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GALILEO'S PUBLIC REGULATED SERVICE : FROM SECURITY TO MILITARY APPLICATIONS ?

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ABSTRACT

Galileo is a satellite positioning and navigation system specifically for civil purposes. Galileo will provide five distinct service groups: the Open Service (OS), the Safety-of-Life Service (SoL), the Commercial Service (CS), the Search and Rescue Service (SAR) and the Public Regulated Service (PRS). The latter will have a highest level of security than the ones of OS, CS, SoL and SAR. PRS is required to be operational at all times and in all circumstances, when other services may be jammed or spoofed. PRS will be an access-controlled and encrypted signal for governmental applications, controlled by civil bodies, and used by identified categories. The use of PRS will be allowed, by European Union and participating states. Member States will be authorised, unanimously, users through the implementation of appropriate controlled access techniques. However, the purposes for which the governmental entities can use the PRS is not clear. Galileo's military use is never openly mentioned, in aid of the more consensual term of "security". All the more, it appears quite difficult that the European military forces make the deadlock on a new system which will reduce their dependence to the GPS.

FULL TEXT

BACKGROUND

Galileo is the first major programme to bring the European political institutions (EU) and the European space institutions (ESA) together. On the EU side, the European Council in June 1999, established the involvement of the European Community in Global Navigation Satellite Systems (GNSS) by the creation of the Galileo satellite navigation programme¹. On the ESA side,

the European Agency was formally involved in the process by the approval of GalileoSat program Declaration, at the ESA Council at the ministerial level, in May 1999. The regulation setting up the Galileo Joint Undertaking was adopted

Satellite Navigation Services – Galileo, of 19 July 1999, Official Journal n° C 221/1, 3 August 1999; See also: WARINSKO (N.), TYTGAT (L.), "Le programme GALILEO, l'engagement de l'Europe dans une nouvelle génération de services de navigation par satellite", *Revue du Marché commun de l'Union européenne*, June 2000, n° 439, pp. 392-394.

¹ Council Resolution (EC) 1999/C 221/01, *The Involvement of Europe in a New Generation of*

on May 2002², following the Council decision of March 2002.

This initiative is the second step having towards satellite navigation technology, the first step having been the European Geostationary Navigation Overlay Service (EGNOS)³. Galileo is the most technically sophisticated and costly European space programme. The goal of this joint initiative is "to put in place the European contribution to a global multimodal navigation system under civilian control"⁴. Since Galileo is a civil system under civil control⁵, does it prevent the military users to use it?

FROM A CIVIL SYSTEM TO A DUAL USE SYSTEM?

The need for a secured service

In contrast with the American GPS, a system completely controlled by the US Department of Defence, and the Russian Federation's military Glonass, Galileo is a satellite positioning and navigation system specifically for civil purposes. Galileo will provide five distinct service groups: the Open Service (OS), the Safety-of-Life Service (SoL), the Commercial Service (CS), the Search and Rescue Service

(SAR) and the Public Regulated Service (PRS). The latter will have a highest level of security than the ones of OS, CS, SoL and SAR.

The European Commission reserves a particular attention to the regulated service. It reminds that "open signals are extremely sensitive to interference or to deliberate - potentially hostile - manipulation. The need for a PRS service is conditioned by the vulnerability of satellite navigation signals, the special features of the service and the very sensitive nature of the anticipated application"⁶.

The PRS is required to be operational at all times and in all circumstances, when other services may be jammed or spoofed. The regulated service will be separated from the other services, so it can be denied without affecting its operations⁷. This service will be an access-controlled and encrypted signal for governmental applications, controlled by civil bodies, and used by identified categories. It will be offered to a limited number of governmental and strategic civil users⁸, at the EU level (such as Europol, the European Anti-Fraud Office (OLAF), civil protection services, safety services, peacekeeping forces, humanitarian response teams), as well as at the national level (i.e., police, fire, ambulance, customs or intelligence

² Council Regulation (EC) No 876/2002, *Setting up the Galileo Joint Undertaking*, Brussels, 21 May 2002, Official Journal n° L 138 of 28 May 2002, p. 001.

³ ANDRIES (S.), "The European Initiative Galileo: A European Contribution to the Global Navigation Satellite System (GNSS)", *Yearbook of Air and Space Law*, vol. XXV, 2000, p. 48.

⁴ European Commission, *Galileo definition Phase*, Initial results, Brussels, 7 June 2000, at. 26.

⁵ Conclusions of the Council of the European Union, 2430th Council Meeting, Transport and Telecommunications, Brussels, 25-26 March 2002, 7282/02 (Presse 78), p. 20; Council Resolution (EC) 2001/C 157/01 on Galileo, of 5 April 2001 July 1999, Official Journal n° C 157, 30 May 2001, pp. 001-003.

⁶ Communication from the Commission to the European Parliament and the Council, *State of progress of the Galileo Programme*, Section 3.2. "The need for a public regulated service (PRS)", Brussels, 24 September 2002, COM (2002) 518 final, p. 7.

⁷ ESA/European Commission, *Galileo - The European Programme for Global Navigation Services*, 2003, p. 21; HOFMANN (M.), "Security Aspects of the Galileo Services", *I.I.S.L. Colloquiums*, n° 46, 2003, pp. 371-378.

⁸ European Commission *The European Dependence on US-GPS and the Galileo Initiative*, Technical Document, 8 February 2002, p. 4.

services responsible for national security). However, the purposes for which the governmental entities can use the PRS remains unclear.

The military use of the regulated service: a Taboo

If the Russian Glonass has generated only military applications, and the American GPS is official considered as a dual use system since 1996⁹, Galileo remains exclusively a civil system. In the European official documents, the military dimension of Galileo is never openly mentioned, in aid of the more consensual term of "security".

By way of example, the Agreement between the US government and the EU Member States on the promotion, provision and use of Galileo and GPS of June 2004, recalls "that the United States operates a satellite-based navigation system known as the GPS, a *dual use system* that provides precision timing, navigation and position location signals for civil and military purposes", and "that the European Community is developing and plans to operate a *civil global satellite navigation, timing and positioning system, Galileo*"¹⁰ (we underline). The Agreement also stipulates that the secured governmental services and signals are considered as "civil"¹¹.

If the defence applications of the PRS are officially accepted, its military purposes remain uncertain. Therefore the borderline between homeland security (i.e. crisis management, law enforcement,

intelligence services...) and military missions (i.e., guided weapons, soldiers...) tends to be more and more blurred¹².

Evaluation of the military benefits of Galileo

Recently, the European Parliament voted to ask the EU and the ESA Joint Undertaking on Galileo not to exclude the possibility for European armies to use Galileo in the context of peacekeeping operations. Galileo will provide the European governments and ESA member states with an extremely accurate satellite navigation system not subject to the operational control of the US army. This clearly has strategic advantages for the defence establishments of Europe.

Within a few years, the EU's dependence on satellite radionavigation will be as far reaching as in the US¹³. Galileo will allowed the European Member States to appear as credible actors: "if Europe truly wishes to be taken seriously as a partner by the US, while ensuring that it has access to capabilities critical for its economic development, it must demonstrate that it has both the will and the means to develop a presence in space. Galileo represents a litmus test for the EU in many different ways"¹⁴.

⁹ U.S. Presidential Decision Document of 29 March 1996 relating to the U.S. Global Positioning System Policy.

¹⁰ Agreement between the US and the European Community, on the Promotion, Provision and Use of Galileo and GPS Satellite-Based Navigation Systems and Related Applications, 26 June 2004, Preamble.

¹¹ *Ibid.*, Article 2 "Definitions" (b), (d).

¹² BOU (J. F.), "Galileo on the way to a Dual-Use System", in Munich Satellite Navigation Summit, 2006 (not published).

¹³ Communication from the Commission to the European Parliament and the Council, *State of progress of the Galileo Programme*, *op. cit.*, p. 7.

¹⁴ BILD (C.) in *Financial Times*, 31 December 2001; See also FERRAZZANI (M.), « Le projet européen Galileo, entreprise commerciale ou service public international », in S.F.D.I., *Le droit de l'espace et la privatisation des activités spatiales, Journée d'études*, Pedone, Paris, 2003, p. 74.

Without an autonomous European satellite navigation programme, Europe will in the next decades, lose its autonomy in defence¹⁵, because every new weapon system and platform is incorporating satellite navigation technology. European defence industries will want to be able to sell precision guided weapons overseas without asking permission for the GPS Precise Positioning Service (PPS). All the more, it appears quite difficult that the European military forces make the deadlock on a new system which will reduce their dependence to the US.

LEGAL ASPECTS OF THE MILITARY USE OF GALILEO

From a legal point of view, nothing prohibits to a Member State of the EU or the ESA to use the PRS for military purposes. However, the process is extremely heavy.

The lack of an unanimous european will

On December 2004, the Council of the European Union recalls that because Galileo is a civil programme under civil control, any change to that principle would require examination in the framework of Title V of the Treaty on European Union, relating to a Common Foreign and Security Policy (CFSP), and particularly in accordance with the articles 17 and 23 of the Treaty¹⁶. In other words, it means that any decision on Galileo with defence, or military, implications would follow under the "Pillar II" procedure, and consequently

¹⁵ European Commission (EC) Directorate-General for Energy and Transport, *Galileo: An Imperative for Europe*, December 2001, position paper, p. 8.

¹⁶ Conclusions of the Council of the European Union, 2629th Council Meeting, Transport, Telecommunications and Energy, *Intermodal Questions – Global Navigation Satellite System*, n° 6, Brussels, 9-10 December 2004, 15472/04 (Presse 345), p. 24.

shall be taken by the Council acting unanimously¹⁷.

The problem is that participating states in the European global navigation system are not agree on its military use. Some EU Member States are neutral. Others, like the UK, a major Galileo financier, is adamant that Galileo remain non-military in every way possible, for political and strategic considerations. The British government recognises that, like any civil technology, Galileo can be used by the military for security purposes. But, it considers that, because the civil status of the PRS is clear, the development of specific military applications is ruled out unless the twenty five Members States agree at the unanimity¹⁸.

The U.K. considers that adding dual use capacity for Galileo would not be justified, from a financial as well as from a strategic point of view. That is, the British government is concerned, in the one hand, by the fact that the PRS must not impact on the effectiveness of the GPS military codes, and on the other hand, by the needs to restrict the amount of overspend to the consequences of security. This economic argument was also underlines by the transport Council in 2004¹⁹. However, "studies have shown the impact of the cost of the governmental service on the design and equipment of the Galileo system as a whole in almost insignifiant as far as the space segment is concerned"²⁰.

¹⁷ Article 23.1 of the Title V of the Treaty on European Union, Official Journal n° C 325 of 24 December 2004.

¹⁸ DUTHIES (E.), "Galileo: a UK view of the PRS", in Munich Satellite Navigation Summit, 2005 (not published).

¹⁹ Conclusions of the Council of the European Union, 2629th Council Meeting, *op. cit.*, p. 24.

²⁰ Communication from the Commission to the European Parliament and the Council, *Progress report on the Galileo research programme as at*

The overlay of signals

The PRS signal will be transmitted on two frequencies, distincts from those of the other Galileo services. Each frequency will occupied a wide bandwidth, providing a signal structure that is resistant to interference, not offered by the open access services.

Considering the limited space in the frequency spectrum allocated to satellite navigation, the overlay of frequency bands used by one of the two Galileo's PRS signal and one of the two GPS's Code M signal is unavoidable. However, such overlay is not only possible, it is also perfectly justifiable.

From a legal point of view, this overlay complies with the international law, as far as there is no harmful interference to either of the two systems²¹. From a technical point of view, it is the more preferable alternative in peacetime as well as in crisis, because it is the frequency spectrum which offers the best performance in terms of resistance and robustness, the best financial issues, and the best guarantee of continuity and integrity²². In addition, the European Community considers that, "it has the know-how to operate a secured signal, it believes that the complementary operation of the GPS and Galileo systems must depend on mutual trust and it has a

prior claim on the right to use the signals"²³.

Also, because of the overlay of the Galileo's secured service signal and the GPS's one, the US efforts to jam Galileo signals without affecting the GPS's services will be greatly complicate. The US took the view that all civils signals, including the PRS can be used for hostile purposes. They therefore wished to have the option of jamming them without disrupting its own GPS's signals. However, in accordance with the provisions of the International Telecommunication Union regulations, if the European PRS and the American Code M use the same frequencies then it will be impossible to selectively jam one of the two signals without disrupting the other²⁴.

In reality, the existence of two highly governmental services, will improve the robustness of the global system²⁵.

The access to the encrypted codes and data

The Member States Council invited the European Commission to develop a policy of access to the governmental service and to be implemented by the European GNSS Supervisory Authority in order to ensure that there are sufficiently robust controls over access to the governmental service²⁶. The access and the use of the PRS should be open to the European Union and its Member States, on an optional basis.

the beginning of 2004, Brussels, 18 February 2004, COM (2004) 112 final, p. 17.

²¹ International Telecommunication Union Radio Regulations, Article 0, Geneva : "All Stations, whatever their purpose, must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of others Members".

²² Communication from the Commission to the European Parliament and the Council, *State of progress of the Galileo Programme*, Brussels, 24 september 2002, COM (2002) 518 final, p. 9.

²³ *Ibid.*, p. 9.

²⁴ Energy and Transport, *Galileo: An Imperative for Europe*, December 2001, position paper, p. 9.

²⁵ BOU (J. F.), "Galileo on the way to a Dual-Use System", *op. cit.*

²⁶ Conclusions of the Council of the European Union, 2629th Council Meeting, *op. cit.*, p. 24.

The PRS, and more particularly its “military” use, could raise new political complications for Europe, because of the divergence of the Members States interests outside the bounds of the EU. Every european member has its one policy “overseas”, for example Spain in Morocco or Greece and Cyprus in Turkey.

In addition, Galileo is not a purely European programme. It involved also international partners. Therefore, other participating states, such as China, could also be authorised to use the PRS by the EU Member States who are supposed to maintain the control of distribution of receivers suggested for this form of services²⁷. The international dimension of Galileo would make the “militay’ use of PRS more difficult, because of the divergence of the lack of a common EU international policy. Besides, the Agreement of June 2004 makes provision for a reciprocal visibility in the military data, between the US and the European Community²⁸.

CONCLUSION

The success of Galileo is closely linked to the exploration of all the possible applications, including the strategic purposes²⁹. Even if Galileo is a civil system under civil control, the European navigation system would necessary have growing challenges in terms of security and defence, particulary in the context of the CFSP and the European Security and

Defence Policy (ESDP)³⁰. It seems indisputable, that without a “dual use” dimension, Galileo will not be fully justify. But the “dual use” dimension of Galileo will follow from its “military” applications and not only from its “security” purposes. The barriers for a dual use european system, seem to be in reality more political than legal.

²⁷ HOFMANN (M.), “Security Aspects of the Galileo Services”, *op. cit.*, p. 372.

²⁸ Article 11 “National Security, Compatibility and Spectrum Use” of the Agreement between the US and the European Community, *op. cit.*

²⁹ Jacques Barrot, quoted in *Vers une nouvelle Europe spatiale*, Fondation Robert Schumann, 2005, p. 9.

³⁰ European Commission (EC), Green Paper on the European Space Policy, Brussels, 21 January 2003, COM (2003) 17 final, Foreword, p. 4.