International Civil Aviation Organization

MIDANPIRG Communication Navigation and Surveillance Sub-Group (CNS SG)

FourthMeeting
(Cairo, Egypt, 25 – 27September 2011)

Agenda Item 5: Developments in CNS Field

SUPPORTING ICAO POSITION TO WRC 12

(Presented by Oman)

SUMMARY

This paper providesproposals on the ICAO Position relating to the forthcoming International Telecommunication Union (ITU) World Radiocommunication conference(2011) (WRC-11) developed by the Secretariat with the assistance of the Aeronautical Communications Panel (ACP), Working Group F (frequency).

Action by the meeting is at paragraph 3.

REFERENCES

- ICAO Position to WRC 12
- ITU CPM Report
- MIDANPIRG/12 Report

1. INTRODUCTION

1.1 MIDANPIRG/12 meeting was held in Amman, Jordan 17-21 October and provided the basis for States to support the ICAO position at the next ITU WRC 12 Meeting. The meeting agreed on the following Conclusion:

CONCLUSION 12/43: SUPPORT ICAO POSITION FOR WRC-12

That, MID States be urged to,

a) include ICAO Position on WRC-12 in their State Position to the extent possible

b) support Civil Aviation Authorities, aviation spectrum experts toparticipate actively in the national and regional level activities relatedto WRC-12 including ITU study groups to support ICAO Position

c) support Civil Aviation Authorities, aviation spectrum experts toparticipate in WRC-12 and coordinate with the ICAO delegation to the conference.

2. DISCUSSION

2.1 The meeting is reminded that Frequency Spectrum is limited resource which is in demand by all States and Organizations. It should also be noted that it is now becoming very commercial as it can bring a lot of revenue to the State. The Telecommunication Authorities have now realised this and have started to utilise this.

2.2 The meeting may wish to note that the ITU WRC 12 Meeting is scheduled to be held in Geneva from the 23rd January 2012 to the 17th February 2012. All WRC meetings are preceded by a Conference Pre Meeting (CPM) and for the WRC 12 Meeting the CPM was held in Geneva form the 14th February to 25th February 2011. CPM will represent the best information on technical, operational and regulatory/procedural issues relevant to the WRCAgenda available at the time of its preparation and should provide a good basis for the discussions at the Conference.

2.3 The meeting is requested to note that the report of the CPM will be used as the basis of all the discussions during the WRC Meeting. WRC 12 Agenda Items have been distributed into 6 different chapters:

CHAPTER 1 – MARITIME AND AERONAUTICAL ISSUES
CHAPTER 2 – RADIOLOCATION AND AMATEUR ISSUES
CHAPTER 3 – FIXED, MOBILE AND BROADCASTING ISSUES
CHAPTER 4 – SCIENCE ISSUES
CHAPTER 5 – SATELLITE ISSUES
CHAPTER 6 – FUTURE WORK PROGRAMME AND OTHER ISSUES

EACH CHAPTER WILL HAVE AGENDA ITEMS WHICH ARE RELATED TO IT.

2.4 During the CPM these agenda items are discussed in length and methods to satisfy them proposed It is normal practice to have several methods suggested by different Organizations tabled during the meeting. If there is several methods which can consolidated they are. These methods are then put in CPM Report. States then have to select the best method to satisfy their position and this is then discussed within the ITU Groupings such as ASMG (Arab Spectrum Management Group). These Groupings will take their position to the WRC meeting and usually they are shared between them. It should be noted also that States and Groupings will lobby a lot during the period between the CPM and the WRC meetings.

2.5 ICAO attends ITU meetings as a UN Organization but as an observer only they do not have any voting power. States only have the voting power. Thus it is very important for all Civil Aviation Authorities to convince their corresponding Telecommunication Authorities in their States to support the position of ICAO in the WRC meetings.

2.6 The ICAO position on the WRC Agenda Items is a general one and is supposed to be used as a guideline. The CPM Report for the WRC 12 has now been published and it has the methods which will satisfy the Agenda Items of the meeting. Appendix A to this working paper gives a brief explanation of the Agenda Items and the methods which will satisfy the ICAO position. Appendix B and C are tables to summarize these methods in English and Arabic respectively.

2.7 The meeting is requested to use this information to when addressing this issue with their corresponding Telecommunication Authorities on an urgent basis as States and ITU Groupings are now taking their final position prior to the WRC 12 Meeting. It should be noted the ASMG Group is having their last meeting prior to the WRC 12 in Sharm El Sheikh from the 1st to the 5th of October 2011.

DRAFT CONCLUSION 4/XX: SUPPORT ICAO POSITION TO WRC 12

That, MID States be urged to,

a) include ICAO Position on WRC-12 in their State Position to the extent possible

b) support Civil Aviation Authorities, aviation spectrum experts to participate actively in the national and regional level activities related to WRC-12 including ITU study groups to support ICAO Position

c) support Civil Aviation Authorities, aviation spectrum experts to participate in WRC-12 and coordinate with the ICAO delegation to the conference.

d) use the methods suggested for the WRC12 Meeting in addressing the ICAO position.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information in this working paper and itsAppendices; and

b) endorse Draft Conclusion in para 2.5.

APPENDIX A

CHAPTER 1 Maritime and Aeronautical issues

(Agenda items 1.3, 1.4, 1.9, 1.10)

AGENDA ITEM 1.3

To consider spectrum requirements and possible regulatory actions, including allocations, in order to support the safe operation of unmanned aircraft systems (UAS), based on the results of ITU R studies, in accordance with Resolution 421 (WRC 07);

Resolution 421 (WRC-07): Consideration of appropriate regulatory provisions for the operation of unmanned aircraft systems

Summary

A significant increase of the worldwide use of unmanned aircraft systems is expected in the future. The seamless operation of unmanned aircraft with piloted aircraft in non-segregated airspaces is becoming vital for the further development of unmanned aircraft applications that will fill many diverse requirements. Therefore, globally harmonized spectrum is required to satisfy this need. WRC-12 Agenda item 1.3 seeks to identify spectrum that can be used to meet this demand. The envisioned unmanned aircraft systems infrastructure will be composed of terrestrial and satellite components.

Methods to satisfy the Agenda Item summary:

Methods A1, A4, A5 and B allow ICAO to develop SARPs which would facilitate automatic compliance to the requirements of Article 8 of the Convention on International Civil Aviation, thus allowing UAS to fly internationally without the need for bilateral coordination.

Methods A2 and A3: it is unlikely that these methods will facilitate international use of UAS in non-segregated airspace, as it will not satisfy ICAO safety requirements, and therefore not facilitate automatic compliance to Article 8 of the Convention on International Civil Aviation.

Proposed methods to support ICAO are A1, A4, A5 and B.

AGENDA ITEM 1.4

To consider, based on the results of ITU R studies, any further regulatory measures to facilitate introduction of new aeronautical mobile (R) service (AM(R)S) systems in the bands 112 117.975 MHz,

960-1 164 MHz and 5 000-5 030 MHz in accordance with Resolutions 413 (Rev.WRC 07), 417 (WRC 07) and 420(WRC 07);

Resolution 413 (Rev.WRC-07)

Use of the band 108-117.975 MHz by the aeronautical mobile (R) service

Summary

At WRC-07 the allocation to the AM(R)S in the band 108-112 MHz was further limited only to ground-based systems that transmit navigational information in support of air navigation functions, while the band 112-117.975 MHz was opened to all AM(R)S systems subject to Resolution 413 (Rev.WRC-07). Studies have been completed on the investigation of any compatibility issues between the analogue broadcasting and AM(R) services that may arise from the introduction of AM(R)S systems in the band 112-117.975 MHz. These studies indicate that no harmful interference will arise from the introduction of AM(R)S systems in the band 112-117.975 MHz into analogue FM broadcasting receivers below 108 MHz and that the both services can operate on a compatible basis. Hence no specific ITU material needs to be developed for the protection of analogue FM broadcasting receivers below 108 MHz from AM(R)S emissions in the band 112-117.975 MHz.

Methods to satisfy the Agenda Item summary:

Method A is proposed and agreed and it will be would apply from the date of the end of WRC-12.

Proposed method to support ICAO is A.

Resolution 417 (WRC-07)

Use of the band 960-1 164 MHz by the aeronautical mobile (R) service

Summary

WRC-07 has allocated the band 960-1 164 MHz to the AM(R)S. This allocation is to support the introduction of applications and concepts in air traffic management supporting safety critical aeronautical communication. The ITU-R has therefore conducted studies on operational and technical means to facilitate sharing between AM(R)S systems operating in the band 960-1 164 MHz and certain ARNS systems operating in the same frequency band. The studies provide separation distances below which site-specific compatibility studies should be performed in order to ensure that in particular non-ICAO standardized ARNS systems are protected.

Methods to satisfy the Agenda Item summary:

Method B is proposed and agreed

Proposed method to support ICAO is B.

Resolution 420 (WRC-07)

Consideration of the frequency bands between 5 000 and 5 030 MHz for aeronautical mobile (R) service surface applications at airports

Summary

Report ITU-R M.2120 was produced in response toWRC-07 Agenda item 1.6 Resolution 414 (WRC 07). This Report estimated the AM(R)S spectrum requirement for surface applications at airports at between 60 and 100 MHz noting that this value would be refined through further study. At WRC-07 the frequency band 5 091 5 150 MHz was allocated to AM(R)S but due to uncertainty in the spectrum requirement and the perceived lack of maturity with respect to compatibility studies between AM(R)S and RNSS in the bands 5 000 5 010 and 5 010-5 030 MHz as well as AM(R)S and RAS in the band 4 990-5 000 MHz, proposals for an allocations to AM(R)S in these bands were rejected. However, WRC-12 Agenda item 1.4 and Resolution 420 (WRC-07) were adopted. Resolution 420 (WRC 07) invites the ITU to determine if AM(R)S spectrum requirements for surface applications at airports could be satisfied in the already-allocated 5 091-5 150 MHz band and in case this is not possible to "further investigate the feasibility of an allocation for AM(R)S for surface applications at airports, study the technical and operational issues relating to the protection of RNSS in the bands between 5 000 and 5 030 MHz and of the RAS in the band 4 990-5 000 MHz from AM(R)S, and develop appropriate Recommendations".

Since WRC-07 the aviation community has continued with its development of a surface based wireless local area network (LAN) for use at airports. Work in standardizing the system has continued in Radio Technical Commission for Aeronautics (RTCA) and more recently in European Organization for Civil Aviation Equipment (EUROCAE). The work of EUROCAE is supported under European Union's Single European Sky ATM Research & Development activities with a completion time-scale of 2013. This time-scale will include laboratory and field validation.

The ITU-R studies conclude that the total identified spectrum requirement to support surface applications at airports is 130 MHz.

View 1: Some members are of the view that of the total identified spectrum requirement of 130 MHz, the required AM(R)S spectrum will not exceed 50 MHz. It should be noted that the additional identified spectrum requirement other than AM(R)S needs to be met by other means such as from allocations to the corresponding services other than AM(R)S. The answer to resolves 1 of Resolution 420 (WRC-07) is that AM(R)S spectrum requirements for surface applications at airports in the 5 GHz range can be fulfilled in the band 5 091-5 150 MHz.

View 2: Some other members are of the view that based on the follow-on study it is clear that the answer to resolves 1 of Resolution 420 (WRC-07) is that AM(R)S spectrum requirements for surface communications at airports in the 5 GHz range cannot be fulfilled in the band 5 091-5 150 MHz, i.e., more than 59 MHz of spectrum will be needed to fulfil airport surface network spectrum requirements. This is especially true taking into account four additional factors: (1) the band 5 091-5 150 MHz is also allocated and intended for use by the airport security system, which per the terms of Recommendation ITU R M.1827 cannot share spectrum with the airport surface system, (2) the fact that channelization limits within the airport system standard result in a granularity such that only 55, 50, or 40 MHz is actually usable for the system depending on whether 5, 10 or 20 MHz system channels are used, and (3) guardbands may be required in order to control emissions into adjacent bands, and (4) in some countries geographic separation of AM(R)S from co-frequency aeronautical mobile telemetry may not be possible, which could render some frequencies unusable.

Methods to satisfy the Agenda Item summary:

Method C1 and C2 are proposed

Proposed method to support ICAO is C2.

AGENDA ITEM 1.9

To revise frequencies and channelling arrangements of Appendix 17 to the Radio Regulations, in accordance with Resolution 351 (Rev.WRC 07), in order to implement new digital technologies for the maritime mobile service;

Resolution 351 (Rev.WRC 07): Review of the frequency and channel arrangements in the HF bands allocated to the maritime mobile service contained in Appendix 17 with a view to improving efficiency through the use of new digital technology by the maritime mobile service

Summary

Ships have traditionally made extensive use of the HF bands for long-distance safety and general communications using Morse telegraphy, radio telex and radio telephony. The introduction of the global maritime distress and safety system (GMDSS) removed the dependence on Morse telegraphy by introducing a standard radio telex system known as narrow-band direct-printing (NBDP).

The spectrum needs of the MMS in the HF bands are based on the introduction of new data exchange technologies into the MMS as an alternative standard for radio telex, which is in rapid decline. The International Maritime Organization (IMO) has noted that NBDP is currently used for the broadcasting of maritime safety information (MSI), ship reporting, weather forecasts and for business communications, e.g. by fishing fleets, but remains part of the International Convention for the Safety of Life at Sea (SOLAS) requirements for vessels sailing in sea areas A31 and A42. All these functions could be provided

by alternative data communication technologies. However, there are some administrations that continue to use NBDPs not only for MSI operations but also for public services.

Methods to satisfy the Agenda Item summary:

Method A1 and A2 are proposed

ICAO requests any changes in Appendix 17 does not cause any harmful interference to the AM(R)S

AGENDA ITEM 1.10

To examine the frequency allocation requirements with regard to operation of safety systems for ships and ports and associated regulatory provisions, in accordance with Resolution 357 (WRC 07);

Resolution 357 (WRC-07): Consideration of regulatory provisions and spectrum allocations for use by enhanced maritime safety systems for ships and ports

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

CHAPTER 2 Radiolocation and amateur issues

(Agenda items 1.14, 1.15, 1.21, 1.23)

AGENDA ITEM 1.14

To consider requirements for new applications in the radiolocation service and review allocations or regulatory provisions for implementation of the radiolocation service in the range 30 300 MHz, in accordance with Resolution 611 (WRC 07);

Resolution 611 (WRC 07): Use of portion of the VHF band by the radiolocation service

Summary

New applications in the RLS for aerospace surveillance, tracking and manoeuvring spacecraft have been identified in the VHF frequency range. VHF radiowaves propagate well through the ionosphere making this band effective and economical for space surveillance operations.

Sharing studies between the RLS and the FS/MS show the services can coexist with separation distances in the order of several hundred kilometres. The separation distances are dependent on antenna heights, additional mitigation techniques and the radar signal characteristics.

Four methods have been proposed to satisfy this agenda item. Methods A, B and C propose a primary allocation to the RLS in the band 154-156 MHz with different conditions establishing protection of currently allocated services. These methods would satisfy the need for a radiolocation allocation. Method D with the proposal of no change to the Radio Regulations was also included.

Methods to satisfy the Agenda Item summary:

Methods A, B,C and D are proposed

Bands being discussed now are not in the ARNS and AM(R)S. ICAO would like to ensure any allocations do not affect the operation of existing and planned Aeronautical systems.

AGENDA ITEM 1.15

To consider possible allocations in the range 3-50 MHz to the radiolocation service for oceanographic radar applications, taking into account the results of ITU R studies, in accordance with Resolution 612 (WRC 07);

Resolution 612 (WRC 07): Use of the radiolocation service between 3 and 50 MHz to support high-frequency oceanographic radar operations

Methods to satisfy the Agenda Item summary:

Methods A, B, and C are proposed

Summary

The possible radiolocation allocations in the range 3-50 MHz could be used for the operation of oceanographic radars that monitor the sea surface for wave heights, currents and tracking of large objects. These radars will have an operational range which will not be greater than 300 km.

Bands being discussed now are not in the AM(R)S. ICAO would like to ensure any allocations do not affect the operation of existing and planned Aeronautical systems.

AGENDA ITEM 1.21

To consider a primary allocation to the radiolocation service in the band 15.4-15.7 GHz, taking into account the results of ITU R studies, in accordance with Resolution 614 (WRC 07);

Resolution 614 (WRC 07): Use of the band 15.4-15.7 GHz by the radiolocation service

Summary

Sharing studies were undertaken with representative systems of radiocommunication services that would be co-allocated with the RLS in all or portions of the 15.4-15.7 GHz band, and compatibility studies were carried out with the RAS, allocated in the adjacent passive band. In the case of the primary

FSS allocation in portions of the 15.4-15.7 GHz band, the FSS system characteristics used for the sharing study were taken from a superseded revision of ITU-R S-Series Recommendation that contained characteristics for sharing studies. Currently there are no operational FSS systems operating in this band.

Furthermore, while there are ICAO and industry standards available, there are no published ITU-R M Series Recommendations with ARNS system parameters for sharing studies. However, there are two published Recommendations ITU-R S.1340 and ITU R S.1341 that provide information on some types of non-ICAO standard systems for sharing study between mobile satellite system feeder links and ARNS systems in portions of the 15.4−15.7 GHz band, which were used in the analyses for this agenda item.

The results of all the studies demonstrate that the operation of radiolocation systems in the 15.4-15.7 GHz band are compatible with adjacent-band and co-frequency allocations, provided that appropriate mitigation techniques are adopted.

Methods to satisfy the Agenda Item summary:

Methods A, B,C and D are proposed

ICAO accept the primary allocation of the radiolocation services in the band but with conditions that no harmful interference is caused and also no protection is required to the Aeronautical services.

AGENDA ITEM 1.23

To consider an allocation of about 15 kHz in parts of the band 415-526.5 kHz to the amateur service on a secondary basis, taking into account the need to protect existing services

Summary

The frequency band 415-526.5 kHz provides unique ground-wave propagation characteristics well suited for present and potential future systems in incumbent services, as well as a secondary allocation to the ARS.

The frequency range 415-526.5 kHz is currently allocated to the BS, MMS, AMS, LMS and ARNS. Traditionally the band has been utilized extensively by these services due to its good ground-wave propagation characteristics. This frequency range would be well suited to reliable, relatively low-power ARS communications for the purposes of training, intercommunication, and technical investigation. A secondary allocation would also augment the overall capability of the ARS to provide assistance in disaster and emergency situations (see, e.g. Recommendation ITU R M.1042 1 “Disaster communications in the amateur and amateur-satellite services”, Recommendation ITU-D 13 “Effective utilisation of the amateur services in disaster mitigation and relief operations”. ARS communications in the MF band would also allow for experimentation, thereby furthering knowledge relating to propagation and equipment design for new transmission modes

Methods to satisfy the Agenda Item summary:

Methods A, B, and C are proposed

Method C is supported by ICAO and method A and B pending making sure that the Amateur service cannot affect the operation of the Aeronautical services in the band.

CHAPTER 3 Fixed, Mobile and Broadcasting issues

(Agenda items 1.5, 1.8, 1.17, 1.20, 1.22)

AGENDA ITEM 1.5

To consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU R studies, in accordance with Resolution 954 (WRC 07);

Resolution 954 (WRC-07): Harmonization of spectrum for use by terrestrial electronic news gathering systems

Summary

This agenda item is to consider worldwide/regional harmonization of spectrum for electronic news gathering (ENG), taking into account the results of ITU R studies, in accordance with Resolution 954 (WRC 07).

Electronic news gathering (ENG) operates terrestrially in appropriate bands allocated to the broadcasting1, fixed and mobile services. In addition to audio and video applications, ENG includes services ancillary to broadcasting (SAB) and services ancillary to production (SAP).

The very nature of ENG in a competitive environment can involve several broadcasters/organizations/networks attempting to cover the same situation in a geographic area, requiring several radio-frequency channels to operate simultaneously often over the same radio path. Co-siting requirements of multiple ENG links, while covering an event, need to be met.

Methods to satisfy the Agenda Item summary:

Methods A, B,C and D are proposed

ICAO opposes any allocations which will affect the interest of aviation

AGENDA ITEM 1.8

To consider the progress of ITU R studies concerning the technical and regulatory issues relative to the fixed service in the bands between 71 GHz and 238 GHz, taking into account Resolutions 731 (WRC 2000) and 732 (WRC 2000);

Resolution 731 (WRC 2000): Consideration by a future competent world radiocommunication conference of issues dealing with sharing and adjacent-band compatibility between passive and active services above 71 GHz

Resolution 732 (WRC 2000): Consideration by a future competent world radiocommunication conference of issues dealing with sharing between active services above 71 GHz

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.17

To consider results of sharing studies between the mobile service and other services in the band 790-862 MHz in Regions 1 and 3, in accordance with Resolution 749 (WRC 07), to ensure the adequate protection of services to which this frequency band is allocated, and take appropriate action;

Resolution 749 (WRC-07): Studies on the use of the band 790-862 MHz by mobile applications and by other services

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.20

To consider the results of ITU R studies and spectrum identification for gateway links for high altitude platform stations (HAPS) in the range 5 850 7 075 MHz in order to support operations in the fixed and mobile services, in accordance with Resolution 734 (Rev.WRC 07);

Resolution 734 (Rev.WRC-07): Studies for spectrum identification for gateway links for high altitude platform stations in the range from 5 850 to 7 075 MHz

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.22

To examine the effect of emissions from short-range devices on radiocommunication services, in accordance with Resolution 953 (WRC 07);

Resolution 953 (WRC 07): Protection of radiocommunication services from emissions by short-range radio devices

Summary

Resolution 953 (WRC-07) and WRC-12 Agenda item 1.22 invite ITU-R to study emissions from short-range devices (SRDs), in particular radio-frequency identification devices (RFIDs), operating inside and outside the frequency bands designated for ISM applications (RR Nos. 5.138 and No. 5.150) to ensure adequate protection of radiocommunication services. This Resolution considers the deployment of SRDs, which can typically cross borders, such as RFIDs and ultra-wideband (UWB) devices, across various frequency bands and recognizes the work already carried out on UWB by ITU-R.

SRD applications have been introduced in various ways in order to meet national requirements. For example, some SRD systems may operate on a non-interference and non-protected basis24 in ISM bands and non ISM bands, whereas, other SRDs may operate under a particular service.

In some countries, a flexible national regulatory regime in which devices are exempt from licensing has been implemented in the ISM bands. The essence of such a regime is twofold: i) access to non exclusive spectrum for certified devices is provided, and ii) basic technical requirements for devices are minimal. Such a regime facilitates spectrum sharing among devices while minimizing constraints on product designs. Moreover, barriers to entry are low in such regimes, thereby facilitating the development of a large eco-system of licence-exempt devices, including short-range devices such as cordless telephones, wireless access systems, RFID, push-to-talk walkie-talkie like products, alarm systems and baby monitors.

A number of SRDs have also been introduced on a licence-exempt basis in non-ISM bands and operate on a non-interference, non-protected basis with licensed services. Such operation is premised on the fact that these SRDs have been certified based upon emissions of very low signal levels. Radiation limits and other technical/operating rules are usually established as a result of compatibility studies. For example, operating parameters can include the specification of indoor use only, the requirement for an enabling signal prior to transmission, and a prohibition against configuring external antennas for permanent outdoor use. Technical parameters can include the specification of radiated power levels, duty-cycles, threshold power detection capability and the inclusion of listen-before-talk techniques.

Methods to satisfy the Agenda Item summary:

Methods A, B,C and D are proposed

Method C and D are supported by ICAO while protecting bands used for Aeronautical Safety Services.

CHAPTER 4 Science issues

(Agenda items 1.6, 1.11, 1.12, 1.16, 1.24)

AGENDA ITEM 1.6

To review No. 5.565 of the Radio Regulations in order to update the spectrum use by the passive services between 275 GHz and 3 000 GHz, in accordance with Resolution 950 (Rev.WRC 07), and to consider possible procedures for free-space optical-links, taking into account the results of ITU R studies, in accordance with Resolution 955 (WRC 07);

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.11

To consider a primary allocation to the space research service (Earth to-space) within the band 22.55-23.15 GHz, taking into account the results of ITU-R studies, in accordance with Resolution 753 (WRC-07);

Resolution 753 (WRC-07): “Use of the band 22.55-23.15 GHz by the space research service”

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.12

To protect the primary services in the band 37-38 GHz from interference resulting from aeronautical mobile service operations, taking into account the results of ITU R studies, in accordance with Resolution 754 (WRC 07);

Resolution 754 (WRC 07): Consideration of modification of the aeronautical component of the mobile service allocation in the 37-38 GHz band for protection of other primary services in the band

Summary

Sharing between systems in the SRS, FS, and FSS and the systems in the AMS in the 37-38 GHz band has been studied resulting in a number of ITU-R Reports. The results of these studies indicate that the emissions from AMS transmitters would, with high probability, cause harmful interference to receiving earth stations of the SRS and FSS. In addition, the transmissions from high-density fixed service systems would cause interference to the airborne receivers of currently defined AMS systems.

AMS systems are currently neither deployed nor planned in the band 37-38 GHz. However, the allocation to the MS does not exclude such systems to operate in the band, and the aviation community would like to investigate the possibility to use the band for applications such as wireless avionic intra-aircraft communications (WAIC) to support data, voice, and video communications between various

systems within a single aircraft. They are not intended to provide air-to-ground, air-to-satellite, or air-to-air communication. They will, in general, include wireless sensors placed throughout the aircraft to monitor the aircraft structure and many of its critical systems and to communicate this information within the aircraft. To enable such WAIC systems, further consideration by a future competent conference may be necessary.

Methods to satisfy the Agenda Item summary:

Methods A and B are proposed

Method B is supported by ICAO and to oppose excluding Aeronautical use in the band.

AGENDA ITEM 1.16

To consider the needs of passive systems for lightning detection in the meteorological aids service, including the possibility of an allocation in the frequency range below 20 kHz, and to take appropriate action, in accordance with Resolution 671 (WRC 07);

Resolution 671 (WRC 07): Recognition of systems in the meteorological aids service in the frequency range below 20 kHz

Summary

WRC-12 Agenda item 1.16 deals with the review of suitable technical and regulatory provisions relative to existing and unrecognized MetAids lightning detection systems operating within the band below 20 kHz. This work has been made with a view that a suitable regulatory environment exists for ensuring recognition and protection is afforded to these existing lightning detection technologies/systems for the future.

Resolution 671 (WRC-07) invites ITU-R to conduct the relevant studies without placing undue constraints on existing services operating in accordance with the Radio Regulations. These shall include sharing and compatibility studies with services already having allocations in potential spectrum for systems in the MetAids taking into account the needs of other services.

The only method proposed to satisfy WRC-12 Agenda item 1.16 supports the segmentation of the frequency band below 14 kHz into four frequency bands, namely below 8.3 kHz, 8.3-9 kHz, 9-11.3 kHz and 11.3-14 kHz. The band 8.3-9 kHz will be allocated on a primary basis to the MetAids together with a national footnote recognizing the use of this band for other services between 8.3 and 9 kHz. The band 9-11.3 kHz will be allocated on a primary basis to the MetAids collectively with the existing primary

allocation to the RNS under some provisions to provide protection to existing RNS systems. The band 11.3-14 kHz will remain allocated on a primary basis to the RNS only. Studies required by Resolution 671 (WRC-07) are completed and this Resolution should be suppressed.

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position. (As for Oman we support the only method as it serves the Met.)

AGENDA ITEM 1.24

To consider the existing allocation to the meteorological-satellite service in the band 7 750 7 850 MHz with a view to extending this allocation to the band 7 850-7 900 MHz, limited to non-geostationary meteorological satellites in the space-to-Earth direction, in accordance with Resolution 672 (WRC 07);

Resolution 672 (WRC-07): Extension of the allocation to the meteorological-satellite service of the band 7 750-7 850 MHz

Summary

Resolution 672 (WRC-07) calls for consideration of the studies between non geostationary meteorological satellites operating in the space-to-Earth direction and the FS and MS in the band 7 850-7 900 MHz with a view to extending the current allocation in the space-to-Earth direction to this band in order to make appropriate modifications to the Table of Frequency Allocations in Article 5 of the Radio Regulations.

At WRC-97, a new worldwide primary allocation was made available to the MetSat in the band 7 750-7 850 MHz. Studies conducted prior to WRC-97 concluded that all the existing services involved would be protected from systems belonging to the MetSat with enough margin using the worst-case scenario.

In the meantime, the mission requirements for the next generation non-GSO MetSat systems (in terms of observations, instruments and user services) clearly show that there is a need to transmit significantly higher data rates as compared to current systems.

Studies have confirmed that applications in the MetSat and the FS have similar characteristics in both the 7 750-7 850 MHz and 7 850-7 900 MHz bands. Furthermore, studies between non geostationary MetSat and the FS (including electronic news gathering and outside broadcasting (ENG/OB)) confirmed that sharing is feasible under the same regulatory conditions and using the same parameters as those currently applied in the band 7 750-7 850 MHz (i.e. using the pfd limits in the band 7 750 7 850 MHz as contained in Table 21-4 of RR Article 21 and applying the values of parameters in Table 8c of RR Appendix 7 for this band).

Sharing with the MS systems could not be studied in details because there are no known systems operating in this band. However, it is expected that the sharing situation would not be significantly different than that for FS systems and that similar pfd limits that would be applied to the FS in the band 7 850-7 900 MHz could also be applied to the MS.

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position. (As for Oman we support the only method as it serves the Met.)

CHAPTER 5 Satellite issues

(Agenda items 1.7, 1.13, 1.18, 1.25, 7)

AGENDA ITEM 1.7

To consider the results of ITU R studies in accordance with Resolution 222 (Rev.WRC 07) in order to ensure long-term spectrum availability and access to spectrum necessary to meet requirements for the aeronautical mobile-satellite (R) service, and to take appropriate action on this subject, while retaining unchanged the generic allocation to the mobile-satellite service in the bands 1 525 1 559 MHz and 1 626.5-1 660.5 MHz;

Resolution 222 (Rev.WRC 07): Use of the bands 1 525-1 559 MHz and 1 626.5-1 660.5 MHz by the mobile-satellite service, and studies to ensure long-term spectrum availability for the aeronautical mobile-satellite (R) service

Summary

The spectrum requirements for the AMS(R)S vary depending on the geographical area or Region being considered, assumptions for the overall system design and the characteristics of each AMS(R)S system, the number of systems which will operate under such a service and the compatibility between each other.

The results of studies under this agenda item show that long-term AMS(R)S spectrum requirements up to the year 2025 are estimated to be less than the available 2 × 10 MHz and could be accommodated in the frequency bands defined by RR No. 5.357A, however, some administrations believe the forecast spectrum requirements may lead to undue constraints on MSS systems, in particular, the existing ones.

Also administrations shall ensure the use of the latest technical advances, which may include prioritization and real-time pre-emptive access between MSS systems, where necessary and where feasible, in order to achieve the most flexible and practical use of the generic allocations. However, studies included in Report ITU-R M.2073 have concluded that prioritization and real-time inter-system pre-emption between different mobile-satellite systems is not practical and, without a significant advance in technology, is unlikely to be feasible for technical, operational and economical reasons.

WRC-07 revised Resolution 222 to remove the request for studies to determine the feasibility and practicality of prioritization and real-time pre-emptive access issues, and invited ITU-R to carry out a number of additional studies towards ensuring long-term spectrum availability for AMS(R)S.

Three systems are currently providing AMS(R)S communications in the 1 545-1 555 MHz and 1 646.5 1 656.5 MHz bands. Other such systems are planned.

In coordinating MSS systems under the procedure of RR Article 9, the notifying administrations for MSS systems in the above bands have adopted two multilateral Memoranda of Understanding (MoU) to facilitate the coordination process: one MoU involves the administrations providing MSS over North America (i.e. ITU Region 2) and a second MoU involves administrations providing MSS over ITU Regions 1 and 3. Under these MoUs, assignments across the bands 1 525-1 559/1 626.5-1 660.5 MHz are coordinated and reviewed usually on an annual basis at so called Operator Review Meetings (ORM) so as to ensure fair and efficient use of the radio spectrum. This multilateral process recognizes the communication needs of the global maritime distress and safety system (GMDSS) and AMS(R)S and the resulting spectrum needed to accommodate the requirements of the systems offering these services, in accordance with the Radio Regulatory provisions. The current coordination process includes a validation process of requested spectrum assignments in order to justify the spectrum requirements and achieve efficient use of the spectrum. By adopting the MoUs, administrations have increased the efficiency and eased the coordination process and reduced the overall resources and cost from MSS and AMS(R)S operators. Additional coordination also takes place outside of the MoU process, where necessary.

It is noted that the details of the coordination meeting and the frequency assignments to MSS networks of operators participating at the meeting agreed under the provisions of the MoU are not available in the public domain. However, it should be noted that details of satellite coordination agreements, whether bilateral or multilateral, in other bands are not available in the public domain either, and are exclusively available to the concerned parties and their administrations. This is a concern to some administrations as they are of the view that the process is not transparent to all ITU Membership and this makes it very difficult for non-notifying administrations and potential AMS(R)S operators to develop long-term plans for spectrum access in order to serve their aviation safety communication needs. Other administrations are however of the view that since AMS(R)S operators and their administrations participate in the coordination process, they have full access to the coordination agreements, including spectrum assignments. Furthermore, any administration can obtain information about the provision of AMS(R)S services through their national air traffic control (ATC) service providers, who would be the organizations signing the service level agreements (SLA) with the satellite operators. Administrations can also obtain AMS(R)S spectrum assignment information through the AMS(R)S operators themselves, as they have the freedom and flexibility to disclose their own spectrum assignments and thus allow them to develop long-term plans for spectrum access.

One notifying administration of one AMS(R)S operator stated encountering difficulties since 2003 in satisfying its spectrum requirements through the MoU/ORM since this administration thinks that their spectrum requirements are treated on an equal basis with the other MSS operators, despite the priority stated in RR No. 5.357A. In particular, this administration stated that in the framework of one Multilateral Meeting (MLM)/ORM group (Regions 1 and 3) no more than 76% of the spectrum requested by that operator was made available and, when then considering the additional constraints on spectrum

reuse due to the other operators in Region 2, the overall resulting spectrum freely accessible for that AMS(R)S network was less than 50% of the requested amount. It is, however, worth noting that as per international public reports, the system of this AMS(R)S operator has been fully operational with 100% availability.

Methods to satisfy the Agenda Item summary:

Methods A, B,C and D are proposed

Method is preferred by ICAO also a combination of B and D are acceptable. Method A and C are not supported By ICAO.

AGENDA ITEM 1.13

To consider the results of ITU R studies in accordance with Resolution 551 (WRC 07) and decide on the spectrum usage of the 21.4-22 GHz band for the broadcasting-satellite service and the associated feeder-link bands in Regions 1 and 3;

Resolution 551 (WRC-07): Use of the band 21.4-22 GHz for broadcasting-satellite service and associated feeder-link bands in Regions 1 and 3

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.18

To consider extending the existing primary and secondary radiodetermination-satellite service (space-to-Earth) allocations in the band 2 483.5-2 500 MHz in order to make a global primary allocation, and to determine the necessary regulatory provisions based upon the results of ITU R studies, in accordance with Resolution 613 (WRC 07);

Resolution 613 (WRC-07): Global primary allocation to the radiodetermination satellite service in the frequency band 2 483.5-2 500 MHz (space-to-Earth)

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 1.25

To consider possible additional allocations to the mobile-satellite service, in accordance with Resolution 231 (WRC 07);

Resolution 231 (WRC-07): Additional allocations to the mobile-satellite service with particular focus on the bands between 4 GHz and 16 GHz

Summary

In many regions and countries of the world, the use of satellite communication systems for the purpose of mobile satellite telephony and data applications has increased in recent past. However, further development and advancement of these systems has been constrained primarily due to shortage of spectrum resources.

ICAO would like to oppose any allocations in the bands which would adversely affect the interest of Aviation.

AGENDA ITEM 7

To consider possible changes in response to Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference: "Advance publication, coordination, notification and recording procedures for frequency assignments pertaining to satellite networks", in accordance with Resolution 86 (Rev.WRC 07);

Resolution 86 (Rev.WRC 07): Implementation of Resolution 86 (Rev. Marrakesh, 2002) of the Plenipotentiary Conference

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

CHAPTER 6 Future work programme and other issues

(Agenda items 1.2, 1.19, 2, 4, 8.1, 8.2)

AGENDA ITEM 1.2

Taking into account the ITU R studies carried out in accordance with Resolution 951 (Rev.WRC 07), to take appropriate action with a view to enhancing the international regulatory framework;

Resolution 951 (Rev.WRC 07): Enhancing the international spectrum regulatory framework

Summary

Resolution 951 (Rev.WRC-07) calls for studies to be undertaken to examine general allocation or procedural issues relating to general spectrum management solutions for enhancing the Radio Regulations (RR) to meet the demands of current, emerging and future radio applications, while taking into account existing services and usage.

There is a growing interest over a number of years to review current spectrum management practices because of a number of factors, including a trend towards convergence of radio technologies and increasing use of digital technologies. In order to ensure that spectrum regulation is keeping pace with

this trend, whilst ensuring the effective and efficient use of spectrum and allowing the operation of radio systems to be free from harmful interference, ITU-R studies were initiated.

In spite of different definitions for the fixed and mobile (except aeronautical and maritime) services, in most frequency bands where one of the two services is allocated, the other one is also allocated. This may indicate that convergence is already achieved in the RR Table of Frequency Allocations, except in some frequency bands, where allocations to both services may be considered on a band by band basis by future WRCs, as required.

Methods to satisfy the Agenda Item summary:

Two approaches for this item with several methods for each particular part of it.

ICAO supports the new provisions or modifications to improve the flexibility of spectrum allocations to it so as to tighten the regulatory provisions and thus protection of aviation systems but make sure the measures taken should not impact adversely on these systems.

AGENDA ITEM 1.19

To consider regulatory measures and their relevance, in order to enable the introduction of software-defined radio and cognitive radio systems, based on the results of ITU R studies, in accordance with Resolution 956 (WRC 07);

Resolution 956 (WRC-07): Regulatory measures and their relevance to enable the introduction of software-defined radio and cognitive radio systems

Summary

Resolution 956 (WRC-07) resolves to invite the ITU-R to study whether there is a need for regulatory measures related to the application of software defined radio (SDR) and cognitive radio system (CRS) technologies.

SDR and CRS technologies are expected to provide additional flexibility and offer improved efficiency to the overall spectrum use. These technologies can be combined or can be deployed independently and can be implemented in systems of any radiocommunication service and the RAS. Any system that uses SDR or CRS technologies must operate in accordance with the provisions of the Radio Regulations.

The implementation of SDR and CRS may introduce specific and unique challenges of a technical or operational nature.

SDR technology is currently operating in some systems and networks in the LMS, MMS, BS, BSS, FSS and MSS. It offers flexibility in radio system design and may help with forward compatibility.

Cognitive radio systems are a field of research activity and applications are under study and trial. Systems which use some cognitive features have already been deployed and some administrations are

authorizing these systems. These administrations have national equipment approval processes to protect existing services from harmful interference. A radio system implementing CRS technology may, however, have an impact on neighbouring countries and coordination may be needed. Should there be applications in which CRS technology is implemented on a non-interference and non-protection basis, the concerned administration should desirably satisfy itself that interference will not be actually generated.

The implementation of CRS technology towards its full-fledged concept may progress stepwise due to a number of technical challenges coupled with the current state of the technology. The CRS technology may also provide additional capabilities to radiocommunication systems, such as dynamic spectrum access.

"Software-defined radio (SDR) is a radio transmitter and/or receiver employing a technology that allows the RF operating parameters including, but not limited to, frequency range, modulation type, or output power to be set or altered by software, excluding changes to operating parameters which occur during the normal pre-installed and predetermined operation of a radio according to a system specification or standard."

"Cognitive radio system (CRS) is a radio system employing technology that allows the system to obtain knowledge of its operational and geographical environment, established policies and its internal state; to dynamically and autonomously adjust its operational parameters and protocols according to its obtained knowledge in order to achieve predefined objectives; and to learn from the results obtained."

Methods to satisfy the Agenda Item summary:

Methods A, B1,B and B2 are proposed

ICAO supports including regulatory measures that will preclude the use of SDR in the Aeronautical Bands unless they are properly licensed to be used in the Aeronautical Bands. The use of CRS is not supported by ICAO in the Aeronautical Bands.

AGENDA ITEM 2

To examine the revised ITU-R Recommendations incorporated by reference in the Radio Regulations communicated by the Radiocommunication Assembly, in accordance with Resolution 28 (Rev.WRC-03),

and to decide whether or not to update the corresponding references in the Radio Regulations, in accordance with principles contained in the Annex 1 to Resolution 27 (Rev.WRC-03)

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 4

In accordance with Resolution 95 (Rev.WRC 07), to review the resolutions and recommendations of previous conferences with a view to their possible revision, replacement or abrogation;

Resolution 95 (Rev.WRC 07)

General review of the Resolutions and Recommendations of world administrative radio conferences and world radiocommunication conferences

ICAO has recommended the action required for items of interest in the attached table

Resolution No.	***Title***	***Action recommended***
18 *(Rev WRC-07)*	Relating to the procedure for identifying and announcing the position of ships and aircraft of States not parties to an armed conflict	No change
20 *(Rev. WRC-03)*	Technical cooperation with developing countries in the field of aeronautical telecommunications	No change
26 *(Rev. WRC-07)*	Footnotes to the Table of Frequency Allocations in Article 5 of the Radio Regulations	No change
27 *(Rev. WRC-07)*	Use of incorporation by reference in the Radio Regulations	No change
28 *(Rev. WRC-03)*	Revision of references to the text of ITU-R recommendations incorporated by reference in the Radio Regulations	No change
63 *(Rev. WRC-07)*	Protection of radiocommunication services against interference caused by radiation from industrial, scientific and medical (ISM) equipment	No change
95 *(Rev. WRC-07)*	General review of the resolutions and recommendations of world administrative radio conferences and world radiocommunication conferences	No change
114 *(Rev. WRC-03)*	Studies on compatibility between new systems of the aeronautical radionavigation service and the fixed-satellite service (Earth-to-space) (limited to feeder links of the non-geostationary mobile-satellite systems in the mobile-satellite service) in the frequency band 5 091 - 5 150 MHz	No change
205 *(Rev. MOB-87)*	Protection of the band 406 - 406.1 MHz allocated to the mobile-satellite service	No change

207 *(Rev. WRC-03)*	Measures to address unauthorized use of and interference to frequencies in the bands allocated to the maritime mobile service and to the aeronautical mobile (R) service	No change
217 *(WRC-97)*	Implementation of wind profiler radars	No change
222 *(Rev. WRC-07)*	Use of the bands 1 525 - 1 559 MHz and 1 626.5 - 1 660.5 MHz by the mobile-satellite service	Modify as necessary based on studies carried out under WRC-11, Agenda Item 1.7
225 *(Rev .WRC-07)*	Use of additional frequency bands for the satellite component of IMT-2000	No change
228 *(Rev. WRC-03)*	Studies on frequency related matters for the future development of IMT-2000 and systems beyond IMT-2000 as defined by ITU-R	No change
339 *(Rev. WRC-07)*	Coordination of NAVTEX services	No change
354 (WRC-07)	Distress and safety radiotelephony procedures for 2 182 kHz	No change
356 (WRC-07)	ITU maritime service information registration	No change
405	Relating to the use of frequencies of the aeronautical mobile (R) service	No change
413 *(WRC-07)*	Use of the band 108 - 117.975 MHz by aeronautical services	Modify as necessary based on studies carried out under WRC-11, Agenda Item 1.4 and other studies
417 (WRC-07)	Use of the band 960 - 1 164 MHz by the aeronautical mobile (R) service	Modify as necessary based on studies carried out under WRC-11, Agenda Item 1.4
418 (WRC-07)	Use of the band 5 091 - 5 250 MHz by the aeronautical mobile service for telemetry applications	No change
419 (WRC-07)	Considerations for use of the band 5 091 - 5 150 MHz by the aeronautical mobile service for certain aeronautical applications	No change
420 (WRC-07)	Consideration of the frequency bands between 5 000 and 5 030 MHz for aeronautical mobile (R) service surface applications at airports	Delete after WRC-11 (WRC-11, Agenda Item 1.4)
421 (WRC-07)	Consideration of appropriate regulatory provisions of the operation of unmanned aircraft systems	Delete after WRC-11 (WRC-11, Agenda Item 1.3)
544 *(WRC-03)*	Identification of additional spectrum for the broadcasting service in the HF bands	Delete

608 *(WRC-03)*	Use of the frequency band 1 215 - 1 300 MHz by systems of the radionavigation satellite service	Delete after studies completed
609 *(WRC-07)*	Protection of aeronautical radionavigation systems from the equivalent power flux-density produced by radionavigation satellite service networks and systems in the 1 164 - 1 215 MHz band	No change
610 *(WRC-03)*	Coordination and bilateral resolution of technical compatibility issues for radionavigation satellite networks and systems in the band 1 164 - 1 300 MHz, 1 559 - 1 610 MHz and 5 010 - 5 030 MHz	No change
611 (WRC-07)	Use of portion of the VHF band by the radiolocation service	Delete after WRC-11 (WRC-11, Agenda Item 1.14)
612 (WRC-07)	Use of the radiolocation service between 3 and 50 MHz to support high-frequency oceanographic radar operations	Delete after WRC-11 (WRC-11, Agenda Item 1.15)
614 (WRC-07)	Use of the band 15.4 - 15.7 GHz by the radiolocation service	Delete after WRC-11 (WRC-11, Agenda Item 1.21)
644 *(Rev. WRC-07)*	Telecommunication resources for disaster mitigation and relief operations	No change
705 *(MOB-87)*	Mutual protection of radio services operating in the band 70 - 130 kHz	No change
729 *(WRC-07)*	Use of frequency adaptive systems in the MF and HF bands	Delete after WRC-11
748 (WRC-07)	Compatibility between the aeronautical mobile (R) Service and the fixed satellite service (Earth-to-space) in the band 5 091 - 5 150 MHz	No change
754 (WRC-07)	Consideration of modification of the aeronautical component of the mobile service allocation in the 37 - 38 GHz band for protection of other primary service in the band	Delete after WRC-11 (WRC-11, Agenda Item 1.12)
805 (WRC-07)	Agenda for the 2011 World Radiocommunication Conference	Delete after WRC-11
951 *(Rev. WRC-07)*	Options to improve the international spectrum regulatory framework	Delete after WRC-11
953 (WRC-07)	Protection of radiocommunication services from emissions by short range devices	No change
956 (WRC-07)	Regulatory measures and their relevance to enable the introduction of software-defined radio and cognitive radio systems	No change

Recommendation No.		***Action recommended***
7 *(Rev. WRC-97)*	Adoption of standard forms for ship station and ship earth station licences and aircraft station and aircraft earth station licences	No change
9	Relating to the measures to be taken to prevent the operation of broadcasting stations on board ships or aircraft outside national territories	No change
71	Relating to the standardization of the technical and operational characteristics of radio equipment	No change
75 *(WRC-03)*	Study on the boundary between the out-of-band and spurious domains of primary radars using magnetrons	No change
401	Relating to the efficient use of aeronautical mobile (R) worldwide frequencies	No change
604 *(Rev. MOB-87)*	Future use and characteristics of emergency position-indicating radio beacons (EPIRBs)	No change
606 *(MOB-87)*	The possibility of reducing the band 4 200 - 4 400 MHz by radio altimeters in the aeronautical radionavigation service	Delete
608 *(Rev. WRC-07)*	Guidelines for consultation meetings established in Resolution **609 (WRC-03)**	No change

AGENDA ITEM 8.1

To consider and approve the Report of the Director of the Radiocommunication Bureau:

This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

AGENDA ITEM 8.2

To recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 806 (WRC 07),

Summary

The aerospace industry is developing new commercial aircraft to provide airlines and the flying public more cost-efficient air transportation while maintaining required levels of safety and reliability. One

important way of accomplishing these aims is to reduce aircraft weight while providing multiple and redundant methods to transmit safety-related information within and on an aircraft. The utilization of wireless technologies may accomplish these goals while providing environmental benefits and cost savings to manufacturers and operators.

Installed Wireless Avionics Intra-Communications (WAIC) systems are one potential way to derive these benefits. WAIC systems consist of radiocommunications between two or more transmitters and receivers on a single aircraft. Both the transmitter and receiver are integrated with or installed on the aircraft. In all cases, communication is part of a closed, exclusive network required for aircraft operation. WAIC systems will not provide air-to-ground or air-to-air communications. WAIC systems will be limited to safety and regularity-of-flight related applications.

New Report ITU-R M. 2197 provides findings on the technical characteristics and operational requirements of WAIC systems for a single aircraft. Current aeronautical services allocations may not be sufficient to permit the introduction of WAIC systems due to the anticipated WAIC bandwidth requirements.

Therefore, ICAO supports a WRC-15 agenda item to conduct studies and take appropriate regulatory action to accommodate WAIC systems.

Methods to satisfy the Agenda Item summary:

To support a future WRC-15 Agenda Item to make necessary regulatory changes to the ITU-R Radio Regulations for Wireless Avionics Intra-Communications (WAIC) systems.

APPENDIX B

CHAPTER 1 Maritime and Aeronautical issues

Agenda Item	Methods to support Aviation Position in WRC 12
1.3	Proposed methods to support ICAO are A1, A4, A5 and B.
1.4 Resolution 413 (Rev.WRC-07) Resolution 417 (WRC-07) Resolution 420 (WRC-07)	Proposed method to support ICAO is A Proposed method to support ICAO is B. Proposed method to support ICAO is C2.
1.9	ICAO requests any changes in Appendix 17 does not cause any harmful interference to the AM(R)S
1.10	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

CHAPTER 2 Radiolocation and amateur issues

1.14	Bands being discussed now are not in the ARNS and AM(R)S. ICAO would like to ensure any allocations do not affect the operation of existing and planned Aeronautical systems.
1.15	Bands being discussed now are not in the AM(R)S. ICAO would like to ensure any allocations do not affect the operation of existing and planned Aeronautical systems
1.21	ICAO accept the primary allocation of the radiolocation services in the band but with conditions that no harmful interference is caused and also no protection is required to the Aeronautical services.
1.23	Method C is supported by ICAO and method A and B pending making sure that the Amateur service cannot affect the operation of the Aeronautical services in the band.

CHAPTER 3 Fixed, Mobile and Broadcasting issues

1.5	ICAO opposes any allocations which will affect the interest of aviation
1.8	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.17	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.20	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.22	Method C and D are supported by ICAO while protecting bands used for Aeronautical Safety Services.

CHAPTER 4 Science issues

1.6	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.11	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.12	Method B is supported by ICAO and to oppose excluding Aeronautical use in the band.
1.16	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position. (As for Oman we support the only method as it serves the Met.)
1.24	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position. (As for Oman we support the only method as it serves the

	Met.)

CHAPTER 5 Satellite issues

1.7	Method is preferred by ICAO also a combination of B and D are acceptable. Method A and C are not supported By ICAO.
1.13	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.18	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
1.25	ICAO would like to oppose any allocations in the bands which would adversely affect the interest of Aviation.
7	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.

CHAPTER 6 Future work programme and other issues

1.2	ICAO supports the new provisions or modifications to improve the flexibility of spectrum allocations to it so as to tighten the regulatory provisions and thus protection of aviation systems but make sure the measures taken should not impact adversely on these systems.
1.19	ICAO supports including regulatory measures that will preclude the use of SDR in the Aeronautical Bands unless they are properly licensed to be used in the Aeronautical Bands. The use of CRS is not supported by ICAO in the Aeronautical Bands.
2	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not take any position.
4	ICAO has recommended the action required for items of interest in the attached table
8.1	This Agenda item has no impact on the Aeronautical services. Thus ICAO did not

	take any position.
8.2	To support a future WRC-15 Agenda Item to make necessary regulatory changes to the ITU-R Radio Regulations for Wireless Avionics Intra-Communications (WAIC) systems.

- END -