

ITALY and Satellite Navigation



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European GNSS and the international activities

ITALY is one of the four major European contributors to the European GNSS

ITALY fund and participate to the Governance of the European GNSS (EGNOS and GALILEO) , hosts one of the four Control Centres of EGNOS and one of the two Control Centres of GALILEO.

ITALY participate at international level to the UN COPUOS GNSS initiatives, have co-chaired the UN GNSS Action Team and actively have promoted the establishment of the ICG and participate in it.

Promotion of GNSS applications in Italy

Italy, recognising the potentiality of GNSS technology, have undertaken initiatives to develop pre-operational projects to pave the way to an extensive use of it

ASI, The Italian Space Agency, promote the navigation service demand and related innovation through both applicative and technological projects at national level.

The **national projects**, aimed to exploit the new features GALILEO will bring, answer to a specific public demand:



Increase the Safety in the Transport Sectors
(Maritime, Civil Aviation, Road Transport and infomobility)



and in general

Improve Territory Safety and Security



ITALY share the need for GNSS spectrum protection.

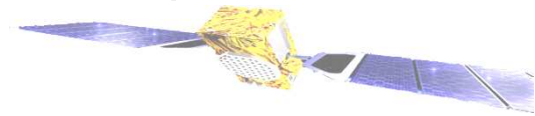
Interference detection and mitigation is one of the important obligations for a State who want to guarantee the correct and efficient use of satellite navigation signals on its territory.

In many applications of GNSS, where the safe and secure navigation is fundamental, ITALY believes that additional navigation technologies have to complement the GNSS, especially in environments where intentional or unintentional disturbances could happen.

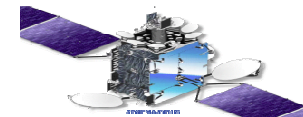
Satellite technologies integration Vision

Italy recognise the synergetic integration potentiality of the satellite technologies NAV, COM, EO to guarantee high added value Applications and Services, integrating:

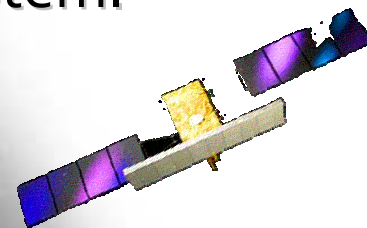
Galileo Programme and its precursor EGNOS;



The national wide band communication satellite programme;



The earth observation programme COSMO-SKYMED, high resolution, dual mode imaging system.



SENECA: Civil Aviation Programme

ASI and ENAV (the Italian Company responsible for Air Traffic Control) have defined a joint national Programme aimed to introduce gradually the satellite navigation, starting from EGNOS programme, into the Civil Aviation control procedures,



Activities:

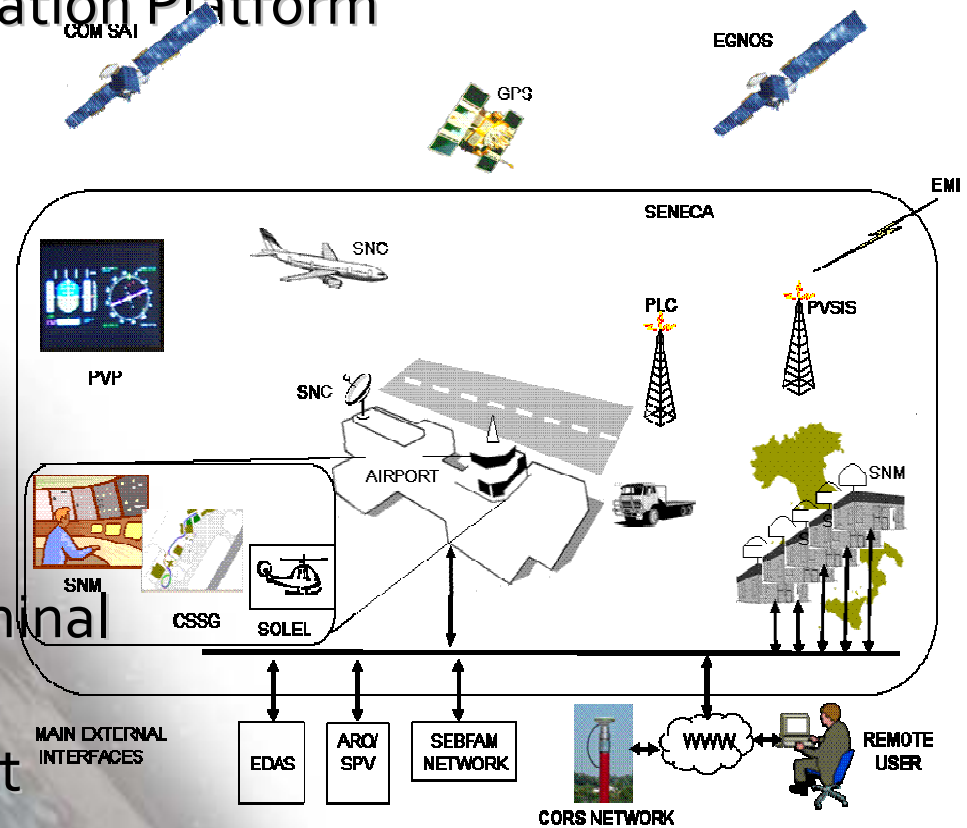
- Support to Certification of EGNOS system
- Verification of EGNOS performances in operational conditions within the national air space
- Introduction of satellite navigation in Civil Aviation procedures and systems
- Development of Innovative Services and Applications based on GALILEO



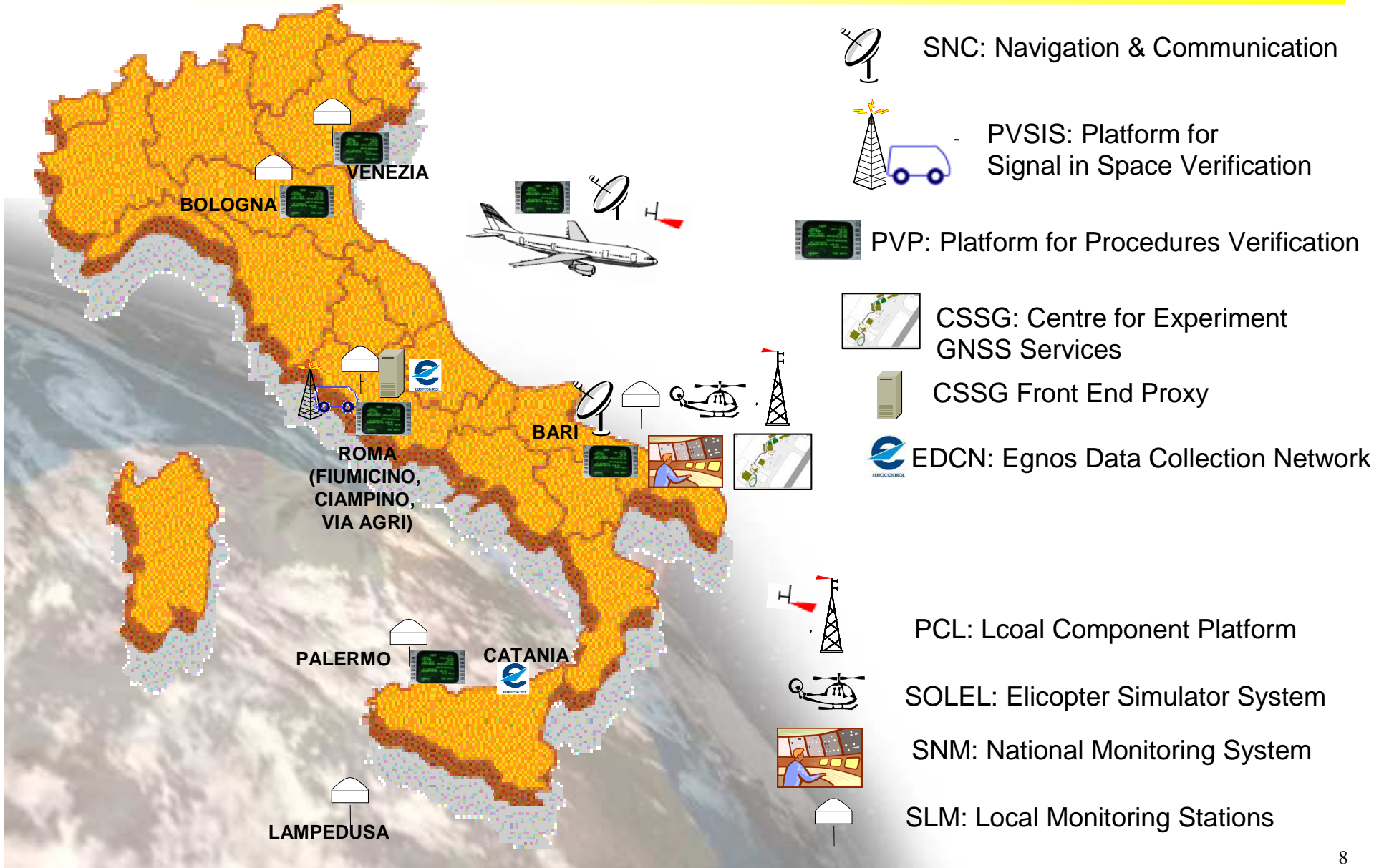
SENECA: Civil Aviation Programme Architecture

- ❑ National Signal Monitoring System
- ❑ Civil Aviation procedures verification Platform
- ❑ Services Experimental Centre
 - GNSS Simulator
 - Data Analysis

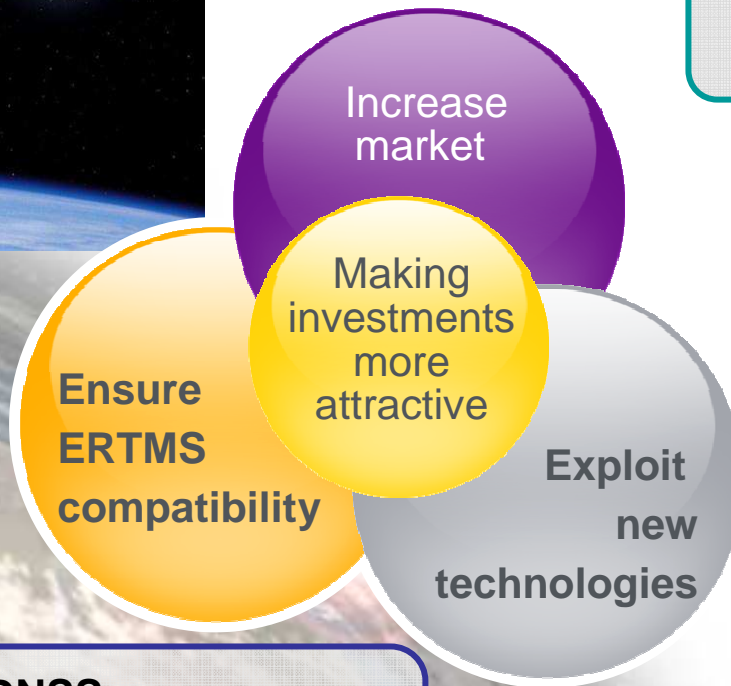
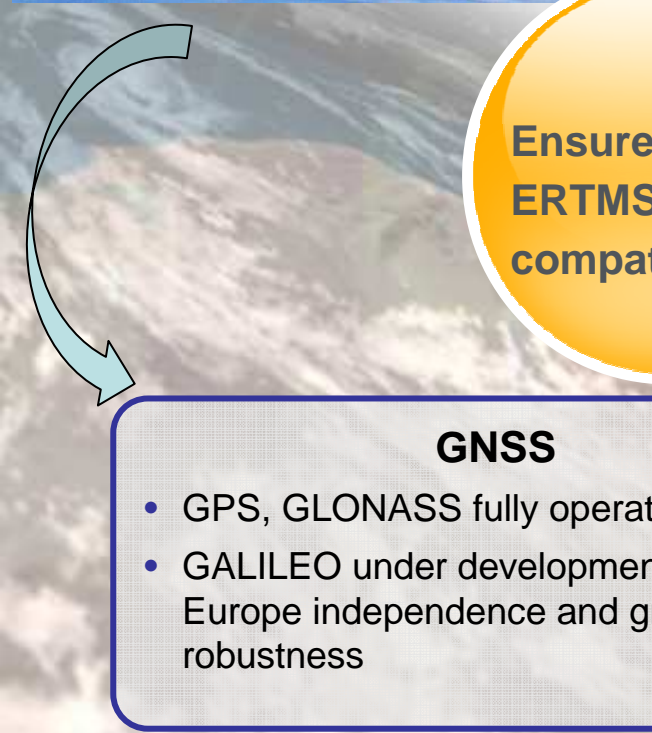
- ❑ Local Elements
- ❑ Multifunctional NAV/COM terminal
- ❑ General Aviation and UAV flight



SENECA Architecture Deployment



ASI sustains new challenges on train control systems

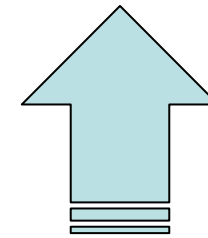


GNSS

- GPS, GLONASS fully operative
- GALILEO under development to provide Europe independence and greater robustness

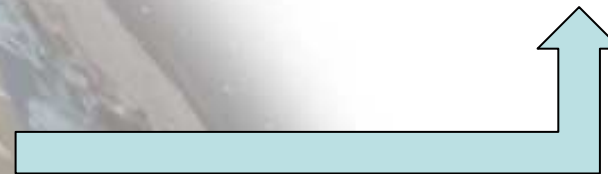
ERTMS (new MoU)

- extending specifications to meet global requirements by introducing:
 - Network independent TLC
 - Satellite positioning



New markets

- private freight/mining lines
- Low traffic-regional lines



3InSat - Train Integrated Safety Satellite System

- A Project financed by ASI within the ESA ARTES Telecommunication Programme
- Development and validation of a satellite-based platform compatible with the ERTMS- ETCS
 - ✓ Exploitation of new satellite TLC technologies
 - ✓ Adoption of GNSS and augmentation networks for meeting SIL-4 requirements

- Roadmap up to the validation and certification phase

Benefits:

- ✓ Increased network capacity/efficiency
- ✓ Lower capex & operational costs

Prioritary applications

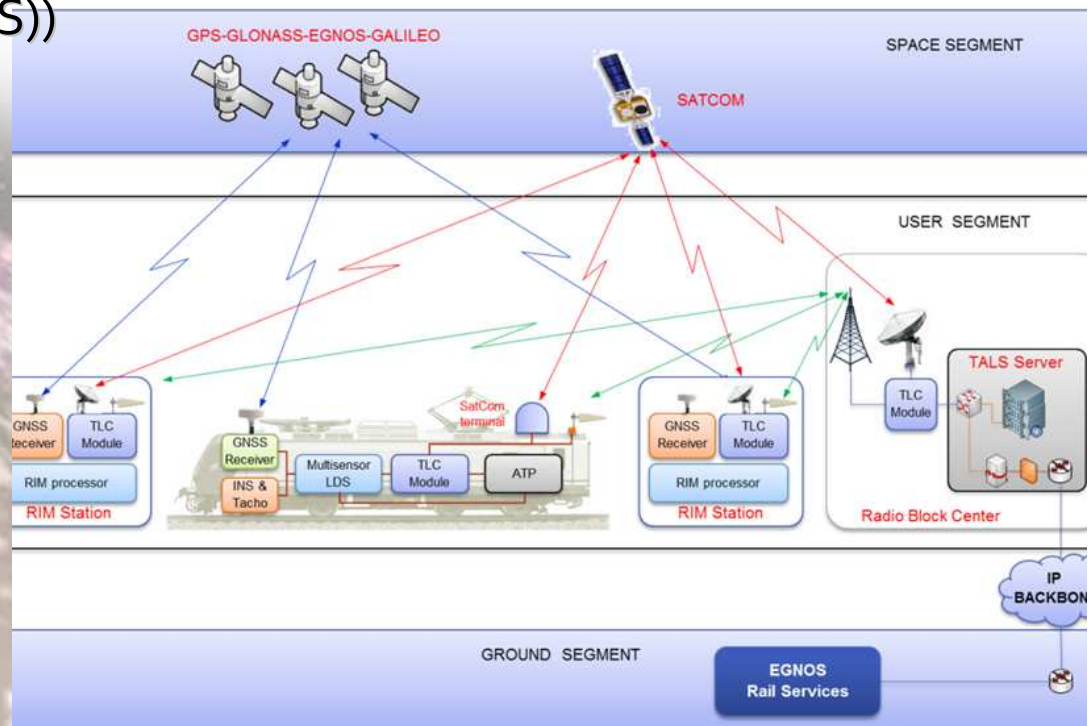
Local lines, low-traffic ,Regional lines, new freight lines on a world-wide level



3InSat - Train Integrated Safety Satellite System

The function of train localization is distributed among the following elements:

1. Space segment (GPS, GALILEO, GLONASS constellations + EGNOS + SATCOM)
2. Augmentation and Integrity Monitoring network
3. On board unit (multiconstellation GNSS receiver+Multisensor Localization Determination System (LDS))



ERSAT - 3InSat Test Site – Olbia-Cagliari railway



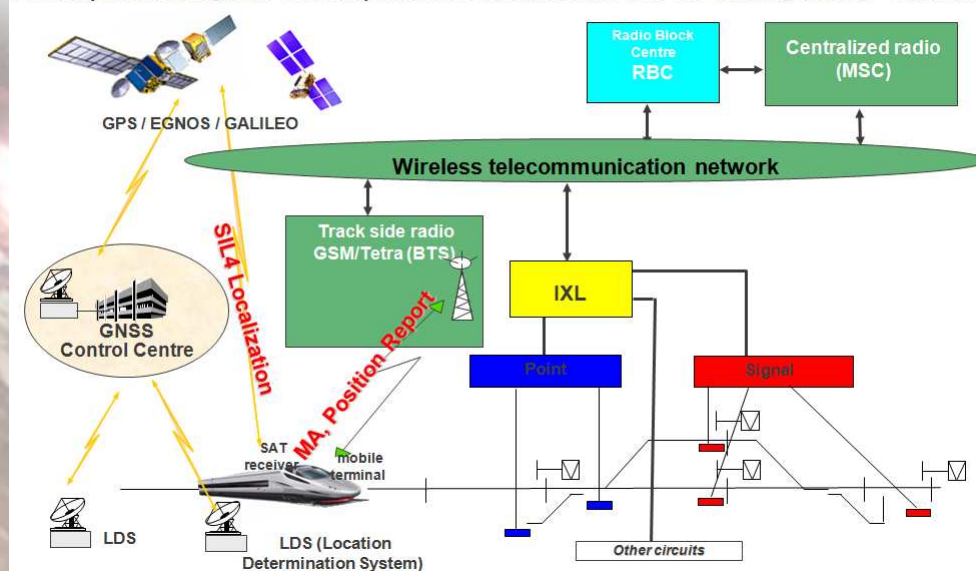
Pilot line



3InSat features for satellite assets validation on the test site:

- Total length: approximately 50 km
- Double track: to test train localization on parallel tracks
- Satellite localization system at SIL-4 level
- Multi-bearer TLC network
- Augmentation network validation
- Test Procedures validation
- Independent assessment by a NoBo (Italcertifer)

ERSAT(ERTMS Regional Satellite) reference architecture: trial site starting in Italy - Sardinia



A satellite with two large solar panel arrays is shown in orbit above Earth. A bright blue beam of light originates from the satellite and illuminates a large area of the Earth's surface. The background is the dark void of space filled with stars.

Thanks