



## The Galileo project put to the test of European competition and public procurement law

*Comments on the regulatory policies of EU procurement with regard to infrastructure projects*

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The usual disclaimer applies



## **Abstract**

For the procurement of products within the Galileo project that involves relatively large batch sizes (space segment and ground stations), the European Community is both bound by law and prompted by micro-economic reasons to organise the contract award in two phases. For the first batch, a minimum of two bidders should be awarded equal lots. In consideration of the experiences made with this award decision it shall be deliberated for the second batch whether the contractual conditions should merely be adapted and dual sourcing should be continued or it will be determined from the outset that the best performing bidder of the first batch will be awarded the second batch.

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## Introduction

Few projects undertaken by the European Union are based on such fragile legal authorization yet have such great economic relevance as the Galileo project.

“Galileo” is the name given to the European satellite navigation system (GNSS)<sup>1</sup>, a joint project of the European Union, ESA and the European aerospace industry. It is based on Art. 154 TEC (establishment and development of trans-European networks with regard to transport, telecommunication and energy infrastructure) and concerns itself exclusively with the civil use of navigation satellites.

The legal authorization called upon for this large-scale project, Art. 154 TEC, would only be applicable if Galileo made a contribution to the realisation of the single market as well as to the strengthening of the economic and social solidarity of the Community as a whole, serving the establishment and development of trans-European networks with regard to traffic, telecommunication and energy infrastructure.<sup>2</sup> The European Union considers this enabling legislation applicable as a matter of course and claims it for all of its implementing legal acts under secondary law. However, the projected construction and operation of a system of navigation satellites intended to provide European independence of GPS<sup>3</sup> remains legally questionable. As the procurement of navigation satellites for the establishment of trans-European networks with regard to the realisation of the single market is not unambiguous. Furthermore, the European Community would appear to be obliged to observe the principle of subsidiarity in this field as well.<sup>4</sup>

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<sup>1</sup> Global Navigation Satellite System

<sup>2</sup> Regulation (EC) No. 683/2008 of 9 July 2008 on the further implementation of the European satellite programmes (EGNOS and Galileo), (2) p. 1, Official Journal L 196 of 24 July 2008, p. 1–11 (hereinafter referred to as “Galileo Regulation”)

<sup>3</sup> Global Positioning System

<sup>4</sup> Thus argued by Voet van Vormizeele in Schwarze, EU-Kommentar, Baden Baden 2009 Art. 154 RZ 9

Yet nobody will doubt the economic benefits and the lack of technological and political alternatives to Galileo, irrespective of all legal objections to the Community's authorisation. The creation of a system of navigation satellites can neither be realised by the Community's separate member states nor can it be realised by all 27 member states in the form of intergovernmental cooperation. According to general consensus, Galileo belongs to the category of those undertakings that are wanted by all member states yet require a Community framework for enabling their realisation.

It is a pity, though, that due to the marginal authority of the European Union in the field of military policy the cardinal importance of a system of navigation satellites for Europe's autonomy in the command of its armies and its independence from the United States of America has not been mentioned in a single legal document with the necessary clarity.<sup>5</sup>

For years the European Union had tried to realise the project within the framework of a so-called public private partnership.<sup>6</sup> It eventually became apparent that the private business enterprises involved were not willing to bear the risks involved in the project during the construction and operation stages. In addition, the in-orbit validation activities proved extremely difficult to realise. All time and cost estimates

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<sup>5</sup> Potential military use requires corresponding constitutional terms of reference due to the principle of conferred competence in accordance with Art. 5 (1) TEC. Art. 17 TEU stipulates the European Union's collective authority for military politics in the context of common foreign and security policy; however, this procedurally designed authority is meant to be realised only gradually, yet by law it is possible to realise it any time through resolutions within the CFSP system: cp. Graf Kielmansegg, *Die verteidigungspolitischen Kompetenzen der Europäischen Union* EuR 2006, 182 (190), (200);

For an in-depth discussion see: IVSG Memo No. 11/2008 *Wesentlicher Fortschritt nicht erkennbar, Anmerkungen zu den verteidigungspolitischen Neuerungen des Lissabon-Vertrages*;

Dietrich, *Die rechtlichen Grundlagen der Verteidigungspolitik der Europäischen Union*, ZaöRV 66 (2006), 663-697; and

Schmidt-Radefeldt, *Parlamentarische Kontrolle der internationalen Streitkräfteintegration*, *Schriften zum Völkerrecht* Band 156, Duncker & Humboldt Berlin

<sup>6</sup> See Hobe / Heinrich / Kerner / Schmidt-Ted, *Zeitschrift für Luft- und Weltraumrecht*, 1/2009, page 48 et seq.

were exceeded. The extent of the budget overrun can be derived from the following table<sup>7</sup>:

Table 1: updated final costs<sup>8</sup>

	Initial CAC	Updated	Comments
Phase CO	46	47	
GIOVE <sup>9</sup>	178	270	Launcher(+40) GIOVE B + GIOVE A2: +15 Impl NSGU Extn GIOVE A
IOV <sup>10</sup>	1003	1424	40M€ IOV delay 350M€ novation 33M€ other changes
2 IOV Launcher	75	176	Soyouz Fregat: 38M€ launch service 64M€/launch
TUS <sup>11</sup>	20	24	MBOC <sup>12</sup> implementation
Sites	16	20	
Miscellaneous (incl. GJU <sup>13</sup> )	69	85	
ESA costs	150	344	Programme elongation Full recharge of GH C ESA as prime
Total	1557	2391	

The GIOVE and IOV phases alone are responsible for more than 500 million euro of additional costs.<sup>14</sup> Technical specifications had to be adapted, resulting in delays and additional expenditure, a development that should have been anticipated. Indeed, “*the Galileo budget for development and validation, as presented to the*

<sup>7</sup> Source: European Space Agency, Council Working Group for the preparation of the Council meeting at ministerial level, Financial situation of the GalileoSat Programme, ESA/C/WG-M(2008)28, 18 July 2008, p. 17

<sup>8</sup> According to European Space Agency, Council Working Group for the preparation of the Council meeting at ministerial level, Financial situation of the GalileoSat Programme, ESA/C/WG-M(2008)28, 18 July 2008, p. 17

<sup>9</sup> Galileo In-Orbit Validation Element

<sup>10</sup> In-Orbit Validation

<sup>11</sup> Test User Segment

<sup>12</sup> New signal implemented on IOV at the Commission's request

<sup>13</sup> Galileo Joint Undertaking

<sup>14</sup> As shown by above ESA table, GIOVE are accountable for 92 million euro and IOV for 421 million euro of additional costs.

Council<sup>15</sup>, was incomplete. It did not contain any explicit contingency budget or reserve. It was lower, at 1.1 billion euro, than the cost estimates resulting from the definition phase.<sup>16</sup>

The programme's new structuring of the year 2007 also forced ESA to double the size of its Galileo team for 2008/2009. This resulted in additional costs of 32 million euro.<sup>17</sup>

Table 2: **The updated cost estimate for the Galileo programme<sup>18</sup>:**

	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 sector*)	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.

Following this sobering experience which became the subject of a report prepared by the European Court of Auditors<sup>19</sup> and was given attention in law journals,<sup>20</sup> the

<sup>15</sup> COM(2000) 750 of 22 November 2000

<sup>16</sup> Cp. ECA, Special Report No. 7/2009 The Management of the Galileo Programme's Development and Validation Phase, with the Commission's replies, History of Galileo, page 27

<sup>17</sup> European Space Agency, Council Working Group for the preparation of the Council meeting at ministerial level, Financial situation of the GalileoSat Programme, ESA/C/WG-M(2008)28, 18 July 2008, p. 7

<sup>18</sup> Source: ECA, Special Report No. 7/2009 The Management of the Galileo Programme's Development and Validation Phase, with the Commission's replies, History of Galileo, page 19

<sup>19</sup> ECA, Special Report No. 7/2009 The Management of the Galileo Programme's Development and Validation Phase, with the Commission's replies, History of Galileo, page 6



European Union decided to realise the Galileo project without PPP. This political intention contrasted with a lack in actual experience for a procurement undertaking of this size and nature. It was therefore an obvious step to commission the European Space Agency (ESA), whose members do not all belong to the EU, as the project's procurement agency.<sup>21</sup> Despite ESA's undeniable expertise and experience in this field, this decision is not without problem as ESA had never dealt with a procurement project of this scale.<sup>22</sup> Furthermore, ESA has so far not realised an undertaking according to the procurement principles of the European Community.

These universally valid procurement principles<sup>23</sup> that are subject to review by the European Court of Justice have been specified decisively by Regulation (EC) No. 683/2008 of 9 July 2008.<sup>24</sup> The specified secondary-law definition abides by those principles claimed by the European Community ever since its foundation: i.e. the creation of a system of undistorted competition for the purpose of the implementation of the single market.<sup>25</sup>

Recital 25 of said Regulation thus reads as follows:<sup>26</sup>

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<sup>20</sup> Hobe / Heinrich / Kerner / Schmidt-Ted, *Zeitschrift für Luft- und Weltraumrecht*, 1/2009, page 48 et seq.

<sup>21</sup> Cp. Art. 18 (1) Regulation (EC) No. 683/2008 of 9 July 2008 on the further implementation of the European satellite programmes (EGNOS and Galileo): *"On the basis of the principles set out in Article 17, the Community, represented by the Commission, shall conclude a multi-annual delegation agreement with ESA, on the basis of a delegation decision adopted by the Commission in accordance with Article 54 (2) of the Financial Regulation [...]."*

<sup>22</sup> For 2008 ESA had a budget of 3.028 billion euro.

[http://www.esa.int/SPECIALS/Ministerial\\_Council/SEMP4N0MF\\_0.html](http://www.esa.int/SPECIALS/Ministerial_Council/SEMP4N0MF_0.html)

<sup>23</sup> Cp. Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts;

Cp. Council Regulation (EC) No. 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities

<sup>24</sup> Official Journal of the European Union L 196 of 24 July 2008

<sup>25</sup> Official Journal of the European Union of 24 July 2008, L 196/3, Recital 25

<sup>26</sup> Regulation (EC) No. 683/2008 of 9 July 2008 on the further implementation of the European satellite programmes (EGNOS and Galileo)

“Open access and fair competition throughout the industrial supply chain and the balanced offering of participation opportunities to industry at all levels, including, in particular, to small and medium-sized enterprises (SMEs), should be pursued across Member States. Possible abuse of dominance or long-term reliance on single suppliers should be avoided. In order to mitigate programme risks, to avoid reliance on single suppliers and to ensure better overall control of the programmes and their costs and schedules, dual sourcing should be pursued, wherever appropriate.”

This passage describes the essential underlying principle of the EU policy with respect to public procurement but it does not sufficiently define it. Art. 17 (3) of the “Galileo Regulation” specifies the standards for awarding contracts during the deployment phase of the Galileo programme as follows:

- a. the procurement of the infrastructure shall be split into a set of six main work packages (system engineering support, ground mission infrastructure completion, ground control infrastructure completion, satellites, launchers and operations), as well as a number of additional work packages, through a comprehensive overall procurement break-down; this does not rule out the prospect of multiple simultaneous procurement strands for individual work packages, including for satellites;
- b. competitive tendering shall be ensured for all packages and, for the six main work packages, a single procedure shall be applied whereby any one independent legal entity, or a group represented for this purpose by a legal entity belonging to that group, may bid for the role of prime contractor for a maximum of two of the six main work packages;
- c. at least 40 % of the aggregate value of the activities shall be subcontracted by competitive tendering at various levels to companies other than those belonging to groups of entities that are prime contractors for any of the main work packages; the Commission shall, on a regular basis, report to the Committee on the fulfilment of this principle. In the event that projections establish that it may not be possible to reach the 40 % threshold, the Commission shall, in accordance with the management procedure referred to in Article 19(3), take the appropriate measures;
- d. dual sourcing shall be pursued wherever appropriate in order to ensure better overall control of the programme, its costs and schedule.



For the launch of satellites into space, however, for security reasons the decision was made in favour of the European enterprise Arianespace. In the following sections, this paper deals with the question if, and how, the principles of the Regulation of 24 July 2008 (Recital 25 and Article 17 (3)) can be realised at least for procurement during the deployment phase.

## II. Project structure

The Galileo project represents one of the two satellite navigation systems promoted by the European Commission.<sup>27</sup> Following its completion, it is intended to provide five main services.<sup>28</sup> The Galileo programme is divided into several phases. The initial definition phase is followed by the development and validation phase, a deployment phase and finally the operation phase. Furthermore, the navigation system is meant to have trans-European relevance in that even non-member states will be allowed to make use of it upon the conclusion of corresponding agreements.<sup>29</sup>

In the context of the project management, the competence is divided between Commission, the European GNSS Supervisory Authority<sup>30</sup> and ESA<sup>31</sup> as follows:

The European Community as represented by the Commission is the owner of the Galileo Navigation Satellite System and the programme assets.<sup>32</sup> Because of the importance and complexity with regard to financing, the three main institutions, the European Parliament, the Council and the Commission, cooperate in the Galileo

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<sup>27</sup> The second system is represented by the *EGNOS* project (*European Geostationary Navigation Overlay Service*).

<sup>28</sup> Open Service = OS, Safety of Life = SoL, Commercial Service = CS, Public Regulated Service = PRS, Search and Rescue = SAR; ECA, Special Report No. 7/2009 The Management of the Galileo Programme's Development and Validation Phase, with the Commission's replies, History of Galileo, page 6. Galileo, S.11.

<sup>29</sup> Cooperation agreements have been concluded with the United States of America (2004), Russia (2006), China (2003) and Israel (2004), and the *NRSCC* (National Remote Sensing Centre of China) and *MATIMOP* (the Israeli Industry Centre for Research & Development) have become members of the *GJU* (Galileo Joint Undertaking). With Ukraine (2005), India (2005), Morocco (2005) and South Korea (2006) general cooperation agreements were concluded that never resulted in an actual participation or even membership in the GJU. Negotiations about cooperation with further countries such as Brazil, Mexico, Chile, Canada, Argentina and Australia were not continued after the dissolution of the GJU: Special Report No. 7/2009 The Management of the Galileo Programme's Development and Validation Phase, with the Commission's replies, Annex III International Cooperation on Galileo, page 62.

<sup>30</sup> *GNSS* Supervisory Authority = *GSA* = a European Union Regulatory Authority that provides support to the European Commission with regard to issues of satellite-based navigation

<sup>31</sup> *ESA* = European Space Agency

<sup>32</sup> Report from the Commission to the European Parliament and the Council on the implementation of the GNSS programmes and on future challenges pursuant to Article 22 of Regulation (EC) No. 683/2008; 2.2 Legal framework, page 4

Inter-Institutional Panel (GIP) according to the joint declaration on the GIP of 9 July 2008.

The Commission is the programme manager and, as such, assumes the overall responsibility for the management of the programmes including the security-related aspects.<sup>33</sup> The GNSS Supervisory Authority<sup>34</sup> has to safeguard the system's security domain accreditation and the operation of the Galileo Security Centre according to the guidelines determined by the Commission.

The full Galileo constellation consists of 30 satellites<sup>35</sup> with their respective launchers, ground infrastructures and initial operations.<sup>36</sup> Two years ago, contracts for the construction of the first four Galileo satellites were already awarded to the company Astrium, a 100% EADS subsidiary,<sup>37</sup> with business sites in Germany, France, Spain and Great Britain.<sup>38</sup>

The procurement tender for the remaining 28 satellites was launched on 1 July 2008. Within the framework of the pre-selection phase, a tender information package was released, containing a number of general specifications and contractual guidelines in addition to the description of the tender procedure. The procurement of the Galileo infrastructure was divided into six main work packages.

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<sup>33</sup> Report from the Commission to the European Parliament and the Council on the implementation of the GNSS programmes and on future challenges pursuant to Article 22 of Regulation (EC) No. 683/2008; 2.2 Legal framework, page 4

<sup>34</sup> Heike Wieland, Europäische GNSS Programme. Rechtliche Struktur und Governance, Symposium Rechtsfragen der Satellitennavigation, 8 October 2008, DLR Oberpfaffenhofen

<sup>35</sup> 28 operational satellites and 4 backup satellites

<sup>36</sup> Report from the Commission to the European Parliament and the Council on the implementation of the GNSS programmes and on future challenges pursuant to Article 22 of Regulation (EC) No. 683/2008; 2.4. Launch of the procurement for the full Galileo constellation, page 6

<sup>37</sup> <http://www.astrium.eads.net/en/press-center/press-releases/2009/galileo-satellite-giove-b-marks-its-first-year-in-orbit>

<sup>38</sup> The core business is divided into three segments: *Astrium Space Transportation* for launchers, carrier rockets and aerospace infrastructures, *Astrium Satellites* for satellites and ground infrastructure segments and *Astrium Services* for the development and supply of satellite-based services.



Each bidding entity is allowed to bid for the role of prime contractor for a maximum of two of these work packages.

After a pre-selection of bidding entities that appeared, to be qualified by the EU Commission,<sup>39</sup> all selected candidates submitted preliminary proposals in November 2008. This was followed by “competitive dialogue” meetings between the candidates and the European Union, represented by ESA. The procurement tender procedure is scheduled to be completed by the end of 2009, following the submission of best and final offers and concluding contracts upon tender acceptance. The entire procurement procedure must comply with the European tender and procurement regulations.<sup>40</sup>

This final phase of the competitive dialogue and the conclusion of concession contracts precede the finalisation of the validation phase IOV.<sup>41</sup> To start series production without waiting for the results of the IOV phase stages a risk for the phase of operations with regard to costs and schedules.

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<sup>39</sup> Cp. Annex 4: GALILEO: 11 candidates short-listed for next step of the procurement procedure

<sup>40</sup> Report from the Commission to the European Parliament and the Council on the implementation of the GNSS programmes and on future challenges pursuant to Article 22 of Regulation (EC) No. 683/2008; 2.2 Legal framework, page 4; Art. 17 (1) of Regulation 683/2008

<sup>41</sup> The contract on the launch of 4 test satellites was signed by ESA and Arianespace not until 16 June 2009. The satellites are scheduled to be boosted into orbit at the end of 2010. <http://www.esa.int>

### III. Procurement conditions regarding navigation satellite systems

#### 1) GPS

Procurement transactions comparable to Galileo and documented in sources accessible to the public can only be found in the USA. Taking a look at NAVSTAR GPS III (Global Positioning System III) proves instructive in this regard. Altogether, 32 satellites will be tendered in three blocks. The contract for the first two satellites, with an option on another ten, has already been awarded to Lockheed Martin in May 2008.<sup>42</sup> The acceptance for the second block of probably eight satellites and the third block of probably 16 satellites is awaited.

Contract awarding in blocks is justified with reference to the reasoning that *block delivery* or *block procurement* meets military requirements best: In consideration of military requirements, corresponding technological adjustments can be made to a relevant number of satellites in a timely manner.<sup>43</sup>

GPS III began as early as November 2000 with the award of a contract for system architecture and the definition of requirements. For this purpose, two 12-month studies were awarded to industry. The contracts, worth USD 16 million each, were secured by Lockheed Martin and Boeing. The same applied for the "System Requirements Review" (SRR). Lockheed Martin and Boeing were awarded contracts for studies of a volume of approx. USD 20 million each. For the next step of procurement, "System Design Review", Lockheed Martin and Boeing were awarded contracts worth USD 50 million each. Upon the request for the

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<sup>42</sup> Press release No. 419-08, May 15, 2008, U.S. Department of Defense.: "The Contract acquires two GPSIIIA research and development satellite[s,] a capability risk reduction and maturation effort to evolve capabilities for GPS IIIB and GPS IIIC, a GPS satellite simulator, and a bus real time simulator. It also includes options for ten additional GPS IIIA production satellites".

<sup>43</sup> Thus Gary Payton, Deputy Under Secretary of the Air Force for Space Programs, "One of the advantages of a block delivery is, depending on warfighter needs, and on demonstrated technology maturity, we can modify the number of spacecraft in each block as we need them in the future. If the technology maturity is promising and is successful, we could transition earlier to GPS IIIB", press release Los Angeles Air Force Base, June 17, 2008.



development and production of GPS III satellites in July 2007 (request for proposal), Lockheed Martin alone was awarded the USD 1.46 billion contract in May 2008.

There are different explanations on the reasons for the acceptance of the Lockheed Martin proposal. According to well informed sources, Lockheed Martin showed a better performance than Boeing did in completing the order for GPS II.<sup>44</sup> For GPS I and II Boeing and Lockheed Martin had been awarded contracts within the framework of the development and production module on a basis of virtual parity.<sup>45</sup>

In the principles of the national U.S. security and space acquisition policy of December 27, 2004<sup>46</sup>, neither a preference for single sourcing nor for dual sourcing was taken as a basis of procurement procedure. However, the guidance does provide highly sophisticated criteria for the decision-making in the acquisition of navigation systems.<sup>47</sup> The considerations of the U.S. Department of Defense for the justification of an acquisition with respect to cost and cost risks remain to be seen. For this purpose, an independent entity conducts ongoing cost analysis with respect to life cycle costs. Why, in application of these aspects, Lockheed Martin was awarded the contract for two GPS III satellites in May 2008 with an option on ten more satellites so that for the competing bidder the mere possibility of the contract award of unequal lots is left, has not been elaborated by the Air Force.<sup>48</sup>

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<sup>44</sup> Boeing won the contract for GPS IIF in 1996. This programme carried several technical problems. The consequence was a delay by more than 3 years and additional costs of \$ 870 million. On this consult "Global Positioning System – Significant challenges in sustaining and upgrading widely used capabilities", Statement of Cristina T. Chaplain, United States Government Accountability Office, May 7, 2009, See also the point of view of Lauren Thompson, analyst in the Lexington Institute.

<sup>45</sup> GPS I Boeing, GPS II A Boeing, GPS II R Lockheed Martin, GPS II RM Lockheed Martin, GPS II F Boeing

<sup>46</sup> National Security Space Acquisition Policy, Guidance for DoD Space System Acquisition Process, Number 03-01, December 27, 2004

<sup>47</sup> Nine different "principles" are identified in this regard: "Mission Success; Accountability; Streamlined / Agile; Inclusive; Flexible; Stable; Disciplined; Credible; Cost Realism". Cp. National Security Space Acquisition Policy, Guidance for DoD Space System Acquisition Process, Number 03-01, December 27, 2004, page 3

<sup>48</sup> "The Air Force planned to use a single prime contractor for 8 GPS IIB spacecraft and 16 GPS IIIC space vehicles". GPS III / GPS Block III, Globalsecurity.org, April 3, 2009.

*"Our primary intent is to establish a long-term contract relationship with one prime. However, we kept our options open. If we have poor execution performance in IIIA or we have a need to increase the industrial base for GPS development capability, we could go to someone else for IIIB development. We structured the contract to give us that option when we move forward in time, that way we'll be able to make that decision if required."*

## 2) EUTELSAT<sup>49</sup>

The intergovernmental organisation EUTELSAT was founded in 1977 to provide Europe with a system of telecommunications satellites.<sup>50</sup> The contractual Convention of 1982 specifies the objectives of this organisation.<sup>51</sup> The organisation itself ranks 47 member states, including 25 of the 27 member states of the European Community.<sup>52</sup> 2001, the public limited company Eutelsat was established consistent with the resolution of Cardiff of 28 May 1999 in order to “operate a system of satellites and to provide satellite services.”<sup>53</sup> For this purpose all assets and activities of EUTELSAT were supposed to be transferred to the new company. However, the intergovernmental organisation EUTELSAT still exists today and sees to it that the public limited company Eutelsat complies with the basic principles of the Convention: The commitment to a universal service, i.e. satellite services coverage beyond Europe, the rules of non-discrimination and of fair competition.<sup>54</sup>

According to an agreement made in the year 1979 the first five satellites were constructed under ESA supervision. Upon completion they were transferred to EUTELSAT for operation purposes. Subsequently EUTELSAT has launched invitations to tenders for follow-up satellite generations on its own. Tenders submitted are assessed according to the usual criteria: quality of the proposal, price and compliance with schedule. Even before the formation of the public limited company Eutelsat in the year 2001, the organisation EUTELSAT had always transacted the procurement of satellites and also space launch vehicles, through dual sourcing with several suppliers (Alcatel, Space Industries, EADS Astrium,

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Colonel Dave Madden, Space and Missile System Center's Global Positioning Systems, press release Los Angeles Air Force Base, June 17, 2008.

<sup>49</sup> European Telecommunications Satellite Organisation

<sup>50</sup> See the Preamble to the Convention of 14 May 1982

<sup>51</sup> Convention of 14 May 1982

<sup>52</sup> Only Estonia and Slovakia

<sup>53</sup> Article II of the Convention of 14 May 1982 in the version of the Cardiff agreement of 20 May 1999

<sup>54</sup> Article III of the Convention of 14 May 1982 in the version of the Cardiff agreement of 20 May 1999



Matra Marconi Space, Arianespace).<sup>55</sup> In this way it was assured that the existence of no single product line of satellites became dependent on the monopoly of one single supplier. This dual sourcing policy had another reason: EUTELSAT wanted to benefit from the most competitive proposal and the most innovative technology each time.

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<sup>55</sup> See Annex 3

#### IV. Potential for the optimisation of procurement

The effort towards an optimisation of procurement within the various Galileo procurement procedures does not take place in an area unregulated by law. The procedures accepted under micro-economic aspects for the determination of the best quality equipment at the lowest price<sup>56</sup> are applied in accordance with the applicable legal provisions of the European Community. These are, as have already been discussed, the general rules of procurement, stipulating for the procurement decision or the acceptance of a tender that among all proposals the most economical one at the best quality will be chosen. With regard to Galileo, this principle of cost effectiveness has been specified and qualified in a normative framework. As it follows from Recital 25 of Regulation No. 683/2008 of 9 July 2008 that the European Community intends to make this undertaking a prime example for the system of undistorted competition. This *telos*, i.e. the objective of open access and fair competition for the entire industrial supply chain, has been condensed to an operating procurement principle according to which, in Art. 17 (3) d of Regulation No. 683/2008, a normative preference for dual sourcing has been laid down in writing. This normative preference for dual sourcing, however, bears the proviso that it assures better overall control of the programmes, their costs and their schedules. The decision on this implies that the risks and costs carried by single sourcing and dual sourcing can be compared with each other. Yet it would normally be necessary to evaluate the navigation system *in toto*, i.e. even after the start of operation, under life cycle aspects<sup>57</sup> with respect to different procurement methods. However, this is not possible for the Galileo procedure because the project as a whole is divided into six main work packages, each one representing a legally independent entity:

- System Support

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<sup>56</sup> Cp. Annex 2: Keyword: Dual sourcing and life cycle costing – cost optimisation through dual sourcing. And Stefan Schweiger (ed.) *Lebenszykluskosten optimieren, Paradigmenwechsel für Anbieter und Nutzer von Investitionsgütern*, 1st edition 2009

<sup>57</sup> *Ibid.* 42.

- Ground Mission System
- Ground Control System
- Space segment
- Launch Services
- Operations

As has been pointed out, only one tenderer (Arianespace) was considered sufficiently qualified for providing services for the segment "Launch Services" while in all other segments several candidates are competing with each other. If the two main work packages "Ground Mission System" and "Space segment" are taken as an example, it cannot be dismissed that dual sourcing of services will result in doubling certain costs (research and design expenses). However, according to Recital 25 of the Regulation of 2008 the legislator unambiguously emphasized that the procurement markets for the separate segments may under no circumstances be made subject to the *dominance* of single suppliers and that medium-term reliance and therefore market dominating positions must be avoided by all means. In view of the experiences made with the award of the contract for IOV satellites to a single supplier and due to the corresponding cost increase and delays it becomes apparent why the legislator decided in favour of dual sourcing as a rule. Another relevant aspect is engineering security; this viewpoint makes more than one supplier imperative.

Therefore, there is a "legal presumption" in favour of the application of dual sourcing to substantial work packages. However, the question remains how dual sourcing is to be organised. Much can be said in favour of a solution by which each work package is divided into two or three partial packages and the short-listed candidates are accepted for the first partial batch based on quantitative parity. Only this way it can be assured that experience collected during this initial phase of

procurement justify assessments and conclusions that can be analysed for use in the second phase of the procurement procedure. If no equal-lot contract awarding is carried out during the initial phase of the batch, experience made with the two tenderers are not necessarily comparable. The tenderer who was assigned the greater portion of the batch will claim other necessities with regard to scheduling and cost level than the bidder who was responsible only for a smaller batch size. If it comes to cost overrun or if the time schedule is not complied with, sufficiently exact conclusions can be derived only from comparable batch sizes. These conclusions can then be taken into consideration during the second phase of the procurement procedure for the final batch in that newly adapted contractual terms are determined for both tenderers. It is also conceivable that compliance with cost limits and time schedules for the first part of the batch is awarded in such a way that the top performing tenderer of the first phase is automatically given the acceptance for the second phase of the procedure. However, this latter approach (i.e. doing without dual sourcing in the final phase) would always be exposed to the risk that the public sector would be confronted – probably even over a long term – by one single private contractor.

It is surprising that neither the European Commission nor the European Parliament's Budget Committee have ever taken a closer look at this issue. It would appear that these institutions should engage in the long-term control of the development of costs *ex officio*.

Conclusion:

In the procurement of products within the framework of the Galileo project that involves relatively large batch sizes (ground mission infrastructure/ satellites), the European Community is not only bound by law but also prompted by the consideration of micro-economic aspects to conduct the procurement procedure in two phases. For the first batch, contracts should be awarded to at least two



tenderers based on quantitative parity. In view of the experiences made with this award decision, for the second part of the batch it shall be deliberated whether merely the procurement conditions will be adapted and dual sourcing will still be applied or it will be determined in advance that the second part of the batch shall be awarded to the best performing bidder during the first phase.

## Annex 1: Status quo under procurement law

1. After testing four satellites<sup>58</sup>, the contract award process for the 28 satellites in the deployment phase of the Galileo project is structured in two stages. It looks likely that a total of 16 satellites were intended to be constructed in the first stage. In the second stage final construction contracts for the remaining number of satellites, probably 12, will be awarded to the bidder that achieves the most cost-effective<sup>59</sup> result of the competing candidates.

The question arises if a tenderer has a claim against the European Union, represented by the European Commission as central contracting authority, entitling him to being awarded a contract of a specific volume even though other competitors have submitted a technically equivalent proposal.

2. Each short-listed, technically qualified bidder is entitled to a contract award based on parity in compliance with Art. 17 (3) c and Art. 17 (3) d “Galileo Regulation”<sup>60</sup> read in conjunction with applicable “Financial Regulations”.<sup>61</sup>

a. These rules provide subjective legal status particularly to small and medium-sized enterprises due to the “effet utile” and specific individualisation: The Commission is obliged to transact the contract award for the initial number of satellites according to the procurement model of dual sourcing. This obligation is a consequence of the normative preference for dual sourcing according to Art. 17 (3) d “Galileo Convention” on the one hand and of the rationale that the presumption favouring dual sourcing cannot be rebutted “in concreto” by arguing for better cost-effectiveness of single sourcing on the other hand. Only dual sourcing guarantees sufficient competition throughout the entire lifecycle of the long-term Galileo project and prevents the formation of a monopoly in the satellite segment.<sup>62</sup> Development in the form of single sourcing, however, carries the risk of technical delays and time delays effecting the schedule. A case in point, the construction of the IOV test satellites has shown that single sourcing leads to a multiplication of costs as well as to delays.

b. With respect to content, each tenderer may claim that the contracting authority will adhere to the procurement criteria, according to the pre-defined proportionate emphasis placed on each of them, and award the contract according to the best cost-benefit ratio. As the results of the first satellite batch will presumably prove decisive for the further procurement process, the tenderer shall be entitled to contract award without abuse of discretion even during the first stage. As any comparison

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<sup>58</sup> during the IOV phase

<sup>59</sup> the best cost-benefit ratio

<sup>60</sup> Regulation No. 683/2008.

<sup>61</sup> Regulation No. 1605/2002 and Regulation No. 1995/2006

<sup>62</sup> Recital 25, reasons for the enactment of the “Galileo Regulation”; Art. 17 (2) “Galileo Regulation”

presupposes identical conditions regarding the number of objects of comparison and cost calculation, this claim with respect to content is directed towards a contract award based on quantitative parity. Each qualified candidate is thus entitled to be awarded a contract for the construction of 50% of satellites from the first batch.

3. If the European Commission awards contracts contrary to these standards, each tenderer may file an action for annulment in the form of a third-party appeal against a decision in accordance with Art. 230 TEC on grounds of the infringement of a secondary right. According to Art. 233 TEC the contracting authority will then be committed to annul its flawed award decision and make a new decision. If the tenderer has already sustained actual losses, he may file an action for damages. Insofar as there is special reason for urgency, the tenderer may resort to provisional legal protection in accordance with Art. 242 TEC.

**Annex 2: Keyword: Dual sourcing and life cycle costing - cost optimisation through dual sourcing**

Dual sourcing can avoid the dependence on a single contractor and the result on the enterprise's pricing power by a systematic comparison of two manufacturers. Furthermore, costs can be compared and saved, if possible, by means of a design-to-cost procedure<sup>63</sup> based on life cycle costing<sup>64</sup>. Dual sourcing allows the entire Galileo project to be put into operation earlier, avoiding opportunity cost<sup>65</sup> that arises due to time delays.

The simultaneous deployment of satellites by two manufacturers requires half the time one manufacturer would take for the same number of satellites in case of single sourcing procurement. At this point it must be deliberated if an early start of operation of the Galileo satellite navigation system economically compensates the amount of additional development expenditure.<sup>66</sup> Time delays affecting projects of this size cause considerable opportunity cost.

Another disadvantage of single sourcing results from the satellites' follow-up costs.<sup>67</sup> Maintenance and other services must be procured from the original manufacturer because of its specific expert knowledge. The amount of costs incurred for such services therefore depends on the manufacturer's pricing power. For this scenario there are no options for comparison, no alternatives.

In order to avoid high follow-up costs, early identification of the life cycle cost drivers<sup>68</sup> is mandatory. The "rule of ten" illustrates the context of exponential growth over all life cycles of products or projects. A change or adjustment costs e.g. one euro in the planning stage, ten euro in the construction and design stage, 100 euro during the pre-production phase (C0 phase), 1,000 euro during deployment and 10,000 euro after delivery.<sup>69</sup>

In the design-to-cost procedure, the satellites' life cycle phases are divided into cost pools prior to the contract award for development and deployment and binding cost

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<sup>63</sup> Procedure of product development according to which the most cost-effective solution for individual components is consistently searched for even during the development stage. In determining costs, follow-up costs (e.g. marketing expenses, service costs) are taken into consideration in particular.

<sup>64</sup> Life cycle costs are the total costs of a product, system or project incurred over its entire life, including the costs it produces for other business divisions. The concept of life cycle costs is of relevance especially for the adequate assessment of the appeal of (investment) projects as decision-making is often based only on a comparison of acquisition cost, disregarding follow-up costs.

<sup>65</sup> Opportunity cost means the cost of the alternative utilization of a scarce factor. Opportunity cost is also defined as loss of use. The term "loss of use" must be specified content-wise in the individual case: "sales loss, loss of earnings, interest loss or profit margin loss."

<sup>66</sup> Development expenses are costs of the implementation of new or further developments incurred for plans or samples prior to the start of marketable production.

<sup>67</sup> Follow-up costs are among others costs of operation, maintenance and other services.

<sup>68</sup> Cost drivers are influencing factors that represent the change or increase in structure costs. The greater the complexity, the higher the structure costs.

<sup>69</sup> Cp. Heiko Noske, Christos Kalogerakis – Lebenszykluskosten optimieren, p. 141 et seq.; ed. by Stefan Schweiger, (2009)

targets are defined for each cost pool. The sum of all cost pools equals the satellites' total life cycle costs. Upon divergences within one cost pool, causes of error are analysed and controlled cost-effectively if possible during the (pre-) stage that bears the error. Thus the effects of the "rule of ten" can be reduced and avoidable follow-up costs can be controlled early on.

Dual sourcing can assure comparability and control of the separate manufacturers and prevent manipulation from happening. The overall concept of the life cycle cost oriented development and construction of satellites can be reused for future space projects. The access to historically valid data provides fundamental decision support for future procurement action.<sup>70</sup>

In summary the following can be said: Through an application of dual sourcing procedures

- one single manufacturer's opportunist advantages and pricing power are avoidable.
- target achievement will be strengthened and promoted by a competitive environment.
- the entire life cycle of all satellites can be more properly identified with regard to quality and quantity and a continuous improvement process is made possible.
- total costs are optimised on the basis of life cycle consideration, high cost transparency and the comparability of two manufacturers.
- compliance with cost and time schedules is assured. This favours the satellites' early readiness for operation and avoids high opportunity cost.

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<sup>70</sup> Cp. National Research Council (U.S.). Committee on Technology for Space Science and Applications of the Aeronautics and Space Engineering Board - Reducing the costs of space science research missions: proceedings of a workshop, p. 49 et seq. (1997); cp. Heiko Noske, Christos Kalogerakis – Lebenszykluskosten optimieren, p. 143 et seq.; ed. by Stefan Schweiger, (2009); cp. Robert Schwarz et. al. – A Probabilistic Model for the Determination of the Effects of Automation of Satellite Operations on Life Cycle Costs, p. 956 et seq. (1996)

### Annex 3: EUTELSAT satellites

Previous satellites (out of service) :

Designated position	Satellite	Launch date	Satellite construction
13° East	ECS 1	16 Jun 1983	British Aerospace
7° East	ECS 2	4 Aug 1984	British Aerospace
13° East	ECS 3	12 Sep 1985 (defect)	British Aerospace
10° East	ECS 4	16 Sep 1987	British Aerospace
13° East	ECS 5	21 Jul 1988	British Aerospace
13° East	EUTELSAT II F1	30 Aug 1990	Aerospatiale
10° East	EUTELSAT II F2	15 Jan 1991	Aerospatiale
16° East	EUTELSAT II F3	7 Dec 1991	Aerospatiale
7° East	EUTELSAT II F4	9 Jul 1992	Aerospatiale
36° East	EUTELSAT II F5	24 Jan 1994 (defect)	Aerospatiale
13° East	EUTELSAT II F6 (HOTBIRD 1)	29 Mar 1995	Aerospatiale
13° East	HOTBIRD 2	21 Nov 1996	Matra Marconi Space
13° East	HOTBIRD 3	2 Sep 1997	Matra Marconi Space
13° East	HOTBIRD 4	27 Feb 1998	Matra Marconi Space
10° East	EUTELSAT W1	Destroyed at launch	Aerospatiale (Alcatel Space)
16° East	EUTELSAT W2	5 Oct 1998	Alcatel Space (Aerospatiale)

Satellites in operation:

Designated position	Satellite	Launch date	Satellite construction
12.5° West	Atlantic Bird 1	28 Aug 2002	Aliena Spazio
8° West	Atlantic Bird 2	25 Sep 2001	Alcatel Space Industries
7° West	Atlantic Bird 4A	12 Feb 2009	EADS Astrium
5° West	Atlantic Bird 3	5 Jul 2002	Alcatel Space Industries
4° East	Eurobird 4A	6 Sep 2000	EADS Astrium
7° East	W3A	16 Mar 2004	EADS Astrium
9° East	Eurobird 9A	11 Mar 2006	Alcatel Space Industries

10° East	W2A	3 Apr 2009	Thales Alenia Space
13° East	Hot Bird 6	21 Aug 2002	Alcatel Space Industries
13° East	Hot Bird 8	5 Aug 2006	EADS Astrium
13° East	Hot Bird 9	20 Dec 2008	EADS Astrium
16° East	W2	5 Oct 1998	Alcatel Space Industries
16° East	Eurobird 16	27 Feb 1998	EADS Astrium
21.5° East	W6	12 Apr 1999	Alcatel Space Industries
25.5° East	Eurobird 2	9 Oct 1998	EADS (formerly Matra Marconi Space)
28.5° East	Eurobird 1	8 Mar 2001	Alcatel Space Industries
33° East	Eurobird 3	27 Sep 2003	Boeing Satellite Systems
36° East	W4	24 May 2000	Alcatel Space Industries
36° East	SESAT 1	18 Apr 2000	Alcatel / NPO-PM
48° East	W48	21 Nov 1996	EADS Astrium
70.5° East	W5	20 Nov 2002	Alcatel Space Industries
76° East	W76	2 Sep 1997	EADS Astrium
<b>Additional capacity</b>			
15° West	Telstar 12	19 Oct 1999	Space Systems/ Loral (leased capacity)
14° West	Atlantic Bird 14	10 Jun 2002	NPO Prikladnoi Mekhaniki (NPO PM) (Bus), Alcatel Space (payload)
8° West	Telecom 2D	8 Aug 1996	EADS (formerly Matra Marconi Space)
3° West	Telecom 2C	6 Dec 1995	EADS (formerly Matra Marconi Space)
53° East	SESAT 2	29 Dec 2003	Alcatel / NPO-PM (leased capacity)

Next launches:

Designated position	Satellite	Estimated launch date	Satellite construction	Comment
36° East	W7	November 2009	Alcatel Space Industries	To replace SESAT 1
16° East	W3B	2 <sup>nd</sup> quarter 2010	Thales Alenia Space	To replace W 2
13° East	KASAT	3 <sup>rd</sup> quarter 2010	EADS Astrium	
7° East	W3C	3 <sup>rd</sup> quarter 2011	Thales Alenia Space	
7° West	Atlantic Bird 7	4 <sup>th</sup> quarter 2011	EADS Astrium	

Quelle: [www.EUTELSAT.com](http://www.EUTELSAT.com)



**Annex 4: Galileo: 11 candidates short-listed for next step of the procurement procedure**

**Press release of the European Commission**

IP/08/1377  
Brussels, 19 September 2008

The European Commission and the European Space Agency have selected 11 applicants out of the 21 applications received for the procurement procedure of the first complete constellation of the European satellite navigation system (GALILEO). During the first phase of the procedure, interested parties submitted a "Request to participate" and candidates were short-listed on the basis of pre-defined selection and exclusion criteria. The next step of the procurement procedure will be organised and managed by the European Space Agency as the delegated procurement agent, in close coordination with the European Commission as the contracting authority.

The 11 pre-selected candidates are:

1. System Support  
ThalesAleniaSpace (IT)  
Logica (NL)
2. Ground Mission System  
ThalesAleniaSpace (FR)  
Logica (UK)
3. Ground Control System  
Astrium (UK)  
G-Nav grouping represented by Lockheed Martin IS&S (UK)
4. Space segment  
Astrium (DE)  
OHB System (DE)
5. Launch Services  
Arianespace (FR)
6. Operations  
Nav-up grouping represented by Inmarsat (UK)  
DLR (DE) und Telespazio (IT)



For more general information about GALILEO, please visit:  
[http://ec.europa.eu/dgs/energy\\_transport/galileo/index\\_de.htm](http://ec.europa.eu/dgs/energy_transport/galileo/index_de.htm)

<http://www.esa.int/export/esaSA/navigation.html>

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