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Agenda Item 8: Preparation for World Radiocommunication Conference 2003 (WRC-2003)

AUSTRALIA'S PREPARATION FOR WORLD RADIOCOMMUNICATION CONFERENCE 2003 (WRC-03)

(Presented by Australia)

SUMMARY

This paper outlines the preparations under way in Australia for the World Radiocommunications Conference in 2003 (WRC-03). It summarises the developing Australian views adopted on particular aviation spectrum bands which are on the agenda for this conference and suggests actions that could be taken by countries within the Asia Pacific region to strengthen support for aviation spectrum requirements.

1. BACKGROUND

1.1 The agenda for the World Radiocommunications Conference in 2003 (WRC-03) proposed at WRC-2000 and approved by the Council of the International Teleccommunication Union (ITU) in July 2000 is published in the ITU Resolution 1156. It is the biggest agenda to be considered by a WRC to date, containing well over 40 agenda items including over 8 items directly affecting aviation spectrum.

1.2 A national committee organised by the Australian Communications Authority (ACA) 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-03. Regular meetings of this committee have been held during the current WRC cycle. 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).

1.3 The progress of studies within the ITU and ICAO and in other organisations such as Eurocontrol and the FAA are closely followed and interim positions on WRC-03 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 submitted preliminary draft Conference Preparatory Meeting (CPM) text to the ITU-R Working Parking 8B related to Agenda Item 1.14 to identify measures to address harmful interference in the HF aeronautical band. The preliminary Australian positions developed to date on the major aviation Agenda items including 1.14 are summarised in this paper.

2. PRELIMINARY POSITIONS ON AVIATION FREQUENCY BANDS

2.1 Agenda Item 1.4 - Review of allocations in the band 5 091-5 150 MHz

*"to consider the results of studies related to Resolution **114 (WRC-95)**, dealing with the use of the band 5 091-5 150 MHz by the fixed-satellite service (Earth-to-space) (limited to non-GSO MSS feeder links), and review the allocations to the aeronautical radionavigation service and the fixed-satellite service in the band 5 091-5 150 MHz"*

Australia currently operates three FSS gateway uplink earth stations in the 5 091-5 250 MHz band and also plans to accommodate future Australian aviation industry requirements for MLS and other planned aeronautical applications. Australia notes the outcome of recent ITU-R studies that support the continued use of the 5 091-5 150 MHz band by the fixed-satellite service (FSS). Australia plans to accommodate both services in the available spectrum through sharing, band sub-division or geographic separation.

2.2 Agenda Item 1.5 - New and additional allocations to the mobile, fixed, EES and space research services and upgrade of radiolocation service in the range 5 150-5 725 MHz

*"to consider, in accordance with Resolution **736 (WRC-2000)**, regulatory provisions and spectrum requirements for new and additional allocations to the mobile, fixed, Earth exploration-satellite and space research services, and to review the status of the radiolocation service in the frequency range 5 150-5 725 MHz, with a view to upgrading it, taking into account the results of ITU-R studies"*

1. Australia supports the proposed allocation to the Mobile service in the bands 5 150-5 350 MHz and 5 470-5 725 MHz for the implementation of wireless access systems including radio local area networks (RLANs), subject to ITU-R studies confirming that satisfactory sharing is achievable. This support:

(a) is based primarily on the need for global harmonisation of frequency allocations, including for RLANS, and recognises that low-powered indoor RLANs are already permitted to operate in Australia in the band 5 150-5 350 MHz under an existing class licence arrangement on a no-interference/no-protection basis;

(b) is subject to the outcome of continuing ITU-R studies called for in Resolution **736 (WRC-2000)** showing that changes to allocations in the frequency range 5 150-5 725 MHz will not result in loss of protection to existing primary services having allocations in the band (see *recognises b* of Resolution **736 (WRC-2000)**); and

(c) is subject to the provision of adequate sharing arrangements for the operation of RLANs in the 5 150-5 250 MHz band while providing ongoing protection to Australia's NGSO MSS feeder links operating in the 5 150-5 250 MHz band (cf WRC-03 agenda item 1.6).

2. Australia is a strong supporter of global harmonisation and, accordingly, does not generally support Regional allocations. Australia has an interest in this proposal because of our arrangement for RLANs in the 5 150-5 350 MHz band, which is expected to be predominantly of a fixed service nature. However, the proposed allocation in the band 5 250-5 350 MHz to the fixed service for fixed wireless access applications in Region 3 appears intended to support a wider-area application than RLANs. Australia has not finalised its position on this proposal.

3. Australia can support the proposal for an additional allocation to the Earth exploration-satellite service (active) and the space research service (active) in the band 5 460-5 570 MHz.

2.3 Agenda Item 1.6 - Protection of non-GSO MSS feeder links in the band 5 150-5250 MHz

"to consider regulatory measures to protect feeder links (Earth-to-space) for the mobile-satellite service which operate in the band 5 150-5 250 MHz, taking into account the latest ITU-R Recommendations (for example, Recommendations ITU-R S.1426, ITU-R S.1427 and ITU-R M.1454)"

Australia has existing FSS gateways in this band and the feeder links will require ongoing protection from harmful interference. Australia supports the ITU-R studies, through the deliberations of the SCRPM, to consider regulatory measures to protect these services from possible interference due to RLANs.

2.4 Agenda Item 1.11 - Secondary MSS allocation in the 14.0-14.5 GHz band

*"to consider possible extension of the allocation to the mobile-satellite service (Earth-to-space) on a secondary basis in the band 14-14.5 GHz to permit operation of the aeronautical mobile-satellite service as stipulated in Resolution **216 (Rev. WRC-2000)"***

Australia's policy is to support new and emerging technology and ensure the efficient use of radio spectrum. The proposed secondary allocation in this band to AMSS required studies to determine if there would be any detrimental effect to primary users. These studies have been completed and, have shown it is feasible for AMSS, through the adoption of interference avoidance techniques, to share and operate with technical compatibility and without detriment to existing and planned primary systems and existing secondary systems in the 14-14.5 GHz band. Australia supports the secondary allocation.

2.5 Agenda Item 1.14 - Harmful interference to the maritime mobile and aeronautical mobile (R) services and new digital technology for maritime MF and HF bands

"*to consider measures to address harmful interference in the bands allocated to the maritime mobile and aeronautical mobile (R) services, taking into account Resolutions 207 (Rev.WRC-2000) and 350 (WRC-2000), and to review the frequency and channel arrangements in the maritime MF and HF bands concerning the use of new digital technology, also taking into account Resolution 347 (WRC-97)"*

Australia particularly supports the work of this agenda item in finding a solution to the issue of HF interference. Australia proposes the following technical and operational solutions which appear in the draft CPM text:

- Australia be involved in any regional monitoring programme to improve the sharing of data/resources by regional APT members. This would assist in any policing initiatives implemented by regional regulatory bodies.

- Administrations be encouraged to investigate legislative measures requiring manufacturers of radio equipment to implement hardware modifications

that prevent unauthorised users from accessing the exclusive aeronautical HF channels (ie 'Channel barring').

- The use of Multilingual Broadcast Warning Messages in cases of strong and/or persistent interference from unauthorised users as a short-term method to mitigate interference.

- Investigation of other initiatives such as regional education and publicity of the proper use of radiocommunications spectrum through closer international and regional liaison with national administrations.

Australia would support a clear priority be given to solutions of minimal cost and maximum operational benefit. Australia considers that backward compatibility and the minimisation of unnecessary restrictions on operations are critically important components of any proposed solution.

The ITU-R should continue to work with administrations whose stations are responsible for causing this interference to take necessary actions to quickly eliminate it. Enforcement of existing regulatory provisions, cooperative action by administrations, and the implementation of recommended measures and techniques, is necessary to help mitigate the occurrences of harmful interference.

Safety related routine voice calling on the 12 MHz and 16MHz distress and safety radiotelephone channels should be allowed to and from those shore stations having SAR responsibilities.

With the reduction in commercial maritime services worldwide, any new technologies being introduced should be on the basis of not causing any interference to safety allocated spectrum within these bands.

2.6 Agenda Item 1.15 – Studies concerning RNSS

"to review the results of studies concerning the radionavigation-satellite service in accordance with Resolutions ***604 (WRC-2000)****,* ***605 (WRC-2000)*** *and* ***606 (WRC-2000)"***

Australia supports the development of new and alternative radionavigation-satellite services (RNSS) and for this purpose has agreed to the new RNSS spectrum allocations made at WRC-2000. The position Australia will adopt at WRC-03 in regard to the operation of RNSS systems in the newly allocated frequency bands will be determined from an assessment of the studies undertaken by the ITU in conjunction with ICAO to protect incumbent services called for under Resolutions adopted at WRC-2000.

The Australian position on the current methods in the draft CPM text is:

Band 1 164-1 215 MHz (Resolution 605):

Method - Aggregate protection criterion for ARNS incorporated into the Radio Regulations with compliance to be assured by administrations

Australia supports this method as it would appear to achieve satisfactory sharing in the 1 164-1 215 MHz band between the existing ARNS and planned RNSS systems. Australia notes, however, that, for the method to be fully successful, agreement will be needed on how the aggregate epfd may be apportioned between individual RNSS systems. Also it will be necessary to agree on how to consider only 'real' systems and not 'paper' systems. WP 8D has proposed some preliminary 'milestone criteria'

which attempt to ensure that only 'real' systems are considered. This could lead to an additional burden on the BR that would have to be taken into account.

Band 1 215-1 300 MHz (Resolution 606):

In this band Australia operates many government service radiolocation radars but no civil ATC radionavigation radars. At this stage, based on the information available from the current ITU-R studies, Australia could support Methods A1, A2 and B. Australia is opposed to Method C as it would lead to a situation where some RNSS would be favoured ahead of other RNSS and that would be unacceptable to Australia.

Method A1 - No pfd Limit in the band 1 215-1 300 MHz; No Change to the Radio Regulations

While introducing no constraints on the new or modernised RNSS systems this may have some significant disadvantages, particularly regarding (a lack of) protection for radionavigation radars in Regions 1 and 3. Australia may have difficulty with this method.

Method A2 - No pfd Limit in the band 1215-1300 MHz; Modification of No. 5.329, consistent with resolves 1 of Resolution 606

Australia could support this method, as it is a more complete package which still allows the new or modernised RNSS systems to operate without pfd limits but gives additional protection to the radiolocation service.

Method B - pfd limit in the band 1 215-1 300 MHz, consistent with considering b) and resolves 1 of Resolution 606 (WRC-2000)

At this stage in the ITU-R studies it has not been possible to clearly identify a pfd limit which would need to be applied in this band to protect radars from new or modernised RNSS systems. However, Australia could support Method B if it became clear that a particular pfd limit was essential and that the RNSS was not unduly hampered.

Method C – pfd limit in one portion of the band 1 215-1 300 MHz and no pfd limit in the other portion of the band 1215-1300 MHz, consistent with *considering* b) and *resolves* 1 of Resolution 606 (WRC-2000)

Australia opposes this method as it would lead to a situation where some RNSS systems would be subject to (severe) pfd limits and others would not be subject to pfd limits at all. Such a regulatory framework would not be in the interests of the RNSS and would inevitably lead to a situation where some bands allocated to RNSS would not be used due to unfavourable regulatory constraints.

Band 5 010-5 030 MHz (Resolution 604): Method - Modification of footnote 5.443B and incorporation of a new Resolution to clarify the application of the pfd/epfd limits.

Australia could support this method.

2.7 Agenda Item 1.28 - Differential correction using the 108-117.975 MHz band

"to permit the use of the band 108–117.975 MHz for the transmission of radionavigation satellite differential correction signals by ICAO standard ground-based systems"

Consistent with the general aim of supporting the development of aeronautical navigation technology, Australia supports the inclusion of the Ground Based Augmentation System (GBAS) and other ICAO standard systems that transmit navigation and surveillance data in the band 108-117.975 MHz, which is normally used by VHF navigation and landing systems in the aeronautical service. The introduction of new systems must not impact adversely on incumbent services nor must it affect the existing planning regime with regard particularly to adjacent high power broadcasting services. There may be planning for future high power digital broadcasting services in the adjacent band, and compatibility studies in the longer term will be useful to confirm compatibility between digital radio broadcasting systems and aeronautical radionavigation systems.

3. ISSUES OF CONCERN TO AVIATION

3.1 Studies for the use of the 5 091-5 150 MHz band for MLS has not reached the ITU study groups although ICAO has provided details on their anticipated requirements for MLS to the ITU-R through input study documents. It seems that ICAO with MLS and the Fixed Satellite Services (providing feeder links for the MSS) have reached a satisfactory agreement for co-primary sharing in this band for an extended period possible until 2018. In the 5 150-5 250 MHz band aeronautical radionavigation has a primary allocation, the introduction of systems for FSS and Radio Local Area Networks (RLANS) have made the introduction of aeronautical safety services almost impossible. ICAO States are considering the use of these bands for aviation systems such as aeronautical mobile satellite feeder links and Airport Network and Location Equipment (ANLE) which includes Japan's Airport Vehicle Position System (AVPS).

3.2 The introduction of the Radionavigation Satellite Service (RNSS), GPS L5 and Galileo E5, whilst of significant benefit to the aviation community has the potential to cause interference to incumbent systems such as DME in the 960 to 1215 MHz band. Sharing criteria have been developed including an equivalent power flux density (EPFD) limit on RNSS that is anticipated to adequately protect the DME whilst avoiding undue constraints on the new RNSS. Similarly, equitable sharing criteria is being developed to ensure protection of the Radiolocation and Radionavigation Services in the 1215 to 1300 MHz from new RNSS systems. Administrations with existing RNSS systems are looking to have their modernised systems exempted from any sharing criteria which could have a detrimental effect on Radiolocation and Radionavigation Services.

3.3 Unauthorised HF interference to aeronautical communications which is still a significant problem on a global scale was put on the WRC agenda (1.14) largely as a result of the publicity by APT administrations. Australia together with some other Asian-Pacific countries have made some progress on technical and operational studies related to this issue. The main focus of the studies have been support for the need for a regional HF monitoring and direction finding capability by regional APT members, legislative measures to implement channel barring of exclusive aeronautical HF frequencies and in extreme interference cases broadcasting of warning messages. The ITU-R should be encouraged to work with administrations to assist in mitigating interference. Enforcement of existing regulatory provisions by administrations should also be encouraged. Support of the studies into this problem should occur by ICAO States through WRC if this issue is to be productively addressed at WRC-03.

3.4 The somewhat narrowly focussed Agenda Item 1.28 to permit the transmission of satellite differential correction signals in the VHF navigation band needs to be broadened to permit

the transmission of ICAO standard systems that transmit navigation and surveillance data signals. Clearly incumbent services such as VOR and ILS need to be protected and there should be no greater risk to adjacent FM broadcast services from these new systems. Australian broadcasters are using the opportunity to introduce the consideration of digital broadcasting systems in the adjacent FM band. Assessment of the interference implications to adjacent aeronautical radionavigation services (including ILS and VOR) will need to be carefully considered.

4. RECOMMENDATION

(1) That the meeting notes that:

- The Australian positions adopted for WRC 2003 are starting to mature as the results of the ITU studies are being finalised;
- The positions adopted in the 5 GHz bands at Agenda Items 1.4, 1.5 and 1.6 may have adverse implications for the aeronautical radionavigation service (ARNS) in the band 5091 to 5250 MHz;
- Asia-Pacific (and in particular) APT administrations were instrumental in putting the problem of unauthorised HF interference on the agenda for WRC-03, and
- That there is a need to provide for the transmission of navigation and surveillance data signals in the VHF navigation band.

(2) That the meeting urges Contracting States to:

- Carefully consider requirements for radionavigation and other services in the 5 GHz band and adopt positions to ensure the protection of this spectrum for aviation use;
- Support the protection of incumbent DME and aviation radar systems as proposed in the RNSS sharing studies while ensuring judicious selection of sharing criteria;
- Participate actively in national and/or regional studies into HF interference mitigation;
- Support the view that the VHF navigation band should be permitted to be used for the transmission of navigation and surveillance data by ICAO standard systems without being limited only to satellite differential correction signals,
- Ensure any introduction of digital broadcasting systems in the adjacent VHF FM broadcast band be only considered in the light of compatibility assessment occurring with existing and planned aeronautical radionavigation services in the VHF RNAV band; and
- Participate and support WRC aeronautical spectrum issues through national and international fora including the APT World Radio Conference Preparatory Meetings (APG2003) and ITU-R World Radio Conference 2003 (WRC-03).

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