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Legal framework of the EU policy in the field of defence space technology

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Abstract. **The defence policy of the European Union is a reference point for development of legislation at supranational level that sets new dimensions for European integration. Maintaining a high-tech defence industrial base is among the key objectives that the Union sets itself in its security and defence policy. In this sense, a European defence policy focuses on cooperation between states to build, develop and upgrade the entire spectrum of land, air, sea and space defence capabilities. "Space is a strategic benefit essential to Europe's independence, security and prosperity." Space as a distinct operational area is of essential importance for the EU defence. The policies of the Union are aimed both at ensuring independent and autonomous access to outer space and development of various types of defence technologies. That will best enable rapid situational awareness, rapid decision-making and efficient operations. The space defence technology infrastructure established by the EU should meet the security needs of the Union. Based on this, the EU legal framework on space as a separate area of security and defence reveals different types of supranational legal instruments. They regulate specific military and political issues regarding space defence and technology development.**

Keywords: defence, European Union, legal framework, space technologies

I. INTRODUCTION

The military defence policy of the European Union is a reference point for the deployment of the legislative process at the supranational level in a direction that sets new dimensions of the European integration. On the international level, the main merit for its development is played by supranational legal and regulatory instruments of different types and degrees, which were adopted under the influence of various factors that directly threaten the European security environment, its citizens, such as the growing strong strategic competition between states and their ambition of military-political hegemony, the wide and varied by type spectrum of complex and unpredictable security threats, the direct attacks against the established European security order, etc.

"Space is a strategic asset central to Europe's independence, security and prosperity."[12]The growing on the international level competition to master the space sector is predetermining the political attitudes of the European Union regarding the same, turning it into a factor of strategic/key importance. Ensuring independent access to outer space and the development of various space technologies will lead to an increase in the defence capabilities of the Union in the rapid decision-making, the effective conduct of operations and providing the best opportunity for a quick and adequate assessment of the situation.

The space defence technology infrastructure established by the EU should meet the security-related needs of the Union. The Union's space industry is already one of the most competitive in the world. However, the emergence of new participants and the development of new technologies are fundamentally changing the traditional models in the field of industry. The remaining of the Union as a leading participant on the international political scene with wide freedom of action in the field of outer space is bound to promotion of scientific and technical progress and support in the competitiveness and innovation capacity of enterprises of the space sector within the Union, in particular of small and medium-sized enterprises (SMEs), start-ups and innovative enterprises. In many cases, the equipment, components and instruments used in the space sector, as well as space data and services, are dual-use. However, the Union's security and defence policy is defined within the framework of the common foreign and security policy in accordance with Title V of the Treaty on European Union (TEU).

II. MATERIALS AND METHODS

In an attempt to analyze the special place occupied by outer space as a separate field and the related space defence technology industry established by a common regulatory legal framework of EU security and defence policy, it should be noted that the latter is currently deeply fragmented. The main reason for this is the fact that the

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material field of application, which regulates these issues, cannot provide the European integration system with a universal and explicit legal regulation in this direction. In this sense, this systemic fragmentation, dating back to the early period of the union's emergence, leads to the formation of a legal mosaic of separate regulations scattered in the various legal sources of the common law of the union and dealing fragmentarily with separate issues of the integration military policy. This, in turn, causes a process of uneven regulatory and institutional development of the EU and creates practical difficulties in the implementation of the relevant supranational provisions.

Under the influence of the above-mentioned processes, the regulatory system of the European defence industry is highly fragmented and, in particular, the space defence industry. Outer space as a separate sector, characterized by its specificities and a particular trajectory of scientific research of a legal dimension, in so far as the latter obeys both the primary law of the EU, established by the provisions of the founding treaties of the EU, and other acts that have been adopted specifically for the purpose of regulating the legal matter.

Already at the very beginning of the preamble of the **Treaty on the Functioning of the European Union (TFEU) [14]** it is expressly proclaimed that one of the leading objectives around which the legal successor of the European Community is concentrated/consolidated is related to the unification of the states of this union from the idea of implementing a common and unified foreign and security policy, and in particular towards gradually taking successive steps towards the "formation of a common/uniform defence policy"[14], which could lead to joint/collective defence in accordance with the provisions of Art. 42 "[14], of the TFEU and through it in this way to achieve the strengthening of the European identity and its independence in order to promote peace, security of progress in Europe and in the world. This concept of the general collective defence of the parties, laid down by the above-mentioned fundamental in kind international treaty, is not new, in as much as the same is placed, subordinated and incorporates in itself the intention of the founders of the Charter of the United Nations, for individual or collective self-defence in hypotheses of carried out armed attack against a member of the Organization, as well as taking the necessary measures to maintain the international peace and security established worldwide. The envisaged package of measures related to taking immediate and specific actions in the event of an attack was created/exists by virtue of the special text established/ implemented by the rule of Art. 51[15].

In parallel with this, the following legal provisions from the TFEU are of particular legal ~~weight/~~importance in relation to the defence and security sector and in particular in the field of outer space of the EU, namely Art. 173 (ex Article 157 TEC) and those from title XIX of the TFEU - dedicated specifically to "Scientific research, technological development and outer space"[14]. In this sense, while the rule of Article 173"[14], of the TFEU aims to establish basic starting points related to guaranteeing the creation of more favourable conditions for the development of European industry and, more specifically, conditions related to "foster better exploitation of the industrial potential of policies of innovation, research and technological development"[14], then this idea further finds confirmation and deployment in Title XIX of the TFEU by means of the foreseen multiannual framework programme of the EU in favour of scientific and technical progress and industrial competitiveness.

The main political positions that form the union in this programme are aimed at creating a stable European scientific and research space at the supranational level, including various types of cooperation and coordination initiatives between countries, as well as investing in various scientific and research activities. According to Art. 189 [14], of the TFEU is envisaged the development of a specialized legal act in the field of outer space, namely a European space policy.

At the same time, if an attempt should be made for a more in-depth study of the process of strengthening the EU's political interest in outer space and determining its starting point, it can be established that this process began towards the end of the 90s of the XX century. In the 1960s of the last century, the cooperation of the first structures of the member states led to the establishment of the first European intergovernmental organization for space research - the European Space Agency (ESA) in 1975, and the 1990s is the period during which the union began to work more actively and to invest on a larger scale in the development of various own space initiatives and programmes. Some authors argue that the initial impetus for the emergence of the idea around the deployment of a European space policy was prompted by the EU's recent drive to develop the established international Galileo programme for satellite navigation and positioning, considered the first "real" space programme, which is led by the European Union. This programme is essentially a civil Global Navigation Satellite System (GNSS). It started at the European level in 1999 under the direction of a tripartite body composed of the European Space Agency, the European Union and the air traffic certification organization Eurocontrol. The main result that the EU is aiming for with its implementation is to provide very precise navigation and time signals, independent of other existing technological systems.

In parallel, the EU is investing in the creation of other major space projects - the European Geostationary Navigation Overlay Service (EGNOS) and Copernicus. Established in 2009 the EGNOS space programme provides navigation services to aviation, marine and land users by improving the accuracy of the U.S.

On the other hand, the Copernicus space project is considered the largest programme of its kind in the world and is the EU's contribution to the Global Earth Observation System of Systems (GEOSS). The launch of this space programme took place in 2014 with the launch of its first satellite. The main purpose of the programme is related to the provision of accurate and up-to-date information on Earth orbit observation, and this data should serve in various spheres of, security, defence, and other EU policies.

In the following years, the security and defence aspects of space policy, the security of space infrastructure, the autonomy and access to space and the 'independence' of the European space sector have

expanded in importance. The Commission developed an EU industrial policy for space and created a Space Surveillance and Tracking (SST) and a Government Satellite Communications (Govsatcom) programme.

The influence of space technologies and in particular of the aforementioned satellite systems and their huge revolutionary technological contribution with respect to the security and defence sector of the EU find their legal reflection in a number of legal sources of integration law.

First of all, this is the one created in 2016 **Europe's Space Strategy[16]** If until now the political attitudes of the EU regarding outer space as a separate strategic sector for the Union are textually and regulatorily scattered in various supranational legal documents among other more general policies against the background of the more global political picture, then with the presented on 26.10.2016 space strategy, the first real step has been taken to systematize the Union's political guidelines regarding the space sector. In parallel with this, in relation to it, it is aimed to synchronize the efforts of the member states in this direction. In this sense, this strategy in itself as a legal act represents the first real and tangible attempt to legally frame the European political priorities regarding the space sector. Strengthening the EU's political positions in relation to outer space is of strategic importance, insofar as in this way "its role as a stronger global factor will be strengthened"[16], and on the other hand, the space sector itself is a serious "asset for security and defence of the union."[16] When analyzing the laid down conceptual model of the space policy, it can be established that the same focuses on the realization of the following four main strategic goals: maximizing the benefits of outer space for EU society and economy, fostering a globally competitive and innovative European space sector, strengthening Europe's autonomy in accessing and using outer space in a secure and safe environment and strengthening Europe's role as a global factor and promoting international cooperation. At the same time, with regard to the defence and security of the EU, this space policy pays special attention to the implementation of a series of initiatives and a specific set of regulatory measures oriented in the following directions:

First of all, the space policy prioritizes as a task the preservation of Europe's autonomous access to outer space. Its implementation can be carried out by means of the parallel implementation of the following steps [16]:

1) Deploying modern, efficient and flexible infrastructure facilities by aggregating demand for launch services in order to provide visibility to the industry and reduce implementation costs;

2) Supporting scientific research and innovation efforts, in particular ensuring Europe's ability to respond and accelerate breakthrough changes (reusability, small launch vehicles);

3) Guaranteeing access to radio frequency spectrum;

4) Guaranteeing the protection and sustainability of Europe's critical space infrastructure and ect.

In addition to the above-mentioned space strategy, in 2016 another document important in its legal nature was developed and adopted, namely **A Global Strategy for the European Union's Foreign and Security Policy** [17]. According to some authors such as Chiara Celentino [3] central to this act is the concept of the strategic independence of the EU, which arose in the defence sector and which is perceived as a common driving force of the common foreign and security policy of the union. At the same time, in the substantive dimensions of this concept, the notion that the primary political line that the EU should follow in relation to its defence sector is invariably bound to the fact that the same should have a powerful defence resource is imposed as a conception. The latter, in its turn, implies its constant optimization.

In view of this, in so far as to the achievement of this perspective in the long term are crucial the maintenance of a significant defence capacity and the development of a modernized space equipment, the latter in turn requires the cumulative presence of two prerequisites. The first is related to the process of "synchronization and mutual adaptation of Member States' national defence planning cycles and capability development practices"[3], and the second is aimed at investing in scientific research and technology development in the field of defence. A part from that, a specific prescription for improving European space defence capabilities is introduced in this strategy. It is explicitly stated that the union should emphasize the implementation of the following initiatives: expanding control of flows that have security implications, which requires investment in intelligence data, surveillance and reconnaissance, including remotely piloted aircraft systems, satellite communications, as well as autonomous access to outer space and permanent Earth surveillance.

Currently, these initially formed political guidelines, established by the aforementioned legal acts, have been further developed and upgraded. The evolutionary upsurge of deployment of European legislation in the field of space defence policy is identified with the period of 2019-2024. A series of consistent and significant in their meaning supranational acts have been adopted, which give a clearer and more complete formula for the place occupied by the space defence policy.

The Regulation (EU) 2021/696 of April 28, 2021 establishing the space programme of the Union and the European Union Agency for the Space Programme[13], adopted by the European Parliament and the Council, appears to have made a special contribution in the field under consideration. It marks a new stage in the existing up to now European regulatory framework concerning space policy and the space defence industry. Already at the very beginning, stepping on the provision of one of the main founding treaties - Article 189, paragraph 2 of the Treaty on the Functioning of the European Union (TFEU) and after taking into account the increased influence of the space industry and related technological innovations in the fields of digital, information and communication technologies on the EU defence sector, the regulation assigns a special place to the newly created space programme covering the period from 2021-2027 and the main strategic objectives laid down in it in relation to the use and development of the space industrial technological base in relation to the aforementioned sector and which objectives are strongly influenced by the revolutionary decisions of the „Horizon Europe“ programme. On the one hand, the ementioned

space regulation provides a differentiation of the majority of types of activities related to the space industry, subdividing them into "upstream activities" aimed at "creation, development, operation, etc. of an operational space system"[13] and "downstream activities" related to the provision of services and products to outer space" [13].

The developed space technologies in the civil sphere are mainly "dual –use", i.e. they possess the potential of defensive actionos and vice versa. In reality, space assets and infrastructure serve both non-governmental and governmental, civil and military purposes, and the proposed programme aims to achieve a systematization of all the regulatory rules that regulate them. On the one hand, the use of this rule-making approach of the European legislator to apply the same rules will help to consolidate the legal framework for all space programmes, and on the other hand, it leads to the facilitation and synchronization of the process of managing European space activities.

In the light of the above, through the above-mentioned supranational act and its direct legal force in relation to the defence sector of the union, the space policy pursues and prioritizes the achievement of more general and additional strategic goals, which in the most synthesized form are the following:

1) Enhancing international cooperation, "beneficial interactions" or interpenetration between space activities and activities related to the security and defence of the Union and its Member States;

2) Increasing the safety and security of both the union and its member states;

3) Ensuring the sustainability of the EU in the conduct of all activities in outer space related to the distribution of space objects and space debris, as well as the space environment;

4) Ensuring the security and technological independence of the union, including in the long term for the infrastructure equipment components;

5) Taking into account the essential security interests of the Union, an autonomous, secure and cost-effective capability to access outer space is supported;

6) Exploiting synergies between civil industry and defence industry, taking into account the security interests of the respective partners and their allies and ect.

For the realization of the same in a long-term plan, the regulation has explicitly provided precisely defined specific priorities and measures. The implementation of the majority of them is closely related to the services available to the navigation satellite systems created so far, such as Galileo, Copernicus, EGNOS, SSA, GOVSATCOM. In relation to the same, the regulation provides, along with the mandatory legal definitions of some key basic concepts in the field under consideration envisaged in the provision of Art. 4 [13] ,explicit definitions of the above-mentioned space programmes with the rule of Art. 3. It has also provided a detailed explanation of their technological nature and functions. Among them, the following stand out with a priori/emphasized importance in terms of the EU's Security and Defence Policy:

a) for Galileo and EGNOS: to provide long-term, state-of-the-art and secure positioning, navigation and timing services whilst ensuring service continuity and robustness;

b) for "Copernicus": to deliver accurate and reliable Earth observation data, information and services integrating other data sources, supplied on a long-term sustainable basis, to support the formulation, implementation and monitoring of the Union and its Member States' policies and actions based on user requirements;

(c) for SSA: to enhance capabilities to monitor, track and identify space objects and space debris with the aim of further increasing the performance and autonomy of capabilities under the SST sub-component at Union level, to provide SWE services and to map and network Member States' capacities under the NEO sub-component;

d) for GOVSATCOM: to ensure the long-term availability of reliable, secure and cost-effective satellite communications services for GOVSATCOM users.

Last but not least in terms of importance within the framework of the aforementioned regulation is related to the transformation of the European GNSS Agency (GSA) into the European Union Agency for the Space Programme (EUSPA).

In March 2022, the Union's subsequent guidelines regarding space policy were reflected in another supranational act that is significant in its legal nature, namely the so-called **The EU's strategic compass [20]**. Defined by most authors as a "cornerstone" of the European Security and Defence Policy, the Strategic Compass is a comprehensive and up-to-date analyzis of the European strategic security environment and the reforms implemented by the Union in this direction. A part from that with the Strategic Compass, in so far as the same is "based on the defence and space packages" [20], the formation of a general strategic vision for an integrated approach in the defence sector, in which clear and precisely defined goals are present, is envisaged as an innovation. In this regard, it should be pointed out that the compass was adopted with the understanding that the effective implementation of the unified defence concept of the union laid down by it is dependent also to a large extent on the global implementation of the same and related recommendations, measures and initiatives. At the same time, against the background of the "shared assessment of the strategic context of the European Union"[20] thus provided with the Strategic Compass and the envisaged "coordinated cooperation in the field of security and defence with the new ways and means to improve European collective defence capabilities set forth in it"[20], the proposals related to the space defence industry stand out. The latter are aimed both at upgrading and supplementing the existing up to now regulatory framework through the creation of a specialized legal act in the field of "EU space policy for security and defence"[20], thus it is revealed that the priority for the union in the long term is the implementation of a strengthened common and consistent approach to

investing in "emerging and disruptive technologies in the field of security and defence."

The Union's main political commitment regarding the defence space technological and industrial base will be tied to increasing its defence capacity and military capabilities by increasing financial means in the direction of developing and improving technologies, ensuring the necessary interaction between civil, military and space industry and exploring opportunities for cooperation with NATO.

Taking into account the fact that "space assets are under civilian control", the EU will put particular emphasis on investing in "dual-use technologies", scientific research and innovation, and in particular one of these future projects will be related to the construction of a "EU space-based global secure communication system in outer space"[19].

The development of "dual-use technologies" was also influenced by the **"Roadmap on critical technologies for security and defence"[18]** adopted during the same period. Taking into account the existence of a legislative gap in integration law regarding the lack of regulatory framework, the European Commission is preparing in 2022 the so-called "Roadmap on critical technologies for security and defence" as the EU's response to curbing strategic dependencies on similar type of technology. At the same time, its main purpose is aimed at forming a unified strategic approach both with regard to the promotion of dual-use Scientific Research, Technological Development and Innovation (SRTDI) at the EU level, and to the identification and acquisition of breakthrough and basic technologies. It also aims to synchronize standards between the civil, defence and space industries through the adoption of some common standards and the creation of a specialized body in the field of critical technologies, namely the Observatory of Critical Technologies.

III. Results and Discussion

The adoption of the **European Space Strategy for Security and Defence [19]** is a high point in the evolutionary development of space defence policy. Its creation marks a new turning point in the legislative process of the EU, in so far as it is the first strictly profiled supranational act in the field of the matter under consideration by it, with which, on the one hand, an attempt is made to introduce the most complete systematization for the created until now original set of EU rules and political guidelines laid down in this direction. On the other hand, the aim is to achieve systematization and upgrading of the existing up to now institutionalized form of interaction of space information exchange by means of "expanding the existing mechanism for responding to space threats"[19].

In the light of the foregoing, it can be reported that this space strategy of the EU in the field of defence and security is a significant achievement for European legislation, insofar as through the same is pursued the achievement of the unification of all legal instruments for the protection of the EU's space assets. Because of this, its legal value is huge. This strategy marks a "paradigm shift aimed at strengthening European resilience in and from space"[11] It helps bridge the existing "gap between space and defence, breaking down silos and strengthening the EU's flagship programs in space for security and defence purposes." [11]

In an interpretive analyzis of this document, it can be established that its very title clearly testifies to the specificity of the issues regulated by it. Its main part is an expanded catalog of all a priori political directions in which the union wishes to invest and further develop. In order to improve its space defence capabilities and maintain the permanent "technical sovereignty" of its space industrial base most of the policy guidelines incorporated in it are fully adapted from the Strategic Compass and directly refer to it. On the other hand, it introduces a number of specific authorizations ahead of their time, such as the development of a road map for future innovations in order to reduce strategic dependencies on technologies and increase the competitiveness of the EU's space industry.

In its most synthesized form, the European Space Strategy for Security and Defence focuses on the implementation of the following package of measures and tasks: a set of actions covering the protection of space systems and services, use of space for security and defence; a coordinated response to space threats and seeking to strengthen existing space security cooperation for responsible behavior in space. In this sense, the main concept on which this strategy is built is related to the deployment of these five main pillars of development [9], which in schematic form look like this:

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Fig. 1. the five main pillars of development [9]

I. Achieving a Shared Understanding of Space Threats.

1) The strategy outlines counterspace capabilities and the main threats in outer space that put space systems and their ground-based infrastructure at risk, relying on a common definition of the space domain. In order to increase the strategic understanding of threats in Member States, the High Representative is tasked with producing a confidential annual analyzis of space threats at EU level, using intelligence information provided by Member States.

II. Increasing impact resistance and protection of space systems and services in the EU. In this regard, the space strategy emphasizes the implementation of the following package of measures:

1) A proposal for the development of a European project specialized in the matter under consideration, a legal act - a law on outer space, which should create in global terms a more general legal framework for security, safety and sustainability in space;

2) Formation of a new structure Information Sharing and Analyzis Center (ISAC);

3) In the long term, activities are envisaged in connection with the provision of autonomous access of the EU to outer space, emphasizing the needs in the field of security and defence;

4) Strengthening the EU's technological sovereignty by reducing strategic dependencies and ensuring security of supply in the field of space and defence, in close cooperation with the European Defence Agency and the European Space Agency and ect.

III.Strengthening the EU's collective ability to respond to any space attacks and threats that put the EU's security interests at risk

1) Strengthening the "space threat response architecture" and expanding the field of application of the existing up to now response mechanism in view of threats in outer space

2) Better detection and identification of space objects through access to information to create awareness of the space domain through relevant national space commands in order to characterize inappropriate ways of on-orbit behaviors and protect EU assets;

3) Conducting space exercises, including with partners, to test and further develop the EU's response to space threats and explore solidarity mechanisms and ect.

IV. Improving the use of outer space for security and defence purposes

1) Developing concepts for the use of outer space in operational engagements in the line of operations under the Common Security and Defence Policy (CSDP);

2) Development of dual-use space capabilities, including for security and defence purposes;

3) European autonomous capability to provide products and services resulting from exploitation;

4) Space assets and related data to support the autonomous decision-making process of the EU and its Member States and ect.

V. Fostering Global Partnerships in the field of security and defence in outer space.

1) The strategy focuses on building and developing the forms of international cooperation, and in particular, strengthening the partnership with the United Nations and the United States is envisaged and ect.

The European Space Strategy for Security and Defence proposes an ambitious regulatory framework to protect the EU's space assets and protect its interests, deter hostile activities in outer space and strengthen its strategic position and autonomy. It is characterized by a number of innovations. The first distinguishing mark of the same is related to the fact that there is an acceleration and facilitation of the process of transforming the existing up to now civil space policy and its remodeling to one with certain military applications - clearly taking into account the fact of the "dual nature" of space assets. The second distinguishing mark is aimed at establishing a lasting trend towards the constant and progressive expansion of the circle of exchange of different types of services and data provided by different revolutionary technologies and innovations in relation to the EU defence sector. The third distinctive feature that characterizes this document is related to the envisaged possibility of adopting/laying/affirming a basic line for the cooperation of the EU member states and the protection of its space assets. Parallel to this legislative level, coherence is also envisaged in the implementation of national space defence strategies. In this way, the aim is to strengthen the synchronization and convergence of the European partners in terms of developing a common consistent process of a unified space strategy implemented by them.

IV. CONCLUSIONS

After three decades of strong economic interdependence, which was supposed to reduce tensions, the return to power politics and the manifestation of armed aggression is the most significant change in international relations. Maintaining a high-tech defense industrial base is among the a priori goals that European Union sets for itself in its military policy. The space defence policy of the European Union is going through a long and complex evolutionary process of development. The improvement of the legal framework of the space sector by means of the various legal acts/instruments adopted at the supranational level in this direction is an important step for the creation of a common vision for space collective defence and the application of uniform standards regarding related space technology, data and services in the defence sector. This, in turn, will lead to an increase in the defence capacity of the Union and to the confirmation of its leadership role in the defence sector among other global actors against the background of the international political scene. Investing in Europe's sovereign space infrastructure, maintaining European leadership and leveraging industrial and scientific expertise in space in the long term is of utmost importance for the European Union, as it will enable a collective defence capability of the Union to be able to respond the challenges today and anticipate the needs of tomorrow.

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