

SATCOM FOR AVIATION

– An ANSP perspective

Langen, 28.March 2022

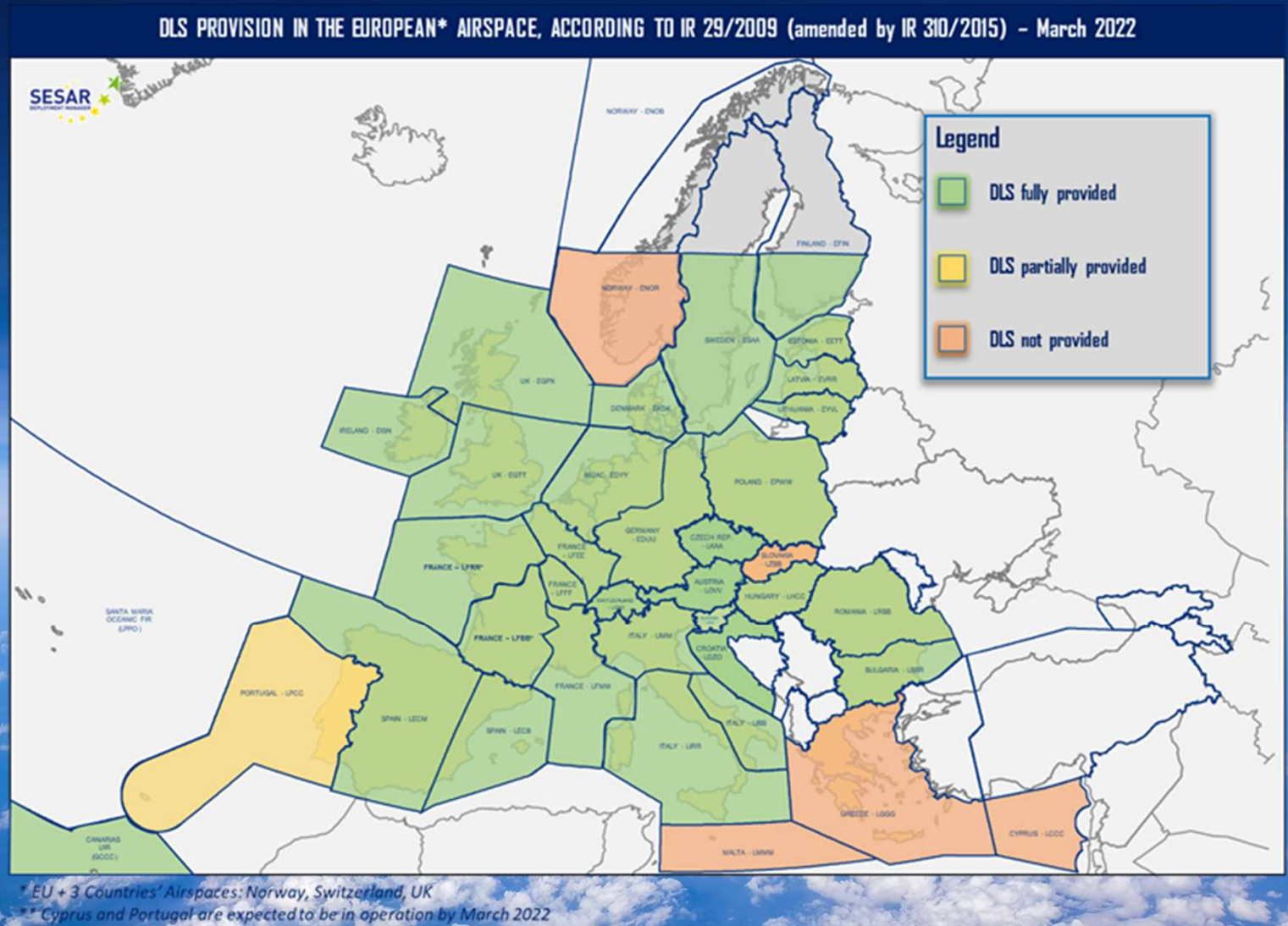


DFS Deutsche Flugsicherung

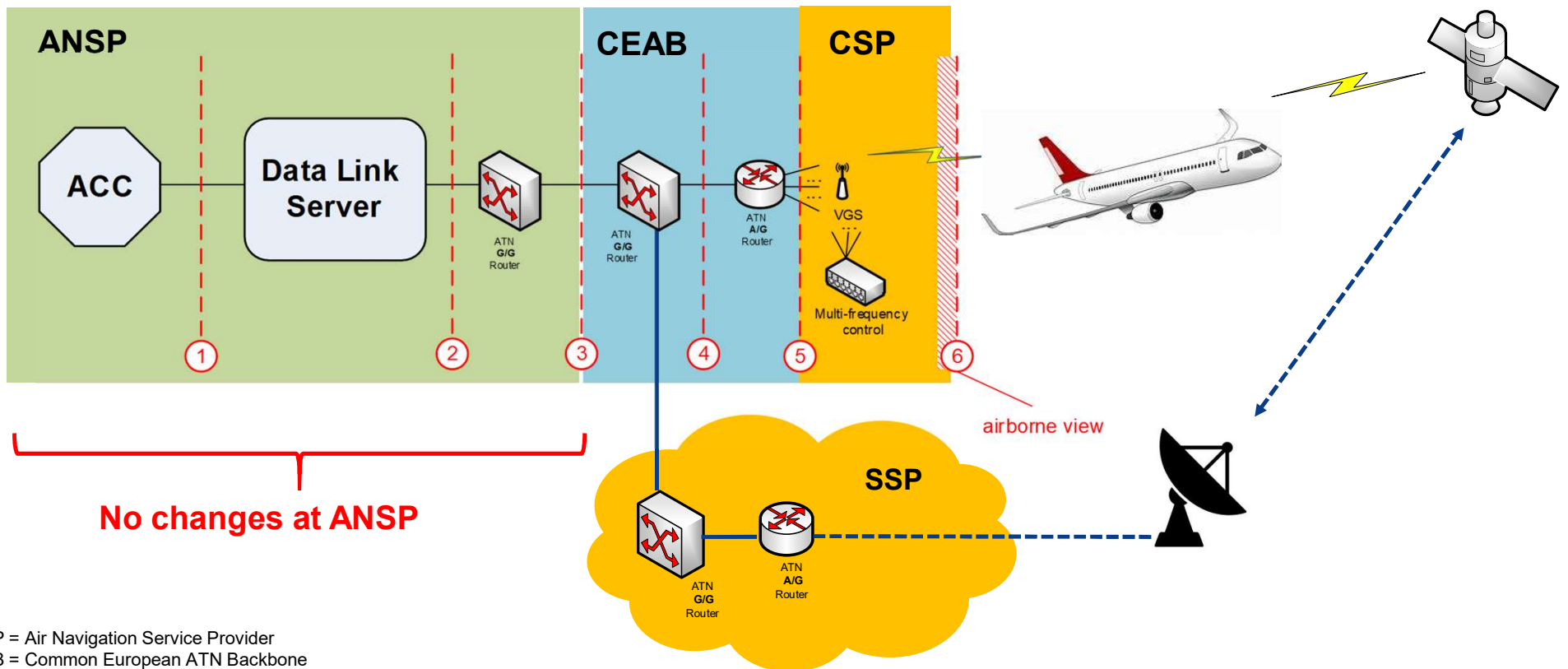
ANSPs need a wideband A/G data link for ATS

- All advanced SESAR ATM concepts require data link as an enabler
 - VDL M2 is considered as an intermediate solution until future wideband technologies are available to support more data hungry applications
 - 3 A/G links are considered supporting ATS, in complement to VDL M2
 - AeroMACS
 - Standards are available but not implemented by AU as ATS means
 - LDACS
 - Promising technology requiring further development/validation to allow for implementation; standards partly available by end 2022
 - SATCOM / IRIS
 - Space technology already deployed; standards available by end 2022; validation complete by 2023
- SATCOM most mature and operationally ready from ANSP perspective**

Data Link in Europe today



ATN/OSI as baseline



ANSP = Air Navigation Service Provider
 CEAB = Common European ATN Backbone
 CSP = Communication Service Provider
 SSP = Satellite Service Provider

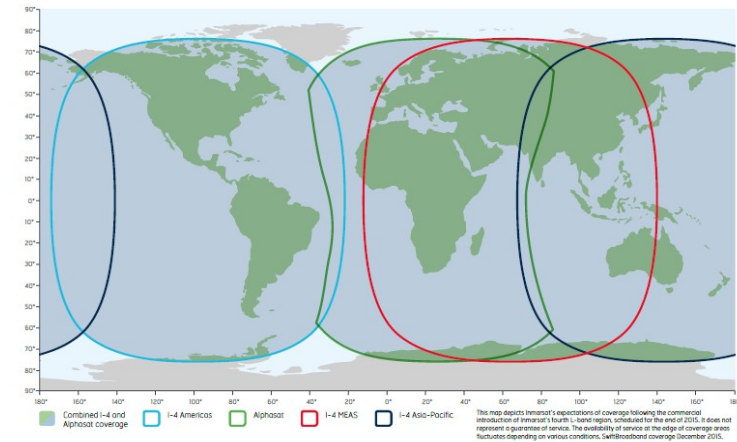
SATCOM CPDLC Tests with DFS in November 2021

Tests with Honeywell Test Aircraft

- Test aircraft on ground (Duluth ,USA) before transfer flight to Europe for IRIS SATCOM test campaign
- Interconnection via SITA CSP in Montreal
- DFS test FDPS and test CWP at Rhein Radar center in Germany
- CPDLC B1 tests
- **No technical issues identified!**



SwiftBroadband coverage



Tests with AIRBUS test setup at AIRBUS in Toulouse

- AIRBUS B2 test setup at Toulouse
- Interconnection via SITA CSP in Montreal using Inmarsat SATCOM
- DFS test FDPS and test CWP at Rhein Radar center in Germany
- CPDLC B1 tests
- **No technical issues identified!**



ANSP use of IRIS SATCOM - Benefits

Major immediate benefits

- **No ANSP capital investment required** - Interconnection via existing ATN/OSI infrastructure
- **No physical deployment required** - early connectivity to ATN networks and service availability in 2023
- **Increase in CPDLC data capacity** – supporting foreseen constantly increasing baseline of DL exchanges
- **Increase in CPDLC coverage** – enabling CPDLC in lower airspace (below FL 195)
- **DL Service resilience** – based on dual equipped aircraft
- **Interoperability** – Iris equipage additionally supports FANS 1/A, providing seamless solution for airspace management, e.g. Oceanic boundary
- **Standardisation** - IRIS SATCOM ICAO standards planned to be finalised during 2022 (EUROCAE MASPS and MOPS are already available)

ANSP use of IRIS SATCOM - Benefits

Major mid to long term benefits

- **Increased capacity for ADS-C/EPP** - Supporting increased DL data traffic demand (PJ38 evaluation of EPP already started and ongoing!)
- **Increased coverage for ADS-C/EPP** – supporting increase in horizon for flight data capture, e.g. from beyond European landmass/oceanic areas
- **Supporting migration from ATN/OSI to ATN/IPS** (SESAR W2 Solution 107) and ATN/IPS Multilink concept (SESAR W2 Solution 77)
- **Interoperability** – Iris equipage provides improved LRCS for use in oceanic/remote airspace
- **Supporting A/G link authentication** to meet future ATS requirements
- **Potential support of „time-critical“ CPDLC services** (CSMA channel access scheme of VDL M2 does not allow it!)
- **Increase in AOC Capacity** – supporting the foreseen constantly increasing baseline of AOC traffic sharing links

(Non-)Risks from ANSP perspective

- **Minimal technical risk** when integrating SATCOM into ANSP datalink operation, through re-use of existing operational delivery infrastructure
- **No investment cost** risk as no additional capital investment is needed to support integration of SATCOM
- Additional costs for SATCOM integration are OPEX based, and based upon a User Pays Principle (UPP), when delivered through a future DSP entity
- **AU will be cautious in investing in SATCOM NG and so roll-out of airborne equipment may be slow**
 - ➔ focus on development of AU case for adoption of Iris including ATC + non-ATC benefit cases
- **Support for integration of SATCOM is not currently harmonised amongst ANSPs in Europe**
 - ➔ needs strong governance work, instead of a direct mandate (use of ACDLS)
- **ANSPs may not be in a position to take advantage of SATCOM capability from the time that it is technically available ➔ delaying the benefits that can be achieved including mitigation of VDL M2 saturation**

(Non-)Risks from ANSP perspective

The **main risk is to not use actual window of opportunity to use SATCOM as the first available wideband datalink**

➔ All future ATM concepts require a wideband data link!

Future support for SATCOM development

DFS and other major ANSPs will further support SATCOM technology for ATS:

- **Support in the context of SESAR projects**
- **Support of standardisation activities in international bodies like EUROCAE and ICAO**
- **Support end-to-end testing of SATCOM deployments to assure functional and performance requirements are reliably met**
 - **Use of Iris Test Facility (lab environment)**
 - **Upcoming demo flights supporting Airbus and Honeywell**
 - **Iris pre-commercial revenue flights - Easyjet**
- **ANSPs working towards establishing required safety and regulatory assurance to support CPDLC exchanges with revenue flights from 2023 onwards, leading to operational adoption**
 - **Certification required!**

THANK YOU FOR
YOUR ATTENTION!



DFS Deutsche Flugsicherung