



ICAO DAKAR UNITING AVIATION

Dakar, Senegal, 11-15 September 2017

Air-Ground Data-Link Implementation in the AFI Region

Presented by

François-Xavier SALAMBANGA

RO/CNS/WACAF



CONTENTS

- Air Navigation Plan in the AFI Region - eANP (Doc 7474) (Air-Ground Data-Link Consideration)
- Regional initiatives on Air-Ground Data-Link implementation
- Air Ground Data Link Implementation
- Steps Fowards



AIR NAVIGATION PLAN IN THE AFI REGION - eANP (Doc 7474) (Air-Ground Data-Link Consideration)

- Air navigation plans exposed in detail the facilities, services and procedures required for international air navigation within a specific area.
- These plans contain Recommendations that Governments can follow when programming the provision of air navigation services, with the assurance that the facilities and services provided in accordance with the plan form of the other States an integral system appropriate for the foreseeable future.
- Each Contracting State is responsible for the provision of services and facilities in its territory, in accordance with article 28 of the Convention. The Council has recommended that these services and facilities include those specified in air navigation plans.
- On June 18, 2014, ICAO Council decided that regional Air Navigation Plans (ANPs) will be published in three volumes replacing in this way regional air navigation plans approved by the Council on 26 February 1997 formed a basic ANP and a document on facilities and services (FASID) in two volumes.

AIR NAVIGATION PLAN IN THE AFI REGION - eANP (Doc 7474) (Air-Ground Data-Link Consideration)

Volume I contains the stable elements of the Plan, whose amendment requires the approval of the **Council**, referred to :

- ✓ the assignment of responsibilities;
- ✓ subject to a regional agreement mandatory requirements;
- ✓ and/or additional requirements specific to the region and are not covered by the SARPs.

Partial list of these elements:

- ✓ (Tables and charts) boundaries of flight information regions (FIR);
- ✓ Search and rescue (SRR) regions (tables and charts) boundaries;
- ✓ (VAAC) volcanic ash advisories centers;
- ✓ Warnings of tropical cyclones (CAGR) centers; Volcano observatories (VO);



AIR NAVIGATION PLAN IN THE AFI REGION- eANP (Doc 7474) (Air-Ground Data-Link Consideration)

Volume II contains the **dynamic elements** of the plan, whose amendment **does not require the approval of the Council** (the approval is for regional agreement of the relevant **PIRG**):

- ✓ referred to the assignment of responsibilities;
- ✓ subject to a regional agreement mandatory requirements; and/or
- ✓ additional requirements specific to the region and are not covered by the SARP.

Partial list of these elements:

- ✓ principal flows of air traffic service (ATS) routes ;
- ✓ Meteorological Watch Office (MWO);
- ✓ codes of the Secondary Surveillance Radar (SSR),
- ✓ five letters Name codes
- ✓ VOLMET broadcasts.



AIR NAVIGATION PLAN IN THE AFI- eANP (Doc 7474) (Air-Ground Data-Link Consideration)

Volume III will contain **dynamic/flexible elements** of the plan, providing guidance for the implementation of its modernization and air navigation systems planning, taking into account emerging programs such as the **ASBU** and **roadmaps** of associated technologies described in the GANP.

Volume III of the ANP will also contain **additional guidance material** appropriate, especially in relation to the **implementation**, to **complement** the material contained in **volumes I and II** of the ANP.

Volume III amendment would **not require** the approval of the **Council** but a regional agreement (**Secretariat and PIRG**)



AIR NAVIGATION PLAN IN THE AFI REGION - eANP (Doc 7474) (Air-Ground Data-Link Consideration)

VOLUME I

PART III – COMMUNICATION , NAVIGATION AND SURVEILLANCE (CNS)

2 GENERAL REGIONAL REQUIREMENTS

AIR-GROUND DATA LINK COMMUNICATIONS

2.5 **Air-ground data link communications should be implemented in such a way that they are regionally and globally harmonized and make efficient use of available communication means and ensure optimum economy in frequency spectrum use and system automation**

VOLUME II

PART III – COMMUNICATION , NAVIGATION AND SURVEILLANCE (CNS)

2 GENERAL REGIONAL REQUIREMENTS

AIR-GROUND DATA LINK COMMUNICATIONS

2.28 **A Strategy for the harmonized implementation of the data link communications in the AFI Region should be developed based on the Global Operational Data Link Document (GOLD) adopted by ICAO Regions and the Aviation System Block Upgrade (ASBU) methodology.**



AIR NAVIGATION PLAN IN THE CAR/SAM REGIONS- - eANP (Doc 7474) (Air-Ground Data-Link Consideration)

PART III COMMUNICATION , NAVIGATION AND SURVEILLANCE (CNS)

2 GENERAL REGIONAL REQUIREMENTS

AIR-GROUND DATA LINK COMMUNICATIONS

2.29 Where applicable, controller-pilot data link communications (CPDLC), based on ATN VDL data link Mode 2 (VDL2) and/or FANS-1/A, should be implemented for air-ground data link communications.

2.30 Partial or divergent aircraft data link evolutions that result in excluding messages from aircraft systems should not be pursued. Interim steps or phases toward full implementation of the common technical definition in ground systems should only be pursued on a regional basis, after coordination between all States concerned.

2.31 Harmonization of operational procedures for implementation of the above packages is essential. States, Planning and Implementation Regional Groups (PIRGs) and air navigation services providers should adopt common procedures to support seamless ATS provision across FIR boundaries, rather than each State or Region developing and promulgating unique procedures for common functions.



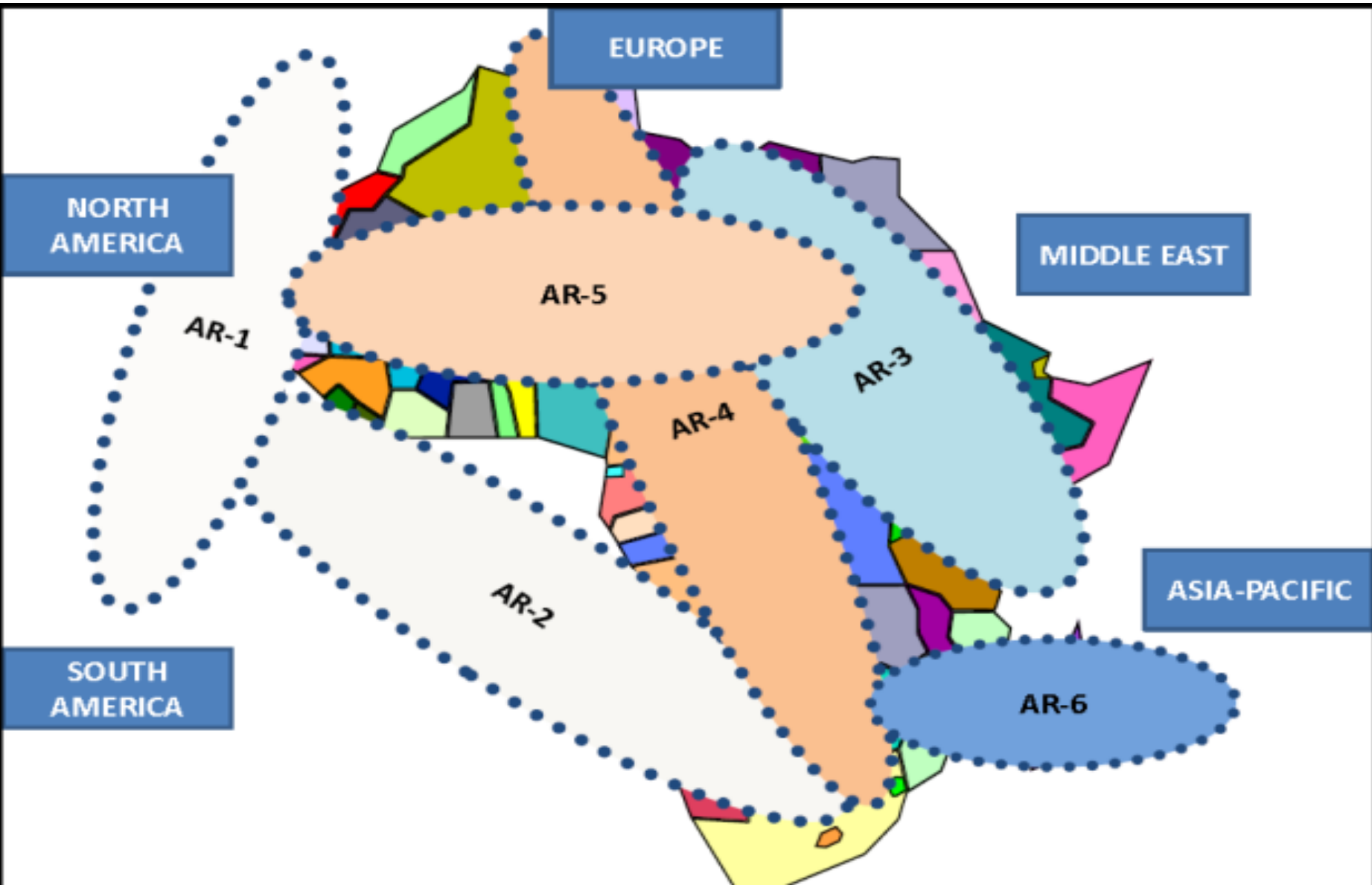
AFI Regional planning -Air-Ground Data-Link Consideration

ENVIRONMENT CONTEXT IN AFRICA

Huge region with remote areas such as:

- Desert (Sahara and Kalahari)**
- Deep equatorial forests**
- Oceanic area (Atlantic and Indian oceans, Mediterranean and Red seas)**

HOMOGENEOUS AREAS AND MAJOR TRAFFIC FLOWS IN THE AFI REGION



Regional planning -Air-Ground Data-Link Consideration

CONCLUSION 15/22: TRIALS ON ADS-C/CPDLC

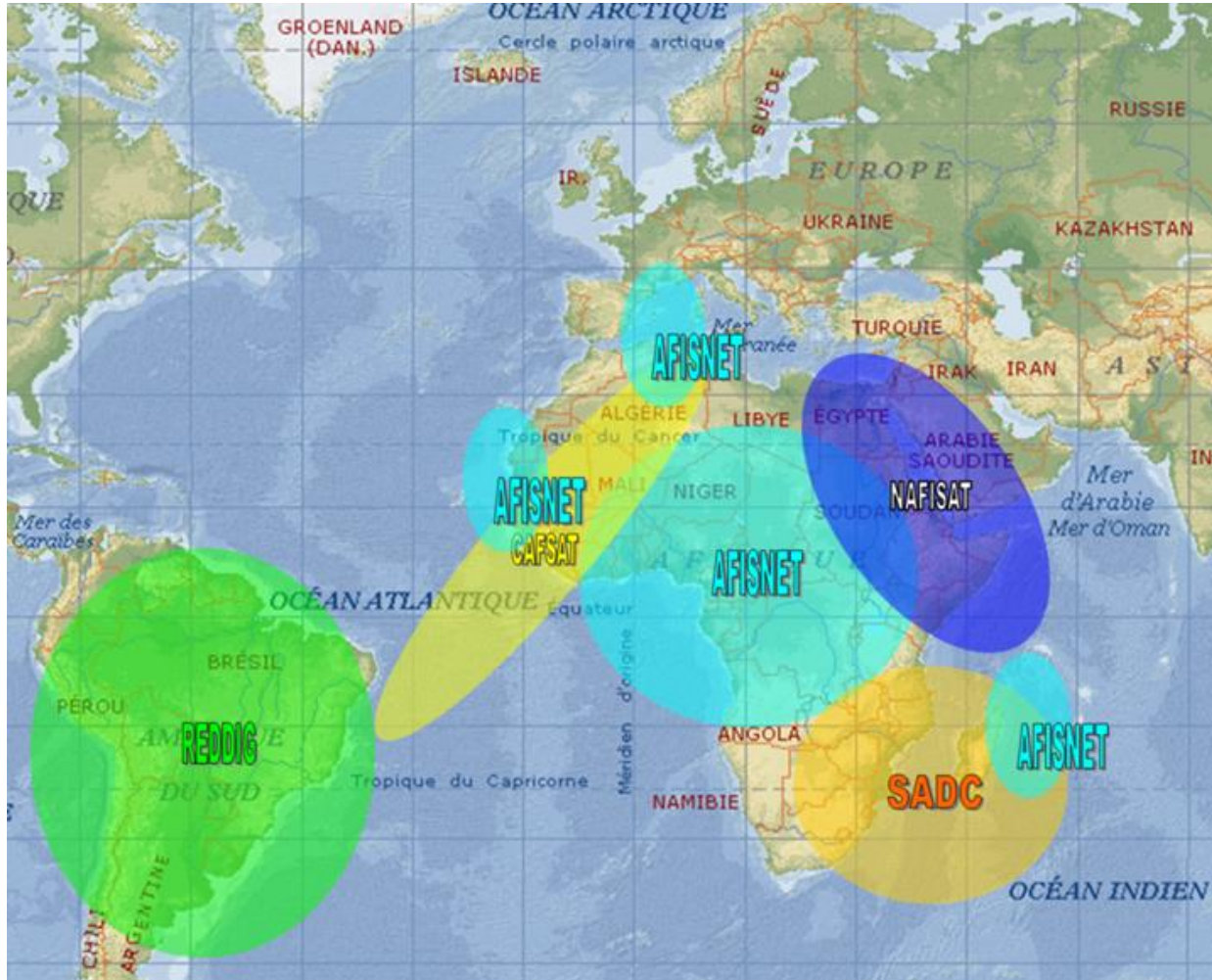
That Airlines with equipped ADS-C/CPDLC collaborate and participate in trials on ADS-C/CPDLC

CONCLUSION 17/31:IMPLEMENTATION OF ADS-C

That, States implement ADS-C Procedures for en-route operations in their managed oceanic and remote continental airspace.

AFI Regional planning -Air-Ground Data-Link Consideration

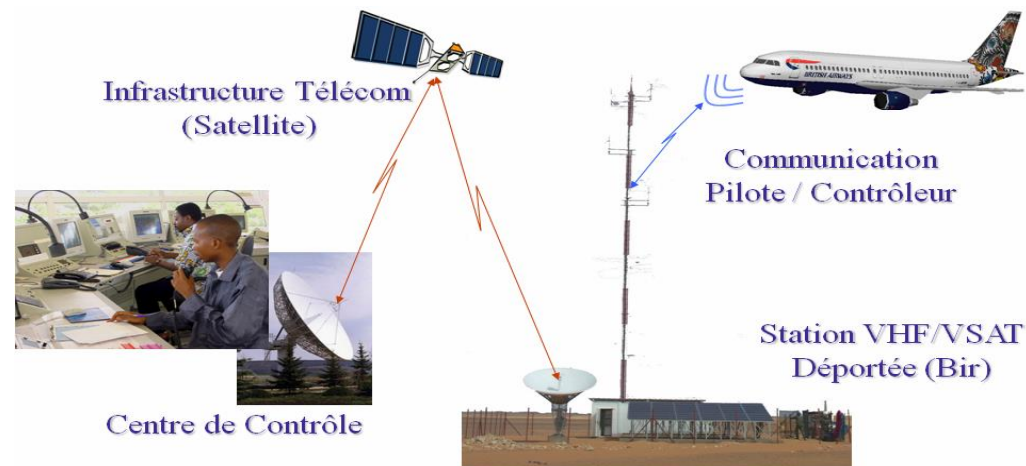
COMMUNICATION STRATEGY: BASED ON A VSAT BACKBONE



Regional Implementation - Air-Ground Data-Link Consideration

EXTENDED VHF COVERAGE WITH DATA LINK CAPABILITIES (VDL MODE 2)

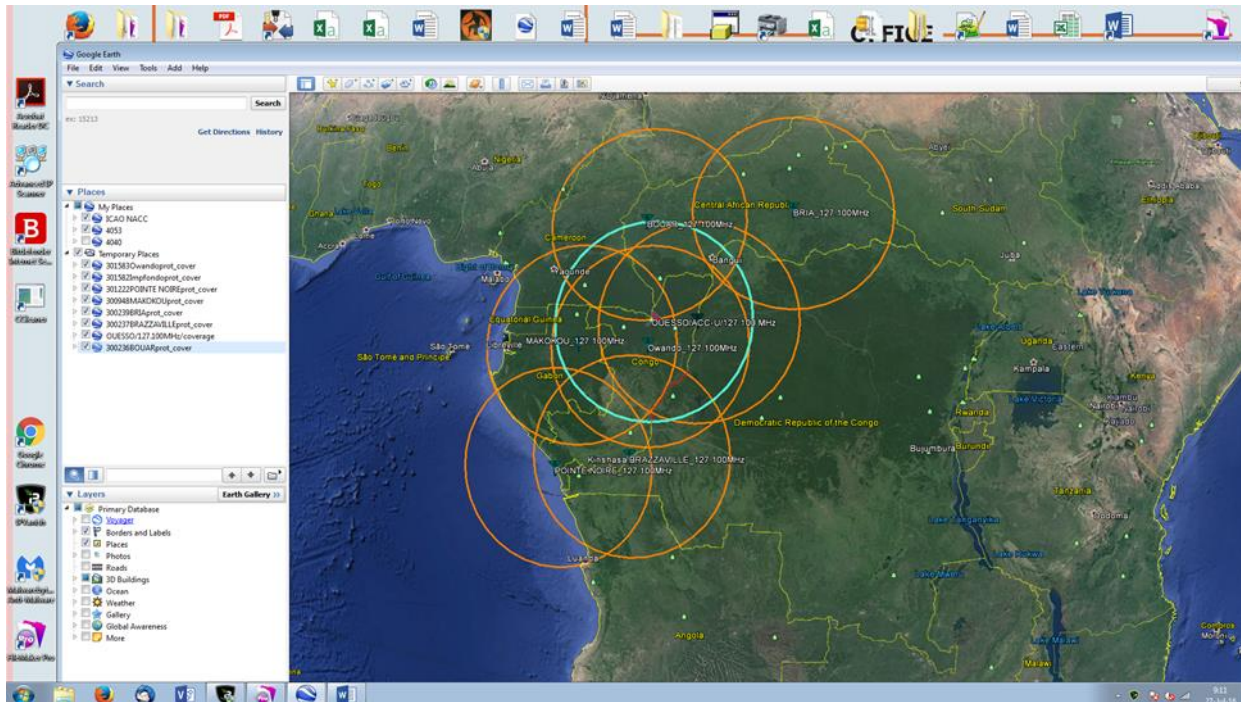
- Ground-ground links to carry the SITA ACCARS data to ensure duplex Air-ground ADS-C/CPDLC



Regional Implementation -Air-Ground Data-Link Consideration

EXTENDED VHF COVERAGE WITH DATA LINK CAPABILITIES (VDL MODE 2)

- Satellite remote VSAT VHF Stations





Regional Operation and monitoring -Air-Ground Data-Link Consideration

- **Good pace of implementation and operation of ADS-C/CPDLC**
- **Good opportunity for the implementation of VDL 2 ands SSR Mode S Data links**
- **Operation with tangible benefit to airlines:**
 - ✓ **Example of SAT airspace**
 - ✓ **Example of AR-4 West to East and AR-5 South to North in AFI Continental**

Regional Implementation - Air-Ground Data-Link Consideration

Air Space	Capabilities	Implementation status
Abidjan (Cote d'Ivoire)	ADS-C/CPDLC	Full operational
Accra (Ghana)	ADS-C/CPDLC	Full operational
Alger (Algeria)	ADS-C/CPDLC	Full operational
Antananarivo (Madagascar)	ADS-C/CPDLC	Full operational
Atlantico	ADS-C/CPDLC	Developing project
Brazzaville (Congo)	ADS-C/CPDLC	Full opérationnel
Canarias	ADS-C/CPDLC	Full opérationnel
Casablanca (Morocco)	ADS-C/CPDLC	TBD
Dakar (Senegal)	ADS-C/CPDLC	Full operational
Kano (Nigeria)	ADS-C/CPDLC	
Kinshasa (DRC)	ADS-C/CPDLC	Developing project on ADS B
Luanda (Angola)	ADS-C/CPDLC	Project
Mauritius	ADS-C/CPDLC	Full operational
N'Djamena (Chad)	ADS-C/CPDLC	Full operational
Niamey (Niger)	ADS-C/CPDLC	Full operational
Roberts FIR	ADS-C/CPDLC	Not Applicable
Sal (Cape Verde)	ADS-C/CPDLC	Full operational
Joahannesburg (SA)	ADS-C/CPDLC	Full operational
	ADS-C/CPDLC	

Regional Operation and monitoring - Air-Ground Data-Link Consideration

Conclusion 20/24: Establishment of a Project Team for the implementation of a data link central monitoring and reporting agency (DL/CMRA)

That:

- a) A Project Team comprised of Cabo Verde (as Team Leader), Ghana, ASECNA, South Africa, Seychelles, AFRAA and IATA is established to identify and propose the main functions of an AFI DL/CMRA, the appropriate organizational framework and a suitable cost effective funding mechanisms; and**
- b) The Project Team Leader should provide a report of the activities of the project, which are to be mainly done through electronic conferences to the Secretariat for submission to the APCC and the outcome should subsequently be submitted to APIRG/21.**



APIRG IIM/SG /1st Meeting consolidated a Project for a DL/CMRA

Objective-Identify and propose:

- **The main functions of the regional DL/CMRA;**
- **Appropriate organizational framework;**
- **Suitable cost effective funding mechanism**

Scope-DL/CMRA Project Team to:

- **Develop the ToRs defining the main functions of the AFI DL/CMRA including information technology, supporting tools and security policies;**
- **Study and identify regional funding mechanisms for the implementation of the DL/CMRA;**
- **APIRG Secretariat to circulate by e-mail correspondence the outcome of the DL/CMRA Project Team for approval by APIRG/21.**

Steps Forwards

- **Continue the implementation of Air Ground Data link in all Area of Routing**
- **Collaborate to ensure continuous operation with an agreed acceptable level of data link provision (RCP/RSP)**
- **Development of the AFI DL/CMRA, through collaborative decision making mechanisms;**
- **ICAO will maintain and reinforce the support for such initiatives**



ICAO

UNITING AVIATION



ICAO

North American
Central American
and Caribbean
(NACC) Office
Mexico City

South American
(SAM) Office
Lima

ICAO
Headquarters
Montréal

Western and
Central African
(WACAF) Office
Dakar

European and
North Atlantic
(EUR/NAT) Office
Paris

Middle East
(MID) Office
Cairo

Eastern and
Southern African
(ESAF) Office
Nairobi

Asia and Pacific
(APAC) Sub-office
Beijing

Asia and Pacific
(APAC) Office
Bangkok



THANK YOU