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| icaologo | International Civil Aviation Organization**REPORT** |

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| **8 September 2017** |
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**FREQUENCY SPECTRUM MANAGEMENT PANEL (FSMP)**

**FIFTH MEETING OF THE WORKING GROUP OF FSMP**

**(FSMP-WG/5)**

**Paris, France**

**4-8 September, 2017**

**REPORT**

**1. Introduction**

1.1 The meeting was opened by Mr Loftur Jonasson from the ICAO Secretariat, Montreal and Mr Mike Biggs, the Rapporteur of Working Group FSMP (FSMP-WG). Mr Jonasson acted as the Secretary of the meeting. Following introductions, Mr Biggs thanked Christian Fleury for facilitating, and Direction Generale de L’Aviation Civile (DGAC) for hosting the meeting. He also welcomed the group and provided introductory remarks, meeting information and housekeeping details.

1.2 The meeting was held in English. After the opening of the meeting the agenda was approved by the group. The agenda is contained in Appendix A.

1.3 The list of papers submitted for consideration by FSMP-WG/5 is contained in Appendix B. The list of participants is in Appendix C.

1.4 The material in this report is organized by meeting agenda item number, and does not necessarily reflect the order of discussions. The meeting conducted a review of the actions from the last meeting. Actions captured during discussions are shown in Appendix D, together with status of prior-meeting(s) actions.

1.5 The meeting also reviewed the FSMP job cards. The following status was agreed:

* Job Card #1: This task was completed for the WRC-19 cycle at FSMP-WG/4 and approved by the ICAO Council in June 2017.
* Job Card #2: The initial ICAO WRC-19 position as developed by FSMP-WG/4 was approved by Council in June 2017. It is expected that it will be updated prior to WRC-19 as studies progress. Development of material for ITU-R meeting and support for the Regional Workshops is ongoing.
* Job Card #3: Ongoing and standing FSMP agenda item
* Job Card #4: Ongoing and standing FSMP agenda item. Proposed that the job card be amended at the next full Panel meeting to expand beyond the ITU Radiocommunication Sector in recognition that there is aviation-related work also occurring in the ITU Telecommunications Standardization Sector.
* Job Card #5: Document 9718 Volume II updates from FSMP-WG/4 were submitted for publication. LDACS work is continuing in CP WGT, and RPAS material is being developed by the RPASP. The meeting suggested that the question of possible ADS-B systems to support RPAS should be included in this job card.
* Job Card #6: The meeting noted that this effort should be a priority given continued efforts to introduce terrestrial communications systems in frequency bands adjacent to 4.2-4.4 GHz (see for example FSMP-WG/5 IP05). IATA noted that they are seeking funding to explore this task starting in CY18, and AVSI stated that their current WAIC/Altimeter test setup could be used to perform the necessary testing.
* Job Card #7: Standing FSMP agenda item, and FSMP-WG/5 WP10 provides details on progress.

**2. Agenda Item 2 – Radio Altimeter and WAIC issues**

2.1 WP10 provided updates to the draft SARPs text with respect to that presented at FSMP-WG/3 in September 2016. The meeting worked through the proposed text and provided comments. In particular, the meeting expressed concern about the proposed level of rejection of out-of-band (OOB) signals and suggested that the WAIC group consider whether it can be improved given the level of interest in implementing new systems, and in particular terrestrial broadband systems, in adjacent frequency bands. It was explained that the OOB rejection levels presented were only for the receiver overload protection portion, and that subsequent IF/baseband filtering would provide significantly more selectivity toward the total OOB signal rejection. This aggregate receiver OOB rejection criteria will be updated and clarified at FSMP-WG/6. The latest draft is contained in Appendix H.

2.2 The author additionally introduced a proposal for consideration by the Meeting to continue progress on the WAIC SARPs based on a report from RTCA in advance of releasing the MOPS being developed by Special Committee 236 (SC-236).  SC-236 projects that it may not complete the entire MOPS in a timeframe that supports timely promotion of the WAIC SARPs through the established ICAO process. The issue is that the MOPS must include more extensive performance specifications and test procedures than needed for safe inter-aircraft coexistence and EMC alone, but are necessary for TSO/ETSO invocation of the MOPS for equipment certification. However, the report will contain those finalized MOPS paragraphs that directly impact the WAIC SARPs, and will be sufficiently complete to address all inter-aircraft compatibility specifications. Thus, it was proposed that the content of this RTCA report serves as the technical basis for completion of the SARPs, and it was asked if such an approach would be acceptable to the FSMP.

2.3 Discussion indicated concern that this proposal might impose undue risk on the implementation of WAIC if the SARP content is completed and frozen based on information in such a report. The concern is that this would constrain SC-236 if further work on the MOPS determines that changes need to be made to the technical information in the report/SARPs. It was suggested that there might be less risk by simply delaying the completion of the SARPs until the MOPS was completed, however, the approach would be acceptable if the WAIC groups preferred to pursue this approach despite the perceived risk.

**3. Agenda Item 3 – Development of (planned) material for ITU-R studies on:**

**3.1 FSS for UAS**

3.1.1 WP02 provided SARP amendment proposals to address the introduction of Remotely Piloted Aircraft into non-segregated international airspace as developed by the C2 Link Working Group (WG2) of the ICAO Remotely Piloted Aircraft System Panel. The initial focus is on instrument flight rules (IFR) operation in controlled airspace in a technology-neutral approach. Their current plan is to add a new Annex 10 Volume VI for RPAS SARPs, however some changes are also proposed to the existing Volume V. FSMP was asked to review those proposals and provide any input using the form provided in the Attachment to the WP. Appendix G provides initial FSMP comments.

**3.2 GADSS**

3.2.1 WP05 provided proposed updates to the GADSS report being drafted by ITU-R Working Party 5B (WP5B) in response to WRC-19 agenda item 1.10. That agenda item considers GADSS spectrum needs as well as any additional regulatory provisions that might be necessary to support its introduction. WP08 provided additional material regarding the “additional regulatory provisions” portion. After discussion, the meeting agreed that no additional spectrum is necessary at this point, and a drafting group was formed to combine the material on other regulatory provisions. The resulting proposed changes to the ITU-R GADSS report are shown in Appendix E for submission to WP5B. Some proposals could not be agreed by the meeting, so an action was given [AI 05-04] to review the proposed GADSS-related changes to the RR Articles contained in Appendix E and provide updates to FSMP-WG/6 (in particular regarding the unresolved issue of whether there is a need to modify Articles 36 and 37)

3.2.2 WP04 provided suggested modifications to the Conference Preparatory Meeting (CPM) draft text on WRC-19 agenda item 1.10, which was also being developed by WP5B. The agreed updates are shown in Appendix F, taking into account changes to the Radio Regulations should not be proposed directly by ICAO.

3.2.3 As an outgrowth of the discussion, the meeting was given an action [AI 05-01] to consider whether additional (i.e., non-GADSS related) regulatory changes to the Radio Regulation are necessary to facilitate introduction of Remotely Piloted Aircraft Systems (RPAS) and/or as general clean-up. If so, aviation could look for a future WRC agenda item to address those changes.

**3.3 Status of proposed update to Recommendation ITU-R SM.1009**

3.3.1 IP04 provides the latest status on ITU-R WP1A efforts to revise SM.1009. The current approach is to not modify that Recommendation, and instead the new material will simply be catalogued in a new report on national approaches and experiences. The document needs to clearly state that SM.1009 is the recommended means for compatibility assessment including for cross-border coordination, and that the other approach(es) have not been reviewed by ICAO or ITU. The meeting supported that way of addressing the new material.

**3.4 Other**

3.4.1 WP03 was a reply liaison from ITU-R WP 1A informing ICAO that, as result of earlier advice from WP 1A to Comité international spécial des perturbations radioélectriques (CISPR), a new work item was initiated on developing a revised edition 9 of the CISPR 15 standard in order to address the interference that can be generated by LED lighting systems. WP 1A suggested that the Case Study, *“LED lighting interference to aviation VHF communications”*, as submitted to the Frequency Spectrum Management Panel in Document FSMP-WG/4-WP/22, and as referenced in the response to WP 1A by ICAO, would assist CISPR/F in progressing their new work item, and would suggest that ICAO submits this case study directly to the CISPR/F subcommittee. The meeting agreed this would be useful and the Secretary will work with ITU-R to determine how it can be accomplished.

3.4.2     WP06 noted that an enhanced flight vision system (EFVS) operating in the 31.8-33.4 GHz band was included in the latest update to Recommendation ITU-R M.1466[[1]](#footnote-1), with a protection criteria of -6 dB interference-to-noise ratio (I/N). The meeting noted that the system discussed was not yet formally specified in ICAO.  However, it was recognized that ICAO recommends for aviation safety applications (e.g., low/no visibility landings) an appropriate safety margin (e.g., 6 dB) should be included in any compatibility analyses.

3.4.3 WP07 noted that some high altitude platforms (HAPS) systems being considered in ITU-R are postulating a minimum operational altitude of 18 km instead of the 20 km contained in the definition of HAPS (RR No. 1.66A). The concern raised was whether such operations might impact aircraft operations. After considerable discussion by the meeting it was agreed that the question would be better addressed by an ICAO operational Panel and the Secretary agreed to hold internal-ICAO consultations to see if there was a minimum altitude below which ICAO felt HAPS operations could cause unacceptable impacts on air traffic operations.

3.4.4 WP15 introduced a proposal from the Technical Sub-Group of the Surveillance Panel to modify some of the ADS-B standards for secondary surveillance radar transponders in order to support their use onboard suborbital vehicles. In particular, changes are suggested to raise the reportable altitude to at least 100 km and the reportable velocity to 14,200 knots. The paper questioned whether such changes would require any ITU action, and after discussion the meeting agreed they should not.

**4. Agenda Item 4 – 5 GHz Band Planning**

**4.1 AeroMACS Status**

4.1.1 IP03 provided details on some initial compatibility testing/simulation between aeronautical mobile telemetry (AMT) and AeroMACS. The paper concluded that for the example AMT systems considered, a 20 MHz guard band is required between the AMT and AeroMACS channels under worst-case conditions. The meeting appreciated the information but noted that an indication of the necessary desired-to-undesired signal ratio required for a given frequency offset would be very useful. The meeting also noted that AMT systems were not standardized, so results may differ for other AMT systems.

**4.2 Global UAS/RPAS channel plan**

4.2.1 IP02 provided information on air-to-air C-band channel measurements performed over the sea in Japan. The material will be used to assist in development of a 5 GHz propagation model, which will be particularly useful in studies where transmissions to/from one RPAS on one channel may interfere with transmissions to/from another RPAS on another channel. The meeting appreciated the information and solicited further updates as studies progress.

**5. Agenda Item 5 – New provisions to support aeronautical radiocommunications**

5.1 IP07 was intended to open a discussion on proposals into the RPASP to use direct ground-to-ground VHF radio communications between unmanned aircraft control stations and air traffic control facilities. The paper suggested that that type of communications arrangement would be an attractive option for smaller unmanned aircraft where the weight and power consumption of a VHF radio may make such a system unfeasible for installation. While this arrangement has many positive aspects for unmanned aircraft design, there are issues that affect the utility such an applications and these issues may render this application unusable in some situations. Finally, the paper noted that there are issues with the ITU Radio Regulations and ICAO SARPs that would need to be addressed in order to support such direct ground-to-ground communications between unmanned aircraft control stations and air traffic control facilities. The meeting raised a large number of concerns with the proposed approach, and an action [AI05-03] was taken for membership to catalog those concerns for FSMP-WG/6.

5.2 IP08 provided an update on the L-Band digital aeronautical communications system (LDACS) work being done by Project Team T of the Communications Panel DCI working group. It was noted that the current job card is not specific to LDACS, so other L-Band technologies could be considered. SARPs are currently targeted for completion in 2026. After discussion, the meeting raised a number of questions regarding the LDACS effort: (a) what are the specific technical parameters of the LDACS system being studied; (b) what were the parameters/assumptions considered in the “worst-case” analyses for impacts to DME/JTIDS from LDACS and/or from DME/JTIDS to LDACS; (c) what is the ground network design foreseen to support the planned LDACS applications; and (d) given the stated need for new data link systems[[2]](#footnote-2), why are the SARPs not going to be available earlier? The Secretary was given an action [AI 05-05] to provide these questions to the Secretary of the CP for further discussion at FSMP-WG/6.

**6. Agenda Item 6: Interference from non-aeronautical sources**

**6.1 Programme Making and Special Events (PMSE)**

6.1.1 WP14 provided an input on the status of European studies regarding possible introduction of PMSE into the frequency band 960-1164 MHz. After considerable discussion, the meeting worked through the material contained in Flimsy 01 which represents the current status of the work in the relevant European body on regulatory and legal aspects of the possible introduction. Several comments were provided, (see Appendix I) and will form the basis of an ICAO input into the European process. Meeting participants were encouraged to inform their state and aviation regulators to be mindful about this PMSE issue and how it can impact aviation safety systems.

**6.2 Other**

6.2.1 Presentation 01provided information on two recent interference cases caused by malfunctioning light emitting diode (LED) bulbs. In both cases the malfunctions manifested as increases in the noise floor in the 100-150 MHz frequency range, precluding aeronautical VHF datalink communications when aircraft were parked at certain airport gates. After considerable investigation both sources were determined to be LED bulbs in the airport that had malfunctioning power regulators. The meeting appreciated the information, and agreed that operators should make sure that their front-line interference investigators should be made aware of the potential for LED bulb interference characteristics to allow for quick identification.

6.2.2 WP12 reported on concerns by some satellite operators and equipment manufacturers that high power LTE operations being introduced in the 1492-1518 MHz band is likely to cause interference to aviation satcom use in the adjacent 1518-1559 MHz band. The main concern was the potential for satellite receiving earth station overload effects caused by the LTE fundamental emissions. The meeting noted that functional checkout of the satcom user terminals is integral to aircraft pre-departure procedures, and as such protection of those user terminals must be ensured on both ground and in-flight. Discussion in the group also recognized similar concerns to ongoing work in the United States and the mismatch of available information. The WP noted that ECC PT1 was currently studying the issue, so a drafting group was formed to provide elements for an ICAO letter into that process. Those elements are contained in Appendix J. In addition, Inmarsat was given an action [AI 05-02] to provide technical details on how they thought the protection could be achieved for existing aircraft installations.

**7. Agenda Item 7: Any other business**

7.1 WP13 and IP06 both dealt with non-ICAO studies regarding control of small UAS outside of controlled airspace. The former presented ECC Report 268 on “Technical and Regulatory Aspects and the Needs for Spectrum Regulation for Unmanned Aircraft Systems (UAS)”. The latter reported on an effort by ITU-T SG20 to use the Internet of Things (IoT) for UAS control, as well as an ICAO response to SG20 clarifying that this task is already being undertaken within ICAO. The meeting had a lengthy discussion on the topic and concluded that FSMP efforts should be focused on supporting the efforts of the RPASP, and that due to already existing congestion, in principle VHF (117.975-137 MHz) and/or L-Band (960-1164 MHz) aeronautical safety spectrum should not be used for these small UAS outside of controlled airspace. It was also agreed that, as needed and if asked, FSMP could provide support to the ICAO group described in IP06 considering the small UAS.

7.2 WP01 discussed the mixed use of Aeronautical Radionavigation service (ARNS) frequency bands 108‑117.975 MHz, 328.6‑335.4 MHz and 960‑1 164 MHz by Civil and Military in India and noted that because of that mix they were having difficulty finding new civil VOR channels above 112 MHz. To assist with addressing that congestion, the author asked if there were any planning criteria for 100 kHz VOR vs ILS. The meeting knew of no such criteria, but suggested that perhaps the existing 50 kHz criteria could provide guidance.

7.3 IP01 reminded the meeting that in the WRC-15 cycle there was an ITU-R WP 5B Working Document toward Preliminary Draft [Report/Recommendation] on frequency channels in the bands of 108‑117.975 MHz, 328.6‑335.4 MHz and 960‑1 164 MHz. The author questioned whether such a document would have helped preclude the current PMSE effort to share 960-1164 MHz. The meeting discussed the topic and noted that within WP5B the document was no longer being pursued. The meeting further noted that perhaps a better approach would be to continue to document the aviation use in the Spectrum handbook, and perhaps in the future offer ITU a link to that document. Regarding the question about whether such material would have impacted the current PMSE effort, the meeting conclusion was “probably not”. It was suggested that in the future we might want to document the aviation process for approving aviation systems, which then could be used as a resource when considering non-aviation proposals.

7.4 WP09 proposed a revised structure for the ICAO Spectrum Handbook (Document 9718) to be considered when planning the 3rd edition review over the next four years. To advance the work in the required reviewing of the handbook, it was proposed that an offline group be created with volunteers to develop the work between FSMP meetings. The virtual group would be coordinated by the ICAO secretariat, acting as the focal point for communications and documents. The meeting agreed to form the correspondence group and membership interested in participating were asked to contact the Secretary via Email [AI 05-06].

7.5 WP11 proposed a format on how to insert the High Frequency (HF) receiver characteristics, and other system characteristics into the ICAO Handbook. The meeting had no comments on the proposal and it will be included in the restructuring exercise discussed above (see 7.4).

7.6 IP05 provided information on current regulatory and legislative processes reviewing usage of the 3.7 to 4.2 GHz frequency band in the United States. The meeting expressed concerns about the proximity to the 4.2-4.4 GHz band extensively used for radio-altimeters and planned for WAIC. As a result, for studies regarding those systems it is very important that the radio altimeter and WAIC out-of-band rejection characteristics (see Job Cards #6 and #7) be determined as soon as possible. During discussions it was also noted that the 3.7-4.2 GHz band, and the lower adjacent band, are used for satellite gateway systems, including those supporting aviation safety communications. That should also be taken into account. It was also suggested that some of the references listed in Resolution **154 (Rev. WRC-15)** might be useful although that document applies “to some countries in Region 1”.

7.7 A verbal update was provided on the VHF radio testing being accomplished by one participant. The studies are progressing, but will not be officially presented until all results are verified. An update will be presented at a future FSMP-WG meeting.

7.8 IP09 provided the status of the long-standing GPS interference issue in Manila. That issue has been resolved as of late August 2017. RNAV approaches to both ends of the runway are now operational.

**8. Date of next meeting**

8.1 The FSMP-WG/6 meeting is scheduled for 15-22 February 2018 at the ICAO Regional Office in Mexico City, Mexico. It will be preceded by a 2 day spectrum workshop 13-14 February, 2018. Papers for FSMP-WG/6 are due one week prior to the meeting.

APPENDICES

Appendix A – Agenda

Appendix B – List of Working Papers, Information Papers and Flimsies

Appendix C – List of Participants

Appendix D – Action Item List

Appendix E – Elements for ICAO response to ITU WPP5B regarding proposed modifications to ITU-R document M.[GADSS]

Appendix F – Elements for ICAO response to ITU WPP5B regarding proposed modifications to WRC-19 agenda item 1.10 (GADSS) CPM text

Appendix G – Initial comments to RPASP on draft RPAS SARPs

Appendix H– Updated draft WAIC SARPs

Appendix I– Elements for proposed ICAO comments on PMSE material being developed by FM51

Appendix J– Elements for proposed ICAO Liaison ECC PT1

**APPENDIX A**

** INTERNATIONAL CIVIL AVIATION ORGANIZATION**

**fifth working Group Meeting of the**

**Frequency Spectrum Management Panel**

**(FSMP-WG/5)**

**(Paris, France, 4-8 September, 2017)**

**AGENDA**

Agenda Item 1: Opening and working arrangements

* Action Item review
* Status of tasks identified on Job Cards

Agenda Item 2: Radio Altimeter and WAIC issues

* Status of compatibility testing

Agenda Item 3: Development of (planned) material for ITU-R Studies on:

1. FSS for UAS
2. GADSS
	* 1. ITU RR non-Article 5 changes
3. Status of proposed update to Recommendation ITU-R SM.1009

Agenda Item 4: 5 GHz Band Planning

1. AeroMACS status
2. Global UAS/RPAS channel plan

Agenda Item 5: New provisions to support aeronautical radiocommunications

* LDACS, status update CP WG-T

Agenda Item 6: Interference from non-aeronautical sources

1. Programme Making and Special Events (PMSE)

Agenda Item 7: Any Other Business

**APPENDIX B**

**List of Papers**

**List of Working Papers**

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| **Paper #** | **Source** | **Title** | **Agenda Item** |
| **1** | India | Use of ILS, VOR and DME frequency bands for ARNS | 7 |
| **2** | M. Neale | SARPs amendment proposals to accommodate Remotely Piloted Aircraft System | 3 |
| **3** | Secretary | Reply Liaison Statement from ITU-R WP1A to ICAO with regard to Questions ITU-R 221-2/1 | 3 |
| **4** | M. Biggs | CPM Text for WRC-19 Agenda Item 1.10 (GADSS) | 3 |
| **5** | M. Biggs | Proposed Modifications to WDPDN Report M.[GADSS] | 3 |
| **6** | C. Fleury | ITU-R Recommendation M.1466-1: Characteristics of and protection criteria or radars operating in the radionavigation service in the frequency band 31.8-33.4 GHz, Protection criteria for Radionavigation service application | 3 |
| **7** | C. Fleury | MANAGEMENT OF FLIGHT ALTITUDES OF HAPS | 3 |
| **8** | C. Fleury | Comments on FSMP-WG04-WP27\_Review of aeronautical articles for GADSS | 3 |
| **9** | A. Roy | ICAO Spectrum Handbook Review | 7 |
| **10** | U. Schwark | Draft SARPs for Wireless Avionics Intra-Communications (WAIC) | 2 |
| **11** | G. Baker | Proposal to Integrate Transceiver Technical Characteristics and Protection Criteria into ICAO Handbook on Radio Frequency Spectrum Requirements for Civil Aviation | 7 |
| **12** | A. Bruce | Frequency Band Allocation to Terrestrial Mobile Communications puts safe Satellite Communication in Aviation at risk | 6 |
| **13** | F. Butsch | What is the suitable spectrum for the command and control of small Unmanned Aircraft outside the controlled airspace? | 7 |
| **14** | Raffi Khatcherian | CEPT work on Audio PMSE sharing the 960-1164 MHz band | 6 |
| **15** | Secretary | Surveillance Standards for Suborbital Vehicles | 3 |

**List of Information Papers, Presentations and Flimsies**

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| **Paper #** | **Source** | **Topic** | **Agenda Item** |
| **1** | India | ITU-R RECOMMENDATION FOR RADIO FREQUENCY CHANNEL ARRANGMENTS FOR ARNS SYSTEMS (ILS, VOR & DME) | 7 |
| **2** | NICT | C-band Channel Measurement Campaign using Small Unmanned Aircraft- Experimental measurement of air-to-air channel radio propagation over the sea | 4 |
| **3** | L. de Souza | AeroMACS and AMT operating at C-band – interference tests | 4 |
| **4** | Secretary | ITU-R WP1A Working Document Towards a Preliminary Draft New Report ITU-R SM.[NAT-APR] | 3 |
| **5** | A. Roy | Ongoing Work in the United States Concerning the 3.7 to 4.2 GHz Frequency Bands | 7 |
| **6** | Secretary | ITU-T SG20 Liaison to ICAO on clarifying the issue of Small UAVs, and a response Liaison from ICAO | 7 |
| **7** | M. Biggs | USE OF DIRECT GROUND-TO-GROUND VHF RADIO COMMUNICATIONS BETWEEN UNMANNED AIRCRAFT CONTROL STATIONS AND AIR TRAFFIC CONTROL STATIONS | 5 |
| **8** | Secretary | LDACS Status Update | 5 |
| **9** | C. Gilo | RESOLUTION OF GPS INTERFERENCE/SIGNAL DEGRADATION IN MANILA, PHILIPPINES THAT AFFECTED FLIGHT AND ATM OPERATIONS | 7 |

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| PRESENTATIONS |
| **1** | A. Roy | LED Lighting Interference Examples | 6 |

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| FLIMSIES |
| **1** | Secretary | Material regarding “Preliminary investigations on regulatory and legal issues on the feasibility of introducing low power audio PMSE in the band 960-1164 MHz” | 6 |
| **2** | Rapporteur | Material for ICAO input to WP5B on M.[GADSS] | 3 |
| **3** | Rapporteur | Material for ICAO input to WP5B on GADSS CPM | 3 |
| **4** | N. Vassiliev | Material from drafting group regarding possible RR regulatory changes to support GADSS | 3 |
| **5** | J.Cramer | Material from drafting group regarding ICAO letter to ECC PT1 on implementation of LTE in the frequency band 1492-1518 MHz | 6 |
| **6** | Rapporteur | Comments from FSMP-WG/5 to the draft RPAS SARPs | 3 |
| **7** | Rapporteur | Updated draft WAIC SARPs | 2 |

**APPENDIX C**

**Fifth meeting of the Working Group of the Frequency Spectrum Management Panel (FSMP-WG/5)**

Paris, France 4-8 September 2017

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**APPENDIX D**

ACTION ITEM LIST

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| Number | Description | Actionee | Due Date | Status |
| 32-5 | Consider the issue of interference to radio altimeters as presented in WG-F/32 WP21. Provide input on issues such as: should ICAO develop altimeter standards? What is the best way for ICAO to raise the visibility of the safety issue? Do high intensity radiated field (HIRF) requirements apply to radio systems, and if so, how? | All | FSMP-WG/5 | CLOSEDJob Card #6. IATA study funding expected to start in CY18. |
| 32-8 | Review the proposal to develop a definition of “aviation safety system” and provide draft inputs as appropriate | All | FSMP-WG/6 | Still open. Input provided in WG-FSMP/1 Flimsy 1 for Comm systems |
| 01-3 | Provide examples of unintentional radiators causing interference to aviation wireless systems (reference WF-F/32 WP02 and IP14) | All | FSMP-WG/5 |  [Action 04-01] LED input in Pres1, CLOSED |
| 01-5 | Provide notional characteristics for the line-of-sight (LOS) and beyond-LOS (BLOS) RPAS systems to be used to begin investigating adjacent channel compatibility with AeroMACS in 5091-5150 MHz. |  | FSMP-WG/6 |  CLOSED |
| 02-6 | Develop a timeline for FSMP actions regarding *resolves* 18 of Resolution **155 (WRC-15)** | All | FSMP-WG/5 |  |
| 02-11 | Develop a simple example outlining the approach for aviation system protection suggested in WP24. | J. Mettrop | FSMP-WG/6 |  |
| 03-03 | Provide comment on the spectrum sharing approach between terrestrial and satellite RPAS C2 systems for the 5 030-5 091 MHz as proposed in FSMP-WG/3 WP10 and FSMP-WG/4 WP17 | All | FSMP-WG/6 | Noted that Europe removing non-operational MLS assignments to facilitate this effort. |
| 04-01 | Provide the FSMP Rapporteur with information via Email on (a) details of instances of disturbances and degradation within their experience caused by electrical/electronic equipment and telecommunication distribution systems operating over metallic conductors, and (b) the noise floor they anticipate in order to satisfy their planned operational requirements, especially where there are precise expectations on the noise floor. | All | May 7, 2017 | CLOSED |
| 04-02 | Review the material contained in FSMP-WG4 WP27 and provide input on possible changes to Chapters VI-VIII of the Radio Regulations resulting from the introduction of GADSS. | All | FSMP-WG5 | CLOSED, see actions 05-01 and 05-04 |
| 04-03 | Develop material on aviation use of VSAT for Chapter 7 of doc 9718, Volume I, for the next update. | Lisa Tele, Bissa Sougue | FSMP-WG8 |  |
| 04-04 | Develop proposed approach to insert the material in FSMP-WG4/WP14 on HF characteristics into Doc 9718 Volume II | Greg Baker | FMSP-WG5 | CLOSED -WP11 |
| 04-05 | Provide input to complete the equipment physical characteristics (e.g., weight) table shown in the Annex of FSMP-WG4/WP26. | All | FSMP-WG6 | Noted IATA had facilitated a meeting on rationalization of avionics, including regarding whether HF requirements could be satisfied by satellite communications. Will present output at a future FSMP WG meeting. |
| 04-06 | With regard to the action to “Conduct an aircraft fleet equipage impact analysis and develop detailed transition plans based on industry input and expected safety benefit” in the radio altimeter job card, initiate outreach to the airlines and aircraft manufacturers. | IATA and ICCAIA | FSMP-WG6 |  |
| 05-01 | Review the need for future WRC agenda item to address ITU Radio Regulations provisions for UAS/RPAS and/or “clean-ups” of existing provisions (e.g., see Annex B to FSMP-WG/4 Working Paper 27). | All | FSMP-WG6 |  |
| 05-02 | Provide technical details on suggested approach for ensuring protection of aeronautical satellite communications in the frequency band 1518-1559 MHz from LTE introduction in the lower adjacent band. | Inmarsat | FSMP-WG6 |  |
| 05-03 | Review the proposed ground-ground VHF communications scheme detailed in FSMP-WG/5 IP07 and provide comments to be included in a liaison to the RPASP. | All | FSMP-WG/6 |  |
| 05-04 | Review the proposed GADSS-related changes to the RR Articles contained in Appendix E of the FSMP-WG/5 report and provide updates to FSMP-WG/6 (in particular regarding the unresolved issue of whether there is a need to modify Articles 36 and 37) | All | FSMP-WG/6 |  |
| 05-05 | Provide questions raised regarding LDACS (see Section 5.2 of the Report of FSMP-WG/5) to the Secretary of the Communication Panel to allow for further FSMP discussion. | Secretary | FSMP-WG/6 |  |
| 05-06 | Explore restructuring of Doc 9718 Volume 1.  | Secretary/A. Roy/correspondence group | FSMP-WG/6(status) |  |

**APPENDIX E**

Elements for ICAO response to ITU WPP5B regarding proposed modifications to ITU-R document M.[GADSS]

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**APPENDIX F**

Elements for ICAO response to ITU WPP5B regarding proposed modifications to WRC-19 agenda item 1.10 (GADSS) CPM text

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**APPENDIX G**

Initial comments to RPASP on draft RPAS SARPs

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**APPENDIX H**

Updated draft WAIC SARPs

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**APPENDIX I**

Elements for proposed ICAO comments on PMSE material being developed by FM51



**APPENDIX J**

Elements for proposed ICAO Liaison ECC PT1

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1. Characteristics of and protection criteria for radars operating in the radionavigation service in the frequency band 31.8-33.4 GHz. [↑](#footnote-ref-1)
2. Reference ICAO Communications Operating Concepts and Requirements, 2007. [↑](#footnote-ref-2)