

# The issue of the dependence of European commercial and institutional space projects on foreign technologies: Is it time to be autonomous in terms of commercially competitive launchers?

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## **Why we need to be autonomous in the production?**

Space control is becoming increasingly important. What until now has been one of the most peaceful areas of international collaboration, despite the fierce competition for technological progress, is beginning to become an area of conflict. The consequences of the events in Ukraine, and the sanctions imposed in response to them, are also having repercussions in this field. One example is the end of the collaboration between the Russia Space State Corporation (Roscosmos) and European Space Agency (ESA), which revealed a structural weakness in European space projects, namely over-reliance on American and Russian launchers. This weakness becomes evident at a time like this, when the choice between cooperation and a defensive line brings out often unresolvable contradictions, leading decision-makers to prefer the latter position.

## **Multi-Domain Operation**

As with other parts of the production chain in the field of aerospace and military technology, excessive dependence on foreign companies could become dangerous in the event of diplomatic and security crises. The impact of strategic superiority in this field should not be underestimated either, with regard to the operations of ground troops, as coordination of efforts has become necessary. Increasingly, the possibility and speed of data collection, management and transmission is becoming decisive for the implementation of operations. Such smallsat payloads, hosted on commercial satellites, are an important piece of the evolving Army concept of multi-domain operations, which seeks to combine efforts on land, sea, air, space and cyberspace.

## **US and Russian projects are progressing faster**

The US Army is already ahead with three satellite programmes, called Gunsmoke, Lonestar and Polaris, which have been underway since November 2018. All three demonstrate capabilities on commercial platforms, including "robust PNT [Precision Navigation & Timing] in low-Earth orbit [LEO]," said the outgoing head of Army Space & Missile Defense Command, Lt. Gen. James Dickinson. The Army's elite Inter-Functional Modernization Team for Assured Positioning, Navigation and Timing (APNT) is also interested in demonstrating "advanced commercial production for military payloads." All three efforts build on the Army's successful demonstration of the Kestrel Eye imaging microsatellite in 2017-2018. Kestrel Eye was "designed to be directly deployable and responsive down to the ... tactical level," Dickinson said at the 2019 Space & Missile Defense Symposium. And that's the model for the future, he stressed: to "provide, down to the tactical level, space effects". He pointed out that "the military is the biggest user of space".

The US military is also evaluating several potential high-altitude alternatives to provide "space-like" capabilities to the soldiers. These alternatives could be deployed rapidly as needed in a crisis to replace satellites destroyed in a conflict or as an alternative to satellite capabilities. They have already created a new type of unit to bring better space support to combat forces, the Intelligence, Information, Cyber, Electronic Warfare, & Space battalion (I2CEWS for short, pronounced "eye-two-cues"). The IC2EWS battalion is part of the Multi-Domain Task Force brigade, which has contributed to at least ten wargames and shows real potential to defeat the sophisticated layered defences known as Anti-Access/Area Denial (A2/AD).

The EU, for its part, is about to establish its own LEO encrypted quantum satellite communication system, a €6 billion project but it will start as early as next year. It will provide government and commercial internet services, overcoming the shortcomings of terrestrial systems and enabling quantum-secure internet connections throughout Europe and Africa. Step towards ensuring the EU's strategic autonomy. The Commission is proposing to invest €2.4 billion, funded through a new EU fund, Union Secure Connectivity.

### **Russia's fears**

In line with their cautious strategy, despite assurances, the Russians have decided to hinder collaborative projects with the EU in this area, not least because of the incisiveness of the use of satellites in the military field and the not-so-hidden acceleration of US military programmes. In fact, Starlink is already being used for military purposes (even in declared support of the Ukrainian effort), which has caused many complaints, especially from China. Moreover, many US military projects in that direction have long been in the spotlight. The US was testing several small satellite programmes to provide direct support from low earth orbit (LEO) for reconnaissance, communications, navigation and more to tactical units on the front line in the field.

### **The facts of the last few days**

Commercial companies, such as Britain's OneWeb, are now also paying the price. After than it has already gone bankrupt a couple of years ago and needed substantial funding to remain in the market Partly due to Space X's decision not to launch their satellites.

To ensure the competitiveness of commercial companies and, in parallel, the development of European space projects, it is necessary to develop autonomy in the production of commercially competitive launchers.

## **Arianespace**

As Arianespace points out in its announcement, according to the mandate given to it by ESA member states, the exploitation of the Soyouz launcher from the European spaceport (CSG, French Guiana) and Baïkonour (Kazakhstan) via Starsem is governed by intergovernmental agreements between France and Russia and by an agreement between ESA and Roscosmos. This exploitation, which began after the end of the Soviet Union, has so far been successful. However, it ended with the latter's unilateral decision to withdraw the CSG and suspend Soyouz launches from the European spaceport.

### **Request of guarantee to OneWeb**

While the Soyuz 2.1b rocket was being transported to the launch pad and positioned for departure, on 3 March, the head of Russia's state space agency, Dmitry Rogozin, demanded that OneWeb (which is building an internet constellation that will contain 648 satellites) provide a written guarantee that its global internet access project would not be used for military purposes and that the British government would give up its stake in the company. The ultimatum was due to expire on 4 March at 21:30 Moscow time. The launch did not take place, and the damage to the company and the possible repercussions on its projects are apparent. The satellites have been secured but cannot be relaunched until a date to be determined.

### **The remaining alternatives**

However, the company responded positively, and in addition to a diplomatic detachment from the Russians' conduct, it stressed the alternatives available to them. It could fall back on other manufacturers: ULA (which will have to use the new Vulcans, not yet ready), ArianeSpace (but will have to wait for the new Ariane 6), rely on ISRO (which does not yet have a high production of launchers), CNSA (which has many flights already booked) or SpaceX (which would not, however, launch satellites competing with Starlink). In general, the next launch of the OneWeb satellite will likely be postponed until next year. Dialogue and collaboration seem to be unlikely paths in the near future, given the mutual mistrust and tension created by the race for technological superiority. A mistrust that the U.S. has undoubtedly contributed to creating, both in Russia and China. Indeed In a Twitter message Roscosmos, said: "The Russian space program against the backdrop of sanctions will be adjusted, the priority will be the creation of satellites in the interests of defense."

## **Military uses of communication satellites**

Secure satellite broadband, offering high download speeds and low latency, is seen as crucial for technologies that are reaching the market such as driverless vehicle. Either for enhanced security or connectivity for governments and the military. The use, or suspected use, of communication satellites for military purposes has led to the intensification of difficulties in international collaboration on space projects. Starlink and SpaceX, which have announced plans to launch as many as 42,000 satellites into orbit, have reportedly initiated frequent instances of cooperation with the US military, which is interested in exploiting the global broadband access that Starlink and other constellations of satellites in LEO could provide. In September 2018, an executive, Gwynne Shotwell, commented that the company would launch weapons into space "for the defence of the United States". This is also an important area of competition between the US and China and could be read as an attempt to regain its edge in communications and close the gap in 5G technologies. In addition to improving data exchange for military use, there is the concern that Starlink satellites are controllable, meaning they can point and crash into space stations or spacecraft if installed with a detection system; they have also used it to control drones and AC gunships.

## **Cnes commented**

This tense atmosphere leads to much distrust and is certainly detrimental to the commercial satellite industry, the plans of leading companies and their development. Similarly, as Philippe Baptiste, CEO of Cnes, commented, Roscom's statements have significant repercussions on the various space cooperation programmes with Russia.

## **Consequences and causes of the diplomatic crisis**

Cnes is examining the consequences of the decision to halt Soyuz launches from the Guiana Space Centre, particularly the Galileo and CSO-3 launches initially planned for 2022. During the First week of March, Roscosmos, pulled its engineers and technicians from the European spaceport. As a result the navigation satellites cannot launch in April. However, the imminent arrival on the market of the new Vega-C and Ariane 6 launchers makes it possible to foresee a rescheduling of European institutional launches. Several bilateral joint scientific programmes are still underway, although they have declined considerably in recent years. As for the projects carried out within the ESA, ISS operations continue with the involvement of all the station's partners. For the ExoMars mission , whose departure in 2022 on a Proton launcher seems to be compromised, the various possible options are currently being studied within ESA. For some observers, this detachment could lead to a stimulus for European launcher production and a gradual move towards autonomy in space projects. For example, Luis Hannoun, British Ministry of Defence, commented: "Arianespace Well, Soyuz sucks. Behind that, there was a lack of effort to do something better. So, it is a good day for the European Space Agency - ESA that it has been suspended. We hope it will be a stimulus for Arianespace to engage in cutting-edge projects. If they need inspiration, they need only look to SpaceX. Stop wasting time with 'tried and tested', start innovating and moving us forward."

## **Weaknesses emerge in a key sector**

However, despite the diplomatic and optimistic tone, the company's comments still suggest concerns about the damage that the Russians' decisions could bring to ongoing projects. Arianespace is the world's leading commercial space transportation company (it holds more than 60% of the global market for geostationary positioning satellites), operating and marketing the Ariane 5 and Vega launchers and some components of the Ariane programme. Furthermore, through the company Starsem, half-controlled by the Russian Space Agency, it financed the development of the new version of the Sojuz launcher, which since February 2007 has become part of the carrier rockets used by the European Space Agency.

## **The role of the CNES**

The company is controlled by CNES, the French Space Agency, an essential source of proposals that aims to maintain and develop France and Europe's competitiveness and ensure that they remain key players in the space sector. It is one of the main structures dealing with access to space for the EU in commercial and defence space activities (e.g. Helios, Athena-Fidus, MuSis-CSO), especially in collaboration with ESA in the NEOSAT programme, which aims to improve industrial leadership for telecommunication satellites. From the outset, it has been involved in developing propulsion subsystems for its own needs. To promote the competitiveness of the industry and the relevance of the research centres with which it works, it also manages the plasma propulsion research group, which is composed of SNECMA, ONERA and several French CNRS laboratories and universities. They said that preparations for the next Ariane 5 and Vega C fields in 2022 will still be carried out according to the initial schedule. By reserving the Ariane 5 and Vega relays, Ariane 6 and Vega C still guarantee Europe autonomous and lasting access to space. It is confident in the success of these two launchers, on which it has been strongly committed since the ESA ministerial conference in Luxembourg in December 2014, in response to both European institutional and global commercial demand.

## **Change in Russian attitude**

Also, of concern remains Russia's decision to focus space development on defence rather than scientific research. An example of what could happen was the anti-satellite test (ASAT) at the end of 2021. Collaboration on the ISS could also stop by 2024. The new decisions could accelerate the development of the new Russian space station (ROSS), also using the new Angara-A5M heavy launchers. Due to widespread fears about the uses to which Starlink will be put, another of the suspicions is that the Ukrainian crisis will move the Russian space agency more towards China, as they are already collaborating on the lunar station project.

## **Risks of dependence on Russian and US launchers production**

The impossibility of creating a no-fly zone in space then makes it even more dangerous to stay behind. In addition to coordination, satellites also have the role of collecting images and information, bypassing the problem of possible atmospheric barriers (e.g. thick cloud banks) through the radars mounted on them. Therefore, it is necessary to speed up European programmes to achieve autonomy. Launchers are the second largest sector of space activity in Europe after commercial satellites, boosting the whole industry. The efforts of Member States to develop and support Ariane and Vega have established well-recognised competencies that allow the industry to participate in international competitions. Ariane 6 will succeed Ariane 5 to enable Europe to maintain leadership in the rapidly evolving commercial launch services market while meeting the needs of European institutional missions.

## **The opportunity to change strategy**

This is an opportunity to highlight the need for member states to work together to support the innovation of commercial companies in the sector and ensure the necessary development of independence in the various project phases. Independence, which the various armies seem no longer able to do without in order to guarantee the security and effectiveness of operations.



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