DOCKET FILE COPY ORIGINAL

**Before the**
**Federal Communications Commission**
**Washington, D.C. 20554**

RECEIVED

NOV 2 6 2004

Federal Communications Commission
Office of the Secretary

| | | |
|---|---|---|
| In the Matter of | ) | |
| | ) | |
| Preparations for the 2007 | ) | Re: IB Docket No. 04-286 |
| World Radiocommunication Conference | ) | Document WAC/032 |
| | ) | |

To: The Commission

# COMMENTS OF AEROSPACE AND FLIGHT TEST RADIO COORDINATING COUNCIL

Aerospace and Flight Test Radio Coordinating Council ("AFTRCC"), by its attorney, hereby submits its Comments in response to the Commission's Public Notice, DA-04-3580, released November 15, 2004. The Public Notice invites comment regarding preliminary views approved by the Commission's World Radiocommunication Conference Advisory Committee ("WAC"). These Comments address the preliminary view regarding Agenda Item 1.6 (Document WAC/032).

## INTRODUCTION

As the Commission's records reflect, AFTRCC is the certified Non-Federal Government coordinator for use of the shared, Government/Non-Government spectrum allocated for flight testing. AFTRCC works closely with Government Area Frequency Coordinators, who are responsible for Federal Government use of the spectrum, in an effort to ensure that interference-free operation is protected, and hence flight test safety maximized.

No. of Copies rec'd 2
List ABCDE

AFTRCC is also a trade association for the nation's principal aerospace manufacturers. In this capacity AFTRCC serves as the spectrum advocate for the aerospace industry on matters affecting flight test spectrum. This fundamental mission was at the heart of AFTRCC's formation nearly 50 years ago. Among its many accomplishments in this regard is AFTRCC's role in helping lead efforts which resulted in the allocation of L- and S- spectrum bands for telemetry. AFTRCC welcomes the opportunity to comment on the instant Public Notice.

## DISCUSSION

Agenda Item 1.6 directs WRC-07 to "consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz ..." in accordance with specified Resolutions adopted at WRC-03 including Resolution 414. Among other things, Res. 414 (WRC-03) contemplates a study of how best to accommodate the requirements for aeronautical systems in the band 5091-5150 MHz.

The preliminary view incorporated in the Public Notice acknowledges that study efforts relative to this band might be subsumed within other studies conducted pursuant to the Agenda Item. However, the document (WAC/032) goes on to observe that

> "the scope of this effort is broader in that aeronautical fixed links are also being considered to allow transmission of aeronautical sensor data on the airport property without requiring costly underground cable installation."

Public Notice at page 10. The document then states as preliminary view number 3, that

> "investigation may be necessary to determine how best to accommodate the requirements for aeronautical systems in the band 5091-5150 MHz, including the possibility of fixed service links limited to aeronautical applications at airports."

Id. at page 11. In addition, the view urges that operations of the fixed satellite service be taken into account.

The band 5091-5150 MHz has been allocated for aeronautical purposes for years, and should remain primarily allocated for that purpose.[1] AFTRCC takes this opportunity to bring to the Commission's attention other aeronautical applications which should be investigated as the U.S. works its way through the international approval process prior to WRC-07.

In particular, AFTRCC invites the Commission's attention to a proposal introduced by the French Administration during the most recent meeting of ITU-R Working Party 8B. That proposal contemplates use of the band for aeronautical telemetry including, possibly, the command and control of unmanned aerial vehicles operating in national airspace. This proposal is referenced in Annex 7 to the Chairman's Report from the 15th Meeting of Working Party 8B (Doc. 8B/98) which sets forth draft CPM text for Agenda Item 1.6. In the course of discussing various possible aeronautical applications for the band 5091-5150 MHz, such as new aviation security and/or aeronautical data transmission systems, Annex 7 notes that the band is also "being considered by studies in response to WRC-07 Agenda Item 1.5." Agenda Item 1.5 directs consideration of the spectrum requirements and possible additional spectrum allocations for aeronautical telemetry.

Annex 6 to the Chairman's Report contains a detailed discussion of the band in question. Among other things, Annex 6 notes that initial investigation in Region 1 alone suggests that 60 MHz of spectrum will be required for wideband aeronautical telemetry for flight testing,

[1] The Fixed Satellite Service allocation reverts to secondary status as of January 1, 2018.

preferably under 7 GHz; and that spectrum will also be required for unmanned aerial vehicles.[2] The document also notes that 5091-5150 MHz is an extension band for microwave landing systems operational at 5030-5091 MHz; that priority must be given to these systems pursuant to RR 5.444; but that "the worldwide use of the extension band by MLS is uncertain and ... the future telemetry and telecommand high bit-rate frequencies could partly take place in the bands just quoted above" subject to further study. Annex 6, in turn, cross-references the studies being conducted of this band under Agenda Item 1.6. A copy of Annexes 6 and 7 is attached.

There are numerous questions which must be resolved before any particular application can be said to be suitable for the 5091-5150 MHz band. The answers to these questions will require further study and analysis.

However, for present purposes, it is enough to suggest that the Commission should remain cognizant of the potential use of 5091-5150 MHz for flight test telemetry. The U.S. position strongly favors additional allocations for telemetry. The challenge is to locate a band or bands where telemetry can share compatibly with incumbent services. At this early stage, bands such as 5091-5150 MHz should not be ruled out as possible candidates without further study. This is the position reflected in the Working Party 8B documents discussed above. It is also the position clearly stated by the U.S. during the recent WP8B meeting which adopted those documents.

---

[2] Working Party 8B also adopted for circulation to other Administrations and concerned agencies a list of study questions relative to plans for the implementation of UAVs in civil airspace. See Annex 16 to Chairman's Report. These questions include, for example, when, where, and how UAVs are scheduled to fly in national airspace, what kinds of flights are contemplated (e.g. air freight), whether the UAV traffic would be completely mixed with traditional piloted traffic, etc. See Attachment for a copy of Annex 16.

Accordingly, AFTRCC urges that the Commission consider the developments referenced above as the agency formulates its views relative to accommodating the needs of aeronautical telemetry for additional spectrum allocations.

Respectfully submitted,

AERONAUTICAL and FLIGHT TEST RADIO COORDINATING COUNCIL

By: 
William K. Keane

Duane Morris LLP
1667 K Street NW
Suite 700
Washington, D.C. 20006

Its Attorneys

November 23, 2004

WSHM121239.2

**Attachment**

INTERNATIONAL TELECOMMUNICATION UNION

**RADIOCOMMUNICATION STUDY GROUPS**

**Document 8B/98-E**
**18 October 2004**
**English only**

## Chairman, Working Party 8B

# REPORT OF THE 15TH MEETING OF WORKING PARTY 8B

(Geneva, 7 September to 16 September 2004)

## SCOPE OF WORKING PARTY 8B

1 The Working Party is responsible for

1.1 studies related to the maritime mobile service, including the Global Maritime Distress and Safety System (GMDSS) and the management of Maritime Mobile Service Identities (MMSI), the aeronautical mobile service and the radiodetermination service (radionavigation and radiolocation); and

1.2 studies on communication systems for use by the maritime mobile service and aeronautical mobile service.

2 The Working Party,

2.1 develops and maintains Recommendations that enable protection for distress and safety applications of the above services while permitting sharing of the limited spectrum resources with other services operating within the allocated bands; and

2.3 studies systems' protection criteria, with particular emphasis on safety-of-life services; and

2.4 assesses compatibility between the cognizant radiocommunication services of Working Party 8B and other services to determine the feasibility of sharing; and

2.5 studies methods to enhance the effective and efficient use of the spectrum of services cognizant to Working Party 8B.

3 The Working Party shall maintain strong cooperative efforts with other United Nations' Specialized Operating Agencies such as the International Civil Aviation Organization (ICAO), International Maritime Organization (IMO) and World Meteorological Organization (WMO).

4 The Working Party shall also maintain strong cooperative efforts with other Task Groups and Working Parties having an interest in the frequency bands allocated for the maritime mobile, aeronautical mobile and radiodetermination services.

CONTENTS

## 1 Introduction

The Working Party was invited to meet in Geneva by BR Circular Letter 8/LCCE/127.

The Working Party considered sixty-two documents (input) pertaining to the radiodetermination, maritime mobile and aeronautical mobile services as well as some documents carried over from the 14th meeting of Working Party 8B (see Annex 19). These were handled by 4 sub-working groups which focused primarily on general radar standards, statistical aspects in protecting radiodetermination systems, new technologies in the maritime mobile service and aeronautical issues. In addition preliminary CPM text has been developed on the WRC-07 agenda items under the responsibility of WP 8B. On request by RRC-04 Working Party 8B prepared a Work Programme in accordance with the Resolutions of RRC-04 (For the complete List of output documents, see Annex 20).

The Working Party had 127 delegates in attendance, representing 32 Administrations, 3 Scientific or Industrial Organizations, 2 Recognized Operating Agencies, 4 Regional or other international Organizations and 1 Specialized Agency of the United Nations (see Annex 21).

The Working Party formed four formal Sub-working groups (SWG) as follows:

| SWG | Subject | Chairman |
|---|---|---|
| 8B-1 | Radiodetermination | Mr. K. Fisher (UK) |
| 8B-2 | Aeronautical | Mr. J. Mettrop (UK) |
| 8B-3 | Maritime | Mr. J. Turban (USA) |
| 8B-4 | RRC-04 | Mr. H. de Baillencourt (F) |

## 2 Executive summary

The Working Party approved one draft new Recommendation, one draft revision to an existing Recommendation, one draft new Report, one draft new Question, and eight liaison statements to other Working Parties, Task Groups and International Organizations. Additionally, it prepared four preliminary texts for consideration at a future meeting and reconsidered the draft work programme on the feasibility of the use of statistical and operational aspects in the protection criteria for radiodetermination radar systems. A list of questions with regard to WRC-07 Agenda item 1.5 has been prepared to be sent out with the invitation to the 16th meeting of Working Party 8B and a work programme was prepared to cover the issues regarding the outcome of RRC-04.

Regarding the preparation of elements for the CPM Report for WRC-07, the Working Party prepared 6 preliminary texts and contributions are invited on these issues for the next meeting.

*"Statement from ICAO:*

*ICAO expressed its concerns with the current draft CPM text in Section 1.3.1.4 regarding the band 5 030–5 150 MHz for telemetry and telecommand applications.*

*For the band 5 030–5 091 MHz ICAO has developed and adopted international standards for the microwave landing system MLS. Avionics and ground systems have been developed. Some systems are installed and additional systems are anticipated.*

*Telecommand and telemetry systems should not adversely affect existing and planned aeronautical systems in the bands under study."*

The Working Party received information regarding a patent statement and licensing declaration in relation to Recommendation ITU-R M.1371.

The Working Party discussed the meeting schedule for 2005–2007.

## 2.1 Summary of actions taken

### 2.1.1 Documents for approval by ITU-R SG 8

One draft new Recommendation, one draft revised Recommendation, one draft new Question and one draft new Report were approved to be forwarded to Study Group 8.

The Working Party prepared a draft new Recommendation ITU-R M.[8B.15-17GHz] on "Characteristics and protection criteria for the radiolocation service in the frequency band 15.7-17.3 Hz" (see Doc. 8/46).

The Working Party prepared a draft revision to Recommendation ITU-R M.1314 on "Reduction of unwanted emissions of radar systems operating above 400 MHz" (see Doc. 8/51).

The Working Party prepared a draft new Report ITU-R M.[RAD-TEST] on "Test results illustrating the susceptibility of maritime radionavigation radars to emissions from digital communication and pulsed systems in the bands 2 900-3 100 MHz and 9 200-9 500 MHz" (see Doc. 8/52).

The Working Party prepared a draft new Question on "Characteristics, protection criteria of and suitable frequency bands for radars operating in the radiodetermination service in the VHF frequency band" (see Doc. 8/50).

The Administration of Syria reserved its position on this draft new Question.

### 2.1.2 Meeting schedule for Working Party 8B for 2005-2007

Working Party 8B considered Document 8B/ADM/20 kindly prepared by the Counsellor Mr. Colin Langtry showing the provisional schedule of meetings for 2005–2007. An additional meeting has been envisaged in April 2005 to support the tasks given to Working Party 8B in regard to RRC-04. The Working Party agreed to this additional meeting. It was mentioned that this meeting could also be used to progress the work on the WRC-07 agenda items. Therefore the agenda of the meeting will be limited to RRC-04 issues and work necessary for the preparation of WRC-07, e.g. CPM text and related Recommendations. All other work items in Working Party 8B will dealt with in November 2005.

### 2.1.3 Information regarding a patent statement and licensing declaration in relation to Recommendation ITU-R M.1371

At the 14th meeting of Working Party 8B, Document 8B/14 from Norway, indicating possible difficulties on IPR issues regarding Recommendation ITU-R M.1371, was discussed. The result

has been reported to ITU-R Study Group 8 and the Study Group decided on the following approach:

1) to await the results of the above mentioned discussions of AIS manufacturers with GP&C Systems International AB;

2) for the Bureau to subsequently seek clarification from the patent holder, if still deemed necessary, and advise the Study Group membership of the outcome (putting this information online as soon as possible);

3) to send a liaison statement from the Director BR to the Director TSB, asking him to draw the attention of the TSB IPR Policy group to the problems encountered by the ITU-R when:

   a) a patent holder waives his rights and withdraws this waiver afterwards; and

   b) a protocol is patented and the use of equipment based on the particular ITU Recommendation has been made mandatory by another organization;

4) to discuss this problem further at the next meeting of SG 8, in particular to consider whether there is a need to adopt in the work programme activities allowing to circumvent the possible difficulties of IPR issues with Recommendation ITU-R M.1371-1.

In the time between the Study Group meeting and the 15th meeting of Working Party 8B the discussions between the AIS manufacturers and GP&C Systems International AB resulted in no positive agreement. Therefore the patent holder was not requested by the Bureau to clarify his position regarding Recommendation ITU-R M.1371.

The Working Party received information about a patent statement and licensing declaration from GP&C Systems International AB (Doc. 8B/94), indicating that the licence holder is prepared to grant a licence to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to manufacture, use and/or sell equipment for implementation of the AIS Class B/CSTDMA Transponder in accordance with ITU's "code of practice" par. 2.2 and the ITU-T Recommendation (TSB Circular 245 IPR/MN).

This statement is neither related to the SOTDMA-Technology covered by Recommendation ITU-R M.1371 nor is it a response to the difficulties reported to Study Group 8. The AIS Class B CSTDMA Technology is not contained in Recommendation ITU-R M.1371 and for the time being there is neither work ongoing nor a proposal in Working Party 8B to include this technology in a revision of the Recommendation. The statement was not made using the official form available on the ITU website.

After some discussion Working Party 8B agreed that in order to give Study Group 8 the possibility to conclude on the issue the situation regarding the statement needs to be clarified. Therefore Working Party 8B kindly invited the Bureau to request the patent holder to reiterate his statement regarding Class B CSTDMA using the official form. In addition the opportunity should be used to request in addition clarification regarding the SOTDMA-Technology contained in Recommendation ITU-R M.1371 using the same form which had not been available when Recommendation ITU-R M.1371 has been developed.

The response of the patent holder should be available in time for the Study Group 8 meeting in December 2004.

Working Party 8B is of the view that this issue should be discussed again at the Study Group level and kindly requests ITU-R Study Group 8 to consider the issue and appropriate action regarding Recommendation ITU-R M.1371 should be decided.

### 2.1.4 Joint IMO/ITU experts group for WRC-07 preparation

Working Party 8B discussed Document 8B/70 containing the outcome of a meeting of a joint IMO/ITU experts group for WRC-07. In order to prepare a draft IMO position on maritime related matters to the World Radiocommunication Conference to be held in 2007 (WRC-07), the Sub-Committee on Radiocommunications and Search and Rescue (COMSAR), at its eighth session (16 to 20 February 2004), proposed and the Maritime Safety Committee (MSC), at its seventy-eighth session (12 to 21 May 2004), approved the establishment of a Joint IMO/ITU experts group.

The Group prepared a preliminary draft IMO position which should be finalized by a correspondence group and submitted to COMSAR 9 (7-11 February 2005) for consideration. With a view to facilitate the work of the correspondence group a List Server has been established with the e-mail address as follows:

imo_itu_experts_wrc_cg@radioaid.rdc.uscg.gov

Any future changes, deletions or additions to the list should be sent to Mr. E. Brady (ebrady@comdt.uscg.mil).

Working Party 8B appreciated the initiative taken by IMO and the ITU-R experts present at the Joint Meeting and invited ITU-R experts on maritime issues to participate further in this joint group to assist IMO in its preparation for WRC-07.

### 2.1.7 Liaison Rapporteurs and correspondence groups

The Working Party considered the list of Liaison Rapporteurs and correspondence groups. Both means are considered very efficient and Working Party 8B will continue to take advantage out of these procedures.

WP 8B established a number of correspondence groups to facilitate and accelerate the work to be carried out. The groups are supported by e-mail reflectors. Each e-mail reflector has a related web page, which shows all e-mails that have been sent previously to that reflector. This table is also available via a link on the WP 8B web page at http://www.itu.int/ITU-R/study-groups/rsg8/rwp8b/index.asp .

For the time being the following correspondence groups are existing:

| Group | E-mail reflector | FTP server | Convenor |
|---|---|---|---|
| Working Party 8B | wp8b@itu.int | ties.itu.int/u/itu-r/ede/rsg8/wp8b | Mr. Thomas Ewers (Germany) |
| Radar WG | wp8b-radar@itu.int | ties.itu.int/u/itu-r/ede/rsg8/wp8b-radar | Mr. Frank Sanders (USA) |
| Maritime WG | rwp8b-maritime@itu.int | ties.itu.int/u/itu-r/ede/rsg8/rwp8b-maritime | Mr. Joe Hersey (USA) |

| | | | |
|---|---|---|---|
| Aeronautical WG | rwp8b-aero@itu.int | ties.itu.int/u/itu-r/ede/rsg8/rwp8b-aero | Mr. John Mettrop (UK) |

Working Party 8B decided to abrogate the correspondence group on WRC issues, because the WRC-07 agenda items can be dealt with by the relevant service-related Correspondence Group. Working Party 8B thanked Mrs. Darlene Drazenovich (USA) for the work dedicated to the WRC correspondence group and the good results.

The Correspondence Group on aeronautical issues will be opened newly and Mr. John Mettrop (UK) kindly agreed to be the convenor. Interested parties are kindly invited to enlist in this correspondence group.

The former Correspondence Group on DSC has been renamed to form a maritime correspondence group with a wider scope. Members of the DSC Correspondence group will be automatically kept for the maritime group. Mr. Joe Hersey (USA) kindly agreed to continue as the convenor.

At previous meetings, WP 8B nominated various rapporteurs to help the working party deal with these issues and recommended to keep liaison with other groups via these rapporteurs.
Mr. George Ward (USA) could not continue as Liaison Rapporteur to WP 8F. WP 8B thanked him for his efforts and the results obtained and nominated Mr. David Reed as the new Rapporteur. The WP 8B Rapporteurs to other groups are as follows:

| | |
|---|---|
| JRG 1A-1C-8B | Mr. Robert Hinkle (USA) |
| WP 8F: | Mr. David Reed (USA) |
| WP 6E, WP 9C, WP 8A | Mr. Paul Rinaldo (USA) |
| TG 1/8 | Mr. John Mettrop (UK) |
| IEC-TC80 on test standards for GMDSS equipment: | Mr. Joe Hersey (USA) |

Regarding the work on the request by RRC-04 to be reported to the IPG it has been proposed to nominate a Rapporteur to IPG to present the results of Working Party 8B. After consultation with the Chairmen of Study Group 8, Working Party 8A and Working Party 8D it was suggested to nominate one Rapporteur for the whole Study Group. Mr. Bruno Espinosa (F) has been indicated as a candidate and Working Party 8B agreed to this proposal. Final decision on this is under the purview of Study Group 8.

### 2.1.8 Seminar on radar technologies

The Working Party noted the success of the Study Group 8 Seminar conducted at the 9th September 2004. The Working Party thanked again Ms. Darlene Drazenovich (USA) for organizing the Seminar in an excellent way.

Following the SG 8 Seminar the proposal has been made to conduct a Working Party 8B Seminar on Radar technologies during the Working Party 8B meeting in November 2005. This proposal has been supported and agreed. The exact timing of the seminar will be discussed at the April 2005 meeting of Working Party 8B. For the organization of the seminar the delegations of USA and France kindly offered to nominate two coordinators.

| | | |
|---|---|---|
| Coordinators: | Mr. Fred Moorefield (USA) | e-mail: fred.moorefield@pentagon.af.mil |
| | (to be advised) (F) | e-mail: |

The Working party thanked the coordinators for their willingness to support the organization of the seminar.

### 2.1.9 Other issues

Input Documents: 8B/35, 8B/38, 8B/42, 8B/43, 8B/46

Output Documents: -

The Working Party received a liaison statement from Working Party 8A concerning WRC-07 Agenda item 1.13 (Doc. 8B/35). The Working Party noted the document.

The Working Party received a document from the Chairman of Study Group 8 on Recommendations to be brought to the attention of Study Group 8 Working Parties 8A, 8B, 8D and 8F (Doc. 8B/38). The Working Party noted the document.

The Working Party received two liaison statements from Working Party 6S concerning WRC-07 Agenda item 1.13 (Doc. 8B/42) and Agenda item 1.5 respectively (Doc. 8B/43). Working Party 6S requested to be informed by WP 8B if any spectrum is newly identified or targeted so that WP 6S may undertake studies to determine if there is any impact on spectrum used for the

broadcasting-satellite service (BSS) or feeder links to the BSS. The Working Party noted the document.

The Working Party received a liaison statement from Task Group 1/8 (Doc. 8B/46). Task Group 1/8 is developing a Report on compatibility studies between ultra-wideband (UWB) devices and radiocommunication services. It is intended that the next meeting of TG 1/8, Geneva, 4-10 November 2004, would complete the preliminary draft new Report. In order to progress the preparation of the draft text for Annexes 1.2, 1.3 and 1.4 of the preliminary draft new Report work will be continued in a correspondence group on the TG 1/8 reflector (rtg1-8-uwb@itu.int ) in preparation for the next TG 1/8 meeting. Working Party 8B noted the document and invited experts from Working Party 8B to participate actively in the correspondence group.

## 3 Report of Sub-Working Groups

### 3.1 Report of Sub-Working Group (SWG) 8B-1 "Radiodetermination"

Sub-Working Group 8B-1 met 7 times during the meeting to discuss the input documents concerning radiodetermination issues. One drafting group 8B-1A was established kindly chaired by Mr. David Reed (USA). 29 input documents were considered and 11 output documents were produced.

#### 3.1.1 Question ITU-R 35/8: Efficient use of the radio spectrum by radar stations in the radiodetermination service

Input Documents: 8B/4

Output Documents: -

Document 8B/4 was a United Kingdom input to the previous session outlining a proposed revision to Recommendation ITU-R M.1313 (Technical characteristics of maritime radionavigation systems). At the previous meeting it had been decided to move the information into a revision of Recommendation ITU-R 1460 and PDNR ITU-R M.[8.5-10GHz]. Since this work was still in progress, SWG 8B-1 requested that Document 8B/4 be again carried over for further consideration at the next session.

#### 3.1.2 Question ITU-R 202/8: Unwanted emissions of primary radar systems

Input Documents: 8B/2 Att 2, 8B/20, 8B/84

Output Documents: 8B/TEMP/38(Rev.1) + Add.1 (PDR) (see Doc. 8/51)

Document 8B/2 Attachment 2 (Chairman Radar Correspondence Group) contained a PDR of Recommendation ITU-R M.1314 (Reduction of unwanted emissions of radar systems operating above 400 MHz). SWG 8B-1 prepared a DR which is given in Doc. 8B/TEMP/38.

Document 8B/20 (Japan) dealt with measurements of the –40 dB bandwidth with magnetrons. The document had been studied by the Joint Rapporteurs Group 1A-1C-8B and no further action was required.

Document 8B/84 (Germany) reported on differences between measurements of unwanted emissions using the two methods given in Recommendation ITU-R M.1177 (Techniques for measurement of unwanted emissions of radar systems). SWG 8B-1 suggests that the Radar Correspondence Group considers the document with a view to a possible revision of Recommendation ITU-R M.1177. SWG 8B-1 therefore invites the WP 8B Chairman to instruct

the Convenor of the RCG to take on this task, to seek the views of members of the RCG, and if appropriate , invite further inputs on this subject. The Convenor should report on progress at the meeting of WP 8B in November 2005.

### 3.1.3 Question ITU-R 226/8: Characteristics of and protection criteria for radars operating in the radiodetermination service

Input Documents: 8B/36 Annex 1, 8B/36 Annex 2, 8B/36 Annex 3, 8B/36 Annex 4, 8B/36 Annex 9, 8B/53, 8B/65, 8B/71, 8B/72, 8B/73, 8B/74, 8B/75, 8B/76, 8B/88

Output Documents: 8B/TEMP46(Rev.1) (PDR), 8B/TEMP/54 (DNReport), 8B/TEMP/59 (PDNR), 8B/TEMP/60 (Work Programme)

Document 8B/53 (IMO) contained details of the performance standards for radars required to be carried on ships under the SOLAS Convention. Relevant parts of the document were included in the revision to Recommendation ITU-R M.1460 given in Doc. 8B/TEMP/46.

Document 8B/65 (Canada) gave notice of tests being conducted on the effect on meteorological radars of wireless access systems which Canada intends to report later. The Document has been noted.

Document 8B/71 (France) contained comments on the draft work programme concerning studies of the feasibility of the use of statistical and operational aspects in the protection criteria for radiodetermination radar systems given Document 8B/36 Annex 9. SWG 8B-1 prepared a revised work programme given in Document 8B/TEMP/60 for further consideration at the next session. Document 8B/76 (France) contained an outline for a draft new report on this topic and SWG 8B-1 considered that this should be carried over for further discussion at the next session.

Document 8B/72 (France) proposed a new report on RCS fluctuation impact and contained a technical description of the impact of fluctuating versus non-fluctuating targets on the assessment of interference to radars. After examining the document in detail, the following points of agreement were made:

1. In general, the material presented in Section 2 regarding non-fluctuating targets and Section 3 regarding fluctuating targets was agreed to be consistent with common knowledge on this subject as taken from standard textbooks and other available material.
2. It was also agreed that the figure in Section 4, which plots $P_d$ versus I/N, can be derived from the preceding material. A similar curve which used a different unit on the X axis (% deterioration of $(1-P_d)$ versus I/N) was also considered to be equivalent.
3. The text for Section 4, up to the first sentence in the paragraph after the figure, was also agreed. However, there were no discussions or agreement on the remaining sentences in this paragraph.
4. The material in Section 5 regarding the method of deriving the results for fluctuating targets from test results of non-fluctuating targets was discussed but there was no agreement on this material. Different conclusions may be drawn depending on whether the radar performance is achieved by using more power or by using post-detector processing.

In conclusion SWG 8B-1 considered that further work was required for the proposal and Document 8B/72 should be carried over for further discussion at the next meeting. Some members offered further inputs of how the impact of fluctuating targets may be applied to sharing studies, and the appropriateness of applying this impact.

Document 8B/73 (France) contained comments on the preliminary draft new report on tests illustrating the susceptibility of maritime radionavigation radars to emissions from digital communication and pulsed systems given in Document 8B/36 Annex 4. SWG 8B-1 prepared a draft new report as Document 8B/TEMP/54.

Document 8B/74 (France) contained comments on the PDNR of Recommendation ITU-R M.1460 (Technical and operational aspects and protection criteria of radiodetermination and meteorological radars in the 2 900-3 100 MHz band). SWG 8B-1 prepared a revised PDNR as Document 8B/TEMP/46(Rev.1) and requested members to submit any further comments with the aim to finalise the work at the meeting of Working Party 8B in November 2005.

Document 8B/75 (France) described the impact of the Sun on the increased noise within a radar receiver. The calculations were made using a frequency of 1 300 MHz and radar characteristics contained in Recommendation ITU-R M.1463. Since the antenna pattern was not contained in this recommendation, the pattern used represented roughly a cosecant squared function in elevation. Discussions led to the following questions and issues:

1. Should the Sun be considered a source of noise in a similar manner as other noise sources that are taken into account within the radar receiver, or should it be considered a source of interference and treated in a similar manner as other man-made sources of interference?
2. How is the approach contained in this document similar to the more traditional approach contained in some radar textbooks?
3. Several technical questions/issues related to this document were raised including:
    a. Appropriateness of the antenna patterns used noting that in one case the noise from the Sun expressed as I/N was greater than -6 dB the entire simulation time. It was noted that the elevation gain pattern used in this document appears to be wider than that suggested for radar 2-2 in Recommendation ITU-R M.1463.
    b. Application of antenna temperature emissivity
    c. Variability of the Sun noise as a function of frequency band
    d. Impact of atmospheric attenuation on the effective Sun noise on the radar receiver
4. Is the noise or interference characteristics of the Sun similar to that expected of satellite transmitters?
5. Is the impact of emission from a station providing the same power as the sun at the input of the radar antenna the same as the impact of the sun?

SWG 8B-1 therefore proposed that Document 8B/75 be carried forward to the next meeting of Working Party 8B for further consideration.

Document 8B/88 (France) contained proposals to develop the PDNR M.[8.5-10GHz] (Characteristics of and protection criteria for radars operating in the radiodetermination service in the frequency band 8 500–10 500 MHz) given in Document 8B/36 Annex 3. SWG 8B-1 developed a revised PDNR at Document 8B/TEMP/59 for further consideration. The representatives of ICAO were requested to provide information on requirements for aeronautical radars if possible.

### 3.1.4 Question ITU-R 234/8: Compatibility of radionavigation and radiolocation services operating in the bands 9 000–9 200 MHz and 9 300–9 500 MHz

Input Documents: 8B/39, 8B/66, 8B/91

Output Documents: 8B/TEMP/35(Rev.1) (CPM), 8B/TEMP/39(Rev.1) (LS)

Documents 8B/39 (Working Party 7C) and 8B/66 (USA) concerned sharing studies between EESS (active) and other services. SWG 8B-1 prepared a liaison statement to Working Party 7C at Doc. 8B/TEMP/39.

Document 8B/91 (USA) contained draft CPM text concerning Agenda item 1.3. SWG 8B-1 prepared revised text at Doc. 8B/TEMP/35.

### 3.1.5 JRG 1A-1C-8B

Input Documents: 8B/47

Output Documents: -

Document 8B/47 (Rapporteur, JRG 1A-1C-8B) reported on the successful meeting of the Joint Rapporteurs Group in Geneva in July 2004. The report was noted.

### 3.1.6 Question ITU-R 62/8, Question ITU-R 217/8: Compatibility between radiodetermination services and RNSS in the band 1 215–1 300 MHz

Input Documents: 8B/57, 8B/59, 8B/60, 8B/81

Output Documents: -

Documents 8B/57 (USA), 8B/59 (USA), 8B/60 (USA) and 8B/81 (Russian Federation) concerned the compatibility between radiodetermination and radionavigation satellite service in the 1 215-1 300 MHz band. The contributions included theoretical studies, measurements results and considerations of using statistical aspects in the protection criteria of radiodetermination radars. SWG 8B-1 considered that there is a need to continue studies on this issue and start development of a Report taking into account the presented contributions and also documents from the last ITU-R study period 2000-2003 such as Documents 8B/137 and 8B/232. Therefore SWG 8B-1 proposed that Documents 8B/57, 8B/59, 8B/60 and 8B/81 are carried forward for consideration on the next meeting of WP 8B.

### 3.1.7 Other issues

Input Documents: 8B/44, 8B/80, 8B/87

Output Documents : 8B/TEMP/37(Rev.1) (LS), 8B/TEMP/36(Rev.2) (DNQ), 8B/TEMP/56 (LS)

Document 8B/44 (Task Group 1/9) contained details of a computer simulation of unwanted emission spectra for use in compatibility studies. SWG 8B-1 prepared a liaison statement in response at Doc. 8B/TEMP/37(Rev.1).

Document 8B/80 (Russian Federation) contained a proposal for a new question concerning radars operating in the VHF band. SWG 8B-1 prepared a draft new question at Doc. 8B/TEMP/36(Rev.2).

Document 8B/87 (France) contained details of some meteorological radars. SWG 8B-1 prepared a liaison statement to send these details to Task Group 1/8 at Doc. 8B/TEMP/56.

### 3.2 Report of Sub-Working Group (SWG) 8B-2 "Aeronautical"

SWG 8B2 met four times to discuss various study items in the areas of Aeronautical services and systems. Three drafting groups were established

#### 3.2.1 Telemetry and telecommand (DG8B2a)

Input Documents: 8B/27, 8B/30, 8B/58, 8B/77, 8B/78, 8B/79, 8B/91

Output Documents: 8B/TEMP/45 (CPM), 8B/TEMP/51 (CL), 8B/TEMP53 (WD)

Two documents carried over from the last meeting as well as 5 new documents were discussed which were related to Telemetry and telecommand (WRC-07 Agenda item 1.5). Five of these documents related to the development of CPM text for Agenda item 1.5 on aeronautical telemetry. These documents were used in the preparation of the draft CPM text for WRC-07 Agenda item 1.5. The results of these deliberations are contained in Doc. 8B/TEMP/45.

One document requested the establishment of a circular letter to ascertain information on the future spectrum requirements for unmanned aerial vehicles. This document was developed to produce Doc. 8B/TEMP/51(Rev.1), a compilation of questions for distribution with the invitation to the next meeting as an annex.

The final document proposed a new report on aeronautical telemetry. This document formed the basis of the preliminary draft new Report on "Operational description of aeronautical mobile telemetry" contained in Doc. 8B/TEMP/53.

#### 3.2.2 AMS(R) between 108 MHz and 6 GHz (DG8B2b)

Input Documents: 8B/86, 8B/91

Output Documents: 8B/TEMP/32 (CPM)

The two input contributions proposed text for the CPM text on Agenda item 1.6 Resolution 414. These documents were used in the preparation of the draft CPM text for WRC-07 Agenda item 1.6 Resolution 414. The results of these deliberations are contained in Doc. 8B/TEMP/32. It should be noted that the spectrum under consideration for Agenda item 1.6 is the same as that for Agenda item 1.5.

#### 3.2.3 VHF broadcasting compatibility (DG8B2c)

Input Documents: 8B/25, 8B/68

Output Documents: 8B/TEMP/34 (WD)

Document 8B/25, carried over from the last meeting, provided an analysis of the compatibility between VDL Mode 4 and broadcasting services. The conclusion of this analysis was that VDL Mode 4 would place additional constraints on broadcasting services below 108 MHz which is in contravention of Resolution 413. Whilst no further contributions on this subject were received at

this meeting, however one administration indicated that they had intended to bring a contribution to this meeting on this subject but for technical reasons had failed to do so but did intend to bring this contribution to the next meeting. Therefore this document should be carried forward to the next meeting.

Working paper 8B/68 propose the generation of a new recommendation on the compatibility between GBAS and FM broadcasters. Since no other contributions had been received and in order to give administrations the chance to consider it's content this document was carried forward as a working document to a preliminary draft new Recommendation in Doc. 8B/TEMP/34.

### 3.2.4 Use of the band 1 668.4–1 675 MHz

Input Documents: 8B/37

Output Documents: 8B/TEMP/55 (LS)

A liaison statement was received from WP 8D requesting information from W 8B information of any service under their purview operating in the band 1 668.4–1 675 MHz. Since there were no known current or future systems operating in the band 1 668.4–1 675 MHz under WP 8B's purview a liaison statement to WP 8D, contained in Doc. 8B/TEMP/55, was prepared reflecting this fact.

### 3.2.5 Revision of Recommendation ITU-R M.1459

Input Documents: 8B/95

Output Documents: 8B/TEMP/58 (LS)

A liaison statement was received from WP 8D regarding a proposed revision to Recommendation ITU-R M.1459 to reflect the results of recent changes to the Radio Regulations. Due to the late reception of the liaison statement from WP 8D the meeting felt that additional time for consideration of the proposed changes and it was hoped that a positive response could be sent to WP 8D after the next meeting of WP 8B. A liaison statement, contained in Doc. 8B/TEMP/58, was produced. Document 8B/95 should be carried over to the next meeting of Working Party 8B.

## 3.3 Report of Sub-Working Group (SWG) 8B-3 "Maritime"

SWG 8B-3 met six times during the meeting to discuss various study items in the areas of the maritime mobile service. Two drafting groups were established. Drafting group 8B-3a discussed digital selective calling (DSC) and other maritime issues. Drafting group 8B-3b discussed World Radiocommunication Conference (WRC) issues.

### 3.3.1 Developments in maritime radiocommunication systems and technology

Input Documents: 8B/40, 8B/49, 8B/50, 8B/63

Output Documents: 8B/TEMP/48(Rev.1) (WD) (see Annex 13), 8B/TEMP/50(Rev.1) (LS)

The group considered a liaison statement from IMO (Doc. 8B/40) regarding the transmission of data and e-mail on Appendix 17 and Appendix 18 bands and contributions from Norway (Docs. 8B/49 and 8B/50) and the United States (Doc. 8B/63). After detailed consideration two output documents were produced. The first output is a working document containing preliminary text for a new Recommendation describing the technical characteristics of MF/HF

radio equipment for the exchange of data and e-mail on Appendix 17 frequencies (see Annex 13).

The second output document was a liaison statement to the IMO summarizing the progress on this work item (Doc. 8B/TEMP/50(Rev.1))

### 3.3.2 Complexity of Digital Selective Calling (DSC) operation

Input Documents: 8B/41, 8B/56, 8B/69

Output Documents: 8B/TEMP/49 (WD) (see Annex 12); 8B/TEMP/52(Rev.1) (LS)

The group considered a liaison statement from IMO (Doc. 8B/41) concerning the complexity of DSC operation and contributions from Denmark (Doc. 8B/69) and the United States (Doc. 8B/56). After detailed consideration two output documents were produced. The first output document contained preliminary text for 2 new annexes to Recommendation ITU-R M.493 (Doc. 8B/TEMP/49). One annex address the user interface for the operation of shipborne equipment and the other annex addresses automated procedures in shipborne equipment (see Annex 12). Working Party 8B will work closely with IEC TC80 as we develop these annexes.

The second output document was a liaison statement to the IMO and IEC TC80 summarizing the progress on this work item (see Annex 18)

### 3.3.3 Digital Selective Calling (DSC) ITU-R M.493 Table 4 Audio Files

Input Documents: 8B/36, 8B/62

Output Documents: -

The group considered contribution 8B/62 from the United States concerning Digital Selective Calling (DSC) audio files (wave files) that will supplement the new table 4 in Recommendation ITU-R M.493-11. This is a work item from the previous WP 8B meeting. These files will be made available on the WP 8B section of the ITU web site. Document 8B/62 contains the text that describes these audio files. After detailed consideration the group will add a few additional audio files to the existing ones described by Doc. 8B/62. The administrations of Japan, United Kingdom, and Denmark will verify the audio files prior to them being placed on the ITU website. The verification will be done by the maritime e-mail reflector and there is no need to raise the issue again in WP 8B.

### 3.3.4 Maritime mobile service identities (MMSIs)

Input Documents: 8B/51, 8B/52

Output Documents: 8B/TEMP/41(Rev.1) (WD)

The group considered contributions 8B/51 and 8B/52 from Norway concerning maritime mobile service identities (MMSIs) to identify aircraft participating in search and rescue operations and for the automatic identification of aids to navigation. After detailed consideration one output document was produced (see Annex 15). The document contains a preliminary draft revision to Article 19 of the Radio Regulations and a preliminary draft revision of Recommendation ITU-R M.585-3. Rec. ITU-R M.585-3 currently only defines MMSIs assigned to ship stations. The revision to this Recommendation would also define MMSIs for coast stations, aircraft stations, and aids to navigation stations. Norway will revise this output as a contribution for the next WP 8B meeting.

### 3.3.5 Proposed revision of Recommendation ITU-R M.1467

Input Documents: 8B/64

Output Documents: 8B/TEMP/47 (PDR) (see Annex 3), 8B/TEMP/57 (Rev.1) (LS)

The group considered contribution 8B/64 from the United States concerning revising Recommendation ITU-R M.1467 to more accurately predict the A2 coverage area in the maritime mobile service. After detailed consideration two output documents were produced. The first output is a preliminary draft revision of Recommendation ITU-R M.1467 (Doc. 8B/TEMP/47, see Annex 3).

The second output document is a liaison statement to the IMO requesting they consider the proposed revisions to Recommendation ITU-R M.1467 before they are made.

### 3.3.6 WRC-07 Agenda item 1.13

Input Documents: 8B/36 (Annex 6), 8B/40, 8B/45, 8B/50, 8B/55, 8B/63, 8B/85, 8B/89, 8B/90

Output Documents: 8B/TEMP/43 (CPM)

The draft CPM text on Agenda item 1.13 from Annex 6 to Document 8B/36 (Chairman's report from previous WP 8B meeting) was revised based on the input documents as follows:

Document 8B/45 is a liaison statement from WP 6E. The document was noted. There was no need to reflect it in the CPM text.

The group reviewed Documents 8B/50 from Telnor and 8B/55, 8B/63 from the United States. The text of these three documents was discussed and reflected in the revised CPM text as appropriate.

The group reviewed Document 8B/85 from the United Kingdom and Documents 8B/89, 8B/90 from France. These documents contain considerations on how to satisfy the Agenda item 1.13 through the sharing of some of the Appendix 17 frequencies with the fixed and mobile services. The considerations in these documents were not reflected as an option in the revised CPM text but administrations were requested to think about the issue for discussion at the next meeting of WP 8B.

### 3.3.7 WRC-07 Agenda item 1.14

Input Documents: 8B/36 (Annex 7), 8B/49, 8B/55, 8B/61, 8B/67

Output Documents: 8B/TEMP/42(Rev.1) (CPM)

The draft CPM text from on Agenda item 1.14 from Annex 7 to Document 8B/36 (Chairman's report from previous WP 8B meeting) was revised based on the input documents as follows:

The group reviewed Document 8B/49 from Telnor concerning digital maritime VHF. There is no need to reflect this document in the CPM text.

The group reviewed Documents 8B/67 from the United Kingdom and 8B/55, 8B/61 from the United States. The text of these three documents was discussed and reflected in the revised CPM text as appropriate.

### 3.3.8 WRC-07 Agenda item 1.16

Input Documents: 8B/36 (Annex 8), 8B/51, 8B/52, 8B/55

Output Documents: 8B/TEMP/40(Rev.1) (CPM)

The draft CPM text from on Agenda item 1.16 from Annex 8 to Document 8B/36 (Chairman's Report from previous WP 8B meeting) was revised based on the input documents as follows:

The group reviewed Document 8B/55 from the United States and Documents 8B/51, 8B/52 from Telnor. The CPM text was revised mainly in accordance with Document 8B/55 and takes into account the development of the relevant ITU-R Recommendations in accordance with Documents 8B/51 and 8B/52.

## 3.4 Report of Sub-Working Group (SWG) 8B-4 "RRC-04"

SWG 8B-4 met two times during the meeting to discuss the work to be done for answering to the task asked by the RRC-04 resolutions.

### 3.4.1 Work Programme

Input Documents: 8B/92, Administrative Circular CA/137, Director of the Radiocommunication Bureau letter (Ref:02(SGD)/0.1681/04, 13 July 2004)

Output Documents: 8B/TEMP/44 (Work Programme) – See Annex 17

Based on the input documents and the RRC-04 resolutions a work programme was drafted and agreed. For work between the meetings of Working Party 8B the Radar Correspondence can be used.

### 3.4.2 Next IPG

Input Documents: 8B/82, 8B/83

Output Documents: -

Two documents were submitted: Docs. 8B/82 and 8B/83 (Russian administration) which propose protection criteria for radars of air traffic control (primary and secondary radars), used in ARNS in the frequency band 645-862 MHz. It was decided to forward the two documents to the next WP 8B meeting to permit for all administrations more time to study the proposals. Some participants requested information about the basis of the values in Document 8B/83. The Russian administration indicated that some background information is available in Document RRC04/72. (http://www.itu.int/md/meetingdoc.asp?type=sitems&lang=e&parent=R03-RRC.04-C-0072).

## 4 Next meeting

The next meeting of WP 8B will be held in Geneva on 11-15 April 2005. **The deadline for input contributions to the next meeting is 4 April 2005.**

INTERNATIONAL TELECOMMUNICATION UNION

**RADIOCOMMUNICATION STUDY GROUPS**

**Annex 6 to Document 8B/98-E 7 October 2004 English only**

Source: Document 8B/TEMP/45

Subject: Agenda item 1.5

## Annex 6 to WP 8B Chairman's Report

# DRAFT CPM TEXT FOR CHAPTER 1

**I. 1.3 Agenda item 1.5:**

*"to consider spectrum requirements and possible additional spectrum allocations for aeronautical telecommand and high bit-rate aeronautical telemetry, in accordance with Resolution 230 (WRC-03)"*

**II. 1.3.1 Summary of technical and operational studies, including a list of relevant ITU-R Recommendations**

**III. 1.3.1.1 Introduction**

This agenda item seeks to address a growing demand in spectrum that is allocated for aeronautical telemetry and associated telecommand. There is a large and growing shortfall in spectrum that is necessary to conduct aeronautical telemetry. The shortfall is due to rapidly increasing telemetry data rates associated with the testing of new technologies. The shortfall is exacerbated by the loss of telemetry spectrum diverted to other than telemetry applications. As indicated in the responses to ITU-R Question 231/8, additional spectrum is necessary due to rapidly increasing data rates associated with the testing of new and emerging technologies. For example, newer technologies rely increasingly on high resolution video for monitoring aircraft functions or increased use of computer based aircraft systems. Without access to additional spectrum, aeronautical development could be subject to escalating delays and costs, and the impairment of global competitiveness of the aerospace industry (including equipment manufacturers, civilian space programs and test ranges, and airlines). In addition, the benefits of new worldwide telemetry spectrum will aid numerous other countries and the international aeronautical community as administrations continue to support their national airlines and some administrations initiate their own space programs. Existing international allocations used for aeronautical telemetry will need to remain available without additional constraints for current applications.

A more complete description of flight test operations, equipment characteristics, and data rate growth is set forth in the draft new Report ITU-R M.[AMT], (See Annex 4 to Doc. 8B/98), entitled "Operational Description of Aeronautical Telemetry."

IV. **1.3.1.2 Spectrum required to satisfy justified wideband aeronautical telemetry requirements and associated telecommand above 3 GHz**

First investigations in Region 1 show that the future air flight testing will require a 60 MHz bandwidth for aeronautical telemetry and telecommand communications. Due to industrial and economic constraints, it is preferable to find such a bandwidth under 7 GHz. Nevertheless, this requirement might be divided, for example, in 5 channels of 12 MHz but the extreme channels cannot be separated by more than 500 MHz.

The future use of unmanned air vehicles will require other spectrum bandwidth, which is under further study.

[To be completed]

V. **1.3.1.3 Review, with a view to upgrading to primary, of secondary allocations to the mobile service in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand**

[To be completed]

VI. **1.3.1.4 Possible additional allocations to the mobile service, including aeronautical mobile, on a primary basis in the frequency range 3-16 GHz for the implementation of wideband aeronautical telemetry and associated telecommand**

To answer the need of 60 MHz bandwidth required in Region 1, it is proposed to study the feasibility of the use of the band 5 030-5 150 MHz. This band is presently used by the MLS (Microwave Landing System) under the AERONAUTICAL RADIO NAVIGATION service (active in 5 030-5 091 MHz). The band 5 091-5 150 MHz is an extension band [not yet in use by aeronautical assets and is scheduled as an extension band] for the MLS. Currently precedence must be given to MLS in accordance with RR 5.444 and to other international standard systems of the aeronautical radionavigation service in the band 5 030-5 150 MHz. Nevertheless, the worldwide use of the extension band by MLS is uncertain and then the future telemetry and telecommand high
bit-rate frequencies could partly take place in the bands just quoted above subject to the study references.

Practically it is worth studying sharing the five 12 MHz bandwidth required between 5 030 and 5 150 MHz.

5 091-5 150 MHz band is already allocated to the ARNS on a primary basis in all Regions and is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This FSS allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**. In the band 5 091-5 150 MHz, the following conditions also apply:

- prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
- prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
- after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;
- after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-03)

The proposals set forth above are intended to be illustrative of various possible bands that could be used to satisfy the agenda item. This proposal should also be brought to the attention of ICAO. Also, the 5 091-5 150 MHz band is being considered by studies in response to WRC-07 agenda item 1.6.

[To be completed]

VII. **1.3.1.5 Designation of existing mobile allocations between 16 and 30 GHz for wideband aeronautical telemetry and associated telecommand**

[To be completed]

VIII. **1.3.1.6 Studies to facilitate sharing between aeronautical telemetry and the associated telecommand, on the one hand, and existing services, on the other hand**

[To be completed]

IX. **1.3.2 Analysis of the results of studies**

[To be completed]

X. **1.3.3 Methods to satisfy the agenda item and their advantages and disadvantages**

[To be completed]

## XI. 1.3.4 Regulatory and procedural considerations

[The following definitions are proposed to be submitted to the Special Committee.

1) **Aeronautical telemetry:** The use of telemetry for the transmission from an aircraft station of results of measurements made in an aircraft, including those relating to the functioning of the aircraft.

Close to the existing definition for the space telemetry, this proposition takes into account other sectors of activity systems: air or maritime surveillance, visible or infrared sensors, earth exploration, synthetic aperture radars, radiolocation, weather data, telemetry, etc. This definition (non-restrictive) is important and includes global frequency requirements.

The aeronautical telemetry, understood under the non restrictive definition, includes wideband data transmission systems which could require up to a few hundreds of MHz bandwidth and more.

In the same way, a definition for the aeronautical telecommand close to the space telecommand definition is proposed as followed:

3) **Aeronautical telecommand:** The use of radiocommunication for the transmission of signals to an aircraft station to initiate, modify or terminate functions of equipment on an associated aircraft object, including the aircraft station.]

[To be completed]

INTERNATIONAL TELECOMMUNICATION UNION

**RADIOCOMMUNICATION STUDY GROUPS**

**Annex 7 to Document 8B/98-E 7 October 2004 English only**

Source: Document 8B/TEMP/32

# Annex 7 to WP 8B Chairman's Report

## PROPOSED DRAFT CPM TEXT ON WRC-07 AGENDA ITEM 1.6

This document proposes a draft CPM text in relation with WRC-07 Agenda item 1.6 Resolution 414.

**XII. 1.4 Agenda item 1.6**

*"to consider additional allocations for the aeronautical mobile (R) service in parts of the bands between 108 MHz and 6 GHz, in accordance with Resolution **414 (WRC-03)** and, to study current satellite frequency allocations, that will support the modernization of civil aviation telecommunication systems, taking into account Resolution **415 (WRC-03)**"*

**XIII. 1.4.1 Resolution 414 (WRC-03)**

"Consideration of the frequency range between 108 MHz and 6 GHz for new aeronautical applications"

**XIV. 1.4.1.1 Summary of technical and operational studies, including a list of relevant ITU-R Recommendations**

Relevant ITU-R Recommendations: [TDB]

Existing aeronautical mobile (route) service (AM(R)S) bands are currently nearing saturation in parts of Europe and the United States. In addition, new applications and concepts in air traffic management put further pressure on existing AM(R)S bands. Finally, many of the evolving navigation and surveillance applications may not meet the ITU-defined use of propagation property of waves required in order to operate in a radionavigation band. WRC-03 provided a good example of the latter issue, with the agenda including addition of a limited AM(R)S allocation to the
108-117.975 MHz band to accommodate International Civil Aviation Organization (ICAO) standard navigation and surveillance systems.

Studies have been carried out by ITU-R in response to Resolution **414 (WRC-03)**. Among the studies conducted are:

1) An investigation on the bands currently available for use by aeronautical systems in the frequency range between 108 MHz and 6 GHz in order to determine whether additional allocations to the AM(R)S are required and can be accommodated in these bands without placing undue constraints to services to which the frequency bands are currently allocated. If those bands are not sufficient, investigation should be made regarding adding AM(R)S allocations to bands that are not currently used by aviation.

2) An investigation on how to accommodate the requirements for aeronautical systems in the 5 091-5 150 MHz band. Though this might be considered a subset of effort 1 as most proposed applications would fit under AM(R)S, the item is slightly broader in that:

1. a) new aviation security requirements are currently being defined internationally; and
2. [b) aeronautical fixed links are also being considered to allow transmission of aeronautical sensor data on the airport property.]

3) [TBD]

...

XV. **1.4.1.2 Analysis of the results of studies**

Current aviation communication bands are severely congested and further pressured by new aviation applications and security requirements. In addition, recent experience has shown that evolving technology for navigation and surveillance may necessitate allocations that are more encompassing than simply aeronautical radionavigation service (ARNS). From the investigation on the bands currently available for use by aeronautical systems in the frequency range between 108 MHz and 6 GHz, the following frequency bands warrant further study:

1) 960-1 164 MHz band which is already allocated to ARNS in all Regions on a primary basis.

2) 5 091-5 150 MHz band which is already allocated to the ARNS on a primary basis in all Regions and is also allocated to the fixed-satellite service (Earth-to-space) on a primary basis. This FSS allocation is limited to feeder links of non-geostationary mobile-satellite systems in the mobile-satellite service and is subject to coordination under No. **9.11A**. In the band 5 091-5 150 MHz, the following conditions also apply:

3. – prior to 1 January 2018, the use of the band 5 091-5 150 MHz by feeder links of non-geostationary-satellite systems in the mobile-satellite service shall be made in accordance with Resolution **114 (Rev.WRC-03)**;
4. – prior to 1 January 2018, the requirements of existing and planned international standard systems for the aeronautical radionavigation service which cannot be met in the 5 000-5 091 MHz band, shall take precedence over other uses of this band;
5. – after 1 January 2012, no new assignments shall be made to earth stations providing feeder links of non-geostationary mobile-satellite systems;
6. – after 1 January 2018, the fixed-satellite service will become secondary to the aeronautical radionavigation service. (WRC-03).

In addition, consistent with considerings d), f ) and g) of Resolution **414 (WRC-03)**, this band is also being considered to support new aviation security requirements and/or to support data links that carry critical aeronautical data from systems such as air traffic control radars, wind shear radars, etc. Also, this band is being considered by studies in response to WRC-07 Agenda item 1.5. [These applications may necessitate additional (non-AM(R)S) allocations.]

[Editors Note – Studies must be performed to determine the relative status of new allocations versus existing ARNS, AMS(R)S, and FSS allocations]

...

**XVI. 1.4.1.3 Method to satisfy the agenda item**

[TBD]

**XVII. 1.4.1.4 Regulatory and procedural considerations**

[TBD]

INTERNATIONAL TELECOMMUNICATION UNION

**RADIOCOMMUNICATION STUDY GROUPS**

**Annex 16 to Document 8B/98-E 8 October 2004 English only**

Source: Doc. 8B/TEMP/51(Rev.1)
Subject: agenda item 1.5

## Annex 16 to WP 8B Chairman's Report

# QUESTIONS RELATED TO THE DEVELOPMENT OF FUTURE UAVS (UNMANNED AERIAL VEHICLES) TO THE WRC-07 AGENDA ITEM 1.5

### XVIII. 1.1.1 Introduction

The agenda item 1.5 for WRC outlines the importance to study the spectrum requirement for aeronautical telemetry and associated telecommand. As this item requires evaluation of the future impact of telecommand and telemetry frequencies with a wide variety of aircraft, the possible use of these links with unmanned aerial vehicles must be taken into account. First studies showed that at a national level it is not possible to obtain precise answers to the question of the integration of such traffic in the traditional national airspace. Nevertheless, the study of item 1.5 requires having a view of the air traffic in the next several decades and precise ideas on the uses of unmanned air vehicles in airspace.

At the present moment, it is supposed that in ten, twenty or perhaps thirty years a significant number of unmanned aerial vehicles will occur in the airspace but it is difficult to understand how these vehicles will be progressively included in our skies.

### *XIX.* 1.1.2 Questions

Due to these limitations for an efficient study of item 1.5, it would be profitable if States, Sector Members and international organizations could offer specific answers to the following questions:

1) When, where and how the unmanned aerial vehicles are scheduled to begin to fly in the airspace?
2) Do specific schemes exist which explain the intermediate phases of the evolution of the airspace?
3) What kind of flights will be carried out by the unmanned aerial vehicles (surveillance, air freight, communication relay, passengers carrying etc.)?
4) Will this kind of traffic be completely mixed with traditional piloted traffic one or will it be separated in space or in altitude?
5) What is the evolution of these schemes in next several decades?

6) What will be the associated safety of life spectrum requirements ?

7) What will be the associated non safety of life spectrum requirements?