WRC-15) in which IALA is invited to contribute.

**2 Discussion**

During the previous study period IALA has studied a VDES satellite component in six channels of the Appendix **18**. IALA intends to continue to work on that option through the development of a working document towards a draft new Report. See in Annex the proposed table of content for this draft new Report.

In addition IALA has noted the possibility to study new spectrum allocations to the maritime mobile-satellite service (Earth‑to‑space and space-to-Earth), within the frequency bands 156.0125-157.4375 MHz and 160.6125-162.0375 MHz. IALA intends to study during this study period the possibility to identify a new MMSS (space-to-Earth) in the frequency band 160.975-161.475 MHz. This would ease the sharing considerations between the terrestrial and satellite components of VDES.

**3 Actions requested**

IALA requests ITU-R WP 5B to consider this information.

# Introduction

# VDE-SAT, the essential supplement to coastal VDES

## To fill the geographical and operational gaps of the VDES coastal network

## To expand of the VDES from coastal area to global coverage

## Use case descriptions

### Distribution of maritime safety information

### Automated or on event ship reporting

### VDE-SAT opportunity for small vessels fleet or developing areas

### Anti-piracy

### VDES infrastructure for developing areas

### High seas communications to small vessels, i.e. fishing vessels

### Ice chart distribution

# Interoperability with the terrestrial VDES

## Resource sharing method for VDES terrestrial and satellite services

## Resource sharing between multiple VDES satellite systems

# Interference to incumbent services and those in adjacent frequency bands

## Maritime Distress and voice services (see Report ITU-R M.2371)

## Satellite AIS

## Radiolocation in the 154-156 MHz band (Russia + others)

## Broadcast in the 162-164 MHz band (Morocco) (Liaison note from WP5B required)

## Space-to-earth in the 162-164 Hz band (China)

## Fixed services in band (Liaison note from WP5B required)

## Land and aeronautical mobile services in-band and in adjacent frequency bands (154-164 MHz)(Liaison note from WP5B required)

## PFD limit calculations, averaging time, polarization, required signal characteristics

# Satellite receiver resilience to harmful interference from incumbent services and those in adjacent frequency band

## Propagation model

## Link budget simulations based on noise measurements

## Performance degradation estimates

# Identification of spectrum requirements and rationale for the use of the frequency bands of Appendix 18 of the RR

## Potential use of the frequency band 160.975-161.475 MHz versus 2024/2084/2025/2085/2026/2086 for satellite downlink

## Frequency plan analysis

### Analysis FDMA, TDMA, CDMA

### In-band PFD mask

### Adjacent Radio Astronomy mask

## Conclusions (primary/secondary)

# Testing, demonstrations and measurements

# Future demonstrations and measurements

## Norsat-2 (ESA VDE-SAT downlink verification planned H1 2017)

## Uplink measurements campaigns?

## Global spectrum sweeps for interference mapping?

## Two-way test/demo VDE-SAT system including protocols?

## Efficiensea 2 coordination

## Other test-satellites planned?

## Norsat-2 and other satellites sharing?

# Technical description for VDE-SAT

## Technical characteristics of the VDE-SAT Downlink in the VHF Maritime Mobil band (new/updated Annex to Rec. ITU-R M.2092)

### Antenna noise levels on-board ships

## Technical characteristics of the VDE-SAT Uplink in the VHF Maritime Mobil band (new/update Annex to Rec. ITU-R M.2092)