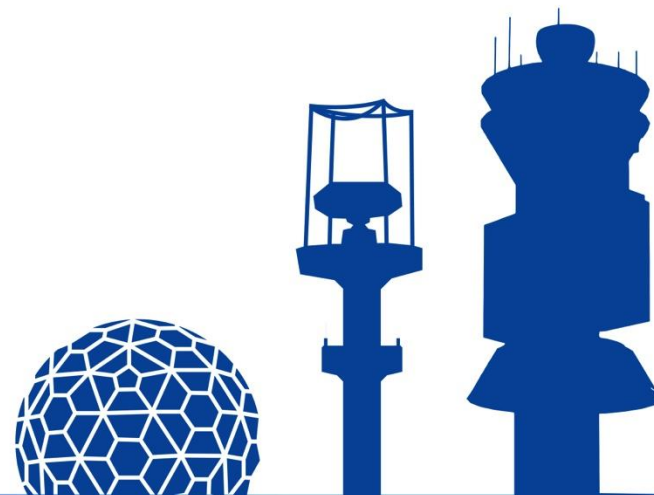




ENAV contribution to EGNOS aviation services adoption and next steps

Patrizio Vanni

GNSS/PBN Expert – Planning & Innovation

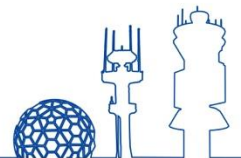


EGNOS Yearly Workshop
Rome, 24 September 2019

enav.it

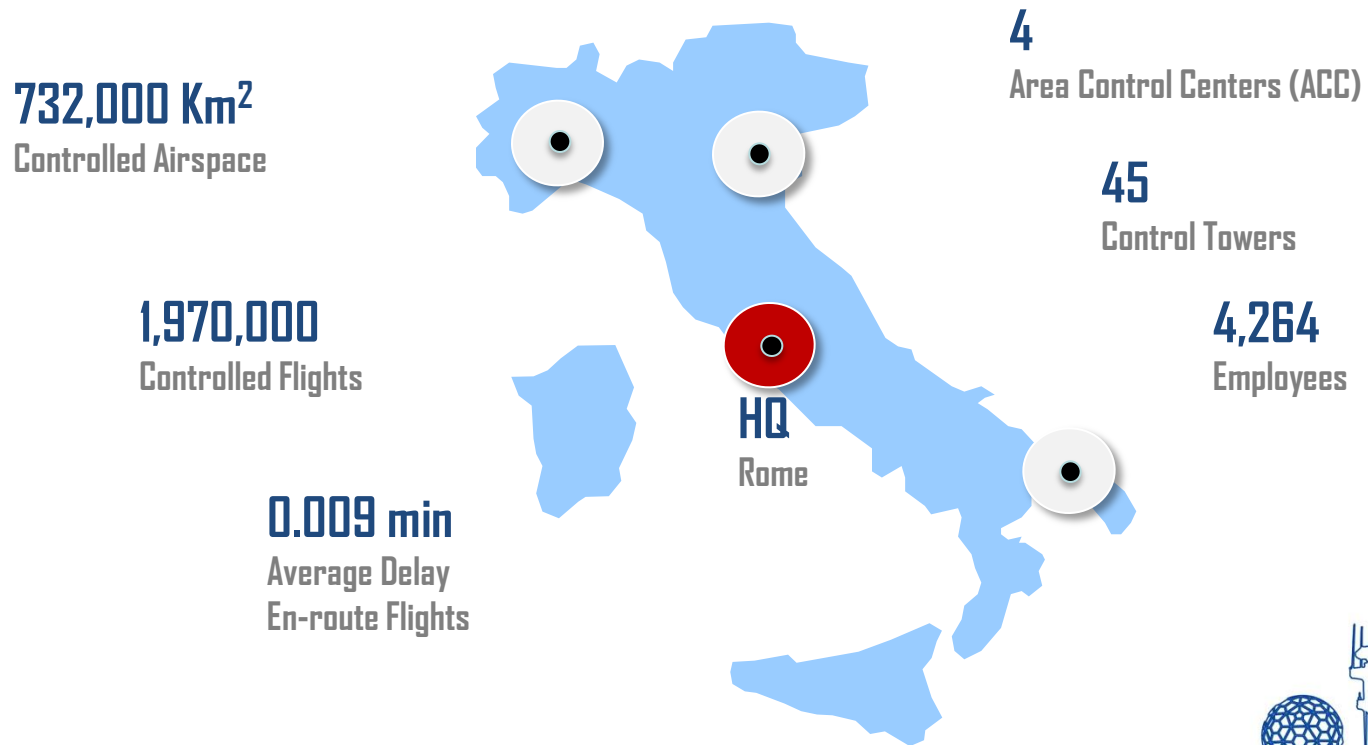
Topics

- ENAV presentation
- Past and current contribution to EGNOS
- Relevant past projects
- Current projects
- Implementation status
- Conclusions

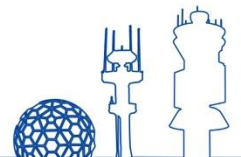


ENAV: the Italian ANS Provider

- Managing and controlling air traffic in Italy
- Operating in a highly regulated industry in particular under the “*Single European Sky*”
- Investing in technology and innovation – *SESAR JU member*



Ownership and Partnership



EGNOS

- 1996: State Law 665/96, stated the role for ENAV in the participation to the GNSS international Programme in coordination with CAA and Italian Space Agency (ASI)
- 1997: First SBAS flight trials in Ciampino
- 1998: Bilateral Agreement signed with ESA for EGNOS exploitation
- 2001: Foundation of ESSP
- 2002: Flight SBAS trials in Cairo Airport with EGNOS Test Bed
- 2003: MCC-RIMS qualification
- 2005: MCC-RIMS Initial Operations
- 2012: Publication of the first LPV procedure in Italy (Milano Linate)
- 2015: Helicopters Emergency network for Piemonte Region
- 2018: First PinS publication (Trento airport)



Some of the Past projects

SENECA

- 2010-2016
- Funded by ASI: Telespazio, SELEX Sistemi Integrati, Thales Alenia Space Italia, IDS
- Precursor to EGNOS use in Italy
- GNSS services prototypes



- 2008-2016
- Funded by EC: Led by Telespazio
- LPV designed and flown at Monastir, Beirut
- EWA for non EU countries
- EGNOS promotion in MEDA region

E-Airport

- 2015-2017
- H2020 funded by GSA: Led by Telespazio
- Demo on enhanced Apron Management service
- Quality/efficiency of aircraft service operations and ground cargo process during turn around



Some of the Past projects



Building EGNSS capacity On EU & Neighbouring multimodal Domains

- 2015-2017
- H2020 funded by GSA: Led by ESSP, Telespazio
- Development of GNSS Monitoring Concept
- LPV designed and flown at Tirana



- 2014-2016
- Sesar LSD, led by Enav, IDS, SEA, Airfrance
- GNSS ATC interface prototype

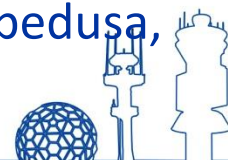


- 2016-2018
- H2020 funded by GSA: Led by ENAV, HCAA, DCAC, MATS, IDS
- Development of GNSS Monitoring network in BLUEMED
- 16 LPV procedures designed, validated and published into AIP



Deployment of SBAS Cat 1 capability on Airbus A320

- Project funded by INEA (CEF 2016)
- Started: 31 December 2017
- Duration: 36 months
- Consortium:
 - AIRBUS OPERATIONS SAS (L)
 - AIRBUS SAS
 - ESSP SAS
 - EASYJET AIRLINE COMPANY LIMITED
 - ENAV S.p.A.
 - SOCIETE AIRFRANCE SA
- ENAV Contribution:
 - implementation of 5 SBAS CAT 1 procedures (Pantelleria (2), Lampedusa, Ancona and Reggio Calabria Airport)



ECARO

- Project funded by GSA in the framework of Civil Aviation Grants
- Started: 1 august 2019
- Duration: 27 months
- Consortium:
 - ENAV (L)
 - Distretto Tecnologico Aerospaziale
 - Planetek
 - Airgreen
 - UMS Skeldar

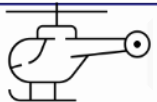


ECARO objectives

Implement SBAS Cat.I procedures



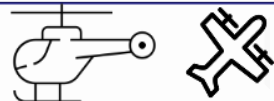
Implement Low Level Routes



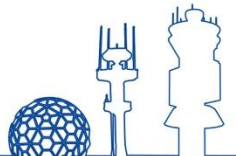
Developing EGNOS based operations adoption for RPAS



Aircraft and rotorcraft retrofit

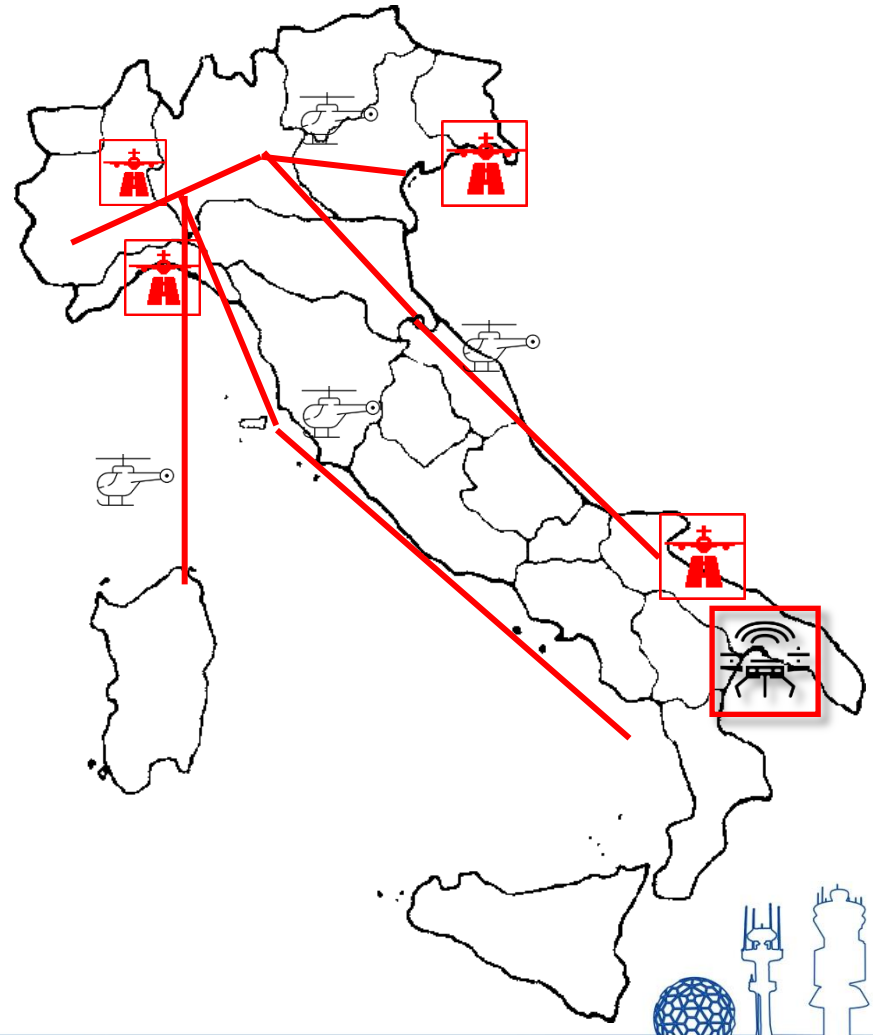


Development of mobile validation platform



Geographical scope

- RNP0.2 LLR design & validation
 - Tirrenica: 270/300NM
 - Adriatica: 190/220NM
 - Appenninica: 120/150NM
- Aircrafts & rotorcraft retrofit
 - 2 ENAV P-180
 - 1 AIRGREEN AW139
- RPAS Test and demos execution
- Airports
 - Genova Sestri
 - Trieste
 - Bari
 - Torino Caselle
 - Grottaglie



DREAMS




- Sesar Very Large Scale Demonstrator
- 2020-2022
- Consortium led by Airbus
- Enhanced approach procedures in Ciampino
 - IGS up to 4°
 - Noise reduction
 - Design and validation
 - Trials with Business Jets (Dassault) in 2021



Statistics: LPV flights top 10 Italian airports

(Source: Eurocontrol CNS dashboard)

	2016		2017		2018		Trend
Roma Fiumicino	0,06%	94	0,15%	223	0,27%	414	
Milano Malpensa	0,59%	492	0,90%	805	1,53%	1485	
Milano Linate	3,76%	2202	4,97%	2884	5,91%	3356	
Venezia	1,61%	724	2,21%	1018	2,78%	1322	
Bergamo	1,26%	502	0,85%	365	0,69%	308	
Napoli	2,30%	723	2,02%	749	2,29%	907	
Catania	0,44%	135	0,79%	272	0,90%	333	
Bologna	2,39%	824	2,88	1025	2,55%	909	
Roma Ciampino	4,24%	1071	4,60%	1211	7,03%	1815	
Palermo	0,41%	90	0,67%	155	1,06%	270	
All airports	1,62%		2,08%		2,64%		

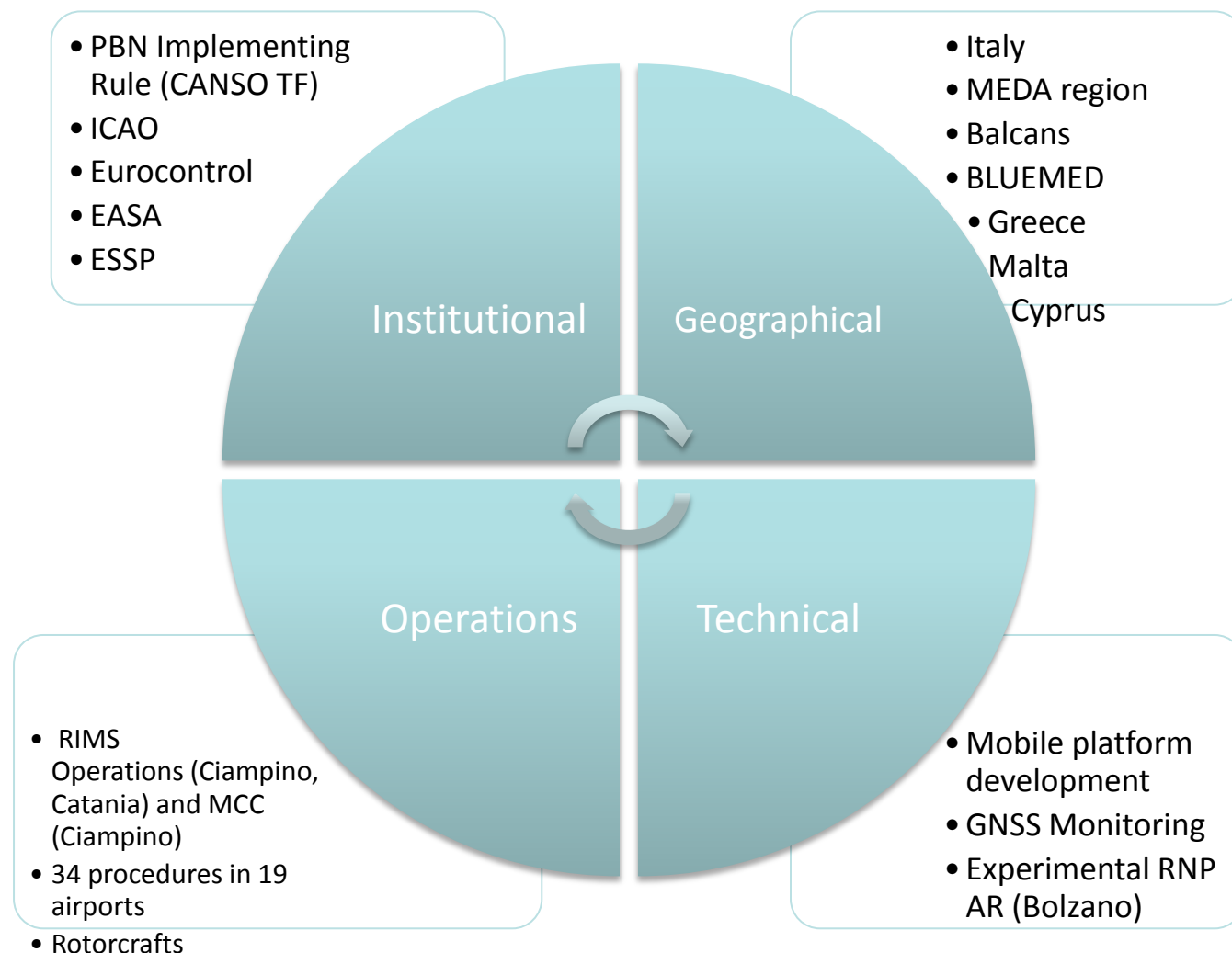


Medium term planning

- Period 2020/2021
- 86% of ENAV airports completed
- Priority to circling and NPA

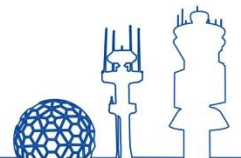
AIRPORT	RWY	TARGET DATE
Ancona (LIPY)	RWY 04 (Circling)	2020
Bari (LIBD)	RWY 07 (PA)	2020
	RWY 25 (NPA)	2020
Brescia (LIPO)	RWY 32 (PA)	2021
	RWY 14 (Circling)	2020
Brindisi (LIBR)	RWY 05 (Circling)	2021
	RWY 23 (Circling)	2021
Crotone (LIBC)	RWY 17 (NPA)	2020
	RWY 35 (NPA)	2020
Cuneo (LIMZ)	RWY 03 (Circling)	2020
Genova (LIMJ)	RWY 28 (PA)	2021
Lamezia Terme (LICA)	RWY 28 (PA)	2021
Lampedusa (LICD)	RWY 26 (NPA)	2020
Palermo (LICJ)	RWY 02 (Circling)	2020
Pantelleria (LICG)	RWY 03 (NPA)	2020
	RWY 21 (NPA)	2020
Parma (LIMP)	RWY 02 (Circling)	2020
Perugia (LIRZ)	RWY 01 (PA)	2021
	RWY 19 (Circling)	2021
Pescara (LIBP)	RWY 04 (Circling)	2020
	RWY 22 (PA)	2021
Rimini (LIPR)	RWY 13 (NPA)	2020
	RWY 31 (PA)	2021
Salerno (LIRI)	RWY 05 (NPA)	2020
Taranto (LIBG)	RWY 17 (Circling)	2020
	RWY 35 (NPA)	2020
Torino	RWY 36 (PA)	2021
	RWY 18 (Circling)	2020
Trieste (LIPQ)	RWY 09 (PA)	2020
Verona (LIPX)	RWY 22 (Circling)	2020

ENAV contribution to EGNOS adoption



Conclusions

- ENAV full supports GNSS deployment, but some points still to be solved:
 - GNSS robustness
 - GNSS integrated avionics (ABAS/SBAS/GBAS) deployment
 - Airspace Users equipped



Thanks for your attention

