

# The ADS-B Webinar



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*NATS*



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## The Shanwick Operation

- Shanwick is one of six Air Traffic Service Providers in the North Atlantic, serving the busiest remote airspace in the world.
- NATS Prestwick Centre is located on the Westcoast of Scotland and also contains our domestic operation.
- Shanwick area of responsibility extends from 8 degrees to 30 degrees West, and from 45 degrees to 61 degrees North.
- Communications with aircraft is either via third party HF or SATVOICE communications provided by IAA, or FANS1/A CPDLC via SATCOM.





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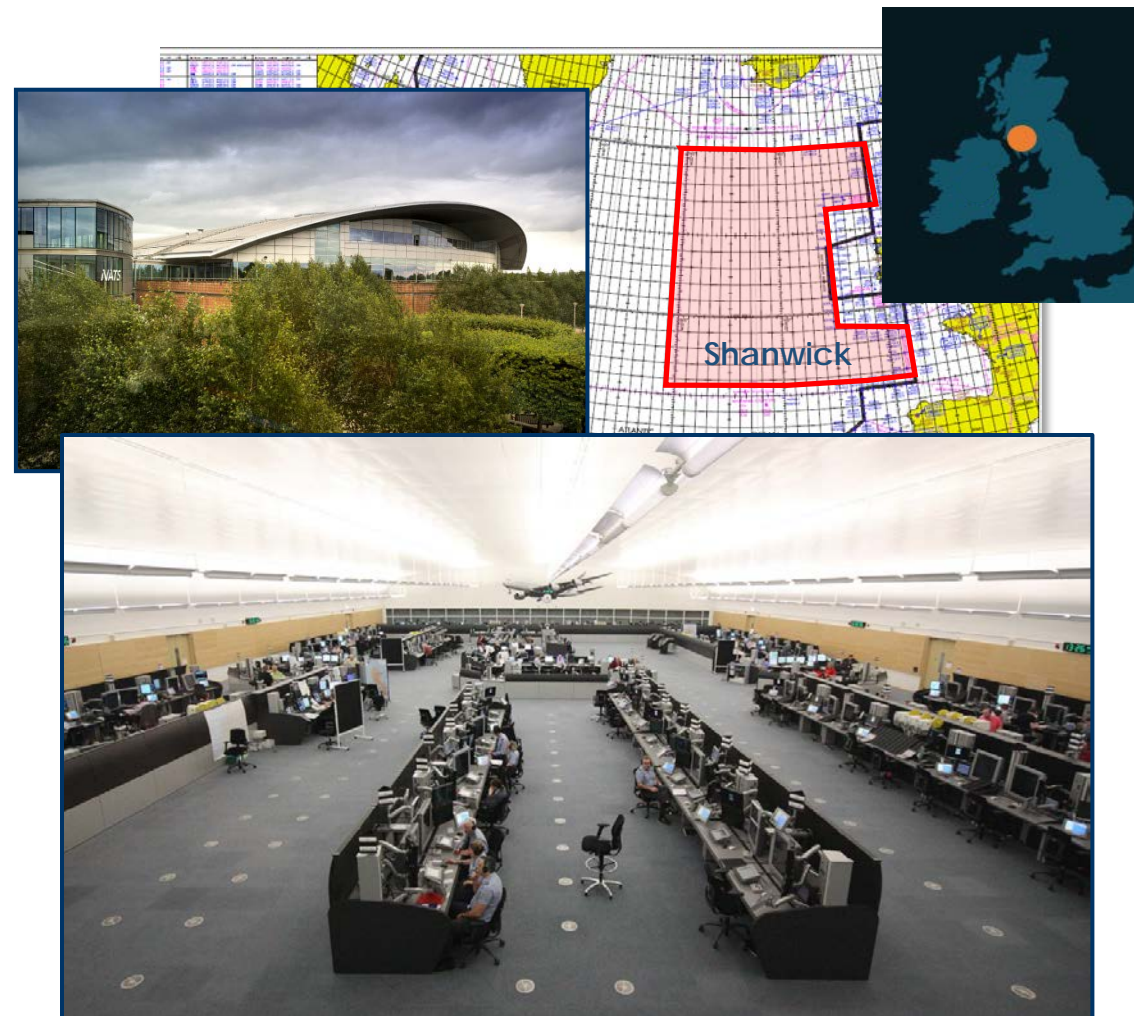
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## The Shanwick Operation

- There are 55 Shanwick Air Traffic Controllers divided into 5 operational shifts who handle circa 500,000 movements a year.
- Prior to the introduction of Space Based ADS-B, these controllers managed traffic procedurally applying horizontal separations in the region of 40-90NM.
- NAT Region mandates FANS1/A ADS-C & CPDLC from FL290-FL410.
- Our Flight Data Processor System (GAATS+) is jointly developed with our partners NAVCANADA.





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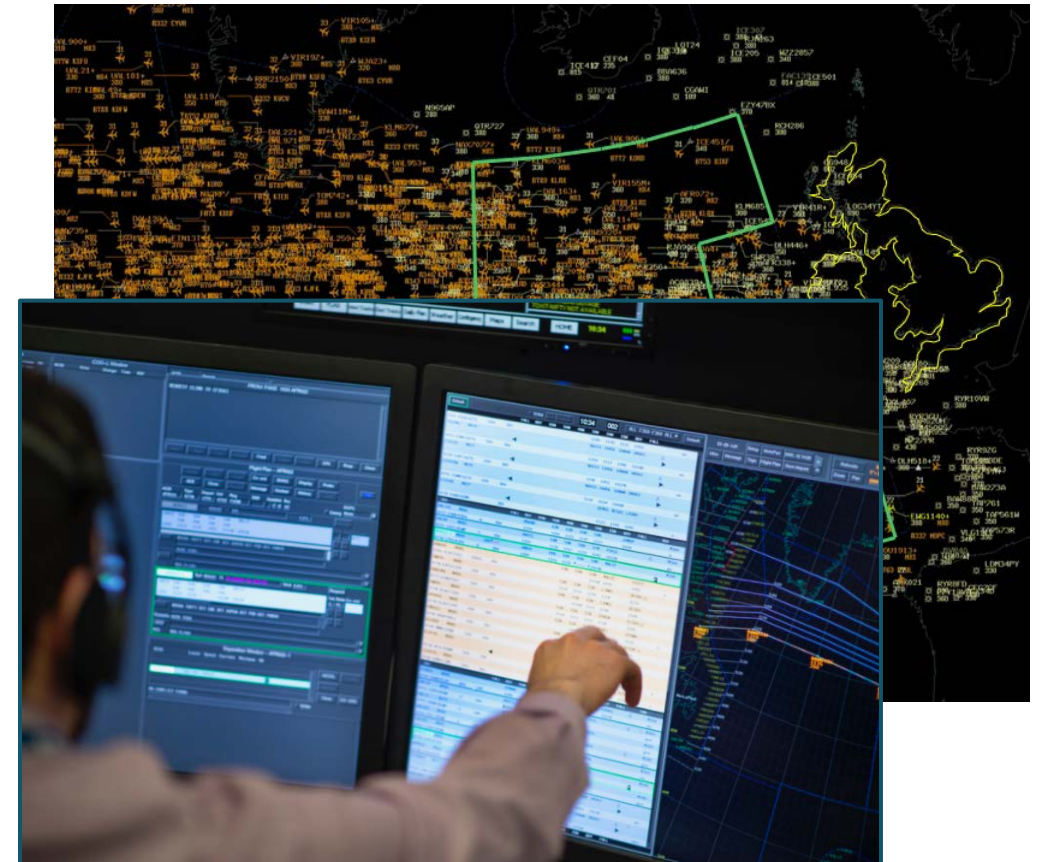
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## Introducing ADS-B into Shanwick

- Shanwick and Gander Oceanic operations simultaneously introduced Space Based ADS-B on the evening of 27<sup>th</sup> of March 2019.
- This involved an upgrade to our Flight Data Processor and implementation of NAVCANADA FUSION Surveillance Tracker software, with surveillance data being provided by Aireon.
- The revolutionary impact of real-time location data being provided to our Air Traffic Controllers was immediate.





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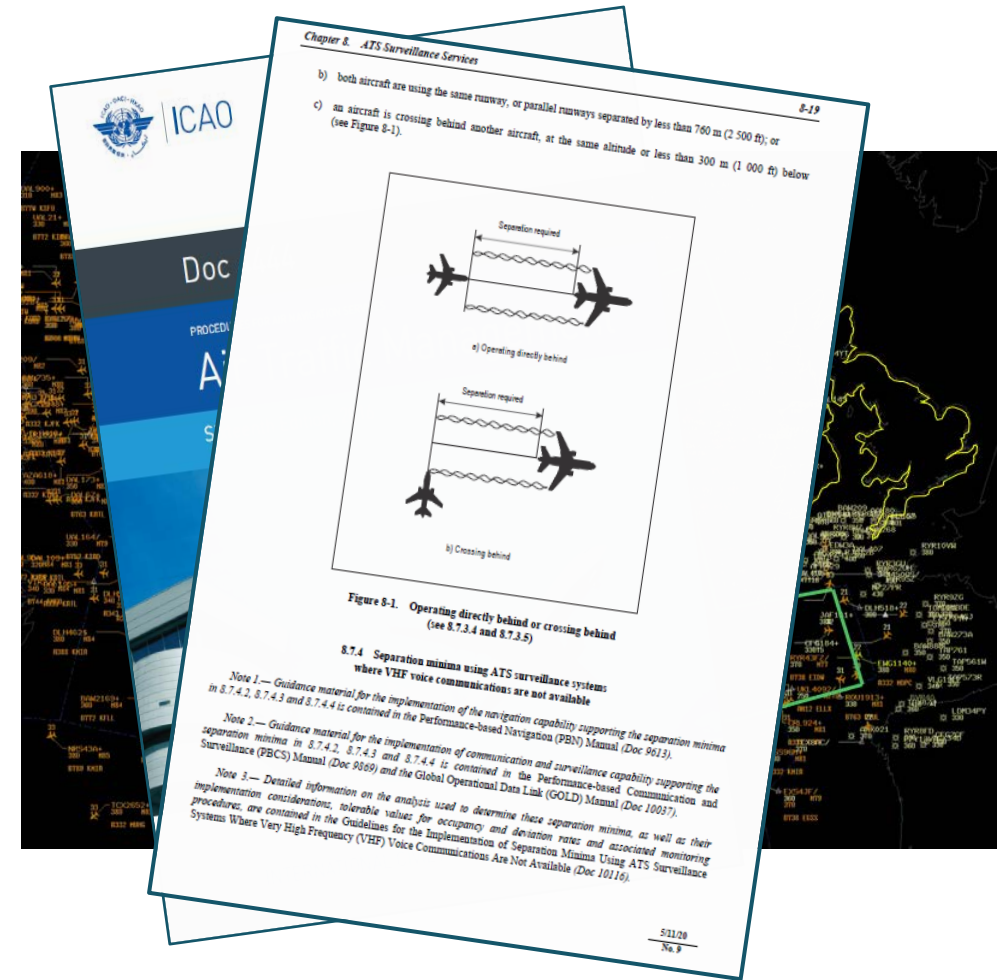
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## Introducing ADS-B into Shanwick

- NATS & NAVCANADA led the work that resulted in the approval of a NAT Region trial implementation of newly developed PANS-ATM separations prior to publication in November 2020.
- Application of ATS Surveillance Separation where VHF Communications is not Available (*PANS-ATM Chapter 8*) commenced with the introduction of ADS-B on the 27<sup>th</sup> of March 2019.
- This reduced application of separation minima from 40 - 90NM to 14 - 17NM.
- Shanwick also introduced a VHF infrastructure in Southeast corner to allow continued access to NAT Region by non Datalink equipped aircraft.





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## Introducing ADS-B into Shanwick – Assurance

- As application of the reduced separations was as a trial implementation, in addition to detailed regulatory assurance requirements, NATS and NAVCANADA were subject to regional scrutiny.
- Development of a Trial Safety Case and regular reporting to NAT Safety Oversight Group was required to evidence technical and operational service performance.
- NATS and NAVCANADA successfully transitioned from trial implementation to full operation on the day of PANS-ATM publication on the 5<sup>th</sup> of November 2020.

**SUCCESS CRITERIA – Longitudinal Separation**

QUESTIONS	METRICS, DETAILS & TARGETS
Safety	<p>i) Longitudinal</p> <p>Scrutinize each longitudinal error to determine if the application of NM and 17 NM separations had an effect on the error. If such an effect is found then quantify the effect on the longitudinal risk due to the application of the 17 NM and 17 NM separations. Target = No increase in longitudinal risk due to the application of the 17 NM and 17 NM separations.</p>
	<p>ii) Vertical</p> <p>Scrutinize each longitudinal error to determine if the application of NM and 17 NM separations had an effect on the error. If such an effect is found then quantify the effect on the vertical risk due to the application of the 17 NM and 17 NM separations. Target = No increase in vertical risk due to the application of the 17 NM and 17 NM separations.</p>

**Agenda Item 1:** Opening of the meeting, welcome and introductions

a) Adoption of agenda and schedule.

**Agenda Item 2:** Updates on significant events and international aviation developments

a) Review of significant international aviation developments, ICAO updates;

b) Report on implementation of NAT SOG follow-up action list



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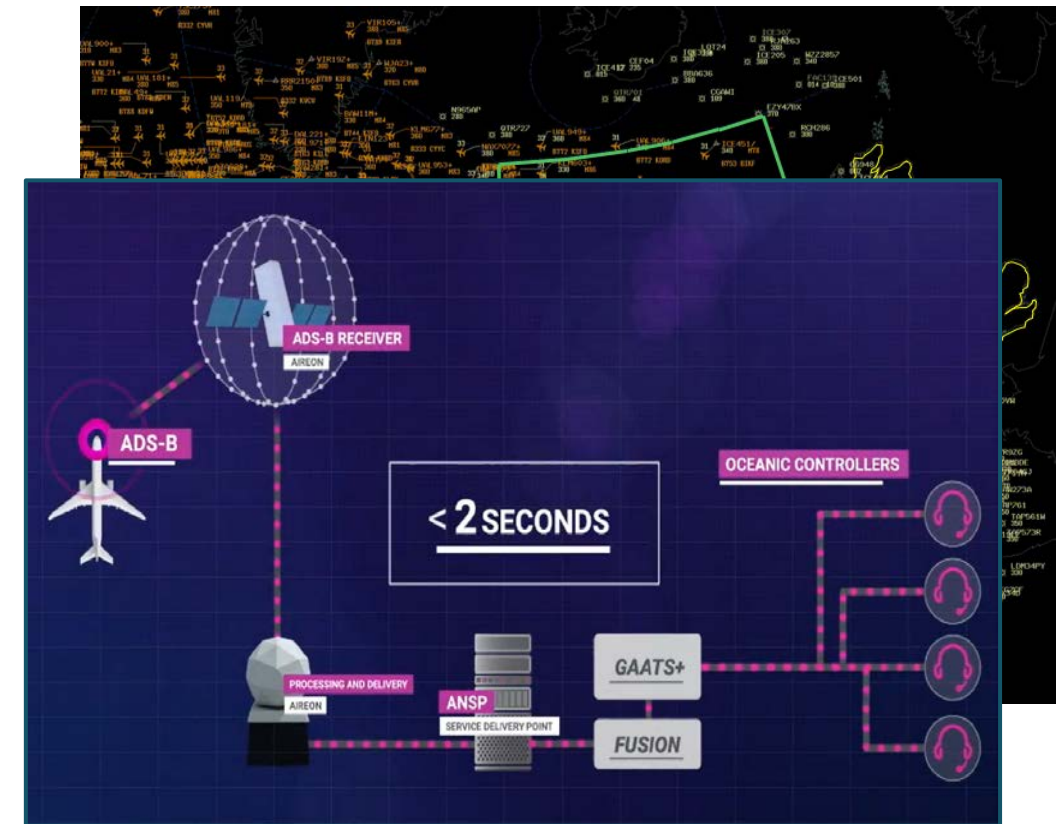
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## Introducing ADS-B into Shanwick – Engineering

- NATS subscribes to the Aireon managed service to receive ADS-B data into the NATS estate.
- Data covers a number of service volume areas which are used for provision of air traffic control, coordination with adjacent interfaces, and to support data analysis.
- Two Aireon Service Delivery Points (SDPs), one in Prestwick and a back-up in the London Air Traffic Control Centre enable the connection of the ASTERIX data stream to the NAVCANADA FUSION surveillance Tracker.
- The output of the tracker is then integrated with the main GAATS+ Flight Data Processor.





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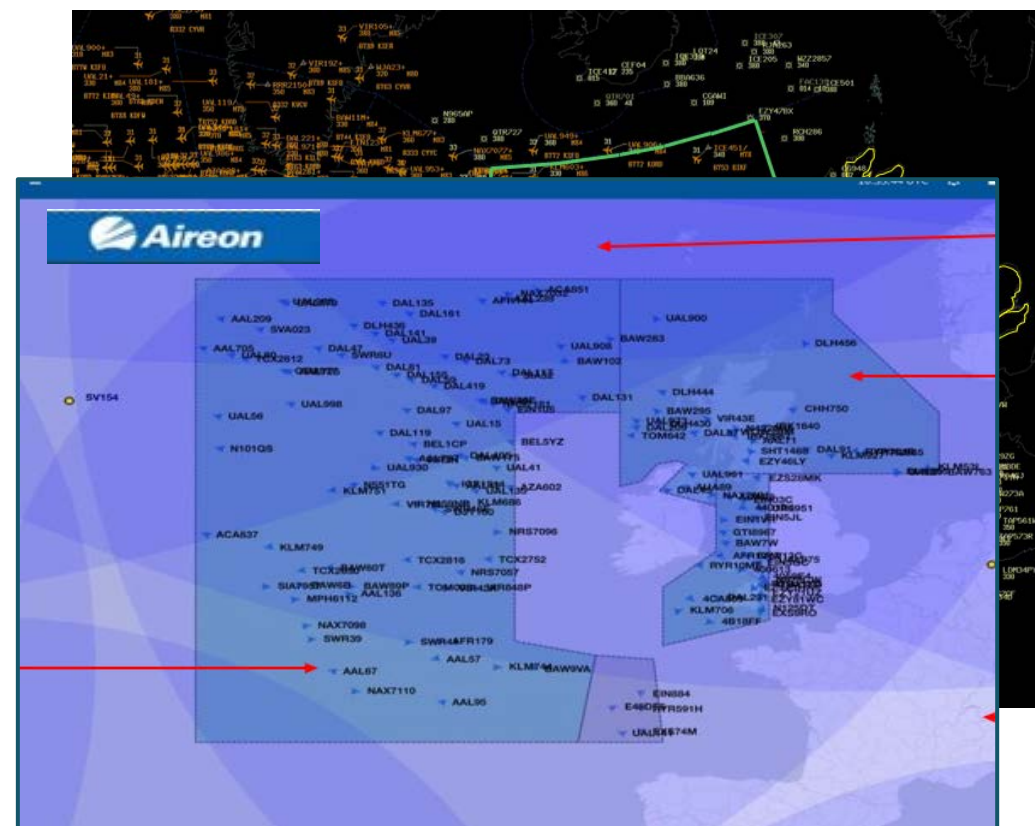
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## Introducing ADS-B into Shanwick – Engineering

- Aireon Maintenance equipment provides updates on service states, planned satellite outages with detailed maps of impacts, coverage outages, faults and errors.
- Additional safety net Short Term Conflict Alert capabilities outside the main Flight Data Processor are available for alerting and post incident analysis.
- GAATS+ correlates ADS-B data with flight plan data and provides alerts when out of conformance.
- ADS-B, ADS-C and Voice position updates are integrated to update flight progress and trigger continuous conflict prediction.
- Flight progress updates were reduced from 14 minutes (ADS-C), to less than 8 seconds.







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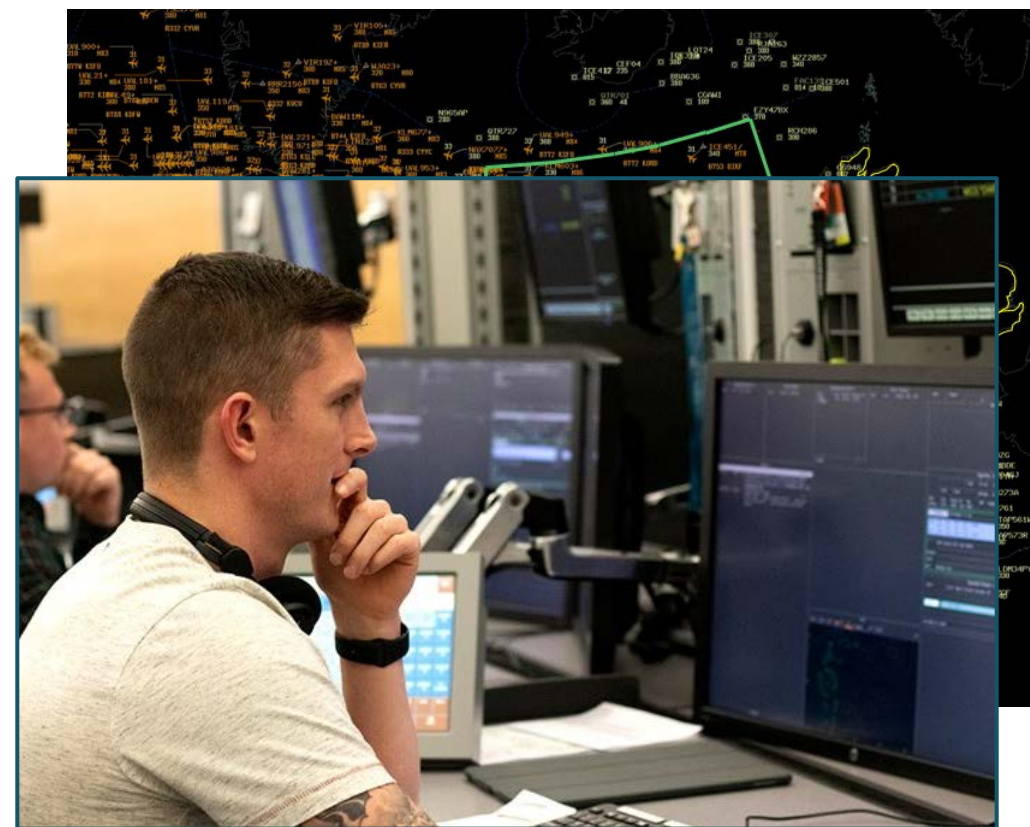
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## Introducing ADS-B into Shanwick – Air Traffic Controller

- Introducing ATS Surveillance Services into what was a remote procedural airspace and system, allowed the Shanwick operation to retain many of the benefits of strategic planning while enabling significant safety and efficiency benefits delivered by ADS-B.
- ADS-C and CPDLC provide a significant safety barrier against events by providing conformance monitoring of flight intentions, allowing air traffic controllers to intervene before any lateral deviations occur.
- ADS-B provides immediate conformance monitoring that allows controllers to far more quickly react to incorrectly selected flight levels by crews and to support contingency situations.





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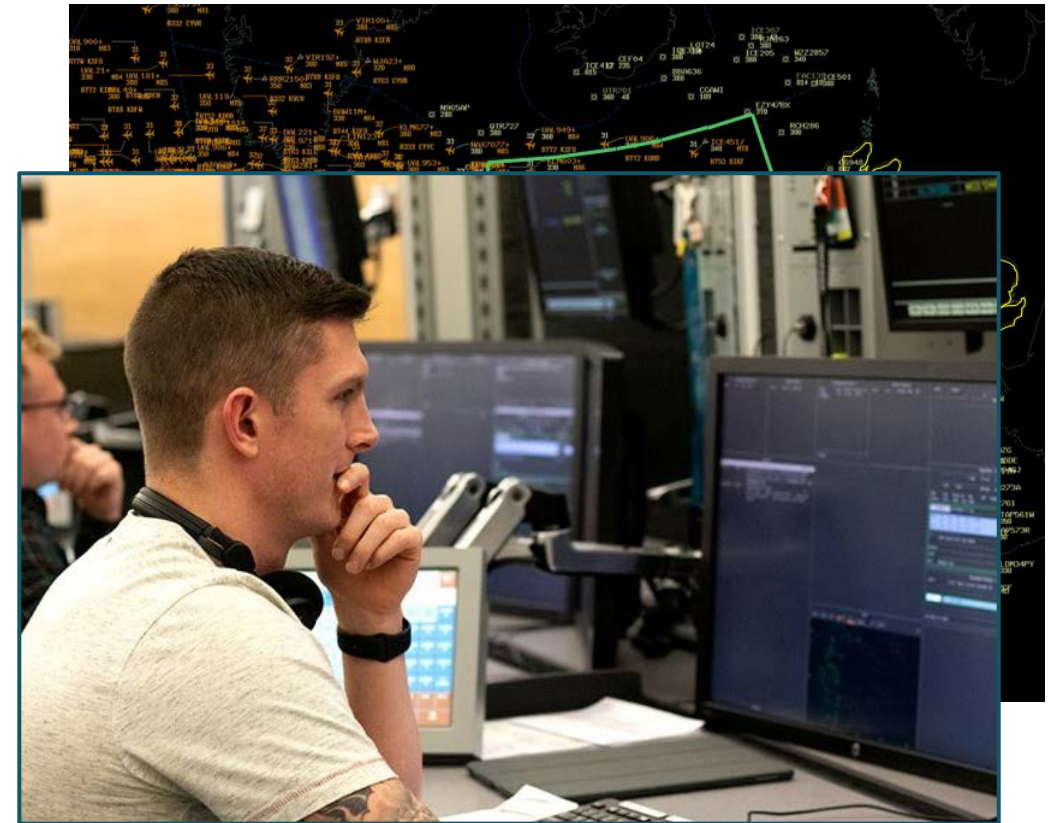
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## Introducing ADS-B into Shanwick – Air Traffic Controller

- To know the position, speed and altitude of every ADS-B equipped aircraft in oceanic airspace – in real time – has been transformational.
- As well as resulting in a significant reduction in safety events within the Shanwick area it has changed the way our controllers provide the service.
- With few issues or outages being reported, and with the same number of controllers, they now have the confidence to provide more tactical services such as direct routings, enhanced support during weather or contingency scenarios and flexible speed operations.





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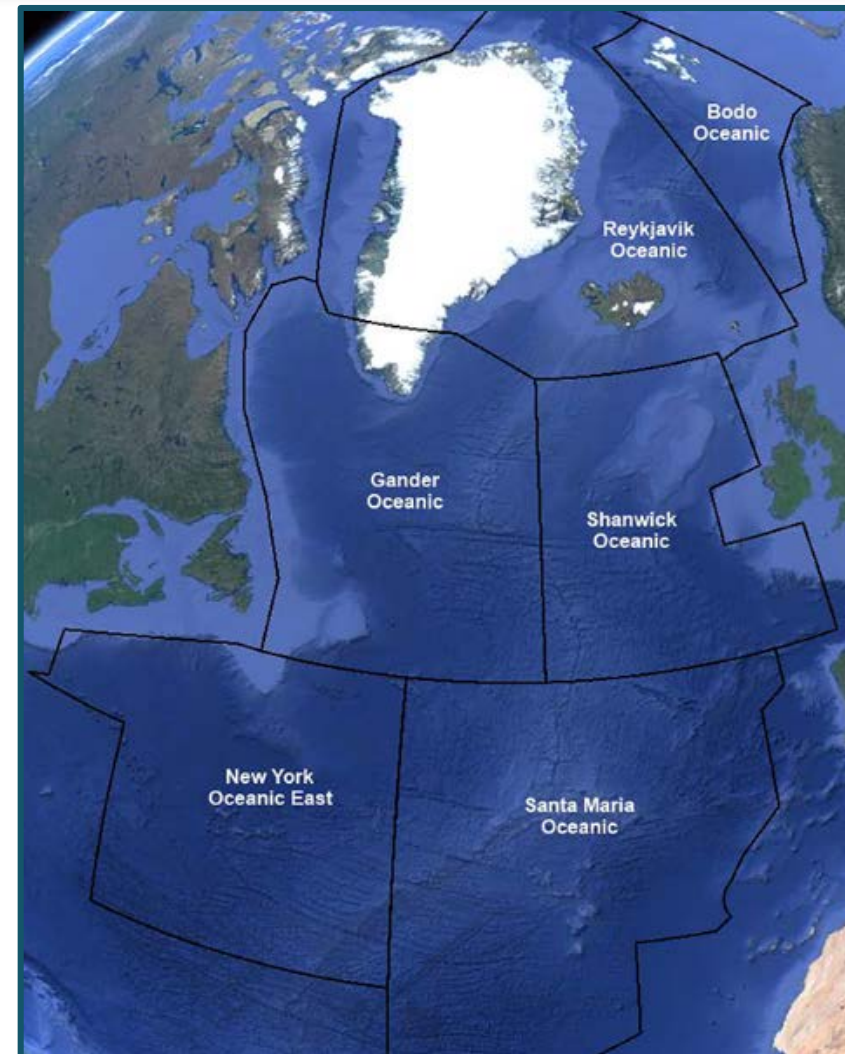
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## Introducing ADS-B - Impact on the Region

- Combining strategic planning of profiles, supported by robust automated conformance monitoring of present and intention data, is the roadmap that will revolutionise air traffic management in the future.
- Introduction of ADS-B has not only had an immediate positive impact on regional safety performance, it is enabling a number of initiatives to remove traditionally structured processes, and thereby creating seamless operational boundaries.





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THANK YOU

