



APANPIRG ADS-B UPDATE Seminar : Singapore




# APANPIRG ADS-B Task Force

## Update on European Program

With agreement from Eurocontrol



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## European Activity

- ADS-B OUT – Airline Pioneers
- ADS-B IN – Airline Pioneers
- ADS-B OUT & IN – ANSP partners



## Pioneer Airspace User partners for ADS-B Out/ Non-Radar Airspace

19 Pioneer Operators / 622 Aircraft



## Pioneer Airspace User partners for ADS-B Out & ADS-B In/ATSAW

5 Pioneer operators – 25 aircraft

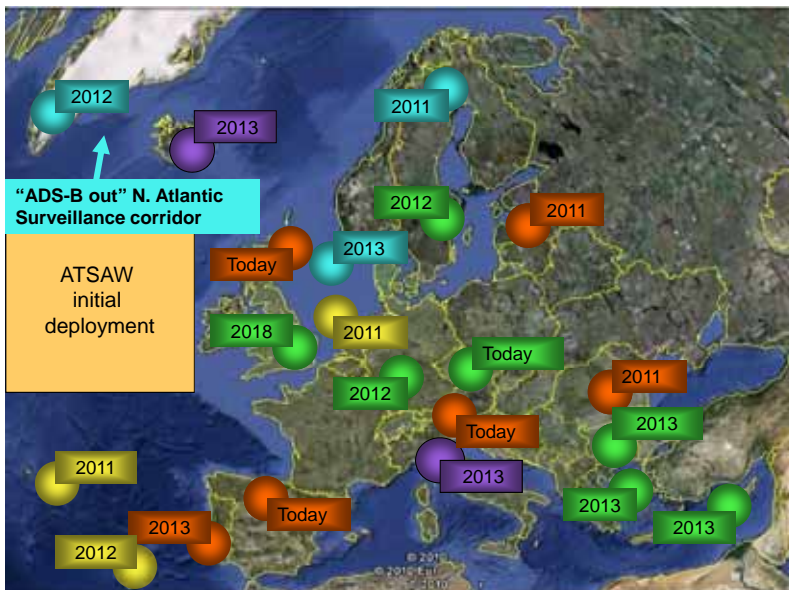




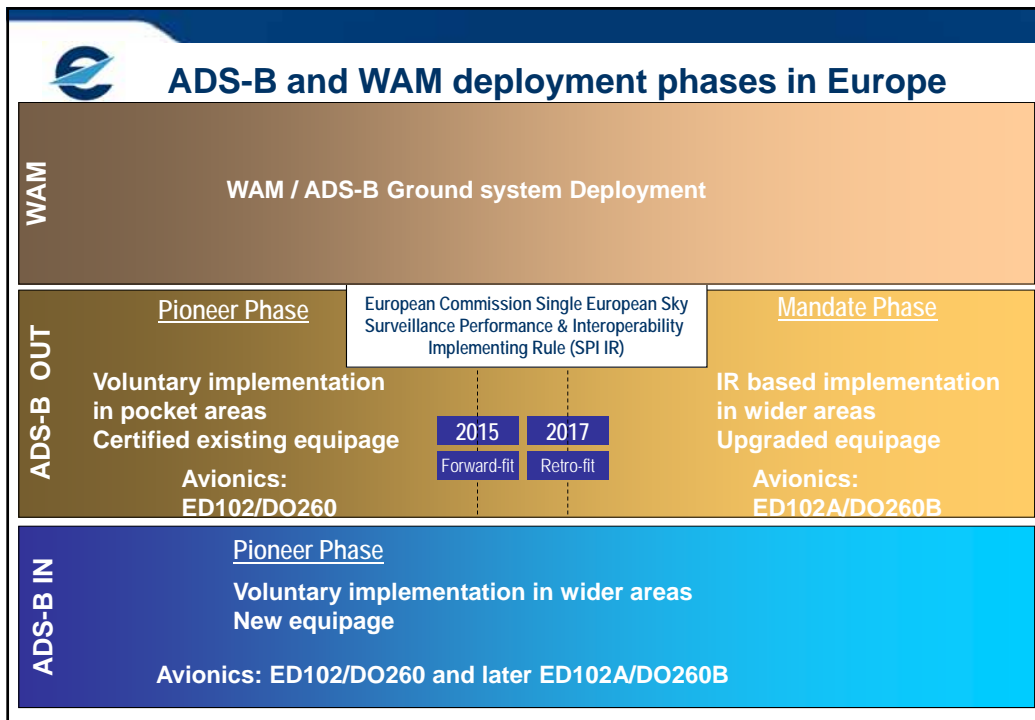
## Pioneer ANSP partners in ongoing CRISTAL trials (ADS-B Out & ADS-B In/ATSAW)



## ADS-B and WAM deployment in Europe



- WAM
- WAM+ADS-B NRA
- ADS-B NRA
- ADS-B RAD
- WAM+ADS-B RAD
- WAM from 2011-2013  
↓  
ADS-B RAD from 2015



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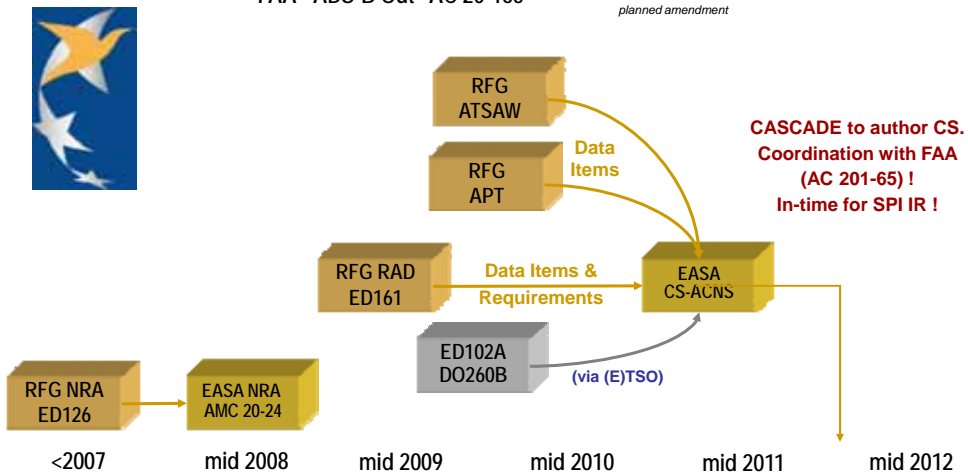



## European Rulemaking

- Challenging timeline using
- New Compliance Specification (CS) instead of AMC

FAA "ADS-B Out" AC 20-165

←-----  
planned amendment



CS-ACNS: (SUR part of) "Airborne CNS Certification Specification"

## SPI IR – RULEMAKING SCHEDULE

- European Commission SES II Rulemaking Process
- Consultation completed: Report plus Final Draft text provided by EUROCONTROL Qtr3 2010
- SES Committee April 2011
- SES Committee Jul 2011 – Formal Approval



## SPI IR ADS-B OUT Surveillance Data

ADS-B-RAD & ADS-B-NRA	
Aircraft Identity	
Aircraft Identification	
Mode A Code (incl. broadcast disabling function)	
ICAO 24 bit aircraft address	
Airborne Horizontal Position	
Including quality indicators: NIC, NACp, SIL, SDA	
Pressure Altitude	
Special Position Identification (SPI)	
Emergency Status and Emergency Indicator	
Version Number	

ATSA-ITP, ATSA-VSA & ATSA-AIRB	
Ground Speed, including quality indicator: NACv	
Emitter Category	
Vertical Rate	

Aircraft Derived Data	
Geometric Altitude, including quality indicator GVA	

ADS-B-APT & ATSA-SURF	
Surface Horizontal Position	
Including quality indicators: NIC, NACp, SIL, SDA	
Heading/Ground Track	
Movement (surface ground speed, including NACv)	
Length/width of Aircraft	
GPS Antenna Offset	

**Mandatory**

### EHS/ACAS II Conditional

Aircraft Derived Data	
Selected Altitude	as for Mode S EHS
Barometric Pressure Setting	Mandate
ACAS Resolution Advisory	if TCAS II equipped



## SPI IR Horizontal Position Quality Requirements

Quality Parameter	Requirement
Position Accuracy (NACp)	NACp ≤ 0.1 NM (i.e. NACp ≥ 7) for both 3 NM and 5 NM separation
Position Integrity Containment Radius (NIC)	<ul style="list-style-type: none"> <li>3 NM Sep: NIC ≤ 0.6 NM (i.e. NIC ≥ 6)</li> <li>5 NM Sep: NIC ≤ 1 NM (i.e. NIC ≥ 5)</li> </ul>
Source Integrity Level (SIL)	SIL=3: 10 <sup>-7</sup> /flight-hour
System Design Assurance (SDA)	SDA=2: MAJOR failure condition, LEVEL C software and design assurance level

### Latency:

Total latency: 1.5 s / 95% (measured from time of applicability)  
 Uncompensated latency: 0.6s / 95% & 1.0s / 99.9%



## Comparison Minimum Position Source Requirements

Minimum Position Source Requirement	(E)TSO-129A SA ON	TSO-196 SA Aware	(E)TSO-145/146 WAAS
Australia	Retrofit (Jun 2012)	Forward Fit (Jun 2012)	
Canada	Retrofit / Forward Fit (2011)		
Europe	Retrofit (Dec 2017) Forward Fit (Jan 2015)		
USA	(practically not meeting data quality availability)	(practically not meeting data quality availability)	Retrofit / Forward Fit (2020)



## SPI IR Overview of Key Avionics Requirements

