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THIRTEENTH AIR NAVIGATION CONFERENCE

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COMMITTEE A

Agenda Item 4: Implementing the global air navigation system and the role of planning and implementation regional groups (PIRGs)
4.3: Implementing ASBUs for performance improvement

IMPLEMENTATION OF ATS SURVEILLANCE INFRASTRUCTURE ON THE AFRICAN CONTINENT

(Presented by the Agency for Air Navigation Safety in Africa and Madagascar (ASECNA) on behalf of its Member States[2])

EXECUTIVE SUMMARY

This paper highlights the progress made by African States in terms of implementation of air traffic services (ATS) surveillance infrastructure to support air navigation safety, as well as the opportunity to improve air navigation services within the Africa-Indian Ocean (AFI) region through surveillance data sharing, in cooperation with the neighbouring air navigation services providers (ANSPs).

It also highlights the challenge of aircraft equipage with automatic dependent surveillance — broadcast (ADS-B) transponder in the AFI region in terms of the retrofit of operating aircrafts even with the existence of mandatory regulation in the US and in the EU, and proposes a regional approach with the support of ICAO.

Action: The Conference is invited to:

a) take note of the efforts provided by African States to extend and improve the surveillance services within the air spaces;
b) encourage Contracting States and organizations to continue cooperation based on surveillance data sharing to improve safety and efficiency in air traffic management; and
c) encourage Contracting States, organizations, and aircraft operators, to adopt a regional approach in the AFI region with the support of ICAO regional bodies, including an ADS-B mandate in a collaborative decision making (CDM) process, to enable all stakeholders to benefit from operational improvements expected from the implementing of ADS-B infrastructures.

[1] English and French versions provided by ASECNA.

[2] Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Equatorial Guinea, France, Gabon, Guinea-Bissau, Madagascar, Mali, Mauritania, Niger, Senegal, Togo

1. INTRODUCTION

1.1 The efficient provision of air navigation services in the Africa-Indian Ocean (AFI) region requires reliable, available and integrated communication, navigation and surveillance systems. In this regard, African States and air navigation services providers (ANSPs) continuously take the necessary actions to develop and implement communications, navigation, and surveillance (CNS) plans, in line with the *Global Air Navigation Plan (*GANP, Doc 9750), the AFI air navigation plan and the AFI strategy to support the safe provision of the air navigation service.

1.2 The continuous air traffic growth requires more flexibility in air traffic Control operation and improved efficiency and call for the implementation of robust surveillance systems which will ensure flexible use of airspaces, by airlines, and the improvement of safety.

1.3 In this regard, the current radar surveillance coverage contributes efficiently to support the provision of air navigation services and additional ongoing projects will provide opportunities, through surveillance data sharing, to reinforce air navigation safety in the AFI region.

1.4 In addition, according to the GANP and the AFI surveillance strategy plan adopted by the AFI States, automatic dependent surveillance – broadcast (ADS-B) systems including space- based ADS-B infrastructure are under rapid development across the continent to extend and reinforce the surveillance coverage.

2. DISCUSSION

Regional cooperation in terms of surveillance improvement

2.1 Several stakeholders have also deployed surveillance systems, mostly radars, resulting in some kind of saturation of surveillance data and huge coverage overlaps across states and neighboring flight information regions (FIRs). States/Organization may take advantage from this current and coming surveillance infrastructure by collaborating and sharing surveillance data with one another to enhance the surveillance coverage in the AFI region.

Cooperation in the Indian ocean region

2.2 ASECNA in cooperation with neighboring ANSPs in Indian Ocean, namely the Seychelles Civil Aviation Authority (SCAA) and the Direction Générale de l'Aviation Civile (DGCA) France for La Reunion, carried out some trials related to the implementation and the sharing of ADS-B data in this Ocean Indian region. The results need to be consolidated.

Cooperation in the Gulf of Guinea

2.3 Within the framework of the implementation of the AFI air navigation plan, the Ghana Civil Aviation Authority (GCAA) and the Nigerian Airspace Management Agency (NAMA) also developed and implemented programmes for ATS and installed Secondary Surveillance Radars (SSRs) compatible Mode S with processing systems with ADS-C and CPDLC capability whereas ROBERTS FIR has an important ADS-B implementation programme.

2.4 A technical meeting between ASECNA, GCAA, NAMA and Roberts FIR, under the coordination of ICAO Western and Central African Office, Dakar (WACAF) Regional office, was held from 27 April to 4 May 2016, and allowed the stakeholders to agree on surveillance data sharing programmes, including the ATS interfacility data communications (AIDC), in order to enhance the surveillance within their airspace. The commitment of the involved ANSPs and the framework of this data sharing, are to be formalized through the signature of Memorandum of Cooperation (MoC).

2.5 On 6 April 6 2018, during the coordination meeting held at ASECNA Headquarters in Dakar, Senegal, the Board of the AFI Satellite Network Management Committee (SNMC), composed of ASECNA, GCAA, NAMA and Roberts FIR, signed the Memorandum of Cooperation (MoC) with the option of pooling expertise and conducting implementing together some projects of common interests.

Cooperation with the other regions

2.6 Some opportunities of surveillance data sharing between ASECNA centers and other neighboring FIR (Casablanca, Algiers, Sudan…) already exist and ASECNA calls for coordination with these ANSPs in order to agree on surveillance data sharing mechanisms.

Evolution of ADS-B implementation of in the AFI region

2.7 According to the GANP and the AFI surveillance strategy, ADS-B will be one of the key surveillance means in the coming decade in the AF region. That technology provides operational benefits in terms of safety and capacity improvement and it is cost effective. Furthermore, space-based ADS-B, which is being developed by the industry, will address the challenge of providing surveillance services in the oceanic or remote continental airspace.

2.8 Several ground-based ADS-B implementation programmes are completed or ongoing in the following States in the AFI region, but not limited to: Ethiopia, Réunion, Seychelles, Mauritania, Morocco, Democratic Republic of Congo (DRC), Tanzania, Roberts FIR including: Guinea, Sierra Leone and Liberia, Sudan, Namibia, Kenya, and seventeen African Member States of ASECNA.

2.9 With regard to the development on going related to ADS-B, and potential safety, capital cost and operational cost, most of AFI ANSPs consider that this technology could improve significantly, the air navigation services provision over oceanic and remote continental airspace.

2.10 In January 2018, ASECNA and AIREON entered into an agreement to scope and implement the use of data services by ASECNA in four phases. ASECNA is already receiving the space-based ADS-B data for monitoring, testing and trials via a VPN connection to AIREON system, while waiting for the implementation of the MPLS line and the Service Delivery Point (SDP) ongoing,

2.11 Some African States/ANSPs are also involved in the planning or implementation of ADS-B satellite based in the near future.

2.12 That initiative taken by ANSPs needs to be accompanied by the aircraft equipage with ADS-B transponder.

2.13 Some region in the world including the US and the EU have adopted mandatory regulation for ADS-B transponder carriage and operation by January and June 2020. The new aircraft

being already equipped since June 2016. Nevertheless, these mandates will obviously not address the issue for the retrofit of aircraft that are registered in African States.

2.14 In order to facilitate harmonized implementation of infrastructure that support seamlessness in the provision of air traffic management and realization of associated benefits by all stakeholders, while avoiding unnecessary duplication of investments on the ground and in the air, Conclusion 21/33 adopted by the AFI Planning and Implementation Regional Group (APIRG/21) urged AFI States to:

a) apply the principles of collaborative decision making that include users at early stages when planning investments into surveillance infrastructure (SSR, ground-based ADS-B, space-based ADS-B, and multilateration);

b) follow the guidelines in the ICAO Circular 326 when implementing surveillance technology while ensuring economic transparency in accordance with ICAO principles of cost-relatedness as per ICAO Doc 9082 and Doc 9161; and

c) avoid the imposition of mandates on a State by State or FIR by FIR basis.

2.15 Therefore, there is a need for the AFI region to address this issue with a regional approach in order to guarantee harmonization and take the maximum benefit of ADS-B implementation.

3. CONCLUSION

3.1 ATS surveillance systems deployed by the various ANSPs in Africa, namely in the Gulf of Guinea (ASECNA, GCAA NAMA, and Roberts) offer an opportunity to achieve a continuity of ATS surveillance service in that sub region by sharing surveillance data, and also implement a seamless airspace.

3.2 The entities concerned are invited to cooperate and implement the surveillance data sharing among them, which constitutes a tangible example of integration of the systems at the regional level in line with the commitments made by APIRG and supported by ICAO.

3.3 The ongoing ADS-B programme deployment in the AFI region needs to be accompanied by the retrofit of aircrafts that cannot be addressed by the mandates adopted by the US and the EU.

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