

ELEVENTH AIR NAVIGATION CONFERENCE

Montreal, 22 September to 3 October 2003

Agenda Item 2 Safety and security in air traffic management : (ATM)

SECURITY OF AIR TRAFFIC MANAGEMENT SYSTEMS

(Presented by African States¹)

SUMMARY

This working paper deals with improvement of ATM information and systems security.

It indicates the reasons and the necessity for the global aeronautical community to protect air traffic management systems against unlawful interference. It therefore proposes amendments of some of the provisions of ICAO Annexes 11 and 12.

Action by the conference is in paragraph 4.

* English and French versions 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. **FOREWORD — CURRENT SITUATION**

1.1 The combination of regulatory measures as well as human and material means aimed at protecting of civil aviation against unlawful interference has been limited so far to:

- a) the airport terminal infrastructures; and
- b) the aircraft
 - 1) immobilized on the ground;
 - 2) moving on the ground; and
 - 3) when it is in diversion or hijacking situation.

2. **WEAKNESSES OF ATM INFRASTRUCTURE IN THE FIELD OF SECURITY**

2.1 The procedures and standards of ICAO reference documents, (Annexes, manuals, documents) essentially deal with emergency situations following acts of unlawful interference. Measures aimed at regulating this field and avoiding such situations are not yet sufficiently standardized.

In the field of aeronautical telecommunications

2.2 In spite of Radio Communications Regulations provisions and the favourable response from Worldwide Radio Communication Conferences of the International Telecommunication Union aiming at ensuring the efficient and orderly development of civil aviation, aeronautical telecommunications are not however totally protected against external interferences. The aviation radio frequency spectrum becomes more and more subject to speculations. The frequency bands allocated to aeronautical services are more and more limited, which affects reception quality and could even deteriorate the source data.

2.3 For example, cellular phones, which operate in frequency bands close to those of equipment such as the distance measuring equipment (DME) could alter the performances of such equipment if they are activated on-board aircraft. Announcement by the flight crew before take off cannot guarantee that mobile telephones are effectively turned off since no control means are available to the flying crew.

2.4 The aviation use of the public internet or TCP/IP protocol stack could be exploited to perpetrate acts of unlawful interference against civil aviation. Indeed, a great quantity of information injected through the network could create congestion and alter its capacities. Downstream data management systems (flight data processing system (FDPS) for example) could also be affected. In this connexion, the decision of the Air Navigation Commission to establish a study group on the use of public internet for aeronautical needs Aviation Use of the Public Internet Study Group (AUPISG) is welcomed.

2.5 If it is possible, from a remote equipment (for example, remote maintenance of the equipment), to act on the air traffic control (ATC) elements (for example deterioration of the image on the screen of visualization and control, modification of position of the aircraft on the scope of the radar, automatic

dependent surveillance (ADS), FDPS, it is feared that inappropriate clearances by the controllers could lead to catastrophes of the scale of the 11 September 2001. A regulatory framework and a secure locking system should necessarily be implemented.

Action of ATC in the security field

2.6 The response ATC in facing on this type of event is not strong enough and is limited to the implementing crisis management procedures.

2.7 For instance, the implementation of ALAR TOOLKIT ASSIST method appears to be an adequate response of ATC in this type of crisis. The method associates the psychological aspects of the response to the technical and professional aspects. However, it tantamounts to just manage the threat and not to prevent against it.

2.8 Moreover, appropriate mechanisms to enable the ATC to know by its own that an aircraft is hijacked without any action from the crew are required.

2.9 Furthermore, the counterattack must be organized in advance within a regional framework of search and rescue (SAR) civilian and military cooperation agreement. Therefore it will be possible to insert in Annex 12 — *Search and Rescue* provisions enabling the rescue coordination centre (RCC) to be better prepared to respond to such threat.

3. CONCLUSION

3.1 If the 11 September 2002 events perpetrated by terrorists started from the cockpit, one has to be persuaded that similar events are possible due to the simple fact that real information could be deteriorated by the introduction in the calculators and equipment of programs built to this effect by outsiders. That is why it is important to implement locking systems to respond to the threat.

3.2 States are informed of current actions undertaken by ICAO, and particularly of the action plan for aviation security aimed at reinforcing security of civil aviation in addition to the provisions already existing in 10 out of 16 annexes directly linked to air navigation. This important plan shall receive the necessary support to reach its objectives.

3.3 Finally the ASSIST method of TOOLKIT ALAR of FSF could be implemented in the air navigation managing entities together with the modification of RCC functions.

4. ACTION BY THE CONFERENCE

4.1 The conference is invited to:

- a) recommend that facilities and equipment providers be requested to establish procedure and specifications for the implementation of a secured methodology to avert external intrusions.

- b) recommend the amendment of Annex 11 — *Air Traffic Services* and Annex 12 — *Search and Rescue* in order to include provisions on the protection of ATM systems against unlawful acts and extend the role of RCC's;
- c) recognize the necessity to develop a regulatory framework for the use of cellular phones on board of aircraft; and
- d) adopt and encourage the application of ASSIST Method of FSF ALAR TOOLKIT to response to the emergency situations caused by unlawful interference acts.

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