

PLENARY MEETING

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Working Group 5

PROPOSED MODIFICATIONS TO THE DRAFT CPM REPORT

CHAPTER 5, AGENDA ITEM 9.1, ISSUE 9.1.5

AGENDA ITEM 9.1

9 *to consider and approve the Report of the Director of the Radiocommunication Bureau, in accordance with Article 7 of the Convention:*

9.1 *on the activities of the Radiocommunication Sector since WRC-12;*

NOTE: Eight issues have been identified by CPM15-1 under this agenda item.

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5/9.1.5 Resolution 154 (WRC-12)

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

(**WP 4A** (technical and regulatory aspects), **SC** (regulatory and procedural aspects) / -)

5/9.1.5/1 Executive summary

Resolution **154 (WRC-12)** invites the ITU-R to study 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 frequency band used for satellite communications related to safe operations of aircraft and reliable distribution of meteorological information, considering that where an adequate terrestrial communication infrastructure is not available, FSS earth stations are the only viable option to augment the communication infrastructure in order to satisfy the overall communications infrastructure requirement of the International Civil Aviation Organization (ICAO) and to ensure distribution of meteorological information under the auspices of the World Meteorological Organization (WMO).

5/9.1.5/2 Background

The efficient provision of air navigation services requires the implementation and operation of ground communications infrastructure with high availability, reliability and integrity. In some countries in Africa, the difficulty of fulfilling these requirements, given the extent of the airspace and weakness in terrestrial communication infrastructure, has led to the extensive deployment of an aeronautical communication infrastructure based on very small aperture terminal (VSAT) systems operating in the FSS. The frequency band of operation is 3 400-4 200 MHz (with the standard C-band frequency range being 3 700-4 200 MHz and the extended C-band frequency range being 3 400-3 700 MHz), which, due to more pronounced rain attenuation at higher frequency bands, is the most viable option for satellite links with high availability in tropical regions. This infrastructure currently spans the entire region and is crucial to ensure the continued growth of traffic while maintaining safe operation of aircraft. The same frequency band is also used for the distribution of meteorological data via satellites under the auspices of the WMO.

WRC-07 allocated the frequency band 3 400-3 600 MHz to the MS, except aeronautical mobile, on a primary basis in 81 countries in Region 1, subject to regulatory and technical restrictions (see RR No. **5.430A**). The deployment of MS systems in the vicinity of airports has led to an increased number of cases of interference into FSS (VSAT) receivers. Consequently, some additional measures are needed to improve the protection of the FSS links supporting aeronautical and meteorological communications. Depending on whether the interference cases are between two stations in the same country (domestic case) or between two stations in neighbouring countries (cross-border case), the consideration of such measures is either a national spectrum-regulatory matter, or an issue of international spectrum regulation between countries.

WRC-12 adopted Resolution **154 (WRC-12)**, and invited the ITU-R to study 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 frequency band used for satellite communications related to safe operations of aircraft and reliable distribution of meteorological information referred to in *considering c*).

Regional coordination was carried out between African Civil Aviation Authorities, air navigation service providers (ANSPs) and the African Telecommunication Union (ATU) in preparation for WRC-15. As a result, the first ATU preparatory meeting to ITU WRC-15 held in Dakar (Senegal), from 18 to 20 March 2013 recommended ATU Member States to “reinforce their support to the existing and future FSS earth stations in the 3 400-4 200 MHz frequency band used for satellite communications related to safe operation of aircraft and reliable distribution of meteorological information by participating in the studies for possible technical and regulatory measures called upon by ITU Resolution 154 (WRC-12).”

5/9.1.5/3 Summary of technical and operational studies, including a list of relevant ITU-R Recommendations

Report ITU-R [M.2109](#) contains sharing studies between IMT-Advanced systems and geostationary-satellite orbit (GSO) networks in the FSS in the 3 400-4 200 and 4 500-4 800 MHz frequency bands.

Report ITU-R [S.2199](#) contains studies on compatibility of broadband wireless access systems and FSS networks in the 3 400-4 200 MHz frequency band.

Recommendation ITU-R [SF.1486](#) contains a sharing methodology between fixed wireless access systems in the FS and VSATs in the FSS in the 3 400-3 700 MHz frequency band.

Recommendation ITU-R [S.1856](#) contains methodologies for determining whether an IMT station at a given location operating in the frequency band 3 400-3 600 MHz would transmit without exceeding the power flux-density limits in RR Nos. **5.430A**, **5.432A**, **5.432B** and **5.433A**.

These studies show a potential for interference from IMT and broadband wireless access stations into FSS earth stations at distances of up to several hundred kilometers. Such large separation distances would impose substantial constraints on deployments of both mobile and earth stations. The studies also show that interference can occur when IMT systems are operated in the adjacent frequency band.

5/9.1.5/4 Regulatory and procedural considerations

Resolution **154 (WRC-12)** could be modified, calling for relevant administrations in Region 1 to use special care in the coordination, assignment, and management of frequencies taking into consideration the potential impact on the FSS earth stations used for satellite communications related to safe operation of aircraft and reliable distribution of meteorological information in the frequency band 3 400-4 200 MHz.

In parallel to the modification of Resolution **154 (WRC-12)**, consideration may be given to modifying RR No. **5.430A** to include a reference to the modified Resolution.

An example of modification of Resolution **154 (WRC-12)** follows.

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RESOLUTION 154 (~~REV.~~WRC-~~12~~15)

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

The World Radiocommunication Conference (Geneva, ~~2012~~2015),

considering

- a)* that the 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 band 3 400-3 600 MHz is allocated on a primary basis to the mobile, except aeronautical mobile, service in the countries in Region 1 specified in No. **5.430A** and identified for International Mobile Telecommunications (IMT) in those countries;
- c)* that in Region 1 the allocation to the mobile, except aeronautical mobile, service in the band 3 400-3 600 MHz is subject to the technical and regulatory conditions listed in No. **5.430A**, 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 band 3 400-4 200 MHz for provision of communications as an aid to safe operation of aircraft and reliable distribution of meteorological information;
- e)* that, in some cases remote and rural areas often still lack a terrestrial communication infrastructure that meets the evolving requirements of modern civil aviation;

- ~~b) — that the cost of providing and maintaining such an infrastructure could be expensive, particularly in remote regions;~~
- ~~e) — where an adequate terrestrial communication infrastructure is not available, fixed-satellite service (FSS) earth stations 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-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 kilometre up to hundreds of kilometres, 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,~~
- ~~d) — that the use of FSS earth stations deployed in some countries in Region 1 for aeronautical communications has the potential to significantly enhance communications between air traffic control centres as well as with remote aeronautical stations,~~

noting

- ~~a) — that the FSS is not a safety service;~~
- ~~b) — that, by its Resolution **20 (Rev.WRC-03)**, WRC resolved to instruct the Secretary-General “to encourage ICAO to continue its assistance to developing countries which are endeavouring to improve their aeronautical telecommunications ...”;~~
- ~~e) — Recommendation ITU-R SF.1486 on sharing methodology between fixed wireless access systems in the fixed service (FS) and very small aperture terminals (VSATs) in the FSS in the 3 400–3 700 MHz band;~~
- ~~d) — Report ITU-R S.2199 on studies on compatibility of broadband wireless access systems and FSS networks in the 3 400–4 200 MHz band;~~
- ~~e) — Report ITU-R M.2109 on sharing studies between International Mobile Telecommunications Advanced (IMT-Advanced) systems and geostationary satellite networks in the fixed-satellite service in the 3 400–4 200 MHz and 4 500–4 800 MHz frequency bands;~~
- ~~a) — that by the date of WRC-15 several cases of harmful interference to the FSS VSATs used for aeronautical safety communications from fixed wireless access or IMT stations of the same administration were reported;~~
- ~~b) — that these reported cases of interference revealed some national difficulties in the coordination of frequencies between the respective national telecommunication regulators responsible for licensing fixed wireless access or IMT systems and national aviation authorities responsible for the management of frequencies for aeronautical purposes, including assignments for VSATs;~~
- ~~c) — that in many countries FSS VSAT earth stations are not subject to individual licencing and not registered as specific stations in national frequency databases and in the ITU Master International Frequency Register (MIFR) due to considerable administrative work;~~

d) that the knowledge of the location and operational frequencies of VSAT stations used for communications to aid 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 the FSS on the one hand and the fixed wireless access systems and IMT applications on the other hand in the 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 draft new Report ITU-R [FSS-IMT C-BAND DOWNLINK];

Editor's note: Report number to be inserted by the BR after approval of the Report at the SG 4 meeting on 26 June 2015.

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 the power flux-density (pfd) limit set forth in No. 5.430A,

resolves

1 that administrations listed in No. 5.430A shall ensure the compliance of the IMT stations with the pfd limit set forth therein and apply the relevant coordination procedures before bringing these applications into use;

2 to urge administrations, when planning and licensing fixed point-to-point, fixed wireless access, and IMT systems in bands referred to in considering b) above, to take into account the protection needs of existing and planned FSS VSAT earth stations by coordinating the deployment of the systems mentioned above with the respective aviation and meteorological authorities at a national level;

3 to invite administrations, taking into account the number of earth stations involved for this particular type of usage, to consider the possibility of licensing the FSS VSAT 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 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 the FSS and mobile service does not limit the use of the band 3 400-4 200 MHz by other existing and planned systems and services in other countries.

resolves to invite ITU-R

to study 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 referred to in considering c);

invites

all members of the Radiocommunication Sector, ICAO and WMO to contribute to these studies,

~~*instructs the Director of the Radiocommunication Bureau*~~
~~to include the results of these studies in his Report to WRC-15 for the purposes of considering~~
~~adequate actions in response to resolves to invite ITU-R above,~~

instructs the Secretary-General
to bring this Resolution to the attention of ICAO and WMO.
