

Acknowledgements

ICAO ENVIRONMENTAL REPORT



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The world needs air travel. Our industry connects communities, connects people and facilitates economic development. As a result, addressing the climate change challenge together is essential to ensuring that we continue to connect the world.

Bombardier's role is to support the industry's goals and commitments towards reducing aviation's emissions by developing more efficient aircraft that incorporate greener technologies. Beyond emissions, we must remain aware of the impact our technological choices have on the overall environmental footprint of our industry. We seek a balanced approach in optimizing aircraft by identifying technologies that help tackle multiple environmental matters at the same time. Our *CSeries* aircraft family is a definitive example of our commitment. Scheduled to enter service in 2013, our narrow-body aircraft will not only burn 20% less fuel and emit 20% less CO₂, it will also produce 50% less NO_x, and will be four times quieter than any other aircraft currently in production in its category*.

Aircraft manufacturers, engine makers, airports, air traffic management services, airlines and governments all have a role to play to help mitigate our industry's impact on climate change. Cooperation is key to developing more efficient technologies and sustainable alternative fuels, to optimize aviation operations and infrastructure, and to establish the right legal and economic incentives that will ensure a level playing field across the industry. Through the Air Transport Action Group, Bombardier and key industry players are working together towards a greener future for flight and are supporting the International Civil Aviation Organization (ICAO) in establishing a global framework for managing aviation's emissions.

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The Greening of ATS Message Handling...

Transition from **AFTN** to **AMHS** Will Reduce Environmental Impact of Air Traffic Service Communications



As the international aviation world steps up its efforts to reduce and minimize the impact of aviation activity on global climate, **Radiocom Inc.** is doing everything possible to support these efforts.

It is well known that the transition from AFTN to **AMHS**, as the new ICAO supported standard for ATS message handling services, will result in numerous savings that will flow both directly and indirectly from more efficient aeronautical communications. System wide gains from more efficient communications systems will result in reduced time taken for operations including: clearances for taxiing and take-offs, flight durations, descents, etc. These incremental time savings will reduce fuel consumption during every phase of a flight, thus having a significant cumulative environmental impact by reducing greenhouse gas emissions on a global basis.

Radiocom's reduced bandwidth requirements are crucial to avoiding greater spectrum congestion, and allowing the re-use of existing communication infrastructures. This is critical for allowing developing countries with limited means to access this state-of-the-art technology, where other protocols that are not optimized for slow links (i.e. Internet), are costly and/or impractical.

As one of the pioneers of **AMHS** Extended Service with a fully integrated ATS communication system, **Radiocom** provides one of the best solutions for transitioning from AFTN to **AMHS**, helping to significantly reduce the environmental impact of aviation operations.

Radiocom's proprietary Comgate® gateway enables bidirectional translation between AFTN and **AMHS** messages, permitting both worlds to coexist, until the inevitable transition from AFTN to Extended **AMHS** takes place.

The Extended ATS Message Handling Service provides the following security services:

- Message origin authentication
- Content integrity
- Message sequence integrity

The general **AMHS** security policy is a common minimum that does not prevent specific Member State users from implementing more stringent security policies. These apply to:

- Communications between direct **AMHS** users supporting the Extended ATS Message Handling Service.
- Communications from direct **AMHS** users to AFTN/**AMHS** gateways supporting the Extended ATS Message Handling Service.

Other security provisions for Extended **AMHS** are:

- Login provisions defined at the ATS Message User Agent, for the ATS Message Server and for the AFTN & **AMHS** Gateway.
- Storage of management information about ATS Message Servers and AFTN & **AMHS** Gateways.

The security offered by **AMHS** is mostly due to the use of the X.400 protocol set, as specified by ITU-T (International Telecommunications Union - Telecommunication Standard Sector). These X.400 standards are an alternative to the more prevalent Internet e-mail Simple Mail Transfer Protocol (SMTP) which is a "de facto" public standard.

Therefore, X.400-based applications offer more capabilities and can be tested more rigorously than SMTP

implementations, and consequently are better for applications where safety, security and speed of messaging are paramount. There are a number of SEMS (Safe Electronic Messaging System) products that are based on X.400 implementations.

The advantages that make X.400 ideal for **AMHS** messaging are:

- Highly reliable;
- Clean protocol layering;
- Extensibility;
- High functionality;
- Per recipient information;
- Delivery reports;
- Unchanged content;
- Peer authentication;
- Priority;
- Security;
- Management and/or originator specified alternate recipient;
- Delivery time control;
- Performance and low bandwidth needs; from Server to User Agent.

X.400 offers many advanced capabilities not available using Internet SMTP messaging. In addition, X.400 is less costly to operate than HTTP, as it requires far less bandwidth.

Radiocom's AMHS only requires a bandwidth of 9.6 kbps or less for communication between the main servers (MTA/MS) and User Agents.

This means that in locations where it is difficult or costly to implement networks of 64 kbps bandwidth (required for HTTP exchange), a lower bandwidth solution is available.

There is no doubt that **AMHS** is the way forward for aviation communications. The transition to **AMHS** worldwide is only a matter of time and as such, an investment in this solution should be sought right from the beginning. This will help avoid excessive and unnecessary transitional solutions costs, for all ICAO Member States.

In these days of concern about climate change impacts, the cumulative environmental efficiencies that will be gained through the implementation of **AMHS** make it the obvious "green solution" for ATS messaging services.

*ICAO Doc.9880-AN/466 used as reference for this article.

AMHS

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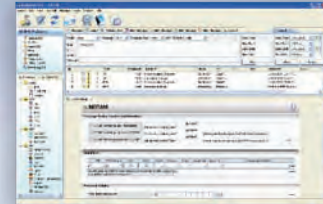
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NIGERIA'S COMMITMENT TO AVIATION ENVIRONMENTAL PROTECTION

Nigeria has embarked on “**clean development mechanisms**” - activities that will limit environmental impact of international aviation.

Several policy options were activated to reduce aircraft emissions and protect aviation environment.

ON GOING EFFORTS BY NIGERIA

- Acquisition of Modern aircraft using the Cape Town Convention and Aircraft Protocol;
- Removal of ATC delays through the implementation of GNSS and PBN as well as runway improvement.
- Massive improvement of airport facilities and infrastructure.
- Adoption of Environmental Management Systems (EMS) by Airlines, Airports and Air Navigation Service providers.
- The development of an alternative source of power supply at the airports (Solar and Wind Energy).

As a result of these measures and the expected improvement in technology including use of alternative fuel, Nigeria is inching towards total compliance of ICAO initiatives on Aviation Environmental Protection.



NIGERIAN CIVIL AVIATION AUTHORITY

ENSURING SAFETY AND SECURITY IN THE AIR

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