

Frequency Management Study Group**WP/WGF2/8****Aeronautical Mobile Communications Panel****WORKING GROUP F****Montreal, 14 to 18 September 1998****1. Introduction**

1.1 The first meeting of AMCP Working Group F and the last meeting of the Frequency Management Study Group was held in Montreal from 14 to 18 September 1998. The Rapporteur of the meeting was Mr. S. Mitchell from the United Kingdom. The Agenda of the meeting is at Appendix A, the list of participants is contained in Appendix B. This list of Working Papers is at Appendix J.

1.2 This first meeting of working Group F was held, following its establishment at AMCP/5.

2. Agenda Item 1: Working Arrangements for AMCP Working Group F

2.1 The meeting discussed the working arrangements for the work in Working Group F, as in various areas the progressing of the work would be guided by the schedule of the various ITU Meetings and Conferences rather than the schedule of the various other tasks which are on the work program of AMCP.

2.2 The meeting expressed concern about the separation with the activities related to the frequency spectrum for GNSS. In this regard the meeting was advised that this arrangement served primarily the purpose to secure the participation of experts involved in the work related to the development of SARPs for GNSS as these would also include elements relating to the protection from interference. It was also noted that, through the normal co-ordination through the panel Secretaries, the necessary liaison between the two groups would be established.

2.3 Concerning the membership of the group, it was noted that it was the intention that States would draw this primarily from the membership of the FMSG. It was also noted that ICAO would issue a State letter on this issue. Membership would be expanded with the AMCP members and or their advisers, as required. Also other expertise made available from States and international organizations would be welcome. Working arrangements will provide for the maximum flexibility in participation. This would assist in addressing regional aspects that require further review in ITU.

2.4 States and relevant international organizations will be informed of the amendments to the work programme of the AMCP and the GNSSP and of the need to make available the required expertise on frequency management issues.

2.5 The reports of the meetings of working group F will be circulated to the panel members for comments and agreement. Members will be requested, by correspondence, to give their comments. As required, (parts of) the material developed by the working group will be submitted directly through the Secretariat to the Air Navigation Commission.

2.6 Within the terms of reference of the working group, the reports will address, *inter alia*,:

- draft ICAO position for ITU World Radiocommunication Conferences
- draft ICAO position for ITU-R study groups
- proposals for amending / adding ICAO policy statements in the RF policy handbook

- proposals for amending technical material in the Handbook.

2.7 The meeting developed terms of reference for the working group, which are contained in Appendix C

2.8 The meeting agreed the view that placing spectrum protection material on the ICAO website could significantly contribute to a better availability of the ICAO requirements for interested parties. The secretary was requested to investigate the possibilities for such publication.

Action: Secretariat.

3. **Agenda Item 2: Additions to the ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation.**

3.1 The meeting was advised that the first version of the ICAO Handbook of Radio Frequency Requirements for civil Aviation and associated Policy Statements had been given its final approval for publication and dissemination as an ICAO document. It would be available to Member States, and others as a saleable document. Publication is now expected to take place in the early autumn 1998. This version includes all of the amendments arising from changes in the Radio Regulations introduced at the ITU World Radiocommunication Conference 1997.

3.2 The meeting also reviewed proposals for enhancing the present document by the addition of a new attachment dealing with those Articles of the ICAO Convention which impacted on the work of ITU and the spectrum management activities in ICAO. The principle for its inclusion was agreed. Some suggestions for minor amendments were made and agreed. Further work on this attachment would be carried out by the Secretariat prior to the presentation of this material to the Air Navigation Commission. It was also noted that concerning the comments developed, advice from the legal bureau in ICAO will be sought before publication..

Action: Secretariat

3.3 The first draft of a new Annex (Annex 1) to the Handbook dealing with the subject of the protection of aviation radio services was agreed in principle to be a worthwhile addition to the document. Aviation radio services were increasingly under pressure due to sharing and interactions with other radio sources, other extraneous sources of radio interference, and a collected source of relevant data was highly desirable. This would include all the recorded material created in the past, such as for example, the results of the compatibility studies on the interference that can be caused by FM broadcasting transmitters into ILS and VOR. The draft Annex was reviewed in detail and several additions and amendments proposed. The work of incorporating these changes and the introduction of missing elements would be progressed by the members and the secretariat with a view to presenting this at the next meeting. **WG members were invited to offer suggestions, advice, and material as assistance towards the completion of the second draft.**

Action: All Members

4. **Agenda Item 3: ICAO Position for the ITU World Radio Conference 2000 (WRC-2000)**

4.1 The meeting reviewed the draft position for the next ITU World Radiocommunication Conference which is scheduled to be held from 8 May - 2 June 2000 in Istanbul (Turkey).

4.2 The draft ICAO position is contained in Appendix D to this report. Key elements are:

- future Conferences should not address the provision of Appendix S27
- need to secure protection for GNSS against interference from MSS and the fixed service
- need to rectify the difficulties related to the introduction of a generic service in the Mobile Satellite Service

- no allocation to be made to MSS in the band 1559 - 1567 MHz in order to protect GNSS

4.3 The meeting noted that a timely start of the activities leading to a development of spectrum requirements for MLS, which will probably be addressed at the first WRC after the WRC 2000, is necessary. The Secretary would co-ordinate this requirement with the Secretary of GNSSP.

Action: Secretariat

5. Agenda Item 4: Preparation for ITU Working Party 8B and Working Party 8 D 19-23 April 1999

5.1 Use of the 1.5/1.6 GHz. bands by the generic Mobile Satellite Service

5.1.1 The meeting reviewed an analysis developed by AMCP Working Group A on the effects of the introduction of a generic allocation to the Mobile Satellite Service which replaced the -until WRC 97 - exclusive allocation to the Aeronautical Mobile Satellite (R) Service. It was agreed that further work is necessary to develop an input document to ITU WP 8D in preparation for the WRC 2000. This paper should be based upon the conclusions from the CMP 97 and the limited action on these conclusions by the WRC 97. AMCP working Group A will review the matter further. It is anticipated that a paper can be prepared and submitted to the April 1999 meeting of WP8D.

Action: AMCP WG A

5.1.2 It was agreed that ICAO should submit a high-level overview of aviation AMS(R)S spectrum requirements to the meeting of WP 8D, scheduled to be held in October 1998 in Geneva. It was considered preferable not to present a detailed derivation of the requirements at this meeting. The methodology and the data used to arrive at the result would instead be presented at the following meeting (April 1999) if deemed opportune. The draft submission is at Appendix I.

Action: ICAO

5.2 Material was presented on the work in WP 8B work related to the introduction of HF data link in the bands governed by the provisions of Appendix S27 to the Radio Regulations. This is further considered under Agenda Item 6.

5.3 WP8D is concerned with mobile satellite matters, and is dealing with a range of issues affecting in particular for GNSS services. For WRC-2000 two important questions appear.

5.4 The first is related to Resolution 218 on the use of the bands 1525 - 1559 MHz and 1526.5 - 1660.5 MHz by the new generic Mobile Satellite Service, and in particular the AMS(R)S spectrum requirements. A paper for submission to WP 8D, which will meet in October 1998, which address these aspects, was developed by the meeting. (See Appendix I).

5.5 The second is related to Resolution 220 (WRC-97) on a study of the feasibility of MSS sharing with GNSS in the band 1559 to 1567 MHz. The WG noted the work carried out by the recent GNSS Panel WG B meeting in Krasnoyarsk, Russian Federation, at which the ICAO input to the meeting of ITU Working Party 8D in April 98 (Document 31) was reviewed and revised. Document 31 was an analysis of the protection requirements for GNSS, ENSS-2, and Pseudolites. This revised document (Appendix E) will be sent to ITU for the October 1998 meeting of WP 8D. The need for more support to the ICAO paper than at the last 8D meeting was considered vital for success in this most important subject which had the potential to seriously affect GNSS operations in the future.

5.6 The WG noted also the GNSSP response to three further subjects active in 8D. These are :

(i) the protection of GNSS from spurious emissions from NGSO mobile (hand held) terminals. Levels agreed in ITU-R (ITU-R Rec. M 1338)after protracted discussions with aviation interests were under pressure to give a time phased dispensation to MSS interests until 2005. The ICAO position of no change agreed in GNSSP was noted. (See Appendix F)

(ii) a paper submitted at the May meeting to establish spurious limits for GSO MSS terminals was reviewed. The levels proposed were acceptable, but as was the case with the NGSO terminals, time phasing allowing higher levels of unwanted emissions than necessary to protect GNSS was not acceptable. (See Appendix G)

(iii) Under Agenda Item 1.15.3 for WRC-2000 , (proposed for inclusion by ICAO at WRC-97), it was hoped to resolve the question of the Fixed Links operated by some 74 countries in Region 1. (Europe Middle East and Africa). The WG noted the paper showing that large separations, 700 kilometers and greater, are required to protect GNSS. The meeting recognized the seriousness of this problem, and the difficulties that may be encountered in persuading many of these countries to cease operations of the fixed service in the GNSS spectrum. The secretariat was requested to bring these concerns to the attention of the ANC in the approval memo covering these papers (See Appendix H).

Action: Secretariat

5.6 WGF also reiterated the appeal for more support to ICAO for these subjects. It was noted however that in some countries and areas, agreements had been made which affected this position.

Action: All members

6. Agenda Item 5: Progress of Regional and national preparations for WRC-2000

6.1 Under this agenda item the meeting reviewed preliminary Canadian proposals to the WRC 2000.

6.2 A study was presented regarding the need for a guard band between the various GNSS elements and the fixed service. Further work will be presented in the future. The Secretary was requested to submit this paper to the GNSSP for comments.

6.3 The meeting received information on the preliminary views of Canada on the agenda of the WRC 2000. The meeting discussed some of these views as they could effect aviation. The information was highly appreciated and the meeting urged other members to present in the future similar information.

7. Agenda Item 6: Use of HF Bands

7.1 The meeting reviewed material developed by AMCP Working Group E on the registration and protection of HF frequencies for HF data link. The meeting noted the result of co-ordination activities between ICAO and the ITU on the development of an arrangement enabling registration and protection of assignments for HF data link under the provisions of Appendix S27 and the Radio Regulations. It was agreed that this material be incorporated in the RF policy handbook. The next meeting of the working group will develop the necessary proposals. The information is contained in Appendix J.

7.2 The meeting also noted a draft new ITU R Recommendation that has been developed by Working Group E on the protection requirements for HF data link. The recommendation, which is mainly an extract from the draft SARPs for HF data link, will be used by the ITU when co-ordinating frequency assignments for HF data link. The meeting agreed that the Recommendation should be sent to the next meeting of ITU Working Party 8B (February 1999). The draft Recommendation is at Attachment K.

7.3 The meeting received information regarding interference from land and maritime mobile users of HF frequencies in the Asian/Pacific region. It was noted that the co-ordination through the ITU channels could not help to remove this interference. The meeting agree that in the handbook reference needs to be made to this kind of interference, together with recommendations on the action that could be taken by States. It was noted that, as such interference can also occur at other frequency bands, and in particular the VHF bands, at the proper place in the handbook material needs to be incorporated. This matter will be further addressed at the next meeting of the working group.

8. Agenda Item 7: ITU Plenipotentiary Conference

No material was presented under this agenda item.

9. Agenda Item 8: Any Other Business

9.1 Need for an AMS(R)S allocations for next generation satellite systems.

9.1.1 Working Group A of the AMCP is currently developing a set of criteria to be used to determine whether a given satellite system can be considered for use as an aid to air traffic services. This work is being conducted in particular with regard to next generation satellite systems (NGSS), i.e. systems which are under developed or deployment now and are not in conformance with the current AMSS SARPs.

9.1.2 During the work on developing spectrum-related criteria, a question arose as to whether NGSS operating in an MSS band without AMS(R)S footnotes could be considered as a candidate for provision of AMS(R)S or should be ruled out a priority. The question was put to Working Group F for comment and advice.

9.1.3 The meeting noted that ITU Radio Regulations do not rule out MAS(R)S communications in an MSS band. However, it was felt that, as an aviation requirement, the use of a band for AMS(R)S should be ruled out unless explicit and adequate regulator provisions in the Table of Frequency Allocations were in existence or expected to come into existence. One working group member expressed a disagreement with this view.

9.1.4 The meeting noted the existence of an AMS(R)S footnote in an MSS band, per se, did not constitute an adequate regulatory provision unless the footnote ensured that aviation spectrum requirements are met and the band is properly protected. Examples of footnotes that were considered inadequate include the S5.362A and S5.367. Working Group A is expected to work further in defining conditions under which regulatory provision for NGSS spectrum allocations are deemed acceptable.

9.2 the meeting welcomed the initiative taken by ICAO and the US to address spectrum issues at the 32nd ICAO Assembly to be held from 22 September to 2 October 1998 in Montreal. It was noted that increased activities by both Contracting States and by ICAO are required to improve awareness of the need to secure adequate spectrum for aeronautical purposes.

9.3 the participation and support from IATA and IFALPA in the work of WGF, and also in other fora such as Eurocontrol, CEPT and ITU, was noted. These organizations can make a substantial contribution to progress the work of ICAO on spectrum management in preparation to the ITU Conferences. In this regard, the meeting discussed and agreed to the need and the usefulness of an executive summary of the ICAO Position, written in easily understandable terms, for dissemination to IATA and IFALPA and other interests who can assist in the lobbying process. The members from IATA and IFALPA would undertake, together with the Secretary of AMCP, to develop some material at the earliest opportunity.

Action: IATA/IFALPA/Secretariat

9.4 The results of work on the GNSS/MSS sharing in the band 1559 to 1567 MHz, carried out in Europe for input to CEPT discussions was noted. The analytical approach differed from that developed by the GNSS Panel but there was a good correlation in the final results. Nevertheless careful analysis of the differences was necessary to isolate the points which would be picked up and commented on by MSS interests. It was recognized also that this work needs to be closely monitored since it was aimed at Resolution 220 for eventual discussion at ITU CPM and at WRC-2000. It was also noted that the recently formed Eurocontrol Spectrum Protection Group held regular meetings in which this subject was in strong focus.

Appendix A Agenda

Appendix B List of Participants

Appendix C Terms of reference

Appendix D Draft ICAO position

Appendix E ICAO submission to WP 8D on MSS (space-Earth) vs. GNSS

Appendix F ICAO submission to WP 8D on unwanted emissions from non-GSO systems

Appendix G ICAO submission to WP 8D on unwanted emissions from GSO systems

Appendix H ICAO submission to WP 8D on interference from fixed service

Appendix I ICAO submission to WP 8D on the spectrum requirements for AMS(R)S

Appendix J Material on registration and co-ordination of assignments for HF data link

Appendix K ICAO submission to WP 8B on the RF characteristics for HF data link

Appendix L List of Working Papers