

The Legal Aspects Of The GNSS And The METIS Project

Turkey

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Historical Background for the GNSS Regulations and ICAO Regulations Concerning GNSS

Chicago Convention

Article 44 :

The aims and objectives of the Organization are to develop the principles and techniques of international air navigation and to foster the planning and development of international air transport so as to:

- (a) Insure the safe and orderly growth of international civil aviation throughout the world;**
- (b) Encourage the arts of aircraft design and operation for peaceful purposes;
- (c) Encourage the development of airways, airports, and air navigation facilities for international civil aviation;**
- (d) Meet the needs of the peoples of the world for safe, regular, efficient and economical air transport;
- (e) Prevent economic waste caused by unreasonable competition;
- (f) Insure that the rights of contracting States are fully respected and that every contracting State has a fair opportunity to operate international airlines;
- (g) Avoid discrimination between contracting States;
- (h) Promote safety of flight in international air navigation;**
- (i) Promote generally the development of all aspects of international civil aeronautics.**

Chicago Convention :
Article 37 :

“Each contracting State undertakes to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures and organization in relation to aircraft, personnel, airways and auxiliary services in all matters in which such uniformity will facilitate and improve air navigation. “

To this end the ICAO shall adopt and amend from time to time, as may be necessary, international standards and recommended practices and procedures dealing with many aspects of aviation such as the communications systems and air navigation aids including ground marketing, rules of air and air traffic control practices, aeronautical maps etc. and such other matters concerned with the safety, regularity and efficiency of air navigation as may from time to time appear appropriate” .

Historical Background for the GNSS Regulations and ICAO Regulations Concerning GNSS

1983 : Formation of Committee on Future Air Navigation Systems (FANS)

Committee reached a conclusion as; “The exploitation of satellite technology was the only viable solution to overcome the limitations that the present systems do have and meet future need on a cost effective global basis.”

ICAO defined the GNSS as “worldwide position and time determination system, that includes one or more satellite constellations, aircraft receivers and system integrity monitoring augmented as necessary to support the required navigation performance for the actual phase of operation.”

1991 :The recommendations of FANS Committee was approved and the primary air navigation system in 21st century was provided by GNSS.

1998: The ICAO Assembly at its thirty-second session adopted the Charter on the Rights and Obligations of States relating to GNSS Services (Resolution A32-19) and the Legal Framework for GNSS (Resolution A32-20), which state fundamental principles applicable to GNSS.

2000 : ICAO issued a Global Navigation Satellite System Manual

2003 : 11 the Air Navigation Conference : A worldwide transition into GNSS based air navigation was proposed.

2004 : At the 32 nd session of the ICAO's Assembly it was decided to draft the legal basis for the GNSS services

Additional Note : Volume I of Annex 10 contains Standards and Recommended Practices and guidance material for the global navigation satellite system (GNSS),

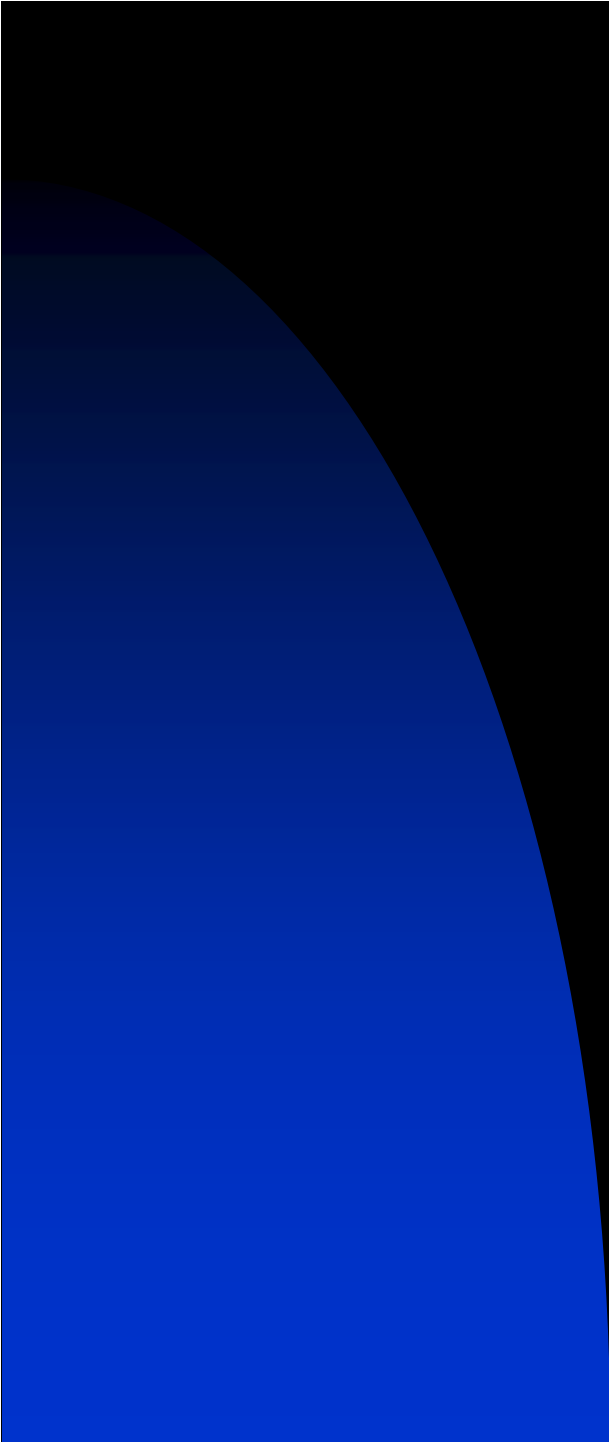
Conclusion part I : Broader international treaty is required to secure the GNSS and GNSS based services' civil use.

2. Egnos and Galileo

EGNOS : *The European Geostationary Navigation Overlay Service (EGNOS) is the first pan-European satellite navigation system. It augments the US GPS satellite navigation system and makes it suitable for safety critical applications such as flying aircraft or navigating ships through narrow channels.*

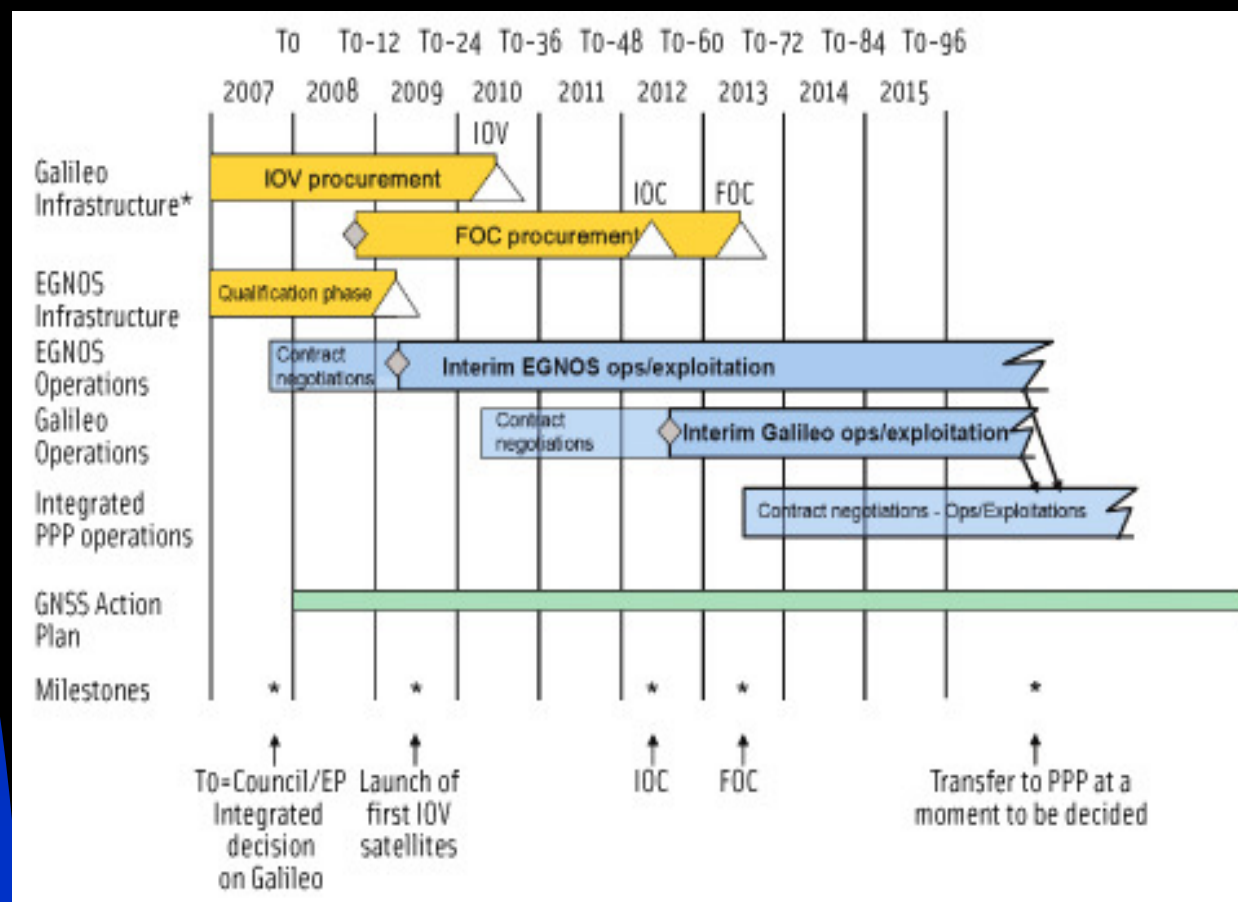
Consisting of three geostationary satellites and a network of ground stations, EGNOS achieves its aim by transmitting a signal containing information on the reliability and accuracy of the positioning signals sent out by GPS. It allows users in Europe and beyond to determine their position to within 1.5 metres.

EGNOS is a joint project of ESA, the European Commission and Eurocontrol, the European Organisation for the Safety of Air Navigation. It is Europe's first activity in the field of Global Navigation Satellite Systems (GNSS) and is a precursor to Galileo, the full global satellite navigation system under development in Europe.



“The Galileo programme is Europe's initiative for a state-of-the-art global satellite navigation system, providing a highly accurate, guaranteed global positioning service under civilian control. While providing autonomous navigation and positioning services, the system established under the Galileo programme will at the same time be interoperable with GPS and GLONASS, the two other global satellite navigation systems. The fully deployed system will consist of 30 satellites and the associated ground infrastructure.”

Chart taken from <http://www.insidegnss.com>



3. METIS Project

The European Commission launched the Euro Med GNSS project aiming the way for the introduction of EGNOS and Galileo services stimulating the involvement of the Mediterranean Partners in GNSS.

The Galileo Joint Undertaking has been entrusted by the EC with the implementation of the Euro Med GNSS project and placed a contract for a project called METIS.

METIS is a project, funded by EC DG Europe Aid Co-Operation Office in the framework of the EU-MED GNSS I Programme, managed by the European GNSS Supervisory Authority (GSA) and run by a consortium of private/public organizations from European and Mediterranean countries.

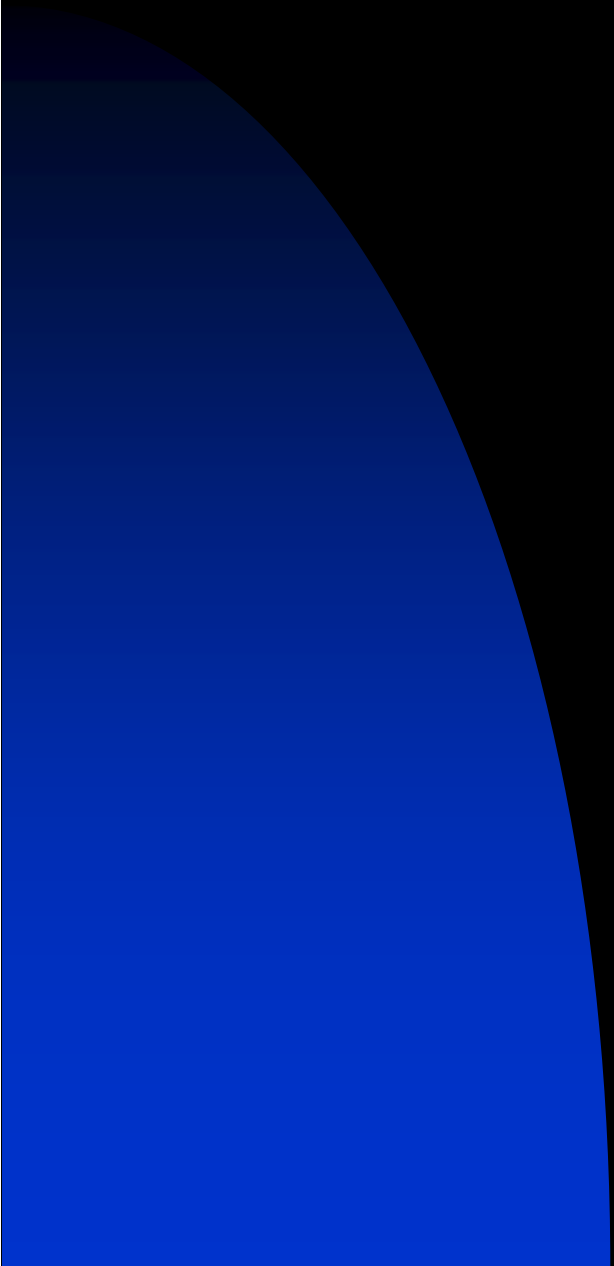
3.1. EU-Mediterranean Relationship:

- Barcelona Declaration : 27 November 1995
- 1998 : Euro-Mediterranean Transport Forum
- 2002 : Launch of the New European Neighbourhood Policy

- 2003 :The Extension of the Ten-T to Neighbouring Countries Report by Loyola de Palacio
- 2004 : Preparation of Blue Paper
- 2007-2013: Based on the conclusions of the Ministerial Conference of EuroMed Transport Forum the Regional Transport Action Plan for the Mediterranean was adopted.

(Action 27 : Mediterranean Countries should continue to collaborate with the EuroMed GNSS projects and liaise with the Galileo Euro Mediterranean Cooperation Office (GEMCO). The Mediterranean countries should also liaise with the European Commission regarding the progress and opportunities related to gradual introduction of European GNSS services in the region as of 2011.)

- 2008 :Establishment of the Union for the Mediterranean



Launch of MEDA GNSS Project and establishment of Galileo EuroMed Mediterranean Cooperation Office (GEMCO) in September 2004 in Cairo to promote the use of GNSS technology, implement education and awareness activities, ease information flow and facilitate interaction among the GNSS actors.

METIS (July 2006-December 2009) has performed activities in support of the implementation of GNSS services in the MEDA

The project defined a GNSS Regional Plan that proposes a Euro-Mediterranean policy to prepare the introduction of EGNOS (European Geostationary Navigation Overlay Service) service and in the future Galileo, in the MEDA area, for the next 5-10 years.

METIS Objective:

Supporting the Euro-Mediterranean policy and actions in favor of the GNSS (EGNOS / GALILEO) services market in MEDA

METIS regions:

Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, the Palestinian Authority, Syria, Tunisia, Turkey

METIS duration:

42 Months (started on July 2006)

Total project cost: 2.50 M€ (100% funded), share:

- 49% EU
- 51% MEDA

METIS Consortium composed by 5 partners, coordinated by Telespazio





METIS performed three main activities:

Activity A: Elaborating the GNSS Regional Plan

Activity B: Implementing a Training & Awareness programme

Activity C: Running several real-life GNSS Service Demonstrations.

21 subcontractors involved in the activities A, B or C.

3.2. Results of the Project

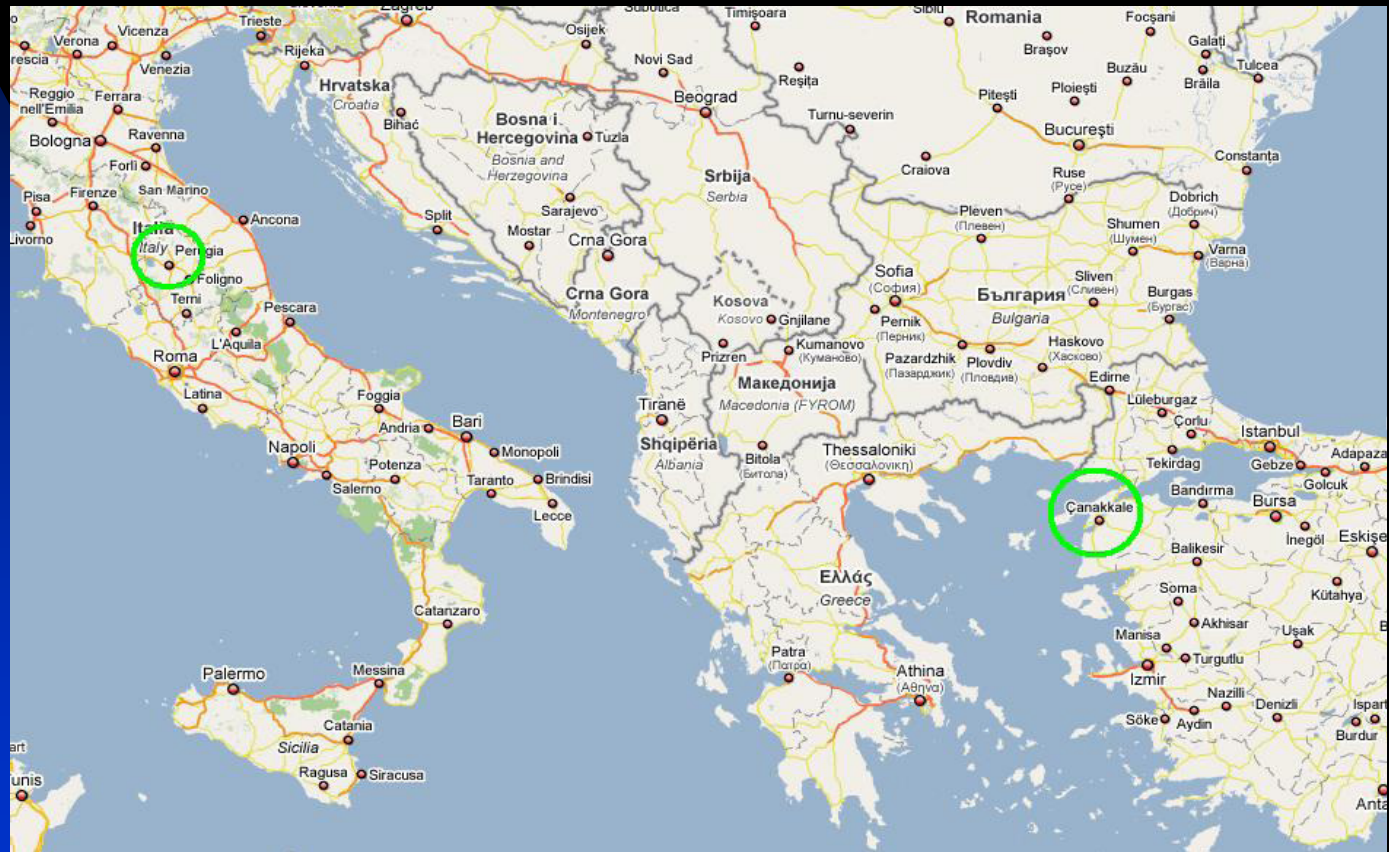
- The demonstrations were conducted at Çanakkale Airport Turkey on 5-6 th of November and at Perugia Airport in Italy on 11th of November.
- Cessna Citation VI I BLUB aircraft was equipped with a GARMIN GNS 480 satellite navigation receiver commonly used by general aviation aircraft.

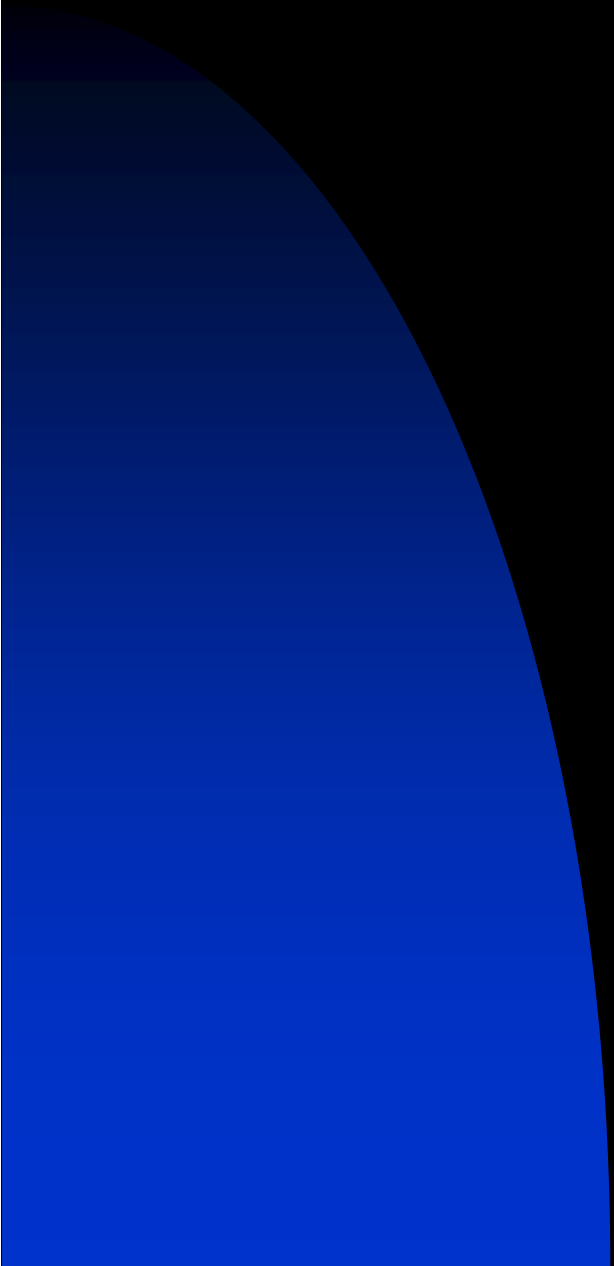
- The GPS navigation unit is compatible with satellite based augmentation systems (SBAS) making it compatible of receiving the EGNOS signal. The operations were carried out under VFR conditions taking into account of the experimental avionics configuration. The experimental avionics equipments included are :

GNS 480 navigation unit that implements real time SBAS navigation solution(position, velocity and time) based on acquisition and processing of GPS signals along with the EGNOS augmentation.

A CDI/VDI unit already installed on ENAV aircraft which is driven by the GARMIN GNS 480 information and enables the pilot to fly the experimental SBAS procedures.

A recording equipment already installed on ENAV aircraft to collect EGNOS and GPS raw data for post porcessing.



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- As the results of the demonstration flights performed in Turkey and in Italy EGNOS has proven to increase safety, efficiency and an airport's capacity for traffic while reducing the need for ground navigation infrastructure.
 - As for the economical consequences of the service studies by METIS estimate that 200 million Euros in benefits will accrue to MEDA's members over the next 10 years from the use of EGNOS and for Turkey just for the civil aviation sector the expected gain shall be 7.6 million Euros over the next 10 years
 - Once certified for use by civil aviation the EGNOS Safety-of Life signal will become a standard in Europe and in Mediterranean countries.

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THANK YOU