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Session 2 – CPDLC and ADS-C Lessons Learned

ANSP Preparation and implementation

ICAO Operational Data Link Seminar – Dakar, Senegal

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ICAO Operational Data Link Seminar

- **Overview**
 - **Who are we? Why are we here?**
 - **How did we get there**
 - **Service Improvement Considerations**
 - **North Atlantic Airspace**
 - **Data Link Mandate – Working Together**
 - **Questions**





**AIRCRAFT
IN THE SKY AT
ANY GIVEN TIME**

7,000



**5,000,000 SQUARE MILES
OF UNITED STATES AIRSPACE**

476
AIRPORT TRAFFIC
CONTROL TOWERS



197
TERMINAL
RADAR
APPROACH
CONTROL
FACILITIES



21
AIR ROUTE TRAFFIC
CONTROL CENTERS



**26,000,000 SQUARE MILES
OF OCEANIC AIRSPACE**



8,727,691
COMMERCIAL FLIGHTS IN 2015



14,000
AIR TRAFFIC
CONTROLLERS

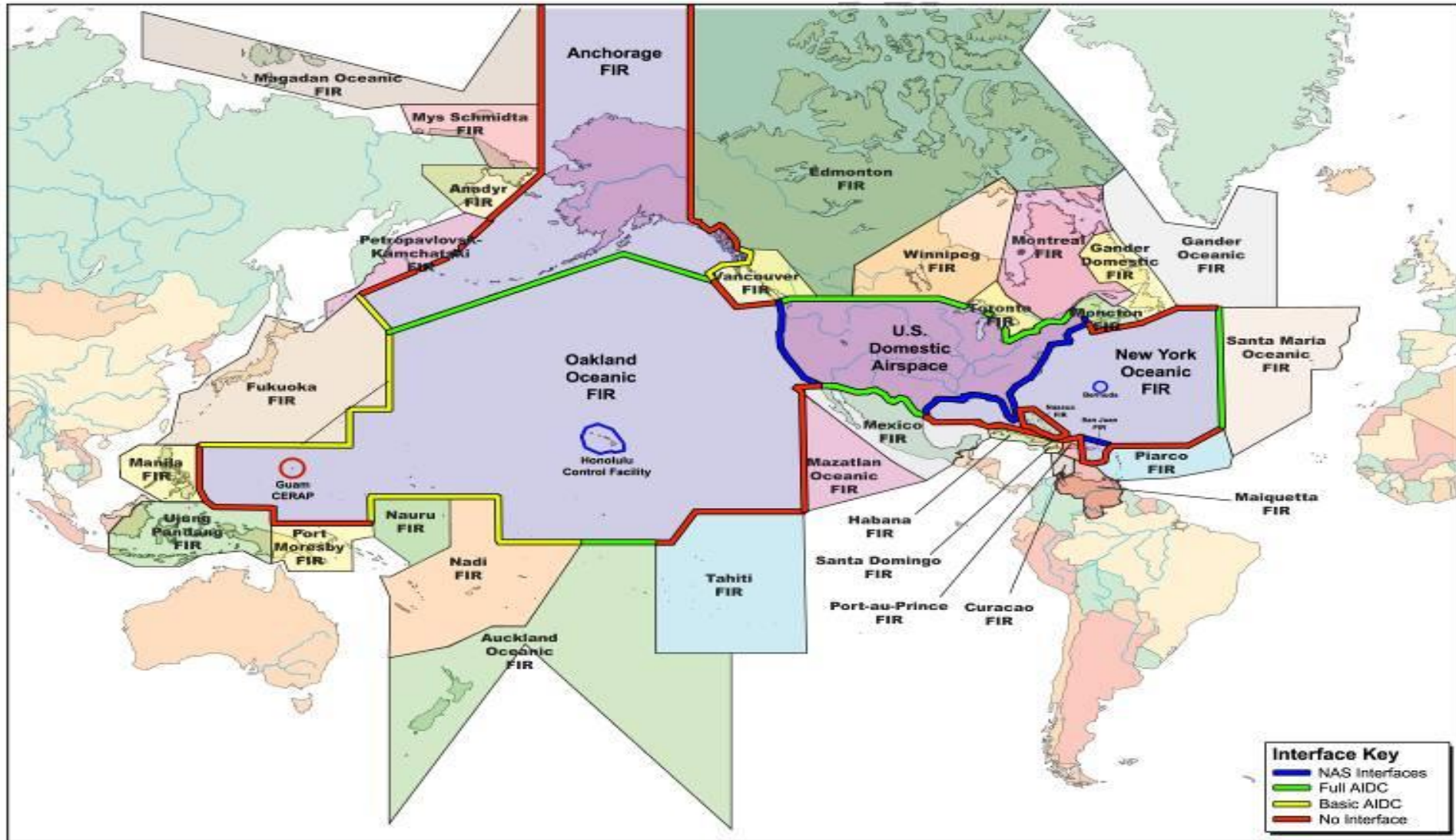


Who Are We?



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FAA United States Managed International Airspace



Why Are We Here?



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Partnership Results



Reduced Lateral and Longitudinal
Separation Standards



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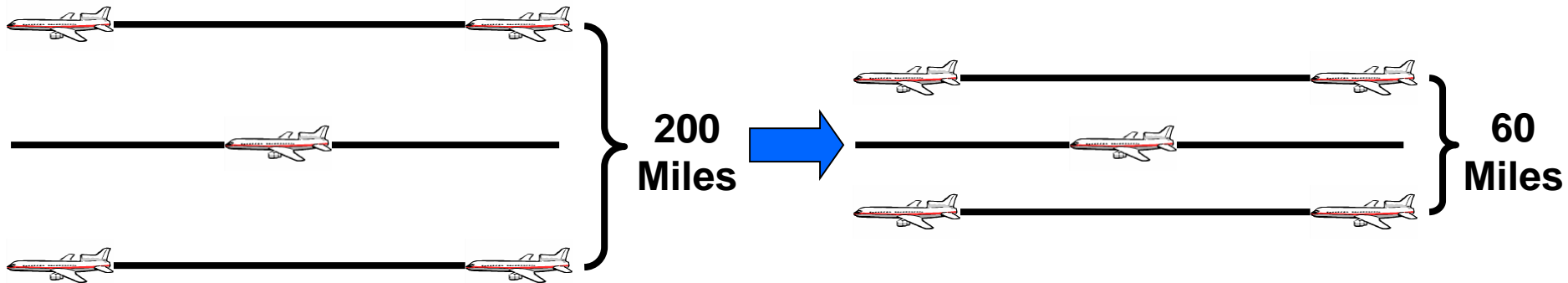
30/30 and D50

- On 10 December 2013, the United States reduced the **lateral** spacing between ADS-C and CPDLC connected RNP-4 aircraft operating in the entire New York Oceanic CTA from 50 NM down to 30 NM.
- Additionally, the **longitudinal** spacing of these same aircraft was reduced from 80 NM down to 30 NM.
- The **longitudinal** spacing of ADS-C and CPDLC connected RNP-10 aircraft was reduced from 80 NM down to 50 NM.

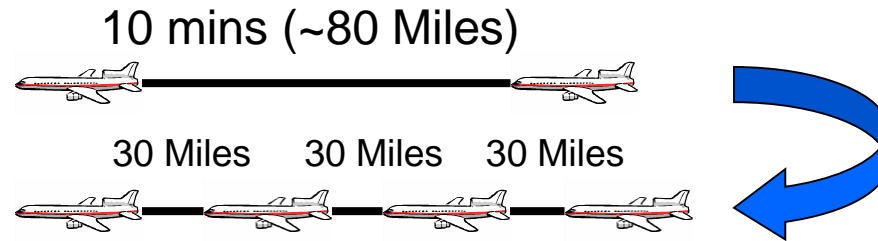


30/30/D50 Graphical Depiction

Lateral Separation



Longitudinal Separation



□ DAL2237
• 340
• N467

□ DAL1151
• 380
• N394

**FANS #
RNP10**

□ FDX3875
• 360
• N410



□ DAL650 3
• 350
• N536



**FANS #
RNP4**

Non FANS RNP10



□ N170X
• 410
• N522

□ DAL836 3
& 340↑360
• N522
r360

PBCS: RCP 240 and RSP 180



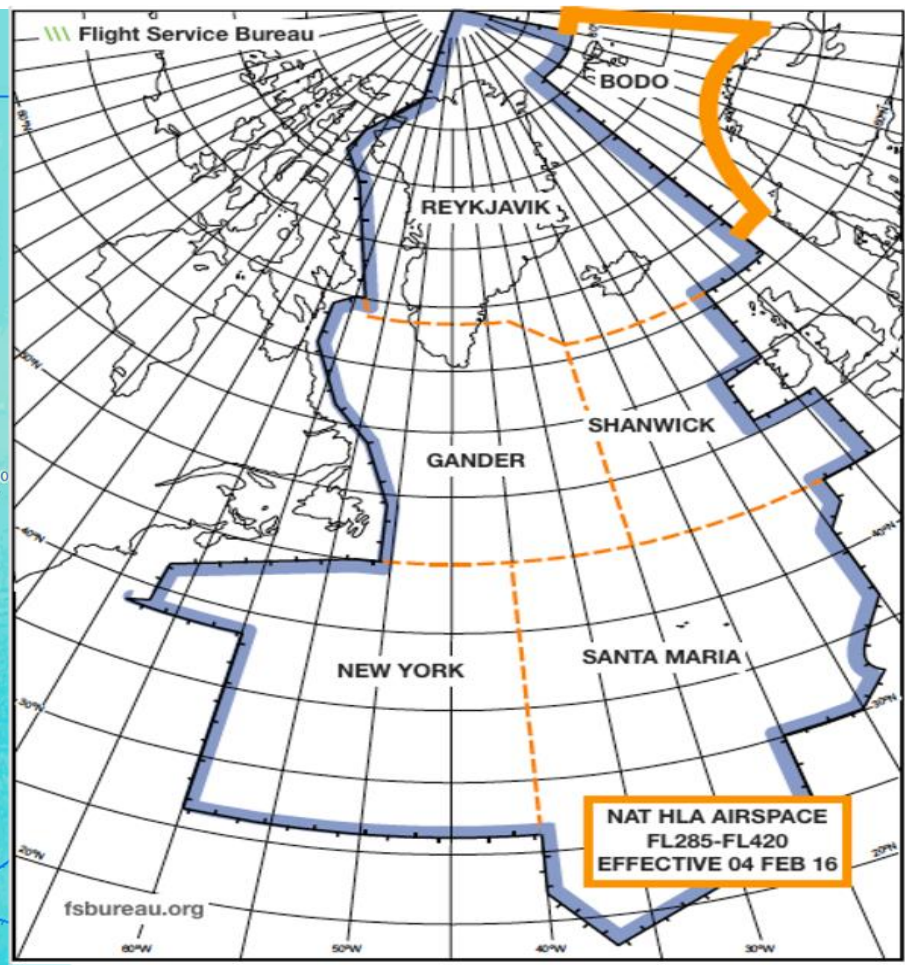
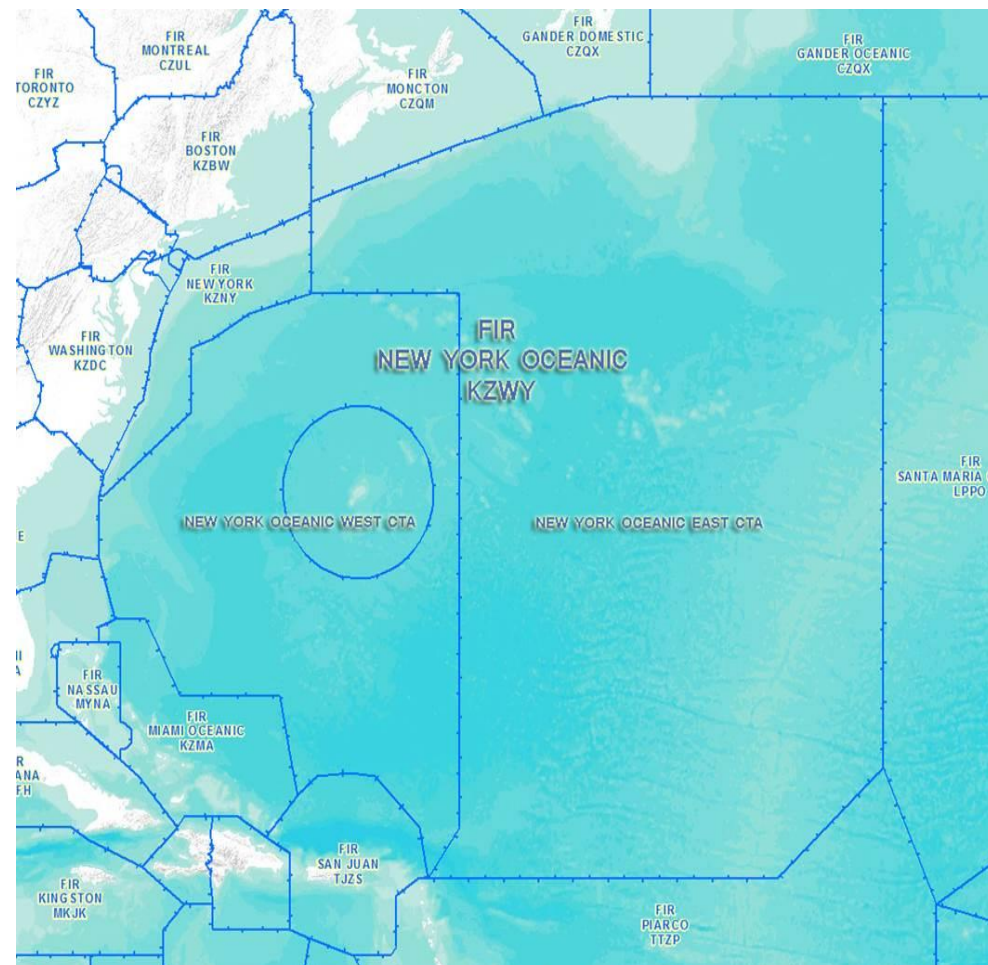
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ATOP Improved Efficiencies Using 30/30/D50

- As a result of these reductions, altitude requests which were previously denied due to traffic are now being granted.
- We are now able to accommodate more altitude, WX deviation and route requests.
- The use of 30/30 and D50 also enable us to transition aircraft to altitudes that other ANSPs may require due to traffic in their FIR.
- This has resulted in greater efficiency for both the provider (KZWY) and the user.



New York Oceanic KZWY- North Atlantic



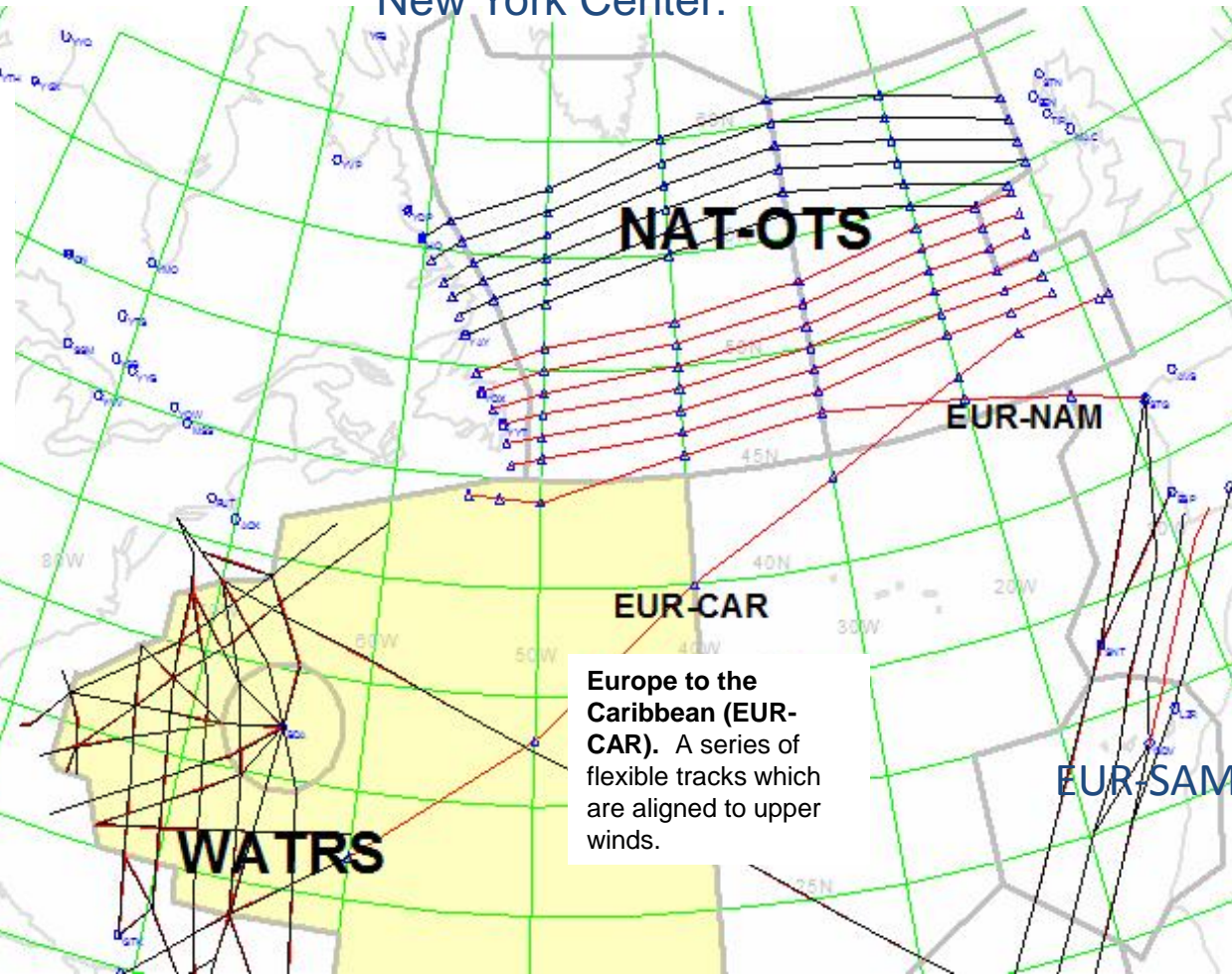
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Atlantic Operations

4 distinct traffic flows affect US Atlantic oceanic operations, controlled from New York Center:

NAT Organized Track System (OTS).

A series of highly organized tracks generated twice daily in the light of wind information. The density of traffic on these tracks is such that few crossing opportunities exist.



Europe to North America (EUR-NAM).

Random tracks are used which can become more complex due to the random nature of the crossing tracks.

Europe to South America (EUR-SAM).

A fixed set of tracks of high complexity which experiences peaks of high traffic density.

Western Atlantic Route System (WATRS). A fixed set of tracks of high complexity which experiences peaks of high traffic density.

Europe to the Caribbean (EUR-CAR). A series of flexible tracks which are aligned to upper winds.



South Atlantic Organizational Structure



ICAO Alignment of ANPs and SUPPs do not recognize the SAT as Oceanic Service Providers.

The NAT and SAT share common service provision as well as borders.



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Current NAT Initiatives

On November 12, 2015, Gander ACC and Shanwick ACC began Phase one of Reduced Lateral Separation Minima (RLatSM) spacing between three identified tracks.

- In the first quarter of 2016, MNPS airspace began the transition to a new airspace definition called High Level Airspace. All applicable ICAO NAT region documentation will be appropriately updated.



NAT Data Link Mandate

- The objectives of the NAT DLM are to enhance communication, surveillance and ATC intervention capabilities in the NAT Region in order to reduce collision risk and enable the NAT Target Level of Safety to be met, particularly in the vertical plane.
 - ADS-C provides capabilities for conformance monitoring of aircraft adherence to cleared route and FL, thereby, significantly enhancing safety in the NAT Region.
 - ADS-C also facilitates search and rescue operations and the capability to locate the site of an accident in oceanic airspace.
 - CPDLC significantly enhances air/ground communication capability and, therefore, controller intervention capability.
- Objectives are that by 2018, 90% of aircraft operating in the NAT region airspace at FL 290 and above will be equipped with Future Air Navigation Systems 1/A (FANS 1/A) (or equivalent) ADS-C and CPDLC systems and that by 2020, 95% of aircraft operating in that airspace, will be so equipped.



NAT Data Link Mandate Cont.

- **NAT DLM Phase 1.** The first phase of the mandate for data link services in the North Atlantic (NAT) Region **commenced 7 February 2013**. As of that date, all aircraft operating on or at any point along two specified tracks within the NAT organized track system (OTS) between FL360 to FL390 (inclusive) during the OTS validity period are required to be fitted with and using FANS 1/A (or equivalent) CPDLC and ADS-C equipment.
- **Phase 2B Commencing 7 December 2017:** FL350-FL390 (inclusive) throughout the ICAO NAT Region;
- **Phase 2C commencing 30 January 2020:** FL290 and above throughout the ICAO NAT Region.





Questions?

