



# Enabling harmonised EGNOS-based operations

**EUROCONTROL**

Aline Troadec (RAISG secretary and Navigation specialist)

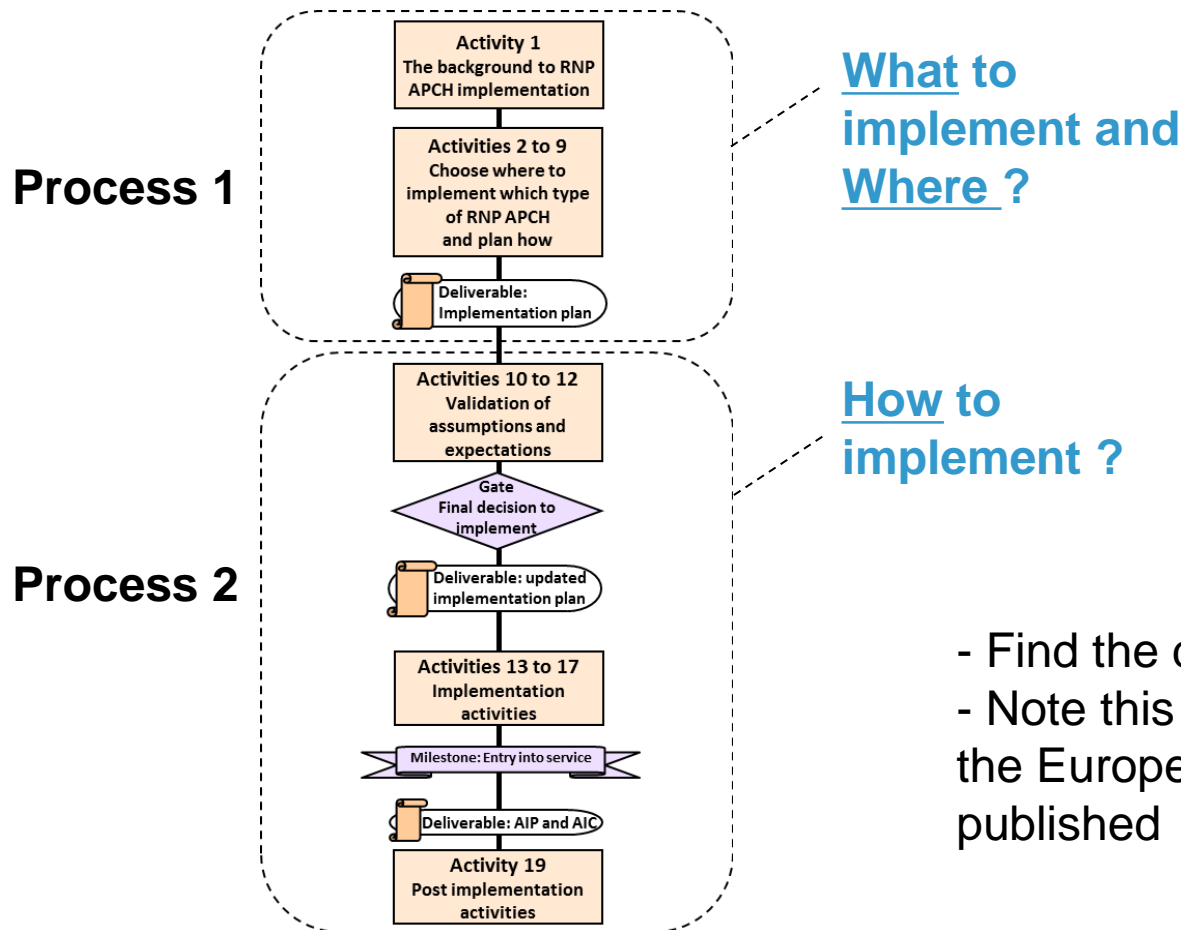
EGNOS Service Provision Workshop 2017

Athens / Greece

# Introduction

- EUROCONTROL supports the implementation of PBN operations (including EGNOS-based operations)
- EGNOS-specific focus: 7 years Framework Partnership Agreement with the GSA (from April 2015)
- Periodic rendez-vous for implementers: the EUROCONTROL RNP APCH Implementation Support Group (RAISG) meetings
  - Latest updates from ICAO and on the European Regulatory framework
  - Deployment status (procedures and fleet equipage)
  - Round table and presentations for national updates on implementation status, issues and challenges
  - Discussions on particular topics (see next slides) and follow up of actions
  - Projects' presentation (SPICE, CaBilAvi)
- Growing interest for Helicopter specific topics in RAISG
  - Five Lives Advisory Group (FLAG) reports to RAISG
  - Safety assessment GM for Low Level routes and PinS (by EUROCONTROL)
- This presentation: **High level view of EUROCONTROL activities and main topics debated relevant to RNP APCH including EGNOS-related aspects**

# Methodology for RNP APCH Implementation - ICAO EUR doc 025



- Find the doc [here](#)
- Note this will be updated when the European PBN regulation is published

# Process 1: What to implement and where

**Activity 1:** The background to RNP APCH implementation

**Activity 2:** Create the implementation project team

**Activity 3:** Agree project objectives, scope and timescale

**Activity 4:** Survey of candidate airports

**Activity 5:** Airport Capabilities Assessment

**Activity 6:** Survey of Traffic Characteristics and Aircraft Operators

**Activity 7:** ATC and NOTAM services

**Activity 8:** Benefits and costs for RNP APCH implementation

**Activity 9:** Choose which kind of RNP APCH to implement

**Implementation Plan**

# EUROCONTROL support to Process 1 (1/3)



European PBN regulation under development by the EC

**A1: Background**

**A2: Impl. team**

**A3: Agree**

**A4: Airports?**

!!!! draft !!!!!

RNP APCH (LPV and LNAV/VNAV)

- **2020**: at every IRE\* without Precision Approach procedure (ILS, MLS, GBAS)

- **2024**: at every IRE

## EUROCONTROL PBN Approach map tool



% of IRE covered by:

	Today	2020
APV	38%	67%
3D	71%	85%

(\* ) IRE = Instrument Runway End

# EUROCONTROL support to Process 1 (2/3)



**A5: Airport Capabilities?**

- Runway type? (Instrument PA or NPA, or non-Instrument)
- Radar/non-radar, ATC/AFIS/no ATC service?
- Runway usage, including weather
- GNSS Infrastructure: EGNOS perf. (ESSP, EWA, SDD maps), GNSS performance measurement campaign, spectrum check, legal recording, real-time monitoring
- Non-GNSS Infra needs at destination or alternate? (impact on rationalisation)
- Local QNH?
- Achievable minima?

**Warning:** Minima for SBAS Cat I (based on EGNOS LPV200 service) is as good as ILS Cat I

# EUROCONTROL support to Process 1 (3/3)

**A6: Traffic & Operators?**

## EUROCONTROL CNS dashboard



	% of capable flights in Europe (July 2017)
GNSS (G)	94,24%
LNAV-only (S1)	24,65%
LNAV and LNAV/VNAV (S2)	59,37%
LPV (B)	2,77%
RNP AR with RF (T1)	5,45%
RNP AR without RF (T2)	1,02%

**A7: ATC and NOTAM services**

Heavily debated 

**A8: Benefits and costs**

Ref. to [EUROCONTROL SI for CBA](#)

**A9: Choose what to implement**

**Implementation Plan**

See EUROCONTROL guidelines and template for “National PBN implementation plan/strategy”

Contact the [NAV User Support Cell](#)

## Process 2: How to implement

**Activity 10:** Procedure design

**Activity 11:** Validation of expected benefits

**Activity 12:** Local Safety Case

?

**Go/No Go?** +

Updated Implementation Plan

**Activity 13:** Procedure validation

**Activity 14:** ATM/CNS Integration Issues

**Activity 15:** AIS Requirements

**Activity 16:** Training Requirements

**Activity 17:** Final review before deployment

**Activity 18:** Introduction into service

AIC and AIP

**Activity 19:** Post-implementation activities



# EUROCONTROL support to Process 2 (1/3)

**A10: Procedure design**

**A11: Expected benefits?**

**A12: Local Safety Case**

**A13: Procedure validation**

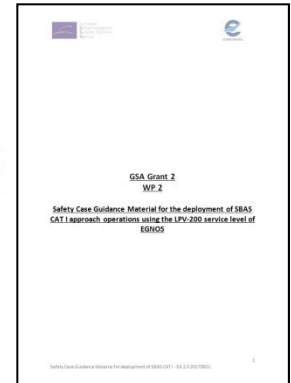
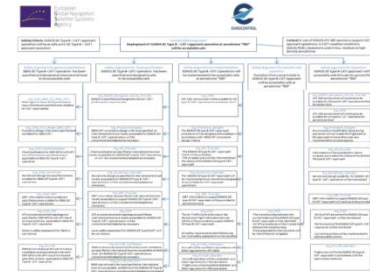
**Go/No Go?**




**Updated Implementation Plan**

- Coding issues and impact on receiver behavior (Switzerland)
- Hybrid Y/T procedure with short legs in Schiphol, no RF but series of waypoints

- Generic safety assessment on APV SBAS (APV1) & APV Baro.
- *(new)* GM for SBAS Cat I deployment developed



- Desktop validation: RVT no longer a EUROCONTROL tool 
- Flight validation (6 scenarios identified and discussed)
- Changes in FAS DB and impact on procedure validation.

# EUROCONTROL support to Process 2 (2/3)

**A14: ATM/CNS Integ. Issues**

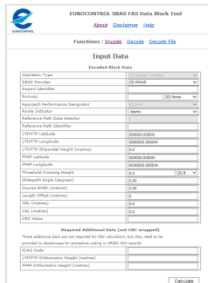
From May 2017, the Network Manager is able to manage traffic as a function of PBN capabilities declared in ATC Flight Plans (NM systems release 21 enables PBN-related restrictions or regulations)

**A15: AIS Requirements**

## \* Approach publication :

- New naming (“ICAO Circular XXX”)
- Use of “Z”, “Y” indexes on charts, publication on different charts
- Coding and charting of SDF
- Coding table versus Textual description
- Need to distinguish between APV1 and Cat I LPV procedures?

- Tools :



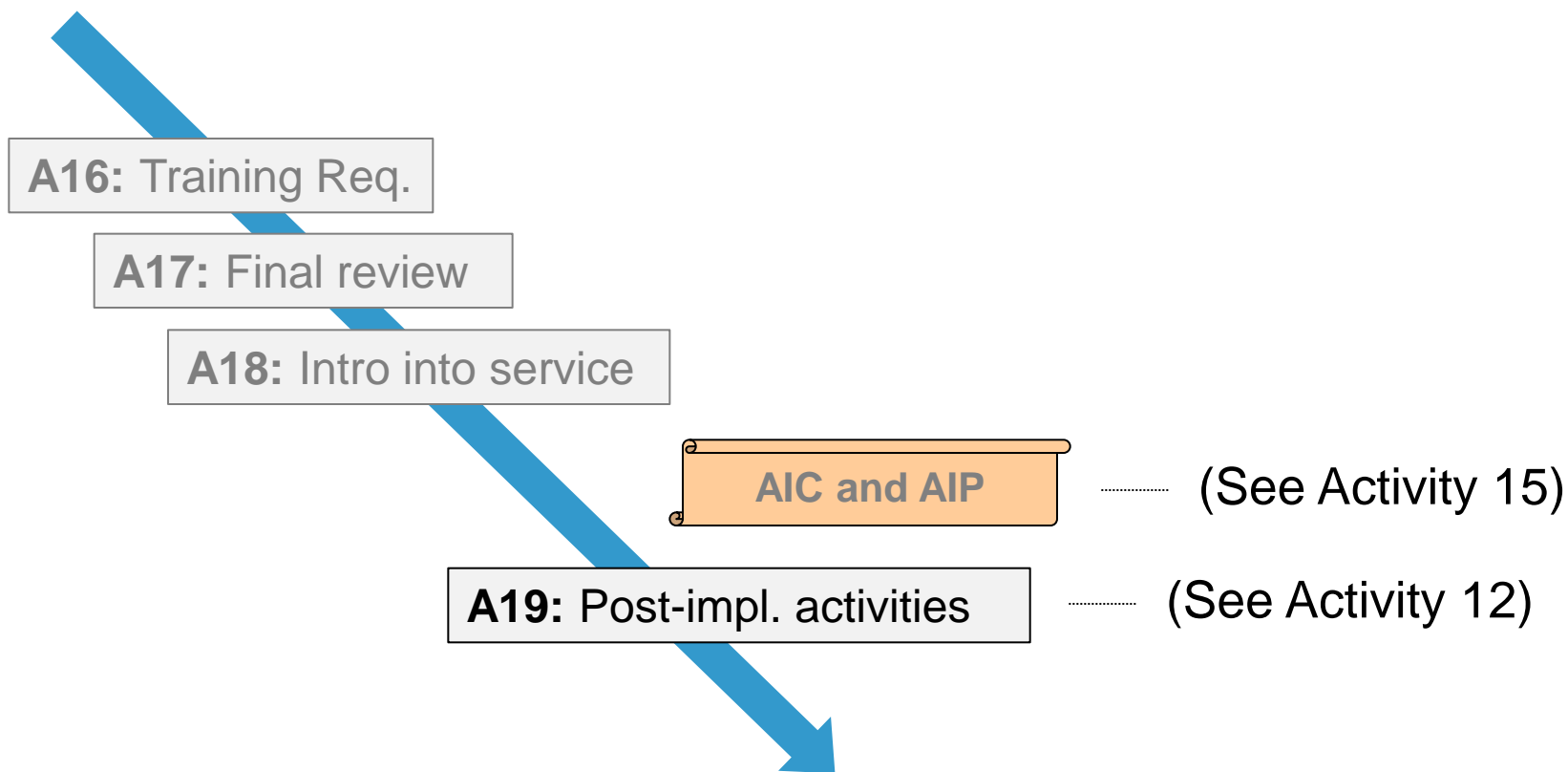
[EUROCONTROL FAS Data Block Tool](#)



*(new)* EUROCONTROL SBAS assignment tool (planned before end 2017)

## \* AIC and AIP publication

# EUROCONTROL support to Process 2 (3/3)





**Any question ?  
Don't hesitate to contact [us](#)**

**Next RAISG meeting: 21 & 22 Nov 2017 in Brussels**  
**Other useful links: our [website](#) & the RAISG [Team site](#)**