



ICAO

IIM/SG2- WP/ WP/04B.1

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICAN OFFICE**

Second Meeting of APIRG Infrastructure and Information Management Sub Group (IIM/SG/2)

(Dakar, Senegal, 09-11 July 2018)

Agenda Item 4: Status of implementation of the regional projects adopted by APIRG

COM Project 1 Overview: Ground-Ground Communications Implementation (ATS / DS, AIDC, VoIP)

(Presented by ANAC-Mali)

SUMMARY
<p>This paper provides an overview of the components of the IIMSG-COM Project 1: Implementation of Ground / Ground Communications (ATS / DS, AIDC, VoIP) of the Infrastructure and Information Management Sub-group. (IIM / SG) of APIRG and proposes a roadmap for it conduct.</p> <p>Action by the meeting is at paragraph 3:</p>
<p>REFERENCE(S):</p> <ul style="list-style-type: none">▪ Annex 10, Aeronautical Telecommunications (Volumes 1, 2 and 3)▪ Annex 11, Air Traffic Services▪ Doc 9694, Manual of Air Traffic Services Data Link Applications▪ Doc 8259, Manual on the Planning and Engineering of the Aeronautical Fixed Telecommunication Network▪ Doc 9880, Manual on Technical Specifications for ATN using ISO/OSI Standards and Protocols▪ Doc 9896, Manual on the Aeronautical Telecommunication Network (ATN) using Internet Protocol Suite (IPS) Standards and Protocols
<p>Related ICAO Strategic Objective(s): A – Safety, B – Air Navigation Capacity and Efficiency</p> <p>Related ASBU KPIs & B0 Modules: PIA1 (B0-FICE); PIA2 (B0-DATM, B0-AMET) PIA3 (B0-FRTO, B0-NOPS, B0-ASEP, B0-OPFL, B0-SNET);</p>

1. INTRODUCTION

1.1 The first meeting of the Infrastructure and Information Management Sub-group (IIM/SG) was to identify, analyze, plan and implement AIM, MET and CNS projects, necessary to support the provision of ATM services in the AFI region while identifying the different links between AFI IIM regional projects, with a view to harmonized and coherent implementation.

2. DISCUSSION

2.1 Definitions

- **ATS / DS** : Air Traffic Service / Direct Speech ; These are direct voice communications or ground-to-ground communications for the needs of air Traffic services.



ICAO

IIM/SG2- WP/ WP/04B.1

INTERNATIONAL CIVIL AVIATION ORGANIZATION WESTERN AND CENTRAL AFRICAN OFFICE

- AIDC : Data communications between ATS facilities ; is a data link application that allows the exchange of data between air traffic services units during the notification, coordination and transfer of flights.
- VoIP : Voice over Internet Protocol (IP)

2.2 Overview of Aeronautical Fixed Service (ground-ground communications)

Annex 11 states that "the coordination and transfer of control of a flight between ATC bodies and successive control areas will be carried out through dialogue"

The aeronautical fixed service provides communications between the following air traffic services organizations:

a) Area control center

(b) Approach control organizations;

b) Aerodrome Control Towers

The speed with which communications must be established has been defined by an indication of time to serve as a guide for telecommunication services, in particular to determine the nature of the necessary telecommunications channels. Thus, the expression "instantaneous" is used for communications that effectively provide an immediate link between controllers; a "fifteen-second" period allows the use of a switchboard and a "five-minute" period means that the methods used will include a retransmission.

2.3 Components of the project

2.3.1 Air Traffic Service/ Direct Speech (ATS/DS)

As is currently the case, ATS / DS circuits in the AFI region are point-to-point links using satellite telecommunications and are therefore implemented via the AFISNET, CAFSAT and NAFISAT / SADC networks, the automation of which is difficult. However, the back-up service is currently provided via satellite telephone links or the public switched telephone network (PSTN).

2.3.2 Data Communications Between ATS Facilities (AIDC)

2.3.2.1 Overview of the application

One of the keys to the future air traffic management system is the bidirectional exchange of data between the aircraft and the ATC system and between the ATC systems. Communications with the aircraft will be increasingly digital. At the same time, the automated exchange of data between ATC systems will allow the rapid dissemination of relevant flight data, particularly with respect to the coordination and transfer of flights between ATS units.

AIDC provides this function.

To do this, AIDC messages relate to three phases of flight coordination by ATS units :

- a) notification phase, during which the controlling ATS unit may communicate to another ATS unit prior to the coordination phase, the aircraft flight path and any relevant changes ;
- b) coordination phase, during which the aircraft's flight path is coordinated between two or more ATS units as the aircraft approaches a common boundary ;
- c) transfer phase, during which communications and the supervisory authority are transferred from one ATS unit to another.

In addition, AIDC allows ATS units to exchange auxiliary ATC data, including free text messages

2.3.2.2 High Level Operational Specifications of AIDC



**INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICAN OFFICE**

The system allows the automatic transfer of control and communications between ATS units by the exchange of digital data.

The tables below (see appendix 1) provide operational specifications of the AIDC function in a data link ATM system.

2.3.3 VoIP : Voice over Internet Protocol

VoIP is a telephony mode using the Internet Protocol (IP). The voice is digitized and routed in packets like any other data.

IP voice or sound over IP can be in Unicast, broadcast or multicast mode on networks, i.e. in "point-to-point" mode, in "one show and several receptions" mode (like a TV transmitter, for example) and in "one show for multiple receptions" mode.

2.4 Benefits

This project is part of the implementation of the B0-FICE (Enhanced Interoperability, Efficiency and Capacity through Ground-to-Ground Integration) module of ASBU.

It reduces controller workload, aircraft spacing, and enhances data integrity and, as a result, increases airspace capacity. In terms of efficiency, reduced separation provides flight levels closer to the optimum level for flight and reduces en route waiting.

It promotes interoperability of systems through the use of standardized interfaces that reduce development costs and allows air traffic controllers to apply the same procedures to the boundaries of areas of responsibility, so crossing boundaries is more transparent for flights.

In terms of safety, it offers a better knowledge of the flight plan data and reduces the risk of coordination errors.

2.5 Execution of the project

2.5.1 Survey of SOL / SOL Communication System Performance in the AFI Region

A survey could be conducted among civil aviation structures as follows :

a- ATS / DS :

- Number of ATS / DS circuits implemented ;
- Average availability of ATS / DS circuits.

b- AIDC :

- Number of AIDC systems installed ;
- Percentage of ATS Units with AIDC ;
- Number of AIDC interconnections implemented ;
- Percentage of ACC centers with AIDC interconnection systems Implemented.

c- VoIP:

- Number of VoIP systems installed ;
- Percentage of ATS Units with VoIP ;
- Number of VoIP interconnections implemented ;
- Percentage of ACC centers with VoIP interconnection systems Implemented.



ICAO

IIM/SG2- WP/ WP/04B.1

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
WESTERN AND CENTRAL AFRICAN OFFICE**

2.5.2 Strategy

Diagnose the results of the aforementioned survey with a view to the strategic choice to be made

3 ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) The meeting is invited to take note of the contents of this information paper.

---END---