

Presented by

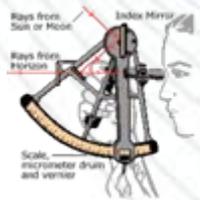
Laurent VIDAL

Surveillance Systems Manager

Technical Support to Sales and Programs



ADS-B OUT



ADS-B Airbus roadmap



ADS-B IN

ADS-B information is received
- **IN** the airborne
- into the **TCAS**

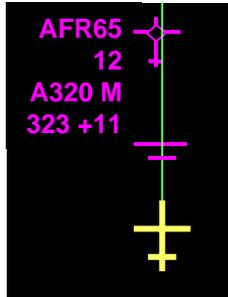
Step 2. ATSAW

Display of other a/c information in the cockpit



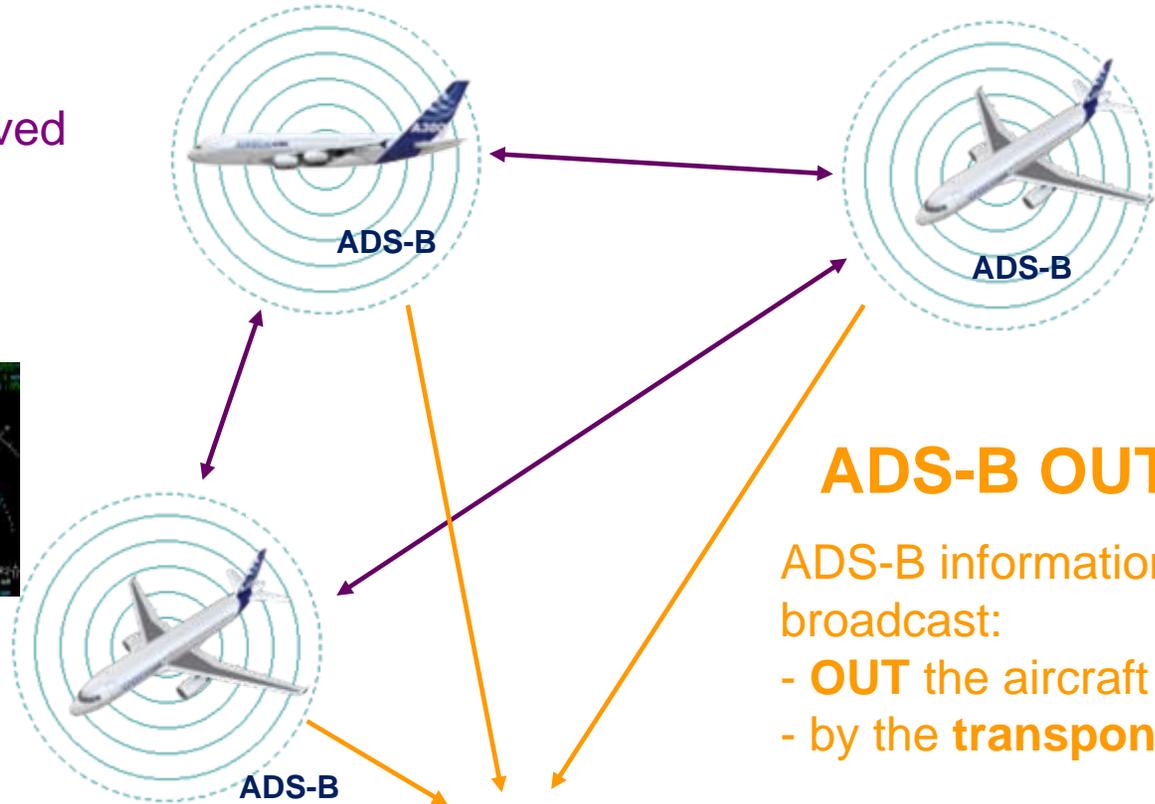
Step 3. SPACING

A/C instructed to maintain spacing with target aircraft



Step 4. ASAS SEPARATION

A/C instructed to maintain separation with other aircraft



ADS-B OUT

ADS-B information is broadcast:

- **OUT** the aircraft
- by the **transponder**

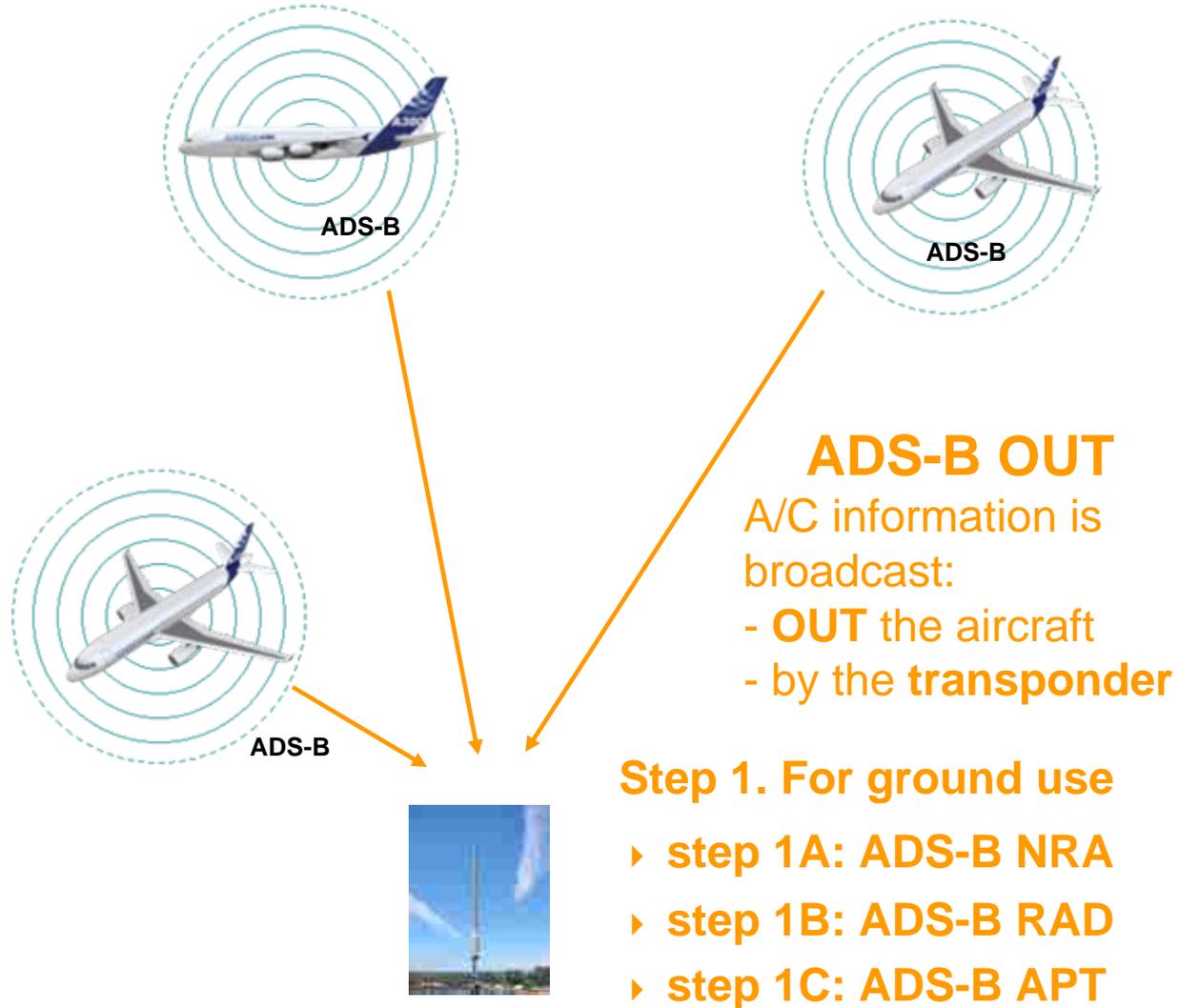
Step 1. For ground use

- ▶ step 1A: ADS-B NRA
- ▶ step 1B: ADS-B RAD
- ▶ step 1C: ADS-B APT



ADS-B Receiver for Air Traffic Control

ADS-B OUT



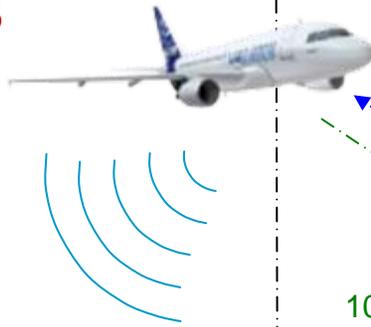
NRA: Non Radar Areas
RAD: Radar Areas
APT: Airport Surfaces

**ADS-B Receiver for
Air Traffic Control**

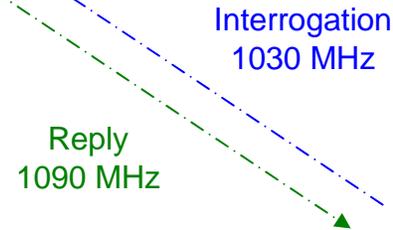
ADS-B OUT for NRA operations



Surveillance with ADS-B Mode S Transponder



Surveillance with SSR Modes A, C, S



Ground perspectives:

- Light and “cheap” installation/maintenance
- Refresh rate (ADS-B : 0.5 s)
- Less electro-magnetic pollution

- Heavy and expensive installation/maintenance
- Refresh rate (SSR: 5 s)

Airborne perspectives:

- Safety enhancement in NRA (traffic management as SSR like)
- Capacity increase by reducing the separation as SSR like (e.g. 5NM)
- Cost effectiveness for airlines (better flight level...)



- Conditions to transmit ADS-B parameters on Airbus aircraft:

A320 & A330/A340

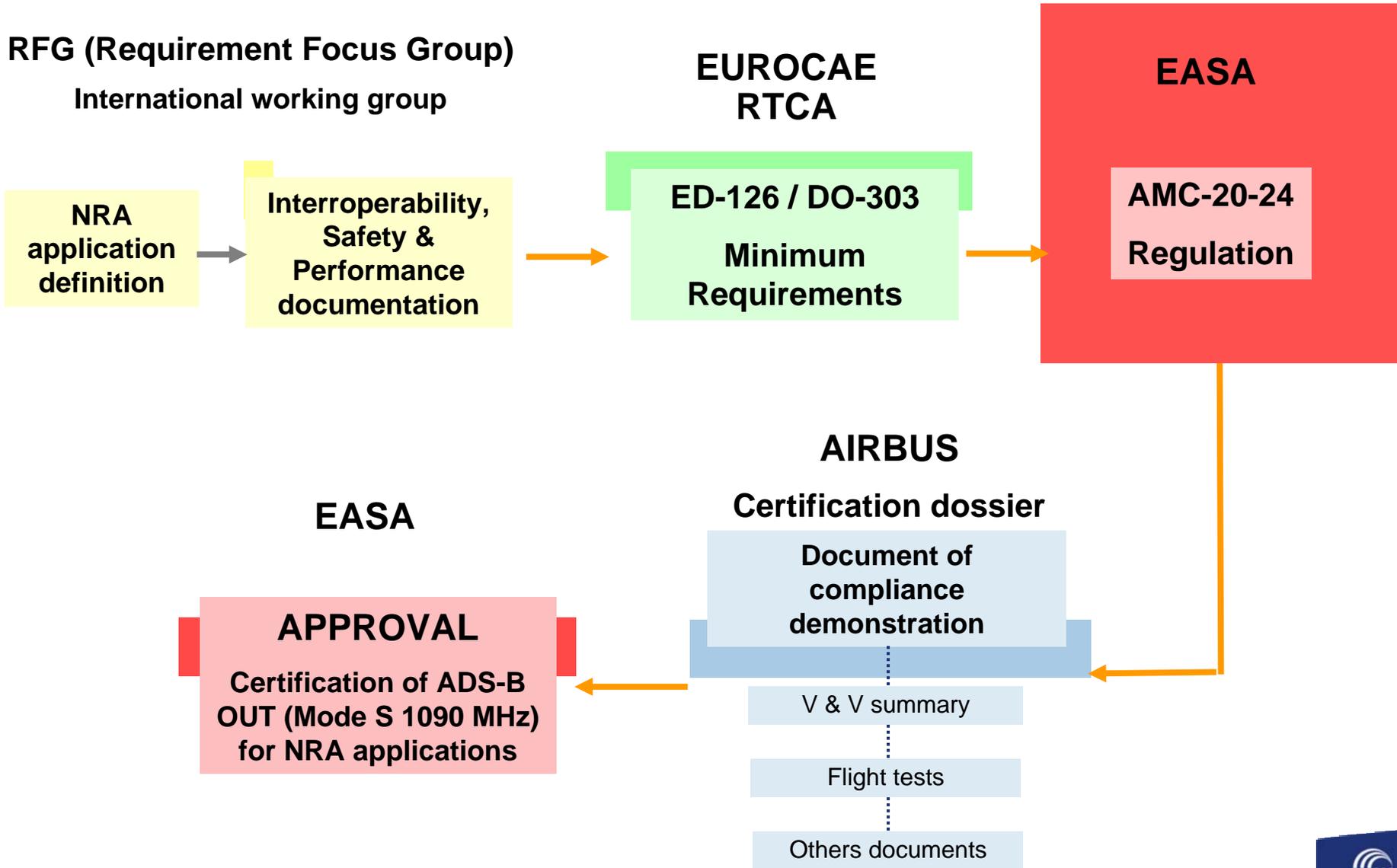
- ▶ EHS wiring provision (basic)
- ▶ Transponders capable of ELS/EHS/ADS-B (compliant DO-260),
 - **ACSS: P/N 7517800-10005A (DO-260)**
P/N 7517800-10100 (DO-260A)
 - **Honeywell: P/N 066-01127-1402 (DO-260)**
 - **Rockwell Collins: P/N 822-1338-021 (DO-260)**
- ▶ MMR (any vendor) OR some GPSSU (not all)

A380

- ▶ EHS/ADS-B parameters provided by AFDX (basic)
- ▶ **AESS H04S05 (compliant DO-260A)**

- **No need** of pin programming to activate ADS-B data transmission.
- **Need** certification for operational use if required by regulation.

ADS-B OUT: Certification process



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- **ADS-B OUT for NRA operation has been certified on Airbus aircraft in compliance with AMC-20-24**
 - ▶ A330/A340 aircraft family since February 2009
 - ▶ A320 aircraft family since September 2008
 - ▶ A380 since June 2009

ADS-B OUT Operational Approval



- As per EASA AMC-20-24 some AIRBUS documentation are required for operational approval:
 - ▶ **Update of AFM:** Statement of compliance with AMC 20-24.
 - ▶ **ADS-B OUT Capability declaration document:**
 - Providing description, interoperability, safety and performance demonstration, specificities...etc
 - Referenced in AFM.
 - Useful for airline discussions with its Authority
- Others Airbus documentaion update:
 - ▶ **FCOM:** Description of ADS-B OUT.
 - ▶ **MEL:** As required by regulations. To refer to your Authority for dispatch conditions.



Exemple of content of AFM page for A330/A340

Reference to compliance with AMC-20-24

ADS-B OUT

The extended squitter ADS-B Out function has been demonstrated to comply with airworthiness requirements for ADS-B Out in Non-Radar Areas contained in AMC 20-24. This approval is based on standards, descriptions, operational procedures and limitations contained in "ADS-B Out Capability Declaration" document reference X3452D07018335 (certification reference 00F340P5144/C0S) at the latest issue.

Note : 1. *Direct ATC controller-pilot VHF voice communications must be available to conduct ADS-B out operations in non-radar areas.*

2. *Compliance with the above does not constitute an operational approval.*

Reference to ADS-B OUT Capability Declaration

ADS-B OUT : Next Steps



- Two further applications defined within RFG: **RAD & APT**
- **ADS- B OUT for RAD** (*application for high density airspace*)
 - ▶ Enables to decommission redundant SSRs providing the same level of surveillance service.
 - ▶ Would be the primary mean of surveillance with radar as a back up.
 - ▶ EASA & FAA requirements for RAD operations recently published:
 - Requirement to be compliant with DO-260B
 - Updates in ADS-B OUT set of messages/performance
 - NIC, NAC, SIL, Emergency status, mode A, latency<0.5sec,....
 - ▶ Development of Airbus transponders DO-260B compliant planned to start beginning 2011.
 - ▶ All next transponders standards will be certified with DO-260B compliance.

ADS-B OUT : Next Steps



- **ADS- B OUT for APT (*application for airports surface*)**

- ▶ New tool for surface movement surveillance
- ▶ Standardization in progress
- ▶ Light involvement from Airbus for the time being
- ▶ DO-260B should fulfill APT requirements

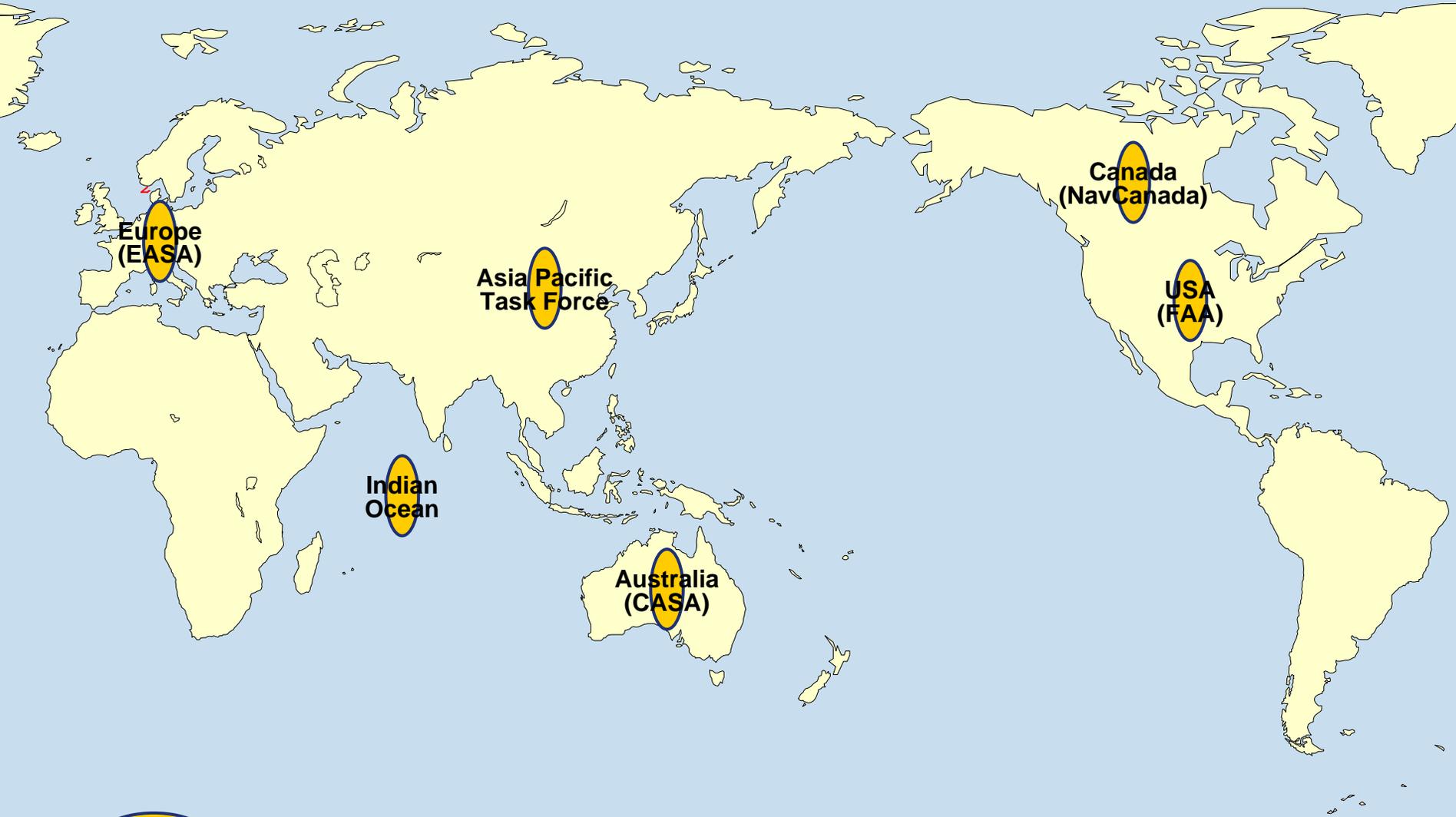
- Airbus is aiming at minimizing implementation steps and ensuring cost effectiveness of standardized solutions

ADS-B OUT: Mandates



- **Canada** (Nav Canada): in the vicinity of Hudson Bay
 - ▶ Mandate for NRA operations: **Nov 2010**
 - ▶ First operations: January 2009
- **Australia** (Airservices Australia):
 - ▶ Mandate for NRA operations: **2013**
- **Europe** (EASA):
 - ▶ Mandate for NRA & RAD operations: **2013** (forward fit), **2015** (retrofit) *(could be delayed of one year – under discussion)*
 - ▶ DO-260B required
- **US** (FAA):
 - ▶ Mandate for NRA & RAD operations: **2020**
 - ▶ Requirements in accordance between US & Europe

ADS-B OUT Implementation



Specific Airbus involvement

THANKS FOR YOUR ATTENTION...



QUESTIONS?

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