

Viasat + Inmarsat Update

IPACG, 4-5 December, Tokyo

Lisa Bee
Director of Air Traffic Services





Agenda

- Satellite, fleet arrangement, and coverage
- Network and system
- SB-S Iris operation

Viasat ANSP services

Over 30 years providing data link services

Oceanic and remote FANS 1/A

- CPDLC meeting RCP240
- ADS-C meeting RSP180
- Dual voice

Flight deck IP connectivity

- Real time weather apps, e.g., turbulence avoidance
- SWIM

Continental ATS B2 FANS 3/C

- CPDLC meeting RCP130
- ADS-C meeting RSP160
- Dual voice

Ready for 4D TBO

- Extended CPDLC message set for trajectory negotiation
- ADS-C Extended Projected Profile (EPP)
- Enhanced security

Satellite update and fleet arrangement

I-6 F1

- I-6 F1 in service over the Indian Ocean
- 70% more power, 50% more capacity per beam

I-4 F2

- I4 F2 in service over APAC

I-4 F1

- Moved to new location for contingency

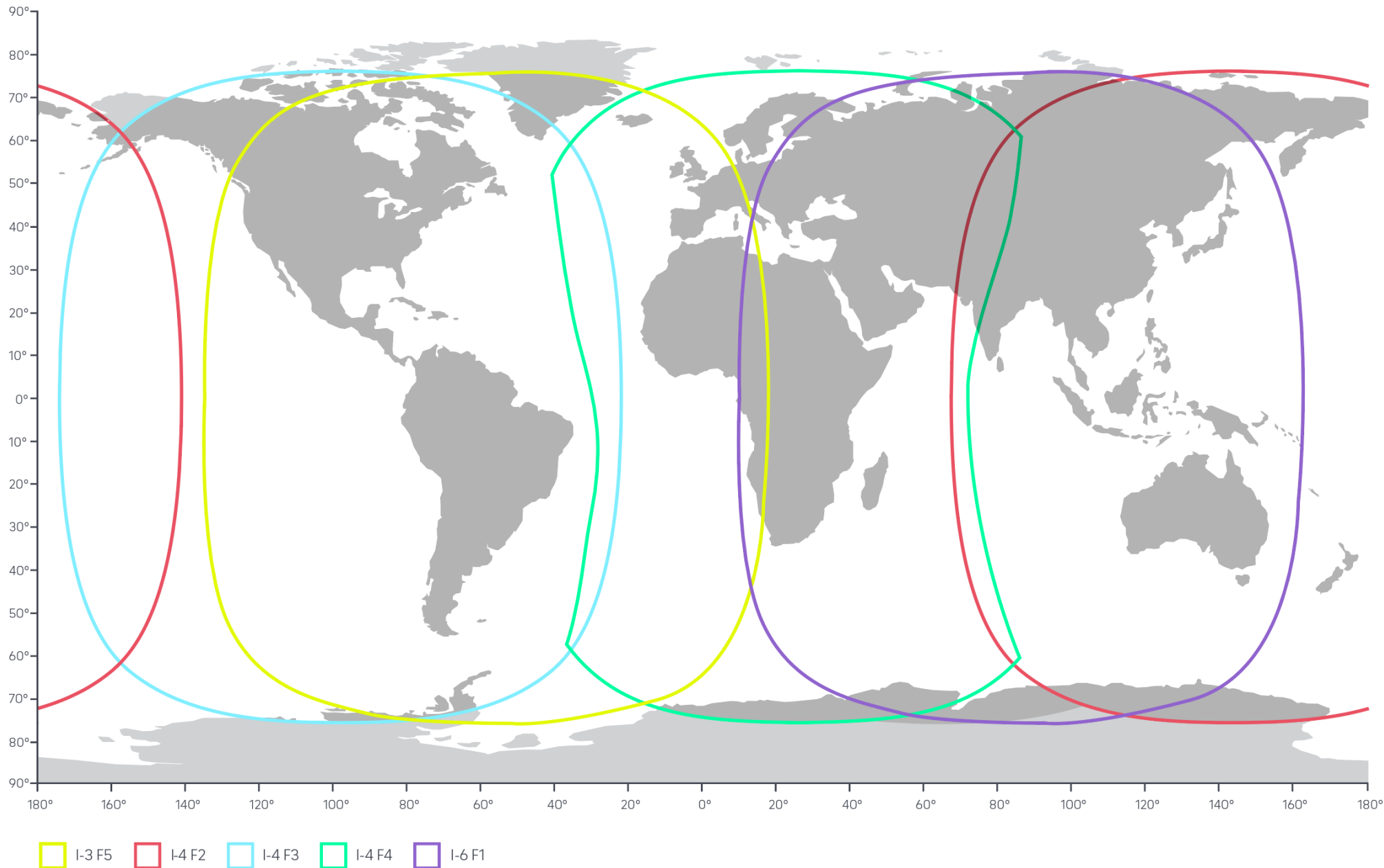
Three I-8 satellites planned for launch in 2026

- Crucial safety services and added network resilience
- Service life extension beyond 2040



Satellite Coverage

- Subject to change
- Coverage map for illustration purposes only



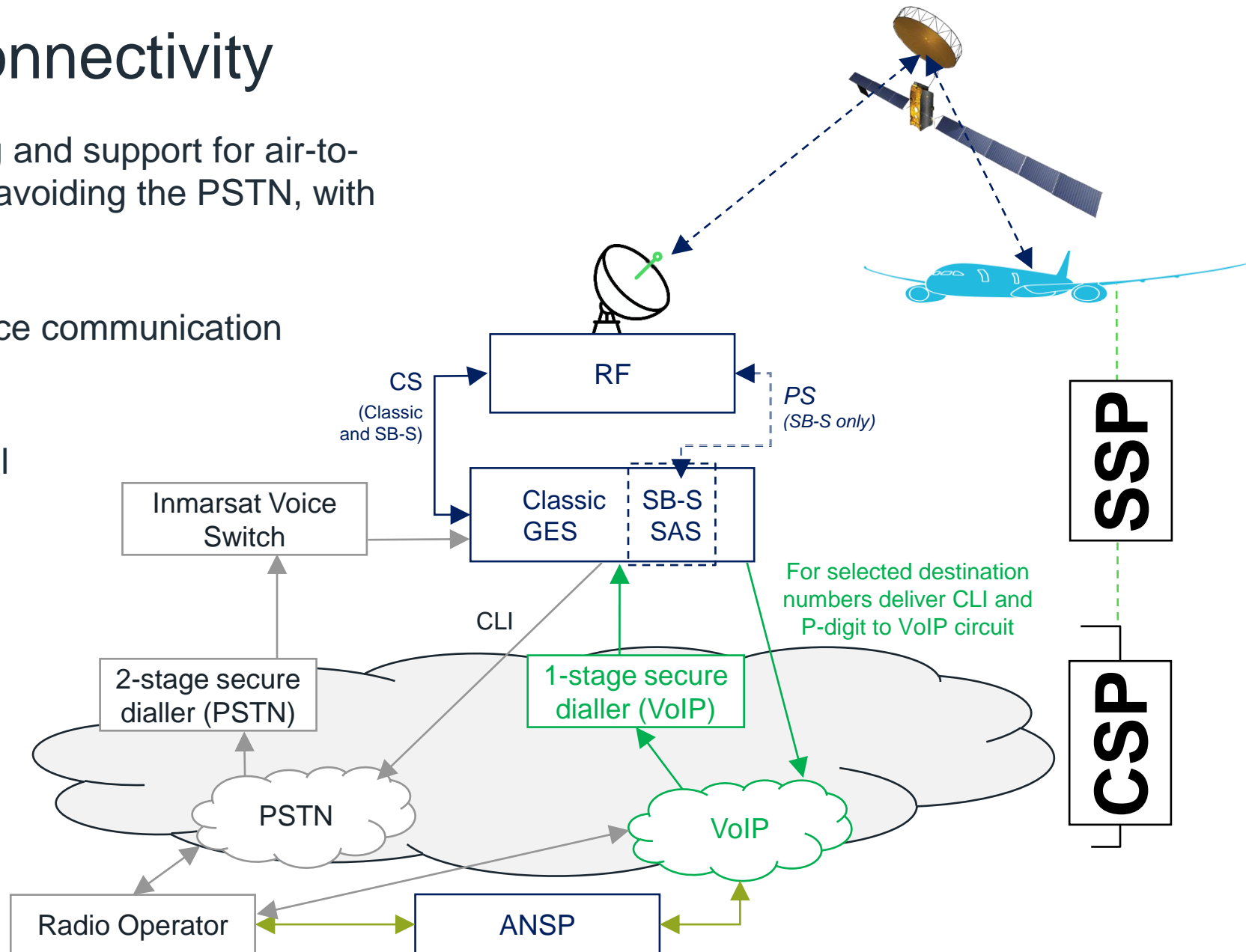
System Updates

Gateway and data logging/analysis:

- Expansion of the Classic Aero and SB-S/Iris data logging, and further development of the performance monitoring support tools available to our Distribution Partners
- Development of data logging to provide voice call performance assessment against the Satcom SARPs PfA
- Implementation of additional resiliency improvements to SB-S 1.0 for improved site switching - each regional gateway can now dynamically process all ocean region traffic
- A new activation & provisioning system is being introduced for SB-Safety
- Two-factor authentication for service activation access (via Okta) is being introduced
- Warkworth is being prepared (with a new software development) to support APAC back-up

SATVOICE VoIP Connectivity

- > 1-stage ground-to-air secure dialling and support for air-to-ground calling on private networks, avoiding the PSTN, with reliable carriage of priority and CLI
- > Enabler for direct controller-pilot voice communication
- > Implemented by SITA, Collins evaluating service in operational trial
- > Aligned with Annex 10, Vol III PfA
- > OPDLWG developing new voice RCP for direct controller-pilot comms



SB-S Iris

The Iris service is built on top of SwiftBroadband-Safety



Over 460 SB-S
equipped aircraft flying
today!



787*
2028



A350
2023



777X
2025



A330
2022



737 NG/MAX
2023



A320/neo
2022



C919
2023



ARJ21
TBC



AIRBUS

COMAC



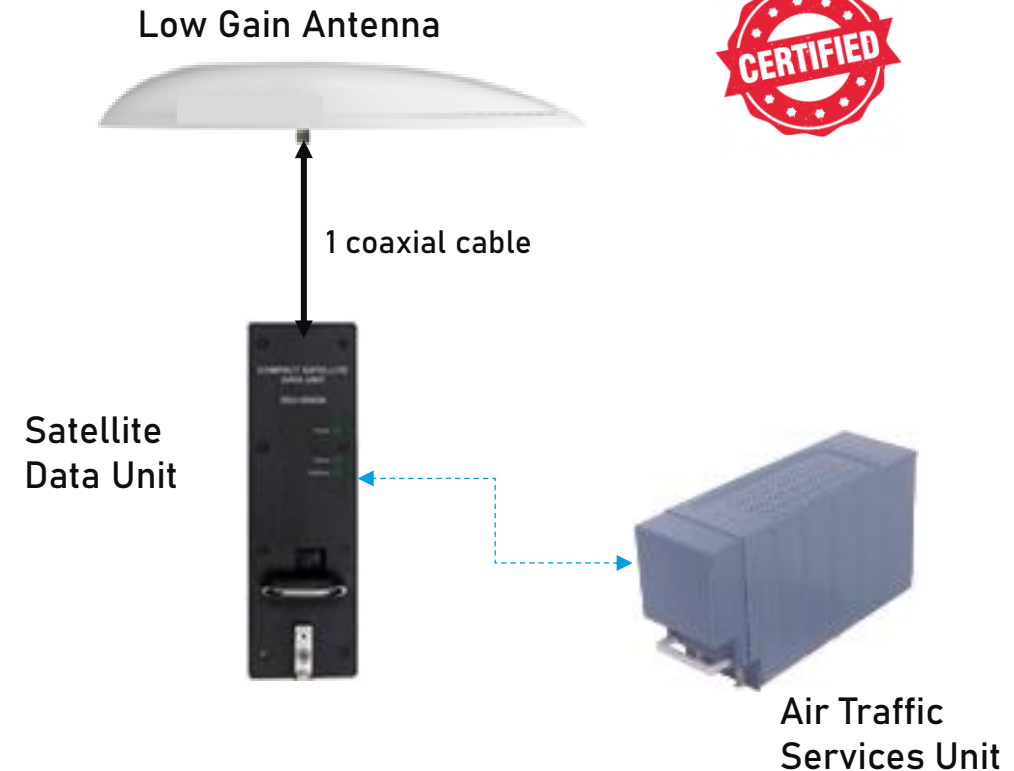
SB-S Iris Service

- > Iris Service is an ICAO-compliant Aeronautical Mobile Satellite Service (AMSS) for ATN B1 / ATS B2 CM and CPDLC and ATS B2 ADS-C
- > Meets stringent performance requirements for domestic airspace
- > Interoperable between domestic/oceanic airspace

SB-S Iris Avionics Installation and Hardware

- > FANS-C over Satcom
- > ATS B2 CPDLC and ADS-C EPP (Extended Projected Profile)
- > Software upgrade to ATSU
- > ATN/OSI software compatible with ATN network.
 - ATN/IPS available through future software upgrade.

AIRBUS
Light Cockpit Satcom





Iris – airspace modernization program

What is it?

- ESA backed air traffic modernization program enabled by ATS B2 satcom in multilink with VDL
- Embraced by Airbus and tightly integrated into cockpit
- Delivers technology and performance needed to increase airspace capacity and flight efficiency and to achieve goals for CO₂ reduction
- Increases datalink capacity by offloading enroute traffic from VDL to satcom to address issue of VDL reaching max capacity in congested domestic airspace

Benefits

- Increased ATM capacity with optimized flight routing
- Minimized delays from lack of ATC capacity
- Reduced environmental impact of air travel

EU Mandate: ATS B2, ADS-C EPP effective 31st December 2027

COMMISSION IMPLEMENTING REGULATION (EU) 2021/116
of 1 February 2021

Extract

System requirements

- (a) Aircraft must be equipped with the capability to automatically down-link trajectory information using ADS-C EPP as part of the ATS B2 services. The trajectory data automatically down-linked from the airborne system must update the ATM system in accordance with the terms of the contract.
- (b) Data link communications ground systems must support ADS-C (downlink of aircraft trajectory using EPP) as part of the ATS B2 services while keeping compatibility with controller – pilot data link communications (CPDLC) services as required by Commission Regulation (EC) No 29/2009 ⁽¹⁾, including provision of service to flights equipped only with the Aeronautical Telecommunication Network Baseline 1 (ATN-B1).



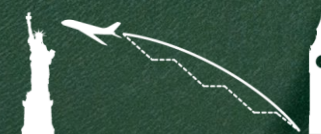
Enables 4D Trajectory-Based Operations



Direct
Routes



Optimum Flight
Levels



Continuous
Climbs



Continuous
Descents



Queue
Management



Speed
Control

Iris pre-commercial flights are supported by 19 ANSPs

Iris Service is currently fully operational and provided by ESSP who is certified and overseen by EASA since July 2023

19 ANSPs have contracted Iris Service

Full specification of Iris Service is provided in the Iris Service Definition Document published at [ESSP website](#)

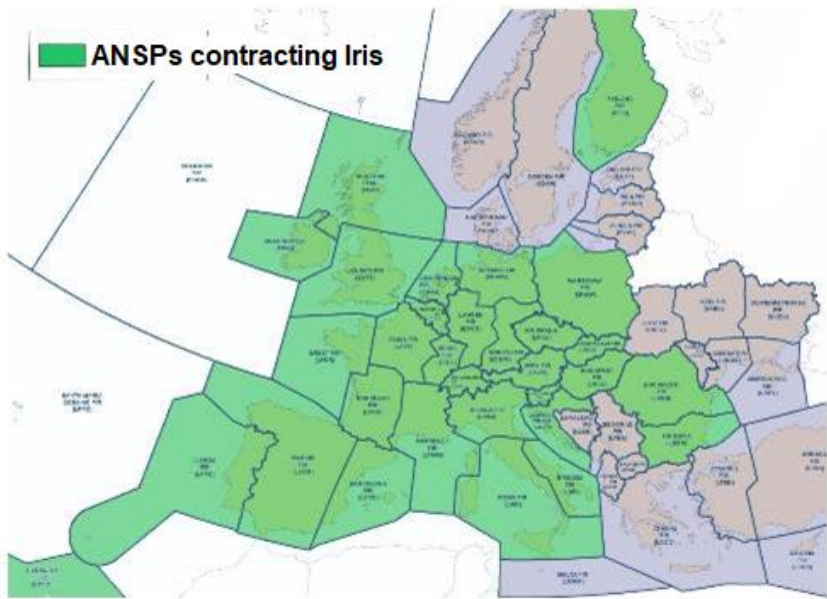


LIST OF APPROVED ATM/ANS ORGANISATIONS UNDER THE OVERSIGHT OF EASA

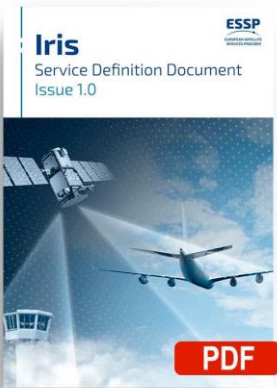
CERTIFICATE REFERENCE	ORGANISATION NAME	COUNTRY	SCOPE	ISSUE DATE	STATUS
EASA.AOA.PAN.038	European Satellite Service Provider (ESSP SAS)	France	Aeronautical Mobile Satellite Service (AMSS)	20/07/2023	Valid



[List of Approved ATM-ANS Organisations](#) (public pdf at EASA website)



- ANS CR
- AIRNAV IRELAND
- AUSTROCONTROL
- BULATSA
- CROATIACONTROL
- DFS
- DSNA
- NAV PORTUGAL
- ECTL/MUAC
- ENAI
- ENAV
- FINTRAFFIC ANS
- HUNGAROCONTROL
- LPS SR
- NATS
- PANSA
- ROMATSA
- SLOVENIACONTROL
- SKYGUIDE



Operational flights with easyJet



0x440CBF
OELSO



0x408011
GUZLT



0x407FFF
GUZLS

- 1 aircraft from the 22nd of January 2024
- 2 more aircraft from the 26th of February 2024
- Number of Flights in January: 24 flights
- Number of Flights thru September: 3367 flights

A growing user base

7

European airlines

72

72 deliveries for
2023–24

~250

orders booked for
2024-28

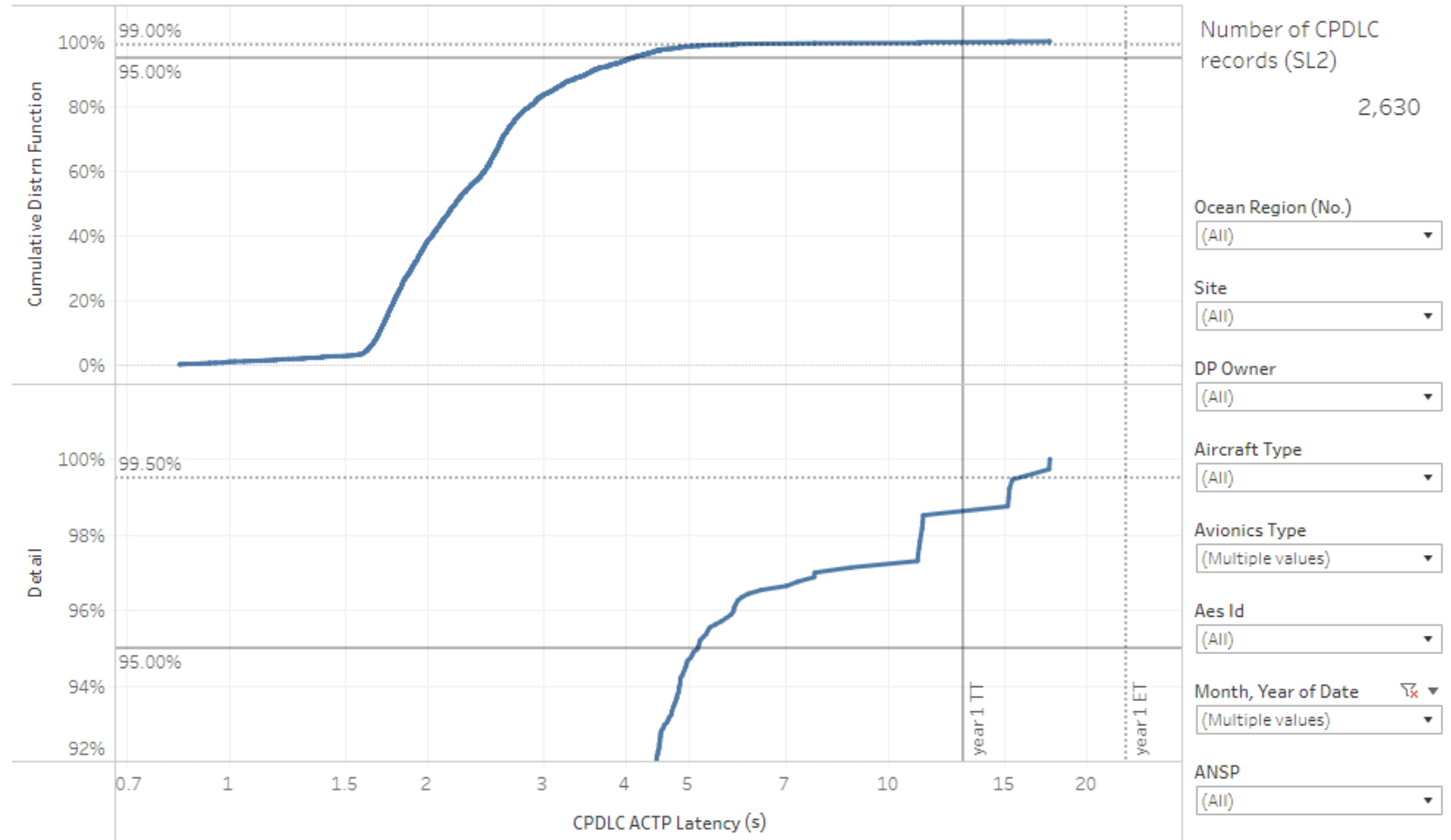
CPDLC Air-Ground Latency

- Excellent performance seen for in-service period
- Tableau chart shows satcom data latency on Iris flights for June-August 2024
- 95th percentile at 4.11 seconds for 2-way satcom air-ground data transfer
- Measurement points: Timestamps at the satellite terminal (SDU) and at the Viasat data link gateway (GDGW)
- ESSP provides monthly end-to-end Iris performance:

<https://satcom-dls-support.essp-sas.eu/>



ATN/OSI CPDLC Latency (Aircraft Iris Satcom terminal to Satcom Ground Gateway)



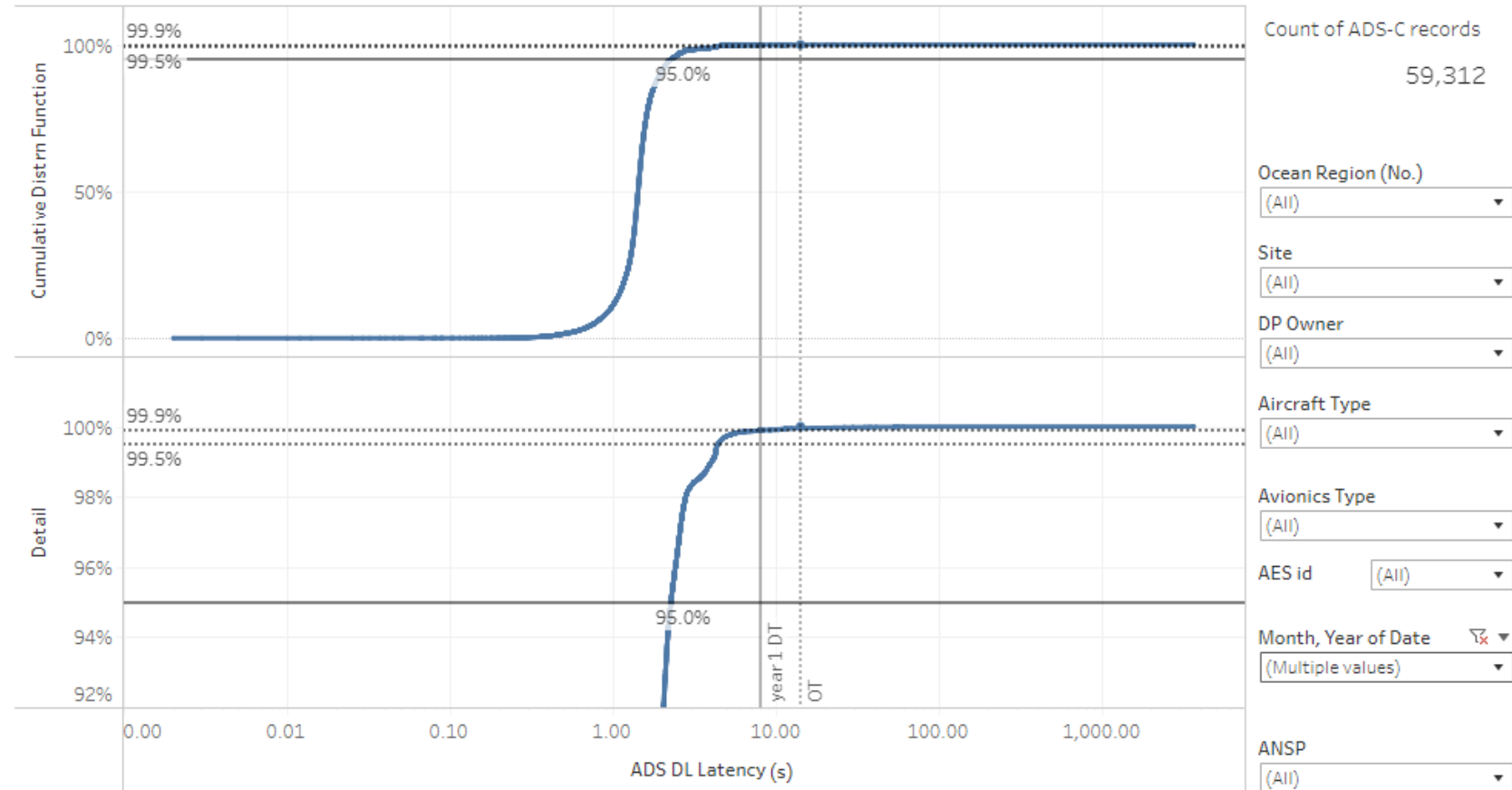
ADS-C Air-Ground Latency

- Excellent performance seen for in-service period
- Tableau chart shows satcom data latency on Iris flights for June-August 2024
- 95th percentile at 2.25 seconds for 1-way satcom air-ground data transfer
- Measurement points:
Timestamps at the satellite terminal (SDU) and at the Viasat data link gateway (GDGW)
- ESSP provides monthly end-to-end Iris performance:

<https://satcom-dls-support.essp-sas.eu/>



ATN/OSI ADS-C Latency (Aircraft Iris Satcom terminal to Satcom Ground Gateway)



Benefits of Connected Airline Operations

MUAC's overview on ATS-B2 benefits



Airborne side ADS-C + CPDLC

Airlines



- Optimized climb and descend profiles
- Optimized routes, less miles flown
- Fuel saving + Reduced CO2 emissions → greener flights
- Future(possibly): less regulations through a more optimized network (use of EPP ETA, runway occupancy parameter, etc.)
- Already available in MUAC's airspace

Pilots



- Link of the ATSU to FMS for easier handling of messages (CPDLCv2)
- Less radio usage for routine information requested by controllers
- Reduced Flight crew workload

	ATN STD	UM	AVG(s)	PC50(s)	PC70(s)	PC95(s)	COUNT
PROCEED DIRECT TO X	B1	74	12,401	10	13	26	519548
PROCEED DIRECT TO X	B2	74R	10,5784	9	11	22	20206
CLEARED TO X VIA Y	B1	79	21,7196	16	23	55	5128
CLEARED TO X VIA Y	B2	79R	18,25	14	19	41	188

Response times to PROCEED DCT and CLEARED TO [...] VIA [...] CPDLC uplinks in B1/B2 airframes in 2022 at MUAC.
Note: Measured as time from uplink to WILCO sending time; there are more contributing factors.



ATS B2 capabilities (provided by SBS + FANS C):

- Extended CPDLC message set for trajectory negotiation
- ADS-C Extended Projected Profile (EPP)

A world of opportunity from connected EFB

- Live weather for turbulence avoidance, avoid harm to passengers, crew and aircraft
- Reduce fuel burn and carbon emissions
- Minimise impact of Irregular Operations
- Enhanced AOC comms – chat apps, IP voice, connected crew apps
- eTechlogs



“Turbulence effects have increased due to climate change”

“Flight Profile Optimization can potentially reduce annual fuel burn by an average of 1% to 3%”



AeroDocs

JEPPESEN
A BOEING COMPANY

SITA

WSI°

SMARTAVIATION



SKY

PATH



Lufthansa
Systems



PACE

Operational in Europe, available globally

Operational in Europe, available globally
Commercial flights with easyJet



Iris Global

Launched June 2022

Iris Global (Phase 3), new ESA project

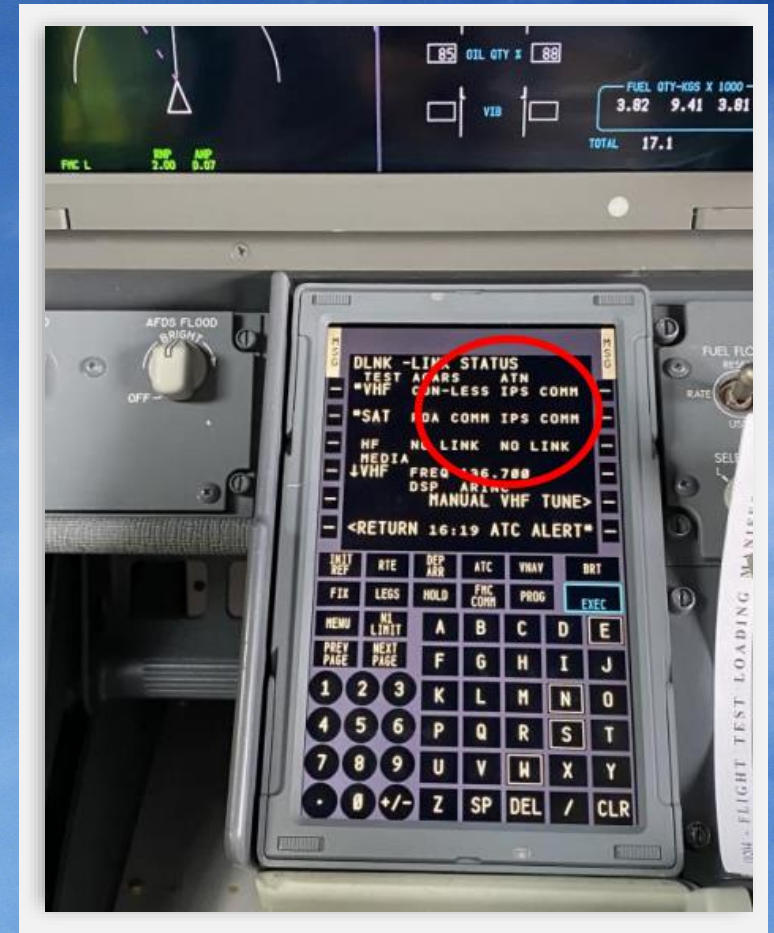
- > International development & demonstrations for Iris-based services work package
- > Opportunity for key Aviation/ATM stakeholders to benefit from funding for Iris demonstrations
- > Opportunity to be a pioneer/early adopter of Iris in the region
- > Future-proof for global ATC and AOC services, as part of fleet renewal

Trajectory-based operations

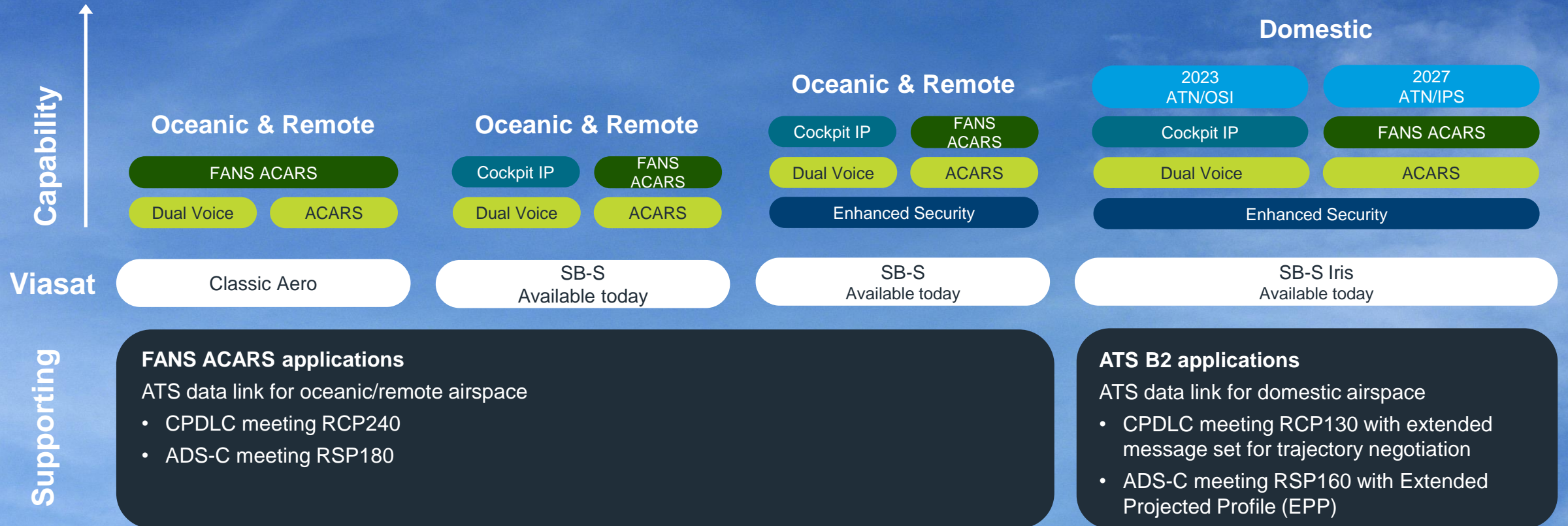
- > Several ANSPs in APAC already demonstrated the use of TBO (via EFB)
- > Opportunity to test/develop a prototype of the ATS B2 service over satcom
- > Trajectory-based demonstrations between regions (mixed environment)
- > Demonstrate the use of the IP connectivity for advanced SWIM-based AOC services

Robust Roadmap to support ATN/IPS standard

- We are building an ATN/OSI and ATN/IPS gateway that allows all aircraft, to transition seamlessly no matter which standard they operate on
- Boeing ecoDemonstrator flight in 2021
- OSI<>IPS interoperability trials 2024/2025



A data link ready for the future



A low-angle, upward-looking shot of several modern skyscrapers with glass facades. The buildings converge towards the top of the frame, creating a sense of height and scale. In the center of the sky, a small airplane is visible, flying towards the viewer. The overall color palette is dominated by the teal and grey tones of the buildings and sky.

Questions?