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ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

REPORT OF COMMITTEE B TO THE CONFERENCE ON AGENDA ITEM 5

The attached report has been approved by Committee B for submission to the Plenary.

Peter Charles Marais
Chairman
Committee B

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(14 pages)

Agenda Item 5 : Review of the outcome of the ITU World Radio Conference (2003) (WRC-2003) and its impact on aeronautical electromagnetic spectrum utilization

5.1 INTERNATIONAL TELECOMMUNICATION UNION (ITU) WORLD RADIOCOMMUNICATION CONFERENCE 2003 (WRC-03)

5.1.1 Preparation for WRC-03

5.1.1.1 The meeting was informed that ICAO Contracting States, international organizations and the ICAO Secretariat had participated actively in the international preparatory meetings for the World Radio Conference (2003) (WRC-03), organized by the International Telecommunication Union (ITU), regional telecommunication organizations[1] and the Aeronautical Communications Panel (ACP) Working Group F. Such participation, as urged in Assembly Resolution A32-13 (see Appendix A), was essential to secure that significant elements of the ICAO position, which had been developed by the Air Navigation Commission and approved by Council, were incorporated by the regional telecommunication organizations in their proposals to the WRC-03. It was recognized that the inclusion of aeronautical experts in the national delegations and the active participation of international organizations and ICAO to the WRC-03 had contributed significantly to the favourable results that were obtained.

5.1.1.2 The meeting noted that during the preparation for the WRC-03, ICAO had organized various regional preparatory meetings to review and address developments by States and regional telecommunication organizations and to consider updates to the ICAO position. These regional meetings were held in conjunction with meetings of AMCP Working Group F, which developed the draft ICAO position, and were critical in the development of the updates to the ICAO position, in particular with regard to the inclusion of regional considerations.

5.1.2 Results of WRC-03 on key aeronautical items

5.1.2.1 The meeting was informed that some countries had deleted their name from a number of footnotes allocating certain aeronautical bands to non-aeronautical services. It was noted that further deletions of country names should be encouraged at WRC-07.

5.1.2.2 The WRC-03 had re-affirmed the need to keep the frequency band 5 091 - 5 150 MHz available for aeronautical radionavigation on a shared basis with the fixed satellite service with priority being given to assignments necessary for international standard systems for the aeronautical radionavigation service (such as the microwave landing system (MLS)). No new assignments to the fixed satellite service would be made after 2012 and at 2018 the fixed satellite service would become secondary. The meeting noted that these arrangements might be revised around 2011.

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[1] Asia-Pacific Telecommunity (APT), Arab Spectrum Management Group (ASMG), European Conference of Postal and Telecommunication Authorities (CEPT), Commisión Interamericana de Telecommunicaciones (CITEL) and African Telecommunication Union (ATU)

5.1.2.3 Revisions to the band 5 150 - 5 725 MHz involved the existing allocations, on a primary basis, to the aeronautical radionavigation service in the band 5 150 - 5 250 MHz and 5 350 - 5 470 MHz. The conference granted a world-wide allocation to the mobile service in the band 5 150 - 5 250 MHz. The meeting also upgraded the radiolocation service from a secondary to a primary service in the band 5 350 - 5 470 MHz. To date, the band 5 150 - 5 250 MHz was not used for aviation and the band 5 350 - 5 470 MHz was used for airborne weather radar. Regulatory provisions were adopted to protect the aeronautical use of the band 5 350 - 5 470 MHz .

5.1.2.4 The radiolocation service in the band 2 900 - 3 100 MHz had been upgraded to a primary service. This band was shared with aeronautical primary surveillance radar systems. Regulatory provisions were adopted to protect the aeronautical use of this band.

5.1.2.5 Open issues from WRC-00 (2000, Istanbul, Turkey) concerning the introduction of allocations to the radionavigation satellite service (RNSS) in the bands 1 164 - 1 215 MHz and 1 215 - 1 300 MHz had been reviewed. In the band 1 164 - 1 215 MHz an aggregate equivalent power flux density for all RNSS satellite systems operating in this band had been established in order to protect the distance measuring equipment (DME) from harmful interference. In the band 1 215 - 1 300 MHz regulatory measures had been incorporated in the radio regulations to ensure that the RNSS shall neither cause interference to nor claim protection from the aeronautical radionavigation service, which was using this band for primary surveillance radar systems. In this regard it was noted that the ITU would continue studies related to the protection of these radar systems.

5.1.2.6 WRC-03 had also introduced in the band 108 - 117.975 MHz an allocation to the Aeronautical Mobile (R) service on a primary basis, limited to systems that transmit navigational information in support of air navigation and surveillance functions in accordance with recognized international standards. This allocation enabled the use of this band for the ICAO standard ground-based augmentation system (GBAS) and VHF digital link (VDL) Mode 4. It was stipulated that these systems shall not cause harmful interference to instrument landing system (ILS) and VHF omnidirectional radio range (VOR), which were also using this band. However, until all issues relating to compatibility with FM broadcast stations operating below 108 MHz would be addressed in the ITU, the use of the band 108-112 MHz by VDL Mode 4 was not allowed.

5.1.2.7 In summary, the meeting noted with appreciation that the results of WRC-03 were very favourable to aviation and that the extensive preparatory work and participation by States had contributed significantly to the successful outcome. The meeting was informed that further work on the outcome of the conference (addressing protection of radar and FM compatibility aspects as reported in 5.1.2.4 and 5.1.2.5 above) would be undertaken within the ITU-R study groups.

5.2 PREPARATION FOR THE WRC-07

5.2.1 WRC-03 also developed the agenda for the next World Radiocommunication Conference, which is expected to be held in 2007. The meeting noted the following items of critical concern to aviation were on the agenda of this conference:

5.2.1.1 Agenda Item 1.1 of WRC-03 would request from administrations to delete their country footnotes or to have their country name deleted from footnotes, if no longer required. Among other things, deletion of footnotes such as footnote RR 5.362B which limit global navigation satellite service (GNSS) implementation in some countries were encouraged by ICAO.

5.2.1.2 Agenda Item 1.2 would consider allocations and regulatory issues related to the earth exploration-satellite (passive) service, space research (passive) service and the meteorological satellite service. International civil aviation would need to ensure that such allocations did not limit current aeronautical usage or future enhancements to aviation systems.

5.2.1.3 Agenda Item 1.3 would consider the upgrade (used for ground-based radar and airborne weather radar) of the radiolocation service to a primary allocation in the bands 9 000 - 9 200 MHz and 9 300 - 9 500 MHz, and the introduction of a primary allocation to the Earth exploration-satellite service (active) and the space research service (active) in the band 9 300 - 9 500 MHz . International civil aviation would need to insure that this upgrade is made in such a manner that current and future aeronautical operations are fully protected.

5.2.1.4 Agenda Item 1.6 of WRC-07 would consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, and to study current satellite-frequency allocations that will support the modernization of civil aviation telecommunication systems. In this connection the meeting noted that in particular elements of the operational concept requiring additional radio-frequency spectrum, including the effect of introduction of additional services and traffic growth, the implementation or transition time frame as well as the need to secure global allocations would need special attention. The meeting noted that this agenda item might also be used to study the spectrum needs of the universal access transceiver (UAT), the potential for airport network and location equipment, aeronautical fixed links in the 5 091 - 5 150 MHz band, and allocations for new technologies to support aeronautical mobile communications requirements.

5.2.1.5 Agenda Item 1.6 of WRC-07 would also include a review on the need of some developing countries which still lack an appropriate communication infrastructure that meets the evolving requirements of modern civil aviation (ITU Resolution 415 refers). In this regard the meeting noted that current satellite frequency allocations that could meet aeronautical requirements to support the modernization of civil aviation telecommunication systems in these countries and in particular those radio frequencies that could be used to support both ICAO communications, navigation, and surveillance/air traffic management (CNS/ATM) systems and other, non-aeronautical, telecommunication services would also need to be addressed. The meeting noted that this issue would be addressed further in ICAO.

5.2.2 The full agenda for the WRC-07 is reproduced in Appendix B.

5.2.3 Noting that the ITU and regional telecommunication organizations would be conducting international preparatory meetings for WRC-07, as they had done for WRC-03 (section 5.1.1.1 refers), the meeting agreed that ICAO Contracting States, international organizations and the ICAO Secretariat should continue their active participation in such meetings, as urged by Assembly Resolution A32-13.

5.2.4 Considering the experience gained during the successful preparation for the WRC-03, the meeting developed the following recommendation:

Recommendation 5/1 — Preparation for WRC-2007

That ICAO

a) urge States and international organizations to continue their efforts on implementation of the relevant elements of Assembly Resolution A32-13 and in particular participate in the preparatory work of the ITU and the regional telecommunication organizations for WRC-07; and

b) continue to assign high priority to the tasks relating to the protection and availability of radio-frequency spectrum allocated to aeronautical services and in particular actively participates in the relevant activities of the ITU-R and of the regional telecommunication organizations.

5.2.4.1 The meeting was informed that ICAO would ensure any required cooperation and participation of all ICAO Regional Offices in the ICAO preparatory activities.

5.2.5 **Schedule for developing the ICAO position for WRC-07**

5.2.5.1 The meeting noted that the draft ICAO position for WRC-07 was expected to be reviewed by the Air Navigation Commission during the second quarter of 2004. This would enable the Council to review and approve the ICAO position in the first quarter of 2005. If required, the ICAO position would be further updated shortly before WRC-07, in the light of developments during the preparatory activities.

5.3 RADIO-FREQUENCY SPECTRUM PLANNING MECHANISMS

5.3.1 The meeting was informed that a spectrum policy framework had been set up in the European Union. This framework consolidated the EU position in the international radio-frequency spectrum coordination process, notably for ITU WRCs. Under this framework, the CEPT coordinated the technical negotiations for Europe for all sectors, including aviation, and the European Commission provided policy guidance, political support and EU-wide regulatory implementation of specific results of WRC. The meeting further noted that a new spectrum management mechanism had been set up by EUROCONTROL to coordinate the development of the aeronautical European aviation position for WRCs.

5.3.2 The meeting was presented with views that there was a fragmentation of activities related to spectrum management and frequency assignment planning over various working groups in the ACP and between the ACP and the NSP. As a consequence, panel members might be required to participate in multiple ICAO groups. The meeting agreed that the Secretariat, as a matter of urgency, should conduct a thorough review of the working arrangements for spectrum and frequency management and should develop

proposals for streamlining and/or consolidating the various spectrum-related activities, to the maximum extent possible.

5.4 USE OF SHARED FREQUENCY BANDS

5.4.1 The meeting recognized the requirement to ensure that adequate spectrum be available to sustain the long-term viability of the existing VOR, ILS and DME infrastructure, including the ability to provide MLS as a long-term replacement for ILS. The development of a coordinated plan for the shared use of these bands with new systems or services would be necessary to establish a methodology for the implementation of these new systems while giving due priority to the existing systems. After it would have been demonstrated to what extent reliance can be placed upon GNSS, it might be feasible to reduce some of the requirements for existing systems.

5.5 ELECTROMAGNETIC INTERFERENCE IN AERONAUTICAL COMMUNICATION AND NAVIGATION SYSTEMS

5.5.1 The meeting noted that due to the increased use of radio systems, both within and outside aviation, harmful electromagnetic interference to aeronautical communication and navigation systems had been a long-standing aviation concern. This concern had been heightened by the introduction of new aeronautical systems.

5.5.1.1 It was recognized that the introduction of new aeronautical systems must take place under conditions that ensured compatibility with existing systems, in particular those operating in the same or adjacent band, through the application of appropriate frequency assignment planning criteria. As part of the aircraft installation process, it was essential to ensure that no harmful interference was caused to any aircraft system.

5.5.1.2 It was further recognized that the increased use of non-aeronautical radio and other electronic equipment, including portable electronic devices that could be brought on board aircraft, had increased the level of potential interference to aeronautical systems. The standards for these systems, which were often claimed to radiate low-power RF energy, were normally agreed by international telecommunication and standards organizations.

5.5.1.3 The meeting recognized the importance of addressing interference issues for aviation and the need for action by States, ICAO and international organizations together. This interference falls broadly into three categories:

a) aeronautical sources;

b) non-aeronautical sources; and

c) malicious interference.

5.5.1.4 It was noted that, since compatibility issues between ILS/VOR and FM broadcasting had become an urgent problem in several ICAO regions, material should be developed to assist States in assessing potential interference from FM broadcasting stations.

5.5.1.5 The meeting noted the problem of interference produced in the VHF COM band by aeronautical sources, including the transmission by aircraft outside the designated service area and the permanent transmission due to stuck microphones. An expert group should work (urgently) on these sources of interference and produce SARPs or guidance material, aiming at reducing their occurrence. In addition the problem of intentional interference in the VHF COM band, which constitutes a real threat, should also be addressed by a group of experts in order to develop guidelines aiming to mitigate the associated risk.

5.5.1.6 The meeting was informed that EUROCAE had completed a draft report on interference from passenger carried portable electronic devices[2] and that this report should be taken into consideration when studying the above issues. The meeting was also informed that RTCA had initiated a similar study, using the EUROCAE study as a basis.

5.5.2 The meeting agreed that ICAO's involvement in these areas was critical and needed to be intensified in order to ensure that relevant regulatory provisions would protect all aeronautical communication and navigation systems from harmful interference as electromagnetic interference to aeronautical communication and navigation systems would present a potential flight safety problem and actual interference in most cases would be required to be removed without delay.

5.5.3 The meeting noted that some States had developed strategies, to control this type of interference at a national level. These included:

a) **Preventive action**. Spectrum users were brought together to raise awareness of the potential risk to civil aviation resulting from interference and identifying known ways to minimize such interference. This could be supplemented by monitoring frequencies in operational use and identifying potential sources of interference; and

b) **Remedial action**. Ground and airborne equipment could be deployed for the detection of interference sources which were detected by the monitoring station when it is beyond line-of-sight of the interfering station.

5.5.4 The meeting recognized that it was necessary to develop guidance material to assist States in implementing means to control interference.

5.5.5 Accordingly, the meeting formulated to the following recommendation:

Recommendation 5/2 — ICAO activities on interference

[2] Report on electromagnetic compatibility between passenger-carried portable electronic devices (PEDs) and aircraft system (WG58 ED118)

That ICAO;

a) intensify its activities to secure protection of aeronautical communication, navigation and surveillance systems from the adverse effects of electromagnetic interference and develops guidance material, as necessary;

b) develop material to assist States in assessing interference from FM broadcasting stations;

c) support the relevant activities of the ITU and regional telecommunication and standards-making organizations; and

d) develop guidance material on the control and removal of interference to aeronautical systems.

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