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Regional Workshop on SSR Mode S II Code and 24 Bits

Addresses assignment

Accra, Ghana, 24-27 October 2023

Module 3: Initiatives for Surveillance Data Sharing
in the airspace of the Gulf of Guinea



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Harvey Gabriel LEKAMISY
Regional Officer CNS ICAO
ESAF



Headlines

- I. Operational Requirements
- II. Regional initiatives
- III. Challenges and constraints
- IV. Expected benefits





Objectives of the Module

Based on the overlapping Desirable Operation Coverages (DOCs) SSR Mode S stations and the opportunities provided by SSR Mode S Signal sharing:



- Inform participant on the on going initiatives for surveillance data sharing in the Gulf of Guinea
- Harmonize best practices in Mode S stations implementation

At the end of the Module, the participants will be able to demonstrate the benefit expected in SSR Mode S data sharing amongst States/ANSPs





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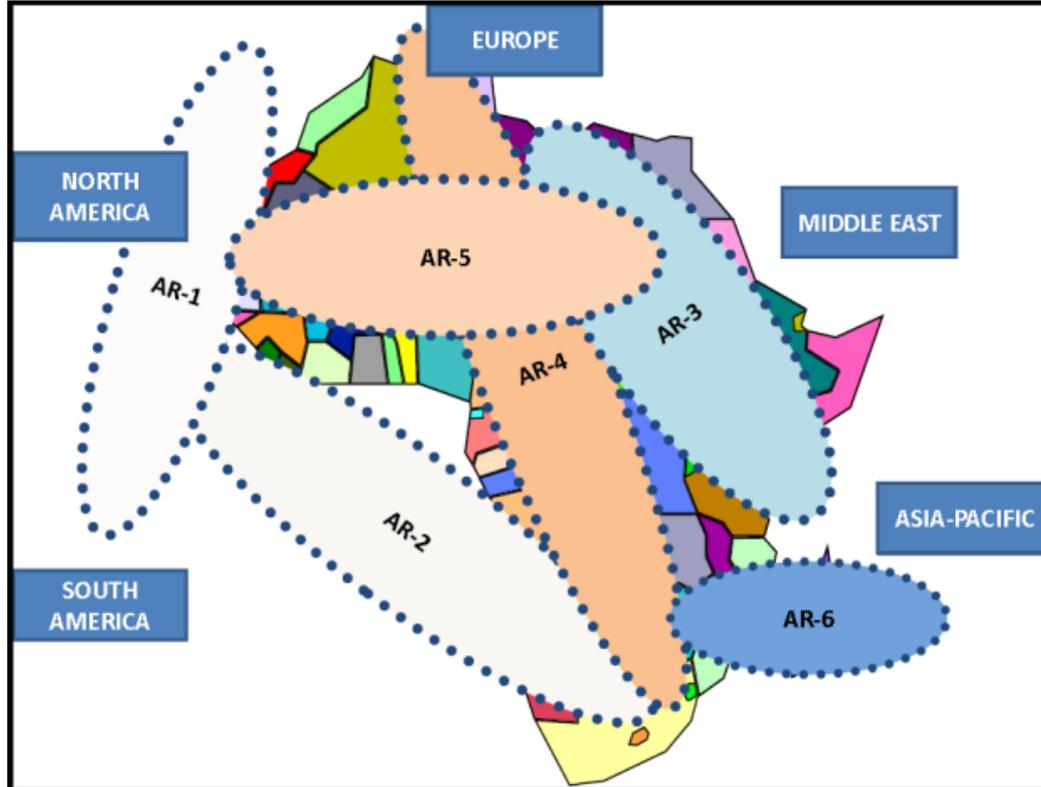
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Operational Requirements



ATM HOMOGENEOUS AREAS IN THE ICAO AFI REGION





ATM Homogeneous Areas in AFI Region

| Areas of routing (AR) | Traffic Flows | Areas involved | Type of area covered | Remarks |
|---|---|---|---|--|
| Africa-Indian Ocean (AFI) Region | | | | |
| AR1 | Europe — South America (EUR/SAM) (oceanic) | Atlantico ¹ , Canarias, Casablanca, Dakar Oceanic, Recife, Sal Oceanic | Oceanic en route low density in southern part and oceanic high density in northern part | Major traffic flow EUR/SAM |
| AR2 | Atlantic Ocean interface between the AFI, NAT and SAM Regions | Accra, Dakar, Johannesburg, Luanda, Sal | Oceanic en route low density | Homogeneous ATM area AFI/NAT/SAM |
| AR3 | Europe — Eastern Africa routes including the area of the Indian Ocean | Addis Ababa, Antananarivo, Asmara, Cairo, Dar es-Salaam, Entebbe, Khartoum, Mauritius, Mogadishu, Nairobi, Seychelles, Tripoli | Continental en route/ oceanic low density | Major traffic flow AFI/EUR |
| AR4 | Europe to Southern Africa | Algiers, Beira, Brazzaville, Cape Town, Gaborone, Harare, Johannesburg, Kano, Kinshasa, Lilongwe, Luanda, Lusaka, N'Djamena, Niamey, Tripoli, Tunis, Windhoek | Continental en route low density | Major traffic flow AFI/EUR |
| AR5 | Continental Western Africa including coastal areas | Accra, Addis Ababa, Brazzaville, Dakar, Dar-es-Salaam, Entebbe, Kano, Khartoum, Kinshasa, Nairobi, Ndjamen, Niamey, Roberts | Continental/oceanic low density | Homogeneous area AFI (this is a growing traffic, developing into major traffic flow) |
| AR6 | Trans-Indian | Antananarivo, Bombay ¹ , Johannesburg Male ¹ , Mauritius, Melbourne ¹ , Seychelles | Oceanic high density | Homogeneous ATM area AFI/ASIA |



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Regional Initiatives



- **Taking benefit on AFI States commitment on Safety**
 - **APIRG Conclusion 16/31: Collective approach for the Management of CNS/ATM system elements**
- **APIRG Conclusion 19/39: Development of integrated programmes based on major ATM Routing Areas and Air Traffic Flow**
- **Taking benefit on Existing mature implemented services and facilities (AFI VSAT Communication, infrastructure, SSRs and ADS-C/CPDLC, AMHS, RVSM, PBN programme)**





Workshop on the Interconnection of Aeronautical Surveillance Systems
Dakar, 14 – 16 April 2014

- **Identification of existing surveillance technologies in Area of Routing 5 (AR-5)**
- **Identification of opportunities for the interconnection of surveillance systems in the AFI Region (example for Areas of Routing 5 (AR-5) & 6)**
- **Tentative planning for surveillance Data Sharing**





Coordination Meeting on the implementation of AIDC and Surveillance Data Sharing

Lomé, Togo, 27-29 April 2016

- Identified/Confirmed Surveillance Coverage (SSR Mode S & ADS-B);
- Decided to share Surveillance Data via point to point SATCOM links in priority and assess on case by case basis any other solution;
- Agreed on the principle of a project to be tailored in order to implement surveillance data sharing on a step by step basis with periodic assessment;
- Decide for a short term trials exercise that should be conducted by 31 December 2016.





Coordination Meeting on the implementation of AIDC and Surveillance Data Sharing

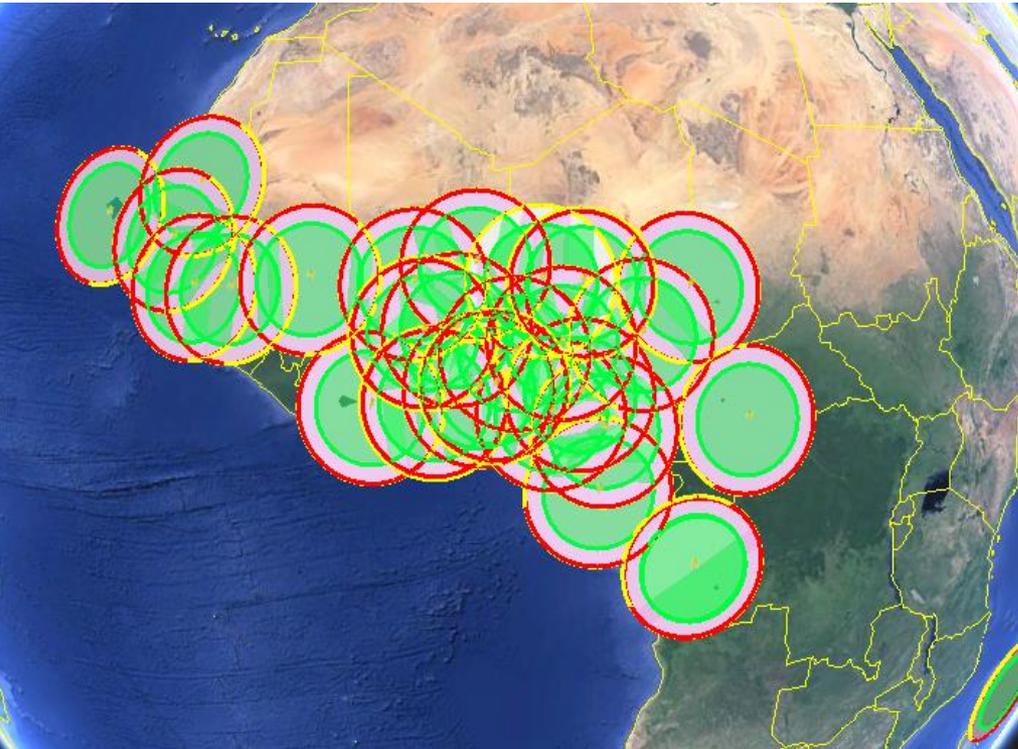
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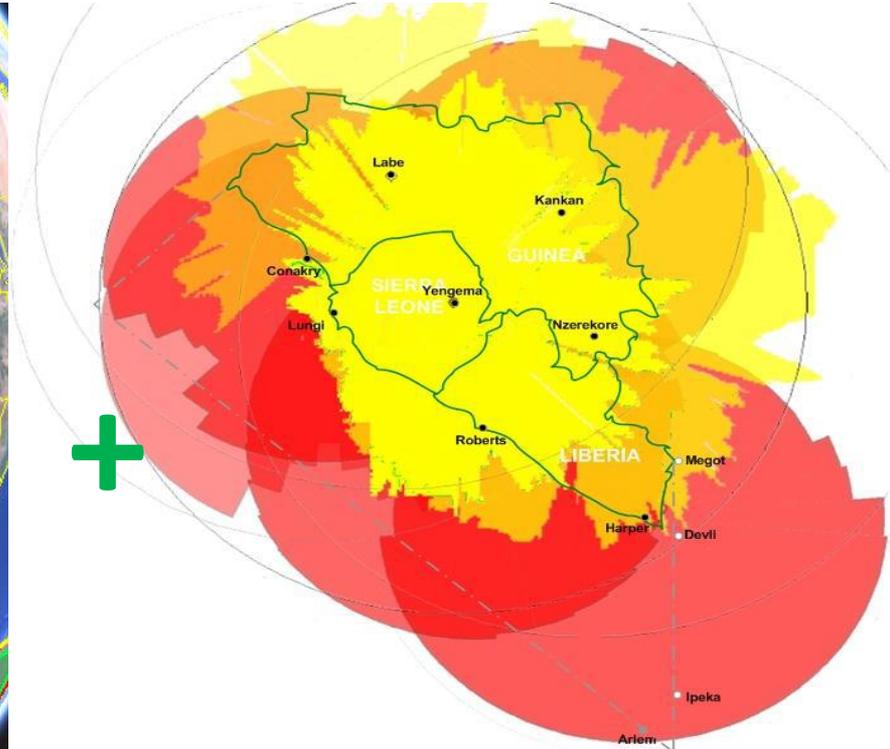




SSR Coverage ASECNA , ASA, GCAA NAMA

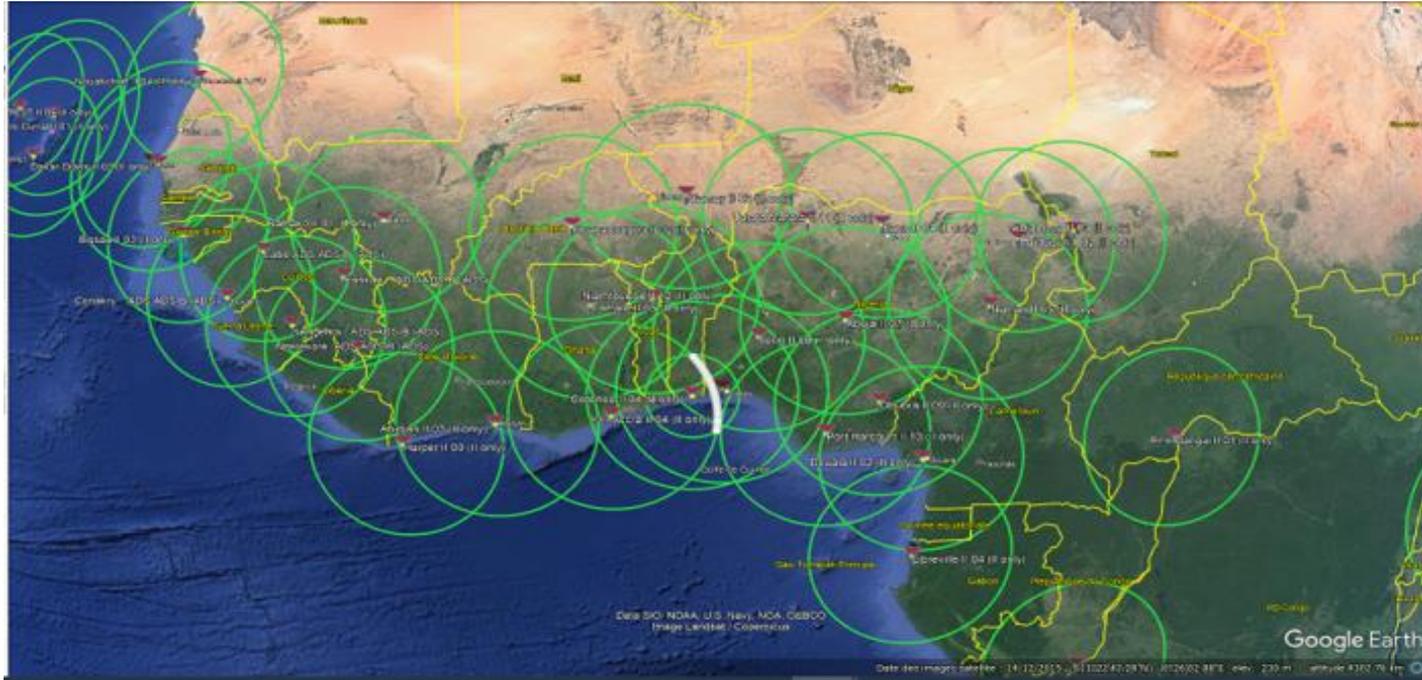


ADS-B Coverage Robert FIR



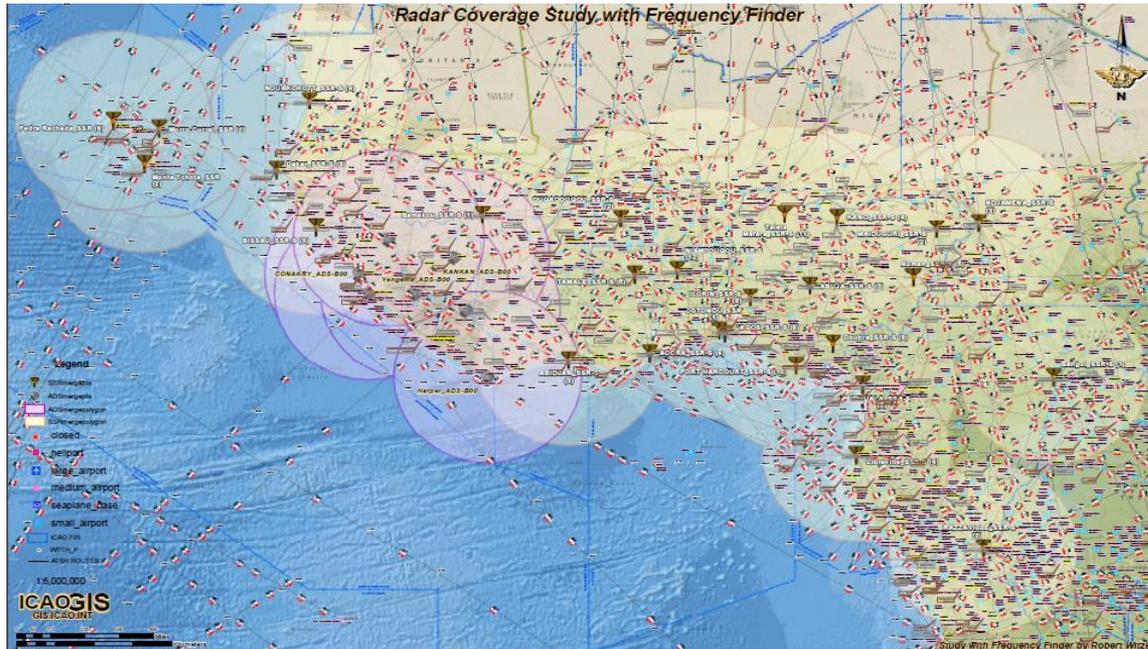


Full SSR Coverage over the air space of Gulf of Guinea





Full SSR & ADS-B Coverage over the air space of Gulf of Guinea





Challenges and Constraints



Building One sky to provide a seamless ANS

Context

- Air Transport : key stakeholder in a huge continent
- Air Transport in Africa: **3-5%** of the Global Market
- For next two decades
 - Annual Growth estimated trend: **5,9%** Vs **4%** for Global growth
 - **125** Millions PAXs to **377** Millions PAXs
- Air Transport based on Safety of life

Challenges

- Need for Efficient and cost effective utilization of airspace
- Weakness of internal industry
- Various national purchasing processes
- Threat of emerging technologies on Civil Aviation system (spectrum, cyber security)





Building One sky to provide a seamless ANS

Currently: Good pace of implementation of SSRs, ADS-C/CPDLC

- Lack of harmonization of implementation plans and projects
- Lack of interconnectivity and data sharing
- **Challenge: How to insure seamless surveillance function along A-R?**
- **Awaited requirements from ATM: Separation minima criteria along A-Rs**





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- **APIRG Conclusion 19/39: Development of integrated programmes based on major ATM Routing Areas and Air Traffic Flow**
- **Taking benefit on Existing mature implemented services and facilities (AFI VSAT Communication, infrastructure, SSRs and ADS-C/CPDLC, AMHS, RVSM, PBN programme)**
- **SNMC Conclusions/Decisions**





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Expected Benefits





Safety

- Detection and mitigation of risk of conflict
- Easier coordination between ATCs
- Contingency capability

Capacity

- Reduction of minima of
- Flexible tracking (CCO, CDO, PBN)
 - ✓ *Adequate planning*
 - ✓ *Increased capacity of ATCs*





Efficiency

- **Regularity**
- **ATFM**
- **Preferred users routes (FLS/Trajectories)**
- **Regular/continuous surveillance capability**



Environment

- **Reduced fuel consumption & CO2 Emission**
- **Reduction of noise**



Economic impact/Cost effectiveness

- Reduced additional investment
- Reduced operations costs for stakeholders
- Reduced Maintenance costs
- Reduced Fuel quantity and cost
- Increase income for ANSPs





Institutional

- **Sub Regional Integration**
- **Sharing of Best Practices**
- **Enabling and empowering Capacities**





François-Xavier SALAMBANGA
 Regional Officer CNS, ICAO, WACAF Office
 Tel Direct : +221 33 869 24 15
 E-mail : fsalambanga@icao.int
 Route de l'Aéroport, Aéroport International Leopold Sedar Senghor
 Bp : 2356 Dakar -Yoff, Senegal



THANK YOU!

