



Agenda Item 5: Assessment of operational requirements in order to determine the implementation of communications, navigation, and surveillance (CNS) capabilities improvement for en-route and terminal area operations

RESULTS OF THE REGIONAL PREPARATORY WORKSHOP FOR INTERNATIONAL TELECOMMUNICATIONS UNION WORLD RADIO COMMUNICATION CONFERENCE (ITU WRC-15)

(Presented by the Secretariat)

SUMMARY	
This working paper presents the results and recommendations from the Regional Preparatory Workshop for International Telecommunications Union World Radio Communication Conference (ITU WRC-15).	
REFERENCE	
Regional Preparatory Workshop for International Telecommunications Union World Radio Communication Conference (ITU WRC-15) (Lima, Peru, 11-12 March 2013).	
ICAO strategic objectives:	<i>A – Safety C – Environmental protection and sustainable development of air transport</i>

1. Background

1.1 The objective of the workshop was to support States in the appropriate management of the frequency spectrum and in preparing to support the ICAO position at ITU WRC-15. It was recalled that the event was intended for staff in charge of radio frequency spectrum management and focal points nominated by the Administrations to coordinate the support to the ICAO position at World Radio Communication Conferences (WRC) in the NAM/CAR/SAM Regions.

1.2 The workshop was attended by 12 States/Territories from the NACC, SAM, AFI, ASIA/PAC and EUR Regions, 5 International Organisations and 1 industry partner, totalling 34 delegates.

2. Analysis

2.1 The workshop reviewed the draft ICAO position for the ITU World Radiocommunication Conference 2015 (WRC-15), planned to be held in November 2015 in Geneva, Switzerland.

2.2 The four most important WRC agenda items supporting the development of aviation spectrum are:

2.2.1 Agenda Item 1.5 considers the potential use of Fixed Satellite Service (FSS) frequency allocations for the command and control of Remotely Piloted Aircraft Systems (Unmanned Aircraft Systems, using ITU terminology).

2.2.2 Agenda Item 1.7 reviews the use of the frequency band 5091 – 5150 MHz (allocated to ARNS in support of MLS and AM(R)S in support of AeroMACS) by the Fixed Satellite Service (Globalstar E-s feederlink). A potential outcome of this agenda item is to improve the conditions for the aeronautical services in the band, while also facilitating the continued unchanged FSS use within the band.

2.2.3 Agenda Item 1.17 is to identify or obtain spectrum for a point-to-point wireless application on-board aircraft, reducing required wiring and thus resulting in more fuel efficient aircraft.

2.2.4 Agenda Item 9.1.5 addresses the reduced spectrum access for the VSAT service in Africa in the frequency band 3400 – 4200 MHz (C-band), due to an allocation to the International Mobile Telecommunications (IMT) service in the band by WRC-07 within ITU Region 1. The workshop discussed that the C-band is in fact heavily used within the CAR/SAM Regions as well, and that recent WIMAX interference cases have been experienced. The workshop noted the importance of this issue also in context with WRC-15 agenda item 1.1, and that all interference cases to aeronautical VSAT must be duly recorded and documented for appropriate presentation within the ITU-R and WRC process when discussing future use and access of the FSS C-band.

2.3 The Workshop recalled that the civil aviation authorities should give maximum priority in supporting the ICAO position at the ITU conferences, as this is the only way to keep protected the current radio frequency spectrum, as well as the new one foreseen for the future aeronautical applications (ICAO Assembly Resolution A/36-11, GREPECAS Conclusion 15/46).

2.4 The adequate allotment/assignment of frequencies for national or international aeronautical use, according to regional agreements and in a coordinated manner between States and ICAO, is a important task to optimize the use of aeronautical radio spectrum and for safety.

2.5 The workshop was briefed on the CAR/SAM frequency assignment topics and availability of frequency assignment COM lists. Also, it was informed that several of the current frequency assignments of the COM lists needed to be reviewed by the States.

2.6 The ICAO draft Frequency Finder Application was presented to the Workshop and query, modify, new entry and export COM List exercises were made to familiarize the workshop participant with ICAO Frequency Finder Application. Same will be also presented at this SAM/IG/11 meeting.

2.7 The **Appendix** to this working paper presents the report of the Regional Preparatory Workshop for International Telecommunications Union World Radio Communication Conference (ITU WRC-15).

3. **Action suggested**

3.1 The Meeting is invited to:

- a) Take note of the information provided;
- b) Analyze the aspects considered in Section 2 and in the Appendix to this working paper, particularly the recommendations formulated by the Workshop and shown in the Appendix; and
- c) Analyze any other considerations in this regard that the Meeting might consider appropriate.

APPENDIX



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**REGIONAL PREPARATORY WORKSHOP FOR INTERNATIONAL
TELECOMMUNICATIONS UNION WORLD RADIO
COMMUNICATION CONFERENCE (ITU WRC-15)**

REPORT

LIMA, PERU, 11 TO 12 MARCH 2013

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HISTORICAL

ii.1 Place and Date of the Workshop

The Regional Preparatory Workshop for International Telecommunications Union World Radiocommunication Conference (ITU WRC-15) was held in the ICAO South American (SAM) Regional Office, Lima, Peru, from 11 to 12 March 2013. The workshop was organized in conjunction with the Twenty Eighth Meeting of the Aeronautical Communication Panel, Working Group – F (ACP WG-F/28).

ii.2 Opening Ceremony

The workshop was opened with the welcome message from Mr. Franklin Hoyer, ICAO Regional Director of the SAM Regional Office, emphasized the importance of the inputs from all ICAO regions for the ICAO WRC-15 position, the critical role of radio spectrum as a limited resource necessary for safety matters, the need to conduct the promotion of the ICAO WRC-15 position through the appropriate national and regional forum. He concluded by stressing how regional meetings such as this serve as a very effective tool in alerting States to the issues be discussed to WRC-15 and in securing their active support.

ii.3 Organisation of the Meeting

The workshop was chaired by Mr. Loftur Jonasson, Technical Officer CNS, ICAO Headquarters, Montreal, and assisted by Mr. Onofrio Smarrelli, Regional Officer CNS, ICAO SAM Regional Office and Mr. Julio Siu, Regional Officer CNS, ICAO NACC Regional Office.

ii.4 Working Languages

The working languages of the workshop were Spanish and English.

ii.5 Agenda

The Agenda of the workshop is presented as **Attachment A**.

ii.6 Objectives, schedule and work mode

The workshop held its first day session from 09:00 to 15:30 hours, with two breaks and the second day from 09:00 to 13:00. A question and answer sessions were conducted and some recommendations were formulated at the end of the workshop.

The objective of the workshop was to support States in the appropriate management of the frequency spectrum and in preparing to support the ICAO position at ITU WRC-15. It was recalled that the event was intended for staff in charge of radio frequency spectrum management and focal points nominated by the Administrations to coordinate the support to the ICAO position at World Radio Communication Conferences (WRC) in the NAM/CAR/SAM Regions.

ii.7 Attendance

The workshop was attended by 12 States/Territories from the NACC, SAM, AFI, ASIA/PAC and EUR Regions, 5 International Organisations and 1 industry partner, totalling 34 delegates as indicated in the list of participants on pages iii-1 to iii-7.

ii.8 List of Documentation

The presentations and documentation are available on the ICAO SAM Regional Office Webpage www.lima.icao.int:

No.	Description	Presented by	Language
1.	Introduction	Onofrio Smarrelli / ICAO	Spanish
2.	ITU/WRC process, results of WRC-12, preparation for future WRCs, outcome of AN-Conf/12	Loftur Jonasson / ICAO	English
3.	An overview of all aviation relevant agenda items to be addressed by the next WRC (WRC-15)	Mike Biggs / FAA	English
4.	WRC-15 Agenda Item 1.1 - <i>Spectrum for mobile and broadband</i>	John Mettrop / UK CAA	English
5.	WRC-15 Agenda Item 1.5 - <i>FSS allocations for Unmanned Aircraft Systems (UAS)</i>	Loftur Jonasson / ICAO	English
6.	WRC-15 Agenda Item 1.17 - <i>Wireless Avionics Intra-communications (WAIC)</i>	Joseph Cramer / BOEING	English
7.	WRC-15 Agenda Item 9.1.5 - <i>VSAT</i>	Koos Pretorius / South Africa	English
8.	Radio Frequency Management and Interference Mitigation	Nikolai Vassiliev / ITU	English
9.	Interference to aeronautical systems and mitigation measures	Mike Biggs / FAA	English
10.	Aeronautical frequency management in the CAR/SAM Regions	Julio Siu – Onofrio Smarrelli/ ICAO	Spanish
11.	New ICAO frequency manager software tool and exercises	Julio Siu - Onofrio Smarrelli/ ICAO	Spanish
12.	ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718), Volume I, and the new Volume II	Loftur Jonasson / ICAO	English
13.	Peruvian experience regarding interference in the South American Digital Network (REDDIG)	Antonino Marquez – Jorge García / Peru	Spanish

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Summary of Discussions

1. The workshop reviewed the draft ICAO position for the ITU World Radiocommunication Conference 2015 (WRC-15), planned to be held in November 2015 in Geneva, Switzerland.
2. Radio frequencies are required for CNS services, and availability of well-protected radio frequencies was recognized as being essential for the safety, regularity and efficiency of air navigation.
3. The workshop was briefed about the last WRC, held in February 2012, and its outcomes for civil aviation requirements due to the active participation of the States and ICAO.
4. Support of the ICAO position for WRC-15 can only be achieved through a national and regional effort with the active participation of the civil aviation administrations in coordination with their telecommunication regulatory authorities. The workshop recognized that active involvement and participation of the entire aviation community from all the ICAO regions is needed in the preparation for ITU WRC-15.
5. It was, therefore, stressed that points-of-contact (PoCs) for the WRC-15 in the States should continue their active involvement in the issue and should ensure that the ICAO Position on the WRC-15 Agenda Items of interest to civil aviation is reflected in the national and regional positions. It was required that States send to the respective ICAO Regional Offices updated information about the nominated States PoC.
6. The workshop informed that there are 15 items on the WRC-15 agenda which directly affect aviation and are addressed in the ICAO Position for the Conference. The outcome of four of these items may support the development of aviation spectrum, however, at least nine items may pose a direct threat to aviation spectrum allocations.
7. The four most important WRC agenda items supporting the development of aviation spectrum are:
 - Agenda Item 1.5 considers the potential use of Fixed Satellite Service (FSS) frequency allocations for the command and control of Remotely Piloted Aircraft Systems (Unmanned Aircraft Systems, using ITU terminology).
 - Agenda Item 1.7 reviews the use of the frequency band 5091 – 5150 MHz (allocated to ARNS in support of MLS and AM(R)S in support of AeroMACS) by the Fixed Satellite Service (Globalstar E-s feederlink). A potential outcome of this agenda item is to improve the conditions for the aeronautical services in the band, while also facilitating the continued unchanged FSS use within the band.
 - Agenda Item 1.17 is to identify or obtain spectrum for a point-to-point wireless application on-board aircraft, reducing required wiring and thus resulting in more fuel efficient aircraft.

- Agenda Item 9.1.5 addresses the reduced spectrum access for the VSAT service in Africa in the frequency band 3400 – 4200 MHz (C-band), due to an allocation to the International Mobile Telecommunications (IMT) service in the band by WRC-07 within ITU Region 1. The workshop discussed that the C-band is in fact heavily used within the CAR/SAM Regions as well, and that recent WIMAX interference cases have been experienced. The workshop noted the importance of this issue also in context with WRC-15 agenda item 1.1, and that all interference cases to aeronautical VSAT must be duly recorded and documented for appropriate presentation within the ITU-R and WRC process when discussing future use and access of the FSS C-band.

8. The workshop informed that the WRC-15 agenda items which could be categorized as direct threat to aviation are:

- Agenda Item 1.1 is the item of most concern, the mobile industry is looking for over 1000 MHz of additional spectrum between 300 – 5000 MHz, and a number of aeronautical bands are under scrutiny.
- Agenda Item 1.5 (UAS). Whether this item is an opportunity or a threat to civil aviation depends on whether aeronautical safety concerns are sufficiently addressed.
- Other agenda items where aviation safety services may be negatively affected by other services include agenda items 1.6, 1.10, 1.11, 1.12 and 1.16.

Recommendation: Ensure protection for the Aeronautical VSAT networks in the CAR/SAM Regions

Considering the wide use of VSAT networks at regional (like MEVA, REDDIG and CAMSAT networks) and at national level in the CAR/SAM Regions as sole or main telecommunication means for aeronautical services and systems provision (voice and data) and the interference experiences presented in this workshop, that:

- a) ICAO to adopt and recommend to CAR/SAM States, the necessary measures to ensure protection of the VSAT networks for the use of aeronautical services in the 3.4-4.2 GHz in the CAR/SAM Regions from other services operating in the band; and
- b) CAR/SAM States:
 - record and document as mandated in the CAR/SAM Air National Plan (Doc 8733), any harmful frequency interference to FSS C-band aeronautical services, including the corresponding reporting to their National Frequency Spectrum Management Entities and subsequently to the CITEL and the WRC process; and
 - coordinate with their national frequency spectrum management authorities to protect the 3400 – 4200 MHz (C-band) to ensure the continued availability of this frequency band for the VSAT services, both nationally and in their positions to WRC-15.

9. Peru informed that from 1 to 5 September 2012, a WIMAX interference in the Lima REDDIG network VSAT node occurred. The WIMAX station that originated the interference operates at the 3.521 Ghz (the REDDIG RX operates at three frequencies around 3.7 Ghz (3.739 206, 3.791 248 and 3.792.562 Hz)). The interference was solved introducing a C-band pass filter (3.7-4.2 Ghz).

10. The workshop recognized the importance for States to use the ICAO position as a basis for their WRC-15 effort, supplemented with the ICAO policy on all aeronautical frequency bands and their use, as contained in the ICAO 'Handbook on Radio Frequency Spectrum Requirements for Civil Aviation' (Doc 9718).

11. The workshop recalled that the CAR/SAM Civil Aviation Authorities are aware of the importance of supporting the ICAO position as agreed in GREPECAS Conclusion 15/46 and NACC/DCA Conclusion 3/6.

12. The adequate allotment/assignment of frequencies for national or international aeronautical use, according to regional agreements and in a coordinated manner between States and ICAO, is a important task to optimize the use of aeronautical radio spectrum and for safety.

13. The workshop was briefed on the CAR/SAM frequency assignment topics and availability of frequency assignment COM lists. Also, it was informed that several of the current frequency assignments of the COM lists needed to be reviewed by the States.

Recommendation: States should review the existing COM lists available on the ICAO Regional Office websites to confirm the use of the frequencies assigned, and notify ICAO of any update to this information.

14. The workshop recalled that Assembly Resolution A36-25, urges States to support firmly the ICAO position at WRCs and in regional and other international activities conducted in preparation for WRCs by the following means:

- a) undertaking to provide for aviation interests to be fully integrated in the development of their positions presented to regional telecommunications for a involved in the preparation of joint proposals to the WRC;
- b) including in their proposals to the WRC, to the extent possible, material consistent with the ICAO position;
- c) supporting the ICAO position and the ICAO policy statements at ITU WRCs as approved by Council and incorporated in the *Handbook on Radio Frequency Spectrum Requirements for Civil Aviation* (Doc 9718);
- d) undertaking to provide experts from their civil aviation authorities to fully participate in the development of States' and regional positions and development of aviation interests at the ITU; and
- e) ensuring, to the maximum extent possible, that their delegations to regional conferences, ITU study groups and WRCs include experts from their civil aviation authorities or other aviation officials who are fully prepared to represent aviation interests.

15. The workshop was informed with the latest version (Version 6) of the Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718), is available on the ACP Website as an unedited version. There will be some minor revisions in the final version, in particular, the draft ICAO position contained in Appendix F will be replaced with the final version and the new draft Spectrum Strategy will replace the current contents of Chapter 8. Both are expected to be approved by ICAO Council in June 2013.

16. The workshop discussed the frequency harmful interference issues, the ITU frequency reporting and management process and exchanged information on how this issue is managed in some administrations. It was recognized that the coordination with and participation of the National Spectrum Management Authority is important for solving these interferences issues particularly the ones caused by or involving non aeronautical parties.

Recommendation: If not yet implemented, States should formalize a mechanism or procedure with their national Spectrum Management Authority for the detection and resolution of unauthorized transmissions causing interference to aeronautical services.

17. The ITU presentation recalled the importance that Aeronautical Administration maintain updated their frequency spectrum assignment and inform their national frequency management authority in order that they proceed to update the ITU Master International Frequency Register (MIFR).

18. ITU presented briefing on their ITU-R studies and some mitigation techniques documents.

19. The ICAO draft Frequency Finder Application was presented and query, modify, new entry and export COM List exercises were made to familiarize the workshop participant with ICAO Frequency Finder Application.

ATTACHMENT A

AGENDA

Monday, 11 March 2013		
HOURL	SUBJECT	EXPOSITOR
08:15-09:00	Registration	
09:00-09:15	Official opening	ICAO SAM Regional Director
09:15-09:30	Introduction	Onofrio Smarrelli / ICAO
09:30-10:00	ITU/WRC process, results of WRC-12, preparation for future WRCs, outcome of AN-Conf/12	Loftur Jonasson / ICAO
10:00-10:45	An overview of all aviation relevant agenda items to be addressed by the next WRC (WRC-15)	Mike Biggs / FAA
10:45-11:00	Questions and discussion session	
11:00-11:30	<i>Coffee break</i>	
11:30-12:00	WRC-15 Agenda Item 1.1 - <i>Spectrum for mobile and broadband</i>	John Mettrop / UK CAA
12:00-12:30	WRC-15 Agenda Item 1.5 - <i>FSS allocations for Unmanned Aircraft Systems (UAS)</i>	Loftur Jonasson / ICAO
12:30-12:45	Questions and discussion session	
12:45-13:45	<i>Lunch Break</i>	
13:45-14:15	WRC-15 Agenda Item 1.17 - <i>Wireless Avionics Intra-communications (WAIC)</i>	Joseph Cramer / BOEING
14:15-14:45	WRC-15 Agenda Item 9.1.5 - <i>VSAT</i>	Koos Pretorius / South Africa
14:45-15:00	Questions and discussion session	
15:00-15:45	Radio Frequency Management and Interference Mitigation	Nikolai Vassiliev / ITU
15:30-15:45	Questions and discussion session	

Tuesday, 12 March 2013		
Hour	Subject	Expositor
09:00-09:30	Interference to aeronautical systems and mitigation measures	Mike Biggs / FAA
09:30-10:00	Aeronautical frequency management in the CAR/SAM Regions	Julio Siu – Onofrio Smarrelli / ICAO
10:00-11:00	New ICAO frequency manager software tool and exercises	Julio Siu- Onofrio Smarrelli/ ICAO
11:00-11:30	<i>Coffee Break</i>	
11:30-12:00	ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation (Doc 9718), Volume I, and the new Volume II	Loftur Jonasson / ICAO
12:00-12:15	Questions and discussion session	
12:15-12:45	Results of the workshop and final recommendations	ICAO
12:45-13:00	Closing ceremony	ICAO