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ADAPTING UKRAINIAN SPACE LAW TO THE CHALLENGES OF THE NEW SPACE ERA

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*The article is devoted to the analysis of the legal and institutional mechanisms of regulation of strategically important space activities in Ukraine. **Research methods:** the scientific-theoretical research methods of abstraction, idealization, construction of hypotheses and models, documentary analysis and synthesis, objective truth, cognitive-analytical etc. **Results:** the origin and historical genesis of legal regime of the space activities in Ukraine, constituent elements of legal mechanism of the development of space industry and the problems of adapting this mechanism to the trends of the «new space», are analyzed. The author suggests adapting the law, and some elements of such adaptation, to create the optimal legal framework of Ukraine's space industry development. **The scientific aim** of this article is to contribute to the development of the adequate and integrated regulation of space industry in Ukraine, to improve the quality and to ensure the effectiveness of legal regulation of space relations and to theoretically develop the concept of the adaptation of the national space law. **Discussion:** the evolution of the national space law is analyzed on the background of Ukraine's space industry development and trends of the New Space. The law needs not a fragmentary, but a comprehensive adaptation, with regard to the peculiarities of the developments of the national space law of Ukraine and its prospective partners.*

Keywords: State Scientific-Technical Space Program of Ukraine; new space; space activities; orbital clogging; adaptation of the law.

Formation of the problem: Legal Regime of the New Space Activities of Ukraine. The humankind has entered into the “new space” era that features:

- non-government players pursuing significant share of the upstream (means of access and presence in space) and downstream (means of information retrieval, orbital production, navigation) space activities;
- using the remote sensing to manage the Earth and celestial bodies' assets;
- advancing satellite communications (including 5 and 6G) and geopositioning;
- environmentally friendly space exploration implying the reusable rocketry and controlled return to Earth from its orbit of launched spacecraft,

stages of launch vehicles, booster blocks, space systems) to avoid its technological clogging.

Most of the Ukraine's space industry belong to the “old” space, when space technologies were created by the state, for it and at public expense. Due to the accumulated scientific and technological potential, Ukrainian space industry might become an important supplier of solutions for the “new space”. It might supply the solutions to control of outer space, the development and production of reusable aerospace systems, *provided* the legal regime of the space activities in Ukraine is adapted to allow commercializing and internationalizing of space technologies and to stimulate the inflow of funding into the space projects. Hence, adapting the national law on the

space activities to the new economic, technological and geopolitical realities is vital for Ukraine.

National Legal Regime of Space Activities.

The theoretical legal aspects of the space activities, including remote sensing, satellite navigation, satellite communications, had been laid down in the works of leading scientists, such as Prof. Y. Shemshuchenko [18], and F. von der Dunk [20], as well as the respective manuals published in Ukraine [8, 9, 10].

The national space law started to evolve soon after Ukraine had gained its independence. Its first act was the Decree of the President of Ukraine on the establishment of the National Space Agency of Ukraine [2]. The foundation of the Ukraine's space law is laid in Art. 92 of its Constitution [1]. The Law of Ukraine "On Space Activities" [5] defines the general principles of space activities in Ukraine and under its jurisdiction outside its borders. The Law is a core act of the system of national space law. It interprets a number of terms and concepts, defines the purpose and principles of space activities, establishes the legal basis for its organization, general requirements for the creation of space technologies and Ukraine's participation in international space cooperation.

The draft laws "On state regulation of satellite navigation" [7] and "On state regulation of remote sensing of the Earth" (its concept being approved by the Cabinet of Ministers of Ukraine in 2013 [13]), determine the legal, economic, organizational and financial fundamentals of public regulation of the respective activities in Ukraine.

The leading Ukrainian scientists had analyzed the Space Activities Law, while its current state provoked well-founded criticism [19], as it:

1) Contains norms with no proper mechanism of their implementation. For example, to implement the rules of Articles. 12, 13, 27 of this Law, the Cabinet of Ministers of Ukraine has yet to approve the rules for certification of space technology and the rules for registration of spacecraft in Ukraine, while the President of Ukraine - the procedure for interaction of the Ministry of Defense of Ukraine and the intelligence bodies with the central executive bodies in the space activities; the rules of space activities in Ukraine shall be ap-

proved in accordance with Art. 8 of the Space Law.

2) Does not cover special aspects and terms of foreign economic activities and complex project management in the space sector;

3) Insufficiently addresses the dynamic emergence of new activities and the interests of potential "new space" participants (until 2019, the national space activities were based exclusively on the state ownership).

Recently, the Law has been modified to end the state monopoly on the development and operation of launch vehicles and spacecraft as well as lift the excessive state regulatory influence and enhance the investment attractiveness of the space industry. The recently introduced declarative permissive procedures for conducting space activities aim at creating attractive economic and legal conditions for them. Such radical changes of the legal regime should have been prepared more carefully, with the clear understanding of their effects on the national security. Hence, we suggest to arrange for the international expert-legal assessment of the compliance of those amendments with the principles of the adequacy of public regulation in the field of space activities.

The national space activities are organized in accordance with the Space Strategy [14]. It is based on the scientific prediction of the development of national space activities that matter for the development of the space industry. While the state determines its demand for the space products and services, the space industry seeks ways to meet it and the global market requirements.

To link the priorities of the space sector development and the funding, primarily public one, the State Space Agency of Ukraine had been developing the 5-year State Scientific-Technical Space Programs of Ukraine since 1994. The programs were providing for the means to preserve and develop the scientific and production potential of the space industry for the benefit of the national economy and security, as well as Ukraine's entry into international space markets. In recent years, space activities have been conducted in the absence of the Program. Since 2020, the powers to develop the Program, to be approved by the Verkhovna Rada of Ukraine, were transferred to the Ministry of Strategic Industries of Ukraine Notably

the space industry was determined as “strategic” by its transfer under the reign of that Ministry [15].

The Concept of the National Space Program [12] adopted by the Cabinet of Ministers of Ukraine, envisages, i.a., the development of new technologies for space industry, the creation of new generations of rocketry and space equipment, the development of navigation and control systems, and the creation and operation of Ukrainian spacecraft.

Elements of the Adaptation of the National Space Law. Adapting the national law on the space activities shall be preceded with the identification of the needs and interests of public and private participants in space relations. The creation, modernization and use of space technology, the provision of space services may be regulated with either separate laws or the “Space Code”.

In our opinion, the specific space relations need not a fragmentary. but a comprehensive adaptation of the law in view of their peculiarities and the developments in international and national space law,

The legal norms that regulate space relations might be consolidated to form the modern legal regime of space activities in Ukraine reflecting the current space terminology, development of commercial space activities, its security, implement competitive principles of space projects and programs, ensure equal access to space activities and its results. Such revision of the space law shall prompt the development of space services and technologies.

The adaptation of the law on the space activities and the national space program should be linked. The Space Program of Ukraine should be synchronized with the programs of its main space industrial partners and ensure the "disruptive" solutions for both space exploration and earthly challenges.

Strategy of the Space Activities and the Space Program of Ukraine shall be in line with the „new space trends” and aim at implementing the results of research and development projects, realized under previous programs, such as:

– creation of a distributed multipurpose orbital neural artificial intelligence network for long-term

use (remote sensing, communication, geopositioning, development of new technologies) with laser optical communication and control;

– creation of an orbital production complex (e.g. semiconductors, human organs for implantation, graphene, helium-3, crystals, etc.). in close cooperation with Ukrainian metallurgical, pharmaceutical and, chemical industries;

– development of vertical and horizontal transport systems for servicing orbital groupings, including reusable orbiters to help manage spacecraft life cycles.

Besides, the effectiveness of national space law may be increased by harmonizing it with the laws on the space activities of its prospective partners, especially the countries where spaceports (Canada, Australia, Great Britain, Portugal, Spain etc.) are being built to provide commercial access to space.

The main task of adaptation is to bring the current national space law in line with the needs of the current stage and prospects for the development of space activities. It should be carried out on a thorough analysis of the practice of its application, international space law and experience of the leading space states. The process should eliminate inconsistencies and conflicts in the current space law, promote the use of new universal norms; eliminate ineffective ones.

The state may depart from the priority of space industry that is stunningly losing its capacities towards the dominance of space technology users that shall define the landscape of the use of space applications, distribution of the scarce state budgets as well as shape partnerships necessary to realize strategic projects in the space sectors.

There shall be created the legal preconditions for attracting the extra-budgetary sources of funding of space projects. Attracting that funds requires the adequate regulation of private-public partnership (including cross-border one in the space activities) in the Law on Public-Private Partnership [6]. Besides the rules, it is important that the state creates organizational and administrative conditions for such partnership, given innovative and investment attractiveness of space activities.

Last but not least, we suggest to enhance the intellectual and production potential of the space industry by using such forms of priority development as scientific\industrial parks and clusters. These forms

shall be developed in coordination with the Ministry of Education and Science (in charge of the scientific parks), as well as the Ministry of Regional Development of Ukraine.

Conclusion. The legal regime of space activities in Ukraine ought to be adapted to the “new space” requirements by introducing the legal mechanisms of

1) regulating the remote sensing and space telecommunications

2) adopting the by-laws in the field of standardization and certification of space activities in Ukraine and

3) linking the requirements of the new space and the rules of the National Scientific-Research Space Program

4) harmonizing the space law of Ukraine with the law of its key foreign partners.

Fulfilling these proposals can help building the system of adequate and integrated regulation of the Ukrainian space sector.

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АДАПТАЦІЯ УКРАЇНСЬКОГО КОСМІЧНОГО ЗАКОНОДАВСТВА ДО ВИКЛИКІВ НОВОЇ КОСМІЧНОЇ ЕРИ

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*Стаття присвячена аналізу правових та інституційних механізмів регулювання стратегічно важливої космічної діяльності в Україні. **Методи дослідження:** науково-теоретичні методи дослідження абстрагування, ідеалізації, побудови гіпотез і моделей, документальний аналіз та синтез, об'єктивна істина, когнітивно-аналітичні та ін. **Результати:** походження та історичний генезис правового режиму космічної діяльності в Україні, аналізуються складові елементи правового механізму розвитку космічної галузі та проблеми адаптації цього механізму до тенденцій «нового космосу». Автор пропонує адаптувати закон та деякі елементи такої адаптації для створення оптимальної правової бази розвитку космічної галузі України. **Наукова мета** цієї статті полягає у сприянні розвитку адекватного та комплексного регулювання космічної галузі в Україні, підвищенні якості та забезпеченні ефективності правового регулювання космічних відносин та теоретичній розробці концепції адаптації у національне космічне право. **Обговорення:** проаналізовано еволюцію національного космічного законодавства на тлі розвитку космічної галузі України та тенденцій розвитку Нового космосу. Закон не потребує фрагментарності, але комплексна адаптація, з урахуванням особливостей розвитку національного космічного права України та її майбутніх партнерів.*

Ключові слова: Державна науково-технічна космічна програма України; новий простір; космічна діяльність; засмічення орбіти; адаптація закону.