International Civil Aviation Organization

**Twenty Seventh Meeting of the Communications/
Navigation and Surveillance Sub-group (CNS SG/27) of
APANPIRG**

Bangkok, Thailand 28 August – 01 September 2023

Agenda Item 5:   Aeronautical Mobile Communications Service and Aeronautical electromagnetic spectrum utilization

REPORT FROM CP-DCIWG-WG-M/1 MEETING

(Presented by Rapporteur of CP-DCIWG-WG-M)

SUMMARY

This Working Paper summarizes the progress of the First Meeting of the Communication Panel/Data Communication Infrastructure Working Group-M (Maintenance) (CP-DCIWG-WG-M/1).

Main achievements of CP-DCIWG-WG-M/1 includes endorsement of ToR, amendment and development of AeroMACS Job Card, VDL M2 & ATN/OSI Job Card.

1.   INTRODUCTION

1.1   CAAC presented a new Job Card in the CP-DCIWG/6 meeting for the update of the ICAO AeroMACS provisions, while maintaining technology-agnostic requirements and performance-based approach, enabling safe/secured adoption of innovations, such as "5G", for aeronautical safety communications.

1.2   The proposed Job Card was in response to action items CP-DCIWG/6-12, CP-DCIWG/6-13 and CP-DCIWG/6-14, which reactivated Working Group-M (Maintenance) (WG-M) to review the proposed updates of the AeroMACS Job card and further develop it. Mr. Yanbo Zhu from China volunteered to be the Rapporteur of WG-M.

1.3   With the support of CP-DCIWG Chair, Secretary as well as delegates from FAA, EuroControl, etc., the First Meeting of WG-M (hereinafter referred to as "WG-M/1") was held virtually during 5-7 June 2023. Each day the meeting was held from 9:00 EST to 12:00 EST. The meeting was hosted by the Rapporteur Mr. Yanbo Zhu and the Secretary Mr. Gulam, Raza Ali Hussein. Thirty-nine participants from Member States and international organizations attended some or all of virtual meeting sessions of the WG-M/1.

1.4   The activities of WG-M/1:

- Review and approval of the WG-M Terms of Reference (WP/2 APP-A Terms-of-Reference).

- Amendment and development of Job Cards.

- Discussions of WG-M work procedure & technical approach.

- Development of SARPs, manuals, and guidance materials.

2   DISCUSSIONS

Review and Approval of the WG-M Terms of Reference(WP/2 APP-A Terms-of-Reference)

2.1   The meeting accepted minor editorial changes in WP/02, which included information on the Terms of Reference (hereinafter referred to as "ToR") of WG-M: a) Background; b) Scope; c) Required Expertise; d) Objectives; e) Specific Working Arrangements.

2.2   The Scope and the Objectives sections of the ToR for VDL M2 was amended and consideration for other VDL M2 industry standards were added.

2.3   The participants agreed to limit scope and objectives for the ATN/OSI standards task in the ToR with the corresponding action item from DCIWG/6.

2.4   With the suggested amendments, the meeting approved the ToR as proposed in WP/2. The approved ToR is in *Appendix A*.

WG-M Work Procedure & Technical Approach

2.5   The meeting suggested that WG-M set up three sub-groups to undertake the AeroMACS, VDL Mode2 and ATN/OSI standard amendment tasks, respectively. The sub-groups may develop the work plan and deliverables schedules to meet the WG-M mandates and provide their proposal to WG-M for endorsement.

2.6   The meeting suggested that VDL M2 and ATN/OSI standards update tasks should be supported by a single subgroup.

2.7   The Rapporteur volunteered to chair the subgroup for AeroMACS, and Mr. Dongsong Zeng from MITRE volunteered to chair the subgroup for VDLM2 & ATN/OSI.

Amendment and Development of Job Cards

AeroMACS (WP/03 AeroMACS Job Card)

2.8   Ms. Jingjing Zhao from CAAC presented WP/03 for an update proposal to the AeroMACS Job Card that was presented at DCIWG/6. The aim of this Job Card is to update the ICAO AeroMACS provisions to maintain technology-agnostic requirements and performance-based approach, and enable safe/secured adoption of innovations, such as "5G", for aeronautical safety communications. The Job Card proposes to enable AeroMACS to support seamless integration of both

RPAS and piloted aircraft CNS safety information exchanges in low-altitude airspace in the vicinity of airports.

2.9   After discussions, the title of the Job Card was added as "Advanced cellular and RPAS Alignment for AeroMACS". The AeroMACS group leader, i.e., Mr. Yanbo Zhu, agreed to postpone the given delivery date to Mar. 2025.

VDL Mode 2 & ATN/OSI

2.10   FAA presented an Information Paper titled "VDL Mode 2 Standards Harmonization Aspects". RTCA SC-214 VDLSG/EUROCAE WG-92/AEEC DLK have been collaborating to update the VDL Mode 2 Standards to enhance operational performances. The ICAO processes will be followed by the WG-M to update and publish Doc 9776. The Doc9776 edition 3 is expected to be completed by the second quarter of 2025, with the applicability date targeted at the third quarter of 2026.

2.11   Dongsong Zeng presented an initial draft Job Card for Doc 9776 and Doc 9880 update. The group reviewed and modified the draft Job Card during the meeting.

Current Status of Relevent Industry Activities

2.12   WG-I activities consist of updates to the SARPS, Technical Manuals and Document 9896, Edition 3 to incorporate the IPS capabilities. WG-I is developing three additional Technical Manuals which will be completed by the fourth quarter of 2024. The WG-I PKI Policy is fully coordinated with the overall communication PKI Policy that is developed by the ICAO Trust Framework Panel.

2.13   A working paper was presented by the CP-DCIWG secretariat to the TFP. A joint task (TFP-CP-DCIWG) is to be formed to continue coordination and the maintenance work of *Manual of the Public Key Infrastructure (PKI) Policy for Aeronautical Communications (Doc 10095)* also to work jointly on the development of the new Manual of Security Services for Aeronautical Communications (Doc 10090).

2.14   IPS MASPS has progressed well under RTCA/EUROCAE. The final draft was released for public Formal Review and Comments (FRAC) in May. The group excepted to approve the MASPS for publication after a joint RTCA SC-223 and EUROCAE WG-108 Plenary meeting in June 12 or shortly thereafter.

2.15   RTCA SC-214/EUROCAE WG-78 plans to release the Revision B of DO-350/ED-228 standard shortly for FRAC. The updates will include B2 application message sets.

2.16   FAA just released an updated TSO C207b for AeroMACS Avionics equipment for public review.

2.17   IEEE has established a Trans-disciplinary Group to work on specific application of 5G technology. Currently, this IEEE group is working on use of 5G for agricultural use. If aviation requires similar support from IEEE Trans-disciplinary Group, Aloke can coordinate that with IEEE but the aviation members need to be prepared for supporting activities.

Development of SARPs, Manuals and Guidance Materials

AeroMACS

2.18   The WP/04 is the AeroMACS SARPs amendment proposal to make the SARPs more performance-based and inclusive of additional technology implementations and less specific to IEEE 802.16e within the ITU Allocated AeroMACS Spectrum (5030 – 5150 MHz). The SARPs update also include AeroMACS communication option in low-altitude airspace in the vicinity of airport for seamless RPAS and air traffic management. The Rapporteur and the Secretary requested the participants to review offline and provide comments. And they will upload the template for comments to the Portal after the meeting.

ATN/OSI

2.19   WP/06 aims at finding the most appropriate version management strategy on ATN/OSI. The meeting concluded that the ATN Subgroup should: Carry out the necessary editorial work to ensure that those parts of Doc9880 Part III common to both the ATN/OSI and the ATN/IPS were moved to Doc9880 Part I. An ATN Version Management strategy should be developed by the subgroup after first considering the options available. There was also discussion on whether the subgroup ToR should specifically exclude from considering any version management strategy that destabilised the existing Baselines. The principle was generally agreed.

Plan for Next Meeting

2.20   The meeting agreed on the WG-M/2 meeting to be held in the Regional Office in Bangkok during 23 -27 Oct.

3.   ACTION BY THE MEETING

3.1   The meeting is invited:

a) to note the information presented in this Working Paper; and

b) to participate WG-M/2 in Bangkok during 23 -27 Oct. and to support the enhancement of AeroMACS SARPs and Technical Manual.

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APPENDIX A - TERMS OF REFERENCE

Communication Panel / Data Communication Infrastructure Working Group – M (Maintenance)

Background	At DCIWG/5, several States requested that the AeroMACS standards be updated to accommodate standard cellular communication technologies to improve the efficiency of 5 GHz AeroMACS spectrum, to mitigate obsolescence of the IEEE 802.16 wireless devices and to reduce deployment and operational costs of AeroMACS. Subsequently, a job card was presented by States at DCIWG/6 to update AeroMACS standards in Annex 10, Chapter 7, and the ICAO Document 10044. At DCIWG/6, a Change Proposal to the existing GANP Thread COMI-B3/1 was submitted to enhance the existing VHF Data Link (VDL) Mode 2 Technical Manual, ICAO Document 9776, to support IPS. These enhancements may include securing the VDLM2 information exchanges, to support IPS over VDLM2 communications, and to improve the performance, integrity, and security of VDLM2. Additionally, WG-I reported that the ATN/OSI Technical Manual, Document 9880 may require additional updates to accommodate new services and security features. Recently, maintenance of the Doc. 9880 was being conducted under DOC 9880 Change Control Board (CCB) that reported directly to DCIWG and via WG-I. However, future management of the OSI standards may be better served under the dedicated Maintenance WG. In consideration of the above, members of DCIWG/6 decided to re-activate WG-M and action **CP-DCIWG/6-12** was assigned to develop the ToR for WG-M.
Scope	Frequency spectrum is a limited resource. With the proliferation of consumer wireless and autonomous systems for aviation, there is continuous pressure to utilize the aviation spectrum more efficiently with the advancement of technology. The WG-M shall develop PfA for the update of the AeroMACS SARPS as necessary in Annex 10, Volume III, Chapter 7; the AeroMACS Technical Manual and Guidance Document 10044 to be performance-based specifications to enable addition of signal-in-space communication technologies, such as 5G, 6G and/or WiFi-6 without requiring further amendment to the standards. It is recommended that the WG-M consider harmonization of AeroMACS cellular specification with the RPAS C2 Link System Cellular Standards for seamless use of the technology for both airport surface, departure and approach phases of flights and for C2 Link System communications. The WG-M shall develop PfA for the update of the VDL Mode 2 SARPS as necessary in Annex 10, Volume III, Chapter 4 and the associated Technical Manual and Guidance Document 9776 to support IPS network services and

	cyber-security capabilities for information exchanges over VDLM2. It is recommended that additional optimization functions be considered to improve the VHF spectrum efficiency. In addition, updates will be required to align with the latest VDL Mode 2 AEEC 631 characteristics, and other industry standards related to VDL Mode 2 The WG-M shall update and maintain Technical Specifications for ATN using ISO/OSI Standards and Protocols Document9880, limited {Reprot of DCIWG/6 ….to the action} xxx
Required Expertise	The WG-M shall be composed of experts in the following areas, as needed, to respectively address the required objectives: • AeroMACS and cellular communications, aeronautical frequency and spectrum management, performance, and signal-in-space requirements for airport safety services to update the corresponding AeroMACS standards. • VDL Mode 2 standards, IPS standards, PKI-based digital cybersecurity technologies, and performance requirements for safety services using VDLM2 communications to update the corresponding VDLM2 standards. • ATN data communication services and ATN/OSI standards • Aeronautical communication, navigation, and surveillance systems representing experts from States, air navigation service providers (ANSPs), communication service providers (CSPs), and the industry.
Objectives (s)	• Proposals for amendments (PfA) for ICAO Annex 10, Volume III, Chapter 7, and ICAO Document 10044 to update the AeroMACS SARPS to be performance based to support existing and future cellular technologies. • Proposals for amendments for ICAO Annex 10, Volume III, Chapter 4, and ICAO Document 9776 to account for updates from the latest VDL Mode 2 AEEC 631 characteristics and other industry related standards as required such as (correction, enhancement, support IPS network services and digitally secure information exchanges over VDLM2 • Proposals for amendments for ICAO Document 9880 to update the ATN/OSI technical requirements to mitigate defects including a version management strategy and to bring ED-229A/DO-351A and Doc 9880 back into alignment, also synchronise the WG-M publication schedule with the one for SC-214/WG-78 • Providing guidance on how to implement the version management strategy effectively.
Specific Working Arrangements	It is expected that WG-M will meet both face-to-face and virtually. • Based on the proposed scope of work, it is anticipated that the current tasks to be concluded in 2 to 3 years, i.e., by end of 2025 and the maintenance activities will be ongoing. • Working Groups M develop their work plan and desminate to sub groups;

| | The working Group M may establish sub groups as needed for the fullfillment of its scope of work; . At least one face-to-face annual meeting of WG-M; the subgroups may meet virtually or face to face as needed . the sub groups to develop the work plan ; and deliverables schedules to meet the WG-M mandates and provide their proposal to WG-M for endorsement. Additional WG-M teleconferences will be held, as required, between the meetings.
The WG-M shall coordinate its activities with other ICAO and industry standard bodies and groups of experts such as ICAO WG-I, ICAO RPAS Panel, ICAO FSMP, ITU-R, ITU-T, RTCA SC-214, EUROCAE WG-78, AEEC Datalink Subcommittee. |