



WORKING PAPER

TWELFTH AIR NAVIGATION CONFERENCE

Montréal, 19 to 30 November 2012

Agenda Item 6: Future direction

6.1: Implementation plans and methodologies

**PROTECTION OF SPECTRUM THAT FACILITATES AERONAUTICAL
COMMUNICATION, NAVIGATION AND SURVEILLANCE SERVICES**

(Presented by South Africa)

SUMMARY

This paper presents the South African position on the protection of spectrum used to facilitate aeronautical services.

Action: The Conference is invited to agree to the recommendation in paragraph 3.2.

1. INTRODUCTION

1.1 There is a mixture of terrestrial and satellite infrastructure within the aeronautical industry. Spectrum for the safety of life services is protected although there are non-ICAO systems operating in those bands. Similarly, the aeronautical industry uses non aeronautical technologies and spectrum to provide auxiliary aeronautical services. For example, very small aperture terminal (VSAT) technology is predominantly used in Africa to provide connectivity for air traffic service communication, navigation and surveillance (CNS) technologies, as the existing terrestrial telecommunication infrastructure is either not available or is unreliable. C-band based VSAT technology has provided a platform in eliminating communication deficiencies within the neighbouring States. It is also used to provide VHF, radar, DME and VOR links between remote sites and control units; whereas, there are plans to use the same VSAT infrastructure to provide GNSS augmentation data-link services. Fixed satellite services (FSS) C-band is a non aeronautical spectrum and as a result, it is not protected to the same level as the safety of life services, although remote sites connected to the VSAT network offer the aviation industry with the safety of life services.

2. BACKGROUND

2.1 VSAT technology in the FSS C-band is primarily used in Africa and other parts of the world to provide connectivity for the safety of life services in the aviation industry as well as telecommunication network between air traffic control units to facilitate safe aircraft movement. Several African countries reported interference on their VSAT ground stations. ICAO State letters T7/7.9.1-0795 and T7/7.9.1-0242, dated 25 October 2011 and 22 March 2012 respectively, recognized the threat by the international mobile telecommunications (IMT) on the downlink FSS C-band frequency (3.4-4.2 GHz) operated by aeronautical VSAT networks. There are several reports of interference to the C-band VSAT terminals, such as ITU-R M.2109 on sharing studies between IMT-advanced systems and geostationary-satellite networks in the FSS. Despite ICAO State letters and reports on VSAT interference, additional spectrum is requested at the ITU level for IMT services within the C-band.

2.2 Aviation in Africa and other tropical regions relies on FSS VSAT links in the C-band due to very little or non-existent terrestrial infrastructure. While this band is for the FSS, it is also allocated to the mobile services in many countries and there are plans by the ITU to increase the spectrum allocation for the mobile services. It is currently very difficult to find suitable FSS C-Band assignments for VSAT links and that difficulty will be compounded by the additional allocation for the mobile services. C-band is preferred because of propagation characteristics in tropical and other sub-tropical areas. Due to atmospheric and rainfall attenuation in higher frequency bands, it is vital that the C-band remains available for this service in these regions.

2.3 South Africa will enhance VHF coverage in the frequency band 118-137 MHz. As the terrestrial telecommunication infrastructure is inadequate in rural areas, VSAT technology will be used as backup links to remote sites.

2.4 South Africa will be implementing DME-DME networks. C-band VSAT is the preferred technology for the interconnection of the DME sites.

2.5 GNSS augmentation in South Africa will also use C-band VSAT technology as a data link.

2.6 Presently, C-band VSAT technology is used to link en-route surveillance facilities.

2.7 The services identified depict that VSAT technology is used to link remote CNS services, which are protected services. The VSAT connectivity does not have comparable levels of protection.

3. CONCLUSION

3.1 Regulatory measures are needed to ensure an appropriate level of protection for the FSS C-band spectrum which is used to augment terrestrial communication networks through the use of VSAT technology. VSAT technology is used to facilitate safety of life CNS services within the aeronautical community.

3.2 Long-term VSAT spectrum availability and protection from interference should be guaranteed across the entire African Continent and other parts of the world. The Conference is invited to agree to the following recommendation:

Recommendation 6/x – Long-term very small aperture terminal spectrum availability and protection

That the Conference request:

- a) that ICAO Member States should not support additional international mobile telecommunications spectrum allocation in the fixed satellite services C-band spectrum at the expense of the current or future aeronautical very small aperture terminal networks; and
- b) ICAO and ICAO Member States to pursue this matter in ITU-R and during the World Radiocommunication Conference (WRC-15, Agenda Items 1.1 and 9.1.5), to prevent any international mobile telecommunications spectrum allocation that compromises the availability of the aeronautical very small aperture terminal networks.

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