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TOWARDS A SEAMLESS CNS/ATM SKY IN THE MIDDLE EAST & AFRICA

Walid Naja – CNS/ATM Program Manager
ADAPT aeroNAV

“The total aircraft movements to/from and within the Middle East region are estimated to increase from some 625,000 in 2007 to around 2,346,000 in 2025 at an average annual growth rate of 7.6 %.” (ICAO, 2008, Appendix 9D, Page 8, Paragraph 6.9).

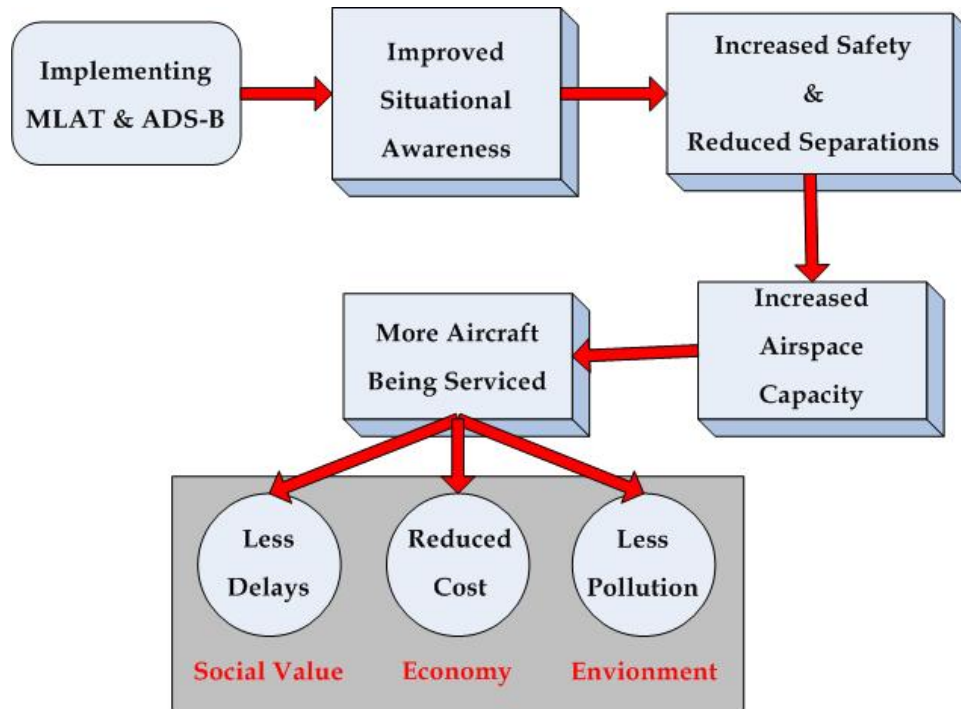
Such enormous growth in aircraft movement will require a significant expansion in airlines fleets, consequently more aircraft will be moving on airport surfaces, on take-off, en-route, and on approach and landing. Even if more airports are being expanded and more runways are being commissioned, with today’s Air Traffic Control (ATC) equipment the only matter guaranteed is a catastrophic deterioration in air traffic throughput; this means more delays in all flight phases, more runway incursions and increased safety hazards. Eventually, extra fuel will be burned for a lesser return; therefore operational cost will considerably increase as well as air pollution.

In other words, today’s ATC technologies (which were inherited from World War II, and gradually improved since) has already reached their operational saturation,

and they will never meet the basic requirements of the future Air Transport Industry (ATI). Today's ATC technologies will certainly damage the future ATI by imposing a severe negative impact on its **Safety**, its **Social Value**, its **Economy**, and its **Environmental Awareness**.

What is needed is a giant move toward a seamless and efficient Air Traffic Management (ATM) system which relies on innovative technologies in Communication, Navigation, and Surveillance (CNS). Multilateration (MLAT) and Automatic Dependent Surveillance & Broadcast (ADS-B) are already available technologies; they are being tested, certified, and implemented in several regions in North America, Europe, South East Asia and Australia. "**MLAT & ADS-B will replace the Radar**", this is an inevitable fact mandated by local, regional, and international aviation authorities worldwide. ICAO has set the year 2025 as an initial target date to have Air Traffic Management rely primarily on ADS-B worldwide.

The direct benefits of MLAT and ADS-B are sequential (refer to the following diagram); with these technologies, pilots and air traffic controllers will have an improved situational awareness which allows significant reduction in separations while maintaining the highest standards of safety. The reduction in separations increases the capacity of the airspace, therefore more aircraft will be serviced, and consequently less delays, less fuel being burned at no return, and finally, less air pollution.



A thorough and coordinated planning conducted by aviation authorities in the Middle East, Africa, and neighboring regions is essential to mitigate current and future airspace congestions. Strategies should be built around the MLAT & ADS-B technologies, and they should be set for a safer and more efficient airspace while having Air Navigation Service Provider (ANSP) personnel trained in parallel.

The strategy should include gradual steps to embrace the transformation throughout the year 2025:

1. **Training:** (In the immediate term). ATC / ATM staff and aviation specialists should understand the operational and technical aspects of Mode S SSR, MLAT & ADS-B.

2. **Install MLAT:** (In the very near term). Plan for a MLAT installation. MLAT has proved to be a cost effective intermediary technology which facilitates the future implementation of ADS-B.
3. **Install ADS-B:** (In the coming term) Upgrade MLAT installations to ADS-B networks at a marginal cost.

Australia, Europe, and the USA have taken the lead in gradually implementing the new technologies of the future CNS/ATM system. The Middle East and Africa has the advantage of learning from other's experiences; as a matter of fact, understanding the proposed technologies and evaluating their benefits is very crucial to visualize the needs to transform today's ATC system into a seamless CNS/ATM system by 2025.

Reference

International Civil Aviation Organization. (2008, November). In *Proceedings from the Tenth Meeting of the MIDANPIRG ATM/SAR/AIS Sub-Group, (ATM/SAR/AIS SC/10)*. Cairo, Egypt.