International Civil Aviation Organization

NINTH MEETING OF THE COMMUNICATIONS/NAVIGATION/SURVEILLANCE AND METEOROLOGY SUB-GROUP OF APANPIRG (CNS/MET SG/9)

Bangkok, Thailand, 11–15 July 2005

Agenda Item 7: Aeronautical electromagnetic spectrum utilization:

1) review preparations for WRC-07

PREPARATIONS FOR WORLD RADIOCOMMUNICATION CONFERENCE 2007 (WRC-07)

(Presented by Australia)

SUMMARY

This paper outlines the preparations under way in Australia for the World Radiocommunications Conference in 2007 (WRC-07). It summarizes the preliminary Australian views adopted on particular aviation spectrum bands which are on the agenda for this WRC-07 and suggests actions that could be taken by States within the Asia Pacific region to strengthen support for aviation spectrum requirements.

1. INTRODUCTION

1.1 The agenda for WRC-07 proposed at WRC-03 and approved by the Council of the International Telecommunication Union (ITU) in June 2004 is published in the ITU Resolution 802. The agenda contains at least 11 items of interest to aviation with 3 directly affecting aviation spectrum.

1.2 A national committee organised by the Australian Communications and Media Authority (ACMA) and formed by representatives from the public and private sectors, with strong representation from the telecommunications and broadcasting industries, is tasked with the development of Australian proposals and positions for WRC-07. Meetings of this committee have begun and prepared preliminary views (see shaded areas in Section 2). These meetings are generally timed to fit in with established programmes for ITU Study Group meetings and meetings of the Asia Pacific Telecommunity Group for WRC preparation (APG). An Aviation Spectrum Group consisting of the ATS provider, civil aviation regulator, civil aviation government department, airlines and other civil aviation stakeholders reviews and provides input on the national proposals and positions for WRC-07.

1.3 The progress of studies within the ITU, ICAO, CEPT1, CITEL2 and in other organisations such as Eurocontrol and the FAA are closely followed and interim positions on WRC-07 aviation issues are developed as appropriate. These positions are further reviewed and refined following international meetings such as the APG where Australia seeks to align as far as possible with regional administrations in order to gain leverage at the WRC through common proposals. Australia is currently preparing for the ICAO ACP WG/F14 (22-26 August 2005), ITU-R WP 8B/D (20-27 September 2005) and APT APG2007-3 (expected to be in February 2006) meetings.

2. WRC-07 AGENDA ITEMS WITH SIGNIFICANT POTENTIAL TO AFFECT AUSTRALIAN CIVIL AVIATION

2.1 Upgrading the radiolocation service to primary allocation in the bands 9000-9200 MHz and 9300-9500 MHz and extending by up to 200 MHz the existing primary allocations to the Earth exploration-satellite service (active) and the space research service (active) in the band 9500-9800 MHz (AI 1.3)

The band 9000-9500 MHz is used internationally for aeronautical radionavigation including precision approach radar, airport surface detection equipment (ASDE) and airborne weather radar. It is also extensively used for defence (radiolocation) & maritime (radionavigation) radars.

Australia aviation makes use of this band for Surface Movement Radar (SMR) which is critical to airport operation during poor weather operation. RPT aircraft also use this band for airborne weather radar (AWR). ITU-R studies need to consider the compatibility of new RLS systems with ARNS/RNS not just existing RLS systems which have been operating satisfactorily in the band. Footnotes are required to protect ARNS/RLS from RLS (and EESS if an allocation is made). Studies are still not conclusive that compatibility with EESS is possible.

Australian Position: Australia supports the upgrading of the radiolocation service (RLS) to primary status in the bands 9 000-9 200 MHz and 9 300-9 500 MHz only on the express condition (through a footnote) that no harmful interference be caused to the aeronautical radionavigation service (ARNS) and the radionavigation service (RNS) and that no protection is required from these radionavigation services, taking into account the results of relevant ITU-R studies and Recommendations. Such studies need to consider the compatibility of existing and new RLS systems with ARNS/RNS.Australia will monitor the progress of ITU-R studies related to the compatibility of EESS (active) and the SRS (active) with the radionavigation service in these bands before forming a position on sharing.

2.2 *Spectrum requirements for aeronautical telecommand and high-bit rate aeronautical telemetry, in the 3-30 GHz band. (AI 1.5)*

These spectrum requirements are to support test flight programmes for modern aircraft and the operation of unmanned aerial vehicles (UAVs). The UAV requirement is primarily being driven by defence interests but civil aviation is considering how to safely integrate these aircraft into controlled airspace shared with civil manned aircraft. It may therefore become necessary to develop common global standards for telemetry and telecommand links between the UAV and the UAV ground control centre. Safety of life (AM(R)S) spectrum requirements for UAVs are now being considered under AI 1.6 Resolution 414.

[1] European Conference of Postal and Telecommunications Administrations - CEPT
[2] Inter-American Telecommunication Commission (CITEL)

Australian Defence is trialling UAVs for eventual integration into civil airspace.

Australian Position: Australia supports the studies under Resolution 230 (WRC–03) into the requirements for justifiable wideband aeronautical mobile telemetry (AMT) and associated telecommand spectrum above 3 GHz, and notes that considering (d) of this Resolution identifies a need to protect existing services.

These studies will need to take into account:

a. existing ARNS and FSS allocations, including the existing and planned usage by each service; and

b. possible developments under Agenda item 1.6 (Resolution 414 (WRC–03)) in the 5 091-5 150 MHz and other aeronautical radionavigation bands between 3 and 6 GHz. Any allocation to AMT in an ARNS or AM(R)S band should be conditional upon the completion of rigorous and conclusive ITU-R studies first which demonstrate that sharing will not have any implications for the safety of operations of affected aviation systems.

In these studies all bands above 3 GHz should be considered under Resolution 230 (WRC–03), including possible additional allocations under Resolves 3, unless completed ITU-R studies show that it is not possible to use those particular bands for wideband AMT and associated telecommand.

2.3 Consider additional allocations for the aeronautical mobile (R) service in the range 108-6000 MHz (AI 1.6 Resolution 414)

This issue was raised in response to congestion in the air-ground VHF communications band specifically in Europe and the US. In addition the spectrum requirements for the following applications are being studied:

a) Airport surface applications;
b) Air-ground/Air-Air voice and data link applications;
c) Advanced surveillance/navigation applications;
d) UAV control

Two distinct categories of AM(R)S spectrum are required. The first (a) -- for airport surface applications, is distinguished by a high data throughput, however only moderate transmission distances and it is expected that a single spectrum resource can be shared at multiple geographic locations. The second category (b), c) and d)) -- like the current VHF AM(R)S application will require line-of-sight propagation, moderate bandwidth, and a number of distinct channels to allow for sector-to-sector frequency assignments.

Aviation studies currently indicate the suitability of portions of the bands 960 – 1 215 MHz (for category 2) as well as the whole band 5 091 – 5 150 MHz (for category 1) for AM(R)S. Portions of other ARNS bands may be added as studies in ICAO progress.

Australian aviation is unlikely to need additional air-ground voice communications bandwidth in the foreseeable future but supports the need for global ICAO standards since Australian registered aircraft operate internationally. Australia may also have a need for some of the other applications identified.

Australian Position: Australia supports global allocations to the aeronautical mobile (R) service in the frequency bands 960-1 164 MHz and 5 091-5 150 MHz if shown to meet global CNS/ATM requirements on the basis of compatibility with the existing services. Priority should be given to finding AM(R)S spectrum in the bands currently available for use by aeronautical systems. In the band 960-1 164 MHz Australia has an existing secondary allocated mobile service which will be required to continue operation should an AM(R)S allocation be made in this band. In the band 5 091-5 150 MHz Australia has three operational FSS Earth-to-space feeder links and compatibility will be required with such feeder links.

2.4 Study current satellite frequency allocations that will support the modernisation of civil aviation telecommunication systems (AI 1.6 Resolution 415)

This agenda was proposed by Kenya and Uganda as a method of improving developing countries CNS/ATM aviation infrastructure. Studies will consider access to satellite communication systems such as VSAT to reduce reliance on expensive and unreliable terrestrial systems. There are also considerations to include the implementation of systems on-board aircraft in different allocations to serve aeronautical purposes other than safety requirements.

Australia supports this agenda item in order to assist developing countries modernize their aeronautical communications systems for CNS/ATM.

Australian Position: Australia supports identification of appropriate regulatory and technical measures that can be used in current satellite frequency allocations that will allow the modernization and future use of aeronautical communications systems for CNS/ATM, especially in developing countries, noting that this spectrum may also support other non-aviation users.
Australia does not oppose allocation of the following bands for the use of the aeronautical mobile-satellite service on a secondary basis:

Region 1: 10.7-11.7 GHz and 12.5-12.75 GHz (s-E)
Region 2: 10.7-12.2 GHz (s-E)
Region 3: 10.7-11.7 GHz and 12.2-12.75 GHz (s-E),

providing such allocation does not have any adverse impact on existing services in these bands. This allocation is not to be used for aeronautical safety-of-life ICAO CNS/ATM communications.

3. ACTION BY THE MEETING

(1) The meeting is invited to note that:

(a) The Australian positions for WRC-07 are preliminary and will mature as the results of the ITU-R studies progress;

(b) There are significant issues that have implications for aviation in the Agenda for WRC-07 including new co-primary allocations in the 9 000 – 9 500 MHz band used for aeronautical radar, spectrum requirements for UAV and aircraft flight test programmes, air-ground voice communication and other safety of life aeronautical applications, and modernisation of civil aviation telecommunication systems through current satellite allocations; and

(c) The 3rd APT World Radio Conference Preparatory Meeting (APG2007-3) is planned for February 2006.

(2) Contracting States are urged to:

(a) Carefully consider State and international requirements for aeronautical services identified in the WRC-07 Agenda and adopt national positions to ensure the availability and protection of this spectrum for aviation use; and

(b) Actively participate and support WRC-07 aeronautical spectrum issues through national, regional and international fora including the APT World Radio Conference Preparatory Meetings (APG2007) and ITU-R World Radio Conference 2007 (WRC-07).

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