



# Integration of the EGNOS programme in the Galileo programme

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# Introduction

## This presentation reaffirms the long-term institutional basis of EGNOS

- It summarises the recent institutional decisions concerning the roles of EGNOS and Galileo in the European satellite navigation programme
- It explains the integration of the EGNOS programme into the Galileo programme
- It confirms the long-term availability of EGNOS to support institutional and other users
- It emphasises the urgent need to bring EGNOS into operation while reaffirming its long-term service availability
- It explains why EGNOS is good for the market

## This presentation summarises the EC Communication and the Council conclusions

- This presentation provides a summary of the EC Communication on the integration of EGNOS into Galileo before giving the Transport Council's conclusions following their deliberations
- Source Material
  - European Commission. *Communication from the Commission to the European Parliament and the Council – Integration of the EGNOS programme in the Galileo programme*. Brussels, 19.3.2003 COM(2003) 123 final
  - Council Conclusions on the integration of the EGNOS programme in the Galileo programme (provisional version), 05.06.2003

## It considers the need to integrate EGNOS in the Galileo programme

- Specified in the recent EC Communication<sup>1</sup>
- The motivation is found in the Resolutions of the Council of the European Union<sup>2,3,4</sup>
  - These require that an action plan be presented for the optimal integration of EGNOS into the Galileo programme (covering technical, operational, financial and institutional aspects) as soon as possible and not later than the end of 2003

1. Commission of the European Communities. *Communication from the Commission to the European Parliament and the Council: Integration of the EGNOS programme in the Galileo programme*. Brussels, 19.3.2003, COM(2003) 123 final
2. Official Journal of the European Communities. Council Resolution of 5 April 2001 on Galileo. OJ C 157, 30.5.2001.
3. Official Journal of the European Communities. 2420th Council Meeting – Transport and Telecommunications. Brussels, 25/26 March 2002.
4. Official Journal of the European Communities. Council Regulation (EC) No 876/2002 of 21 May 2002 setting up the Galileo Joint Undertaking. OJ L 138, 28.5.2002.

## Let's start with a quick review of EGNOS ...

- Institutional
- Financial
- Technical

## EGNOS has a firm role in the European satellite navigation strategy

### ➤ Institutionally

- Tripartite agreement covers development up to the completion of a first implementation phase
- In the following phase EGNOS should be integrated in the Galileo programme
- In the long-term we can conceive a dual system structure GPS/EGNOS and Galileo

### ➤ The Council in its conclusions

- *Reaffirms* that EGNOS is an integral part of the European satellite radio-navigation policy and *underlines* that it contributes to the European Union strategy for employment, economic reform and social cohesion launched by the Lisbon European Council in March 2000



## EGNOS has been funded by the public and private sectors

### ➤ Public

- The EU Trans-European Networks budget
- The ESA Member and Associate States

### ➤ Private

- Public and private national air traffic service providers from a number of EU Member States who have formed the EGNOS Operation and Infrastructure Group (EOIG)

## Outlining the financial arrangements draws out the difference in the sizes of the two programmes

Cost (MEURO)	EGNOS	Galileo
Development and deployment		
Total	330	3200
EC Contribution	116.4	550 + TBD
Operations		
Total	33	220
EC Contribution	≤ 33	TBD

- The cost of the EGNOS approval procedure, the development of specific applications and promotion expenses will total around 14.4 MEURO

## Its technical characteristics

- EGNOS is dependent on the US GPS system
- EGNOS is independent from and complementary to the future GALILEO system
- It transmits an integrity message which makes it possible to provide new services approaching those that Galileo will offer tomorrow
- It is compatible with global standards (ICAO and IMO)
- It is interoperable with third party systems (WAAS, MSAS ...)

## EGNOS Benefits

- **General**
- **To Users**
- **To Galileo**

## There are sound technical benefits

- EGNOS has enabled EU to develop a technical capability and know-how in satellite radio navigation
- Signals will be available *openly* throughout Europe and the Mediterranean (by ESTB since 2002)
- Vastly superior to GPS alone
  - Accuracy and of positioning (WAD, GEOs)
  - Availability (GEOs)
  - Integrity/safety (6 second TTA)
- Transmits UTC

**Possible to consider providing a legal guarantee for certain services**

## The communication talks about important political advantages

- EU policy on satellite radionavigation
  - Completion of the first phase (GNSS1)
  - Extension to the whole of geographical Europe facilitates Galileo's market launch
- Future services
  - New Member States will benefit
  - Safety-of-life in demand from developing countries that have limited infrastructure
  - Further extension to benefit regions beyond Europe and the Mediterranean
- Product of cooperation with the US and Russian Federation through GPS and GLONASS

## EGNOS looks to a future aviation world underpinned by satellite radio navigation

- First investors in this new technology
- Fully in-line with ICAO policy on the significant use of satellite navigation to guide aircraft in all phases of flight and ultimately to eliminate terrestrial systems
- Airbus Industrie and others are fitting their aircraft with EGNOS equipment
- Improvement in operating conditions
- Environmentally, new landing and take-off procedures will help combat noise pollution near airports

## Other sectors will also see benefits

Sector	Benefit
Maritime & Inland Waterways	Development of new info/guidance systems Automatic Identification System
Rail	Aviation may act as a catalyst for adoption of similar systems by rail to improve safety
Road	Guidance available more widely Substantially reduce risks of road toll invoicing errors
Agriculture	Improved crop management Monitoring compliance to Community rules
Synchronised Networks	Improved reliability important for financial institutions and energy utilities



## EGNOS is a great model for Galileo and invaluable for its implementation

- Acquired technological expertise and know-how
  - Safety of life is a differentiator
  - Puts Europe in a good position to move to the next level
- Services are a precursor to Galileo
  - Shaping international policy
  - Developing confidence worldwide in advanced satellite navigation systems that deliver integrity
  - Development of new applications
- Integrating EGNOS and Galileo gives European users high quality signals from Galileo and GPS

## Its lifecycle experience is directly applicable to Galileo and facilitates its entry into service

- Without EGNOS, Galileo would suffer delays
- Paves the way to future international acceptance particularly of safety-of-life services
- EGNOS approval procedures will make it possible to operate Galileo within the planned timeframe and as soon as it is deployed
- The ability to use the Galileo services in 2008 translate into operational savings equivalent to five years of EGNOS operating costs

**EGNOS should come into service quickly in 2004**

## EGNOS also brings direct savings in operational costs

- Integration generates cost savings
  - 9% (15.1 MEURO pa) if functioning independently
  - 12% (21.8 MEURO pa) if fully integrated
- Galileo savings from
  - Joint use of technical infrastructure
  - Know-how on system development & operation
  - Early, speed market penetration by European system
  - Complementary, and non-competitive with EGNOS
  - Sharing of distribution and user support networks
- EGNOS experience and integration with Galileo will enhance prospects of success from cost control and risk reduction

## Finally, it has an impact on market development, interoperability and industry involvement

- EGNOS is an opportunity for the EU to position itself on the world market for satellite radio navigation and to enable European technology to service the European market
- EGNOS facilitates the interoperability of the future Galileo system with the current GPS system
- Public sector support for EGNOS increases private investor confidence in the EU political commitment to Galileo thus encouraging private sector investment
- EGNOS creates awareness of the Galileo brand

## Integration Options

## There are three ways for integrating EGNOS into Galileo

- There are three options
  - Ending public subsidies to the EGNOS programme
  - Complete independence of EGNOS activities from Galileo
  - Full integration of EGNOS in the Galileo programme

## Ending EGNOS public subsidies is not an option

- Withdraws from participation in ICAO SBAS
- Signals the end of the EGNOS programme
  - Benefits are generally macroeconomic
- Unhealthy impact on Galileo services
  - Prevents rapid approval
  - All approvals costs added to Galileo
  - Delays introduction
  - Commercial handicap
  - Distorts the market place for European suppliers
- Increases Galileo risk
- Wastes 300 MEURO

## Complete independence spells the end of Europe's satellite navigation policy – and hence can be disregarded

- Unfettered competition in the same market segments
- Duplication of expenditure
- No benefits from full integration



## Full integration at the technical level does not pose any specific technical problems

- Integrating EGNOS into Galileo gives European users high quality signals from Galileo and GPS
- Some reuse of EGNOS infrastructure
  - RIMS and comms links
- High-integrity software *experience* will be transferred to Galileo thus reducing development costs
- Practically, the approval and implementation of EGNOS will be concluded successfully in all the transport modes concerned
  - It is important to encourage service providers in all possible areas of EGNOS application to introduce EGNOS in Europe
- EGNOS showcases highly precise, reliable European satellite radionavigation techniques thus raising awareness of Galileo

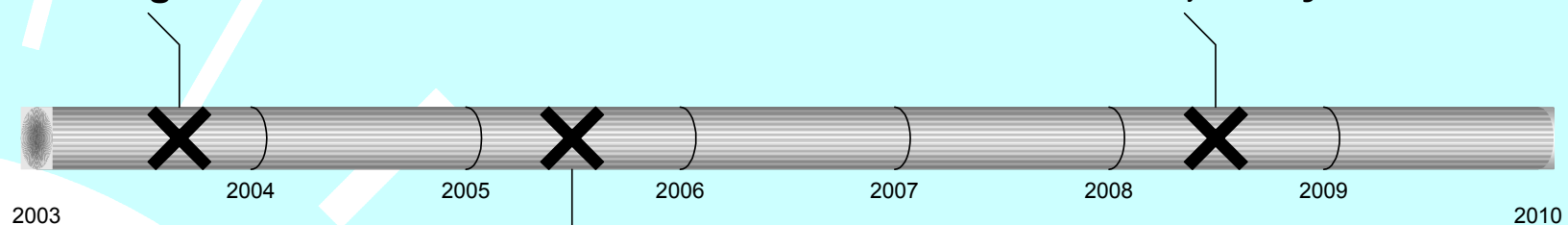
## At the institutional level integrating the management in a single entity would be the best solution

- Short-term (pragmatic not operational)
  - EGNOS operational body (selected in 2004)
  - EGNOS service provision under control of the JU
    - Its first task is to “oversee the optimal integration of EGNOS in the Galileo programme”
- Medium and long-term
  - Operate EGNOS and Galileo under the contract to be concluded with the future Galileo concession holder
  - Commercial management and operations are both contracted out
  - EGNOS is an important tool for preparing the market

## The integration of EGNOS in Galileo should proceed in three phases

The JU launches a call for tenders to select an EGNOS operator for 2004 – 2008. The Concession remains under the control of the JU. When the JU is concluded this task will pass to the public authority tasked with monitoring the Galileo Concession holder

The Galileo public owners, the concession holder and users of the two systems will evaluate the benefits of EGNOS and thus be in a position to state their views on the development and evolution of the systems



EGNOS operations responsibility of the Galileo Concession holder. EGNOS is managed separately until Galileo services are available on the market. The Galileo concession holder is free to renegotiate the EGNOS concession agreement concluded by the JU if better financial terms can be obtained

## Conclusions

## The Communication recommends ...

- EGNOS programme should be concluded & used as a precursor to Galileo and a market development tool
- EGNOS programme control should be placed under the JU
  - Launch call for tenders for an EGNOS operator
  - Supervise operations after 2004
- Management of EGNOS should be an integral part of the future concession agreement for the management of Galileo
- The basic EGNOS system should receive public funding of 33 MEURO annually from 2004 – 2008
- Extending EGNOS geographically should be promoted to share its operation with these regions
- Once Galileo is operation, the decision to continue with EGNOS should be taken by Council on a proposal from the Commission

## The Transport Council Conclusions are far more positive and help industry and users to invest in the future

- The Council *reaffirms* that EGNOS is an integral part of the European satellite radio-navigation policy and *underlines* that it contributes to the European Union strategy for employment, economic reform and social cohesion launched by the Lisbon European Council in March 2000
- When EGNOS funding is guaranteed
  - It should be certified for aviation use
  - It should become operational as soon as possible
  - It should allow for a service availability in the *long term*
  - It should be used both as a precursor to GALILEO and as an instrument enabling GALILEO to penetrate rapidly the market for satellite radio-navigation services

## They see the importance of placing the EGNOS programme under the control of the Joint Undertaking

- The role of the JU includes
  - Supervising the management of EGNOS after the programme "Operational Readiness Review" has been completed in April 2004
  - Concluding an agreement with an economic operator charged with operating EGNOS from April 2004 *with due regard to the opinion of those parties who contributed to the funding of the development and deployment phases* of the EGNOS system
  - Making recommendations for suitable arrangements concerning ownership of EGNOS assets, intellectual property rights and commercial exploitation rights
- The advantages of a possible inclusion of the management of EGNOS as part of the future concession agreement for the management of GALILEO should be evaluated together with potential GALILEO concessionaires

## They also ensure that current investors are involved in its future including at a policy level

- The future orientation of EGNOS after GALILEO is fully deployed should be decided by the Council, on a proposal from the Commission, in liaison with the service providers and the users, once GALILEO becomes fully operational
- All parties who contributed to the funding of the development and deployment phases of the EGNOS system, *particularly the EOIG members*, should be involved in the future policy decisions concerning the system and that an appropriate agreement should therefore be concluded between all parties concerned and the GALILEO Joint Undertaking



## The Council's finance comments recognise the importance of ensuring that EGNOS is improved to meet international standards

- The EGNOS system should as far as necessary receive public funding from various sources from 2004 to 2008 in order to improve the system to meet the obligations of the international standards (such as ICAO and IMO)
- The European Community will further contribute to EGNOS funding in the framework of Community budget for the trans-European networks (TENs) under the present Financial Perspectives, as a separate item and in accordance with the TEN-T financial regulation, and that it will consider further contributing to this funding after 2006

## Looking ahead, extending EGNOS beyond Europe will ensure its long-term future

- The extension of EGNOS to other parts of the world should be *pursued determinedly* by the Commission and Member States, to share its operation with these regions and to promote the European technology
- Extension options include
  - Coverage expansion through the deployment of extra RIMS (candidates include Africa, Eastern Europe, the Mediterranean)
  - Technology copies in, say, India or South America

## These conclusions are important, they are good for the market

- They reaffirm the role of EGNOS within European radionavigation policy and emphasise EU strategic benefits
- They protect current investors, ensure their long-term interest and establish a legal framework for their future involvement
  - This is vital for the Galileo concession process
- They emphasise the urgent need to bring EGNOS into operation while reaffirming its long-term service availability
  - The focus on aviation and maritime use gives *long term* a new perspective
- They ensure that EGNOS meets institutional user requirements through the standards process
- They direct the EC and Member States to pursue determinedly the extension of EGNOS to other parts of the world