**INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP**
**TWENTEENTH MEETING (APIRG/20)**

**Yamoussoukro, Cote d'Ivoire (30 November – 2nd December 2015)**

**Agenda Item 2: Performance Framework for Regional Air Navigation Planning and Implementation**

**2.4 Communications, Navigation and Surveillance (CNS)**

# COMMUNICATIONS SYSTEMS:
# AERONAUTICAL SPCTRUM ISSUES

*(Presented by the Secretariat)*


| SUMMARY |
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| This working paper presents the report of the summary up of the actions taken in the fields of the Aeronautical spectrum as discussed during the Sixth Meeting of APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/6, Dakar, Senegal, 18-22 May 2015) for consideration by APIRG/20. |
| ***Action by the meeting is at paragraph 3.*** |
| **REFERENCES** :<br>ICAO SP AFI RAN 2008, Report (Doc 9930)<br>APIRG/19 Report<br>APIRG Extraordinary Report<br>CNS/SG/6 Report |


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| *Strategic Objective(s)* | This working paper related to the Strategic Objectives **A**: ***Safety; B: Air Navigation Capacity and Efficiency***<br>Related **ICAO ASBU Performance Improvement Areas and Block0 Modules**: **PIA1 (*B0-FICE*); PIA2 (*B0-DATM, B0-AMET*); PIA3 (*B0-FRTO, B0-NOPS, B0-ASEP, B0-OPFL, B0-SNET*); PIA4 (*B0-TBO*).** |

## 1. INTRODUCTION

1.2 The Sixth Meeting of the APIRG Communications, Navigation and Surveillance Sub-group (CNS/SG/6) was held in Dakar, Senegal from 18 to 22 May 2015. It was attended by fifty two (52) participants from Seventeen (17) Contracting States, three international organizations namely AFCAC, ASECNA and the Roberts FIR.

1.3 This working paper presents the report of the APIRG Communications Navigation and Surveillance Sub Group sixth meeting on Aeronautical spectrum and the updated information on the outcome of the last ITU World Radiocommunication Conference (ITU WRC-15)

## 2. DISCUSSION

***Coordination action in the framework of the AFI Frequency Management Group (AFI/FMG) and VSAT C band protection.***

2.1 The meeting examined the status of implementation of the Conclusions and Decisions of the CNS/SG/5 meeting held in Nairobi, Kenya from 16 to 19 September 2013 and endorsed by APIRG 19th meeting, Dakar, Senegal, 28- 31 October 2013.

2.2 The Secretariat presented to the meeting the action undertaken to coordinate the attendance by the AFI Civil Aviation community to the first and third preparatory meetings of the African Telecommunication Union (ATU) held respectively in Dakar, Senegal from 18 to 20 March 2013 and in Abuja, Nigeria from 26 to 30 January 2015.

2.3 During these meetings the ICAO views were presented based on the aim to ensuring that the ITU Radio Regulations shall not be in conflict with ICAO Standards and Recommended Practices, enabling the advancement of technological innovation to maintain and enhance the safety of the global air transport system as well as increasing efficiency in spectrum utilization.

2.4 ICAO position on the WRC-15 Agenda Items of particular importance to civil aviation (1.1; 1.5; 1.17 and 9.1.5) was presented in detail and ICAO specific views on the other various Agenda Items recorded under each respective agenda items in particular agenda items 1.4; 1.6; 1.7; 1.10; 1.11; 1.12; 1.16; 4; 8; 9.1.1; 9.1.6 and 10.

2.5 ASECNA, the Rapporteur of the AFI Frequency Management Group (AFI/FMG) reported on the coordination action undertaken toward stakeholders in order to obtain the support to ICAO position in particular the protection of the C-band operated by the AFI Aeronautical satellite based Networks.

2.63 The Secretariat informed the meeting on the 4th and last preparatory meeting convened by ATU in Nairobi, Kenya from 20 to 24 July 2015 and strongly encouraged States to attend as well as to participate in the sub-regional meetings in ECOWAS and SADC.

***Outcome of the ITU World Radiocommunication Conference (WRC-15)***

2.7 The ITU World Radiocommunication Conference (WRC-15) was held in the Centre International de Conference de Genève (CICG) from 2 to 27 November 2015. The meeting was attended by about 4100 participants against 3200 for the last conference showing an increase of escalation of interest and pressure.

2.8 ICAO attendance was ensured by two technical Officers from ICAO HQs covering the whole conference time. They were supported by the Regional Officers CNS WACAF during the first two weeks and the Regional Officer CNS ESAF for the third week.

2.9 Moreover the various coordination actions undertaken by the Secretariat in conjunction with stake holders during the preparatory activities, the aviation community strategized in Geneva in order to have a support to ICAO position leading to100% success in promoting/defending the ICAO Position. Focus was made on African civil aviation delegates included in national delegation.

2.10 Under 1.17 dealing with Wireless Avionics Intra-Communications (WAIC) the 4200-4400MHZ was allocated to this service.

2.11 The Agenda item 1.5 of the conference has been subject to intense and long discussion. The development of an allocation for UAS CNPC links (RPAS C2 links) using FSS spectrum is provisional, and will enter into full force in 2023, provided that ICAO successful develop SARPs using the conditions described in the ITU Resolution associated with the allocation. However the important part is that this Resolution gives the RPAS panel the adequate material needed for development of SARPs for the C2 link. This proved to be a very divisive issue amongst some of our civil aviation colleagues during the WRC deliberations; however the end result is in good alignment with the ICAO Position.

2.12 In Agenda 1.1 dealing inter alia with aeronautical frequencies (**Appendix 1**) no change in their allocation for IMTs was obtained.

2.13 Under Agenda item dealing with Global Flight Tracking (GFT) allocation was made to the band **1090MHZ** in the direction Earth to Space for ADS-B operation leading to GFT. As a follow up to GFT, a WRC-19 agenda item was developed to facilitate the development of Global Aviation Distress and Safety System (GADSS).

2.14 Agenda item 9.1.5 related to the protection of the C Band lead to the revision of Resolution 154 WRC-15 (**Appendix 2**) in order to ensure the safe operation of C Band VSATs.

2.15 Before and during this Conference, the difficulties encountered in the coordination to have the support from the AFI States gave the lesson on a necessity to reinforce the coordination amongst stakeholders in particular for the protection of the C-Band. Based on the above, the following draft conclusions are formulated:

**DRAFT CONCLUSION 20/XX: SUPPORT TO ICAO POSITION**

**That;**

**In accordance with the Finals acts of WRC-15:**

**a) Administrations/Organizations continue to support ICAO position for WRC in particular on agenda item of high importance to the safe operation of aircraft by participation in the national and regional/sub regional preparatory meetings for ITU WRC meetings; and**

**b) The Secretariat reinforce the coordinate of the initiatives aiming to ensuring the alignment of their national position with ICAO position for WRC-19.**

**DRAFT CONCLUSION XX: PROTECTION OF C BAND SPECTRUM**

**That;**

**In accordance with Resolution 154 (Rev WRC-15), Administrations/Organizations take the appropriate measures in order to ensure the protection of the satellite C-band operated by the AFI VSAT networks:**

**a) Registration of the aeronautical VSAT frequencies in the States register held by the national authorities of regulation of telecommunication and:**

**b) Follow-up with the concerned authorities in the States to further register the frequencies in the ITU Master International Frequency Register (MIFR).**

## 3. CONCLUSION

3.1 The meeting is invited to:

a) Note the information presented in this working paper; and

**b)** Review and adopt the above draft conclusions on Aeronautical spectrum

**-END-**

**Appendix 1**

**Aeronautical frequency spectrum coveted by IMTS**

| Frequency Bands | Aeronautical Service |
|---|---|
| **400 – 406 MHz** | ELT |
| **960 – 1215 MHz** | DME, SSR, 1090ES, MLAT, ACAS, UAT, GNSS, LDACS |
| **1215 – 1350 MHz** | PSR |
| **1559 – 1610 MHz** | GNSS |
| **1.5 / 1.6 GHz** | AMS(R)S (sub-bands) |
| **2700 – 3100 MHz** | PSR (airport approach |
| **3400 – 4200 MHz** | FSS used extensively in the AFI region for aeronautical ground-ground and Air Ground communications carrying safety critical data (VSAT). See also Agenda Item 9.1.5. |
| **4200 – 4400 MHz** | Radio Altimeters, **WAIC** |
| **5000 – 5250 MHz** | MLS, UAS Terrestrial & Satellite, AeroMACS, Aeronautical Telemetry |
| **5350 – 5470 MHz** | Airborne Weather Radar |

**APPENDIX 2**

# RESOLUTION 154 (REV.WRC-15)

Consideration of technical and regulatory actions in order to support existing and future operation of fixed-satellite service earth stations within the frequency band 3 400-4 200 MHz, as an aid to the safe operationof aircraft and reliable distribution of meteorological information in some countries in Region 1

The World Radiocommunication Conference (Geneva, 2015),

*considering*

*a)* that the frequency band 3 400-4 200 MHz is allocated worldwide to the fixed-satellite service (FSS) in the space-to-Earth direction and to the fixed service on a primary basis;

*b)* that the frequency band 3 400-3 600 MHz is allocated on a primary basis to the mobile, except aeronautical mobile, service and identified for International Mobile Telecommunications (IMT) in Region 1 countries as specified in Article **5** of the Radio Regulations;

*c)* that in Region 1, the allocation to the mobile, except aeronautical mobile, service in the frequency band 3 400-3 600 MHz is subject to technical and regulatory conditions aimed at ensuring compatibility with co-primary services of neighbouring countries;

*d)* that a number of developing countries rely, to a great extent, on FSS systems using very small aperture terminals (VSAT) in the frequency band 3 400-4 200 MHz for the provision of communications as an aid to safe operation of aircraft and reliable distribution of meteorological information;

*e)* that, in some cases, where an adequate terrestrial communication infrastructure is not available, VSAT networks referred to in *considering d)* above are the only viable option to augment the communication infrastructure in order to satisfy the overall communications infrastructure requirements of the International Civil Aviation Organization (ICAO) and to ensure distribution of meteorological information under the auspices of the World Meteorological Organization (WMO);

*f)* that the relevant ITU Radiocommunication Sector (ITU-R) studies showed a potential for interference from fixed wireless access and IMT stations into FSS receiving earth stations at distances from less than one kilometers up to hundreds of kilometers, depending on the parameters and deployment of stations of these services;

*g)* that WRC-12, taking into account the studies mentioned in *considering f)* above, decided to study technical and regulatory measures to support the FSS earth stations referred to in *considering e)* above,

*noting*

*a)* that, by the date of this conference, several cases of harmful interference to the FSS VSATs used for aeronautical safety communications from fixed wireless access or IMT stations were reported;

*b)* that these reported cases of interference indicated difficulties that some administrations have encountered in the coordination of frequencies between the fixed wireless access or IMT systems and frequency assignments for VSATs used for aeronautical and meteorological purposes;

*c)* that, in many countries, FSS VSAT earth stations are not subject to individual licensing and not registered as specific stations in their national frequency databases and in the ITU Master International Frequency Register (MIFR) due to the considerable administrative work involved;

*d)* that knowledge of the location and operational frequencies of VSAT stations used for communications as an aid to the safe operation of aircraft and/or distribution of meteorological information is critically important for ensuring compatibility with applications of other services,

*recognizing*

*a)* that ITU-R conducted comprehensive studies of compatibility between FSS on the one hand and fixed wireless access systems and IMT applications on the other hand in the frequency band 3 400-4 200 MHz, and summarized the results of the studies in Recommendation ITU-R SF.1486 as well as Reports ITU-R S.2199, ITU-R M.2109 and ITU-R S.2368;

*b)* that the Recommendation and Reports identified in *recognizing a)* offer a set of mitigation techniques that could be employed for international coordination and at a national level and to facilitate coexistence of FSS, fixed service and mobile service systems;

*c)* that Recommendation ITU-R S.1856 contains methodologies for verification of compliance with the relevant power flux-density (pfd) limit set forth in the Radio Regulations,

*resolves*

1 to recommend that administrations in countries where the frequency band 3 400-3 600 MHz is allocated on a primary basis to the mobile, except aeronautical mobile, service in Region 1 and identified for IMT in Region 1 ensure compliance of IMT stations with the relevant provisions set forth in the Radio Regulations and apply the relevant coordination procedures before bringing these applications into use;

2 to urge administrations in Region 1, when planning and/or licensing fixed point-to-point, fixed wireless access and IMT systems in frequency bands referred to in *considering b)* above, to take into account the protection needs of existing and planned FSS earth stations within the frequency band 3 400-4 200 MHz, as an aid to the safe operation of aircraft and reliable distribution of meteorological information in some countries in Region 1;

3 to invite administrations in Region 1, taking into account the number of earth stations involved for this particular type of usage, to consider the possibility of licensing the FSS earth stations used for communications as an aid to the safe operation of aircraft and/or distribution of meteorological information on an individual basis and registering them in the MIFR as specific earth stations;

4 to encourage administrations in Region 1 to employ the appropriate mitigation techniques described in the ITU-R publications referred to in *recognizing a)* above;

5 to invite administrations to ensure that the application of these technical and regulatory measures to FSS and the mobile service does not limit the use of the frequency band 3 400-4 200 MHz by other existing and planned systems and services in other countries,

*instructs the Secretary-General*

to bring this Resolution to the attention of ICAO and WMO.

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