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Comparative Analysis of Russian and Foreign Experience of Unmanned Aerial Systems State Regulation

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ABSTRACT

Nowadays, there have been various fields of human life and economic activity used unmanned aerial vehicles (UAVs) and unmanned aerial systems (UAS) based on them. The capabilities of modern UAVs allow them to become participants in air traffic, which implies regulation of their creation and use by the state. However, regarding rapidly developing technologies, state regulators do not always keep pace with transforming realities in their decisions, both in the Russian Federation and in other countries of the world. The paper considers state regulation issues of the UAS development, their certification, registration, operation, as well as ensuring the safety of use in Russia and abroad in order to assess the possibilities for further development of legislation to achieve a compromise between the needs of the state, private business and citizens in this field.

Keywords: unmanned aerial vehicles; unmanned aerial systems; unmanned aircraft; UAV; BASS; BVS; state regulation

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UNMANNED AERIAL SYSTEMS IN THE CONTEXT OF THE DIGITAL ECONOMY

In recent decades, modern technology, especially information technology, has penetrated virtually all spheres of human life and professional activity, qualitatively radically changing many of them. The process of digitalisation, both in its importance for the individual and society as a whole, and in its rate of formation, is unparalleled in history. In connection with this circumstance, the concept of digital economy is naturally formed, which is now understood not only as the circulation of information goods and services (as it was just a decade ago), but a fundamentally different paradigm of economic and social structure, based on the penetration of information technology in all areas of human life and development based on its wide application of a global network of economic and social activities [1]. At the same time, the scale and pace of its development cannot be ignored by the state and business, for they face the urgent tasks of adapting to new economic behavior and the need to change strategies and functions of public authorities. Such challenges evidently require proper legal support for new economic mechanisms, which in recent years has been taken into account by the leaders of most developed and developing countries, including the Russian Federation. In particular, at the plenary session of the St. Petersburg International Economic Forum in 2022, Russian President V. V. Putin stated the need to "form a fundamentally new, flexible regulatory framework for the implementation of digital technologies in all spheres of life".[1]

In turn, the lack of proper legal support for the digital economy may not only hinder the unlocking of its potential, but also create risks for both business and public administration [2]. The importance of these risks increases in those sectors where modern technologies do not form new branches of human activity, but significantly modify the existing ones. These include the use and exploitation of unmanned technologies.

Unmanned aerial vehicles and unmanned aerial systems based on them are not a new phenomenon in the technical sense. Until recently, however, their scope of application has been relatively limited: on the one hand, limited to specific projects in the military and aerospace industry and, on the other hand, limited to aeromodelling. Technological advances that have significantly increased the manoeuvrability, autonomy, and range of UAVs and at the same time have reduced the size and cost of UAVs, led to their literally explosive proliferation in a variety of fields of human life and economic activity. UAVs have begun to be widely used in commercial projects (for cargo deliveries, video and photography, topographic and geodetic surveys, application of pesticides and fertilizers in agriculture, etc.) and at the state level, for example in emergency response and rectification of the consequences. UAVs also continue to be used for sports and recreational purposes and, due to their increasing accessibility and ease of use, they are increasingly being purchased by people who have nothing to do with organised aeromodelling and who have very little understanding of the legal situation they face when using high-tech "toys".

Therefore, it cannot be denied that UAVs today can have a significant impact on maintaining public order and helping to save lives [3]. As part of the "technology of the future", they can not only simplify, but also radically change the lives of society and individual citizens [4]. In addition, the Rosaviation has noted a steady increase in

[1] URL: https://forumspb.com/news/news/vladimir-putin-postavil-zadachu-dobitsya-v-rf-vseobshchey-tsifrovoy-gramotnosti/

the number of UAV violations of airspace, which is a threat. At the same time, private unauthorized launches of light UAVs near airfields and other air transport infrastructure are particularly dangerous [5]. But while such cases are usually due to legal and technical illiteracy of citizens, in a number of other situations the use of drones threatens law and order when used intentionally. In particular, they can be used for smuggling [6], delivering prohibited items to correctional facilities [7], filming secret and private objects [8], carrying out terrorist acts [9], etc. The mere possibility of a drone crashing or colliding uncontrollably with people, vehicles and other property of citizens is also a source of threat [10].

Thus, like many other innovative technologies, in a relatively short period of time UAVs, which were considered as specific devices of niche application, have become a phenomenon that requires addressing the issue of its legal status and state regulation, in full accordance with the opinion of S. G. Kamolov, who observes that "...innovation and information technology have become critical elements of modern management. Understanding new opportunities and risks <...> — is a pressing need for scientists and practitioners alike. <...> today, the state needs to answer the key question: how to protect the legitimate interests of every citizen in an era of digital standardisation and unification?" [11].

In recent years, a noticeable number of publications have appeared in the scientific literature concerning the creation, certification, accounting, and operation of drones, dealing with general issues of legal regulation of this sphere [3, 12–14], sectoral specifics of UAV regulation [9, 15, 16], international legal and comparative legal aspects of the problem [17–19], etc. Nevertheless, it should be noted that most of them refer to scientific periodicals and, most likely, are directed to the statement of the problem. At the same time, fundamental works, and dissertation studies on the regulation of unmanned systems, including aviation systems, are not currently presented in the domestic scientific literature.

As a contribution to the development of the mentioned problems, the author conducted a comparative study of state regulation of UAS development, certification, registration, operation, as well as ensuring the safety of UAS use in Russia and abroad in order to assess the possibility of further development of legislation to achieve a compromise between the needs of the state, private business and citizens in this area. Its general methodological basis was founded on the dialectical method of knowledge, purposeful and systematic approaches to the complex of problems under study. The specific methodology was based on the special methods of knowledge: comparative-legal, formal-logical, and formal-legal, as well as — abstraction, analogy, and legal modeling.

Most existing publications recognise UAVs as full-fledged participants in air traffic, which implies legal regulation of their creation and use by the state. However, with respect to rapidly evolving technologies, state regulators, both in the Russian Federation and elsewhere in the world, have not always kept up with the rapidly changing realities in making their decisions.

In the Russian Federation, for example, the relevant terminology is still not clearly defined in the legislation. The key legal act in the field of airspace exploitation and aviation activities in our country, — the Air Code of the Russian Federation[2] (AC RF), operates with the term "unmanned aircraft vehicle" (UAV), defining it as an aircraft controlled (managed) by a pilot who is not

[2] Air Code of the Russian Federation of 19.03.1997 No. 60-FL. URL: http://www.consultant.ru/document/cons_doc_LAW_13744/

on board. The term "aircraft vehicle" also appears in the Federal Rules for the Use of Airspace in relation to UAVs.[3] At the same time, some national standards, industry, and sectoral methodological and departmental documents[4] use the term "unmanned flying vehicle" interpreted in the same way as UAV. It should be noted that the domestic regulatory framework is currently unifying the terminology regarding UAVs by replacing the term "flying vehicle" with "aircraft vehicle" (for example, the Rules of Airspace have, until recently, included the concept of "flying vehicle").

International documents also reveal different approaches to fixing the conceptual framework in this field. In particular, the Convention on International Civil Aviation in Annex II "Rules of the Flights" uses the same terminology as in the Russian AC and provides a similar definition of the concept ("aircraft designed to fly without a pilot on board").[5] At the same time, Council Regulation of the European Union (EC) No. 428/2009 "On setting up a Community regime for the control of exports, movement, trade and transit of dual-use goods" operates with the concept of an "unmanned aerial vehicle".[6] It should be noted that this terminology is used more frequently in international legislation and regulations of foreign countries and tends to replace the term "aircraft".

The term "unmanned aircraft vehicle" is also almost always used in the specialized literature, which raises the question of whether this broad introduction of the term "unmanned aerial vehicle" into the domestic regulatory framework is appropriate. In addition to the obvious difficulties arising from differences in terminology, the use of such terms may create a number of other conflicts, in particular with respect to the legal regime of UAVs. For example, according to Article 130 of the Civil Code of the Russian Federation (CC)[7] aircraft subject to registration belong to immovable property. On the other hand, according to the Unmanned Aerial Vehicles Registration Rules,[8] UAVs with a take-off weight of 0.15 kg or more, i.e., including amateur (household) vehicles, are subject to such registration. This raises the question of extending to them other norms of the Civil Code of the Russian Federation relating to immovable property and the appropriateness of such an extension [20].

Nevertheless, despite the existing problems even in the area of terminology unification, it should be noted that the problem of legal regulation of UAVs and UAS in our country has recently received

[3] Decree of the Government of the Russian Federation of 11.03.2010 No 138 'On approval of Federal Rules for Use of Airspace of the Russian Federation' (with amendments and additions, in force from 09.06.2021).URL: http://www.consultant.ru/document/cons_ doc_LAW_98957/

[4] Letter dated 03.11.2009 from the Ministry of Regional Development of the Russian Federation No. 36576-IP/08 "On the acquisition and maintenance of an unmanned aerial vehicle". URL: https://docs.cntd.ru/document/902230744; GOST R 59926–2021/ ISO/IEC TR 20547–2:2018. National Standard of the Russian Federation. Information technology. Reference architecture for big data. Part 2. Variants of use and derived requirements" (approved and enacted by Rosstandart Order No.1685-st dated 02.12.2021). URL: https://docs.cntd.ru/document/1200182073; SRM 218.9.017–2019. "Sectoral road methodological document. Methodological recommendations on the production of aerial photographic work using unmanned aerial vehicles for road construction and reconstruction front end engineering design". URL: https://rosavtodor.gov.ru/storage/app/media/uploaded-files/odm-2189017–2019.pdf

[5] Travnikov A. I., Abashidze A. Kh., edited. International Air Law. A Textbook for Bachelor's and Master's Degree. Moscow: Publishing house Yurait; 2019. 444 p. URL: https://mx3.urait.ru/uploads/pdf_review/B 4F3D 6A0–7570–4555–9ACE-5228BBCC 9376.pdf

[6] Ibidem.

[7] Civil Code of the Russian Federation (Part One) of 30.11.1994 No. 51-FL. URL: http://www.consultant.ru/document/cons_doc_LAW_5142/

[8] Decree of the Government of the Russian Federation of 25.05.2019 No. 658 "On Approval of the Rules for Accounting of Unmanned Civil Aircraft with a Maximum Take-off Weight of 0.15 kilograms to 30 kilograms, imported into the Russian Federation or Manufactured in the Russian Federation". URL: https://base.garant.ru/72255560/

increased, albeit somewhat belated, attention. The norms regulating the legal status of UAVs/UASs first entered domestic legal usage only in 2015, when the Federal Law of 30.12.2015 No. 462-FL "On amendments to the Air Code of the Russian Federation regarding the use of unmanned aircraft" (the so-called "drone law").[9] In 2019, the Decree of the Government of the Russian Federation of 25.05.2019 No. 658[10] approved the Rules for Accounting of Unmanned Civil Aircraft, and the necessary amendments were made to the Rules of Airspace Use, approved by Russian Government Decree No. 138 of 11.03.2010.[11] An important year in terms of the development of the regulatory framework for the creation and operation of UAS was 2021, when national standards for the classification and categorisation of UAS (GOST R 59517–2021), their development procedure (GOST R 59518–2021), airworthiness requirements (GOST R 59751–2021) and a number of others were approved and enacted [21].

Special consideration should be given to the Concept of Integration of Unmanned Aerial Vehicles in the Common Airspace of the Russian Federation, approved by RF Government Decree No. 2806-d of 05.10.2021,[12] which is aimed at achieving such a state of air legislation and the air transport system that would allow unmanned and manned aircraft to fly in the common airspace at an acceptable safety level. This Concept defines the main directions for the integration of unmanned aircraft into the common airspace of the Russian Federation, the development of relevant technologies, and the improvement of the legal and regulatory and technical framework for the use of unmanned systems. The stages of integration of unmanned aerial vehicles into Russian airspace are regulated by the Concept until 2030; however, its provisions provide for the testing and approbation of such technologies using experimental legal regimes (ELR) in accordance with the provisions of Federal Law No. 258-FL of 31 July 2020 "On Experimental Legal Regimes in the sphere of Digital Innovation in the Russian Federation".[13] As part of the implementation of the above provisions, in March 2022 Decrees No. 458[14] and No. 462,[15] of the Government of the Russian Federation of 24.03.2022 were adopted establishing ELR in the field of digital innovation for UAS operation in a number of regions of the Russian Federation (Khanty-Mansiysk Autonomous District, the Kamchatka Territory, Yamalo-Nenets Autonomous District, Chukotka Autonomous District and the Tomsk Region). In these constituent entities of the Russian Federation, it is possible to carry out UAV flights for mail and cargo delivery without excessive regulatory load, as well as to conduct aerial photography, and in the Tomsk region, in addition to that, the use of UAS in agriculture for aerial chemical works is allowed. The duration

[9] URL: http://www.consultant.ru/document/cons_doc_LAW_191538/

[10] URL: https://base.garant.ru/72255560/

[11] URL: https://www.consultant.ru/document/cons_doc_LAW_98957/

[12] URL: http://www.consultant.ru/document/cons_doc_LAW_397613/

[13] URL: http://www.consultant.ru/document/cons_doc_LAW_358738/

[14] Government Resolution of the Russian Federation No. 458 of 24.03.2022 "On Establishing an Experimental Legal Regime in the sphere of Digital Innovation and Approving a Programme for an Experimental Legal Regime in Digital Innovation on the Operation of Unmanned Aerial Systems in the Tomsk Region". URL: http://publication.pravo.gov.ru/Document/View/0001202203260012

[15] Government Resolution of the Russian Federation of 24.03.2022 No. 462 "On the establishment of an experimental legal regime in the field of digital innovation and approval of a programme of experimental legal regime in the field of digital innovation for the operation of unmanned aerial systems in the Kamchatka Territory, Khanty-Mansiysk Autonomous District — Yugra, Chukotka Autonomous District and Yamalo-Nenets Autonomous District". URL: http://publication.pravo.gov.ru/Document/View/0001202203260014

of the ELR in the experimental regions will be three years, after which conclusions will be made and decisions will be taken on the further development of UAS in Russia.

The aforementioned documents have largely closed the regulatory gaps in terms of UAS development, certification, registration, and operation. However, the issues of ensuring the safety of others, regulating the joint use of manned and unmanned aerial systems, protecting privacy and other interests of citizens, regulating, and developing the UAV market and many others remain inadequately regulated [13], although the development of legislation in this direction is among the activities envisaged by the Concept of Integration of Unmanned Aerial Vehicles into a Common Airspace. The existing regulations also need continuous improvement to meet the ever-changing realities of this area of regulation (as an example, during the short period of existence of the Regulation on Accounting for Unmanned Civil Aircraft Vehicles that are subject to accounting, their minimum flight weight has already had to be changed from 0.25 to 0.15 kg).

REGULATORY FRAMEWORK FOR THE CREATION, ACCOUNTING, AND OPERATION OF UNMANNED AERIAL VEHICLES

In the recent history of domestic legislation and state regulation of various spheres of social life, the practice of shaping effective approaches has developed, taking into account the identification and use of relevant experience of foreign countries. However, foreign regulators are now also faced with the need to address the regulatory issues of widespread implementation of UAV systems in various spheres of human activity promptly, as they arise.

When analysing foreign experience in the field in question, it is logical to focus primarily on countries where the implementation of UAS is at a higher level. According to the International Federation of Robotics (IFR) these include China, Japan, Sweden, Italy, Singapore, UK, USA, Canada, Germany, Italy, and France. The study of the practice of regulatory control of the creation, accounting, and operation of UAS in these countries allows us to speak of the possibility to identify a certain pattern that has developed in this area and has been applied in general terms by the domestic regulator as well [19]. First of all, it includes the amendments to the main legal act regulating airspace use, establishing basic general norms concerning UAS (conceptual framework, classification of UAVs, general certification and accounting requirements, basic operating principles). Special issues related to obtaining airworthiness certificates, approval of flight schedules, procedures, and administrative procedures for UAV accounting, etc., are regulated by separate documents (standards, orders, etc.). Provisions set out in such documents are also generally similar to those introduced in the domestic regulatory framework. They include limitations on the altitude and region of UAV flights, determine the minimum take-off weight of vehicles subject to state accounting, contain requirements for the creation and/or certification of UAVs and UAS. There are, of course, some regional and national specifics — for example, UK legislation requires programmatic restrictions of UAV flight areas (near airports, strategic sites, etc.) and Canada has special requirements for UAVs flying where there are people and their pilots (operators) [17].

However, globally, there is a greater variety of approaches to government regulation of the creation (importation), registration and operation of UAS, which can be divided into three groups [13]. The first would include countries where the importation, acquisition, and operation of UAS/UAVs for personal and

commercial use is completely prohibited (Armenia, Turkey, Peru, Vietnam). The second would include those where the use of UAVs is not in fact regulated by the state and can be carried out freely (Iceland, Denmark). Russia, like the above-mentioned countries and many others, belongs to the third and most numerous groups of countries, where the use of UAVs is regulated by the state and is allowed subject to certain requirements for their certification (licensing), accounting and operating procedures. These requirements may be quite liberal (for example, Singapore does not regulate the use of UAVs weighing up to 7 kg), rather strict (in the Philippines and Malaysia, any UAV must be registered, and its operator must have a certificate and license issued after training), or even irrelevant to the problems of UAS use (Morocco, in particular, prohibits the operation of UAVs imported into the country, but allows the use of those purchased in its territory).

Regulators in a number of countries have taken steps not only to regulate the spontaneous situation of UAS/UAV applications, but also to streamline their development process. In the USA, for example, a strategic development document on the use and operation of UAVs until 2038 has been approved, but it is mainly related to their military applications..[16] In the Russian Federation, for its part, the Decree of Government of the Russian Federation No 576-d dated 03.04.2018[17] approved the Action Plan ("roadmap") to improve legislation and remove administrative barriers in order to ensure the implementation of the action plan ("roadmap") of the National Technology Initiative in the direction of "Aeronet". It covers the development of air legislation, including in terms of UAS technologies (which are also included in the National Strategy for the Development of Artificial Intelligence until 2030[18]).

In general, it can be said that the state regulation of the use of UAS, both in Russia and worldwide, is at the very beginning of its formation. At the same time, it is obvious that further technological development will contribute to the increasing expansion of the scope of UAS application, which will require adequate regulatory support based on the use of the best global practices and unification of legislation in terms of applied terminology, as well as approaches to UAV and UAS classification, requirements for their certification and operators (pilots), etc. It should be noted that the problems of using unmanned systems cannot be solved only by introducing the necessary provisions into legislation — this will also require the development, implementation and fine-tuning of mechanisms for their implementation in accordance with the changing realities.

[16] DoD Unmanned Systems Integrated Roadmap FY 2013–2038. URL: https://publicintelligence.net/dod-unmanned-systems-2013/

[17] The Decree of the Government of the Russian Federation No. 576-d of 03.04.2018 "On approval of the action plan ("road map") on improvement of legislation and elimination of administrative barriers in order to ensure implementation of the action plan ("road map") of the National Technological Initiative in the direction of "Aeronet". URL: https://www.consultant.ru/document/cons_doc_LAW_295241/

[18] Presidential Decree of the Russian Federation No. 490 of 10.10.2019 "On the Development of Artificial Intelligence in the Russian Federation" (together with the "National Strategy for the Development of Artificial Intelligence until 2030"). URL: https://www.consultant.ru/document/cons_doc_LAW_335184/

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