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COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 16 May 2007
COM(2007)261 final

**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT AND THE COUNCIL**

**GALILEO AT A CROSS-ROAD:
THE IMPLEMENTATION OF THE EUROPEAN GNSS PROGRAMMES**

{SEC(2007)624}

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GALILEO AT A CROSS-ROAD: THE IMPLEMENTATION OF THE EUROPEAN GNSS PROGRAMMES

1. INTRODUCTION

The European satellite navigation programmes Galileo and EGNOS have come to a cross-road. A political choice is required on how to proceed. The concession negotiation which should have led to the deployment and exploitation of Galileo has stalled. The delays accumulated so far and the absence of any sign of progress on the concession negotiation is a risk for the delivery of the project within the timeline and foreseen budget.

In view of the situation, and following the letter of Vice President Barrot to the Council Presidency of 14 March 2007, the Council of Transport Ministers of 22 March 2007 requested the Commission to:

- *assess and report by the June Council on overall progress of the Galileo project, including the outstanding issues listed by the bidding consortium as summarised in the Presidency's report and including the project cost and financing thereof, with a view to the swift progress of the project;*
- *submit as soon as possible for discussion possible solutions for securing the long-term public financial obligations, as requested in the Council conclusions of October 2006, including a scenario for the earliest possible provision of EGNOS satellite navigation services as precursor to Galileo, and to report to the June Council;*
- *assess, assisted by GSA and ESA, the progress in the concession negotiations and to submit alternative scenarios, also assessed for costs, risk and affordability, for the forthcoming June Council meeting.*

The European Parliament, in its Resolution of 24 April 2007¹, reiterated its support for the Galileo programme, expressed its concerns about the progress, and called on the Commission to come forward with appropriate proposals, based in part on the same points as mentioned by the Council and, in particular, for a strengthening of public governance by ensuring political responsibility and leadership of the Commission.

This Communication responds to the requests of the Council and the European Parliament and is complemented by a Document of the Services of the Commission SEC(2007)624 of 16 May 2007.

¹ European Parliament Resolution of 26 April 2007 on the Galileo concession contract negotiations

2. EGNOS AND GALILEO: THE EUROPEAN GNSS PROGRAMMES

Satellite navigation is a technology allowing users worldwide to pinpoint their location at any time. The range of applications which are made possible is wide and spans a large set of domains, from traditional transport to communication, land survey, agriculture, fisheries, environment protection, scientific research, tourism and others. Satellite navigation can improve vehicle navigation and relieve traffic conditions, guide people with disabilities or localise goods, animals and containers. Furthermore, it can ease civil protection operations in harsh environment, speed up rescue operations for people in distress at sea, and provide tools for coastguards and border controls. It is also a formidable asset for time stamping of financial transactions, scientific research in meteorology, geodesy, earth movement monitoring and others.

Considerable achievements have already been accomplished over the last ten years, based on the hard work of the public institutions, the European research establishments, and European industry. The public sector budgets totalled over 2.5 B€.

Europe developed EGNOS which is based on GPS signals and provides augmentation signals, re-transmitted by three geostationary satellites. EGNOS makes it possible to move the accuracy of GPS positioning below 5 meters. Moreover, it sends an integrity message informing users in the event of problems on GPS satellites. EGNOS should become operational in 2008 and provide early access over Europe to 3 of the 5 global services of Galileo. EGNOS has been essential in the promotion of European research, knowledge and know-how in this state-of-the-art technology.

Galileo is based on a constellation of 30 satellites placed in a medium earth orbit (at an altitude of approximately 24 000 km) continuously covering the entire surface of the earth. The selected configuration is optimal, as it ensures the presence of a minimum of four satellites above any point of the earth at any moment. Indeed, navigation receivers can calculate their position only if they receive simultaneously the signals of a minimum of four satellites.

The first Galileo experimental satellite was launched in December 2005.

In parallel, close and fruitful cooperation has been put in place with the US. This has led to an EU-US Agreement² on the full interoperability of the GPS and Galileo open signals and a recent joint decision to improve the characteristics of these signals, effectively establishing the global standard for satellite navigation. This is expected to lead to the wide-spread use of combined GPS/Galileo receivers in mass-market applications.

The Commission invites the Council and the European Parliament to recognise the investments and achievements in the European GNSS programmes.

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EU-US Agreement on the promotion, provision and use of Galileo and GPS satellite based navigation systems and related applications, June 2004

3. THE PATH FOLLOWED

Following the European Council of Nice in December 2000, the Council Resolution of 5 April 2001 approved the launch of the European satellite navigation programme Galileo.

The Council had foreseen the development of the programme in three phases (development and in-orbit validation phase, deployment phase and operational phase). Regarding the financing of these phases, the Council decided that the development phase should be financed entirely by the public sector and, as far as the other phases are concerned, they should be financed by both the public and the private sectors in the framework of a public-private-partnership on the basis of a maximum of one-third of the cost of the deployment for the public sector. The start of the operational phase was foreseen in early 2008.

On 17 October 2003, in accordance with its mandate laid out in Regulation 876/2002, the Galileo Joint Undertaking launched a concession call for the deployment and operational phase of Galileo. On 4 July 2005, the GJU agreed on the basis of certain specific conditions, to the creation of a Merged Consortium, recently named "*Euro-GNSS*", located in Toulouse and composed of 8 partners (AENA, Alcatel, EADS, Finmeccanica, Hispasat, Inmarsat, Thales and TeleOp) as the single negotiating partner for the Galileo concession.

The negotiations effectively started in January 2006, following internal industrial disagreements and a mediation³ with regard to the division of role and responsibilities as well as locations of major ground installations of the system.

Negotiations focused on the Heads of Terms, i.e. the core elements of the concession contract. A first version was initialled on 20 November 2006. Since the beginning of 2007 the negotiations came to a stop.

4. ASSESSMENT OF THE OVERALL PROGRESS AND CHANCES OF IMPLEMENTATION

The European GNSS programmes Galileo and EGNOS have accumulated a delay of 5 years with regard to the initial calendar and are currently facing a number of difficulties, in particular due to industrial governance and the difficulties to transfer risk to the private sector at reasonable conditions. However there are also issues linked to the public governance.

EGNOS is nearing operational readiness and has provided proof-of-concept. Its implementation and availability is now urgent.

The progress of the development phase of Galileo however has accumulated substantial delays and cost overruns.

Although the downstream market for global satellite navigation services is very promising indeed (predicted to be around 450 B€ annually⁴ as from 2025, worldwide), the market for the concession holder, which provides the signals-in-space, appears uncertain. Among the reasons are the uncertainties of the commercial use of Galileo, with the fact that the GPS civil signal is free of charge, and that there is still considerable uncertainty to what extent the public authorities will use the Public Regulated Service (PRS) of Galileo.

3 The mediation of ex-Commissioner Karel van Miert resulted in an agreement among the 8 members of the Merged Consortium on 5 December 2005.

4 ProDDAGE market analysis report, ESYS Consulting, 2006.

As a result, the Merged Consortium expects the EU to underpin the associated risk. This element was clearly underestimated in the original plans for Galileo as there was always the assumption that the private sector would assume the market risk.

Unless the EU reacts quickly and decisively, the current delays may have a domino effect in terms of the investments in the downstream applications and services markets which rely on the certainty of the time schedule by which the Galileo and EGNOS infrastructures will be put in place.

The technological complexity of EGNOS and Galileo is considerable and has probably been underestimated. The design is currently in the hands of the public sector, namely the European Space Agency. The transfer of the design risk, and the closely associated completion risk, cost overrun risk and performance risk to the Merged Consortium has not proven to be possible at reasonable conditions. Moreover, the EU has taken an assumption that Galileo could be developed and deployed in a much shorter time and with considerably less public financing than it took the US for GPS. Although admittedly GPS has particular requirements, the EU assumption may have been optimistic.

Both the industrial and public governance have proven to be a major factor. The current industrial organisations are neither efficient nor capable of reaching decisions, largely due to disputes on roles, responsibilities and programme work share. In addition, for the purposes of the PPP, i.e. ultimately the provision of services, the Merged Consortium has a composition with different focus, namely mostly the construction of the constellation whilst a PPP would ideally require a consortium led by service providers. Moreover, the lack of clarity of the respective roles and responsibilities on the public side has not made the situation any easier.

Continuing with the current negotiations would imply that the implementation of Galileo would proceed on the basis of the publicly procured, first four satellites and related ground infrastructure of the development phase and that the remainder of the system would be procured, deployed and exploited by the Merged Consortium. However, as a result of the accumulated delays, the start of the PPP would not commence before mid 2009 and full deployment would be delayed until 2014 or later.

Furthermore, additional considerable risk mitigation actions are required to cover the gap between the development and the deployment phases, particularly through the procurement of an additional 4 satellites and related infrastructure, in order to avoid that industries teams dissolve. In addition, significant revenue losses can be expected resulting from a late arrival on the market in the face of the emerging global competition such as GPS-III.

In this respect, the points raised by a letter of the Merged Consortium to the EU Presidency⁵ cover a large number of points which can only be resolved either in negotiations (technical baseline, IOV and EGNOS handover conditions, risk transfer and mitigation, a joint GSA/Merged Consortium business development roadmap, update the programme and negotiating roadmap), or by the Merged Consortium itself (update the cost model, private funding commitments, proper governance, resolve outstanding arguments on work shares), or indeed by the EU (strengthen public governance, ensure longer-term financial certainty of public funding arrangements, resolve the EGNOS institutional issues). These latter matters are addressed in this Communication and in the Document of the Services. The Commission

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Letter of the Merged Consortium to Minister Tiefensee and Vice President Barrot, 9 March 2007.

considers that the points raised are of value in the evaluation of the programme as a total. However, the material reason for this negotiation not progressing is primarily related to the inability of the Merged Consortium to effectively manage the process, agree on a common position, and engage in the negotiation as a consequence of the underestimated complexity of the programme, the unclear parameters for revenues and the heterogeneous composition of the consortium.

The latest letter of the Merged Consortium, setting out its position on the situation in response to the imposition of the pre-conditions formulated by Council⁶, neither provides any significant new elements nor any credible evidence on a commitment to proceed. Therefore, and despite the partial fulfilment by the Merged Consortium of these pre-conditions, the Commission believes that the negotiation has failed to achieve reasonable results and has come to the conclusion that the current concession negotiation stands therefore little chance to be concluded satisfactorily, with a balanced sharing of risks, at best value for money to the EU, in good time, and with sufficient assurances for efficient private sector governance.

In summary, the Commission considers that the current situation is a result of the combined effects of continuous, unresolved disputes over share of industrial work, a misjudgement that market risk could be transferred to the private sector, an unresolved negotiation with respect to the transfer of design risk, the technical complexity of the programme, and insufficiently strong and clear public governance.

The Commission invites the Council and the European Parliament to take note of the failure of the current concession negotiation and to conclude that, on this basis, the current PPP negotiations should be ended.

5. DOES EUROPE NEED A SATELLITE NAVIGATION SYSTEM?

In view of these difficulties, the question is whether to stop the programme or to pursue in a renewed context.

Galileo has become a flagship project for both its strategic value and its important contribution to the Lisbon strategy, and incarnating the political, economic, and technological dimensions of the European Union. This has been emphasised on several occasions by the European Council at their Summits in Cologne, Feira, Nice, Stockholm, Laeken, Barcelona, and Brussels.

Global Satellite Navigation Systems (GNSS) are rapidly developing into critical infrastructures for modern society, which will rely on it for vital functions such as border controls, transport logistics, financial operations, and surveillance of energy and communications infrastructures.

Hence, Galileo provides important contributions to Community policies in areas, as varied as transport management, transport of dangerous goods, emergency services (eCall), mobile telephony, financial services, energy, navigation in seas and waterways, air transport, civil protection and humanitarian missions, agriculture, fisheries, and surveying. A major and increasing part of our economic activity is based on position and timing information.

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Letter of the Merged Consortium to the GSA, 24 April 2007

Abandoning Galileo would recreate and significantly increase the dependency on GPS (US)⁷ and potentially Glonass (Russia) and Compass/Beidou (China). All these systems are of a governmental, dual use or military nature, constructed and operated entirely on the basis of public funding. Europe would be the only major economy without such a strategic asset. This will have further important political impacts for the European Union as our co-operation with third countries will lack an important asset. This would mean that the European Union would be dependent on military/dual use foreign systems and technologies for applications vital to the running of the society tomorrow.

Moreover, Galileo is a pillar of the emerging European Space Policy and signifies Europe's ambitions in space, technology, and innovation. Not implementing Galileo, but only proceeding with the implementation of EGNOS, would not only be a major technological drawback for Europe but would cause a major loss of macro-economic opportunities for European manufacturing and services industries. In the absence of resident technical expertise, the European private sector would be in a bad position to reap the benefits of the world-wide market of satellite navigation services and applications of 450 B€ annually by 2025. The European private sector has indicated that it counts on achieving a one-third market share thereof, equivalent to 150B€ annually. Market studies for satellite navigation show rapid growth especially in the downstream markets for road applications and locations based services and equipment. Developing and maintaining technical resident European expertise in the upstream market (the development, deployment, and operations of the system) is a pre-requisite for allowing the European downstream market to deploy its full potential in innovation of applications and services throughout the economy.

Last but not least, Europe has already engaged 2.5 B€ in the development of the European GNSS programmes⁸ to date.

The Commission invites the Council and the European Parliament to reaffirm the necessity to put in place an autonomous satellite navigation system, to endorse the continuation of the Galileo programme as a strategic asset for the European Union, and to recognise its economic value.

6. WHICH GALILEO?

The assessment of potential major modifications to the requirements, re/de-scoping of the services, constellation design and in coverage, low-cost infrastructures and alike have shown that the system characteristics, as they have been agreed by the Council, are still fully appropriate. The main focus should be on maintaining the tight schedule of program development and deployment.

The system characteristics adopted for Galileo are the result of around ten years of design and technical qualification. Many possible configurations were assessed in an open process which allowed experts and potential users of navigation systems to express their views in order to ultimately determine and agree on the Galileo mission requirements. Design teams, both in ESA and in industry, defined the system in an interactive process and tailored the programme in line with these mission and performance requirements. Since then, neither the basic

7 EGNOS augments, and is based on, GPS signals by means of a, currently only regional, European ground infrastructure.

8 The EU and ESA budgets combined include the IOV contract (1.5 B€), the EGNOS costs (0.7 B€) and ESA and EU research over the years

configuration of the system (satellite constellation, ground segment) nor the definition of the services has been challenged by any stakeholder. This demonstrates the validity and the robustness of the concept developed.

Any radical change in design would lead to the cancellation of the actual industrial contracts in the development phase and therefore to a full re-bidding for the entire programme, with the associated delays this would involve. Such a scenario incites a combined effect of a loss of the investment made so far in the project and a very late entry-to-market of a system with degraded performances and an undoubtedly low resistance in competition against new systems like GPS-III. The forecast economic profitability of such a scenario is very low.

The potential cost savings from a reduced system therefore induce the reverse effect of their initial objective and are a much less important factor than the respect of the time schedule associated with a system maintaining its initial technical definition.

The Commission invites the Council and the European Parliament to recognise that the Galileo system characteristics remain fully compatible with the ambitions of the European Union for this strategic asset, namely a 30 satellites constellation offering five different services with an excellent quality of the signal in space.

7. ALTERNATIVE SCENARIOS

The Commission concurs with the view that a PPP provides the best conditions to control costs, manage completion and technical risks, and optimise market exploitation. However, if negotiations for the transfer of relevant market, cost control, completion, and technology risks to the private sector can not succeed due to a high price and unfavourable terms for such a transfer, then the basic requirements for a PPP are not met. The necessary actions need to be undertaken to create the appropriate environment which would offer a good chance of transferring the risks to the private sector at reasonable conditions.

Therefore, the Commission has pursued the PPP approach for the implementation of Galileo but has re-profiled it through scenarios with a more appropriate moment at which a private partner assumes programme responsibility.

All of the retained scenarios start with a public procurement of a certain number of satellites and the associated ground segment, followed by a PPP undertaking the procurement of the remaining satellites, if any, as well as the exploitation, operations and maintenance of the infrastructure.

For comparison purposes only, a scenario is maintained whereby the current negotiations with the Merged Consortium would be continued. In this hypothetical case, continuing the negotiations would mean that the implementation of Galileo proceeds on the current basis of the first four, publicly procured satellites while the remainder of the system would be deployed and exploited through the foreseen PPP contract with "Euro-GNSS", i.e. the Merged Consortium⁹. However, risk mitigation actions are required, as set out later. The following two scenarios are retained:

⁹ See analysis in section 4

A. INITIAL OPERATIONAL CAPACITY (IOC) PROCUREMENT, FOLLOWED BY A PPP

Under this scenario, the public sector finances and procures an operational system with limited performances. This core infrastructure is composed of 18 satellites with the associated ground segment. The IOC allows provision of early Galileo services for a wide range of users and provides confidence on design robustness to the future concessionaire. Both positioning accuracy and coverage are sufficient to introduce services on the market¹⁰ but yet without capitalising on Galileo's technical value-added. The remaining 12 satellites are procured by the private sector under the PPP concession scheme which also contains the operations and exploitation activities. The IOC will be ready by end 2011, with users having access only to early services at that time. Full deployment and service availability can be achieved by end-2013, provided that the PPP contract is signed in time. The PPP contract would cover the period 2010-2030.

<p>A total of 18 satellites under public procurement followed by a PPP for procurement of 12 satellites, operations, and exploitation</p>	<p>The chart displays a timeline from 2007 to 2015. An orange bar labeled 'IOV' spans from 2007 to 2010. A blue bar labeled 'IOC' spans from 2008 to 2011. A green bar labeled 'PPP (incl. FOC deployment)' spans from 2010 to 2030. A light blue bar labeled 'EGNOS' spans from 2008 to 2013. Milestones are indicated by diamonds at the start and triangles at the end of each bar.</p>
<p>Main characteristics</p>	<ul style="list-style-type: none"> - EGNOS operational in early 2008 - Complete current development phase (In-Orbit-Validation): 2010 - Completion of the deployment of the first constellation: end 2013 - PPP contract for completion of infrastructure deployment, operations, and exploitation: 2010-2030 - Full service provision and performances availability: end 2013

B. FULL OPERATIONAL CAPABILITY (FOC) PROCUREMENT, FOLLOWED BY A PPP

In this scenario the public sector finances and procures the complete operational system with full performances. This infrastructure is composed of 30 satellites with the associated ground segment. It allows the provision of all Galileo services for all targeted users and provides full confidence of design robustness to the future concession holder. The PPP contains operations and exploitation activities. The public sector is gradually able to increase the capability to provide services. In an intermediate step the infrastructure reaches a constellation of initial operational capability by end-2011 and the full deployment is achieved by the end of 2012. The PPP concession contract covers the period 2010-2030.

¹⁰ 4 meters horizontal accuracy for 87% availability or 20 meters accuracy for 98% availability

A total of 30 satellites under public procurement followed by a PPP for operations and exploitation	2007	2008	2009	2010	2011	2012	2013	2014	2015
	IOV				FOC	IOC	FOC		
Main characteristics	<ul style="list-style-type: none"> - EGNOS operational in early 2008 - Complete current development phase (In-Orbit-Validation): 2010 - Completion of the deployment of the first constellation: end 2012 - PPP contract for exploitation: 2010-2030 - Full service provision and performances availability: end 2012 								

- FOC is earlier than in the previous scenario as there is not need to wait for the PPP to commence and order the last 12 satellites.
- A technical handover of two years is foreseen between ESA and the Concession Holder before IOC operations commence

In light of the evaluation of the various scenarios, the procurement by the public sector of the full constellation is the most advantageous. Effectively, as the trend shows (see the table in Annex), the more the private sector is requested to provide financing for the infrastructure, the higher the part of the availability payment, to be paid by the public sector, which underpins debt, debt interest and the return on equity.

This needs to be off-set against the risks that are retained under the various scenarios. Normally, the higher levels of underpinning of the public sector are compensated by a transfer of risk to the private sector. However, as the current concession negotiations have shown, this risk transfer is currently not negotiable at reasonable conditions for the public sector and, in effect, in all scenarios the public sector retains most of these risks. As a result, the effect of underpinning of debt, debt interest, and return on equity plays a major role in the overall value-for-money assessment.

The assumption has been of a baseline revenue return over the period 2007-2030 of a total of around 10 B€. However, most of this will be available towards the end of the period. Therefore the total costs for the public sector are not a simple subtraction of revenues from the total nominal costs but it is necessary to calculate a so-called Net Present Value (at a discount rate of 6%) of the total public sector costs. It is the standard method for the financial appraisal of long-term projects. In addition, the part of the total revenue that the public sector will be able to retain depends on the scenario and is linked to remuneration of the concession holder. The result of the estimations is presented in the table below.

Scenario	Total Public Sector Costs NPV (in B€) 2007-2030
Continue present scheme, and add mitigation actions	~ 1.8
Build an initial operational capability (IOC) followed by a PPP	~ 2.2
Build the full, first constellation (FOC) followed by a PPP	~ 1.0

The public sector contribution expressed in Net Present Value, which takes account of the different sharing scenarios of revenues between the public and the private sectors, is most advantageous in the FOC scenario with a value of around 1.0 B€. In return however, a larger investment is necessary in the Financial Framework 2007-2013.

Finally, it should be highlighted that the most important element which could not be modelled is the deployment of GPS-III from 2013 until 2018 that introduces a number of equivalent services free-of-charge. In view of this, the later the delivery of the full Galileo constellation, the more negative the impact will be on the concession revenues.

The Commission invites the Council and the European Parliament to:

- confirm that it is necessary, appropriate, and in the interest of the European GNSS programmes to proceed with their implementation through an alternative scenario.
- take note of the relevant advantages and financial implications of the available, realistic scenarios.
- take note in particular of the importance of an early completion of the full constellation, and the cost implied by delays in political decisions.

8. A STRATEGIC ASSESSMENT

On the basis of its assessment, the Commission invites Council and European Parliament to conclude that **the preferred option and only scenario providing a satisfactory way forward is a re-profiled, two-step PPP approach:**

- (1) **Step 1:** start with the **immediate implementation of EGNOS, through a specific concession**, as a precursor to Galileo with initial service availability by early 2008, and complement the current public procurement of the initial satellites and infrastructure by **deploying the first full Galileo constellation under a public procurement** with a target of Full Operational Capability by end 2012.
- (2) **Step 2:** In parallel, negotiate and put in place a **PPP for the subsequent EGNOS and Galileo exploitation phase** from 2010-2030.

The choice for this scenario is based, in particular, on the high programmatic certainty (only scenario where the completion of the deployment phase does not depend on the success of a parallel concession process), the fully fledged program logic (essential for a smooth hand-over to a concession holder), the best re-use of investments of the development phase (restoring confidence and motivating the industrial teams), the fastest time-to-market (offering the best chance of a significant Galileo market share), and last but not least best value-for-money.

However, a number of critical programme issues need to be addressed.

The current industrial organisation is neither efficient nor capable of reaching decisions, largely due to the fact that the private sector acts on the basis of unclear roles, responsibilities,

and programme work share. It is therefore essential that interferences in the industrial organisation is minimised in order to let normal business practices come to the fore, while respecting the strategic nature of the Galileo programme and the critical role of broad-based, European industrial supply and private sector participation therein. Tight management is required to ensure the time schedule of the programme both as regards cost control and time-to-market. 5 years have been lost already compared to original schedules and at significant costs.

As the owner of the system, the EU has the responsibility, in particular, to: ensure that its political commitments and vision are implemented, determine and agree on the overall specifications and requirements for the system; to be able to monitor and control the strict adherence to such requirements throughout the construction, deployment, and exploitation phases; to oversee the different phases of the programme in order to avoid further delays and cost overruns; and providing the conditions for coherent, efficient, and harmonious private sector governance wherever relevant.

With regard to the need for an efficient and sound programme management, the European Commission needs to be able to run the programme with adequate programme management controls and tools, fully respecting the political vision and conditions of the European Union as a whole. The Commission commits to regular and detailed reporting to the Council and the European Parliament on all aspects of the programme implementation.

The Commission recommends retaining the European Space Agency (ESA) as the procurement agent and designing authority on behalf of the European Union. This means that ESA will have to exercise its technical expertise under EU rules and subject to overall EU management of the programme. Also in view of the approach taken, a clear procurement agreement with ESA is necessary, in particular with regard to the retained level of liability if acting as a procurement agent and/or design authority for the EU.

Such an agreement and its associated financing rules should give clear indications of the procurement process and be based, *inter alia*, on the following elements:

- Recognition of the strategic nature of the Galileo programme and the critical role of broad-based European industrial supply and private sector participation therein;
- Competitive tendering in contract batches for all space and ground segment elements;
- Dual-sourcing wherever possible to improve efficiency and decrease dependencies;
- Due account of existing achievements and investments and of agreements as far as relevant;
- Firm and fixed price contracts;
- Regular and detailed reporting requirements;
- Regular audits of the EU Court of Auditors to ensure that the financial interests of the EU and the community character of the programme are respected.

Moreover, the Commission strongly believes that it can not take any effective political responsibility for the programme without substantial evaluation of the structure and role of the Galileo Supervisory Authority (GSA), including the legal and practical means through which the European Commission can exercise its programme management responsibility transparently under accountability to Council and Parliament.

In the new situation, the role of the GSA has to be thoroughly reviewed. If the necessity of maintaining such a specific EU Agency is confirmed, the GSA may in future have such tasks as: procure the new EGNOS and Galileo concessions, and assist the Commission in the development of EGNOS and Galileo applications. In order to assure that the Commission can assume its full responsibilities in the development of the programme, it will make proposals to align the governance of the GSA to the new situation.

Preparation of markets is necessary through an early implementation of EGNOS and through actions in standardisation, certification, and market awareness-raising¹¹. These measures may also reduce the risks of revenue short-falls for the concession holder at a later stage and therefore of costs to the EU. Whilst maintaining the system as a civil system significant revenues could also come from military users. There have been considerable discussions on the use of the PRS signal over the past years, this need to be continued¹².

The design risk of Galileo is managed by the public sector as a result of the past decision to develop the system on the basis of a public procurement by the European Space Agency of two experimental satellites¹³ and the first four operational satellites and related infrastructure¹⁴. It is therefore the role of the EU, with the assistance from ESA, to develop a strategy whereby the design risk is mitigated before the remaining risk can be transferred. The organisational and legal issues surrounding the design risk are essential aspects of the programme implementation.

In terms of time schedule, timely programme implementation and the launching of satellites is essential as, *inter alia*, the EU can not afford to lose its rights to the use of the relevant global satellite navigation frequencies.

The Commission also invites the Council and the European Parliament to proceed on the basis of the following principles:

- 1) Recognise that EGNOS will achieve operational capability by early 2008 and immediate action is required to implement its services as a pre-cursor to Galileo.
- 2) Recognise that the European GNSS programmes are defined, agreed, managed, and overseen at the level of the European Union in the interest of all of its Member States.
- 3) Recognise the strategic nature of the Galileo programme and the critical role of broad-based European industrial supply and private sector participation therein.
- 4) Retain the European Space Agency (ESA) as the procurement agent and design authority on behalf of the European Union, and acting under the latter's authority and rules.
- 5) The need to introduce robust and fair competition in the programme on the basis of dual-sourcing and regular competitive tendering in all elements of the programme, wherever possible, in order to improve efficiency and decrease dependencies. Due account needs to be taken of existing achievements and investments, and of agreements as far as relevant.

11 Green Paper on Satellite Navigation Applications, COM(2006)769, of 12/12/06 and foreseen follow-up actions

12 In the context of the recent proposal for a European Space Policy COM(2007)212, the Commission took the view that civilian space programmes, such as Galileo, have a multiple-use capacity and may have military users.

13 Giove-A satellite launched in December 2005 and Giove-B satellite be readied for launch late 2007 or early 2008.

14 The In-Orbit-Validation (IOV) or development contract put in place by ESA and financed by ESA and the EC.

- 6) Recognise the need for the strengthening and restructuring of the public governance of the European GNSS programmes on the basis of political responsibility and leadership of the Commission, on the basis of proposals by the latter;
- 7) Recognise the need to provide confidence to downstream investors in services and applications through firm commitments on delivering Galileo on time, based on fair and non-discriminatory access to its services

9. FINANCING OF THE RECOMMENDED SCENARIO

Present costing, on the basis of the current concession negotiations up to the end of 2006, of the scenario continuing with the Merged Consortium reveals a need for the European Union to purchase additional satellites before the PPP can be put in place, to mobilise some 2.4 B€ for the financial period 2007 to 2013, to underwrite market risks through availability payments for the period until 2030 of around 10 B€, and to accept further liabilities for design and termination risks as well as for third party liability. Depending on the actual revenue streams, the public sector would recuperate some 8 B€ under a baseline revenue scenario. This puts into question the advantages of an early PPP approach.

In order to finance the recommended scenario of a public procurement of the first constellation and ensuing PPP, the European Union and its Member States would have to mobilise a total of 3.4 B€ for the period 2007 to 2013, whereas the budget commitment over the entire period will reduce to around 9 B€. The advantages of this scenario are that it offers the most advantageous time line, the best value-for-money, the conditions for a subsequent PPP phase will be much more clearly developed, while the overall budget commitment appropriation is substantially reduced.

Under none of the scenarios are the current provisions of the financial perspectives sufficient. Moreover, all scenarios need an EU Programme Regulation going much beyond 2013.

Clearly, a political decision to re-profile the PPP as suggested would require agreement on the financing scenario before deciding on implementation. In the next months, the Commission will proceed with an analysis of the implementation details related to the preferred scenario and which will be carried out in parallel to the identification of the additional financing. Notwithstanding, the Commission considers important to advance with the adoption of the currently proposed EU Programme Regulation to be able to continue with the stabilisation of the EGNOS programme and to continue, with the assistance from ESA, with the preparations of the preferred scenario..

In order to identify the necessary additional financial means, the Commission, at this stage, considers exploring the following options:

- Examination of financing possibilities through a targeted increase of the ceiling of Heading 1A of the financial framework in compliance with the own resources ceiling and the provisions set up in the Inter-institutional Agreement of 17 May 2006 between the European Parliament, the Council and the Commission on budgetary discipline and sound financial management¹⁵. This procedure implies both branches of the budgetary authority.
- Mobilisation of additional resources from the Member States outside the Multi-annual Financial Framework.

¹⁵ EUOJ C 139 of 14.6.2006.

The Commission will explore these options or their combination together with the Budgetary Authority.

The Commission invites the Council and the European Parliament to:

- 1) secure, as a first step, the progress of the EGNOS and Galileo projects, to advance rapidly with the adoption of the currently proposed EU Programme Regulation;
- 2) examine the possibilities for additional financing;
- 3) discuss and agree, on the basis of a proposal that the Commission will present by September 2007, the modalities on how to proceed in view of the financing gap, including, if necessary, a financing mechanism which will cover the entire period until 2030.

ANNEX: Financial modelling of the scenarios

In terms of judging the financial implications of the retained scenarios, the financial modelling is based on early assumptions and extrapolation of crucial data and the results need therefore to be viewed as approximate and for comparison purposes. The definitive results will depend on the terms of the respective contracts.

Scenario	Total number of satellites under public procurement	Public sector support ²			Total required public sector budget commitment ⁶ 2007-2030 Nominal	Start of full operations ⁷
		Requested public sector budget in perspectives 2007-2013 ³ (for satellites and infrastructure under public procurement)	Availability Payments (underpinning by public sector) for the PPP (until 2030)			
			Fixed part ⁴ : - operating cost - maintenance - replenishment debt interest Nominal	Variable part (depending on number of satellites and infrastructure procured by private sector) ⁵ : - debt principal - debt interest - return on equity Nominal		
Continue present scheme, and add mitigation actions ⁸	4+4	2.4	5.3	3 - 4	11 - 12	Mid-2014
Build an initial operational capability (IOC) followed by a PPP	18	3.0	5.3	2 - 3	10 - 11	End-2013
Build the full, first constellation (FOC) followed by a PPP	30	3.4	5.3	0.5 - 1	9 - 10	End-2012

All figures are indicative and in Billions of Euros. Further details can be found in the Document of the Services of the Commission.

1. According to the latest programmatic analysis carried out by the European Space Agency, the accumulated delays imply risk mitigation activities and the construction of four additional satellites to ensure the continuity of the industrial production line between the in orbit validation phase and the first activities of the deployment phase. Moreover, it also implies the need to protect the in orbit validation phase against potential launch failure. This was initially covered by the first satellites of the deployment phase.
2. In the Galileo PPP model, the public sector contributes with grants for the deployment of the infrastructure and with availability payments to underpin the exploitation of the system. The private sector contributes with equity and debt.

3. The figures include the part of Galileo procurement costs for the public sector, the EGNOS exploitation costs, and the IOV cost overruns. Estimates are based on ESA costing data, validated by existing contracts and the ESA procurement database, and cross-checked against all the submitted bids during the entire concession negotiation phase. The effect of the cost of public financial resources is not modelled in the financial calculations. Such costs are in the range of 4% and applies to all scenarios and for comparison purposes only affect the difference between 3.4 B€ and 2.4 B€ (i.e. on 1B€). The outcome is marginal and covered within the range of the total public budget commitment (see 6).
 4. The fixed part of the availability payment covers operations, maintenance, and interest of the replenishment debt. This is the same for all scenarios as it concerns the operations and maintenance of the entire constellation and its replenishment. Data is based on cost estimates from the technical and economical studies carried out during the definition phase by ESA and the Commission (GALA, PwC, Comparative System Studies) and cross-checked against all the submitted bids during the entire concession negotiation phase.
 5. The variable part of the availability payment covers the debt service (debt principal, interests, fees, etc) and return on equity injected. This is dependent on the debt and equity that is linked to the size of the procurement that the private sector needs to undertake, and the agreed gearing between equity and debt.
 6. The public sector budget commitment concerns the overall direct costs for the public sector by adding procurement costs (see 3) and availability payments (see 4 and 5). This covers market risk.
 7. Start of full operations is important with regard to the arrival of competing systems. The earlier the starting date of full operations for all services and markets, the higher the market share for Galileo is expected to be.
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