



INTERNATIONAL CIVIL AVIATION ORGANIZATION  
ELEVENTH MEETING OF THE NAFISAT SUPERVISORY COMMITTEE  
(NAIROBI, KENYA, 10-11 OCTOBER 2016)

**Agenda item 9: Outcome of ITU WRC-15 pertaining to VSAT networks**

**Resolution 154 (Rev. WRC 15) and challenges for the safe operation of AFISNET  
in the 3 400-4 200 C-band**

*(Presented by ICAO Secretariat)*

**SUMMARY**

The purpose of this paper is to provide the meeting with a summary of the Finals Acts of ITU World Radiocommunication Conference (ITU WRC) (Geneva, 3-27 November 2015), in particular those related to the protection of the down link Fixed Satellite Service (FSS) C-Band operated by AFI satellite based networks (AFISNET, CAFSAT, NAFISAT, SADC2).

**References:**

- Report on ACP Working Group F Meetings
- Finals Acts of ITU WRC-15
- ITU Recommendation 724-WRC-07
- ITU Resolution 154 (COM6/24)-WRC 12
- ITU Resolution 154 (Rev. WRC-15)
- Report on APIRG/18 Meeting
- Report on APIRG/19 Meeting
- Report on APIRG/20 Meeting

**Action by the meeting is at paragraph 3.**

**1. Introduction**

1.1 The threat on the operation of FSS C-band encountered by aeronautical VSAT networks from the International Mobile Telecommunication (IMT, WIMAX) was earlier identified by the AFI Region and appropriate actions have been conducted with evolving results during the ITU World Radiocommunication Conferences (WRC-07; WRC-12). The outcome of these Conferences such as Recommendation **724 WRC-07**; **Resolution 154 WRC-12** were widely shared during SNMC previous sessions.

1.2 It may be recalled that Resolution **154 WRC-12** resolves “to invite ITU-R to provide after studies, for next WRC-15 a set of “**possible technical and regulatory measures in some countries in Region 1 to support the existing and future FSS earth stations in the 3 400-4 200 MHz band used for satellite communications related to safe operation of aircraft and reliable distribution of meteorological information**” and invited States and ICAO and WMO to participate in these studies.

**2. Discussion**

2.1 In order to carry out the implementation tasks called up by this Resolution, the Secretariat coordinated the participation of SNMC members to attended various regional African Telecommunication Union (ATU) preparatory meetings (APM) amongst which, the 1<sup>st</sup> APM held in Dakar Senegal from 18 to 20 March 2013;

the 3<sup>rd</sup> APM, Abuja, Nigeria, 26 – 30 January 2015, the 4<sup>th</sup> APM, Nairobi, Kenya, 20-23 July 2015 and the ECOWAS last preparatory meeting held in Lomé, Togo from 19 to 21 August 2015.

2.2 The ITU World Radiocommunication Conference 2015 (**WRC-15**) was held in Geneva, Switzerland from 2 to 27 November 2015. In total, about **3 300** delegates from **162** ITU Member States and **130** other entities, including international organizations and industry, participated in the work of the conference. Over **40** topics related to frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources were discussed.

2.3 The ICAO delegation to the conference included the Director of the Air Navigation Bureau (**D/ANB**) for the first day, two Technical Officers (CNS) from ICAO Headquarters for full time, the Regional Officer CNS, ICAO ESAF Office for the third week and the Regional Officer ICAO WACAF Office and Secretary of SNMC for the first two weeks.

2.4 As the result of the regional coordination, Civil Aviation experts were included in some African States delegation (Cote d'Ivoire, Ghana, Kenya, Nigeria, Tanzania, Togo, Uganda...). Delegates of Air Navigation Service providers (**ANSPs-ASECNA, GCAA, ATNS, KCAA, UCAA...**) attended the Conference.

2.5 Two aviation coordination meetings were organized by the ICAO delegation during the conference. The pace of attendance to this meeting was satisfactory as well as the debates conducted to clarify ICAO position. Coordination and promotion of the ICAO policy during the conference were also performed on a more bilateral basis, including individuals, various industry groups and representing spectrum administrations. At the end ICAO position for WRC 15 was successfully promoted although some agenda items of high importance to civil aviation required lengthy debate and continuous time consuming strategic coordination.

2.6 Under ITU WRC 15 **Agenda item 5 (Sub-item 9.1.5):** *Consideration of technical and regulatory actions in order to support existing and future operation of fixed-satellite service earth stations within the 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 (Resolution 154 (WRC-12))* the civil aviation community was looking for Resolution 154 WRC-12 to be strengthened in order to reinforce the protection of the C-Band spectrum.

After intense discussion and continuous coordination on this agenda item, the conference agreed on a revision of Resolution **154** fully in line with the ICAO Position. The revised resolution is attached as **Appendix** to this Working Paper.

2.7 This important result is justified by the involvement of C-band FSS industry and users in the debates and coordination activities undertaken before and during the conference. During this conference, ASECNA, GCAA, Kenya, South Africa, Togo and industry partners provided useful support to the initiative and this should be recognized and encouraged.

2.8 As a follow up measure the next steps will be to share for implementation, this resolution with SNMC stakeholders in particular with CAAs and National Telecommunication Regulation Authority. Aviation service providers operating VSAT stations should be encouraged to have their stations licensed and registered in the ITU Master International Frequency Register (**MIFR**). In this regard **APIRG/30** has already adopted a conclusion for the implementation of Resolution 154(Rev.WRC 15).

2.9 The experience gained during this conference shows that an earlier and good preparation for the forthcoming Conference must be taken through dialogue with these stakeholders and the industry.

2.10 ICAO Regional Offices WACAF and ESAF will continue the necessary coordination actions with partners (Industry, ANSPS, Regional Economic Integration Communities, Regional Association of Telecommunication Regulators, ATU, ITU...) and with the AFI neighboring ICAO regions (MID, SAM, EUR, and APAC) to populate and share Resolution 154-(Rev. WRC15) that addresses the issues of safe operation of satellite based VSAT networks supporting Aeronautical Fixed Services between these regions.

**3. Action by the meeting**

3.1 The meeting is invited to:

- a) Take note of the information given above
- b) Encourage SNMC Sates/Organizations to share WRC-15 outcome on issues related to the provision of spectrum for civil aviation;
- c) Implement Resolution 154 (Rev. WRC 15) by licencing the NAFISAT and other C-band VSAT Stations and by ensuring their Registration in the ITU Master International frequency Register (MIFR)
- d) Reinforce their collaboration with their National Authority of Regulation of Telecommunication in order to submit and support the position of ICAO for the future WRC-19.

-END-

Appendix X

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 operation of 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.