



ORGANISATION DE L'AVIATION CIVILE INTERNATIONALE

**Sixth meeting of the APIRG Information and Infrastructure Management
Sub-Group (IIM/SG6)**

(Nairobi, July 31 – August 03, 2023)

Agenda item 3 Achievements in AIM, CNS and MET

3.2: Achievements in the implementation of IIM/SG projects

**WP3.2C Implementation of Air/Ground communication (HF/VHF voice data,
CPDLC)**

(Presented by the IIM COM3 project team)

| SUMMARY |
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| <p>This working paper presents the progress of the IIM/SG COM3 Implementation of Air/Ground communication (HF/VHF voice data, CPDLC)</p> <p>Meeting action in paragraph 3 .</p> |
| <p>REFERENCE(S):</p> <ul style="list-style-type: none"> ▪ Annex 10 – Aeronautical Telecommunications (Volumes 1, 2 and 3) ▪ Appendix 11 – Air Traffic Services ▪ Doc 4444 – Procedures for Air Navigation Services ▪ Doc 9694 – Manual of Air Traffic Services (ATS) Data Link Applications ▪ IIMSG5 WP3.1A3 Appendix 2 Level of implementation of ASBU elements in the CNS domain |
| <p>This working paper relates to ICAO's Strategic Objectives : A – Safety; B – Capacity and efficiency.</p> <p>KPIS and ASBU B0 modules concerned:</p> <ul style="list-style-type: none"> ▪ |

1. Introduction

1.1. Project Objectives

- a) Assist States in implementing the COM3 ASBU COMI, COMS and FICE elements.
- b) In the framework of the technologies Roadmap for Communication defined in the GANP 6th edition and the AFI Communication strategy assist States in the implementation of Aeronautical Mobile Service through:
 - a. High Frequency/Very High Frequency (**HF/VHF**) voice Communication
 - b. High Frequency/Very High Frequency Data link communication (**HF/VHF DL**)
 - c. Controller/Pilot Data Link Communication (**CPDLC**)

1.2. Project Scope

- a) The provision of air/ground communication between Pilots and ATCOs will cover all Airspaces and Air Traffic Control Centers involved in the provision of air navigation service for international civil aviation. The implementation scheme will be in accordance with the requirements of the provision of Aeronautical Mobile Service (AMS) as defined by the AFI Air Navigation Plan (AFI/RAN Abuja 1997).
- b) The Project benefit to all ESAF and WACAF States and interested Organizations and cover the implementation of the following ASBU COM3 elements.
 - B0/1 - Aircraft Communication Addressing Reporting System (ACARS)
 - B0/3 - VHF Data Link (VDL) Mode O/A
 - B0/4 - VHF Data Link (VDL) Mode 2 Basic
 - B0/5 - Satellite Communication (SATCOM) Class C Data
 - B0/6 - High Frequency Data Link (HF DL)
 - B1/2 - VHF Data Link (VDL) Mode 2 Multi- Frequency
 - B1/3 - SATCOM Class B Voice and Data
 - B1/4 - Aeronautical Mobile Airport Communication System (AeroMACS)
 - B2/2 - Aeronautical Mobile Aircraft Communication System (AeroMACS) aircraft mobile connection
 - B2/3 - Link meeting requirements for non-safety critical communication
 - B0/1 - CPDLC (FANS 1/A & ATN B1) for domestic and procedural airspace
 - B1/1 - PBCS approved CPDLC (FANS 1/A +) for domestic and procedural airspace
 - B1/3 - SATVOICE (incl. routine communication) for procedural airspace
 - B2/3 - PBCS approved SATVOICE (incl. routine communications) for procedural airspace
 - FICE - B2/1 - Planning Service

2. Discussions

2.1. Project Deliverables /Achievements

- 2.1.1. Developed the Questionnaire analysis template and analysed responses received;
- 2.1.2. Commenced with the development of AFI HDL/VDL Manual/Guideline and completed the HDL
- 2.1.3. Section;

2.1.4. Commenced with the development of AFI Communication Strategy; and

2.1.5. Commenced with the project costing.

| COM3 Project Deliverables | Planned Delivery Date | Revised Delivery | Objectives |
|---|-----------------------|----------------------------|---|
| Project Progress Report | After each meeting | | To enable the Chair/Vice Chair and the Secretariat to monitor the progress of the project team |
| Project Organisation / Plan | 31 December 2017 | 31 May 2018 (Completed) | To outline the tasks for the project organization and coordination. Revised. |
| Project Description | 31 December 2017 | 31 May 2018 (Completed) | To provide a description of the project |
| Project Terms of reference | 31 December 2017 | 31 May 2018 (Completed) | |
| Project Linkage | 31 October 2017 | 31 May 2018 | |
| Implementation status of HF &VHF stations (Voice & data Link) | Quarterly | | To monitor the HF &VHF stations (Voice & data Link) implementation status and provide assistance or recommendations |
| Implementation/Operation status of CPDLC Circuits | Quarterly | | To monitor the CPDLC implementation status and provide assistance or recommendations |
| Teleconferences, Workshops/Seminars, meetings (French and English) on VHF/CPDLC systems operation and their implementation scheme | Bi-Monthly | | |
| Implementation/sharing and Operation status of Remote VHF/HF systems | Quarterly | | To monitor the HF &VHF stations (Voice & data Link) implementation/sharing status and provide assistance or recommendations |
| Assessment/Reporting on the operation of Air ground communication system and operation | Quarterly | | To provide assistance and recommendations. |
| Detailed guidance provided to States not complying with the AFI AMS Plan | Quarterly | | To provide assistance and recommendations. |

| COM3 Project Deliverables | Planned Delivery Date | Revised Delivery | Objectives |
|---|-----------------------|------------------|--|
| List of States with VHF and CPDLC, implemented | Quarterly | | Monitor implementation status and challenges. |
| Project Costing Estimate | 31/03/2022 | WIP | To develop project costing estimates |
| HF DL / VDL Requirement (Manual / Guidance) | After 2 years | March 2024 | To provide HF DL / VDL Requirement (Manual / Guidance) for AFI states. |
| AFI Communication Strategy | 31/03/2022 | 31/03/2024 | To develop the AFI Communication Strategy |
| ASBU COMI, COMS and FICE elements Implementation status | Quarterly | | Not yet started |

2.2. Baseline (2022) – Status of the ASBU implementation

2.2.1. The project has not commenced to assist States with the implementation of the COM3 ASBU elements. The status of the implementation of the ASBU elements by these States in 2022 including 2023 will be provided in the next project report.

| ASBU elements | Implementation status of COMI-B0 elements | | | | | Comments |
|---------------|---|------------|------------|------------|------------|----------|
| | COMI-B0/1 | COMI -B0/3 | COMI -B0/4 | COMI -B0/5 | COMI -B0/6 | |
| States | | | | | | |
| State A | | | | | | |
| State B | | | | | | |
| ASBU elements | Implementation status of COMI-B1 elements | | | | Comments | |
| | COMI-B1/2 | COMI -B1/3 | COMI -B1/4 | | | |
| States | | | | | | |
| State A | | | | | | |
| State B | | | | | | |
| ASBU elements | Implementation status of COMI-B2 elements | | | | Comments | |
| | COMI-B2/2 | COMI -B2/3 | | | | |
| States | | | | | | |
| State A | | | | | | |
| State B | | | | | | |
| ASBU elements | Implementation status of COMS-B0 elements | | | | Comments | |
| | COMS-B0/1 | | | | | |
| States | | | | | | |

| States | | | | | | |
|---------------|---|-----------|-----------|--|--|----------|
| State A | | | | | | |
| State B | | | | | | |
| ASBU elements | Implementation status of COMS-B1 elements | | | | | Comments |
| | States | COMS-B0/1 | COMS-B1/3 | | | |
| State A | | | | | | |
| State B | | | | | | |
| ASBU elements | Implementation status of COMS-B2 elements | | | | | Comments |
| | States | COMS-B2/1 | COMS-B2/3 | | | |
| State A | | | | | | |
| State B | | | | | | |
| ASBU elements | Implementation status of FICE elements | | | | | Comments |
| | States | FICE-B2/1 | | | | |
| State A | | | | | | |
| State B | | | | | | |

3. Status of the implementation of the 2023 Action Plan

| Ref. ASBU element | Deliverable | Task/activity | Beneficiary States | Status | Comments |
|---|-------------|---------------|--------------------|--------|----------|
| The status of the implementation of the COM3 ASBU elements by these States in 2022 including 2023 will be provided in the next project report | | | | | |

4. ASBU Elements implementation status

6.1. ESAF States

| Ref. ASBU element | Number of ESAF States assisted | Number of States reporting "Completed" | Number of States reporting "Partially completed" | Number of States reporting "Planned" | Number of States reporting "Not yet started" | Comments |
|---|--------------------------------|--|--|--------------------------------------|--|----------|
| The status of the implementation of the COM3 ASBU elements by these States in 2022 including 2023 will be provided in the next project report | | | | | | |

6.2. WACAF States

| Ref. ASBU element | Number of WACAF | Number of States | Number of States reporting | Number of States | Number of States reporting "Not yet started" | Comments |
|-------------------|-----------------|------------------|----------------------------|------------------|--|----------|
|-------------------|-----------------|------------------|----------------------------|------------------|--|----------|

| | States assisted | reporting “Completed” | “Partially completed” | reporting “Planned” | | |
|---|-----------------|-----------------------|-----------------------|---------------------|--|--|
| The status of the implementation of the COM3 ASBU elements by these States in 2022 including 2023 will be provided in the next project report | | | | | | |

5. Summary of ASBU implementation

5.1. ESAF Office

| Ref. ASBU element | Number of ESAF States assisted | Number of States reporting “Completed” | Number of States reporting “Partially completed” | Number of States reporting “Planned” | Number of States reporting “Not yet started” | Comments |
|---|--------------------------------|--|--|--------------------------------------|--|----------|
| The status of the implementation of the COM3 ASBU elements by these States in 2022 including 2023 will be provided in the next project report | | | | | | |

5.2. WACAF States

| Ref. ASBU element | Number of ESAF States assisted | Number of States reporting “Completed” | Number of States reporting “Partially completed” | Number of States reporting “Planned” | Number of States reporting “Not yet started” | Comments |
|---|--------------------------------|--|--|--------------------------------------|--|----------|
| The status of the implementation of the COM3 ASBU elements by these States in 2022 including 2023 will be provided in the next project report | | | | | | |

6. Status of air navigation deficiencies

6.1. Summary of APIRG air navigation deficiencies in the COM3 field within the project scope

| State | COM3 facilities & services | Deficiency ID | Status |
|--|----------------------------|---------------|--------|
| The summary of the APIRG air navigation deficiencies in the COM3 field will be provided in the next project report | | | |

7. Implementation challenges

9.1. The key challenge faced by the project is related to the project questionnaire survey and State responses. This will allow the team to track and report the AFI Air/Ground communication, between Pilots and ATCOs, Implementation status that will ensure all Airspaces and Air Traffic Control Centers involved in the provision of air aviation service for international civil aviation have required coverage.

9.2. The received questionnaires have been analysed; and following general recommendations are noted:

- a. States need to invest in HF system, which is IP compatible, ready for SELCAL migration and has DL capabilities;
- b. Migrate systems including communication links and be IP ready; and
- c. Consider deploying the renewable energy to address the power outage issues due to lack of backup power.

8. Conclusion

10.1 The meeting is invited to:

- a) Take note of the progress made so far regarding the IMSG Communication Project 3 deliverables and challenges;
- b) Encourage State participation in the AFI region projects.