

DP-3a)

First Working Group Meeting on the Implementation of AN-Conf/12 Rec,3/8 (c), (Dakar, Senegal , 13-14 October 2014)

Agenda Item 3 a): Review/Updates on the adopted Framework of the AFI/CAD Concept (AFI/CAD Doc. 001).

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THE BUSINESS PLAN OF THE OF THE AFI-CAD PROJECT (AFI-CAD Doc. 007) of the APIRG/17 Report

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ICAO Regional Officer AIM

ICAO Regional Office Dakar, in collaboration with the AFI-
CAD Consultant

Mr. Peter Rudolph

Avitech AG



International Civil Aviation Organization



AFI-CAD Business Plan

- Overview & Next Steps

Objective of the meeting

The main objective of this meeting was to provide guidance to States, in accordance with the requirements of AFI Part of the Draft e-ANP that has been presented at the 12th Air Navigation Conference. The meeting also reviewed the ASBU modules related to interoperability system and data (AIM) that has been presented at the 12 Air Navigation Conference. It is expected that operational improvements will be outlined in a logical stepwise block upgrades that at a minimum:

identifies the operational benefit; determine the necessary procedures; nominate the required technology; develop the business case; and propose a preliminary strategy for regulatory approval.

Objective of the meeting

The meeting noted that following a review of the Action agreed by the Air Navigation Commission on 8 March 2011 (ANC 186-6 refers); the Commission noted that the transition in the AFI Region will benefit if a robust communication infrastructure exist. The Commission further called upon the Secretariat to support/monitor the transition of AIS to AIM through region mechanism.

Following the recent review of the revised AFI Plan by the 12 AN Conference, it was agreed that the Concept of AFI-CAD when implemented, will offer all AIM related tasks including even the classic AIM services to reduce the ANSP's efforts and timelines needed by the States on their way to the AIS/AIM Transition process. This has also been re-confirmed by Recommendation 3/8 (c) of the 12thAN Conference which states:

ANC 12 Rec.3/8 (c):

That States:

engage in intra-regional and interregional cooperation for an expeditious transition from aeronautical information service (AIS) to aeronautical information management (AIM) in a harmonized manner and to using digital data exchange and consider the regional or sub regional AIS databases as an enabler for the transition from AIS to AIM

Objective of the meeting

- * To this effect, the meeting noted that ASECNA is progressively engaged in implementing in accordance with the AFI-CAD Concept, a Regional AIS Database to accommodate and enable all the States in the Western and Central African Region to effectively transition from AIS to AIM. In accordance with the AFI-CAD Concept, the meeting also noted that South Africa has invited AFI States to join the South African Regional AIS Database as an enabler in the transition process to enhance AIM implementation within the AFI Region.
- * The meeting then endorsed the possibility of AFI States migrating to the ASECNA Regional AIS Database as an enabler in the transition process, in accordance with the AFI-CAD Concept as per Recommendation 3/8 (c) of the 12th AN Conference, and also endorsed the possibility of AFI States migrating to the South African Regional AIS Database as an enabler, in accordance with the AFI-CAD Concept as per Recommendation 3/8 (c) of the 12th AN Conference.
- * Finally the meeting reviewed and noted DP 10 presented by ASECNA concerning AIM deployment to open the door for innovations provided in Appendix 7-A.

What is the purpose of this Presentation?

- * To show AFI-CAD status and results
- * Suggestions for next steps
- * Encourage further input for actual AIM cost
- * Vision



Contents

- * What is AFI-CAD? How is AFI-CAD?
- * What drives AFI-CAD?
- * History
- * Results
- * Participation & Involvement
- * Business Plan
- * Schedule
- * Next Steps



What means AFI-CAD (1)

AFI-CAD =

ICAO **African Region**

Centralized

Aeronautical Information Services (AIS/AIM)

Database

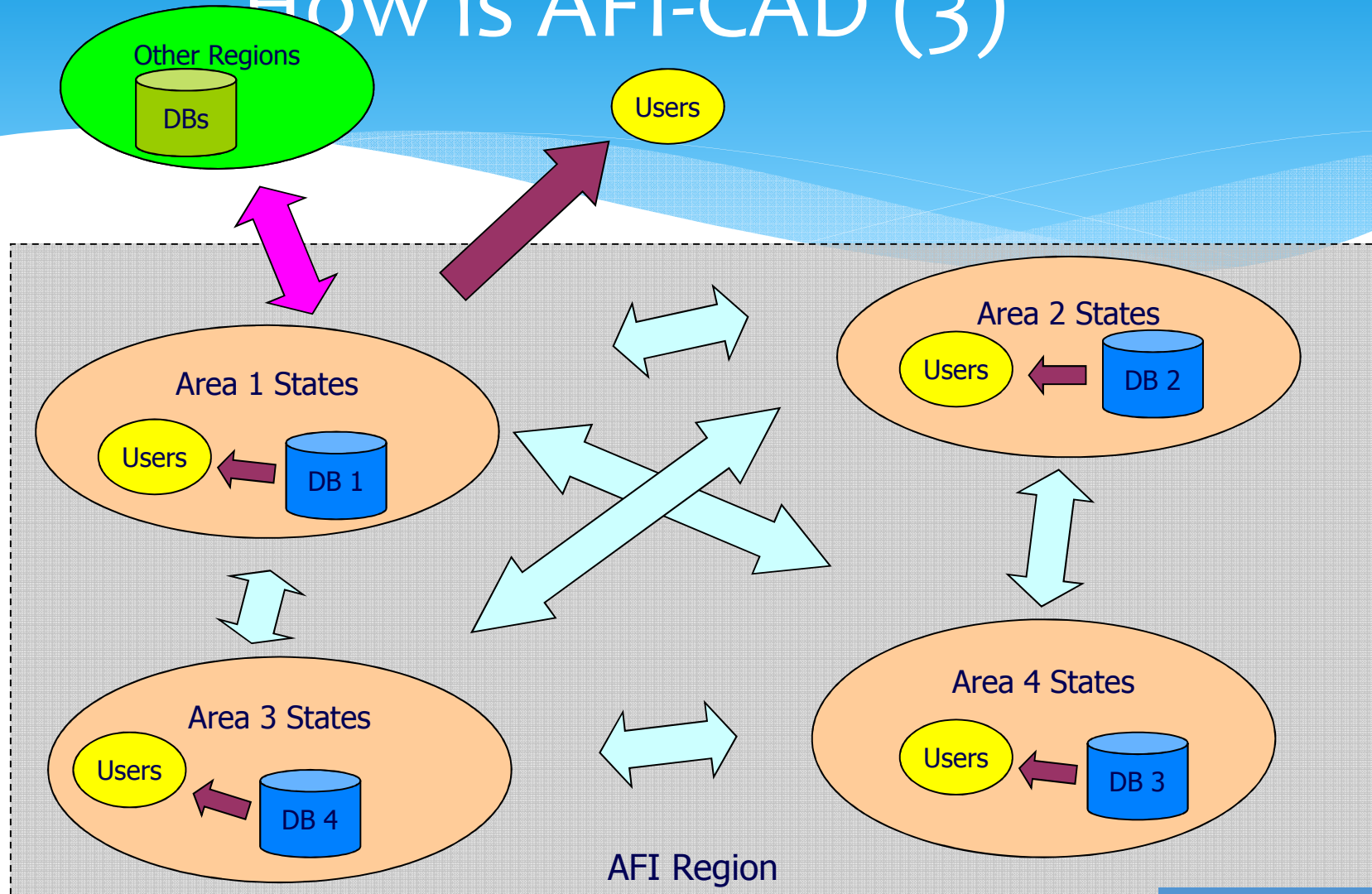


What is AFI-CAD (2)

- * 4 AIS/AIM Databases across the AFI Region where consistent and high quality aeronautical data of the Region will be made available to airspace users and others supporting satellite navigation and PBN
- * All AFI Region countries provide their data to AFI-CAD
- * AFI-CAD makes it easier for users to access the data and to exchange data with other regions
- * Each Country maintains its own AIS/AIM (database) to provide the data to AFI-CAD



How is AFI-CAD (3)



What drives AFI-CAD (2) - eTOD



Applicable 12th Nov 2015



Recommended Practice

Area 1 – Entire territory of a state

Area 2 – Terminal control area

Area 3 – Aerodrome/heliport area

Area 4 – Cat II or III operations area



Applicable since 20th Nov 2008

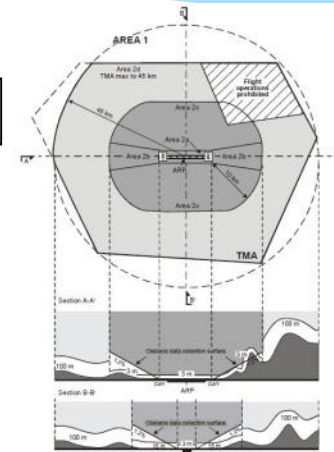


Figure AS-2. Obstacle data collection surfaces — Area 1 and Area 2

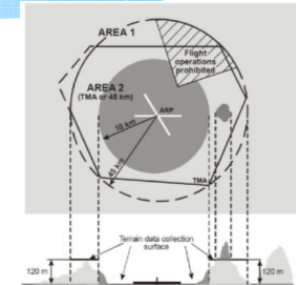


Figure AS-3. Terrain and obstacle data collection surface — Area 3

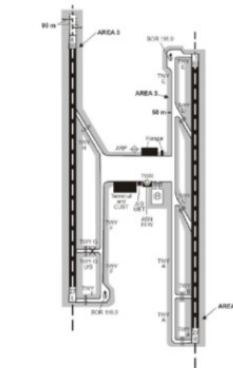
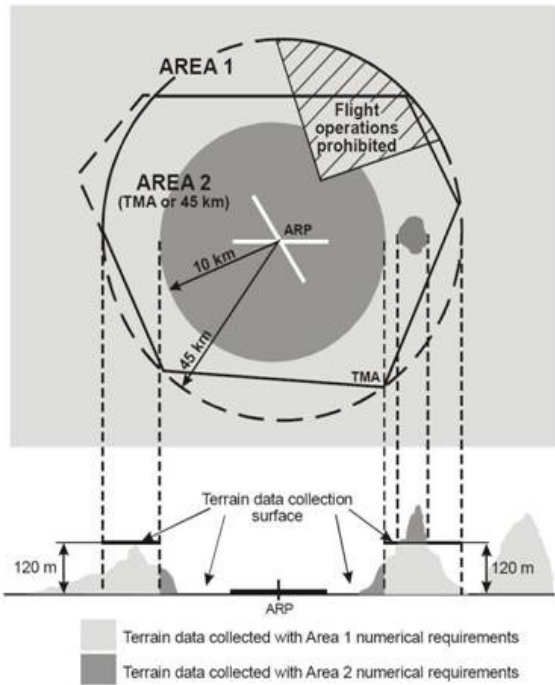


Figure AS-4. Terrain and obstacle data collection surface — Area 4

[Annex 15, Chap. 10, Amend. 36]

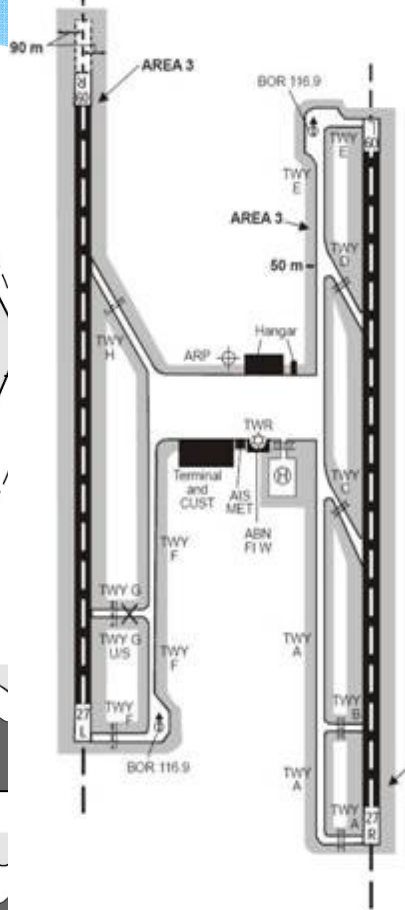
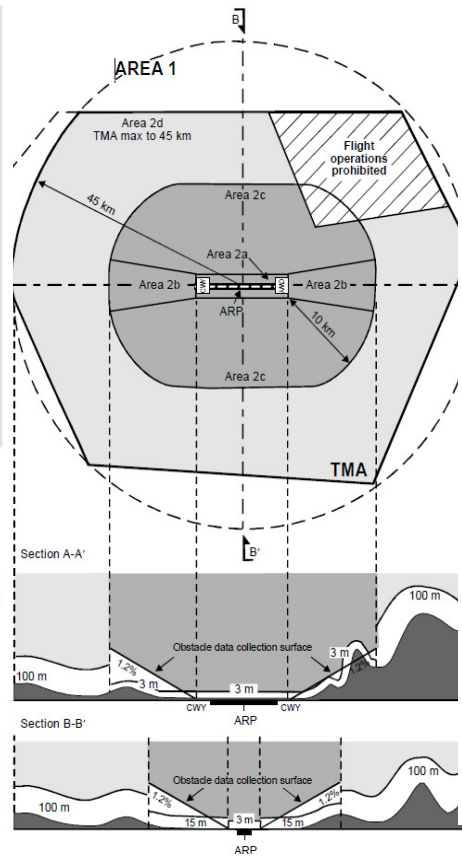


ICAO standards

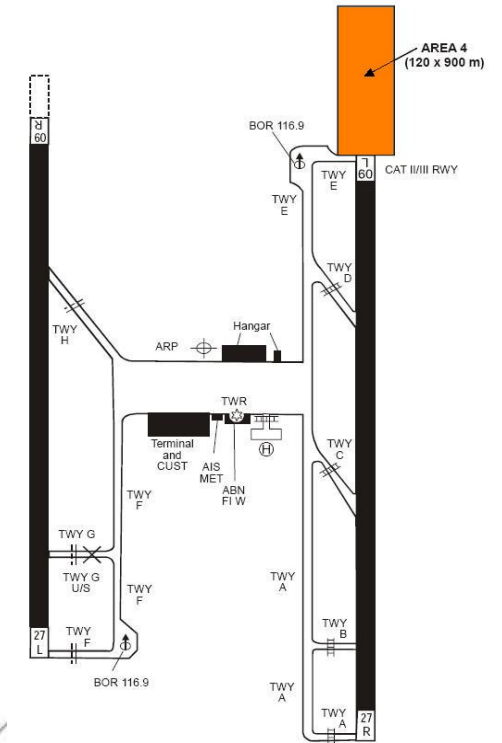


• Area 1 = State (2008)

• Area 2 = TMA (2015)



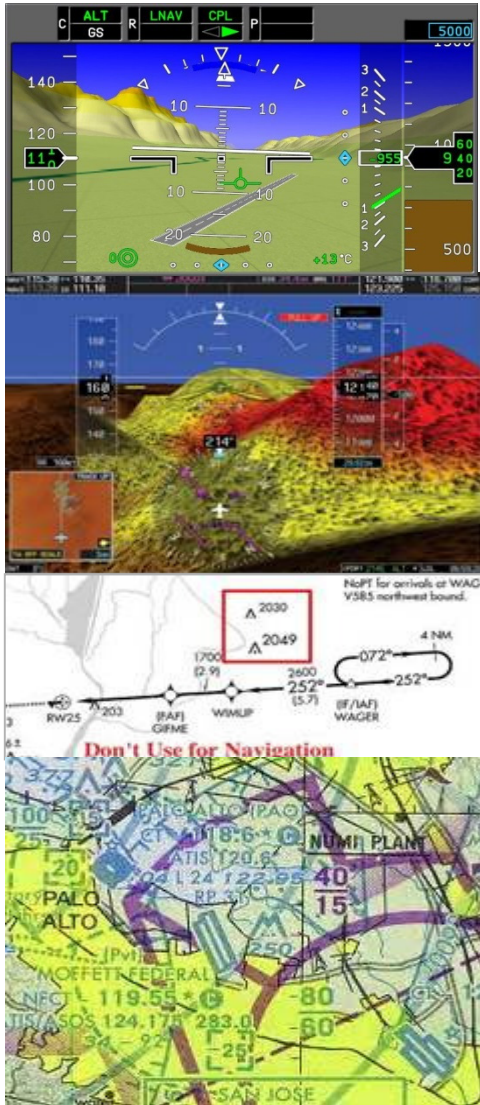
• Area 3 =
• Aerodrome/Heliport
(Recommendation)



• Area 4 =
• CAT II/III RWY (2008)

Implementation drivers

- Ground Proximity Warning System (GPWS) / Minimum Safety Altitude Warning (MSAW)
- Instrument Flight Procedure Design
- Advanced Surface Movement Guidance and Control systems (A-SMGCS)
- Aeronautical Charts / On-board DB
- Flight simulator, obstacle management
- Synthetic Vision System



CARRIER		NEW BRIDGELONGER (LX-AUX)		31L		DRY	
CONF 1-1	CONF 2	CONF 1-1	CONF 2	CONF 1-1	CONF 2	CONF 1-1	CONF 2
75							
74							
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History

- * AFI-CAD
 - * SG/1, Johannesburg, 8-10 November 2006
 - * SG/2, Nairobi, 3-5 October 2007
 - * SG/3, Dakar, 7-9 October 2008
 - * SG/4, Johannesburg, 26 June 2009
- * APIRG/16, Rubavu, 19-23.11.2007 - Conc. 16/41, 16/42, 16/44
- * SIP 09 September 2008
- * SP AFI RAN, Durban, 24-29 November 2008 – noted
- * 2 Questionnaires April 2009
- * ATS/AIS/SAR SG/11, Nairobi, 26-30 April 2010 - review
- * AIS/MAP TF/5, Dakar, 11-12 May 2010 – review
- * APIRG/17, Ouagadougou , 2 – 6 August 2010 – Endorsement under App. 3.6 I of Report
- * ICAO Air Navigation Commission endorsement on 8 March 2011 (ANC 186 – 6 Refers)



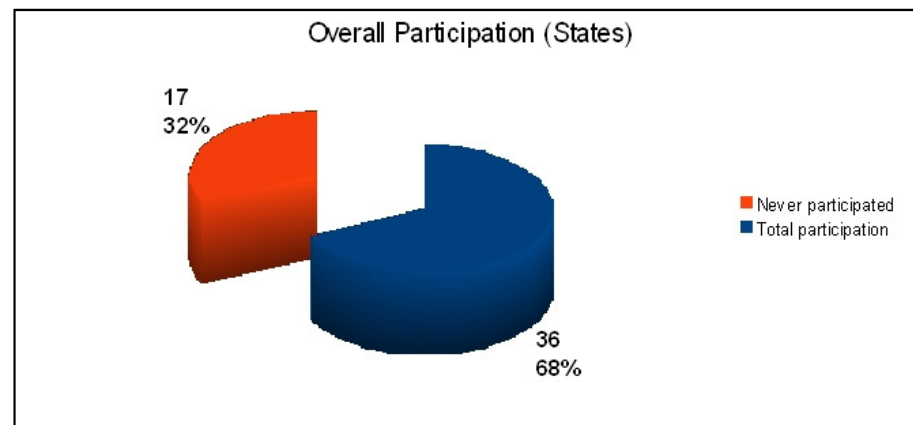
Results of the four Study Group Meetings

- * Framework
- * Recommendations
- * Business Plan
- * User Requirements (Basis)

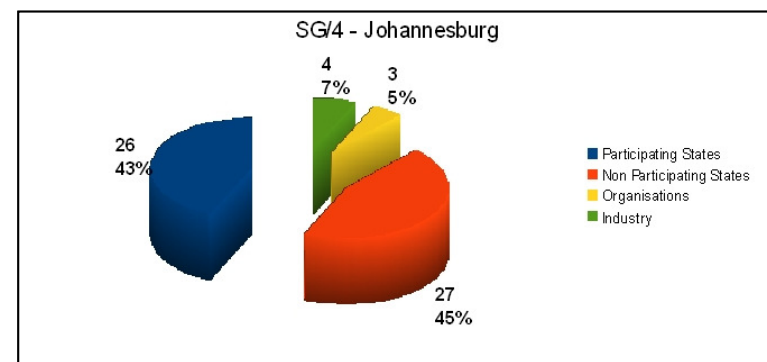
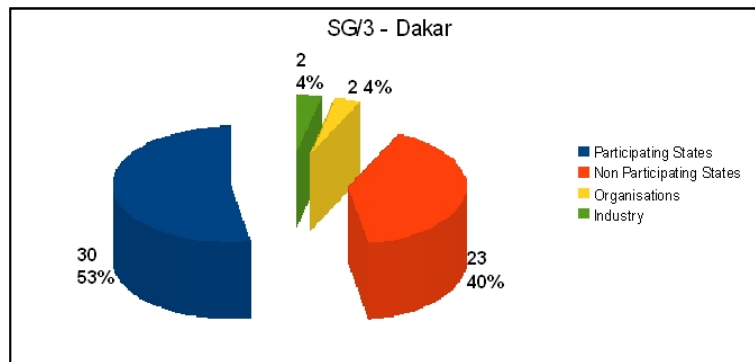
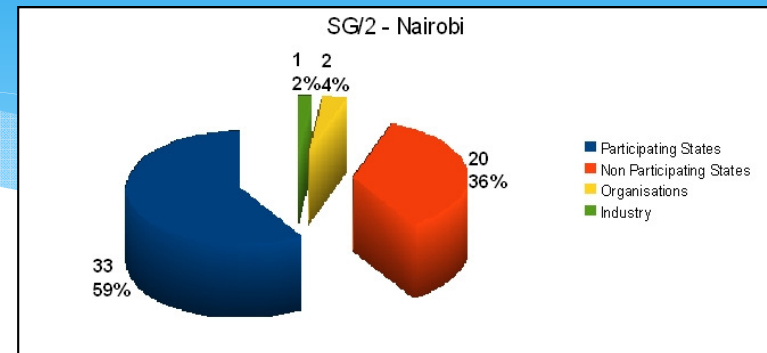
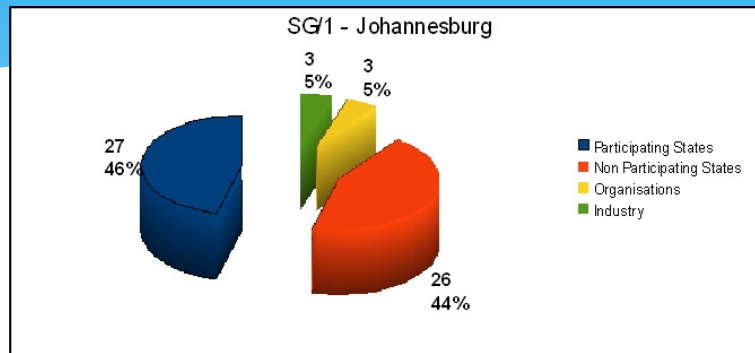


Participation & Involvement (1)

- * SG/1: 6 States, ASECNA, Roberts FIR, Eurocontrol, IATA, ICAO, 3 industry
- * SG/2: 14 States, ASECNA, Roberts FIR, IATA, ICAO, 1 industry
- * SG/3: 12 States, ASECNA, Roberts FIR, IATA, ICAO, 2 industry
- * SG/4: 15 States, ASECNA, Eurocontrol, IATA, 4 industry



Participation & Involvement (2)



Business Plan

- * 8 Chapters
 - * (1) Introduction
 - * (2) Vision & Mission, Strategic Objectives
 - * (3) AFI-CAD Strategic Profile
 - * (4) Organization, Management, Milestones
 - * (5) Financial Plan
 - * (6) Benefits & Disadvantages (Risks)
 - * (7) Action Plan
 - * (8) Summary & Conclusion
- * Appendixes and Annexes

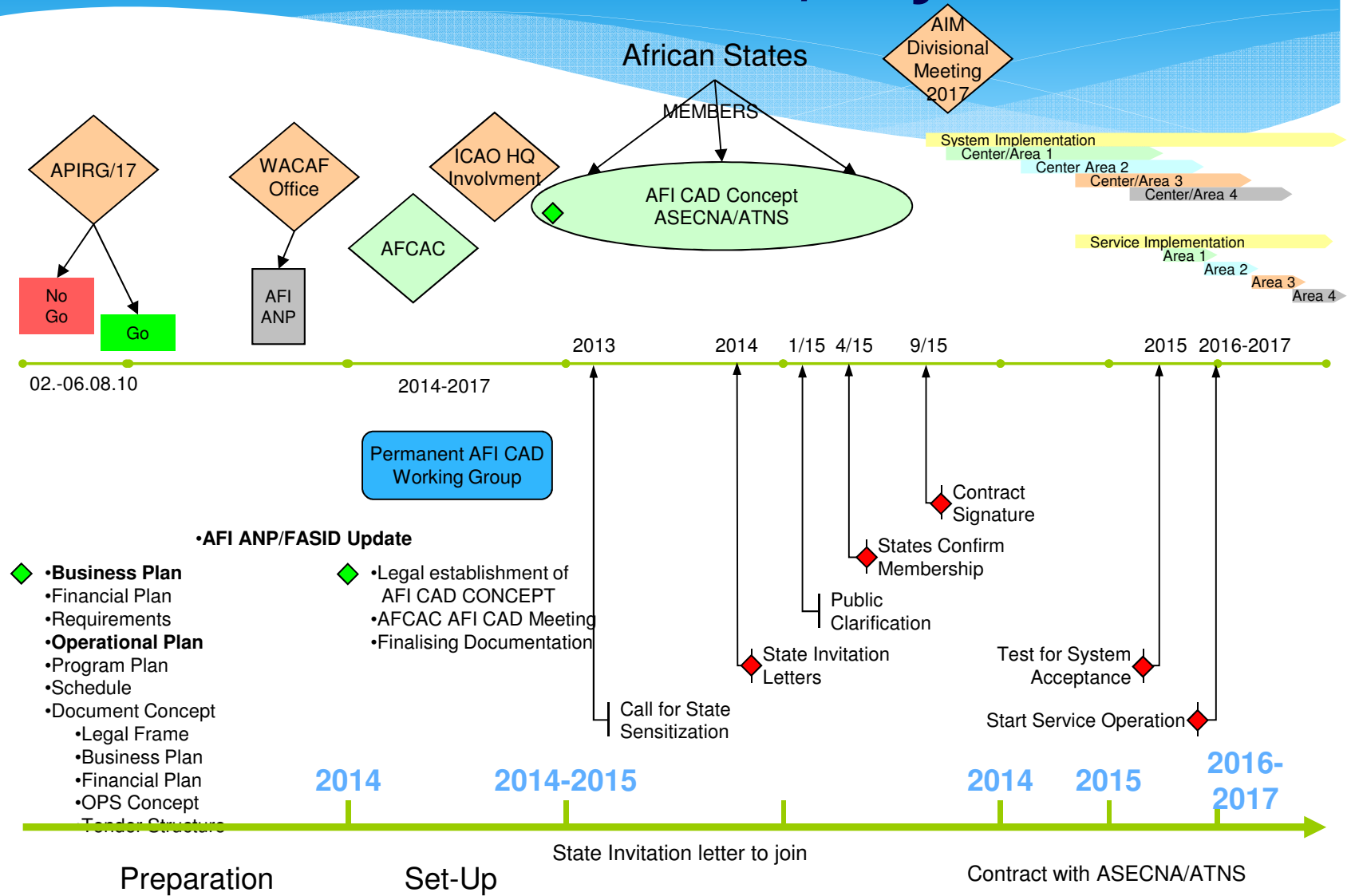


Business Plan - Annexes

- * (A) Requirements Specification for the whole Program
- * (B) AFI-CAD Guidance Material
- * (C) Process Model for realization
- * (D) Current cost questionnaire



Schedule -Timeline/Major Milestones

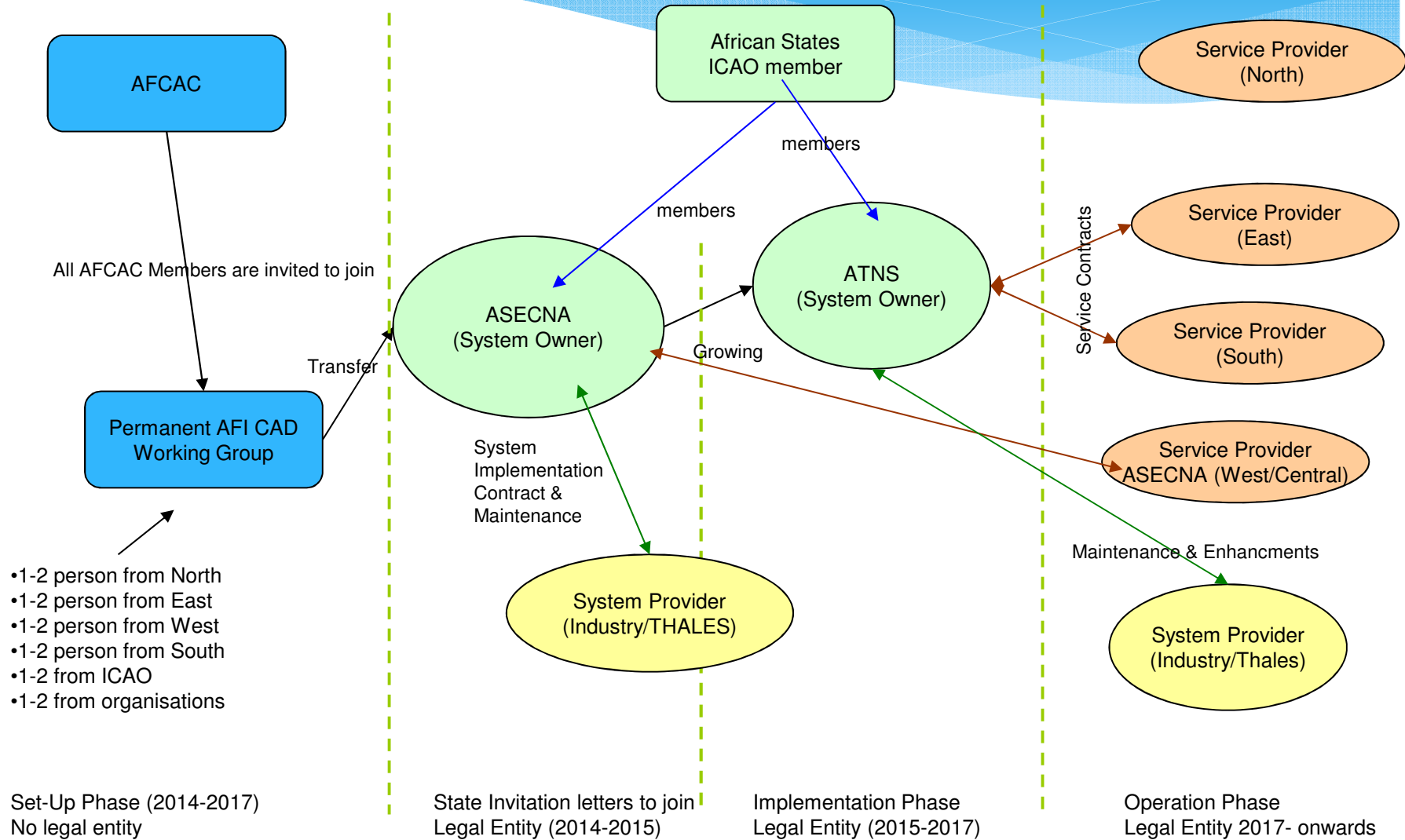


Next Steps – Suggestions

- * Action Plan
 - * Cost questionnaires consolidation
 - * Cost interviews
 - * Finalization of the Business Plan
 - * Finalization of the Financial Plan
- * Provide all material to ICAO TCB



Legal Framework Set-Up



Schedule – Timeline/Mayor

- * **APIRG/17 endorsed the AFI-CAD Business Plan as per Appendix 3.6 I of its report.**
- * **The AFI-ANP Section within the current draft Global GANP to be presented at the 12th A.N. Conference has been amended to include the services of the AFI-CAD concomitant with the EAD's inclusion in the European part of the GANP.**
- * **The legal framework of the Business Plan requires endorsement by the AFI DGCA's meeting with the entire Recommendations of the Guidance material to enable the required executive agreements concerning:**
 - **The selection of the location of databases**
 - **Sources of financing of the project as per the Business Plan or as recommended by the TCB to AFI DGCA's**
 - **The setting –up of the Permanent AFI-CAD Working Group.**



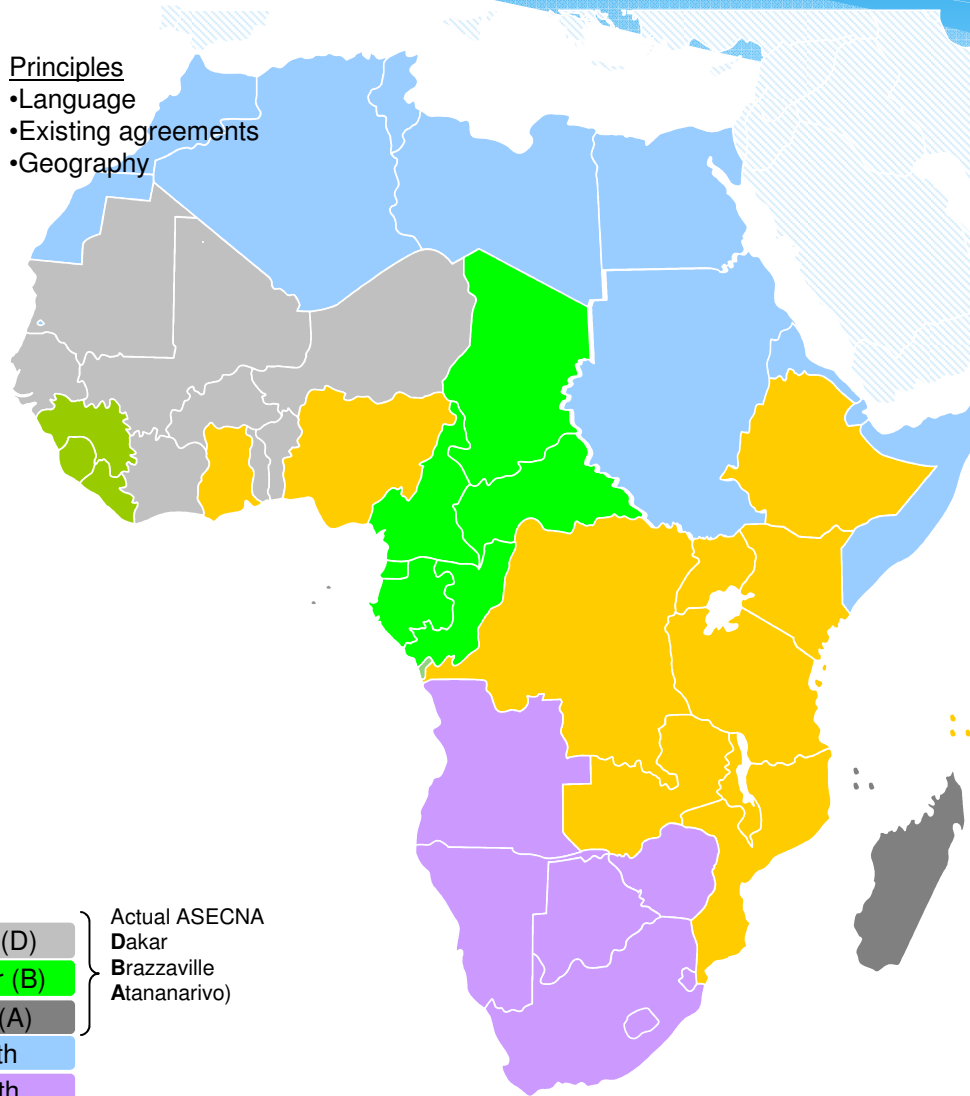
IMPLEMENTATION PROCESS

- * **The two fundamental decisions** regarding the Agency / Organisation to be entrusted with the development, establishment and the operations of the AFI-CAD bearing in mind that the Group EAD's experience with EAD, is prepared to provide consultation support to ICAO and the AFI-States in the development, establishment and the operation of the AFI-CAD
- * **The mayor milestones would then be:**
 - Systems implementation contract to be signed upon approval by the AFI-CAD Permanent Working Group in accordance with the legal framework/time schedule of the Business Plan.
 - Service provision contract to be signed in accordance with the legal framework / time schedule of the AFI-CAD Business Plan.



AFI-CAD Initial Regions

- Principles**
- Language
 - Existing agreements
 - Geography



- | | | |
|------|------------|---|
| DB 1 | West (D) | Actual ASECNA
Dakar
Brazzaville
Atananarivo) |
| | Center (B) | |
| | East (A) | |
| DB 2 | North | |
| DB 3 | South | |
| DB 4 | Center | Actual Roberts |
| | West (R) | |

1	Mauritania
2	Senegal
3	Gambia
4	Guinea Bissau
5	Mali
6	Coate d'Ivoire
7	Burkina Faso
8	Togo
9	Benin
10	Niger
11	Cameroon
12	Equatoria Guinea
13	Gabon
14	Congo
15	Central African Republic
16	Chad
17	Angola
18	Namibia
19	Botswana
20	Zimbabwe
21	Swaziland
22	Lesotho
23	South Africa

24	Guinea
25	Sierra Leone
26	Liberia
27	Ghana
28	Nigeria
29	Democratic Rep Congo
30	Uganda
31	Kenya
32	Ethiopia
33	Tanzania
34	Burundi
35	Malawi
36	Mozambique
37	Rwanda
38	Sychelles
39	Zambia
40	Comores
41	La Reunion *
42	Madagascar
43	Eritrea
44	Sudan
45	Egypt
46	Somalia

47	Tunesia
48	Algeria
49	Morocco *
50	Sahrawi
51	Lybia
52	Djibouti
53	Cape Verde



AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * APIRG Entrusting ASECNA and South Africa with development, establishment and operation of sub regional and regional AIS Database in accordance with the concept of the AFI-CAD Business Plan endorsed by the APIRG/17 Meeting and the ICAO Air Navigation commission .

*

AFI-CAD towards compliance ADQ Implementation Requirements of ICAO Annex 15 For States in the AFI Region

AFI-CAD GAP Analysis

- *
- * **The assessment considered:**

- * **The AFI-CAD System made up of a number of Components:**
- * **SDO;**
- * **INO;**
- * **PAMS;**
- * **AIP Tool;**
- * **Chart Tool.**

- *
- * **IT Provision;**

- *
- * **Service Provision:**
- * **Data Operations;**
- * **Help Desk.**

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * **AFI-CAD User Requirements**
- *
- * **AIXM 5.1**
- * ~ 50%: ECIT to be used for AIXM 5.1 input > 50%: own system
- * ~ 1/2: have 5.1 to 4.5 mapping
- *
- * **Metadata**
- * > 90%: support is requested
- * > 90%: ISO compliant
- * > 50%: for Data Users
- * > 75%: EAD to support the provision
- *
- * **Data Origin**
- * > 50%: No support is requested
- * > 85%: EAD timeline will support the process

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * **AFI-CAD Ad-hoc Study Group**
- *
- * Recommendations
- *
- * Statement of Compliance [for the system]
- *
- * Full compliance to the globally recognised standard [AIXM 5.1]
- *
- * Transition for full compliance to be planned and agreed by AFI-CAD stakeholders
- *
- *

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

* **EAD Ad-hoc Study Group
SESISC**

*

* **Recommendations**

*

* **Statement of Compliance [for the system]**

*

* **Full compliance to the globally recognised standard [AIXM 5.1]**

*

* **Transition for full compliance to be planned and agreed by EAD stakeholders**

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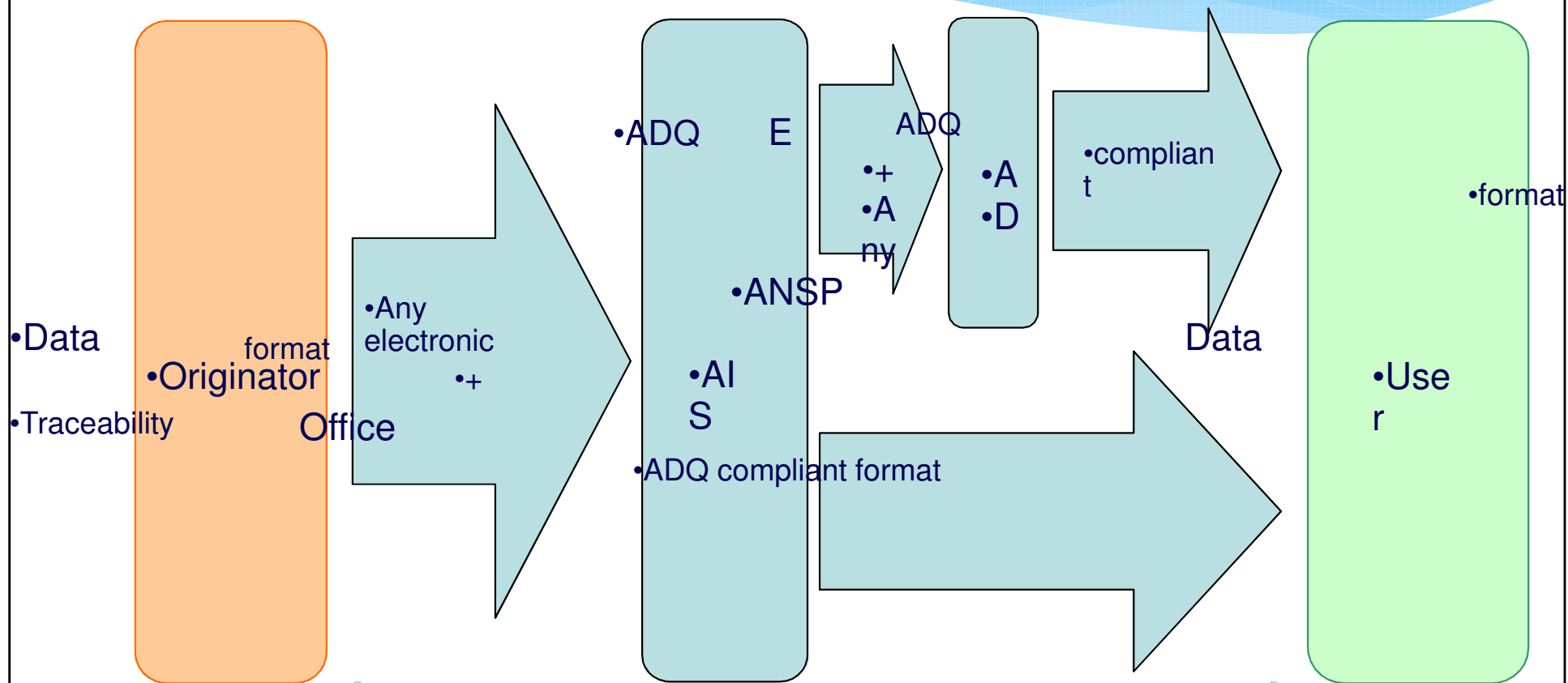
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•ADQ technical requirements



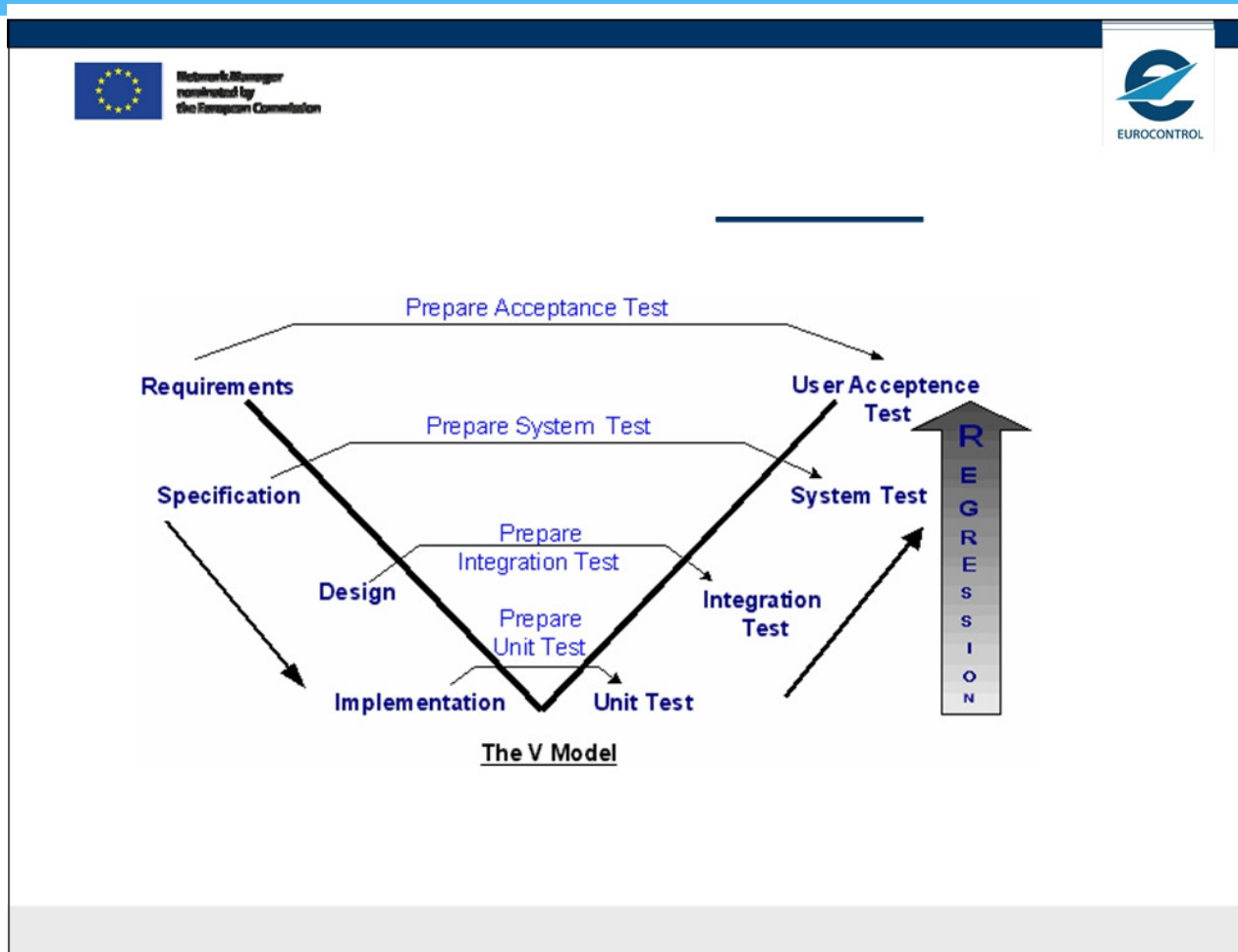
Network Manager
 established by
 the European Commission



•EAD Business scope = current SDO + any extension requested by ANSP/AIS



AFI-CAD towards compliance ADQ Implementation Requirements of ICAO Annex 15 For States in the AFI Region



Network Manager
mandated by
the European Commission



AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * Compliance
 - * Requirements engineering ✓
 - Specification ✓
 - * Design ✓
 - * Implementation ✓
 - Unit test ✓
 - * Integration test ✓
 - System test ✓
 - * Assessment and verification ✓
 - *
 - * Full traceability from requirement to test result ✓
 - * Traceability from identified and documented error to requirement implementation is ongoing
 - * Full ED153 / SWAL3 compliance of the EAD software development process

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * Training
- * Staff must be made duly aware of requirements laid down in 73/2010
Requirement has been addressed
- *
- * Training is scheduled
- * Compliance
- *
- * Gradually during 2013/2014
- *
- * Full compliance Summer 2014

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * Certification
- * Statement of Compliance
- * Referring to DSU per Subsystem
- *
- * Technical file containing
- * Mapping
- * Regulation Specification Requirement Manual
- *
- * Quality Management ✓
- * Plans Standards Monitoring Supplier
- *
- * Safety Management ✓
- * Contingency Procedures ✓
Test Management ✓

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

- * Compliance

- *

- *

- * Certification of software DoS / DoC

- *

- *

AFI-CAD towards compliance
ADQ Implementation Requirements of ICAO Annex 15
For States in the AFI Region

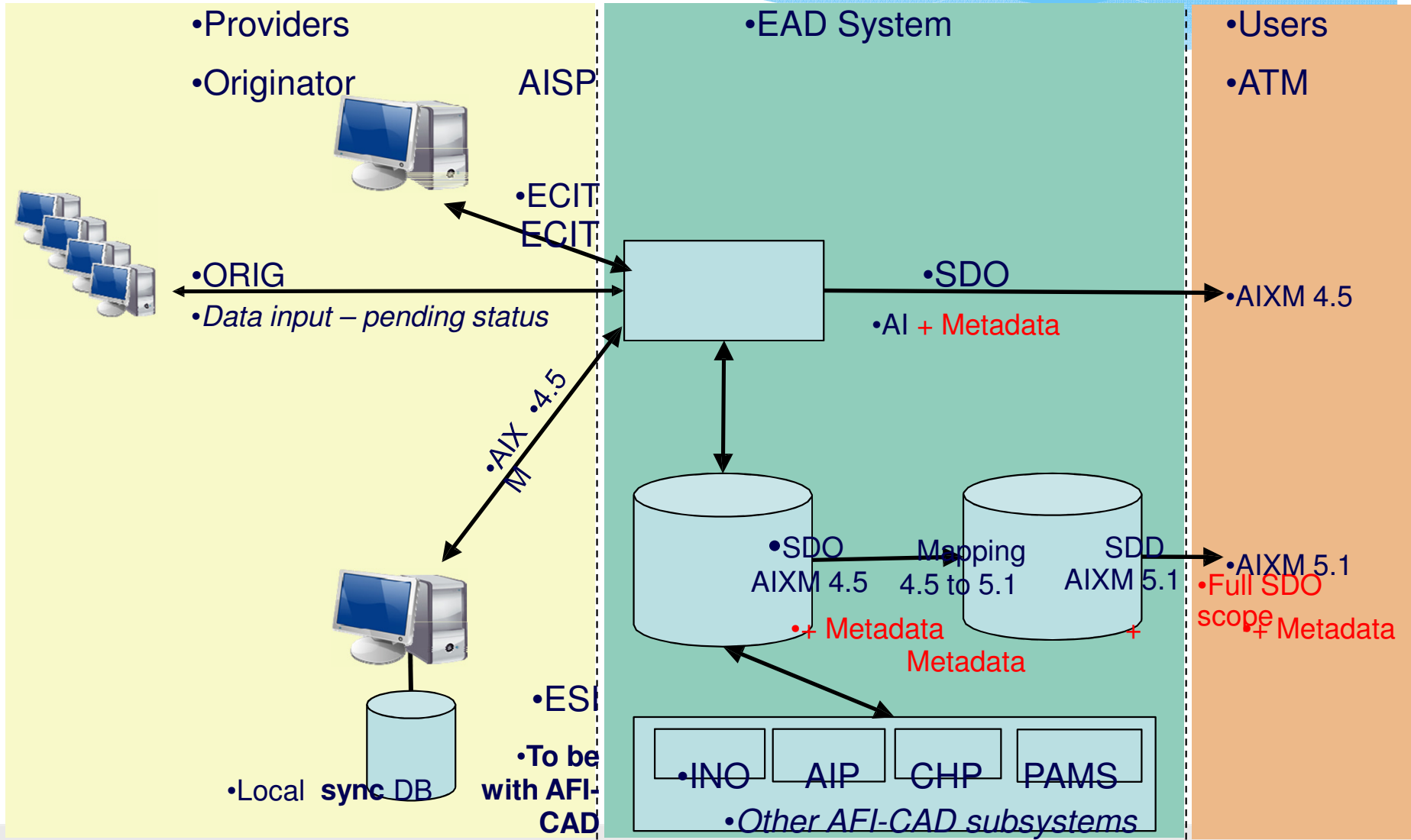
- * ADQ - Data Set and Data Exchange Requirements
- *
- * Assumption is that EAD must support:
- *
- * Metadata Input/Output
- * Input/Output of Static data in AIXM 5.1 format Direct input by Data Originators
- *
- * Data set scope => full IAIP



Network Manager
nominated by
the European Commission

•AFI-CAD system evolution - Step 1

•Originator + Input Metadata + AIXM 5.1 output

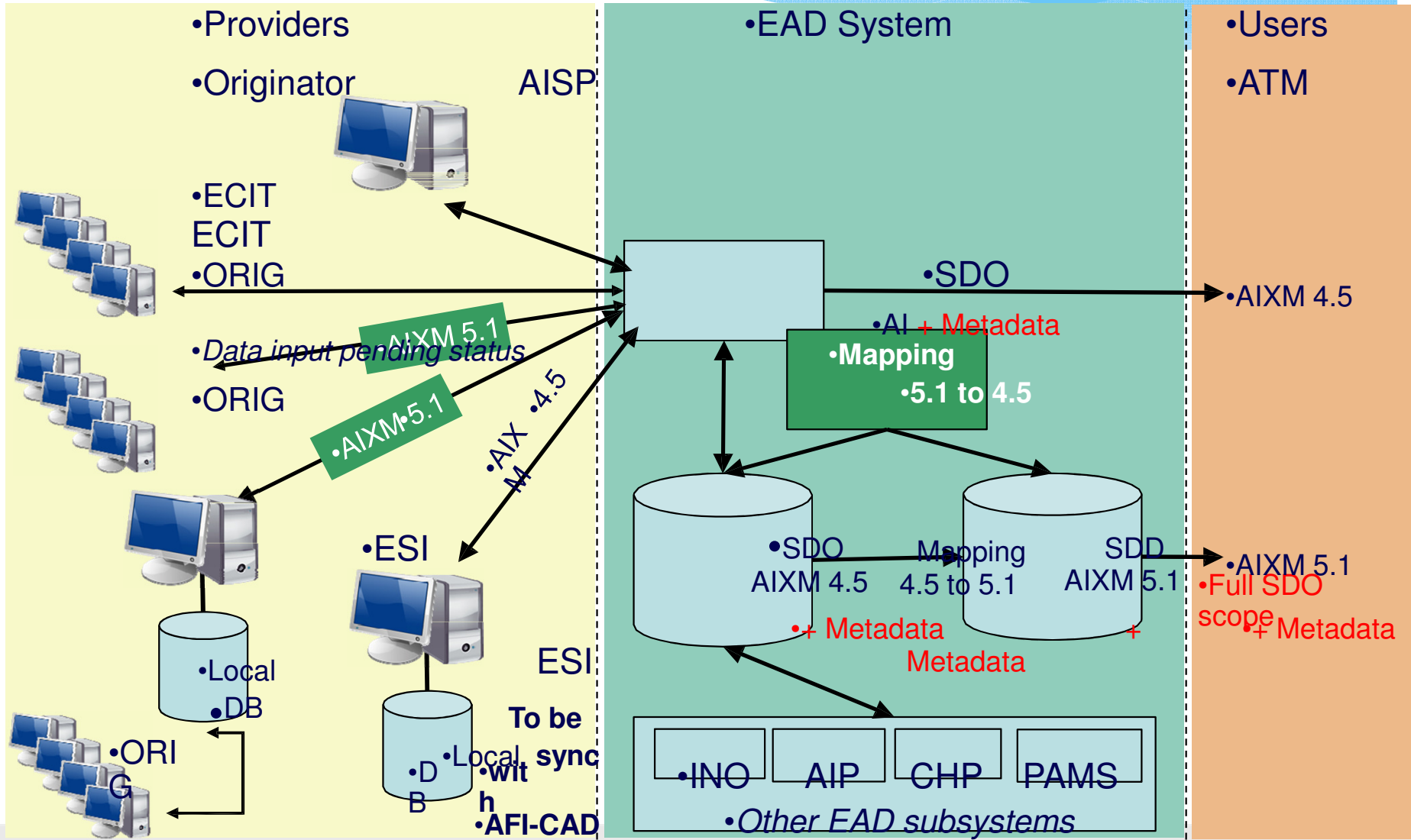




Network Manager
nominated by
the European Commission

•AFI-CAD system evolution - Step 2

•Step 1 + AIXM 5.1 input from local DB



AFI-CAD technical requirements

* AFI-CAD technical requirements

*

*

* Complexity on technical level as AFI-CAD allows clients to connect and exchange data via different types of interface that can even be combined

* ECIT AFI-CAD Terminal connected to the AFI-CAD system (no need for a local DB)

* ESI System to system connection in order to synchronised local DB with AFI-CAD DB IFS Manual exchange of data file based on file system (Drop)
ESI + ECIT

* IFS + ECIT

IFS + ESI

* IFS + ESI + ECIT

* In addition EAD shall be able to manage in parallel different types of format

* AIXM 3.x, AIXM 4.5, AIXM 5.1

* ARINC

* Clients are migrating to new format not at the same time. Strongly depending on selected interface or interface combination

* Necessity to support ESI clients using AIXM 4.5 format until all have migrated to AIXM 5.1.

AFI-CAD Service requirements

- * **AFI-CAD Service requirements**

- * Consistency, timeliness, performance

- * ☐ Training is planned

- * ☐ Full conformity until 2017

- *

- * Security management

- * ☐ Update of the existing AFI-CAD Service QMS ☐ Full conformity until 2017

- *

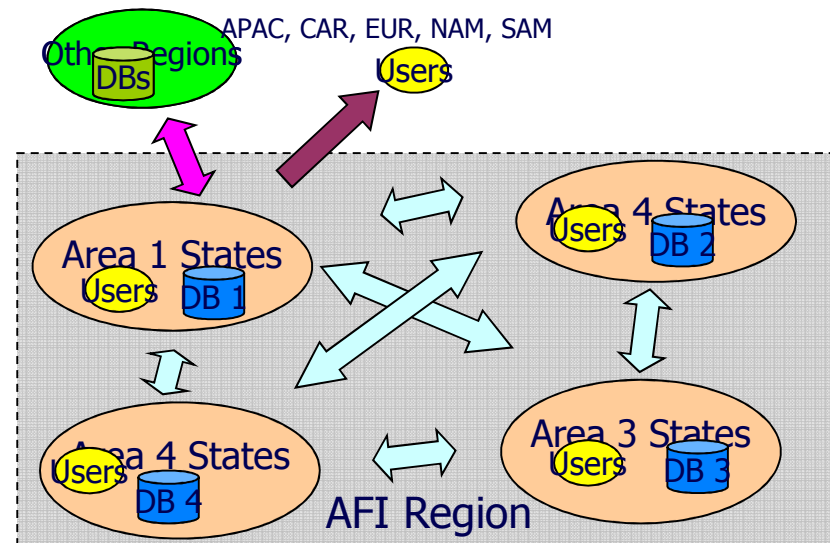
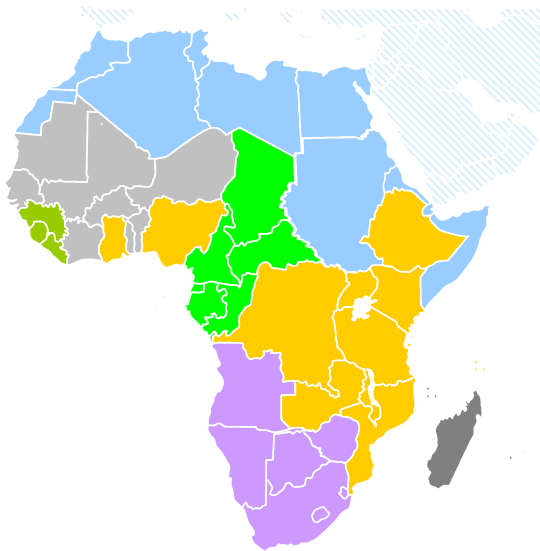
- * Additional requirements

- * ☐ Upgrade infrastructure

- * ☐ Full conformity until 2014/7

Vision

- * 4 AIS/AIM Databases across the AFI Region where consistent and high quality aeronautical data of the Region will be made available to airspace users and others



CONCLUSIONS

1. Just like the EAD, the concept of the AFI-CAD when implemented will offer all AIM related tasks including even the classic AIM Services to reduce the ANSPs effort and timelines needed by the States on their way to the AIS/AIM transition process.
2. The AFI States are facing a lot of challenging tasks in the AIS/AIM Transition process and it is anticipated that implementation of the AFI-CAD would provide the following solutions :
 - Support to the e-AIP Production
 - Support to the charting production
 - Other tailor made solutions taking into account the necessities of States



CONCLUSIONS (2)

- EAD has agreed to provide AFI-CAD with its training modules to support the eventual training of the AFI-States migrating to the AFI-CAD.
- This will enable the AFI-CAD to develop and maintain yearly training programs similar to the EAD training program to facilitate the training of AFI States in the AIS/AIM transition process.
- Noting that Groupe EAD is comited to share its knowledge to support the implementation of the AFI-CAD project, the AFI-CAD Study Group agreed on « not re-inventing the wheel » in the transition process by going for an EAD similar model adopted to the realities of the AFI Region in order to save time and resources.
- Full compatibility foreseen with the European model to exchange aeronautical data.

3. Finally:

- . EUROCONTROL confirms its support to this African initiative.
- . The Groupe EAD is prepared to provide consulting support to the AFI CAD implementation process.



CONCLUSIONS (3)

- * **Conclusion**
- * ADQ is a challenge for AFI-CAD
Changes are in progress
- *
- * ? Processes
- * ? System
- * ? Service
- *
- * Full support of compliance can be achieved by mid 2017
- *