



الهيئة العربية للطيران المدني

Summary Report
ACAC New Surveillance Technologies Seminar
Jordan – Amman, 23 – 24 June 2009

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1- Place and duration:

ACAC New Surveillance Technologies Seminar was hosted by the Jordanian Civil Aviation Regulatory Commission (CARC), in the Regency Hotel in Amman on 23 – 24 June 2009, the seminar organized by the Arabic Civil Aviation Commission (ACAC).

2- Seminar Objectives:

The seminar focused on three technologies:

- Mode S SSR;
- Wide Area Multilateration (WAM);
- Automatic Dependent Surveillance – Broadcast (ADS-B).

The aim of the seminar was to ensure participants understood the characteristics of each technology, highlighting any unique features, and debating each technology's place in an overall surveillance strategy for a State or the region.

The presentations covered technical and operational overviews of the new technologies, implementation issues, and potential procurement and approval approaches.

3- Attendance:

The Seminar was attended by 34 Participants from 5 ACAC Member States included (Jordan, Syria, Egypt, Qatar, and Bahrain) . Also representatives from ACAC, the ICAO Middle East Office, IATA, SITA, Helios and Comsoft attended the seminar.

A full list of participants is attached to this report.

Experts from ICAO, Helios, SITA and Comsoft presented to the seminar. A welcome speech was given by Mohamed Elkady – Air Navigation Expert of ACAC and Mr Ahmed Azam, Deputy Chief Commissioner of the Jordanian CARC.

4- Seminar programme:

a) Day 1: 23 June 2009

The seminar commenced with welcomes speech from Mr. Mohamed Elkady representative of ACAC, and from Mr. Ahmed Azam - the Deputy Chief Commissioner of the Jordanian CARC. The importance of the seminar objectives was highlighted

Mohamed Elkady welcomed all the participants who attended the seminar and thanked Jordanian CARC for their hosting the meeting and their hospitality. Also, he conveyed the greetings of Mr. Mohamed Elalaj – DG of ACAC, expressing the seminar with a very successful and fruitful deliberations.

The first session was an introduction to the new surveillance technologies, including a discussion of their place within the existing surveillance infrastructure. Mr Ben Stanley of Helios showed how each technology differed in terms of deriving the aircraft's position, and also highlighted the similarities between the new technologies, including their common use of aircraft identification methods.

Following this introduction, the rest of the day was taken up with three modules covering each of the technologies. Mr Scott Kelly of Helios gave a general technical overview of the operation of Mode S SSR systems. In particular, Mr Kelly focused on potential implementation issues with Mode S SSR systems, including 24-bit addresses, interrogator codes and the principles of lockout for Mode S. He also introduced the main Mode S applications – Elementary Surveillance (ELS) and Enhanced Surveillance (EHS).

Mr Ben Stanley then gave a presentation on the principles of Wide Area Multilateration (WAM). A general overview of the technology was given, focusing on the similarities and differences with Mode S SSR, the positioning method, and the various timing solutions proposed by WAM suppliers. The characteristics of a distributed surveillance system were also explored, including the need for detailed coverage planning, infrastructure planning, and integration issues with current ATM systems.

Automatic Dependent Surveillance – Broadcast (ADS-B) was the next surveillance technology to be presented to the seminar. Mr Scott Kelly gave an overview of the principles of ADS-B, reinforcing the point that ADS-B is a dependent technology (i.e. it depends on the aircraft's navigation systems to determine the position) and showing how the position is transmitted via a unique encoding method (Compact Position Reporting). He showed how ADS-B uses similar information elements to Mode S SSR, and discussed the means for error detection.

The final presentation on the first day of the seminar was given by Mr Roger Becker of Comsoft on their experiences with ADS-B implementation. Mr Becker gave details of Comsoft's implementations in the United Arab Emirates, Sweden and Indonesia, and discussed how ADS-B infrastructure could be deployed.

b) Day 2: 24 June 2009

Day 2 of the seminar began with a presentation focusing on the detail of the ADS-B datalink – 1090MHz Extended Squitter. 1090ES is recommended as the globally interoperable ADS-B link of choice by ICAO (ANC/11). Mr Scott Kelly presented the topology, message sets and signals of 1090ES. He also showed a demonstration of an ADS-B ground station (using the Kinetic SBS-1 receiver), highlighting the potential issues when implementing ADS-B (e.g. use of aircraft identity by flight crews, correct setting of 24-bit address etc).

Following this technical overview, Mr Ben Stanley discussed the potential changes in ATM operations arising from the use of each of the new technologies (Mode S SSR, WAM and ADS-B). Operational use of new data items and new surveillance coverage areas were debated. Differences between the technologies were also discussed, for example in the potential operational failure modes visible to the controller.

The seminar was then addressed by the ICAO Middle East Regional CNS Officer Eng. Raza Ali Gulam, on ICAO's position on new surveillance technologies. Mr Gulam made it clear that ICAO supported the transition to new surveillance technologies, where appropriate, but that it was not ICAO's place to specify which technology to procure in each local situation. Mr Gulam presented an overview of the technologies, and the supporting ICAO documentation available for States.

The next session, presentation by Mr Ben Stanley, focused on procurement and approval considerations. An overview of a possible procurement process was shown, focusing on the ICAO performance-based surveillance approach. Safety considerations were discussed, along with the necessary steps for both service provider and regulator in giving approval for operational use. The session also discussed tender preparation, building on lessons learnt from other tenders world-wide in identifying key elements to be included in the tender.

Mr Ben Stanley and Mr Scott Kelly (Helios) presented the implementation status of the new surveillance technologies world-wide. It was clear that all three technologies are now moving to operational use for Air Traffic Services, supported by safety cases. Examples of Mode S SSR deployment in Europe, WAM deployment in Austria and South Africa, and ADS-B deployment in the USA and Australia were given, along with many other implementations.

A discussion was then held on potential surveillance strategies for a State. A (fictitious) example was given to the participants to focus discussions, with the participants highlighting the variables most likely to impact the eventual technology choice.

The final presentation was given by Dr Atif Sharaf of SITA, looking at practical examples of ADS-C and ADS-B implementations. A generic example of ADS-C implementation was presented, followed by a detailed overview of recent ADS-B trials in Indonesia. Participants were encouraged to review the ICAO MID region strategy for ADS-B implementation *“that MID States, in collaboration with the airspace users, are encouraged to develop and implement ADS-B trials programme, when cost-benefit models warrant it.”*

5) Recommendations:

There was also a very interesting round table discussion between the delegates of ACAC states and the representatives of ACAC, ICAO, Helios, and SITA, and the following recommendations could be extracted as conclusions from the seminar:

1) ACAC Air Navigation Committee (ANC) has to monitor Implementation of ADS-B and Multilateration in ACAC area.

2) ACAC and ICAO Middle East has to encourage States to Develop awareness and training programs in the technical and operational aspects, in coordination with ACAC and ICAO MID Office.

3) ACAC states are invited to:

- implement MIDANPIRG/11 Conclusion 11/69 : MID region Strategy for the implementation of ADS-B.
- Consider the implementation of ADS-B & Multilateration, especially in non radar covered area and/or low level areas, which will bring more capacity and operational efficiencies.
- Consider implementation of new technologies Multilateration in Surface movement.
- Shares experience and trails results in new surveillance technologies.
- Encourage cross-FIR surveillance data interchange whenever it enhances regional safety.

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- Attached the list of Participants

