



**EASA**  
European Aviation Safety Agency

# EASA support in the implementation of EGNOS-based operations

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TE.GEN.00409-001



- EASA involvement in SBAS-based operations
- Oversight of the ESSP
- Development of regulations
- Regulation for aircrew and air operations
- Overview of PBN specifications
- Aircraft eligibility
- LNAV/VNAV with SBAS
- Update on AUR Part PBN (PBN NPA)

# EASA involvement in SBAS-based operations

## OVERSIGHT



## EATMN (AUR Part PBN)



## ATM/ANS



## AIRCREW



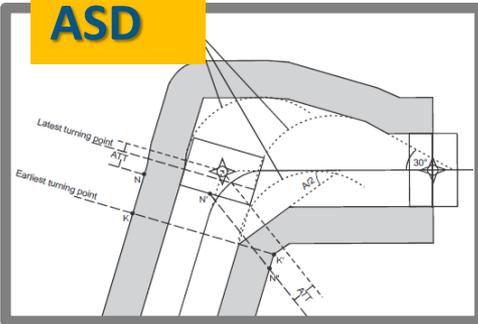
## AIR OPERATIONS



## E-TSO



## ASD



## AD



## DAT

0100110  
00110110  
10001101

## AIS





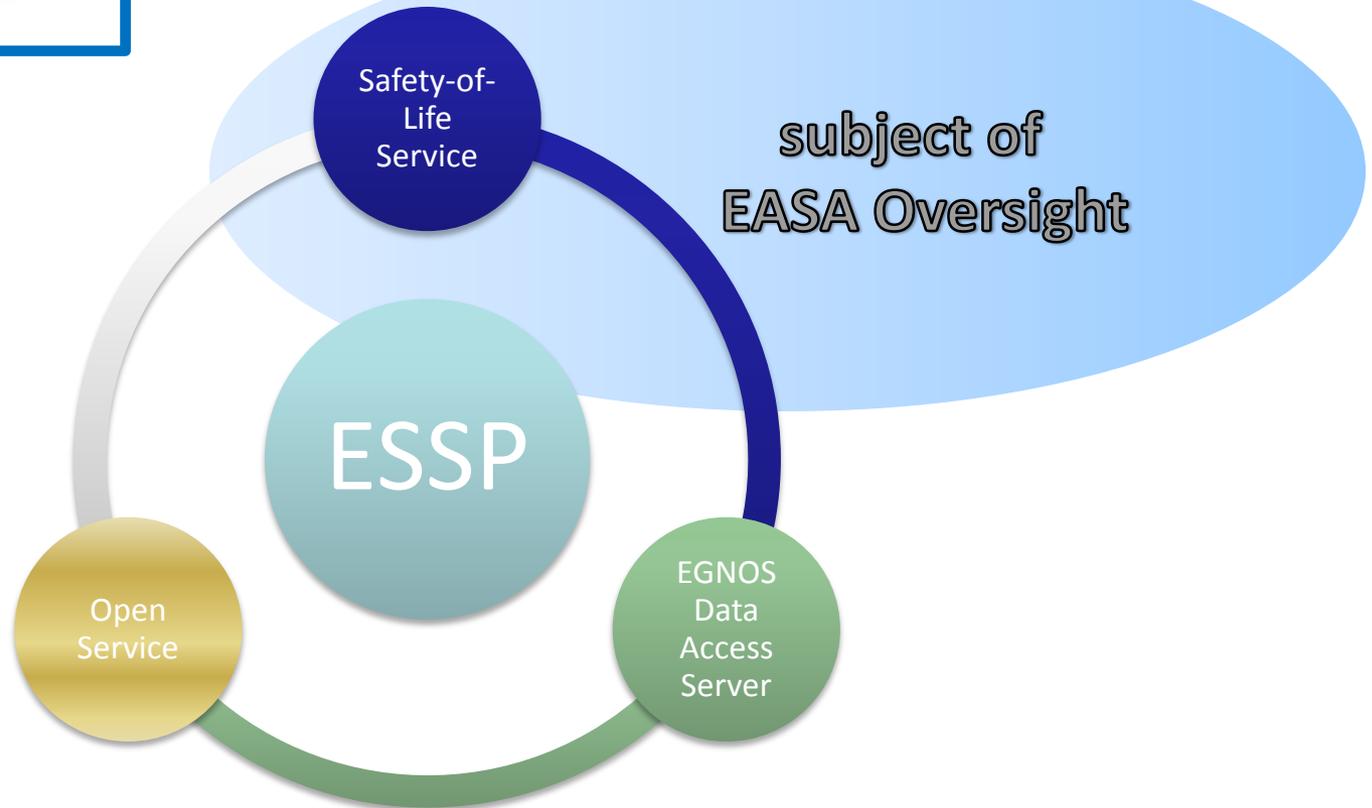
# Oversight of the ESSP

OVERSIGHT



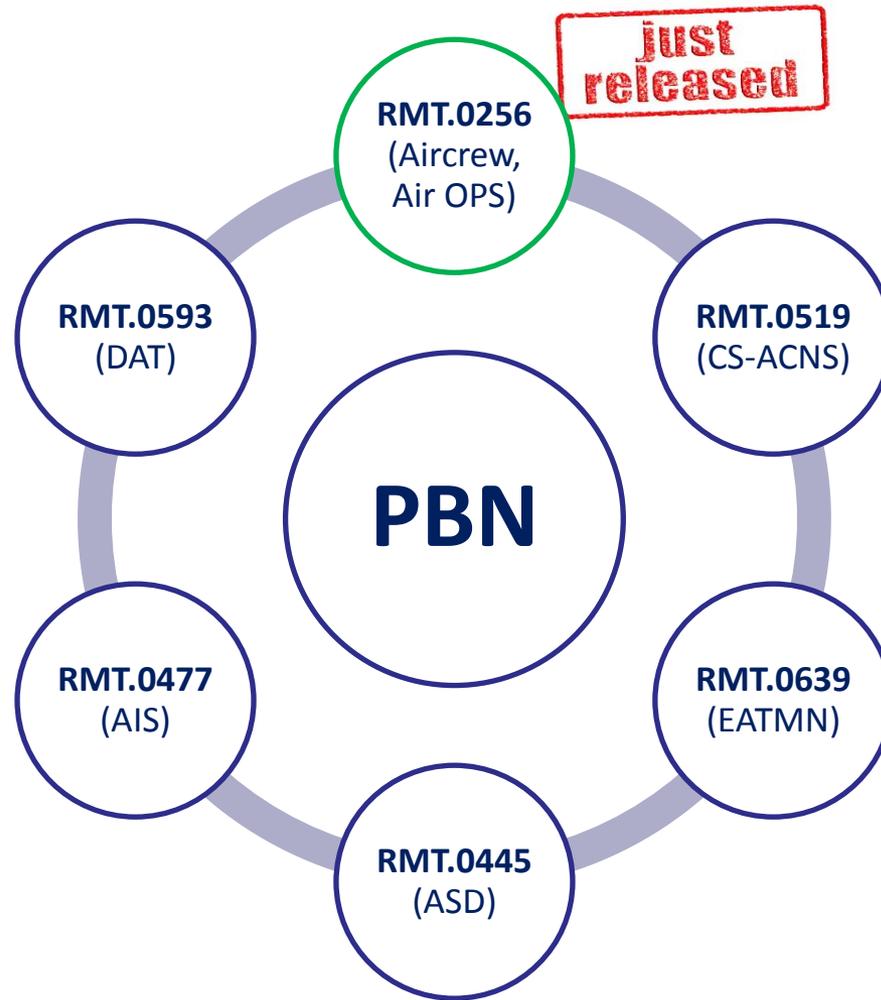
**ESSP successfully re-certified in July 2016**

Oversight results are shared with NSAs on yearly meetings





# Development of regulations





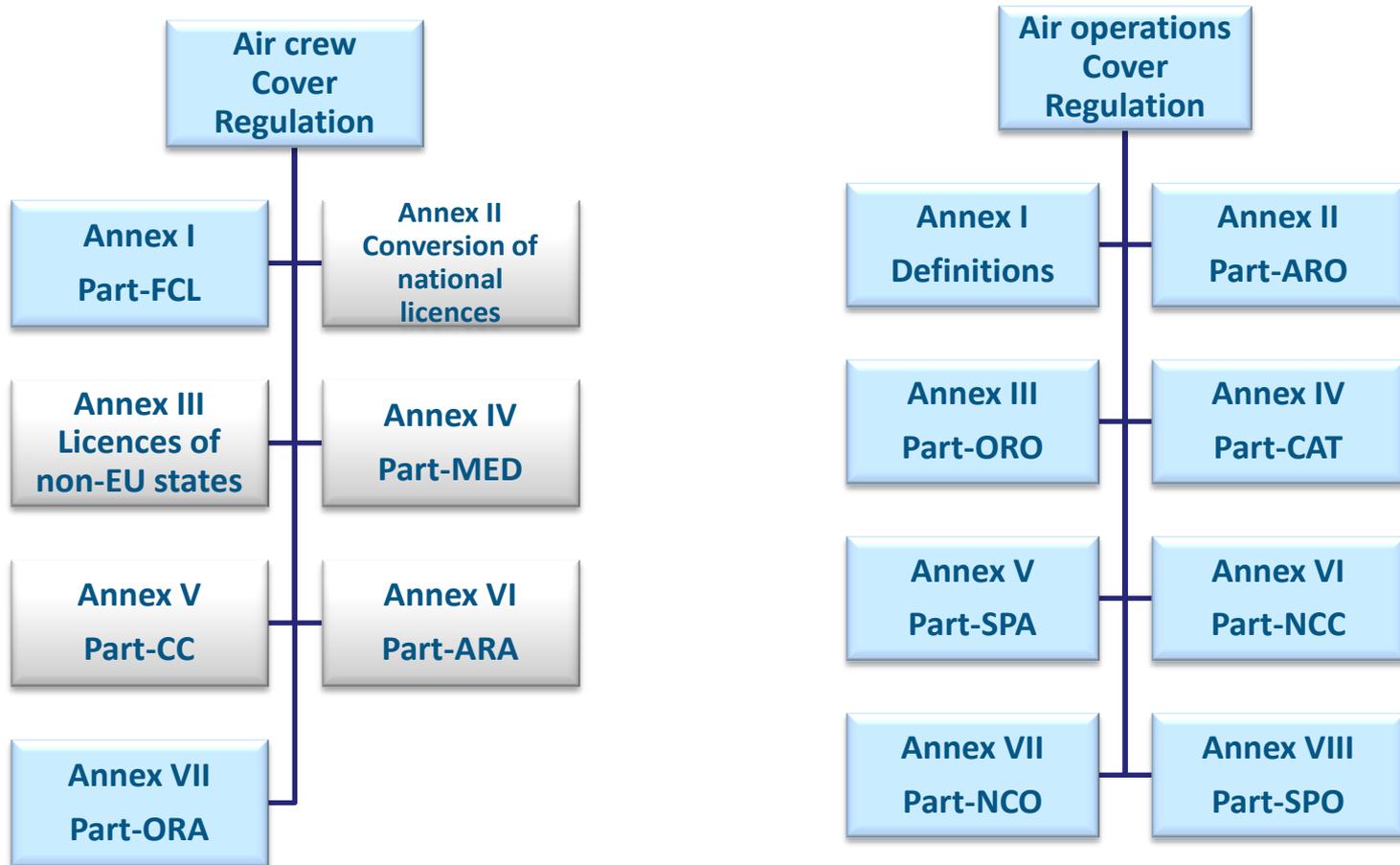
# Development of regulations

- **Overview of all PBN-related rulemaking tasks (RMT)**
  - **RMT.0519 (CS-ACNS)**
    - developing the airworthiness rules for PBN operations
  - **RMT.0639 (EATMN)**
    - containing rules addressed to ANSPs and aerodrome operators for the use of PBN specifications en-route , terminal area and approach
  - **RMT.0445 (ASD)**
    - specifying that PANS-OPS criteria to be used for procedure design
  - **RMT.0477 (AIS)**
    - ensuring data quality of raw data and specifying aeronautical information products and services
  - **RM.0593 (DAT)**
    - ensuring the quality of the provision of air navigation data through service providers

## Main elements of the new regulatory approach:

- ▶ Full integration of PBN into the European regulatory framework for pilot training and air operations
- ▶ Most PBN specifications are treated as a normal mode of navigation
- ▶ The requirement for specific (operational) approvals was removed for most PBN specifications and replaced by improved pilot training, testing and checking rules and performance-based and proportionate operating rules
- ▶ A specific approval remains only for complex PBN specifications and operations which cannot (yet) be trained sufficiently during initial pilot training: RNP AR APCH and RNP 0.3 (helicopter operations)

► **Affected requirements and related AMC/GM (in blue shape fill)**





# Overview of PBN specifications

## Overview of PBN specifications, flight phase, specific approvals

Navigation specification	FLIGHT PHASE							
	En route		Arrival	Approach				Departure
	Oceanic	Continental		Initial	Intermediate	Final	Missed	
RNAV 10	10							
RNAV 5		5	5					
RNAV 2		2	2					2
RNAV 1		1	1	1	1		1	1
RNP 4	4							
RNP 2	2	2						
RNP 1			1	1	1		1	1
A-RNP	2	2 or 1	1-0.3	1-0.3	1-0.3	0.3	1-0.3	1-0.3
RNP APCH (LNAV)				1	1	0.3	1	
RNP APCH (LNAV/VNAV)				1	1	0.3	1	
RNP APCH (LP)				1	1		1	
RNP APCH (LPV)				1	1		1	
RNP AR APCH				1-0.1	1-0.1	0.3-0.1	1-0.1	
RNP 0.3 (H)		0.3	0.3	0.3	0.3		0.3	0.3

Numbers specify the accuracy level



no specific approval required



specific approval required



# Aircraft eligibility

## No specific approval is required

	AMC 20-12	AMC 20-4	AMC 20-26	AMC 20-27	AMC 20-28	JAA TGL 2	JAA AMJ 202	JAA TGL 3	JAA TGL 10
<b>RNAV 10</b>	OK								
<b>RNAV 5</b>		OK		CHECK	OK	OK	OK	CHECK	OK
<b>RNP 4</b>									
<b>RNP 2 Oceanic</b>									
<b>RNAV 1(2)</b>									OK
<b>RNP 1(2) Continental</b>									OK for GPS
<b>RNP 1 RF (Terminal)</b>			OK						
<b>RNP APCH - LNAV</b>		CHECK		OK	OK			CHECK	
<b>RNP APCH - LNAV/VNAV</b>				CHECK	OK if enabled				
<b>RNP APCH - LPV</b>					OK				

*Note: FAA standards are not listed*



# LNAV/VNAV with SBAS

- LNAV/VNAV minima of the RNP(GNSS) approach can be used whenever:
  - Aircraft is compliant to
    - AMC 20-27 plus CM-AS-002; or
    - AMC 20-28
  - It is explicitly declared that angular guidance has been accounted for in the approach design
  - Approach is retrieved from the Navigation Database

Note: Where approaches with angular guidance can be used, this is indicated with the character 'A' in the ARINC 424 coding. This is not visible to the flight crew. However, if the character "A" is missing the approach cannot be retrieved from the Navigation Database.



# Update on AUR Part PBN (PBN NPA)

## Opinion 10/2016 (PBN NPA)

### Highlights of the outcome of the public consultation

- ▶ RNP APCH with LNAV/VNAV or LPV at all instrument runway ends which are not served by precision approach procedures before 30 January 2020
- ▶ PBN SID/STAR/ATS routes to conform to the RNAV 1 or the RNP1 specification as of 6 December 2018
- ▶ Consistency of PBN requirements for the en-route – SID/STAR transition with the SIDs/STARs
- ▶ RNP 0.3 for rotorcrafts
- ▶ Current RNAV 5 for en-route is maintained



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**End slide**

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