

CLASSIC AERO IMPROVEMENTS TO DELIVER ENHANCED OPERATIONS

Inmarsat satellite communications services are being improved worldwide to deliver new efficiency benefits without equipment upgrades

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For 30 years Inmarsat has provided the industry-standard satellite communications system for aviation – the Classic Aero service. Classic Aero is the market-leading voice and data safety service for the cockpit and is used by more than 200 of the world’s major airlines, jet operators and government agencies around the world. The voice and data service was revolutionary when it was launched, has

continued to evolve to meet the changing needs of the industry and remains consistently reliable and capable.

Typically, before the recent pandemic, Inmarsat would process about 135,000 aircraft position reports a day and 50 million throughout the whole year through its global network. More than 90% of the world’s aircraft crossing oceans use the service today – over 12,500 aircraft in total.

Critical functionality

Classic Aero provides two functions critical to managing air traffic – communications and surveillance. By delivering surveillance with Automatic Dependent Surveillance – Contract (ADS-C) and communications with Controller-Pilot Data Link Communications (CPDLC), Classic Aero made it possible to reduce the separation requirements between aircraft in the sky,



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nautical miles. This has been particularly beneficial for airlines operating over the busy skies of the North Atlantic.

And now, global aviation authorities are preparing to reduce separation again – below 30 nautical miles – thanks to enhancements to Inmarsat’s satellite network.

New benefits

Inmarsat is making the Classic Aero satcom service even more powerful, enabling airlines to maximise operational benefits and even reap new benefits from their current satcom equipment. The result for airlines is increased operational efficiency and cost savings, without the need to upgrade thousands of aircraft currently flying and using the Classic Aero satcom service. Instead, Inmarsat is investing in its network to ensure it meets the demands for higher performance.

So how will this work? Inmarsat is calling the improvement programme Advanced Air Traffic Services (AATS). The project includes essential upgrades to the Classic Aero service’s infrastructure that will maintain required performance, while providing expanded capacity and the capability to support air traffic services efficiency initiatives planned by air traffic service providers, the International Civil Aviation Organization (ICAO) and regulators.

The required performance in question comes from ICAO Performance Based Communications and Surveillance (PBCS) criteria, a framework that ensures emerging technologies for communication and surveillance fully support ATM operations and are implemented and operated safely. Performance-based separation standards include both the currently published CPDLC and ADS-C enabled standards, such as 30 nautical miles longitudinal and 23 nautical miles lateral. New CPDLC and ADS-C enabled standards scheduled for publication in November 2020 are also covered by the AATS programme. These new standards will reduce longitudinal separation requirements to 20 nautical miles and add a 12 nautical mile lateral separation minima for situations where one aircraft is climbing or descending through the altitude of another in level flight.

Additional performance-based separation standards will also be published in November that are enabled by CPDLC with space-based ADS-B surveillance. ANSPs that choose to implement a CPDLC with space-based ADS-B operation can continue to benefit from ADS-C safety and efficiency capabilities, such as route conformance and advanced waypoint reporting as well as use

expanding oceanic airspace capacity by more than 300% and saving airlines billions of dollars over the following decades.

To calculate those savings, aviation consultancy Helios found that the increased use of satellite communication (satcom) in oceanic regions between 2001 and 2016 generated a US\$3 billion benefit for the aviation industry. The Helios study found that air traffic management benefits totalled

US\$1.1 billion, while the remaining US\$1.9 billion was provided by improved communications between the aircraft and their operations centres.

The study demonstrated that satcom technology enabled more planes to safely fly in the air at any one time. It showed that enhanced communication and tracking meant the gap between aircraft could be reduced from 100 nautical miles to 30

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Above: New CPDLC and ADS-C enabled standards scheduled for November 2020 will increase airspace capacity with reduced separation requirements

Below: AATS will provide expanded capacity and capability with existing Classic Aero equipment

as backup surveillance. AATS provides efficiency benefits to operators and ANSPs by ensuring that the Classic Aero network can support these performance-based reduced separation standards with greater capacity and support for CPDLC and high update rate ADS-C. The programme will enable customers to comply with the updated performance-based standards with their existing Classic Aero equipment, thus enabling them to benefit from flight efficiency improvements, resulting in time and cost savings.

Improved communications

As air traffic separations are reduced, there is also an increasing need for fast controller-to-

pilot voice communication for any needed interventions. The AATS programme includes enhancements that provide better communication and future efficiency benefits by improving the speed of ground-to-air satellite voice connections and enabling direct communications between controllers and pilots.

Inmarsat has supported implementation and evaluation of this satellite voice-over-IP capability by air traffic service providers and is working with ICAO and air traffic service providers to develop performance requirements and understand how these fast voice capabilities can be leveraged to improve airspace and flight efficiency and flexibility.

ADS-C for air traffic surveillance

The USA Government recently published a report that outlines the Federal Aviation Administration's (FAA) endorsement of enhanced ADS-C technology in US oceanic airspace as part of its implementation of new international standards by 2022.

The report specifically confirms that ADS-C remains the most advanced and indispensable technology needed for ATC surveillance over the oceans. It confirms that Inmarsat is the leading provider of all the required satellite communication and surveillance capabilities for safe separation of aircraft in flight over the oceans.

In addition, the report was specific about the advantages of ADS-C over space-based Automatic Dependent Surveillance – Broadcast (ADS-B). It concluded that ADS-C was significantly more cost effective than space-based ADS-B and that ADS-C would enable the improvements FAA needed to efficiently manage projected air traffic growth in oceanic airspace. The report further established ADS-C as being the only operationally ready solution for oceanic airspace, as it described significant concerns that existed with integrating space-based ADS-B into FAA operations, which would need to be studied and resolved.

CPDLC and ADS-C, supported by Inmarsat's Classic Aero and now SB-S services, have been the cornerstones of oceanic aviation safety for more than two decades. The report reiterates the significant value of Inmarsat solutions for aircraft operations and safety, and underscores Inmarsat's continuous innovation and ability to deliver value to its customers. ❖



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