

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 1: Introduction and assessment of a global air traffic management (ATM) operational concept

**1.4 The role of airborne collision avoidance systems (ACAS) technologies
:**

IMPLEMENTATION OF AIRBORNE COLLISION AVOIDANCE SYSTEM II (ACAS II) IN THE AFRICA-INDIAN OCEAN (AFI) REGION

(Presented by African States¹)

SUMMARY

The paper examines the status of implementation of ACAS II in the AFI Region. It highlights the difficulties encountered in the process and urges ICAO to take measures to remedy the situation.

Action by the conference is in paragraph 5.

* French version provided by African States.

¹ Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cap Verde, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libyan Arab Jamahiriya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe

1. INTRODUCTION

1.1 The African airspace and airports have been consistently criticised for lacking in basic safety enhancement infrastructure. The major areas include non-provision of ATC service to en-route traffic, non-coordination of traffic traversing contiguous flight information regions, inadequate search and rescue facilities and failure to disseminate operationally significant meteorological and aeronautical information.

1.2 These have arisen from the inability of air navigation service providers to provide facilities and services specified in the Africa-Indian Ocean Air Navigation Plan. The underlying reason is mainly funding and, to some extent, inadequate level of expertise to implement these provisions.

1.3 The AFI Planning and Implementation Regional Group (APIRG) has for many years devoted attention to the elimination of deficiencies identified in the air navigation field in the region. Tremendous improvements have been witnessed arising from the activities of the planning group and the follow-up actions of the regional offices of ICAO. Many ATS routes are now provided with ATC service, ATS/DS circuits are implemented and dissemination of aeronautical and meteorological information has improved.

1.4 The implementation of VSATs including the AFISNET, CAFSAT and SADC networks has enabled the provision of these telecommunications-based services.

1.5 The global aviation community through ICAO continues to express concerns about safety issues. The implementation of safety tools on the ground for air traffic controllers (such as Short Term Conflict Alert, Area Proximity Warning) and for pilots (such as collision avoidance system) is now a regional requirement.

1.6 The ICAO Universal Safety Oversight Audit Programme (USOAP) has been extended to Air Traffic Services and Aerodromes.

2. IMPLEMENTATION OF ACAS II

2.1 ***ICAO Annex 6 — Operation of Aircraft — Part 1 — International Commercial Air Transport — Aeroplanes, Chapter 6, paragraph 6.18 — Aeroplanes required to be equipped with airborne collision avoidance system (ACAS II) reads:***

From 1 January 2003, all turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 15 000 kg or authorized to carry more than 30 passengers shall be equipped with an airborne collision avoidance system (ACAS II).

From 1 January 2005, all turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II).

Recommendation.— *all aeroplanes should be equipped with an airborne collision avoidance system (ACAS II)*

An airborne collision avoidance system shall operate in accordance with the relevant provisions of Annex 10, Volume IV.

2.2 Chapter 6, paragraph 6.19. — Aeroplanes required to be equipped with pressure — altitude reporting transponder:

All aeroplanes shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV.

Note.—This provision is intended to improve the effectiveness of air traffic services as well as airborne collision avoidance systems.

2.3 It is generally agreed that ACAS II provides a last resort safety net designed to prevent mid-air collisions between aircraft though there are still problems associated with the system such as 1 000 ft level-off encounters.

2.4 The system limitations and inhibits demand that ACAS has to complement decision-making support tools for ground-based air traffic control functions such as conflict detection and resolution, automatic reminders, non-conformance warnings etc.

3. STATUS OF IMPLEMENTATION

3.1 The difficulties experienced by AFI States in the implementation of ACAS II necessitated the sep up of a Task Force to develop strategies for its implementation. This was pursuant to APIRG/12 Decision 12/1 and AFI/7 Recommendations 5/23. The mandatory carriage of ACAS II and operation of pressure-altitude reporting SSR transponders became effective in the AFI Region on 1 January 2000.

3.2 Many States have, however, not incorporated this provision in their national legislation and did not publish the required AIC to give advance notice to airlines on the implementation of ACAS II. The training of air traffic controllers and pilots on the use of ACAS has not been seriously pursued by many administrations.

3.3 These matters were addressed at the APIRG/13 Meeting that took place in Sal, Cape Verde, in June 2001 and a number of Conclusions on ACAS were formulated (see the appendix).

3.4 The APIRG/14 Meeting in Yaounde from 23 to 27 June 2003 was still concerned that there were still problems in the implementation of ACAS II that might compromise safety. The meeting urged ICAO to provide guidance material to States.

3.5 The carriage of ACAS II and operation of pressure-altitude reporting transponder is now an international Standard. States are expected to domesticate this provision in their national legislation.

3.6 Though many airlines undertaking international operations have installed ACAS II and SSR with pressure-altitude reporting transponders, this is not the case for domestic operators in the region. Many of these airlines have the older aircraft types in their fleet and the cost of equipage therefore poses a serious concern.

3.7 These aircraft types comply with the requirements of States in the region that have implemented radar services by carrying SSR with pressure-altitude reporting transponders.

3.8 About 40 per cent of the States in the region so far have published the AIC on ACAS implementation. The training of air traffic controllers and pilots has not been seriously addressed.

3.9 There is no gain saying that many States will encounter serious difficulty in attempt to segregate ACAS equipped and non-ACAS equipped aircraft in the airspace.

4. **CONCLUSION**

4.1 Many States in the region continue to experience difficulty in the implementation of ACAS II.

4.2 Many States have not domesticated the international Standards in Annex 6, paragraph 6.18 on the carriage of ACAS II.

4.3 The airlines in the region have equipped aircraft meant for international operations with ACAS II. Many of those meant for domestic operations have not been equipped.

4.4 Training of air traffic controllers and pilots has not been seriously addressed by many administrations.

4.5 It is generally accepted that ACAS II provides a last resort safety net to prevent mid-air collisions. However, the system's limitations and inhibits need to be noted.

5. **ACTION BY THE CONFERENCE**

5.1 The conference is invited to:

- a) note the difficulty being experienced in the region on the implementation of ACAS II;
- b) take due consideration of the situation prevailing in the AFI Region with regards to real levels of implementation of ACAS while defining the role of ACAS systems in future ATM systems safety.

— — — — —