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THE MANAGEMENT OF THE GALILEO PROGRAMME'S DEVELOPMENT AND VALIDATION PHASE

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(pursuant to Article 248(4), second subparagraph, CE)

EUROPEAN COURT OF AUDITORS

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ACRONYMS

ARTES	Advanced Research in Telecommunications Systems
CNES	Centre National d'Etudes Spatiales
CS	Commercial Service
EC	European Communities
EGNOS	European Geostationary Navigation Overlay Service
EOIG	EGNOS Operator and Infrastructure Group
ESA	European Space Agency
FP6	Sixth Framework Programme of the European Community for research, technological development and demonstration activities, contributing to the creation of the European Research Area and to innovation (2002 to 2006)
GCC	Galileo Control Centre
GCS	Ground Control Segment
GDP	Gross Domestic Product
GIOVE	Galileo In-Orbit Validation Element
GJU	Galileo Joint Undertaking
GMS	Ground Mission Segment
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSA	European GNSS Supervisory Authority
GSTB	Galileo System Test Bed
HoT	Heads of Terms
INTOSAI	International Organisation of Supreme Audit Institutions
IOV	In-Orbit-Validation
JTI	Joint Technology Initiative
NRSCC	National Remote Sensing Centre of China
OS	Open Service
PB-Nav	Programme Board on Satellite Navigation
PFI	Private finance initiative
PPP	Public-private partnership
PRS	Public Regulated Service
PwC	PricewaterhouseCoopers
RTD	Research and Technological Development
SAR	Search and Rescue
SESAR	Single European Sky ATM Research
SoL	Safety of Life
TEN-T	Trans-European Transport Network

SUMMARY

I.
The EGNOS and Galileo programmes were initiated in the mid 1990s with the aim of establishing a European Global Navigation Satellite System (GNSS). EGNOS is a regional satellite based augmentation system for Europe that improves the signals coming from existing satellite navigation systems such as GPS. Galileo is currently under development as Europe's Global Satellite Navigation System.

II.
In order to manage the development and validation phase of the Galileo programme, the European Commission and the European Space Agency (ESA) set up a dedicated structure, the Galileo Joint Undertaking (GJU), which operated from September 2003 until the end of 2006. In 2007, the activities of the GJU were transferred to the GNSS Supervisory Authority, a Community Agency.

III.
The Galileo programme was the first of its kind in several respects: it was the first close collaboration between the ESA and the Commission on such a large space programme, the first industrial programme to be managed at European level and the first time the Commission was to participate in a public-private partnership.

IV.
Negotiations with the private sector on a concession agreement stalled in early 2007 and the Parliament and the Council decided to redirect the programme in autumn 2007. Technological development has been set back five years. As at the end of 2008, no operational satellites have been launched and cost estimates for the development and validation phase have almost doubled from 1,1 to 2,1 billion euro. The Court's audit of the development and validation phase of the Galileo programme examined:

(i) which factors accounted for the failure of the concession process;

(ii) which factors accounted for the reported delays and cost overruns of technological development;

(iii) to what extent spending on research and development activities has benefited the Galileo programme;

(iv) how well the GJU had integrated EGNOS into Galileo;

(v) whether the Galileo programme was adequately governed.

SUMMARY

V.
The Court concluded that management of the development and validation phase was inadequate. The Galileo programme experienced problems at different levels:

(i) The GJU was not a strong programme manager nor was any other body assigned this role. The GJU did not achieve most of its objectives – owing, however, to factors that were largely outside the GJU's control.

(ii) The programme lacked a strong strategic sponsor and supervisor: the Commission did not proactively direct the programme, leaving it without a helmsman.

(iii) Owing to their different programme expectations, Member States intervened in the interest of their national industries and held up decisions. The compromises made led to implementation problems, delays and, in the end, to cost overruns.

VI.
The PPP was inadequately prepared and conceived. As a result, the GJU was required to negotiate a PPP which was unrealistic.

VII.
The GJU's task of supervising the technological development activities was seriously constrained by governance issues, an incomplete budget, delays and the industrial organisation of the development and validation phase.

VIII.
Discontinuities, the inappropriateness of the Sixth Framework Programme (FP6) for funding market development activities, the absence of a comprehensive market development approach and delays account for the limited usefulness of Galileo RTD results.

IX.
The integration of EGNOS into Galileo was only partially successful because the GJU's mandate was not clear, the decision to include EGNOS in the concession negotiations held up the achievement of the EGNOS programme, the EGNOS institutional framework was not clear and the GJU devoted little effort to market development for EGNOS.

X.
The programme's governance was inadequate. The division of roles between the entities involved in the development and validation phase of the programme (EU and ESA Member States, Commission, GJU and ESA) was not clearly defined. The Commission did not provide adequate leadership in developing and managing Galileo.

XI.
If the mid-2007 redirection of the EGNOS and Galileo programmes is to succeed, the Commission must considerably strengthen its management of the programmes. This report includes a number of recommendations aimed at supporting the Commission in this task.

XII.
Finally, should the EU resolve to engage in other large infrastructure programmes, the Commission must ensure it has access to the appropriate management tools.

INTRODUCTION

1. This audit report is about the European Union's involvement in satellite navigation in the period 2003-2006.

2. The European Union's satellite navigation strategy consists of two programmes: EGNOS[1] and Galileo.

(a) EGNOS is a regional system for Europe that monitors and corrects the signals emitted by existing satellite navigation systems[2] by improving their accuracy and assessing their reliability.

(b) Galileo is currently under construction as Europe's Global Navigation Satellite System (GNSS). It is the European counterpart of the American GPS and a joint initiative of the European Commission and the European Space Agency (ESA) (see ***Annex I).***

[1] European Geostationary Navigation Overlay Service..

[2] GPS (Global Positioning System), a GNSS developed and operated by the United States Department of Defense; GLONASS, a GNSS developed by the former Soviet Union and now operated for the government of the Russian Federation by its Space Forces..

THE HISTORY OF GALILEO

EARLY DAYS (BEFORE 1999)

3. The history of Galileo began in 1994, with the European Commission's proposal to engage Europe in satellite navigation[3]. Based on this proposal, in December 1994 the Council of the European Union invited the Commission to initiate the necessary activities[4].

4. The Commission's initial strategy for the development of a GNSS comprised two stages. The first (GNSS-1) was to develop a complement to the existing GPS and GLONASS systems. This stage, known as EGNOS, consists of three transponders on geostationary satellites and a network of ground stations covering all of Europe which are used to improve the accuracy of GPS and GLONASS (see footnote 2) and to assess the reliability of their signals.

5. EGNOS was first implemented in 1994 as an ESA programme with financing from several sources (ESA Member States, the European Commission, Eurocontrol and a number of national civil aviation operators and other organisations[5]). It was initially intended as a demonstrator, but gradually it was decided to convert it into a pre-operational and then an operational programme (see also ***Annex II***).

6. The second stage (GNSS-2) was to implement a global civil satellite navigation system, known as Galileo. This will ultimately consist of 30 satellites at a fixed altitude of approximately 23 000 km, as well as a network of ground stations, and will offer five levels of services (see ***Box 1***).

[3] COM(94) 248 – Satellite navigation services: a European approach.

[4] Resolution of the Council of the European Union of 19 December 1994 on the European contribution to the development of a Global Navigation Satellite System (GNSS).

[5] Grouped into the EGNOS Operator and Infrastructure Group (EOIG).

7. There were three motives underlying the creation of Galileo:

(a) political (Galileo is a declaration of an independent European GNSS capability);

(b) economic (Galileo was seen as commercially viable and was justified by predictions of substantial economic and social benefits);

(c) technological (Galileo was to become the most sophisticated navigation system available).

8. The Galileo programme was divided at the outset into four phases (see ***Table 1***):

(a) technical definition;

(b) development and validation;

(c) deployment;

(d) commercial operation.

BOX 1

OWN RESOURCES REGULATION PROVISIONS

The Open Service (OS) will be free of user charges and will provide competitive position and timing performance relative to other GNSS systems.

Safety of Life (SoL) will deliver enhanced performance (including an integrity function, i.e. a timely warning of reduced accuracy) and certification and will be offered with a service guarantee to the critical transport community, e.g. aviation and maritime.

The Commercial Service (CS) will provide access to two additional (encrypted) signals, to allow for a higher data throughput rate and enable users to improve accuracy.

The Public Regulated Service (PRS) will provide position and timing to specific users requiring a high continuity of service (e.g. emergency services, security forces and the military), with controlled access.

Finally, Galileo will contribute, through its Search And Rescue (SAR) service to the International Satellite System for Search and Rescue (Cospas-Sarsat). Galileo satellites will be able to pick up signals from emergency beacons carried on ships, planes or persons and send them back to national rescue centers, enabling the latter to pinpoint the location of an accident.

TABLE 1

PHASES OF THE GALILEO PROGRAMME AS FORESEEN IN NOVEMBER 2000

Phases and main objectives	Initial timing	Governance structure*
Definition phase Technical activities • Technical studies • Technology pre-developments Other activities • Preparation of governance structures for the next phase • Legal and business development feasibility studies • International agreements	1999-2000	European Commission and the ESA separately plus coordination via PMB (Programme Management Board), GPO (Galileo Programme Office) and GISS (Galileo Interim Support Structure)
Development and validation phase Technical activities • Detailed definition of space, ground and user segments • Development and construction of prototype satellites and minimal ground segment • "In-orbit" validation of the system Other activities • Research grants (FP6) • Development business plan • Concession negotiations • EGNOS integration • International agreements	2001-2005	European Commission and the ESA through GJU
Deployment phase Technical activities • Satellite assembly and launch • Installation of complete ground segment Other activities • Business development	2006-2007	European GNSS Supervisory Authority (GSA) + concession holder
Commercial operation phase Technical activities • Satellite renewal • Operation of the centers • Maintenance Other activities • Commercial activities	2008+	European GNSS Supervisory Authority (GSA) + concession holder

*The amendments to the Galileo management structure proposed by recent (2007) Commission communications and Council resolutions are not reflected in this table.

DEFINITION (1999 – 2002)

9. The Galileo programme got underway in 1999, when the Council gave the go-ahead for the definition phase[6]. During this phase, both the Commission and the ESA undertook technical studies, pre-developments and feasibility studies. Funding from the European Community budget was mainly allocated via the Fourth and Fifth Framework Programmes for Research and Development[7]. ESA funding was allocated through its GalileoSat programme.

10. In November 2000[8], the Commission presented the European Parliament and the Council with the results of the definition phase. These contained concrete proposals on the definition of the system, its economic and financial aspects and its management structure. The timetable for the next phases of the Galileo programme was established as follows (see also ***Table 1***):

(a) the development and validation phase would run from 2001 to 2005;

(b) the deployment phase would run from 2006 to 2007;

(c) the commercial operation phase would start in 2008.

The communication planned for EGNOS to become operational in 2003.

11. The Commission stated in the same communication that "cost/benefit studies show Galileo to be cost-effective and sufficiently attractive to obviate the need for any further public funding in the form of subsidies from 2007." The Galileo system was to cost a total of 3,3 billion euro (see ***Table 2*** for a detailed breakdown). The Commission considered the PPP to be "an essential factor for the success of the Galileo programme". The communication also highlighted the urgency of taking a political decision to continue the programme at the Nice European Council in December 2000.

[6] Council Resolution of 19 July 1999 on the involvement of Europe in a new generation of satellite navigation services - Galileo-Definition phase.

[7] Decision No 1110/94/EC of the European Parliament and of the Council of 26 April 1994 concerning the fourth framework programme of the European Community activities in the field of research and technological development and demonstration (1994 to 1998) (OJ L 126, 18.5.1994, p. 1); Decision No 182/1999/EC of the European Parliament and of the Council of 22 December 1998 concerning the fifth framework programme of the European Community for research, technological development and demonstration activities (1998 to 2002) (OJ L 26, 1.2.1999, p. 1).

[8] COM(2000) 750 of 22 November 2000 – Commission communication to the European Parliament and the Council – On Galileo.

12. As requested by the Council of the European Union in its Resolution of 5 April 2001, the Commission had several studies made of a business plan for Galileo. These studies recommended a 'concession'-model of PPP[9]. The Council confirmed the choice of a concession to fund the deployment and operational phases of the Galileo programme and agreed in March 2002 "to work to secure a cost-share of at most 1/3 for the Community budget and at least 2/3 for the private sector" for the deployment phase.

DEVELOPMENT AND VALIDATION UNDER THE GJU (2003-2006)

PURPOSE

13. From a technical point of view, the development and validation phase consisted of the technological development of part of the system – an initial core satellite constellation of two experimental and four operational satellites, the associated ground segment and test user segments, making validation possible through in-orbit and ground-based tests (also called In-Orbit Validation of IOV). The ESA was responsible for implementing these technological development activities through its GalileoSat programme.

14. In parallel with technological development, the Commission focused, during the development and validation phase, on other activities aiming at bridging the gap between the system and its future users in order to prepare for the successive phases of the programme, through business development and mobilisation of funds. Early development of user segments was seen as the key to subsequent use of the Galileo system if direct revenue was to be generated. Therefore, the Commission targeted private-sector involvement through a PPP. Additionally, the focus was on funding RTD activities through the Sixth Framework Programme for Research (FP6)[10] in order to support both technological development and business development and on using EGNOS as a precursor programme to prepare the market for Galileo. EGNOS will deliver regional services similar to three of the five future Galileo services – OS, SoL and SAR (see ***Box 1***).

[9] A DBFO (design-build-finance-operate) type of PPP where the private party recovers costs from user charges or availability payments.

[10] Decision No 1513/2002/EC of the European Parliament and of the Council of 27 June 2002 concerning the sixth framework programme of the European Community for research, technological development and demonstration activities, contributing to the creation of the European Research Area and to innovation (2002 to 2006) (OJ L 232, 29.8.2002, p. 1).

THE GALILEO JOINT UNDERTAKING – THE MANAGEMENT VEHICLE FOR THE DEVELOPMENT AND VALIDATION PHASE

15. The development and validation phase was to be managed by the GJU, a dedicated structure set up by the Commission and the ESA after approval by the Council of the European Union and the ESA Council. The former Council's decision to proceed in full with development and validation was not taken until March 2002[11], 15 months later than expected. This delay was caused by lengthy negotiations among the EU Member States concerning the use of the system for military purposes and private-sector funding and participation in the programme. The ESA Council's official go-ahead for development and validation was further delayed until May 2003. This was caused by lengthy discussions among the ESA Member States on their industrial participation in the programme. The GJU was set up by EC regulation in May 2002[12] [13], its Foundation Act was signed in June 2003 and it became operational in September 2003.

16. The main reason for setting up the GJU was the need for a coordination platform between the ESA and the Commission. There were several other reasons[14], such as the need to run the programme through a single entity and the capacity to attract private funds for development and validation. However, although the private sector indicated its readiness to contribute up to 200 million euro to the development and validation phase[15] by signing a Memorandum of Understanding, this intention never materialised.

17. As established by its Statutes, the GJU was to:

(a) supervise all Galileo programme activities planned for the development and validation phase;

(b) make any necessary adjustments in the light of developments occurring during the development and validation phase;

(c) prepare for the deployment and operational phases.

[11] Preliminary approval for some activities was given in April 2001.

[12] Council Regulation (EC) No 876/2002 of 21 May 2002 setting up the Galileo Joint Undertaking (OJ L 138, 28.5.2002, p. 1).

[13] Article 171 of the EC Treaty: "The Community may set up joint undertakings or any other structure necessary for the efficient execution of Community research, technological development and demonstration programmes."

[14] Regulation (EC) No. 876/2002; European Council conclusions of March 2001; COM(2001) 336 of 20 June 2001 – Proposal for a Council Regulation on the establishment of the Galileo Joint Undertaking.

[15] Whereas 13 of Regulation (EC) No 876/2002.

18. The GJU's main tasks, as established by its Statutes, were:

(a) management of a tendering procedure resulting in the conclusion of a concession agreement;

(b) supervision of the ESA's technological development activities;

(c) initiation and management of research activities;

(d) integration of EGNOS into Galileo.

19. At the start, the GJU consisted only of its two founding members, the ESA and the Commission. The National Remote Sensing Centre of China (NRSCC) joined the GJU in October 2004, to be followed in September 2005 by the Israeli company MATIMOP (see also ***Annex III***). The GJU's governance structure is presented in ***Figure 2***.

FUNDING

20. During the development and validation phase, EU funds (from TEN-T[16] and FP6) were channeled through the GJU while the ESA co-financed Galileo through its GalileoSat and ARTES programmes (***Figure 1***). From 1999 to 2007, the funds allocated to Galileo came to 1,94 billion euro.

PROGRESS

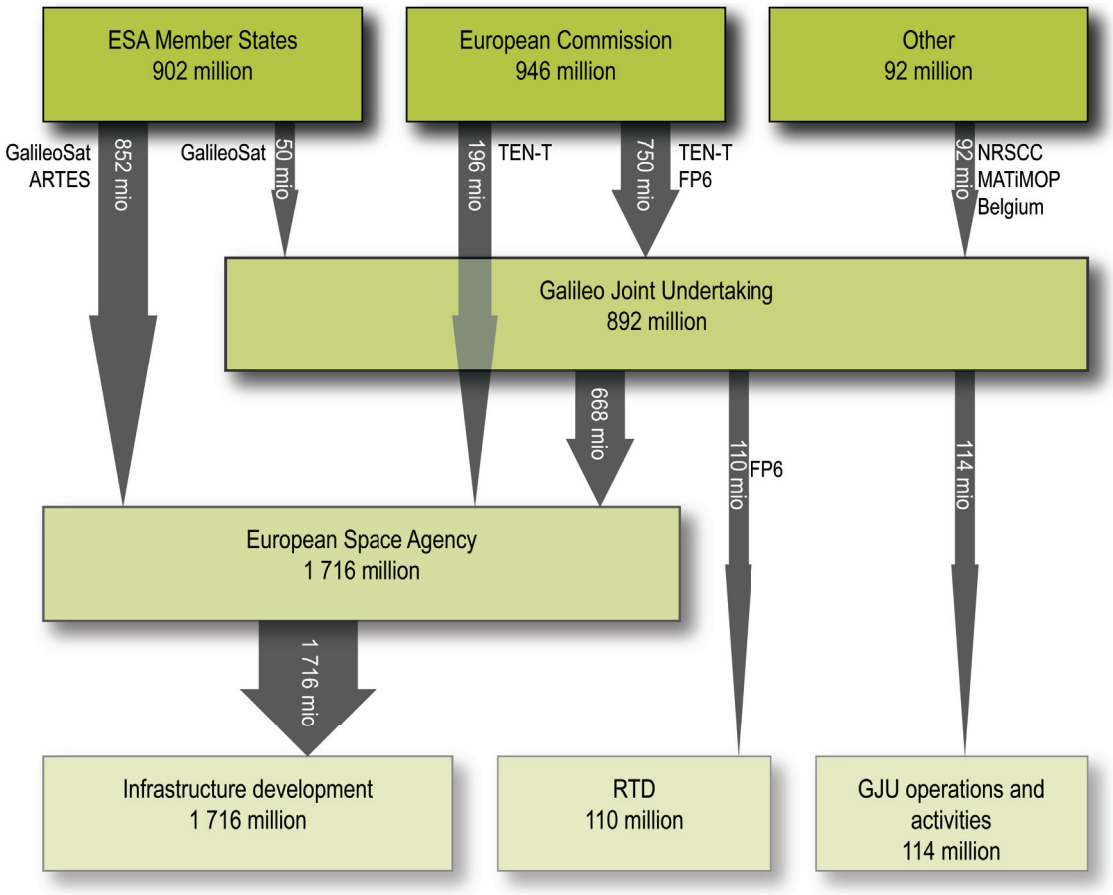
21. In October 2004, the Commission sent a communication on the programme's progress to the Parliament and the Council[17]. This communication prepared the ground for a Transport Council meeting in December 2004, at which it was decided to move to the programme's deployment phase. The Commission did not present an updated timetable. At that point the technological development had accumulated a delay of about three years.

[16] Council Regulation (EC) No 2236/95 of 18 September 1995 laying down general rules for the granting of Community financial aid in the field of trans-European networks (OJ L 228, 23.9.1995, p. 1); Decision No 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the trans-European transport network (OJ L 228, 9.9.1996, p. 1), as amended by Decision No 1346/2001/EC (OJ L 185, 6.7.2001, p. 1).

[17] COM(2004) 636 final Communication from the Commission to the European Parliament and the Council – Moving to the deployment and operational phases of the European satellite radio-navigation programme.

FIGURE 1

GALILEO DEVELOPMENT AND VALIDATION PHASE – FINANCING FLOW (1999-2007)*



*The Chinese and Israeli contributions consisted of a contribution to the GJU's base capital (5 million and 4 million euro respectively) and a contribution to be used to finance the activities of their own national industries (through contracts with the ESA). The latter was not mobilised in full.

Source: ECA estimate

22. The communication stated that the GJU had "successfully completed the procedure for selecting the future concession holder". However, the concession selection phase had just been extended until the end of January 2005. In February 2005, moreover, the GJU did not select a preferred bidder between two candidate consortia[18]. Instead, the tenderers proposed to join into a merged consortium, to which the GJU agreed in June 2005, and made a joint bid.

23. Between July and December 2005, both the concession negotiations and technological development activities were blocked owing to intervention by some Member States. Disagreement between Member States focused on the composition of the merged consortium which was to bid for the concession contract and the location of the system's activity centers, ground infrastructure and headquarters. Through mediation[19], an agreement was reached in December 2005. Negotiations with the merged consortium actually started in January 2006.

24. On 28 December 2005, the first experimental satellite, called GIOVE-A, was successfully launched, thus securing access to the Galileo frequencies allocated by the International Telecommunications Union.

25. In June 2006[20], the Commission released an updated timetable for Galileo[21]. The development and validation phase would now run until early 2009, and deployment would take place in 2009 and 2010 (a three-year shift with regard to the initial timetable). This communication also expanded the budget for the development and validation phase to 1,5 billion euro (400 million euro more than the initial budget). On the concession negotiations, the Commission said: "It has become clear that a concession solution is best suited to the specific features of the programme. [...] By the end of 2006, the estimated costs and income and the public sector contribution will have been finalised. In addition, the financial plan will be confirmed and the main terms of the contract will be fixed."

26. In November 2006, the negotiators from the GJU and the merged consortium initialed the Galileo PPP Heads of Terms (HoT) v.1, the first draft of a non-contractually binding statement. This document was the GJU's nearest approach to a concession agreement.

[18] The Eurely and iNavsat consortia. A third pre-selected consortium led by Eutelsat withdrew from the selection phase in summer 2004.

[19] In October 2005, the Vice President of the European Commission appointed a former European Commissioner as mediator – Press release IP/05/1345.

[20] COM(2006) 272 of 7 June 2006 – Communication from the Commission to the European Parliament and the Council – Taking stock of the Galileo programme.

[21] The first time the Commission released this schedule was in the "note to editors" of Press release IP/05/1345 dd. 25 October 2005.

DEVELOPMENT AND VALIDATION POST-GJU (SINCE 2006)

27. At the end of 2006, the GJU considered that it had "successfully concluded the main tasks"[22] . The GJU was wound up at the end of December 2006[23] and its activities were transferred to the European GNSS Supervisory Authority (GSA), which had been set up in July 2004 to manage the public-interest aspects of the European GNSS programmes and to act as the regulatory authority for the programmes during the Galileo deployment and operational phases[24] . This activity transfer resulted in a change in the GSA's role, which was not foreseen at its creation.

28. The concession negotiations with the merged consortium stalled in early 2007. In a communication of May 2007[25], the European Commission acknowledged that EGNOS and Galileo had accumulated substantial delays (five years with regard to the initial timetable) and cost overruns. In 2007, the Council of the European Union[26] decided to redirect the programme: the system would now be deployed by 2013 with full funding from the Community budget (see Table 2), and with the ESA in the role of delegated procurement agent. On this basis, the European Parliament and the Council adopted a regulation on the further implementation of the GNSS programmes[27]. On 1 July 2008 the Commission published a call for expressions of interest for the purchase of infrastructure for the Galileo system, under six headings (system support, ground mission segment, ground control segment, space segment (satellites), launch services and operations). After pre-selection of suitable candidates, preliminary proposals were received at the end of 2008. The competitive dialogue process is expected to be finalised in the course of 2009.

[22] GJU press release of 30 November 2006 – Next step in the Galileo Program; Handover of the management from the Galileo Joint Undertaking to the European GNSS Supervisory Authority.

[23] Council Regulation (EC) No 1942/2006 of 12 December 2006 amending Regulation (EC) No 1321/2004 on the establishment of structures for the management of the European satellite radio-navigation programmes (OJ L 367, 22.12.2006, p. 18); Council Regulation (EC) No 1943/2006 of 12 December 2006 amending Regulation (EC) No 876/2002 setting up the Galileo Joint Undertaking (OJ L 367, 22.12.2006, p. 21).

[24] Council Regulation (EC) No 1321/2004 of 12 July 2004 on the establishment of structures for the management of the European satellite radio-navigation programmes (OJ L 246, 20.7.2004, p. 1).

[25] 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, 16 May 2007.

[26] Council resolutions and conclusions of 6-8 June, 1-2 October and 29-30 November 2007.

[27] Regulation (EC) No 683/2008 of the European Parliament and of the Council of 9 July 2008 on the further implementation of the European satellite navigation programmes (EGNOS and Galileo) (OJ L 196, 24.7.2008, p. 1).

29. In its communication of May 2007 the Commission analysed the failure of the concession negotiations in considerable detail. This document aimed to clear the way for redirecting the programme. In that light, it provides a non-exhaustive view of some of the reasons for failure. It addresses the fact that the Commission's assumptions on timing, budget and transfer of market risk and design risk "may have been optimistic". The communication also addresses issues such as public governance, private sector governance and the fact that Member States' national interests had prevailed over the programme's long-term strategic aims. However, it does not address issues such as the preparation of the PPP (including time and expertise) and reporting, factors that are elaborated futher in this report.

TABLE 2

GALILEO COST ESTIMATES

	Original cost estimate in million euro (COM(2000)750)	Updated cost estimate in million euro (COM(2007)261 and ESA documents)
Definition phase	80	80
Development and validation phase	1 100	2 100
Deployment	2 150	3 400
Total	3 330 (of which 1 800 million to be borne by the public)*	5 580 (all to be borne by the public sector)**

* Annual operating costs, including constellation replacement, were estimated at 220 million euro..

** Availability payments (fixed part) for operating cost, maintenance and replenishment debt interest until 2030 are estimated at 5 300 million euro..

AUDIT SCOPE AND APPROACH

30. The Court carried out an audit of the management of the Galileo development and validation phase by examining:

(a) which factors accounted for the failure of the concession process;

(b) which factors accounted for the reported delays and cost overruns of technological development;

(c) to what extent spending on research and development activities has benefited the Galileo programme;

(d) how well the GJU had integrated EGNOS into Galileo;

(e) whether the Galileo programme was adequately governed.

31. The audit addressed the period during which the GJU managed the development and validation phase (September 2003 – December 2006), focusing in particular on its mandate, the process of setting it up and the management of its tasks. Audit work was performed during 2007 and 2008. The Court followed the programme's development, including its redirection, up to the end of 2008.

32. The Court gathered audit evidence through file reviews and interviews at the GJU, the Commission and the ESA, and through interviews with other Galileo stakeholders such as representatives of Member States, the GSA (GNSS Supervisory Authority), beneficiaries of research projects, European space industry representatives, companies bidding for the concession, and consultants contracted by the GJU.

33. In order to assess the quality of the GJU's management of research and development activities, the Court conducted a survey of 482 beneficiaries of one or more research projects funded under the "Aeronautics and space" thematic priority of FP6.

OBSERVATIONS

34. The following audit findings cover the different tasks of the GJU during the development and validation phase (paragraphs 35 to 65) as well as issues related to public-sector governance (paragraphs 66 to 74). Each section describes in detail the GJU's objectives and uses them as a benchmark for its results. Next, the Court assesses the reasons why the GJU did not achieve most of its objectives. Where relevant, experience of existing programmes, projects or organisations has been used as a benchmark. In other cases generally accepted project management principles were used. In particular for paragraphs 35 to 42, the Court has also used a set of audit criteria derived from best practice in establishing PPPs[28] (see ***Annex IV*** for a detailed overview of this analysis).

[28] INTOSAI Guidelines on Best Practice for the Audit of Public/ Private Finance and Concessions (revised) – November 2007..

CONCESSION NEGOTIATIONS FAILED

OBJECTIVE

35. The GJU's most important task was to negotiate a PPP under which the private sector would invest, in partnership with the European Commission, in the creation and use of the Galileo infrastructure. It was initially foreseen that a concession holder (the private companies concerned) would be designated before the end of 2004, that the GJU would conclude the negotiations in 2005 and that the GSA would award a concession contract by the end of 2005.

RESULTS

36. As planned, the GJU launched the concession process in steps (pre-selection, selection, negotiation). It issued an initial set of tender documents in April 2004, after which it organised a competitive dialogue procedure and provided bidders with a draft concession contract and evaluation criteria.

37. The GJU was unable to select a preferred bidder, either in October 2004, or after the selection phase was extended, in February 2005. Negotiations did not start until January 2006, after the bidders had merged into one consortium.

38. The deadline for awarding the concession contract was postponed twice, from December 2005 to December 2006, and then to December 2007. Early in 2007, the Commission and the GSA decided to cancel the negotiations.

[29] PPP/PFI practices in the UK.

REASONS FOR FAILURE

39. The PPP was inadequately prepared and conceived. As a result, the GJU was required to negotiate a PPP which was unrealistic.

Preparation

40. There is considerable experience of PPP projects in Member States and third countries. Experience indicates that best practice includes the following elements.

(a) Proper preparation: the public sector should clearly define project requirements, assess private-sector capabilities, evaluate potential benefits, examine alternative ways of meeting its needs, investigate the appropriate risk allocation, consider affordability and likely value for money, and outline a business case. The choice of a particular type of PPP should be preceded by an appropriate risk assessment.

(b) Sufficient time: the experience of other organisations[29] suggests that defining a robust PPP approach and public-sector positions takes more than a year, even with PPP projects that are less complex than Galileo.

(c) Appropriate management resources: managing a PPP project requires a dedicated team with appropriate skills, assembled in good time.

(d) Maintaining effective competition.

(e) Regular review of an ongoing PPP project to ensure that it continues to offer value for money.

41. A number of these best practices were not observed by the Commission during the preparatory phase of the Galileo PPP[30]:

(a) Proper preparation: Despite the fact that it had several studies carried out, the Commission did not investigate traditional public procurement and a public sector comparator was never constructed[31]. In addition, the Commission did not investigate in advance how risk might realistically be allocated between the public and private sectors; at what stage in the project or in respect of which part of Galileo's activities a PPP might be most likely to succeed; or the relative benefits of different PPP models[32]. The Commission proposed, and the Council adopted, a PPP for the deployment and operational phases of Galileo in order to obtain a political consensus. Having examined the case for public and private sector investment through several studies, the Commission chose a 'concession' for the PPP (see paragraph 12). The Commission's documentation defined the characteristics of a concession, but with arguments based on general statements rather than on reasoning specific to Galileo, and an ambitious timetable was proposed for procurement. Although several of the risks and difficulties that would have to be overcome were identified at the preparatory stage[33], the Commission did not clearly assess how these might affect the feasibility of the deal or how the public sector might tackle them effectively.

(b) Sufficient time: Given the ambitious timetable, according to which it was to report to the Transport Council in December 2004, the Commission did not allow the GJU sufficient time[34] to define a concession approach. Several bidders also expressed concern that insufficient time was available to prepare a credible business plan during the competitive dialogue procedure. As a consequence, the GJU's initial tender documentation did not set specific objectives. In particular, it failed to address most difficulties inherent in the concession model. This resulted in industry bids containing no firm pricing or commitments, and which were qualified with conditions and caveats to such an extent that they were an insufficient basis for comparison and evaluation. For the same reason, the GJU had no robust evaluation criteria for a comparative evaluation of incoming bids. The first clear statement of the public-sector position on a number of issues important to Galileo was the "Heads of Terms" agreed with the bidders at the end of 2006.

[30] A detailed overview of the criteria used for auditing the public sector's management of the Galileo concession process, together with a summary of the assessment for each criterion is given in Annex IV.

[31] A public sector comparator is an estimate of what the project would cost if traditional procurement methods were used. This is used to help determine whether private finance offers better value for money than traditional procurement.

[32] Only the Joint Venture model and the concession model were investigated.

[33] Several constraints for a PPP were highlighted, such as revenue uncertainty (market risk), technological risks, interdependencies between development and deployment phases (design risk), and industrial concentration in the space manufacturing sector.

[34] The GJU issued a first set of tender documentation less than eight months after becoming operational.

(c) Appropriate management resources: the GJU was a new organisation, with a novel legal set-up, a newly-assembled team, a new chief and no past experience in concession negotiations. External advisors were not called upon until September 2004 (i.e. after the issue of tender documentation and the initial stage of competitive dialogue).

(d) Maintaining competition: from autumn 2004 onwards, there were two competing industrial consortia. They proposed in May 2005 to join forces to present a single bid. The GJU agreed to the merger on certain conditions[35] and in the hope of achieving greater value for money. In the absence of a public sector comparator, any competitive element in the procedure was lost.

(e) Regular review: the public sector should regularly review an ongoing PPP project to ensure that it continues to offer value for money. Although the GJU's reports evaluating the concession identified several risks and problems[36] , its reporting on the programme's progress was unduly positive. In its regular official statements it never questioned the feasibility of the concession but merely postponed the deadline for awarding the contract each year for a further twelve months. As a consequence, those Member States, which relied on the GJU did not have sufficient information on which to request corrective action (see also paragraph 74(f)).

[35] Compliance with EU legislation on public markets and competition, a rigid time frame, substantial bid improvements with respect to the previous individual offers and a commitment by the merged consortium to a common and adequate legal structure..

[36] Evaluation reports of October 2004, February 2005 and June 2005.

[37] Traditional PPP infrastructure projects relate for instance to tunnels and roads. The most comparable PPP, Paradigm / Skynet (UK defence telecommunications system), is however different from Galileo in many ways: it has a lower technological risk, the UK Ministry of Defence represents a secure baseline revenue source, an existing track record of operations is available and the project is piloted by a single sponsor with PPP experience (UK Ministry of Defence).

The PPP model chosen

42. The choice of a PPP in the form of a concession was proposed by the Commission and decided upon by the Council as a political consensus between Member States. This PPP concession, based on a cost share of at most 1/3 public and at least 2/3 private contributions which the GJU was required to negotiate, differed substantially, in several respects, from any other PPP then in existence[37].

(a) Galileo has a high level of technological risk. It comprises a constellation of 30 medium earth orbit satellites with new components (such as a new type of atomic clocks) so far untested in space.

(b) Revenue generation is difficult to predict as GPS open signals are freely available. An exploitation model still has to be defined.

(c) The Galileo concession was to start after rather than before system design and partial infrastructure development by the public sector. While close to the DBFO (design – build – finance – operate) concession type, the Galileo PPP differed significantly in that a private concession holder was expected to commit itself to building, financing and operating a new system that had been conceived and handed over by the public sector (***Box 2***). .

BOX **2**

THE MAJOR RISKS OF THE CONCESSION

The three main factors impeding the concession negotiations were the transfer from the public to the private sector of market risk, design risk and the third-party liability regime..

To transfer market risk, there was a need for confidence that market revenue could be obtained in accordance with an agreed baseline market development scenario. However, market uncertainty, the prospect of revenue being far in the future and the anticipated major role of the public sector in market development made it difficult to transfer this risk to the private sector.

To transfer design risk, there was a need for assurance that the design (prepared by the ESA during the development and validation phase) had no inherent problems that might result in a faulty or underperforming system (for which the concession holder would be responsible during operation). It was difficult to transfer this risk, not only because of the technical complexity of the Galileo design and the outputs expected of the concession holder during the operational phase, but also because of the division of duties between, on the one hand, design and development (the ESA) and, on the other hand, deployment, operation and maintenance (concession holder).

The third-party liability regime concerns extra-contractual liabilities towards potential victims of Galileo failures, for which no specific legal or insurance model is available.

TECHNOLOGICAL DEVELOPMENT ACTIVITIES DELAYED AND OVER BUDGET

OBJECTIVE

43. 43.The second of the GJU's four main tasks was to supervise the ESA's technological development activities so as to ensure that sufficient satellites and ground segment installations were constructed and made operational to demonstrate the capability and reliability of the system, all within the planned time and budget (see paragraph 13).

[38] Regulation (EC) No 683/2008.

[39] The estimates were earlier updated in February 2005 and May 2007.

RESULTS

44. 44.By December 2006, only one experimental satellite (GIOVE-A) was operational and had successfully secured frequency filings for Galileo with the International Telecommunications Union. The second experimental satellite (GIOVE-B) was launched in April 2008, 30 months later than originally planned. The current schedule[38] has the development and validation phase terminating in 2010 – five years late. According to the cost estimates produced by the ESA in July 2008[39], development and validation will cost 1 billion euro more than the initial budget of 1,1 billion euro (***see Table 3***).

TABLE 3

COMPARISON OF THE 2001 AND 2008 BUDGET ESTIMATES FOR THE DEVELOPMENT AND VALIDATION PHASE (IN MILLION EURO - 2001 PRICES)

Activity	Initial budget estimate	July 2008 budget estimate
Galileo System Test Bed (GSTB-V2)	85	173
Launchers	90	224
In-Orbit-Validation (IOV)	747	1 253
ESA cost	110	303
Other	68	151
Total	**1 100**	**2 104**

Source: ESA.

REASONS FOR DELAYS AND COST OVERRUNS

45. The GJU's task of supervising technological development activities was seriously constrained by governance issues, an incomplete budget, delays and the industrial organisation of the development and validation phase.

46. The GJU was given the task of supervising technological development, but this task was not further defined. In practice, ESA worked without supervision from the GJU but in accordance with its own rules and procedures. The GJU's supervisory role vis-à-vis the ESA was at odds with its governance structure. It is further treated as a governance issue in paragraphs 66 to 74.

47. The Galileo budget for development and validation, as presented to the Council[40], was incomplete. It did not contain any explicit contingency budget or reserve[41]. It was lower, at 1,1 billion euro, than the cost estimates resulting from the definition phase. Moreover, no allowance was made for the Commission's 50 million euro financial contribution to the GJU, and security requirements (120 million euro) were not factored in[42]. The overall resource requirements and costs of a project should be established at the planning stage, including, where needed, change and contingency budgets. The experience of other organisations suggests that space programmes typically need a contingency budget of between 10 % and 40 %, depending on programme complexity, the degree of innovation and the number of unknowns.

48. The development and validation phase did not start until May 2003, 29 months later than planned (see paragraph 15). According to ESA calculations, confirmed by the GJU, some 142 million euro in extra costs can be attributed to this delay[43].

[40] COM(2000) 750 of 22 November 2000.

[41] On ESA's participation in the development and validation phase (which is half of the total budget) a de facto contingency allowance of 20 % applies: if the cumulative cost overrun is lower than 20 % of the programme's financial envelope, no participating Member State is allowed to withdraw from the programme.

[42] Security requirements were considered too late in the programme: in 2004 the Galileo Security Board announced additional requirements worth an estimated 120 million euro in extra costs. The resulting 1 000 change requests had far-reaching consequences on the technical baseline and thus on ongoing development activities.

[43] This sum comprises: (a) 41 million euro to develop a second test satellite in order to mitigate the risk entailed in securing frequency filings before June 2006, there being too great a risk with only one satellite; (b) 15 million euro for additional payload developments; (c) 40 million euro in extra costs incurred by ESA for the major change in schedule; (d) 46 million euro in extra labour costs for industry due to changing economic conditions

49. The industrial organisation of the development and validation phase, characterised by a specific set up based on an ad hoc prime contractor, led to delays and cost overruns. A competitive environment is expected to be beneficial for achieving results on time and within budget. In 2000, a joint venture of leading European space companies was created[44] to act as industrial prime to develop and deliver the Galileo infrastructure. In an oligopolistic environment such as the European space industry, the creation of the joint venture further reduced competition. The ESA had no choice but to place several contracts with this joint venture between July 2001 and December 2004. Several of the contracts suffered from significant delays and cost overruns. According to ESA reports, these problems were to be attributed to problematic management, non-clarity of reporting and decision lines and the fact that the selection of subcontractors was driven by "self-imposed industrial distribution constraints rather than cost and schedule efficiency". As a consequence of serious problems in the implementation of the main contract of the development and validation phase, the ESA decided in December 2007 to modify substantially the IOV industrial organisation and contractual framework. The ESA took over the tasks and responsibilities of the overall prime contractor. This reorganisation will mean that additional costs[45] are incurred during the development and validation phase. According to ESA estimates, this will include 350 million euro for the revised industrial framework and 194 million euro for ESA costs[46].

50. The stalling of the concession negotiations in the second half of 2005 (see paragraph 23) also affected technological development: the programme was delayed by four and a half months, and extra costs of 103 million euro can be attributed to this delay and to the implementation of the 5 December 2005 agreement[47].

LIMITED USEFULNESS OF RTD ACTIVITIES

OBJECTIVE

51. The GJU's third task was[48] to initiate and manage the necessary research activities to support achievement of the key tasks and objectives of the Galileo development and validation phase (i.e. technological development and early development of user segments – see also paragraphs 13 and 14).

[44] The location and functions of the headquarters, the company's management structure and the allocation of work packages to the various subcontractors were the subject of an agreement between different governmentss.

[45] Including termination of the IOV contract.

[46] Extension of IOV coverage until 2010 and preparation of procurement responsibilities for full operational capability (FOC).

[47] The partners in the merged consortium agreed to establish two identical Galileo Control Centres (GCC) composed of a GMS (Ground Mission Segment) and a GCS (Ground Control Segment), but to cross-implement the GCC through the Germany-based GMS and the Italy-based GCS, rather than having one operational and one back-up GCC. It was also agreed to set up a third GMS in cold back-up mode and a third GCS.

[48] The Commission gave this mandate to the GJU in its FP6 work programme of 9 December 2002 (thematic priority 1.4: "Aeronautics and space"). It was translated into three annual Specific Support Action (FP6) contracts with the GJU.

RESULTS

52. Between September 2003 and December 2006 the GJU selected, negotiated and monitored a total of 70 research projects worth 110 million euro and financed from FP6 through several calls for proposals. Activities focused on user segment development, which consisted in fostering innovative services and applications of appropriate technology (receivers, local components), and on market development in different user communities. RTD activities also included some technological development of the Galileo system and EGNOS demonstration activities.

53. The audit showed[49] that the GJU was generally perceived as an efficient structure for implementing the Galileo area of the FP6 work programme[50]. The research projects raised interest and awareness in the user communities and have succeeded in bringing different organisations and stakeholders together. However, the ultimate use of the RTD activities for the Galileo programme is limited. The GJU did not sufficiently exploit the project results to formulate a coherent set of user-validated requirements that could serve the ESA as the basis for the Galileo system specification. A high number of projects consisted in a detailed analysis of the regulatory efforts required both at EU and Member State level to foster GNSS applications in a large number of economic and social sectors. No follow-up was given to the results of these projects.

REASONS FOR LIMITED USEFULNESS

54. Discontinuities, the inappropriateness of FP6 for funding market development activities, the absence of a comprehensive market-development approach and delays account for the limited usefulness of Galileo RTD results.

55. When the Commission proposed winding up the GJU, it intended to ensure programme continuity by making a smooth transfer of activities to the GSA[51]. However, transferring the task of monitoring more than 50 projects from the GJU to the GSA led to delays and caused problems in terms of project support, project follow-up, and the dissemination of project results, [52].

[49] Especially through the survey and interviews of FP6 participants.

[50] The survey results reveal a positive overall view of the GJU management, especially in the following areas: tender documentation (statements of work), contract management, monitoring and reviews. The areas considered to need improvement included: the policy of intellectual property rights and the dissemination and use of results.

[51] COM(2006) 261 – Proposal for a Council Regulation amending Regulation (EC) No 1321/2004 on the establishment of structures for the management of the European satellite radio-navigation programmes, 2 June 2006.

[52] 75 % of the 482 survey participants reported a negative impact on their project(s). .

56. The instrument for granting FP subsidies is inappropriate for funding market development activities. FP6 grants (following a call for proposals) essentially follow a bottom-up approach with no centralised exploitation of results. Ideally, the FP6 activities should have been supported by consolidating their results in a comprehensive top-down market development approach at the level of the GJU/GSA (see also EGNOS – paragraph 65). Without such a pro-active approach, it is difficult to ensure projects' continued utility for the Galileo programme once they have been completed.

[53] Also called the EGNOS framework agreement.

[54] This objective arose because of the financing problems facing EGNOS in January 2006.

57. The survey results also confirmed that the cumulative programme delays (in technological development, EGNOS operations and the concession negotiations) adversely affected both the execution of FP6 projects (for instance through the unavailability of the EGNOS signal) and the future exploitation of project results (due to their impact on GNSS business and research development opportunities).

EGNOS INTEGRATION ONLY PARTIALLY SUCCESSFUL

OBJECTIVE

58. As Galileo's precursor, EGNOS has a crucial role in the early development of user segments (see also paragraph 14). The GJU's fourth task was to "oversee the optimal integration of EGNOS into Galileo" (see footnote12). EGNOS and Galileo being two fully independent systems (***see Annex II*** for a detailed comparison of EGNOS and Galileo), integration does not relate to the technical sharing of infrastructure but to the following:

(a) Integration into the Galileo governance and management structures was considered necessary in order to handle issues such as the conclusion of an agreement among the owners of EGNOS[53] , the integration of EGNOS and Galileo financing[54] and the timing for appointing an EGNOS economic operator.

(b) At market level, the purpose of integration was to prepare the way for the market introduction of Galileo, using EGNOS as a precursor system, since it will deliver regional services similar to three of the five future Galileo services.

RESULTS

59. On the political front, EGNOS and Galileo have been integrated into a single European GNSS policy. Similarly, from a financial point of view, Commission funding for EGNOS has been incorporated into Galileo funding.

60. However, EGNOS has suffered from delays, and the main challenges of the programme, such as market development, certification and the role of the different stakeholders, are still unresolved:

(a) Since October 2004 a framework agreement on the ownership and future exploitation of EGNOS has been under negotiation. As of September 2008, there was still no such agreement. The EGNOS OS signal has technically been available since July 2006, but without an economic operator it cannot be declared operational[55].

(b) The GJU's market penetration plan was never implemented and a certifiable version of EGNOS is not expected until March 2009, at least two years later than expected[56].

REASONS FOR LIMITED SUCCESS

61. The GJU's success in attaining its fourth objective was hampered by a number of factors:

(a) the GJU's role and mandate vis-à-vis EGNOS was not clear;

(b) the decision to integrate EGNOS into Galileo was detrimental for EGNOS;

(c) the EGNOS institutional framework is very complex;

(d) the GJU devoted too little effort to market development activities.

[55] Due to liability issues and uncertainty about the future of EGNOS financing and governance.

[56] In the absence of clear milestones and planning for EGNOS, this is only a conservative estimate.

62. The GJU's role and mandate vis-à-vis EGNOS was not clear. The GJU Statutes stated only that the GJU would "oversee the optimal integration of EGNOS in Galileo". According to the Tripartite Agreement[57], ESA was responsible, through its ARTES-9 programme, for the technical development and operation of EGNOS. But these legal texts do not make clear who was the overall EGNOS programme manager. In the absence of a programme manager, EGNOS clearly lacked a long-term strategic vision[58], which led to uncertainty, delays and cost overruns (***Annex II***).

63. Even though the decision to integrate EGNOS into the concession negotiations secured continued Community funding, it at the same time held up the achievement of the EGNOS programme because:

(a) delays in the concession negotiations put back the EGNOS technological development deadlines; and

(b) all activity in connection with the appointment of an economic operator for EGNOS was stopped because this was the responsibility of the Galileo concession holder.

In addition, the need to conclude a framework agreement for EGNOS made the concession negotiations more complex.

64. The EGNOS institutional framework is very complex. The various financial stakeholders in EGNOS all have different priorities. As the owner of EGNOS assets for the duration of the ARTES-9 programme, the ESA acts on behalf of the countries with a financial stake in that programme. Any transfer of ownership is conditional on their consent[59]. The Commission has no ownership rights to EGNOS, but through the GSA, according to Regulation (EC) No 1321/2004, it should become the owner of EGNOS assets. The absence of a clear mandate for the GJU as EGNOS programme manager resulted in doubts as to whether the GJU was empowered to negotiate a framework agreement for EGNOS.

[57] Agreement between the European Community, the European Space Agency and the European Organisation for the Safety of Air Navigation on a European contribution to the development of a global navigation satellite system (GNSS), signed in 1998 (OJ L 194, p. 16). .

[58] For instance: long-term financial commitment, stable technical baseline, clear path towards future governance, prioritisation of objectives w.r.t. EGNOS extension outside Europe, clear vision on complementarity of EGNOS and Galileo.

[59] According to the bilateral agreements between ESA and eight national air traffic (management) service providers and other agencies.

65. In addition, the GJU's attention was dominated by institutional, financial and international cooperation issues and limited time and resources were devoted to the early development of a set of service enablers for EGNOS: the GJU did not exploit FP6 market development results in a centralised way (paragraph 56) and did not implement the EGNOS market penetration plan.

[60] The Commission acknowledged in its communication of May 2007 that "the timing of the hand-over of activities from the GJU to the GSA on 1 January 2007 has proven to be suboptimal (...). The GSA was still in the process of being built up and its relationships with the Commission and ESA not settled"

INADEQUATE PUBLIC-SECTOR GOVERNANCE

66. The following sections focus on the division of roles and on how the Commission fulfilled its role as the key promoter of the Galileo programme.

UNCLEAR DIVISION OF ROLES

67. The division of roles between the entities involved in the development and validation phase of the programme (EU and ESA Member States, Commission, GJU and ESA) was not clearly defined.

68. The GJU's ability to manage the programme effectively was constrained by:

(a) Its governance structure (***Figure 2***).
The GJU Statutes gave it a supervisory role vis-à-vis the technological development work to be done by the ESA. However, the ESA was both a founding member of the GJU (and thus represented on the Executive Committee and the Administrative Board) and a 'contractor' (recipient of funding and responsible for implementation under the ESA/GJU agreement). Thus, in practice, the GJU was not in a position to supervise the ESA effectively due to this conflict of interest for the ESA within the GJU.

(b) Its temporary nature.
Closing down the GJU before the end of the development and validation phase undermined its authority[60].

69. The ESA/GJU agreement on implementing technological development activities in the development and validation phase (negotiated by the Commission before the GJU became operational[61]) was not specific enough (a better model would be the ESA-EUMETSAT agreements[62] [63]). This resulted in a lack of clarity regarding the rules governing the placing of contracts[64], transfer of ownership, reporting and implementation[65]. The agreement did not clarify the roles of the different actors. In the spirit of the framework agreement between the ESA and the European Community[66], these roles should have been complementary: the ESA as the competent technical body, the Commission addressing the political dimension and the GJU addressing user requirements and certification.

70. The ESA was both involved in programme management (through the GJU) and responsible for the day-to-day management of the technological development activities of both Galileo and EGNOS.

71. The unclear division of roles resulted in unclear lines of accountability. Many decisions relating to Galileo were affected by the fact that no one actor (Commission, GJU, ESA, Member States) assumed full responsibility: the decision in favour of separate development and deployment phases, the choice of a PPP, acceptance of the bidders' merger proposal, the ESA/GJU agreement, incomplete budgeting, delays to EGNOS technological development and the IOV industrial organisation.

72. Management of the programme was also made more difficult by interventions by Member States in the management of individual programme components (paragraphs 23 and 49).

[61] Later formally adopted by the GJU Administrative Board and signed by the Executive Director.

[62] EUMETSAT (the European Organisation for the Exploitation of Meteorological Satellites) is an intergovernmental organisation, formed to service a total of 21 Member and nine Cooperating States.

[63] The ESA is responsible for the development of the space segment of EUMETSAT programmes, and EUMETSAT is responsible for the overall system. The ESA-EUMETSAT agreements are more elaborate on aspects such as:

- financial liability, its breakdown into industrial price and ESA costs, and procedures to ensure that limits of financial liability are respected;
- the use of a management margin and approval procedures;
- the establishment of clear communication lines;
- clear procedures for dealing with change notices that are not covered by the work initially envisaged;
- ownership of physical and intellectual property.

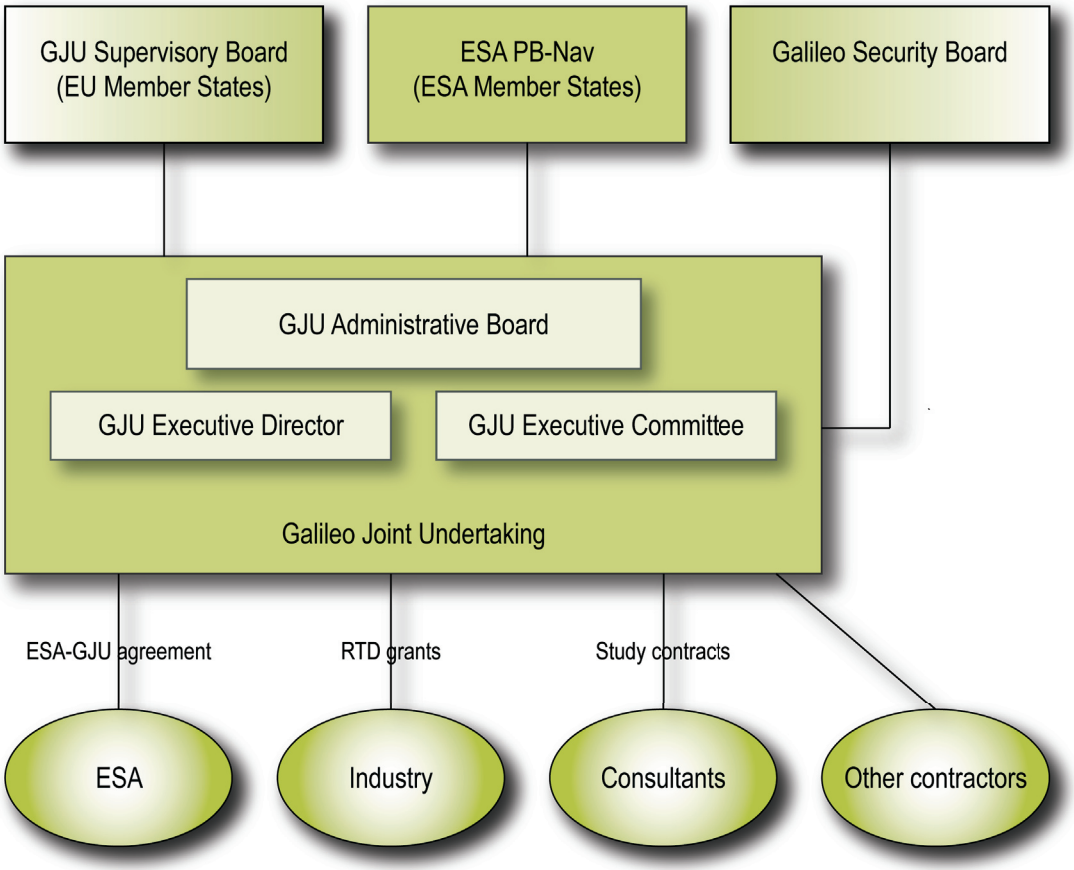
[64] ESA applies the "fair-returns" principle as part of its industrial policy. In other words, a country paying a contribution to ESA will receive, within a certain margin, industry contracts of a value equivalent to that contribution. In theory, this principle applies to only 50 % of the budget for development and validation. In practice, it is not possible to apply such rules to 50 % of an activity that is managed as being one and indivisible.

[65] For example, on the implementation and financing of certain change notices, such as authentication, data exchange, high precision positioning service and the 5 December agreement.

[66] Framework Agreement between the European Community and the European Space Agency (OJ L 261, 6.8.2004, p. 64).

FIGURE 2

GOVERNANCE STRUCTURE OF THE GJU



The GJU was governed by an Executive Director, four Boards and an Executive Committee. All issues on the agenda of the Administrative Board were prepared at Executive Committee meetings and were first discussed at the level of the EU Member States by the Supervisory board and at the level of the ESA Member States at the PB-Nav (Programme Board on Satellite Navigation). The ESA and the Commission had an equal number of votes on the Administrative Board, which required a consensus for all decisions.

THE PROGRAMME LACKED A STRONG STRATEGIC SPONSOR AND SUPERVISOR

73. Between 1999 and 2004, the Commission actively played its role of initiating the programme and getting it started. Delays and cost overruns became apparent in the course of 2005, but no significant corrective action was taken until March 2007.

74. Throughout the programme, the Commission, as the programme's key promoter, did not observe a number of management principles, such as:

(a) Setting clear, realistic and acceptable objectives: the programme has multiple objectives, which resulted in a diverse range of stakeholder expectations. In addition to its political, economic and technological motives (paragraph 7), Member States have seen Galileo as a means of consolidating the European space industry. For some Member States, the possible military or defence use of the system has been an equally important objective. The Commission did not prioritise the programme's objectives.

(b) Defining appropriate strategies and instruments to pursue them: the Commission has not pursued a long-term strategic vision for the EGNOS and Galileo programmes[67] but has focused on short-term goals and decisions. This is illustrated by:

(i) the absence of a roadmap for EGNOS and Galileo. Issues relating to, for instance, the future exploitation model for Galileo and EGNOS, the implementation of system priorities (e.g. which service to implement first) or the development of non-civil aviation markets for EGNOS still had to be resolved at the end of 2008;

(ii) the problems encountered in negotiating a framework agreement for EGNOS. As part of European satellite navigation policy, the Commission proposed uniting the EGNOS and Galileo programmes under a single umbrella: the European satellite navigation programmes. However, this was done without the prior agreement of the other EGNOS stakeholders (paragraphs 5 and 64) and with little thought for the complexity of the institutional framework. The GJU (and later the GSA) was charged with negotiating such an agreement, but at the end of 2008 no progress had been made. As a result, technical issues (managed by the ESA) apart, no entity was empowered to take key decisions concerning EGNOS and to direct the programme;

[67] Such as the complementarity of the two programmes, models for the future exploitation of EGNOS and Galileo or the implementation of system priorities.

(iii) the Commission's preoccupation with navigating the programme from one Council meeting to the next (see for example paragraphs 21 and 22 on the Commission's communication of 6 October 2004).

(c) Setting up a future (permanent) organisation: between July 1999 and December 2006 the Commission charged six different temporary structures with providing technical support for Galileo programme management or with the actual management task. The GJU was the fifth such initiative. As a flexible and dedicated organisation with an entrepreneurial mindset, it could have been an effective programme manager. However, its position was undermined by its temporary nature[68], its governance structure (***Figure 2***) and its lack of expertise.

(d) Securing the appropriate skills to perform all programme components managed and supervised by the public sector: when setting up the GJU, the Commission did not pay sufficient attention to the fact that it was a new organisation and that it had insufficient experience and expertise to perform its tasks (see also paragraph 41(c)).

(e) Providing for risk management: at the programme's outset, the Commission did not adequately address the risks related to the Galileo concession (e.g. market risk, design risk and technological risk) (see also paragraph 41(a) and ***Box 2***) and thus launched the concession process without the necessary preparation.

(f) Taking timely decisions on all programme features: the Commission did not sufficiently critically review or monitor the GJU's progress reports. Commission communications consistently echoed the positive tone of official GJU statements. As a consequence, the Commission did not request or take significant corrective action until March 2007, even though the concession deadline was postponed annually for a further twelve months.

[68] Even before the GJU became operational, the Commission published a proposal for a Council Regulation setting up the GSA as its successor (COM(2003) 471 final of 31 July 2003).

CONCLUSIONS AND RECOMMENDATIONS

75. The management of the development and validation phase was inadequate. The Galileo programme experienced problems at different levels:

(a) The GJU was not a strong programme manager nor was any other body assigned this role. It did not meet most of its objectives – owing, however, to factors that were largely outside the GJU's control.

(b) The programme lacked a strong strategic sponsor and supervisor: the Commission did not proactively direct the programme, leaving it without a helmsman. The programme's management suffered a number of shortcomings: an absence of realistic objectives, an appropriate strategy and skills; insufficient preparatory work; and the long reaction time before the taking of corrective action.

(c) Owing to their different expectations for the programme, Member States intervened in the interest of their national industries causing decisions to be held up. The resulting compromises led to implementation problems, delays and, in the end, to cost overruns.

76. ## WHICH FACTORS ACCOUNTED FOR THE FAILURE OF THE CONCESSION PROCESS?

The PPP was inadequatelyprepared and conceived. As a result, the GJU was required to negotiate a PPP which was unrealistic (paragraphs 35 to 42).

WHICH FACTORS ACCOUNTED FOR THE REPORTED DELAYS AND COST OVERRUNS OF TECHNOLOGICAL DEVELOPMENT?

77. The GJU's task of supervising technological development activities was seriously constrained by governance issues, an incomplete budget, delays and the industrial organisation of the development and validation phase (paragraphs 43 to 50).

TO WHAT EXTENT HAS SPENDING ON RESEARCH AND DEVELOPMENT ACTIVITIES BENEFITED THE GALILEO PROGRAMME?

78. The RTD results were of limited usefulness because of discontinuities, the inappropriateness of FP6 for funding market development activities, the absence of a comprehensive market development approach and delays (paragraphs 51 to 57).

HOW WELL HAS THE GJU INTEGRATED EGNOS INTO GALILEO?

79. The integration of EGNOS into Galileo was only partially successful because the GJU's mandate was not clear, the decision to include EGNOS in the concession negotiations held up the achievement of the EGNOS programme, the EGNOS institutional framework was not clear and the GJU devoted little effort to market development for EGNOS (paragraphs 58 to 65).

WAS THE GALILEO PROGRAMME ADEQUATELY GOVERNED?

80. The programme's governance was inadequate. The division of roles between the entities involved in the development and validation phase of the programme (EU and ESA Member States, Commission, GJU and ESA) was not clearly defined. The Commission did not provide adequate leadership in developing and managing Galileo (paragraphs 66 to 74).

LESSONS FOR THE FUTURE

81. The Galileo programme organisation has changed markedly since 2007. But many of the lessons learned from the GJU are of relevance both to the continuing Galileo programme and to further possible joint undertakings and industrial programmes.

82. The Commission has proposed itself as programme manager, a challenging role for which it has little experience. While this may be an expedient solution for the short term, the Commission should consider whether this would be the most appropriate long term arrangement. The Court has the following recommendations.

RECOMMENDATION 1

To gain authority as a programme manager, the Commission should adapt its resources and its legal and financial instruments to the specificities of the development and management of an industrial programme:

(a) the quantity and expertise of its human resources should be commensurate with its task as programme manager;

(b) an appropriate EU-ESA cooperation framework should be established;

(c) the Commission should ensure it has the financial instruments to fund infrastructure (other than via grants) and to commit itself to bearing the yearly operating and replenishment costs of this infrastructure over a long time horizon;

(d) programme governance should be such as to enable the programme manager to perform its tasks coherently (define expectations, grant powers and verify performance).

83. Galileo needs a clear direction to be successful. Decisions on its future cannot be taken by the Commission alone but clear leadership is paramount.

RECOMMENDATION 2

The Commission should urgently clarify the programme's political objectives and translate them into *strategic and operational objectives* that will provide Galileo with a solid roadmap from now until beyond full deployment. For example:

(a) How should Galileo be positioned as a commercial system? Is it required to break even financially or will it require continuing public-sector support? Is it about maximising revenue generation, or maximising macroeconomic benefits and serving the whole Galileo value chain through services and goods generated by its applications?

(b) How will EGNOS and Galileo relate to each other once Galileo is fully operational? Will they exist side by side thus ensuring useful redundancy in service provision, or will EGNOS be dismantled?

84. The failure of the concession negotiations does not imply that there is no basis for a Galileo concession in the future. But any future attempts to involve private finance need to be based on a more realistic assessment of what is marketable and if the case for a PPP really exists. It should be noted that successful exploitation models exist for other international satellite projects, such as Inmarsat, Intelsat, Eutelsat or Eumetsat.

RECOMMENDATION 3

The Commission should take sufficient time to prepare the commercial operation phase, drawing on best practice in the Member States, considering various models for private-sector initiative and taking account of experience in comparable sectors.

85. Depending on the decision of how Galileo should be positioned as a commercial system (see recommendation 2), the European Union will either have to engage in fostering early market development of Galileo/EGNOS revenues (for generating direct revenues to offset against costs) or accept to fund Galileo's total potential costs (potentially 10 billion euro over the coming 20 years). In the former case, an appropriate framework for users should be created.

RECOMMENDATION 4

The Commission should ensure that the following issues are addressed:

(a) analysis, consolidation and validation of relevant and stable user requirements;

(b) development of enabling actions (such as the necessary legal and regulatory framework);

(c) promotion of EGNOS as a showcase for Galileo, by certifying EGNOS' SoL service and making the EGNOS and Galileo exploitation models compatible;

(d) development of a clear and compatible pricing policy or revenue model for Galileo and EGNOS services, and a third-party liability policy.

86. The Commission has since created other joint undertakings (SESAR, ITER and several Joint Technology Initiatives (JTIs)). Experience of Galileo suggests that the approach to these new ventures should be well planned and realistic.

RECOMMENDATION 5

For any *future joint undertakings and industrial programmes* in which the EU resolves to engage, the Commission should:

(a) ensure that there are clear and compelling reasons for creating a joint undertaking;

(b) ensure that all realistic options on private-sector cooperation have been properly considered;

(c) endeavour to establish a governance structure that does not impede proper programme management by the joint undertaking.

This Report was adopted by the Court of Auditors in Luxembourg at its meeting of 14 May 2009.

For the Court of Auditors

Vítor Manuel da Silva Caldeira
President

ANNEX I

THE EUROPEAN SPACE AGENCY

The ESA is an intergovernmental organisation, created in its current form in 1975 from the merger of two existing agencies, ELDO (European Launcher Development Organisation) and ESRO (European Space Research Organisation). The ESA has 18 Member States: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. The national bodies responsible for space in these countries sit on the ESA's ruling Council.

The ESA's purpose is to provide for and to promote, for exclusively peaceful purposes, cooperation among European States in space research and technology and their space applications, with a view to their being used for scientific purposes and for operational space applications systems.

The ESA's activities fall into two categories – 'mandatory' and 'optional'. Programmes carried out under the General Budget and the Science Programme budget are 'mandatory'; they include the Agency's basic activities (studies on future projects, technology research, shared technical investments, information systems and training programmes). All Member States contribute to these programmes on a scale based on their GDP. The other programmes, known as 'optional', involve a reduced number of Member States which are free to decide on their level of participation. Both ARTES-9 and GalileoSat are optional programmes. The ESA's budget spending for 2006 amounted to almost 3 billion euro.

The ESA and the European Community are mutually independent organisations. They have different Member States and are governed by different rules and procedures. The ESA is not bound by EU regulations.

A Framework Agreement between the ESA and the European Community (in force since May 2004) formalises cooperation between the two institutions. The European Space Policy, signed in May 2007, unifies the ESA's approach with those of the individual EU Member States and creates, for the first time, a common political framework for space activities in Europe.

ANNEX II

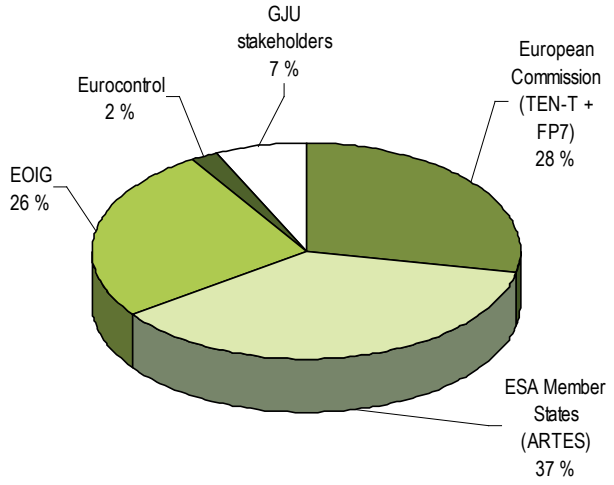
EGNOS FACTS, FIGURES AND ILLUSTRATIVE EXAMPLES

COMPARISON BETWEEN EGNOS AND GALILEO

	EGNOS	Galileo
Link with other GNSSs	Augments the GPS and GLONASS signals	Fully independent from other GNSSs
Services	3: OS, SoL, SAR	5: OS, CS, PRS, SoL, SAR
Coverage	Regional (Europe)	Global
Space segment	3 transponders on geostationary (GEO) satellites orbiting at 36 000 km	30 medium earth orbit (MEO) satellites orbiting at 23 000 km
Ground segment	4 MCCs (Mission Control Centres) 34 RIMS (Ranging and Integrity Monitoring Stations) 6 NLES (Navigation Land Earth Stations)	3 GCCs (Galileo Control Centres) 20 GSSs (Galileo Sensor Stations) 5 S-band up-link stations 10 C-band up-link stations
Financed by	ESA, European Commission, Eurocontrol, EOIG, GJU stakeholders	ESA, European Commission, China, Israel

EGNOS FUNDING SOURCES

EGNOS funding sources (Total 630 million euro, 2001 prices)
Funds allocated between 1995 and 2007



Source: ECA estimate.

EGNOS LACKED A LONG-TERM VISION

The EGNOS objectives were gradually adapted during the programme's transformation from a demonstrator to a fully fledged operational programme. It suffered from the absence of a long-term strategy and political commitment. Some examples:

(a) EGNOS grants from the European Commission were paid in annual tranches and systematically arrived late. Contributions from ESA Member States were also late. Some programme activities were therefore delayed, giving rise to uncertainty about the programme's deployment planning.

(b) Mid-term, changing requirements, evolving standards and new ideas on the certification of the system caused delays and extra costs.

(c) As of September 2008, there was still no roadmap for EGNOS.

(d) Although the EGNOS OS signal became available in July 2006, as of September 2008 the system had still not been declared operational due to issues of third party liability, uncertainty about the programme's future in terms of financing and governance and the Commission's reluctance to accept the system technically.

(e) Despite the ESA's and the GJU's efforts to demonstrate the capabilities of EGNOS overseas (e.g. in Africa, China and South America), there is no real strategy to support EGNOS outside Europe.

(f) In the GJU's organisational structure EGNOS was assigned to the technical division rather than treated as a fully-fledged, cross-sectoral programme. Until 2006 the GJU did not receive the financial means from the Commission to devote to specific EGNOS-related studies.

ANNEX III

INTERNATIONAL COOPERATION ON GALILEO

The EU has entered into several international agreements related to Galileo.

Cooperation agreements have been signed with the United States (2004) and with Russia (2006) in order to ensure interoperability and compatibility between Galileo and existing GNSSs such as GPS and GLONASS.

Cooperation agreements with China (2003) and Israel (2004), respectively, brought GJU membership of the NRSCC and MATIMOP.

General cooperation agreements have been signed with Ukraine (2005), India (2005), Morocco (2005), and South Korea (2006) but have never led to a concrete participation or GJU membership.

The purpose of all these agreements was to minimise the technological and political risks, promote and reinforce industrial and political know-how, stimulate the provision of system applications, offer third-country market penetration, promote Galileo as international standard and prepare the ground for the installation of terrestrial-segment components in different regions of the world.

Relations with the Chinese and Israeli undertakings were damaged when the GJU was wound up and problems arose with transferring the relevant agreements to the GSA. Discussions on cooperation with further other countries such as Brazil, Mexico, Chile, Canada, Argentina and Australia were also discontinued after the GJU was closed down.

CRITERIA USED BY THE ECA TO ASSESS THE PUBLIC SECTOR'S MANAGEMENT OF THE GALILEO CONCESSION PROCESS, TOGETHER WITH A SUMMARY OF THE ASSESSMENT

Criteria (based on INTOSAI Guidelines on Best Practice for the Audit of Public/Private Finance and Concessions)	Body responsible	Have criteria been met?	Summary of assessment
A. Scoping the project			
A.1 Selection of the project			
How did the audited body prioritise potential projects? Did it implement them in that priority order?	Commission (Council)	Not assessed (political choice)	Galileo was a unique project and the decision to implement it was of a political nature. Following a Commission initiative launched in the early 1990s, the Council approved the Galileo programme and entrusted the European Commission with its management. Subsequently, at the Commission's proposal, and in order to launch the development phase, the public-private partnership / concession was decided upon as a political consensus between Member States. It was envisaged that the management and financing of the subsequent phases would use this scenario. See successive Commission communications, Commission studies and Council conclusions from 1994 to 2003.
A.2 Definition of project requirements			
Did the audited body state its requirements clearly from the start and express them in output terms making clear any particular constraints to which the private sector will be subject?	Commission (Council)	Partly	As can be derived from the Commission's preparatory work and decisions taken by the Council, the European public sector stated its requirements in very broad terms. The proposed concession was supposed to cover the financing and management of deployment and operation - including replenishment - of the Galileo system. To that end, the concession holder would procure, launch, operate, exploit and maintain the system and its components during the concession period so as to deliver the five Galileo satellite services and to serve the subsequent development of downstream applications. Consideration was also given to including the management of EGNOS and the provision of EGNOS services in the contractual arrangements for the Galileo concession. The Commission's preparatory work for the concession left a good deal of uncertainty on crucial issues, such as the underlying revenue model and the transition path between the development and deployment phases. While it identified briefly some of the constraints facing the private sector's participation in the project, it did not outline a public-sector strategy that could be proposed to the private sector. The Commission's preparatory work thus failed to provide the private sector with clear requirements and constraints for the proposed Galileo concession.

A.3 Private-sector capabilities			
			The Commission's preparatory work concluded positively, if in broad terms, on the feasibility of a concession as opposed to the alternative joint venture model (which took the form of capital shares in the GJU). The private sector was judged reluctant to participate and invest in the latter owing to uncertainty about the expected financial returns and the potential for conflicts of interest in the development and validation phase. It also concluded positively that the European private sector had the necessary capabilities to deliver the Galileo system and services through its established technical know-how and its proven experience in financing and managing large projects. However, as stated in A.2, the project requirements were not sufficiently clear. Consequently, the assessment of the private sector's capabilities for delivering these requirements remained overly general. The Commission was therefore not in a position to make a preliminary assessment of the private sector's capabilities.
A.4 Evaluation of potential benefits			
Did the audited body make a preliminary evaluation of the benefits it sought?	Commission (Council)	Partly	The rationale for implementing Galileo through a PPP included the following arguments (cf. Commission Communication of 10 February 1999): complementary finance, improved project design, overall value for money, better take-up of the service, central importance given to users' needs and better management of costs. One study carried out at the Commission's behest produced a list of objectives: to achieve full operational capability as soon as possible, ideally by early 2008 in order to meet windows of opportunity in the GNSS market, to obtain a significant proportion of the deployment cost through private funding (with an indicative 2/3 share), to obtain value for money (by optimising the technical solution and system, optimising procurement competition and efficiency, achieving an appropriate degree of risk transfer and creating financial incentives for performance), to involve European industry so that it could benefit from the contracts to build the system and manufacture user equipment, to give the private sector responsibility for ensuring that system performance and specifications met the performance requirements of the market as well as the public sector, to optimise revenue generation from the market, to reduce the need for public expenditure and spread the public contribution over a longer period, and to optimise whole life costs by introducing private-sector efficiencies. The study recognised that a project with such a multitude of objectives would require trade-offs. However, the Commission's preparatory work presented no trade-offs. What is more, these general objectives were not specific enough for the proposed Galileo concession. The Commission should have outlined a strategy stating, for instance: (i) the public sector's preferences for Galileo's commercial exploitation; (ii) the public sector's strategy for ensuring a practical transition path to resolve interdependencies between the development and deployment phases. Such elements could have subsequently served as meaningful evaluation and selection criteria against which to judge the bids submitted during the competitive tender process.
A.5 Wider policy objectives (incl. regulatory aspects)			
Did the audited body assess the impact any wider policy objectives might have on the project?	Commission (Council)	Partly	The Galileo project is hemmed in by strategic considerations (e.g. the potential for military use). The Member States disagree among themselves on such issues. Nevertheless, approximately one third of Galileo's potential revenue is expected to come from the use of the PRS (public regulated service) by e.g. emergency services, security forces, the millitary. The development of GNSS applications also depends heavily on regulatory measures to be introduced at both Member State and EU level. Again approximately one third of potential revenue was judged to depend on legislative support from the public sector, without which the private sector cannot anticipate revenue. However, the Commission did not present a plan to boost Galileo's chances of success by regulatory measures.

Criteria (based on INTOSAI Guidelines on Best Practice for the Audit of Public/Private Finance and Concessions)	Body responsible	Have criteria been met?	Summary of assessment
A.6 Selection of the most suitable form of partnership			
Did the audited body examine a range of alternative ways of meeting its needs, such as traditional public-sector procurement or privatisation, before choosing the public/private finance and concessions option?	Commission (Council)	No	A traditional public procurement was not investigated as part of the Commission's preparatory work. The Commission limited itself to examining (i) the development of a business plan for the Galileo programme and (ii) the appropriate structure for a PPP. The Commission's preparatory work proposed a PPP in the form of a concession model as opposed to a joint venture model. Contrary to one of the recommendations of two studies executed by PricewaterhouseCoopers (November 2001 and January 2003), no public-sector comparator was subsequently built to provide a benchmark against which the overall benefit of private-sector bids for the PPP could be measured, with a view to improving the public sector's negotiating position.
A.7 Innovation			
Did the audited body identify the scope for innovation in advance in areas such as design and construction, operation and project financing?	Commission	Partly	The Commission's preparatory work recognised the need for innovation in the proposed Galileo concession, but did not precisely identify where or how innovation was possible. The Commission did not conduct any further preparatory work. At the outset of the concession selection process, the tender documentation encouraged bidders to propose innovative solutions by authorising them to present variant bids. However, the lack of clear requirements for the Galileo concession (see A.2) made it impossible for innovation to be considered up front during the selection process.
A.8 Risk assessment			
Did the audited body investigate in advance the appropriate allocation of project risks between the public-sector and private-sector parties affected by the project?	Commission	No	No examination of the risk allocation at the preparatory stage took place. This would have been possible if clear requirements had been established for the private sector.
A.9 Affordability and likely value for money			
Before starting the procurement process, did the audited body consider the extent to which the project was likely to be affordable and offer value for money?	Commission	No	Although risks and difficulties that would need to be overcome before establishing a concession with private partners were identified at the preparatory stage, there was no assessment of the extent to which these uncertainties might affect project feasibility. The potential benefits of the Galileo project were examined, but the arguments for and against the concession approach were not fully developed. The affordability and likely value for money of the Galileo concession were not considered before starting the procurement process.

A.10 Outline business case			
Did the audited body prepare a proper business case to support the decision to begin the project's procurement?	Commission	Partly	At the Council's request (Council Resolution of 5 April 2001), the Commission undertook some preparatory work to support the development of a business plan for the Galileo programme and investigate an appropriate model (business case) for the PPP. Although this work made the case for public-sector support, citing the strong cost/benefit ratio, it did not clearly present the merits and drawbacks of using the concession model.
B. Project management			
B.1 Project team			
Did the audited body assess the skills it would need to deliver the project successfully? Where could the audited body obtain these, e.g. from in-house staff or external advisers? Did the audited body then assemble its project team in good time?	Shared Commission - GJU	Partly	The GJU became operational in September 2003 when it took over existing staff from GISS. There were additional recruitments, but the GJU failed to recruit staff with prior direct experience of managing the process of setting up PPPs and concessions. The GJU appointed external advisors only at a late point in time in the selection process (i.e. after the issue of tender documentation and the competitive dialogue).
B.2 Market investigation			
Did the audited body investigate the market prior to beginning the formal procurement in order to establish that there were suppliers who were willing to tender for the project?	Commission	Partly	On 22 February 2003, the Commission launched a call for expressions of interest (OJ C 43, 22.2.2003, p. 12) from undertakings for the "Galileo concession". This call aimed at constituting a database of interested companies and allowing them to prepare for the tender process. 85 companies expressed an interest and were registered in the database. Although an information day was organised for interested parties, no effort was made to assess their understanding and perception of the proposed concession requirements. In general,the interest of potential suppliers existed for a Galileo project, but they needed more precise requirements before entering into a concession.
B.3 Contractual matters			
Did the audited body identify the contractual issues that were likely to arise during the procurement and drew up a draft contract, setting out initial proposals on each issue?	GJU	Partly	A draft contract was prepared during the selection phase and the competitive dialogue. However, the draft contract was still very premature given the existence of numerous uncertainties, not the least of which was the lack of any preference for an applicable law.
B.4 Tender strategy			
Did the audited body prepare a tendering strategy covering the number of tender rounds to be held, the number of bids to be invited at each tender stage, the body's approach to communicating with bidders and a realistic timetable for the tender process?	Shared Commission - GJU	Partly	The Commission's preparatory work produced an indicative procurement plan for selection and negotiation by way of a call for expressions of interest, a call for concessions, a pre-selection phase and a selection phase. The contract award was envisaged within 14 months of the start of the process. Despite the delayed start of GJU operations, the Commission and the GJU initially kept to the plan of organising selection and negotiation over a short period in 2003 and 2004 (concession notice OJ 2003/S 200 - 179789). However, this timetable was very ambitious. PPP/PFI practice in the United Kingdom suggests that it takes considerably longer (a period of 18 months is not exceptional) to define specific and coherent objectives even for an average, not particularly complex PPP project. Well-established ESA procurement practices also suggest that defining a robust approach in the European space industry landscape requires much more than a year, even for an experienced organisation.

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B.5 Project timetable			
Did the audited body prepare a credible project timetable which identified milestones against which progress could be measured, and points within the process at which the body was to review the project's continued viability?	Shared Commission - GJU	Partly	The initial overall timetable for the Galileo programme was communicated on several occasions between 2000 and 2004 (see Table 1). The timetable was, however, very general and did not contain intermediate milestones to be used for reviewing the programme's viability. Updates to the timetable were officially notified in 2006 and 2007. Intermediate milestones relating to the concession process were postponed on several occasions, but with no comment on the project's continued feasibility.
B.6 Cost and benefit comparison			
Did the audited body assess costs and benefits of the public/private finance option against an alternative procurement option?	Shared Commission - GJU	No	The Commission's preparatory work included a cost/benefit analysis of the Galileo project, but there was no such analysis of its proposed concession approach against an alternative procurement option. As indicated under A.6, studies by PricewaterhouseCoopers recommended the preparation of a robust public sector comparator. However, this recommendation was never taken up.
B.7 Tender list			
Did the audited body succeed in creating a good tender list?	Shared Commission - GJU	Partly	Pre-selected consortia (see also B.2) included a good range of European industrial capabilities to deliver the Galileo system. However, operators and downstream industries were marginalised by space manufacturing companies. This situation was further exacerbated after one of the three pre-selected consortia decided to withdraw from the selection process during summer 2004.

B.8 Specification of requirements			
Did the audited body set out a clear specification of the requirements?	GJU	No	The GJU tender documentation served mainly to help bidders structure their proposals. However, while it gave general principles it did not reflect specific objectives, clear risk positions or preferred approaches endorsed by the GJU as public-sector representative. In particular, the tender documentation did not address design flaws and inherent difficulties of the proposed concession scheme. For instance, the GJU did not spell out its preferred option (or alternative options) for market development, but merely asked bidders to submit their proposed approaches. In addition, while the GJU asked bidders to describe their strategy on taking over the results from the IOV and with regard to the topic "third-party liability", it did not establish the applicable law of the concession contract, although this could have served bidders as a basis for their analysis. The only exception related to launch options, where the GJU clearly indicated its preference for Ariane 5 and Soyuz. As a consequence, bidders did not have sufficient details on the position and preferences of the public sector, and they were left to their own judgment when submitting bids, with no guidance for their proposals and no opportunity to respond precisely to clear requirements.
B.9 Maintaining competition			
Did the audited body succeed in maintaining competitive tension to contract award and manage the negotiations with the preferred bidder well?	GJU	No	Inasmuch as it was unable to select a preferred bidder on two occasions and approved the merger, the GJU failed to maintain competitive tension.
B.10 Regular reviews			
During procurement, did the audited body regularly assess whether the project continued to offer value for money?	Shared Commission - GJU	No	In its communications, the GJU regularly showed its firm commitment to reaching an agreement with the private sector, but it failed to assess feasibility and potential value for money (see also B.5).
B.11 Budgets for project costs			
Did the audited body set and control realistic budgets for all project costs, including internal and external resources?	Shared	Yes	The GJU relied on the approval of annual budgets for each of its tasks. However, the Commission and the GJU did not estimate the level of expenditure by both the public and the private sectors for the entire selection and negotiation process. The private sector presented an estimate of 24,5 million euros in October 2005.
B.12 Appointment of advisers			
Did the audited body appoint good quality external advisers after competition?	Shared	Partly	The GJU selected experienced external advisors by competitive tender, but it appointed them at a late point in time in the selection process (i.e. after the issue of tender documentation and the competitive dialogue).

Criteria (based on INTOSAI Guidelines on Best Practice for the Audit of Public/Private Finance and Concessions)	Body responsible	Have criteria been met?	Summary of assessment
B.13 Cost management			
How did the audited body monitor and manage its project costs, including internal and external resources?	Shared	Partly	The GJU employed external advisors and consultants through framework contracts concluded following calls for tender. Costs were kept under control through the placement of individual work orders. However, the GJU had no long-term policy regarding the costs of external advisors.
C. Bids and contract			
C.1 Bidders' proposals			
Was a good range of solutions proposed by bidders??		*Partly*	The bids received by the GJU reflected the bidders' expertise and experience as the European leaders in the industry. However, as the public sector gave no precise specifications (see B.8), the bidders lacked guidance for their proposals and had no opportunity to respond precisely to clear requirements. This problem was identified by one pre-selected bidder which accurately predicted the outcome of the concession process in spring 2004 (minute of a Competitive Dialogue meeting): "The GJU's tender documentation contains many good instructions, and the decision to hold bilateral fortnightly meetings (i.e. through competitive dialogue meetings) is wise, but significant concerns remain. There is far too little time to analyse the GJU's requirements, plan the Galileo Operating Company business plan and present a bid by 1 September this year. Bids written in the time available will have to resort to guesswork on a grand scale. Verbal statements to bidders to do the best they can contradict the written instructions to create and present a legally binding offer. The GJU does not have the means to make a valid bid comparison based on public sector value. The GJU is not creating a public sector business plan with which it can make these comparisons, and cannot do so in the timescale of the competition. In particular, bid measurements will be inconsistent because of: (i) the need for bidders to heavily qualify their bids with conditions, conditions which will differ between the bids and which the GJU will not be able to evaluate; (ii) the GJU requiring bidders to create their own key output commitments, again which will differ between the bids and which the GJU will not be able to evaluate. As a consequence, bidders face a procurement risk quite out of order with the accepted principles of PPPs." As predicted, the submitted bids did not contain firm pricing and commitments and the GJU was compelled to extend the selection phase. A technical note from a GJU advisor in December 2004 confirmed the above judgement: "In a number of respects, the lack of developments in the bidders' proposals reflected the uncertainty about the GJU's requirements. As a consequence of this uncertainty, there were singificant structural differences between the bids (making direct comparison difficult) and both bidders offered only indicative pricing."

C.2 Bid assessment			
Did the audited body carry out a broad-ranging assessment of the bids?		Partly	The GJU assessed and marked the bids received in accordance with its pre-established general evaluation criteria (financial, technical, management). However, in February 2005 the GJU ultimately gave the competing bids an equal overall assessment (see also C.1).
C.3 Choice of bidder			
Did the audited body assess the results of the evaluations so as to select the bid offering the best value?		Partly	The GJU evaluated the bids by applying its formal tender evaluation criteria. However, it did not possess detailed and robust evaluation criteria reflecting precise requirements against which to judge and compare competing bids (see also A.4). The GJU declared itself unable to select a preferred bidder on two occasions: in October 2004 and, after having extended the selection phase, February 2005.
C.4 Changes during negotiations with successful bidder			
Did the audited body minimise changes to the terms of the deal during the final negotiations with the successful bidder?		No	After the approval of the merger and the submission of a joint bid, the GJU lost its ability to drive the negotiation process. It was unable to compel the merger conditions to be observed, and the negotiations suffered from the composition of the merged consortium and its inability to reach consensus (owing to the number of shareholders, their diverse interests, PPP experience, etc.).

ANNEX V

GLOSSARY OF TERMS USED IN THIS REPORT

Availability payment: A periodic payment made to a concessionaire by a public authority for providing an available facility.

Business case: Information that describes the justification for setting up and continuing a project. It provides the reasons and answers the question "Why?" for the project.

Business plan: A formal statement of a set of business goals, the reasons why they are believed attainable, and the plan for reaching those goals.

Concession agreement: An agreement between public and private partners according to the latter the exclusive right to operate, maintain and carry out investment in a public utility.

Conflict of interest: Situation in which a certain person or organisation is acting in two capacities, the goals or interests of which are opposed.

Competitive tension: Situation in which competitors are forced to make their offers of goods/services/bids as attractive to the procuring organisation as possible so as not to lose their position to rival competitors, resulting in a better deal for the awarding authority.

Galileo User Segment: In contrast to the space segment and ground segment of the system, the user segment translates the signals into services for the final users. It consists of different types of user receivers.

Governance structure: The system of oversight in place to enable management to maintain control over the project, including the allocation of management responsibilities and the processes and systems for reporting to management.

Public-private partnership: A government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies.

Public sector comparator: An estimate of what the project would cost if traditional procurement methods were used. This is used to help determine whether private finance offers better value for money than traditional procurement.

Risk allocation: The agreement between the parties to a public / private finance deal or concession which defines which parties or party is responsible for bearing the financial or other consequences of that event occuring, minimising the chance that a particular adverse event should arise, and for mitigating the impact of that event.

Risk transfer: The passing of risk normally borne by the procuring organisation to the private sector service provider.

Tender process: The practice of advertising for, then receiving and evaluating offers or bids from different private sector companies to operate the services under the public private finance and concessions deal, with a view to achieving the greatest value for money.

Traditional procurement: A contract in which the customer simply pays the contractor for the provision of an asset as work in developing this asset progresses. Such assets are fully paid for on their completion. The maintenance of these assets are dealt with in separate contracts, while their operation remains the responsibility of the public sector.

REPLY OF THE COMMISSION

SUMMARY

I-V.
Galileo and EGNOS are two path breaking programmes aiming at establishing a European Global Navigation Satellite System. The European Space Agency and the Commission started these two programmes as a joint initiative, and obtained from their respective Member States strong support for the programmes.

ESA took charge of the technological development and the Commission was responsible for policy making. Together they set up the Galileo Joint Undertaking as a coordination platform to oversee the implementation of the development and validation phase.

For the deployment and operations phase, on the Commission's proposal, the Council set up a regulatory agency (the GSA) to represent the interests of the public sector in the public private partnership (PPP).

Member States and the European Space Agency played a key role since its inception. After having experienced difficulties in finding private source financing, the integrated Galileo/ Egnos programme became in 2008 an EU programme fully financed from the EU budget. From that point in time, the Commission has taken on the role of programme manager. With the new set-up responsibilities have been clarified and the Commission today considers that it is on the right track towards achieving its objectives. The Commission acknowledges that there were delays and cost overruns, but given the innovative nature and the technical sophistication of the pre-project the Commission considers the Court's evaluation of the management of the development and validation phase overly negative. With the benefit of hindsight, it appears that more could have been done to address some of the encountered problems at an earlier stage.

REPLY OF THE COMMISSION

V.
(i)
The GJU was set up to act as an interface between ESA, responsible for carrying out the technological development activities (IOV or in-orbit validation phase), and the European Commission in charge of the policy aspects.

(ii)
The Commission constantly supervised the programme, without interfering with ESA's responsibility, especially as regards technical and industrial matters. The Commission stepped in whenever needed to avert blockages and propose adaptations of the programme.

VI.
The choice of the PPP was a political decision taken by the Council. The Commission received a clear political mandate to prepare a PPP, within a limited timeframe, and prepared it on the basis of information available at the time in this very specific and innovative sector. The industry came up with serious and realistic proposals in reply to the call for a PPP Concession.

VIII.
Through the GJU and then GSA, the Commission has used FP6 funds to fund technological development activities, and application-related RTD. These RTD projects, and especially application-related RTD are to bear fruits in the medium/long run (2009-2015) and exploitation of such work is to be included in the forthcoming "GNSS Application Action Plan".

IX.
The Commission proposal to integrate EGNOS into Galileo effectively saved the EGNOS programme, and ensured availability of the funding necessary to continue this project. The Commission maintained this integrated approach both during and after the concession negotiation.

X.
The statement of the Court does not fully take into account the reality of the environment at that time. The programme involved a large number of public sector stakeholders (EU and ESA member states, ESA, third countries, Commission) with different institutional roles and responsibilities, and the Commission worked actively to find the tools to properly take on board these stakeholders. The Commission achieved real progress in the field of international cooperation. The creation of the GJU and of the GSA, as well as the proposals to redirect the programme that culminated in the adoption of Regulation 683/2008, are illustrations of the leadership exercised by the Commission with due regard to the respective roles of the stakeholders.

XI.
The Commission has received a clear mandate to take over the programme management of the deployment phase, and as a consequence has started to adapt its management capacity, both in house and with the support of qualified external advisors.

XII.
The lessons learned through Galileo are shared with Member States and other stakeholders to improve the management of large infrastructure programmes.

REPLY OF THE COMMISSION

INTRODUCTION

2.
The European Space Agency and the Commission started EGNOS and Galileo as a joint initiative, and obtained from their respective Member States strong support for the programmes.

ESA took charge of the technological development and the Commission was responsible for policy making. Together they set up the Galileo Joint Undertaking as a coordination platform to oversee the implementation of the development and validation phase.

For the deployment and operations phase, on the Commission's proposal, the Council set up a regulatory agency (the GSA) to represent the interests of the public sector in the public private partnership (PPP).

THE HISTORY OF GALILEO

15.
For the implementation of the development phase of the Galileo Programme the GJU was created to ensure the unity of the administration and the financial control of the project for the research, development and demonstration phase of the Galileo programme, and to this end mobilize the funds assigned to that programme (Article 1 of Regulation (EC) No. 876/2002). The technical responsibility of this phase was entrusted to ESA in the framework of its GalileoSat programme. The approval of the GalileoSat programme by ESA member states triggered the start of the industrial activities. The Galileo Joint Undertaking was the coordination platform between ESA and the Commission for the development and validation phase.

17-18.
In accordance with Article 2 of the GJU Statutes the main tasks are:

(1) oversee the integration of EGNOS into Galileo as well as the implementation of the Galileo development and validation phase;
(2) launch through ESA the industrial activities of the development phase;
(3) prepare, in cooperation with the Commission and ESA, the deployment and operational phases by managing the tendering procedure resulting in the conclusion of a concession agreement;
(4) supervise the carrying out of all programme activities.

21.
The purpose given by the March 2004 transport Council to the Commission's communication of October 2004 was not to report on the progress of the development and validation phase, but on the start of the deployment and operational phases.

The delay in the technological development (IOV or in-orbit validation phase) at that time was considered not incompatible with the start of the activities for the deployment phase of the programme in 2006.

REPLY OF THE COMMISSION

22.
Information available at the time was supporting the idea that expecting a favourable outcome of the procurement process was not unreasonable. The Communication indicated that the procedure so far was successful and requested the Council's confirmation in order:

– to enable the Joint Undertaking to complete the negotiation of the concession contract due to be signed in the course of 2005, and
– to enable private-sector stakeholders to confirm their bids and financial commitments.

23.
The Commission, fulfilling the political responsibility assigned to it, created the conditions for agreement between Member States by asking former Commissioner Van Miert to mediate. The Commission managed to unblock concession negotiation and that part of the development and validation phase activities that had been stalled by disagreements among Member States between July and December 2005.

26.
Over 2006, and more particularly in the second half of 2006, with the strong support of the Commission and the European Investment Bank, the GJU narrowed down the differences with the Merged consortium to the few substantial issues that were remaining intractable. The result of these negotiations, together with the negotiating team, and the other activities of the GJU, were transferred to the GSA at the end of 2006.

27.
At the end of 2005, the Commission prepared the grounds for the deployment phase by initiating the steps to ensure the handover from the GJU, created for the Development Phase, to the GSA, created for managing public sector interests in the PPP scheme for the Deployment and operations phase.

Two assumptions were driving these actions from Commission: 1) that Concession negotiation could be completed by end 2006, something that the status of negotiations after the merging of the consortia was giving some credibility to, and 2) that the delays now apparent on the IOV phase meant that the IOV phase would outlive GJU.

28.
In a parallel development, over 2006 and 2007, ESA continued to experience serious difficulties in its management of both EGNOS and Galileo. On EGNOS the difficulties were mostly technical. On Galileo the industrial set up and its management by ESA was experiencing substantial delays and cost overruns. ESA embarked in a major reshuffling of the contractual relationships it had created for the GalileoSat programme.

Faced with these difficulties and the stalling of the Concession process, the Commission proposed to Council and Parliament to redirect the programme, fund the deployment phase from the Community budget, act as programme manager and use ESA as procurement agent for the deployment phase. Regulation 683/2008 on the further implementation of the GNSS programmes was adopted on 9 July 2008.

REPLY OF THE COMMISSION

29.
The scope of the communication of May 2007 was not to describe in details the reasons of the failure of the concession negotiations, but rather to take stock of the results of the negotiations and propose a way forward.

31.
In the period audited by the Court (September 2003-December 2006), the GJU was established to ensure the unity of the administration and the financial control of the project for the research, development and demonstration phase of the Galileo programme, and to mobilize the funds assigned to that programme.

OBSERVATIONS

39.
The PPP's conception was based on studies and reports elaborated in the course of the Galileo definition phase, which had shown the viability of delivering the Galileo deployment, operation and commercial exploitation under a PPP structure entailing private financing. The choice of the PPP has been encouraged and finally endorsed by the Council. The preparation of the PPP was constrained by the limited time available. The industry came up with serious and realistic proposals in reply to the call for a PPP Concession.

41.
As shown by the studies available to the Commission, best practices in the PPP domain were definitely taken into account. Nevertheless these best practices have been developed with established industries and services (motorways, hospitals, power plants...), where risks are already relatively well identified and cost comparators easy to build based upon existing cost data. This was and still is far from being the case for the Galileo deployment, operation and commercial exploitation.

(a)
The unprecedented nature of the Galileo Project made it extremely difficult to apply PPP best practices, such as developing a reliable public sector comparator for lack of data.

The material difference in scope between the IOV and FOC (full operational capability) made it impossible to apply the data coming from the IOV to develop such a comparator.

The studies commissioned by the Commission and the GJU clearly indicated the risks at stake for the deployment, operation and commercial exploitation of the infrastructure proposed and assessed their efficient allocation as achievable under a PPP/concession scheme.

(b)
In view of the time pressure, and the difficulty to find enough precedents to build upon, the Commission and GJU opted for a competitive dialogue process for the procurement, in order to enable for a gradual fine tuning of the tender specifications.

The Competitive dialogue procedure exists to handle complex cases such as the Galileo PPP given its technical, financial and legal set up.

The unknown elements characterizing the Galileo PPP were indeed supposed to be tackled through this procedure by interactions with extremely serious and dedicated bidders.
The procedure was extended in time so as to allow the candidates precisely to put forward refined and more credible business plan and financial models.

REPLY OF THE COMMISSION

The extension of the dialogue process and the interactions between the GJU and the candidates, even after their merger, produced important results, which were incorporated in the Heads of Terms.

(c)
The GJU staff encompassed professionals having accrued specific experience in the space domain and projects, having specific management experiences in relation to public sector infrastructure projects and project financing. There was no "knowledge gap" when compared to industry teams.

Experienced advisors were involved in the conception phase of the Programme (see in particular the inception study). As from the start of the active phase of the competitive dialogue, experienced advisors (Price Waterhouse Coopers, Lovell's, ...) and European Investment Bank senior staff were assisting the GJU in negotiations either before or after the merging of the candidates and in the context of the merger process itself.

(d)
The merger of the two offers was not encouraged nor supported neither by the GJU nor by the Commission. To mitigate the effects on the process described by the Court (essentially loss of competition), the Commission imposed conditions on the Merger approval.

After careful scrutiny of the joint proposal, the GJU, with the assistance of highly qualified advisors, assessed that the joined proposal delivered better value for money with respect to the individual bids.

(e)
The Member States did not have to rely on GJU's official reporting only since they were represented at the Supervisory Board of the GJU which was debriefed extensively on the progress of the negotiations and regularly updated on the progress of the programme.

They were also represented in specific working groups, notably the PPP Expert meeting, to follow more closely the negotiation process and were given full visibility over the difficulties faced during negotiation, precisely on matters related to the concession.

Though complex, the negotiations were structured and conducted in a serious and professional manner by the two parties, and offered not sufficient ground for the GJU to question the feasibility of the concession. GJU reports were targeting a broader public than Member States, and as such had to keep certain commercial information confidential.

42.
The PPP model proposed by the Commission differed from other PPP models then in existence. The very specific nature of the activities and risks at stake meant that other existing projects could not be taken as a reference for the Galileo Project for what regards the sharing of risks and financing between public and private sector.

(a)
The technological complexity of the Galileo Project is a fact well understood by all the stakeholders involved and especially by the private sector.

REPLY OF THE COMMISSION

(b)
Inception studies clearly indicated that revenue generation was difficult to predict, but did not consider it as a show stopper for the delivery of the PPP scheme.

Availability payments by the public sector were considered a suitable instrument to ensure financial viability.

The Heads of Terms included a possible availability payment structure upon which a high level agreement was achieved with the private sector.

(c)
The fact that the design has been developed under the responsibility of the public sector through the development phase was known to the private sector and was highlighted as an element of complexity for the relevant risk allocation within the concession scheme.

Nevertheless reports by experts in the field never outlined this as a major blocking point for the viability of the concession scheme.

It is to be recalled that the industry having developed the design during the development phase was largely represented in the candidates for the concession contract.

Box 2

Market risk, design risk and to a lesser extent third party liability risks were the more contentious areas during negotiations.

Nevertheless progress was achieved in the course thereof at least for what concern liability risk and market risk allocation.

Moreover it is probable that failure of the concession negotiation can also be attributed to other factors, for instance industry's realization of more advantageous financing options.

The difficulty to transfer market risk was identified and acknowledged, and as a consequence Heads of Terms were clearly pointing to a possible agreement where the risk transfer would be minimal at a first stage, with mechanisms for a gradual increase in the degree of market risk transfer during the course of the contract.

The transfer of design risk has been the most controversial issue of the PPP negotiation. The IOV phase originally conceived to reduce design risks was perceived by the private sector as a major constraint to the undertaking thereof.

The attitude of industry to refuse any undertaking of design risk on the basis of lack of visibility, involvement and validation capabilities of the IOV phase has been strongly challenged during negotiation given that the potential concession holder was composed mainly of the same industrial actors who had a visibility on their own performance at the design stage.

The founding elements for a third party liability mitigation structure were agreed at Head of Terms level.

REPLY OF THE COMMISSION

43.
The GJU was instructed by its regulation to "charge to [ESA] the carrying-out of activities required during the development phase with regard to the space and the earth segment associated with the system".

These activities were carried out by ESA in the framework of the GalileoSat programme, jointly funded by ESA member states on a voluntary basis and the European Communities.

45.
ESA was responsible for carrying out the GalileoSat programme and reported to GJU on its actions. GJU supervision as stated in Art 2 paragraph 4, was limited to ensuring that all phases of the programme dovetailed correctly, and was not conceived as a replacement of ESA technical expertise.

47.
The Galileo Budget for development and validation was established based on studies commissioned by the Commission and was accepted by ESA in the GalileoSat declaration.

The GalileoSat declaration foresaw a standard ESA 20% flexibility on its contribution, creating a de facto 10% contingency on the total budget, which proved insufficient due to the programme complexity.

48.
Late start of the GalileoSat programme by ESA Member States resulted in upstart delays and increased costs, which were never recovered.

49.
The procurement of the IOV phase was performed by ESA following its own procurement system.

ESA chose in favour of an industrial organization led by a single prime contractor, but still ensuring, at least on the part of the programme funded by ESA Member States, a geographical return to subcontractors.

Galileo was the first and only GNSS programme actually opened for European space industry participation. As a result, the prime contractor chosen was likely to enjoy a definitive competitive advantage for future competitions (primarily for the deployment phase). This had major repercussions for the industrial policy furthered by ESA.

As a consequence of this and of the actions of several interested member states, the prime contractor eventually elected was a joint venture of antagonistic companies, which never managed to work efficiently together.

Faced with increased costs and delays, ESA finally decided to opt in December 2007, for a different industrial organization and contractual framework, whereby it would take direct prime responsibilities and contract out directly to subcontractors the different work packages.

53.
Research activities funded by the FP6 were focused on all the main user sectors, addressing research on applications and other aspects (standardisation, legal and service provision aspects, market...) that will enable the future use of Galileo. The research projects in the various user sectors have generally included development, tests and demonstration activities.

REPLY OF THE COMMISSION

Exploitation of such work is to be included in the forthcoming "GNSS Application Action Plan".

The definition of the services, which were the basis for the system specifications, had been performed earlier, with FP5 funds.

54.
The aim of the FP is to foster the development of technologies and services, although leaving the market actors freedom to choose in which domain such developments shall take place. This approach has demonstrated its validity in the sense that several companies, notably SMEs, have acquired knowledge and experience which has positioned them as leaders on the market, such as Ifen and Septentrio for dual Galileo/GPS receptors, Polestar for indoor positioning solutions and Telesys for location based services.

As in any research activity, the outcome of projects is not guaranteed, and depends on several factors which are beyond the remit of the Commission. The use of the results on the commercial market has to remain a decision to be taken by the project consortia themselves.

55.
The follow up of the projects by GSA was ensured mostly by personnel having previously worked for GJU on these projects. The GSA fostered the dissemination of project results by setting up an internet based database of project results, organizing two successful "Growing Galileo" events taking stock of these results, and publishing a compendium of such results.

A number of FP6 projects have experienced delays, but a project by project analysis points to various causes not necessarily linked to the transfer.

56.
The activities funded with FP6 include the development of new applications, evaluation of related market potential, investigation of possible business models, and research on business plans suitable for their commercialization. Experience of market development and technological innovation shows that most of market innovations are created by the market, and not by a top down approach. This is especially true in non mature markets such as this one, where the GJU/GSA would have had difficulties in devising comprehensive development strategies.

57.
The delays on the Galileo/EGNOS programme may explain part of the delays in some FP6 projects.

60.
EGNOS has suffered from delays that are mainly due to technological issues not in the control of the Commission, which imply development delays.

(a)
The conclusion of the EGNOS agreement proved to be very difficult due to intrinsic difficulties proper to the relationship between the different parties involved in EGNOS. Finally the agreement was finalized by the end of 2008 and signed on 31 March 2009. Moreover, the ESA's programme for EGNOS (ARTES9) under which EGNOS is currently operated, is ending on 31 March 2009 time when the system should be compliant with the technical specifications needed for its exploitation by an economic operator.

REPLY OF THE COMMISSION

(b)
In March 2009 the system will effectively be certifiable, and it is planned to certify the operator by 2010 in accordance with Single European Sky regulation.

61.
(b)
The integration of EGNOS into Galileo though affirmed as an objective at political level has always been the source of problems from a contractual standpoint.

For this reason the candidates for the concession contract were required to address the EGNOS integration into Galileo as an optional scenario.

The bids received were clearly showing the benefits of integrating the two systems, and the negotiations of the concession contract after the merger of the two candidates were carried out on an integrated scenario.

(c)
The EGNOS institutional framework is complex due to historical reasons on how the programme was set up.

(d)
The GJU has commissioned the preparation of several business plans for EGNOS and studies on the possible commercialization of its services which outlined a fairly limited potential in terms of EGNOS revenue generation capabilities.

Discussions held with the aviation sector have shown the difficulty of establishing a revenue generation mechanism for the EGNOS signal itself which is open and accessible to any user for free.

In this respect it is to be underlined that from a technical standpoint EGNOS OS and SoL are not different in terms of accessibility by users. They only differ from a certification standpoint.

These assumptions justified the GJU attitude not to invest in market development activities for EGNOS.

62.
The EGNOS programme was run as an ESA programme (ARTES 9) principally funded by ESA member states and EOIG. Funding from the EU was limited.

Delays and cost overruns have been experienced in the framework of the ARTES 9 programme for various technical reasons.

63.
(a)
Independently from the concession process, EGNOS faced a series of technological issues, under the control of neither the Commission nor GJU, which also resulted in programmatic delays.

(b)
It is very difficult to appoint an operator for an infrastructure which is not completed from a technical standpoint. Moreover it would have been impossible for the Commission to entrust an operator without having rights on the assets to be operated.

The appointment of an EGNOS economic operator is now under finalization under the responsibility of the European Commission.

The need to conclude a framework agreement had a limited impact on the concession negotiations.

REPLY OF THE COMMISSION

64.
The GJU received a clear mandate to integrate EGNOS into Galileo which made it necessary to negotiate a Framework Agreement with the various EGNOS stakeholders, to clear the path for the ultimate transfer of ownership of EGNOS.

The Framework agreement negotiations led by GJU were ultimately not successful due to the complex institutional framework recognized by the Court itself, but have served as a sound basis for the current finalized agreement with the Commission.

65.
Due to the delays experienced by the programme, the GJU did not implement the EGNOS market penetration plan.

67.
The allocation of tasks between the parties during the development phase was inspired by the principle of cooperation between the parties in order to create a joint platform for the development of the programme.

This approach has been readdressed for the purposes of the deployment phase by the GNSS Regulation which clearly provides for a strict division of roles and responsibilities between the involved parties.

68.
(a)
Regarding GJU main tasks see Commission's position under point 17.

The Commission notes that this governance structure, and notably the dual role of ESA were clearly identified in the founding regulation of the GJU.

(b)
The winding up of the GJU does not have any The winding up of the GJU does not have any impact on the role of GJU in that phase of the programme.

On the other hand closing down the GJU was necessary to avoid duplication of roles between GJU and GSA.

69.
The ESA/GJU agreement was intended to set forth a partnership between the parties co-financing the project whereby ESA would have applied its own rules for placing contracts.

Implementation and reporting arrangements were not detailed as in standard contractual relationships due to the cooperative nature of the agreement. The specific reporting modalities were established by the GJU executive committee when payment obligations to ESA started to fall due.

The delegation agreement between the Commission and ESA signed on December 2008 for the deployment phase, provides for strict monitoring and reporting obligations

70.
ESA was responsible for both the IOV Phase and EGNOS through two ESA programmes GalileoSat and ARTES 9.

71.
The Commission is of the opinion that ESA is clearly accountable for the results of the technological development activities it is conducting. The Commission has clearly taken its political responsibilities in the programme. Every decision can be traced back to the body entrusted to take it.

REPLY OF THE COMMISSION

73.
The Commission exercised a key promoter role for the GNSS programmes.

In 2005-2007 the concession negotiations were in process and delivered in December 2006 the expected Heads of Terms.

Corrective actions were taken at the time when evidence of the failure of the concession negotiation became clear.

Difficulties experienced in the negotiations up to the end of 2006 were not sufficient to conclude on the impossibility of delivering the Galileo infrastructure under a PPP concession scheme.

Only by the beginning of 2007 the Commission had the elements to assess that the concession process prolongation would not have delivered good value for the public sector and therefore to terminate the negotiations.

The Commission also refers to its reply to point 23.

74.
The difficulties experienced in the development phase were due to reasons which were largely outside the Commission's control and mostly not influenced by the management principles guiding its actions.

(a)
The Commission managed to get clear objectives for the European GNSS Programmes, endorsed by Council and Parliament.

A programme of this magnitude is likely to raise a diverse range of stakeholder expectations, and notably Member States may have held and promoted different objectives but this has not changed the objectives set at the outset of the programme.

(b)
The choice of a PPP concession model capable to capture different phases of the project (deployment, operation, commercial exploitation) corresponds indeed to a long term strategic vision and planning.

The lack of success of this process does not affect the long term approach adopted by the Council.

(i)
Under a PPP Concession scheme the exploitation model and roadmap is supposed to be delivered by the private sector.

One of the reasons for choosing this model lays exactly in the fact that the private sector has been judged to be in the position to do so.

Following the GNSS Regulation the Commission will be in charge to define such roadmap for Galileo in parallel with the deployment of the infrastructure.

As far as EGNOS is concerned the establishment of the roadmap will be a matter for negotiations in the context of the selection of the future EGNOS operator.

REPLY OF THE COMMISSION

(ii)
The problems encountered in negotiating a framework agreement for EGNOS depended largely on the dynamics between the EGNOS stakeholders.

The negotiation of the agreement has been taken over by the GSA and concluded by the Commission without any discontinuity or gap of negotiating power.

The EC – EOIG agreement was finalized by December 2008 and signed on 31 March 2009.

(iii)
Taking into account the political and strategic nature of the programme the Commission has taken care to regularly inform and check the consensus at Council meetings.

(c)
Due to the provisions of the Treaty, the Commission had to create two legal structures: the GJU (under Article 171) to serve as a cooperation vehicle with ESA on the Development and validation phase, and the GSA (under Article 308) to pilot the Deployment and Operations phase. To pave the way for these two structures, support activities were performed under four different contracts, but these did not involve the creation of legal structures.

(d)
See the Commission comments under point 41 c).

(e)
The risk matrix for the concession has been developed in a comprehensive form during the dialogue phase and with the assistance of experienced advisors by the GJU.

An extensive set of documents on the identification and possible allocation of such risks have been produced during the course of the negotiations with the concession candidates.

The nature of the project, as described above, did not allow a thorough identification and appreciation of the magnitude of these risks up front.

(f)
The Commmission exercised a key promoter role for the GNSS programmes. Corrective actions were taken at the time when evidence of the failure of the concession negotiation became clear.

Difficulties experienced in the negotiations up to the end of 2006 were not sufficient to conclude on the impossibility of delivering the Galileo infrastructure under a PPP concession scheme.

Only by the beginning of 2007 the Commission had the elements to assess that the concession process prolongation would not have delivered good value for the public sector and therefore to terminate the negotiations.

REPLY OF THE COMMISSION

CONCLUSIONS AND RECOMMENDATIONS

75.
Given the innovative nature and the technical sophistication of the project the Commission considers the Court's evaluation of the management of the development and validation phase overly negative.

(a)
The GJU was not conceived as a strong operational programme manager. Regulation 876/2002 clearly states that: "For the implementation of the development phase of the Galileo programme, a Joint Undertaking within the meaning of Article 171 of the Treaty is hereby set up for a period of four years. The aim of the Joint Undertaking shall be to ensure the unity of the administration and the financial control of the project for the research, development and demonstration phase of the Galileo programme, and to this end mobilise the funds assigned to that programme." It also requires from the GJU to " charge to [ESA] the carrying-out of the activities required during the development phase with regard to the space segment and the earth segment associated with the system," effectively recognising ESA responsibility for carrying out the technological development activities.

(b)
The Commission, within the limits of its responsibility, constantly supervised and guided the programme. The Commission stepped in whenever was needed to avert blockages, provide additional funds and adapt the structures of the programme.

The realignment of the programme proposed by the Commission in 2008 clearly assigned the role of programme manager to the Commission, to address the issue to which the Court has given prominence.

76.
The PPP was prepared with the level of information available at the time, based on preparatory work having recourse to state of the art external advice.

The PPPs conception was based on studies and reports elaborated in the course of the Galileo definition phase, which had shown the viability of delivering the Galileo deployment, operation and commercial exploitation under a PPP structure entailing private financing. The choice of the PPP has been encouraged and finally endorsed by the Council. The preparation of the PPP was constrained by the limited time available. The specific challenges of the Galileo PPP, linked principally with technical and market specificities explain in a large part the inability to conclude the concession process.

77.
ESA encountered technical and programmatic difficulties, which explain the delays and cost overruns.

78.
RTD activities have been instrumental in helping define the Galileo mission and performances, focus on all the main user sectors, addressing research on applications and other aspects that will enable the future use of Galileo.

REPLY OF THE COMMISSION

Those activities have raised significant interest in the users' communities and have developed technologies and knowledge that will be exploited in a later commercialization phase.

79.
The integration of EGNOS into Galileo has been essential to ensure the continuity of the EGNOS programme, and secure the needed financing.
In spite of the technological difficulties, and thanks to the clarification of the institutional framework at the initiative of the Commission, EGNOS will be the first European GNSS programme in operation.

80.
The Commission had to exercise its promoter's role over the duration of the programme, taking into account all stakeholders, especially ESA as partner in this joint initiative. The Commission actively managed the situation, and regularly took the initiative to unblock and foster the programme.

81.
The Commission has overhauled the management of the programme, taking on board many recommendations of the Court of Auditors.

82.
The Commission decided to propose to take over the programme management of Galileo at a decisive time for the programme. Council and EP endorsed this proposal by adopting the regulation 683/2008. It is part of the remit of Commission to propose the most appropriate solution over the long term.

Recommendation 1
The Commission has already made very concrete steps to adapt its resources and its legal and financial instruments to act as a programme manager. In order to facilitate this process a Galileo Interinstitutional Panel (GIP) has been set up.

(a)
The Commission has secured the transfer of 30 experienced staff from GSA (some with experience dating back to GJU) and completed internal recruitments to set up a dedicated Galileo team.

(b)
Regulation 683/2008 is clarifying the respective roles and responsibilities of ESA and the Commission. In application of this Regulation, the Commission has entered into the delegation agreements with ESA for the performance of FOC procurement activities and EGNOS further development activities.

(c)
Regulation 683/2008 provided the Commission with a dedicated Galileo budget line to fund the infrastructure. The Commission is using public procurement to purchase the infrastructure.

As regards the operations and replenishment costs, the Commission is preparing the next financial framework to ensure adequate budget coverage. It will also review the financial instruments made available under its financial regulation to make sure they are adequate for the funding of the programme.

(d)
The governance framework created by Regulation 683/2008, clearly allocates roles and responsibilities.

REPLY OF THE COMMISSION

83.
Regulation 683/2008 has clearly tasked the Commission to exercise leadership and to propose to Council and Parliament scenarios for Galileo beyond the Deployment Phase. In addition a Galileo Interinstitutional panel is set up.

Recommendation 2
Regulation 683/2008 has reiterated the programme's political objectives that have remained constant over the past years. It has also provided the programme with a solid roadmap for the deployment phase, and has requested the Commission to come up in 2010 with a Communication on the future of Galileo beyond the Deployment phase.

(a)
The Commission's Communication will cover, inter alia, the strategic and operational objectives of Galileo. It will address the question of the model for the operations of the system taking into account market realities, desirable positioning of the system on the value chain, and will clearly highlight the consequences of models proposed in terms of budget and public sector responsibilities.

(b)
The Communication will tackle the issue of the integration of EGNOS into Galileo.

84.
Commission has already started to work with the various stakeholders to draft this Communication and has sought the support of external advisers to help it take stock of the wealth of information gathered over the years, notably thanks to the Concession negotiation experience.

Recommendation 3
In order to be ready in time for the end of the Deployment phase, the Commission has started the work for the preparation of the operational phase. It will take into account the experience available.

85.
The Commission will analyse the options as required by the Regulation 683/2008 and present its conclusion in 2010.

Recommendation 4
(a+b)
In the framework of the Communication, the Commission is compiling user requirements and mapping out the enabling actions that are needed to foster the use of GNSS technology. This will enable the Commission to propose an appropriate regulatory framework.

(c)
The Commission has taken steps to ensure that an operational EGNOS meets the needs of its users, particularly in the aviation sector, and for that purpose has selected an experienced operator with strong aviation background.

86.
The Commission has set up and may set up other joint undertakings. Each of those are thoroughly planned and assessed against the criteria relevant for their activity, on a case by case basis.

Recommendation 5
The Commission carefully examines, on a case by case basis, the rationale and the optimal governance of any new joint undertaking.

REPLY OF THE COMMISSION

ANNEX II

The EGNOS programme was conducted under an optional ESA programme (ARTES 9) under ESA programme management. As the first ESA programme in navigation, it suffered from numerous technical difficulties.

(b)
This research programme has been run for more than 10 years, during which technical requirements changed and the certification environment evolved.

(c)
Due to the failure of the Concession negotiation the Roadmap for EGNOS had to be redrafted in accordance with the new governance established in July 2008 by Regulation 683/2008.

(d)
One of the main reasons for EGNOS not being operational has been the difficulties experienced by ESA to keep the signal available with the level of quality and reliability that may enable its certification.

Technical acceptance by ESA has only started beginning of March 2009. This is a prerequisite for handover of the system to EC, which will, at that time, and not before accept the system if it meets the objectives that ESA has set for itself in the ARTES 9 programme.

(e)
ESA's and GJU's efforts to demonstrate the capabilities of EGNOS overseas have been coordinated and funded by the Commission. Based on these preparatory studies, the Commission will decide whether to propose or not the extension of EGNOS outside Europe.

(f)
The GJU received from the Commission TEN-T 2004 and TEN-T 2005 funds specifically targeted at EGNOS, as well as funds from DG AIDCO in 2005. In addition, several FP6 projects were dealing with EGNOS. Finally, the GJU benefited from a discretionary studies budget approved on a yearly basis by its Board, that could have been used, if GJU Management had so decided, to fund specific EGNOS-related studies.

ANNEX III

The agreements with NRSCC and MATIMOP and the GJU were transferred to the GSA. The winding up of GJU was agreed with MATIMOP and NRSCC at Management Board level. Third country discussions were held by the Commission, not by the GJU, and therefore the closing down of the GJU had no impact on such discussions.

REPLY OF THE COMMISSION

ANNEX IV

The Commission refers in general to the replies provided above to the text of the Court's report, in particular paragraphs 39, 41 and 42.

A.2.
Due to the unprecedented nature of the project Due to the unprecedented nature of the project it was not possible to reach the level of maturity on requirements and constraints that can be found in projects with established industries and services (motorways, hospitals, power plants...), where risks are already relatively well identified and cost comparators easy to build based upon existing cost data. In view of the time pressure, and the difficulty to find enough precedents to build upon, the Commission and the GJU opted for a competitive dialogue process for the procurement, in order to enable for a gradual fine tuning of the tender specifications.

The competitive dialogue procedure exists to handle complex cases such as the Galileo PPP given its technical, financial and legal set up.

The unknown elements characterizing the Galileo PPP were supposed to be tackled through this procedure by interactions with extremely serious and dedicated bidders.

The extension of the dialogue process and the interactions between the GJU and the candidates, even after their merger, produced important results, which were incorporated in the Heads of Terms.

A.3.
See the reply to A.2.

A.4.
See the reply to A.2.

A.5.
In all its recent relevant regulatory activities, the Commission has included provisions fostering GNSS applications (see for instance the European Electronic Toll System).

The Commission has however been careful not to distort competition in favour of Galileo or EGNOS.

The respective shares of revenues depending directly or indirectly on the public sector were estimated by the prospective concessionaire at the time of negotiations. The communication on the future of Galileo will reassess these figures and propose adequate regulatory measures.

A.6.
The choice of the PPP has been encouraged and finally endorsed by the Council.

Developing a reliable public sector comparator was not a realistic option for lack of relevant data, contrary to what exists for more mainstream industries.

Even data coming from the IOV (in-orbit validation) could not be used to develop such a comparator, because of the material difference in scope between the IOV and FOC (full operational capability).

REPLY OF THE COMMISSION

A.7.
Through the competitive dialogue, innovative solutions have been generated and proposed by bidders, and thoroughly discussed.

Particular care was given to assess those innovative commercialisation solutions that the bidders had identified. Through this process the Commission was able to gain insight into new applications and markets.

A.9.
These topics were covered under the preliminary studies conducted by Price Waterhouse Coopers, and the conclusion of those studies were supporting the value for money of the PPP option.

B.1.
The GJU staff encompassed professionals having accrued specific experience in the space domain and projects, having specific management experiences in relation to public sector infrastructure projects and project financing. There was no "knowledge gap" when compared to industry teams.

Experienced advisors were involved in the conception phase of the Programme (see in particular the inception study). As from the start of the active phase of the competitive dialogue, experienced advisors (Price Waterhouse Coopers, Lovell's,...) and European Investment Bank senior staff were assisting the GJU in negotiations either before or after the merging of the candidates and in the context of the merger process itself.

B.2.
Throughout the competitive dialogue phase, full attention was given to the assessment and fostering of the understanding of all parties as to the requirements for entering into a Concession.

This was one of the reasons for the choice of the competitive dialogue procedure.

B.3.
During the competitive dialogue phase, the draft contract was further refined and expanded, and extensive discussions on the choice of applicable law were held.

B.4.
The planning was ambitious, and the GJU amended it to take account of the fact that negotiations were more complex than initially expected.

B.5.
The continued feasibility of the project was regularly reviewed and commented upon, notably in successive communications from the Commission.

B.6.
See the reply to A.6.

B.7.
As noted by the Court, the tender process managed to attract a diverse range of European companies, strongly dedicated to the project. It is only natural that for an innovative and challenging space project, space industry took a prominent role in the consortia. Operators were nevertheless present in all competing consortia.

REPLY OF THE COMMISSION

B.8.
See the reply to A.2.

B.11.
Private sector bid costs were not assessed as there was no intention to fund them from public money.

B.12.
See the reply to B.1.

B.13.
The costs of external advisors were constantly monitored.

C.1.
See the reply to B.2.

C.2.
The bids were thoroughly assessed and compared.

C.4.
In spite of the merger, the GJU managed to drive the negotiation process and achieve convergence on many topics, which was reflected in the Heads of Terms signed at the end of 2006 with the merged consortium.

THE GALILEO PROGRAMME WAS INITIATED IN THE MID 1990S WITH THE AIM OF ESTABLISHING A EUROPEAN GLOBAL NAVIGATION SATELLITE SYSTEM. IT HAS SEEN SERIOUS DELAYS AND COST-OVERRUNS. IN THIS SPECIAL REPORT THE COURT AUDITED THE DEVELOPMENT AND VALIDATION PHASE OF THE GALILEO PROGRAMME LOOKING AT WHICH FACTORS ACCOUNTED FOR THE FAILURES. THE COURT CONCLUDED THAT MANAGEMENT OF THE DEVELOPMENT AND VALIDATION PHASE WAS INADEQUATE. IF THE MID-2007 REDIRECTION OF THE EGNOS AND GALILEO PROGRAMMES IS TO SUCCEED, THE COMMISSION MUST CONSIDERABLY STRENGTHEN ITS MANAGEMENT OF THE PROGRAMMES. THIS REPORT INCLUDES A NUMBER OF RECOMMENDATIONS AIMED AT SUPPORTING THE COMMISSION IN THIS TASK. FINALLY, SHOULD THE EU RESOLVE TO ENGAGE IN OTHER LARGE INFRASTRUCTURE PROGRAMMES, THE COMMISSION MUST USE THE APPROPRIATE MANAGEMENT TOOLS.